Appendix D
Data Validation Report

EcoChem, INC.
Environmental Data Quality

DATA VALIDATION REPORT

BLAINE MINI MART
CONFIRMATIONAL SAMPLING

Prepared for:

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EcoChem Project: C4149-1

August 9, 2011

Approved for Release

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PROJECT NARRATIVE

Basis for Data Validation

This report summarizes the results of validation performed on soil and quality control (QC) sample data for the Blaine Mini Mart Confirmational Sampling – Blaine, Washington. A complete list of samples is provided in the **Sample Index**.

ESN Northwest Chemistry Laboratory, Olympia, Washington, analyzed the samples. The analytical methods and EcoChem project chemists are listed below:

Analysis	Method of Analysis	Primary Review	Secondary Review
BTEX and MTBE	SW8260C	Mark Brindle	Christine Ransom
Gasoline Range Organics	NWTPH-Gx and SW 8260C		
Naphthalenes	SW8260C and SW8270C		
Diesel and Residual Range Organics	NWTPH-Dx and SW8270C		

The data were reviewed using guidance and quality control criteria documented in the analytical method; *Blaine Mini Mart Confirmational Sampling - Sampling and Analysis Plan and Quality Assurance Project Plan* (April 2011) and *USEPA National Functional Guidelines for Organic Data Review* (EPA, 2008).

EcoChem's goal in assigning data assessment qualifiers is to assist in proper data interpretation. If values are estimated (J or UJ), data may be used for site evaluation and risk assessment purposes but reasons for data qualification should be taken into consideration when interpreting sample concentrations. If values are assigned an R, the data are to be rejected and should not be used for any site evaluation purposes. If values have no data qualifier assigned, then the data meet the data quality objectives as stated in the documents and methods referenced above.

Data qualifier definitions, reason codes, and validation criteria are included as **Appendix A**. A Qualified Data Summary Table is included as **Appendix B**. Data Validation Worksheets will be kept on file at EcoChem, Inc. A qualified electronic data deliverable (EDD) in the Washington State Department of Ecology Environmental Information Management (EIM) format is also submitted with this report.

SAMPLE INDEX
SAIC - Blaine Mini-Mart

Sample ID	MTBE/BTEX	GRO	Naphthalenes	DRO
EX1-F5-7	√	√	√	√
EX1-S8-12	√	√	√	√
EX1-S9-5	√	√	√	√
EX1-S10-13	√	√	√	√
EX1-S11-8	√	√	√	√
EX2-B19-10	√	√	√	√
EX2-B20-8	√	√	√	√
EX2-B21-7	√	√	√	√
EX2-S41-4	√	√	√	√
EX2-B22-6	√	√	√	√
EX2-B23-6	√	√	√	√
EX2-B24-2	√	√	√	√
EX2-S37-5	√	√	√	√
EX2-S38-11	√	√	√	√
EX2-S39-5	√	√	√	√
EX2-S40-4	√	√	√	√
EX1-S1-3	√	√	√	√
EX1-S2-3	√	√	√	√
EX1-S4-2	√	√	√	√
EX1-S5-2	√	√	√	√
EX1-S6-2	√	√	√	√
EX1-S7-2	√	√	√	√
EX1-F1-4	√	√	√	√
EX1-S3-2	√	√	√	√
EX1-F3-4	√	√	√	√
EX1-F4-4	√	√	√	√
EX1-F2-15	√	√	√	√
EX1-F1-4-2	√	√	√	√
EX2-S1-3	√	√	√	√
EX2-S2-5	√	√	√	√
EX2-S3-5	√	√	√	√
EX2-S4-5	√	√	√	√
EX2-S5-10	√	√	√	√
EX2-B1-14	√	√	√	√
EX2-S6-4	√	√	√	√
EX2-B2-14	√	√	√	√
EX2-S7-4	√	√	√	√
EX2-S8-10	√	√	√	√
EX2-S22-8	√	√	√	√
EX2-B8-13	√	√	√	√
EX2-B9-10	√	√	√	√
EX2-B11-9	√	√	√	√
EX2-S9-4	√	√	√	√
EX2-S10-10	√	√	√	√

SAMPLE INDEX
SAIC - Blaine Mini-Mart

Sample ID	MTBE/BTEX	GRO	Naphthalenes	DRO
EX2-B3-14	√	√	√	√
EX2-B3-14-2	√	√	√	√
EX2-B4-14	√	√	√	√
EX2-S12-10	√	√	√	√
EX2-S11-4	√	√	√	√
EX2-S13-4	√	√	√	√
EX2-S14-6	√	√	√	√
EX2-S15-10	√	√	√	√
EX2-B5-14	√	√	√	√
EX2-S16-4	√	√	√	√
EX2-S17-4	√	√	√	√
EX2-S18-10	√	√	√	√
EX2-B6-15	√	√	√	√
EX2-S19-4	√	√	√	√
EX2-S20-14	√	√	√	√
EX2-B7-15	√	√	√	√
EX2-B8-14	√	√	√	√
EX2-S21-4	√	√	√	√
EX2-S30-5	√	√	√	√
EX2-S31-10	√	√	√	√
EX2-B18-13	√	√	√	√
EX2-S23-4	√	√	√	√
EX2-S24-6	√	√	√	√
EX2-B12-11	√	√	√	√
EX2-B13-12	√	√	√	√
EX2-S25-4	√	√	√	√
EX2-S26-14	√	√	√	√
EX2-B14-14	√	√	√	√
EX2-B15-8	√	√	√	√
EX2-S27-5	√	√	√	√
EX2-S28-6	√	√	√	√
EX2-B16-11	√	√	√	√
EX2-S29-4	√	√	√	√
EX2-B17-12	√	√	√	√
EX2-B17-12-2	√	√	√	√
EX2-B32-8	√	√	√	√
EX2-S33-5	√	√	√	√
EX2-S34-11	√	√	√	√
EX2-S35-12	√	√	√	√
EX2-S36-12	√	√	√	√

DATA VALIDATION REPORT
Blaine Mini-Mart Confirmational Sampling
Fixed Base Lab Data
MTBE and BTEX by Method 8260C
Gasoline Range Organics by Method 8260C and NWTPH-Gx
Naphthalenes, Diesel and Residual Range Organics by Method 8270C

This report documents the review of analytical data from the analysis of 28 soil samples and the associated laboratory and field quality control (QC) samples. ESN Northwest Chemistry Laboratory, Olympia, Washington, analyzed the samples. A full validation (EPA Stage 4) was performed for one batch of samples for each method. The remaining data received a summary (EPA Stage 2B) level validation. See the **Sample Index** for a list of samples that were reviewed.

I. DATA PACKAGE COMPLETENESS

The laboratory submitted all information necessary to perform a full validation. Summary forms were provided for: sample results, surrogate recoveries, method blanks, laboratory control samples, matrix spike/matrix spike duplicates, and laboratory duplicates. Instrument tuning, calibration, calibration verification, and internal standard recoveries were evaluated using the raw data. No case narrative was provided.

II. EDD TO HARDCOPY VERIFICATION

A complete (100%) verification of the electronic data deliverable (EDD) results was performed by comparison to the hardcopy laboratory data package. The following error was noted.

- The laboratory reported all result for 2-methylnaphthalene in the EDD as 2-methylphenanthrene. The analyte name was corrected in the EDD.

III. TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

1	Sample Receipt, Preservation, and Holding Times	1	Field Duplicates
	Initial Calibration (ICAL)	2	Internal Standards
	Continuing Calibration (CCAL)		Target Analyte List
	Laboratory Blanks	1	Reporting Limits
2	Surrogate Compounds		Compound Identification
	Laboratory Control Samples (LCS)	1	Reported Results
1	Matrix Spikes/Matrix Spike Duplicate (MS/MSD)	1	Calculation Verification
	Laboratory Duplicates		

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[1] ***Quality control results are discussed below, but no data were qualified.***
[2] ***Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.***

Sample Preservation and Holding Times

The validation guidance documents state that the cooler temperatures should be within an advisory temperature range of 2° to 6°C. No cooler temperatures were recorded by the laboratory. No action was taken on this basis.

Surrogate Compounds

8270C: The percent recovery (%R) value for p-terphenyl-d14 was greater than the 150% upper control limit in Sample EX1-F4-4. No target analytes were detected in this sample; no action was necessary based on the potential high bias.

The %R values for p-terphenyl-d14 were less than the 50% control limit in Samples EX2-B20-8 and EX2-B24-2. No target analytes were detected in these samples; reporting limits were estimated (UJ-13) to indicate a potential low bias.

Matrix Spike/Matrix Spike Duplicates

8270C: Target analytes naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were not included in the matrix spike/matrix spike duplicate (MS/MSD) spike mixture. The laboratory spiked the MS/MSD sets with acenaphthene and pyrene, which were not target compounds. MS/MSD analyses were not performed for diesel and lube oil range organics. No action was taken based on MS/MSD recoveries.

Field Duplicates

The relative percent difference (RPD) control limit is 50% for results greater than 5x the reporting limit (RL). For results less than 5x the RL, the difference between the sample and duplicate must be less than 2x the RL.

One set of field duplicate samples was submitted: EX1-F1-4 & EX1-F1-4-2. No target analytes were detected in either sample. Field precision was acceptable.

Internal Standards

8270C: The %R values for naphthalene-d8 were less than the lower control limit in all samples. All results for naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were estimated (J/UJ-19) to indicate a potential low bias

Reporting Limits

Reporting limits were not adjusted for individual sample weights or percent solids. No action was taken on this basis.

Reported Results

Total solids were not reported in the EDD as a target analyte. Because there is no field in the EIM structure for total solids, this information is not in the EDD.

8260C: The target analytes m,p-xylene and o-xylene specified in the QAPP were reported as combined Total xylenes.

Calculation Verification

Several results were verified by recalculation from the raw data. No calculation or transcription errors were noted.

IV. OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory followed the specified analytical method. With the exceptions noted above, accuracy was acceptable as demonstrated by the surrogate, laboratory control sample, and MS/MSD %R values. Precision was acceptable as demonstrated by the MS/MSD, laboratory duplicate, and field duplicate RPD values.

Results were estimated based on surrogate %R and internal standard %R outliers.

All data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
Blaine Mini Mart Confirmational Sampling
Mobile Lab Data
BTEX, MTBE, and Naphthalenes by Method 8260C
Gasoline Range Organics by Method 8260C and NWTPH-Gx
Diesel and Residual Range Organics by Method NWTPH-Dx

This report documents the review of analytical data from the analysis of 57 soil samples and the associated laboratory and field quality control (QC) samples. ESN Northwest Chemistry Laboratory, Olympia, Washington, analyzed the samples. A full validation (EPA Stage 4) was performed for one batch of samples for each method. The remaining data received a summary (EPA Stage 2B) level validation. See the **Sample Index** for a list of samples that were reviewed.

I. DATA PACKAGE COMPLETENESS

The laboratory submitted all information necessary to perform a full validation. Summary forms were provided for: sample results, surrogate recoveries, method blanks, laboratory control samples (LCS), matrix spike/matrix spike duplicates (MS/MSD), and laboratory duplicates. Instrument tuning, calibration, calibration verification, and internal standard recoveries were evaluated using the raw data. No case narrative was provided.

II. EDD TO HARDCOPY VERIFICATION

A complete (100%) verification of the electronic data deliverable (EDD) results was performed by comparison to the hardcopy laboratory data package. The following errors were noted.

- The laboratory reported all result for 2-methylnaphthalene in the EDD as 2-methylphenanthrene. The analyte name was corrected in the EDD by EcoChem.
- The MTBE result for sample EX2-B32-8 was missing from the EDD. This result was added by EcoChem.

III. TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

1	Sample Receipt, Preservation, and Holding Times	1	Field Duplicates
	Initial Calibration (ICAL)	2	Internal Standards
2	Continuing Calibration (CCAL)		Target Analyte List
2	Laboratory Blanks	1	Reporting Limits
1	Surrogate Compounds		Compound Identification
2	Laboratory Control Samples (LCS)	1	Reported Results
	Matrix Spikes/Matrix Spike Duplicates (MS/MSD)	1	Calculation Verification
2	Laboratory Duplicates		

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[1] ***Quality control results are discussed below, but no data were qualified.***
[2] ***Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.***

Sample Receipt, Preservation, and Holding Times

The mobile laboratory received the samples directly from the samplers at the site. No sample preservation was necessary.

Continuing Calibration

8260C: All continuing calibration (CCAL) relative response factor (RRF) values were greater than the 0.05 minimum control limit. The values for percent difference (%D) were within the ±25% control limit, with the exceptions noted below. For %D outliers indicative of a low bias, associated non-detects and positive results were estimated (J/UJ-5B). For %D outliers indicative of a high bias, positive results only in the associated samples were estimated (J-5B).

CCAL 5/03/11 06:49 1-methylnaphthalene and 2-methylnaphthalene (low)

CCAL 5/03/11 07:37 MTBE and naphthalene (low); 2-methylnaphthalene (high)

CCAL 5/04/11 07:15 naphthalene (high); 1-methylnaphthalene (low)

CCAL 5/05/11 06:57 naphthalene, 1-methylnaphthalene, 2-methylnaphthalene (low)

CCAL 5/12/11 07:12 2-methylnaphthalene (low)

CCAL 5/11/11 06:45 naphthalene (low); 2-methylnaphthalene (high)

CCAL 5/12/11 08:26 naphthalene and 2-methylnaphthalene (high)

CCAL 5/16/11 07:10 1-methylnaphthalene and 2-methylnaphthalene (low)

CCAL 5/17/11 06:51 1-methylnaphthalene and 2-methylnaphthalene (low)

Surrogate Compounds

8260C: The surrogates 1,4-dichloroethane-d4, toluene-d8, and 4-bromofluorobenzene were added to each sample before extraction. The sample result summary forms list "dibromofluoromethane" instead of 1,4-dichloroethane-d4 as the first surrogate compound. No action was taken other than to note the discrepancy.

The percent recovery (%R) values for 1,4-dichloroethane-d4 and 4-bromofluorobenzene were greater than the upper control limit of 135% in several samples. There were no positive results associated with the surrogate outliers; therefore no action was necessary based on the potential high bias.

Laboratory Blanks

Laboratory blanks were extracted and analyzed at the required frequency of one per 20 samples. To assess the impact of each blank contaminant on the reported sample results, action levels were established at five times the concentrations reported in the blanks. If a contaminant is reported in an associated field sample and the concentration is less than the action level, the result is qualified as not detected (U-7). No action is taken if the sample result is greater than the action level, or for non-detected results.

The following qualifiers were assigned based on method blank contamination.

8260C: The target analyte 1-methylnaphthalene was detected in the method blank associated with samples analyzed on 5/5/2011. The 1-methylnaphthalene results in Samples EX2-S16-14 and EX2-B6-15 were qualified as not detected (U-7).

Laboratory Control Samples

8260C: Target analytes 1-methylnaphthalene, 2-methylnaphthalene, and gasoline were not included in the LCS spike mixture.

For the LCS associated with samples analyzed on 5/5/2011, the %R values for benzene, toluene, and total xylenes were greater than the upper control limits. The positive results for these analytes in the associated samples were estimated (J-10) to indicate a potential high bias.

For the LCS associated with samples analyzed on 5/6/2011, the %R value for total xylenes was greater than the upper control limit. The positive results for total xylenes in the associated samples were estimated (J-10).

NWTPH-Dx: No LCS analyses were performed for this method. Accuracy was evaluated using the surrogate recoveries.

Laboratory Duplicates

Laboratory duplicates were analyzed at the required frequency of one per 20 samples.

8260C: For the duplicate pair EX2-S13-4 & EX2-S13-4 DUP, the relative percent difference (RPD) value for total xylenes was greater than the 50% control limit, at 79%. The total xylene result in Sample EX2-S13-4 was estimated (J-9).

Matrix Spike/Matrix Spike Duplicates

8260C: Target analytes 1-methylnaphthalene, 2-methylnaphthalene, and gasoline were not included in the MS/MSD spike mixture.

For the MS/MSD analyses performed using Samples EX2-S1-3, EX2-S14-6, EX2-B8-14, and EX2-B15-8, the RPD values for naphthalene was greater than the 50% control limit. Naphthalene was not detected in the parent samples; therefore no qualifiers were required.

For the MS/MSD analysis performed using Sample EX2-B15-8, the MSD %R value for naphthalene was greater than the upper control limit. The MS %R value was within control limits. No qualifiers were assigned for the single outlier.

For the MS/MSD analysis performed using Sample EX2-S30-5, the MS %R value for total xylenes was greater than the upper control limit. The MSD %R value was within control limits. No qualifiers were assigned for a single outlier.

For the MS/MSD analysis performed using Sample EX2-B18-3, the %R values for total xylenes were greater than the upper control limit. Total xylenes were not detected in the parent sample; no action was necessary based on the potential high bias.

NWTPH-Dx: No MS/MSD analyses were performed.

Field Duplicates

The RPD control limit is 50% for results greater than 5x the reporting limit (RL). For results less than 5x the RL, the difference between the sample and duplicate must be less than 2x the RL.

Two sets of field duplicate samples were submitted: EX2-B3-14 & EX2-B3-14-2 and EX2-B17-12 & EX2-B17-12-2. All field precision criteria were met.

Internal Standards

8260C: The %R values for fluorobenzene, chlorobenzene-d5 and/or 1,4-dichlorobenzene were less than the lower control limits in many samples. The reporting limits and positive results were estimated (J/UJ-19) for these samples.

Sample IDs			Internal Standard	Associated Analytes
EX2-S24-6	EX2-B12-11	EX2-B13-12	Chlorobenzene-d5	Toluene, Ethyl Benzene, Total Xylenes
EX2-B11-9	EX2-S25-4	EX2-B15-8		
EX2-S27-5	EX2-S28-6	EX2-B16-11		
EX2-S29-4	EX2-B17-12	EX2-B17-12-2		
EX2-S30-5	EX2-S34-11			
EX2-S23-4	EX2-S26-14	EX2-S31-10	Fluorobenzene Chlorobenzene-d5	MTBE, Benzene Toluene, Ethyl Benzene, Total Xylenes
EX2-S32-8	EX2-S33-5	EX2-S35-12		
EX2-S36-12				
EX2-B18-13			Fluorobenzene hlorobenzene-d5 1,4-Dichlorobenzene	All

Reporting Limits

Reporting limits were not adjusted for individual sample weights or percent solids. No action was taken on this basis.

Reported Results

Total solids were not reported in the EDD as a target analyte. Because there is no field in the EIM structure for total solids, this information is not in the EDD.

8260C: The target analytes m,p-xylene and o-xylene specified in the QAPP were reported as combined Total xylenes.

Calculation Verification

Several results were verified by recalculation from the raw data. No calculation or transcription errors were noted.

IV. OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory followed the specified analytical methods. With the exceptions noted above, accuracy was acceptable as demonstrated by the surrogate, MS/MSD, and LCS %R values and precision was acceptable as demonstrated by the MS/MSD, laboratory duplicate, and field duplicate RPD values.

Results were estimated based on continuing calibration %D, LCS %R, laboratory duplicate RPD, and internal standard %R outliers. Results were qualified as not detected based on method blank contamination.

All data, as qualified, are acceptable for use.

EcoChem, INC.
Environmental Data Quality

APPENDIX A
DATA QUALIFIER DEFINITIONS REASON CODES AND CRITERIA TABLES

DATA VALIDATION QUALIFIER CODES
Based on National Functional Guidelines

The following definitions provide brief explanations of the qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents the approximate concentration.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

The following is an EcoChem qualifier that may also be assigned during the data review process:

DNR	Do not report; a more appropriate result is reported from another analysis or dilution.

DATA QUALIFIER REASON CODES

1	Holding Time/Sample Preservation
2	Chromatographic pattern in sample does not match pattern of calibration standard.
3	Compound Confirmation
4	Tentatively Identified Compound (TIC) (associated with NJ only)
5A	Calibration (initial)
5B	Calibration (continuing)
6	Field Blank Contamination
7	Lab Blank Contamination (e.g., method blank, instrument, etc.)
8	Matrix Spike(MS & MSD) Recoveries
9	Precision (all replicates)
10	Laboratory Control Sample Recoveries
11	A more appropriate result is reported (associated with "R" and "DNR" only)
12	Reference Material
13	Surrogate Spike Recoveries (a.k.a., labeled compounds & recovery standards)
14	Other (define in validation report)
15	GFAA Post Digestion Spike Recoveries
16	ICP Serial Dilution % Difference
17	ICP Interference Check Standard Recovery
18	Trip Blank Contamination
19	Internal Standard Performance (e.g., area, retention time, recovery)
20	Linear Range Exceeded
21	Potential False Positives
22	Elevated Detection Limit Due to Interference (i.e., laboratory, chemical and/or matrix)

EcoChem Validation Guidelines for Volatile Analysis by GC/MS (Based on Organic NFG 1999)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler Temperature	4°C±2°C Water: HCl to pH < 2	J(+)/UJ(-) if greater than 6 deg. C **(EcoChem PJ)**	1
Hold Time	Waters: 14 days preserved 7 Days: unpreserved (for aromatics) Solids: 14 Days	J(+)/UJ(-) if hold times exceeded If exceeded by > 3X HT: J(+)/R(-) **(EcoChem PJ)**	1
Tuning	BFB Beginning of each 12 hour period Method acceptance criteria	R(+/-) all analytes in all samples associated with the tune	5A
Initial Calibration (Minimum 5 stds.)	RRF > 0.05	**(EcoChem PJ, see TM-06)** If MDL= reporting limit: J(+)/R(-) if RRF < 0.05 If reporting limit > MDL: note in worksheet if RRF <0.05	5A
	%RSD < 30%	**(EcoChem PJ, see TM-06)** J(+) if %RSD > 30%	5A
Continuing Calibration (Prior to each 12 hr. shift)	RRF > 0.05	**(EcoChem PJ, see TM-06)** If MDL= reporting limit: J(+)/R(-) if RRF < 0.05 If reporting limit > MDL: note in worksheet if RRF <0.05	5B
	%D <25%	**(EcoChem PJ, see TM-06)** If > +/-90%: J+/R- If -90% to -26%: J+ (high bias) If 26% to 90%: J+/UJ- (low bias)	5B
Method Blank	One per matrix per batch No results > CRQL	U(+) if sample (+) result is less than CRQL and less than appropriate 5X or 10X rule (raise sample value to CRQL)	7
		U(+) if sample (+) result is greater than or equal to CRQL and less than appropriate 5X and 10X rule (at reported sample value)	7
	No TICs present	R(+) TICs using 10X rule	7
Storage Blank	One per SDG <CRQL	U(+) the specific analyte(s) results in all assoc.samples using the 5x or 10x rule	7
Trip Blank	Frequency as per project QAPP	Same as method blank for positive results remaining in trip blank after method blank qualifiers are assigned	18
Field Blanks (if required in QAPP)	No results > CRQL	Apply 5X/10X rule; U(+) < action level	6

EcoChem Validation Guidelines for Volatile Analysis by GC/MS (Based on Organic NFG 1999)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
MS/MSD (recovery)	One per matrix per batch Use method acceptance criteria	Qualify parent only unless other QC indicates systematic problems: J(+) if both %R > UCL J(+)/UJ(-) if both %R < LCL J(+)/R(-) if both %R < 10% **PJ if only one %R outlier**	8
MS/MSD (RPD)	One per matrix per batch Use method acceptance criteria	J(+) in parent sample if RPD > CL	9
LCS *low conc. H2O VOA*	One per lab batch Within method control limits	J(+) assoc. cmpd if > UCL J(+)/R(-) assoc. cmpd if < LCL J(+)/R(-) all cmpds if half are < LCL	10
LCS *regular VOA (H2O & solid)*	One per lab batch Lab or method control limits	J(+) if %R > UCL J(+)/UJ(-) if %R <LCL J(+)/R(-) if %R < 10% **(EcoChem PJ)**	10
LCS/LCSD *(if required)*	One set per matrix and batch of 20 samples RPD < 35%	J(+)/UJ(-) assoc. cmpd. in all samples	9
Surrogates	Added to all samples Within method control limits	J(+) if %R >UCL J(+)/UJ(-) if %R <LCL but >10% **(see PJ[1])** J(+)/R(-) if <10%	13
Internal Standard (IS)	Added to all samples Acceptable Range: IS area 50% to 200% of CCAL area RT within 30 seconds of CC RT	J(+) if > 200% J(+)/UJ(-) if < 50% J(+)/R(-) if < 25% RT>30 seconds, **narrate and Notify PM**	19
Field Duplicates	**Use QAPP limits. If no QAPP:** Solids: RPD <50% OR absolute diff. < 2X RL (for results < 5X RL) Aqueous: RPD <35% OR absolute diff. < 1X RL (if either result < 5X RL)	Narrate and qualify if required by project **(EcoChem PJ)**	9
TICs	Major ions (>10%) in reference must be present in sample; intensities agree within 20%; check identification	NJ the TIC unless: R(+) common laboratory contaminants **See Technical Director for ID issues**	4
Quantitation/ Identification	RRT within 0.06 of standard RRT Ion relative intensity within 20% of standard All ions in std. at > 10% intensity must be present in sample	**See Technical Director if outliers**	14 21 (false +)

PJ[1] No action if there are 4+ surrogates and only 1 outlier.

EcoChem Validation Guidelines for Semivolatile Analysis by GC/MS (Based on Organic NFG 1999)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler Temperature	4°C ±2°	J(+)/UJ(-) if greater than 6 deg. C (EcoChem PJ)	1
Holding Time	Water: 7 days from collection Soil: 14 days from collection Analysis: 40 days from extraction	Water: J(+)/UJ(-) if ext. > 7 and < 21 days J(+)/R(-) if ext > 21 days (EcoChem PJ) Solids/Wastes: J(+)/UJ(-) if ext. > 14 and < 42 days J(+)/R(-) if ext. > 42 days (EcoChem PJ) J(+)/UJ(-) if analysis >40 days	1
Tuning	DFTPP Beginning of each 12 hour period Method acceptance criteria	R(+/-) all analytes in all samples associated with the tune	5A
Initial Calibration (Minimum 5 stds.)	RRF > 0.05	(EcoChem PJ, see TM-06) If MDL= reporting limit: J(+)/R(-) if RRF < 0.05 If reporting limit > MDL: note in worksheet if RRF <0.05	5A
	%RSD < 30%	(EcoChem PJ, see TM-06) J(+) if %RSD > 30%	5A
Continuing Calibration (Prior to each 12 hr. shift)	RRF > 0.05	(EcoChem PJ, see TM-06) If MDL= reporting limit: J(+)/R(-) if RRF < 0.05 If reporting limit > MDL: note in worksheet if RRF <0.05	5B
	%D <25%	(EcoChem PJ, see TM-06) If > +/-90%: J+/R- If -90% to -26%: J+ (high bias) If 26% to 90%: J+/UJ- (low bias)	5B
Method Blank	One per matrix per batch No results > CRQL	U(+) if sample (+) result is less than CRQL and less than appropriate 5X or 10X rule (raise sample value to CRQL)	7
		U(+) if sample (+) result is greater than or equal to CRQL and less than appropriate 5X and 10X rule (at reported sample value)	7
	No TICs present	R(+) TICs using 10X rule	7
Field Blanks (Not Required)	No results > CRQL	Apply 5X/10X rule; U(+) < action level	6

EcoChem Validation Guidelines for Semivolatile Analysis by GC/MS (Based on Organic NFG 1999)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
MS/MSD (recovery)	One per matrix per batch Use method acceptance criteria	Qualify parent only unless other QC indicates systematic problems: J(+) if both %R > UCL J(+)/UJ(-) if both %R < LCL J(+)/R(-) if both %R < 10% PJ if only one %R outlier	8
MS/MSD (RPD)	One per matrix per batch Use method acceptance criteria	J(+) in parent sample if RPD > CL	9
LCS low conc. H2O SVOA	One per lab batch Within method control limits	J(+) assoc. cmpd if > UCL J(+)/R(-) assoc. cmpd if < LCL J(+)/R(-) all cmpds if half are < LCL	10
LCS regular SVOA (H2O & solid)	One per lab batch Lab or method control limits	J(+) if %R > UCL J(+)/UJ(-) if %R <LCL J(+)/R(-) if %R < 10% (EcoChem PJ)	10
LCS/LCSD *(if required)*	One set per matrix and batch of 20 samples RPD < 35%	J(+)/UJ(-) assoc. cmpd. in all samples	9
Surrogates	Minimum of 3 acid and 3 base/neutral compounds Use method acceptance criteria	Do not qualify if only 1 acid and/or 1 B/N surrogate is out unless <10% J(+) if %R > UCL J(+)/UJ(-) if %R < LCL J(+)/R(-) if %R < 10%	13
Internal Standards	Added to all samples Acceptable Range: IS area 50% to 200% of CCAL area RT within 30 seconds of CC RT	J(+) if > 200% J(+)/UJ(-) if < 50% J(+)/R(-) if < 25% RT>30 seconds, narrate and Notify PM	19
Field Duplicates	Use QAPP limits. If no QAPP: Solids: RPD <50% OR absolute diff. < 2X RL (for results < 5X RL) Aqueous: RPD <35% OR absolute diff. < 1X RL (for results < 5X RL)	Narrate and qualify if required by project (EcoChem PJ)	9
TICs	Major ions (>10%) in reference must be present in sample; intensities agree within 20%; check identification	NJ the TIC unless: R(+) common laboratory contaminants See Technical Director for ID issues	4
Quantitation/ Identification	RRT within 0.06 of standard RRT Ion relative intensity within 20% of standard All ions in std. at > 10% intensity must be present in sample	See Technical Director if outliers	14 21 (false +)

EcoChem Validation Guidelines for Total Petroleum Hydrocarbons-Gasoline Range

(Based on EPA National Functional Guidelines as applied to criteria in NWTPH-Gx, June 1997, Wa DOE & Oregon DEQ)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler Temperature & Preservation	4°C±2°C Water: HCl to pH < 2	J(+)/UJ(-) if greater than 6 deg. C	1
Holding Time	Waters: 14 days preserved 7 days unpreserved Solids: 14 Days	J(+)/UJ(-) if hold times exceeded J(+)/R(-) if exceeded > 3X (EcoChem PJ)	1
Initial Calibration	5 calibration points (All within 15% of true value) Linear Regression: $R^2 \geq 0.990$ If used, RSD of response factors ≤20%	Narrate if fewer than 5 calibration levels or if %R >15% J(+)/UJ(-) if R^2 <0.990 J(+)/UJ(-) if %RSD > 20%	5A
Mid-range Calibration Check Std.	Analyzed before and after each analysis shift & every 20 samples. Recovery range 80% to 120%	Narrate if frequency not met. J(+)/UJ(-) if %R < 80% J(+) if %R >120%	5B
Method Blank	At least one per batch (≤10 samples) No results >RL	U (at the RL) if sample result is < RL & < 5X blank result.	7
		U (at reported sample value) if sample result is ≥ RL and < 5X blank result	7
Trip Blank (if required by project)	No results >RL	Action is same as method blank for positive results remaining in trip blank after method blank qualifiers are assigned.	18
Field Blanks (if required by project)	No results > RL	Action is same as method blank for positive results remaining in field blank after method and trip blank qualifiers are assigned.	6
MS samples (accuracy) (if required by project)	%R within lab control limits	Qualify parent only, unless other QC indicates systematic problems. J(+) if both %R > upper control limit (UCL) J(+)/UJ(-) if both %R < lower control limit (LCL) No action if parent conc. >5X the amount spiked. Use PJ if only one %R outlier	8
Precision: MS/MSD or LCS/LCSD or sample/dup	At least one set per batch (≤10 samples) RPD ≤ lab control limit	J(+) if RPD > lab control limits	9

EcoChem Validation Guidelines for Total Petroleum Hydrocarbons-Gasoline Range

(Based on EPA National Functional Guidelines as applied to criteria in NWTPH-Gx, June 1997, Wa DOE & Oregon DEQ)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
LCS (not required by method)	%R within lab control limits	J(+)/UJ(-) if %R < LCL J(+) if %R > UCL J(+)/R(-) if any %R <10% (EcoChem PJ)	10
Surrogates	Bromofluorobenzene and/or 1,4-difluorobenzene added to all samples (inc. QC samples). %R = 50-150%	J(+)/UJ(-) if %R < LCL J(+) if %R >UCL J(+)/R(-) if any %R <10% No action if 2 or more surrogates are used, and only one is outside control limits. (EcoChem PJ)	13
Pattern Identification	Compare sample chromatogram to standard chromatogram to ensure range and pattern are reasonable match. Laboratory may flag results which have poor match.	J(+)	2
Field Duplicates	Use project control limits, if stated in QAPP EcoChem default: water: RPD < 35% solids: RPD < 50%	Narrate outliers If required by project, qualify with J(+)/UJ(-)	9
Two analyses for one sample (e.g., dilution)	Report only one result per analyte	"DNR" (or client requested qualifier) all results that should not be reported. (See TM-04)	11

EcoChem Validation Guidelines for Total Petroleum Hydrocarbons-Diesel & Residual Range

(Based on EPA National Functional Guidelines as applied to criteria in NWTPH-Dx, June 1997, Wa DOE & Oregon DEQ)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler Temperature & Preservation	4°C±2°C Water: HCl to pH < 2	J(+)/UJ(-) if greater than 6 deg. C	1
Holding Time	Ext. Waters: 14 days preserved 7 days unpreserved Ext. Solids: 14 Days Analysis: 40 days from extraction	J(+)/UJ(-) if hold times exceeded J(+)/R(-) if exceeded > 3X (EcoChem PJ)	1
Initial Calibration	5 calibration points (All within 15% of true value) Linear Regression: $R^2 \geq 0.990$ If used, RSD of response factors ≤20%	Narrate if fewer than 5 calibration levels or if %R >15% J(+)/UJ(-) if R^2 <0.990 J(+)/UJ(-) if %RSD > 20%	5A
Mid-range Calibration Check Std.	Analyzed before and after each analysis shift & every 20 samples. Recovery range 85% to 115%	Narrate if frequency not met. J(+)/UJ(-) if %R < 85% J(+) if %R >115%	5B
Method Blank	At least one per batch (≤20 samples) No results >RL	U (at the RL) if sample result is < RL & < 5X blank result.	7
		U (at reported sample value) if sample result is ≥ RL and < 5X blank result	7
Field Blanks (if required by project)	No results > RL	Action is same as method blank for positive results remaining in the field blank after method blank qualifiers are assigned.	6
MS samples (accuracy) (if required by project)	%R within lab control limits	Qualify parent only, unless other QC indicates systematic problems. J(+) if both %R > upper control limit (UCL) J(+)/UJ(-) if both %R < lower control limit (LCL) No action if parent conc. >5X the amount spiked. Use PJ if only one %R outlier	8
Precision: MS/MSD or LCS/LCSD or sample/dup	At least one set per batch (≤10 samples) RPD ≤ lab control limit	J(+) if RPD > lab control limits	9
LCS (not required by method)	%R within lab control limits	J(+)/UJ(-) if %R < LCL J(+) if %R > UCL J(+)/R(-) if any %R <10% (EcoChem PJ)	10

EcoChem Validation Guidelines for Total Petroleum Hydrocarbons-Diesel & Residual Range

(Based on EPA National Functional Guidelines as applied to criteria in NWTPH-Dx, June 1997, Wa DOE & Oregon DEQ)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Surrogates	2-fluorobiphenyl, p-terphenyl, o-terphenyl, and/or pentacosane added to all samples (inc. QC samples). %R = 50-150%	J(+)/UJ(-) if %R < LCL J(+) if %R > UCL J(+)/R(-) if any %R <10% No action if 2 or more surrogates are used, and only one is outside control limits. (EcoChem PJ)	13
Pattern Identification	Compare sample chromatogram to standard chromatogram to ensure range and pattern are reasonable match. Laboratory may flag results which have poor match.	J(+)	2
Field Duplicates	Use project control limits, if stated in QAPP EcoChem default: water: RPD < 35% solids: RPD < 50%	Narrate (Use Professional Judgement to qualify)	9
Two analyses for one sample (dilution)	Report only one result per analyte	"DNR" (or client requested qualifier) all results that should not be reported. (See TM-04)	11

EcoChem, INC.
Environmental Data Quality

APPENDIX B
QUALIFIED DATA SUMMARY TABLE

QUALIFIED DATA SUMMARY TABLE
SAIC - Blaine Mini-Mart

Sample ID	Method	Analyte	Result	Units	Lab Qualifier	DV Qualifier	DV Reason Code
EX1-F5-7	SW8270	Naphthalene	0.02	mg/Kg	U	UJ	19
EX1-F5-7	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-F5-7	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-S8-12	SW8270	Naphthalene	0.02	mg/Kg	U	UJ	19
EX1-S8-12	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-S8-12	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-S9-5	SW8270	Naphthalene	0.02	mg/Kg	U	UJ	19
EX1-S9-5	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-S9-5	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-S10-13	SW8270	Naphthalene	0.02	mg/Kg	U	UJ	19
EX1-S10-13	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-S10-13	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-S11-8	SW8270	Naphthalene	0.02	mg/Kg	U	UJ	19
EX1-S11-8	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-S11-8	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX2-B19-10	SW8270	Naphthalene	0.02	mg/Kg	U	UJ	19
EX2-B19-10	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX2-B19-10	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX2-B20-8	SW8270	Naphthalene	0.02	mg/Kg	U	UJ	13,19
EX2-B20-8	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	13,19
EX2-B20-8	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	13,19
EX2-B21-7	SW8270	Naphthalene	0.02	mg/Kg	U	UJ	19
EX2-B21-7	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX2-B21-7	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX2-S41-4	SW8270	Naphthalene	0.02	mg/Kg	U	UJ	19
EX2-S41-4	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX2-S41-4	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX2-B22-6	SW8270	Naphthalene	0.02	mg/Kg	U	UJ	19
EX2-B22-6	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX2-B22-6	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX2-B23-6	SW8270	Naphthalene	0.02	mg/Kg	U	UJ	19
EX2-B23-6	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX2-B23-6	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX2-B24-2	SW8270	Naphthalene	0.02	mg/Kg	U	UJ	13,19
EX2-B24-2	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	13,19
EX2-B24-2	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	13,19
EX2-S37-5	SW8270	Naphthalene	0.02	mg/Kg	U	UJ	19
EX2-S37-5	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX2-S37-5	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX2-S38-11	SW8270	Naphthalene	0.02	mg/Kg	U	UJ	19
EX2-S38-11	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX2-S38-11	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX2-S39-5	SW8270	Naphthalene	0.21	mg/Kg		J	19
EX2-S39-5	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-S1-3	SW8270	Naphthalene	0.02	mg/Kg	U	UJ	19

QUALIFIED DATA SUMMARY TABLE
SAIC - Blaine Mini-Mart

Sample ID	Method	Analyte	Result	Units	Lab Qualifier	DV Qualifier	DV Reason Code
EX1-S1-3	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-S1-3	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-S2-3	SW8270	Naphthalene	0.02	mg/Kg	U	UJ	19
EX1-S2-3	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-S2-3	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-S4-2	SW8270	Naphthalene	0.02	mg/Kg	U	UJ	19
EX1-S4-2	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-S4-2	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-S5-2	SW8270	Naphthalene	0.02	mg/Kg	U	UJ	19
EX1-S5-2	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-S5-2	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-S6-2	SW8270	Naphthalene	0.02	mg/Kg	U	UJ	19
EX1-S6-2	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-S6-2	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-S7-2	SW8270	Naphthalene	0.02	mg/Kg	U	UJ	19
EX1-S7-2	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-S7-2	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-F1-4	SW8270	Naphthalene	0.02	mg/Kg	U	UJ	19
EX1-F1-4	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-F1-4	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-S3-2	SW8270	Naphthalene	2	mg/Kg		J	19
EX1-S3-2	SW8270	1-Methylnaphthalene	5.2	mg/Kg		J	19
EX1-S3-2	SW8270	2-Methylnaphthalene	7.9	mg/Kg		J	19
EX1-F3-4	SW8270	Naphthalene	0.02	mg/Kg	U	UJ	19
EX1-F3-4	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-F3-4	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-F4-4	SW8270	Naphthalene	0.02	mg/Kg	U	UJ	19
EX1-F4-4	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-F4-4	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-F2-15	SW8270	Naphthalene	0.02	mg/Kg	U	UJ	19
EX1-F2-15	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-F2-15	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-F1-4-2	SW8270	Naphthalene	0.02	mg/Kg	U	UJ	19
EX1-F1-4-2	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX1-F1-4-2	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX2-S39-5	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX2-S40-4	SW8270	Naphthalene	0.02	mg/Kg	U	UJ	19
EX2-S40-4	SW8270	1-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX2-S40-4	SW8270	2-Methylnaphthalene	0.02	mg/Kg	U	UJ	19
EX2-S1-3	SW8260C	Methyl t-butyl ether	0.05	mg/Kg	U	UJ	5B
EX2-S1-3	SW8260C	Naphthalene	1	mg/Kg	U	UJ	5B
EX2-S1-3	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S1-3	SW8260C	2-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S2-5	SW8260C	Methyl t-butyl ether	0.05	mg/Kg	U	UJ	5B
EX2-S2-5	SW8260C	Naphthalene	1	mg/Kg	U	UJ	5B

QUALIFIED DATA SUMMARY TABLE
SAIC - Blaine Mini-Mart

Sample ID	Method	Analyte	Result	Units	Lab Qualifier	DV Qualifier	DV Reason Code
EX2-S2-5	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S2-5	SW8260C	2-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S3-5	SW8260C	Methyl t-butyl ether	0.05	mg/Kg	U	UJ	5B
EX2-S3-5	SW8260C	Naphthalene	1	mg/Kg	U	UJ	5B
EX2-S3-5	SW8260C	1-Methylnaphthalene	2	mg/Kg		J	5B
EX2-S3-5	SW8260C	2-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S4-5	SW8260C	Methyl t-butyl ether	0.05	mg/Kg	U	UJ	5B
EX2-S4-5	SW8260C	Naphthalene	1	mg/Kg	U	UJ	5B
EX2-S4-5	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S4-5	SW8260C	2-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S5-10	SW8260C	Methyl t-butyl ether	0.05	mg/Kg	U	UJ	5B
EX2-S5-10	SW8260C	Naphthalene	1	mg/Kg	U	UJ	5B
EX2-S5-10	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S5-10	SW8260C	2-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-B1-14	SW8260C	Methyl t-butyl ether	0.05	mg/Kg	U	UJ	5B
EX2-B1-14	SW8260C	Naphthalene	1	mg/Kg	U	UJ	5B
EX2-B1-14	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-B1-14	SW8260C	2-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S6-4	SW8260C	Methyl t-butyl ether	0.05	mg/Kg	U	UJ	5B
EX2-S6-4	SW8260C	Naphthalene	1	mg/Kg	U	UJ	5B
EX2-S6-4	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S6-4	SW8260C	2-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-B2-14	SW8260C	Methyl t-butyl ether	0.05	mg/Kg	U	UJ	5B
EX2-B2-14	SW8260C	Naphthalene	1	mg/Kg	U	UJ	5B
EX2-B2-14	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-B2-14	SW8260C	2-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S7-4	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S8-10	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S22-8	SW8260C	Total Xylenes	5.5	mg/Kg		J	10
EX2-B11-9	SW8260C	Toluene	0.05	mg/Kg	U	UJ	19
EX2-B11-9	SW8260C	Ethylbenzene	0.05	mg/Kg	U	UJ	19
EX2-B11-9	SW8260C	Total Xylenes	0.15	mg/Kg	U	UJ	19
EX2-S9-4	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S10-10	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-B3-14	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-B3-14-2	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-B4-14	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S12-10	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S11-4	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S13-4	SW8260C	Benzene	0.05	mg/Kg		J	10
EX2-S13-4	SW8260C	Total Xylenes	0.37	mg/Kg		J	9,10
EX2-S13-4	SW8260C	Naphthalene	1	mg/Kg	U	UJ	5B
EX2-S13-4	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S13-4	SW8260C	2-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S14-6	SW8260C	Naphthalene	1	mg/Kg	U	UJ	5B

QUALIFIED DATA SUMMARY TABLE
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Sample ID	Method	Analyte	Result	Units	Lab Qualifier	DV Qualifier	DV Reason Code
EX2-S14-6	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S14-6	SW8260C	2-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S15-10	SW8260C	Naphthalene	1	mg/Kg	U	UJ	5B
EX2-S15-10	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S15-10	SW8260C	2-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-B5-14	SW8260C	Naphthalene	1	mg/Kg	U	UJ	5B
EX2-B5-14	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-B5-14	SW8260C	2-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S16-4	SW8260C	Benzene	0.27	mg/Kg		J	10
EX2-S16-4	SW8260C	Toluene	2	mg/Kg		J	10
EX2-S16-4	SW8260C	Total Xylenes	3.5	mg/Kg		J	10
EX2-S16-4	SW8260C	Naphthalene	1	mg/Kg	U	UJ	5B
EX2-S16-4	SW8260C	1-Methylnaphthalene	1.1	mg/Kg		U	7
EX2-S16-4	SW8260C	2-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S17-4	SW8260C	Benzene	0.08	mg/Kg		J	10
EX2-S17-4	SW8260C	Toluene	0.47	mg/Kg		J	10
EX2-S17-4	SW8260C	Total Xylenes	2.3	mg/Kg		J	10
EX2-S17-4	SW8260C	Naphthalene	1	mg/Kg	U	UJ	5B
EX2-S17-4	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S17-4	SW8260C	2-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S18-10	SW8260C	Naphthalene	1	mg/Kg	U	UJ	5B
EX2-S18-10	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S18-10	SW8260C	2-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-B6-15	SW8260C	Naphthalene	1	mg/Kg	U	UJ	5B
EX2-B6-15	SW8260C	1-Methylnaphthalene	1.4	mg/Kg		U	7
EX2-B6-15	SW8260C	2-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S19-4	SW8260C	Total Xylenes	2.6	mg/Kg		J	10
EX2-S21-4	SW8260C	Total Xylenes	9.3	mg/Kg		J	10
EX2-S30-5	SW8260C	Toluene	0.05	mg/Kg	U	UJ	19
EX2-S30-5	SW8260C	Ethylbenzene	0.05	mg/Kg	U	UJ	19
EX2-S30-5	SW8260C	Total Xylenes	0.15	mg/Kg	U	UJ	19
EX2-S31-10	SW8260C	Methyl t-butyl ether	0.05	mg/Kg	U	UJ	19
EX2-S31-10	SW8260C	Benzene	0.02	mg/Kg	U	UJ	19
EX2-S31-10	SW8260C	Toluene	0.05	mg/Kg	U	UJ	19
EX2-S31-10	SW8260C	Ethylbenzene	0.05	mg/Kg	U	UJ	19
EX2-S31-10	SW8260C	Total Xylenes	0.15	mg/Kg	U	UJ	19
EX2-B18-13	SW8260C	Methyl t-butyl ether	0.05	mg/Kg	U	UJ	19
EX2-B18-13	SW8260C	Benzene	0.05	mg/Kg	U	UJ	19
EX2-B18-13	SW8260C	Toluene	0.05	mg/Kg	U	UJ	19
EX2-B18-13	SW8260C	Ethylbenzene	0.05	mg/Kg	U	UJ	19
EX2-B18-13	SW8260C	Total Xylenes	0.15	mg/Kg	U	UJ	19
EX2-B18-13	SW8260C	Naphthalene	1	mg/Kg	U	UJ	19
EX2-B18-13	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B,19
EX2-B11-9	SW8260C	Naphthalene	1	mg/Kg	U	UJ	5B
EX2-S23-4	SW8260C	Methyl t-butyl ether	0.05	mg/Kg	U	UJ	19

QUALIFIED DATA SUMMARY TABLE
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Sample ID	Method	Analyte	Result	Units	Lab Qualifier	DV Qualifier	DV Reason Code
EX2-S23-4	SW8260C	Benzene	0.02	mg/Kg	U	UJ	19
EX2-S23-4	SW8260C	Toluene	0.05	mg/Kg	U	UJ	19
EX2-S23-4	SW8260C	Ethylbenzene	0.05	mg/Kg	U	UJ	19
EX2-S23-4	SW8260C	Total Xylenes	0.15	mg/Kg	U	UJ	19
EX2-S23-4	SW8260C	Naphthalene	1	mg/Kg	U	UJ	5B
EX2-S24-6	SW8260C	Toluene	0.05	mg/Kg	U	UJ	19
EX2-S24-6	SW8260C	Ethylbenzene	0.05	mg/Kg	U	UJ	19
EX2-S24-6	SW8260C	Total Xylenes	0.15	mg/Kg	U	UJ	19
EX2-S24-6	SW8260C	Naphthalene	1	mg/Kg	U	UJ	5B
EX2-B12-11	SW8260C	Toluene	0.05	mg/Kg	U	UJ	19
EX2-B12-11	SW8260C	Ethylbenzene	0.05	mg/Kg	U	UJ	19
EX2-B12-11	SW8260C	Total Xylenes	0.15	mg/Kg	U	UJ	19
EX2-B12-11	SW8260C	Naphthalene	1	mg/Kg	U	UJ	5B
EX2-B13-12	SW8260C	Toluene	0.05	mg/Kg	U	UJ	19
EX2-B13-12	SW8260C	Ethylbenzene	0.05	mg/Kg	U	UJ	19
EX2-B13-12	SW8260C	Total Xylenes	0.15	mg/Kg	U	UJ	19
EX2-B13-12	SW8260C	Naphthalene	1	mg/Kg	U	UJ	5B
EX2-S25-4	SW8260C	Toluene	0.05	mg/Kg	U	UJ	19
EX2-S25-4	SW8260C	Ethylbenzene	0.17	mg/Kg		J	19
EX2-S25-4	SW8260C	Total Xylenes	0.92	mg/Kg		J	19
EX2-S25-4	SW8260C	Naphthalene	1	mg/Kg	U	UJ	5B
EX2-S26-14	SW8260C	Methyl t-butyl ether	0.05	mg/Kg	U	UJ	19
EX2-S26-14	SW8260C	Benzene	0.02	mg/Kg	U	UJ	19
EX2-S26-14	SW8260C	Toluene	0.05	mg/Kg	U	UJ	19
EX2-S26-14	SW8260C	Ethylbenzene	0.05	mg/Kg	U	UJ	19
EX2-S26-14	SW8260C	Total Xylenes	0.15	mg/Kg	U	UJ	19
EX2-S26-14	SW8260C	Naphthalene	1	mg/Kg	U	UJ	5B
EX2-B14-14	SW8260C	Naphthalene	1	mg/Kg	U	UJ	5B
EX2-B15-8	SW8260C	Toluene	0.05	mg/Kg	U	UJ	19
EX2-B15-8	SW8260C	Ethylbenzene	0.05	mg/Kg	U	UJ	19
EX2-B15-8	SW8260C	Total Xylenes	0.15	mg/Kg	U	UJ	19
EX2-B15-8	SW8260C	2-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S27-5	SW8260C	Toluene	0.05	mg/Kg	U	UJ	19
EX2-S27-5	SW8260C	Ethylbenzene	0.05	mg/Kg	U	UJ	19
EX2-S27-5	SW8260C	Total Xylenes	0.15	mg/Kg	U	UJ	19
EX2-S27-5	SW8260C	2-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S28-6	SW8260C	Toluene	0.05	mg/Kg	U	UJ	19
EX2-S28-6	SW8260C	Ethylbenzene	0.05	mg/Kg	U	UJ	19
EX2-S28-6	SW8260C	Total Xylenes	0.15	mg/Kg		J	19
EX2-S28-6	SW8260C	2-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-B16-11	SW8260C	Toluene	0.05	mg/Kg	U	UJ	19
EX2-B16-11	SW8260C	Ethylbenzene	0.05	mg/Kg	U	UJ	19
EX2-B16-11	SW8260C	Total Xylenes	0.15	mg/Kg	U	UJ	19
EX2-B16-11	SW8260C	2-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S29-4	SW8260C	Toluene	15	mg/Kg		J	19

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Sample ID	Method	Analyte	Result	Units	Lab Qualifier	DV Qualifier	DV Reason Code
EX2-S29-4	SW8260C	Ethylbenzene	5.8	mg/Kg		J	19
EX2-S29-4	SW8260C	Total Xylenes	48	mg/Kg		J	10,19
EX2-B17-12	SW8260C	Toluene	0.05	mg/Kg	U	UJ	19
EX2-B17-12	SW8260C	Ethylbenzene	0.05	mg/Kg	U	UJ	19
EX2-B17-12	SW8260C	Total Xylenes	0.15	mg/Kg	U	UJ	19
EX2-B17-12-2	SW8260C	Toluene	0.05	mg/Kg	U	UJ	19
EX2-B17-12-2	SW8260C	Ethylbenzene	0.05	mg/Kg	U	UJ	19
EX2-B17-12-2	SW8260C	Total Xylenes	0.15	mg/Kg	U	UJ	19
EX2-B18-13	SW8260C	2-Methylnaphthalene	1	mg/Kg	U	UJ	5B,19
EX2-S31-10	SW8260C	Methyl t-butyl ether	0.05	mg/Kg	U	UJ	19
EX2-B32-8	SW8260C	Benzene	0.02	mg/Kg	U	UJ	19
EX2-B32-8	SW8260C	Toluene	0.05	mg/Kg	U	UJ	19
EX2-B32-8	SW8260C	Ethylbenzene	0.05	mg/Kg	U	UJ	19
EX2-B32-8	SW8260C	Total Xylenes	0.15	mg/Kg	U	UJ	19
EX2-B32-8	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-B32-8	SW8260C	2-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S33-5	SW8260C	Methyl t-butyl ether	0.05	mg/Kg	U	UJ	19
EX2-S33-5	SW8260C	Benzene	0.05	mg/Kg	U	UJ	19
EX2-S33-5	SW8260C	Toluene	0.05	mg/Kg	U	UJ	19
EX2-S33-5	SW8260C	Ethylbenzene	0.05	mg/Kg	U	UJ	19
EX2-S33-5	SW8260C	Total Xylenes	0.15	mg/Kg	U	UJ	19
EX2-S33-5	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S33-5	SW8260C	2-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S34-11	SW8260C	Toluene	0.05	mg/Kg	U	UJ	19
EX2-S34-11	SW8260C	Ethylbenzene	0.05	mg/Kg	U	UJ	19
EX2-S34-11	SW8260C	Total Xylenes	0.15	mg/Kg	U	UJ	19
EX2-S34-11	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S34-11	SW8260C	2-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S35-12	SW8260C	Methyl t-butyl ether	0.05	mg/Kg	U	UJ	19
EX2-S35-12	SW8260C	Benzene	0.05	mg/Kg	U	UJ	19
EX2-S35-12	SW8260C	Toluene	0.05	mg/Kg	U	UJ	19
EX2-S35-12	SW8260C	Ethylbenzene	0.05	mg/Kg	U	UJ	19
EX2-S35-12	SW8260C	Total Xylenes	0.15	mg/Kg	U	UJ	19
EX2-S35-12	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S35-12	SW8260C	2-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S36-12	SW8260C	Methyl t-butyl ether	0.05	mg/Kg	U	UJ	19
EX2-S36-12	SW8260C	Benzene	0.02	mg/Kg	U	UJ	19
EX2-S36-12	SW8260C	Toluene	0.05	mg/Kg	U	UJ	19
EX2-S36-12	SW8260C	Ethylbenzene	0.05	mg/Kg	U	UJ	19
EX2-S36-12	SW8260C	Total Xylenes	0.15	mg/Kg	U	UJ	19
EX2-S36-12	SW8260C	1-Methylnaphthalene	1	mg/Kg	U	UJ	5B
EX2-S36-12	SW8260C	2-Methylnaphthalene	1	mg/Kg	U	UJ	5B