SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
Organic Data Review Checklist - Standard Validation

Project: Harley-Davidson

SDG No: 160-42353-1

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.

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 Jr. Date: 4/30/15

QA Reviewed by: A Bruce Date: 5-15-15

4/30/15

I. Case Narrative

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

Remarks: There were issues with sample labels on the containers. See narrative for explanation.

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: No 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: No issues

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: 1100 issue

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 ISTDs

Hold Time Summary

Sample Number	Method	Date Collected	Analysis Date	Date Extracted	Days to Analysis
180-42353-1	MCAWW 300.0	3/24/2015	3/25/2015		1
180-42353-10	MCAWW 300.0	3/24/2015	3/25/2015		1
180-42353-11	MCAWW 300.0	3/24/2015	3/26/2015		2
180-42353-12	MCAWW 300.0	3/24/2015	3/25/2015		1
180-42353-13	MCAWW 300.0	3/24/2015	3/25/2015		1
180-42353-14	MCAWW 300.0	3/24/2015	3/26/2015		2
180-42353-15	MCAWW 300.0	3/24/2015	3/26/2015		2
180-42353-16	MCAWW 300.0	3/24/2015	3/25/2015		1
180-42353-19	MCAWW 300.0	3/24/2015	3/25/2015		1
180-42353-2	MCAWW 300.0	3/24/2015	3/25/2015		1
180-42353-20	MCAWW 300.0	3/24/2015	3/25/2015		1
180-42353-21	MCAWW 300.0	3/24/2015	3/26/2015		2
180-42353-22	MCAWW 300.0	3/24/2015	3/26/2015		2
180-42353-23	MCAWW 300.0	3/24/2015	3/26/2015		2
180-42353-24	MCAWW 300.0	3/24/2015	3/26/2015		2
180-42353-25	MCAWW 300.0	3/24/2015	3/26/2015		2
180-42353-26	MCAWW 300.0	3/24/2015	3/25/2015		1
180-42353-3	MCAWW 300.0	3/24/2015	3/25/2015		1
180-42353-4	MCAWW 300.0	3/24/2015	3/26/2015		2
180-42353-5	MCAWW 300.0	3/24/2015	3/26/2015		2
180-42353-6	MCAWW 300.0	3/24/2015	3/25/2015		1
180-42353-7	MCAWW 300.0	3/24/2015	3/26/2015		2
180-42353-8	MCAWW 300.0	3/24/2015	3/25/2015		1
180-42353-9	MCAWW 300.0	3/24/2015	3/26/2015		2
180-42353-1	SM SM 2320B	3/24/2015	3/31/2015		7
180-42353-10	SM SM 2320B	3/24/2015	3/31/2015		7
180-42353-11	SM SM 2320B	3/24/2015	3/31/2015		7
180-42353-12	SM SM 2320B	3/24/2015	3/31/2015		7
180-42353-13	SM SM 2320B	3/24/2015	3/31/2015		7
180-42353-14	SM SM 2320B	3/24/2015	3/31/2015		7
180-42353-15	SM SM 2320B	3/24/2015	3/31/2015		7
180-42353-16	SM SM 2320B	3/24/2015	3/31/2015		7
180-42353-19	SM SM 2320B	3/24/2015	3/31/2015		7
180-42353-2	SM SM 2320B	3/24/2015	3/31/2015		7
180-42353-20	SM SM 2320B	3/24/2015	3/31/2015		7
180-42353-21	SM SM 2320B	3/24/2015	3/31/2015		7
180-42353-22	SM SM 2320B	3/24/2015	3/31/2015		7
180-42353-23	SM SM 2320B	3/24/2015	3/31/2015		7
180-42353-24	SM SM 2320B	3/24/2015	3/31/2015		7
180-42353-25	SM SM 2320B	3/24/2015	3/31/2015		7
180-42353-26	SM SM 2320B	3/24/2015	3/31/2015		7

Sample Number	Method	Date Collected	Analysis Date	Date Extracted	Days to Analysis
180-42353-3	SM SM 2320B	3/24/2015	3/31/2015		7
180-42353-4	SM SM 2320B	3/24/2015	3/31/2015		7
180-42353-5	SM SM 2320B	3/24/2015	3/31/2015		7
180-42353-6	SM SM 2320B	3/24/2015	3/31/2015		7
180-42353-7	SM SM 2320B	3/24/2015	3/31/2015		7
180-42353-8	SM SM 2320B	3/24/2015	3/31/2015		7
180-42353-9	SM SM 2320B	3/24/2015	3/31/2015		7
180-42353-1	SW846 6020A	3/24/2015	4/2/2015	3/30/2015	9
180-42353-10	SW846 6020A	3/24/2015	4/2/2015	3/30/2015	9
180-42353-11	SW846 6020A	3/24/2015	4/2/2015	3/30/2015	9
180-42353-12	SW846 6020A	3/24/2015	4/2/2015	3/30/2015	9
180-42353-13	SW846 6020A	3/24/2015	4/2/2015	3/30/2015	9
180-42353-14	SW846 6020A	3/24/2015	4/2/2015	3/30/2015	9
180-42353-15	SW846 6020A	3/24/2015	4/2/2015	3/30/2015	9
180-42353-16	SW846 6020A	3/24/2015	4/2/2015	3/30/2015	9
180-42353-19	SW846 6020A	3/24/2015	4/2/2015	3/30/2015	9
180-42353-2	SW846 6020A	3/24/2015	4/2/2015	3/30/2015	9
180-42353-20	SW846 6020A	3/24/2015	4/2/2015	3/30/2015	9
180-42353-21	SW846 6020A	3/24/2015	4/2/2015	3/30/2015	9
180-42353-22	SW846 6020A	3/24/2015	4/2/2015	3/30/2015	9
180-42353-23	SW846 6020A	3/24/2015	4/2/2015	3/31/2015	9
180-42353-24	SW846 6020A	3/24/2015	4/2/2015	3/31/2015	9
180-42353-25	SW846 6020A	3/24/2015	4/2/2015	3/31/2015	9
180-42353-26	SW846 6020A	3/24/2015	4/2/2015	3/31/2015	9
180-42353-3	SW846 6020A	3/24/2015	4/2/2015	3/30/2015	9
180-42353-4	SW846 6020A	3/24/2015	4/2/2015	3/30/2015	9
180-42353-5	SW846 6020A	3/24/2015	4/2/2015	3/30/2015	9
180-42353-6	SW846 6020A	3/24/2015	4/2/2015	3/30/2015	9
180-42353-7	SW846 6020A	3/24/2015	4/2/2015	3/30/2015	9
180-42353-8	SW846 6020A	3/24/2015	4/2/2015	3/30/2015	9
180-42353-9	SW846 6020A	3/24/2015	4/2/2015	3/30/2015	9
180-42353-1	SW846 8260C	3/24/2015	3/30/2015		6
180-42353-10	SW846 8260C	3/24/2015	3/30/2015		6
180-42353-11	SW846 8260C	3/24/2015	3/31/2015		7
180-42353-11	SW846 8260C	3/24/2015	4/1/2015		8
180-42353-12	SW846 8260C	3/24/2015	3/30/2015		6
180-42353-13	SW846 8260C	3/24/2015	3/30/2015		6
180-42353-14	SW846 8260C	3/24/2015	3/30/2015		6
180-42353-15	SW846 8260C	3/24/2015	3/30/2015		6
180-42353-16	SW846 8260C	3/24/2015	3/30/2015		6
180-42353-17	SW846 8260C	3/24/2015	3/30/2015		6
180-42353-18	SW846 8260C	3/24/2015	3/30/2015		6
180-42353-19	SW846 8260C	3/24/2015	3/31/2015		7

Sample Number	Method	Date Collected	Analysis Date	Date Extracted	Days to Analysis
180-42353-2	SW846 8260C	3/24/2015	3/30/2015		6
180-42353-20	SW846 8260C	3/24/2015	3/31/2015		7
180-42353-21	SW846 8260C	3/24/2015	3/30/2015		6
180-42353-22	SW846 8260C	3/24/2015	4/1/2015		8
180-42353-23	SW846 8260C	3/24/2015	3/31/2015		7
180-42353-24	SW846 8260C	3/24/2015	3/31/2015		7
180-42353-25	SW846 8260C	3/24/2015	4/1/2015		8
180-42353-26	SW846 8260C	3/24/2015	3/31/2015		7
180-42353-3	SW846 8260C	3/24/2015	3/30/2015		6
180-42353-4	SW846 8260C	3/24/2015	3/30/2015		6
180-42353-5	SW846 8260C	3/24/2015	3/30/2015		6
180-42353-6	SW846 8260C	3/24/2015	3/30/2015		6
180-42353-7	SW846 8260C	3/24/2015	3/30/2015		6
180-42353-8	SW846 8260C	3/24/2015	3/30/2015		6
180-42353-9	SW846 8260C	3/24/2015	3/30/2015		6

Trip Blank Detections

Sample ID	Sample	Analyte	Result	Method	Units	Qual

No detections

AGM

4/20/15

CASE NARRATIVE

Client: Groundwater Sciences Corporation

Project: Harley Davidson

Report Number: 180-42353-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 03/25/2015; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 1.2° C and 2.1° C.

Per Kait Fleming, Groundwater Sciences on Thursday, March 26, 2015, the sample IDs for samples HD-COD-SW-6-0/1-0 and HD-COD-SW-7-0/1-0 were to be switched in the system for reporting. Based on the field notes, sample HD-COD-SW-6-0/1-0 was sampled earlier in the day than sample HD-COD-SW-7-0/1-0. The samples were logged in according to Groundwater Sciences' request.

VOLATILES
Several samples were diluted to bring the concentration of target analytes within the calibration range. Elevated reporting limits (RLs) are provided.

The laboratory control sample (LCS) for batch 136938 recovered outside control limits for the following analytes: 1,1,2,2-Tetrachloroethane. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

The laboratory control sample (LCS) for batch 137218 recovered outside control limits for the following analytes: Bromomethane and Trans-1,3-dichloropropene. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Tetrachloroethene and Trichloroethene failed the recovery criteria low for the MS/MSD of sample HD-MW-99S-0/1-0 (180-42353-20) in batch 180-137048.

METALS
Magnesium and Sodium were detected in method blank MB 180-136963/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

Calcium was detected in method blank MB 180-137092/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

ALKALINITY
Bicarbonate Alkalinity as CaCO3 and Total Alkalinity as CaCO3 to pH 4.5 were detected in method blank MB 180-137006/2 at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

Bicarbonate Alkalinity as CaCO3 and Total Alkalinity as CaCO3 to pH 4.5 were detected in method blank MB 180-137006/27 at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

IC
Chloride and Nitrate as N were detected in method blank MB 180-136546/46 at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

Chloride and Nitrate as N were detected in method blank MB 180-136546/6 at levels that were above the method detection limit but below

the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

Chloride failed the recovery criteria low for the MS of sample HD-MW-99D-0/1-0 (180-42353-21) in batch 180-136546.

The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount.