APPENDIX E. DATA VALIDATION REPORT

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DATA VALIDATION REPORT

Survey and Sampling of Lower Duwamish Waterway Seeps Data

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1.0 Introduction

Data validation was performed the following laboratory data packages:

Sample Date	Lab	Report Number(s)	Report Date(s)
06/29/2004	Analytical Resources	GU26	08/03/2004
06/30/2004		GU45	08/03/2004
07/01/2004		GU59	
07/02/2004		GU76	
07/02-07/03/2004		GU83	
07/1/2004		GV04	08/03/2004
07/30/2004		GX14	08/16/2004
06/29-07/03/2004	Frontier Geosciences	-	07/29/2004

Metals analyses were performed by Frontier Geosciences Inc. (FGS) in Seattle, Washington. All other analyses were performed by Analytical Resources, Inc. (ARI) in Tukwila, Washington.

Validation was performed by Cari Sayler. For ARI data, laboratory batches for each method were selected for full validation based on concentrations of contaminants and a sufficient number of samples to meet the 20% requirement. FGS did not assign samples to separate preparation batches and the analytical batches were analyte dependant. For FGS data, the first eight samples analyzed for each method underwent full validation. A summary validation was performed on the remaining batches. A sample cross reference, indicating the validation type is provided in section 13.0 of this report.

Numeric quality control criteria for the requirements listed below are presented in the laboratory reports, in the project Quality Assurance Project Plan (QAPP), in the analytical methods, or in EPA's functional guidelines for data validation. Data qualifiers are summarized in Section 14.0 of this report.

2.0 Sample Custody and Preservation

Sample custody was maintained as required from sample collection to receipt at the laboratory. The samples were received intact with the proper documentation, with one exception: Trip blanks submitted with 6/29, 6/30 and 7/1 samples were not listed on the chain of custody. Trip blanks were analyzed for volatiles and, where appropriate, TPH-gasoline.

Sample and fractions analyzed matched chain of custodies with the following exceptions: Semivolatile and TPH-diesel analyses were not performed on sample LDW-SP-64-C-F due to insufficient sample volume. Pesticide analysis was cancelled for sample LDW-SP-64-C-U because it was not required due to high field turbidity results.

The QAPP requirement for sample preservation is 4°C. Functional Guidelines expands on this requirement as 4 ± 2 °C. Sample receipt temperatures ranged from 1.8 to 6°C in batches GU45, GU59, GU76, GU83, and GV04. The sample receipt temperatures for batch GU26 were 10.8 and 12.2°C. The samples were collected within a few hours of delivery to the laboratory and samples may not have completely cooled. The sample receipt temperature for batch GX14 was 14°C. Samples were delivered to the laboratory 6½ to 7 hours after sample collection. All volatile results in batch GX14 were qualified as estimated.

3.0 Volatile Organic Analyses

The samples were analyzed by EPA Method 8260B. The following data requirements were evaluated:

- Quality control analysis frequencies
- Multiple analysis results
- Analysis holding times
- Instrument performance check (tune) ion abundances (full validation only)
- Instrument calibration (full validation only)
- Laboratory blank contamination
- Trip blank contamination
- Surrogate recoveries
- MS recoveries
- MS/MSD relative percent differences (RPDs)
- LCS recoveries
- Field replicate precision
- Internal standard areas and retention time shifts (full validation only)
- Compound identifications (full validation only)
- Compound quantitations (full validation only)

Unless otherwise specified, discussions below for full validation data requirements refer only to batch GU45.

Quality control analysis frequencies: The QAPP specifies that the following quality control samples be analyzed one per analytical batch or one per twenty samples: method blank, LCS, MS, and MSD. In addition, surrogate compounds must be measured in each field and quality control sample.

Each batch included a method blank, LCS, LCSD, and appropriate surrogates. MS/MSD were analyzed with batch F3071004A and F3071404A. Due to insufficient sample volume, no MS/MSD were analyzed with batch F5080504A. A frequency of 1/20 was achieved for MS/MSD and no qualifiers were assigned.

Multiple analysis results: Six compounds were analyzed by both 8260B and by 8270C: 1,2-Dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2,4-trichlorobenzene, naphthalene and hexachlorobutadiene.

The best result to report was selected based on the following guidelines:

(1) If both results were non-detects, the lower reporting limit was selected.
(2) If one result was not detected and the other detected, the detection was selected.
(3) If both results were detections the following additional criteria were applied:
    (a) If one result was off-scale and one was on-scale, the on-scale result was selected.
    (b) If associated QC results indicated high bias, the lower concentration result was selected.
    (c) If associated QC results indicated no, low, or mixed biases, the higher concentration result was selected.

Sample results not selected as the best result to report were qualified R2, rejected due to the availability of a better result analyzed by another method.

Analysis holding times: Samples must be analyzed within 14 days of collection. All samples were analyzed within the holding time. However, as noted above, due to elevated cooler temperatures all volatile results in batch GX14 were qualified as estimated.

Laboratory blank results: Criteria for method blanks are that analyte concentrations must be below the PQL, or below 10% of the lowest associated sample concentration. No target analytes were detected in the method blanks.

Trip blank results: Criteria for trip blanks are that analyte concentrations must be below the PQL, or below 10% of the lowest associated sample concentration. No target analytes were detected in the trip blanks.

Instrument calibration: Functional guidelines criteria for calibrations include minimum response factors of 0.05, maximum %RSDs of 30% for initial calibration compounds with average response factor quantitations, minimum correlation coefficients of 0.990 for initial calibration compounds with linear or quadratic quantitations, and continuing calibration maximum % differences of ±25%.

The initial calibration %RSDs and/or correlation coefficients were within criteria, all response factors were above the 0.05 minimum, and the continuing calibration differences were within the ±25% range for target analytes.

Instrument performance check (tune) ion abundances: Ion abundance criteria exist for 8 ions in bromofluorobenzene. These criteria were met in each 12-hour standard.

Internal standard areas and retention time shifts: Internal standard area counts in each sample must not vary by more than a factor of 2 from the associated 12-hour standard. The internal standard retention times in each sample must not vary by more than ±30 seconds from the associated 12-hour standard. All internal standard areas and retention times were within range.

Surrogate recoveries: The DQI for accuracy is 75-125%. Several samples have recovery values outside the laboratory control limits, but within the QAPP DQI limits. No qualifiers were assigned.

LCS recoveries and RPDs: DQI for accuracy is 75-125% and the DQI for precision is <30%. The following recoveries were outside the DQI:

QC Sample	Analyte	% Recovery
F3071004A LCS	1,2-Dibromo-3-chloropropane	68.4
F3071004A LCS	2-Hexanone	67.2
F3071004A LCS	Naphthalene	73.0
F3071404A LCS	Bromomethane	65.2
F3071404A LCSD	Bromomethane	68.4
F5080504A LCS	1,2,4-Trichlorobenzene	130
F5080504A LCSD	1,2,4-Trichlorobenzene	126

For 1,2-dibromo-3-chloropropane, 2-hexanone, and naphthalene, qualifiers are not required because the average LCS/LCSD recovery is within limits. For 1,2,4-Trichlorobenzene, qualifiers were not required because the recoveries are above the DQI. 1,2,4-Trichlorobenzene was not detected in any of the samples. Bromomethane reporting limits were qualified as estimated in the associated samples.

All other LCS and LCSD recoveries and all LCS/LCSD RPD values met the DQI.

MS recoveries: The DQI for accuracy is 75-125%.

Batch	QC Sample	Analyte	% Recovery
F3071004A	LDW-SP-54-C-U MS	1,2,4-Trichlorobenzene	71.8
F3071004A	LDW-SP-54-C-U MS	1,2,4-Trimethylbenzene	67.8
F3071004A	LDW-SP-54-C-U MS	1,3,5-Trimethylbenzene	67.8
F3071004A	LDW-SP-54-C-U MS	2-Chloroethylvinylether	ND
F3071004A	LDW-SP-54-C-U MS	4-Isopropyltoluene	59.2
F3071004A	LDW-SP-54-C-U MS	Acrolein	66.4
F3071004A	LDW-SP-54-C-U MS	Bromomethane	74.0
F3071004A	LDW-SP-54-C-U MS	Hexachlorobutadiene	49.6
F3071004A	LDW-SP-54-C-U MS	n-Propylbenzene	66.0
F3071004A	LDW-SP-54-C-U MS	Styrene	48.6
F3071004A	LDW-SP-54-C-U MSD	2-Chloroethylvinylether	ND
F3071004A	LDW-SP-54-C-U MSD	4-Isopropyltoluene	74.2
F3071004A	LDW-SP-54-C-U MSD	4-Methyl-2-Pentanone (MIBK)	128

Batch	QC Sample	Analyte	% Recovery
F3071004A	LDW-SP-54-C-U MSD	Bromomethane	73.0
F3071004A	LDW-SP-54-C-U MSD	Hexachlorobutadiene	72.2
F3071004A	LDW-SP-54-C-U MSD	Styrene	60.0
F3071404A	LDW-SP-41-C-U MS	2-Chloroethylvinylether	ND
F3071404A	LDW-SP-41-C-U MS	Bromomethane	59.6
F3071404A	LDW-SP-41-C-U MS	Methyl Iodide	70.8
F3071404A	LDW-SP-41-C-U MSD	2-Chloroethylvinylether	ND
F3071404A	LDW-SP-41-C-U MSD	Bromomethane	70.6
F3071404A	LDW-SP-41-C-U MSD	Styrene	65.4

For 2-Chloroethylvinylether, the reporting limit in all samples has been rejected because the MS and MSD recovery values were less than 10%. The reporting limits for the remaining analytes were qualified as estimated in the native samples only.

MS/MSD RPDs: The DQI for precision is <30%. The following RPDs exceeded the DQI:

Batch	QC Sample	Analyte	RPD
F3071004A	LDW-SP-54-C-U MS/MSD	Hexachlorobutadiene	37.1
F3071404A	LDW-SP-41-C-U MS/MSD	Styrene	33.4

Hexachlorobutadiene and styrene were not detected in the native samples and no qualifiers were necessary.

Field replicate precision: LDW-SP-82-C-FD-U was a field replicate. Volatile analytes were not detected in the sample/field replicate. Field replicate precision could not be evaluated.

Compound identifications: Spectra of positive results were evaluated for compliance with identification criteria. The retention times for positive results were within the retention time windows. Chromatograms were reviewed for evidence of false negatives. No discrepancies were noted.

Compound quantitations: Concentrations of 1,2-dichlorobenzene in samples and QC samples were recalculated to verify sample quantitations. Concentrations of carbon disulfide, chlorobenzene 1,3-dichlorbenzene and 1,4-dichlorobenzene in sample LDW-SP-54-C-U were also recalculated. No discrepancies were noted.

Overall assessment: Documentation was found to be clear and complete. No calculation, identification, or transcription errors were noted. Calibration data and instrument performance check results demonstrate acceptable instrument performance. Low LCS, LCSD, MS and MSD recoveries resulted in some estimated reporting limits and the rejection of 2-Chloroethylvinylether.

With the exception of 2-Chloroethylvinylether, volatile organic data as qualified are acceptable for use.

4.0 Semivolatile Organic Analyses

The samples were analyzed by EPA Method 8270C. The following data requirements were evaluated:

- Quality control analysis frequencies
- Multiple analysis results
- Extraction and analysis holding times
- Instrument performance check (tune) ion abundances (full validation only)
- Instrument calibration (full validation only)
- Laboratory blank contamination
- Surrogate recoveries
- MS recoveries
- MS/MSD relative percent differences (RPDs)
- LCS recoveries
- Field replicate precision
- Internal standard areas and retention time shifts (full validation only)
- Compound identifications (full validation only)
- Compound quantitations (full validation only)

Unless otherwise specified, discussions below for full validation data requirements refer only to batch GU45.

Quality control analysis frequencies: The QAPP specifies that the following quality control samples be analyzed one per analytical batch method blank, laboratory control sample matrix spike, and matrix spike duplicate. In addition, surrogate compounds must be measured in each field and quality control sample.

Required quality control samples were analyzed. MS/MSDs were analyzed on samples LDW-SP-41-C-F and LDW-SP-41-C-U in batch SV0702A, and LDW-SP-75-C-F and LDW-SP-75-C- U in batch SV0707A.

Multiple analysis results: Two analyses were performed for sample LDW-SP-61-C-F due to a concentration exceeding the calibration range. The best result to report was selected based on the guidelines described in section 3.0. Sample results not selected as the best result to report were qualified R1, rejected due to the availability of better results.

In the unfiltered samples, six compounds were analyzed by both 8260B and by 8270C: 1,2-Dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2,4-trichlorobenzene, naphthalene and hexachlorobutadiene. The best result to report was selected based on the guidelines described in section 3.0. Sample results not selected as the best result to report were qualified R2, rejected due to the availability of a better result analyzed by another method.

Analysis holding times: Samples must be extracted within 7 days of collection. Extracts must be analyzed within 40 days of extraction. All samples were extracted and analyzed within holding time.

Laboratory blank results: Criteria for method blanks are that analyte concentrations must be below the PQL, or below 10% of the lowest associated sample concentration. The method blank associated with batch SV0707A contained bis(2-ethylhexyl) phthalate at a concentration of 1.2 µg/L. Bis(2-ethylhexyl)phthalate was not detected in the method blank associated with batch SV0702A. Due to the sporadic nature of contamination, concentrations of bis(2-ethylhexyl)phthalate below ten times the blank level in any sample are qualified as undetected at the reported concentration.

A high level of bis(2-ethylhexyl)phthalate was detected in the filtered sample from Seep 61 (LDW-SP-61-C-F, 2300 ug/L) with consistent concentrations reported for the undiluted and diluted sample. Bis(2-ethylhexyl)phthalate was present in the unfiltered sample from seep 61 at a much lower level ((LDW-SP-61-C-U, 3.1 ug/L). The laboratory attributed this to contamination from the rubber stopper used in the filtering apparatus which was not wrapped with Teflon tape.

The bis(2-ethylhexyl)phthalate result in sample LDW-SP-61-C-F was rejected and is unusable for any purpose. Because the Teflon tape was not used for any of the filtered samples, all phthalates in the remaining filtered samples were qualified as undetected.

Field blank results: Criteria for field blanks are that analyte concentrations must be below the PQL, or below 10% of the lowest associated sample concentration. Rinsate blanks LDW-SP-64-RB-S-U (1.2 ug/L) and LDW-SP-64-RB-MP-U (2.4 ug/L) contained bis(2-ethylhexyl)phthalate. Samples were already qualified due to laboratory blank contamination and no further qualifiers were assigned.

Instrument calibration: Functional guidelines criteria for calibrations include minimum response factors of 0.05, initial calibration maximum relative standard deviations (RSDs) of 30%, and continuing calibration maximum % differences of ±25%.

The initial calibration RSDs were within the criteria. All initial and continuing calibration response factors were above the 0.05 minimum. Continuing calibration % differences were within criteria.

Instrument performance check (tune) ion abundances: Ion abundance criteria exist for 11 ions in decafluorotriphenylphosphine. These criteria were met in each 12-hour standard.

Internal standard areas and retention time shifts: Internal standard area counts in each sample must not vary by more than a factor of 2 from the associated 12-hour standard. The internal standard retention times in each sample must not vary by more than ±30 seconds from the associated 12-hour standard. All internal standard areas and retention times were within range.

Surrogate recoveries: The DQI for accuracy is 20-130%. Laboratory reported control limits for surrogate recoveries ranged from 27-136 to 47-101%. Surrogates were not recovered in sample LDW-SP-61-C-F due to the necessary dilution factor. No qualifiers were assigned. All other surrogate recoveries were within both limits.

LCS recoveries: The DQI for accuracy is 20-130%. The LCS recoveries were within limits.

MS recoveries: The DQI for accuracy is 20-130%. All MS and MSD recoveries met the DQI for accuracy.

MS/MSD RPDs: The DQI for precision is RPD ≤30%. All MS/MSD RPDs met the DQI for precision.

Field replicate precision: LDW-SP-82-C-FD-F and LDW-SP-82-C-FD-U were field replicates. The only compounds detected in the sample/field replicates are laboratory contaminants. Field replicate precision could not be evaluated.

Compound identifications: Spectra of positive results were evaluated for compliance with identification criteria. The retention times for positive results were within the retention time windows. Chromatograms were reviewed for evidence of false negatives. No discrepancies were noted.

Compound quantitations: Concentrations of 1,3-dichlorobenzene, 1,4-dichlorobenzene, bis(2-ethylhexyl)phthalate, and the surrogate 2,4,6-tribromophenol were recalculated to verify sample quantitations. No discrepancies were noted.

Overall assessment: Documentation was found to be clear and complete. No calculation or transcription errors were noted. Multiple analysis results were reduced to the most appropriate result. Accuracy and precision was within acceptable limits. Some results for common laboratory contaminants were qualified as undetected and one bis(2-ethylhexyl)phthalate result was rejected as unusable.

With the exception of one bis(2ethylhexyl)phthalate result, semivolatile organic data are acceptable for use as qualified.

5.0 Pesticide Analyses

Analyses were performed by EPA Method 8080 modified, with silica gel cleanup. The following data requirements were evaluated:

- Quality control analysis frequencies
- Multiple analysis results
- Extraction and analysis holding times
- Instrument calibration (full validation only)
- Laboratory blank contamination
- Field blank contamination
- Surrogate recoveries
- MS recoveries
- MS/MSD relative percent differences (RPDs)
- LCS recoveries
- Field replicate precision
- Internal standard areas and retention time shifts (full validation only)
- Compound identifications (full validation only)
- Compound quantitations (full validation only)

Unless otherwise specified, discussions below for full validation data requirements refer only to batch GU59.

Quality control analysis frequencies: The QAPP specifies that the following quality control samples be analyzed one per analytical batch or one per twenty samples: method blank, laboratory control sample, matrix spike, and matrix spike duplicate. In addition, surrogate compounds must be measured in each field and quality control sample.

Required quality control samples were analyzed. MS/MSDs were analyzed on samples LDW-SP-41-C-F in batch PE0702A and LDW-SP-75-C- U in batch PE0707A.

Multiple analysis results: Multiple analyses were not reported.

Holding times: Samples must be extracted within 7 days of collection. Extracts must be analyzed within 40 days of extraction. All samples were extracted and analyzed within holding times.

Laboratory blank results: Criteria for method blanks are that analyte concentrations must be below the PQL, or below 10% of the lowest associated sample concentration. No contamination was detected in the method blank.

Field blank results: Criteria for field blanks are that analyte concentrations must be below the PQL, or below 10% of the lowest associated sample concentration. Delta-BHC was found in LDW-SP-64-RB-MP-U at a concentration of 0.0035 ug/L. Delta-BHC was not detected in any sample and no qualifiers were assigned.

Instrument calibration: Data usability criteria for calibrations include minimum correlation coefficients of 0.990 or maximum RSDs of ±20% for each initial calibration, and maximum % differences of ±25% for each continuing calibration. DDT and Endrin breakdown must be individually below 20% and combined below 30%.

All initial calibration compound RSDs were within 20%. All continuing calibration % differences were within ±25%. The % breakdowns were acceptable.

Surrogate recoveries: Laboratory reported control limits for surrogate recoveries were 25-118 for TCMX and 25-134 for DCBP. The DQI for accuracy was 50-150%.

The following surrogate recoveries were outside the DQI.

Sample ID	Surrogate	% Recovery
LDW-SP-10-C-F	Tetrachlorometaxylene	32.5
LDW-SP-12-C-F	Tetrachlorometaxylene	48.8
LDW-SP-12-C-U	Tetrachlorometaxylene	42.8
LDW-SP-20-C-F	Tetrachlorometaxylene	44.5
LDW-SP-20-C-U	Tetrachlorometaxylene	48.5
LDW-SP-61-C-U	Tetrachlorometaxylene	44.5
LDW-SP-62-C-F	Tetrachlorometaxylene	39.0
LDW-SP-64-C-F	Decachlorobiphenyl	49.2
LDW-SP-64-C-F	Tetrachlorometaxylene	49.2

Sample ID	Surrogate	% Recovery
LDW-SP-69-C-F	Decachlorobiphenyl	49.8
LDW-SP-69-C-F	Tetrachlorometaxylene	38.2
LDW-SP-69-C-U	Decachlorobiphenyl	33.8
LDW-SP-69-C-U	Tetrachlorometaxylene	39.5
LDW-SP-71-C-F	Tetrachlorometaxylene	33.8
LDW-SP-71-C-U	Tetrachlorometaxylene	38.2
LDW-SP-75-C-F	Tetrachlorometaxylene	45.2
LDW-SP-75-C-U	Decachlorobiphenyl	48.2
LDW-SP-75-C-U	Tetrachlorometaxylene	41.0
LDW-SP-76-C-F	Tetrachlorometaxylene	31.8
LDW-SP-76-C-U	Tetrachlorometaxylene	34.0
LDW-SP-80-C-U	Tetrachlorometaxylene	35.0
LDW-SP-82-C-FD-U	Decachlorobiphenyl	44.2
LDW-SP-82-C-FD-U	Tetrachlorometaxylene	34.5

All surrogate recoveries were within the laboratory limits. None of the samples with both surrogate recoveries below the DQI contained pesticides. No qualifiers were assigned.

Please note that the reported pesticide surrogate recoveries that do not match the reported PCB recoveries were reported from a different column. According to the laboratory, pesticide surrogate recoveries were reported from the column with the higher concentration and PCB surrogate recoveries were reported from the first column. The method does not specify procedures for choosing surrogate results, and both procedures are considered acceptable.

LCS recoveries: The DQI for accuracy was 50-150%. The recoveries of endrin aldehyde in the LCS from batch PE0702A (12.0%) and in the LCS from batch PE0707A (42.8%) were below the DQI. The reporting limit for endrin aldehyde was estimated in all associated samples. All other LCS recoveries were within these limits.

MS recoveries: The DQI for accuracy was 50-150%. The recovery of gamma-BHC in LDW-SP-75-C-U MSD (49.0%) was slightly below the DQI. No qualifiers were assigned. All other MS and MSD recoveries were within limits.

MS/MSD RPDs: The RPD for aldrin in LDW-SP-75-C-U MS/MSD (36.5%) exceeded the DQI for precision of <30%. Aldrin was not detected in the associated samples and no qualifiers were assigned. All other RPDs were within limits.

Field replicate precision: LDW-SP-82-C-FD-F and LDW-SP-82-C-FD-U were field replicates. Pesticides were not detected in the sample/field replicates. Field replicate precision could not be evaluated.

Compound identifications: Chromatograms and quantitation reports were reviewed for accuracy of compound identifications. No discrepancies were noted. Additionally, according to the laboratory narrative, a standard addition analysis was

performed on sample LDW-SP-39-C-U which confirmed the identification of heptachlor epoxide.

Compound quantitations: Concentrations of delta-BHC, gamma chlordane, and heptachlor epoxide were recalculated to verify sample quantitations. No discrepancies were noted.

Overall assessment: Calibration and instrument performance data indicate acceptable performance. Dual column confirmations were performed. Quality control results demonstrated acceptable levels of precision. Low LCS recoveries resulted in estimated endrin aldehyde reporting limits. Pesticide data, as qualified, are acceptable for use.

6.0 PCB Analyses

Analyses were performed by EPA Method 8080 modified, with silica gel cleanup. The following data requirements were evaluated:

- Quality control analysis frequencies
- Multiple analysis results
- Extraction and analysis holding times
- Instrument calibration (full validation only)
- Laboratory blank contamination
- Surrogate recoveries
- MS recoveries
- MS/MSD relative percent differences (RPDs)
- LCS recoveries
- Field replicate precision
- Internal standard areas and retention time shifts (full validation only)
- Compound identifications (full validation only)
- Compound quantitations (full validation only)

Unless otherwise specified, discussions below for full validation data requirements refer only to batch GU45.

Quality control analysis frequencies: The QAPP specifies that the following quality control samples be analyzed one per analytical batch or one per twenty samples: method blank, laboratory control sample, matrix spike, and matrix spike duplicate. In addition, surrogate compounds must be measured in each field and quality control sample.

Each batch included a method blank, laboratory control sample and appropriate surrogates. MS/MSDs were analyzed on samples LDW-SP-41-C-U in batch PB0702A and LDW-SP-75-C-F in batch PB0707A. No MS/MSDs were analyzed in batch PB0709A due to insufficient sample volume. A frequency of 1/20 was achieved and no qualifiers were assigned.

Multiple analysis results: Sample LDW-SP-54-C-U was diluted and reanalyzed due to concentrations exceeding the calibration range. The best result to report was selected based on the guidelines described in section 3.0. Sample results not selected as the best result to report were qualified R1, rejected due to the availability of better results.

Holding times: Samples must be extracted within 7 days of collection. Extracts must be analyzed within 40 days of extraction. All samples were extracted and analyzed within holding times.

Laboratory blank results: Criteria for method blanks are that analyte concentrations must be below the PQL, or below 10% of the lowest associated sample concentration. No contamination was detected in the method blanks.

Field blank results: Criteria for field blanks are that analyte concentrations must be below the PQL, or below 10% of the lowest associated sample concentration. No contamination was detected in the field blanks.

Instrument calibration: Data usability criteria for calibrations include minimum correlation coefficients of 0.990 or maximum RSDs of ±20% for each initial calibration, and maximum % differences of ±25% for each continuing calibration. All initial calibration compound RSDs were within 20%. Continuing calibration data was missing from the data package. Resubmissions were provided. All continuing calibration % differences were within ±25%.

Surrogate recoveries: Laboratory reported control limits for surrogate recoveries were 25-118 for TCMX and 25-134 for DCBP. The DQI for accuracy was 50-150%.

The following surrogate recoveries were outside the DQI.

Sample ID	Surrogate	% Recovery
LDW-SP-10-C-F	TCMX	32.5
LDW-SP-12-C-F	TCMX	48.8
LDW-SP-12-C-U	TCMX	42.8
LDW-SP-20-C-F	TCMX	44.5
LDW-SP-20-C-U	TCMX	48.5
LDW-SP-54-C-F	DCBP	43.2
LDW-SP-54-C-U DL	DCBP	D
LDW-SP-54-C-U DL	TCMX	D
LDW-SP-61-C-U	TCMX	44.5
LDW-SP-62-C-F	DCBP	45.8
LDW-SP-62-C-F	TCMX	39.0
LDW-SP-64-C-F	DCBP	46.8
LDW-SP-64-C-F	TCMX	49.2
LDW-SP-69-C-F	DCBP	37.8
LDW-SP-69-C-F	TCMX	38.2
LDW-SP-69-C-U	DCBP	28.2
LDW-SP-69-C-U	TCMX	39.5
LDW-SP-71-C-F	DCBP	49.0
LDW-SP-71-C-F	TCMX	33.8
LDW-SP-71-C-U	DCBP	40.8

Sample ID	Surrogate	% Recovery
LDW-SP-71-C-U	TCMX	38.2
LDW-SP-75-C-F	TCMX	45.2
LDW-SP-75-C-U	DCBP	36.2
LDW-SP-75-C-U	TCMX	41.0
LDW-SP-76-C-F	DCBP	40.8
LDW-SP-76-C-F	TCMX	31.8
LDW-SP-76-C-U	DCBP	44.8
LDW-SP-76-C-U	TCMX	34.0
LDW-SP-80-C-U	TCMX	35.0
LDW-SP-82-C-FD-U	DCBP	43.0
LDW-SP-82-C-FD-U	TCMX	34.5
LDW-SP-82-C-U	DCBP	45.5

For sample LDW-SP-54-C-U DL, a dilution factor of 20 was used and control limits do not apply. Except for sample LDW-SP-54-C-U DL, all surrogate recoveries were within the laboratory limits.

Only one of the samples with both surrogate recoveries below the DQI contained PCBs. The Aroclor 1254 result in sample LDW-SP-71-C-U was qualified as estimated.

Please note that the reported PCB surrogate recoveries that do not match the reported pesticite recoveries were reported from a different column. According to the laboratory, pesticide surrogate recoveries were reported from the column with the higher concentration and PCB surrogate recoveries were reported from the first column. The method does not specify procedures for choosing surrogate results, and both procedures are considered acceptable.

LCS recoveries: The DQI for accuracy was 50-150%. The Aroclor 1016 recovery (48.2%) in the LCS from batch PB0707B was slightly below the DQI. No qualifiers were assigned. All other LCS recoveries were within limits.

MS recoveries: The DQI for accuracy was 50-150%. The Aroclor 1016 recovery (48.3%) in LDW-SP-75-C-F MSD was slightly below the DQI. No qualifiers were assigned. All other MS and MSD recoveries were within limits.

MS/MSD RPDs: The DQI for precision is <30%. All RPDs were within limits.

Field replicate precision: LDW-SP-82-C-FD-F and LDW-SP-82-C-FD-U were field replicates. PCBs were not detected in the sample/field replicates. Field replicate precision could not be evaluated.

Compound identifications: Chromatograms and quantitation reports for each sample in batch GU45 were reviewed for accuracy of compound identifications. Identifications of Aroclors 1248 and 1260 were confirmed. Upon initial review, the identification of Aroclor 1254 could not be confirmed due to the pattern overlap with Aroclors 1248 and 1260. On-site at the laboratory, the validator viewed sample chromatograms on-screen with overlays from the calibration standards. The presence of Aroclor 1254 was confirmed for sample LDW-SP-64-C-U and both

analyses of LDW-SP-54-C-U, although the quantitation is likely biased somewhat high due to the pattern overlap with Aroclors 1248 and 1260. The Aroclor 1254 result in these two samples were qualified as estimated.

In consultation with laboratory personnel, it was determined that the pattern match for Aroclor 1254 in sample LDW-SP-54-C-F was insufficient for identification. The laboratory agreed to resubmit the results for this sample with Aroclor 1254 as a non-detect with an elevated reporting limit.

Compound quantitations: Concentrations of Aroclors 1248, 1254, and 1260 in batch GU45 were recalculated to verify sample quantitations. Other than peak selection discrepancies eliminated with the change in Aroclor 1254 identification for sample LDW-SP-54-C-F, no discrepancies were noted.

Overall assessment: Calibration and instrument performance data indicate acceptable performance. Dual column confirmations were performed. Multiple analysis results were reduced to the most appropriate value. Quality control results demonstrated acceptable levels of precision. One result was estimated due to low surrogate recoveries and two results were estimated due to quantitation interferences. One result was changed to a non-detect. PCB data, as resubmitted and qualified, are acceptable for use.

7.0 Gasoline Range Petroleum Hydrocarbon Analyses

Analyses were performed by WA DOE Method NWTPH-G. The following data requirements were evaluated:

- Quality control analysis frequencies
- Multiple analysis results
- Extraction and analysis holding times
- Instrument calibration (full validation only)
- Laboratory blank contamination
- Trip blank contamination
- Surrogate recoveries
- MS recoveries
- MS/MSD relative percent differences (RPDs)
- LCS recoveries
- Field replicate precision
- Compound identifications (full validation only)
- Compound quantitations (full validation only)

Unless otherwise specified, discussions below for full validation data requirements refer only to batches GU45 and GV04.

Quality control analysis frequencies: The QAPP specifies that the following quality control samples be analyzed one per analytical batch: method blank and laboratory control sample. The following quality control samples must be analyzed for each 20

samples: matrix spike and matrix spike duplicate. In addition, surrogate compounds must be measured in each field and quality control sample.

Each batch included a method blank, laboratory control sample, laboratory control sample duplicate and appropriate surrogates. MS/MSDs were analyzed on sample LDW-SP-41-C-U in batch P1070604A. A frequency of 1/20 was achieved for MS/MSDs.

Multiple analysis results: Multiple analyses were not reported.

Holding times: Samples must be analyzed within 14 days of collection. All samples were analyzed within holding times. However, cooler temperatures for samples in batches GU26 exceeded recommended ranges, and results were qualified as estimated.

Laboratory blank results: Criteria for method blanks are that analyte concentrations must be below the PQL, or below 10% of the lowest associated sample concentration. No contamination was detected in the method blank.

Trip blank results: Criteria for trip blanks are that analyte concentrations must be below the PQL, or below 10% of the lowest associated sample concentration. Gasoline was not detected in the trip blanks.

Instrument calibration: Method criteria for calibrations include minimum correlation coefficients of 0.990 and % differences $\pm$15% for each standard in the initial calibration, and maximum % differences of $\pm$20% for each calibration check standard. The laboratory uses a maximum response factor RSD of 20%, which is an acceptable substitution for the minimum correlation coefficient criteria, and this criterion was met. Errors in the reported response factors were noted and the laboratory resubmitted the calibration form.

The $\pm$15% criteria was exceeded (-18% & +18%) in the two lowest standards of the initial calibration associated with batch GU45. This exceedance is slight, and no qualifiers were assigned.

All calibration check % differences were within $\pm$20%.

Surrogate recoveries: Method criteria for surrogate recoveries are 50-150%. The DQI for accuracy was 75-125%. Surrogate recoveries were within both limits.

LCS recoveries: The DQI for accuracy was 75-125%. The LCS recoveries were within these limits.

MS recoveries: The DQI for accuracy was 75-125%. MS and MSD recoveries were within limits.

MS/MSD RPDs: The DQI for precision is <30%. The MS/MSD RPD was within limits.

Field replicate precision: LDW-SP-82-C-FD-U was a field replicate. Gasoline was not detected in the sample/field replicate and field replicate precision could not be evaluated.

Compound identifications: Chromatograms and quantitation reports for each sample in batch GU45 and GV04 were reviewed for accuracy of compound identifications. The method defined quantitation range was used. Low levels of petroleum hydrocarbons were detected at Seep 54. The laboratory reported this detected result as not identifiable.

Compound quantitations: Concentrations of gasoline range organics and surrogates from each sample in batches GU45 and GV04 were recalculated to verify sample quantitations. No discrepancies were noted.

Overall assessment: Documentation for calibrations required some clarification and corrections from the laboratory. Calibration data indicate acceptable performance. Quality control results demonstrated acceptable levels of accuracy and precision. Gasoline range hydrocarbon data, as reported, are acceptable for use.

8.0 Extended Diesel Range Petroleum Hydrocarbon Analyses

Analyses were performed by WA DOE Method NWTPH-Dx. The following data requirements were evaluated:

- Quality control analysis frequencies
- Multiple analysis results
- Extraction and analysis holding times
- Instrument calibration (full validation only)
- Laboratory blank contamination
- Field blank contamination
- Surrogate recoveries
- MS recoveries
- MS/MSD relative percent differences (RPDs)
- LCS recoveries
- Field replicate precision
- Compound identifications (full validation only)
- Compound quantitations (full validation only)

Unless otherwise specified, discussions below for full validation data requirements refer only to batch GU45 and GV04.

Quality control analysis frequencies: The QAPP specifies that the following quality control samples be analyzed one per analytical batch: method blank and laboratory control sample. The following quality control samples must be analyzed for each 20 samples: matrix spike, matrix spike duplicate, and matrix duplicate. In addition, surrogate compounds must be measured in each field and quality control sample.

Each batch included a method blank, laboratory control sample, laboratory control sample duplicate and appropriate surrogates. MS/MSDs were analyzed on sample LDW-SP-41-C-U and LDW-SP-41-C-F in batch TD0702A. A frequency of 1/20 was achieved for MS/MSDs.

No matrix duplicates were analyzed due to limited sample volume. Precision is evaluated based on MS/MSD and sample/field replicate variability and no qualifiers were assigned.

Multiple analysis results: Multiple analyses were not reported.

Holding times: Samples must be extracted within 7 days of collection. Extracts must be analyzed within 40 days of extraction. All samples were extracted and analyzed within holding times.

Laboratory blank results: Criteria for method blanks are that analyte concentrations must be below the PQL, or below 10% of the lowest associated sample concentration. No contamination was detected in the method blank.

Field blank results: Criteria for field blanks are that analyte concentrations must be below the PQL, or below 10% of the lowest associated sample concentration. No target analytes were detected in the field blanks.

Instrument calibration: Method criteria for calibrations include minimum correlation coefficients of 0.990 and % differences ±15% for each standard in the initial calibration, and maximum % differences of ±15% for each calibration check standard. The laboratory uses a maximum response factor RSD of 20%, which is an acceptable substitution for the minimum correlation coefficient criteria. This criterion was met.

The % differences for each standard in the initial calibration were within ±15%. All calibration check % differences were within ±15%.

Surrogate recoveries: Laboratory control limits for surrogate recoveries are 46-123%. The DQI for accuracy was 30-160%. Surrogate recoveries were within both limits.

LCS recoveries: The DQI for accuracy was 30-160%. The LCS recoveries were within these limits.

MS recoveries: The DQI for accuracy was 30-160%. MS and MSD recoveries were within limits.

MS/MSD RPDs: The DQI for precision is <30%. The MS/MSD RPDs were within limits.

Field replicate precision: Field replicate results are as follows:

Field Rep ID	Sample ID	Analyte	FD Result (mg/L)	Sample Result (mg/L)	RPD
LDW-SP-80-C-FD-F	LDW-SP-80-C-F	Diesel Range Hydrocarbons	0.41	0.59	36.0
LDW-SP-80-C-FD-U	LDW-SP-80-C-U	Diesel Range Hydrocarbons	0.47	0.61	25.9

Qualifiers are not assigned based on field replicate results.

Compound identifications: Chromatograms and quantitation reports were reviewed for accuracy of compound identifications. The method defined quantitation range

was used. Low levels of petroleum hydrocarbons were detected at Seep 54 and Seep 80. The laboratory reported each detected result as not identifiable.

Compound quantitations: Concentrations of diesel range organics and o-terphenyl were recalculated to verify sample quantitations. No discrepancies were noted.

Overall assessment: Documentation was found to be clear and complete. Calibration data indicate acceptable performance. Quality control results demonstrated acceptable levels of accuracy and precision. Extended diesel range hydrocarbon data, as reported, are acceptable for use.

9.0 Metals Analyses

Analyses were performed by EPA Method 200.8 modified. The following data requirements were evaluated:

- Quality control analysis frequencies
- Analysis holding times
- ICP-MS tune mass calibration and resolution: (full validation only)
- Instrument calibration (full validation only)
- Laboratory blank contamination
- SRM recoveries
- Laboratory duplicate precision
- MS recoveries
- MS/MSD relative percent differences
- ICP-MS internal standard relative intensities (full validation only)
- Field replicate precision
- Analyte quantitations (full validation only)

Unless otherwise specified, discussions below for full validation data requirements refer only to data associated with samples LDW-SP-71-C-F, LDW-SP-71-C-U, LDW-SP-76-C-F, LDW-SP-76-C-U, LDW-SP-69-C-U, LDW-SP-69-C-F, LDW-SP-48-C-F, LDW-SP-48-C-U, LDW-SP-54-C-F, and LDW-SP-54-C-U.

Quality control analysis frequencies: The QAPP specifies that the following quality control samples be analyzed one per batch or one per twenty samples: method blank, LCS, MS and laboratory duplicate. Each analytical batch contained a method blank, SRM, MS, MSD, and laboratory duplicate. The SRM serves as the LCS, and requirements are considered met.

Holding times: Samples must be analyzed within 6 months of collection. The samples were analyzed within the holding times.

Instrument tune mass calibration and resolution: Functional Guidelines criteria for ICP-MS mass calibration are 1) peak widths of 0.75 amu or less at 5% peak height or peak widths of 0.8 any or less at 10% peak height; 2) mass differences of 0.1 amu or less; and 3) signal intensity RSDs of <5%. Tuning solution data was not present

in the data package. The laboratory was contacted and two tuning reports were submitted. These tunes met criteria #1 and #2 above.

The laboratory associated the tune data analyzed on 7/6 with samples analyzed 7/6 and 7/13 and the tune data analyzed on 7/14 with samples analyzed 7/14 and 7/15. Method 200.8 does not require daily mass calibration if periodic performance data demonstrates that the instrument meets criteria. The laboratory analyzes a performance solution daily which contains a different set of metals (magnesium, rhodium, lead cesium and barium) in order to measure oxides and background as well as sensitivity. The daily performance solution met criteria #3 above for the data submitted 7/6, 7/13, and 7/14. Daily performance report was not available for 7/15 due to accidental erasure of the data file.

No qualifiers were assigned based on these discrepancies.

Instrument calibration: Functional guidelines criterion for calibration verifications is a maximum % difference of ±10%. Method 200.8 specifies a criteria of ±10% for corrective action and ±15% for sample re-analysis. All calibration verification % differences associated with reported samples were within ±10%.

Laboratory blank results: Criteria for method blanks are that analyte concentrations must be below the PQL, or below 10% of the lowest associated sample concentration. This criterion was met.

Field blank results: Criteria for field blanks are that analyte concentrations must be below the PQL, or below 10% of the lowest associated sample concentration. The following analytes were present in the rinsate blanks at a level above the reporting limit:

Sample ID	Analyte	Value (ug/L)
LDW-SP-64-C-RB-MP-U	Chromium	4.05
LDW-SP-64-C-RB-MP-U	Copper	1.59
LDW-SP-64-S-RB-U	Chromium	5.25
LDW-SP-64-S-RB-U	Copper	1.61

Samples from Seeps 10 and 62 are associated with rinsate blank LDW-SP-64-S-RB-U. All other samples are associated with rinsate blank LDW-SP-64-C-RB-MP-U. All sample results between 5 and 10 times the blank concentration were qualified as estimated. All sample results below 5 times the blank concentration were qualified as undetected.

SRM recoveries: The DQI for accuracy is 75-125%. The SRM recoveries were within these limits.

MS recoveries: The DQI for accuracy is 75-125%. The MS recoveries were within this range.

Laboratory duplicate RPDs: The DQI for precision is <35% and is applicable when concentrations exceed 5 times the reporting limit. The functional guidelines criteria for concentrations below 5 times the reporting limit is +/- the reporting limit. These criteria were met.

Internal standard relative intensities: Functional guidelines criterion for internal standards is relative intensities within 60-125% of the initial calibration blank. The following internal standard relative intensities were outside the 60-125% limit:

Sample	Internal standard	%RI
LDW-SP-76-C-F	Scandium 45	138.8%
LDW-SP-48-C-F	Platinum 195	51.7%

Chromium, nickel, copper, and zinc results in sample LDW-SP-76-C-F and the lead result in sample LDW-SP-48-C-F were qualified as estimated.

All other relative intensities were within limits.

Field replicate precision: Field replicate results are as follows:

Replicate ID	Sample ID	Analyte	Replicate Result (µg/L)	Sample Result (µg/L)	RPD
LDW-SP-82-FD-F	LDW-SP-82-C-F	Cadmium	0.503	0.513	1.97
LDW-SP-82-FD-F	LDW-SP-82-C-F	Chromium	3.51	3.25	7.69
LDW-SP-82-FD-F	LDW-SP-82-C-F	Copper	8.27	8.22	0.606
LDW-SP-82-FD-F	LDW-SP-82-C-F	Lead	0.201	0.206	2.45
LDW-SP-82-FD-F	LDW-SP-82-C-F	Nickel	3.36	3.56	5.78
LDW-SP-82-FD-F	LDW-SP-82-C-F	Silver	0.084 B	0.113 B	29.4
LDW-SP-82-FD-F	LDW-SP-82-C-F	Zinc	158	164	3.73
LDW-SP-82-FD-U	LDW-SP-82-C-U	Cadmium	0.606	0.569	6.29
LDW-SP-82-FD-U	LDW-SP-82-C-U	Chromium	5.81	5.65	2.79
LDW-SP-82-FD-U	LDW-SP-82-C-U	Copper	13.4	10.9	20.6
LDW-SP-82-FD-U	LDW-SP-82-C-U	Lead	8.29	2.31	113
LDW-SP-82-FD-U	LDW-SP-82-C-U	Nickel	6.12	5.83	4.85
LDW-SP-82-FD-U	LDW-SP-82-C-U	Silver	0.126 B	0.088 B	35.5
LDW-SP-82-FD-U	LDW-SP-82-C-U	Zinc	201	186	7.75

Qualifiers are not assigned based on field replicate results.

Analyte quantitations: Concentrations of cadmium were recalculated to verify sample quantitations.

Overall assessment: No transcription errors were noted. Calibration data demonstrate acceptable instrument performance. Quality control results demonstrate acceptable accuracy. Low and high internal standard relative intensities and field blank contamination resulted in estimated data.

The metals data, as qualified, are acceptable for use.

10.0 Mercury Analyses

Analyses were performed by EPA Method 1631E. The following data requirements were evaluated:

- Quality control analysis frequencies
- Preparation and analysis holding times

- Instrument calibration (full validation only)
- Laboratory blank contamination
- SRM recoveries
- Laboratory duplicate precision
- MS recoveries
- Field replicate precision
- Analyte quantitations (full validation only)

Unless otherwise specified, discussions below for full validation data requirements refer only to data associated with samples LDW-SP-48-C-F, LDW-SP-48-C-U, LDW-SP-54-C-F, LDW-SP-69-C-F, LDW-SP-69-C-U, LDW-SP-71-C-F, LDW-SP-71-C-U, LDW-SP-76-C-F, and LDW-SP-76-C-U.

Quality control analysis frequencies: The QAPP specifies that the following quality control samples be analyzed one per batch or one per twenty samples: three method blanks, LCS, MS, MSD, and laboratory duplicate. Each analytical batch contained three or four method blanks, SRM, MS, MSD, and laboratory duplicate. The SRM serves as the LCS, and requirements are considered met.

Holding times: Samples must be analyzed within 28 days of collection. The samples were analyzed within the holding times.

Laboratory blank results: Criteria for method blanks are that analyte concentrations must be below the PQL, or below 10% of the lowest associated sample concentration. These criteria were met.

Field blank results: Criteria for field blanks are that analyte concentrations must be below the PQL, or below 10% of the lowest associated sample concentration. Mercury was not detected in the rinsate, funnel, or piezometer blanksInitial calibration: Method criteria for initial calibration include 5 point calibration with an RSD $\leq$15% and a low standard recovery of 75-125%. The laboratory performed a linear regression calculation and appropriately substituted the correlation coefficient requirement of greater than 0.995 for the RSD requirement. Correlation coefficients and low standard recoveries met criteria.

Calibration verifications: The Functional Guidelines criterion for calibration verification is a maximum % difference of $\pm$20%. The method specifies laboratory generated control limits and the laboratory utilizes 75-125% limits. All calibration verifications met both criteria.

SRM recoveries: The DQI for accuracy is 75-125%. The SRM recoveries were within these limits.

MS recoveries: The DQI for accuracy is 75-125%. The water MS recoveries were within this range.

Laboratory duplicate RPDs: The DQI for precision is <25% and is applicable when concentrations exceed 5 times the reporting limit. The functional guidelines criteria for concentrations below 5 times the reporting limit is +/- the reporting limit. These criteria were met.

Field replicate precision: Field replicate results are as follows:

Replicate ID	Sample ID	Analyte	Replicate Result (ng/L)	Sample Result (ng/L)	RPD
LDW-SP-82-FD-F	LDW-SP-82-C-F	Mercury	2.95	3.80	25.1
LDW-SP-82-FD-U	LDW-SP-82-C-U	Mercury	11.7	16.8	35.8

Qualifiers are not assigned based on field replicate results.

Analyte quantitations: Concentrations the first eight samples were recalculated to verify sample quantitations. The quantitation method followed laboratory SOPs.

Overall assessment: Documentation was found to be clear and complete. No calculation or transcription errors were noted. Calibration data demonstrate acceptable instrument performance. Quality control results demonstrate acceptable accuracy and precision. Two results were estimated due to ambient blank contamination.

The mercury data, as qualified, are acceptable for use.

11.0 Arsenic Analyses

Analyses were performed by Standard Method 3114C. The following data requirements were evaluated:

- Quality control analysis frequencies
- Preparation and analysis holding times
- Instrument calibration (full validation only)
- Laboratory blank contamination
- SRM recoveries
- Laboratory duplicate precision
- MS recoveries
- Field replicate precision
- Analyte quantitations (full validation only)

Unless otherwise specified, discussions below for full validation data requirements refer only to data associated with samples LDW-SP-10-C-F, LDW-SP-12-C-F, LDW-SP-12-C-U, LDW-SP-20-C-F, LDW-SP-20-C-U, LDW-SP-62-C-F, LDW-SP-75-C-F, LDW-SP-75-C-U, and LDW-SP-80-C-F.

Quality control analysis frequencies: The QAPP specifies that the following quality control samples be analyzed one per batch or one per twenty samples: three method blanks, LCS, MS, MSD, and laboratory duplicate. Each analytical batch contained four method blanks, SRM, MS, MSD, and laboratory duplicate. The SRM serves as the LCS, and requirements are considered met.

Holding times: Samples must be analyzed within 6 months of collection. The samples were analyzed within the holding times.

Laboratory blank results: Criteria for method blanks are that analyte concentrations must be below the PQL, or below 10% of the lowest associated sample concentration. These criteria were met.

Field blank results: Criteria for field blanks are that analyte concentrations must be below the PQL, or below 10% of the lowest associated sample concentration. Mercury was not detected in the field blanks. These criteria were met.

Initial calibration: The laboratory analyzed an 8-point calibration curve. The correlation coefficient was above 0.995. The low standard recovery was within 75-125%.

Calibration verifications: Continuing calibration verification % differences were within ±20%.

SRM recoveries: The DQI for accuracy is 75-125%. The SRM recoveries were within these limits.

MS recoveries: The DQI for accuracy is 75-125%. The water MS recoveries were within this range.

Laboratory duplicate RPDs: The DQI for precision is <25% and is applicable when concentrations exceed 5 times the reporting limit. The functional guidelines criteria for concentrations below 5 times the reporting limit is +/- the reporting limit. These criteria were met.

Field replicate precision: Field replicate results are as follows:

Replicate ID	Sample ID	Analyte	Replicate Result (µg/L)	Sample Result (µg/L)	RPD
LDW-SP-82-FD-F	LDW-SP-82-C-F	Arsenic	1.14	1.20	5.12
LDW-SP-82-FD-U	LDW-SP-82-C-U	Arsenic	2.2	1.55	34.7

Qualifiers are not assigned based on field replicate results.

Analyte quantitations: Concentrations the first eight samples were recalculated to verify sample quantitations. The quantitation method followed laboratory SOPs.

Overall assessment: Documentation was found to be clear and complete. No calculation or transcription errors were noted. Calibration data demonstrate acceptable instrument performance. Quality control results demonstrate acceptable precision and accuracy.

The arsenic data, as reported, are acceptable for use.

12.0 General Chemistry Analyses

Analysis of the water samples were performed by EPA Method 160.2 for total suspended solids (TSS) and EPA Method 415.1 for total organic carbon (TOC) and dissolved organic carbon (DOC).The following data requirements were evaluated:

- Quality control analysis frequencies
- Holding times
- Instrument calibration (full validation only)
- Laboratory blank contamination
- SRM recoveries
- Laboratory triplicate relative standard deviations (RSDs)
- MS recoveries
- Field replicate precision
- Compound quantitations (full validation only)

Unless otherwise specified, discussions below for full validation data requirements refer only to batch GU45.

Quality control analysis frequencies: For TSS, the QAPP requires the analysis of one matrix replicate per twenty samples and one method blank per batch. For TOC and DOC, the QAPP requires the analysis of one matrix replicate, one matrix spike, and one LCS per twenty samples, as well as one method blank in each batch or SDG. The following quality control samples were analyzed in each batch:

Analysis	QC samples
TSS	Method blank, LCS, and duplicate
TOC	Method blank, SRM, MS, and duplicate
DOC	Method blank, SRM, MS, and duplicate

The SRM serves as the LCS for TOC and DOC, and requirements are considered met.

Holding times: The holding times listed in the QAPP are 28 days for TOC and DOC, and 7 days for TSS. Samples were analyzed within the holding time. However, the DOC samples were not acidified upon receipt at the laboratory. Samples were acidified prior to analysis, 6 to 10 days after sample collection. DOC results were qualified as estimated.

Laboratory blank results: Criteria for method blanks are that analyte concentrations must be below the PQL, or below 10% of the lowest associated sample concentration. The method blank results met these criteria.

Instrument calibration: Instrument calibration correlation coefficients for TOC were above the 0.990 minimum and calibration verification standard recovery values were within the 90-110% criterion.

LCS, SRM, and MS recoveries: The DQI for accuracy is 75-125%. All LCS, SRM, and MS recoveries were within these limits.

Laboratory duplicate RPDs: The DQI for precision is <20% and is applicable when concentrations exceed 5 times the reporting limit. The functional guidelines criteria for concentrations below 5 times the reporting limit is +/- the reporting limit. These criteria were met for TOC and DOC.

The RPD for lab duplicate LDW-SP-41-C-U (87.3%) exceeded the DQI. All TSS results in lab batch EPA_160.2-070204_1 were qualified as estimated.

Field replicate precision: Field replicate results are as follows:

Field Rep ID	Sample ID	Analyte	FD Result (mg/L)	Sample Result (mg/L)	RPD
LDW-SP-82-C-FD-U	LDW-SP-82-C-U	TSS	5.8	11.2	63.5
LDW-SP-82-C-FD-U	LDW-SP-82-C-U	TOC	1.6	2.5	43.9
LDW-SP-82-C-FD-F	LDW-SP-82-C-F	DOC	ND	ND	NA

Qualifiers are not assigned based on field replicate results.

Compound quantitations: Raw instrument output for TOC and handwritten data sheets for TSS were missing from the data package. The laboratory resubmitted the missing information. Concentrations from samples and QC in batch GU45 for each analyte were recalculated to verify sample quantitations. No discrepancies were noted.

Overall assessment: With resubmission, documentation was found to be clear and complete. Calibration data indicate acceptable instrument performance. Quality control results demonstrate acceptable levels of accuracy. Lab duplicate variability resulted in some estimated TSS concentrations. Sample preservation resulted in estimated DOC concentrations.

General chemistry data, as qualified, are acceptable for use.

13.0 Sample Cross Reference

ARI Extraction batch numbers are shown in the following table. Shaded text indicates that a full validation was performed.

SampID	Sample Date	Lab ID	VOCs	SVOCs	Pest	PCBs	Gas	Diesel	TOC/DOC	TSS
LDW-SP-71-C-F	06/29/04	GU26A		SV0702A	PE0702A	PB0702A			070904_1704	
LDW-SP-71-C-U	06/29/04	GU26B	F3071004A	SV0702A	PE0702A	PB0702A			070104_1100	063004_1718
LDW-SP-76-C-F	06/29/04	GU26C		SV0702A	PE0702A	PB0702A			070904_1704	
LDW-SP-76-C-U	06/29/04	GU26D	F3071004A	SV0702A	PE0702A	PB0702A			070104_1100	063004_1718
LDW-SP-69-C-F	06/29/04	GU26E		SV0702A	PE0702A	PB0702A			070904_1704	
LDW-SP-69-C-U	06/29/04	GU26F	F3071004A	SV0702A	PE0702A	PB0702A			070104_1100	063004_1718
Trip Blank		GU26G	F3071004A							
LDW-SP-48-C-U	06/30/04	GU45A	F3071004A	SV0707A	PE0707A	PB0707B			070104_1100	070704_1815
LDW-SP-48-C-F	06/30/04	GU45B		SV0707A	PE0707A	PB0707B			070904_1704	
LDW-SP-54-C-U	06/30/04	GU45C	F3071004A	SV0707A	PE0707A	PB0707B	P2070104A	TD0702A	070104_1100	070704_1815
LDW-SP-54-C-F	06/30/04	GU45D		SV0707A	PE0707A	PB0707B		TD0702A	070904_1704	
LDW-SP-82-C-U	06/30/04	GU45E	F3071004A	SV0707A	PE0707A	PB0707B			070104_1100	070704_1815
LDW-SP-82-C-F	06/30/04	GU45F		SV0707A	PE0707A	PB0707B			070904_1704	
LDW-SP-82-C-FD-U	06/30/04	GU45G	F3071004A	SV0707A	PE0707A	PB0707B			070104_1100	070704_1815
LDW-SP-82-C-FD-F	06/30/04	GU45H		SV0707A	PE0707A	PB0707B			070904_1704	
Trip Blank		GU45I	F3071004A				P2070104A			
LDW-SP-10-C-F	07/01/04	GU59A		SV0702A	PE0702A	PB0702A		TD0702A	070904_1704	
LDW-SP-12-C-F	07/01/04	GU59B		SV0702A	PE0702A	PB0702A		TD0702A	070904_1704	
LDW-SP-20-C-F	07/01/04	GU59C		SV0702A	PE0702A	PB0702A		TD0702A	070904_1704	
LDW-SP-41-C-F	07/01/04	GU59D		SV0702A	PE0702A	PB0702A		TD0702A	070904_1704	
LDW-SP-12-C-U	07/01/04	GU59E	F3071404A	SV0702A	PE0702A	PB0702A	P1070604A	TD0702A	070104_1100	070204_1540
LDW-SP-20-C-U	07/01/04	GU59F	F3071404A	SV0702A	PE0702A	PB0702A	P1070604A	TD0702A	070104_1100	070204_1540
LDW-SP-41-C-U	07/01/04	GU59G	F3071404A	SV0702A	PE0702A	PB0702A	P1070604A	TD0702A	070104_1100	070204_1540
LDW-SP-39-C-F	07/01/04	GU59H		SV0702A	PE0702A	PB0702A		TD0702A	070904_1704	
LDW-SP-80-C-F	07/01/04	GU59I		SV0702A	PE0702A	PB0702A		TD0702A	070904_1704	
LDW-SP-39-C-U	07/01/04	GU59J	F3071404A	SV0702A	PE0702A	PB0702A	P1070604A	TD0702A	070104_1100	070204_1540
LDW-SP-80-C-U	07/01/04	GU59K	F3071404A	SV0702A	PE0702A	PB0702A	P1070704A	TD0702A	070104_1100	070204_1540
Trip Blank		GU59L	F3071404A				P1070604A			
LDW-SP-62-C-F	07/02/04	GU76A		SV0707A	PE0707A	PB0707B			070904_1704	
LDW-SP-61-C-U	07/02/04	GU76B	F3071404A	SV0707A	PE0707A	PB0707B			071504_1002	070704_1740
LDW-SP-61-C-F	07/02/04	GU76C		SV0707A	PE0707A	PB0707B			070904_1704	
LDW-SP-69-C-U	07/02/04	GU76D					P1070604A	TD0707A		
LDW-SP-69-C-F	07/02/04	GU76E						TD0707A		
LDW-SP-75-C-U	07/03/04	GU83A	F3071404A	SV0707A	PE0707A	PB0707B			071504_1002	070704_1740
LDW-SP-75-C-F	07/03/04	GU83B		SV0707A	PE0707A	PB0707B			070904_1704	
LDW-SP-64-RB-S-U	07/03/04	GU83C		SV0707A	PE0707A	PB0707B		TD0707A		
LDW-SP-64-RB-MP-U	07/03/04	GU83D		SV0707A	PE0707A	PB0707B		TD0707A		
LDW-SP-64-C-U	07/02/04	GU83E	F3071404A	SV0707A		PB0709A	P1070604A	TD0707A		
LDW-SP-64-C-F	07/02/04	GU83F			PE0707A	PB0707B			070904_1704	
LDW-SP-80-C-FD-F	07/01/04	GV04A						TD0707A		

SampID	Sample Date	Lab ID	VOCs	SVOCs	Pest	PCBs	Gas	Diesel	TOC/DOC	TSS
LDW-SP-80-C-FD-U	07/01/04	GV04B					P1070704A	TD0707A		
LDW-SP-10-C-U	07/30/04	GX14A	F5080504A							
LDW-SP-62-C-U	07/30/04	GX14B	F5080504A							
Trip Blank		GX14C	F5080504A							

FGS analytical batch numbers are shown in the following tables. Shaded text indicates that a full validation was performed.

Sample ID	Sample Date	Metals	Hg	As
LDW-SP-71-C-F	06/29/04	A1/A2	B1	C2
LDW-SP-71-C-U	06/29/04	A1/A2	B1	C2
LDW-SP-76-C-F	06/29/04	A1/A2	B1	C2
LDW-SP-76-C-U	06/29/04	A1/A2	B2	C2
LDW-SP-69-C-AB	06/29/04		B1	
LDW-SP-69-C-U	06/29/04	A1/A2	B1	C2
LDW-SP-69-C-F	06/29/04	A1/A2	B1	C2
LDW-SP-48-C-F	06/30/04	A1/A2	B1	C2
LDW-SP-48-C-U	06/30/04	A1/A2	B1	C2
LDW-SP-54-C-F	06/30/04	A1/A2	B1	C2
LDW-SP-54-C-U	06/30/04	A1/A2	B1	C2
LDW-SP-82-FD-U	06/30/04	A1/A2	B1	C2
LDW-SP-82-C-AB	06/30/04		B1	
LDW-SP-82-C-F	06/30/04	A1/A2	B1	C2
LDW-SP-82-C-U	06/30/04	A1/A2	B1	C2
LDW-SP-82-FD-F	06/30/04	A1/A2	B1	C2
LDW-SP-80-C-F	07/01/04	A1/A2	B2	C1
LDW-SP-80-C-AB-U	07/01/04		B2	
LDW-SP-80-C-U	07/01/04	A1/A2	B2	C2

Sample ID	Sample Date	Metals	Hg	As
LDW-SP-10-C-F	07/01/04	A1/A2	B2	C1
LDW-SP-12-C-U	07/01/04	A1/A2	B2	C1
LDW-SP-12-C-F	07/01/04	A1/A2	B2	C1
LDW-SP-20-C-F	07/01/04	A1/A2	B2	C1
LDW-SP-20-C-U	07/01/04	A1/A2	B2	C1
LDW-SP-20-C-AB-U	07/01/04		B2	
LDW-SP-41-C-U	07/01/04	A1/A2	B2	C1
LDW-SP-41-C-F	07/01/04	A1/A2	B2	C1
LDW-SP-39-C-F	07/01/04	A1/A2	B2	C1
LDW-SP-39-C-U	07/01/04	A1/A2	B2	C1
LDW-SP-64-C-F	07/02/04	A3/A4	B3	C1
LDW-SP-61-C-F	07/02/04	A3/A4	B3	C1
LDW-SP-61-C-U	7/2/2004	A3/A4	B3	C1
LDW-SP-62-C-F	7/2/2004	A3/A4	B3	C1
LDW-SP-62-C-AB	7/2/2004		B3	
LDW-SP-75-C-F	07/03/04	A1/A2	B1	C1
LDW-SP-75-C-U	07/03/04	A1/A2	B1	C1
Funnel Blank	7/8/2004		B1	
Piezometer Blank	7/8/2004		B1	

14.0 Qualified Summary Table

Sample	Analyte	Qualifier	Reason
Volatile Organic Analyses			
LDW-SP-48-C-U	1,2,4-Trichlorobenzene	R2	Analyzed by another method with lower RL
LDW-SP-48-C-U	1,2-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-48-C-U	1,3-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-48-C-U	1,4-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-48-C-U	2-Chloroethylvinylether	R	Not Recovered in MS/MSDs
LDW-SP-48-C-U	Hexachlorobutadiene	R2	Analyzed by another method with lower RL
LDW-SP-48-C-U	Naphthalene	R2	Analyzed by another method with lower RL
LDW-SP-54-C-U	1,2,4-Trichlorobenzene	R2	Analyzed by another method with lower RL
LDW-SP-54-C-U	1,2,4-Trimethylbenzene	UJ	Low MS Recovery
LDW-SP-54-C-U	1,3,5-Trimethylbenzene	UJ	Low MS Recovery
LDW-SP-54-C-U	2-Chloroethylvinylether	R	Not Recovered in MS/MSDs
LDW-SP-54-C-U	4-Isopropyltoluene	UJ	Low MS Recovery
LDW-SP-54-C-U	4-Methyl-2-Pentanone (MIBK)	UJ	Low MSD Recovery
LDW-SP-54-C-U	Acrolein	UJ	Low MS Recovery
LDW-SP-54-C-U	Bromomethane	UJ	Low MS and MSD Recovery
LDW-SP-54-C-U	Hexachlorobutadiene	R2	Analyzed by another method with lower RL
LDW-SP-54-C-U	Naphthalene	R2	Analyzed by another method with lower RL
LDW-SP-54-C-U	n-Propylbenzene	UJ	Low MS Recovery
LDW-SP-54-C-U	Styrene	UJ	Low MS and MSD Recovery
LDW-SP-82-C-FD-U	1,2,4-Trichlorobenzene	R2	Analyzed by another method with lower RL
LDW-SP-82-C-FD-U	1,2-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-82-C-FD-U	1,3-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-82-C-FD-U	1,4-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-82-C-FD-U	2-Chloroethylvinylether	R	Not Recovered in MS/MSDs
LDW-SP-82-C-FD-U	Hexachlorobutadiene	R2	Analyzed by another method with lower RL
LDW-SP-82-C-FD-U	Naphthalene	R2	Analyzed by another method with lower RL
LDW-SP-82-C-U	1,2,4-Trichlorobenzene	R2	Analyzed by another method with lower RL
LDW-SP-82-C-U	1,2-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-82-C-U	1,3-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-82-C-U	1,4-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-82-C-U	2-Chloroethylvinylether	R	Not Recovered in MS/MSDs
LDW-SP-82-C-U	Hexachlorobutadiene	R2	Analyzed by another method with lower RL
LDW-SP-82-C-U	Naphthalene	R2	Analyzed by another method with lower RL
LDW-SP-10-C-U	1,1,1,2-Tetrachloroethane	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	1,1,1-Trichloroethane	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	1,1,2,2-Tetrachloroethane	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	1,1,2-Trichloro-1,2,2-trifluoroethane	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	1,1,2-Trichloroethane	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	1,1-Dichloroethane	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	1,1-Dichloroethene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	1,1-Dichloropropene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	1,2,3-Trichlorobenzene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	1,2,3-Trichloropropane	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	1,2,4-Trichlorobenzene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	1,2,4-Trimethylbenzene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	1,2-Dibromo-3-chloropropane	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	1,2-Dichlorobenzene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	1,2-Dichloroethane	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	1,2-Dichloropropane	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	1,3,5-Trimethylbenzene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	1,3-Dichlorobenzene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	1,3-Dichloropropane	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	1,4-Dichlorobenzene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	2,2-Dichloropropane	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	cis-1,2-Dichloroethene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	cis-1,3-Dichloropropene	UJ	Elevated cooler temperatures

Sample	Analyte	Qualifier	Reason
LDW-SP-10-C-U	m,p-Xylene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	trans-1,2-Dichloroethene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	trans-1,3-Dichloropropene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	trans-1,4-Dichloro-2-butene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	2-Butanone	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	2-Chloroethylvinylether	R	Not Recovered in MS/MSDs
LDW-SP-10-C-U	2-Chlorotoluene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	2-Hexanone	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	4-Chlorotoluene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	4-Isopropyltoluene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	4-Methyl-2-Pentanone (MIBK)	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Acetone	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Acrolein	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Acrylonitrile	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Benzene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Bromobenzene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Bromochloromethane	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Bromodichloromethane	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Bromoethane	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Bromoform	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Bromomethane	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Carbon Disulfide	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Carbon Tetrachloride	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Chlorobenzene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Chloroethane	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Chloroform	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Chloromethane	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Dibromochloromethane	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Dibromomethane	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Ethylbenzene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Ethylene Dibromide	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Hexachlorobutadiene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Isopropylbenzene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Methyl Iodide	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Methylene Chloride	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Naphthalene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	n-Butylbenzene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	n-Propylbenzene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	o-Xylene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	sec-Butylbenzene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Styrene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	tert-Butylbenzene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Tetrachloroethene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Toluene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Trichloroethene	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Trichlorofluoromethane	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Vinyl Acetate	UJ	Elevated cooler temperatures
LDW-SP-10-C-U	Vinyl Chloride	UJ	Elevated cooler temperatures
LDW-SP-12-C-U	1,2,4-Trichlorobenzene	R2	Analyzed by another method with lower RL
LDW-SP-12-C-U	1,2-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-12-C-U	1,3-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-12-C-U	1,4-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-12-C-U	2-Chloroethylvinylether	R	Not Recovered in MS/MSDs
LDW-SP-12-C-U	Bromomethane	UJ	Low LCS/LCSD recovery
LDW-SP-12-C-U	Hexachlorobutadiene	R2	Analyzed by another method with lower RL
LDW-SP-12-C-U	Naphthalene	R2	Analyzed by another method with lower RL
LDW-SP-20-C-U	1,2,4-Trichlorobenzene	R2	Analyzed by another method with lower RL
LDW-SP-20-C-U	1,2-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-20-C-U	1,3-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-20-C-U	1,4-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-20-C-U	2-Chloroethylvinylether	R	Not Recovered in MS/MSDs
LDW-SP-20-C-U	Bromomethane	UJ	Low LCS/LCSD recovery
LDW-SP-20-C-U	Hexachlorobutadiene	R2	Analyzed by another method with lower RL
LDW-SP-20-C-U	Naphthalene	R2	Analyzed by another method with lower RL

Sample	Analyte	Qualifier	Reason
LDW-SP-39-C-U	1,2,4-Trichlorobenzene	R2	Analyzed by another method with lower RL
LDW-SP-39-C-U	1,2-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-39-C-U	1,3-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-39-C-U	1,4-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-39-C-U	2-Chloroethylvinylether	R	Not Recovered in MS/MSDs
LDW-SP-39-C-U	Bromomethane	UJ	Low LCS/LCSD recovery
LDW-SP-39-C-U	Hexachlorobutadiene	R2	Analyzed by another method with lower RL
LDW-SP-39-C-U	Naphthalene	R2	Analyzed by another method with lower RL
LDW-SP-41-C-U	1,2,4-Trichlorobenzene	R2	Analyzed by another method with lower RL
LDW-SP-41-C-U	1,2-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-41-C-U	1,3-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-41-C-U	1,4-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-41-C-U	2-Chloroethylvinylether	R	Not Recovered in MS/MSDs
LDW-SP-41-C-U	Bromomethane	UJ	Low LCS, LCSD, MS and MSD recoveries
LDW-SP-41-C-U	Hexachlorobutadiene	R2	Analyzed by another method with lower RL
LDW-SP-41-C-U	Methyl Iodide	UJ	Low MS Recovery
LDW-SP-41-C-U	Naphthalene	R2	Analyzed by another method with lower RL
LDW-SP-41-C-U	Styrene	UJ	Low MSD Recovery
LDW-SP-61-C-U	1,2,4-Trichlorobenzene	R2	Analyzed by another method with lower RL
LDW-SP-61-C-U	1,2-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-61-C-U	1,3-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-61-C-U	1,4-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-61-C-U	2-Chloroethylvinylether	R	Not Recovered in MS/MSDs
LDW-SP-61-C-U	Bromomethane	UJ	Low LCS/LCSD recovery
LDW-SP-61-C-U	Hexachlorobutadiene	R2	Analyzed by another method with lower RL
LDW-SP-61-C-U	Naphthalene	R2	Analyzed by another method with lower RL
LDW-SP-62-C-U	1,1,1,2-Tetrachloroethane	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	1,1,1-Trichloroethane	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	1,1,2,2-Tetrachloroethane	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	1,1,2-Trichloro-1,2,2-trifluoroethane	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	1,1,2-Trichloroethane	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	1,1-Dichloroethane	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	1,1-Dichloroethene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	1,1-Dichloropropene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	1,2,3-Trichlorobenzene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	1,2,3-Trichloropropane	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	1,2,4-Trichlorobenzene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	1,2,4-Trimethylbenzene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	1,2-Dibromo-3-chloropropane	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	1,2-Dichlorobenzene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	1,2-Dichloroethane	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	1,2-Dichloropropane	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	1,3,5-Trimethylbenzene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	1,3-Dichlorobenzene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	1,3-Dichloropropane	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	1,4-Dichlorobenzene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	2,2-Dichloropropane	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	cis-1,2-Dichloroethene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	cis-1,3-Dichloropropene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	m,p-Xylene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	trans-1,2-Dichloroethene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	trans-1,3-Dichloropropene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	trans-1,4-Dichloro-2-butene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	2-Butanone	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	2-Chloroethylvinylether	R	Not Recovered in MS/MSDs
LDW-SP-62-C-U	2-Chlorotoluene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	2-Hexanone	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	4-Chlorotoluene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	4-Isopropyltoluene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	4-Methyl-2-Pentanone (MIBK)	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Acetone	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Acrolein	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Acrylonitrile	UJ	Elevated cooler temperatures

Sample	Analyte	Qualifier	Reason
LDW-SP-62-C-U	Benzene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Bromobenzene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Bromochloromethane	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Bromodichloromethane	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Bromoethane	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Bromoform	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Bromomethane	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Carbon Disulfide	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Carbon Tetrachloride	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Chlorobenzene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Chloroethane	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Chloroform	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Chloromethane	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Dibromochloromethane	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Dibromomethane	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Ethylbenzene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Ethylene Dibromide	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Hexachlorobutadiene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Isopropylbenzene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Methyl Iodide	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Methylene Chloride	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Naphthalene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	n-Butylbenzene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	n-Propylbenzene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	o-Xylene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	sec-Butylbenzene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Styrene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	tert-Butylbenzene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Tetrachloroethene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Toluene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Trichloroethene	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Trichlorofluoromethane	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Vinyl Acetate	UJ	Elevated cooler temperatures
LDW-SP-62-C-U	Vinyl Chloride	UJ	Elevated cooler temperatures
LDW-SP-64-C-U	1,2,4-Trichlorobenzene	R2	Analyzed by another method with lower RL
LDW-SP-64-C-U	1,2-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-64-C-U	1,3-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-64-C-U	1,4-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-64-C-U	2-Chloroethylvinylether	R	Not Recovered in MS/MSDs
LDW-SP-64-C-U	Bromomethane	UJ	Low LCS/LCSD recovery
LDW-SP-64-C-U	Hexachlorobutadiene	R2	Analyzed by another method with lower RL
LDW-SP-64-C-U	Naphthalene	R2	Analyzed by another method with lower RL
LDW-SP-69-C-U	1,2,4-Trichlorobenzene	R2	Analyzed by another method with lower RL
LDW-SP-69-C-U	1,2-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-69-C-U	1,3-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-69-C-U	1,4-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-69-C-U	2-Chloroethylvinylether	R	Not Recovered in MS/MSDs
LDW-SP-69-C-U	Hexachlorobutadiene	R2	Analyzed by another method with lower RL
LDW-SP-69-C-U	Naphthalene	R2	Analyzed by another method with lower RL
LDW-SP-71-C-U	1,2,4-Trichlorobenzene	R2	Analyzed by another method with lower RL
LDW-SP-71-C-U	1,2-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-71-C-U	1,3-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-71-C-U	1,4-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-71-C-U	2-Chloroethylvinylether	R	Not Recovered in MS/MSDs
LDW-SP-71-C-U	Hexachlorobutadiene	R2	Analyzed by another method with lower RL
LDW-SP-71-C-U	Naphthalene	R2	Analyzed by another method with lower RL
LDW-SP-75-C-U	1,2,4-Trichlorobenzene	R2	Analyzed by another method with lower RL
LDW-SP-75-C-U	1,2-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-75-C-U	1,3-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-75-C-U	1,4-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-75-C-U	2-Chloroethylvinylether	R	Not Recovered in MS/MSDs
LDW-SP-75-C-U	Bromomethane	UJ	Low LCS/LCSD recovery
LDW-SP-75-C-U	Hexachlorobutadiene	R2	Analyzed by another method with lower RL
LDW-SP-75-C-U	Naphthalene	R2	Analyzed by another method with lower RL
LDW-SP-76-C-U	1,2,4-Trichlorobenzene	R2	Analyzed by another method with lower RL

Sample	Analyte	Qualifier	Reason
LDW-SP-76-C-U	1,2-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-76-C-U	1,3-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-76-C-U	1,4-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-76-C-U	2-Chloroethylvinylether	R	Not Recovered in MS/MSDs
LDW-SP-76-C-U	Hexachlorobutadiene	R2	Analyzed by another method with lower RL
LDW-SP-76-C-U	Naphthalene	R2	Analyzed by another method with lower RL
LDW-SP-80-C-U	1,2,4-Trichlorobenzene	R2	Analyzed by another method with lower RL
LDW-SP-80-C-U	1,2-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-80-C-U	1,3-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-80-C-U	1,4-Dichlorobenzene	R2	Analyzed by another method with same result
LDW-SP-80-C-U	2-Chloroethylvinylether	R	Not Recovered in MS/MSDs
LDW-SP-80-C-U	Bromomethane	UJ	Low LCS/LCSD recovery
LDW-SP-80-C-U	Hexachlorobutadiene	R2	Analyzed by another method with lower RL
LDW-SP-80-C-U	Naphthalene	R2	Analyzed by another method with lower RL
Semivolatile Organic Analyses			
LDW-SP-48-C-F	bis(2-Ethylhexyl)phthalate	U	Laboratory contamination
LDW-SP-48-C-U	bis(2-Ethylhexyl)phthalate	U	Laboratory contamination
LDW-SP-54-C-U	1,2-Dichlorobenzene	R2	Analyzed by another method with detected result
LDW-SP-54-C-U	1,3-Dichlorobenzene	R2	Analyzed by another method with higher concentration
LDW-SP-54-C-U	1,4-Dichlorobenzene	R2	Analyzed by another method with higher concentration
LDW-SP-54-C-U	bis(2-Ethylhexyl)phthalate	U	Laboratory contamination
LDW-SP-82-C-FD-F	bis(2-Ethylhexyl)phthalate	U	Laboratory contamination
LDW-SP-82-C-FD-F	Di-n-Butylphthalate	U	Likely laboratory contamination
LDW-SP-39-C-U	bis(2-Ethylhexyl)phthalate	U	Laboratory contamination
LDW-SP-41-C-F	Diethylphthalate	U	Likely laboratory contamination
LDW-SP-41-C-U	bis(2-Ethylhexyl)phthalate	U	Laboratory contamination
LDW-SP-61-C-F	bis(2-Ethylhexyl)phthalate	R1	Analysis with on-scale result available
LDW-SP-61-C-F	Di-n-Butylphthalate	U	Likely laboratory contamination
LDW-SP-61-C-F DL	1,2,4-Trichlorobenzene	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	1,2-Dichlorobenzene	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	1,3-Dichlorobenzene	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	1,4-Dichlorobenzene	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	1,4-Dioxane	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	2,2'-Oxybis(1-Chloropropane)	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	2,4,5-Trichlorophenol	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	2,4,6-Trichlorophenol	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	2,4-Dichlorophenol	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	2,4-Dimethylphenol	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	2,4-Dinitrophenol	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	2,4-Dinitrotoluene	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	2,6-Dinitrotoluene	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	2-Chloronaphthalene	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	2-Chlorophenol	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	2-Methylnaphthalene	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	2-Methylphenol	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	2-Nitroaniline	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	2-Nitrophenol	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	3,3'-Dichlorobenzidine	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	3-Nitroaniline	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	4,6-Dinitro-2-Methylphenol	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	4-Bromophenyl-phenylether	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	4-Chloro-3-methylphenol	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	4-Chloroaniline	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	4-Chlorophenyl-phenylether	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	4-Methylphenol	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	4-Nitroaniline	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	4-Nitrophenol	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Acenaphthene	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Acenaphthylene	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Anthracene	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Benzo(a)anthracene	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Benzo(a)pyrene	R1	Analysis with lower RL available

Sample	Analyte	Qualifier	Reason
LDW-SP-61-C-F DL	Benzo(b)fluoranthene	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Benzo(g,h,i)perylene	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Benzo(k)fluoranthene	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Benzoic Acid	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Benzyl Alcohol	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	bis(2-Chloroethoxy) Methane	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Bis-(2-Chloroethyl) Ether	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	bis(2-Ethylhexyl)phthalate	R	Laboratory contamination
LDW-SP-61-C-F DL	Butylbenzylphthalate	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Carbazole	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Chrysene	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Dibenz(a,h)anthracene	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Dibenzofuran	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Diethylphthalate	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Dimethylphthalate	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Di-n-Butylphthalate	R1	Analysis with detected result available
LDW-SP-61-C-F DL	Di-n-Octyl phthalate	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Fluoranthene	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Fluorene	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Hexachlorobenzene	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Hexachlorobutadiene	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Hexachlorocyclopentadiene	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Hexachloroethane	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Indeno(1,2,3-cd)pyrene	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Isophorone	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Naphthalene	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Nitrobenzene	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	N-Nitroso-Di-N-Propylamine	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	N-Nitrosodiphenylamine	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Pentachlorophenol	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Phenanthrene	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Phenol	R1	Analysis with lower RL available
LDW-SP-61-C-F DL	Pyrene	R1	Analysis with lower RL available
LDW-SP-61-C-U	bis(2-Ethylhexyl)phthalate	U	Laboratory contamination
LDW-SP-62-C-F	bis(2-Ethylhexyl)phthalate	U	Laboratory contamination
LDW-SP-64-C-U	bis(2-Ethylhexyl)phthalate	U	Laboratory contamination
LDW-SP-64-RB-MP-U	bis(2-Ethylhexyl)phthalate	U	Laboratory contamination
LDW-SP-64-RB-S-U	bis(2-Ethylhexyl)phthalate	U	Laboratory contamination
LDW-SP-69-C-F	Diethylphthalate	U	Likely laboratory contamination
LDW-SP-71-C-U	bis(2-Ethylhexyl)phthalate	U	Laboratory contamination
LDW-SP-75-C-F	bis(2-Ethylhexyl)phthalate	U	Laboratory contamination
LDW-SP-75-C-U	bis(2-Ethylhexyl)phthalate	U	Laboratory contamination
LDW-SP-76-C-F	bis(2-Ethylhexyl)phthalate	U	Laboratory contamination
LDW-SP-76-C-F	Diethylphthalate	U	Likely laboratory contamination
Pesticide Analyses			
LDW-SP-48-C-F	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-48-C-U	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-54-C-F	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-54-C-U	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-82-C-F	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-82-C-FD-F	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-82-C-FD-U	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-82-C-U	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-10-C-F	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-12-C-F	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-12-C-U	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-20-C-F	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-20-C-U	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-39-C-F	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-39-C-U	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-41-C-F	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-41-C-U	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-61-C-F	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-61-C-U	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-62-C-F	Endrin Aldehyde	UJ	Low LCS recoveries

Sample	Analyte	Qualifier	Reason
LDW-SP-64-C-F	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-69-C-F	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-69-C-U	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-71-C-F	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-71-C-U	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-75-C-F	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-75-C-U	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-76-C-F	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-76-C-U	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-80-C-F	Endrin Aldehyde	UJ	Low LCS recoveries
LDW-SP-80-C-U	Endrin Aldehyde	UJ	Low LCS recoveries
PCB Analyses			
LDW-SP-54-C-F	Aroclor 1254	U	Poor pattern match
LDW-SP-54-C-U	Aroclor 1248	R1	Analysis with on-scale result available
LDW-SP-54-C-U	Aroclor 1254	J	Quantitation interference from Aroclors 1248 and 1260 overlap
LDW-SP-54-C-U DL	Aroclor 1016	R1	Analysis with lower RL available
LDW-SP-54-C-U DL	Aroclor 1221	R1	Analysis with lower RL available
LDW-SP-54-C-U DL	Aroclor 1232	R1	Analysis with lower RL available
LDW-SP-54-C-U DL	Aroclor 1242	R1	Analysis with lower RL available
LDW-SP-54-C-U DL	Aroclor 1254	R1	Analysis with lower concentration available
LDW-SP-54-C-U DL	Aroclor 1260	R1	Analysis with same result available
LDW-SP-64-C-U	Aroclor 1254	J	Quantitation interference from Aroclors 1248 and 1260 overlap
LDW-SP-71-C-U	Aroclor 1254	J	Low surrogate recovery
Metals Analyses			
LDW-SP-10-C-F	Chromium	U	RB Contamination
LDW-SP-10-C-F	Copper	J	RB Contamination
LDW-SP-12-C-F	Chromium	U	RB Contamination
LDW-SP-12-C-F	Copper	J	RB Contamination
LDW-SP-12-C-U	Chromium	U	RB Contamination
LDW-SP-12-C-U	Copper	J	RB Contamination
LDW-SP-20-C-F	Chromium	U	RB Contamination
LDW-SP-20-C-F	Copper	J	RB Contamination
LDW-SP-20-C-U	Chromium	U	RB Contamination
LDW-SP-20-C-U	Copper	J	RB Contamination
LDW-SP-39-C-F	Chromium	U	RB Contamination
LDW-SP-39-C-F	Copper	J	RB Contamination
LDW-SP-39-C-U	Chromium	U	RB Contamination
LDW-SP-39-C-U	Copper	J	RB Contamination
LDW-SP-41-C-F	Chromium	U	RB Contamination
LDW-SP-41-C-F	Copper	U	RB Contamination
LDW-SP-41-C-U	Chromium	U	RB Contamination
LDW-SP-41-C-U	Copper	U	RB Contamination
LDW-SP-48-C-F	Chromium	U	RB Contamination
LDW-SP-48-C-F	Copper	J	RB Contamination
LDW-SP-48-C-F	Lead	J	Low internal standard intensity
LDW-SP-48-C-U	Chromium	U	RB Contamination
LDW-SP-48-C-U	Copper	J	RB Contamination
LDW-SP-54-C-F	Chromium	U	RB Contamination
LDW-SP-54-C-F	Copper	U	RB Contamination
LDW-SP-54-C-U	Copper	U	RB Contamination
LDW-SP-61-C-F	Chromium	U	RB Contamination
LDW-SP-61-C-F	Copper	U	RB Contamination
LDW-SP-61-C-U	Chromium	U	RB Contamination
LDW-SP-61-C-U	Copper	U	RB Contamination
LDW-SP-62-C-F	Chromium	U	RB Contamination
LDW-SP-62-C-F	Copper	U	RB Contamination
LDW-SP-64-C-F	Chromium	U	RB Contamination
LDW-SP-64-C-F	Copper	U	RB Contamination
LDW-SP-69-C-F	Chromium	U	RB Contamination
LDW-SP-69-C-F	Copper	U	RB Contamination
LDW-SP-69-C-U	Chromium	U	RB Contamination
LDW-SP-69-C-U	Copper	J	RB Contamination
LDW-SP-71-C-F	Chromium	U	RB Contamination

Sample	Analyte	Qualifier	Reason
LDW-SP-71-C-F	Copper	U	RB Contamination
LDW-SP-71-C-U	Chromium	U	RB Contamination
LDW-SP-71-C-U	Copper	J	RB Contamination
LDW-SP-75-C-F	Chromium	U	RB Contamination
LDW-SP-75-C-F	Copper	U	RB Contamination
LDW-SP-75-C-U	Chromium	U	RB Contamination
LDW-SP-75-C-U	Copper	J	RB Contamination
LDW-SP-76-C-F	Chromium	UJ	RB Contamination, high internal standard intensity
LDW-SP-76-C-F	Copper	UJ	RB Contamination, high internal standard intensity
LDW-SP-76-C-F	Nickel	J	High internal standard intensity
LDW-SP-76-C-F	Zinc	J	High internal standard intensity
LDW-SP-76-C-U	Chromium	U	RB Contamination
LDW-SP-80-C-F	Chromium	U	RB Contamination
LDW-SP-80-C-U	Chromium	U	RB Contamination
LDW-SP-82-C-F	Chromium	U	RB Contamination
LDW-SP-82-C-F	Copper	J	RB Contamination
LDW-SP-82-C-U	Chromium	U	RB Contamination
LDW-SP-82-C-U	Copper	J	RB Contamination
LDW-SP-82-FD-F	Chromium	U	RB Contamination
LDW-SP-82-FD-F	Copper	J	RB Contamination
LDW-SP-82-FD-U	Chromium	U	RB Contamination
LDW-SP-82-FD-U	Copper	J	RB Contamination
General Chemistry Analyses			
LDW-SP-48-C-F	Dissolved Organic Carbon	UJ	Sample not preserved upon receipt at lab
LDW-SP-54-C-F	Dissolved Organic Carbon	J	Sample not preserved upon receipt at lab
LDW-SP-82-C-F	Dissolved Organic Carbon	UJ	Sample not preserved upon receipt at lab
LDW-SP-82-C-FD-F	Dissolved Organic Carbon	UJ	Sample not preserved upon receipt at lab
LDW-SP-10-C-F	Dissolved Organic Carbon	J	Sample not preserved upon receipt at lab
LDW-SP-12-C-F	Dissolved Organic Carbon	UJ	Sample not preserved upon receipt at lab
LDW-SP-20-C-F	Dissolved Organic Carbon	UJ	Sample not preserved upon receipt at lab
LDW-SP-39-C-F	Dissolved Organic Carbon	UJ	Sample not preserved upon receipt at lab
LDW-SP-41-C-F	Dissolved Organic Carbon	UJ	Sample not preserved upon receipt at lab
LDW-SP-61-C-F	Dissolved Organic Carbon	UJ	Sample not preserved upon receipt at lab
LDW-SP-62-C-F	Dissolved Organic Carbon	UJ	Sample not preserved upon receipt at lab
LDW-SP-64-C-F	Dissolved Organic Carbon	J	Sample not preserved upon receipt at lab
LDW-SP-69-C-F	Dissolved Organic Carbon	J	Sample not preserved upon receipt at lab
LDW-SP-71-C-F	Dissolved Organic Carbon	UJ	Sample not preserved upon receipt at lab
LDW-SP-75-C-F	Dissolved Organic Carbon	UJ	Sample not preserved upon receipt at lab
LDW-SP-76-C-F	Dissolved Organic Carbon	J	Sample not preserved upon receipt at lab
LDW-SP-80-C-F	Dissolved Organic Carbon	J	Sample not preserved upon receipt at lab
LDW-SP-12-C-U	Total Suspended Solids	J	Lab duplicate
LDW-SP-20-C-U	Total Suspended Solids	J	Lab duplicate
LDW-SP-39-C-U	Total Suspended Solids	J	Lab duplicate
LDW-SP-41-C-U	Total Suspended Solids	J	Lab duplicate
LDW-SP-80-C-U	Total Suspended Solids	J	Lab duplicate

15.0 Abbreviations and Definitions

DV Qualifier	Definition
U	The material was analyzed for, but was not detected above the level of the associated value.
J	The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification.

DV Qualifier	Definition
UJ	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The sample result is rejected. The presence or absence of the analyte cannot be verified and data are not usable.
R1	This sample result has been rejected in favor of a more accurate and/or precise result. The other result should be used.
R2	This sample result has been rejected in favor of a result from another method.

Abbreviation	Definition
DL	Dilution
DV	Data validation
FD	Field replicate
LCS	Laboratory control sample
MS	Matrix spike
MSD	Matrix spike duplicate
RE	Reanalysis or re-extraction/reanalysis
RL	Reporting limit
RPD	Relative percent difference
Surr	Surrogate

16.0 References

USEPA Contract Laboratory Program National Functional Guidelines For Organic Data Review, Office of Emergency and Remedial Response, U.S. Environmental Protection Agency, October 1999, EPA540/R-99/008.

USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, Office of Emergency and Remedial Response, U.S. Environmental Protection Agency, July 2002, EPA540/R-01/008.

Recommended Guidelines for Measuring Organic Compounds In Puget Sound Water, Sediment And Tissue Samples, Puget Sound Water Quality Authority, April 1997.

Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment and Tissue Samples, Puget Sound Water Quality Authority, April 1997.

Method 8000B: Determinative Chromatographic Separations*, SW-846, Third Edition,* US Environmental Protection Agency, Office of Solid Waste, December 1996.

Method 8260B: Volatile Organic compounds by Gas Chromatography/Mass Spectrometry (GC/MS)*, SW-846, Third Edition,* US Environmental Protection Agency, Office of Solid Waste, December 1996.

Method 8270C: Semivolatile Organic compounds by Gas Chromatography/Mass Spectrometry (GC/MS)*, SW-846, Third Edition,* US Environmental Protection Agency, Office of Solid Waste, December 1996.

Method 8081A: Organochlorine Pesticides by Gas Chromatography*, SW-846, Third Edition,* US Environmental Protection Agency, Office of Solid Waste,

December 1996.

Method 8082: Polychlorinated Biphenyls (PCBs) by Gas Chromatography*, SW-846, Third Edition,* US Environmental Protection Agency, Office of Solid Waste, December 1996.

NWTPH-Gx - Volatile Petroleum Products Method for Soil and Water Analyses, *Analytical Methods For Petroleum Hydrocarbons,* Washington State Department of Ecology, ECY 97-602, June 1997.

NWTPH-Dx - Semivolatile Petroleum Products Method for Soil and Water Analyses, *Analytical Methods For Petroleum Hydrocarbons,* Washington State Department of Ecology, ECY 97-602, June 1997.

Method 200.8, *Determination of Trace Elements In Waters And Wastes By Inductively Coupled Plasma-Mass Spectrometry*, US Environmental Protection Agency, Office of Water EPA-821-R-99-017, October 1999

Method 1631, Revision E: Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry, US Environmental Protection Agency, Office of Water, EPA-821-R-02-019, *August 2002*

Method 3114 – Arsenic and Selenium by Hydride Generation/Atomic Absorption Spectrometry, *Standard Methods for Examination of Water & Wastewater*