Tier II Data Validation Report Summary

Client: Chevron Environmental Management Company (EMC) Cincinnati	Laboratory: Lancaster Laboratories, Inc.
Project Name: 2nd Semiannual 2009 Lysimeter Sampling	Sample Matrix: Groundwater
Project Number: 500-017-012	Sample Start Date: December 9, 2009
Date Validated: February 22, 2010	Sample End Date: December 9, 2009
Parameters Included: Methane by Solid Waste 846 (SW-846) Modified Method 8015B; Total and Dissolved Metals by SW-846 Method 6010B; and Nitrate Nitrogen and Sulfate by Environmental Protection Agency (EPA) Method 300.0.	
Laboratory Project ID: 1174579	
Data Validator: 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 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 sample 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 and the USEPA CLP National Functional Guidelines for Inorganic Data Review, document number EPA 540R-04-004, October 2004.

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SAMPLE NUMBERS TABLE

Client Sample ID	Laboratory Sample Number
L-20S, 120909	5860147
L-20S, Filtered 120909	5860148
L-18S, 120909	5860149
L-18S, Filtered 120909	5860150
L-21S, 120909	5860151
L-21S, Filtered 120909	5860152
L-93S, 120909	5860153
L-93S, Filtered 120909	5860154
Trip Blank, 120909	5860155

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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. 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 qualifiers used during this validation included:

J – Estimated concentration

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 points were rejected. The data completeness measure for this data package is 100% and is acceptable.

VALIDATION CRITERIA CHECKLIST	
1. Was the report free of any non-conformances related to the analytical data identified by the laboratory?	No
Comments: The laboratory did not note any non-conformances related to the analytical data except where reported below.	
2. Were data qualification flags or any other notes used by the laboratory? If yes, define.	Yes
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 (1) The result for one or both determinations was less than five times the limit of quantitation (LOQ). (2) The unspiked result was more than four times the spike added. *- Outside of specification For methane, the laboratory noted that due to interfering peaks on the chromatogram, the values reported represent the lowest reporting limits attainable.	
3. Were sample COC forms complete?	Yes
Comments: The COC form was complete from the field to the laboratory with the following exception. The Custody was maintained as evidenced by proper signatures, dates, and times of receipt.	
4. Were detection limits in accordance with the QAPP, permit, or method?	Yes
Comments: The detection limits were found to be acceptable. Dilutions up to 20 times were applied to samples for methane, nitrate nitrogen, and sulfate analyses. 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: The requested analytical methods were in compliance with the COC and the attached analyte list, *Analytical Requests for Groundwater*.	
6. Were samples received in good condition within method specified requirements?	Yes
Comments: The samples were received in good condition but below the recommended temperature range of 4°C +/- 2°C at 1.6° C. The cooler temperature below 2°C was acceptable since the samples were not reported to be frozen upon receipt at the laboratory and the sample containers were reported to be intact.	
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 µg/L or mg/L, which are appropriate units for the requested analyses and the water matrix.	
9. Do the laboratory reports include all constituents requested to be reported?	Yes
Comments: The laboratory report included the requested constituents listed on the attached list, *Analytical Requests for Groundwater*.	
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 blanks prepared was greater than 5% of the total number of samples.	

VALIDATION CRITERIA CHECKLIST	
12. Were method blank samples free of analyte contamination?	Yes
Comments: There were no detections of the requested analytes reported 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?	Yes
Comments: The total number of matrix spike samples prepared was greater than 5% of the total number of samples. All matrix spikes were prepared from samples not associated with this sampling event.	
14. Were MS/MSD percent recoveries and MS/MSD RPD values within data validation or laboratory quality control (QC) limits?	Yes
Comments: The project specific MS/MSD recoveries were within laboratory-specified limits or were not applicable since the result was greater than four times the spiked concentration. The MS and MSD spike recoveries and RPD values for non-project samples were considered but matrix similarity to project samples could not be guaranteed.	
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?	Yes
Comments: Laboratory control samples were prepared on at least a 5% basis for the total number of samples.	
16. Were LCS/LCSD percent recoveries and LCS/LCSD RPD values within laboratory QC limits?	Yes
Comments: The LCS/LCSD percent recoveries and LCS/LCSD RPD values were within laboratory QC limits.	
17. Were surrogate recoveries within laboratory control limits?	Yes
Comments: Surrogate recoveries were within laboratory control limits.	
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?	Yes
Comments: There was one trip blank (Trip Blank, 120909) collected with the samples of this data set, which is greater than 10% the total number of samples.	
19. Were the trip blank, field blank, and/or equipment blank samples free of analyte contamination?	No
Comments: There were no detections of the requested analytes in the sample Trip Blank, 120909.	
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?	No
Comments: There were no field duplicates associated with this data set.	
21. Were field duplicate RPD values within data validation QC limits (soil 0-50%, water 0-30%, or air 0-25%)?	N/A
Comments: There were no field duplicates associated with this data set.	
22. Were laboratory duplicate RPD values within laboratory-specified limits?	Yes
Comments: Laboratory duplicates were prepared for the following analyses including methane, metals, sulfate, and nitrate nitrogen. Laboratory duplicates were prepared from samples not associated with this data set.	

DATA QUALIFICATION SUMMARY

Analyte	Field Sample ID	Lab Sample ID	Result	Reviewer Qualifier	Reviewer Qualifier Reason
Manganese	L-93S, 120909	5860153	0.0034	J	Flagged by the Lab: Result between MDL and RL.
Manganese	L-93S, Filtered 120909	5860154	0.0035	J	Flagged by the Lab: Result between MDL and RL.