

US EPA ARCHIVE DOCUMENT



## Tier II Data Validation Report Summary

Client: Chevron Environmental Management Company (EMC) Cincinnati	Laboratory: Lancaster Laboratories, Inc.
Project Name: 2 <sup>nd</sup> Semiannual 2009 GW Sampling	Sample Matrix: Groundwater
Project Number: 500-017-012	Sample Start Date: November 12, 2009
Date Validated: February 22, 2010	Sample End Date: November 17, 2009
Parameters Included: Volatile Organic Compounds (VOC) by Solid Waste-846 (SW-846) Method 8260B; Total Petroleum Hydrocarbons (TPH) as Gasoline Range Organics (GRO) water C6-C10 and TPH as Diesel Range Organics (DRO) water C10-C28 by SW-846 Method 8015B; and Dissolved Metals by SW-846 Method 6010B	
Laboratory Project ID: 1171654	
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 field blank and trip blank samples 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
MW-17,111209	5841269
MW-17,111209 Filtered	5841270
BD-2,111209	5841271
BD-2,111209 Filtered	5841272
MW-26R,111209	5841273
MW-26R,111209 Filtered	5841274
MW-48S,111209	5841275
MW-48S,111209 Filtered	5841276
MW-80,111609	5841277
MW-80,111609 Filtered	5841280
MW-64,111609	5841284
MW-64,111609 Filtered	5841285
Trip Blank,111709	5841286



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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)
- ✓ 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. Other data were qualified J for high surrogate and MS/MSD recoveries.

Data qualifiers used during this validation included:

- J – Estimated concentration
- UJ – Estimated reporting limit

### 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 (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	
3. Were sample COC forms complete?	Yes
Comments: The COC form was complete from the field to the laboratory with the following exception. As noted by the lab on the receipt notes, the COC listed sample BD-2 but was labeled BD-1 on the metals bottle. The sample was analyzed for metals as per the COC as BD-2. 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 of 5 and 50 times were applied to VOC samples MW-17 and BD-2. A dilution of 10 times was applied to sample MW-80 for TPH-DRO. 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, <i>Analytical Requests for Groundwater</i> .	
6. Were samples received in good condition within method specified requirements?	Yes
Comments: The samples were received in good condition both within and below the recommended temperature range of 4°C +/- 2°C at 2.1 and 1.9° 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?	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, <i>Analytical Requests for Groundwater</i> .	
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?	No
Comments: There were no detections of the requested analytes reported in the method blank samples with the following exception. The method blank for TPH-DRO had a reported detection of 59 ug/L. No qualification is necessary since sample results are greater than 10x 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: The total number of matrix spike samples prepared was greater than 5% of the total number of samples. Matrix spikes were prepared for VOCs batch L093261AA, TPH-GRO batch 09323A07A and 09324A07A, TPH-DRO batch 093220020A, and metals batch 093241848010 from sample MW-80.	
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/MSD recoveries were within laboratory-specified limits or were not applicable since the result was greater than four times the spiked concentration with the following exceptions: For VOC batch L093261AA, the MSD percent recovery for chlorobenzene was below the limits of 87-124% at 86%. For TPH-DRO batch 093220020A the MSD recovery was below the range of 63-154% at 55%. <b>As a result of the out of range recoveries, the associated results for chlorobenzene and TPH-DRO were J/UJ qualified due to a possible low bias.</b> The MS spike recovery for the non-project sample was 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?	No
Comments: Surrogate recoveries were within laboratory control limits with the following exceptions: <b>For TPH-GRO batch 09323A07A, surrogate recoveries were above the limits of 63-135% at 319% (MW-80), 338% (MW-80MS), 260% (MW-80MSD) and 178% (MW-64). As a result of possible high bias, detections in the associated samples were qualified as J. The matrix spike samples did not require qualification. The parent samples were qualified.</b> For TPH-GRO batch 09324A07A, surrogate recovery was above the limit of 63-135% at 223% for the MS sample. Since the associated sample surrogate recoveries were acceptable, no further action was determined to be necessary. <b>For TPH-DRO batch 093220020A, surrogate recoveries were above the limit of 54-127% at 328% (MW-80), 469% (MW-80MS), and 146% (MW-80MSD). As a result of possible high bias, detections in the associated samples were qualified as J.</b>	
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 were two trip blanks (Trip Blank, 111709) 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, 111709.	
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?	Yes
Comments: There was one field duplicate (BD-2, 111209) collected as a duplicate of sample MW-17 with the samples of this data set.	

**VALIDATION CRITERIA CHECKLIST**

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

Comments: The field duplicates RPDs associated with this data set were all within the QC limit of 0-30%.

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

Comments: Laboratory duplicates were prepared for metals using sample MW-80. The duplicate RPD values were within the specified limits but were qualified by the laboratory with (1) indicating that the result for one or both determinations was less than five times the LOQ.

## DATA QUALIFICATION SUMMARY

Analyte	Field Sample ID	Lab Sample ID	Result (ug/L)	Reviewer Qualifier	Reviewer Qualifier Reason
Benzene	MW-48S,111209	5841275	3	J	Flagged by the Lab: Result between MDL and RL.
Benzene	MW-64,111609	5841284	0.8	J	Flagged by the Lab: Result between MDL and RL.
Chlorobenzene	BD-2,111209	5841271	ND(25)	UJ	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Chlorobenzene	MW-17,111209	5841269	ND(25)	UJ	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Chlorobenzene	MW-26R,111209	5841273	ND(5)	UJ	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Chlorobenzene	MW-48S,111209	5841275	ND(5)	UJ	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Chlorobenzene	MW-64,111609	5841284	ND(5)	UJ	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Chlorobenzene	MW-80,111609	5841277	ND(5)	UJ	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Chlorobenzene	Trip Blank,111709	5841286	ND(5)	UJ	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Diesel Range Organics	MW-64,111609	5841284	890	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Diesel Range Organics	MW-80,111609	5841277	5100	J	The surrogate recovery(ies) were above the acceptable limits indicating a possible high bias.
Gasoline Range Organics	MW-64,111609	5841284	610	J	The surrogate recovery(ies) were above the acceptable limits indicating a possible high bias.
Gasoline Range Organics	MW-80,111609	5841277	2700	J	The surrogate recovery(ies) were above the acceptable limits indicating a possible high bias.
Toluene	MW-48S,111209	5841275	0.8	J	Flagged by the Lab: Result between MDL and RL.
Toluene	MW-64,111609	5841284	1	J	Flagged by the Lab: Result between MDL and RL.
Benzene	MW-48S,111209	5841275	3	J	Flagged by the Lab: Result between MDL and RL.
Benzene	MW-64,111609	5841284	0.8	J	Flagged by the Lab: Result between MDL and RL.
Chlorobenzene	BD-2,111209	5841271	ND(25)	UJ	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Chlorobenzene	MW-17,111209	5841269	ND(25)	UJ	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Chlorobenzene	MW-26R,111209	5841273	ND(5)	UJ	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Chlorobenzene	MW-48S,111209	5841275	ND(5)	UJ	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.



## FIELD DUPLICATE SUMMARY

Client Sample ID: MW-17 Field Duplicate Sample ID: BD-2			
Analyte	Laboratory Result (units)	Duplicate Result (units)	Relative Percent Difference (RPD)
Benzene	8000	8200	2.5%
Toluene	120	120	0.0%
Ethylbenzene	390	400	2.5%
Xylenes, Total	300	300	0.0%
Arsenic, dissolved	0.0625	0.0612	2.1%
Field duplicate RPD control limits should not exceed 30% for water as established by USEPA Region 1 Laboratory Data Validation Function Guidelines for Evaluation of Organic Analysis, December 1996.			