# Tier II Data Validation Report Summary

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|---|---|
| Client: Chevron Environmental Management Company (EMC) Cincinnati | Laboratory: Lancaster Laboratories, Inc. |
| Project Name: Routine Final Remedy Monitoring | Sample Matrix: Groundwater |
| Project Number: 500-017-012 | Sample Start Date: September 17, 2009 |
| Date Validated: October 7, 2009 | Sample End Date: September 22, 2009 |
| Parameters Included: Volatile Organic Compounds (VOC) by Solid Waste 846 (SW-846) Method 8260B and Dissolved Metals by SW-846 Method 6010B | |
| Laboratory Project ID: 1163088 | |
| Data Validator: Jessica Swanson, Environmental Chemist | |

**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 field duplicate and 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 equipment and 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 |
|---|---|
| Equipment_Blank, 091709 | 5784231 |
| MW-135S, 091709 | 5784232 |
| MW-135I, 091709 | 5784233 |
| MW-135D, 091709 | 5784234 |
| BMW-1S, 091709 | 5784235 |
| BMW-1I, 091809 Unspiked | 5784236 |
| BMW-1I, 091809MS | 5784237 |
| BMW-1I, 091809MSD | 5784238 |
| BMW-1I, 091809DUP | 5784239 |
| BMW-1D, 091809 | 5784240 |
| BMW-2D, 092109 | 5784241 |
| BMW-2I, 092109 | 5784242 |
| MW-136I, 092109 | 5784243 |
| MW-136D, 092109 | 5784244 |
| BMW-2S, 092109 | 5784245 |
| MW-137I, 092209 Unspiked | 5784246 |
| MW-137I, 092209MS | 5784247 |
| MW-137I, 092209MSD | 5784248 |
| MW-137I, 092209DUP | 5784249 |
| BD-1, 092209 | 5784250 |
| BMW-3D, 092209 | 5784251 |
| BMW-3I, 092209 | 5784252 |
| BMW-3S, 092209 | 5784253 |
| MW-137D, 092209 | 5784254 |
| BD-2, 092209 | 5784255 |
| Equipment_Blank, 092209(P) | 5784256 |
| Equipment_Blank, 092209 | 5784257 |
| Trip_Blank | 5784258 |

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
- ✓ Field Duplicates
- ✓ Equipment and Trip Blanks

**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? | 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.<br>J – Estimated value<br>(1) The result for one or both determinations was less than five times the limit of quantitation (LOQ). | |
| 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, or indicated as acceptable by the Tier I validator? | Yes |
| Comments: As indicated by the Tier I data validator, the detection limits were acceptable. Dilutions were not required for the sample analyses. | |
| 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 and both within and outside the recommended temperature range of 4°C +/- 2°C at 1.3°C and 3.6°C. The cooler temperature that was 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: Samples were analyzed within the method specified or technical 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 as indicated by the Tier I validator? | Yes |
| Comments: As indicated by the Tier I data validator, 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? | Yes |
| 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. | |
| 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. | |

| VALIDATION CRITERIA CHECKLIST | |
|---|---|
| 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 spike samples for VOC batch W092681AA and dissolved metals batch 092681848004 were prepared from sample BMW-1I, 091809 Unspiked. The matrix spike samples for VOC batch W092682AA and dissolved metals batch 092681848005 were prepared from sample MW-137I, 092209 Unspiked. The matrix spike samples for dissolve metals batch 092681848001 were prepared from a sample not associated with this data set. | |
| 14. Were MS/MSD percent recoveries and MS/MSD RPD values within data validation or laboratory QC limits? | Yes |
| Comments: Project specific and non-project matrix spikes percent recoveries and MS/MSD RPD values were within laboratory quality control (QC) limits. The MS/MSD percent recoveries and MS/MSD RPD values for non-project sample were considered but data would not have been 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) and three equipment blanks (Equipment_Blank, 091709; Equipment_Blank, 092209(P); and Equipment_Blank, 092209) 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 samples Trip_Blank; Equipment_Blank, 091709; or Equipment_Blank, 092209.<br>In sample Equipment_Blank, 092209 (P), total xylenes was reported at a concentration of 0.9 µg/L. No qualification was required since the sample results were reported as non-detect for total xylenes. | |
| 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: There were two field duplicates collected with the samples of this data set. Sample BD-1, 092209 was collected as a duplicate of sample MW-137I and sample BD-2, 092209 was collected as a duplicate of sample MW-137D. | |
| 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 RPD values could not be calculated since both the parent and duplicate samples were reported as non-detect for the requested analytes. | |
| 22. Were laboratory duplicate RPD values within laboratory-specified limits? | Yes |
| Comments: Laboratory duplicate RPD values were within laboratory-specified limits and were qualified by the laboratory with (1) indicating that the result for one or both determinations was less than five times the LOQ. Laboratory duplicates were prepared for dissolved metals batch 092684848004 from sample BMW-1I, 091809 Unspiked and for dissolved metals batch 092681848005 from sample MW-137I, 092209 Unspiked. The laboratory duplicate for dissolved metals batch 092681848001 was prepared from a sample not associated with this data set. | |

**DATA QUALIFICATION SUMMARY**

| Analyte | Field Sample ID | Lab Sample ID | Result | Units | Reviewer Qualifier | Reviewer Qualifier Reason |
|---|---|---|---|---|---|---|
| Xylenes, Total | Equipment_Blank, 092209(P) | 5784256 | 0.9 | µg/L | J | Flagged by the Lab: Result between MDL and RL. |