CERTIFICATION

| | | | |
|---|---|---|---|
| SDG No: | 1701477C | 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 26 and 29, 2017 and were analyzed in Eurofins Laboratory of Folson, California that reported the data under SDG No.: 1701477C. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: QC criteria from "Compendium Method TO-15. Determination of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters and Analyzed By Gas Chromatography/Mass Spectrometry (GC/MS), January, 1999"; USEPA Hazardous Waste Support Branch. 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 analytes 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 |
|---|---|---|---|
| 1701477C-01A | B18SS-2-012617 | Air | Methanol |
| 1701477C-02A | B18SS-3-012617 | Air | Methanol |
| 1701477C-03A | B18SS-4-012617 | Air | Methanol |
| 1701477C-04A | B18SS-5-012617 | Air | Methanol |
| 1701477C-05A | B13SS-1-012917 | Air | Methanol |
| 1701477C-06A | B13SS-2-012917 | Air | Methanol |
| 1701477C-07A | B13SS-2DUP-012917 | Air | Methanol |
| 1701477C-08A | B13SS-3-012917 | Air | Methanol |
| 1701477C-09A | B15SS-1-012917 | Air | Methanol |
| 1701477C-10A | B15SS-1DUP-012917 | Air | Methanol |
| 1701477C-11A | B13IA-1-012817 | Air | Methanol |
| 1701477C-12A | B13IA-2-012817 | Air | Methanol |
| 1701477C-13A | B13IA-2DUP-012817 | Air | Methanol |
| 1701477C-14A | B13IA-3-012817 | Air | Methanol |
| 1701477C-15A | B18IA-5-012817 | Air | Methanol |
| 1701477C-16A | B15IA-1-012817 | Air | Methanol |
| 1701477C-17A | B15IA-1DUP-012817 | Air | Methanol |
| 1701477C-18A | B1315AA-012817 | Air | Methanol |

Reviewer Name: Rafael Infante
Chemist License 1888

Signature:

Date: March 18, 2017

ESTADO LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
LIC. # [redacted]
QUIMICO LICENCIADO
$1.00
A 1617194

eurofins | Air Toxics

**Client Sample ID: B18SS-2-012617**

**Lab ID#: 1701477C-01A**

**EPA METHOD TO-15 GC/MS**

| | | | |
|---|---|---|---|
| **File Name:** | **j020212** | **Date of Collection:** | **1/26/17 6:38:00 PM** |
| **Dil. Factor:** | **2.38** | **Date of Analysis:** | **2/2/17 06:03 PM** |

| Compound | Rpt. Limit (ppbv) | Amount (ppbv) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|---|---|---|---|---|
| Methanol | 120 | Not Detected | 160 | Not Detected |

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

| Surrogates | %Recovery | Method Limits |
|---|---|---|
| 1,2-Dichloroethane-d4 | 101 | 70-130 |
| Toluene-d8 | 101 | 70-130 |
| 4-Bromofluorobenzene | 99 | 70-130 |

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**Client Sample ID: B185SS-3-012617**

**Lab ID#: 1701477C-02A**

**EPA METHOD TO-15 GC/MS**

| | | | |
|---|---|---|---|
| **File Name:** | **j020213** | **Date of Collection:** | **1/26/17 6:18:00 PM** |
| **Dil. Factor:** | **2.42** | **Date of Analysis:** | **2/2/17 06:26 PM** |

| Compound | Rpt. Limit (ppbv) | Amount (ppbv) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|---|---|---|---|---|
| Methanol | 120 | 360 | 160 | 470 |

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

| Surrogates | %Recovery | Method Limits |
|---|---|---|
| 1,2-Dichloroethane-d4 | 98 | 70-130 |
| Toluene-d8 | 103 | 70-130 |
| 4-Bromofluorobenzene | 100 | 70-130 |

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**Client Sample ID: B18SS-4-012617**
**Lab ID#: 1701477C-03A**
**EPA METHOD TO-15 GC/MS**

| | | | |
|---|---|---|---|
| **File Name:** | **j020214** | **Date of Collection:** | **1/26/17 5:07:00 PM** |
| **Dil. Factor:** | **2.82** | **Date of Analysis:** | **2/2/17 06:50 PM** |

| Compound | Rpt. Limit (ppbv) | Amount (ppbv) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|---|---|---|---|---|
| Methanol | 140 | 160 | 180 | 220 |

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

| Surrogates | %Recovery | Method Limits |
|---|---|---|
| 1,2-Dichloroethane-d4 | 98 | 70-130 |
| Toluene-d8 | 103 | 70-130 |
| 4-Bromofluorobenzene | 105 | 70-130 |

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**Client Sample ID: B18SS-5-012617**

**Lab ID#: 1701477C-04A**

**EPA METHOD TO-15 GC/MS**

| | | | |
|---|---|---|---|
| **File Name:** | **j020215** | **Date of Collection:** | **1/26/17 5:58:00 PM** |
| **Dil. Factor:** | **2.52** | **Date of Analysis:** | **2/2/17 07:13 PM** |

| Compound | Rpt. Limit (ppbv) | Amount (ppbv) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|---|---|---|---|---|
| Methanol | 130 | 140 | 160 | 190 |

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

| Surrogates | %Recovery | Method Limits |
|---|---|---|
| 1,2-Dichloroethane-d4 | 99 | 70-130 |
| Toluene-d8 | 104 | 70-130 |
| 4-Bromofluorobenzene | 104 | 70-130 |

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**Client Sample ID: B13SS-1-012917**

**Lab ID#: 1701477C-05A**

**EPA METHOD TO-15 GC/MS**

| | | | |
|---|---|---|---|
| **File Name:** | **j020216** | **Date of Collection:** | **1/29/17 3:11:00 PM** |
| **Dil. Factor:** | **2.47** | **Date of Analysis:** | **2/2/17 07:36 PM** |

| Compound | Rpt. Limit (ppbv) | Amount (ppbv) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|---|---|---|---|---|
| Methanol | 120 | 190 | 160 | 250 |

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

| Surrogates | %Recovery | Method Limits |
|---|---|---|
| 1,2-Dichloroethane-d4 | 101 | 70-130 |
| Toluene-d8 | 102 | 70-130 |
| 4-Bromofluorobenzene | 104 | 70-130 |

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IC # 1888
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**Client Sample ID: B13SS-2-012917**

**Lab ID#: 1701477C-06A**

**EPA METHOD TO-15 GC/MS**

| | | | |
|---|---|---|---|
| **File Name:** | **j020217** | **Date of Collection:** | **1/29/17 3:55:00 PM** |
| **Dil. Factor:** | **2.58** | **Date of Analysis:** | **2/2/17 07:59 PM** |

| Compound | Rpt. Limit (ppbv) | Amount (ppbv) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|---|---|---|---|---|
| Methanol | 130 | 270 | 170 | 350 |

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

| Surrogates | %Recovery | Method Limits |
|---|---|---|
| 1,2-Dichloroethane-d4 | 101 | 70-130 |
| Toluene-d8 | 103 | 70-130 |
| 4-Bromofluorobenzene | 102 | 70-130 |

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**Client Sample ID: B13SS-2DUP-012917**

**Lab ID#: 1701477C-07A**

**EPA METHOD TO-15 GC/MS**

| | | | |
|---|---|---|---|
| **File Name:** | **j020218** | **Date of Collection:** | **1/29/17 3:55:00 PM** |
| **Dil. Factor:** | **2.46** | **Date of Analysis:** | **2/2/17 08:23 PM** |

| Compound | Rpt. Limit (ppbv) | Amount (ppbv) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|---|---|---|---|---|
| Methanol | 120 | 300 | 160 | 390 |

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

| Surrogates | %Recovery | Method Limits |
|---|---|---|
| 1,2-Dichloroethane-d4 | 97 | 70-130 |
| Toluene-d8 | 105 | 70-130 |
| 4-Bromofluorobenzene | 105 | 70-130 |

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LIC # 1888
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**Client Sample ID: B13SS-3-012917**

**Lab ID#: 1701477C-08A**

**EPA METHOD TO-15 GC/MS**

| | | | |
|---|---|---|---|
| **File Name:** | **j020219** | **Date of Collection:** | **1/29/17 3:36:00 PM** |
| **Dil. Factor:** | **2.58** | **Date of Analysis:** | **2/2/17 08:46 PM** |

| Compound | Rpt. Limit (ppbv) | Amount (ppbv) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|---|---|---|---|---|
| Methanol | 130 | 550 | 170 | 720 |

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

| Surrogates | %Recovery | Method Limits |
|---|---|---|
| 1,2-Dichloroethane-d4 | 99 | 70-130 |
| Toluene-d8 | 104 | 70-130 |
| 4-Bromofluorobenzene | 101 | 70-130 |

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LIC # 1888
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**Client Sample ID: B15SS-1-012917**

**Lab ID#: 1701477C-09A**

**EPA METHOD TO-15 GC/MS**

| | | | |
|---|---|---|---|
| **File Name:** | j020220 | **Date of Collection:** | 1/29/17 5:55:00 PM |
| **Dil. Factor:** | 2.38 | **Date of Analysis:** | 2/2/17 09:10 PM |

| Compound | Rpt. Limit (ppbv) | Amount (ppbv) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|---|---|---|---|---|
| Methanol | 120 | 230 | 160 | 310 |

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

| Surrogates | %Recovery | Method Limits |
|---|---|---|
| 1,2-Dichloroethane-d4 | 101 | 70-130 |
| Toluene-d8 | 103 | 70-130 |
| 4-Bromofluorobenzene | 102 | 70-130 |

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**Client Sample ID: B15SS-1DUP-012917**

**Lab ID#: 1701477C-10A**

**EPA METHOD TO-15 GC/MS**

| | | | |
|---|---|---|---|
| **File Name:** | **j020221** | **Date of Collection:** | **1/29/17 5:55:00 PM** |
| **Dil. Factor:** | **2.47** | **Date of Analysis:** | **2/2/17 09:33 PM** |

| Compound | Rpt. Limit (ppbv) | Amount (ppbv) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|---|---|---|---|---|
| Methanol | 120 | 170 | 160 | 220 |

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

| Surrogates | %Recovery | Method Limits |
|---|---|---|
| 1,2-Dichloroethane-d4 | 100 | 70-130 |
| Toluene-d8 | 102 | 70-130 |
| 4-Bromofluorobenzene | 103 | 70-130 |

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JC # 1888
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**Client Sample ID: B13IA-1-012817**

**Lab ID#: 1701477C-11A**

**EPA METHOD TO-15 GC/MS**

| | | | |
|---|---|---|---|
| **File Name:** | **j020204** | **Date of Collection:** | **1/29/17 2:45:00 PM** |
| **Dil. Factor:** | **1.64** | **Date of Analysis:** | **2/2/17 12:01 PM** |

| Compound | Rpt. Limit (ppbv) | Amount (ppbv) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|---|---|---|---|---|
| Methanol | 82 | Not Detected | 110 | Not Detected |

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

| Surrogates | %Recovery | Method Limits |
|---|---|---|
| 1,2-Dichloroethane-d4 | 97 | 70-130 |
| Toluene-d8 | 101 | 70-130 |
| 4-Bromofluorobenzene | 101 | 70-130 |

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**Client Sample ID: B13IA-2-012817**

**Lab ID#: 1701477C-12A**

**EPA METHOD TO-15 GC/MS**

| | | | |
|---|---|---|---|
| **File Name:** | j020205 | **Date of Collection:** | 1/29/17 3:08:00 PM |
| **Dil. Factor:** | 1.61 | **Date of Analysis:** | 2/2/17 12:24 PM |

| Compound | Rpt. Limit (ppbv) | Amount (ppbv) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|---|---|---|---|---|
| Methanol | 80 | Not Detected | 100 | Not Detected |

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

| Surrogates | %Recovery | Method Limits |
|---|---|---|
| 1,2-Dichloroethane-d4 | 97 | 70-130 |
| Toluene-d8 | 102 | 70-130 |
| 4-Bromofluorobenzene | 100 | 70-130 |

LIBRE ASOCIADO DE PUERTO RICO
Manuel Infante Méndez
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**Client Sample ID: B13IA-2DUP-012817**

**Lab ID#: 1701477C-13A**

**EPA METHOD TO-15 GC/MS**

| | | | |
|---|---|---|---|
| **File Name:** | j020206 | **Date of Collection:** | 1/29/17 3:10:00 PM |
| **Dil. Factor:** | 1.55 | **Date of Analysis:** | 2/2/17 12:47 PM |

| Compound | Rpt. Limit (ppbv) | Amount (ppbv) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|---|---|---|---|---|
| Methanol | 78 | Not Detected | 100 | Not Detected |

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

| Surrogates | %Recovery | Method Limits |
|---|---|---|
| 1,2-Dichloroethane-d4 | 97 | 70-130 |
| Toluene-d8 | 102 | 70-130 |
| 4-Bromofluorobenzene | 103 | 70-130 |

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RQ # 1888
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**Client Sample ID: B13IA-3-012817**

**Lab ID#: 1701477C-14A**

**EPA METHOD TO-15 GC/MS**

| | | | |
|---|---|---|---|
| **File Name:** | **j020207** | **Date of Collection:** | **1/29/17 2:52:00 PM** |
| **Dil. Factor:** | **1.64** | **Date of Analysis:** | **2/2/17 01:10 PM** |

| Compound | Rpt. Limit (ppbv) | Amount (ppbv) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|---|---|---|---|---|
| Methanol | 82 | Not Detected | 110 | Not Detected |

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

| Surrogates | %Recovery | Method Limits |
|---|---|---|
| 1,2-Dichloroethane-d4 | 100 | 70-130 |
| Toluene-d8 | 103 | 70-130 |
| 4-Bromofluorobenzene | 103 | 70-130 |

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Rafael Infante Méndez
IC # 1888

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**Client Sample ID: B18IA-5-012817**

**Lab ID#: 1701477C-15A**

**EPA METHOD TO-15 GC/MS**

| | | | |
|---|---|---|---|
| File Name: | j020208 | Date of Collection: | 1/29/17 4:25:00 PM |
| Dil. Factor: | 1.64 | Date of Analysis: | 2/2/17 01:34 PM |

| Compound | Rpt. Limit (ppbv) | Amount (ppbv) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|---|---|---|---|---|
| Methanol | 82 | 82 | 110 | 110 |

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

| Surrogates | %Recovery | Method Limits |
|---|---|---|
| 1,2-Dichloroethane-d4 | 97 | 70-130 |
| Toluene-d8 | 102 | 70-130 |
| 4-Bromofluorobenzene | 103 | 70-130 |

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Manuel Infante Méndez
IQ # 1888
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**Client Sample ID: B15IA-1-012817**

**Lab ID#: 1701477C-16A**

**EPA METHOD TO-15 GC/MS**

| | | | |
|---|---|---|---|
| **File Name:** | **j020209** | **Date of Collection:** | **1/29/17 3:44:00 PM** |
| **Dil. Factor:** | **1.61** | **Date of Analysis:** | **2/2/17 01:57 PM** |

| Compound | Rpt. Limit (ppbv) | Amount (ppbv) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|---|---|---|---|---|
| Methanol | 80 | Not Detected | 100 | Not Detected |

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

| Surrogates | %Recovery | Method Limits |
|---|---|---|
| 1,2-Dichloroethane-d4 | 97 | 70-130 |
| Toluene-d8 | 103 | 70-130 |
| 4-Bromofluorobenzene | 102 | 70-130 |

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**Client Sample ID: B15IA-1DUP-012817**

**Lab ID#: 1701477C-17A**

**EPA METHOD TO-15 GC/MS**

| | | | |
|---|---|---|---|
| **File Name:** | **j020210** | **Date of Collection:** | **1/29/17 3:44:00 PM** |
| **Dil. Factor:** | **1.55** | **Date of Analysis:** | **2/2/17 02:20 PM** |

| Compound | Rpt. Limit (ppbv) | Amount (ppbv) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|---|---|---|---|---|
| Methanol | 78 | Not Detected | 100 | Not Detected |

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

| Surrogates | %Recovery | Method Limits |
|---|---|---|
| 1,2-Dichloroethane-d4 | 98 | 70-130 |
| Toluene-d8 | 104 | 70-130 |
| 4-Bromofluorobenzene | 101 | 70-130 |

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**Client Sample ID: B1315AA-012817**

**Lab ID#: 1701477C-18A**

**EPA METHOD TO-15 GC/MS**

| | | | |
|---|---|---|---|
| **File Name:** | **j020211** | **Date of Collection:** | **1/29/17 4:12:00 PM** |
| **Dil. Factor:** | **1.71** | **Date of Analysis:** | **2/2/17 02:43 PM** |

| Compound | Rpt. Limit (ppbv) | Amount (ppbv) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|---|---|---|---|---|
| Methanol | 86 | Not Detected | 110 | Not Detected |

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

| Surrogates | %Recovery | Method Limits |
|---|---|---|
| 1,2-Dichloroethane-d4 | 99 | 70-130 |
| Toluene-d8 | 101 | 70-130 |
| 4-Bromofluorobenzene | 100 | 70-130 |

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**Sample Transportation Notice**
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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) David Lindstrand [signature]
Company: AMAJ Email:
Address: 2700 Winchester City: Purchase State: NY Zip: 10577
Phone: 914-251-0400 X309 Fax:

**Project Info:**
P.O. #:
Project #: BMS VI Invest.
Project Name: Buildings 8, 13, 15, 18 and 30

**Turn Around Time:** ☒ Normal ☐ Rush ____ specify

Lab Use Only
Pressurized by: V.V
Date: 2/2/17
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 | B18SS-2-012617 | 1L1743 | 1/26/17 | 1838 | TO-15, MeOH, CH4 | 30 | 5 | 4.5"Hg | 15psi |
| 02A | B18SS-3-012617 | 00763 | 1/26/17 | 1818 | TO-15, MeOH, CH4 | 30 | 5 | 5.0"Hg | 15psi |
| 03A | B18SS-4-012617 | 00882 | 1/26/17 | 1707 | TO-15, MeOH, CH4 | 30 | 9 | 8.5"Hg | 15psi |
| 04A | B18SS-5-012617 | 00816 | 1/26/17 | 1758 | TO-15, MeOH, CH4 | 30 | 5 | 6.0"Hg | 15psi |
| 05A | B13SS-1-012917 | N2055 | 1/29/17 | 1511 | TO-15, MeOH, CH4 | 30 | 5 | 5.5"Hg | 15psi |
| 06A | B13SS-2-012917 | 1063 | 1/29/17 | 1555 ~~1605~~ | TO-15, MeOH, CH4 | 30 | 5 | 6.5"Hg | 15psi |
| 07A | B13SS-2DUP-012917 | 1044 | 1/29/17 | 1555 ~~1601~~ | TO-15, MeOH, CH4 | 30 | 5 | 5.0"Hg | 15.4psi |
| 08A | B13SS-3-012917 | 37697 | 1/29/17 | 1536 ~~1541~~ | TO-15, MeOH, CH4 | 30 | 5 | 6.5"Hg | 15psi |
| 09A | B15SS-1-012917 | 37759 ~~0691~~ | 1/29/17 | 1755 | TO-15, MeOH, CH4 | 30 | 5 | 4.5"Hg | 15psi |
| 10A | B15SS-1DUP-012917 | N1955 | 1/29/17 | 1755 | TO-15, MeOH, CH4 | 30 | 5 | 5.5"Hg | 15psi |

| Relinquished by: (signature) | Date/Time | Received by: (signature) | Date/Time |
|---|---|---|---|
| [signature] | 1700 Jan. 30, 2017 | Fed EX | |
| Relinquished by: (signature) | Date/Time | Received by: (signature) | Date/Time |
| | | Andrea Augustin EAIL | 1/31/17 1020 |
| Relinquished by: (signature) | Date/Time | Received by: (signature) | Date/Time |
| | | | |

**Notes:**
Canister 0691 will not be analyzed (B15SS-1-012917). Received without an initial vacuum

| Lab Use Only | Shipper Name | Air Bill # | Temp (°C) | Condition | Custody Seals Intact? | Work Order # |
|---|---|---|---|---|---|---|
| | Fed Ex | | NA | Good | Yes No None | 1701477 |

Form 1293 rev.11

**Air Toxics LTD.**

TO-15

# 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 8,13,15, 18, and 30

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

Pressurized by: V.V
Date: 2/2/17
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) |
|---|---|---|---|---|---|---|---|---|
| 11A | B13IA-2-012817 | 00124 | 1/28-29/17:1445 | TO-15, MeOH, $CH_4$ | 30 "Hg | 6.5 | 5.5"Hg | 5psi |
| 12A | B13IA-2-012817 | 6L0046 | 1/28-29/17:1508 | TO-15, MeOH, $CH_4$ | 30 "Hg | 5 | 5.0"Hg | 6psi |
| 13A | B13IA-2DUP-012817 | 00401 | 1/28-29/:1516 | TO-15, MeOH, $CH_4$ | 30 "Hg | 6 | 4.0"Hg | 5psi |
| 14A | B13IA-3-012817 | N1639 | 1/28-29/17:1452 | TO-15, MeOH, $CH_4$ | 30 "Hg | 6 | 5.5"Hg | 5psi |
| 15A | B15IA-5-012817 | 907CMT | 1/28-29/17:1625 | TO-15, MeOH, $CH_4$ | 29 "Hg | 5 | 5.0"Hg | 5.4psi |
| 16A | B15IA-1-012817 | N0597 | 1/28-29/17:1544 | TO-15, MeOH, $CH_4$ | 28 "Hg | 6 | 5.0"Hg | 5psi |
| 17A | B15IA-1DUP-012817 | 00937 | 1/28-29/17:1544 | TO-15, MeOH, $CH_4$ | 30 "Hg | 5 | 4.0"Hg | 5psi |
| 18A | B15IAA-012817 | 34744 | 1/28-29/:1612 | TO-15, MeOH, $CH_4$ | 30 "Hg | 7 | 4.0"Hg | 5psi |
| | | | | | "Hg | | V.V 2/2/17 | |
| | | | | | "Hg | | | |

Relinquished By: (Signature) Date/Time: Jan. 30, 2017 1200
Received By: (Signature) Date/Time: Fed EX
Relinquished By: (Signature) Date/Time
Received By: (Signature) Date/Time: 1/31/17 1020 Andrea Anderson
Relinquished By: (Signature) Date/Time
Received By: (Signature) Date/Time

Notes: Do not analyze Can N0627, 0443, and 0908. Canisters not used for sampling. Do not analyze 36459. Also not used

| Shipper Name | Air Bill # | Opened By | Temp © | Condition | Custody Seals | Work Order # |
|---|---|---|---|---|---|---|
| Fed Ex | | AB | NA | Good | Yes No None | 1701477 |

EXECUTIVE NARRATIVE

| | | | |
|---|---|---|---|
| SDG No: | **1701477C** | Laboratory: | **Eurofins, Folson, CA** |
| Analysis: | **TO-15** | Number of Samples: | **18** |
| Location: | | | |

SUMMARY: Eighteen (18) samples were analyzed for methanol in ambient air following Compendium Method TO-15. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: QC criteria from "Compendium Method TO-15. Determination of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters and Analyzed By Gas Chromatography/Mass Spectrometry (GC/MS), January, 1999"; USEPA Hazardous Waste Support Branch. 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, RPD within the method performance criteria and the 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:
Date: March 16, 2017

METHANOL DATA SAMPLE SUMMARY

METHOD: TO-15

| | | METHANOL - TO-15 | | | | | |
|---|---|---|---|---|---|---|---|
| Sample ID | Date | Results | Units | Dilution Factor | Lab Flag | Validation | Reportable |
| 1701477C-01A | 1/26/2017 | 160 | ug/m$^3$ | 2.38 | - | U | Yes |
| 1701477C-02A | 1/26/2017 | 470 | ug/m$^3$ | 2.42 | - | - | Yes |
| 1701477C-03A | 1/26/2017 | 180 | ug/m$^3$ | 2.82 | - | - | Yes |
| 1701477C-04A | 1/26/2017 | 190 | ug/m$^3$ | 2.52 | - | - | Yes |
| 1701477C-05A | 1/29/2017 | 250 | ug/m$^3$ | 2.47 | - | - | Yes |
| 1701477C-06A | 1/29/2017 | 350 | ug/m$^3$ | 2.58 | - | - | Yes |
| 1701477C-07A | 1/29/2017 | 350 | ug/m$^3$ | 2.46 | - | - | Yes |
| 1701477C-08A | 1/29/2017 | 720 | ug/m$^3$ | 2.58 | - | - | Yes |
| 1701477C-09A | 1/29/2017 | 310 | ug/m$^3$ | 2.38 | - | - | Yes |
| 1701477C-10A | 1/29/2017 | 220 | ug/m$^3$ | 2.47 | - | - | Yes |
| 1701477C-11A | 1/29/2017 | 110 | ug/m$^3$ | 1.64 | - | U | Yes |
| 1701477C-12A | 1/29/2017 | 100 | ug/m$^3$ | 1.61 | - | U | Yes |
| 1701477C-13A | 1/29/2017 | 100 | ug/m$^3$ | 1.55 | - | U | Yes |
| 1701477C-14A | 1/29/2017 | 110 | ug/m$^3$ | 1.64 | - | U | Yes |
| 1701477C-15A | 1/29/2017 | 110 | ug/m$^3$ | 1.64 | - | - | Yes |
| 1701477C-16A | 1/29/2017 | 100 | ug/m$^3$ | 1.61 | - | U | Yes |
| 1701477C-17A | 1/29/2017 | 100 | ug/m$^3$ | 1.55 | - | U | Yes |
| 1701477C-18A | 1/29/2017 | 110 | ug/m$^3$ | 1.71 | - | U | Yes |

Project Number:__1701477C___
Date:_____01/26_&_29/17____

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: QC criteria from "Compendium Method TO-15. Determination of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters and Analyzed By Gas Chromatography/Mass Spectrometry (GC/MS), January, 1999"; USEPA Hazardous Waste Support Branch. 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.: __1701477C_____ Sample matrix: ___Air_____
No. of Samples: _____18_____

Trip blank No.: _____-_____
Field blank No.: _____-_____
Equipment blank No.:___-_____
Field duplicate No.:_1701477C-06A/1701477C-07A;_1701477C-09A/1701477C-10A_____
_____1701477C-12A/1701477C-13A;_1701477C-16A/1701477C-17A_____

___X___ Data Completeness
___X___ Sampling Integrity/Preservation
___X___ GC/MS Tuning
___X___ Internal Standard Performance
___X___ Blanks
___X___ Surrogate Recoveries
___X___ Laboratory Control Spikes
___X___ Field Duplicates
___X___ Calibrations
___X___ Compound Identifications
___X___ Compound Quantitation
___X___ Quantitation Limits

Overall Comments:_____VOCs_(methanol)_by_method_TO-15_____
_____

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

Reviewer:_____ Rafael Infante _____
Date:__ _____03/16/17_____

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 stated that the SUMMA canisters employed were 100 % certified.

**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 __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

## Gas Chromatograph/Mass Spectrometer (GC/MS) Instrument Performance Check

**Action:**

**NOTES:** This requirement does not apply when samples are analyzed by the Selected Ion Monitoring (SIM) technique.
All mass spectrometer instrument conditions must be identical to those used during the sample analysis. Background subtraction actions resulting in spectral distortions for the sole purpose of meeting the method specifications are contrary to the Quality Assurance (QA) objectives, and are therefore unacceptable.

**NOTES:** No data should be qualified based on BFB or DFTTP failure. Instances of this should be noted in the narrative.
All ion abundance ratios must be normalized to m/z 95, the nominal base peak, even though the ion abundance of m/z 174 may be up to 120% that of m/z 95.

1. If samples are analyzed without a preceding valid instrument performance check, qualify all data in those samples as unusable (R).
2. If the laboratory has made minor transcription errors which do not significantly affect the data, the data reviewer should make the necessary corrections on a copy of the form.
3. If the laboratory has failed to provide the correct forms or has made significant transcription or calculation errors, the Region's designated representative should contact the laboratory and request corrected data. If the information is not available, the reviewer must use professional judgment to assess the data and notify the Project Officer (PO).
4. If ion abundance criteria are not met, professional judgment may be applied to determine to what extent the data may be utilized. When applying professional judgment to this topic, the most important factors to consider are the empirical results that are relatively insensitive to location on the chromatographic profile and the type of instrumentation. Therefore, the critical ion abundance criteria for BFB are the m/z 95/96, 174/175, 174/176, and 176/177 ratios. The relative abundances of m/z 50 and 75 are of lower importance. This issue is more critical for Tentatively Identified Compounds (TICs) than for target analytes.
5. Note, in the Data Review Narrative, decisions to use analytical data associated with BFB instrument performance check failures (not meeting contract requirements).
6. If the reviewer has reason to believe that instrument performance check criteria were achieved using techniques other than those described in the Compendium method TO-15 entitled "Determination Of Volatile Organic Compounds(VOCs) In Air Collected In Specially-Prepared Canisters And Analyzed By Gas Chromatography/Mass Spectrometry(GC/MS)", section 10.4, obtain additional information on the instrument performance checks. If the techniques employed are found to be at variance with the contract requirements, the performance and procedures of the laboratory may merit evaluation.
7. Use professional judgment to determine whether associated data should be qualified based on the spectrum of the mass calibration compound.

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

__X___ 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.

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:_____02/02/2017_____
Date of initial calibration verification:_____-_____
Dates of continuing calibration:_____02/02/2017_____
Instrument ID numbers:_____MSD-J_____
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. Initial calibration retention times meet method specific requirements. One point calibration curve performed. | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**Note:**

The following criteria apply:

**Table 5. Initial Calibration Actions for TO-15 Analyses**

| Criteria for TO-15 Analysis | Action | |
|---|---|---|
| | Detected Associated Compounds | Non-Detected Associated Compounds |
| RRF < 0.010 (poor response volatile target compounds, Table 4)<br>RRF < 0.050 (all other volatile target compounds) | J (based on mass spectral identification) | R |
| RRF > 0.010 (poor response volatile target compounds, Table 4)<br>RRF > 0.050 (all other volatile target compounds) | No qualification | |
| % RSD > 40.0 or < -40.0 (poor response volatile target compounds, Table 4)<br>% RSD > 30.0 or < -30.0 (all other Volatile target compounds) | No qualification | |
| % RSD < 40.0 and > -40.0 (poor response volatile target compounds, Table 4)<br>% RSD < 30.0 and > -30.0 (all other volatile target compounds) | J | Use professional judgment |

**Table 6. Continuing Calibration Verification (CCV) Actions for TO-15 Analyses**

| Criteria for CCV | Action | |
|---|---|---|
| | Detected Associated Compounds | Non-Detected Associated Compounds |
| RRF < 0.010 (poor response volatile target compounds, Table 4)<br>RRF < 0.050 (all other volatile target compounds) | J (based on mass spectral identification) | R |
| RRF > 0.010 (poor response volatile target compounds, Table 4)<br>RRF > 0.050 (all other volatile target compounds) | No qualification | |
| %D > 40.0 or < -40.0 (poor response volatile target compounds, Table 4)<br>%D > 30.0 or < -30.0 (all other Volatile target compounds) | J | UJ |
| %D < 40.0 and > -40.0 (poor response volatile target compounds, Table 4)<br>%D < 30.0 and > -30.0 (all other volatile target compounds) | No qualification | |

If the % D for daily calibration exceeds -90, use professional judgment to see if non-detects nee to be qualified as unusable "R"

**Note:** Methanol is not a poor response compound; the regular calibration/calibration verification criteria are employed.

A separate worksheet should be filled for each initial curve

**Table 4. TO 15 Volatile Compounds List***

| Compound | **CAS Number** | **Synonyms** |
|---|---|---|
| Acetone | 67-64-1 | Dimethyl ketone; Dimethylformaldehyde; 2-Propanone |
| Allyl chloride | 107-05-1 | 3-Chloropropene; 3-Chloroprene |
| Benzene | 71-43-2 | Benzol; Benzine |
| Benzyl chloride | 100-44-7 | Chloromethylbenzene; alpha-Chlorotoluene |
| Bromodichloromethane | 75-27-4 | Monobromodichloromethane; Methane-bromodichloro |
| Bromoethene | 593-60-2 | Vinyl bromide; Monobromoethene |
| Bromoform | 75-25-2 | Tribromoethane |
| Bromomethane | 74-83-9 | Methyl bromide; Monobromomethane |
| 1,3-Butadiene | 106-99-0 | Biethylene; Erythrene; Pyrrolyene |
| ***Carbon disulfide*** | ***75-15-0*** | ***Carbon bisulfide; Carbon sulfide*** |
| Carbon tetrachloride | 56-23-5 | Carbon tet; Tetrachloromethane |
| Chlorobenzene | 108-90-7 | Monochlorobenzene; Chlorobenzol; Benzene chloride |
| ***Chloroethane*** | ***75-00-3*** | ***Ethyl chloride; Chlorene; Chloryl*** |
| Chloroethene | 75-01-4 | Vinyl chloride; Ethylene monochloride |
| Chloroform | 67-66-3 | Trichloromethane; Methyltrichloride; Methane trichloride |
| ***Chloromethane*** | ***74-87-3*** | ***R40; Methyl chloride; Monochloromethane*** |
| Cyclohexane | 110-82-7 | Hexamethylene; Hexahydrobenzene; Hexanaphthene |
| Dibromochloromethane | 124-48-1 | Chlorodibromomethane |
| ***1,2-Dibromoethane*** | ***106-93-4*** | ***EDB; Ethylene dibromide*** |
| 1,2-Dichlorobenzene | 95-50-1 | ODB; Chloroben |
| 1,3-Dichlorobenzene | 541-73-1 | meta-Dichlorobenzene; m-Phenylenedichloride |
| 1,4-Dichlorobenzene | 106-46-7 | para-Dichlorobenzene; Parazene; Santochlor |
| 1,1-Dichloroethane | 75-34-3 | Ethylidene chloride; Ethylidene dichloride |
| 1,2-Dichloroethane | 107-06-2 | Ethylene dichloride; Glycol dichloride; 1,2-DCA |
| 1,1-Dichloroethene | 75-35-4 | 1,1-DCE; Vinylidene chloride |
| cis-1,2-Dichloroethylene | 156-59-2 | cis-1,2-DCE; cis-Acetylene dichloride |
| trans-1,2-Dichloroethylene | 156-60-5 | trans-1,2-DCE; trans-Acetylene dichloride |
| ***1,2-Dichloropropane*** | ***78-87-5*** | ***Propylene dichloride; Propylene chloride*** |
| cis-1,3-Dichloropropene | 10061-01-5 | 1-Propene,1,3-dichloro-,(z)-; cis-1,3-Dichloro-1-Propene |
| trans-1,3-Dichloropropene | 10061-02-6 | trans-1,3-Dichloro-1-Propene; trans-1,3-Dichloropropylene |
| ***1,4-Dioxane*** | ***123-91-1*** | ***Diethylene dioxide; Diethylene ether*** |
| Ethyl acetate | 141-78-6 | Acetic acid ethyl ester; Acetic ether |
| Ethylbenzene | 100-41-4 | Ethylbenzol; Phenylethane |
| 4-Ethyltoluene | 622-96-8 | 1-Ethyl-4-methyl benzene; p-Methylethylbenzene |
| Freon 11 (CCl3F) | 75-69-4 | Trichlorofluoromethane; Fluorotrichloromethane; Fluorocarbon 11 |

| | | |
|---|---|---|
| Freon 12 (CCl2F2) | 75-71-8 | Dichlorodifluoromethane; Fluorocarbon 12 |
| Freon 113 (C2Cl3F3) | 76-13-1 | 1,1,2-Trichloro-1,2,2-trifluoroethane; Fluorocarbon 113; 1,1,2-Trichlorotrifluoroethane |
| Freon 114 (C2Cl2F4) | 76-14-2 | 1,2-Dichlorotetrafluoroethane; Halocarbon 114; 1,2-Dichloro-1,1,2,2-tetrafluoroethane |
| Heptane | 142-82-5 | Dipropylmethane; Heptyl hydride |
| Hexachlorobutadiene | 87-68-3 | 1,3-Hexachlorobutadiene; Perchlorobutadiene |
| Hexane | 110-54-3 | n-Hexane; Hexyl hydride |
| 2-Hexanone | 591-78-6 | Methyl butyl ketone; Butyl methyl ketone; Hexan-2-one |
| Isopropyl alcohol | 67-63-0 | 2-Propanol; Isopropanol |
| ***Methylene chloride*** | ***75-09-2*** | ***Dichloromethane; Methylene dichloride*** |
| ***Methyl ethyl ketone*** | ***78-93-3*** | ***MEK; 2-Butanone; Ethyl methyl ketone*** |
| Methyl isobutyl ketone | 108-10-1 | MIBK; 2-Pentanone; Hexone; Isopropylacetone |
| Methyl tert-butyl ether | 1634-04-4 | MTBE; 2-Methoxy-2-methylpropane; tert-Butyl methyl ether |
| Propylene | 115-07-1 | Propene; Methylethylene |
| Styrene | 100-42-5 | Vinylbenzene; Phenylethylene |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | Tetrachloroethane; Acetylene tetrachloride; Bonoform |
| Tetrachloroethene | 127-18-4 | PCE; PERC; Perchloroethylene; Ethylene tetrachloride; Carbon bichloride; Carbon dichloride |
| Tetrahydrofuran | 109-99-9 | Diethylene oxide; Butylene oxide |
| Toluene | 108-88-3 | Toluol; Methylbenzene |
| 1,2,4-Trichlorobenzene | 120-82-1 | 1,2,4-Trichlorobenzol |
| 1,1,1-Trichloroethane | 71-55-6 | Methyl chloroform; Trichloroethane |
| 1,1,2-Trichloroethane | 79-00-5 | beta-Trichloroethane; Ethane trichloride; Vinyl trichloride |
| Trichloroethene | 79-01-6 | TCE; Acetylene trichloride; Ethinyl trichloride |
| 1,2,4-Trimethylbenzene | 95-63-6 | Pseudocumene; Pseudocumol |
| 1,3,5-Trimethylbenzene | 108-67-8 | Mesitylene; Trimethylbenzol |
| 2,2,4-Trimethylpentane | 540-84-1 | Iso-octane; Isobutyltrimethylmethane |
| Vinyl acetate | 108-05-4 | Acetic acid ethenyl ether; Ethenyl acetate |
| p-Xylene | 106-42-3 | p-Methyltoluene; 1,4-dimethylbenzene |
| m-Xylene | 108-38-3 | m-Methyltoluene; 1,3-dimethylbenzene |
| o-Xylene | 95-47-6 | o-Methyltoluene; 1,2-Dimethylbenzene |

*Laboratories use different sets and subsets of analytes on as needed basis.

NOTES:

Compounds in bold italicized letters may have poor GCMS response. These poor response compounds are evaluated using more relaxed relative response factor criteria as stated below.

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

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.

Blanks criteria and appropriate actions

**Table 7. Blank Actions for TO-15 Analyses**

| Blank Type | Blank Result | Sample Result | Action for Samples |
|---|---|---|---|
| Method, Storage, Field, Trip, Instrument*** | Detects | Not detected | 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 ≤ blank concentration | Report blank value for sample concentration with a U |
| | | ≥ CRQL* and > blank concentration | No qualification required |
| | = CRQL* | ≤ CRQL* | Report CRQL value with a U |
| | | > CRQL* | No qualification required |
| | Gross contamination ** | Detects | Report blank value for sample concentration with a U |

* 2x the CRQL for methylene chloride, 2-butanone and acetone.
** 4x the CRQL for methylene chloride, 2-butanone, and acetone.
*** Qualifications based on instrument blank results affect only the sample analyzed immediately after the sample that has target compounds that exceed the calibration range or non-target compounds that exceed 100 µg/L.

| DATE ANALYZED | LAB ID | LEVEL/ MATRIX | COMPOUND | CONCENTRATION UNITS |
|---|---|---|---|---|
| _All_method_blank_meet_method_specific_criteria._____ | | | | |
| _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ |

**Note:** Concentration detected below the reporting limit, results qualified following the table above.

Field/Equipment/Trip blank

| DATE ANALYZED | LAB ID | LEVEL/ MATRIX | COMPOUND | CONCENTRATION UNITS |
|---|---|---|---|---|

_No_field/trip/equipment_blanks_analyzed_with_this_data_package._____

Field/trip blank actions

Field or Trip blank when available should be assessed for possible contaminants in the canister used for trip blank. This canister and its analytical results are specific to the trip blank sample **only**. If contaminants are present in the canister used for trip blank, its suitability for use as trip blank can be assessed using the following criteria.

**Table 8. Field/Trip Blank suitability based on Canister contamination**

| Clean canister Result | Field/Trip Blank Result | Action for Field/Trip Blank |
|---|---|---|
| Detects | Not detected | No qualification, no action for samples is required |
| Detects | < clean canister result or ≥ clean canister result but < 2X the clean canister result | Report as non-detect "U", invalid as trip blank, no action for samples is required. |
| | ≥ 2x the clean canister result | No qualification, valid trip blank for sample actions. |

| 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-DICHLOROETHANE-d4** **Toluene-d8** **4-BFB**

_Surrogate_recoveries_within_laboratory_control_limits_____
_____
_____
_____
_____
_____

QC Limits* (Air)

_____LL_to_UL___70__to_130__ _70__to_130_ _70__to_130__

* 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 _____

VIII. LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices. LCS concentration should be in the middle of the calibration range and under the same sample conditions.

1. LCS Recoveries Criteria

**Table 9. LCS/LCSD Actions for TO-15 Analyses**

| Criteria | Action | |
|---|---|---|
| | Detected Associated Compounds | Non-detected Associated Compounds |
| **Percent recovery Criteria** | | |
| %R > Upper Acceptance Limit (>130%) | J | No qualification |
| %R in the acceptable range, 70-130% | No qualification | |
| %R < Lower Acceptance Limit (< 70 %) | J | UJ |
| %R < 50% | J | R |
| Lower Acceptance Limit ≤ %R ≤ Upper Acceptance Limit | No qualification | |
| | | |
| **Relative Percent Difference Criteria** | | |
| % RPD ≤ 25% | No qualification | |
| % RPD > 25 % | J | UJ |

LCS ID COMPOUND % R QC LIMIT

_LCS/LCSD_(Blank_spike)_analyzed_in_this_data_package._%_recoveries_and_RPD_____
_within_laboratory_control_limits._____
_____
_____
_____
_____
_____
_____

**Note:**

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/LABORATORY DUPLICATE PRECISION

Sample IDs: __1701477C-06A/1701477C-07A__ Matrix:_Air____
Sample IDs: __1701477C-09A/1701477C-10A__ Matrix:_Air____
Sample IDs: __1701477C-12A/1701477C-13A__ Matrix:_Air____
Sample IDs: __1701477C-16A/1701477C-17A__ Matrix:_Air____

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. In the absence of QAPP guidance for validated data from field duplicates, the following action will be taken.

Identify which samples within the data package are field duplicates. Estimate the relative percent difference (RPD) between the vales for each compound. Note large RPDs (>50 %) in the narrative. Use professional judgment to qualify data when RPD > 50 %.

| COMPOUND | SQL | SAMPLE CONC. | DUPLICATE CONC. | RPD | ACTION |
|---|---|---|---|---|---|
| 1701477C-09A/1701477C-10A | | | | | |
| Methanol | 160 | 310 | 220 | 34 % | No action, concentration < 5 SQL and RPD within method performance criteria. |
| Laboratory/field duplicate analyzed with this data package. RPD within laboratory and method performance criteria for target analytes except for the cases described in this document. Methanol RPD outside the laboratory control limit but within the method performance criteria, no action taken. | | | | | |

Other suggested 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 _____

## 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 +40% or -40% of the IS area in the associated calibration standard (CCV standard or mid-point from initial calibration).
* Retention time (RT) within ± 20 seconds of the IS area in the associated calibration standard.

**Table 10. Internal Standard Actions for TO-15 Analyses**

| Criteria | Action | |
|---|---|---|
| | Detected Associated Compounds* | Non-detected Associated Compounds* |
| Area counts > 140% of CCV or mid-point standard from initial calibration) | J- | No qualification |
| Area counts < 60% of CCV or mid-point standard from initial calibration) | J+ | R |
| Area counts ≥ 60% but ≤ 140% of CCV or mid-point standard from initial calibration) | No qualification | |
| RT difference > 20.0 seconds between samples CCV or mid-point standard from initial calibration) | R* | |
| RT difference < 20.0 seconds between samples and CCV or mid-point standard from initial calibration) | No qualification | |

* Examine the chromatographic profile for that sample to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Detects should not need to be qualified as unusable (R) if the mass spectral criteria are met.

| DATE | SAMPLE ID | IS OUT | IS AREA | ACCEPTABLE RANGE | ACTION |
|---|---|---|---|---|---|

_Internal_standard_area_and_retention_times_within_laboratory_control_limits_for_both_samples
_and_calibration_standards_____
_____
_____
_____
_____
_____
_____

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:

1701477C-02A

Methanol RF = 2.76251

[ ] = (148261)(400)/(145549)(2.76251)

= 147.5 ppbv 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 |
|---|---|---|
| Samples diluted by a factor of 2.82 or less except for the followings. | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

**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).

**Overall assessment of the data:** Results are valid; the data can be used for decision making purposes.