Tier II Data Validation Report

Client: Chevron Environmental Management Company – Cincinnati	Laboratory: Lancaster Laboratories, Inc., of Lancaster, PA
Project Name: Routine Final Remedy Monitoring	Sample Matrix: Water
Project Number: 500-017-012	Sample Start Date: July 10, 2009
Date Validated: August 24, 2009	Sample End Date: July 10, 2009
Parameters Included: Volatile Organic Compounds (VOC) by Solid Waste 846 (SW-846) Method 8260B and Semi-Volatile Organic Compounds (SVOC) by SW-846 Method 8270C	
Laboratory Project ID: 1153922	
Data Validator's Name: Tim Gunn, CHMM	

DATA EVALUATION CRITERIA SUMMARY

A Tier II Data Validation was performed by Trihydro Corporation's Chemical Data Evaluation Services group on the analytical data report package generated by Lancaster Laboratories, Inc., of Lancaster, Pennsylvania evaluating samples from the Chevron-Cincinnati site located in Hooven, Ohio.

Precision, accuracy, method compliance, and completeness of this data package were assessed during this data review. Precision was determined by evaluating the calculated relative percent difference (RPD) values of samples from laboratory control sample duplicate pairs. Laboratory accuracy was established by reviewing the laboratory control samples (LCS) and laboratory control sample duplicates (LCSD) to verify that none of the data were biased. Method compliance was established by reviewing holding times, calibrations, detection limits, surrogate recoveries, method blanks, and the LCS and LCSD percent recoveries against method specific requirements. Completeness was evaluated by determining the overall ratio of the number of samples planned versus the number of samples with valid analyses. Determination of completeness included a review of the chain-of-custody, laboratory analytical methods, and any other necessary documents associated with this analytical data set.

Data were evaluated in general accordance with validation criteria set forth in the USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Superfund Organic Methods Data Review, document number USEPA-540-R-08-01, June 2008 with additional reference to USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review, document number EPA 540/R-99-008 of October 1999.

SAMPLE NUMBERS TABLE

Client Sample ID	Laboratory Sample Number
MW-140_LNAPL, 071009	5725921

The samples were analyzed for client-specified analytes. Chain-of-custody (COC) completeness is included in Section #3. The laboratory data were reviewed to evaluate compliance with the required methods and the quality of the reported data. A leading check mark (✓) indicates that the referenced data were deemed acceptable. A preceding crossed circle (⊗) signifies problems with the referenced data that may have warranted attaching qualifiers to the data.

- ⊗ Data Completeness
- ✓ COC Documentation
- ✓ Holding Times and Preservation
- ✓ Laboratory Blanks
- ⊗ System Monitoring Compounds (i.e. Surrogates)
- ⊗ Laboratory Control Samples/Laboratory Control Sample Duplicates (LCS/LCSD)
- ✓ Internal Standards

OVERALL DATA PACKAGE ASSESSMENT

Based on a data validation review, the data are acceptable as delivered with the exceptions noted below as rejected data. Data qualified by the laboratory are discussed in Section #2.

The purpose of validating data and assigning qualifiers is to assist in proper data interpretation. Data which are not qualified meet the site data quality objectives. If values are assigned qualifiers other than an R, the data may be used for site evaluation, with the reasons for qualification being given consideration when interpreting sample concentrations. Data points which are assigned an R qualifier should not be used for any site evaluation purposes. Data were qualified with J data flags by the laboratory if the result was greater than or equal to the method detection limit (MDL) but less than the limit of quantitation (LOQ). Laboratory J flags were preserved in the data and included in the Data Qualification Summary table at the end of this report. Data were qualified for out of range surrogate recoveries and out of range LCS/LCSD percent recoveries.

Data qualifiers used during this validation included:

J – Estimated concentration

UJ – Estimated reporting limit

R - Rejected, Data not usable

Data Completeness

The analyses appeared to be performed as requested on the chain-of-custody records. The associated samples were received by the laboratory and appeared to be analyzed properly. One data point was rejected. The data completeness measure for this data package is 98.9%.

VALIDATION CRITERIA CHECKLIST	
1. Did the laboratory identify any non-conformances related to the analytical data?	Yes
Comments: The laboratory noted the following related to this data set. The laboratory noted that the received vials were very odorous. Method 8260B: The GC/MS volatile internal standard peak areas were outside the quality control (QC) limits for both the initial analysis and the re-analysis. The values reported were from the initial analysis of the sample. The internal standard peak areas that were outside of the QC limits were for tert-butyl alcohol-d10 at 283% in the initial analysis and at 356% in the re-analysis. No further action was necessary since tert-butyl alcohol was not requested for analysis in the samples. Method 8270C: Due to the nature of the analysis, the recoveries of several compounds were outside of QC limits in the LCS/LCSD. No further action was taken. Due to sample matrix interferences observed during the extraction, the normal reporting limits were not attained. The analytes 3-methylphenol and 4-methylphenol cannot be resolved under the chromatographic conditions used for sample analysis. The result reported for 4-methylphenol represents the combined total of both compounds.	
2. Were data qualification flags used by the laboratory? If yes, define.	Yes
Comments: The following data qualification flags were used by the laboratory. J – Estimated value * - Outside of specification	
3. Were sample chain-of-custody forms complete?	Yes
Comments: The COC record from field to laboratory was complete. Custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt. There was a note on the COC to see attached analyte list. Requested analyses were included on the COC with specific analytes on the list.	
4. Were detection limits in accordance with the QAPP, permit, or method?	Yes
Comments: The detection limits for SW-846 8260B were indicated to be acceptable. Due to sample matrix interferences observed during the extraction, the normal reporting limits for SW-846 8270C were not attained. The final usability of the data with respect to dilutions will be determined by the project manager.	
5. Were the requested analytical methods in compliance with the QAPP, permit, or COC?	Yes
Comments: As indicated by the Tier I validation, the requested analytical methods were performed in accordance with the COC form.	
6. Were samples received in good condition within method specified requirements?	Yes
Comments: Samples were received in good condition. Due to the nature of the sample, special packaging protocols were necessary. The laboratory noted on the Environmental Sample Administration Receipt Documentation Log that they received eight vials that were very odorous.	
7. Were samples analyzed within method specified or technical holding times?	Yes
Comments: The samples were extracted or analyzed within method specified holding times.	
8. Were reported units appropriate for the associated sample matrix/matrices and method(s) of analyses?	Yes
Comments: Sample results were reported in units of µg/kg. These units are appropriate for the methods noted and the light non-liquid aqueous liquids (LNAPL) matrix.	
9. Do the laboratory reports include all constituents requested to be reported?	Yes
Comments: The laboratory report included the constituents requested to be reported. There was a note on the COC to see attached analyte list. The COC requested the analysis of VOCs, and SVOCs; and the attached list specified the analytes.	

VALIDATION CRITERIA CHECKLIST

10. Was there indication from the laboratory that the initial or continuing calibration verification results were within acceptable limits? N/A

Comments: Initial and continuing calibration data were not included as part of this data set; however, these data are assumed to be acceptable as the laboratory did not note that any calibration verification results were outside acceptable limits.

11. Was the total number of method blank samples prepared equal to at least 5% of the total number of samples, or analyzed as required by the method? Yes

Comments: The total number of method blank samples prepared was equal to at least 5% of the total number of samples.

12. Were method blank detections reported for this data set? No

Comments: There were no detections of target analytes in the method blank samples.

13. Was the total number of matrix spike samples prepared equal to at least 5% of the total number of samples, or analyzed as required by the method? No

Comments: There were no matrix spike samples prepared for the associated batches. The lab noted "Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, an LCS/LCSD was performed, unless otherwise specified in the method.

14. Were matrix spike recoveries within laboratory-specified limits? N/A

Comments: There were no matrix spike samples prepared for the associated batches.

15. Was the total number of laboratory control samples analyzed equal to at least 5% of the total number of samples, or analyzed as required by the method? Yes

Comments: The total number of LCS/LCSDs analyzed was equal to at least 5% of the total number of samples.

16. Were laboratory control recoveries within laboratory-specified limits? No

Comments: The project specific LCS/LCSD recoveries were within laboratory-specifications with the following exceptions.

In SVOC batch 09201SLA026, several LCS and LCSD percent recoveries were reported outside of the acceptable limits. The following table lists these analytes; those not listed were within laboratory-specified limits.

Analyte	LCS	LCSD	Limit
Acenaphthene	114%	114%	76-111%
Benzenethiol	130%	121%	35-83%
Dibenzofuran	112%		79-108%
1,3-Dichlorobenzene	106%	110%	70-98%
2, 4- Dinitrophenol	0%	0%	44-106%
1-Methylnaphthalene	108%	106%	74-105%
2-Methylnaphthalene	109%	107%	76-105%
Naphthalene	109%		73-106%
Phenanthrene	116%	115%	77-113%
Pyridine	105%	95%	35-80%

The analytes recovered above the LCS/LCSD limits were qualified J for detections in the sample as a result of possible high bias.

The analyte 2,4-dinitrophenol was rejected using an R flag since the percent recovery below 30%, indicating a possible low bias. Since the result was non-detect it was rejected.

VALIDATION CRITERIA CHECKLIST	
17. Were surrogate recoveries within laboratory control limits?	No
Comments: The surrogate recoveries were within laboratory-specifications with the following exceptions. **In VOC batch R092041AA, the sample surrogate recoveries for dibromofluoromethane (65%; acceptable range 71-114%), toluene-d8 (760%; acceptable range 70-123%), and 4-bromofluorobenzene (748%; acceptable range 70-111%) were recovered outside of specification.** **Since three of the four VOC surrogates were outside of acceptable limits, one bias low and two bias high, the VOC analytes were qualified as J for detections and as UJ for non-detections in the sample.** In SVOC batch 09201SLA026, the sample surrogate recovery for nitrobenzene-d5 (132%; acceptable range 49-120%) was recovered outside of specification. Qualification is only necessary when two of the three base/neutral or acid surrogates are outside of acceptable limits. No qualification was necessary for the SVOC surrogates since the surrogate nitrobenzene-d5 is a base/neutral surrogate and the other base/neutral surrogates were within control limits for the sample.	
18. Was the number of equipment, trip, or field blanks collected equal to at least 10% of the total number of samples, or as required by the project guidelines, QAPP, SAP, or permit?	No
Comments: There were no trip or field blanks collected for this sample.	
19. Were detections found in trip blanks, equipment blanks, or field blanks?	N/A
Comments: There were no trip or field blanks collected for this sample.	
20. Were the field duplicates collected equal to at least 10% of the total number of samples, or as required by the project guidelines, QAPP, SAP, or permit, or as indicated by the Tier I validator?	No
Comments: Field duplicates were not collected with this data set.	
21. Were field duplicate RPD values less than the upper RPD limit (soil [50%], water [30%], or air/vapor [25%]), as specified by the laboratory or method?	N/A
Comments: Field duplicates were not collected with this data set	
22. Were laboratory duplicate RPD values within laboratory-specified limits?	N/A
Comments: Laboratory duplicates were not performed for this data set.	

DATA QUALIFICATION SUMMARY

Analyte	Field Sample ID	Lab Sample ID	Result (µg/kg)	Reviewer Qualifier	Reviewer Qualifier Reason
1,1,1- Trichloro- ethane	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
1,1,1,2- Tetrachloro- ethane	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
1,1,2- Trichloro- ethane	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
1,1,2,2- Tetrachloro- ethane	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
1,1-Dichloro- ethane	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
1,1-Dichloro- ethene	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
1,2- Dibromo- ethane	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
1,2- Dichloro- ethane	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
1,2,4- Trimethyl- benzene	MW-140_LNAPL,071009	5725921	6700000	J	The surrogate recovery(ies) were out of range
1,2-Dibromo 3- chloro- propane	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
1,3,5-Trimethyl- benzene	MW-140_LNAPL,071009	5725921	3800000	J	The surrogate recovery(ies) were out of range
1,4-Dioxane	MW-140_LNAPL,071009	5725921	ND (500000)	UJ	The surrogate recovery(ies) were out of range
1-Methyl- naphthalene	MW-140_LNAPL,071009	5725921	3100000	J	The LCS and/or LCSD recovery(ies) were above the acceptable limits indicating a possible high bias.
2,4- Dinitro- phenol	MW-140_LNAPL,071009	5725921	ND (600000)	R	The LCS and/or LCSD recovery(ies) were below the acceptable limits indicating a possible low bias.
2-Butanone	MW-140_LNAPL,071009	5725921	ND (20000)	UJ	The surrogate recovery(ies) were out of range
2-Methyl- naphthalene	MW-140_LNAPL,071009	5725921	5200000	J	The LCS and/or LCSD recovery(ies) were above the acceptable limits indicating a possible high bias.
4-Methyl- 2- Pentanone	MW-140_LNAPL,071009	5725921	ND (20000)	UJ	The surrogate recovery(ies) were out of range
Acenaph- thene	MW-140_LNAPL,071009	5725921	83000	J	The LCS and/or LCSD recovery(ies) were above the acceptable limits indicating a possible high bias.
Acetone	MW-140_LNAPL,071009	5725921	ND (40000)	UJ	The surrogate recovery(ies) were out of range
Benzene	MW-140_LNAPL,071009	5725921	33000	J	The surrogate recovery(ies) were out of range
Benzo(a)- anthracene	MW-140_LNAPL,071009	5725921	15000	J	Flagged by the Lab: Result between MDL and RL.
Bromo- dichloro- methane	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
Bromo- methane	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range

Analyte	Field Sample ID	Lab Sample ID	Result (µg/kg)	Reviewer Qualifier	Reviewer Qualifier Reason
Bromoform	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
Carbon Disulfide	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
Carbon tetrachloride	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
Chlorobenzene	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
Chloroethane	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
Chloroform	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
Chloromethane	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
Chrysene	MW-140_LNAPL,071009	5725921	29000	J	Flagged by the Lab: Result between MDL and RL.
cis-1,2- Dichloro-ethene	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
Cis-1,3- dichloro-propene	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
Cyclohexane	MW-140_LNAPL,071009	5725921	11000000	J	The surrogate recovery(ies) were out of range
Dibenzo- furan	MW-140_LNAPL,071009	5725921	62000	J	The LCS and/or LCSD recovery(ies) were above the acceptable limits indicating a possible high bias.
Dibromo-chloromethane	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
Dichloro- difluoro-methane	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
Ethyl- benzene	MW-140_LNAPL,071009	5725921	2000000	J	The surrogate recovery(ies) were out of range
Fluor- anthene	MW-140_LNAPL,071009	5725921	22000	J	Flagged by the Lab: Result between MDL and RL.
Hexane	MW-140_LNAPL,071009	5725921	4700000	J	The surrogate recovery(ies) were out of range
Isopropyl-benzene	MW-140_LNAPL,071009	5725921	860000	J	The surrogate recovery(ies) were out of range
m,p-Xylene	MW-140_LNAPL,071009	5725921	3200000	J	The surrogate recovery(ies) were out of range
Methylene Chloride	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
MTBE	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
Naphthalene	MW-140_LNAPL,071009	5725921	1600000	J	The LCS and/or LCSD recovery(ies) were above the acceptable limits indicating a possible high bias.
Naphthalene	MW-140_LNAPL,071009	5725921	340000	J	The surrogate recovery(ies) were out of range
n-Butyl- benzene	MW-140_LNAPL,071009	5725921	1800000	J	The surrogate recovery(ies) were out of range
n-Propyl- benzene	MW-140_LNAPL,071009	5725921	3400000	J	The surrogate recovery(ies) were out of range
o-Xylene	MW-140_LNAPL,071009	5725921	40000	J	The surrogate recovery(ies) were out of range

Analyte	Field Sample ID	Lab Sample ID	Result (µg/kg)	Reviewer Qualifier	Reviewer Qualifier Reason
Phen- anthrene	MW-140_LNAPL,071009	5725921	460000	J	The LCS and/or LCSD recovery(ies) were above the acceptable limits indicating a possible high bias.
sec-Butylbenzene	MW-140_LNAPL,071009	5725921	370000	J	The surrogate recovery(ies) were out of range
Styrene	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
Tetrachloro-ethene	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
Toluene	MW-140_LNAPL,071009	5725921	30000	J	The surrogate recovery(ies) were out of range
trans-1,2-Dichloro- ethene	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
trans-1,3-Dichloro- propene	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
Trans-1,4-Dichloro-2-Butene	MW-140_LNAPL,071009	5725921	ND (100000)	UJ	The surrogate recovery(ies) were out of range
Trichloro- ethene	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
Trichloro-fluoromethane	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range
Vinyl Chloride	MW-140_LNAPL,071009	5725921	ND (10000)	UJ	The surrogate recovery(ies) were out of range