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## Tier II Data Validation Report Summary

Client: Chevron Environmental Management Company (EMC) Cincinnati	Laboratory: Lancaster Laboratories, Inc.
Project Name: Routine Final Remedy Groundwater Monitoring, Monthly Southwest Quad	Sample Matrix: Groundwater
Project Number: 500-017-012	Sample Start Date: November 17, 2009
Date Validated: January 7, 2010	Sample End Date: November 19, 2009
Parameters Included: Volatile Organic Compounds (VOC) by Solid Waste 846 (SW-846) Method 8260B	
Laboratory Project ID: 1172040	
Data Validator: Mike Gaither, Environmental Scientist	

### 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 evaluating samples from the Chevron EMC site located in Cincinnati, 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 duplicate pairs. Laboratory accuracy was established by reviewing the demonstrated percent recoveries of matrix spike (MS) and matrix spike duplicate (MSD) samples, and of laboratory control samples (LCS) and laboratory control sample duplicates (LCSD) to verify that none of the data were biased. Additionally, field accuracy was established by collecting a trip blank to monitor for possible ambient or cross contamination during sampling. Method compliance was established by reviewing holding times, 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. Review of duplicates is conducted in accordance with USEPA Region 1 Laboratory Data Validation Function Guidelines for Evaluation of Organic Analysis, December 1996.



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### SAMPLE NUMBERS TABLE

Client Sample ID	Laboratory Sample Number
MW-133,111709	5844026
EB-1,111709	5844027
MW-35,111709	5844028
MW-138,111809	5844029
MW-139,111809	5844030
MW-142,111809	5844031
Trip_Blank,111909	5844032

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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)
- ✓ Matrix Spike/Matrix Spike Duplicates (MS/MSD)
- ✓ Laboratory Duplicates
- ⊗ Trip Blank

### 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 also qualified due to a trip blank detection.

Data qualifiers used during this validation included:

- J – Estimated concentration
- JB – Estimated concentration due to blank contamination

### 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. No data were rejected. The data completeness measure for this data package is 100% and is acceptable.

<b>VALIDATION CRITERIA CHECKLIST</b>	
<p>1. Was the report free of any non-conformances related to the analytical data identified by the laboratory?</p> <p>Comments: The laboratory noted the following non-conformance related to the data. For sample MW-142, the reporting limits for the GC/MS volatile compounds were raised due to the level of non-target compounds. For sample trip blank, the result reported for toluene in this trip blank may be attributed to trace amounts of toluene recently found in HCl preserved vials from the manufacturer.</p>	No
<p>2. Were data qualification flags or any other notes used by the laboratory? If yes, define.</p> <p>Comments: The laboratory noted that the samples were filtered in the field for dissolved metals. The laboratory used the following data qualification flags with this data set. J – Estimated value (2) – The un-spiked result was more than four times the spike added.</p>	Yes
<p>3. Were sample COC forms complete?</p> <p>Comments: The COC form was complete from the field to the laboratory. Custody was maintained as evidenced by proper signatures, dates, and times of receipt.</p>	Yes
<p>4. Were detection limits in accordance with the QAPP, permit, or method, or indicated as acceptable by the Tier I validator?</p> <p>Comments: The detection limits were acceptable. A dilution factor of 2 times was required for the VOC analysis for sample MW-142. The final usability of the data with respect to dilutions will be determined by the project team.</p>	Yes
<p>5. Were the requested analytical methods in compliance with the QAPP, permit, or COC?</p> <p>Comments: The requested analytical methods were in compliance with the COC and the attached analyte list, <i>Analytical Requests for Groundwater</i>.</p>	Yes
<p>6. Were samples received in good condition within method specified requirements?</p> <p>Comments: The samples were received in good condition and within the recommended temperature range of 4°C +/- 2°C at 3.5°C. Custody seals were present and intact.</p>	No
<p>7. Were samples analyzed within method specified or technical holding times?</p> <p>Comments: Samples were analyzed within the method specified or technical holding times.</p>	Yes
<p>8. Were reported units appropriate for the associated sample matrix/matrices and method(s) of analyses?</p> <p>Comments: Sample results were reported in µg/L, which is an appropriate unit for the requested analyses and the water matrix.</p>	Yes
<p>9. Do the laboratory reports include all constituents requested to be reported as indicated by the Tier I validator?</p> <p>Comments: The laboratory report included the requested constituents.</p>	Yes
<p>10. Was there indication from the laboratory that the initial or continuing calibration verification results were within acceptable limits?</p> <p>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.</p>	N/A
<p>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?</p> <p>Comments: The total number of method blanks prepared was greater than 5% of the total number of samples.</p>	Yes
<p>12. Were method blank samples free of analyte contamination?</p> <p>Comments: Method blanks samples were free of analyte contamination.</p>	Yes

VALIDATION CRITERIA CHECKLIST	
<p>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?</p> <p>Comments: Matrix spike samples were prepared on at least a 5% basis for the total number of samples. The matrix spike samples were prepared from samples not associated with this data set.</p>	Yes
<p>14. Were MS/MSD percent recoveries and MS/MSD RPD values within data validation or laboratory quality control (QC) limits?</p> <p>Comments: MS and MSD percent recoveries for target analytes were within laboratory-specified limits, data validation limits, or were not applicable due to sample concentrations that were greater than four times the spiked amounts. These MS and MSD percent recoveries for non-project samples were considered but were not qualified since matrix similarity to project samples could not be guaranteed.</p>	Yes
<p>15. Was the total number of LCSs analyzed equal to at least 5% of the total number of samples, or analyzed as required by the method?</p> <p>Comments: Laboratory control samples were prepared on at least a 5% basis for the total number of samples.</p>	Yes
<p>16. Were LCS/LCSD percent recoveries and LCS/LCSD RPD values within laboratory QC limits?</p> <p>Comments: The LCS/LCSD percent recoveries and LCS/LCSD RPD values were within laboratory QC limits.</p>	Yes
<p>17. Were surrogate recoveries within laboratory control limits?</p> <p>Comments: Surrogate recoveries were within laboratory control limits.</p>	Yes
<p>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, or as indicated by the Tier I validator?</p> <p>Comments: There was one trip blank (Trip Blank, 111909) collected with the samples of this data set, which is greater than 10% of the total number of samples.</p>	Yes
<p>19. Were the trip blank, field blank, and/or equipment blank samples free of analyte contamination?</p> <p>Comments: There were no detections in the trip blank sample with one exception. Toluene was detected at 2 ug/L. <b>The toluene detection in sample MW-142 was qualified as JB since the detection in the trip blank may indicate possible cross contamination.</b> The lab had indicated that toluene trip blank detection may be attributed to trace amounts of toluene recently found in HCl preserved vials from the manufacturer. Replacement vials from another manufacturer had been distributed by the lab for all subsequent sampling events and it was recommended that all vials suspected of containing toluene were be disposed of or returned to the lab for disposal.</p>	No
<p>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?</p> <p>Comments: Field duplicate samples were not collected with the samples of this data set.</p>	No
<p>21. Were field duplicate RPD values within data validation QC limits (soil 0-50%, water 0-30%, or air 0-25%)?</p> <p>Comments: Field duplicate samples were not collected with the samples of this data set.</p>	N/A
<p>22. Were laboratory duplicate RPD values within laboratory-specified limits?</p> <p>Comments: Laboratory duplicates were not prepared for this data set.</p>	N/A

### DATA QUALIFICATION SUMMARY

Analyte	Field Sample ID	Lab Sample ID	Result (ug/L)	Reviewer Qualifier	Reviewer Qualifier Reason
Benzene	MW-139,111809	5844030	2	J	Flagged by the Lab: Result between MDL and RL.
Toluene	MW-142,111809	5844031	11	JB	Trip blank detection
Toluene	Trip_Blank,111909	5844032	2	J	Flagged by the Lab: Result between MDL and RL.