checked 6/30/14

MEMORANDUM

TO: Mr. Terry Taylor
Anderson, Mulholland and Associates

DATE: June 27, 2014

FROM: R. Infante

FILE: JB69587

RE: Data Validation
BMS-Biopile Closure Sublimer, Humacao, PR
BM16.00.09
Accutest Job Numbers: JB69587

SUMMARY

Full validation was performed on the data for several soil samples, one field blank, one equipment blank, and two trip blanks analyzed selected volatile organic compounds by method SW846-8260B and methanol by SW846-8015C (DAI). Moisture of soil samples was determined using methodSM2540 G-97. The samples were collected at the BMS-Biopile Closure Sublimer, Humacao, PR site on June 17, 2014 and submitted to Accutest Laboratories of Dayton, New Jersey that analyzed and reported the results under delivery group (SDG) JB69587.

The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: "*USEPA Region 2, SOP HW-24, Validating Volatile Organic Compounds by GC/MS, SW-846 Method 8260B (August 2009-Revision 2)*, the *USEPA National Functional Guidelines for Low Concentration Organic Data Review (August 2009-Revision 2)*, the *USEPA National Functional Guidelines for Organic Data Review for Low Concentration Water (SOP HW-13, August 2009-Revision 3)* (noted herein as the "primary guidance documents"). Also, QC criteria from "*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update IV, December 1998),*" are utilized. The guidelines were modified to accommodate the non-CLP methodology. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

In general the data are valid as reported and may be used for decision making purposes.

SAMPLES

The samples included in the review are listed below

FIELD SAMPLE ID	LABORATORY ID	ANALYSIS
R-2(0-0.5)	JB69587-1	VOCs + METHANOL
R-1(0-0.5)	JB69587-2	VOCs + METHANOL
R-3(0-0.5)	JB69587-3	VOCs + METHANOL
R-4(0-0.5)	JB69587-4	VOCs + METHANOL
R-12(0-0.5)	JB69587-5	VOCs + METHANOL
R-5(0-0.5)	JB69587-6	VOCs + METHANOL
R-6(0-0.5)	JB69587-7	VOCs + METHANOL
R-7(0-0.5)	JB69587-8	VOCs + METHANOL
R-7D(0-0.5)	JB69587-9	VOCs + METHANOL
EB061714	JB69587-10	VOCs + METHANOL

FIELD SAMPLE ID	LABORATORY ID	ANALYSIS
R-10(0-0.5)	JB69587-11	VOCs + METHANOL
R-9(0-0.5)	JB69587-12	VOCs + METHANOL
R-9(0-0.5) MSD	JB69587-12D	VOCs + METHANOL
R-9(0-0.5) MS	JB69587-12S	VOCs + METHANOL
R-11(0-0.5)	JB69587-13	VOCs + METHANOL
Q1(0-0.5)	JB69587-14	VOCs + METHANOL
Q2(0-0.5)	JB69587-15	VOCs + METHANOL
Q3(0-0.5)	JB69587-16	VOCs + METHANOL
Q4(0-0.5)	JB69587-17	VOCs + METHANOL
FB061714	JB69587-18	VOCs + METHANOL
TB061714	JB69587-19	VOCs
TRIP BLANK	JB69587-20	VOCs
R-8(0-0.5)	JB69587-21	VOCs + METHANOL

Sample data were reviewed for the following parameters, where applicable to the method

- Agreement of analysis conducted with chain of custody (COC) form
- Holding time and sample preservation
- Gas chromatography/mass spectrometry (GC/MS) tunes
- Initial and continuing calibrations
- Method blanks/trip blanks/field blank
- Surrogate spike recovery
- Matrix spike/matrix spike duplicate (MS/MSD) results
- Internal standard performance
- Field duplicate results
- Laboratory control sample/laboratory control sample duplicate (LCS/LCSD) results
- Quantitation limits and sample results

DISCUSSION

Agreement of Analysis Conducted with COC Request

Sample reports corresponded to the analytical request designated on the chain-of-custody.

Holding Times and Sample Preservation

The cooler temperatures were within the QC acceptance criteria of 4°C ± 2°C.

Sample preservation was acceptable. Samples analyzed within method recommended holding time.

GC/MS Tunes

The frequency and abundance of bromofluorobenzene (BFB) tunes were within the QC acceptance criteria. All samples were analyzed within the tuning criteria associated with the method.

Initial and Continuing Calibrations

VOCs
The percent relative standard deviations (%RSDs) and response factors (RFs) of all target analytes were within the QC acceptance criteria in the initial calibration. Correlation coefficients (r^2) of target analytes were within the QC acceptance criteria. Ongoing accuracy of the instrument was determined by the analysis of a continuing calibration standard. Initial and continuing calibration meets method performance criteria except for the followings:

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
GCMSV				
06/20/14	cc7751-20	- 23.1 %	4-methyl-2-pentanone	JB69587-16; -17; -21; -16MS; -17DUP
06/23/14	cc7751-50	- 27.9 %	4-methyl-2-pentanone	JB69587-1; -2; 1MS; -2DUP; -11; -13

Positive results and non-detects were qualified as estimated (J) in affected samples.

Methanol
Initial and continuing calibration meet the method performance criteria.

Method Blank/Trip Blank/Field Blank

Target analytes were not detected in laboratory method blanks for VOCs.

Two trip blanks and one equipment/field blanks were analyzed with this data package. No target analytes detected in the trip/field/equipment blanks. Methanol was not analyzed in the trip blanks analyzed as part of this data package.

Surrogate Spike Recovery

The surrogate recoveries were within the laboratory QC acceptance limits in all samples analyzed.

MS/MSD

VOCs
Matrix spike was performed on samples JB69587-16MS; JB69587-4MS; JB69587-1MS; JB697000-3MS. Recoveries for MS/MSD and RPD were within laboratory control limits except for the followings:

- Ethylbenzene outside control limits in sample JB69700-3MS. No action taken, analyte not detected in affected samples.

Matrix spikes/Matrix spike duplicates were performed on samples JB69587-12MS/-12MSD (Soil) and JB695352-11MS/-11MSD. Recoveries for MS/MSD and RPD were within laboratory control limits.

Methanol
Matrix spike was performed on samples JB68943-89ASpikeMS/MSD and JB69587-12MS/12MSD. Recoveries for MS/MSD and RPD were within laboratory control limits

Internal Standard Performance

VOCs
Samples were spiked with the method specified internal standard. Internal standard performance met the QC acceptance criteria in all sample analyses except for the following:

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION
06/20/14	JB69587-12MSD	Tert-butyl alcohol	37948	150324 - 39581	No action

Field/Labotarory Duplicate Results

Field/laboratory duplicates were analyzed as part of this data set. RPD results were within laboratory/recommended control limits except for the followings:

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
JB69959-2/-2DUP					
Ethylbenzene		17.3	8.5	68	No action – sample used for QC only; outside sample batch
Toluene		0.98	0.58	51	
Xylenes		15.7	8.4	61	

LCS/LCSD Results

VOCs
The laboratory analyzed one LCS (blank spike) associated with each matrix from this data set. The % recoveries of all spiked analytes were within the laboratory QC acceptance limits.

Methanol
The laboratory analyzed one LCS (blank spike) associated with each matrix from this data set. The % recoveries of all spiked analytes were within the laboratory QC acceptance limits.

Quantitation Limits and Sample Results

Dilutions were not required with this data set.

Calculations were spot checked.

Certification

The following samples JB69587-1; JB69587-2; JB69587-3; JB69587-4; JB69587-5; JB69587-6; JB69587-7;JB69587-8; JB69587-9; 69587-10; JB69587-11; JB69587-12; JB69587-12D; JB69587-12S; JB69587-13; JB69587-14; JB69587-15; JB69587-16; JB69587-17; JB69587-18; JB69587-19; JB69587-20 and JB69587-21 were analyzed following standard procedures accepted by regulatory agencies. The quality control requirements met the methods criteria except in the occasions described in this document. The results are valid and can be used for decision taking purposes.

Rafael Infante
Chemist License 1888

Raw Data: V145606.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-2 (0-0.5)		
Lab Sample ID:	JB69587-1	**Date Sampled:**	06/17/14
Matrix:	SO - Soil	**Date Received:**	06/18/14
Method:	SW846 8260B SW846 5035	**Percent Solids:**	94.2
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	V145606.D	1	06/23/14	KC	06/18/14 14:00	n/a	VV6207
Run #2							

	Initial Weight
Run #1	4.5 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result		RL	MDL	Units	Q
71-43-2	Benzene	ND		0.59	0.21	ug/kg	
108-88-3	Toluene	ND		1.2	0.27	ug/kg	
100-41-4	Ethylbenzene	ND		1.2	0.23	ug/kg	
1330-20-7	Xylene (total)	ND		1.2	0.25	ug/kg	
67-64-1	Acetone	ND		12	2.9	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	J	5.9	0.63	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		59-130%
17060-07-0	1,2-Dichloroethane-D4	96%		65-123%
2037-26-5	Toluene-D8	105%		77-125%
460-00-4	4-Bromofluorobenzene	88%		71-132%

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ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: V145607.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-1 (0-0.5)		
Lab Sample ID:	JB69587-2	**Date Sampled:**	06/17/14
Matrix:	SO - Soil	**Date Received:**	06/18/14
Method:	SW846 8260B SW846 5035	**Percent Solids:**	94.0
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	V145607.D	1	06/23/14	KC	06/18/14 14:00	n/a	VV6207
Run #2							

	Initial Weight
Run #1	4.8 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.55	0.20	ug/kg	
108-88-3	Toluene	ND	1.1	0.26	ug/kg	
100-41-4	Ethylbenzene	ND	1.1	0.21	ug/kg	
1330-20-7	Xylene (total)	ND	1.1	0.24	ug/kg	
67-64-1	Acetone	ND	11	2.8	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND J	5.5	0.59	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		59-130%
17060-07-0	1,2-Dichloroethane-D4	96%		65-123%
2037-26-5	Toluene-D8	103%		77-125%
460-00-4	4-Bromofluorobenzene	89%		71-132%

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N = Indicates presumptive evidence of a compound

Raw Data: V145611.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-10 (0-0.5)		
Lab Sample ID:	JB69587-11	**Date Sampled:**	06/17/14
Matrix:	SO - Soil	**Date Received:**	06/18/14
Method:	SW846 8260B SW846 5035	**Percent Solids:**	96.9
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	V145611.D	1	06/23/14	KC	06/18/14 14:00	n/a	VV6207
Run #2							

	Initial Weight
Run #1	3.7 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.70	0.25	ug/kg	
108-88-3	Toluene	ND	1.4	0.32	ug/kg	
100-41-4	Ethylbenzene	ND	1.4	0.27	ug/kg	
1330-20-7	Xylene (total)	ND	1.4	0.30	ug/kg	
67-64-1	Acetone	ND	14	3.5	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND J	7.0	0.75	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		59-130%
17060-07-0	1,2-Dichloroethane-D4	98%		65-123%
2037-26-5	Toluene-D8	104%		77-125%
460-00-4	4-Bromofluorobenzene	89%		71-132%

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J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GH97031.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-10 (0-0.5)		
Lab Sample ID:	JB69587-11	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846-8015C (DAI)	Percent Solids:	96.9
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH97031.D	1	06/19/14	XPL	n/a	n/a	GGH4596
Run #2							

	Initial Weight
Run #1	5.0 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-56-1	Methanol	ND	210	49	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	97%		58-133%
111-27-3	Hexanol	105%		58-133%

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RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-10 (0-0.5)		
Lab Sample ID:	JB69587-11	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
		Percent Solids:	96.9
Project:	BMS-ICM, Humacao, PR		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Moisture, Percent	3.1		%	1	06/19/14 12:30	NR	SM2540 G-97

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Raw Data: X147671.D

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Report of Analysis

Client Sample ID:	R-9 (0-0.5)		
Lab Sample ID:	JB69587-12	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846 8260B SW846 5035	Percent Solids:	96.0
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X147671.D	1	06/20/14	KC	06/18/14 14:00	n/a	VX6383
Run #2							

	Initial Weight
Run #1	4.6 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.57	0.20	ug/kg	
108-88-3	Toluene	ND	1.1	0.26	ug/kg	
100-41-4	Ethylbenzene	ND	1.1	0.22	ug/kg	
1330-20-7	Xylene (total)	ND	1.1	0.24	ug/kg	
67-64-1	Acetone	ND	11	2.8	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.7	0.61	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	112%		59-130%
17060-07-0	1,2-Dichloroethane-D4	100%		65-123%
2037-26-5	Toluene-D8	119%		77-125%
460-00-4	4-Bromofluorobenzene	121%		71-132%

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J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GH97028.D

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Report of Analysis

Client Sample ID:	R-9 (0-0.5)		
Lab Sample ID:	JB69587-12	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846-8015C (DAI)	Percent Solids:	96.0
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH97028.D	1	06/19/14	XPL	n/a	n/a	GGH4596
Run #2							

	Initial Weight
Run #1	5.0 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-56-1	Methanol	ND	210	50	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	78%		58-133%
111-27-3	Hexanol	77%		58-133%

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Report of Analysis

Client Sample ID:	R-9 (0-0.5)		
Lab Sample ID:	JB69587-12	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
		Percent Solids:	96.0
Project:	BMS-ICM, Humacao, PR		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Moisture, Percent	4		%	1	06/19/14 12:30	NR	SM2540 G-97

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RL = Reporting Limit

Raw Data: V145612.D

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Report of Analysis

Client Sample ID:	R-11 (0-0.5)		
Lab Sample ID:	JB69587-13	**Date Sampled:**	06/17/14
Matrix:	SO - Soil	**Date Received:**	06/18/14
Method:	SW846 8260B SW846 5035	**Percent Solids:**	95.0
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	V145612.D	1	06/23/14	KC	06/18/14 14:00	n/a	VV6207
Run #2							

	Initial Weight
Run #1	4.1 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.64	0.23	ug/kg	
108-88-3	Toluene	ND	1.3	0.30	ug/kg	
100-41-4	Ethylbenzene	ND	1.3	0.25	ug/kg	
1330-20-7	Xylene (total)	ND	1.3	0.28	ug/kg	
67-64-1	Acetone	ND	13	3.2	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND J	6.4	0.69	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		59-130%
17060-07-0	1,2-Dichloroethane-D4	97%		65-123%
2037-26-5	Toluene-D8	106%		77-125%
460-00-4	4-Bromofluorobenzene	87%		71-132%

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Raw Data: GH97033.D

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Report of Analysis

Client Sample ID:	R-11 (0-0.5)		
Lab Sample ID:	JB69587-13	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846-8015C (DAI)	Percent Solids:	95.0
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH97033.D	1	06/19/14	XPL	n/a	n/a	GGH4596
Run #2							

	Initial Weight
Run #1	5.1 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-56-1	Methanol	ND	210	49	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	105%		58-133%
111-27-3	Hexanol	102%		58-133%

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Report of Analysis

Client Sample ID:	R-11 (0-0.5)		
Lab Sample ID:	JB69587-13	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
		Percent Solids:	95.0
Project:	BMS-ICM, Humacao, PR		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Moisture, Percent	5		%	1	06/20/14 11:35	AC	SM2540 G-97

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RL = Reporting Limit

Raw Data: A206684.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	Q1 (0-0.5)		
Lab Sample ID:	JB69587-14	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846 8260B SW846 5035	Percent Solids:	94.8
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	A206684.D	1	06/23/14	CM	06/18/14 14:00	n/a	VA7793
Run #2							

	Initial Weight
Run #1	4.9 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.54	0.19	ug/kg	
108-88-3	Toluene	ND	1.1	0.25	ug/kg	
100-41-4	Ethylbenzene	ND	1.1	0.21	ug/kg	
1330-20-7	Xylene (total)	ND	1.1	0.23	ug/kg	
67-64-1	Acetone	ND	11	2.7	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.4	0.58	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		59-130%
17060-07-0	1,2-Dichloroethane-D4	107%		65-123%
2037-26-5	Toluene-D8	109%		77-125%
460-00-4	4-Bromofluorobenzene	107%		71-132%

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B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GH97034.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	Q1 (0-0.5)		
Lab Sample ID:	JB69587-14	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846-8015C (DAI)	Percent Solids:	94.8
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH97034.D	1	06/19/14	XPL	n/a	n/a	GGH4596
Run #2							

	Initial Weight
Run #1	5.2 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-56-1	Methanol	ND	200	48	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	99%		58-133%
111-27-3	Hexanol	102%		58-133%

ESTADO LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
IC # 1888
QUIMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	Q1 (0-0.5)		
Lab Sample ID:	JB69587-14	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
		Percent Solids:	94.8
Project:	BMS-ICM, Humacao, PR		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Moisture, Percent	5.2		%	1	06/20/14 11:35	AC	SM2540 G-97

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Rafael Infante Méndez
IC # 1888
QUIMICO LICENCIADO

RL = Reporting Limit

Raw Data: A206685.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	Q2 (0-0.5)		
Lab Sample ID:	JB69587-15	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846 8260B SW846 5035	Percent Solids:	94.7
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	A206685.D	1	06/23/14	CM	06/18/14 14:00	n/a	VA7793
Run #2							

	Initial Weight
Run #1	4.9 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.54	0.19	ug/kg	
108-88-3	Toluene	ND	1.1	0.25	ug/kg	
100-41-4	Ethylbenzene	ND	1.1	0.21	ug/kg	
1330-20-7	Xylene (total)	ND	1.1	0.23	ug/kg	
67-64-1	Acetone	ND	11	2.7	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.4	0.58	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%		59-130%
17060-07-0	1,2-Dichloroethane-D4	109%		65-123%
2037-26-5	Toluene-D8	108%		77-125%
460-00-4	4-Bromofluorobenzene	105%		71-132%

ESTADO LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
IC # 1888
QUIMICO LICENCIADO

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RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GH97037.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	Q2 (0-0.5)		
Lab Sample ID:	JB69587-15	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846-8015C (DAI)	Percent Solids:	94.7
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH97037.D	1	06/19/14	XPL	n/a	n/a	GGH4596
Run #2							

	Initial Weight
Run #1	5.5 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-56-1	Methanol	ND	190	46	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	102%		58-133%
111-27-3	Hexanol	101%		58-133%

ESTADO LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
IC # 1888
QUIMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	Q2 (0-0.5)		
Lab Sample ID:	JB69587-15	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
		Percent Solids:	94.7
Project:	BMS-ICM, Humacao, PR		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Moisture, Percent	5.3		%	1	06/20/14 11:35	AC	SM2540 G-97

ESTADO LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
IC # 1888
QUIMICO LICENCIADO

RL = Reporting Limit

Raw Data: V145542.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	Q3 (0-0.5)		
Lab Sample ID:	JB69587-16	**Date Sampled:**	06/17/14
Matrix:	SO - Soil	**Date Received:**	06/18/14
Method:	SW846 8260B SW846 5035	**Percent Solids:**	91.6
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	V145542.D	1	06/20/14	KC	06/18/14 14:00	n/a	VV6205
Run #2							

	Initial Weight
Run #1	5.0 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.55	0.19	ug/kg	
108-88-3	Toluene	ND	1.1	0.25	ug/kg	
100-41-4	Ethylbenzene	ND	1.1	0.21	ug/kg	
1330-20-7	Xylene (total)	ND	1.1	0.23	ug/kg	
67-64-1	Acetone	ND	11	2.7	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND J	5.5	0.58	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		59-130%
17060-07-0	1,2-Dichloroethane-D4	104%		65-123%
2037-26-5	Toluene-D8	109%		77-125%
460-00-4	4-Bromofluorobenzene	94%		71-132%

ESTADO LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
LIC # 1888
QUIMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GH97038.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	Q3 (0-0.5)		
Lab Sample ID:	JB69587-16	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846-8015C (DAI)	Percent Solids:	91.6
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH97038.D	1	06/19/14	XPL	n/a	n/a	GGH4596
Run #2							

	Initial Weight
Run #1	5.0 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-56-1	Methanol	ND	220	52	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	105%		58-133%
111-27-3	Hexanol	101%		58-133%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	Q3 (0-0.5)		
Lab Sample ID:	JB69587-16	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
		Percent Solids:	91.6
Project:	BMS-ICM, Humacao, PR		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Moisture, Percent	8.4		%	1	06/20/14 11:35	AC	SM2540 G-97

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Rafael Infante Méndez
LIC # 1888
QUIMICO LICENCIADO

RL = Reporting Limit

Raw Data: V145543.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	Q4 (0-0.5)		
Lab Sample ID:	JB69587-17	**Date Sampled:**	06/17/14
Matrix:	SO - Soil	**Date Received:**	06/18/14
Method:	SW846 8260B SW846 5035	**Percent Solids:**	91.4
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	V145543.D	1	06/20/14	KC	06/18/14 14:00	n/a	VV6205
Run #2							

	Initial Weight
Run #1	5.2 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.53	0.19	ug/kg	
108-88-3	Toluene	ND	1.1	0.24	ug/kg	
100-41-4	Ethylbenzene	ND	1.1	0.20	ug/kg	
1330-20-7	Xylene (total)	ND	1.1	0.23	ug/kg	
67-64-1	Acetone	ND	11	2.6	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND J	5.3	0.56	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%		59-130%
17060-07-0	1,2-Dichloroethane-D4	101%		65-123%
2037-26-5	Toluene-D8	109%		77-125%
460-00-4	4-Bromofluorobenzene	95%		71-132%

ESTADO LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
LIC # 1888
QUIMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	Q4 (0-0.5)		
Lab Sample ID:	JB69587-17	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846-8015C (DAI)	Percent Solids:	91.4
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH97039.D	1	06/19/14	XPL	n/a	n/a	GGH4596
Run #2							

	Initial Weight
Run #1	5.0 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-56-1	Methanol	ND	220	52	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	99%		58-133%
111-27-3	Hexanol	95%		58-133%

Rafael Infante Méndez
LIC # 1888

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	Q4 (0-0.5)		
Lab Sample ID:	JB69587-17	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
		Percent Solids:	91.4
Project:	BMS-ICM, Humacao, PR		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Moisture, Percent	8.6		%	1	06/20/14 11:35	AC	SM2540 G-97

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Rafael Infante Méndez
LIC # 1888
QUIMICO LICENCIADO

RL = Reporting Limit

Raw Data: 3A132091.D

Accutest Laboratories

Report of Analysis

4.18 4

Client Sample ID:	FB061714		
Lab Sample ID:	JB69587-18	Date Sampled:	06/17/14
Matrix:	AQ - Field Blank Soil	Date Received:	06/18/14
Method:	SW846 8260B	Percent Solids:	n/a
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A132091.D	1	06/22/14	HA	n/a	n/a	V3A5714
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.50	0.21	ug/l	
108-88-3	Toluene	ND	1.0	0.22	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.40	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.20	ug/l	
67-64-1	Acetone	ND	10	2.6	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.1	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	94%		79-120%
17060-07-0	1,2-Dichloroethane-D4	85%		72-123%
2037-26-5	Toluene-D8	97%		78-119%
460-00-4	4-Bromofluorobenzene	95%		74-119%

ESTADO LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
IC # 1888
QUIMICO

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	FB061714		
Lab Sample ID:	JB69587-18	Date Sampled:	06/17/14
Matrix:	AQ - Field Blank Soil	Date Received:	06/18/14
Method:	SW846-8015C (DAI)	Percent Solids:	n/a
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH97053.D	1	06/20/14	XPL	n/a	n/a	GGH4598
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	98%		48-150%
111-27-3	Hexanol	94%		48-150%

ESTADO LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
IC # 1888
QUIMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: A206694.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	TB061714		
Lab Sample ID:	JB69587-19	Date Sampled:	06/17/14
Matrix:	SO - Trip Blank Soil	Date Received:	06/18/14
Method:	SW846 8260B	Percent Solids:	n/a
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	A206694.D	1	06/23/14	CM	n/a	n/a	VA7794
Run #2							

	Initial Weight
Run #1	5.0 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.50	0.18	ug/kg	
108-88-3	Toluene	ND	1.0	0.23	ug/kg	
100-41-4	Ethylbenzene	ND	1.0	0.19	ug/kg	
1330-20-7	Xylene (total)	ND	1.0	0.22	ug/kg	
67-64-1	Acetone	ND	10	2.5	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	0.54	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%		59-130%
17060-07-0	1,2-Dichloroethane-D4	103%		65-123%
2037-26-5	Toluene-D8	109%		77-125%
460-00-4	4-Bromofluorobenzene	105%		71-132%

LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
IC # 1888
QUIMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 3A132092.D

Accutest Laboratories

Report of Analysis

4.20 4

Client Sample ID:	TRIP BLANK		
Lab Sample ID:	JB69587-20	Date Sampled:	06/17/14
Matrix:	AQ - Trip Blank Soil	Date Received:	06/18/14
Method:	SW846 8260B	Percent Solids:	n/a
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A132092.D	1	06/22/14	HA	n/a	n/a	V3A5714
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.50	0.21	ug/l	
108-88-3	Toluene	ND	1.0	0.22	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.40	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.20	ug/l	
67-64-1	Acetone	ND	10	2.6	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.1	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	95%		79-120%
17060-07-0	1,2-Dichloroethane-D4	87%		72-123%
2037-26-5	Toluene-D8	97%		78-119%
460-00-4	4-Bromofluorobenzene	95%		74-119%

ESTADO LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
IC # 1888
QUIMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Raw Data: V145544.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-8 (0-0.5)		
Lab Sample ID:	JB69587-21	**Date Sampled:**	06/17/14
Matrix:	SO - Soil	**Date Received:**	06/18/14
Method:	SW846 8260B SW846 5035	**Percent Solids:**	96.6
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	V145544.D	1	06/20/14	KC	06/18/14 14:00	n/a	VV6205
Run #2							

	Initial Weight
Run #1	4.0 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.65	0.23	ug/kg	
108-88-3	Toluene	ND	1.3	0.30	ug/kg	
100-41-4	Ethylbenzene	ND	1.3	0.25	ug/kg	
1330-20-7	Xylene (total)	ND	1.3	0.28	ug/kg	
67-64-1	Acetone	ND	13	3.2	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND J	6.5	0.69	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		59-130%
17060-07-0	1,2-Dichloroethane-D4	104%		65-123%
2037-26-5	Toluene-D8	107%		77-125%
460-00-4	4-Bromofluorobenzene	93%		71-132%

ESTADO LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
LIC # 1888
QUIMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GH97040.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-8 (0-0.5)		
Lab Sample ID:	JB69587-21	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846-8015C (DAI)	Percent Solids:	96.6
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH97040.D	1	06/19/14	XPL	n/a	n/a	GGH4596
Run #2							

	Initial Weight
Run #1	5.1 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-56-1	Methanol	ND	200	48	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	101%		58-133%
111-27-3	Hexanol	100%		58-133%

ESTADO LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
IC # 1888
QUIMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-8 (0-0.5)		
Lab Sample ID:	JB69587-21	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
		Percent Solids:	96.6
Project:	BMS-ICM, Humacao, PR		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Moisture, Percent	3.4		%	1	06/20/14 11:35	AC	SM2540 G-97

ESTADO LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
IC # 1888
QUIMICO LICENCIADO

RL = Reporting Limit

Raw Data: GH97029.D GH97030.D

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: JB69587
Account: AMANYWP Anderson, Mulholland & Associates
Project: BMS-ICM, Humacao, PR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JB69587-12MS	GH97029.D	1	06/19/14	XPL	n/a	n/a	GGH4596
JB69587-12MSD	GH97030.D	1	06/19/14	XPL	n/a	n/a	GGH4596
JB69587-12	GH97028.D	1	06/19/14	XPL	n/a	n/a	GGH4596

The QC reported here applies to the following samples: Method: SW846-8015C (DAI)

JB69587-9, JB69587-11, JB69587-12, JB69587-13, JB69587-14, JB69587-15, JB69587-16, JB69587-17, JB69587-21

CAS No.	Compound	JB69587-12 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-56-1	Methanol	ND		5210	4900	94	5210	5240	101	7	44-146/19

CAS No.	Surrogate Recoveries	MS	MSD	JB69587-12	Limits
111-27-3	Hexanol	94%	102%	78%	58-133%
111-27-3	Hexanol	94%	97%	77%	58-133%

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Rafael Infante Méndez
IC # 1888
QUIMICO LICENCIADO

8.3.2 8

* = Outside of Control Limits.

Raw Data: X147672.D X147673.D

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: JB69587
Account: AMANYWP Anderson, Mulholland & Associates
Project: BMS-ICM, Humacao, PR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JB69587-12MS	X147672.D	1	06/20/14	KC	n/a	n/a	VX6383
JB69587-12MSD	X147673.D	1	06/20/14	KC	n/a	n/a	VX6383
JB69587-12	X147671.D	1	06/20/14	KC	n/a	n/a	VX6383

The QC reported here applies to the following samples: Method: SW846 8260B

JB69587-8, JB69587-9, JB69587-12

CAS No.	Compound	JB69587-12 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND		55.4	37.0	67	57.9	40.0	69	8	10-181/30
71-43-2	Benzene	ND		55.4	52.0	94	57.9	56.8	98	9	45-131/22
100-41-4	Ethylbenzene	ND		55.4	54.0	97	57.9	59.4	103	10	30-139/26
108-10-1	4-Methyl-2-pentanone(MIBK)	ND		55.4	39.9	72	57.9	42.5	73	6	31-140/25
108-88-3	Toluene	ND		55.4	53.3	96	57.9	57.9	100	8	38-135/23
1330-20-7	Xylene (total)	ND		166	160	96	174	176	101	10	30-140/25

CAS No.	Surrogate Recoveries	MS	MSD	JB69587-12	Limits
1868-53-7	Dibromofluoromethane	108%	107%	112%	59-130%
17060-07-0	1,2-Dichloroethane-D4	89%	87%	100%	65-123%
2037-26-5	Toluene-D8	121%	120%	119%	77-125%
460-00-4	4-Bromofluorobenzene	116%	114%	121%	71-132%

ESTADO LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
IC # 1888
QUIMICO

* = Outside of Control Limits.

Foreign Soil ↓ SLL SFB STB SSTB

ACCUTEST LABORATORIES

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PAGE 1 OF 2 PN

FED-EX Tracking # 7703 3324 6871 | Bottle Order Control # | Accutest Quote # | Accutest Job # JB69587

Client / Reporting Information

Company Name: Anderson Mutholland & Assoc.
Street Address: 110 Corporate Park Dr.
City / State / Zip: White Plains, NY 10604
Project Contact / E-mail: Terry Taylor
Phone # / Fax #: 914-251-0400 ext 309
Sampler(s) Name(s) / Phone #: Nestor Rivera

Project Information

Project Name: Biopile Closure Subliner Sampling
Street: Rd #3, Km. 77.5
City / State: Humacao, PR
Project #: Bristol-Myers Squibb
Client Purchase Order #:
Project Manager: David Lindstrand

Billing Information (if different from Report to)
Company Name:
Street Address:
City / State / Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Accutest Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	VOC - See Note	Methanol - D8015	% Moisture	LAB USE ONLY
1	R-2 (0-0.5)		6/17/14	1221	NR	SO	6					3			3	X	X	X	
2	R-1 (0-0.5)			1233												X	X	X	L51
3	R-3 (0-0.5)			1255												X	X	X	1403
4	R-4 (0-0.5)			1251												X	X	X	4955
5	R-12 (0-0.5)			1305												X	X	X	V813
6	R-5 (0-0.5)			1313												X	X	X	
7	R-6 (0-0.5)			1322												X	X	X	
8	R-7 (0-0.5)			1500												X	X	X	
9	R-7D (0-0.5)			1503		SO	6					3			3	X	X	X	
10	EB 061714			1505		LIQ	6	6								X	X		
11	R-10 (0-0.5)			1508		SO	6					3			3	X	X	X	
12	R-9 (0-0.5)		6/17/14	1520	NR	SO	6					3			3	X	X	X	

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Top Blank

Turnaround Time (Business days)

- ☐ Std. 10 Business Days
- ☒ 5 Day RUSH
- ☐ 3 Day EMERGENCY
- ☐ 2 Day EMERGENCY
- ☐ 1 Day EMERGENCY
- ☐ other

Emergency & Rush T/A data available VIA Lablink

Approved By (Accutest PM): / Date:

Data Deliverable Information

- ☐ Commercial "A" (Level 1)
- ☐ Commercial "B" (Level 2)
- ☐ FULLT1 (Level 3+4)
- ☐ NJ Reduced
- ☐ Commercial "C"
- ☐ NYASP Category A
- ☐ NYASP Category B
- ☐ State Forms
- ☐ EDD Format
- ☐ Other

Commercial "A" = Results Only
Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

VOC: Acetone, Benzene, Ethylbenzene, Toluene, Xylene, MIBK

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1 Nestor M. Rivera	6/17/14 1732	1 FEDEX	2 FEDEX	6-18-14 1000	2 [signature]
3		3	4		4
5		5	Custody Seal # 202,204 ☐ Intact ☐ Not intact	Preserved where applicable ☒	On Ice ☒ Cooler Temp 2.1, 2.4 °C

3A

JB69587: Chain of Custody
Page 1 of 4

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FED-EX Tracking # 7703 9324 6871
Accutest Quote #
Accutest Job # JB69587

Client / Reporting Information

Company Name: Anderson Mulholland & Assoc.
Street Address: 110 Corporate Park Dr.
City, State, Zip: White Plains, NY 10604
Project Contact: Terry Taylor
E-mail:
Phone #: 914-251-0400 ext 309
Fax #:
Sampler(s) Name(s): Nestor Rivera
Phone #:

Project Information

Project Name: Biopile Closure Subliner Sampling
Street: Rd #3, Km. 77.5
City: Humacao
State: PR
Project #: Bristol-Myers Squibb
Client Purchase Order #:
Project Manager: David Lindstrand

Billing Information (if different from Report to):
Company Name:
Street Address:
City, State, Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Accutest Sample #	Field ID / Point of Collection	MEOH Vial #	Date Collected	Time Collected	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	VOC - see Note	Methanol - D8015	% Moisture									LAB USE ONLY
11	R-9MS (0-0.5)		6/17/14	1523	NR	SO	6						3		3	X	X	X									
12	R-9MSD (0-0.5)			1526												X	X	X									
13	R-11 (0-0.5)			1535												X	X	X									
14	Q1 (0-0.5)			1608												X	X	X									
15	Q2 (0-0.5)			1614												X	X	X									
16	Q3 (0-0.5)			1624												X	X	X									
17	Q4 (0-0.5)			1635		SO	6						3		3	X	X	X									
18	FB 061714			1640		Liq	6	6								X	X										
19	TB 061714	2693, 2694	6/17/14	1640	NR	Liq	2	2					2			X	X										
20	Trip Blank		6-13-14	0600			2	2																			
21	R-8 (0-0.5)		6-17-14	1351			6						3		3												

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL - Sludge
SED-Sediment
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid
WP - Wipe
FB-Field Blank
EB-Equipment Blank
RB- Rinse Blank
TB-Trip Blank

Turnaround Time (Business days)

- [ ] Std. 10 Business Days
- [x] 5 Day RUSH
- [ ] 3 Day EMERGENCY
- [ ] 2 Day EMERGENCY
- [ ] 1 Day EMERGENCY
- [ ] other

Emergency & Rush T/A data available VIA Lablink

Approved By (Accutest PM): / Date: 6/18/14

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [ ] EDD Format
- [ ] Other

Commercial "A" = Results Only
Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

VOC: Acetone, Benzene, Ethylbenzene, Toluene, Xylene, MIBK

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1 Nestor M. Rivera	6/17/14 1732	FEDEX	2 FEDEX	6-17-14 1800	2
Relinquished by Sampler: 3	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
Relinquished by: 5	Date Time:	Received By: 5	Custody Seal # 202, 204 [ ] Intact [ ] Not Intact	Preserved where applicable	On Ice / Cooler Temp.

Raw Data: A206683.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-6 (0-0.5)		
Lab Sample ID:	JB69587-7	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846 8260B SW846 5035	Percent Solids:	94.7
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	A206683.D	1	06/23/14	CM	06/18/14 14:00	n/a	VA7793
Run #2							

	Initial Weight
Run #1	4.8 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.55	0.19	ug/kg	
108-88-3	Toluene	ND	1.1	0.26	ug/kg	
100-41-4	Ethylbenzene	ND	1.1	0.21	ug/kg	
1330-20-7	Xylene (total)	ND	1.1	0.24	ug/kg	
67-64-1	Acetone	ND	11	2.7	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.5	0.59	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		59-130%
17060-07-0	1,2-Dichloroethane-D4	108%		65-123%
2037-26-5	Toluene-D8	110%		77-125%
460-00-4	4-Bromofluorobenzene	104%		71-132%

ESTADO LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
IC # 1888
QUIMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GH97023.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-6 (0-0.5)		
Lab Sample ID:	JB69587-7	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846-8015C (DAI)	Percent Solids:	94.7
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH97023.D	1	06/19/14	XPL	n/a	n/a	GGH4595
Run #2							

	Initial Weight
Run #1	5.1 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-56-1	Methanol	ND	210	49	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	103%		58-133%
111-27-3	Hexanol	102%		58-133%

Rafael Infante Méndez
IC # 1888
QUIMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-6 (0-0.5)		
Lab Sample ID:	JB69587-7	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
		Percent Solids:	94.7
Project:	BMS-ICM, Humacao, PR		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Moisture, Percent	5.3		%	1	06/19/14 12:30	NR	SM2540 G-97

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IC # 1896
QUIMICO LICENCIADO

RL = Reporting Limit

Raw Data: X147703.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-7 (0-0.5)		
Lab Sample ID:	JB69587-8	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846 8260B SW846 5035	Percent Solids:	96.7
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X147703.D	1	06/21/14	KC	06/18/14 14:00	n/a	VX6383
Run #2							

	Initial Weight
Run #1	4.2 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.62	0.22	ug/kg	
108-88-3	Toluene	ND	1.2	0.29	ug/kg	
100-41-4	Ethylbenzene	ND	1.2	0.24	ug/kg	
1330-20-7	Xylene (total)	ND	1.2	0.26	ug/kg	
67-64-1	Acetone	ND	12	3.1	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	6.2	0.66	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	112%		59-130%
17060-07-0	1,2-Dichloroethane-D4	99%		65-123%
2037-26-5	Toluene-D8	121%		77-125%
460-00-4	4-Bromofluorobenzene	118%		71-132%

COLEGIO DE QUIMICOS LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
QUIMICO LICENCIADO
IC # 1888

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Raw Data: GH97024.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-7 (0-0.5)		
Lab Sample ID:	JB69587-8	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846-8015C (DAI)	Percent Solids:	96.7
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH97024.D	1	06/19/14	XPL	n/a	n/a	GGH4595
Run #2							

	Initial Weight
Run #1	5.1 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-56-1	Methanol	ND	200	48	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	103%		58-133%
111-27-3	Hexanol	100%		58-133%

ESTADO LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
IQ # 1888
QUIMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-7 (0-0.5)		
Lab Sample ID:	JB69587-8	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
		Percent Solids:	96.7
Project:	BMS-ICM, Humacao, PR		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Moisture, Percent	3.3		%	1	06/19/14 12:30	NR	SM2540 G-97

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Méndez
IC # 1888
QUIMICO LICENCIADO

RL = Reporting Limit

Raw Data: X147704.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-7D (0-0.5)		
Lab Sample ID:	JB69587-9	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846 8260B SW846 5035	Percent Solids:	96.4
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X147704.D	1	06/21/14	KC	06/18/14 14:00	n/a	VX6383
Run #2							

	Initial Weight
Run #1	3.9 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.66	0.24	ug/kg	
108-88-3	Toluene	ND	1.3	0.31	ug/kg	
100-41-4	Ethylbenzene	ND	1.3	0.26	ug/kg	
1330-20-7	Xylene (total)	ND	1.3	0.29	ug/kg	
67-64-1	Acetone	ND	13	3.3	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	6.6	0.71	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	112%		59-130%
17060-07-0	1,2-Dichloroethane-D4	100%		65-123%
2037-26-5	Toluene-D8	121%		77-125%
460-00-4	4-Bromofluorobenzene	118%		71-132%

LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
IC # 1888
QUIMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GH97032.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-7D (0-0.5)		
Lab Sample ID:	JB69587-9	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846-8015C (DAI)	Percent Solids:	96.4
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH97032.D	1	06/19/14	XPL	n/a	n/a	GGH4596
Run #2							

	Initial Weight
Run #1	5.3 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-56-1	Methanol	ND	200	47	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	94%		58-133%
111-27-3	Hexanol	94%		58-133%

...tael Infante Méndez IC # 1888 QUIMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-7D (0-0.5)		
Lab Sample ID:	JB69587-9	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
		Percent Solids:	96.4
Project:	BMS-ICM, Humacao, PR		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Moisture, Percent	3.6		%	1	06/19/14 12:30	NR	SM2540 G-97

COLEGIO DE QUIMICOS DE PUERTO RICO LIBRE ASOCIADO
Rafael Infante Méndez
IQ # 1888
QUIMICO LICENCIADO

RL = Reporting Limit

Raw Data: 3A132090.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	EB061714		
Lab Sample ID:	JB69587-10	Date Sampled:	06/17/14
Matrix:	AQ - Equipment Blank	Date Received:	06/18/14
Method:	SW846 8260B	Percent Solids:	n/a
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A132090.D	1	06/22/14	HA	n/a	n/a	V3A5714
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.50	0.21	ug/l	
108-88-3	Toluene	ND	1.0	0.22	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.40	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.20	ug/l	
67-64-1	Acetone	ND	10	2.6	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.1	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	95%		79-120%
17060-07-0	1,2-Dichloroethane-D4	86%		72-123%
2037-26-5	Toluene-D8	98%		78-119%
460-00-4	4-Bromofluorobenzene	95%		74-119%

LABORATORIO ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
IC # 1888
QUIMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GH97052.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	EB061714		
Lab Sample ID:	JB69587-10	Date Sampled:	06/17/14
Matrix:	AQ - Equipment Blank	Date Received:	06/18/14
Method:	SW846-8015C (DAI)	Percent Solids:	n/a
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH97052.D	1	06/20/14	XPL	n/a	n/a	GGH4598
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	71%		48-150%
111-27-3	Hexanol	78%		48-150%

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Rafael Infante Méndez
IC # 1888
QUIMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: V145611.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-10 (0-0.5)		
Lab Sample ID:	JB69587-11	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846 8260B SW846 5035	Percent Solids:	96.9
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	V145611.D	1	06/23/14	KC	06/18/14 14:00	n/a	VV6207
Run #2							

	Initial Weight
Run #1	3.7 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.70	0.25	ug/kg	
108-88-3	Toluene	ND	1.4	0.32	ug/kg	
100-41-4	Ethylbenzene	ND	1.4	0.27	ug/kg	
1330-20-7	Xylene (total)	ND	1.4	0.30	ug/kg	
67-64-1	Acetone	ND	14	3.5	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	7.0	0.75	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		59-130%
17060-07-0	1,2-Dichloroethane-D4	98%		65-123%
2037-26-5	Toluene-D8	104%		77-125%
460-00-4	4-Bromofluorobenzene	89%		71-1[illegible]

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B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GH97020.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-4 (0-0.5)		
Lab Sample ID:	JB69587-4	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846-8015C (DAI)	Percent Solids:	95.7
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH97020.D	1	06/19/14	XPL	n/a	n/a	GGH4595
Run #2							

	Initial Weight
Run #1	5.1 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-56-1	Methanol	ND	200	49	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	106%		58-133%
111-27-3	Hexanol	101%		58-133%

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J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-4 (0-0.5)		
Lab Sample ID:	JB69587-4	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
		Percent Solids:	95.7
Project:	BMS-ICM, Humacao, PR		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Moisture, Percent	4.3		%	1	06/19/14 12:30	NR	SM2540 G-97

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RL = Reporting Limit

Raw Data: A206663.D

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Report of Analysis

Client Sample ID:	R-12 (0-0.5)		
Lab Sample ID:	JB69587-5	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846 8260B SW846 5035	Percent Solids:	91.3
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	A206663.D	1	06/22/14	CM	06/18/14 14:00	n/a	VA7793
Run #2							

	Initial Weight
Run #1	4.9 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.56	0.20	ug/kg	
108-88-3	Toluene	ND	1.1	0.26	ug/kg	
100-41-4	Ethylbenzene	ND	1.1	0.22	ug/kg	
1330-20-7	Xylene (total)	ND	1.1	0.24	ug/kg	
67-64-1	Acetone	ND	11	2.8	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.6	0.60	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%		59-130%
17060-07-0	1,2-Dichloroethane-D4	106%		65-123%
2037-26-5	Toluene-D8	109%		77-125%
460-00-4	4-Bromofluorobenzene	106%		71-13[illegible]

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ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
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J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GH97021.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-12 (0-0.5)		
Lab Sample ID:	JB69587-5	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846-8015C (DAI)	Percent Solids:	91.3
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH97021.D	1	06/19/14	XPL	n/a	n/a	GGH4595
Run #2							

	Initial Weight
Run #1	5.0 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-56-1	Methanol	ND	220	52	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	102%		58-133%
111-27-3	Hexanol	98%		58-133%

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E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-12 (0-0.5)		
Lab Sample ID:	JB69587-5	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
		Percent Solids:	91.3
Project:	BMS-ICM, Humacao, PR		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Moisture, Percent	8.7		%	1	06/19/14 12:30	NR	SM2540 G-97

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RL = Reporting Limit

Raw Data: A206664.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-5 (0-0.5)		
Lab Sample ID:	JB69587-6	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846 8260B SW846 5035	Percent Solids:	95.2
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	A206664.D	1	06/22/14	CM	06/18/14 14:00	n/a	VA7793
Run #2							

	Initial Weight
Run #1	4.7 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.56	0.20	ug/kg	
108-88-3	Toluene	ND	1.1	0.26	ug/kg	
100-41-4	Ethylbenzene	ND	1.1	0.22	ug/kg	
1330-20-7	Xylene (total)	ND	1.1	0.24	ug/kg	
67-64-1	Acetone	ND	11	2.8	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.6	0.60	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		59-130%
17060-07-0	1,2-Dichloroethane-D4	104%		65-123%
2037-26-5	Toluene-D8	109%		77-125%
460-00-4	4-Bromofluorobenzene	107%		71-132%

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ND = Not detected MDL = Method Detection Limit
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J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GH97022.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-5 (0-0.5)		
Lab Sample ID:	JB69587-6	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846-8015C (DAI)	Percent Solids:	95.2
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH97022.D	1	06/19/14	XPL	n/a	n/a	GGH4595
Run #2							

	Initial Weight
Run #1	5.0 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-56-1	Methanol	ND	210	50	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	104%		58-133%
111-27-3	Hexanol	101%		58-133%

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IC # 1888
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J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-5 (0-0.5)		
Lab Sample ID:	JB69587-6	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
		Percent Solids:	95.2
Project:	BMS-ICM, Humacao, PR		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Moisture, Percent	4.8		%	1	06/19/14 12:30	NR	SM2540 G-97

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RL = Reporting Limit

Raw Data: GH97019.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-3 (0-0.5)		
Lab Sample ID:	JB69587-3	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846-8015C (DAI)	Percent Solids:	93.5
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH97019.D	1	06/19/14	XPL	n/a	n/a	GGH4595
Run #2							

	Initial Weight
Run #1	5.3 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-56-1	Methanol	ND	200	48	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	90%		58-133%
111-27-3	Hexanol	90%		58-133%

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IC # 1888

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-3 (0-0.5)		
Lab Sample ID:	JB69587-3	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
		Percent Solids:	93.5
Project:	BMS-ICM, Humacao, PR		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Moisture, Percent	6.5		%	1	06/19/14 12:30	NR	SM2540 G-97

RL = Reporting Limit

Raw Data: A206662.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-4 (0-0.5)		
Lab Sample ID:	JB69587-4	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846 8260B SW846 5035	Percent Solids:	95.7
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	A206662.D	1	06/22/14	CM	06/18/14 14:00	n/a	VA7793
Run #2							

	Initial Weight
Run #1	5.7 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.46	0.16	ug/kg	
108-88-3	Toluene	ND	0.92	0.21	ug/kg	
100-41-4	Ethylbenzene	ND	0.92	0.18	ug/kg	
1330-20-7	Xylene (total)	ND	0.92	0.20	ug/kg	
67-64-1	Acetone	ND	9.2	2.3	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	4.6	0.49	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		59-130%
17060-07-0	1,2-Dichloroethane-D4	102%		65-123%
2037-26-5	Toluene-D8	107%		77-125%
460-00-4	4-Bromofluorobenzene	104%		71-132%

Rafael Infante Méndez
IC # 1888
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E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: V145606.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-2 (0-0.5)		
Lab Sample ID:	JB69587-1	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846 8260B SW846 5035	Percent Solids:	94.2
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	V145606.D	1	06/23/14	KC	06/18/14 14:00	n/a	VV6207
Run #2							

	Initial Weight
Run #1	4.5 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.59	0.21	ug/kg	
108-88-3	Toluene	ND	1.2	0.27	ug/kg	
100-41-4	Ethylbenzene	ND	1.2	0.23	ug/kg	
1330-20-7	Xylene (total)	ND	1.2	0.25	ug/kg	
67-64-1	Acetone	ND	12	2.9	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.9	0.63	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		59-130%
17060-07-0	1,2-Dichloroethane-D4	96%		65-123%
2037-26-5	Toluene-D8	105%		77-125%
460-00-4	4-Bromofluorobenzene	88%		71-132%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GH97017.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-2 (0-0.5)		
Lab Sample ID:	JB69587-1	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846-8015C (DAI)	Percent Solids:	94.2
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH97017.D	1	06/19/14	XPL	n/a	n/a	GGH4595
Run #2							

	Initial Weight
Run #1	5.2 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-56-1	Methanol	ND	200	49	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	82%		58-133%
111-27-3	Hexanol	81%		58-133%

ELA LIBRE ASOCIADO DE PUERTO RICO
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RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-2 (0-0.5)		
Lab Sample ID:	JB69587-1	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
		Percent Solids:	94.2
Project:	BMS-ICM, Humacao, PR		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Moisture, Percent	5.8		%	1	06/19/14 12:30	NR	SM2540 G-97

RL = Reporting Limit

Raw Data: V145607.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-1 (0-0.5)		
Lab Sample ID:	JB69587-2	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846 8260B SW846 5035	Percent Solids:	94.0
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	V145607.D	1	06/23/14	KC	06/18/14 14:00	n/a	VV6207
Run #2							

	Initial Weight
Run #1	4.8 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.55	0.20	ug/kg	
108-88-3	Toluene	ND	1.1	0.26	ug/kg	
100-41-4	Ethylbenzene	ND	1.1	0.21	ug/kg	
1330-20-7	Xylene (total)	ND	1.1	0.24	ug/kg	
67-64-1	Acetone	ND	11	2.8	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.5	0.59	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		59-130%
17060-07-0	1,2-Dichloroethane-D4	96%		65-123%
2037-26-5	Toluene-D8	103%		77-125%
460-00-4	4-Bromofluorobenzene	89%		71-132%

Colegio de Químicos Licenciados de Puerto Rico
Rafael Infante Méndez
Químico Licenciado # 1888

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GH97018.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-1 (0-0.5)		
Lab Sample ID:	JB69587-2	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846-8015C (DAI)	Percent Solids:	94.0
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH97018.D	1	06/19/14	XPL	n/a	n/a	GGH4595
Run #2							

	Initial Weight
Run #1	5.0 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-56-1	Methanol	ND	210	51	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	89%		58-133%
111-27-3	Hexanol	87%		58-133%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-1 (0-0.5)		
Lab Sample ID:	JB69587-2	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
		Percent Solids:	94.0
Project:	BMS-ICM, Humacao, PR		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Moisture, Percent	6		%	1	06/19/14 12:30	NR	SM2540 G-97

COLEGIO QUIMICO LIBRE ASOCIADO DE PUERTO RICO
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RL = Reporting Limit

Raw Data: A206661.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	R-3 (0-0.5)		
Lab Sample ID:	JB69587-3	Date Sampled:	06/17/14
Matrix:	SO - Soil	Date Received:	06/18/14
Method:	SW846 8260B SW846 5035	Percent Solids:	93.5
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	A206661.D	1	06/22/14	CM	06/18/14 14:00	n/a	VA7793
Run #2							

	Initial Weight
Run #1	4.4 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.61	0.22	ug/kg	
108-88-3	Toluene	ND	1.2	0.28	ug/kg	
100-41-4	Ethylbenzene	ND	1.2	0.23	ug/kg	
1330-20-7	Xylene (total)	ND	1.2	0.26	ug/kg	
67-64-1	Acetone	ND	12	3.0	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	6.1	0.65	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%		59-130%
17060-07-0	1,2-Dichloroethane-D4	108%		65-123%
2037-26-5	Toluene-D8	113%		77-125%
460-00-4	4-Bromofluorobenzene	108%		71-132%

...ABOGADO DE PUERTO RICO
...fael Infante
Méndez
...IC # 1888
...UIMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

DATA REVIEW WORKSHEETS

Project Number:____JB69587_____
Date:_____06/17/2014_____

REVIEW OF VOLATILE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: USEPA Region 2, SOP HW-24, Standard Operating Procedure for the Validation of Organic Data Acquired using SW-846 Method 8260B (August, 2009-Revision 2), the USEPA National Functional Guidelines for Low/Medium Concentration Organic Data Review (SOW SOM01.2 SOP HW-33, August 2009 – Revision 2), the USEPA National Functional Guidelines for Organic Data Review for Low Concentration Water (SOP HW-13, August, 2009-Revision 3). Also, QC criteria from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update III, December 1996)," specifically for Methods 8000/8260B are utilized. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) _Accutest_____ data package received has been reviewed and the quality control and performance data summarized. The data review for VOCs included:

Lab. Project/SDG No.: __JB69587_____ Sample matrix: ___Soil_____
No. of Samples: _____21_____

Trip blank No.: _____JB69587-19;__JB69587-20_____
Field blank No.: _____JB69587-18_____
Equipment blank No.:__JB69587-10_____
Field duplicate No.:____JB69587-8/JB69587-9_____

___X___ Data Completeness
___X___ Holding Times
___N/A_ GC/MS Tuning
___N/A_ Internal Standard Performance
___X___ Blanks
___X___ Surrogate Recoveries
___X___ Matrix Spike/Matrix Spike Duplicate
___X___ Laboratory Control Spikes
___X___ Field Duplicates
___X___ Calibrations
___X___ Compound Identifications
___X___ Compound Quantitation
___X___ Quantitation Limits

Overall Comments:_Methanol_by_SW846-8015C_(DAI)_____

Definition of Qualifiers:

J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated nondetect

Reviewer:_____
Date:__06/27/2013_____

DATA REVIEW WORKSHEETS

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

All criteria were met __X__
Criteria were not met
and/or see below _____

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	pH	ACTION
All samples analyzed within method recommended holding time.				

Criteria

Aqueous samples – 14 days from sample collection for preserved samples (pH $\leq$ 2, 4°C), no air bubbles.
Aqueous samples – 7 days from sample collection for unpreserved samples, 4°C, no air bubbles.
Soil samples- 7 days from sample collection.
Cooler temperature (Criteria: 4 $\pm$ 2 °C): 2.1°/1.8°C - OK

Actions

If the VOCs vial(s) have air bubbles, estimate positive results (J) and reject nondetects (R).
If the % solids of soil samples is 10-50%, estimates positive results (J) and nondetects (UJ)
If the % solid of soil samples is < 10%, estimate positive results (J) and reject nondetects (R).
If holding times are exceeded but < 14 days beyond criteria, estimate positive results (J) and nondetects (UJ).
If holding times are exceeded but < 28 days beyond criteria, estimate positive results (J) and reject nondetects (R).
If holding times are grossly exceeded (> 28 days beyond criteria), reject all results (R).
If samples were not iced or if the ice were melted (> 10°C), estimate positive results (J) and nondetects (UJ).

All criteria were met ___N/A____
Criteria were not met see below _____

GC/MS TUNING

The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits

_N/A_ The BFB performance results were reviewed and found to be within the specified criteria.

_N/A_ BFB tuning was performed for every 12 hours of sample analysis.

If no, use professional judgment to determine whether the associated data should be accepted, qualified or rejected.

List the samples affected: _____

If mass calibration is in error, all associated data are rejected.

DATA REVIEW WORKSHEETS

All criteria were met __X__
Criteria were not met
and/or see below _____

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____01/28/14_____
Dates of continuing calibration:___06/19/14;_06/20/13_____
Instrument ID numbers:_____GCGH_____
Matrix/Level:__Aqueous/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
All initial and continuing calibration meeth the method performance criteria.				

Criteria

All RFs must be > 0.05 regardless of method requirements for SPCC.
All %RSD must be ≤ 15 % regardless of method requirements for CCC.
All %Ds must be ≤ 20% regardless of method requirements for CCC.
It should be noted that Region 2 SOP HW-24 does not specify criterion for the curve correlation coefficient (r). A limit for r of ≥ 0.995 has therefore been utilized as professional judgment.

Actions

If any compound has an initial RF or a continuing RF of < 0.05, estimate positive results (J) and reject nondetects (R), regardless of method requirements.
If any compound has a %RSD > 15%, estimate positive results (J) and use professional judgment to qualify nondetects.
If any compound has a %RSD > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and nondetects (UJ).
If any compound has a % D > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has r > 0.995, estimate positive results and nondetects.

A separate worksheet should be filled for each initial curve

All criteria were met __X__
Criteria were not met
and/or see below _____

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS

____All_method_blank_meeth_method_specific_criteria_____

Field/Equipment/Trip blank

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS

_____

_No_target_analytes_detected_in_the_field/equipment_blanks_associated_with_this_data_____
_package._____

All criteria were met _X__
Criteria were not met
and/or see below _____

V B. BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

ALs = 10x the amount of common contaminants (methylene chloride, acetone, 2-butanone, and toluene)
ALs = 5x for any other compounds

Specific actions are as follows:

If the concentration is < sample quantitation limit (SQL) and ≤ AL, report the compound as not detected (U) at the SQL.
If the concentration is ≥ SQL but ≤ AL, report the compound as not detected (U) at the reported concentration.
If the concentration is ≥ SQL and > AL, report the concentration unqualified.

Notes:

High and low level blanks must be treated separately
Compounds qualified "U" for blank contamination are still considered "hits" when qualifying for calibration criteria.

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES

All criteria were met __X__
Criteria were not met
and/or see below _____

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.
List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery.
Matrix: solid/aqueous

SAMPLE ID **SURROGATE COMPOUND** **ACTION**

~~**1,2-DCA**~~ ~~**DBFM**~~ ~~**TOL-d8**~~ ~~**BFB**~~
Hexanol

_All_surrogate_recoveries_within_laboratory_control_limits_in_at_least_one_of_the_signal._____

QC Limits* (Aqueous)
_____LL_to_UL___ ____to_____ ___to_____ ___to_____ ___to_____
QC Limits* (Solid-Low)
_____LL_to_UL___ ____to_____ ___to_____ ___to_____ ___to_____
QC Limits* (Solid-Med)
_____LL_to_UL___ ____to_____ ___to_____ ___to_____ ___to_____

1,2-DCA = 1,2-Dichloromethane-d4 TOL-d8 = Toluene-d8
DBFM = Dibromofluoromethane BFB = Bromofluorobenzene

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 80 – 120 % for aqueous and 70 – 130 % for solid samples.

Actions:

QUALITY	%R < 10%	%R = 10% - LL	%R > UL
Positive results	J	J	J
Nondetects results	R	UJ	Accept

Surrogate action should be applied:
If one or more surrogate in the VOC fraction is out of specification, but has a recovery of > 10%.
If anyone surrogate in a fraction shows < 10 % recovery.

All criteria were met __X___
Criteria were not met
and/or see below _____

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:__JB68943-89ASpike-MS/4MSD_____ Matrix/Level: ___Soil_____
Sample ID:__JB69587-12MS/-12MSD_____ Matrix/Level: ___Soil_____

MS OR MSD	COMPOUND	% R	RPD	QC LIMITS	ACTION
_MS/MSD_recoveries_and_RPD_within_laboratory_control_limits._____					

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).
If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).
If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were met __X__
Criteria were not met
and/or see below _____

VII. B MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD – Unspiked Compounds

It should be noted that Region 2 SOP HW-24 does not specify a MS/MSD criteria for the unspiked compounds in the sample. A %RSD of < 50% has therefore been utilized as professional judgment.

If all target analytes were spiked in the MS/MSD, this review element is not applicable.

List the %RSD of the compounds which do not meet the criteria.

Sample ID:_____ Matrix/Level/Unit:_____

COMPOUND	SAMPLE CONC.	MS CONC.	MSD CONC.	% RSD	ACTION

Actions:

* If the % RSD > 50, qualify the positive result in the unspiked samples as estimated (J).
* If the % RSD is not calculated (NC) due to nondetected value, use professional judgment to qualify the data.

All criteria were met __X__
Criteria were not met
and/or see below _____

VIII. LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

Where LCS spiked with the same analyte at the same concentrations as the MS/MSD? Yes or No. If no make note in data review memo.
List the %R of compounds which do not meet the criteria

LCS ID	COMPOUND	% R	QC LIMIT

___Recoveries_within_laboratory_control_limits.__(blank_spikes)_____

_____

_____

_____

_____

_____

_____

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All analytes in the associated sample results are qualified for the following criteria.

If 25 % of the LCS recoveries were < LL (or 70 %), qualify all positive results (j) and reject nondetects (R).
If two or more LCS were below 10 %, qualify all positive results as (J) and reject nondetects (R).

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? Yes or No.
If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

All criteria were met __X__
Criteria were not met
and/or see below _____

IX. FIELD DUPLICATE PRECISION

Sample IDs: __JB69587-8/JB69587-9_____ Matrix:___Soil_____

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.
Suggested criteria: RPD ± 30% for aqueous samples, RPD ± 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
RPD within laboratory and generally acceptable control limits.					

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were met __N/A___
Criteria were not met
and/or see below _____

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

* Area of +100% or -50% of the IS area in the associated calibration standard.
* Retention time (RT) within 30 seconds of the IS area in the associated calibration standard.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION

Actions:

1. IS actions should be applied to the compound quantitated with the out-of-control ISs

QUALITY	IS AREA < -25%	IS AREA = -25 % TO – 50%	IS AREA > + 100%
Positive results	J	J	J
Nondetected results	R	UJ	ACCEPT

2. If a IS retention time varies more than 30 seconds, the chromatographic profile for that sample must be examined to determine if any false positive or negative exists. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for the sample fraction.

All criteria were met __X__
Criteria were not met
and/or see below _____

XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

JB69587-12MS

Methanol RF = 15.75

[ ] = (84765)/(15.75)

= 5381.9 ppb OK

All criteria were met __X__
Criteria were not met
and/or see below _____

XII. QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION

B. Percent Solids

List samples which have ≤ 50 % solids

_____
_____
_____
_____
_____
_____

Actions:

If the % solids of a soil sample is 10-50%, estimate positive results (J) and nondetects (UJ)

If the % solids of a soil sample is < 10%, estimate positive results (J) and reject nondetects (R)

DATA REVIEW WORKSHEETS

Project Number:____JB69587_____
Date:_____06/27/2014_____

REVIEW OF VOLATILE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: USEPA Region 2, SOP HW-24, Standard Operating Procedure for the Validation of Organic Data Acquired using SW-846 Method 8260B (August, 2009-Revision 2), the USEPA National Functional Guidelines for Low/Medium Concentration Organic Data Review (SOW SOM01.2 SOP HW-33, August 2009 – Revision 2), the USEPA National Functional Guidelines for Organic Data Review for Low Concentration Water (SOP HW-13, August, 2009-Revision 3). Also, QC criteria from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update III, December 1996)," specifically for Methods 8000/8260B are utilized. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) _Accutest_____ data package received has been reviewed and the quality control and performance data summarized. The data review for VOCs included:

Lab. Project/SDG No.: __JB69587_____ Sample matrix: ___Solid_____
No. of Samples: _____23_____

Trip blank No.: ____JB69587-19;_JB69587-20_____
Field blank No.: ____JB69587-18_____
Equipment blank No.:_JB69587-10_____
Field duplicate No.:__JB69587-8/-9_____

___X___ Data Completeness
___X___ Holding Times
___X___ GC/MS Tuning
___X___ Internal Standard Performance
___X___ Blanks
___X___ Surrogate Recoveries
___X___ Matrix Spike/Matrix Spike Duplicate
___X___ Laboratory Control Spikes
___X___ Field Duplicates
___X___ Calibrations
___X___ Compound Identifications
___X___ Compound Quantitation
___X___ Quantitation Limits

Overall Comments:_Selected__VOC's_by_SW846-8260B_____
_____

Definition of Qualifiers:

J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated nondetect

Reviewer:_____
Date:__06/27/2013_____

DATA REVIEW WORKSHEETS

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

All criteria were met __X__
Criteria were not met
and/or see below _____

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	pH	ACTION
All samples analyzed within the recommended method holding time				

Criteria

Aqueous samples – 14 days from sample collection for preserved samples (pH $\leq$ 2, 4°C), no air bubbles.
Aqueous samples – 7 days from sample collection for unpreserved samples, 4°C, no air bubbles.
Soil samples- 7 days from sample collection.
Cooler temperature (Criteria: 4 $\pm$ 2 °C): 2.1°/1.8°C - OK

Actions

If the VOCs vial(s) have air bubbles, estimate positive results (J) and reject nondetects (R).
If the % solids of soil samples is 10-50%, estimates positive results (J) and nondetects (UJ)
If the % solid of soil samples is < 10%, estimate positive results (J) and reject nondetects (R).
If holding times are exceeded but < 14 days beyond criteria, estimate positive results (J) and nondetects (UJ).
If holding times are exceeded but < 28 days beyond criteria, estimate positive results (J) and reject nondetects (R).
If holding times are grossly exceeded (> 28 days beyond criteria), reject all results (R).
If samples were not iced or if the ice were melted (> 10°C), estimate positive results (J) and nondetects (UJ).

All criteria were met __X__
Criteria were not met see below _____

GC/MS TUNING

The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits

__X___ The BFB performance results were reviewed and found to be within the specified criteria.

__X___ BFB tuning was performed for every 12 hours of sample analysis.

If no, use professional judgment to determine whether the associated data should be accepted, qualified or rejected.

List the samples affected: _____

If mass calibration is in error, all associated data are rejected.

All criteria were met __X__
Criteria were not met
and/or see below _____

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____06/12/14_____06/13/14_____
Dates of continuing calibration:_06/13/14;_06/21/14____06/22/14;_06/23/14_____
Instrument ID numbers:_____GCMS3A_____GCMSA_____
Matrix/Level:_____Aqueous/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, **%D**, r	COMPOUND	SAMPLES AFFECTED
Initial and continuing calibration meet method specific requirements				

Criteria

All RFs must be > 0.05 regardless of method requirements for SPCC.
All %RSD must be ≤ 15 % regardless of method requirements for CCC.
All %Ds must be ≤ 20% regardless of method requirements for CCC.
It should be noted that Region 2 SOP HW-24 does not specify criterion for the curve correlation coefficient (r). A limit for r of ≥ 0.995 has therefore been utilized as professional judgment.

Actions

If any compound has an initial RF or a continuing RF of < 0.05, estimate positive results (J) and reject nondetects (R), regardless of method requirements.
If any compound has a %RSD > 15%, estimate positive results (J) and use professional judgment to qualify nondetects.
If any compound has a %RSD > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and nondetects (UJ).
If any compound has a % D > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has r > 0.995, estimate positive results and nondetects.

A separate worksheet should be filled for each initial curve

All criteria were met _____
Criteria were not met
and/or see below __X__

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____06/11/14_____06/18/14_____
Dates of continuing calibration:_06/20/14;__06/23/13;__06/19/14;__06/20/14;__06/21/14_
Instrument ID numbers:_____GCMSV_____GCMSX_____
Matrix/Level:_____Aqueous/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
GCMSV				
06/20/14	cc7751-20	- 23.1 %	4-methyl-2-pentanone	JB69587-16; -17; -21; -16MS; -17DUP
06/23/14	cc7751-50	- 27.9 %	4-methyl-2-pentanone	JB69587-1; -2; 1MS; -2DUP; -11; -13

Action: estimate positive results (J) and nondetects (UJ).

Criteria

All RFs must be > 0.05 regardless of method requirements for SPCC.
All %RSD must be ≤ 15 % regardless of method requirements for CCC.
All %Ds must be ≤ 20% regardless of method requirements for CCC.
It should be noted that Region 2 SOP HW-24 does not specify criterion for the curve correlation coefficient (r). A limit for r of ≥ 0.995 has therefore been utilized as professional judgment.

Actions

If any compound has an initial RF or a continuing RF of < 0.05, estimate positive results (J) and reject nondetects (R), regardless of method requirements.
If any compound has a %RSD > 15%, estimate positive results (J) and use professional judgment to qualify nondetects.
If any compound has a %RSD > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has a % RSD > 20%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and nondetects (UJ).
If any compound has a % D > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has r > 0.995, estimate positive results and nondetects.

A separate worksheet should be filled for each initial curve

All criteria were met __X__
Criteria were not met
and/or see below _____

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
____All_method_blank_meeth_method_specific_criteria_____				

Field/Equipment/Trip blank

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS

_____
_No_target_analytes_detected_in_the_trip/field/equipment_blanks_analyzed_with_this_data_____
_package._____

All criteria were met __X__
Criteria were not met
and/or see below _____

V B. BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

ALs = 10x the amount of common contaminants (methylene chloride, acetone, 2-butanone, and toluene)
ALs = 5x for any other compounds

Specific actions are as follows:

If the concentration is < sample quantitation limit (SQL) and ≤ AL, report the compound as not detected (U) at the SQL.
If the concentration is ≥ SQL but ≤ AL, report the compound as not detected (U) at the reported concentration.
If the concentration is ≥ SQL and > AL, report the concentration unqualified.

Notes:

High and low level blanks must be treated separately
Compounds qualified "U" for blank contamination are still considered "hits" when qualifying for calibration criteria.

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES

All criteria were met __X__
Criteria were not met
and/or see below _____

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.
List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery.
Matrix: solid/aqueous

SAMPLE ID	SURROGATE COMPOUND				ACTION
	1,2-DCA	DBFM	TOL-d8	BFB	

_All_surrogate_recoveries_within_laboratory_control_limits_____

QC Limits* (Aqueous)
_____LL_to_UL___ ____to_____ ___to_____ ___to_____ ___to_____
QC Limits* (Solid-Low)
_____LL_to_UL___ ____to_____ ___to_____ ___to_____ ___to_____
QC Limits* (Solid-Med)
_____LL_to_UL___ ____to_____ ___to_____ ___to_____ ___to_____

1,2-DCA = 1,2-Dichloromethane-d4 TOL-d8 = Toluene-d8
DBFM = Dibromofluoromethane BFB = Bromofluorobenzene

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 80 – 120 % for aqueous and 70 – 130 % for solid samples.

Actions:

QUALITY	%R < 10%	%R = 10% - LL	%R > UL
Positive results	J	J	J
Nondetects results	R	UJ	Accept

Surrogate action should be applied:
If one or more surrogate in the VOC fraction is out of specification, but has a recovery of > 10%.
If any one surrogate in a fraction shows < 10 % recovery.

All criteria were met __X__
Criteria were not met
and/or see below _____

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:__JB69587-16MS____ Matrix/Level:___Solid_____
Sample ID:__JB69587-4MS_____ Matrix/Level:___Solid_____
Sample ID:__JB69587-1MS_____ Matrix/Level:___Solid_____
Sample ID:__JB69700-3MS_____ Matrix/Level:___Solid_____

MS OR MSD	COMPOUND	% R	RPD	QC LIMITS	ACTION
_JB69700-3MS_____					
_MS_____	Ethylbenzene_____	204_%_____		30-139_____	No_action_

Note: No action – ethylbenzene not detected in affected sample JB69587-19

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).
If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).
If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were met __X__
Criteria were not met
and/or see below _____

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:__JB69587-12MS/-12MSD___ Matrix/Level:___Soil_____
Sample ID:__JB695352-11MS/-11MSD__ Matrix/Level:___ Aqueous _____

MS OR MSD	COMPOUND	% R	RPD	QC LIMITS	ACTION

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).
If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).
If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were met __X__
Criteria were not met
and/or see below _____

VII. B MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD – Unspiked Compounds

It should be noted that Region 2 SOP HW-24 does not specify a MS/MSD criteria for the unspiked compounds in the sample. A %RSD of < 50% has therefore been utilized as professional judgment.

If all target analytes were spiked in the MS/MSD, this review element is not applicable.

List the %RSD of the compounds which do not meet the criteria.

Sample ID:_____ Matrix/Level/Unit:_____

COMPOUND	SAMPLE CONC.	MS CONC.	MSD CONC.	% RSD	ACTION

Actions:

* If the % RSD > 50, qualify the positive result in the unspiked samples as estimated (J).
* If the % RSD is not calculated (NC) due to nondetected value, use professional judgment to qualify the data.

All criteria were met __X__
Criteria were not met
and/or see below _____

VIII. LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

Where LCS spiked with the same analyte at the same concentrations as the MS/MSD? Yes or No. If no make note in data review memo.
List the %R of compounds which do not meet the criteria

LCS ID	COMPOUND	% R	QC LIMIT

___Recoveries_within_laboratory_control_limits_(blank_spikes)_____

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All analytes in the associated sample results are qualified for the following criteria.

If 25 % of the LCS recoveries were < LL (or 70 %), qualify all positive results (j) and reject nondetects (R).
If two or more LCS were below 10 %, qualify all positive results as (J) and reject nondetects (R).

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? Yes or No.
If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

All criteria were met __X__
Criteria were not met
and/or see below _____

IX. FIELD DUPLICATE PRECISION

Sample IDs: __JB69587-8/-9_____ Matrix:___Soil____

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.
Suggested criteria: RPD ± 30% for aqueous samples, RPD ± 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
RPD within laboratory and general acceptable control limits					

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were met _____
Criteria were not met
and/or see below ___X___

IX. LABORATORY DUPLICATE PRECISION

Sample IDs: __JB69587-17/-17DUP_____ Matrix:__Soil____
Sample IDs: __JB69587-3/-2DUP_____ Matrix:__Soil____
Sample IDs: __JB69587-2/-2DUP_____ Matrix:__Soil____
Sample IDs: __JB69959-2/-2DUP_____ Matrix:__Soil____

Laboratory duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.
Suggested criteria: RPD ± 30% for aqueous samples, RPD ± 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
JB69959-2/-2DUP					
Ethylbenzene		17.3	8.5	68	No action – sample used for QC only; outside sample batch
Toluene		0.98	0.58	51	
Xylenes		15.7	8.4	61	

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were met ____
Criteria were not met
and/or see below __X__

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

* Area of +100% or -50% of the IS area in the associated calibration standard.
* Retention time (RT) within 30 seconds of the IS area in the associated calibration standard.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION

_Internal_standard_area_within_laboratory_control_limits_except_for_the_following:_____

__06/20/14____JB69587-12MSD__Tert-butyl_alcohol__37948___150324_-_39581___No_action_

Actions:

1. IS actions should be applied to the compound quantitated with the out-of-control ISs

QUALITY	IS AREA < -25%	IS AREA = -25 % TO – 50%	IS AREA > + 100%
Positive results	J	J	J
Nondetected results	R	UJ	ACCEPT

2. If a IS retention time varies more than 30 seconds, the chromatographic profile for that sample must be examined to determine if any false positive or negative exists. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for the sample fraction.

All criteria were met __X__
Criteria were not met
and/or see below _____

XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

Blank Spike 06/20/14 (GCMSX)

Acetone RF = 0.025

[ ] = (5455)(50)/(206321)(0.025)

= 52.8 ppb OK

All criteria were met __X__
Criteria were not met
and/or see below _____

XII. QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION

B. Percent Solids

List samples which have ≤ 50 % solids

_____
_____
_____
_____
_____
_____

Actions:

If the % solids of a soil sample is 10-50%, estimate positive results (J) and nondetects (UJ)

If the % solids of a soil sample is < 10%, estimate positive results (J) and reject nondetects (R)