# DATA VALIDATION REPORT

**Portland Harbor Superfund Site**

**June 2023 Sediment Sampling**

**SDG: K2306972**

Chemical Analyses Performed by:

**ALS Environmental Kelso**

Prepared by:

**ENVIRONMENTAL DATA SERVICES, LTD.**

Prepared for:

**HGL**

**September 28, 2023**

**5 Brilliant Avenue, Pittsburgh, PA 15215**
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ENVIRONMENTAL DATA SERVICES, LTD.

## EXECUTIVE NARRATIVE

**Sample Delivery Group**: K2306972
**Laboratory:** ALS Environmental
**Site:** Portland Harbor Superfund Site
**Sampling dates**: 06/18/2023
**Number of Samples:** 1
**Test Method:** NWTPH-Dx
**Analysis:** Diesel Range Organics (DRO) and Residual Range Organics (RRO)

**Validation Level:** Level 2A

**Quality Assurance Project Plan:** Uniform Federal Policy-Quality Assurance Project Plan, Revision 3, Remedial Design Services, Swan Island Basin Project Area, Portland Harbor Superfund Site, Portland Multnomah County, Oregon, May 2022 (QAPP).

**Validation Guidelines:** United States Environmental Protection Agency (USEPA) National Functional Guidelines for Organic Superfund Methods Data Review, OLEM 9240.0-51, EPA-540-R-20-005, (November 2020).

| Client Sample ID | Laboratory Sample ID |
|---|---|
| SIB-SED-MG-AAM169-NW-061723 | K2306972-001 |

Table 1 provides a summary of the major and minor data quality issues identified in this data set. All data are acceptable except those results which have been qualified with “R”, rejected. Data validation qualifiers along with associated descriptions are provided in Table 2. All data qualification related to this group of samples is detailed on the attached sheets.

All data users should note two facts. First, an "R" flag means that the associated value is unusable due to significant quality control (QC) problems, the data is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on any data tables even as a last resort. Second, no analyte concentration, even if it passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

## DATA ASSESSMENT

### 1. NARRATIVE AND COMPLETENESS REVIEW:

*The case narrative was reviewed, and the data package was checked for completeness. No discrepancies were noted.*

### 2. SAMPLE DELIVERY AND CONDITION:

*The samples arrived at the laboratory in acceptable condition. Proper custody was documented.*

### 3. HOLDING TIME:

**The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detect results are flagged "R", rejected. Qualifications were applied to the samples and analytes as shown below.**

*All sample analyses were within the method requirements.*

### 4. BLANKS:

**Quality assurance (QA) blanks (i.e. method, trip, field, or rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field and rinse blanks measure cross-contamination of samples during field operations. Qualifications were applied to the samples and analytes as shown below.**

**A) Method Blank**

*Method blanks were analyzed with appropriate frequency. No problems requiring result qualification were found for this criterion.*

**B) Field / Equipment Blank**

*No sample was submitted as an equipment / field blank in association with this sample delivery group (SDG).*

**C) Trip Blank**

*Trip blanks were not submitted for DRO or RRO analyses.*

### 5. SURROGATES:

**All samples are spiked with system monitoring compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate recovery limits were outside quality control limits established in the QAPP, qualifications were applied to all the samples and analytes as shown below.**

*No problems were found for this criterion.*

## 6. INTERNAL STANDARDS PERFORMANCE:

**Internal standard performance criteria are meant to ensure that the gas chromatograph (GC) sensitivity and response are stable during every experimental run. The retention time of the internal standard must not vary by more than ±10 seconds from the associated continuing calibration standard. The area count must be within a (50-200%) range of the associated standard. If the area count is greater than 200%, non-detected results are not qualified and positive results are flagged as estimated with potential negative bias, "J-". If the area count is less than 50%, positive results are flagged as estimated with potential positive bias, "J+", and non-detected results are flagged "UJ". If the area count is less than 20%, positive results are flagged as estimated with potential positive bias, "J+", and non-detected results will be classified as unusable "R". Qualifications were applied to the samples and analytes as shown below.**

*Internal standards were not used for DRO or RRO analyses.*

## 7. MATRIX DUPLICATE:

**Matrix duplicate (MD) data are generated to determine the long-term precision of the analytical method in various matrices. The MD data may be used in conjunction with other quality control criteria for additional qualification of data.**

*Sample SIB-SED-MG-AAM169-NW-061723 was submitted for MD pair evaluations in association with this SDG. Upon evaluation, all precision indicators were favorable with the following exception. The observed precision between the parent and duplicate samples was outside acceptance limits for DRO. The result reported for the impacted analyte in the parent sample has been qualified estimated "J" on this basis.*

## 8. LABORATORY CONTROL SAMPLE:

**The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Aqueous/water, soil/sediment, wipe, and filter LCSs shall be analyzed for each analyte utilizing the same sample preparations, analytical methods, and quality assurance/quality control (QA/QC) procedures as employed for the samples. All LCS percent recoveries must fall within the control limits established in the QAPP. Qualifications were applied to the samples and analytes as shown below.**

*LCS evaluations were performed in association with the samples in this SDG. Observed recoveries were found to be acceptable in all cases.*

## 9. COMPOUND IDENTIFICATION:

**Compound Identification**

**The compounds are identified on the GC-FID by using the analytes relative retention time (RRT) on the chromatogram. For the results to be a positive hit, the sample peak must be within the anticipated RRT range for compounds.**

*Target compound identifications were not reviewed for samples at the Stage 2A level.*

**Compound Quantification**

*Target compound result quantitation was not reviewed for samples validated at the Stage 2A level.*

*Manual integrations were not reviewed for samples at the Stage 2A level.*

## 10. FIELD DUPLICATE:

**Field duplicates may be taken and analyzed as an indication of overall precision. These analyses measure both field and laboratory precision. A control limit of 50% for the Relative Percent Difference (RPD) for solid samples and 30% RPD for liquid samples shall be used for original and duplicate sample values greater than or equal to five times the Project Quantitation Limit (PQL). A control limit of two times the PQL shall be used if either the sample or duplicate value is less than five times the PQL. For field duplicate analyses that do not meet the technical criteria, the action was applied to only the field sample and its duplicate.**

*No samples were submitted as a field duplicate pair in association with this SDG.*

## 11. DILUTIONS, RE-EXTRACTIONS & REANALYSIS:

**Samples may be re-analyzed for dilution, re-extraction and for other QC reasons. In such cases, the best result values are used.**

*No dilutions, re-extractions, or other re-analyses were performed on any sample associated with this SDG other than those required to quantitate concentrations within the calibration curve values.*

## 12. PROJECT DEFINED REPORTING LIMITS:

*No problems were found for this criterion.*

## 13. OTHER PROBLEMS:

*None.*

**Table 1 Major and Minor Findings**

| | Were acceptance criteria met? | | |
|---|---|---|---|
| | Yes | No | |
| **DRO and RRO** | | **Major** | **Minor** |
| Sample Delivery Condition | x | | |
| Holding Time | x | | |
| Method Blank | x | | |
| Field/Equipment Blank | NA | | |
| Trip Blank | NA | | |
| Surrogates | x | | |
| Internal Standards | NA | | |
| Matrix Duplicate | | | x |
| Laboratory Control Samples | x | | |
| Compound Identification | NA | | |
| Field Duplicate | NA | | |
| Project Reporting Limits | x | | |
| Other Quality Control Data out of Specification | x | | |

Major = Major data quality issue identified resulting in rejection of data.
Minor = Minor data quality issue identified resulting in the qualification of data. Data qualification should be used to inform the data users of data limitations.
NA = Not applicable

**Table 2 Data Validation Qualifiers**

| Data Qualifier | Definition |
|---|---|
| U | The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit. |
| J | The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample. |
| UJ | The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise. |
| R | The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample. |

ENVIRONMENTAL DATA SERVICES, LTD.

## EXECUTIVE NARRATIVE

**Sample Delivery Group**: K2306972
**Laboratory:** ALS Kelso
**Site:** Portland Harbor Superfund Site
**Sampling dates**: 6/18/2023
**Number of Samples:** 1
**Test Method:** Method ALS SOP, Butyltins, Rev 16.0, SOC-BUTYL 12/2/2020
**Analysis:** Tributyltin

**Validation Level:** Level 2A

**Quality Assurance Project Plan:** Uniform Federal Policy-Quality Assurance Project Plan, Revision 3, Remedial Design Services, Swan Island Basin Project Area, Portland Harbor Superfund Site, Portland Multnomah County, Oregon, May 2022 (QAPP).

**Validation Guidelines:** United States Environmental Protection Agency (USEPA) National Functional Guidelines for Organic Superfund Methods Data Review, OLEM 9240.0-51, EPA-540-R-20-005, (November 2020).

| Client Sample ID | Laboratory Sample ID |
|---|---|
| SIB-SED-MG-AAM169-NW-061723 | K2306972-001 |

Table 1 provides a summary of the major and minor data quality issues identified in this data set. All data are acceptable except those results which have been qualified with “R”, rejected. Data validation qualifiers along with associated descriptions are provided in Table 2. All data qualification related to this group of samples is detailed on the attached sheets.

All data users should note two facts. First, an "R" flag means that the associated value is unusable due to significant quality control (QC) problems, the data is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on any data tables even as a last resort.

Second, no analyte concentration, even if it passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

# ORGANIC DATA ASSESSMENT

## 1. NARRATIVE AND COMPLETENESS REVIEW:

*The case narrative was reviewed, and the data package was checked for completeness. No discrepancies were noted.*

## 2. SAMPLE DELIVERY AND CONDITION:

*The sample arrived at the laboratory in acceptable condition. Proper custody was documented. No qualification was required.*

## 3. HOLDING TIME:

**The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detect results are flagged "R", rejected. Qualifications were applied to the samples and analytes as shown below.**

*No problems were found for this criterion.*

## 4. BLANK CONTAMINATION:

**Quality assurance (QA) blanks; i.e. method, trip, field, or rinse blanks; are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field and rinse blanks measure cross-contamination of samples during field operations. Qualifications were applied to the samples and analytes as shown below.**

### A) Method blank contamination:

*No problems were found for this criterion.*

### B) Field/Equipment blank contamination:

*No equipment blank was submitted in association with this sample delivery group (SDG).*

## 5. SURROGATES/SYSTEM MONITORING COMPOUNDS

**All samples are spiked with surrogate/system monitoring compounds (SMC) prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate/SMC concentrations were outside contract specifications, qualifications were applied to the samples and analytes as shown below. Surrogates recovery should meet the limits established in the QAPP for this data set.**

*No problems were found for this criterion.*

## 6. MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY:

**Matrix spike/matrix spike duplicate (MS/MSD) data is generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD data may be used in conjunction with other quality control criteria for additional qualification of data. The spiking compound recoveries and relative percent differences (RPDs) should meet the limits established in the QAPP.**

*No sample was submitted for MS/MSD evaluation in association with this SDG.*

## 7. FIELD DUPLICATES:

**Field duplicates may be taken and analyzed as an indication of overall precision. These analyses measure both field and laboratory precision. A control limit of 50% for the Relative Percent Difference (RPD) for solid samples and 30% RPD for liquid samples shall be used for original and duplicate sample values greater than or equal to five times the Project Quantitation Limit (PQL). A control limit of two times the PQL for solid samples and +/- the PQL for liquid samples shall be used if either the sample or duplicate value is less than five times the PQL. For field duplicate analyses that do not meet the technical criteria, the action was applied to only the field sample and its duplicate.**

*No samples were submitted as a field duplicate pair in association with this SDG.*

## 8. LABORATORY CONTROL SAMPLES:

**The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Aqueous/water, soil/sediment, wipe, and filter LCSs shall be analyzed for each analyte utilizing the same sample preparations, analytical methods, and quality assurance/quality control (QA/QC) procedures as employed for the samples. All LCS percent recoveries must fall within the QAPP control limits. Qualifications were applied to the samples and analytes as shown below.**

*The LCS evaluations were performed at the appropriate frequency. No problems were found for this criterion.*

## 9. OTHER PROBLEMS:

*None.*

## 10. DILUTIONS, RE-EXTRACTIONS & REANALYSIS:

**Samples may be re-analyzed for dilution, re-extraction and for other QC reasons. In such cases, the best result values are used.**

*No problems were identified. Dilutions were performed as necessary to bring target analyte concentrations into calibration range.*

## 11. PROJECT DEFINED REPORTING LIMITS:

*No problems were found for this criterion.*

**Table 1 Major and Minor Findings**

| | Were acceptance criteria met? | | |
|---|---|---|---|
| | Yes | No | |
| **Tributyltin** | | Major | Minor |
| Holding Time | x | | |
| Method Blank | x | | |
| Equipment/Field Blank | NA | | |
| Surrogates/System Monitoring Compounds | x | | |
| Matrix Spike/Matrix Spike Duplicate | NA | | |
| Field Duplicate | NA | | |
| Laboratory Control Samples | x | | |
| Other Quality Control Data out of Specification | x | | |
| Project Reporting Limits | x | | |

Major = Major data quality issue identified resulting in rejection of data.
Minor = Minor data quality issue identified resulting in the qualification of data. Data qualification should be used to inform the data users of data limitations.
NA = Not applicable

**Table 2 Data Validation Qualifiers**

| Data Qualifier | Definition |
|---|---|
| U | The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit. |
| J | The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample. |
| UJ | The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise. |
| R | The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample. |

ENVIRONMENTAL DATA SERVICES, LTD.

## EXECUTIVE NARRATIVE

**Sample Delivery Group**: K2306972
**Laboratory:** ALS Environmental
**Site:** Portland Harbor Superfund Site
**Sampling dates**: 06/18/2023
**Number of Samples:** 1
**Test Method:** EPA SW846 8082A
**Analysis:** Aroclor Polychlorinated Biphenyls (PCB)

**Validation Level:** Level 2A

**Quality Assurance Project Plan:** Uniform Federal Policy-Quality Assurance Project Plan, Revision 3, Remedial Design Services, Swan Island Basin Project Area, Portland Harbor Superfund Site, Portland Multnomah County, Oregon, May 2022 (QAPP).

**Validation Guidelines:** United States Environmental Protection Agency (USEPA) National Functional Guidelines for Organic Superfund Methods Data Review, OLEM 9240.0-51, EPA-540-R-20-005, (November 2020).

| Client Sample ID | Laboratory Sample ID |
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| SIB-SED-MG-AAM169-NW-061723 | K2306972-001 |

Table 1 provides a summary of the major and minor data quality issues identified this data set. All data are acceptable except those results which have been qualified with “R”, rejected. Data validation qualifiers along with associated descriptions are provided in Table 2. All data qualification related to this group of samples is detailed on the attached sheets.

All data users should note two facts. First, an "R" flag means that the associated value is unusable due to significant quality control (QC) problems, the data is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on any data tables even as a last resort. Second, no analyte concentration, even if it passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

# DATA ASSESSMENT

## 1. NARRATIVE AND COMPLETENESS REVIEW:

*The case narrative was reviewed, and the data package was checked for completeness. No discrepancies were noted.*

## 2. SAMPLE DELIVERY AND CONDITION:

*The samples arrived at the laboratory in acceptable condition. Proper custody was documented.*

## 3. HOLDING TIME:

**The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detect results are flagged "R", rejected. Qualifications were applied to the samples and analytes as shown below.**

*All sample analyses reported were within the validation guidance.*

## 4. BLANK CONTAMINATION:

**Quality assurance (QA) blanks (i.e. method, trip, field, or rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure cross-contamination of samples during field operations. Qualifications were applied to the samples and analytes as shown below.**

### A) Method blank contamination

*No problems were found for this criterion.*

### B) Field/Equipment blank contamination

*No sample was submitted as an equipment blank in association with the samples in this sample delivery group (SDG).*

## 5. SURROGATES:

**All samples are spiked with system monitoring compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate recovery limits were outside quality control limits established in the QAPP, qualifications were applied to all the samples and analytes as shown below.**

*No problems were found for this criterion.*

## 6. MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY:

**Matrix spike/matrix spike duplicate (MS/MSD) data is generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD data may be used in conjunction with other quality control criteria for additional qualification of data.**

*No sample was submitted for MS/MSD pair evaluations in association with this SDG.*

## 7. FIELD DUPLICATES:

**Field duplicates may be taken and analyzed as an indication of overall precision. These analyses measure both field and laboratory precision. A control limit of 50% for the Relative Percent Difference (RPD) for solid samples and 30% RPD for liquid samples shall be used for original and duplicate sample values greater than or equal to five times the Project Quantitation Limit (PQL). A control limit of two times the PQL shall be used for solid samples and +/- the PQL for liquid samples if either the sample or duplicate value is less than five times the PQL. For field duplicate analyses that do not meet the technical criteria, the action was applied to only the field sample and its duplicate.**

*No samples were submitted as a field duplicate pair in association with this SDG.*

## 8. LABORATORY CONTROL SAMPLES:

**The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Aqueous/water, soil/sediment, wipe, and filter LCSs shall be analyzed for each analyte utilizing the same sample preparations, analytical methods, and quality assurance/quality control (QA/QC) procedures as employed for the samples. All LCS percent recoveries must fall within the QAPP control limits. Qualifications were applied to the samples and analytes as shown below.**

*No problems were found for this criterion.*

## 9. DILUTIONS, RE-EXTRACTIONS & REANALYSIS:

**Samples may be re-analyzed for dilution, re-extraction and for other QC reasons. In such cases, the best result values are used.**

*No problems were found for this criterion.*

## 10. PROJECT DEFINED REPORTING LIMITS:

*No problems were found for this criterion.*

## 11. OTHER PROBLEMS:

*None.*

**Table 1 Major and Minor Findings**

| | Were acceptance criteria met? | | |
|---|---|---|---|
| | Yes | No | |
| **PCBs** | | Major | Minor |
| Holding Time | x | | |
| Method Blank | x | | |
| Equipment/Rinse Blank | NA | | |
| Surrogates | x | | |
| Matrix Spike/Matrix Spike Duplicate | NA | | |
| Field Duplicate | NA | | |
| Laboratory Control Samples | x | | |
| Project Reporting Limits | x | | |
| Other Quality Control Data out of Specification | x | | |

Major = Major data quality issue identified resulting in rejection of data.
Minor = Minor data quality issue identified resulting in the qualification of data. Data qualification should be used to inform the data users of data limitations.
NA = Not applicable

**Table 2 Data Validation Qualifiers**

| Data Qualifier | Definition |
|---|---|
| U | The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit. |
| J | The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample. |
| NJ | The analyte has been “tentatively identified” or “presumptively” as present and the associated numerical value is the estimated concentration in the sample. |
| UJ | The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise. |
| R | The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample. |

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## EXECUTIVE NARRATIVE

**Sample Delivery Group**: K2306972
**Laboratory:** ALS Environmental
**Site:** Portland Harbor Superfund Site
**Sampling dates**: 06/18/2023
**Number of Samples:** 1
**Test Method:** 1699M Laboratory Standard Operating Procedure (SOP) SVM-PESTMS2
**Analysis:** Project Targeted Organochlorine Pesticides

**Validation Level:** Level 2A

**Quality Assurance Project Plan:** Uniform Federal Policy-Quality Assurance Project Plan, Revision 3, Remedial Design Services, Swan Island Basin Project Area, Portland Harbor Superfund Site, Portland Multnomah County, Oregon, May 2022 (QAPP).

**Validation Guidelines:** United States Environmental Protection Agency (USEPA) National Functional Guidelines for Organic Superfund Methods Data Review, OLEM 9240.0-51, EPA-540-R-20-005, (November 2020).

| Client Sample ID | Laboratory Sample ID |
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# DATA ASSESSMENT

## 1. NARRATIVE AND COMPLETENESS REVIEW:

*The case narrative was reviewed, and the data package was checked for completeness. No discrepancies were noted.*

## 2. SAMPLE DELIVERY AND CONDITION:

*The samples arrived at the laboratory in acceptable condition. Proper custody was documented.*

## 3. HOLDING TIME:

**The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detect results are flagged "R", rejected. Qualifications were applied to the samples and analytes as shown below.**

*All sample analyses reported were within the validation guidance.*

## 4. BLANK CONTAMINATION:

**Quality assurance (QA) blanks (i.e. method, trip, field, or rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure cross-contamination of samples during field operations. Qualifications were applied to the samples and analytes as shown below.**

### A) Method blank contamination

*No problems were found for this criterion.*

### B) Field/Equipment blank contamination

*No sample was submitted as an equipment blank in association with the samples in this sample delivery group (SDG).*

## 5. SURROGATES:

**All samples are spiked with system monitoring compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate recovery limits were outside quality control limits established in the QAPP, qualifications were applied to all the samples and analytes as shown below.**

*No problems were found for this criterion.*

## 6. MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY:

**Matrix spike/matrix spike duplicate (MS/MSD) data is generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD data may be used in conjunction with other quality control criteria for additional qualification of data.**

*No sample was submitted for MS/MSD pair evaluations in association with this SDG.*

## 7. FIELD DUPLICATES:

**Field duplicates may be taken and analyzed as an indication of overall precision. These analyses measure both field and laboratory precision. A control limit of 50% for the Relative Percent Difference (RPD) for solid samples and 30% RPD for liquid samples shall be used for original and duplicate sample values greater than or equal to five times the Project Quantitation Limit (PQL). A control limit of two times the PQL shall be used for solid samples and +/- the PQL for liquid samples if either the sample or duplicate value is less than five times the PQL. For field duplicate analyses that do not meet the technical criteria, the action was applied to only the field sample and its duplicate.**

*No samples were submitted as a field duplicate pair in association with this SDG.*

## 8. LABORATORY CONTROL SAMPLES:

**The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Aqueous/water, soil/sediment, wipe, and filter LCSs shall be analyzed for each analyte utilizing the same sample preparations, analytical methods, and quality assurance/quality control (QA/QC) procedures as employed for the samples. All LCS percent recoveries must fall within the QAPP control limits. Qualifications were applied to the samples and analytes as shown below.**

*No problems were found for this criterion requiring qualification of sample results.*

## 9. DILUTIONS, RE-EXTRACTIONS & REANALYSIS:

**Samples may be re-analyzed for dilution, re-extraction and for other QC reasons. In such cases, the best result values are used.**

*No problems were found for this criterion.*

## 10. PROJECT DEFINED REPORTING LIMITS:

*No problems were found for this criterion.*

## 11. OTHER PROBLEMS:

*None.*

**Table 1 Major and Minor Findings**

| | Were acceptance criteria met? | | |
|---|---|---|---|
| | Yes | No | |
| **Organochlorine Pesticides** | | Major | Minor |
| Holding Time | x | | |
| Method Blank | x | | |
| Equipment/Rinse Blank | NA | | |
| Surrogates | x | | |
| Matrix Spike/Matrix Spike Duplicate | NA | | |
| Field Duplicate | NA | | |
| Laboratory Control Samples | x | | |
| Project Reporting Limits | x | | |
| Other Quality Control Data out of Specification | x | | |

Major = Major data quality issue identified resulting in rejection of data.
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**Table 2 Data Validation Qualifiers**

| Data Qualifier | Definition |
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| UJ | The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise. |
| R | The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample. |

ENVIRONMENTAL DATA SERVICES, LTD.

## EXECUTIVE NARRATIVE

**Sample Delivery Group**: K2306972
**Laboratory:** ALS Environmental
**Site:** Portland Harbor Superfund Site
**Sampling dates**: 06/18/2023
**Number of Samples:** 1
**Test Method:** SW 846 8270D Low Level; SW 846 8270D SIM
**Analysis:** Bis(2-Ethylhexyl)phthalate; Polynuclear Aromatic Hydrocarbons (PAHs)

**Validation Level:** Level 2A

**Quality Assurance Project Plan:** Uniform Federal Policy-Quality Assurance Project Plan, Revision 3, Remedial Design Services, Swan Island Basin Project Area, Portland Harbor Superfund Site, Portland Multnomah County, Oregon, May 2022 (QAPP).

**Validation Guidelines:** United States Environmental Protection Agency (USEPA) National Functional Guidelines for Organic Superfund Methods Data Review, OLEM 9240.0-51, EPA-540-R-20-005, (November 2020).

| Client Sample ID | Laboratory Sample ID |
|---|---|
| SIB-SED-MG-AAM169-NW-061723 | K2306972-001 |

Table 1 provides a summary of the major and minor data quality issues identified this data set. All data are acceptable except those results which have been qualified with “R”, rejected. Data validation qualifiers along with associated descriptions are provided in Table 2. All data qualification related to this group of samples is detailed on the attached sheets.

All data users should note two facts. First, an "R" flag means that the associated value is unusable due to significant quality control (QC) problems, the data is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on any data tables even as a last resort. Second, no analyte concentration, even if it passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

# DATA ASSESSMENT

## 1. NARRATIVE AND COMPLETENESS REVIEW:

*The case narrative was reviewed, and the data package was checked for completeness. No discrepancies were noted.*

## 2. SAMPLE DELIVERY AND CONDITION:

*The samples arrived at the laboratory in acceptable condition. Proper custody was documented.*

## 3. HOLDING TIME:

**The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detect results are flagged "R", rejected. Qualifications were applied to the samples and analytes as shown below.**

*All sample analyses reported were within the validation guidance.*

## 4. BLANK CONTAMINATION:

**Quality assurance (QA) blanks (i.e. method, trip, field, or rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure cross-contamination of samples during field operations. Qualifications were applied to the samples and analytes as shown below.**

### A) Method blank contamination

*No problems were found for this criterion with the following exceptions. The target analytes listed below were positively detected in the method blank associated with the sample in this sample delivery group (SDG). Positive results for the impacted analytes in the associated sample have been evaluated and no qualification of sample results was necessary on this basis.*

| | |
|---|---|
| *bis(2-ethylhexyl)phthalate* | *phenanthrene* |
| *anthracene* | *pyrene* |

### B) Field/Equipment blank contamination

*No sample was submitted as an equipment blank in association with the samples in this SDG.*

## 5. SURROGATES:

**All samples are spiked with system monitoring compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate recovery limits were outside quality control limits established in the QAPP, qualifications were applied to all the samples and analytes as shown below.**

*No problems were found for this criterion.*

## 6. MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY:

**Matrix spike/matrix spike duplicate (MS/MSD) data is generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD data may be used in conjunction with other quality control criteria for additional qualification of data.**

*Sample was SIB-SED-MG-AAM169-NW-061723 was submitted for MS/MSD pair evaluations for PAH SIM in association with this SDG. Upon evaluation all precision and accuracy indicators were favorable.*

## 7. FIELD DUPLICATES:

**Field duplicates may be taken and analyzed as an indication of overall precision. These analyses measure both field and laboratory precision. A control limit of 50% for the Relative Percent Difference (RPD) for solid samples and 30% RPD for liquid samples shall be used for original and duplicate sample values greater than or equal to five times the Project Quantitation Limit (PQL). A control limit of two times the PQL shall be used for solid samples and +/- the PQL for liquid samples if either the sample or duplicate value is less than five times the PQL. For field duplicate analyses that do not meet the technical criteria, the action was applied to only the field sample and its duplicate.**

*No samples were submitted as a field duplicate pair in association with this SDG.*

## 8. LABORATORY CONTROL SAMPLES:

**The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Aqueous/water, soil/sediment, wipe, and filter LCSs shall be analyzed for each analyte utilizing the same sample preparations, analytical methods, and quality assurance/quality control (QA/QC) procedures as employed for the samples. All LCS percent recoveries must fall within the QAPP control limits. Qualifications were applied to the samples and analytes as shown below.**

*No problems were found for this criterion with the following exceptions. The observed recovery for the target analyte bis(2-ethylhexyl)phthalate was higher than the highest acceptance limits in the LCS associated with the sample in this SDG. The positive result reported for the impacted analyte has been qualified "J" on this basis.*

## 9. DILUTIONS, RE-EXTRACTIONS & REANALYSIS:

**Samples may be re-analyzed for dilution, re-extraction and for other QC reasons. In such cases, the best result values are used.**

*No problems were found for this criterion.*

## 10. PROJECT DEFINED REPORTING LIMITS:

*No problems were found for this criterion.*

## 11. OTHER PROBLEMS:

*None.*

**Table 1 Major and Minor Findings**

| | Were acceptance criteria met? | | |
|---|---|---|---|
| | Yes | No | |
| **Bis(2-Ethylhexyl)phthalate** | | **Major** | **Minor** |
| Holding Time | x | | |
| Method Blank | x | | |
| Equipment/Rinse Blank | NA | | |
| Surrogates | x | | |
| Matrix Spike/Matrix Spike Duplicate | NA | | |
| Field Duplicate | NA | | |
| Laboratory Control Samples | | | x |
| Project Reporting Limits | x | | |
| Other Quality Control Data out of Specification | x | | |
| | **Were acceptance criteria met?** | | |
| | **Yes** | **No** | |
| **PAHs** | | **Major** | **Minor** |
| Holding Time | x | | |
| Method Blank | x | | |
| Equipment/Rinse Blank | NA | | |
| Surrogates | x | | |
| Matrix Spike/Matrix Spike Duplicate | x | | |
| Field Duplicate | NA | | |
| Laboratory Control Samples | x | | |
| Project Reporting Limits | x | | |
| Other Quality Control Data out of Specification | x | | |

Major = Major data quality issue identified resulting in rejection of data.
Minor = Minor data quality issue identified resulting in the qualification of data. Data qualification should be used to inform the data users of data limitations.
NA = Not applicable

**Table 2 Data Validation Qualifiers**

| Data Qualifier | Definition |
|---|---|
| U | The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit. |
| J | The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample. |
| UJ | The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise. |
| R | The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample. |

ENVIRONMENTAL DATA SERVICES, LTD.

## EXECUTIVE NARRATIVE

**Sample Delivery Group**: K2306972
**Laboratory:** ALS Kelso
**Site:** Portland Harbor Superfund Site
**Sampling dates**: 6/18/23
**Number of Samples:** 1
**Test Method:** SW 9060
**Analysis:** Total Organic Carbon (TOC)

**Validation Level:** Level 2A

**Quality Assurance Project Plan:** Uniform Federal Policy-Quality Assurance Project Plan, Revision 3, Remedial Design Services, Swan Island Basin Project Area, Portland Harbor Superfund Site, Portland Multnomah County, Oregon, May 2022 (QAPP).

**Validation Guidelines:** United States Environmental Protection Agency (USEPA) National Functional Guidelines for Organic Superfund Methods Data Review, OLEM 9240.0-51, EPA-540-R-20-005, (November 2020).

| Client Sample ID | Laboratory Sample ID |
|---|---|
| SIB-SED-MG-AAM169-NW-061723 | K2306972-001 |

Table 1 provides a summary of the major and minor data quality issues applied to this data set. All data are acceptable except those results which have been qualified with “R”, rejected. Data validation qualifiers along with associated descriptions are provided in Table 2. All data qualification related to this group of samples is detailed on the attached sheets.

All data users should note two facts. First, an "R" flag means that the associated value is unusable due to significant quality control (QC) problems, the data is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on any data tables even as a last resort. Second, no analyte concentration, even if it passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

# DATA ASSESSMENT

## 1. NARRATIVE AND COMPLETENESS REVIEW

*The case narrative was reviewed, and the data package was checked for completeness. No discrepancies were noted.*

## 2. SAMPLE DELIVERY AND CONDITION

*The samples arrived at the laboratory in acceptable condition. Proper custody was documented.*

## 3. HOLDING TIME

**The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". When holding times are exceeded the non-detects will be flagged as unusable, "R". Qualifications were applied to the samples and analytes as shown below.**

*No problems were found for this criterion.*

## 4. BLANK CONTAMINATION

**Quality assurance (QA) blanks; i.e. method, trip, field, or rinse blanks; are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field and rinse blanks measure cross-contamination of samples during field operations. Qualifications were applied to the samples and analytes as shown below.**

### A) Method blank contamination

*No problems were found for this criterion.*

### B) Field/Equipment blank contamination

*No sample was submitted in association with the sample in this sample delivery group (SDG).*

## 5. LABORATORY CONTROL SAMPLE

**The Laboratory Control Sample (LCS) serves to monitor the overall performance of each step during the analysis. Aqueous/water and soil/sediment LCSs shall be analyzed for each analyte utilizing the same sample preparations, analytical methods, and quality assurance/quality control procedures as employed for the samples. All LCS percent recoveries must fall within the QAPP established acceptance limits. Qualifications were applied to the samples and analytes as shown below.**

*No problems were found for this criterion.*

## 6. MATRIX SPIKE/MATRIX SPIKE DUPLICATE/MATRIX DUPLICATE

**The matrix spike/matrix spike duplicate (MS/MSD) sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike percent recovery and MS/MSD relative percent differences (RPDs) must fall within the QAPP established acceptance limits. However, spike recovery limits do not apply when the sample concentration is greater than or equal to four times the spike added.**

*Sample SIB-SED-MG-AAM169-NW-061723 was submitted for MS/MSD and matrix duplicate pair evaluations in association with this SDG. Upon evaluation all precision and accuracy indicators were favorable.*

## 7. FIELD DUPLICATES:

**Field duplicates may be taken and analyzed as an indication of overall precision. These analyses measure both field and laboratory precision. A control limit of 50% for the Relative Percent Difference (RPD) for solid samples and 30% RPD for liquid samples shall be used for original and duplicate sample values greater than or equal to five times the Project Quantitation Limit (PQL). A control limit of two times the PQL shall be used if either the sample or duplicate value is less than five times the PQL. For field duplicate analyses that do not meet the technical criteria, the action was applied to only the field sample and its duplicate.**

*No samples were submitted as a field duplicate pair in association with this SDG.*

## 8. PROJECT DEFINED REPORTING LIMITS:

*No problems were found for this criterion.*

## 9. OTHER PROBLEMS:

*None.*

**Table 1 Major and Minor Findings**

| | Were acceptance criteria met? | | |
|---|---|---|---|
| | Yes | No | |
| **TOC** | | **Major** | **Minor** |
| Holding Time | x | | |
| Method Blank | x | | |
| Field Blank | NA | | |
| Matrix Spike/Matrix Spike Duplicate/Matrix Duplicate | x | | |
| Laboratory Control Sample | x | | |
| Field Duplicate | NA | | |
| Project Reporting Limits | x | | |
| Other | x | | |

Major = Major data quality issue identified resulting in rejection of data.
Minor = Minor data quality issue identified resulting in the qualification of data. Data qualification should be used to inform the data users of data limitations.
NA = Not applicable

**Table 2 Data Validation Qualifiers**

| Data Qualifier | Definition |
|---|---|
| U | The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit. |
| J | The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample. |
| UJ | The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise. |
| R | The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample. |
| N | The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification. |
| NJ | The analyte was tentatively identified, and the associated numerical value represents its approximate concentration. |

# Qualified Sample Result Summaries

Summary of Qualified Results

[1] Validated results assigned by validator that are different than those assigned by the laboratory have been indicated in bold blue font.

| Sample | Lab ID | Analyte | Validated Result[1] | lab_qualifiers | validator_qualifiers | interpreted_qualifiers | unit | Reason Codes |
|---|---|---|---|---|---|---|---|---|
| SIB-SED-MG-AAM169-NW-061723 | K2306972-001 | PHC AS DIESEL FUEL | 180 | H | J | J | mg/kg | FDPR |
| SIB-SED-MG-AAM169-NW-061723 | K2306972-001 | BIS(2-ETHYLHEXYL) PHTHALATE | 2100 | | J | J | ug/kg | LCSH |

# ATTACHMENT E
# Data Qualification Reason Codes

| QC Element | Reason Code | Definition |
|---|---|---|
| Ambient Blank | ABH | Ambient blank result ≥ limit of quantitation (LOQ) |
| Ambient Blank | ABHB | Result is judged to be biased high based on associated ambient blank result |
| Ambient Blank | ABL | Ambient blank result <LOQ |
| Analyte Quantitation | ACR | Result above the upper end of the calibrated range |
| Analyte Quantitation | EXC | Result excluded; another data point for this analyte was selected for use (use with X-qualified results) |
| Analyte Quantitation | RTW | Target analyte outside retention time window |
| Analyte Quantitation | PSL | Solid matrix sample with percent solids less than 50% |
| Analyte Quantitation | PSLX | Solid matrix sample with percent solids less than 10% |
| Analyte Quantitation | TR | Result between the detection limit and LOQ |
| Calibration Blank | CBH | Initial or continuing calibration blank result ≥LOQ |
| Calibration Blank | CBHB | Result is judged to be biased high based on associated continuing calibration blank result |
| Calibration Blank | CBL | Initial or continuing calibration blank result <LOQ |
| Calibration Blank | CBN | Negative initial or continuing calibration blank result with absolute value <LOQ |
| Calibration Blank | CBNH | Negative initial or continuing calibration blank result with absolute value ≥LOQ |
| Continuing Calibration | CCCC | Calibration check compound did not meet percent difference (%D) criterion in continuing calibration standard |
| Continuing Calibration | CCVD | Continuing calibration standard did not meet %D criterion |
| Continuing Calibration | CRFL | Continuing calibration RRF below acceptance criterion |
| Continuing Calibration | CSPC | System performance check compound did not meet minimum RRF criterion in continuing calibration |
| Continuing Calibration | CVDX | Continuing calibration standard did not meet %D criterion, extreme discrepancy |
| Confirmation | CF | Confirmation precision exceeded acceptance criterion |
| Cyanide Method | DSH | High-level distillation standard did not meet %D criterion |
| Cyanide Method | DSL | Low-level distillation standard did not meet %D criterion |
| Equipment Blank | EBH | Equipment blank result ≥LOQ |
| Equipment Blank | EBHB | Result is judged to be biased high based on associated equipment blank result |
| Equipment Blank | EBL | Equipment blank result <LOQ |
| Field Duplicate | FDPA | Field duplicate results did not meet absolute difference criterion |
| Field Duplicate | FDPR | Field duplicate results did not meet RPD criterion |
| Holding Time | HTA | Analytical holding time exceeded |
| Holding Time | HTAX | Analytical holding time exceeded, extreme discrepancy |
| Holding Time | HTP | Preparation holding time exceeded |
| Holding Time | HTPX | Preparation holding time exceeded, extreme discrepancy |
| Initial Calibration | ICCC | Calibration check compound did not meet percent relative standard deviation (%RSD) criterion in initial calibration |

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## ATTACHMENT E (continued)
## Data Qualification Reason Codes

| QC Element | Reason Code | Definition |
|---|---|---|
| Initial Calibration | ICLS | Initial calibration low-level standard >LOQ |
| Initial Calibration | ICR2 | Initial calibration $r^2$ below acceptance criterion |
| Initial Calibration | ICRD | Initial calibration %RSD above acceptance criterion |
| Initial Calibration | ICRX | Initial calibration %RSD above acceptance criterion, extreme discrepancy |
| Initial Calibration | IRFL | Initial calibration RRF below acceptance criterion |
| Initial Calibration | ISPC | System performance check compound did not meet minimum mean RRF criterion in initial calibration |
| Initial Calibration | LQSH | LOQ check standard above acceptance criteria |
| Initial Calibration | LQSL | LOQ check standard below acceptance criteria |
| Initial Calibration | SSVD | Second-source standard did not meet %D criterion |
| Initial Calibration Verification | ICVD | Continuing calibration standard did not meet %D criterion |
| Initial Calibration Verification | ICVX | Continuing calibration standard did not meet %D criterion, extreme discrepancy |
| Interference Check Standard | ICAH | Non-spiked concentration above acceptance criterion in ICSA |
| Interference Check Standard | ICAN | Negative concentration with absolute value above acceptance criterion in ICSA |
| Interference Check Standard | ICHX | Non-spiked concentration above acceptance criterion in ICSA, extreme discrepancy |
| Interference Check Standard | ICNX | Negative concentration with absolute value above acceptance criterion in ICSA, extreme discrepancy |
| Interference Check Standard | ICSH | ICSA or ICSAB spiked analyte with high percent recovery (%R) |
| Interference Check Standard | ICSL | ICSA or ICSAB spiked analyte with low %R |
| Internal Standards | IRH | Internal standard peak area above upper limit |
| Internal Standards | IRL | Internal standard peak area below lower limit |
| Internal Standards | IRLX | Internal standard peak area below lower limit, extreme discrepancy |
| Internal Standards | ISRT | Internal standard retention time outside window |
| Labeled Standards | LSH | Labeled standard %R above acceptance criterion |
| Labeled Standards | LSL | Labeled standard %R below acceptance criterion |
| Labeled Standards | LSLX | Labeled standard %R below acceptance criterion, extreme discrepancy |
| Laboratory Control Sample | LCLX | LCS and/or LCSD %R below acceptance criterion, extreme discrepancy |
| Laboratory Control Sample | LCSH | LCS and/or LCSD %R above acceptance criterion |
| Laboratory Control Sample | LCSL | LCS and/or LCSD %R below acceptance criterion |
| Laboratory Control Sample | LCSP | LCS/LCSD RPD above acceptance criterion |
| Laboratory Duplicate | LDPA | Laboratory duplicate results did not meet absolute difference criterion |
| Laboratory Duplicate | LDPR | Laboratory duplicate results did not meet RPD criterion |

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| QC Element | Reason Code | Definition |
|---|---|---|
| Low-Level Calibration Check | LLCH | Low-level calibration check above the upper limit |
| Low-Level Calibration Check | LLCL | Low-level calibration check below the lower limit |
| Low-Level Calibration Check | LLXL | Low-level calibration check below the lower limit, extreme discrepancy |
| Method Blank | MBH | Method blank result ≥LOQ |
| Method Blank | MBHB | Result is judged to be biased high based on associated method blank result |
| Method Blank | MBL | Method blank result <LOQ |
| Matrix Spike | MSH | MS and/or MSD %R above acceptance criterion |
| Matrix Spike | MSL | MS and/or MSD %R below acceptance criterion |
| Matrix Spike | MSLX | MS and/or MSD %R below acceptance criterion, extreme discrepancy |
| Matrix Spike | MSP | MS/MSD RPD above acceptance criterion |
| Post-Digestion Spike | PDH | Post-digestion spike recovery high |
| Post-Digestion Spike | PDL | Post-digestion spike recovery low |
| Post-Digestion Spike | PDLX | Post-digestion spike recovery low, extreme discrepancy |
| Post-Digestion Spike | PDN | Post-digestion spike not performed or not applicable and serial dilution result not performed or not applicable |
| Sample Delivery and Condition | BUB | Bubbles >5 millimeters in volatile organic compounds vial |
| Sample Delivery and Condition | DAM | Sample container damaged |
| Sample Delivery and Condition | PRE | Sample not properly preserved |
| Sample Delivery and Condition | TEMP | Sample received at elevated temperature |
| Sample Delivery and Condition | TMPX | Sample received at elevated temperature, extreme discrepancy |
| Serial Dilution | SDIL | Serial dilution did not meet %D criterion |
| Serial Dilution | SDN | Serial dilution not performed |
| Surrogate | SSH | Surrogate %R high |
| Surrogate | SSL | Surrogate %R low |
| Surrogate | SSLX | Surrogate %R low, extreme discrepancy |
| Surrogate | SSN | Surrogate compound not spiked into sample |
| Trip Blank | TBH | Trip blank result ≥LOQ |
| Trip Blank | TBL | Trip blank result <LOQ |
| Validator Judgment | VJ | Validator judgment (see validation narrative) |

ICS = interference check sample
MS = matrix spike
MSD = matrix spike duplicate
QC = quality control
RPD = relative percent difference
RRF = relative response factor

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# Data Validation Worksheet

**NWTPH 8015 METHOD VALIDATION CHECKLIST**

| | |
|---|---|
| Site: | Portland Harbor |
| Laboratory: | ALS Environmental |
| SDG: | K2306972 |
| Data Validator: | PMH |
| Validation Date: | 9/25/2023 |
| Reviewer: | DLW |
| Review Date: | 9/28/2023 |

Analyzed for: ☑ RRO ☑ DRO

**Data Completeness and Deliverables**

***Have any missing deliverable been recieved and added to the data package?*** ☐ Yes ☑ No

**ACTION:** Call lab for explanation/resubmittal of any missing deliverables. If the lab cannot provide them, note the effect on reviewof the data in the non-compliance section of the data assessment narrative.

Notes and validation action:

**Custody Documents and Narratives**

***Are chains of custody present and complete for all samples?*** ☑ Yes ☐ No

**ACTION:** Contract lab for replacement of missing documents.

***Do chains of custody or lab narratives indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data?*** ☐ Yes ☑ No

***Per NFG: Are the % solids >30% for all solids samples?*** ☑ Yes ☐ No

**ACTION**: If the %Solids for a soil/sediment sample is < 10.0%, use professional judgment to qualify detects and non-detects.
If the %Solids for a soil/sediment sample is ≥ 10.0% and < 30.0%, use professional judgment to qualify detects and non-detects.

Notes and validation action:

all % solids >30%

**Holding Times**

***Have any technical holding times, determined from date of collection to date of extraction been exceeded?*** ☐ Yes ☑ No

**NOTE: Per QAPP DRO and RRO preserved and cooled samples 14 days to prepare and 40 days from extraction to analysis**

**or**
**Freeze to −10°C for up to 1 year**

**ACTION**: If holding times are exceeded, flag all data as estimated ("J" for detects and "R" for non-detects).

Notes and validation action:

| | | |
|---|---|---|
| Collected | 6/18/23 | |
| Prepped | 6/27/23 | ok |
| Analyzed | 6/28/23 | ok |

**Surrogate Recovery**

***Are surrogate recoveries summarized within the report?*** ☑ Yes ☐ No

**ACTION**: If no, contact the lab for explanation/re-submittals. If redeliverables are not available, document in the narrative notes.
(Surrogate % R limits - **use QAPP limits**).
o-terphenyl: 50-150
n-triacontane: 50-150

No outliers

***Were outliers marked as such?*** ☐ Yes | No

***Were surrogate recoveries outside of specifications for any sample or method blank?*** ☐ Yes | No

**ACTION:** 1. Flag all positive results as "J-" estimated with low bias if surrogate recovery is < lower acceptance limit but >10%.
2. Flag all non-detects as "UJ" estimated detection limits when recoveries are less than the lower limit.
3. Flag all positive results as "J+" estimated with high bias if surrogate recovery is > upper acceptance limit
4. If recoveries are above the upper limit, do not flag non-detects.
5. If any surrogate recovery is less than 10%:
a. qualify positive results as "J-" estimated with low bias.
b. non-detects for that sample should be qualified as "R" rejected.

Notes and validation action:

| Sample | %R | Flag |
|---|---|---|

DRO:
all ok

RRO:
all ok

**Internal Standards**

***Were internal standards used?*** ☐ Yes ☑ No
***Were area response within 50 to 200% of the opening CCV or mid-point standard from ICAL?*** ☐ Yes ☐ No ☑ NA
***Are RT shifts between samples and opening CCV or mid-point standard from ICAL <10.0 seconds?*** ☐ Yes ☐ No ☑ NA

**ACTION**: If the area response of an internal standard compound in a sample or blank is < 20% of the area response of the same internal standard compound in the associated opening CCV or mid-point standard CS3 from the associated ICAL, qualify detects as estimated high (J+) and non-detects as unusable (R).
If the area response of an internal standard compound in a sample or blank is ≥ 20% and < 50% of the area response of the same internal standard compound in the associated opening CCV or mid-point standard CS3 from the associated ICAL, qualify detects as estimated high (J+) and non-detects as unusable (UJ).
If the area response of an internal standard compound in a sample or blank is within the inclusive range of 50-200% of the area response of the same internal standard compound in the associated opening CCV or mid-point standard CS3 from the associated ICAL, detects and non-detects should not be qualified.
If the area response of an internal standard compound in a sample or blank is > 200% of the area response of the same internal standard compound in the associated opening CCV or mid-point standard CS3 from the associated ICAL, qualify detects as estimated low (J-). Non-detects should not be qualified.
If the RT shift between sample/blank and the associated opening CCV or mid-point standard CS3 from the associated ICAL of an internal standard compound is > 10.0 seconds, qualify detects and non-detects as unusable (R). The EPA Regional CLP COR should be contacted to arrange for reanalysis.

Notes and validation action:
none

**Matrix Spike/ Matrix Duplicate**

***Is a matrix spike/matrix spike duplicate/ matrix duplicate summary present?*** ☑ Yes ☐ No
Were matrix spikes analyzed at the required frequency for each of the following matrixes:

**ACTION:** If any matrix spike data are missing, call the lab for explanation/re-submittal. If information is not available, document the effect in narrative notes.

***Are all matrix spike and/or matrix spike duplicate/ matrix duplicate %Rs or RPDs within acceptance range? (use QAPP limits)*** ☐ Yes ☑ No ☐ NA
DRO(C10-C25): 42-134% for solids, RPD ≤ 40
RRO (C25-C35): 48-141% for solids, RPD ≤ 40

**ACTION:** Qualify parent sample only.
a. If the MS/MSD %R is < 20%, qualify detects as estimated (J) and non-detects as unusable (R).
b. If the MS/MSD %R is ≥ 20% and < lower acceptance limit, qualify detects as estimated (J) and non-detects as estimated (UJ).
c. If the MS/MSD %R or RPD is ≥ lower acceptance limit and ≤ upper acceptance limit, detects and non-detects should not be qualified.
d. If the MS/MSD %R or RPD is > upper acceptance limit, qualify detects as estimated (J). Non-detects should not be qualified.
Note, NFG does not assign bias when qualifying for MS/MSD

Notes and validation action: MS/MSDs not analyzed, only duplicates

| Sample | MS %R | MSD %R | RPD | Flag |
|---|---|---|---|---|
| Matrix Duplicates: | | | | |
| K2306972-001 | | | DRO 42%↑ | results >5X LOQ and abs diff >LOQ, Q J FDPR |
| SIB-SED-MG-AAM169-NW-061723 | | | RRO ok | |

**Laboratory Control Sample**

***Were LCS samples evaluated with each batch of 20 samples or less and were observed percent recoveries within the QAPP defined limits?*** ☑ Yes ☐ No
DRO(C10-C25): 42-134% for solids, RPD ≤ 40
RRO (C25-C35): 48-141% for solids, RPD ≤ 40

**ACTION**: Document in Data Assessment Narrative.

Notes and validation action:

| LCS or LCSD | %R | Associated samples: | Flag |
|---|---|---|---|
| DRO/RRO | | | |
| KQ2311270-03 | DRO ok | | |
| | RRO ok | | |

***Has a method blank analysis been reported per twenty samples of a similar matrix or concentration level, and for each extraction batch?*** ☑ Yes ☐ No

***Upon examination of laboratory and field blank data, do any blanks contain positive results?*** ☑ Yes | No

**ACTION:** Per NFG: If the analytes are detected at comparable levels in the method blank, the source of thecontamination may be in the analytical system. Apply the recommended actions for themethod blank.
For any method blank reported with results < CRQLs, report sample results that are < CRQLs at theCRQLs and qualify as non-detect (U). For any method blank reported with results that are< CRQLs, use professional judgment to qualify sample results that are ≥ CRQLs. Positive results in samples,especially those near but above the CRQL, may be biased high by low level contamination in the method blank, and should be considered as estimated(J+).
For any method blank reported with results ≥ CRQLs, report sample results that are < CRQLs at theCRQLs and qualify as non-detect (U).
For any method blank reported with results ≥ CRQLs, report sample results that are ≥ CRQLs but< Blank Results at sample results and qualify as non-detect (U) or as unusable (R). Useprofessional judgment to qualify sample results that are ≥ CRQLs and ≥ Blank Results.

***Are there field/rinse/equipment blanks associated with every sample?*** ☐ Yes | ☑ No
***Are there trip blanks associated with every sample?*** ☐ Yes | ☑ No

Per Ken Email: Use 5X rule for blanks

Notes and validation action:

| MB | positives | | Flag | assocated samples |
|---|---|---|---|---|
| DRO/RRO | | | | |
| **MB** | | | | |
| KQ2311270-02 | yes | DRO = 3.5 J mg/kg | none results >5X | |
| | | RRO = 5.0 J mg/kg | none results >5X | |

**Equipment blanks**

none

**Calibration**

***Are raw data and summary sheets present for both initial and continuing calibrations?*** ☐ Yes | No

***Are the % RSD values for the initial calibration less than or equal to 20% or correlation coefficient greater than 0.995?*** ☐ Yes | No

**ACTION**: Associated sample data for those analytes with % RSD > 20 will be qualified as estimated.

***Are the % D values between the true and measured concentration values for the initial and continuing calibrations + 20?*** ☐ Yes | No
**ACTION**: If no, data following the last in-control standard to the next-incontrol standard are potentially affected. Associated detected sample data will be qualified as "J" estimated and associated non-detected sample data will be qualified as "UJ" estimated.

***Are miss-calculations or transcription errors found?*** ☐ Yes | No
**NOTE**: If yes, contact the laboratory.

Notes and validation action:

| Calibration | Date | Time | criteria met | Samples that followed in sequence |
|---|---|---|---|---|
| calibration not validated at stage 2A | | | | |

**Compound Quantitation and Reported Detection Limits**

***Were miscalculation/transcription errors found?***

☐ Yes | No | ✓ NA

Notes and validation action:

**Field Duplicates**

***Were field duplicates submitted for DRO/GRO analysis?***

☑ Yes | No

**Per Portland Harbor QAPP: FD RPD ≤ 50% if both results >5x PQL**
**For low-level results (one or both detected values ≤5x PQL) or when one result is a non -detection, the control limit is absolute difference ≤2x PQL. Non-detected values will be assigned the nominal value of the MDL for making this comparison.**

**ACTION**: Where both the sample duplicate values are greater than 5 times the LOQ, acceptable sampling and analytical precision is indicated by an RPD for the two field duplicate results of less than or equal to 50 percent solid samples and 30 percent for liquid. Where one or both analytes of the field duplicate pair are less than 5 times the PQL, satisfactory precision is indicated if the field duplicate results agree within 2 times the PQL solid. If the above criteria are not met for an analyte, qualify all associated sample data for that analyte

Notes and validation action:
none

**Review Level**
***Is a level 4 review required for this project?***

☑ Yes

List samples reviewed and bold samples used for calculations:
SDG valdiated at level 2A

# Tributyltin

**CLIENT:** HGL

**PROJECT:** Portland Harbor Superfund Site

**SDG:** K2306972

**LAB:** ALS Kelso

**Validated by:** KB

**Validation date: 9/18/23**

**Reviewed by:DLW**

**Review date: 9/26/23**

**ALS SOP**

**Use project Reason Codes, do not use bias, special MB rules**

**Sample Receipt / Hold times (COC, receipt logs, case narrative)**

| | | | | | | |
|---|---|---|---|---|---|---|
| Tributyltin **SOLID** | Laboratory-modified Krone-Unger (SOC-BUTYL/ EXT-OSWT) | 4 oz glass jar | Cool ≤6°C | 14 days to prepare and 40 days from extraction to analysis | Freeze to −10°C for up to 1 year | ALS-Kelso |
| Tributyltin **LIQUID** | Laboratory-modified Krone-Unger (SOC-BUTYL/ EXT-OSWT) | 2 x L amber glass | Cool ≤6°C | 7 days to prepare and 40 days from extraction to analysis | NA | ALS-Kelso |

✓Temperature upon receipt (<6◦C) ok

✓HT

**Pesticides Table 1. Preservation and Holding Time Actions**

| Matrix | Preservation | Criteria | Action | |
|---|---|---|---|---|
| | | | Detect | Non-detect |
| Aqueous/Non-aqueous | Samples received at a temperature > 6°C | | J | UJ |
| Aqueous/Non-aqueous | Cooled at temperature ≤ 6°C | TCLP/SPLP leachate samples prepared within the 14-day technical holding time | No qualification | No qualification |
| | Not cooled at temperature ≤ 6°C | TCLP/SPLP leachate samples prepared within the 14-day technical holding time | Use professional judgment | Use professional judgment |
| | Cooled/not cooled at temperature ≤ 6°C | TCLP/SPLP leachate samples prepared outside the 14-day technical holding time | J | R |

| Matrix | Preservation | Criteria | Action | |
|---|---|---|---|---|
| | | | Detect | Non-detect |
| Aqueous | Cooled at temperature ≤ 6°C | Samples and TCLP/SPLP leachates extracted within the 7-day and analyzed within the 40-day technical holding time | No qualification | No qualification |
| | | Samples and TCLP/SPLP leachates extracted outside the 7-day and analyzed outside or within the 40-day technical holding time | J | R |
| | | Samples and TCLP/SPLP leachates extracted outside or within the 7-day and analyzed outside the 40-day technical holding time | J | R |
| Aqueous | Not cooled at temperature ≤ 6°C | Samples and TCLP/SPLP leachates extracted within the 7-day and analyzed within the 40-day technical holding time | Use professional judgment | Use professional judgment |
| | | Samples and TCLP/SPLP leachates extracted outside the 7-day and analyzed outside or within the 40-day technical holding time | J | R |
| | | Samples and TCLP/SPLP leachates extracted outside or within the 7-day and analyzed outside the 40-day technical holding time | J | R |

| Matrix | Preservation | Criteria | Action | |
|---|---|---|---|---|
| | | | Detect | Non-detect |
| Non-aqueous | Cooled at temperature ≤ 6°C | Samples extracted within the 14-day and analyzed within the 40-day technical holding time | No qualification | No qualification |
| | | Samples extracted outside the 14-day and analyzed outside or within the 40-day technical holding time | J- | R |
| | | Samples extracted outside or within the 14-day and analyzed outside the 40-day technical holding time | J- | R |
| Non-aqueous | Not cooled at temperature ≤ 6°C | Samples extracted within 14- day and analyzed within the 40-day technical holding time | Use professional judgment | Use professional judgment |
| | | Samples extracted outside the 14-day and analyzed outside or within the 40-day technical holding time | J | R |
| | | Samples extracted outside or within the 14-day and analyzed outside the 40-day technical holding time | J | R |

Criteria listed in the Table are the EPA CLP SOW and NFG criteria, however, alternate criteria may be specified in the QAPP or project-specific SOPs.

Instructed to ignore samples 1 and 2 in this SDG, only validate SIB-SC-N07-0-1-08242022 (sample 3).

Sampled: 6/18/23 Sample 1

Prepped: 6/26/2023 sample 1 HT OK

Analyzed: 7/7/2023 Sample 1 HT OK

**Blanks (Form 4, Form 1)**

- ✓ evaluate storage, method, clean up, field blanks
- ✓ method blank were prepared and analyzed in association with all samples in SDG

**Pesticides Table 5. Blank Actions**

| Blank Type | Blank Result | Sample Result | Action |
|---|---|---|---|
| | Not analyzed at specified frequency or sequence | Detect | J |
| | | Non-detect | No qualification |
| Method, TCLP/SPLP LEB, Sulfur cleanup, Instrument, Field (including Equipment and Rinse) | Detects | Non-detect | No qualification |
| | < QL | < QL | Report at QL and qualify U |
| | | ≥ QL | Report at sample result and qualify J+ or No qualification |
| | ≥ QL | < QL | Report at QL and qualify U |
| | | ≥ QL but < Blank Result | Report at sample result and qualify U |
| | | ≥ QL and ≥ Blank Result | Report at sample result and qualify J+ or No qualification |
| | Gross contamination | Detect | Report at sample result and qualify R |

Criteria listed in the Table are the EPA CLP SOW and NFG criteria, however, alternate criteria may be specified in the QAPP or project-specific SOPs.

Use 5X rule for project

KQ2311078-04 ND

**Surrogates (Form 2)**

- ✓ Tripropyltin added to all samples

%Rs within 10-120% solids
%Rs within 31-137% liquids

**Pesticides Table 6. Surrogate Actions**

| Criteria | Action* | |
|---|---|---|
| | Detect | Non-detect |
| Surrogate not present or not at specified concentration | J or R | UJ or R |
| RT out of specified RT window | Use professional judgment | Use professional judgment |
| RT within specified RT window | No qualification | No qualification |
| %R < Expanded Lower Acceptance Limit (10%, undiluted sample) | J- | R |
| %R < Expanded Lower Acceptance Limit (10%, diluted sample) | Use professional judgment | Use professional judgment |
| Expanded Lower Acceptance Limit (10%) ≤ %R < specified Lower Acceptance Limit | J- | UJ |
| %R within specified Acceptance Limits | No qualification | No qualification |





| Criteria | Action* | |
|---|---|---|
| | Detect | Non-detect |
| Upper Acceptance Limit < %R ≤ Expanded Upper Acceptance Limit (200%) | J+ | No qualification |
| %R > Expanded Upper Acceptance Limit (200% ) | J+ | Use professional judgment |

Criteria listed in the Table are the EPA CLP SOW and NFG criteria, however, alternate criteria may be specified in the QAPP or project-specific SOPs.

Refer to the Note under Part A, Section II, General Table 1. Data Qualifiers and Definitions for guidance on the use of the J+ and J- qualifiers.

* Use professional judgment in qualifying data, as surrogate recovery problems may not directly apply to target analytes.

All ok

**LCS (Form 3, batch worksheet)**

- ✓ LCS for each matrix
- ✓ if qualification is required, qualified all samples prepped with the L

%Rs within 10-122% solids RPD </= 40

%Rs within 32-122% liquids RPD </= 30



**Pesticides Table 8. LCS Actions**

| Criteria | Action | |
|---|---|---|
| | Detect | Non-detect |
| LCS not performed at specified frequency or concentration | Use professional judgment | Use professional judgment |
| LCS %R limits not specified | Use professional judgment | Use professional judgment |
| %R < specified Lower Acceptance Limit | J- | R |
| %R within specified Acceptance Limits | No qualification | No qualification |
| %R > specified Upper Acceptance Limit | J+ | No qualification |

Criteria listed in the Table are the EPA CLP SOW criteria, however, alternate criteria may be specified in the QAPP or project-specific SOPs.

Refer to the Note under Part A, Section II, General Table 1. Data Qualifiers and Definitions for guidance on the use of the J+ and J- qualifiers.

KQ2311078-03 OK

**MS/MSD (Form 3)**

%Rs withing 10-122% solids RPD </= 40

%Rs withing 32-122% liquids RPD </= 30

✓ qualify parent sample only

**Pesticides Table 7. MS/MSD Actions**

| Criteria | Action | |
|---|---|---|
| | Detect | Non-detect |
| MS/MSD not analyzed at specified frequency or concentration | Use professional judgment | Use professional judgment |
| MS/MSD not prepared from field sample | Use professional judgment | Use professional judgment |
| %R or RPD limits not specified | Use professional judgment | Use professional judgment |
| %R < Expanded Lower Acceptance Limit (20%) | J | R |
| Expanded Lower Acceptance Limit (20%) ≤ %R < specified Lower Acceptance Limit | J | UJ |
| %R or RPD within specified Acceptance Limits | No qualification | No qualification |
| %R or RPD > specified Upper Acceptance Limit | J | No qualification |

Criteria listed in the Table are the EPA CLP SOW and NFG criteria, however, alternate criteria may be specified in the QAPP or project-specific SOPs.

MS MSD RPD

None

**Field Duplicates**

✓ If both original sample and duplicate sample results are ≥ 5x the PQL and the RPD is > 50% for solid samples or 30% for liquid samples, qualify detects as estimated "J", and qualify non-detects as estimated "UJ". List samples and results effected below.

✓ If the original sample or duplicate sample result is < 5x the PQL (including non-detects) and the absolute difference between sample and duplicate > 2X PQL for solid samples and the PQL for liquid samples, qualify detects as estimated "J" and non-detects as estimated "UJ".

✓ see field duplicate worksheet

None

**CLIENT:** HGL

**PROJECT:** Portland Harbor Superfund Site

**SDG:** K2306972

**Validated by:** LL 9/27/2023

**Reviewed by:** **DLW**

**LAB:** ALS Kelso

Method: EPA SW846 8082A Aroclors

Do not use bias per client

Level 2A

**Sample Receipt / Hold times** (COC, receipt logs, case narrative)

✓received at <10% ◦C

✓HT (aqueous– 7 days to extract, 40 days extraction to analysis; solids – 14 days to extraction, 40 days extraction to analysis). Frozen -10 degrees C for up to 1 year.

Collected: 6/18/23

Extracted: 6/27/23

Analyzed: 7/6/23

All ok

**Surrogates/Labeled Compounds (Form II)**

- ✓ %Rs within limit. used lab limits as reported not those in QAPP

If any surrogate is out, qualify all results per NFG 2020.

All ok

**Blanks (Form IV, Form 1)**

- ✓ evaluate storage, method, and field blanks
- ✓ method blank were prepared and analyzed in association with all samples in SDG
- ✓ blanks may not be qualified because of contamination in another blank

Method Blanks
KWG2301120-4 all ND

Equipment Blanks

None

**LCS (Form III, batch worksheet)**

- ✓ use lab limits as reported to evaluate accuracy (%R)
- ✓ if qualification is required, qualified all samples in prep batch

Per EDS guidance-do not Reject results unless %R is <10% recovery.

All ok

**MS/MSD (Form III)**

- ✓ use lab limits as reported to evaluate accuracy (%R) and precision (RPD)
- ✓ qualify parent sample only
- ✓ remember 4X rule

none

**Field Duplicates**

✓ RPD ≤50% (solid matrix) or ≤30% (aqueous matrix) if both results ≥5x PQL

For low-level results (one or both detected values ≤5x PQL) or when one result is a non-detection, the control limit is absolute difference ≤2x PQL (solid matrix) or ≤PQL (aqueous matrix). Non-detected values will be assigned the nominal value of the MDL for making comparison.

Qualify detects as estimated "J" and qualify non-detects as estimated "UJ".

List samples and results effected below.

✓ see field duplicate worksheet

none

**CLIENT:** HGL

**PROJECT:** Portland Harbor Superfund Site

**SDG:** K2306972

**Validated by:** LL 9/26/2023

**Reviewed by:** **DLW**

**LAB:** ALS Kelso

Method: 1699M (SVM-PESTMS2)

Do not use bias per client

Level 2A

**Sample Receipt / Hold times** (COC, receipt logs, case narrative)

✓received at <10% ◦C

✓HT (aqueous– 7 days to extract, 40 days extraction to analysis; solids – 14 days to extraction, 40 days extraction to analysis). Frozen -10 degrees C for up to 1 year.

Collected: 6/18/23

Extracted: 6/28/23

Analyzed: 7/8/23

All ok

| Analyte Name |
|---|
| Aldrin |
| gamma-BHC (Lindane) |
| cis-Chlordane |
| trans-Chlordane |
| 2,4'-DDD |
| 4,4'-DDD |
| 2,4'-DDE |
| 4,4'-DDE |
| 2,4'-DDT |
| 4,4'-DDT |
| Dieldrin |
| cis-Nonachlor |
| trans-Nonachlor |
| Oxychlordane |

**Semivolatiles Table 1. Preservation and Holding Time Actions**

| Matrix | Preservation | Criteria | Action | |
|---|---|---|---|---|
| | | | Detect | Non-detect |
| Aqueous/Non-aqueous | Samples received at a temperature > 6°C | | J | UJ |
| Aqueous/Non-aqueous | Cooled at temperature ≤ 6°C | TCLP/SPLP leachate samples prepared within the 14-day technical holding time | No qualification | No qualification |
| | Not cooled at temperature ≤ 6°C | TCLP/SPLP leachate samples prepared within the 14-day technical holding time | Use professional judgment | Use professional judgment |
| | Cooled/not cooled at temperature ≤ 6°C | TCLP/SPLP leachate samples prepared outside the 14-day technical holding time | J | R |
| Aqueous | Cooled at temperature ≤ 6°C | Samples and TCLP/SPLP leachates extracted within the 7-day and analyzed within the 40-day technical holding time | No qualification | No qualification |
| | | Samples and TCLP/SPLP leachates extracted outside the 7-day and analyzed outside or within the 40-day technical holding time | J- | R |
| | | Samples and TCLP/SPLP leachates extracted outside or within the 7-day and analyzed outside the 40-day technical holding time | J- | R |

| Matrix | Preservation | Criteria | Action | |
|---|---|---|---|---|
| | | | Detect | Non-detect |
| Aqueous | Not cooled at temperature ≤ 6°C | Samples and TCLP/SPLP leachates extracted within the 7-day and analyzed within the 40-day technical holding time | Use professional judgment | Use professional judgment |
| | | Samples and TCLP/SPLP leachates extracted outside the 7-day and analyzed outside or within the 40-day technical holding time | J | R |
| | | Samples and TCLP/SPLP leachates extracted outside or within the 7-day and analyzed outside the 40-day technical holding time | J | R |
| Non-aqueous | Cooled at temperature ≤ 6°C | Samples extracted within the 14-day and analyzed within the 40-day technical holding time | No qualification | No qualification |
| | | Samples extracted outside the 14-day and analyzed outside or within the 40-day technical holding time | J- | R |
| | | Samples extracted outside or within the 14-day and analyzed outside the 40-day technical holding time | J- | R |
| Non-aqueous | Not cooled at temperature ≤ 6°C | Samples extracted within 14- day and analyzed within the 40-day technical holding time | Use professional judgment | Use professional judgment |
| | | Samples extracted outside the 14-day and analyzed outside or within the 40-day technical holding time | J | R |
| | | Samples extracted outside or within the 14-day and analyzed outside the 40-day technical holding time | J | R |

**Surrogates/Labeled Compounds (Form II)**

✓ %Rs within limit. used lab limits as reported not those in QAPP

If any surrogate is out, qualify all results as follows in Table 7.

**Table 7. Labeled Compound Recovery Actions for CDD/CDF Analysis**

| Criteria | Action | |
|---|---|---|
| | Detect | Non-detect |
| IAR criteria not met in sample but met in all associated calibration standards | J | UJ |
| IAR fails in sample and fails in any one of associated calibration standards | J | R |
| %R < 10% and S/N ratio ≥ 10 | J- | R |
| %R < 10% and S/N ratio < 10 | R | R |
| %R ≥ 10% but < Lower Acceptance Limit | J- | UJ |
| Lower Acceptance Limit ≤ %R ≤ Upper Acceptance Limit | No qualification | No qualification |
| %R > Upper Acceptance Limit | J+ | UJ |
| %R of Cleanup Standard < Lower Acceptance Limit | J | UJ |

**Semivolatiles Table 7. Surrogate Actions**

| Criteria | Action | |
|---|---|---|
| | Detect | Non-detect |
| Surrogate not present or not at specified concentration | J or R | UJ or R |
| %R < Expanded Lower Acceptance Limit (10%, excluding surrogates with 10% as a lower acceptance limit, undiluted sample analysis) | J- | R |
| Expanded Lower Acceptance Limit (10%) ≤ %R (excluding surrogates with 10% as a lower acceptance limit, undiluted sample analysis) < specified Lower Acceptance Limit | J- | UJ |
| %R < specified Lower Acceptance Limit (diluted sample analysis) | Use professional judgment | Use professional judgment |
| %R within specified Acceptance Limits | No qualification | No qualification |
| %R > specified Upper Acceptance Limit | J+ | No qualification |

All ok

**Blanks (Form IV, Form 1)**

✓ evaluate storage, method, and field blanks

✓ method blank were prepared and analyzed in association with all samples in SDG

✓ blanks may not be qualified because of contamination in another blank

**Semivolatiles Table 6. Blank Actions**

| Blank Type | Blank Result | Sample Result | Action |
|---|---|---|---|
| | Not analyzed at specified frequency or sequence | Detect | J |
| | | Non-detect | No qualification |
| Method, TCLP/SPLP LEB, Field (including Equipment and Rinse) | Detect | Non-detect | No qualification |
| | < QL | < QL | Report at QL and qualify U |
| | | ≥ QL | Report at sample result and qualify J+ or No qualification |
| | ≥ QL | < QL | Report at QL and qualify U |
| | | ≥ QL but < Blank Result | Report at sample result and qualify U |
| | | ≥ QL and ≥ Blank Result | Report at sample result and qualify J+ or No qualification |

| Blank Type | Blank Result | Sample Result | Action |
|---|---|---|---|
| | Gross contamination | Detect | Report at sample result and qualify R |
| | TICs concentrations ≥ QLs | Detect | Use professional judgment |

Method Blanks

KQ2311260-04 all ND

Equipment Blanks

None

**LCS (Form III, batch worksheet)**

- ✓ use lab limits as reported to evaluate accuracy (%R)
- ✓ if qualification is required, qualified all samples in prep batch

Semivolatiles Table 9. LCS Actions

| Criteria | Action | |
|---|---|---|
| | Detect | Non-detect |
| LCS not performed at specified frequency or concentration | Use professional judgment | Use professional judgment |
| LCS %R limits not specified | Use professional judgment | Use professional judgment |
| %R < specified Lower Acceptance Limit | J- | R |
| %R within specified Acceptance Limits | No qualification | No qualification |
| %R > specified Upper Acceptance Limit | J+ | No qualification |

Per EDS guidance-do not Reject results unless %R is <10% recovery.

All ok

**MS/MSD (Form III)**

- ✓ use lab limits as reported to evaluate accuracy (%R) and precision (RPD)
- ✓ qualify parent sample only
- ✓ remember 4X rule

none

Semivolatiles Table 8. MS/MSD Actions

| Criteria | Action | |
|---|---|---|
| | Detect | Non-detect |
| MS/MSD not analyzed at specified frequency | Use professional judgment | Use professional judgment |
| MS/MSD not prepared from field sample | Use professional judgment | Use professional judgment |
| %R or RPD limits not specified | Use professional judgment | Use professional judgment |
| %R < Expanded Lower Acceptance Limit (10%, excluding spiked analyte with %R lower limit of 10% or less) | J | R |
| Expanded Lower Acceptance Limit (10%, excluding spiked analyte with %R lower limit of 10% or less) ≤ %R < specified Lower Acceptance Limit | J | UJ |
| %R or RPD within specified Acceptance Limits | No qualification | No qualification |
| %R or RPD > specified Upper Acceptance Limit | J | No qualification |

**Field Duplicates**

✓ RPD ≤50% (solid matrix) or ≤30% (aqueous matrix) if both results ≥5x PQL

For low-level results (one or both detected values ≤5x PQL) or when one result is a non-detection, the control limit is absolute difference ≤2x PQL (solid matrix) or ≤PQL (aqueous matrix). Non-detected values will be assigned the nominal value of the MDL for making comparison.

Qualify detects as estimated "J" and qualify non-detects as estimated "UJ".

List samples and results effected below.

✓ see field duplicate worksheet

none

**CLIENT:** HGL

**PROJECT:** Portland Harbor Superfund Site

**SDG:** K2306972

**Validated by:** LL 9/26/23

**Reviewed by:** **DLW**

**LAB:** ALS Kelso

Level 2A

**Sample Receipt / Hold times** (COC, receipt logs, case narrative)

✓received at <6% ◦C

✓HT (aqueous– 7 days to extract, 40 days extraction to analysis; solids – 14 days to extraction, 40 days extraction to analysis)

Collected: 6/18/23

Extracted: 6/27/23
Analyzed: 7/20/23

All ok

**Semivolatiles Table 1. Preservation and Holding Time Actions**

| Matrix | Preservation | Criteria | Action | |
|---|---|---|---|---|
| | | | Detect | Non-detect |
| Aqueous/Non-aqueous | Samples received at a temperature > 6°C | | J | UJ |
| Aqueous/Non-aqueous | Cooled at temperature ≤ 6°C | TCLP/SPLP leachate samples prepared within the 14-day technical holding time | No qualification | No qualification |
| | Not cooled at temperature ≤ 6°C | TCLP/SPLP leachate samples prepared within the 14-day technical holding time | Use professional judgment | Use professional judgment |
| | Cooled/not cooled at temperature ≤ 6°C | TCLP/SPLP leachate samples prepared outside the 14-day technical holding time | J | R |
| Aqueous | Cooled at temperature ≤ 6°C | Samples and TCLP/SPLP leachates extracted within the 7-day and analyzed within the 40-day technical holding time | No qualification | No qualification |
| | | Samples and TCLP/SPLP leachates extracted outside the 7-day and analyzed outside or within the 40-day technical holding time | J- | R |
| | | Samples and TCLP/SPLP leachates extracted outside or within the 7-day and analyzed outside the 40-day technical holding time | J- | R |

| Matrix | Preservation | Criteria | Action | |
|---|---|---|---|---|
| | | | Detect | Non-detect |
| Aqueous | Not cooled at temperature ≤ 6°C | Samples and TCLP/SPLP leachates extracted within the 7-day and analyzed within the 40-day technical holding time | Use professional judgment | Use professional judgment |
| | | Samples and TCLP/SPLP leachates extracted outside the 7-day and analyzed outside or within the 40-day technical holding time | J | R |
| | | Samples and TCLP/SPLP leachates extracted outside or within the 7-day and analyzed outside the 40-day technical holding time | J | R |
| Non-aqueous | Cooled at temperature ≤ 6°C | Samples extracted within the 14-day and analyzed within the 40-day technical holding time | No qualification | No qualification |
| | | Samples extracted outside the 14-day and analyzed outside or within the 40-day technical holding time | J- | R |
| | | Samples extracted outside or within the 14-day and analyzed outside the 40-day technical holding time | J- | R |
| Non-aqueous | Not cooled at temperature ≤ 6°C | Samples extracted within 14- day and analyzed within the 40-day technical holding time | Use professional judgment | Use professional judgment |
| | | Samples extracted outside the 14-day and analyzed outside or within the 40-day technical holding time | J | R |
| | | Samples extracted outside or within the 14-day and analyzed outside the 40-day technical holding time | J | R |

**Surrogates (Form II)**

✓ %Rs within limit. Used QAPP limits p-Terphenyl-d14 solid 30-102, aqueous 48-109

If any surrogate is out, qualify all results as follows in Table 7.

**Semivolatiles Table 7. Surrogate Actions**

| Criteria | Action | |
|---|---|---|
| | Detect | Non-detect |
| Surrogate not present or not at specified concentration | J or R | UJ or R |
| %R < Expanded Lower Acceptance Limit (10%, excluding surrogates with 10% as a lower acceptance limit, undiluted sample analysis) | J- | R |
| Expanded Lower Acceptance Limit (10%) ≤ %R (excluding surrogates with 10% as a lower acceptance limit, undiluted sample analysis) < specified Lower Acceptance Limit | J- | UJ |
| %R < specified Lower Acceptance Limit (diluted sample analysis) | Use professional judgment | Use professional judgment |
| %R within specified Acceptance Limits | No qualification | No qualification |
| %R > specified Upper Acceptance Limit | J+ | No qualification |

All ok

**Blanks (Form IV, Form 1)**

✓ evaluate storage, method, and field blanks

✓ method blank were prepared and analyzed in association with all samples in SDG

✓ blanks may not be qualified because of contamination in another blank

Use project 5X rule for blanks, Q U at result value, additional Q J may be used based on other failures

Method Blanks

KQ2311179-04

Bis(2-ethylhexyl) Phthalate 12 J (124.49) 5X=622.45

Sample >5X no Q

Equipment Blanks

None

**LCS (Form III, batch worksheet)**

✓ use QAPP limits to evaluate accuracy (%R) aqueous 42-147%R, solid 39-113%R

✓ if qualification is required, qualified all samples in prep batch

Semivolatiles Table 9. LCS Actions

| Criteria | Action | |
|---|---|---|
| | Detect | Non-detect |
| LCS not performed at specified frequency or concentration | Use professional judgment | Use professional judgment |
| LCS %R limits not specified | Use professional judgment | Use professional judgment |
| %R < specified Lower Acceptance Limit | J- | R |
| %R within specified Acceptance Limits | No qualification | No qualification |
| %R > specified Upper Acceptance Limit | J+ | No qualification |

Per EDS guidance-do not Reject results unless %R is <10% recovery.

KQ2311179-03 ↑ Q J (LCSH)

**MS/MSD (Form III)**

✓ use QAPP limits to evaluate accuracy (%R) and precision (RPD)

aqueous 42-147%R RPD 30, solid 39-113%R RPD 40

✓ qualify parent sample only

✓ remember 4X rule

MS MSD RPD

none

Semivolatiles Table 8. MS/MSD Actions

| Criteria | Action | |
|---|---|---|
| | Detect | Non-detect |
| MS/MSD not analyzed at specified frequency | Use professional judgment | Use professional judgment |
| MS/MSD not prepared from field sample | Use professional judgment | Use professional judgment |
| %R or RPD limits not specified | Use professional judgment | Use professional judgment |
| %R < Expanded Lower Acceptance Limit (10%, excluding spiked analyte with %R lower limit of 10% or less) | J | R |
| Expanded Lower Acceptance Limit (10%, excluding spiked analyte with %R lower limit of 10% or less) ≤ %R < specified Lower Acceptance Limit | J | UJ |
| %R or RPD within specified Acceptance Limits | No qualification | No qualification |
| %R or RPD > specified Upper Acceptance Limit | J | No qualification |

**Field Duplicates**

✓ RPD ≤50% (solid matrix) or ≤30% (aqueous matrix) if both results ≥5x PQL

For low-level results (one or both detected values ≤5x PQL) or when one result is a non-detection, the control limit is absolute difference ≤2x PQL (solid matrix) or ≤PQL (aqueous matrix). Non-detected values will be assigned the nominal value of the MDL for making comparison.

Qualify detects as estimated "J" and qualify non-detects as estimated "UJ".

List samples and results effected below.

✓ see field duplicate worksheet

none

**CLIENT:** HGL

**PROJECT:** Portland Harbor Superfund Site

**SDG:** K2306972

**Validated by:** LL 9/26/23

**Reviewed by:** **DLW**

**LAB:** ALS Kelso

Level 2A 8270 SIM PAH

**Sample Receipt / Hold times** (COC, receipt logs, case narrative)

✓received at <6% ◦C

✓HT (aqueous– 7 days to extract, 40 days extraction to analysis; solids – 14 days to extraction, 40 days extraction to analysis)

Collected: 6/18/23

Extracted: 6/27/23

Analyzed: 6/29/23

All ok

**Semivolatiles Table 1. Preservation and Holding Time Actions**

| Matrix | Preservation | Criteria | Action | |
|---|---|---|---|---|
| | | | Detect | Non-detect |
| Aqueous/Non-aqueous | Samples received at a temperature > 6°C | | J | UJ |
| Aqueous/Non-aqueous | Cooled at temperature ≤ 6°C | TCLP/SPLP leachate samples prepared within the 14-day technical holding time | No qualification | No qualification |
| | Not cooled at temperature ≤ 6°C | TCLP/SPLP leachate samples prepared within the 14-day technical holding time | Use professional judgment | Use professional judgment |
| | Cooled/not cooled at temperature ≤ 6°C | TCLP/SPLP leachate samples prepared outside the 14-day technical holding time | J | R |
| Aqueous | Cooled at temperature ≤ 6°C | Samples and TCLP/SPLP leachates extracted within the 7-day and analyzed within the 40-day technical holding time | No qualification | No qualification |
| | | Samples and TCLP/SPLP leachates extracted outside the 7-day and analyzed outside or within the 40-day technical holding time | J- | R |
| | | Samples and TCLP/SPLP leachates extracted outside or within the 7-day and analyzed outside the 40-day technical holding time | J- | R |

| Matrix | Preservation | Criteria | Action | |
|---|---|---|---|---|
| | | | Detect | Non-detect |
| Aqueous | Not cooled at temperature ≤ 6°C | Samples and TCLP/SPLP leachates extracted within the 7-day and analyzed within the 40-day technical holding time | Use professional judgment | Use professional judgment |
| | | Samples and TCLP/SPLP leachates extracted outside the 7-day and analyzed outside or within the 40-day technical holding time | J | R |
| | | Samples and TCLP/SPLP leachates extracted outside or within the 7-day and analyzed outside the 40-day technical holding time | J | R |
| Non-aqueous | Cooled at temperature ≤ 6°C | Samples extracted within the 14-day and analyzed within the 40-day technical holding time | No qualification | No qualification |
| | | Samples extracted outside the 14-day and analyzed outside or within the 40-day technical holding time | J- | R |
| | | Samples extracted outside or within the 14-day and analyzed outside the 40-day technical holding time | J- | R |
| Non-aqueous | Not cooled at temperature ≤ 6°C | Samples extracted within 14- day and analyzed within the 40-day technical holding time | Use professional judgment | Use professional judgment |
| | | Samples extracted outside the 14-day and analyzed outside or within the 40-day technical holding time | J | R |
| | | Samples extracted outside or within the 14-day and analyzed outside the 40-day technical holding time | J | R |

**Surrogates (Form II)**

✓ %Rs within limit. Used lab limits

If any surrogate is out, qualify all results as follows in Table 7.

**Semivolatiles Table 7. Surrogate Actions**

| Criteria | Action | |
|---|---|---|
| | Detect | Non-detect |
| Surrogate not present or not at specified concentration | J or R | UJ or R |
| %R < Expanded Lower Acceptance Limit (10%, excluding surrogates with 10% as a lower acceptance limit, undiluted sample analysis) | J- | R |
| Expanded Lower Acceptance Limit (10%) ≤ %R (excluding surrogates with 10% as a lower acceptance limit, undiluted sample analysis) < specified Lower Acceptance Limit | J- | UJ |
| %R < specified Lower Acceptance Limit (diluted sample analysis) | Use professional judgment | Use professional judgment |
| %R within specified Acceptance Limits | No qualification | No qualification |
| %R > specified Upper Acceptance Limit | J+ | No qualification |

All ok

**Blanks (Form IV, Form 1)**

✓ evaluate storage, method, and field blanks

✓ method blank were prepared and analyzed in association with all samples in SDG

✓ blanks may not be qualified because of contamination in another blank

**Semivolatiles Table 6. Blank Actions**

| Blank Type | Blank Result | Sample Result | Action |
|---|---|---|---|
| | Not analyzed at specified frequency or sequence | Detect | J |
| | | Non-detect | No qualification |
| Method, TCLP/SPLP LEB, Field (including Equipment and Rinse) | Detect | Non-detect | No qualification |
| | < QL | < QL | Report at QL and qualify U |
| | | ≥ QL | Report at sample result and qualify J+ or No qualification |
| | ≥ QL | < QL | Report at QL and qualify U |
| | | ≥ QL but < Blank Result | Report at sample result and qualify U |
| | | ≥ QL and ≥ Blank Result | Report at sample result and qualify J+ or No qualification |

| Blank Type | Blank Result | Sample Result | Action |
|---|---|---|---|
| | Gross contamination | Detect | Report at sample result and qualify R |
| | TICs concentrations ≥ QLs | Detect | Use professional judgment |

Method Blanks

KQ2311272-04

Anthracene 0.29 J (0.30) 5X=1.5

Phenanthrene 0.94 J (0.96) 5X=4.8

Pyrene 0.65 J (0.66) 5X=3.3

Smple All >5X no Q

Equipment Blanks

None

**LCS (Form III, batch worksheet)**

- ✓ use lab limits to evaluate accuracy (%R)
- ✓ if qualification is required, qualified all samples in prep batch

**Semivolatiles Table 9. LCS Actions**

| Criteria | Action | |
|---|---|---|
| | Detect | Non-detect |
| LCS not performed at specified frequency or concentration | Use professional judgment | Use professional judgment |
| LCS %R limits not specified | Use professional judgment | Use professional judgment |
| %R < specified Lower Acceptance Limit | J- | R |
| %R within specified Acceptance Limits | No qualification | No qualification |
| %R > specified Upper Acceptance Limit | J+ | No qualification |

all ok

**MS/MSD (Form III)**

- ✓ use QAPP limits to evaluate accuracy (%R) and precision (RPD)
- ✓ qualify parent sample only
- ✓ remember 4X rule

**Semivolatiles Table 8. MS/MSD Actions**

| Criteria | Action | |
|---|---|---|
| | Detect | Non-detect |
| MS/MSD not analyzed at specified frequency | Use professional judgment | Use professional judgment |
| MS/MSD not prepared from field sample | Use professional judgment | Use professional judgment |
| %R or RPD limits not specified | Use professional judgment | Use professional judgment |
| %R < Expanded Lower Acceptance Limit (10%, excluding spiked analyte with %R lower limit of 10% or less) | J | R |
| Expanded Lower Acceptance Limit (10%, excluding spiked analyte with %R lower limit of 10% or less) ≤ %R < specified Lower Acceptance Limit | J | UJ |
| %R or RPD within specified Acceptance Limits | No qualification | No qualification |
| %R or RPD > specified Upper Acceptance Limit | J | No qualification |

SIB-SED-MG-AAM169-NW-061723 K2306972-001 all ok

**Field Duplicates**

✓ RPD ≤50% (solid matrix) or ≤30% (aqueous matrix) if both results ≥5x PQL

For low-level results (one or both detected values ≤5x PQL) or when one result is a non-detection, the control limit is absolute difference ≤2x PQL (solid matrix) or ≤PQL (aqueous matrix). Non-detected values will be assigned the nominal value of the MDL for making comparison.

Qualify detects as estimated "J" and qualify non-detects as estimated "UJ".

List samples and results effected below.

✓ see field duplicate worksheet

none

**TOC Validation Checklist**

| | |
|---|---|
| **Site:** | Portland Harbor |
| **Laboratory:** | ALS Environmental |
| **SDG:** | K2306972 |
| **Data Validator:** | KB |
| **Validation Date:** | 9/18/2023 |
| **Reviewer:** | DLW |
| **Review Date:** | 9/28/2023 |
| **Method:** | 9060 |

| | |
|---|---|
| **Date Collected:** | 6/18/2023 |
| **Date of Analysis:** | 7/3/2023 |

**Data Completeness and Deliverables**

***Have any missing deliverable been recieved and added to the data package?*** ☐ Yes ☑ No

**ACTION:** Call lab for explanation/resubmittal of any missing deliverables. If the lab cannot probive them, note the effect on review of the data in the non-compliance section of the data assessment narrative.

Notes and validation action:

**Custody Documents and Narratives**

***Are chains of custody present and complete for all samples?*** ☑ Yes ☐ No

**ACTION:** Contact lab for replacement of missing documents.

***Do chains of custody or lab narratives indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data?*** ☐ Yes ☑ No

***Per NFG: Are the % solids >30% for all solids samples?***

**ACTION**: If the %Solids for a soil/sediment sample is < 10.0%, use professional judgment to qualify detects and non-detects.
If the %Solids for a soil/sediment sample is ≥ 10.0% and < 30.0%, use professional judgment to qualify detects and non-detects.

Notes and validation action: all samples % solids > 30%

**Temperature:**

***Sample coolers received @ 0-6 ℃ ?*** ☑ Yes ☐ No

**Preservation:**

***Sulfuric or hydrochloric acid pH of 2?*** ☐ Yes ☑ No

**ACTION:** Samples improperly preserved shall be noted in the data validation report. Professional judgement may result in the results of an analysis of an improperly preserved sample by the laboratory being qualified as estimated "J-" or "R".

**ACTION**: If samples >6°C but <10° C flag all positive results as estimated "J" an all non-detects "UJ".

Notes and validation action: solid samples no pres required

**Holding Time**

***Does the holding time exceed 28 days?*** ☐ Yes ☑ No

***or***
***Freeze to −10°C***
***for up to 1 year***

**ACTION:** If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the

Notes and validation action: HT ok

**Calibration Verification**

***Are raw data and summary sheets present for both inital and continuing calibrations?*** ☐ Yes ☑ No

***At least the number of standards requried by QAPP and a blank?*** ☐ Yes ☐ No

***Correlation coeff > 0.995?*** ☐ Yes ☐ No

***Are the %D values between lab limits?*** ☐ Yes ☐ No

***Are the ICV/CCV %r within 80-120%?*** ☐ Yes ☐ No
**ACTION:** If criteria not met, qualify with bias per NFG

Notes and validation action: not validated at stage 2 A

90-110

Level 2A

**Blanks**

***Has a method blank analysis been reported per twenty samples of a similar matrix or concentration level, and for each extraction batch?*** ☑ Yes ☐ No

***Upon examination of laboratory and field blank data, do any blanks contain positive results?*** ☑ Yes ☐ No

***Have calibration blanks been analyzed at the proper frequency?*** ☐ Yes ☐ No ☑ NA

***Are there field/rinse/equipment blanks associated with every sample?*** ☑ Yes ☐ No

**ACTION:** If contamination is present, qualify per NFG.
Per Ken email: Use 5X rule with blanks

Notes and validation action:

| blank | positives | Flag | associated samples |
|---|---|---|---|
| KQ2311078-04 | ND | none | all |

equipment blank
None

**Matrix Spike**

***Is a matrix spike/matrix spike duplicate summary present?*** ☑ Yes ☐ No

**ACTION:** If any matrix spike data are missing, call the lab for explanation/re-submittal. If information is not available, document the effect in narrative notes.

***Are all matrix spike and/or matrix spike duplicate %Rs or RPDs within 70-130%?*** ☑ Yes ☐ No
Use QAPP Limits: 72-122%R, RPD ≤ 20 (solid)
83-117%R, RPD ≤ 17 (aqueous)

**ACTION:** If no, qualify with bias per NFG.

Notes and validation action:

| Sample | MS %R | MSD %R | RPD | Flag |
|---|---|---|---|---|
| SIB-SED-MG-AAM169-NW-061723 (-001) | 100 | 98 | 1 | |

**Laboratory Duplicate**

***Is a laboratory duplicate summary present?*** ☑ Yes ☐ No

***Are the RPDs within 20%?*** Use QAPP Limits ☑ Yes ☐ No

**ACTION:** If orginal and duplicate results are ≥ 5X CRQL and RPD is >20% or original and duplicate results are <5X CRQL and the absolute difference between sample and duplicate is >CRQL then qualify as "J" and/or "UJ."

Notes and validation action:

| Sample | RPD |
|---|---|
| SIB-SED-MG-AAM169-NW-061723 (-001) | 3 |

**Laboratory Control Sample**

***Were LCS samples evaluated with each batch of 20 samples or less and were observed percent recoveries within the laboratory defined limits of (75-125%)?***

☑ Yes ☐ No

Use QAPP Limits: 72-122%R, RPD ≤ 20 (solid)
83-117%R, RPD ≤ 17 (aqueous)

**ACTION**: If LCS %R fall outside the control limits, qualify per NFG

Notes and validation action:

| LCS or LCSD | %R | Flag | Associated samples: |
|---|---|---|---|
| K2306972-LCS | 99 | none | sample 1 |

**Field Duplicate s**

***Were field duplicates submitted for TOC analysis?***

☑ Yes ☐ No

**ACTION**: For field duplicate analyses that do not meet the technical criteria as required by QAPP, apply action to only the parent sample and its duplicate.

RPD 50% (solid) 30% (aqueous) if both results >=5X PQL

Notes and validation action:
None

**Review Level**

☐ Yes ☑ No

List samples reviewed and bold samples used for calculations: