



Tier II Data Validation Report Summary

Client: Chevron Environmental Management Company (EMC) Cincinnati	Laboratory: Lancaster Laboratories, Inc.
Project Name: Barrier Wall Monitoring Network Sampling	Sample Matrix: Groundwater
Project Number: 500-017-012	Sample Start Date: December 22, 2009
Date Validated: February 22, 2010	Sample End Date: December 22, 2009
Parameters Included: Volatile Organic Compounds (VOC) by Solid Waste-846 (SW-846) Method 8260B; Carbon Dioxide by SW-846 Method 8000B; Methane by SW-846 Modified Method 8015B; Total and Dissolved Metals by SW-846 Method 6010B; Ferric Iron by SW-846 Modified Method 6010B; Chloride and Sulfate by Environmental Protection Agency (EPA) Method 300.0; Kjeldahl Nitrogen by EPA Method 351.2; Nitrate Nitrogen and Nitrite Nitrogen by EPA Method 353.2; Total Carbon (TC), Total Inorganic Carbon (TIC), and Total Organic Carbon (TOC) by EPA Method 415.1; Alkalinity by Method Standard Method 20 th Edition (SM20) 2320B; Ferrous Iron by Modified Method SM20 3500 Fe B; Sulfide by Method SM20 4500 S2 D; and Ammonia Nitrogen by Modified Method SM20 4500NH3 B/C	
Laboratory Project ID: 1176482	
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 submitting trip blanks 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. Review of duplicates is conducted in accordance with USEPA Region 1 Laboratory Data Validation Function Guidelines for Evaluation of Organic Analysis, December 1996.



Tier II Data Validation Report Summary

SAMPLE NUMBERS TABLE

Client Sample ID	Laboratory Sample Number
MW-137D,122209	5872396
MW-137D,122209 Filtered	5872397
BSW-1D,122209	5872403
BSW-1D,122209 Filtered	5872404
BSW-2D,122209	5872405
BSW-2D,122209 Filtered	5872406
BSW-1S,122209	5872407
BSW-1S,122209 Filtered	5872408
BD-3,122209	5872409
BD-3,122209 Filtered	5872410
BSW-2S,122209	5872411
BSW-2S,122209 Filtered	5872412
BD-2,122209	5872418
BD-2,122209 Filtered	5872419
TripBlank,122209	5872420



Tier II Data Validation Report

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)
- ✓ Field Duplicates
- ✓ 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 were also qualified J for poor MS/MSD repeatability and extractions out of hold time.

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?	Yes
Comments: The laboratory did not note any non-conformances related to the analytical data.	
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 * - Outside of specification (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.	
3. Were sample COC forms complete?	Yes
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.	
4. Were detection limits in accordance with the QAPP, permit, or method?	Yes
Comments: As indicated by the Tier I data validator, the detection limits were acceptable. A dilution of 20 times was required for chloride and sulfate analysis and 5 times for total carbon analysis. 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 0.7°- 1.5° C. The cooler temperature below 2°C was judged as acceptable since the samples were not reported to be frozen upon receipt at the laboratory and the sample containers were reported to be intact. Custody seals were present and intact.	
7. Were samples analyzed within method specified or technical holding times?	No
Comments: The samples were extracted or analyzed within method specified holding times with the following exception. The ferrous iron analysis was performed past the immediate recommended analysis time. The modified Method SM20 3500 Fe B states that holding time is 24 hours but the procedure can also be used in the laboratory if it is understood that normal sample exposure to air during shipment may result in precipitation of iron. As a result, the data were accepted with qualification of J for detections.	
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.	
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.	

VALIDATION CRITERIA CHECKLIST	
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.	
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 with the following exceptions: Detections were reported in method blanks for total carbon analysis (batches 09365049501A and 09365049501B) at 0.56 and 0.56 ug/L. No qualification is necessary since sample results were greater than 10x the blank detection.	
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: Matrix spike samples were prepared on at least a 5% basis for the total number of samples. Matrix spikes were prepared for VOC (Y093631AA), Methane (093620000A), carbon dioxide (093640000A), Metals (100051848001), nitrite (09357105101A), Kjeldahl nitrogen (09362108101A), total carbon (09365049501A), and total organic carbon (10006106102B) using sample MW-137D. Matrix spikes were prepared for VOC (Y093631AA) and metals (093651848009) using sample BSW-2S. Matrix spikes were prepared for kjeldahl nitrogen (09362108101B) using sample BSW-1D. The remaining matrix spikes were prepared from samples not associated with this data set.	
14. Were MS/MSD percent recoveries and MS/MSD RPD values within data validation or laboratory quality control (QC) limits?	No
Comments: The project specific MS and MSD percent recoveries were within data validation QC limits or unspiked results were greater than four times the spike added. MS/MSD RPD value were within data validation QC limits with the exception of carbon dioxide analysis (093640000A) which had MS/MSD RPD of 21% which is above the limit of 20%. CO2 results will be qualified J for poor repeatability. MS and MSD spike recoveries for non-project samples were considered but data were not qualified since 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, or as indicated by the Tier I validator?	Yes
Comments: There was one trip blank (Trip Blank, 122209) 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?	Yes
Comments: There were no detections of the requested analytes in the sample Trip Blank, 122209.	
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?	Yes
Comments: Two field duplicates were collected with the samples of this set which include BD-2 and BD-3 which are duplicate samples of BSW-2S and BSW-1S, respectively.	

VALIDATION CRITERIA CHECKLIST

21. Were field duplicate RPD values within data validation QC limits (soil 0-50%, water 0-30%, or air 0-25%)?

N/A

Comments: Field duplicate RPDs were not applicable since no detection were reported for the sample/duplicate pairs.

22. Were laboratory duplicate RPD values within laboratory-specified limits?

Yes

Comments: Laboratory duplicate RPD values were within specified limits. Laboratory duplicates for metals (100051848001), nitrite (09357105101A), Kjeldahl nitrogen (09362108101A), total carbon (09365049501A), total organic carbon (10006106102B), and nitrate (10006106102B) were prepared from MW-137D. Laboratory duplicate for metals (093651848001) was prepared from sample BSW-2S and duplicate for Kjeldahl nitrogen (09362108101B) was prepared from BSW-1D.

The project specific laboratory duplicate RPD value was within the data validation QC limits or were qualified by the laboratory with (1) indicating that the result for one or both determinations was less than five times the LOQ. Laboratory duplicate RPDs for non-project samples were considered but data were not qualified since matrix similarity to project samples could not be guaranteed.



DATA QUALIFICATION SUMMARY

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
CO2 by Headspace	BSW-1D,122209	5872403	6100	ug/L	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
CO2 by Headspace	BSW-2D,122209	5872405	4500	ug/L	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
CO2 by Headspace	MW-137D,122209	5872396	11000	ug/L	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Iron, Ferrous	BSW-1D,122209	5872403	0.015	mg/L	J	Sample was extracted outside of the acceptable holding time.
Iron, Ferrous	BSW-2D,122209	5872405	0.041	mg/L	J	Sample was extracted outside of the acceptable holding time.
Iron, Ferrous	MW-137D,122209	5872396	0.014	mg/L	J	Sample was extracted outside of the acceptable holding time.
Iron, Total	BSW-2D,122209	5872405	0.0734	mg/L	J	Flagged by the Lab: Result between MDL and RL.
Iron, Total	MW-137D,122209	5872396	0.0649	mg/L	J	Flagged by the Lab: Result between MDL and RL.
Nitrogen, Nitrite	MW-137D,122209	5872396	0.024	mg/L	J	Flagged by the Lab: Result between MDL and RL.