SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
Organic Data Review Checklist - Standard Validation

Project: Harley-Davidson

SDG No: 180-42391-1

Analysis: See attached

Method: See attached

Laboratory: TestAmerica Pittsburgh

Matrix: Water

The above data package has been reviewed and the analytical quality control/quality assurance performance data have been summarized. The general criteria used to assess the analytical integrityof the data were based on an examination of the following:

Case Narrative
Analytical Holding Times
Sample Preservation

Project Blanks

Project Specific QA/QC or contract requirements may take priority over validation criteria in this procedure.

Overall Remarks: No major issues

Please see attached letter from Lab - AGM 6/24/16

Definition of Qualifiers:

"U", not detected at the associated level
"UJ", not detected and associated value estimated
"J", associated value estimated
"R", associated value unusable or analyte identity unfounded
"=", compound properly identified and value positive

Reviewed by: Alan G. Miller JI. Date: 4/20/15

QA Reviewed by: [signature] Date: 5-15-15

AGM 4/20/15

I. Case Narrative

Verify direct statements made within the Laboratory Case Narrative (note discrepancies).

Remarks: No major issues

II. Re-analysis and Secondary Dilutions

Verify that re-analysis and secondary dilutions were performed and reported as necessary. Determine appropriate results to report.

Remarks:

III. Holding Times

VOC - Waters - unpreserved: aromatic within 7 days, non-aromatic within 14 days of sample collection
VOC - Waters - preserved: aromatic and non-aromatic within 14 days of sample collection
VOC - Soils - preserve or analyze within 48 hours of sample collection; analyze within 14 days of preservation

SVOC, Pest., PCB - Waters - extract within 7 days of sample collection, analyze within 40 days of extraction
SVOC, Pest., PCB - Soils - extract within 14 days of sample collection, analyze within 40 days of extraction

Deviations:

Sample #	VOC		SVOC			Pest/PCB		
	Date Collected	Date Analyzed	Date Collected	Date Extracted	Date Analyzed	Date Collected	Date Extracted	Date Analyzed

Actions:
1. If holding times are exceeded, all results are qualified as estimated (J/UJ)
2. If holding times are exceeded by more than 2X, reviewer may qualify non-detected results as unusable (R)

Remarks: Nee ISSues

III. Holding Times

Metals - Waters - preserved to pH<2, 180 days from sample collection
Metals - Soils - 180 days from sample collection
Mercury - Waters - preserved to pH<2, 28 days from sample collection
Mercury - Soils - 28 days from sample collection

Deviations:

Sample #	Metals				Mercury			
	Date Collected	Date Analyzed	Days >HT	pH Check	Date Collected	Date Analyzed	Days >HT	pH Check

Actions:

1. If preserved samples exceed holding time, qualifty all associated results as estimated (J/UJ).
2. If unpreserved samples exceed holding time, qualify all associated results as unusable (R).
3. If holding times are exceeded by more than 2X, reviewer may qualify non-detected results as unusable (R)
4. If water samples are not acidified, use professional judgement. Minimally, qualify data as estimated (J) and non-detects unusable (R).
5. If soil samples exceed holding time, use professional judgement to qualify data.

Remarks: No Issues

III. Holding Times

Sample should be preserved and analyzed according to the appropriate analytical method
In general the following preservations and holding times for waters can be applied:

Sulfate, 4 degress C, 28 days
Sulfide, 4 degrees C, pH ≥9 with zinc acetate/sodium hydroxide, 7 days
Bromide/Chloride/Fluoride, no preservative required, 28 days
Nitrate/Nitrite or Ammonia, 4 degrees C, pH ≤ 2 with sulfuric acid, 28 days
Nitrate or Nitrite, 4 degrees C, 48 hours
Alkalinity, 4 degrees C, 14 days
TDS/TSS, 4degrees C, 7 days
Phosphate (total), 4 degrees C, pH < 2 with sulfuric acid, 28 days
Hexavalent Chromium, Cool 4 degress C, water- 24 hours, soil - 30 days

Deviations:

Sample #	Analyte	Date Collected	Date Extracted	Date Analyzed	Notes:

Actions:

1. If holding times are exceeded, all results are qualified as estimated (J/UJ)
2. If holding times are exceeded by more than 2X, reviewer may qualify non-detected results as unusable (R)
3. If samples were not properly preserved, use professional judgement to qualify the data

Remarks: N/A (ESAD)

VI. Blanks

All blanks were reported per matrix per concentration level for each 12 hour period on each GC/MS system used to analyze VOCs and SVOCs Yes ☐ No ☐

Review associated laboratory and project blank samples. List documented contamination below:

Laboratory Method Blanks:

Date:	Lab ID #	Fraction	Compound	Conc. (ppb)

Associated Project Blanks (e.g., equipment rinsates, trip blanks, etc.)

Date	Lab ID #	Fraction	Compound	Conc. (ppb)

Remarks: No detections

VI. Blanks (continued)

Calculate action levels based on 10X the highest blank concentration of "common laboratory solvents", VOCs (methylene chloride, acetone, toluene, 2-butanone, cyclohexane) or SVOCs (phthalates), and 5X the highest blank concentration for all other VOC, SVOC, Pesticides, and PCB compounds. Sample weights, volumes, and dilution factors must be taken into account when applying the 5X and 10X criteria. This allows the total amount of contaminant present to be considered.

Deviations:

Compound	Maximum Conc. Detected, (ppb)	Action Level (ppb)	Samples Affected

Actions:

1. If compound results exceed the action levels, the data are not qualified
2. If compound results are below the required reporting level, report results as non-detect (U) at the reporting level
3. If the compound is detected above the reporting level, but below the action level, qualify as not-detected (U)
4. If gross contamination exists in blanks (i.e.,, saturated peaks by GC/ MS), all affected compounds in the associated samles should be qualifed as unusable (R) due to interference.
5. If blanks were not analyzed per matrix per concentration level for each 12 hour period on each GC/MS system used to analyze VOCs and SVOCs use professional judgement to qualifty data. Data may be rejected (R).

Remarks: No detections

Hold Time Summary

Sample Number	Method	Date Collected	Analysis Date	Date Extracted	Days to Analysis
180-42391-10	MCAWW 300.0	3/25/2015	3/26/2015		1
180-42391-11	MCAWW 300.0	3/25/2015	3/26/2015		1
180-42391-12	MCAWW 300.0	3/25/2015	3/26/2015		1
180-42391-13	MCAWW 300.0	3/25/2015	3/26/2015		1
180-42391-2	MCAWW 300.0	3/25/2015	3/26/2015		1
180-42391-3	MCAWW 300.0	3/25/2015	3/26/2015		1
180-42391-4	MCAWW 300.0	3/25/2015	3/26/2015		1
180-42391-5	MCAWW 300.0	3/25/2015	3/26/2015		1
180-42391-6	MCAWW 300.0	3/25/2015	3/26/2015		1
180-42391-7	MCAWW 300.0	3/25/2015	3/26/2015		1
180-42391-8	MCAWW 300.0	3/25/2015	3/26/2015		1
180-42391-9	MCAWW 300.0	3/25/2015	3/26/2015		1
180-42391-10	SM SM 2320B	3/25/2015	3/31/2015		6
180-42391-11	SM SM 2320B	3/25/2015	3/31/2015		6
180-42391-12	SM SM 2320B	3/25/2015	3/31/2015		6
180-42391-13	SM SM 2320B	3/25/2015	3/31/2015		6
180-42391-2	SM SM 2320B	3/25/2015	3/31/2015		6
180-42391-3	SM SM 2320B	3/25/2015	3/31/2015		6
180-42391-4	SM SM 2320B	3/25/2015	3/31/2015		6
180-42391-5	SM SM 2320B	3/25/2015	3/31/2015		6
180-42391-6	SM SM 2320B	3/25/2015	3/31/2015		6
180-42391-7	SM SM 2320B	3/25/2015	3/31/2015		6
180-42391-8	SM SM 2320B	3/25/2015	3/31/2015		6
180-42391-9	SM SM 2320B	3/25/2015	3/31/2015		6
180-42391-10	SW846 6020A	3/25/2015	4/2/2015	3/31/2015	8
180-42391-11	SW846 6020A	3/25/2015	4/2/2015	3/31/2015	8
180-42391-12	SW846 6020A	3/25/2015	4/2/2015	3/31/2015	8
180-42391-13	SW846 6020A	3/25/2015	4/2/2015	3/31/2015	8
180-42391-2	SW846 6020A	3/25/2015	4/2/2015	3/31/2015	8
180-42391-3	SW846 6020A	3/25/2015	4/2/2015	3/31/2015	8
180-42391-4	SW846 6020A	3/25/2015	4/2/2015	3/31/2015	8
180-42391-5	SW846 6020A	3/25/2015	4/2/2015	3/31/2015	8
180-42391-6	SW846 6020A	3/25/2015	4/2/2015	3/31/2015	8
180-42391-7	SW846 6020A	3/25/2015	4/2/2015	3/31/2015	8
180-42391-8	SW846 6020A	3/25/2015	4/2/2015	3/31/2015	8
180-42391-9	SW846 6020A	3/25/2015	4/2/2015	3/31/2015	8
180-42391-1	SW846 8260C	3/25/2015	4/2/2015		8
180-42391-10	SW846 8260C	3/25/2015	4/3/2015		9
180-42391-10	SW846 8260C	3/25/2015	4/4/2015		10
180-42391-11	SW846 8260C	3/25/2015	4/3/2015		9
180-42391-11	SW846 8260C	3/25/2015	4/6/2015		12

Sample Number	Method	Date Collected	Analysis Date	Date Extracted	Days to Analysis
180-42391-12	SW846 8260C	3/25/2015	4/3/2015		9
180-42391-13	SW846 8260C	3/25/2015	4/3/2015		9
180-42391-2	SW846 8260C	3/25/2015	4/6/2015		12
180-42391-3	SW846 8260C	3/25/2015	4/2/2015		8
180-42391-3	SW846 8260C	3/25/2015	4/4/2015		10
180-42391-4	SW846 8260C	3/25/2015	4/2/2015		8
180-42391-5	SW846 8260C	3/25/2015	4/2/2015		8
180-42391-6	SW846 8260C	3/25/2015	4/3/2015		9
180-42391-6	SW846 8260C	3/25/2015	4/4/2015		10
180-42391-7	SW846 8260C	3/25/2015	4/4/2015		10
180-42391-8	SW846 8260C	3/25/2015	4/2/2015		8
180-42391-9	SW846 8260C	3/25/2015	4/2/2015		8
180-42391-9	SW846 8260C	3/25/2015	4/6/2015		12

Trip Blank Detections

Sample ID	Sample	Analyte	Result	Method	Units	Qual

No detections

AGM

4/20/15

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

June 27, 2016

Steve Snyder
Groundwater Sciences Corporation
2601 Market Place Street, Suite 310
Harrisburg, PA 17110

Dear Steve Snyder,

This letter is in reference to corrective action and data review performed for the Harley Davidson groundwater monitoring project for samples collected in 2014 and 2015.

You contacted TestAmerica in February 2016 regarding the results from a sampling event in May of 2015. In reviewing this data, we found an error in applying a dilution factor to the results and initiated corrected action. Root cause analysis revealed the analyst was not noting the sample dilution in the name of the sample when they set up the run and they were not noting that a sample was a reanalysis. Both of these are important so that the dilution is documented at the time it is performed (and the analyst doesn't have to remember the dilution they prepared to document it later) and so that the data reviewer can verify that multiple runs correlate with one another. We corrected the report in question and performed review of the rest of the samples submitted for the project.

Virginia Zusman, QA Manager, reviewed the remaining 189 reports (over 2100 analytical runs) that were analyzed during the requested time period. The first review was looking at samples with multiple runs to check for correlation between them. The second review was looking at those results within the historical range of results that we have for that sampling point. Comparing results in this manner is a somewhat subjective exercise. There are inherent biases from instrument to instrument, analyst to analyst and sample aliquot to sample aliquot and the laboratory is not always aware of field conditions that may be dynamic. Methods typically reference 20% as an allowable relative percent difference between replicates; a lot of industry standard project limits allow for 40% RPD. In some cases one analyte was in agreement between analyses but other analytes were not. Applying a dilution factor to any bias will magnify that bias by that dilution factor. This can explain some of the discrepancies but from these two reviews we identified three more dilution documentation errors and one case where there were missing analytes from the dilutions (analytes reported in one dilution but not the other).

We then performed an additional review concentrating on specific samples at your request. After this review, we found two more instances where the dilution factor was incorrectly documented; one of which we could not determine the dilution factor that was analyzed. In two more cases we provided data from dilutions that were analyzed but not originally reported.

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A summary table of the revisions is listed below.

Summary Table of Revisions

Lab ID	Field ID	Date sampled	Revision issued	Comments
180-32564-6	HD-CW-15A-0/1-0	5/7/2014	4/26/2016	20X dilution factor changed to 500X
180-44321-21	HD-CW-15A-0/1-0	5/20/2015	2/23/2016	1X dilution factor changed to 250X
180-38183-3	HD-MW-100S-0/1-0	10/28/2014	4/26/2016	1X dilution factor changed to 5X
180-42391-11	HD-MW-37S-0/1-0	3/25/2015	3/9/2016	1X dilution factor changed to 40X
180-44401-5	HD-MW-132-0/1-0	5/21/2015	4/26/2016	DCA/DCE missing in dilutions
180-44321-19	HD-CW-9-0/1-0	5/20/2015	6/15/2016	125X dilution factor changed to 12.5X
180-38183-9	HD-MW-93D-0/1-0	10/28/2014	6/15/2016	2X was reported; 10X also analyzed. 10X results were reported additionally.
180-42391-7	HD-MW-100D-0/1-0	3/25/2015	6/15/2016	1X was reported; 5X also analyzed. 5X results were reported additionally.
180-42504-8	HD-MW-51D-0/1-0	3/27/2015		Results do not fit in with historical results; could not definitively determine dilution factor. GSC indicated they would reject results.

The corrective action report is attached for your reference.

We apologize for these errors and are confident that the common root cause has been corrected. Future analyses will also be compared to historical context so that we can alert you to any discrepancies.

Please let me know if you have any questions or additional concerns.

Sincerely,
Deborah L. Lowe

Laboratory Director
TestAmerica - Pittsburgh

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

iCAT #1651 – VOA dilution reporting error
Created 3/1/16
Incident Reported 2/29/16
iCAT closed 3/18/16

Incident description

Sample 180-44321-21 was originally analyzed at a x250 dilution. Recovery of 1 surrogate was below control limits, so the sample was reanalyzed. For the reanalysis, the analyst forgot to enter the x250 dilution factor in the worklist, therefore, when it was reported, the results were reported as undiluted. The discrepancy in the results was not caught when the reanalysis data was reviewed or during review of the report.

Investigation

Analyst noted that initial analysis was analyzed at a x250 dilution and resulted with surrogates out. Analyst then re-analyzed the sample to confirm matrix but did not enter into the work list that it was a x250 dilution. After placing the 250x dilution factor to re-analysis, the concentrations confirmed Analyst checked to see why there was an issue. The rerun was not designated with a RS (for reanalysis), therefore the 2nd level data reviewer did not know to look for an initial analysis to compare the results to. Final report completeness reviews are done by PM's, however they do not check that sample results are comparable. If the lab indicates that a dilution or reanalysis was needed, the PM checks to make sure that the dilution or reanalysis data is present, but they do not review the data to compare results. The way that the results appear in the final data package (all samples in numerical order and THEN any dilutions or re-analyses) makes it difficult to compare results for the same sample.

Corrective Action

Re-issued report to the client correcting the dilution factor and describing this incident. Analyst will add the dilution factor and/or RA, as appropriate, to the sample name on the chrome worklist so that it will appear on the raw data in the header information. If the TALS batch dilution does not match the dilution in the header, this will be immediately obvious to the data reviewer. Data review will include generating a prelim report for that sections data to check final results as they will appear in the report and make sure that all needed data is present and comparable.