CERTIFICATION

SDG No:	1701428D	Laboratory:	Eurofins, Folson, CA
Site:	BMSMC	Matrix:	Air

SUMMARY: Air samples (Table 1) were collected on the BMSMC facility. The BMSMC facility is located in Humacao, PR. Samples were taken January 21, 23, 24 and 26, 2017 and were analyzed in Eurofins Laboratory of Folson, California that reported the data under SDG No.: 1701428D. Results were validated using the validation QC requirements of ASTM D-1946 method for measuring permanent gases and light hydrocarbons in refinery and other sources samples using gas chromatography (GC) and a thermal conductivity detector (TCD) and/or flame ionization detection (FID). The sample integrity and preservation section is validated following the criteria of the following guideline document: USEPA, Validating Air Samples. Volatile Organic Analysis of Ambient Air in Canisters by Method TO-15, (SOP # HW-31. Revision #6. June, 2014). The analyses performed are shown in Table 1. Individual data review worksheets are enclosed for each target analyte group. The data sample summary form shows analyte results that were qualified.

In summary, the results are valid and can be used for decision making purposes.

Table 1. Samples analyzed and analysis performed

SAMPLE ID	SAMPLE DESCRIPTION	MATRIX	ANALYSIS PERFORMED
1701428D-01A	B30IA-1-012117	Air	Methane
1701428D-02A	B30IA-2-012117	Air	Methane
1701428D-03A	B30IA-3-012117	Air	Methane
1701428D-04A	B30IA-4-012117	Air	Methane
1701428D-05A	B30IA-4D-012117	Air	Methane
1701428D-06A	B30IA-5-012117	Air	Methane
1701428D-07A	B1830AA-012117	Air	Methane
1701428D-08A	B18IA-1-012117	Air	Methane
1701428D-09A	B18IA-1D-012117	Air	Methane
1701428D-10A	B18IA-2-012117	Air	Methane
1701428D-11A	B18IA-3-012117	Air	Methane
1701428D-12A	B18IA-4-012117	Air	Methane
1701428D-13A	B8IA-2-012317	Air	Methane
1701428D-14A	B8IA-2D-012317	Air	Methane
1701428D-15A	B8AA-012317	Air	Methane
1701428D-16A	B8SS-2-012417	Air	Methane
1701428D-17A	B8SS-2D-012417	Air	Methane
1701428D-18A	B18SS-1-012617	Air	Methane
1701428D-19A	B18SS-1Dup-012617	Air	Methane

Reviewer Name: Rafael Infante
Chemist License 1888

Signature:

Date: March 18, 2017

ESTADO LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
LIC # 1888
QUIMICO LICENCIADO
$1.00
A 1617199

eurofins | Air Toxics

Client Sample ID: B30IA-1-012117

Lab ID#: 1701428D-01A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	10020205	Date of Collection:	1/21/17 6:17:00 PM
Dil. Factor:	1.61	Date of Analysis:	2/2/17 09:57 AM

Compound	Rpt. Limit (%)	Amount (%)
Methane	0.00016	0.0011

Container Type: 6 Liter Summa Canister (100% Certified)

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

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Client Sample ID: B30IA-2-012117

Lab ID#: 1701428D-02A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	10020206	Date of Collection:	1/21/17 6:20:00 PM
Dil. Factor:	1.64	Date of Analysis:	2/2/17 10:22 AM

Compound	Rpt. Limit (%)	Amount (%)
Methane	0.00016	0.00044

Container Type: 6 Liter Summa Canister (100% Certified)

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

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Client Sample ID: B301A-3-012117

Lab ID#: 1701428D-03A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	10020207	Date of Collection:	1/21/17 6:21:00 PM
Dil. Factor:	1.91	Date of Analysis:	2/2/17 10:59 AM

Compound	Rpt. Limit (%)	Amount (%)
Methane	0.00019	0.00071

Container Type: 6 Liter Summa Canister (100% Certified)

...ABORATORIO ASOCIADO DE PUERTO RICO
...fael Infante Méndez
...IC # 1888
...QUIMICO LICENCIADO

eurofins | Air Toxics

Client Sample ID: B30IA-4-012117

Lab ID#: 1701428D-04A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	10020208	Date of Collection:	1/21/17 6:22:00 PM
Dil. Factor:	1.61	Date of Analysis:	2/2/17 11:23 AM

Compound	Rpt. Limit (%)	Amount (%)
Methane	0.00016	0.00056

Container Type: 6 Liter Summa Canister (100% Certified)

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

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Client Sample ID: B30IA-4D-012117

Lab ID#: 1701428D-05A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	10020209	Date of Collection:	1/21/17 6:22:00 PM
Dil. Factor:	1.68	Date of Analysis:	2/2/17 11:53 AM

Compound	Rpt. Limit (%)	Amount (%)
Methane	0.00017	0.00054

Container Type: 6 Liter Summa Canister (100% Certified)

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

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Client Sample ID: B30IA-5-012117

Lab ID#: 1701428D-06A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	10020210	Date of Collection:	1/21/17 6:25:00 PM
Dil. Factor:	1.64	Date of Analysis:	2/2/17 12:19 PM

Compound	Rpt. Limit (%)	Amount (%)
Methane	0.00016	0.00040

Container Type: 6 Liter Summa Canister (100% Certified)

ASOCIADO DE PUERTO RICO
Manuel Infante Méndez
1888
QUIMICO LICENCIADO

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Client Sample ID: B1830AA-012117

Lab ID#: 1701428D-07A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	10020211	Date of Collection:	1/21/17 6:42:00 PM
Dil. Factor:	1.64	Date of Analysis:	2/2/17 12:42 PM

Compound	Rpt. Limit (%)	Amount (%)
Methane	0.00016	0.00018

Container Type: 6 Liter Summa Canister (100% Certified)

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

eurofins | Air Toxics

Client Sample ID: B18IA-1-012117

Lab ID#: 1701428D-08A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	10020212	Date of Collection:	1/21/17 6:07:00 PM
Dil. Factor:	1.79	Date of Analysis:	2/2/17 01:23 PM

Compound	Rpt. Limit (%)	Amount (%)
Methane	0.00018	0.00020

Container Type: 6 Liter Summa Canister (100% Certified)

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

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Client Sample ID: B18IA-1D-012117

Lab ID#: 1701428D-09A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10020213**	**Date of Collection:**	**1/21/17 6:07:00 PM**
Dil. Factor:	**1.68**	**Date of Analysis:**	**2/2/17 01:53 PM**

Compound	**Rpt. Limit (%)**	**Amount (%)**
Methane	0.00017	0.00021

Container Type: 6 Liter Summa Canister (100% Certified)

eurofins | Air Toxics

Client Sample ID: B18IA-2-012117

Lab ID#: 1701428D-10A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10020214**	**Date of Collection:**	**1/21/17 6:00:00 PM**
Dil. Factor:	**1.75**	**Date of Analysis:**	**2/2/17 02:20 PM**

Compound	Rpt. Limit (%)	Amount (%)
Methane	0.00018	0.00018

Container Type: 6 Liter Summa Canister (100% Certified)

eurofins | Air Toxics

Client Sample ID: B18IA-3-012117

Lab ID#: 1701428D-11A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	10020215	Date of Collection:	1/21/17 6:10:00 PM
Dil. Factor:	1.58	Date of Analysis:	2/2/17 03:14 PM

Compound	Rpt. Limit (%)	Amount (%)
Methane	0.00016	0.00022

Container Type: 6 Liter Summa Canister (100% Certified)

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

eurofins | Air Toxics

Client Sample ID: B18IA-4-012117

Lab ID#: 1701428D-12A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	10020216	Date of Collection:	1/21/17 6:12:00 PM
Dil. Factor:	1.41	Date of Analysis:	2/2/17 03:39 PM

Compound	Rpt. Limit (%)	Amount (%)
Methane	0.00014	0.00021

Container Type: 6 Liter Summa Canister (100% Certified)

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Client Sample ID: B8IA-2-012317

Lab ID#: 1701428D-13A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	10020217	Date of Collection:	1/23/17 12:23:00 PM
Dil. Factor:	1.75	Date of Analysis:	2/2/17 04:05 PM

Compound	Rpt. Limit (%)	Amount (%)
Methane	0.00018	0.00028

Container Type: 6 Liter Summa Canister (100% Certified)

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Client Sample ID: B8IA-2D-012317

Lab ID#: 1701428D-14A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	10020218	Date of Collection:	1/23/17 12:23:00 PM
Dil. Factor:	1.87	Date of Analysis:	2/2/17 04:32 PM

Compound	Rpt. Limit (%)	Amount (%)
Methane	0.00019	0.00024

Container Type: 6 Liter Summa Canister (100% Certified)

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Client Sample ID: B8AA-012317

Lab ID#: 1701428D-15A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	10020219	Date of Collection:	1/23/17 9:20:00 AM
Dil. Factor:	1.46	Date of Analysis:	2/2/17 04:55 PM

Compound	Rpt. Limit (%)	Amount (%)
Methane	0.00015	0.00024

Container Type: 6 Liter Summa Canister (100% Certified)

LIBRE ASOCIADO DE PUERTO RICO
Miguel Infante Méndez
1858
QUIMICO LICENCIADO

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Client Sample ID: B8SS-2-012417

Lab ID#: 1701428D-16A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10020220**	**Date of Collection:**	**1/24/17 3:35:00 PM**
Dil. Factor:	**2.49**	**Date of Analysis:**	**2/2/17 05:40 PM**

Compound	**Rpt. Limit (%)**	**Amount (%)**
Methane	0.00025	34

Container Type: 1 Liter Summa Canister (100% Certified)

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Client Sample ID: B8SS-2D-012417

Lab ID#: 1701428D-17A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	10020221	Date of Collection:	1/24/17 3:35:00 PM
Dil. Factor:	2.42	Date of Analysis:	2/2/17 06:49 PM

Compound	Rpt. Limit (%)	Amount (%)
Methane	0.00024	33

Container Type: 1 Liter Summa Canister (100% Certified)

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

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Client Sample ID: B18SS-1-012617

Lab ID#: 1701428D-18A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	10020222	Date of Collection:	1/26/17 5:30:00 PM
Dil. Factor:	2.50	Date of Analysis:	2/2/17 07:13 PM

Compound	Rpt. Limit (%)	Amount (%)
Methane	0.00025	0.00021 J

J = Estimated value.

Container Type: 1 Liter Summa Canister (100% Certified)

LIBRE ASOCIADO DE PUERTO RICO
Manuel Infante Méndez
Q # 1588
QUIMICO LICENCIADO

eurofins | Air Toxics

Client Sample ID: B18SS-1Dup-012617

Lab ID#: 1701428D-19A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	10020223	Date of Collection:	1/26/17 5:30:00 PM
Dil. Factor:	2.46	Date of Analysis:	2/2/17 07:38 PM

Compound	Rpt. Limit (%)	Amount (%)
Methane	0.00025	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

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Sample Transportation Notice
Relinquishing signature on this document indicates that sample is being shipped in compliance with all applicable local, State, Federal, national, and international laws, regulations and ordinances of any kind. Air Toxics Limited assumes no liability with respect to the collection, handling or shipping of these samples. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Air Toxics Limited against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples. D.O.T. Hotline (800) 467-4922

180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX (916) 985-1020

Page 1 of 2

Project Manager: Terry Taylor
Collected by: (Print and Sign) RO, TT, DL, RNO
Company: AMAI Email: ttaylor@amiconsult.com
Address: 2700 Westchester Ave City: Purchase State: NY Zip: 10577
Phone: 914-251-0400 x309 Fax: 914-251-1286

Project Info:
P.O. #
Project #: BMS V1
Project Name: BMS V1

Turn Around Time:
☒ Normal
☐ Rush
specify

Lab Use Only
Pressurized by:
Date:
Pressurization Gas: N_2 He

Lab I.D.	Field Sample I.D. (Location)	Can #	Date of Collection	Time of Collection	Analyses Requested	Canister Pressure/Vacuum Initial	Final	Receipt	Final (psi)
01A	B301A-1-012117	25236	01/21/17	1817	TO-15, MeOH, CH_4	30"	5"		
02A	B301A-2-012117	N1755	01/21/17	1820	TO-15, MeOH, CH_4	30"	6.5		
03A	B301A-3-012117	9551	01/21/17	1821	TO-15, MeOH, CH_4	28"	10.5"		
04A	B301A-4-012117	00895	01/21/17	1822	TO-15, MeOH, CH_4	30"	5"		
05A	B301A-4D-012117 00898	~~00895~~	01/21/17	1822	TO-15, MeOH, CH_4	30"	6"		
06A	B301A-5-012117	33787	01/21/17	1825	TO-15, MeOH, CH_4	30"+	6"		
07A	B1830AA-012117	33585	1/21/17	1842	TO-15, MeOH, CH_4	30"	6"		
08A	B181A-1-012117	N1735	1/21/17	1807	TO-15, MeOH, CH_4	30"+	8"		
09A	B181A-1D-012117	00138	1/21/17	1807	TO-15, MeOH, CH_4	30"	7.5"		
10A	B181A-2-012117	6L1216	1/21/17	1800	TO-15, MeOH, CH_4	30"+	5"		

Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
[signature]	1-27-17 1400	Fed EX Track No. 7782 9053 0772	
Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
		[signature]	1/30/17 0920
Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time

Notes: Tag for canister 00898 indicated it is N0448. That ID is not on the packing slip. The canister has the serial # 00898, and is listed on the packing slip

Lab Use Only	Shipper Name	Air Bill #	Temp (°C)	Condition	Custody Seals Intact?	Work Order #
	Fed Ex		N/A	good	Yes No (None)	1701428

Form 1293 rev.11

Air Toxics LTD.

Chain-of-Custody Record

Contact Person Terry Taylor
Company Anderson Mulholland & Associates, Inc.
Address 2700 Winchester, Suite 417 City Purchase State NY Zip 10577
Phone 914-251-0400, x 309 FAX
Collected By: (Signature)

Project Information:
P.O. #
Project #
Project Name BMS VI Invest.
Buildings 8,13, 5, 18, and 30

Turn Around Time:
[X] Normal
[ ] Rush
Specify

Pressurized by:
Date:
Press. Gas: N2 He

Lab I.D.	Field Sample I.D.	Canister I.D.	Date & Time	Analysis Requested	Canister Pressure/Vacuum Initial	Final	Receipt	Final (psi)
11 A	B18IA-3-012117	34320	1/21/17:1810	TO-15, MeOH, CH_4	29 "Hg	6		
12 A	B18IA-4-012117	N1591	1/21/17:1812	TO-15, MeOH, CH_4	29.5 "Hg	6		
13 A	B8IA-2-012317	N1726	1/23/17:1223	TO-15, MeOH, CH_4	29 "Hg	8		
14 A	B8IA-2D-012317	N0416	1/23/17:1223	TO-15, MeOH, CH_4	29 "Hg	9		
15 A	B8AA-012317	0316	1/23/17:0920	TO-15, MeOH, CH_4	29 "Hg	3		
16 A	B8SS-2-012417	1L1603	1/24/17:1535	TO-15, MeOH, CH_4	30 "Hg	5		
17 A	B8SS-2D-012417	12373	1/24/17:1535	TO-15, MeOH, CH_4	29 "Hg	5		
18 A	B18SS-1-012617	1L1720	1/26/17:1730	TO-15, MeOH, CH_4	30 "Hg	5		
~~19 A~~	~~B18SS-1DUP-012616~~				"Hg			
20 A	B18SS-1DUP-012617	N1939	1/26/17:1730	TO-15, MeOH, CH_4	30 "Hg	6		

N.V. 1/30/17 19A

Relinquished By: (Signature) Date/Time 1-27-17 1400
Received By: (Signature) Date/Time Fed EX
Relinquished By: (Signature) Date/Time
Received By: (Signature) Date/Time 1/28/17 0920
Relinquished By: (Signature) Date/Time
Received By: (Signature) Date/Time

Notes:
FedEx Tracking No. 7782 9053 0772

Shipper Name	Air Bill #	Opened By	Temp ©	Condition	Custody Seals	Work Order #
Fed Ex		EATL	N/A	good	Yes No None	1701428

EXECUTIVE NARRATIVE

SDG No:	**1701428D**	Laboratory:	**Eurofins, Folson, CA**
Analysis:	**ASTM D-1946**	Number of Samples:	**19**
Location:			

SUMMARY: Nineteen (19) samples were analyzed for methane in ambient air following ASTM Method D-1946. The sample results were assessed according to the following documents in the order of precedence: QC criteria from ASTM D-1946 method for measuring permanent gases and light hydrocarbons in refinery and other sources samples using gas chromatography (GC) and a thermal conductivity detector (TCD) and/or flame ionization detection (FID). The sample integrity and preservation section is validated following the criteria of the following guideline document: USEPA, Validating Air Samples. Volatile Organic Analysis of Ambient Air in Canisters by Method TO-15, (SOP # HW-31. Revision #6. June, 2014). The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

Results are valid and can be used for decision making purposes.

Critical issues: **None**
Major: **None**
Minor: **None**

Critical findings: **None**
Major findings: **None**
Minor findings: **1.** Field duplicates analyzed with this data package. RPD within laboratory and generally acceptable control limits except for the cases described in the Data Review Worksheet. No action taken, sample and duplicate concentration < 5 x SQL.

COMMENTS: Results are valid and can be used for decision making purposes.

Reviewers Name: Rafael Infante
Chemist License 1888

Signature: Rafael Infante
Date: March 17, 2017

METHANE DATA SAMPLE SUMMARY

METHOD: ASTM D-1946

METHANE - ASTM - D-1946

Sample ID	Date	Results	Units	Dilution Factor	Lab Flag	Validation	Reportable
1701428D-01A	1/21/2017	0.0011	%	1.61	-	-	Yes
1701428D-02A	1/21/2017	0.00044	%	1.64	-	-	Yes
1701428D-03A	1/21/2017	0.00071	%	1.91	-	-	Yes
1701428D-04A	1/21/2017	0.00056	%	1.61	-	-	Yes
1701428D-05A	1/21/2017	0.00054	%	1.68	-	-	Yes
1701428D-06A	1/21/2017	0.0004	%	1.64	-	-	Yes
1701428D-07A	1/21/2017	0.00018	%	1.64	-	-	Yes
1701428D-08A	1/21/2017	0.0002	%	1.79	-	-	Yes
1701428D-09A	1/21/2017	0.00021	%	1.68	-	-	Yes
1701428D-10A	1/21/2017	0.00018	%	1.75	-	-	Yes
1701428D-11A	1/21/2017	0.00022	%	1.58	-	-	Yes
1701428D-12A	1/21/2017	0.00021	%	1.41	-	-	Yes
1701428D-13A	1/23/2017	0.00028	%	1.75	-	-	Yes
1701428D-14A	1/23/2017	0.00024	%	1.87	-	-	Yes
1701428D-15A	1/23/2017	0.00024	%	1.46	-	-	Yes
1701428D-16A	1/24/2017	34.0	%	2.49	-	-	Yes
1701428D-17A	1/24/2017	33.0	%	2.42	-	-	Yes
1701428D-18A	1/26/2017	0.00021	%	2.50	J	J	Yes
1701428D-19A	1/26/2017	0.00025	%	2.46	-	U	Yes

Project Number:____1701428D_____
Date:____01/21-23-24-26/2017_____

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 the following documents in the order of precedence: QC criteria from ASTM D-1946 method for measuring permanent gases and light hydrocarbons in refinery and other sources samples using gas chromatography (GC) and a thermal conductivity detector (TCD) and/or flame ionization detection (FID). The sample integrity and preservation section is validated following the criteria of the following guideline document: USEPA, Validating Air Samples. Volatile Organic Analysis of Ambient Air in Canisters by Method TO-15, (SOP # HW-31. Revision #6. June, 2014). 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) _Eurofins_____ data package received has been reviewed and the quality control and performance data summarized. The data review for VOCs included:

Lab. Project/SDG No.: __1701428D_____ Sample matrix: ___Air_____
No. of Samples: _____19_____

Trip blank No.: _____-_____
Field blank No.: _____-_____
Equipment blank No.:___-_____
Field duplicate No.:_ 1701428D-04A/1701428D-05A;_1701428D-08A/1701428D-09A_____
_____1701428D-13A/1701428D-14A;_1701428D-16A/1701428D-17A_____
_____1701428D-18A/1701428D-19A_____

___X___ Data Completeness
___X___ Holding Times
___X___ Calibrations
___X___ Blanks
___X___ Quantitation Limits
___X___ Laboratory Control Spikes
___X___ Field Duplicates
___X___ Compound Identifications
___X___ Compound Quantitation

Overall Comments:_Methane_by_ASTM_method_D-1946_(modified)_____
_____

Definition of Qualifiers:
J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated nondetect

Reviewer:_____ Rafael Dufant _____

Date:__ 03/17/2017_____

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

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

SAMPLE INTEGRITY AND PRESERVATION

Canister used for sampling of the ambient air must be demonstrated clean, and leak free prior to sample collection. Cleanliness is demonstrated by the analysis of an individual canister or analysis of a representative canister, if only batch cleaning was required. Leak proof testing is performed on individual canisters. Canisters are used in conjunction with gauges, valves and flow controllers. Therefore, canister should be demonstrated clean and leak free inclusive of these components as appropriate.

a. Leak proof test:
Was the pressure of each canister measured before shipping? **Yes** or No
Was the pressure of each canister measured before sampling? **Yes** or No
Did the canister hold vacuum/pressure within +/- 2 psi from the date shipped to the sampling date? **Yes** or No

Note:

1. The laboratory should be notified if the difference between the laboratory and field pressure is greater than 2 psi.

Actions:
Actions for use of canisters with failing leak test criteria are indicated in Table 1 below.

Table 1. Canister Leak test Actions for TO-15 Analysis*

Matrix	Difference in initial and 24 hour pressure (psi) Criteria	Action	
		Detected Associated Compounds	Non-Detected Associated Compounds
Air	≤ 5	No qualification	
Air	> 5	J	UJ or R

*Excessive time period (> 3months) elapsed between leak test and actual use should be considered in evaluation of canister integrity.

b. Cleanliness
Integrity of the canister used for sampling of air for analysis should be maintained at all times including time of shipment to the field, sampling, shipping back to the laboratory and time of analysis. Analytical results of canister cleaning verification must be taken into account in the validation of sample results.

Does the canister meet the cleanliness criteria? **Yes** or No

Is the canister verification included in the data package? Yes or **No**

Actions:

Canister contamination actions are stated in Table 2 below.

Note: Laboratory states that samples were collected on SUMMA canisters 100 % qualified.

Table 2. Canister Contamination Actions for TO-15 Analyses

Contamination Type/level	Canister Cleaning Result	Sample Result	Action for Samples
Clean Canister analysis	Detects	Analytes found in clean canister analysis are non-detects	No qualification required
	<CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL and < 2x the CRQL	Report concentration of sample with a U
		≥ 2x the CRQL	No qualification required
	> CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL and ≤ clean canister value	Report clean canister value with a U
		≥ CRQL and > clean canister value	No qualification required
	= CRQL	≤ CRQL	Report CRQL value with a U
		> CRQL	No qualification required

c. Holding time and sample integrity

SUMMA canisters are to minimize sample charges or loss for majority of the analyte. Sample integrity is maintained by ensuring the system is closed tight and canister pressure from the time of sampling to the time of analysis is maintained within a difference allowable due to temperature change.

Was the canister pressure measured at the conclusion of the sampling period? **Yes** or No

Was the canister pressure measured upon arrival to the laboratory? **Yes** or No

Was the canister pressure difference between sampling and analysis less than 5 psi? **Yes** or No

Actions:

Qualify sample results using technical holding time information as stated in Table 3.

Pressure difference between sampling and analysis should be less than 5 psi. Qualify samples as per Table 3 requirements.

Table 3. Holding Time Actions for TO-15 Volatile Analyses

Matrix	Preserved (Pressure difference between sampling and analysis ≤ 5psi)	Criteria	Action	
			Detected Associated Compounds	Non-Detected Associated Compounds
Air	Yes	< 30 days	No qualification	
	Yes	>30 days	J	UJ
Air	No	< 30 days	J	UJ
	No	>30 days	J	R

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

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	Pressure difference < 5 psi	ACTION
All samples analyzed within the recommended method holding time. All summa canisters received in good conditions. Pressure difference < 5 psi between sampling and analysis.				

<u>The following pressure conversion is used, if necessary</u>

PRESSURE CONVERSION TABLE								
PSI	ATM	kgf/cm²	in.H_2O	mmHg	in.Hg	Kpa	Bar	mm H_2O
1	0.068046	0.070307	27.7276	51.715	2.03602	6.895	0.6895	704.28104
14.696	1	1.0332	407.484	760	29.921	101.325	1.01325	10350.0936
14.2233	0.96784	1	394.38	735.559	28.959	98.096	0.98067	10000
0.036092	0.002454	0.00253	1	1.8651	0.07343	0.249	0.00249	25.4
0.019336	0.001315	0.001359	0.53616	1	0.03937	0.1333	0.001333	13.618464
0.491154	0.0033421	0.03453	13.6185	25.4	1	3.3864	0.033864	345.9099
0.145	0.00987	0.010197	4.0186	7.5006	0.2953	1	0.01	102.07244
14.5038	0.98692	1.01972	402.156	750.062	29.53	100	1	10214.7624

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 24 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.

Note: Samples analyzed using GC with either TCD or FID detection.

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:____01/12/17_____
Dates of continuing calibration:_02/02/17_____
Instrument ID numbers:_____GC-10_____
Matrix/Level:_____Air/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
Initial and continuing calibrations meet method specific requirements with the following modifications: A minimum of 5-point calibration curve is performed. Quantitation is based on the average Response Factor. The standards used by the laboratory are blended to a >/= 95% accuracy.				

General criteria employed for validation

All RFs must be > 0.05 regardless of method requirements.
All %RSD must be ≤ 15 % regardless of method requirements.
All %Ds must be ≤ 30% regardless of method requirements.
Method ASTM D1946 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 % D > 30%, 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_meet_method_specific_criteria_____				

Field/Equipment/Trip blank

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS

_____
_No_field/trip/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 _____

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

____LCS/LCSD_(Blank_spike)_analyzed_in_this_data_package;_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

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 _____
Criteria were not met
and/or see below ____X___

IX. FIELD/LABORATORY DUPLICATE PRECISION

Sample ID_____LCS/LCSD_(02/02/17)_____ Matrix:___Air___
Sample ID_____1701428D-04A/1701428D-05A _____ Matrix:___Air___
Sample ID_____1701428D-08A/1701428D-09A _____ Matrix:___Air___
Sample ID_____1701428D-13A/1701428D-14A _____ Matrix:___Air___
Sample ID_____1701428D-16A/1701428D-17A _____ Matrix:___Air___
Sample ID_____1701428D-18A/1701428D-19A _____ Matrix:___Air___

Field/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 ± 25% for air samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL, %	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
Field/laboratory duplicates analyzed as part of this data package. LCS/LCSD (laboratory) RPD within laboratory control limits. Field duplicate RPD within laboratory control limits except in the cases described in this document.					
1701428D-18A/1701428D-19A					
Methane	0.00025	0.00021	ND	-	No action, professional judgment. Sample/duplicate concentration < 5 x SQL

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 __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:

1701428D-16A

Methane RF = 217680049

[ ] = (2972686485)/(217680049)

= 13.66 % OK

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

XII. QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASONS FOR DILUTION
All samples diluted by a factor of less than 2.50		

System Performance

Action:

Use professional judgment to qualify the data if it is determined that system performance has degraded during sample analyses. Note, for Laboratory Project Officer (PO) action, any degradation of system performance which significantly affected the data.

Note:

Overall Assessment of Data

Action:

1. Use professional judgment to determine if there is any need to qualify data which were not qualified based on the Quality Control (QC) criteria previously discussed.
2. Write a brief narrative to give the user an indication of the analytical limitations of the data. Note, for Laboratory Project Officer (PO) action, any inconsistency of the data with the Sample Delivery Group (SDG) Narrative. If sufficient information on the intended use and required quality of the data is available, the reviewer should include their assessment of the usability of the data within the given context. This may be used as part of a formal Data Quality Assessment (DQA).

Note: Results are valid; the data can be used for decision making purposes.