

Data Validation Report

Project:	Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling	
Laboratory:	Test America, Knoxville, Tennessee	
Service Request:	580-79669-3	
Analyses/Method:	Chlorinated Biphenyls by HRGC/HRMS / E1668A	
Validation Level:	Stage 2A	
AECOM Project Number:	60566335.2.12	
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SUMMARY

The samples listed below were collected by AECOM in Portland Harbor in Portland, OR on August 16, 2018.

Sample ID	Matrix/Sample Type
PDI-SG-B437	Sediment
PDI-SG-B437-D	Sediment/Field Duplicate
PDI-SG-B438	Sediment

Data validation activities were conducted with reference to:

- EPA Method 1668A: Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS (USEPA, August 2003),
- USEPA Contract Laboratory Program National Functional Guidelines for High Resolution Superfund Methods Data Review (April 2016),
- Quality Assurance Project Plan, Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling, Portland Harbor Superfund Site (March 2018), and the
- Laboratory quality control (QC) limits.

The National Functional Guidelines were modified to accommodate the non-CLP methodologies. In the absence of method-specific information, laboratory QC limits, project-specific requirements and/or AECOM professional judgment were used as appropriate.

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness [chain-of-custody (COC)/sample integrity]
- ✓ Holding times and sample preservation
- ✓ Laboratory blanks/equipment blanks
- NA Matrix spike (MS) and/or matrix spike duplicate (MSD) results
- ✓ Ongoing precision and recovery results

- ✓ Field duplicate results
- ✓ Labeled compounds and labeled clean-up standard recoveries
- X Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (X) indicates that a QC nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as qualified and may be used for decision making purposes. Select data points were qualified as estimated or negated due to nonconformances of certain QC criteria (see discussion below).

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Holding Times and Sample Preservation

Sample preservation and preparation/analysis holding times were reviewed for conformance with method criteria. All method QC acceptance criteria were met.

Laboratory Blanks

Method blank results are evaluated as to whether there are contaminants detected above the estimated detection limit (EDL). Target compounds were detected in the laboratory method blanks associated with the samples in this data set.

The NFG guidance stipulates that a conservative approach should be taken with regards to qualification of PCB congeners due to the toxicity of these compounds and the reporting of false negative results should be avoided. Therefore, in order to avoid the reporting of false negative results professional judgment was used to qualify the data in the following manner. As allowed in the NFG, a blank action limit (BAL) was determined as 5 times the method blank result:

- When the sample results were < the method blank result, the sample result was qualified as nondetect (U) at the sample result.
- When the sample result was \geq the method blank result and \leq the BAL, the sample result was qualified as estimated and potentially biased high (J+).
- When the sample result was > the BAL, sample result was not qualified.

It was not necessary to qualify the sample results for blank contamination using the criteria above.

MS/MSD Results

A MS/MSD was not submitted with this sample delivery group (SDG).

Ongoing Precision and Recovery

The OPR %Rs and/or RPDs were reviewed for conformance with the method QC acceptance criteria. All method QC acceptance criteria were met.

Field Duplicate Results

Field duplicate RPDs were reviewed for conformance with the AECOM QC acceptance criteria of $\leq 50\%$ [if one or both results were greater than five times the practical quantitation limit (PQL)] for solid matrices and $\leq 30\%$ [if one or both results were greater than five times the PQL] for aqueous matrices. All QC acceptance criteria was met.

Labeled Compounds and Labeled Clean-up Standard Recoveries

The labeled compounds and labeled clean-up standard %Rs were reviewed for conformance with the QC acceptance criteria. No QC outliers were noted during the sample review.

Sample Results/Reporting Issues

All sample results detected at concentrations less than the lowest calibration standard (or PQL) but greater than the EDL are qualified by the laboratory as estimated (J). This "J" qualifier is retained during data validation.

The laboratory qualified the sample results with a "q" to indicate that the ion abundance ratio was outside of the QC acceptance limits; the result should be considered as an Estimated Maximum Possible Concentration (EMPC). These results were qualified as estimated and tentatively identified (JN). Qualified sample results are summarized in Table 1.

It should be noted that the "JN" qualifier was retained rather than replacement with the conventional overall "J", "J+", and "J-" qualifiers in instances where sample results were qualified for multiple quality control nonconformances.

Percent Solids Content

The percent solids data were reviewed since the amount of moisture in a solid sample may have an impact on data representativeness. Due to the extremely low solubility of PCB congeners in water, these analytes should be contained in the solid phase. Consequently, the NFG guidance does not stipulate a percent solids criterion. If applicable, EPA Regional guidance is used when assessing percent solids content. In the absence of EPA Regional guidance, AECOM uses 30% solids (from the NFG semivolatile guidance) as a benchmark to evaluate the percent solids content and professional judgment is used to determine the necessity to qualify data. Data were not qualified on the basis of percent solids content.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.

ATTACHMENTS

Attachment A: Qualifier Codes and Explanations

Attachment B: Reason Codes and Explanations

Table 1 - Data Validation Summary of Qualified Data

Sample ID	Matrix	Compound	Result	RDL	EDL	Units	Validation Qualifiers	Validation Reason
PDI-SG-B437	SE	PCB-1	0.0014	0.00020	0.00020	ng/g	JN	k
PDI-SG-B437	SE	PCB-102	0.012	0.00039	0.00039	ng/g	JN	k
PDI-SG-B437	SE	PCB-103	0.0082	0.00040	0.00040	ng/g	JN	k
PDI-SG-B437	SE	PCB-108	0.012	0.0016	0.0016	ng/g	JN	k
PDI-SG-B437	SE	PCB-114	0.0067	0.0014	0.0014	ng/g	JN	k
PDI-SG-B437	SE	PCB-12	0.0023	0.0018	0.0018	ng/g	JN	k
PDI-SG-B437	SE	PCB-120	0.0040	0.00029	0.00029	ng/g	JN	k
PDI-SG-B437	SE	PCB-124	0.012	0.0016	0.0016	ng/g	JN	k
PDI-SG-B437	SE	PCB-126	0.0086	0.0016	0.0016	ng/g	JN	k
PDI-SG-B437	SE	PCB-13	0.0023	0.0018	0.0018	ng/g	JN	k
PDI-SG-B437	SE	PCB-131	0.0063	0.0036	0.0036	ng/g	JN	k
PDI-SG-B437	SE	PCB-134	0.036	0.0034	0.0034	ng/g	JN	k
PDI-SG-B437	SE	PCB-139	0.010	0.0029	0.0029	ng/g	JN	k
PDI-SG-B437	SE	PCB-140	0.010	0.0029	0.0029	ng/g	JN	k
PDI-SG-B437	SE	PCB-143	0.036	0.0034	0.0034	ng/g	JN	k
PDI-SG-B437	SE	PCB-152	0.0020	0.00013	0.00013	ng/g	JN	k
PDI-SG-B437	SE	PCB-154	0.013	0.00014	0.00014	ng/g	JN	k
PDI-SG-B437	SE	PCB-16	0.010	0.00024	0.00024	ng/g	JN	k
PDI-SG-B437	SE	PCB-162	0.0025	0.0021	0.0021	ng/g	JN	k
PDI-SG-B437	SE	PCB-169	0.0036	0.0017	0.0017	ng/g	JN	k
PDI-SG-B437	SE	PCB-172	0.031	0.000080	0.000080	ng/g	JN	k
PDI-SG-B437	SE	PCB-19	0.0020	0.00026	0.00026	ng/g	JN	k
PDI-SG-B437	SE	PCB-191	0.0050	0.000054	0.000054	ng/g	JN	k
PDI-SG-B437	SE	PCB-197	0.0046	0.00018	0.00018	ng/g	JN	k
PDI-SG-B437	SE	PCB-200	0.015	0.00016	0.00016	ng/g	JN	k
PDI-SG-B437	SE	PCB-207	0.014	0.00044	0.00044	ng/g	JN	k
PDI-SG-B437	SE	PCB-209 (decachlorobiphenyl)	0.051	0.000035	0.000035	ng/g	JN	k
PDI-SG-B437	SE	PCB-22	0.016	0.00077	0.00077	ng/g	JN	k
PDI-SG-B437	SE	PCB-24	0.00029	0.00018	0.00018	ng/g	JN	k
PDI-SG-B437	SE	PCB-3	0.0031	0.00025	0.00025	ng/g	JN	k
PDI-SG-B437	SE	PCB-35	0.0018	0.00077	0.00077	ng/g	JN	k
PDI-SG-B437	SE	PCB-4	0.0043	0.0026	0.0026	ng/g	JN	k
PDI-SG-B437	SE	PCB-43	0.0024	0.00036	0.00036	ng/g	JN	k
PDI-SG-B437	SE	PCB-55	0.0020	0.00028	0.00028	ng/g	JN	k
PDI-SG-B437	SE	PCB-60	0.014	0.00029	0.00029	ng/g	JN	k
PDI-SG-B437	SE	PCB-63	0.0058	0.00026	0.00026	ng/g	JN	k
PDI-SG-B437	SE	PCB-73	0.0024	0.00036	0.00036	ng/g	JN	k
PDI-SG-B437	SE	PCB-8	0.015	0.0016	0.0016	ng/g	JN	k

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PDI-SG-B437	SE	PCB-98	0.012	0.00039	0.00039	ng/g	JN	k
PDI-SG-B437-D	SE	PCB-103	0.0083	0.00043	0.00043	ng/g	JN	k
PDI-SG-B437-D	SE	PCB-12	0.0038	0.0019	0.0019	ng/g	JN	k
PDI-SG-B437-D	SE	PCB-120	0.0031	0.00031	0.00031	ng/g	JN	k
PDI-SG-B437-D	SE	PCB-13	0.0038	0.0019	0.0019	ng/g	JN	k
PDI-SG-B437-D	SE	PCB-148	0.0010	0.00023	0.00023	ng/g	JN	k
PDI-SG-B437-D	SE	PCB-15	0.015	0.0019	0.0019	ng/g	JN	k
PDI-SG-B437-D	SE	PCB-175	0.0066	0.00048	0.00048	ng/g	JN	k
PDI-SG-B437-D	SE	PCB-19	0.0029	0.00022	0.00022	ng/g	JN	k
PDI-SG-B437-D	SE	PCB-2	0.0077	0.00030	0.00030	ng/g	JN	k
PDI-SG-B437-D	SE	PCB-205	0.0051	0.00097	0.00097	ng/g	JN	k
PDI-SG-B437-D	SE	PCB-25	0.0057	0.00068	0.00068	ng/g	JN	k
PDI-SG-B437-D	SE	PCB-26	0.010	0.00072	0.00072	ng/g	JN	k
PDI-SG-B437-D	SE	PCB-29	0.010	0.00072	0.00072	ng/g	JN	k
PDI-SG-B437-D	SE	PCB-3	0.0022	0.00031	0.00031	ng/g	JN	k
PDI-SG-B437-D	SE	PCB-35	0.0024	0.00075	0.00075	ng/g	JN	k
PDI-SG-B437-D	SE	PCB-37	0.023	0.00075	0.00075	ng/g	JN	k
PDI-SG-B437-D	SE	PCB-4	0.0061	0.0027	0.0027	ng/g	JN	k
PDI-SG-B437-D	SE	PCB-43	0.0034	0.00034	0.00034	ng/g	JN	k
PDI-SG-B437-D	SE	PCB-45	0.013	0.00039	0.00039	ng/g	JN	k
PDI-SG-B437-D	SE	PCB-51	0.013	0.00039	0.00039	ng/g	JN	k
PDI-SG-B437-D	SE	PCB-72	0.0045	0.00027	0.00027	ng/g	JN	k
PDI-SG-B437-D	SE	PCB-73	0.0034	0.00034	0.00034	ng/g	JN	k
PDI-SG-B437-D	SE	PCB-77	0.016	0.00026	0.00026	ng/g	JN	k
PDI-SG-B437-D	SE	PCB-8	0.012	0.0017	0.0017	ng/g	JN	k
PDI-SG-B437-D	SE	PCB-82	0.038	0.00050	0.00050	ng/g	JN	k
PDI-SG-B437-D	SE	PCB-84	0.092	0.00051	0.00051	ng/g	JN	k
PDI-SG-B438	SE	PCB-100	0.036	0.00024	0.00024	ng/g	JN	k
PDI-SG-B438	SE	PCB-103	0.035	0.00024	0.00024	ng/g	JN	k
PDI-SG-B438	SE	PCB-12	0.010	0.0019	0.0019	ng/g	JN	k
PDI-SG-B438	SE	PCB-122	0.016	0.0023	0.0023	ng/g	JN	k
PDI-SG-B438	SE	PCB-123	0.019	0.0020	0.0020	ng/g	JN	k
PDI-SG-B438	SE	PCB-126	0.0048	0.0021	0.0021	ng/g	JN	k
PDI-SG-B438	SE	PCB-13	0.010	0.0019	0.0019	ng/g	JN	k
PDI-SG-B438	SE	PCB-154	0.055	0.00014	0.00014	ng/g	JN	k
PDI-SG-B438	SE	PCB-169	0.0082	0.0023	0.0023	ng/g	JN	k
PDI-SG-B438	SE	PCB-182	0.011	0.00031	0.00031	ng/g	JN	k
PDI-SG-B438	SE	PCB-19	0.011	0.00036	0.00036	ng/g	JN	k
PDI-SG-B438	SE	PCB-2	0.0070	0.00035	0.00035	ng/g	JN	k
PDI-SG-B438	SE	PCB-201	0.038	0.00034	0.00034	ng/g	JN	k
PDI-SG-B438	SE	PCB-35	0.0072	0.0014	0.0014	ng/g	JN	k

Sample ID	Matrix	Compound	Result	RDL	EDL	Units	Validation Qualifiers	Validation Reason
PDI-SG-B438	SE	PCB-39	0.0073	0.0013	0.0013	ng/g	JN	k
PDI-SG-B438	SE	PCB-4	0.020	0.0027	0.0027	ng/g	JN	k
PDI-SG-B438	SE	PCB-54	0.00047	0.0000082	0.0000082	ng/g	JN	k
PDI-SG-B438	SE	PCB-58	0.012	0.00035	0.00035	ng/g	JN	k
PDI-SG-B438	SE	PCB-67	0.012	0.00030	0.00030	ng/g	JN	k
PDI-SG-B438	SE	PCB-9	0.0038	0.0020	0.0020	ng/g	JN	k
PDI-SG-B438	SE	PCB-93	0.036	0.00024	0.00024	ng/g	JN	k

Attachment A**Qualifier Codes and Explanations**

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
J-	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with a potential low bias.
J+	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with a potential high bias.
JN	The analyte was tentatively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Attachment B

Reason Codes and Explanations

Reason Code	Explanation
be	Equipment blank contamination
bf	Field blank contamination
bl	Laboratory blank contamination
c	Calibration issue
cl	Clean-up standard recovery
d	Reporting limit raised due to chromatographic interference
fd	Field duplicate RPDs
h	Holding times
i	Internal standard areas
k	Estimated Maximum Possible Concentration (EMPC)
l	LCS or OPR recoveries
lc	Labeled compound recovery
ld	Laboratory duplicate RPDs
lp	Laboratory control sample/laboratory control sample duplicate RPDs
m	Matrix spike recovery
ma	Multiple analyses. Sample analyzed more than once, a value from another analysis should be used.
md	Matrix spike/matrix spike duplicate RPDs
nb	Negative laboratory blank contamination
p	Chemical preservation issue
r	Dual column RPD
q	Quantitation issue
s	Surrogate recovery
su	Ion suppression
t	Temperature preservation issue
x	Percent solids
y	Serial dilution results
z	ICS results