Data resources will be provided separately on CD. Data resources for AASF Byrd Field include:

## Environmental Data Resources, Inc.™ Geocheck Report

- 2019 Environmental Data Resources, Inc.™ Geocheck Report for AASF Byrd Field, VA

## Real Property Information

- 2002 Deed and Agreement of Lease By and Between Capital Region Airport Commission and the United States of America, Army Guard Property at Richmond International Airport, Lease No. DACA65-5-03-0045
- 2006 Supplemental Agreement No. 1 to Army Guard Lease, Lease No. DACA65-5-03-0045
- 2011 Supplemental Agreement No. 2, Lease No. DACA65-5-03-0045
- 2013 Memorandum for ARNG-ILI-R, Review of Environmental Documentation for the Proposed Lease Amendment for Army Aviation Support Facility (AASF) at Richmond International Airport, Sandston, Virginia
- 2013 Memorandum for ARNG-ILI-R, Request for DA License, Richmond International Airport, Sandston, Virginia
- 2014 Memorandum for ARNG-ILI-R, Revision of the 20 September 2013 Memorandum – Review of Environmental Documentation for the Proposed Lease Amendment for Army Aviation Support Facility (AASF) at Richmond International Airport, Sandston, Virginia
- 2014 Memorandum for the U.S. Army Corps of Engineers Norfolk District, Direct to Add 6.326 Acres and 6,707 Square Feet to Lease DACA65-5-03-0045 and Issue License to the Virginia Army National Guard (VAARNG) for the Entire Leased Property for Use as an Army Aviation Support Facility at Richmond International Airport, Sandston, Virginia

## Miscellaneous Data Resources

- 2008 Phase I Environmental Site Assessment, Air Guard Munitions Facility, Beulah Road, Sandston, Virginia 23250
- 2013 Memorandum for Record, Environmental Condition of Property Evaluation, Army Aviation Support Facility (AASF), Sandston, Virginia
- 2016 Final Perfluorinated Compounds Preliminary Assessment Site Visit Report, Former Richmond Air National Guard Base, Richmond, Virginia
- 2017 Memorandum for Record, Environmental Condition of Property Evaluation, Army Aviation Support Facility (AASF), Sandston, Virginia
- 2018 Final Groundwater Monitoring Report, Site 1 Basewide Groundwater Operable Unit (OU1), Former Virginia Air National Guard Base, Sandston, Virginia

Byrd Field

844-800 Portugee Rd

Richmond, VA 23250

Inquiry Number: 5577731.3

March 01, 2019

# Certified Sanborn® Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

# Certified Sanborn® Map Report

03/01/19

**Site Name:**

Byrd Field
844-800 Portugee Rd
Richmond, VA 23250
EDR Inquiry # 5577731.3

**Client Name:**

AECOM
12120 Shamrock Plaza
Omaha, NE 68154
Contact: Brittany Kirchmann

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by AECOM were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

## *Certified Sanborn Results:*

**Certification #** AF58-458B-93C6

**PO #** NA

**Project** Byrd Field

### UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Sanborn® Library search results

Certification #: AF58-458B-93C6

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ☑ Library of Congress
- ☑ University Publications of America
- ☑ EDR Private Collection

*The Sanborn Library LLC Since 1866™*

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**Byrd Field**

844-800 Portugee Rd

Richmond, VA 23250

Inquiry Number: 5577731.5

March 04, 2019

# The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

# EDR Aerial Photo Decade Package

03/04/19

**Site Name:**

Byrd Field
844-800 Portugee Rd
Richmond, VA 23250
EDR Inquiry # 5577731.5

**Client Name:**

AECOM
12120 Shamrock Plaza
Omaha, NE 68154
Contact: Brittany Kirchmann

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

***Search Results:***

| Year | Scale | Details | Source |
|---|---|---|---|
| 2016 | 1"=500' | Flight Year: 2016 | USDA/NAIP |
| 2012 | 1"=500' | Flight Year: 2012 | USDA/NAIP |
| 2009 | 1"=500' | Flight Year: 2009 | USDA/NAIP |
| 2000 | 1"=750' | Flight Date: March 26, 2000 | USGS |
| 1994 | 1"=500' | Acquisition Date: March 17, 1994 | USGS/DOQQ |
| 1989 | 1"=750' | Flight Date: March 11, 1989 | USDA |
| 1984 | 1"=500' | Flight Date: April 02, 1984 | USDA |
| 1972 | 1"=500' | Flight Date: October 01, 1972 | USDA |
| 1968 | 1"=500' | Flight Date: February 26, 1968 | USGS |
| 1965 | 1"=500' | Flight Date: June 05, 1965 | USDA |
| 1952 | 1"=500' | Flight Date: October 26, 1952 | USGS |
| 1950 | 1"=500' | Flight Date: April 01, 1950 | USDA |
| 1947 | 1"=500' | Flight Date: April 07, 1947 | USC&GS |
| 1937 | 1"=500' | Flight Date: April 01, 1937 | USDA |

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INQUIRY #: 5577731.5
YEAR: 2016
= 500'
N
EDR

INQUIRY #: 5577731.5

YEAR: 2012

= 500'

N

EDR

INQUIRY #: 5577731.5
YEAR: 2009
= 500'
N
EDR

INQUIRY #: 5577731.5
YEAR: 2000
= 750'
N
EDR
Subject boundary not shown because it exceeds image extent or image is not georeferenced.

INQUIRY #: 5577731.5
YEAR: 1994
= 500'
N
EDR

INQUIRY #: 5577731.5

YEAR: 1989

= 750'

N

EDR

Subject boundary not shown because it exceeds image extent or image is not georeferenced.

INQUIRY #: 5577731.5
YEAR: 1984
= 500'
N
EDR

INQUIRY #: 5577731.5

YEAR: 1972

= 500'

N

EDR

Subject boundary not shown because it exceeds image extent or image is not georeferenced.

INQUIRY #: 5577731.5

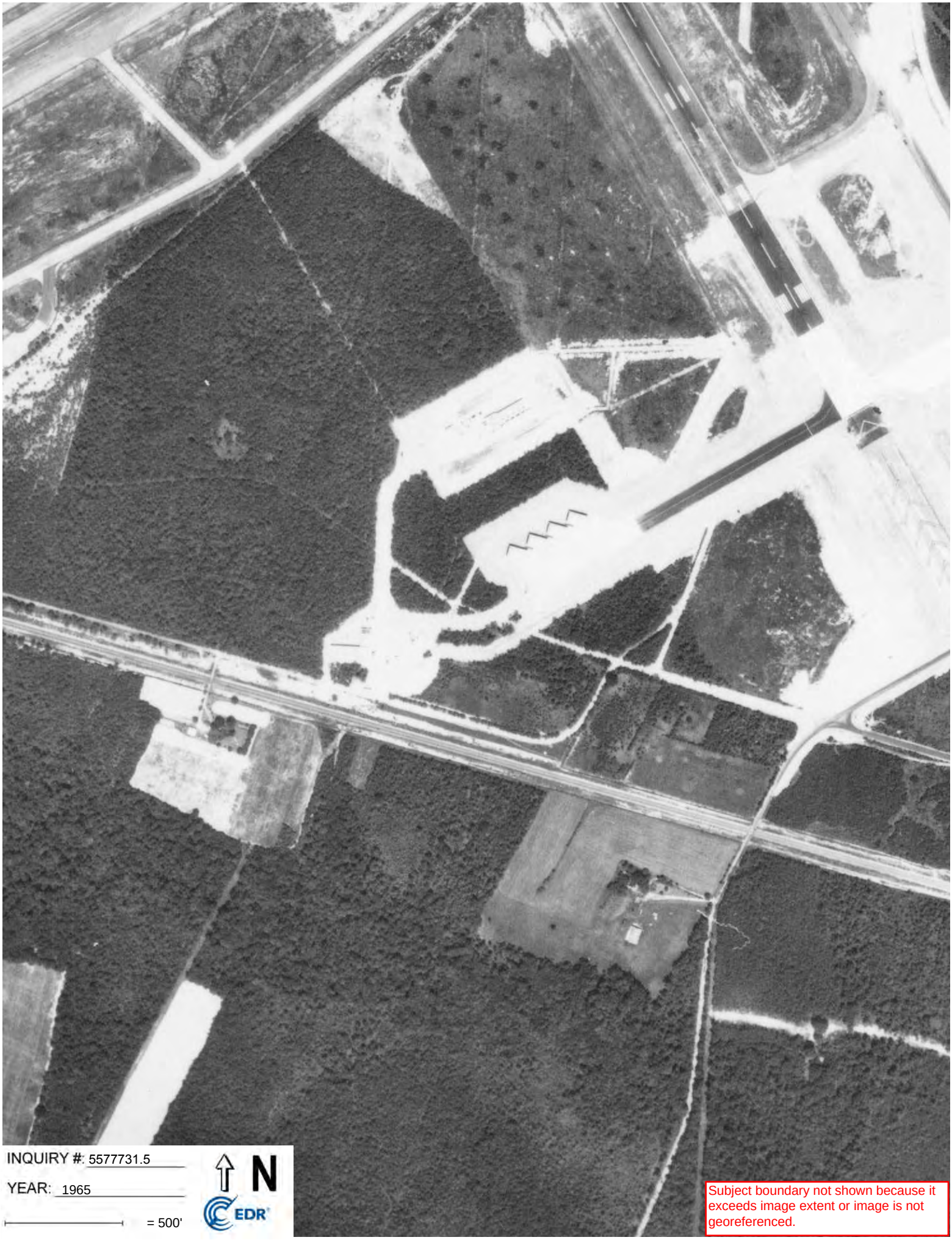
YEAR: 1968

= 500'

N

EDR

Subject boundary not shown because it exceeds image extent or image is not georeferenced.



INQUIRY #: 5577731.5

YEAR: 1965

= 500'

N

EDR

Subject boundary not shown because it exceeds image extent or image is not georeferenced.

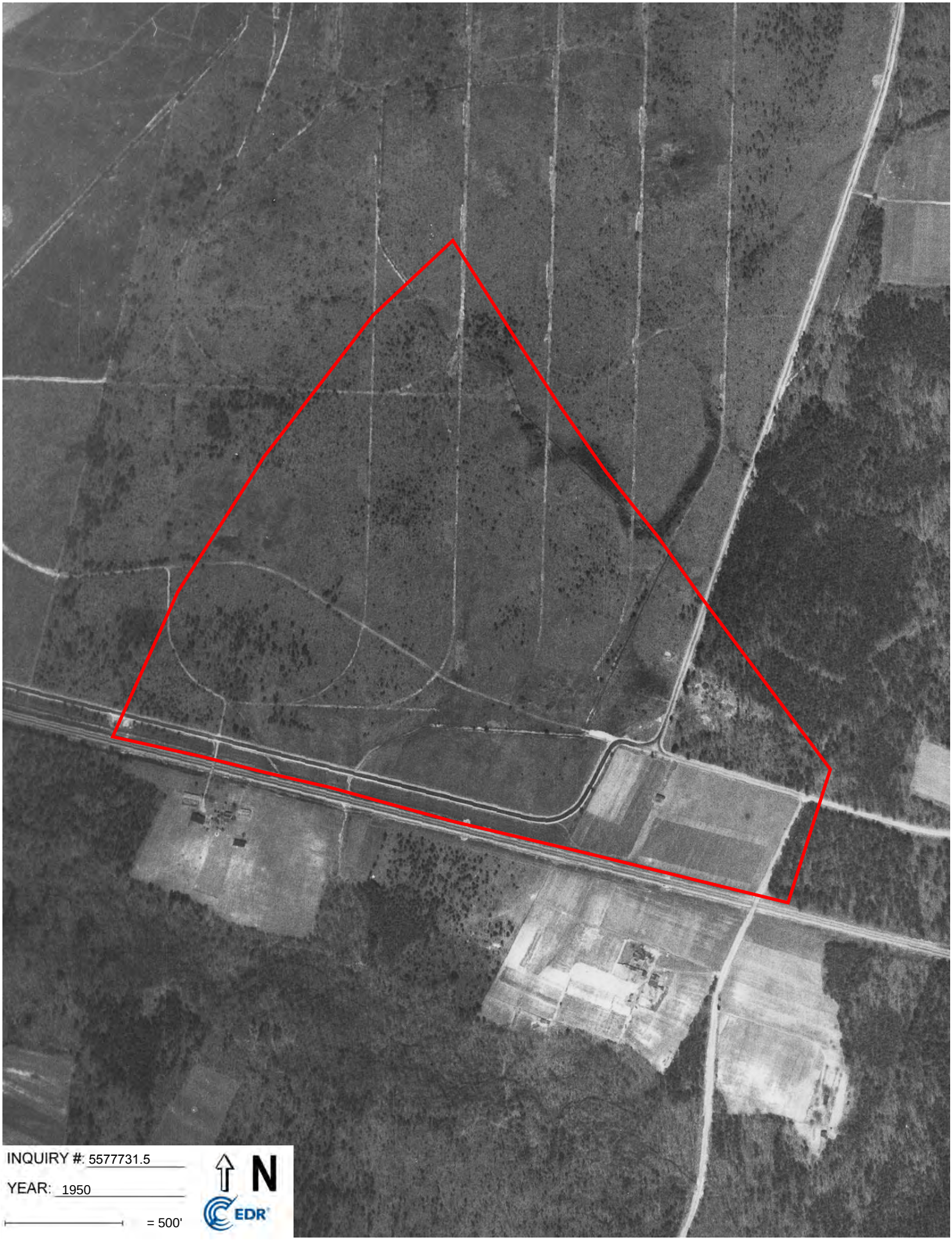
INQUIRY #: 5577731.5

YEAR: 1952

= 500'

N

EDR


INQUIRY #: 5577731.5
YEAR: 1950
= 500'
N
EDR

INQUIRY #: 5577731.5
YEAR: 1947
= 500'
N
EDR
Subject boundary not shown because it exceeds image extent or image is not georeferenced.

INQUIRY #: 5577731.5

YEAR: 1937

= 500'

N

EDR

Subject boundary not shown because it exceeds image extent or image is not georeferenced.

**Byrd Field**
844-800 Portugee Rd
Richmond, VA  23250

Inquiry Number: 5577731.2s
March 01, 2019

# The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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| Government Records Searched/Data Currency Tracking | GR-1 |

**GEOCHECK ADDENDUM**

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***Thank you for your business.***
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# EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

## TARGET PROPERTY INFORMATION

### ADDRESS

844-800 PORTUGEE RD
RICHMOND, VA 23250

### COORDINATES

| | |
|---|---|
| Latitude (North): | 37.4928480 - 37° 29' 34.25'' |
| Longitude (West): | 77.3122160 - 77° 18' 43.97'' |
| Universal Tranverse Mercator: | Zone 18 |
| UTM X (Meters): | 295584.0 |
| UTM Y (Meters): | 4151854.8 |
| Elevation: | 150 ft. above sea level |

### USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

| | |
|---|---|
| Target Property Map: | 5951117 DUTCH GAP, VA |
| Version Date: | 2013 |
| North Map: | 5951493 SEVEN PINES, VA |
| Version Date: | 2013 |

### AERIAL PHOTOGRAPHY IN THIS REPORT

| | |
|---|---|
| Portions of Photo from: | 20140814 |
| Source: | USDA |

# MAPPED SITES SUMMARY

Target Property Address:
844-800 PORTUGEE RD
RICHMOND, VA 23250

Click on Map ID to see full detail.

| MAP ID | SITE NAME | ADDRESS | DATABASE ACRONYMS | RELATIVE ELEVATION | DIST (ft. & mi.) DIRECTION |
|---|---|---|---|---|---|
| 1 | US FOODSERVICE INC | 363 LERCH DR | LUST, LTANKS | Higher | 297, 0.056, SE |
| 2 | VIRGINIA ARMY NATION | 5901 BEULAH ROAD | LUST, LTANKS, TIER 2 | Higher | 2248, 0.426, NNE |
| 3 | ELLEN JIM PROPERTY | 3450 CHARLES CITY RD | LUST, LTANKS, SPILLS | Higher | 2301, 0.436, WSW |
| 4 | BYRD FIELD | | FUDS | Higher | 3449, 0.653, NNW |

# EXECUTIVE SUMMARY

## TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

## DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

## STANDARD ENVIRONMENTAL RECORDS

### *Federal NPL site list*

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

### *Federal Delisted NPL site list*

Delisted NPL ---------- National Priority List Deletions

### *Federal CERCLIS list*

FEDERAL FACILITY ---------- Federal Facility Site Information listing
SEMS ---------- Superfund Enterprise Management System

### *Federal CERCLIS NFRAP site list*

SEMS-ARCHIVE ---------- Superfund Enterprise Management System Archive

### *Federal RCRA CORRACTS facilities list*

CORRACTS ---------- Corrective Action Report

### *Federal RCRA non-CORRACTS TSD facilities list*

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

### *Federal RCRA generators list*

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-SQG ---------- RCRA - Small Quantity Generators
RCRA-CESQG ---------- RCRA - Conditionally Exempt Small Quantity Generator

### *Federal institutional controls / engineering controls registries*

LUCIS ---------- Land Use Control Information System
US ENG CONTROLS ---------- Engineering Controls Sites List

US INST CONTROL ..... Sites with Institutional Controls

***Federal ERNS list***

ERNS ..... Emergency Response Notification System

***State- and tribal - equivalent CERCLIS***

SHWS ..... This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

***State and tribal landfill and/or solid waste disposal site lists***

SWF/LF ..... Solid Waste Management Facilities

***State and tribal leaking storage tank lists***

INDIAN LUST ..... Leaking Underground Storage Tanks on Indian Land

***State and tribal registered storage tank lists***

FEMA UST ..... Underground Storage Tank Listing
UST ..... Registered Petroleum Storage Tanks
AST ..... Registered Petroleum Storage Tanks
INDIAN UST ..... Underground Storage Tanks on Indian Land

***State and tribal institutional control / engineering control registries***

ENG CONTROLS ..... Engineering Controls Sites Listing
INST CONTROL ..... Voluntary Remediation Program Database

***State and tribal voluntary cleanup sites***

INDIAN VCP ..... Voluntary Cleanup Priority Listing
VCP ..... Voluntary Remediation Program

***State and tribal Brownfields sites***

BROWNFIELDS ..... Brownfields Site Specific Assessments

**ADDITIONAL ENVIRONMENTAL RECORDS**

***Local Brownfield lists***

US BROWNFIELDS ..... A Listing of Brownfields Sites

***Local Lists of Landfill / Solid Waste Disposal Sites***

INDIAN ODI ..... Report on the Status of Open Dumps on Indian Lands
ODI ..... Open Dump Inventory
DEBRIS REGION 9 ..... Torres Martinez Reservation Illegal Dump Site Locations
IHS OPEN DUMPS ..... Open Dumps on Indian Land

***Local Lists of Hazardous waste / Contaminated Sites***

US HIST CDL ..... Delisted National Clandestine Laboratory Register

US CDL ..... National Clandestine Laboratory Register

***Local Land Records***

LIENS 2 ..... CERCLA Lien Information

***Records of Emergency Release Reports***

HMIRS ..... Hazardous Materials Information Reporting System
SPILLS ..... Prep/Spills Database Listing
SPILLS 90 ..... SPILLS 90 data from FirstSearch

***Other Ascertainable Records***

RCRA NonGen / NLR ..... RCRA - Non Generators / No Longer Regulated
DOD ..... Department of Defense Sites
SCRD DRYCLEANERS ..... State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR ..... Financial Assurance Information
EPA WATCH LIST ..... EPA WATCH LIST
2020 COR ACTION ..... 2020 Corrective Action Program List
TSCA ..... Toxic Substances Control Act
TRIS ..... Toxic Chemical Release Inventory System
SSTS ..... Section 7 Tracking Systems
ROD ..... Records Of Decision
RMP ..... Risk Management Plans
RAATS ..... RCRA Administrative Action Tracking System
PRP ..... Potentially Responsible Parties
PADS ..... PCB Activity Database System
ICIS ..... Integrated Compliance Information System
FTTS ..... FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS ..... Material Licensing Tracking System
COAL ASH DOE ..... Steam-Electric Plant Operation Data
COAL ASH EPA ..... Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER ..... PCB Transformer Registration Database
RADINFO ..... Radiation Information Database
HIST FTTS ..... FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS ..... Incident and Accident Data
CONSENT ..... Superfund (CERCLA) Consent Decrees
INDIAN RESERV ..... Indian Reservations
FUSRAP ..... Formerly Utilized Sites Remedial Action Program
UMTRA ..... Uranium Mill Tailings Sites
LEAD SMELTERS ..... Lead Smelter Sites
US AIRS ..... Aerometric Information Retrieval System Facility Subsystem
US MINES ..... Mines Master Index File
ABANDONED MINES ..... Abandoned Mines
FINDS ..... Facility Index System/Facility Registry System
DOCKET HWC ..... Hazardous Waste Compliance Docket Listing
ECHO ..... Enforcement & Compliance History Information
UXO ..... Unexploded Ordnance Sites
FUELS PROGRAM ..... EPA Fuels Program Registered Listing
AIRS ..... Permitted Airs Facility List
NPDES ..... Comprehensive Environmental Data System
COAL ASH ..... Coal Ash Disposal Sites
DRYCLEANERS ..... Drycleaner List

ENF Enforcement Actions Data
Financial Assurance Financial Assurance Information Listing
TIER 2 Tier 2 Information Listing
UIC Underground Injection Control Wells

**EDR HIGH RISK HISTORICAL RECORDS**

***EDR Exclusive Records***

EDR MGP EDR Proprietary Manufactured Gas Plants
EDR Hist Auto EDR Exclusive Historical Auto Stations
EDR Hist Cleaner EDR Exclusive Historical Cleaners

**EDR RECOVERED GOVERNMENT ARCHIVES**

***Exclusive Recovered Govt. Archives***

RGA LF Recovered Government Archive Solid Waste Facilities List
RGA LUST Recovered Government Archive Leaking Underground Storage Tank

**SURROUNDING SITES: SEARCH RESULTS**

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

**STANDARD ENVIRONMENTAL RECORDS**

***State and tribal leaking storage tank lists***

LUST: The Leaking Underground Storage Tank Database.

A review of the LUST list, as provided by EDR, has revealed that there are 3 LUST sites within approximately 0.5 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***US FOODSERVICE INC*** | ***363 LERCH DR*** | ***SE 0 - 1/8 (0.056 mi.)*** | ***1*** | ***8*** |
| Database: LUST REG PD, Date of Government Version: 12/02/2014<br>Facility Status: Closed<br>Pollution Complaint #: 19911663<br>Pollution Complaint #: 20094567 | | | | |
| ***VIRGINIA ARMY NATION*** | ***5901 BEULAH ROAD*** | ***NNE 1/4 - 1/2 (0.426 mi.)*** | ***2*** | ***9*** |
| Database: LUST REG PD, Date of Government Version: 12/02/2014 | | | | |

Facility Status: Closed
Pollution Complaint #: 20024177

***ELLEN JIM PROPERTY*** ***3450 CHARLES CITY RD*** ***WSW 1/4 - 1/2 (0.436 mi.)*** ***3*** ***10***
Database: LUST REG PD, Date of Government Version: 12/02/2014
Facility Status: Closed
Pollution Complaint #: 20034171

LTANKS: The Leaking Tanks Database contains current Leaking petroleum tanks. The data comes from the Department of Environmental Quality.

A review of the LTANKS list, as provided by EDR, and dated 10/02/2018 has revealed that there are 3 LTANKS sites within approximately 0.5 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***US FOODSERVICE INC*** | ***363 LERCH DR*** | ***SE 0 - 1/8 (0.056 mi.)*** | ***1*** | ***8*** |
| Facility Status: Closed<br>CEDS Facility Id: 200000163138<br>Pollution Complaint #: 19911663<br>Pollution Complaint #: 20094567 | | | | |
| ***VIRGINIA ARMY NATION*** | ***5901 BEULAH ROAD*** | ***NNE 1/4 - 1/2 (0.426 mi.)*** | ***2*** | ***9*** |
| Facility Status: Closed<br>CEDS Facility Id: 200000205430<br>Pollution Complaint #: 20024177 | | | | |
| ***ELLEN JIM PROPERTY*** | ***3450 CHARLES CITY RD*** | ***WSW 1/4 - 1/2 (0.436 mi.)*** | ***3*** | ***10*** |
| Facility Status: Closed<br>CEDS Facility Id: 200000208347<br>Pollution Complaint #: 20034171 | | | | |

**ADDITIONAL ENVIRONMENTAL RECORDS**

***Other Ascertainable Records***

FUDS: The Listing includes locations of Formerly Used Defense Sites Properties where the US Army Corps Of Engineers is actively working or will take necessary cleanup actions.

A review of the FUDS list, as provided by EDR, and dated 01/31/2015 has revealed that there is 1 FUDS site within approximately 1 mile of the target property.

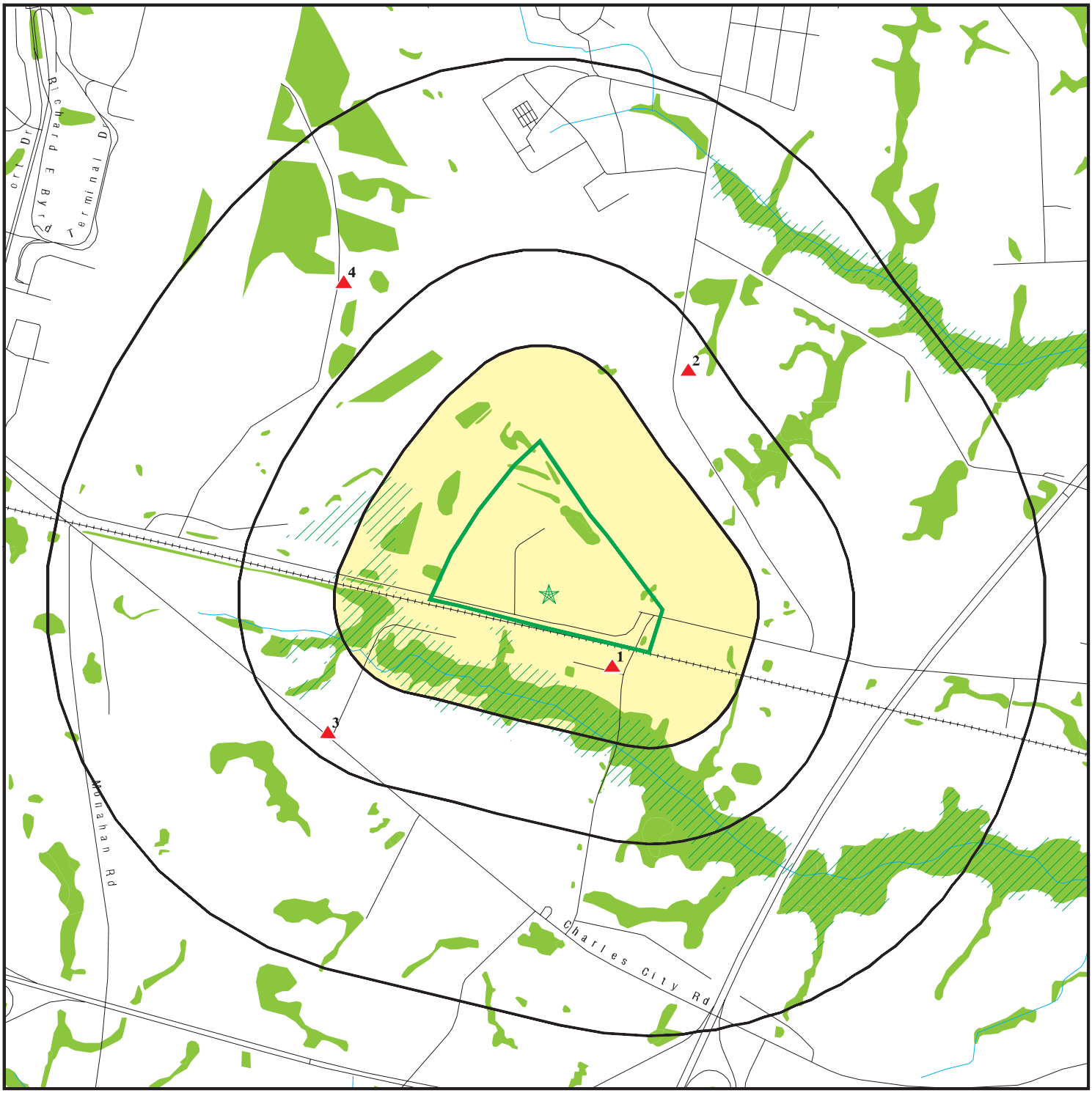
| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| BYRD FIELD | | NNW 1/2 - 1 (0.653 mi.) | 4 | 11 |
| Federal Facility ID:: VA9799F1653<br>INST ID:: 57843 | | | | |

# EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 2 records.

| Site Name | Database(s) |
|---|---|
| COMMONWEALTH AVIATION DBA MILLION | LUST, LTANKS |
| 0 BEULAH RD PROPERTY | LTANKS |

# OVERVIEW MAP - 5577731.2S




Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Dept. Defense Sites

Indian Reservations BIA

100-year flood zone

500-year flood zone

National Wetland Inventory

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

| | | | |
|---|---|---|---|
| SITE NAME: | Byrd Field | CLIENT: | AECOM |
| ADDRESS: | 844-800 Portugee Rd<br>Richmond VA 23250 | CONTACT: | Brittany Kirchmann |
| LAT/LONG: | 37.492848 / 77.312216 | INQUIRY #: | 5577731.2s |
| | | DATE: | March 01, 2019 4:14 pm |

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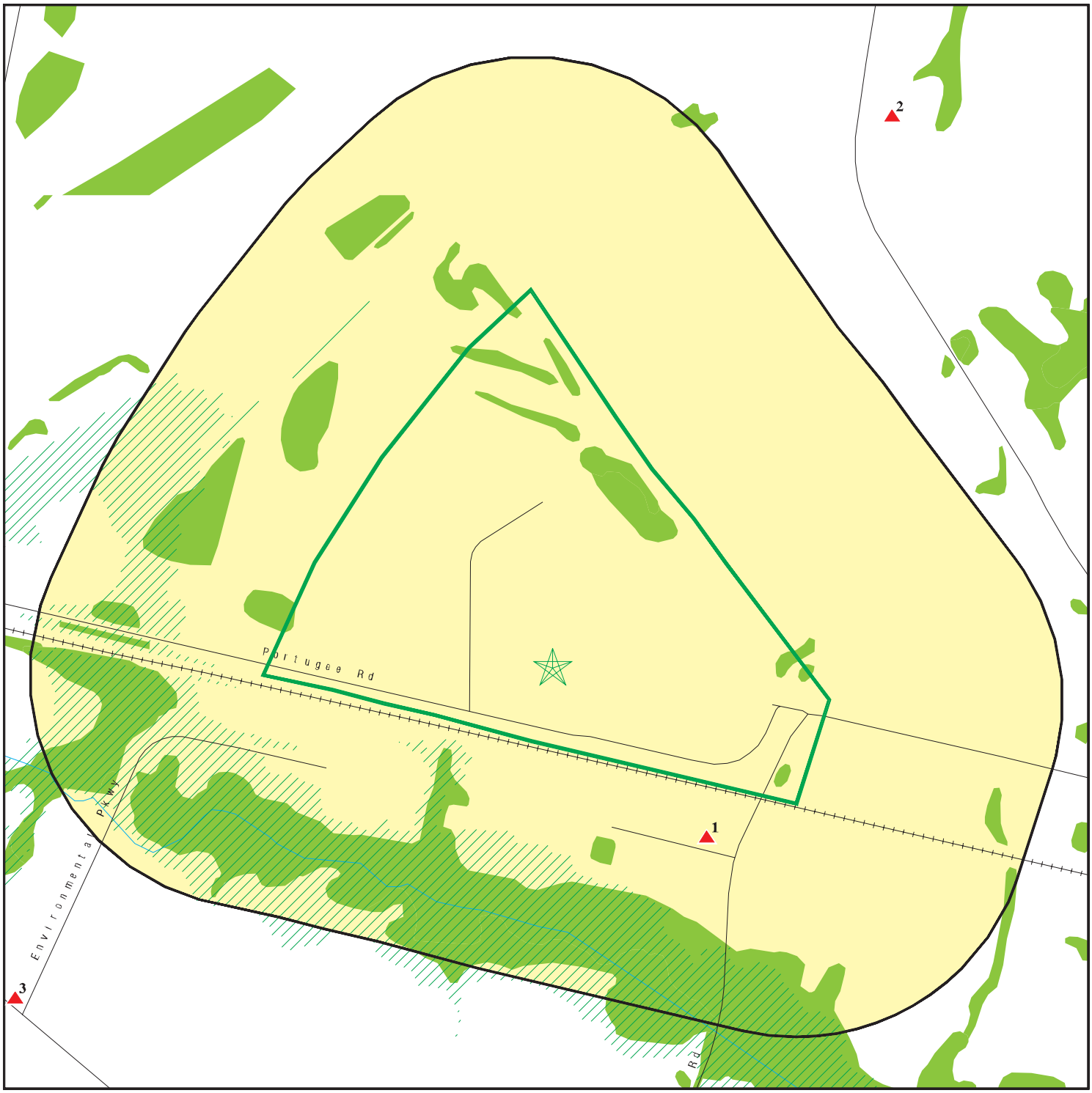
# DETAIL MAP - 5577731.2S




Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

Sensitive Receptors

National Priority List Sites

Dept. Defense Sites

0 1/8 1/4 1/2 Miles

Indian Reservations BIA

100-year flood zone

500-year flood zone

National Wetland Inventory

N

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

| | |
|---|---|
| SITE NAME: Byrd Field | CLIENT: AECOM |
| ADDRESS: 844-800 Portugee Rd<br>Richmond VA 23250 | CONTACT: Brittany Kirchmann |
| LAT/LONG: 37.492848 / 77.312216 | INQUIRY #: 5577731.2s<br>DATE: March 01, 2019 4:17 pm |

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# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| **STANDARD ENVIRONMENTAL RECORDS** | | | | | | | | |
| ***Federal NPL site list*** | | | | | | | | |
| NPL | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| Proposed NPL | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| NPL LIENS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ***Federal Delisted NPL site list*** | | | | | | | | |
| Delisted NPL | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ***Federal CERCLIS list*** | | | | | | | | |
| FEDERAL FACILITY | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| SEMS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Federal CERCLIS NFRAP site list*** | | | | | | | | |
| SEMS-ARCHIVE | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Federal RCRA CORRACTS facilities list*** | | | | | | | | |
| CORRACTS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ***Federal RCRA non-CORRACTS TSD facilities list*** | | | | | | | | |
| RCRA-TSDF | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Federal RCRA generators list*** | | | | | | | | |
| RCRA-LQG | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| RCRA-SQG | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| RCRA-CESQG | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| ***Federal institutional controls / engineering controls registries*** | | | | | | | | |
| LUCIS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| US ENG CONTROLS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| US INST CONTROL | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Federal ERNS list*** | | | | | | | | |
| ERNS | TP | | NR | NR | NR | NR | NR | 0 |
| ***State- and tribal - equivalent CERCLIS*** | | | | | | | | |
| SHWS | N/A | | N/A | N/A | N/A | N/A | N/A | N/A |
| ***State and tribal landfill and/or solid waste disposal site lists*** | | | | | | | | |
| SWF/LF | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***State and tribal leaking storage tank lists*** | | | | | | | | |
| LUST | 0.500 | | 1 | 0 | 2 | NR | NR | 3 |
| INDIAN LUST | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| LTANKS | 0.500 | | 1 | 0 | 2 | NR | NR | 3 |
| ***State and tribal registered storage tank lists*** | | | | | | | | |
| FEMA UST | 0.250 | | 0 | 0 | NR | NR | NR | 0 |

# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| UST | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| AST | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| INDIAN UST | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| ***State and tribal institutional control / engineering control registries*** | | | | | | | | |
| ENG CONTROLS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| INST CONTROL | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***State and tribal voluntary cleanup sites*** | | | | | | | | |
| INDIAN VCP | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| VCP | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***State and tribal Brownfields sites*** | | | | | | | | |
| BROWNFIELDS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| **ADDITIONAL ENVIRONMENTAL RECORDS** | | | | | | | | |
| ***Local Brownfield lists*** | | | | | | | | |
| US BROWNFIELDS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Local Lists of Landfill / Solid Waste Disposal Sites*** | | | | | | | | |
| INDIAN ODI | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ODI | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| DEBRIS REGION 9 | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| IHS OPEN DUMPS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Local Lists of Hazardous waste / Contaminated Sites*** | | | | | | | | |
| US HIST CDL | TP | | NR | NR | NR | NR | NR | 0 |
| US CDL | TP | | NR | NR | NR | NR | NR | 0 |
| ***Local Land Records*** | | | | | | | | |
| LIENS 2 | TP | | NR | NR | NR | NR | NR | 0 |
| ***Records of Emergency Release Reports*** | | | | | | | | |
| HMIRS | TP | | NR | NR | NR | NR | NR | 0 |
| SPILLS | TP | | NR | NR | NR | NR | NR | 0 |
| SPILLS 90 | TP | | NR | NR | NR | NR | NR | 0 |
| ***Other Ascertainable Records*** | | | | | | | | |
| RCRA NonGen / NLR | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| FUDS | 1.000 | | 0 | 0 | 0 | 1 | NR | 1 |
| DOD | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| SCRD DRYCLEANERS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| US FIN ASSUR | TP | | NR | NR | NR | NR | NR | 0 |
| EPA WATCH LIST | TP | | NR | NR | NR | NR | NR | 0 |
| 2020 COR ACTION | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| TSCA | TP | | NR | NR | NR | NR | NR | 0 |

# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| TRIS | TP | | NR | NR | NR | NR | NR | 0 |
| SSTS | TP | | NR | NR | NR | NR | NR | 0 |
| ROD | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| RMP | TP | | NR | NR | NR | NR | NR | 0 |
| RAATS | TP | | NR | NR | NR | NR | NR | 0 |
| PRP | TP | | NR | NR | NR | NR | NR | 0 |
| PADS | TP | | NR | NR | NR | NR | NR | 0 |
| ICIS | TP | | NR | NR | NR | NR | NR | 0 |
| FTTS | TP | | NR | NR | NR | NR | NR | 0 |
| MLTS | TP | | NR | NR | NR | NR | NR | 0 |
| COAL ASH DOE | TP | | NR | NR | NR | NR | NR | 0 |
| COAL ASH EPA | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| PCB TRANSFORMER | TP | | NR | NR | NR | NR | NR | 0 |
| RADINFO | TP | | NR | NR | NR | NR | NR | 0 |
| HIST FTTS | TP | | NR | NR | NR | NR | NR | 0 |
| DOT OPS | TP | | NR | NR | NR | NR | NR | 0 |
| CONSENT | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| INDIAN RESERV | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| FUSRAP | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| UMTRA | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| LEAD SMELTERS | TP | | NR | NR | NR | NR | NR | 0 |
| US AIRS | TP | | NR | NR | NR | NR | NR | 0 |
| US MINES | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| ABANDONED MINES | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| FINDS | TP | | NR | NR | NR | NR | NR | 0 |
| DOCKET HWC | TP | | NR | NR | NR | NR | NR | 0 |
| ECHO | TP | | NR | NR | NR | NR | NR | 0 |
| UXO | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| FUELS PROGRAM | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| AIRS | TP | | NR | NR | NR | NR | NR | 0 |
| NPDES | TP | | NR | NR | NR | NR | NR | 0 |
| COAL ASH | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| DRYCLEANERS | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| ENF | TP | | NR | NR | NR | NR | NR | 0 |
| Financial Assurance | TP | | NR | NR | NR | NR | NR | 0 |
| TIER 2 | TP | | NR | NR | NR | NR | NR | 0 |
| UIC | TP | | NR | NR | NR | NR | NR | 0 |
| **EDR HIGH RISK HISTORICAL RECORDS** | | | | | | | | |
| ***EDR Exclusive Records*** | | | | | | | | |
| EDR MGP | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| EDR Hist Auto | 0.125 | | 0 | NR | NR | NR | NR | 0 |
| EDR Hist Cleaner | 0.125 | | 0 | NR | NR | NR | NR | 0 |
| **EDR RECOVERED GOVERNMENT ARCHIVES** | | | | | | | | |
| ***Exclusive Recovered Govt. Archives*** | | | | | | | | |
| RGA LF | TP | | NR | NR | NR | NR | NR | 0 |

# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| RGA LUST | TP | | NR | NR | NR | NR | NR | 0 |
| - Totals -- | | 0 | 2 | 0 | 4 | 1 | 0 | 7 |

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

N/A = This State does not maintain a SHWS list. See the Federal CERCLIS list.

**1**
**SE**
**< 1/8**
**0.056 mi.**
**297 ft.**

**US FOODSERVICE INC**
**363 LERCH DR**
**SANDSTON, VA 23150**

**LUST** **S103837304**
**LTANKS** **N/A**

**Relative:**
**Higher**

**Actual:**
**150 ft.**

LUST REG PD:

| | |
|---|---|
| Region: | PD |
| **Status:** | **Closed** |
| Pollution Complaint #: | 19911663 |
| Reg Code: | PRO |

| | |
|---|---|
| Region: | PD |
| **Status:** | **Closed** |
| Pollution Complaint #: | 20094567 |
| Reg Code: | PRO |

LTANKS:

| | |
|---|---|
| Region: | PRO |
| CEDS Facility Id: | 200000163138 |
| **Case Status:** | **Closed** |
| Pollution Complaint #: | 19911663 |
| Reported: | 05/23/1991 |
| Case Closed Date: | 09/11/1991 |
| Program: | RP Lead |
| Federally Regulated UST (Y/N): | Y |
| Regulated Petroleum UST (1): | N |
| Excluded UST (1): | N |
| Deferred UST (1): | N |
| Partially Deferred UST (1): | N |
| Exempt 1 UST (2): | N |
| Exempt 2 Heating Oil UST (2): | N |
| Small Heating Oil AST (2): | N |
| Regulated AST (3): | N |
| Unregulated AST (3): | N |
| Other Y/N: | N |
| Unknown Y/N: | N |
| Other Description: | Not reported |
| Heating Oil Category: | Not reported |

| | |
|---|---|
| Region: | PRO |
| CEDS Facility Id: | 200000163138 |
| **Case Status:** | **Closed** |
| Pollution Complaint #: | 20094567 |
| Reported: | 06/01/2009 |
| Case Closed Date: | 07/30/2009 |
| Program: | RP Lead |
| Federally Regulated UST (Y/N): | Y |
| Regulated Petroleum UST (1): | Y |
| Excluded UST (1): | N |
| Deferred UST (1): | N |
| Partially Deferred UST (1): | N |
| Exempt 1 UST (2): | N |
| Exempt 2 Heating Oil UST (2): | N |
| Small Heating Oil AST (2): | N |
| Regulated AST (3): | N |
| Unregulated AST (3): | N |
| Other Y/N: | N |
| Unknown Y/N: | N |

**US FOODSERVICE INC (Continued)** **S103837304**

Other Description: Not reported
Heating Oil Category: Not reported

---

**2**
**NNE**
**1/4-1/2**
**0.426 mi.**
**2248 ft.**

**VIRGINIA ARMY NATIONAL GUARD - SANDSTON READINESS** **LUST** **S106059380**
**5901 BEULAH ROAD** **LTANKS** **N/A**
**SANDSTON, VA 23150** **TIER 2**

**Relative:**
**Higher**

**Actual:**
**150 ft.**

LUST REG PD:
Region: PD
**Status: Closed**
Pollution Complaint #: 20024177
Reg Code: PRO

LTANKS:
Region: PRO
CEDS Facility Id: 200000205430
**Case Status: Closed**
Pollution Complaint #: 20024177
Reported: 12/13/2001
Case Closed Date: 08/22/2013
Program: RP Lead
Federally Regulated UST (Y/N): N
Regulated Petroleum UST (1): N
Excluded UST (1): N
Deferred UST (1): N
Partially Deferred UST (1): N
Exempt 1 UST (2): N
Exempt 2 Heating Oil UST (2): Y
Small Heating Oil AST (2): N
Regulated AST (3): N
Unregulated AST (3): N
Other Y/N: N
Unknown Y/N: N
Other Description: Not reported
Heating Oil Category: Category 3

TIER 2:
Facility ID: 5425137
CAS Number: 68476302
SIC Code: Not reported
NAICS: Not reported
Entered Chemical Name: Diesel Fuel
Average Amt Code: 24999
Owner Name: Not reported
Owner Phone: Not reported
Contact Type: Not reported

Facility ID: 5425137
CAS Number: 68476302
SIC Code: Not reported
NAICS: Not reported
Entered Chemical Name: Fuel Oil
Average Amt Code: 24999
Owner Name: Not reported
Owner Phone: Not reported

**VIRGINIA ARMY NATIONAL GUARD - SANDSTON READINESS CENTER (Continued)** **S106059380**

Contact Type: Not reported

---

**3**
**WSW**
**1/4-1/2**
**0.436 mi.**
**2301 ft.**

**ELLEN JIM PROPERTY**
**3450 CHARLES CITY RD**
**RICHMOND, VA 23231**

**LUST** **S105623806**
**LTANKS** **N/A**
**SPILLS**

**Relative:**
**Higher**

**Actual:**
**152 ft.**

LUST REG PD:

| | |
|---|---|
| Region: | PD |
| **Status:** | **Closed** |
| Pollution Complaint #: | 20034171 |
| Reg Code: | PRO |

LTANKS:

| | |
|---|---|
| Region: | PRO |
| CEDS Facility Id: | 200000208347 |
| **Case Status:** | **Closed** |
| Pollution Complaint #: | 20034171 |
| Reported: | 10/29/2002 |
| Case Closed Date: | 02/19/2003 |
| Program: | RP Lead |
| Federally Regulated UST (Y/N): | N |
| Regulated Petroleum UST (1): | N |
| Excluded UST (1): | N |
| Deferred UST (1): | N |
| Partially Deferred UST (1): | N |
| Exempt 1 UST (2): | N |
| Exempt 2 Heating Oil UST (2): | Y |
| Small Heating Oil AST (2): | N |
| Regulated AST (3): | N |
| Unregulated AST (3): | N |
| Other Y/N: | N |
| Unknown Y/N: | N |
| Other Description: | Not reported |
| Heating Oil Category: | Category 2 |

SPILLS:

| | |
|---|---|
| Fips City/County: | Richmond City |
| Status: | Closed |
| Reference Id: | 4536 |
| IR Number: | 2010-P-3424 |
| Associated IR: | Not reported |
| Incident Date: | 05/14/2010 |
| Call Received Date: | 06/10/2010 |
| Closure Comments: | SITE CLEANED UPRw Ehrhart - Incident was opened to edit the incident details tab (material) and subsequently closed. |
| Threat To: | Not reported |
| Terrorism (Y/N): | N |
| Characterize Incident: | Unknown |
| Incident Type: | Petroleum |
| Incident Subtype: | Petroleum * Surface Spill |
| Materials: | Diesel (10-10 Gallons) |
| Effect To Receptor: | Not reported |
| Water Body: | Not reported |
| Low Quantity To Water: | Not reported |
| High Quantity To Water: | Not reported |

**ELLEN JIM PROPERTY (Continued)** **S105623806**

| | |
|---|---|
| Quantity Units: | Not reported |
| Other Receptors: | Not reported |
| RP Company: | ECR |
| RP Name: | Not reported |
| Property Owner: | Not reported |
| Property Company: | Not reported |
| Duration Of Event (Hrs): | 0 |
| Impacts: | Not reported |
| Other Impacts: | Not reported |
| Steps Taken: | Not reported |
| Steps Taken Description: | Not reported |
| System Components: | Not reported |
| Other System Components: | Not reported |
| Cause Of Event: | Not reported |
| Corrective Action Taken: | Not reported |
| Weather Status: | N/A |
| Precipitation (Wet): | 0 |
| Discharge Type: | N/A |
| Discharge Volume: | 0 |
| Unknown Discharge (Y/N): | N |
| Site Name: | ECR |
| Closure Date: | 09/09/2010 |
| Orig. Call Incident Description: | THERE WAS A SMALL RELEASE FROM A SADDLE TANK TO GROUND 10 GALLONS OF OIL. THEY ARE CLEANING IT UP AND WILL DISPOSE OF SOIL. DID NOT GET TO WETLANDS. THEY ARE EXEMPT FROM NEEDING A STORMWATER PERMIT. |
| Original Call Material Description: | OIL |
| Original Call Location Description: | ECR, HENRICO COUNTY |
| Incident Ongoing at time of Call: | N |
| Agencies Notified (Y/N): | N |
| Other Agencies: | Not reported |
| Permitted (Y/N): | N |
| Call Reported By Company Name: | Not reported |
| Call Property Owner Company Name: | Not reported |
| Call Property Owner Name: | Not reported |
| Site Summary: | SPILL TO GROUND- DID NOT REACH WETLANDS |

---

**4** **BYRD FIELD** **FUDS** **1010309659**
**NNW** **N/A**
**1/2-1** **SANDSTON, VA**
**0.653 mi.**
**3449 ft.**

**Relative:**
**Higher**

**Actual:**
**158 ft.**

FUDS:

| | |
|---|---|
| EPA Region: | 03 |
| Congressional District: | 03 |
| FUDS Number: | C03VA0178 |
| State: | VA |
| Facility Name: | BYRD FIELD |
| Fiscal Year: | 2013 |
| City: | SANDSTON |
| Federal Facility ID: | VA9799F1653 |
| Telephone: | 410-962-2809 |
| INST ID: | 57843 |
| County: | HENRICO |
| RAB: | Not reported |
| **CORPS_DIST**: | Baltimore District (NAB) |
| NPL Status: | Not Listed |
| CTC: | 539.39999999999998 |

**BYRD FIELD (Continued)** **1010309659**

| | |
|---|---|
| Current Owner: | Local Government |
| Future Prog: | Not reported |
| Description: | The Army constructed storage warehouses, barracks, dining facilities, storage vaults, runway improvements, hardstands, hangers, and an underground fuel distribution system. After World War II, the various facilities were used by Virginia Air and Army National Guard. A 1984 site visit resulted in a project for debris removal at the airport. The former Army Air Base is now owned by more than 250 persons/businesses including housing subdivisions and business/industrial parks. A site visit and meeting with airport officials was conducted on 7 June 1990. |
| Current Program: | Not reported |
| History: | In 1942 and 1943, the United States acquired 1,872.53 acres in fee, 1,280.16 acres by lease and 66.89 acres in easements for use as an Army air field, named the Richmond Army Air Base. On 1 November 1946, the Army excessed 1,691.88 acres, fee-owned, together with the leased areas and easements to the War Assets Administration (WAA). An additional 77.32 acres was subsequently excessed to GSA. By quitclaim deed of 1 July 1947, the WAA terminated the lease for 1277.71 acres to the City of Richmond and conveyed an additional 970 acres. Between 1 July 1947 and 10 June 1948, the WAA terminated the other lease and easements and disposed of an additional 712.84 acres. Between 14 March 1950 and 10 September 1985, GSA disposed of 86.36 acres. The former Army Air Base is now owned by more than 250 persons/businesses including housing subdivisions and business/industrial parks. A site visit and meeting with airport officials was conducted on 7 June 1990. |
| Latitude Degree: | 37 |
| Latitude Minute: | 30 |
| Latitude Second: | 17 |
| Latitude Direction: | N |
| Longitude Degree: | -77 |
| Longitude Minute: | 19 |
| Longitude Second: | 19 |
| Longitude Direction: | E |

Count: 2 records. ORPHAN SUMMARY

| City | EDR ID | Site Name | Site Address | Zip | Database(s) |
|---|---|---|---|---|---|
| SANDSTON | S118972373 | 0 BEULAH RD PROPERTY | 0 BEULAH RD | 23150 | LTANKS |
| SANDSTON | S113231575 | COMMONWEALTH AVIATION DBA MILLION | 400 PORTUGEE RD | 23150 | LUST, LTANKS |

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

**Number of Days to Update:** Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

**STANDARD ENVIRONMENTAL RECORDS**

***Federal NPL site list***

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 12/12/2018
Date Data Arrived at EDR: 12/28/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 14

Source: EPA
Telephone: N/A
Last EDR Contact: 02/15/2019
Next Scheduled EDR Contact: 04/15/2019
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 12/12/2018
Date Data Arrived at EDR: 12/28/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 14

Source: EPA
Telephone: N/A
Last EDR Contact: 02/15/2019
Next Scheduled EDR Contact: 04/15/2019
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

***Federal Delisted NPL site list***

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 12/12/2018
Date Data Arrived at EDR: 12/28/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 14

Source: EPA
Telephone: N/A
Last EDR Contact: 02/15/2019
Next Scheduled EDR Contact: 04/15/2019
Data Release Frequency: Quarterly

***Federal CERCLIS list***

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 11/07/2016
Date Data Arrived at EDR: 01/05/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 92

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 01/04/2019
Next Scheduled EDR Contact: 04/15/2019
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 12/12/2018
Date Data Arrived at EDR: 12/28/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 14

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 02/15/2019
Next Scheduled EDR Contact: 04/29/2019
Data Release Frequency: Quarterly

***Federal CERCLIS NFRAP site list***

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 12/13/2018
Date Data Arrived at EDR: 12/28/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 14

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 02/15/2019
Next Scheduled EDR Contact: 04/29/2019
Data Release Frequency: Quarterly

***Federal RCRA CORRACTS facilities list***

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/28/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 86

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 12/03/2018
Next Scheduled EDR Contact: 04/08/2019
Data Release Frequency: Quarterly

***Federal RCRA non-CORRACTS TSD facilities list***

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/28/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 12/03/2018
Next Scheduled EDR Contact: 04/08/2019
Data Release Frequency: Quarterly

***Federal RCRA generators list***

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/28/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 12/03/2018
Next Scheduled EDR Contact: 04/08/2019
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/28/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 12/03/2018
Next Scheduled EDR Contact: 04/08/2019
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/28/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 12/03/2018
Next Scheduled EDR Contact: 04/08/2019
Data Release Frequency: Quarterly

***Federal institutional controls / engineering controls registries***

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 10/17/2018
Date Data Arrived at EDR: 10/25/2018
Date Made Active in Reports: 12/07/2018
Number of Days to Update: 43

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 02/07/2019
Next Scheduled EDR Contact: 05/27/2019
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 07/31/2018
Date Data Arrived at EDR: 08/28/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 17

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/04/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 07/31/2018
Date Data Arrived at EDR: 08/28/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 17

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/04/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Varies

***Federal ERNS list***

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 09/24/2018
Date Data Arrived at EDR: 09/25/2018
Date Made Active in Reports: 11/09/2018
Number of Days to Update: 45

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 02/08/2019
Next Scheduled EDR Contact: 04/08/2019
Data Release Frequency: Quarterly

***State- and tribal - equivalent CERCLIS***

SHWS: This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: Department of Environmental Quality
Telephone: 804-698-4236
Last EDR Contact: 12/14/2018
Next Scheduled EDR Contact: 04/01/2019
Data Release Frequency: N/A

***State and tribal landfill and/or solid waste disposal site lists***

SWF/LF: Solid Waste Management Facilities

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 12/03/2018
Date Data Arrived at EDR: 12/04/2018
Date Made Active in Reports: 01/30/2019
Number of Days to Update: 57

Source: Department of Environmental Quality
Telephone: 804-698-4238
Last EDR Contact: 12/03/2018
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: Semi-Annually

***State and tribal leaking storage tank lists***

LUST REG WC: Leaking Underground Storage Tank List

Leaking underground storage tank site locations. Includes: counties of Alleghany, Bedford, Botetourt, Craig, Floyd, Franklin, Giles, Henry, Montgomery, Patrick, Pulaski, Roanoke; cities of Bedford, Clifton Forge, Covington, Martinsville, Radford, Roanoke, Salem.

Date of Government Version: 06/04/2015
Date Data Arrived at EDR: 06/05/2015
Date Made Active in Reports: 07/07/2015
Number of Days to Update: 32

Source: Department of Environmental Quality West Central Regional Office
Telephone: 540-562-6700
Last EDR Contact: 08/29/2016
Next Scheduled EDR Contact: 12/12/2016
Data Release Frequency: No Update Planned

LUST REG NO: Leaking Underground Storage Tank Tracking Database

Leaking underground storage tank site locations. Includes: counties of Arlington, Caroline, Culpeper, Fairfax, Fauquier, King George, Loudoun, Louisa, Madison, Orange, Prince William, Rappahannock, Spotsylvania, Stafford; cities of Alexandria, Fairfax, Falls Church, Fredericksburg, Manassas, Manassas Park.

Date of Government Version: 05/18/2004
Date Data Arrived at EDR: 05/22/2004
Date Made Active in Reports: 07/09/2004
Number of Days to Update: 48

Source: Department of Environmental Quality Northern Regional Office
Telephone: 703-583-3800
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG VA: Leaking Underground Storage Tank List

Leaking underground storage tank site locations. Includes: counties of Albemarle, Augusta, Bath, Clarke, Fluvanna, Frederick, Greene, Highland, Nelson, Page, Rockbridge, Rockingham, Shenandoah, Warren; cities of Buena Vista, Charlottesville, Harrisonburg, Lexington, Staunton, Waynesboro, Winchester.

Date of Government Version: 12/06/2011
Date Data Arrived at EDR: 12/08/2011
Date Made Active in Reports: 01/16/2012
Number of Days to Update: 39

Source: Department of Environmental Quality Valley Regional Office
Telephone: 540-574-7800
Last EDR Contact: 08/29/2016
Next Scheduled EDR Contact: 12/12/2016
Data Release Frequency: No Update Planned

LUST REG TD: Leaking Underground Storage Tank Sites

Leaking underground storage tank site locations. Includes: counties of Accomack, Isle of Wight, James City, Northampton, Southampton, York; cities of Chesapeake, Franklin, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, Williamsburg.

Date of Government Version: 06/30/2013
Date Data Arrived at EDR: 07/05/2013
Date Made Active in Reports: 09/16/2013
Number of Days to Update: 73

Source: Department of Environmental Quality Tidewater Regional Office
Telephone: trofoia@deq.vir
Last EDR Contact: 09/26/2016
Next Scheduled EDR Contact: 01/09/2017
Data Release Frequency: Quarterly

LUST REG SW: Leaking Underground Storage Tank Database

Leaking underground storage tank site locations. Includes: counties of Bland, Buchanan, Carroll, Dickenson, Grayson, Lee, Russell, Scott, Smyth, Tazewell, Washington, Wise, Wythe; cities of Bristol, Galax, Norton.

Date of Government Version: 07/15/2013
Date Data Arrived at EDR: 07/18/2013
Date Made Active in Reports: 09/16/2013
Number of Days to Update: 60

Source: Department of Environmental Quality Southwest Regional Office
Telephone: 276-676-4800
Last EDR Contact: 10/11/2016
Next Scheduled EDR Contact: 01/23/2017
Data Release Frequency: No Update Planned

LUST REG SC: Leaking Underground Storage Tanks

Leaking underground storage tank site locations. Includes: counties of Amherst, Appomattox, Buckingham, Campbell, Charlotte, Cumberland, Halifax, Lunenburg, Mecklenburg, Nottoway, Pittsylvania, Prince Deward; cities of Danville, Lynchburg.

Date of Government Version: 09/06/2013
Date Data Arrived at EDR: 09/06/2013
Date Made Active in Reports: 09/17/2013
Number of Days to Update: 11

Source: Department of Environmental Quality, South Central Region
Telephone: 434-582-5120
Last EDR Contact: 08/29/2016
Next Scheduled EDR Contact: 12/12/2016
Data Release Frequency: Semi-Annually

LUST REG PD: Leaking Underground Storage Tank Sites

Leaking underground storage tank site locaitons. Includes: counties of Amelia, Brunswick, Charles City, Chesterfield, Dinwiddie, Essex, Gloucester, Goochland, Greensville, Hanover, Henrico, King and Queen, King William, Lancaster, Mathews, Middlesex, New Kent, Northumberland, Powhatan, Prince George, Richmond, Surry, Sussex, Westmoreland; cities of Colonial Heights, Emporia, Hopewell, Petersburg.

Date of Government Version: 12/02/2014
Date Data Arrived at EDR: 12/04/2014
Date Made Active in Reports: 01/16/2015
Number of Days to Update: 43

Source: Department of Environmental Quality Piedmont Regional Office
Telephone: 804-527-5020
Last EDR Contact: 08/29/2016
Next Scheduled EDR Contact: 12/12/2016
Data Release Frequency: Quarterly

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 04/12/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 04/10/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/13/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 04/12/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 04/25/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 04/24/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 05/08/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 04/01/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

LTANKS: Leaking Petroleum Storage Tanks
Includes releases of petroleum from underground storage tanks and aboveground storage tanks.

Date of Government Version: 10/02/2018
Date Data Arrived at EDR: 11/29/2018
Date Made Active in Reports: 01/30/2019
Number of Days to Update: 62
Source: Department of Environmental Quality
Telephone: 804-698-4010
Last EDR Contact: 02/28/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Quarterly

***State and tribal registered storage tank lists***

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 05/15/2017
Date Data Arrived at EDR: 05/30/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 136
Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 01/08/2019
Next Scheduled EDR Contact: 04/22/2019
Data Release Frequency: Varies

UST: Registered Petroleum Storage Tanks
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 10/30/2018
Date Data Arrived at EDR: 11/29/2018
Date Made Active in Reports: 01/29/2019
Number of Days to Update: 61
Source: Department of Environmental Quality
Telephone: 804-698-4010
Last EDR Contact: 02/27/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Quarterly

AST: Registered Petroleum Storage Tanks
Registered Aboveground Storage Tanks.

Date of Government Version: 10/30/2018
Date Data Arrived at EDR: 11/29/2018
Date Made Active in Reports: 01/29/2019
Number of Days to Update: 61
Source: Department of Environmental Quality
Telephone: 804-698-4010
Last EDR Contact: 02/27/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Quarterly

INDIAN UST R10: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 04/12/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63
Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 04/10/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63
Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 04/25/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 04/24/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 04/01/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 04/12/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 05/08/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 04/13/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

***State and tribal institutional control / engineering control registries***

ENG CONTROLS: Engineering Controls Sites Listing

A listing of sites with Engineering Controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 01/07/2019
Date Data Arrived at EDR: 01/08/2019
Date Made Active in Reports: 02/25/2019
Number of Days to Update: 48

Source: Department of Environmental Quality
Telephone: 804-698-4228
Last EDR Contact: 01/07/2019
Next Scheduled EDR Contact: 04/22/2019
Data Release Frequency: Quarterly

INST CONTROL: Voluntary Remediation Program Database

Sites included in the Voluntary Remediation Program database that have deed restrictions.

Date of Government Version: 01/07/2019
Date Data Arrived at EDR: 01/08/2019
Date Made Active in Reports: 02/25/2019
Number of Days to Update: 48

Source: Department of Environmental Quality
Telephone: 804-698-4228
Last EDR Contact: 01/07/2019
Next Scheduled EDR Contact: 04/22/2019
Data Release Frequency: Quarterly

***State and tribal voluntary cleanup sites***

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

VRP: Voluntary Remediation Program

The Voluntary Cleanup Program encourages owners of elected contaminated sites to take the initiative and conduct voluntary cleanups that meet state environmental standards.

Date of Government Version: 01/07/2019
Date Data Arrived at EDR: 01/08/2019
Date Made Active in Reports: 02/25/2019
Number of Days to Update: 48

Source: Department of Environmental Quality
Telephone: 804-698-4228
Last EDR Contact: 01/07/2019
Next Scheduled EDR Contact: 04/22/2019
Data Release Frequency: Quarterly

INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 12/19/2018
Next Scheduled EDR Contact: 04/08/2019
Data Release Frequency: Varies

***State and tribal Brownfields sites***

BROWNFIELDS: Brownfields Site Specific Assessments

To qualify for Brownfields Assessment, the site must meet the Federal definition of a Brownfields and should have contaminant issues that need to be addressed and a redevelopment plan supported by the local government and community. Virginia's Department of Environmental Quality performs brownfields assessments under a cooperative agreement with the U.S. Environmental Protection Agency at no cost to communities, property owners or, prospective purchasers. The assessment is an evaluation of environmental impacts caused by previous site uses similar to a Phase II Environmental Assessment.

Date of Government Version: 01/23/2019
Date Data Arrived at EDR: 01/24/2019
Date Made Active in Reports: 02/22/2019
Number of Days to Update: 29

Source: Department of Environmental Quality
Telephone: 804-698-4207
Last EDR Contact: 01/24/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Quarterly

**ADDITIONAL ENVIRONMENTAL RECORDS**

***Local Brownfield lists***

US BROWNFIELDS: A Listing of Brownfields Sites

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 12/17/2018
Date Data Arrived at EDR: 12/18/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 24

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 12/18/2018
Next Scheduled EDR Contact: 04/01/2019
Data Release Frequency: Semi-Annually

***Local Lists of Landfill / Solid Waste Disposal Sites***

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 01/29/2019
Next Scheduled EDR Contact: 05/13/2019
Data Release Frequency: Varies

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 01/17/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land

A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 02/01/2019
Next Scheduled EDR Contact: 05/13/2019
Data Release Frequency: Varies

***Local Lists of Hazardous waste / Contaminated Sites***

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 09/21/2018
Date Data Arrived at EDR: 09/21/2018
Date Made Active in Reports: 11/09/2018
Number of Days to Update: 49

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 02/21/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: No Update Planned

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 09/21/2018
Date Data Arrived at EDR: 09/21/2018
Date Made Active in Reports: 11/09/2018
Number of Days to Update: 49

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 02/21/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Quarterly

***Local Land Records***

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 12/12/2018
Date Data Arrived at EDR: 12/28/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 14

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 02/15/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Semi-Annually

***Records of Emergency Release Reports***

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 03/26/2018
Date Data Arrived at EDR: 03/27/2018
Date Made Active in Reports: 06/08/2018
Number of Days to Update: 73

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 02/08/2019
Next Scheduled EDR Contact: 04/08/2019
Data Release Frequency: Quarterly

SPILLS PC: Pollution Complaint Database

Pollution Complaints Database. The pollution reports contained in the PC database include the initial release reporting of Leaking Underground Storage Tanks and all other releases of petroleum to the environment as well as releases to state waters. The database is current through 12/1/93. Since that time, all spill and pollution reporting information has been collected and tracked through the DEQ regional offices.

Date of Government Version: 06/01/1996
Date Data Arrived at EDR: 10/22/1996
Date Made Active in Reports: 11/21/1996
Number of Days to Update: 30

Source: Department of Environmental Quality
Telephone: 804-698-4287
Last EDR Contact: 03/08/2010
Next Scheduled EDR Contact: 06/21/2010
Data Release Frequency: No Update Planned

SPILLS WC: Prep Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 09/21/2009
Date Data Arrived at EDR: 09/29/2009
Date Made Active in Reports: 10/30/2009
Number of Days to Update: 31

Source: Department of Environmental Quality, West Central Region
Telephone: 540-562-6700
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

SPILLS: Prep/Spills Database Listing

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment. PREP staff often work to assist local emergency responders, other state agencies, federal agencies, and responsible parties, as may be needed, to manage pollution incidents. Oil spills, fish kills, and hazardous materials spills are examples of incidents that may involve the DEQ's PREP Program.

Date of Government Version: 11/01/2018
Date Data Arrived at EDR: 11/29/2018
Date Made Active in Reports: 01/30/2019
Number of Days to Update: 62

Source: Department of Environmental Quality
Telephone: 804-698-4287
Last EDR Contact: 02/27/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Quarterly

SPILLS NO: PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 09/23/2009
Date Data Arrived at EDR: 09/29/2009
Date Made Active in Reports: 10/30/2009
Number of Days to Update: 31

Source: Department of Environmental Quality, Northern Region
Telephone: 703-583-3864
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

SPILLS VA: PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 08/08/2012
Date Data Arrived at EDR: 08/09/2012
Date Made Active in Reports: 10/05/2012
Number of Days to Update: 57

Source: Department of Environmental Quality, Valley Regional Office
Telephone: 540-574-7800
Last EDR Contact: 05/06/2013
Next Scheduled EDR Contact: 08/19/2013
Data Release Frequency: Quarterly

SPILLS TD: PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 09/17/2009
Date Data Arrived at EDR: 09/23/2009
Date Made Active in Reports: 10/06/2009
Number of Days to Update: 13

Source: Department of Environmental Quality, Tidewater Region
Telephone: trofoia@deq.vir
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: Quarterly

SPILLS SW: Reportable Spills

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 01/21/2010
Date Data Arrived at EDR: 01/22/2010
Date Made Active in Reports: 02/16/2010
Number of Days to Update: 25

Source: Department of Environmental Quality, Southwest Region
Telephone: 276-676-4839
Last EDR Contact: 07/13/2012
Next Scheduled EDR Contact: 10/29/2012
Data Release Frequency: No Update Planned

SPILLS PD: PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 10/20/2009
Date Data Arrived at EDR: 10/29/2009
Date Made Active in Reports: 12/03/2009
Number of Days to Update: 35

Source: Department of Environmental Quality, Piedmont Region
Telephone: 804-527-5020
Last EDR Contact: 02/06/2012
Next Scheduled EDR Contact: 05/21/2012
Data Release Frequency: Quarterly

SPILLS BRL: Prep/Spills Database Listing

A listing of spills locations located in the Blue Ridge Regional area, Lynchburg.

Date of Government Version: 09/18/2009
Date Data Arrived at EDR: 09/18/2009
Date Made Active in Reports: 10/06/2009
Number of Days to Update: 18

Source: DEQ, Blue Ridge Regional Office
Telephone: 434-582-6218
Last EDR Contact: 11/28/2011
Next Scheduled EDR Contact: 03/12/2012
Data Release Frequency: Varies

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 09/01/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/15/2013
Number of Days to Update: 43

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

***Other Ascertainable Records***

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/28/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 12/03/2018
Next Scheduled EDR Contact: 04/08/2019
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 01/31/2015
Date Data Arrived at EDR: 07/08/2015
Date Made Active in Reports: 10/13/2015
Number of Days to Update: 97

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 02/22/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 01/11/2019
Next Scheduled EDR Contact: 04/22/2019
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 01/11/2019
Next Scheduled EDR Contact: 04/22/2019
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 02/15/2019
Next Scheduled EDR Contact: 05/27/2019
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 08/31/2018
Date Data Arrived at EDR: 09/25/2018
Date Made Active in Reports: 11/09/2018
Number of Days to Update: 45

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 02/04/2019
Next Scheduled EDR Contact: 04/08/2019
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 02/08/2019
Next Scheduled EDR Contact: 05/20/2019
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 02/08/2019
Next Scheduled EDR Contact: 05/20/2019
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 06/21/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 198

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 12/21/2018
Next Scheduled EDR Contact: 04/01/2019
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 01/10/2018
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 2

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 02/20/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 12/12/2018
Date Data Arrived at EDR: 12/28/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 14

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 02/15/2019
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 10/26/2018
Date Data Arrived at EDR: 11/06/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 66

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 01/22/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 08/13/2018
Date Data Arrived at EDR: 10/04/2018
Date Made Active in Reports: 11/09/2018
Number of Days to Update: 36

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 02/15/2019
Next Scheduled EDR Contact: 05/20/2019
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 09/14/2018
Date Data Arrived at EDR: 10/11/2018
Date Made Active in Reports: 12/07/2018
Number of Days to Update: 57

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 01/11/2019
Next Scheduled EDR Contact: 04/22/2019
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 01/07/2019
Next Scheduled EDR Contact: 04/22/2019
Data Release Frequency: Quarterly

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: Quarterly

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 08/30/2016
Date Data Arrived at EDR: 09/08/2016
Date Made Active in Reports: 10/21/2016
Number of Days to Update: 43
Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 01/22/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76
Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 12/05/2018
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 12/03/2018
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 05/24/2017
Date Data Arrived at EDR: 11/30/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 15
Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 10/02/2018
Date Data Arrived at EDR: 10/03/2018
Date Made Active in Reports: 11/09/2018
Number of Days to Update: 37

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 01/03/2019
Next Scheduled EDR Contact: 04/15/2019
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 10/01/2018
Date Data Arrived at EDR: 10/30/2018
Date Made Active in Reports: 01/18/2019
Number of Days to Update: 80

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 01/29/2019
Next Scheduled EDR Contact: 05/11/2019
Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 09/30/2018
Date Data Arrived at EDR: 10/12/2018
Date Made Active in Reports: 12/07/2018
Number of Days to Update: 56

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 01/07/2019
Next Scheduled EDR Contact: 04/22/2019
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 09/28/2017
Number of Days to Update: 218

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 02/13/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 01/07/2019
Next Scheduled EDR Contact: 04/22/2019
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 08/08/2017
Date Data Arrived at EDR: 09/11/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 3

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 01/31/2019
Next Scheduled EDR Contact: 05/20/2019
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 06/23/2017
Date Data Arrived at EDR: 10/11/2017
Date Made Active in Reports: 11/03/2017
Number of Days to Update: 23

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 02/22/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 12/12/2018
Date Data Arrived at EDR: 12/28/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 14

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 02/15/2019
Next Scheduled EDR Contact: 04/15/2019
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 08/01/2018
Date Data Arrived at EDR: 08/29/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 37

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 02/27/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 12/05/2005
Date Data Arrived at EDR: 02/29/2008
Date Made Active in Reports: 04/18/2008
Number of Days to Update: 49

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 11/30/2018
Next Scheduled EDR Contact: 03/11/2019
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 11/30/2018
Next Scheduled EDR Contact: 03/11/2019
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 09/10/2018
Date Data Arrived at EDR: 09/11/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 3

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 12/19/2018
Next Scheduled EDR Contact: 03/25/2019
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 11/15/2018
Date Data Arrived at EDR: 12/05/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 37

Source: EPA
Telephone: (215) 814-5000
Last EDR Contact: 01/31/2019
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: Quarterly

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 06/19/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 87

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 01/14/2019
Next Scheduled EDR Contact: 04/29/2019
Data Release Frequency: Varies

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 09/02/2018
Date Data Arrived at EDR: 09/05/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 9

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 01/07/2019
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: Quarterly

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 07/26/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 71

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 11/30/2018
Next Scheduled EDR Contact: 03/11/2019
Data Release Frequency: Varies

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 08/22/2018
Date Data Arrived at EDR: 08/22/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 44

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 02/21/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Quarterly

AIRS: Permitted Airs Facility List

A listing of permitted Airs facilities.

Date of Government Version: 09/21/2018
Date Data Arrived at EDR: 11/01/2018
Date Made Active in Reports: 12/26/2018
Number of Days to Update: 55

Source: Department of Environmental Quality
Telephone: 804-698-4000
Last EDR Contact: 01/14/2019
Next Scheduled EDR Contact: 04/01/2019
Data Release Frequency: Annually

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CEDS: Comprehensive Environmental Data System

Virginia Water Protection Permits, Virginia Pollution Discharge System (point discharge) permits and Virginia Pollution Abatement (no point discharge) permits.

Date of Government Version: 12/18/2018
Date Data Arrived at EDR: 12/19/2018
Date Made Active in Reports: 01/29/2019
Number of Days to Update: 41

Source: Department of Environmental Quality
Telephone: 804-698-4077
Last EDR Contact: 12/14/2018
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: Quarterly

COAL ASH: Coal Ash Disposal Sites

A listing of facilities with coal ash impoundments.

Date of Government Version: 12/10/2018
Date Data Arrived at EDR: 12/12/2018
Date Made Active in Reports: 01/30/2019
Number of Days to Update: 49

Source: Department of Environmental Protection
Telephone: 804-698-4285
Last EDR Contact: 12/03/2018
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: Varies

DRYCLEANERS: Drycleaner List

A listing of registered drycleaners.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 11/01/2018
Date Made Active in Reports: 12/26/2018
Number of Days to Update: 55

Source: Department of Environmental Quality
Telephone: 804-698-4407
Last EDR Contact: 01/07/2019
Next Scheduled EDR Contact: 04/22/2019
Data Release Frequency: Varies

ENFORCEMENT: Enforcement Actions Data

A listing of enforcement actions.

Date of Government Version: 06/01/2018
Date Data Arrived at EDR: 06/06/2018
Date Made Active in Reports: 07/05/2018
Number of Days to Update: 29

Source: Department of Environmental Quality
Telephone: 804-698-4031
Last EDR Contact: 01/02/2019
Next Scheduled EDR Contact: 04/15/2019
Data Release Frequency: Quarterly

Financial Assurance 1: Financial Assurance Information Listing

A listing of financial assurance information for underground storage tank facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 01/30/2019
Date Data Arrived at EDR: 01/31/2019
Date Made Active in Reports: 02/22/2019
Number of Days to Update: 22

Source: Department of Environmental Quality
Telephone: 804-698-4205
Last EDR Contact: 01/28/2019
Next Scheduled EDR Contact: 05/11/2019
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information listing

Solid waste financial assurance information.

Date of Government Version: 11/01/2018
Date Data Arrived at EDR: 11/06/2018
Date Made Active in Reports: 12/27/2018
Number of Days to Update: 51

Source: Department of Environmental Quality
Telephone: 804-698-4123
Last EDR Contact: 01/28/2019
Next Scheduled EDR Contact: 05/11/2019
Data Release Frequency: Varies

TIER 2: Tier 2 Information Listing

A listing of facilities which store or manufacture hazardous materials and submit a chemical inventory report.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 01/20/2017
Date Made Active in Reports: 02/14/2017
Number of Days to Update: 25

Source: Department of Environmental Quality
Telephone: 804-698-4159
Last EDR Contact: 12/14/2018
Next Scheduled EDR Contact: 04/01/2019
Data Release Frequency: Annually

UIC: Underground Injection Control Wells
A listing of underground injection controls wells.

Date of Government Version: 01/29/2019
Date Data Arrived at EDR: 01/30/2019
Date Made Active in Reports: 02/25/2019
Number of Days to Update: 26

Source: Department of Mines, Minerals and Energy
Telephone: 276-415-9700
Last EDR Contact: 01/30/2019
Next Scheduled EDR Contact: 05/11/2019
Data Release Frequency: Quarterly

**EDR HIGH RISK HISTORICAL RECORDS**

***EDR Exclusive Records***

EDR MGP: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations
EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners
EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

**EDR RECOVERED GOVERNMENT ARCHIVES**

***Exclusive Recovered Govt. Archives***

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environmental Quality in Virgina.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/20/2014
Number of Days to Update: 203

Source: Department of Environmental Quality
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environmental Quality in Virgina and at the Regional VA Levels.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/15/2014
Number of Days to Update: 198

Source: Department of Environmental Quality
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

**OTHER DATABASE(S)**

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 11/12/2018
Date Data Arrived at EDR: 11/14/2018
Date Made Active in Reports: 12/04/2018
Number of Days to Update: 20

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 02/12/2019
Next Scheduled EDR Contact: 05/27/2019
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 07/13/2018
Date Made Active in Reports: 08/01/2018
Number of Days to Update: 19

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 01/07/2019
Next Scheduled EDR Contact: 04/22/2019
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 01/01/2019
Date Data Arrived at EDR: 01/30/2019
Date Made Active in Reports: 02/14/2019
Number of Days to Update: 15

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 01/30/2019
Next Scheduled EDR Contact: 05/11/2019
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 10/23/2018
Date Made Active in Reports: 11/27/2018
Number of Days to Update: 35

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 01/11/2019
Next Scheduled EDR Contact: 04/29/2019
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 02/23/2018
Date Made Active in Reports: 04/09/2018
Number of Days to Update: 45

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 02/19/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 06/15/2018
Date Made Active in Reports: 07/09/2018
Number of Days to Update: 24

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 12/07/2018
Next Scheduled EDR Contact: 03/25/2019
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: PennWell Corporation
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Electric Power Transmission Line Data
Source: PennWell Corporation
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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 804-692-1900

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

**STREET AND ADDRESS INFORMATION**

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# GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

**TARGET PROPERTY ADDRESS**

BYRD FIELD
844-800 PORTUGEE RD
RICHMOND, VA 23250

**TARGET PROPERTY COORDINATES**

| | |
|---|---|
| Latitude (North): | 37.492848 - 37° 29' 34.25'' |
| Longitude (West): | 77.312216 - 77° 18' 43.98'' |
| Universal Tranverse Mercator: | Zone 18 |
| UTM X (Meters): | 295584.0 |
| UTM Y (Meters): | 4151854.8 |
| Elevation: | 150 ft. above sea level |

**USGS TOPOGRAPHIC MAP**

| | |
|---|---|
| Target Property Map: | 5951117 DUTCH GAP, VA |
| Version Date: | 2013 |
| North Map: | 5951493 SEVEN PINES, VA |
| Version Date: | 2013 |

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**GROUNDWATER FLOW DIRECTION INFORMATION**

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

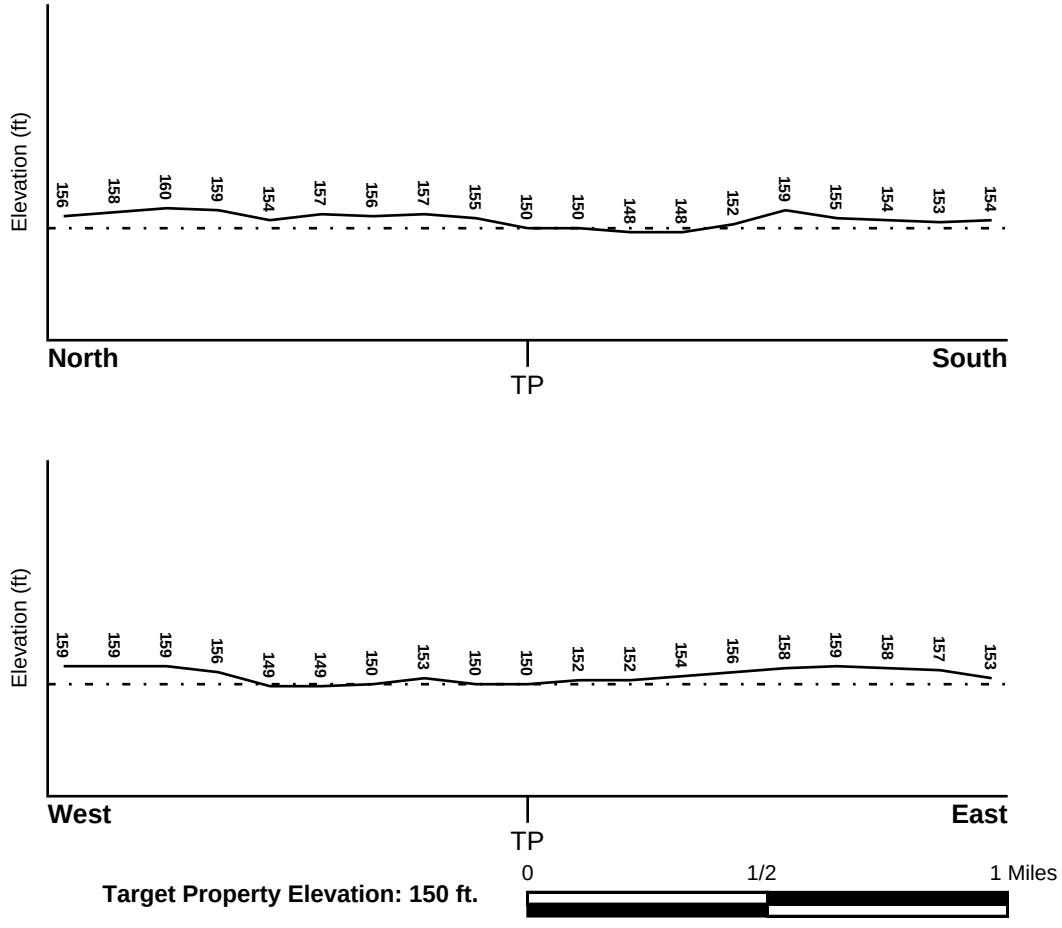
**TOPOGRAPHIC INFORMATION**

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

**TARGET PROPERTY TOPOGRAPHY**

General Topographic Gradient: General South

**SURROUNDING TOPOGRAPHY: ELEVATION PROFILES**




Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

## HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

### FEMA FLOOD ZONE

| Flood Plain Panel at Target Property | FEMA Source Type |
|---|---|
| 51087C0235C | FEMA FIRM Flood data |

| Additional Panels in search area: | FEMA Source Type |
|---|---|
| 51087C0170C | FEMA FIRM Flood data |
| 51085C0445B | FEMA FIRM Flood data |
| 51087C0165C | FEMA FIRM Flood data |
| 51087C0230C | FEMA FIRM Flood data |

### NATIONAL WETLAND INVENTORY

| NWI Quad at Target Property | NWI Electronic Data Coverage |
|---|---|
| DUTCH GAP | YES - refer to the Overview Map and Detail Map |

## HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

***Site-Specific Hydrogeological Data*:***

| | |
|---|---|
| Search Radius: | 1.25 miles |
| Status: | Not found |

## AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

| MAP ID | LOCATION FROM TP | GENERAL DIRECTION GROUNDWATER FLOW |
|---|---|---|
| Not Reported | | |

* ©1996 Site−specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**GROUNDWATER FLOW VELOCITY INFORMATION**

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

**GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY**

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

**ROCK STRATIGRAPHIC UNIT**

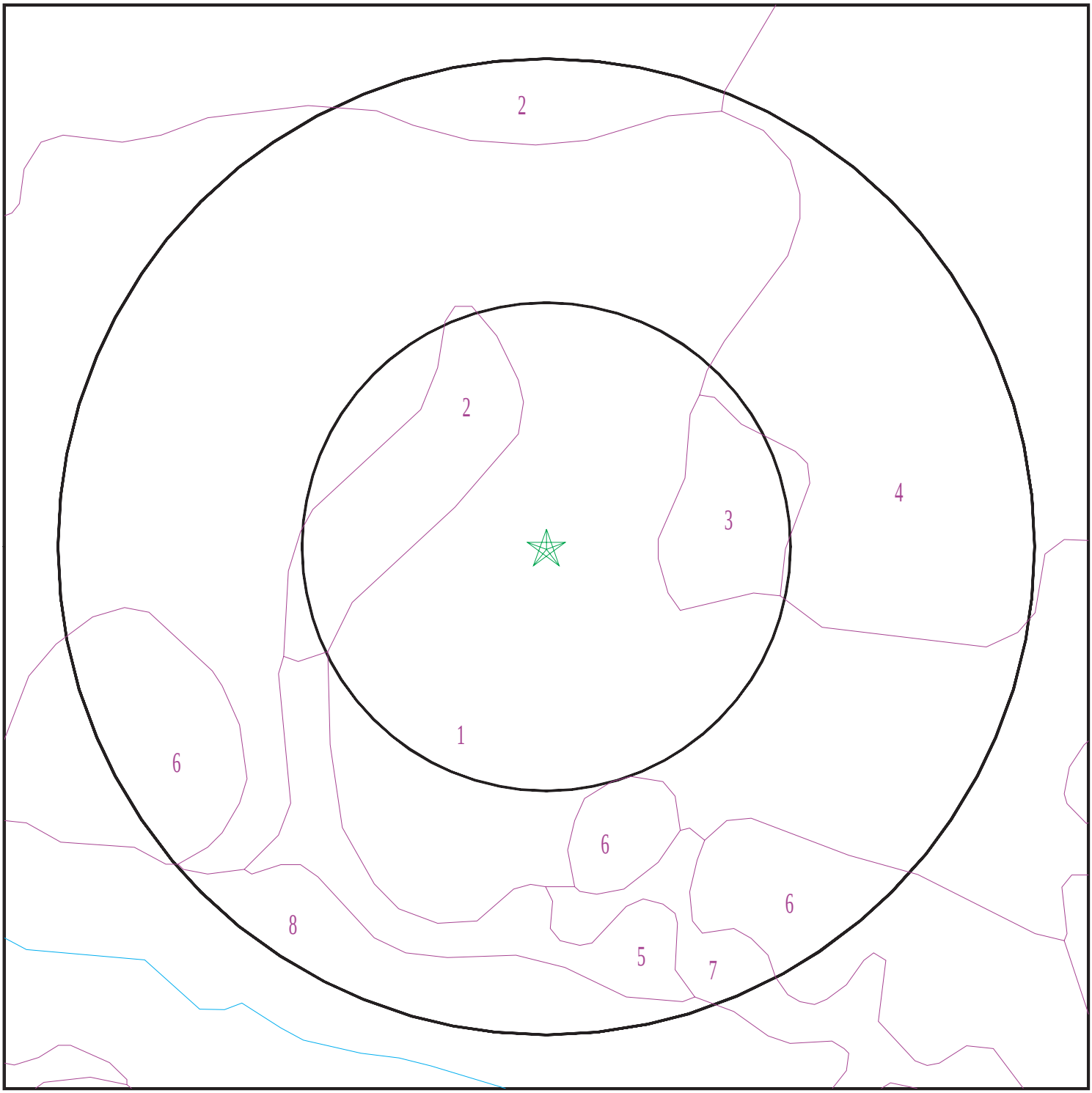
| | |
|---|---|
| Era: | Cenozoic |
| System: | Tertiary |
| Series: | Miocene |
| Code: | Tm *(decoded above as Era, System & Series)* |

**GEOLOGIC AGE IDENTIFICATION**

Category: Stratified Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

# SSURGO SOIL MAP - 5577731.2s




| | | | |
|---|---|---|---|
| SITE NAME: | Byrd Field | CLIENT: | AECOM |
| ADDRESS: | 844-800 Portugee Rd<br>Richmond VA 23250 | CONTACT: | Brittany Kirchmann |
| | | INQUIRY #: | 5577731.2s |
| LAT/LONG: | 37.492848 / 77.312216 | DATE: | March 01, 2019 4:18 pm |

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# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY**

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

---

**Soil Map ID: 1**

Soil Component Name: Atlee

Soil Surface Texture: very fine sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 61 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 11 inches | very fine sandy loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 14<br>Min: 1.4 | Max: 5.5<br>Min: 3.6 |
| 2 | 11 inches | 22 inches | clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 14<br>Min: 1.4 | Max: 5.5<br>Min: 3.6 |
| 3 | 22 inches | 53 inches | clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 14<br>Min: 1.4 | Max: 5.5<br>Min: 3.6 |
| 4 | 53 inches | 78 inches | clay | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 14<br>Min: 1.4 | Max: 5.5<br>Min: 3.6 |

**Soil Map ID: 2**

Soil Component Name: Lenoir

Soil Surface Texture: silt loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Somewhat poorly drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 38 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 5 inches | silt loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 1.4<br>Min: 0.42 | Max: 5.5<br>Min: 3.6 |
| 2 | 5 inches | 78 inches | silty clay | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 1.4<br>Min: 0.42 | Max: 5.5<br>Min: 3.6 |

**Soil Map ID: 3**

Soil Component Name: Coxville

Soil Surface Texture: silt loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Poorly drained

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: All hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 15 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 7 inches | silt loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 4<br>Min: 1.4 | Max: 5.5<br>Min: 3.6 |
| 2 | 7 inches | 78 inches | clay | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 4<br>Min: 1.4 | Max: 5.5<br>Min: 3.6 |

---

**Soil Map ID: 4**

Soil Component Name: Lynchburg

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Somewhat poorly drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 31 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 14 inches | fine sandy loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 14<br>Min: 4 | Max: 5.5<br>Min: 3.6 |
| 2 | 14 inches | 78 inches | clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 14<br>Min: 4 | Max: 5.5<br>Min: 3.6 |

---

**Soil Map ID: 5**

Soil Component Name: Chewacla

Soil Surface Texture: silt loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Somewhat poorly drained

Hydric Status: All hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 60 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 9 inches | silt loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils. | COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. | Max: 14<br>Min: 4 | Max: 5.5<br>Min: 4.5 |

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 2 | 9 inches | 46 inches | clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils. | COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. | Max: 14 Min: 4 | Max: 5.5 Min: 4.5 |
| 3 | 46 inches | 78 inches | sandy clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils. | COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. | Max: 14 Min: 4 | Max: 5.5 Min: 4.5 |

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**Soil Map ID: 6**

Soil Component Name: Kempsville

Soil Surface Texture: very fine sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 11 inches | very fine sandy loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 141 Min: 0.42 | Max: 6 Min: 4.5 |

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 2 | 11 inches | 59 inches | sandy clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 141 Min: 0.42 | Max: 6 Min: 4.5 |
| 3 | 59 inches | 78 inches | clay | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 141 Min: 0.42 | Max: 6 Min: 4.5 |

---

**Soil Map ID: 7**

Soil Component Name: Duplin

Soil Surface Texture: very fine sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 60 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 7 inches | very fine sandy loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 4 Min: 1.4 | Max: 5.5 Min: 4.5 |

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 2 | 7 inches | 78 inches | clay | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 4<br>Min: 1.4 | Max: 5.5<br>Min: 4.5 |

---

**Soil Map ID: 8**

Soil Component Name: Kinston

Soil Surface Texture: silt loam

Hydrologic Group: Class B/D - Drained/undrained hydrology class of soils that can be drained and are classified.

Soil Drainage Class: Poorly drained

Hydric Status: All hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 15 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 5 inches | silt loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand. | Max: 14<br>Min: 4 | Max: 5.5<br>Min: 4.5 |
| 2 | 5 inches | 74 inches | clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand. | Max: 14<br>Min: 4 | Max: 5.5<br>Min: 4.5 |

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 3 | 74 inches | 78 inches | sandy loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand. | Max: 14<br>Min: 4 | Max: 5.5<br>Min: 4.5 |

**LOCAL / REGIONAL WATER AGENCY RECORDS**

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

**WELL SEARCH DISTANCE INFORMATION**

| DATABASE | SEARCH DISTANCE (miles) |
|---|---|
| Federal USGS | 1.000 |
| Federal FRDS PWS | Nearest PWS within 1 mile |
| State Database | 1.000 |

**FEDERAL USGS WELL INFORMATION**

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| No Wells Found | | |

**FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION**

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| 1 | VA4087670 | 1/4 - 1/2 Mile SE |

Note: PWS System location is not always the same as well location.

**STATE DATABASE WELL INFORMATION**

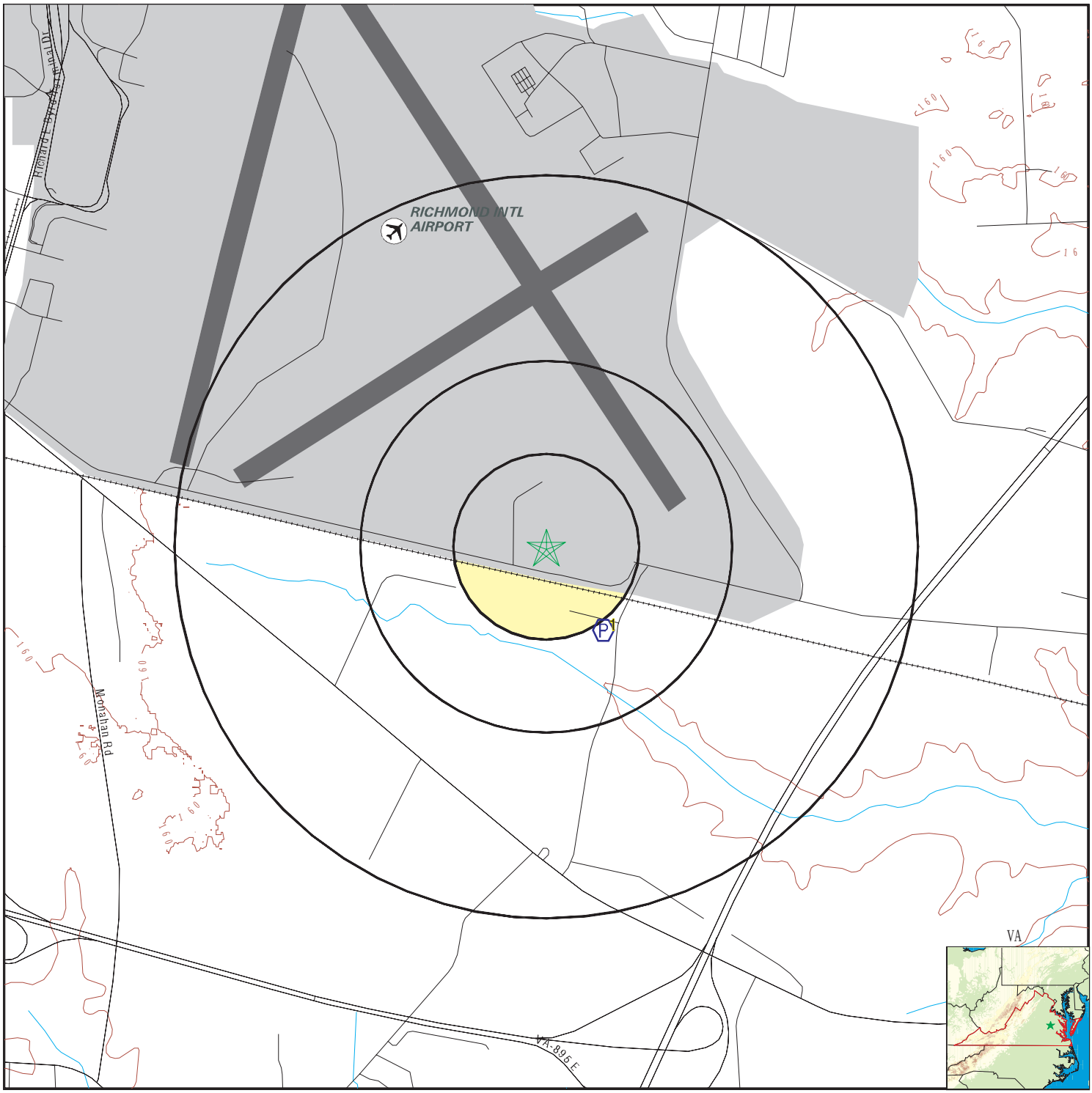
| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**STATE DATABASE WELL INFORMATION**

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| No Wells Found | | |

# PHYSICAL SETTING SOURCE MAP - 5577731.2s




- County Boundary
- Major Roads
- Contour Lines
- Airports
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons

0 1/4 1/2 1 Miles

- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- HD Closest Hydrogeological Data
- Oil, gas or related wells

N

| | | | |
|---|---|---|---|
| SITE NAME: | Byrd Field | CLIENT: | AECOM |
| ADDRESS: | 844-800 Portugee Rd<br>Richmond VA 23250 | CONTACT: | Brittany Kirchmann |
| LAT/LONG: | 37.492848 / 77.312216 | INQUIRY #: | 5577731.2s |
| | | DATE: | March 01, 2019 4:18 pm |

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# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

**1**
**SE** **FRDS PWS** **VA4087670**
**1/4 - 1/2 Mile**
**Higher**

| | | | |
|---|---|---|---|
| Epa region: | 03 | State: | VA |
| Pwsid: | VA4087670 | Pwsname: | MAZO-LERCH COMPANY, INC. |
| Cityserved: | Not Reported | Stateserved: | VA |
| Zipserved: | Not Reported | Fipscounty: | 51087 |
| Status: | Closed | Retpopsrvd: | 60 |
| Pwssvcconn: | 2 | Psource longname: | Groundwater |
| Pwstype: | NTNCWS | Owner: | Private |
| Contact: | MAZOLERCH COMPANY | Contactorgname: | Not Reported |
| Contactphone: | 804-737-2891 | Contactaddress1: | MARVIN DODD-MEAT MGR |
| Contactaddress2: | 363 LERCH DR | Contactcity: | SANDSTON |
| Contactstate: | VA | Contactzip: | 23150 |
| Pwsactivitycode: | I | | |

| | | | |
|---|---|---|---|
| PWS ID: | VA4087670 | PWS type: | System Owner/Responsible Party |
| PWS name: | MR GARY LERCH OPERATIONS MGR | | |
| PWS address: | MAZO LERCH COMPANY INC | PWS address: | 363 LERCH DR |
| PWS city: | SANDSTON | PWS state: | VA |
| PWS zip: | 23150 | PWS ID: | VA4087670 |
| Activity status: | Active | Date system activated: | 8906 |
| Date system deactivated: | Not Reported | Retail population: | 00000060 |
| System name: | MAZOLERCH COMPANY | System address: | MARVIN DODD-MEAT MGR |
| System address: | 363 LERCH DR | System city: | SANDSTON |
| System state: | VA | System zip: | 23150 |

| | | | |
|---|---|---|---|
| County FIPS: | Not Reported | City served: | HENRICO |

| | | | |
|---|---|---|---|
| Population served: | Under 101 Persons | Treatment: | Untreated |

| | | | |
|---|---|---|---|
| Latitude: | 372922 | Longitude: | 0771835 |

PWS currently has or had major violation(s) or enforcement:Yes

| | | | |
|---|---|---|---|
| Violation ID: | 94V0001 | Violation source ID: | Not Reported |
| PWS telephone: | Not Reported | Contaminant: | COLIFORM (TCR) |
| Violation type: | Max Contaminant Level, Monthly (TCR) | | |
| Violation start date: | 050194 | Violation end date: | 053194 |
| Violation period (months): | 001 | Violation awareness date: | Not Reported |
| Major violator: | Not Reported | Maximum contaminant level: | Not Reported |
| Number of required samples: | Not Reported | Number of samples taken: | Not Reported |
| Analysis method: | Not Reported | Analysis result: | Not Reported |

PWS currently has or had major violation(s) or enforcement:Yes

| | | | |
|---|---|---|---|
| Violation ID: | 93V0001 | Violation source ID: | Not Reported |
| PWS telephone: | 8047372891 | Contaminant: | BENZENE |
| Violation type: | Max Contaminant Level, Average | | |
| Violation start date: | 040192 | Violation end date: | 033193 |
| Violation period (months): | 012 | Violation awareness date: | 020493 |
| Major violator: | Not Reported | Maximum contaminant level: | Not Reported |
| Number of required samples: | Not Reported | Number of samples taken: | Not Reported |
| Analysis method: | Not Reported | Analysis result: | 000024600000000 |

| | | | |
|---|---|---|---|
| System Name: | MAZOLERCH COMPANY | Violation Type: | 22 |
| Contaminant: | 3100 | Compliance Begin: | 1994-05-01 |
| Compliance End: | 1994-05-31 | Violation ID: | 9400001V |

| | | | |
|---|---|---|---|
| Enforcement Date: | 1994-08-01 | Enforcement Action: | SIE |
| System Name: | MAZOLERCH COMPANY | Violation Type: | 22 |
| Contaminant: | 3100 | Compliance Begin: | 1994-05-01 |
| Compliance End: | 1994-05-31 | Violation ID: | 9400001V |
| Enforcement Date: | 1994-08-01 | Enforcement Action: | SFJ |
| System Name: | MAZOLERCH COMPANY | Violation Type: | 22 |
| Contaminant: | 3100 | Compliance Begin: | 1994-05-01 |
| Compliance End: | 1994-05-31 | Violation ID: | 9400001V |
| Enforcement Date: | 1994-08-15 | Enforcement Action: | SIF |

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
# RADON

**AREA RADON INFORMATION**

Federal EPA Radon Zone for HENRICO County: 3

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

---

Federal Area Radon Information for HENRICO COUNTY, VA

Number of sites tested: 49

| Area | Average Activity | % <4 pCi/L | % 4-20 pCi/L | % >20 pCi/L |
|---|---|---|---|---|
| Living Area - 1st Floor | 1.021 pCi/L | 100% | 0% | 0% |
| Living Area - 2nd Floor | Not Reported | Not Reported | Not Reported | Not Reported |
| Basement | 3.480 pCi/L | 80% | 20% | 0% |

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

## TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

## HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

## HYDROGEOLOGIC INFORMATION

AQUIFLOW$^{R}$ Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

## GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

## LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Virginia Public Water Supplies
Source: Department of Health, Office of Water Programs
Telephone: 804-786-1756

## OTHER STATE DATABASE INFORMATION

Virginia Oil and Gas Wells
Source: Department of Mines, Minerals and Energy
Telephone: 804-692-3200
A listing of oil and gas well locations.

RADON

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

EPA Region 3 Statistical Summary Readings
Source: Region 3 EPA
Telephone: 215-814-2082
Radon readings for Delaware, D.C., Maryland, Pennsylvania, Virginia and West Virginia.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary faultlines, prepared in 1975 by the United State Geological Survey

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

**STREET AND ADDRESS INFORMATION**

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**Byrd Field**
844-800 Portugee Rd
Richmond, VA  23250

Inquiry Number: 5577731.2s
March 01, 2019

# EDR Summary Radius Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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***Thank you for your business.***
Please contact EDR at 1-800-352-0050
with any questions or comments.


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# EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

## TARGET PROPERTY INFORMATION

### ADDRESS

844-800 PORTUGEE RD
RICHMOND, VA 23250

### COORDINATES

| | |
|---|---|
| Latitude (North): | 37.4928480 - 37° 29' 34.25'' |
| Longitude (West): | 77.3122160 - 77° 18' 43.97'' |
| Universal Tranverse Mercator: | Zone 18 |
| UTM X (Meters): | 295584.0 |
| UTM Y (Meters): | 4151854.8 |
| Elevation: | 150 ft. above sea level |

### USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

| | |
|---|---|
| Target Property: | TP |
| Source: | U.S. Geological Survey |

| | |
|---|---|
| Target Property: | N |
| Source: | U.S. Geological Survey |

### AERIAL PHOTOGRAPHY IN THIS REPORT

| | |
|---|---|
| Portions of Photo from: | 20140814 |
| Source: | USDA |

# MAPPED SITES SUMMARY

Target Property Address:
844-800 PORTUGEE RD
RICHMOND, VA 23250

Click on Map ID to see full detail.

| MAP ID | SITE NAME | ADDRESS | DATABASE ACRONYMS | RELATIVE ELEVATION | DIST (ft. & mi.) DIRECTION |
|---|---|---|---|---|---|
| 1 | US FOODSERVICE INC | 363 LERCH DR | LUST, LTANKS | Higher | 297, 0.056, SE |
| 2 | VIRGINIA ARMY NATION | 5901 BEULAH ROAD | LUST, LTANKS, TIER 2 | Higher | 2248, 0.426, NNE |
| 3 | ELLEN JIM PROPERTY | 3450 CHARLES CITY RD | LUST, LTANKS, SPILLS | Higher | 2301, 0.436, WSW |
| 4 | BYRD FIELD | | FUDS | Higher | 3449, 0.653, NNW |

# EXECUTIVE SUMMARY

## TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

## SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

## STANDARD ENVIRONMENTAL RECORDS

### *State and tribal leaking storage tank lists*

LUST: A review of the LUST list, as provided by EDR, has revealed that there are 3 LUST sites within approximately 0.5 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***US FOODSERVICE INC*** | ***363 LERCH DR*** | ***SE 0 - 1/8 (0.056 mi.)*** | ***1*** | ***8*** |
| Database: LUST REG PD, Date of Government Version: 12/02/2014<br>Facility Status: Closed<br>Pollution Complaint #: 19911663<br>Pollution Complaint #: 20094567 | | | | |
| ***VIRGINIA ARMY NATION*** | ***5901 BEULAH ROAD*** | ***NNE 1/4 - 1/2 (0.426 mi.)*** | ***2*** | ***8*** |
| Database: LUST REG PD, Date of Government Version: 12/02/2014<br>Facility Status: Closed<br>Pollution Complaint #: 20024177 | | | | |
| ***ELLEN JIM PROPERTY*** | ***3450 CHARLES CITY RD*** | ***WSW 1/4 - 1/2 (0.436 mi.)*** | ***3*** | ***8*** |
| Database: LUST REG PD, Date of Government Version: 12/02/2014<br>Facility Status: Closed<br>Pollution Complaint #: 20034171 | | | | |

LTANKS: A review of the LTANKS list, as provided by EDR, and dated 10/02/2018 has revealed that there are 3 LTANKS sites within approximately 0.5 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***US FOODSERVICE INC*** | ***363 LERCH DR*** | ***SE 0 - 1/8 (0.056 mi.)*** | ***1*** | ***8*** |
| Facility Status: Closed<br>CEDS Facility Id: 200000163138 | | | | |

Pollution Complaint #: 19911663
Pollution Complaint #: 20094567

| | | | | |
|---|---|---|---|---|
| ***VIRGINIA ARMY NATION*** | ***5901 BEULAH ROAD*** | ***NNE 1/4 - 1/2 (0.426 mi.)*** | ***2*** | ***8*** |
| Facility Status: Closed<br>CEDS Facility Id: 200000205430<br>Pollution Complaint #: 20024177 | | | | |
| ***ELLEN JIM PROPERTY*** | ***3450 CHARLES CITY RD*** | ***WSW 1/4 - 1/2 (0.436 mi.)*** | ***3*** | ***8*** |
| Facility Status: Closed<br>CEDS Facility Id: 200000208347<br>Pollution Complaint #: 20034171 | | | | |

**ADDITIONAL ENVIRONMENTAL RECORDS**

***Other Ascertainable Records***

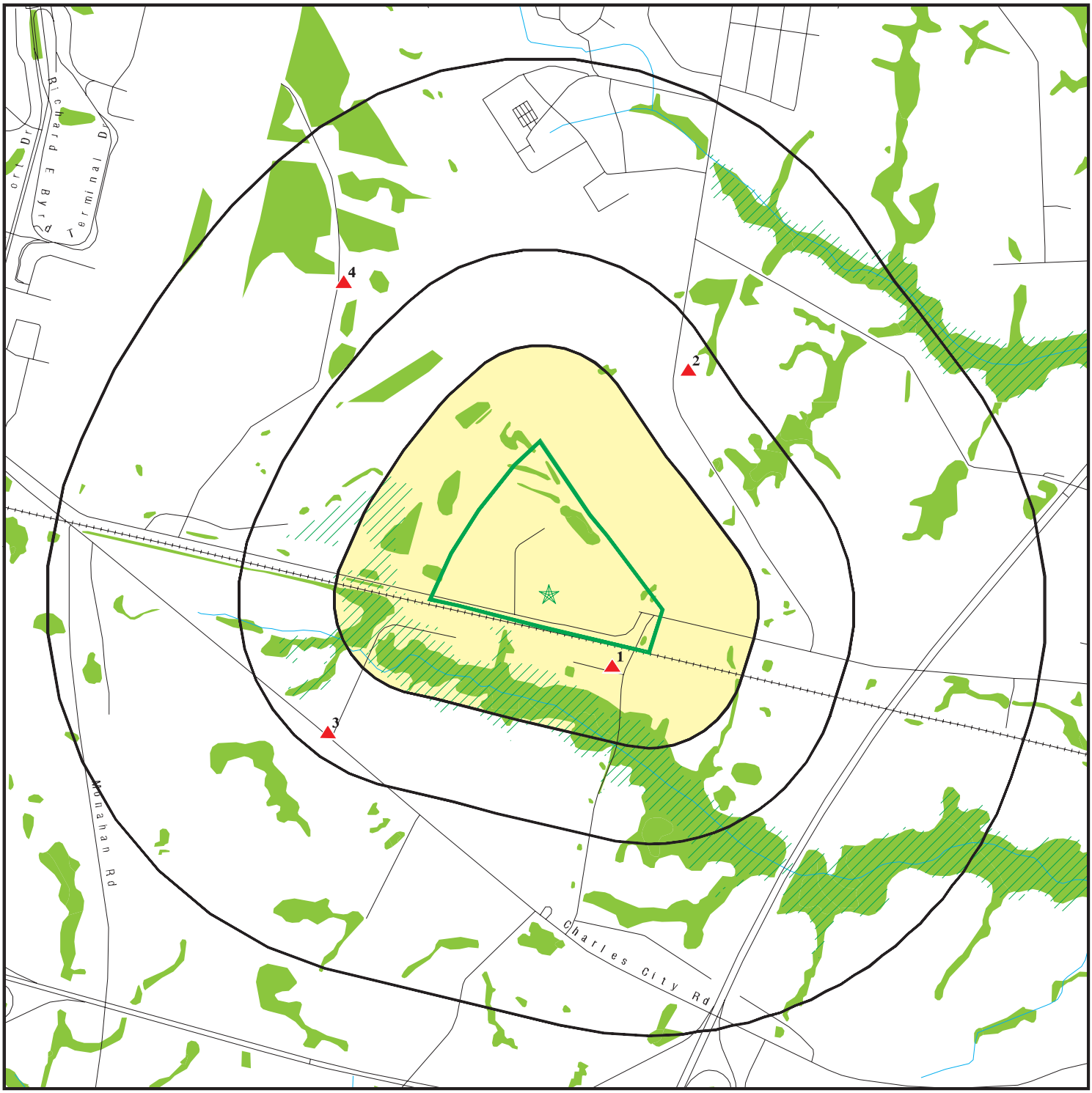
FUDS: A review of the FUDS list, as provided by EDR, and dated 01/31/2015 has revealed that there is 1 FUDS site within approximately 1 mile of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| BYRD FIELD<br>Federal Facility ID:: VA9799F1653<br>INST ID:: 57843 | | NNW 1/2 - 1 (0.653 mi.) | 4 | 9 |

Count: 2 records. ORPHAN SUMMARY

| City | EDR ID | Site Name | Site Address | Zip | Database(s) |
|---|---|---|---|---|---|
| SANDSTON | S118972373 | 0 BEULAH RD PROPERTY | 0 BEULAH RD | 23150 | LTANKS |
| SANDSTON | S113231575 | COMMONWEALTH AVIATION DBA MILLION | 400 PORTUGEE RD | 23150 | LUST, LTANKS |

# OVERVIEW MAP - 5577731.2S




Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Dept. Defense Sites

Indian Reservations BIA

100-year flood zone

500-year flood zone

National Wetland Inventory

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

| | | | |
|---|---|---|---|
| SITE NAME: | Byrd Field | CLIENT: | AECOM |
| ADDRESS: | 844-800 Portugee Rd<br>Richmond VA 23250 | CONTACT: | Brittany Kirchmann |
| LAT/LONG: | 37.492848 / 77.312216 | INQUIRY #: | 5577731.2s |
| | | DATE: | March 01, 2019 4:14 pm |

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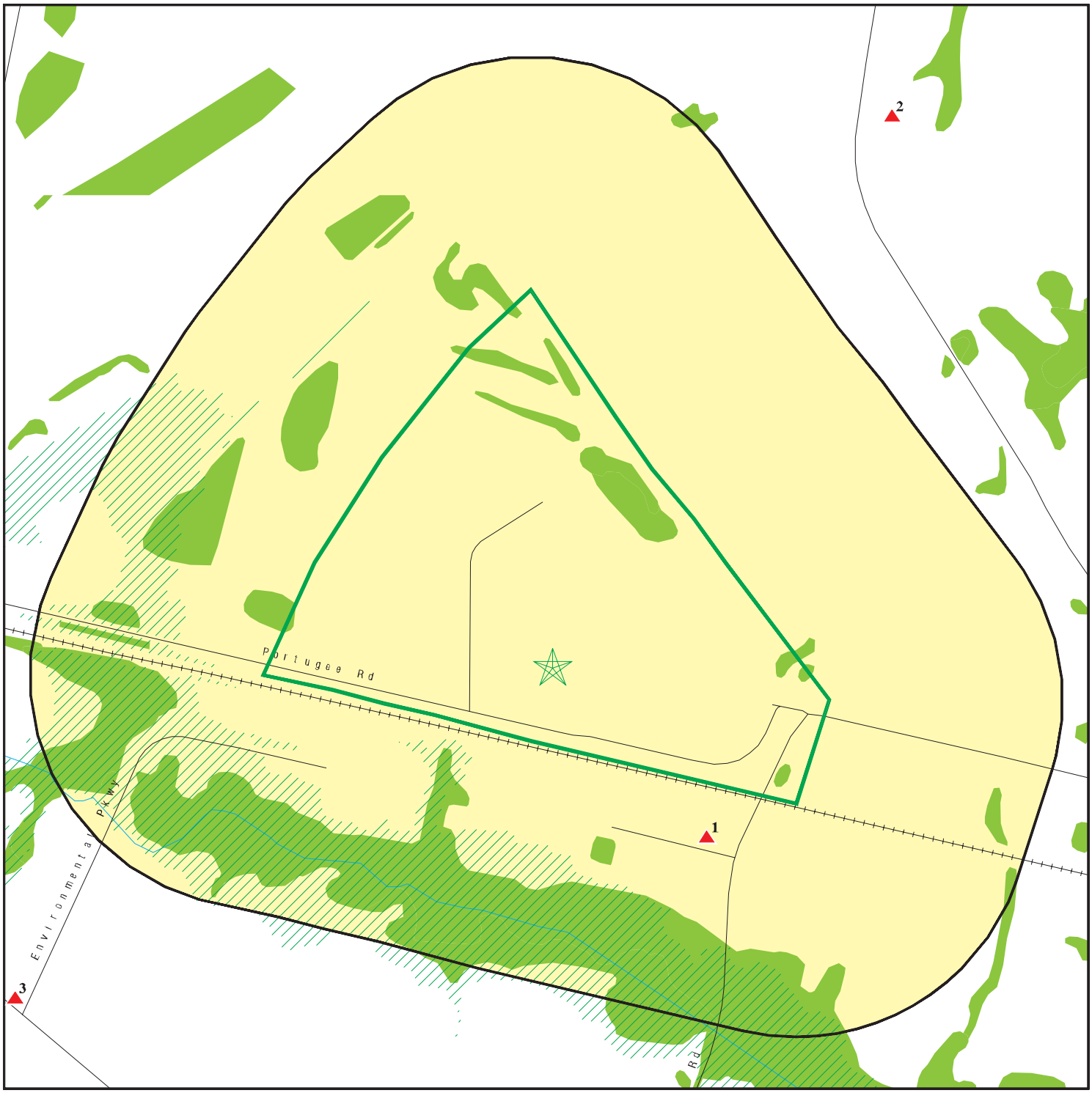
# DETAIL MAP - 5577731.2S




Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

Sensitive Receptors

National Priority List Sites

Dept. Defense Sites

0 1/8 1/4 1/2 Miles

Indian Reservations BIA

100-year flood zone

500-year flood zone

National Wetland Inventory

N

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

| | |
|---|---|
| SITE NAME: Byrd Field | CLIENT: AECOM |
| ADDRESS: 844-800 Portugee Rd<br>Richmond VA 23250 | CONTACT: Brittany Kirchmann |
| LAT/LONG: 37.492848 / 77.312216 | INQUIRY #: 5577731.2s<br>DATE: March 01, 2019 4:17 pm |

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# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| **STANDARD ENVIRONMENTAL RECORDS** | | | | | | | | |
| ***Federal NPL site list*** | | | | | | | | |
| NPL | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| Proposed NPL | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| NPL LIENS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ***Federal Delisted NPL site list*** | | | | | | | | |
| Delisted NPL | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ***Federal CERCLIS list*** | | | | | | | | |
| FEDERAL FACILITY | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| SEMS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Federal CERCLIS NFRAP site list*** | | | | | | | | |
| SEMS-ARCHIVE | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Federal RCRA CORRACTS facilities list*** | | | | | | | | |
| CORRACTS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ***Federal RCRA non-CORRACTS TSD facilities list*** | | | | | | | | |
| RCRA-TSDF | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Federal RCRA generators list*** | | | | | | | | |
| RCRA-LQG | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| RCRA-SQG | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| RCRA-CESQG | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| ***Federal institutional controls / engineering controls registries*** | | | | | | | | |
| LUCIS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| US ENG CONTROLS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| US INST CONTROL | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Federal ERNS list*** | | | | | | | | |
| ERNS | TP | | NR | NR | NR | NR | NR | 0 |
| ***State- and tribal - equivalent CERCLIS*** | | | | | | | | |
| SHWS | N/A | | N/A | N/A | N/A | N/A | N/A | N/A |
| ***State and tribal landfill and/or solid waste disposal site lists*** | | | | | | | | |
| SWF/LF | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***State and tribal leaking storage tank lists*** | | | | | | | | |
| LUST | 0.500 | | 1 | 0 | 2 | NR | NR | 3 |
| INDIAN LUST | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| LTANKS | 0.500 | | 1 | 0 | 2 | NR | NR | 3 |
| ***State and tribal registered storage tank lists*** | | | | | | | | |
| FEMA UST | 0.250 | | 0 | 0 | NR | NR | NR | 0 |

# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| UST | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| AST | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| INDIAN UST | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| ***State and tribal institutional control / engineering control registries*** | | | | | | | | |
| ENG CONTROLS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| INST CONTROL | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***State and tribal voluntary cleanup sites*** | | | | | | | | |
| INDIAN VCP | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| VCP | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***State and tribal Brownfields sites*** | | | | | | | | |
| BROWNFIELDS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| **ADDITIONAL ENVIRONMENTAL RECORDS** | | | | | | | | |
| ***Local Brownfield lists*** | | | | | | | | |
| US BROWNFIELDS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Local Lists of Landfill / Solid Waste Disposal Sites*** | | | | | | | | |
| INDIAN ODI | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ODI | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| DEBRIS REGION 9 | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| IHS OPEN DUMPS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Local Lists of Hazardous waste / Contaminated Sites*** | | | | | | | | |
| US HIST CDL | TP | | NR | NR | NR | NR | NR | 0 |
| US CDL | TP | | NR | NR | NR | NR | NR | 0 |
| ***Local Land Records*** | | | | | | | | |
| LIENS 2 | TP | | NR | NR | NR | NR | NR | 0 |
| ***Records of Emergency Release Reports*** | | | | | | | | |
| HMIRS | TP | | NR | NR | NR | NR | NR | 0 |
| SPILLS | TP | | NR | NR | NR | NR | NR | 0 |
| SPILLS 90 | TP | | NR | NR | NR | NR | NR | 0 |
| ***Other Ascertainable Records*** | | | | | | | | |
| RCRA NonGen / NLR | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| FUDS | 1.000 | | 0 | 0 | 0 | 1 | NR | 1 |
| DOD | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| SCRD DRYCLEANERS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| US FIN ASSUR | TP | | NR | NR | NR | NR | NR | 0 |
| EPA WATCH LIST | TP | | NR | NR | NR | NR | NR | 0 |
| 2020 COR ACTION | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| TSCA | TP | | NR | NR | NR | NR | NR | 0 |

# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| TRIS | TP | | NR | NR | NR | NR | NR | 0 |
| SSTS | TP | | NR | NR | NR | NR | NR | 0 |
| ROD | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| RMP | TP | | NR | NR | NR | NR | NR | 0 |
| RAATS | TP | | NR | NR | NR | NR | NR | 0 |
| PRP | TP | | NR | NR | NR | NR | NR | 0 |
| PADS | TP | | NR | NR | NR | NR | NR | 0 |
| ICIS | TP | | NR | NR | NR | NR | NR | 0 |
| FTTS | TP | | NR | NR | NR | NR | NR | 0 |
| MLTS | TP | | NR | NR | NR | NR | NR | 0 |
| COAL ASH DOE | TP | | NR | NR | NR | NR | NR | 0 |
| COAL ASH EPA | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| PCB TRANSFORMER | TP | | NR | NR | NR | NR | NR | 0 |
| RADINFO | TP | | NR | NR | NR | NR | NR | 0 |
| HIST FTTS | TP | | NR | NR | NR | NR | NR | 0 |
| DOT OPS | TP | | NR | NR | NR | NR | NR | 0 |
| CONSENT | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| INDIAN RESERV | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| FUSRAP | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| UMTRA | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| LEAD SMELTERS | TP | | NR | NR | NR | NR | NR | 0 |
| US AIRS | TP | | NR | NR | NR | NR | NR | 0 |
| US MINES | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| ABANDONED MINES | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| FINDS | TP | | NR | NR | NR | NR | NR | 0 |
| DOCKET HWC | TP | | NR | NR | NR | NR | NR | 0 |
| ECHO | TP | | NR | NR | NR | NR | NR | 0 |
| UXO | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| FUELS PROGRAM | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| AIRS | TP | | NR | NR | NR | NR | NR | 0 |
| NPDES | TP | | NR | NR | NR | NR | NR | 0 |
| COAL ASH | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| DRYCLEANERS | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| ENF | TP | | NR | NR | NR | NR | NR | 0 |
| Financial Assurance | TP | | NR | NR | NR | NR | NR | 0 |
| TIER 2 | TP | | NR | NR | NR | NR | NR | 0 |
| UIC | TP | | NR | NR | NR | NR | NR | 0 |
| **EDR HIGH RISK HISTORICAL RECORDS** | | | | | | | | |
| ***EDR Exclusive Records*** | | | | | | | | |
| EDR MGP | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| EDR Hist Auto | 0.125 | | 0 | NR | NR | NR | NR | 0 |
| EDR Hist Cleaner | 0.125 | | 0 | NR | NR | NR | NR | 0 |
| **EDR RECOVERED GOVERNMENT ARCHIVES** | | | | | | | | |
| ***Exclusive Recovered Govt. Archives*** | | | | | | | | |
| RGA LF | TP | | NR | NR | NR | NR | NR | 0 |

# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| RGA LUST | TP | | NR | NR | NR | NR | NR | 0 |
| - Totals -- | | 0 | 2 | 0 | 4 | 1 | 0 | 7 |

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

N/A = This State does not maintain a SHWS list. See the Federal CERCLIS list.

**1**
**SE**
**< 1/8**
**0.056 mi.**
**297 ft.**

**Relative:**
**Higher**

**US FOODSERVICE INC**
**363 LERCH DR**
**SANDSTON, VA 23150**

**LUST**
**LTANKS**

**S103837304**
**N/A**

Click here for full text details

**LUST**
Pollution Complaint #: 19911663
Pollution Complaint #: 20094567
Facility Status: Closed

**LTANKS**
Facility Status: Closed
CEDS Facility Id: 200000163138
Pollution Complaint #: 19911663
Pollution Complaint #: 20094567

---

**2**
**NNE**
**1/4-1/2**
**0.426 mi.**
**2248 ft.**

**Relative:**
**Higher**

**VIRGINIA ARMY NATIONAL GUARD - SANDSTON READINESS**
**5901 BEULAH ROAD**
**SANDSTON, VA 23150**

**LUST**
**LTANKS**
**TIER 2**

**S106059380**
**N/A**

Click here for full text details

**LUST**
Pollution Complaint #: 20024177
Facility Status: Closed

**LTANKS**
Facility Status: Closed
CEDS Facility Id: 200000205430
Pollution Complaint #: 20024177

---

**3**
**WSW**
**1/4-1/2**
**0.436 mi.**
**2301 ft.**

**Relative:**
**Higher**

**ELLEN JIM PROPERTY**
**3450 CHARLES CITY RD**
**RICHMOND, VA 23231**

**LUST**
**LTANKS**
**SPILLS**

**S105623806**
**N/A**

Click here for full text details

**LUST**
Pollution Complaint #: 20034171
Facility Status: Closed

**LTANKS**
Facility Status: Closed
CEDS Facility Id: 200000208347
Pollution Complaint #: 20034171

**SPILLS**
Facility Status: Closed
IR Number: 2010-P-3424

**4**
**NNW**
**1/2-1**
**0.653 mi.**
**3449 ft.**

**Relative:**
**Higher**

**BYRD FIELD**

**SANDSTON, VA**

**Click here for full text details**

**FUDS**
Federal Facility ID:: VA9799F1653
INST ID:: 57843

**FUDS** **1010309659**
**N/A**

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

| St | Acronym | Full Name | Government Agency | Gov Date | Arvl. Date | Active Date |
|---|---|---|---|---|---|---|
| VA | AIRS | Permitted Airs Facility List | Department of Environmental Quality | 09/21/2018 | 11/01/2018 | 12/26/2018 |
| VA | AST | Registered Petroleum Storage Tanks | Department of Environmental Quality | 10/30/2018 | 11/29/2018 | 01/29/2019 |
| VA | BROWNFIELDS | Brownfields Site Specific Assessments | Department of Environmental Quality | 01/23/2019 | 01/24/2019 | 02/22/2019 |
| VA | CEDS | Comprehensive Environmental Data System | Department of Environmental Quality | 12/18/2018 | 12/19/2018 | 01/29/2019 |
| VA | COAL ASH | Coal Ash Disposal Sites | Department of Environmental Protection | 12/10/2018 | 12/12/2018 | 01/30/2019 |
| VA | DRYCLEANERS | Drycleaner List | Department of Environmental Quality | 12/31/2017 | 11/01/2018 | 12/26/2018 |
| VA | ENFORCEMENT | Enforcement Actions Data | Department of Environmental Quality | 06/01/2018 | 06/06/2018 | 07/05/2018 |
| VA | ENG CONTROLS | Engineering Controls Sites Listing | Department of Environmental Quality | 01/07/2019 | 01/08/2019 | 02/25/2019 |
| VA | Financial Assurance 1 | Financial Assurance Information Listing | Department of Environmental Quality | 01/30/2019 | 01/31/2019 | 02/22/2019 |
| VA | Financial Assurance 2 | Financial Assurance Information listing | Department of Environmental Quality | 11/01/2018 | 11/06/2018 | 12/27/2018 |
| VA | INST CONTROL | Voluntary Remediation Program Database | Department of Environmental Quality | 01/07/2019 | 01/08/2019 | 02/25/2019 |
| VA | LTANKS | Leaking Petroleum Storage Tanks | Department of Environmental Quality | 10/02/2018 | 11/29/2018 | 01/30/2019 |
| VA | LUST REG NO | Leaking Underground Storage Tank Tracking Database | Department of Environmental Quality Northern | 05/18/2004 | 05/22/2004 | 07/09/2004 |
| VA | LUST REG PD | Leaking Underground Storage Tank Sites | Department of Environmental Quality Piedmont | 12/02/2014 | 12/04/2014 | 01/16/2015 |
| VA | LUST REG SC | Leaking Underground Storage Tanks | Department of Environmental Quality, South Ce | 09/06/2013 | 09/06/2013 | 09/17/2013 |
| VA | LUST REG SW | Leaking Underground Storage Tank Database | Department of Environmental Quality Southwest | 07/15/2013 | 07/18/2013 | 09/16/2013 |
| VA | LUST REG TD | Leaking Underground Storage Tank Sites | Department of Environmental Quality Tidewater | 06/30/2013 | 07/05/2013 | 09/16/2013 |
| VA | LUST REG VA | Leaking Underground Storage Tank List | Department of Environmental Quality Valley Re | 12/06/2011 | 12/08/2011 | 01/16/2012 |
| VA | LUST REG WC | Leaking Underground Storage Tank List | Department of Environmental Quality West Cent | 06/04/2015 | 06/05/2015 | 07/07/2015 |
| VA | RGA LF | Recovered Government Archive Solid Waste Facilities List | Department of Environmental Quality | | 07/01/2013 | 01/20/2014 |
| VA | RGA LUST | Recovered Government Archive Leaking Underground Storage Tan | Department of Environmental Quality | | 07/01/2013 | 01/15/2014 |
| VA | SHWS | This state does not maintain a SHWS list. See the Federal CE | Department of Environmental Quality | | | |
| VA | SPILLS | Prep/Spills Database Listing | Department of Environmental Quality | 11/01/2018 | 11/29/2018 | 01/30/2019 |
| VA | SPILLS 90 | SPILLS90 data from FirstSearch | FirstSearch | 09/01/2012 | 01/03/2013 | 02/15/2013 |
| VA | SPILLS BRL | Prep/Spills Database Listing | DEQ, Blue Ridge Regional Office | 09/18/2009 | 09/18/2009 | 10/06/2009 |
| VA | SPILLS NO | PREP Database | Department of Environmental Quality, Northern | 09/23/2009 | 09/29/2009 | 10/30/2009 |
| VA | SPILLS PC | Pollution Complaint Database | Department of Environmental Quality | 06/01/1996 | 10/22/1996 | 11/21/1996 |
| VA | SPILLS PD | PREP Database | Department of Environmental Quality, Piedmont | 10/20/2009 | 10/29/2009 | 12/03/2009 |
| VA | SPILLS SW | Reportable Spills | Department of Environmental Quality, Southwes | 01/21/2010 | 01/22/2010 | 02/16/2010 |
| VA | SPILLS TD | PREP Database | Department of Environmental Quality, Tidewate | 09/17/2009 | 09/23/2009 | 10/06/2009 |
| VA | SPILLS VA | PREP Database | Department of Environmental Quality, Valley R | 08/08/2012 | 08/09/2012 | 10/05/2012 |
| VA | SPILLS WC | Prep Database | Department of Environmental Quality, West Cen | 09/21/2009 | 09/29/2009 | 10/30/2009 |
| VA | SWF/LF | Solid Waste Management Facilities | Department of Environmental Quality | 12/03/2018 | 12/04/2018 | 01/30/2019 |
| VA | TIER 2 | Tier 2 Information Listing | Department of Environmental Quality | 12/31/2014 | 01/20/2017 | 02/14/2017 |
| VA | UIC | Underground Injection Control Wells | Department of Mines, Minerals and Energy | 01/29/2019 | 01/30/2019 | 02/25/2019 |
| VA | UST | Registered Petroleum Storage Tanks | Department of Environmental Quality | 10/30/2018 | 11/29/2018 | 01/29/2019 |
| VA | VRP | Voluntary Remediation Program | Department of Environmental Quality | 01/07/2019 | 01/08/2019 | 02/25/2019 |
| US | 2020 COR ACTION | 2020 Corrective Action Program List | Environmental Protection Agency | 09/30/2017 | 05/08/2018 | 07/20/2018 |
| US | ABANDONED MINES | Abandoned Mines | Department of Interior | 09/10/2018 | 09/11/2018 | 09/14/2018 |
| US | BRS | Biennial Reporting System | EPA/NTIS | 12/31/2015 | 02/22/2017 | 09/28/2017 |
| US | COAL ASH DOE | Steam-Electric Plant Operation Data | Department of Energy | 12/31/2005 | 08/07/2009 | 10/22/2009 |
| US | COAL ASH EPA | Coal Combustion Residues Surface Impoundments List | Environmental Protection Agency | 07/01/2014 | 09/10/2014 | 10/20/2014 |
| US | CONSENT | Superfund (CERCLA) Consent Decrees | Department of Justice, Consent Decree Library | 09/30/2018 | 10/12/2018 | 12/07/2018 |
| US | CORRACTS | Corrective Action Report | EPA | 03/01/2018 | 03/28/2018 | 06/22/2018 |
| US | DEBRIS REGION 9 | Torres Martinez Reservation Illegal Dump Site Locations | EPA, Region 9 | 01/12/2009 | 05/07/2009 | 09/21/2009 |
| US | DOCKET HWC | Hazardous Waste Compliance Docket Listing | Environmental Protection Agency | 05/31/2018 | 07/26/2018 | 10/05/2018 |
| US | DOD | Department of Defense Sites | USGS | 12/31/2005 | 11/10/2006 | 01/11/2007 |

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

| St | Acronym | Full Name | Government Agency | Gov Date | Arvl. Date | Active Date |
|---|---|---|---|---|---|---|
| US | DOT OPS | Incident and Accident Data | Department of Transporation, Office of Pipeli | 10/01/2018 | 10/30/2018 | 01/18/2019 |
| US | Delisted NPL | National Priority List Deletions | EPA | 12/12/2018 | 12/28/2018 | 01/11/2019 |
| US | ECHO | Enforcement & Compliance History Information | Environmental Protection Agency | 09/02/2018 | 09/05/2018 | 09/14/2018 |
| US | EDR Hist Auto | EDR Exclusive Historical Auto Stations | EDR, Inc. | | | |
| US | EDR Hist Cleaner | EDR Exclusive Historical Cleaners | EDR, Inc. | | | |
| US | EDR MGP | EDR Proprietary Manufactured Gas Plants | EDR, Inc. | | | |
| US | EPA WATCH LIST | EPA WATCH LIST | Environmental Protection Agency | 08/30/2013 | 03/21/2014 | 06/17/2014 |
| US | ERNS | Emergency Response Notification System | National Response Center, United States Coast | 09/24/2018 | 09/25/2018 | 11/09/2018 |
| US | FEDERAL FACILITY | Federal Facility Site Information listing | Environmental Protection Agency | 11/07/2016 | 01/05/2017 | 04/07/2017 |
| US | FEDLAND | Federal and Indian Lands | U.S. Geological Survey | 12/31/2005 | 02/06/2006 | 01/11/2007 |
| US | FEMA UST | Underground Storage Tank Listing | FEMA | 05/15/2017 | 05/30/2017 | 10/13/2017 |
| US | FINDS | Facility Index System/Facility Registry System | EPA | 11/15/2018 | 12/05/2018 | 01/11/2019 |
| US | FTTS | FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fu | EPA/Office of Prevention, Pesticides and Toxi | 04/09/2009 | 04/16/2009 | 05/11/2009 |
| US | FTTS INSP | FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fu | EPA | 04/09/2009 | 04/16/2009 | 05/11/2009 |
| US | FUDS | Formerly Used Defense Sites | U.S. Army Corps of Engineers | 01/31/2015 | 07/08/2015 | 10/13/2015 |
| US | FUELS PROGRAM | EPA Fuels Program Registered Listing | EPA | 08/22/2018 | 08/22/2018 | 10/05/2018 |
| US | FUSRAP | Formerly Utilized Sites Remedial Action Program | Department of Energy | 08/08/2017 | 09/11/2018 | 09/14/2018 |
| US | HIST FTTS | FIFRA/TSCA Tracking System Administrative Case Listing | Environmental Protection Agency | 10/19/2006 | 03/01/2007 | 04/10/2007 |
| US | HIST FTTS INSP | FIFRA/TSCA Tracking System Inspection & Enforcement Case Lis | Environmental Protection Agency | 10/19/2006 | 03/01/2007 | 04/10/2007 |
| US | HMIRS | Hazardous Materials Information Reporting System | U.S. Department of Transportation | 03/26/2018 | 03/27/2018 | 06/08/2018 |
| US | ICIS | Integrated Compliance Information System | Environmental Protection Agency | 11/18/2016 | 11/23/2016 | 02/10/2017 |
| US | IHS OPEN DUMPS | Open Dumps on Indian Land | Department of Health & Human Serivces, Indian | 04/01/2014 | 08/06/2014 | 01/29/2015 |
| US | INDIAN LUST R1 | Leaking Underground Storage Tanks on Indian Land | EPA Region 1 | 04/13/2018 | 05/18/2018 | 07/20/2018 |
| US | INDIAN LUST R10 | Leaking Underground Storage Tanks on Indian Land | EPA Region 10 | 04/12/2018 | 05/18/2018 | 07/20/2018 |
| US | INDIAN LUST R4 | Leaking Underground Storage Tanks on Indian Land | EPA Region 4 | 05/08/2018 | 05/18/2018 | 07/20/2018 |
| US | INDIAN LUST R5 | Leaking Underground Storage Tanks on Indian Land | EPA, Region 5 | 04/12/2018 | 05/18/2018 | 07/20/2018 |
| US | INDIAN LUST R6 | Leaking Underground Storage Tanks on Indian Land | EPA Region 6 | 04/01/2018 | 05/18/2018 | 07/20/2018 |
| US | INDIAN LUST R7 | Leaking Underground Storage Tanks on Indian Land | EPA Region 7 | 04/24/2018 | 05/18/2018 | 07/20/2018 |
| US | INDIAN LUST R8 | Leaking Underground Storage Tanks on Indian Land | EPA Region 8 | 04/25/2018 | 05/18/2018 | 07/20/2018 |
| US | INDIAN LUST R9 | Leaking Underground Storage Tanks on Indian Land | Environmental Protection Agency | 04/10/2018 | 05/18/2018 | 07/20/2018 |
| US | INDIAN ODI | Report on the Status of Open Dumps on Indian Lands | Environmental Protection Agency | 12/31/1998 | 12/03/2007 | 01/24/2008 |
| US | INDIAN RESERV | Indian Reservations | USGS | 12/31/2014 | 07/14/2015 | 01/10/2017 |
| US | INDIAN UST R1 | Underground Storage Tanks on Indian Land | EPA, Region 1 | 04/13/2018 | 05/18/2018 | 07/20/2018 |
| US | INDIAN UST R10 | Underground Storage Tanks on Indian Land | EPA Region 10 | 04/12/2018 | 05/18/2018 | 07/20/2018 |
| US | INDIAN UST R4 | Underground Storage Tanks on Indian Land | EPA Region 4 | 05/08/2018 | 05/18/2018 | 07/20/2018 |
| US | INDIAN UST R5 | Underground Storage Tanks on Indian Land | EPA Region 5 | 04/12/2018 | 05/18/2018 | 07/20/2018 |
| US | INDIAN UST R6 | Underground Storage Tanks on Indian Land | EPA Region 6 | 04/01/2018 | 05/18/2018 | 07/20/2018 |
| US | INDIAN UST R7 | Underground Storage Tanks on Indian Land | EPA Region 7 | 04/24/2018 | 05/18/2018 | 07/20/2018 |
| US | INDIAN UST R8 | Underground Storage Tanks on Indian Land | EPA Region 8 | 04/25/2018 | 05/18/2018 | 07/20/2018 |
| US | INDIAN UST R9 | Underground Storage Tanks on Indian Land | EPA Region 9 | 04/10/2018 | 05/18/2018 | 07/20/2018 |
| US | INDIAN VCP R1 | Voluntary Cleanup Priority Listing | EPA, Region 1 | 07/27/2015 | 09/29/2015 | 02/18/2016 |
| US | INDIAN VCP R7 | Voluntary Cleanup Priority Lisitng | EPA, Region 7 | 03/20/2008 | 04/22/2008 | 05/19/2008 |
| US | LEAD SMELTER 1 | Lead Smelter Sites | Environmental Protection Agency | 12/12/2018 | 12/28/2018 | 01/11/2019 |
| US | LEAD SMELTER 2 | Lead Smelter Sites | American Journal of Public Health | 04/05/2001 | 10/27/2010 | 12/02/2010 |
| US | LIENS 2 | CERCLA Lien Information | Environmental Protection Agency | 12/12/2018 | 12/28/2018 | 01/11/2019 |
| US | LUCIS | Land Use Control Information System | Department of the Navy | 10/17/2018 | 10/25/2018 | 12/07/2018 |
| US | MLTS | Material Licensing Tracking System | Nuclear Regulatory Commission | 08/30/2016 | 09/08/2016 | 10/21/2016 |

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

| St | Acronym | Full Name | Government Agency | Gov Date | Arvl. Date | Active Date |
|---|---|---|---|---|---|---|
| US | NPL | National Priority List | EPA | 12/12/2018 | 12/28/2018 | 01/11/2019 |
| US | NPL LIENS | Federal Superfund Liens | EPA | 10/15/1991 | 02/02/1994 | 03/30/1994 |
| US | ODI | Open Dump Inventory | Environmental Protection Agency | 06/30/1985 | 08/09/2004 | 09/17/2004 |
| US | PADS | PCB Activity Database System | EPA | 09/14/2018 | 10/11/2018 | 12/07/2018 |
| US | PCB TRANSFORMER | PCB Transformer Registration Database | Environmental Protection Agency | 05/24/2017 | 11/30/2017 | 12/15/2017 |
| US | PRP | Potentially Responsible Parties | EPA | 08/13/2018 | 10/04/2018 | 11/09/2018 |
| US | Proposed NPL | Proposed National Priority List Sites | EPA | 12/12/2018 | 12/28/2018 | 01/11/2019 |
| US | RAATS | RCRA Administrative Action Tracking System | EPA | 04/17/1995 | 07/03/1995 | 08/07/1995 |
| US | RADINFO | Radiation Information Database | Environmental Protection Agency | 10/02/2018 | 10/03/2018 | 11/09/2018 |
| US | RCRA NonGen / NLR | RCRA - Non Generators / No Longer Regulated | Environmental Protection Agency | 03/01/2018 | 03/28/2018 | 06/22/2018 |
| US | RCRA-CESQG | RCRA - Conditionally Exempt Small Quantity Generators | Environmental Protection Agency | 03/01/2018 | 03/28/2018 | 06/22/2018 |
| US | RCRA-LQG | RCRA - Large Quantity Generators | Environmental Protection Agency | 03/01/2018 | 03/28/2018 | 06/22/2018 |
| US | RCRA-SQG | RCRA - Small Quantity Generators | Environmental Protection Agency | 03/01/2018 | 03/28/2018 | 06/22/2018 |
| US | RCRA-TSDF | RCRA - Treatment, Storage and Disposal | Environmental Protection Agency | 03/01/2018 | 03/28/2018 | 06/22/2018 |
| US | RMP | Risk Management Plans | Environmental Protection Agency | 10/26/2018 | 11/06/2018 | 01/11/2019 |
| US | ROD | Records Of Decision | EPA | 12/12/2018 | 12/28/2018 | 01/11/2019 |
| US | SCRD DRYCLEANERS | State Coalition for Remediation of Drycleaners Listing | Environmental Protection Agency | 01/01/2017 | 02/03/2017 | 04/07/2017 |
| US | SEMS | Superfund Enterprise Management System | EPA | 12/12/2018 | 12/28/2018 | 01/11/2019 |
| US | SEMS-ARCHIVE | Superfund Enterprise Management System Archive | EPA | 12/13/2018 | 12/28/2018 | 01/11/2019 |
| US | SSTS | Section 7 Tracking Systems | EPA | 12/31/2009 | 12/10/2010 | 02/25/2011 |
| US | TRIS | Toxic Chemical Release Inventory System | EPA | 12/31/2016 | 01/10/2018 | 01/12/2018 |
| US | TSCA | Toxic Substances Control Act | EPA | 12/31/2016 | 06/21/2017 | 01/05/2018 |
| US | UMTRA | Uranium Mill Tailings Sites | Department of Energy | 06/23/2017 | 10/11/2017 | 11/03/2017 |
| US | US AIRS (AFS) | Aerometric Information Retrieval System Facility Subsystem ( | EPA | 10/12/2016 | 10/26/2016 | 02/03/2017 |
| US | US AIRS MINOR | Air Facility System Data | EPA | 10/12/2016 | 10/26/2016 | 02/03/2017 |
| US | US BROWNFIELDS | A Listing of Brownfields Sites | Environmental Protection Agency | 12/17/2018 | 12/18/2018 | 01/11/2019 |
| US | US CDL | Clandestine Drug Labs | Drug Enforcement Administration | 09/21/2018 | 09/21/2018 | 11/09/2018 |
| US | US ENG CONTROLS | Engineering Controls Sites List | Environmental Protection Agency | 07/31/2018 | 08/28/2018 | 09/14/2018 |
| US | US FIN ASSUR | Financial Assurance Information | Environmental Protection Agency | 08/31/2018 | 09/25/2018 | 11/09/2018 |
| US | US HIST CDL | National Clandestine Laboratory Register | Drug Enforcement Administration | 09/21/2018 | 09/21/2018 | 11/09/2018 |
| US | US INST CONTROL | Sites with Institutional Controls | Environmental Protection Agency | 07/31/2018 | 08/28/2018 | 09/14/2018 |
| US | US MINES | Mines Master Index File | Department of Labor, Mine Safety and Health A | 08/01/2018 | 08/29/2018 | 10/05/2018 |
| US | US MINES 2 | Ferrous and Nonferrous Metal Mines Database Listing | USGS | 12/05/2005 | 02/29/2008 | 04/18/2008 |
| US | US MINES 3 | Active Mines & Mineral Plants Database Listing | USGS | 04/14/2011 | 06/08/2011 | 09/13/2011 |
| US | UXO | Unexploded Ordnance Sites | Department of Defense | 09/30/2017 | 06/19/2018 | 09/14/2018 |

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

| St | Acronym | Full Name | Government Agency | Gov Date | Arvl. Date | Active Date |
|---|---|---|---|---|---|---|
| CT | CT MANIFEST | Hazardous Waste Manifest Data | Department of Energy & Environmental Protecti | 11/12/2018 | 11/14/2018 | 12/04/2018 |
| NJ | NJ MANIFEST | Manifest Information | Department of Environmental Protection | 12/31/2017 | 07/13/2018 | 08/01/2018 |
| NY | NY MANIFEST | Facility and Manifest Data | Department of Environmental Conservation | 01/01/2019 | 01/30/2019 | 02/14/2019 |
| PA | PA MANIFEST | Manifest Information | Department of Environmental Protection | 12/31/2017 | 10/23/2018 | 11/27/2018 |
| RI | RI MANIFEST | Manifest information | Department of Environmental Management | 12/31/2017 | 02/23/2018 | 04/09/2018 |
| WI | WI MANIFEST | Manifest Information | Department of Natural Resources | 12/31/2017 | 06/15/2018 | 07/09/2018 |
| US | AHA Hospitals | Sensitive Receptor: AHA Hospitals | American Hospital Association, Inc. | | | |
| US | Medical Centers | Sensitive Receptor: Medical Centers | Centers for Medicare & Medicaid Services | | | |
| US | Nursing Homes | Sensitive Receptor: Nursing Homes | National Institutes of Health | | | |
| US | Public Schools | Sensitive Receptor: Public Schools | National Center for Education Statistics | | | |
| US | Private Schools | Sensitive Receptor: Private Schools | National Center for Education Statistics | | | |
| VA | Daycare Centers | Sensitive Receptor: Licensed Facilities | Department of Social Services | | | |
| US | Flood Zones | 100-year and 500-year flood zones | Emergency Management Agency (FEMA) | | | |
| US | NWI | National Wetlands Inventory | U.S. Fish and Wildlife Service | | | |
| US | Topographic Map | | U.S. Geological Survey | | | |
| US | Oil/Gas Pipelines | | PennWell Corporation | | | |
| US | Electric Power Transmission Line Data | | PennWell Corporation | | | |

**STREET AND ADDRESS INFORMATION**

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# GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

**TARGET PROPERTY ADDRESS**

BYRD FIELD
844-800 PORTUGEE RD
RICHMOND, VA 23250

**TARGET PROPERTY COORDINATES**

| | |
|---|---|
| Latitude (North): | 37.492848 - 37° 29' 34.25'' |
| Longitude (West): | 77.312216 - 77° 18' 43.98'' |
| Universal Tranverse Mercator: | Zone 18 |
| UTM X (Meters): | 295584.0 |
| UTM Y (Meters): | 4151854.8 |
| Elevation: | 150 ft. above sea level |

**USGS TOPOGRAPHIC MAP**

| | |
|---|---|
| Target Property Map: | 5951117 DUTCH GAP, VA |
| Version Date: | 2013 |
| North Map: | 5951493 SEVEN PINES, VA |
| Version Date: | 2013 |

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**GROUNDWATER FLOW DIRECTION INFORMATION**

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

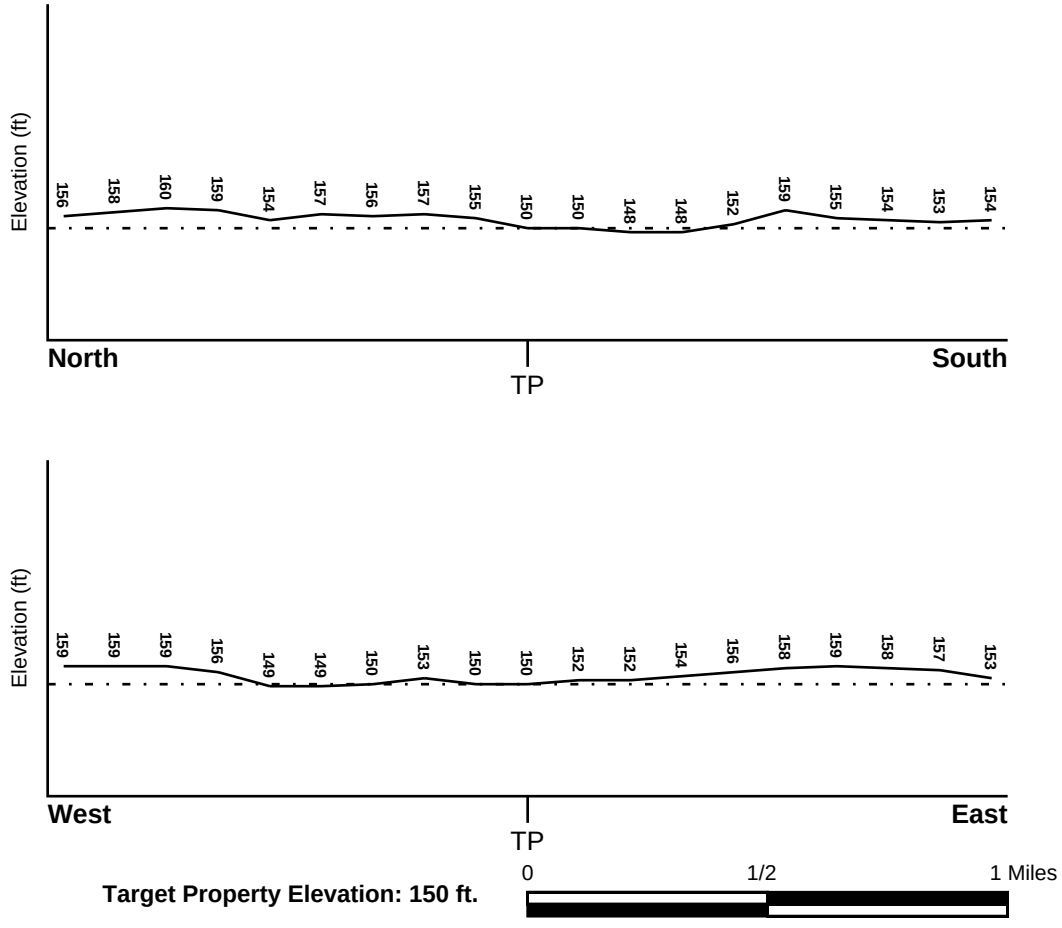
**TOPOGRAPHIC INFORMATION**

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

**TARGET PROPERTY TOPOGRAPHY**

General Topographic Gradient: General South

**SURROUNDING TOPOGRAPHY: ELEVATION PROFILES**




Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

## HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

### FEMA FLOOD ZONE

| Flood Plain Panel at Target Property | FEMA Source Type |
|---|---|
| 51087C0235C | FEMA FIRM Flood data |

| Additional Panels in search area: | FEMA Source Type |
|---|---|
| 51087C0170C | FEMA FIRM Flood data |
| 51085C0445B | FEMA FIRM Flood data |
| 51087C0165C | FEMA FIRM Flood data |
| 51087C0230C | FEMA FIRM Flood data |

### NATIONAL WETLAND INVENTORY

| NWI Quad at Target Property | NWI Electronic Data Coverage |
|---|---|
| DUTCH GAP | YES - refer to the Overview Map and Detail Map |

## HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

***Site-Specific Hydrogeological Data*:***

| | |
|---|---|
| Search Radius: | 1.25 miles |
| Status: | Not found |

## AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

| MAP ID | LOCATION FROM TP | GENERAL DIRECTION GROUNDWATER FLOW |
|---|---|---|
| Not Reported | | |

* ©1996 Site−specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**GROUNDWATER FLOW VELOCITY INFORMATION**

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

**GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY**

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

**ROCK STRATIGRAPHIC UNIT**

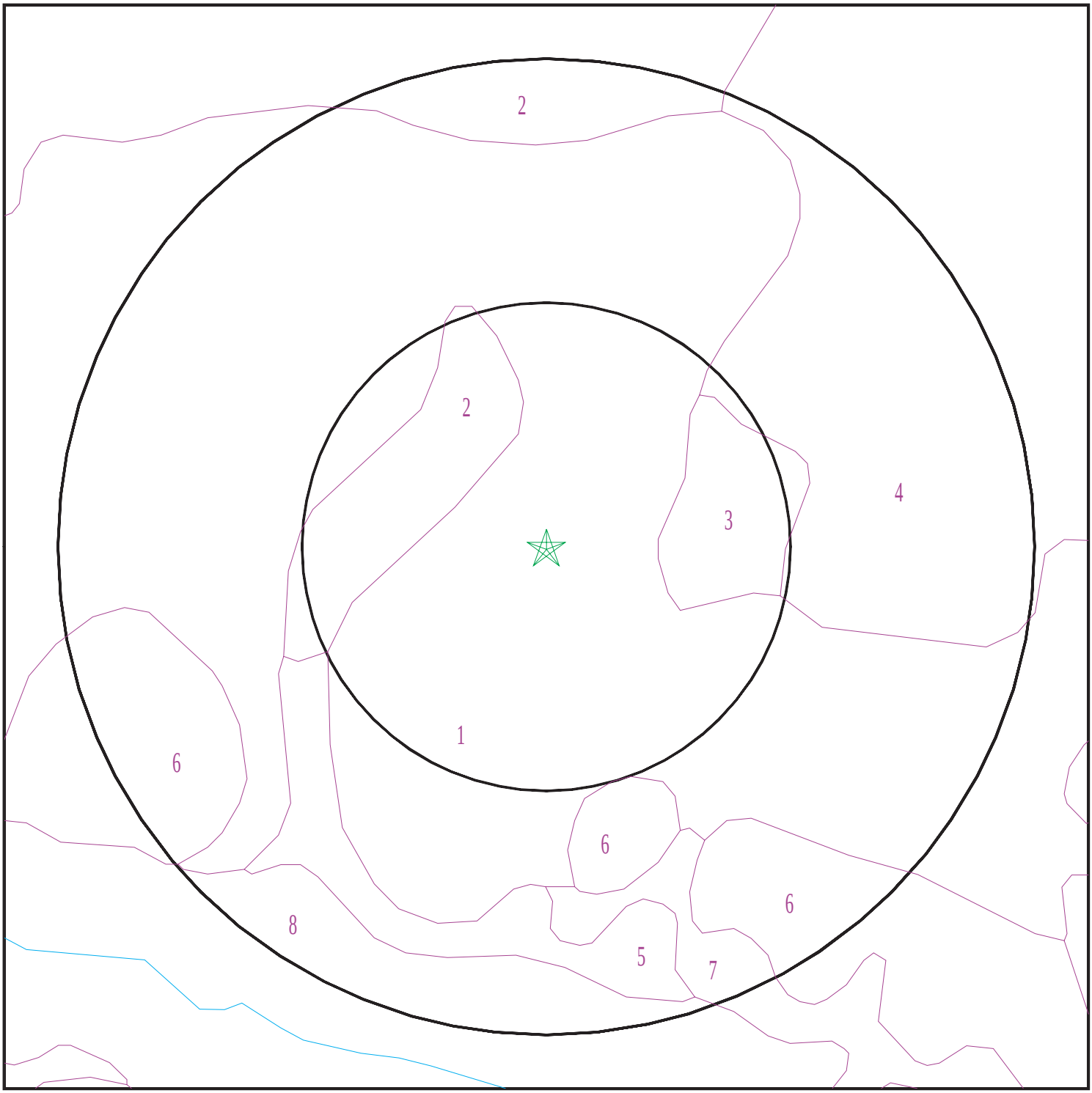
| | |
|---|---|
| Era: | Cenozoic |
| System: | Tertiary |
| Series: | Miocene |
| Code: | Tm *(decoded above as Era, System & Series)* |

**GEOLOGIC AGE IDENTIFICATION**

Category: Stratified Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

# SSURGO SOIL MAP - 5577731.2s




| | | | |
|---|---|---|---|
| SITE NAME: | Byrd Field | CLIENT: | AECOM |
| ADDRESS: | 844-800 Portugee Rd<br>Richmond VA 23250 | CONTACT: | Brittany Kirchmann |
| | | INQUIRY #: | 5577731.2s |
| LAT/LONG: | 37.492848 / 77.312216 | DATE: | March 01, 2019 4:18 pm |

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# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY**

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

---

**Soil Map ID: 1**

Soil Component Name: Atlee

Soil Surface Texture: very fine sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 61 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 11 inches | very fine sandy loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 14<br>Min: 1.4 | Max: 5.5<br>Min: 3.6 |
| 2 | 11 inches | 22 inches | clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 14<br>Min: 1.4 | Max: 5.5<br>Min: 3.6 |
| 3 | 22 inches | 53 inches | clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 14<br>Min: 1.4 | Max: 5.5<br>Min: 3.6 |
| 4 | 53 inches | 78 inches | clay | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 14<br>Min: 1.4 | Max: 5.5<br>Min: 3.6 |

**Soil Map ID: 2**

Soil Component Name: Lenoir

Soil Surface Texture: silt loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Somewhat poorly drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 38 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 5 inches | silt loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 1.4<br>Min: 0.42 | Max: 5.5<br>Min: 3.6 |
| 2 | 5 inches | 78 inches | silty clay | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 1.4<br>Min: 0.42 | Max: 5.5<br>Min: 3.6 |

**Soil Map ID: 3**

Soil Component Name: Coxville

Soil Surface Texture: silt loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Poorly drained

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: All hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 15 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 7 inches | silt loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 4<br>Min: 1.4 | Max: 5.5<br>Min: 3.6 |
| 2 | 7 inches | 78 inches | clay | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 4<br>Min: 1.4 | Max: 5.5<br>Min: 3.6 |

---

**Soil Map ID: 4**

Soil Component Name: Lynchburg

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Somewhat poorly drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 31 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 14 inches | fine sandy loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 14<br>Min: 4 | Max: 5.5<br>Min: 3.6 |
| 2 | 14 inches | 78 inches | clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 14<br>Min: 4 | Max: 5.5<br>Min: 3.6 |

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**Soil Map ID: 5**

Soil Component Name: Chewacla

Soil Surface Texture: silt loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Somewhat poorly drained

Hydric Status: All hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 60 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 9 inches | silt loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils. | COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. | Max: 14<br>Min: 4 | Max: 5.5<br>Min: 4.5 |

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 2 | 9 inches | 46 inches | clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils. | COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. | Max: 14 Min: 4 | Max: 5.5 Min: 4.5 |
| 3 | 46 inches | 78 inches | sandy clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils. | COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. | Max: 14 Min: 4 | Max: 5.5 Min: 4.5 |

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**Soil Map ID: 6**

Soil Component Name: Kempsville

Soil Surface Texture: very fine sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 11 inches | very fine sandy loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 141 Min: 0.42 | Max: 6 Min: 4.5 |

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 2 | 11 inches | 59 inches | sandy clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 141 Min: 0.42 | Max: 6 Min: 4.5 |
| 3 | 59 inches | 78 inches | clay | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 141 Min: 0.42 | Max: 6 Min: 4.5 |

---

**Soil Map ID: 7**

Soil Component Name: Duplin

Soil Surface Texture: very fine sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 60 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 7 inches | very fine sandy loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 4 Min: 1.4 | Max: 5.5 Min: 4.5 |

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 2 | 7 inches | 78 inches | clay | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 4<br>Min: 1.4 | Max: 5.5<br>Min: 4.5 |

---

**Soil Map ID: 8**

Soil Component Name: Kinston

Soil Surface Texture: silt loam

Hydrologic Group: Class B/D - Drained/undrained hydrology class of soils that can be drained and are classified.

Soil Drainage Class: Poorly drained

Hydric Status: All hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 15 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 5 inches | silt loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand. | Max: 14<br>Min: 4 | Max: 5.5<br>Min: 4.5 |
| 2 | 5 inches | 74 inches | clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand. | Max: 14<br>Min: 4 | Max: 5.5<br>Min: 4.5 |

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 3 | 74 inches | 78 inches | sandy loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand. | Max: 14<br>Min: 4 | Max: 5.5<br>Min: 4.5 |

**LOCAL / REGIONAL WATER AGENCY RECORDS**

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

**WELL SEARCH DISTANCE INFORMATION**

| DATABASE | SEARCH DISTANCE (miles) |
|---|---|
| Federal USGS | 1.000 |
| Federal FRDS PWS | Nearest PWS within 1 mile |
| State Database | 1.000 |

**FEDERAL USGS WELL INFORMATION**

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| No Wells Found | | |

**FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION**

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| 1 | VA4087670 | 1/4 - 1/2 Mile SE |

Note: PWS System location is not always the same as well location.

**STATE DATABASE WELL INFORMATION**

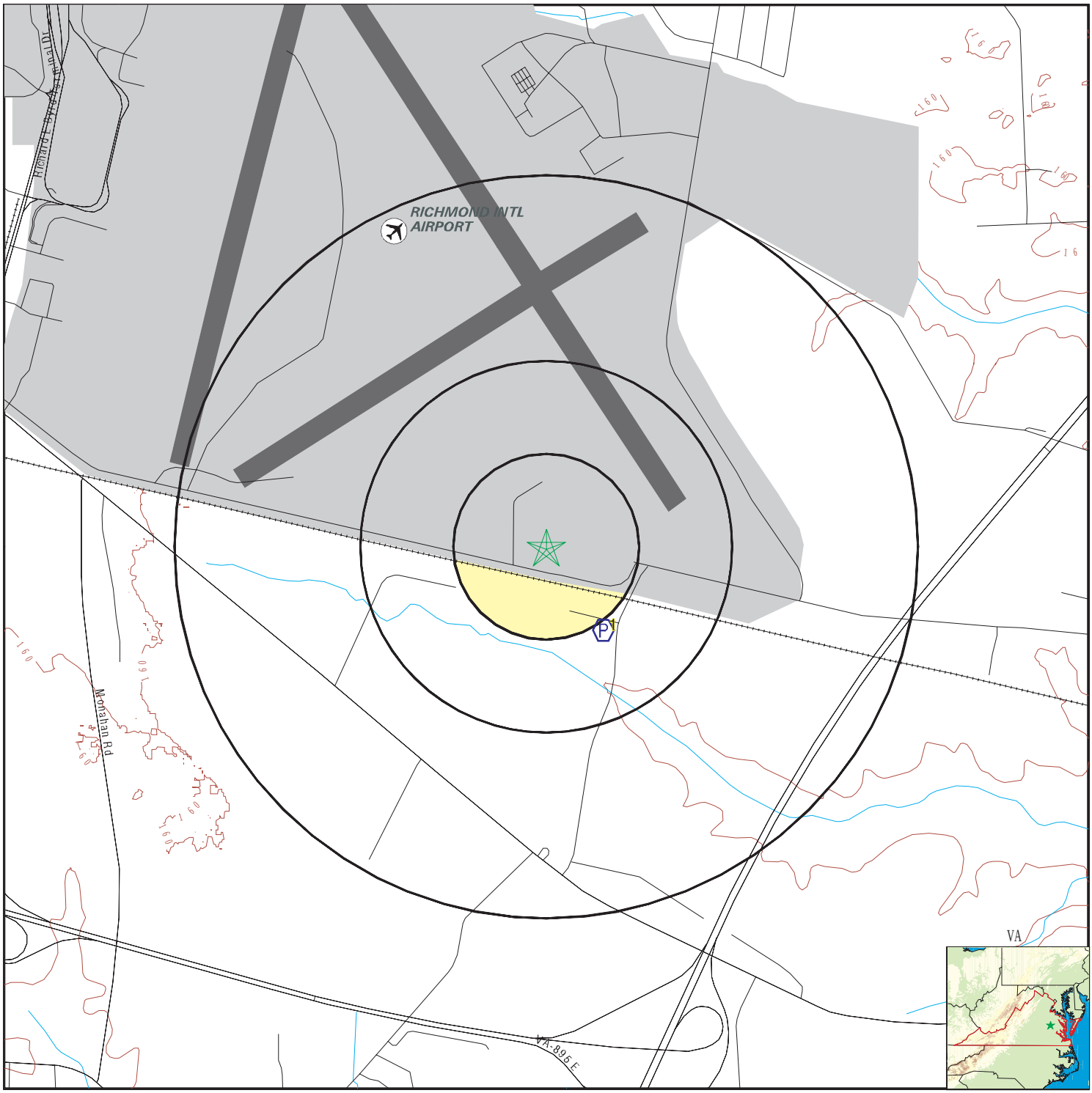
| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**STATE DATABASE WELL INFORMATION**

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| No Wells Found | | |

# PHYSICAL SETTING SOURCE MAP - 5577731.2s




- County Boundary
- Major Roads
- Contour Lines
- Airports
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons

0 1/4 1/2 1 Miles

- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- HD Closest Hydrogeological Data
- Oil, gas or related wells

N

| | | | |
|---|---|---|---|
| SITE NAME: | Byrd Field | CLIENT: | AECOM |
| ADDRESS: | 844-800 Portugee Rd<br>Richmond VA 23250 | CONTACT: | Brittany Kirchmann |
| LAT/LONG: | 37.492848 / 77.312216 | INQUIRY #: | 5577731.2s |
| | | DATE: | March 01, 2019 4:18 pm |

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# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

| Map ID<br>Direction<br>Distance<br>Elevation | | Database | EDR ID Number |
|---|---|---|---|
| **1**<br>**SE**<br>**1/4 - 1/2 Mile**<br>**Higher** | **Click here for full text details** | **FRDS PWS** | **VA4087670** |

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
# RADON

**AREA RADON INFORMATION**

Federal EPA Radon Zone for HENRICO County: 3

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

---

Federal Area Radon Information for HENRICO COUNTY, VA

Number of sites tested: 49

| Area | Average Activity | % <4 pCi/L | % 4-20 pCi/L | % >20 pCi/L |
|---|---|---|---|---|
| Living Area - 1st Floor | 1.021 pCi/L | 100% | 0% | 0% |
| Living Area - 2nd Floor | Not Reported | Not Reported | Not Reported | Not Reported |
| Basement | 3.480 pCi/L | 80% | 20% | 0% |

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

## TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Source: U.S. Geological Survey

## HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

## HYDROGEOLOGIC INFORMATION

AQUIFLOW$^{R}$ Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

## GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

## LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Virginia Public Water Supplies
Source: Department of Health, Office of Water Programs
Telephone: 804-786-1756

## OTHER STATE DATABASE INFORMATION

Virginia Oil and Gas Wells
Source: Department of Mines, Minerals and Energy
Telephone: 804-692-3200
A listing of oil and gas well locations.

RADON

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

EPA Region 3 Statistical Summary Readings
Source: Region 3 EPA
Telephone: 215-814-2082
Radon readings for Delaware, D.C., Maryland, Pennsylvania, Virginia and West Virginia.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary faultlines, prepared in 1975 by the United State Geological Survey

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

**STREET AND ADDRESS INFORMATION**

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11/15/02

DACA65- 5-03-0045

# DEED AND AGREEMENT OF LEASE

**By and Between**

**CAPITAL REGION AIRPORT COMMISSION**

**and**

**THE UNITED STATES OF AMERICA**

**ARMY GUARD PROPERTY AT**

**RICHMOND INTERNATIONAL AIRPORT**

Dated as of November 15, 2002

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**THIS DEED AND AGREEMENT OF LEASE No. 3** (this "Lease"), made and entered into this 15th day of November, 2002, by and between the **CAPITAL REGION AIRPORT COMMISSION**, a political subdivision of the Commonwealth of Virginia, whose interest in the property hereinafter described is that of owner and operator of Richmond International Airport, hereinafter called "Lessor", and **THE UNITED STATES OF AMERICA**, acting by and through the Department of the Army, hereinafter called the "Government":

**W I T N E S S E T H :**

The parties hereto for the consideration hereinafter mentioned covenant and agree as follows:

1. **Leased Land.** For the term, and subject to the matters, herein specified, the Lessor hereby leases to the Government and the Government leases from the Lessor, on the terms herein set forth, the following described premises, to-wit:

Approximately 87.831 acres shown as Parcel 1 on the attached plat by Gene Watson & Associates, P.C., dated November 7, 2001, last revised April 2, 2002, attached hereto and marked Exhibit A, and described by metes and bounds on Exhibit B-1 hereto. Said land (hereinafter called the "Leased Land") is situated at Richmond International Airport (the "Airport"), Henrico County, Virginia.

SUBJECT to a non-exclusive 60-foot right of way, for pedestrian and vehicular ingress to and egress from Parcel 2 on Exhibit A, to be used in common with Lessor and the Air Guard, said right-of-way being depicted on Exhibit A and described by metes and bounds on Exhibit B-2 hereto; and

SUBJECT ALSO, to the retention by the Lessor of an easement in, and prior right of use of Portugee Road as the same exists on the Leased Land. The general location of said road is shown on Exhibit A. This right of control includes without limitation, the right to install utilities and other facilities (except buildings) of its own in, along, across, over and

under said road, and to grant such rights to others, so long as such uses shall not interfere in any material respect with the use of said road by the Government.

By separate agreement, the Lessor has granted the Government the right to use, jointly with others, the "Jointly Used Flying Facilities" as defined in that certain Airport Joint Use Agreement to which Lessor and the Government are parties, dated as of July 1, 1997 (the "Joint Use Agreement"), in accordance with and subject to the terms of said agreement, and any successor agreement which may be entered into by Lessor and the parties thereto.

The above described Leased Land is to be used only for the following purpose: For the requirements of the United States Government with respect to the use of Army National Guard ("Guard") type aircraft and for Guard helicopter service. No other use shall be permitted without the express prior written consent of Lessor, in its sole discretion.

2. (a) **Effective Time; Term**. This Lease shall commence and become effective upon, and subject to, (i) completion of execution hereof and (ii) proper release by other agencies of the Government to Lessor of Buildings Nos. 2732, 2734 and 2738 at the Airport in condition satisfactory to Lessor (such time herein called the "Effective Date"). Subject to the other provisions of this Lease, the fixed basic term of this Lease shall begin on the Effective Date and shall expire at midnight on the last day of October 2032.

(b) **Extension Provisions**. Provided that this Lease is in full force and effect and no "Event of Default" (as hereinafter defined) by Lessee has occurred and is continuing on the effective date of any extension, the term of this Lease thereafter shall continue for four (4) successive extension periods of five (5) years each, subject to the right of either the Lessor or the Government to nullify such extensions as follows: By written notice to the other, given as provided in subsection 25(g) hereof, not later than 90 days prior to the expiration of the 5th year of the fixed basic term, either party shall have the right to terminate

this lease effective at the end of said fixed basic term (e.g., the end of the 30th year of this lease). Absent the giving of this notice, thereafter, by similar written notice given not later than 90 days prior to the expiration of the 10th year of the basic term either party shall have the right to terminate this lease effective at the end of the 35th year of this lease. Absent the giving of a prior termination notice, either party shall have the right to terminate this lease effective at the end of the 40th year of this lease by similar written notice given not later than 90 days prior to the expiration of the 15th year of the basic term. Absent the giving of a prior termination notice, either party shall have the right to terminate this lease effective at the end of the 45th year of this lease by similar written notice given not later than ninety (90) days prior to the expiration of the 20th year of the basic term.

(c) Effective as of the Effective Date this Lease supercedes all prior agreements ("Prior Agreements") between the Lessor and the Government insofar as same pertain to the Leased Land. The Prior Agreements shall be applicable for periods prior to the Effective Date. The Airport Joint Use Agreement between the Lessor and the United States of America dated July 1, 1997 remains in full force and effect.

3. **Rent**. Subject to the provisions set forth in the next sentence, the Government shall pay the Lessor $1.00 per year for the use and occupancy of the Leased Land. However, the rent initially to be paid by the Government is based upon use of the Leased Land by military units with aeronautical missions and such rental shall at all times comply with (i) the current requirements of applicable law and regulation, including without limitation the policy and procedures concerning the use of airport revenue established by the Federal Aviation Administration or successor agency and (ii) common practice with respect to rentals for similarly situated facilities leased by the Government. Should applicable law and regulation, or a different use of the Leased Land permitted by Lessor, or common practice, require payment by the Government of additional rent, then the rent

required by this Lease shall be increased to an amount which will satisfy such applicable law or regulation, reflect such different use, or conform to the then common practice, as the case may be.

4. **Fixtures; Structures.** Subject to the provisions of this Lease, the Government shall have the right, during the existence of this Lease, to attach fixtures, and erect structures or signs, in or upon the Leased Land, which fixtures and structures, or signs, so placed in, upon or attached to the Leased Land shall be and remain the property of the Government and may be removed or otherwise disposed of by the Government.

5. **Certain Use Restrictions.** Unless required for National Defense, no pilotless aircraft or guided missile shall be operated by the Government. Munitions, fuel, and "Hazardous Materials" (as hereinafter defined) may be stored in or on the Leased Premises, subject to any and all applicable federal, state, local and military rules and regulations, and subject also to "Environmental Laws" as specified in Paragraph 22 hereof.

6. **Brokerage.** The Lessor warrants that no person or selling agency has been employed or retained to solicit or secure this Lease upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee. For breach or violation of this warranty the Government shall have the right to annul this Lease without liability or in its discretion to deduct from the rental payable hereunder the full amount of such commission, percentage, brokerage, or contingent fee.

7. **No Congressional Benefit Disclosure.** No member of or Delegate to Congress or Resident Commissioner shall be admitted to any share or part of this Lease or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this Lease if made with a corporation for its general benefit.

8. **Termination of Right to Proceed.** (a) The Government may, by written notice to the Lessor, terminate the right of the Lessor to proceed under this lease if it is

found, after notice and hearing, by the Secretary of the Army or his duly authorized representative, that gratuities (in the form of entertainment, gifts or otherwise) were offered or given by the Lessor, or any agent or representative of the Lessor, to any officer or employee of the Government with a view toward securing this Lease or securing favorable treatment with respect to the awarding or amending, or the making of any determinations with respect to the performing of this Lease; provided, that the existence of facts upon which the Secretary of the Army or his duly authorized representative makes such findings shall be in issue and may be reviewed in any competent court.

(b) In the event this Lease is terminated as provided in subparagraph (a) above, the Government shall be entitled (i) to pursue the same remedies against the Lessor as it could pursue in the event of a breach of the Lease by the Lessor, and (ii) as a penalty in addition to any other damages to which it may be entitled by law, to exemplary damages in an amount (as determined by the Secretary of the Army or his duly authorized representative) which shall be not less than three nor more than ten times the costs incurred by the Lessor in providing any such gratuities to any such officer or employee.

(c) The rights and remedies of the Government provided in this Paragraph shall not be exclusive and are in addition to any other rights and remedies provided by law or under this Lease.

9. **Government Work.** (a) In addition to the rights contained in Section 4, the Government shall also have the right, subject to the provisions of this Lease, to connect to utility and distribution systems situated on the Airport and also the right to make extensions and/or additions to existing runways, roadways, aprons and taxiways. It is agreed, however, that no construction of buildings, structures, utility connections, runways, roadways, aprons, taxiways, or other facilities (collectively "Improvements") shall be initiated by the Government under any of the provisions of this Lease unless such construction has the

prior approval of the Lessor. The Lessor's authorized representatives shall have access to the construction areas other than classified areas during construction; provided, such approval by the Lessor will not be unreasonably withheld, and may include consideration of the availability of funds for such construction.

(b) It is mutually recognized that the extensions and improvements of runways, aprons, taxiways, and, subject to Lessor's specific approval in each instance, other portions of the Airport and appurtenant facilities accomplished by the Government under the provisions of subsection (a) above, will become integral parts of Jointly Used Flying Facilities, and it is agreed that during the existence of this Lease they shall remain in place for such joint use, provided that this provision shall not apply to those facilities to be used exclusively by the Government and to be erected on the Leased Land described in Section 1 above. It is also further agreed that at the termination or expiration of this Lease the Government shall have the option of transferring said extensions and improvements to runways, aprons, and taxiways to the Lessor in lieu of their removal, provided, however that same are then in good condition, normal wear and tear excepted.

(c) The Government shall surrender possession of the Leased Land upon the expiration or termination of this Lease and it is further agreed that the Government shall have the option of transferring the Improvements situated thereon (collectively the "Improvements") to the Lessor in lieu of their removal, provided, however, that Lessor need not accept, and the Government shall remove at its sole cost and expense, any such Improvements, which are in violation of the provisions of Section 22 hereof or which are in disrepair, provided further, that if the Government gives written notice thereof to the Lessor at least 60 days before the expiration or termination of this Lease, the Government shall have the right to make a mutually acceptable cash settlement with Lessor in lieu of

performance of its obligation to effect repairs (but not in lieu of its obligations under Section 22).

10. **Use of Airport Roads**. (a) The Government shall have reasonable access to and from the Leased Land, in common with others, over such Airport road or roads as the Lessor from time to time may designate or other areas of the Airport designated for the purpose. In the event it becomes necessary for the Government to construct an access road to the Leased Land, it shall construct and maintain such road at its expense, strictly in accordance with the provisions of Section 9, and at such location or locations as shall be specified by Lessor. The use of the Airport by vehicles of the Government beyond the boundaries of the Leased Land shall be subject to the rules and regulations of the Lessor, as same may be amended from time to time.

(b) The Lessor, at any time, may temporarily or permanently close or consent to or request the closing of any Airport roadway outside the Leased Land and any other area at the Airport presently or hereafter used as such, so long as a reasonably equivalent means of ingress and egress, as provided above, remains available to the Government, which hereby releases and discharges the Lessor, its successors and assigns, of and from any and all claims, demands or causes of action the Government may have against the Lessor by reason of the exercise of any of the powers reserved to the Lessor under this subsection (b).

11. **Utilities**. (a) As long as such services are then being provided by the Lessor to Airport tenants, but expressly subject to subsection (b) below, the Lessor shall furnish water and sewer services at presently existing locations in the vicinity of the Leased Premises upon the terms and conditions hereinafter set forth. The Government shall accept such services and agrees to pay, as additional rent, (i) a monthly fee for the operation and maintenance of the facilities affording such service, and (ii) water and sewer

connection fees, all the foregoing as from time to time specified and determined pursuant to Lessor's Rules and Regulations. A copy of the current edition of such Rules and Regulations, as amended through May 25, 1999, is attached hereto as Exhibit C.

**A. Water.**

(1) Water shall be delivered at the point of delivery in such quantity and of such quality and at such pressure as the quantity, quality and pressure exists in the distribution system on the Airport at the point and time of delivery.

(2) The Lessor will not be required to repair or maintain any portion or component of the water distribution system within the boundaries of the Leased Land, which responsibility will be solely that of the Government; nor be required to enlarge, extend or alter in any manner the existing water distribution system on the Airport or any part thereof in order to supply water to the Government, which shall accept only water supplied by Lessor and at such points of delivery as shall be designated by Lessor.

(3) The water delivered shall be used exclusively for the purposes and operations of the Government and it shall not use water so delivered nor authorize or permit water so delivered to be used directly or indirectly for any other purpose.

(4) The Lessor will install a meter or meters of such make, kind and size and at such place or places as it shall determine necessary to adequately measure the quantity of water delivered to the Government under this Lease, and all water delivered and used shall be measured through such meter or meters. The Government shall reimburse the Lessor for the cost of such meter or meters and the installation thereof. The meter or meters so installed shall be the property of the Lessor.

(5) The Government will comply fully with the Lessor's backflow prevention and cross-connection control program for the Airport and will pay the cost of any backflow prevention devices or separation equipment required pursuant to that program.

**B. Sewer.**

(1) The Government shall have the right to discharge sanitary sewage originating on the Leased Premises into the existing sanitary sewer system on the Airport, which feeds into the County of Henrico system. The discharge of the Government's sanitary sewage shall not interfere with or impair the disposal of all other sanitary sewage originating on the Airport; nor shall the Lessor be required to extend or enlarge its existing sanitary sewage collection system.

(2) The Government will not permit storm water, surface water, subsurface water or any effluent of any character other than permissible sanitary sewage to be discharged into the system.

(3) The Government will not permit sewage to be discharged into the system which damages or overcharges or is likely to damage or overcharge it, or which is detrimental to public health and safety or which is in violation of the requirements of applicable laws or regulations, including those promulgated by the County of Henrico.

(4) The Government will not permit water used for any purpose other than that of the Government to be discharged into the system.

(5) The Lessor will not be required to repair or maintain any portion or component of the sanitary sewer system within the boundaries of the Leased Land, which responsibility will be that of the Government, or the County of Henrico, as the case may be; nor be required to enlarge, extend or alter in any manner the existing sewage distribution on the Airport or any part thereof in order to provide sewer service to the Government.

**C. Other Utilities.**

The Government shall arrange with the appropriate utility or service companies, or municipalities, or other suppliers, supplying utilities and services in the area, for the supply to the Leased Premises of all other services, including electric power and

telephone service. The Government shall pay the appropriate utilities or service companies for the supply of such service.

(b) Anything to the contrary in this Lease notwithstanding, by that date which is no later than the last day of March 2004, the Government shall arrange for its own water and sewer services, either directly from the County of Henrico or through another provider. Thereafter the Lessor shall no longer be obligated to provide such services.

12. **Maintenance and Operation of Airport.** The Lessor will maintain and operate the Airport in the manner and to the extent required by and subject to the terms, conditions, and provisions of the quitclaim deed dated July 1, 1947, from the War Assets Administration to the City of Richmond (the "Quitclaim Deed") recorded in the office of the Clerk of the Circuit Court of the County of Henrico, Virginia, in Deed Book 398 at page 209. Nothing in this Lease shall be construed to change, restrict or otherwise alter any such provision of the Quitclaim Deed.

13. **Runway; Taxiway Maintenance.** The Lessor shall not be required or obligated to maintain any of the runway, apron or taxiway extensions and/or additions constructed or improved by the Government pursuant to subsection 9(a) hereof during the term of this Lease unless and until they are first constructed or improved by the Government in a manner satisfactory to the Executive Director of the Lessor and are part of the Jointly Used Flying Facilities.

14. **Certain Definitions.** In and throughout this Lease, the following words shall have the following meanings, respectively, unless the context shall clearly require otherwise, to-wit:

(a) "Airport" means the Richmond International Airport, aforesaid;

(b) "Laws" means all federal, state, regional, county and local laws, ordinances, resolutions, orders, directions and regulations, including without limitation those

pertaining to environmental matters, applicable to the Government, to its construction and to its operations in and on and use of the Leased Land and to its performance of its undertakings set forth in this Lease.

(c) "Leased Premises" means the Leased Land and the "Improvements" (as defined in subsection 9(a)) heretofore or hereafter constructed by Lessee on the Leased Land.

15. **Government Construction.** (a) If the Government constructs, fabricates, installs and/or equips any Improvements on the Leased Land (all of which collectively hereinafter referred to as "constructed" or "construction"), such construction (i) shall comply with the provisions of Section 9 hereof; (ii) shall entail no detriment to the Airport and its facilities; (iii) shall conform in all respects with a master plan which has been submitted to Lessor; and (iv) shall comply with subsection (b) next following. Neither Lessor, nor anyone on its behalf, shall have any responsibility whatsoever as to the technical sufficiency or adequacy or safety of the Improvements or any of their component parts or of any other physical condition or feature pertaining to the Improvements.

(b) All necessary approvals from governmental authorities shall be obtained by the Government prior to constructing the Improvements, and such improvements shall be constructed strictly in compliance with applicable Laws. Upon completion of construction of the Improvements, all required occupancy permits and authorizations from appropriate authorities authorizing the occupancy, possession and use of the Improvements for their intended purposes shall also be obtained by the Government and no use shall be made of the Improvements without such permits and authorizations.

16. **Quiet Possession; Land Leased "As Is"; Permitted Activities.** (a) Upon and subject to the other terms and provisions hereof, and unless an "Event of Default" by it shall have occurred hereunder, the Government shall be suffered and permitted to have the

use, peaceful possession and quiet enjoyment of the Leased Premises during the term of this Lease, subject to the matters hereinbefore and hereinafter set forth.

(b) The Government acknowledges that the Leased Land is leased in its present condition; and that it has examined same and leases same "as is" in such condition, without any representations or warranties on the part of the Lessor whatsoever.

(c) The Leased Land is leased by the Lessor to the Government solely for the activities described in Section 1 hereof, and for no other purpose without the prior written consent of the Lessor, in its sole discretion. Without the prior written consent of the Lessor, in its sole discretion, no permitted activities shall be conducted by any person or entity other than the specified branch of the military; nor shall any activities other than permitted activities be conducted from or upon the Leased Premises.

(d) The Lessor reserves the right for it, and for its contractors, engineers and architects, to enter upon the Leased Land where necessary and without unreasonable interference with the Government's use of the Leased Land, for the purpose of constructing, installing and/or maintaining under the surface of the ground any portion of the Lessor's systems which presently pass or hereafter may pass through the Leased Land.

17. **Maintenance by Lessor.** The Lessor agrees to operate, maintain and keep in good repair, or cause to be maintained and kept in good repair, the areas and facilities provided by the Lessor for the public in accordance with the practices of a reasonably prudent airport operator. The Lessor agrees to use its best efforts reasonably necessary for the safe, convenient and proper use of the Airport by those who are authorized to use the same and, in particular, to maintain and operate the Airport in accordance with all applicable standards, rules and regulations of the Federal Aviation Administration ("FAA") and any other regulatory authority having jurisdiction.

18. **Maintenance by Government**. (a) The Government at all times shall keep in a clean and orderly condition and appearance (including grounds maintenance), the Leased Premises and all of the Government's fixtures, equipment and personal property which are located in or upon any part thereof.

(b) Additionally, the Government shall --

(i) take good care of the Leased Premises and shall maintain the same, including Portugee Road, at all times in good condition.

(ii) maintain and repair all utility service lines located in, on, and upon the Leased Premises to the extent used by the Government exclusively, except to the extent that such maintenance or repair is the obligation of the utility company providing such utility service.

(c) The Government shall provide at its sole cost and expense the necessary arrangements for adequate sanitary handling and disposal away from the Airport of all trash, garbage and other refuse which results from the Government's operations. The Government shall provide at its sole cost and expense the necessary receptacles for all such trash, garbage and other refuse. The piling of boxes, cartons, barrels or other similar receptacles or the maintenance of unsightly items such as damaged aircraft or equipment in disrepair, on or about the Leased Land is prohibited.

19. **Compliance With Regulations**. (a) The Government shall comply with all applicable FAA regulations, as the same may be amended from time to time, and shall comply with all other applicable present or future Laws.

(b) The Government covenants and agrees to observe and obey (and to require its personnel and employees to observe and obey and to exercise its best effort to require guests and invitees and those doing business with it to observe and obey) (i) the Rules and Regulations of the Lessor (including future amendments and supplements

thereto) governing the conduct and operations of the Government and others on the Leased Premises and the Airport, including without limitation the Rules and Regulations and security requirements of the Lessor set forth in Exhibits C and D attached hereto and (ii) such future reasonable rules and regulations as, from time to time during the term hereof, may be promulgated by the Lessor, including without limitation those promulgated for reasons of safety, health, sanitation, compliance with environmental laws and regulations, and good order; provided that any such rules and regulations shall not be inconsistent with the provisions of this Lease or with the rules and regulations of the FAA and shall be uniform in their application to others at the Airport similarly situated. The provisions of Exhibits C and D are incorporated herein by reference. The obligation of the Government to exercise its best efforts to require such observance on the part of its guests, invitees and business visitors shall apply only while such persons are on the Leased Premises. The Government shall (i) comply with the provisions of any storm water discharge permits pertaining to the Airport and (ii) pay its equitable share of the permitting, monitoring and compliance costs with respect to any general permit obtained by the Lessor, all as reasonably established by the Lessor.

20. **Indemnification**. To the fullest extent permitted by law, the Government shall indemnify, defend and hold the Lessor, its Commissioners, officers, agents and employees harmless from and against any and all claims, actions, damages, liabilities and expenses, including reasonable attorney's and other professional fees, arising from or caused by the acts or negligence of the Government's employees or agents.

21. **Contractor and Subcontractor Insurance Requirements**. At all times during the term of this Lease the Government shall prescribe Federal Acquisition Regulation (FAR) clause 52.228-5, *Insurance-Work on a Government Installation*, or comparable provision(s), in all Government contracts that exceed the simplified acquisition threshold as

prescribed in FAR Part 13 that require work on the Leased Premises. Government contractors and their subcontractors shall maintain and provide evidence of at least the following insurance and liability coverage: workman's compensation and employer's liability, $100,000; general liability, $500,000 per occurrence; and automobile liability, $200,000 per person, $500,000 per occurrence for

bodily injury, and $20,000 per occurrence for property damages. The Government shall notify the Lessor of all such contractors within 30 days after the award of contract.

22. **Environmental Matters.** (a) The Government shall comply with all Environmental Laws (defined below), pertaining to the leasehold and to its possession and use of the Leased Premises, and it shall timely obtain and maintain all permits, approvals or other authorizations and timely make all notifications, registrations, and filings required by such Environmental Laws. Copies of such permits, approvals or other authorizations and all notifications and registrations of petroleum storage tanks shall be provided promptly to the Lessor. The Government further covenants and agrees that its storage, accumulation, and other management and use of Hazardous Materials on the Leased Premises shall also be in accordance with Paragraph 5 of this Lease.

(b) If the Government fails to take timely and proper corrective action pursuant to this Lease or any Environmental Laws regarding any release of Hazardous Materials, the Lessor, at its option, may declare such failure to constitute an "Event of Default" hereunder, and/or the Lessor, at its option may, but shall not be obligated to, do whatever is necessary to eliminate such Hazardous Materials from the Leased Premises or otherwise comply with Environmental Laws, and the cost thereof (including the Lessor's reasonable fees, costs and expenses incurred in connection therewith) shall be so much additional rent hereunder which shall become immediately due and payable without notice.

The Government shall give to the Lessor and its agents and employees reasonable access to the Leased Premises for such purposes and hereby specifically grants to the Lessor a license, effective upon expiration of a reasonable time for cure or the applicable specified cure period, as the case may be, to remove the Hazardous Materials. Except as prohibited by the Federal Tort Claims Act, the Government shall indemnify the Lessor and hold it harmless from and against all loss, damage, and expense (including, without limitation, reasonable attorney fees and costs incurred in the investigation, defense, and settlement of claims) that the Lessor may incur as a result of or in connection with the assertion against the Lessor of any claim relating directly or indirectly, in whole or in part, to matters for which the Government has responsibility under this paragraph 22, and such indemnification shall survive the expiration or sooner termination of this Lease. The Government covenants and agrees that no Hazardous Materials shall be stored on the Leased Premises, except as specifically provided in Paragraph 5 hereof.

(c) The Government shall promptly notify the Lessor in writing of any order or pending or threatened action by any regulatory agency or other governmental body, or any claims made by any third party, relating to Hazardous Materials on, or emanations from, the Leased Premises, and shall promptly furnish the Lessor with copies of any correspondence or legal pleadings in connection therewith. The Government shall immediately notify the Executive Director of the Lessor of any releases, spills, overfills, leaks, discharges or emissions of any Hazardous Materials. The Government shall make, and shall provide Lessor's Executive Director with copies of, all required filings and notifications to federal, state and local authorities related to any such release or other occurrences set forth in the preceding sentence or related to its use or management of Clause (D) Substances. In addition, the Lessor shall have the right, but shall not be obligated, to notify any state, federal or local governmental authority of information which may come to its attention with

respect to Hazardous Materials on or emanating from the Leased Premises and the Government irrevocably releases the Lessor from any claims of loss, damage, liability, expense or injury relating to or arising from, directly or indirectly, any such disclosure.

(d) If at any time during the term of this Lease the Lessor has reasonable basis to suspect the presence of Hazardous Materials on the Leased Premises in violation of the provisions of this Paragraph 22, and in all events upon the termination of this Lease or upon the occurrence of an "Event of Default" (as defined in Paragraph 23), the Lessor may require the Government (i) to provide the Lessor, at the Government's expense, with a full or partial environmental inspection or audit of the Leased Premises, prepared by a qualified consultant approved by the Lessor, certifying as to the presence or absence of Hazardous Materials, or, alternatively, at the Lessor's option (ii) to permit the Lessor to so inspect or audit the Leased Premises at the Government's expense. The Government hereby grants the Lessor, its employees, agents and independent contractors the right to enter upon the Leased Premises for the purposes of conducting tests, soil borings, the installation of monitoring wells and such other tests as the Lessor deems necessary or desirable, and the Government agrees to cooperate fully with respect to such matters.

(e) For the purposes of this Lease:

(A) "Environmental Laws" shall mean all federal, state, and local laws, regulations, ordinances, rules, orders or decrees, and permits and approvals, all as amended, relating to the regulation or protection of human health, the environment, natural resources, or historical/cultural resources, including without limitation (1) those addressing the emission, discharge, release, generation, transportation, storage, disposal, distribution, or other management of Hazardous Materials; the reporting, notification, or disclosure of the presence or release of Hazardous Materials; and underground or aboveground storage tanks, related tank systems and connected piping; and (2) specifically including without

limitation the Comprehensive Environmental, Response, Compensation, and Liability Act of 1980, as amended; the Resource Conservation and Recovery Act, as amended; the Toxic Substances Control Act, as amended; the Federal Water Pollution Control Act, as amended; the Clean Air Act, as amended; the Occupational Safety and Health Act, as amended; all regulations and rules issued thereunder; and their state and local counterparts, as amended.

(B) "Hazardous Materials" shall mean any (1) petroleum products or used or waste petroleum products, flammables, explosives, radioactive materials, asbestos in any form, urea formaldehyde insulation, polychlorinated biphenyls, radon gas, discarded tires, discarded batteries or parts thereof, or construction or demolition debris; (2) any chemicals, emissions, materials, substances, pollutants, discharges, or wastes which are defined or characterized as "solid" "hazardous," "toxic," "special," "medical," "biohazard," or other words of similar import, pursuant to any Environmental Laws; and (3) any other chemical, material, substance, waste, emission, discharge, or pollutant, exposure to which is prohibited, limited, or regulated by any governmental authority, or shown to be a carcinogen, mutagen, or otherwise is adverse to human health or the environment.

23. **Events of Default**. The following shall be "Events of Default" as to the Government under this Lease and the term "Event of Default" shall mean, whenever it is used in this Lease, any one or more of the following events:

(a) Failure by the Government to pay or cause to be paid within 30 days after written notice of the non receipt of same, any rental or any other monetary amount required to be paid by the Government hereunder.

(b) Failure by the Government to observe and perform any covenant, condition or agreement on its part to be observed or performed other than as referred to in

subparagraph (a) next above, for a period of 45 days after written notice, specifying such failure and requesting that it be remedied, given to the Government by the Lessor.

(c) Any other matter herein specifically defined as an Event of Default.

(d) A material default by the United States of America under the Joint Use Agreement referred to in Section 1, or expiration of such agreement without execution by the parties thereto of an extension or renewal of such agreement which is satisfactory to such parties in their sole discretion. Lessor's right of termination of this Lease pursuant to this subsection (c) shall be upon 180 days prior written notice to the Government.

(e) Whenever any Event of Default referred to in this Lease shall have occurred and be continuing, the Lessor may, but shall not be obligated to, take any one or more of the following remedial steps as against the Government:

(1) The Lessor may terminate this Lease.

(2) The Lessor may take whatever other action at law or in equity as may appear necessary or desirable to collect the rent and other sums due hereunder, or to enforce performance and observance of any obligation, agreement or covenant of the Government under this Lease.

(f) No remedy herein conferred upon or reserved to the Lessor is intended to be exclusive of any other available remedy or remedies, but each and every such remedy shall be cumulative and shall be in addition to every other remedy given under this Lease or hereafter existing under law or in equity. No delay or omission to exercise any right or power accruing upon any Event of Default shall impair any such right or power or shall be construed to be a waiver thereof, but any such right and power may be exercised from time to time and as often as may be deemed expedient.

(g) In the event any covenant contained in this Lease should be breached by either party and thereafter waived by the other party, such waiver, to be effective, must be in

writing and shall be limited to the particular breach so waived and shall not be deemed to waive any other breach hereunder.

24. **Assignments.** (a) The Lessor may transfer or assign this Lease to any successor in interest to the Lessor to whom the Airport may be transferred. The Lessor shall thereupon be released from any further liability hereunder, provided, however, that the successor in interest shall execute and deliver to the Lessor, with a copy to the Government, an instrument assuming the lawful obligations of the Lessor under this Lease.

(b) The Government shall not make any transfer or assignment of, or sublet or encumber, the Leased Premises or any part thereof, or its interest in this Lease, including any transfer by operation of law, or grant to others, including without limitation any other branch of the military, any use, easement or other rights in or with respect to the Leased Premises, without the written consent of the Lessor in each specific instance and in the Lessor's sole discretion.

25. **Miscellaneous.** (a) The Lessor, its officers and employees, shall have the right at reasonable times, upon prior notice and in accordance with the Government's security requirements, to enter upon the Leased Premises for the purpose of inspecting the same, and for the doing of any act or thing which the Lessor may be obligated or have the right to do under this Lease.

(b) Without limiting the generality of the foregoing, the Lessor shall have the right, for its own benefit or for the benefit of the Government and others at the Airport, to maintain existing and future utilities systems or portions thereof on the Leased Land, including therein without limitation thereto, systems for the supply of heat, water, gas, fuel and electricity, and for the furnishing of fire alarm, fire protection, sprinkler, sewage, drainage, telephone and telegraph service, including all lines, pipes, mains, wires, conduits and equipment connected with or appurtenant thereto, and to make such repairs,

replacements or alterations as, in the opinion of the Lessor, may be deemed necessary or advisable and, from time to time, to construct or install over, in or under the Leased Land new systems or parts thereof, including lines, pipes, mains, wires, conduits and equipment; provided, however, that in exercising such rights the Lessor shall not unreasonably interfere with the Government's operations on the Leased Land or abridge the rights conferred on Government by this Lease.

(c) Neither the Lessor nor the Government shall be deemed in violation of this Lease if it is prevented from performing any of its obligations hereunder by reason of strikes, boycotts, labor disputes, embargoes, shortage of materials, acts of God, acts of the public enemy, acts of superior governmental authority, weather conditions, floods, riots, rebellions, sabotage, or any other circumstances for which it is not responsible or which is not in its control, and the time for performance shall be automatically extended by the period the party is prevented from performing its obligations hereunder. Lack of funds shall not be a circumstance entitling a party to an extension of time pursuant to this subparagraph.

(d) This Lease is subject to and subordinate to applicable existing easements, agreements, conditions and restrictions, including but not limited to each and every term, condition, reservation and restriction contained in (i) the Quitclaim Deed and (ii) the deed and agreement, dated January 1, 1976, by and between the City of Richmond, the County of Henrico, and the Lessor, recorded in the Clerk's Office, Circuit Court, Henrico County, Virginia, in Deed Book 1684, Page 944. This Lease is also subject to and subordinate to the provisions of any existing or future agreement between the Lessor and the United States of America relative to the operation and maintenance of the Airport, the execution of which has been or may be required as a condition precedent to the expenditure of federal funds for the development of the Airport.

(e) This Lease shall not be recorded. Either party shall, at the request of the other, execute, acknowledge and deliver, a memorandum or short form of lease prepared by the requesting party; provided, however, that the relations between the Lessor and the Government shall be governed solely by the provisions of this Lease and not by any short form or memorandum which may be executed, delivered and recorded.

(f) If any word, phrase, clause, paragraph, section or other part of this Lease shall ever be held to be invalid or unconstitutional by any court of competent jurisdiction, the remainder of this Lease and the application of such word, phrase, clause, sentence, paragraph, section or other part of this Lease to any other person or circumstances shall not be affected thereby.

(g) Notices provided for in this Lease shall be sufficient if sent by registered or certified mail, postage prepaid, addressed, if to the Lessor: 1 Richard E. Byrd Terminal Drive, Richmond International Airport, Virginia 23250-2400, Attention: President, or to such other address and person as the Lessor may direct in writing; and if to the Government: Norfolk District Corps of Engineers, 803 Front Street, Norfolk VA 23510-1096, Attention: Real Estate Branch, or to such other address and person as the Government may direct in writing.

(h) The laws of the State of Virginia and United States of America shall govern the construction of this Lease, which contains the entire understanding and all representations, warranties, covenants or undertakings of the parties with respect to the leasing of the Leased Land. There are no oral agreements between the parties hereto affecting this Lease, which supersedes and cancels any and all previous negotiations, discussions and understandings between the parties hereto with respect to the leasing of the Leased Land.

26. **Changed Circumstances**. In the event either the Commission or the Government desires to adjust the configuration of the Leased Land, or the Government desires to change the use as specified in Section 1 hereof, such party, by written notice to the other, may request discussion of the subject. Such discussion shall be held at an agreed time and place not later than 30 days from the aforesaid notice. Such discussion shall be completely without obligation.

**IN WITNESS WHEREOF**, the parties hereto have hereunto subscribed their names as of the date first above written, acting by their duly authorized representatives.

**CAPITAL REGION AIRPORT COMMISSION** By _____
Jon E. Mathiasen
President and Chief Executive Officer

**THE UNITED STATES OF AMERICA** By _____
Dillard H. Horton
Chief Real Estate Branch
Norfolk District Corps of Engineers

COMMONWEALTH OF VIRGINIA )
: ss
CITY OF )

BEFORE ME, a Notary Public in and for the Commonwealth of Virginia, City of _____, personally appeared Mr. JON E. MATHIASEN, PRESIDENT AND CHIEF EXECUTIVE OFFICER, CAPITAL REGION AIRPORT COMMISSION, to me known to be the identical person and officer whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the said instrument in the capacity therein stated for the purposes therein expressed as the act and deed of the United States of America.

GIVEN under my hand and seal, this 11th day of September, 2003.

NOTARY PUBLIC

(SEAL)

My Commission Expires: 3/28/07

GOVERNMENT ACKNOWLEDGMENT

COMMONWEALTH OF VIRGINIA )
: ss
CITY OF NORFOLK )

BEFORE ME, a Notary Public in and for the Commonwealth of Virginia, City of Norfolk, personally appeared **DILLARD H. HORTON**, to me known to be the identical person and officer whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the said instrument in the capacity therein stated for the purposes therein expressed as the act and deed of the United States of America.

GIVEN under my hand and seal, this 4th day of SEPTEMBER, 2003.

Brenda B. Hartman
NOTARY PUBLIC

(SEAL)

My Commission Expires:

My Commission Expires June 30, 2004

## EXHIBITS

Exhibit A - Plat of Leased Land by Gene Watson & Associates, P.C., dated November 7,2001, last revised April 2, 2002.

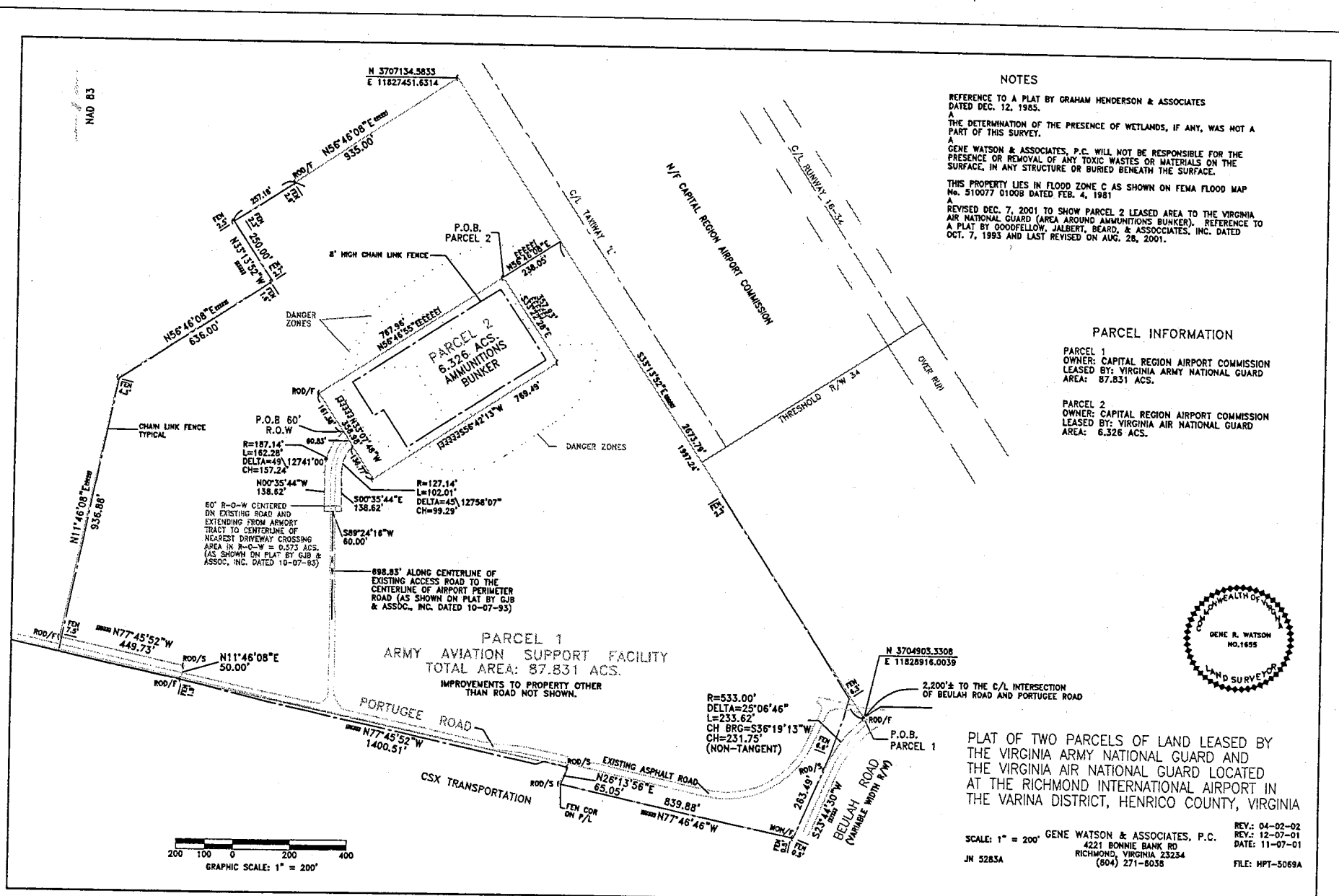
Exhibit B -1 Metes and bounds description of the Leased Land

Exhibit B-2 Metes and bounds description of 60-foot right of way

Exhibit C - Rules and Regulations of the Lessor as amended through May 25, 1999

Exhibit D - Security Requirements of the Lessor (contract)

591088v3




## NOTES

REFERENCE TO A PLAT BY GRAHAM HENDERSON & ASSOCIATES DATED DEC. 12, 1985.

A

THE DETERMINATION OF THE PRESENCE OF WETLANDS, IF ANY, WAS NOT A PART OF THIS SURVEY.

A

GENE WATSON & ASSOCIATES, P.C. WILL NOT BE RESPONSIBLE FOR THE PRESENCE OR REMOVAL OF ANY TOXIC WASTES OR MATERIALS ON THE SURFACE, IN ANY STRUCTURE OR BURIED BENEATH THE SURFACE.

THIS PROPERTY LIES IN FLOOD ZONE C AS SHOWN ON FEMA FLOOD MAP No. 510077 0100B DATED FEB. 4, 1981

A

REVISED DEC. 7, 2001 TO SHOW PARCEL 2 LEASED AREA TO THE VIRGINIA AIR NATIONAL GUARD (AREA AROUND AMMUNITIONS BUNKER). REFERENCE TO A PLAT BY GOODFELLOW, JALBERT, BEARD, & ASSOCIATES, INC. DATED OCT. 7, 1993 AND LAST REVISED ON AUG. 28, 2001.

## PARCEL INFORMATION

PARCEL 1
OWNER: CAPITAL REGION AIRPORT COMMISSION
LEASED BY: VIRGINIA ARMY NATIONAL GUARD
AREA: 87.831 ACS.

PARCEL 2
OWNER: CAPITAL REGION AIRPORT COMMISSION
LEASED BY: VIRGINIA AIR NATIONAL GUARD
AREA: 6.326 ACS.

COMMONWEALTH OF VIRGINIA
GENE R. WATSON
NO.1655
LAND SURVEYOR

# PLAT OF TWO PARCELS OF LAND LEASED BY THE VIRGINIA ARMY NATIONAL GUARD AND THE VIRGINIA AIR NATIONAL GUARD LOCATED AT THE RICHMOND INTERNATIONAL AIRPORT IN THE VARINA DISTRICT, HENRICO COUNTY, VIRGINIA

SCALE: 1" = 200'
JN 5283A

GENE WATSON & ASSOCIATES, P.C.
4221 BONNIE BANK RD
RICHMOND, VIRGINIA 23234
(804) 271-8038

REV.: 04-02-02
REV.: 12-07-01
DATE: 11-07-01

FILE: HPT-5069A

EXHIBIT "A"

LEGAL DESCRIPTION OF PARCEL 1 AS SHOWN ON A PLAT BY GENE WATSON & ASSOCIATES, P.C. DATED NOV. 7, 2001 LAST REVISED APR. 02, 2002

BEGINNING AT A ROD FOUND ON THE NORTHERN RIGHT-OF-WAY LINE OF BEULAH ROAD 2200'± WEST OF THE CENTERLINE INTERSECTION OF BEULAH ROAD AND PORTUGEE ROAD; THENCE ALONG THE RIGHT-OF-WAY LINE BEING A CURVE TO THE LEFT HAVING A RADIUS OF 533.00' A LENGTH OF 233.62' A DELTA OF 25°06'46" A CHORD LENGTH OF 231.75' AND A CHORD BEARING OF S36\12719'13"W (NON-TANGENT) TO A ROD SET; THENCE S23\12744'30"W 263.49' TO A MONUMENT FOUND AT THE NORTHWEST INTERSECTION OF CSX TRANSPORTATION RAILROAD AND BEULAH ROAD; THENCE ALONG THE NORTHERN RIGHT-OF-WAY LINE OF THE RAILROAD N77°46'46"W 839.88' TO A ROD SET; THENCE N26°13'56"E 65.05' TO A MONUMENT FOUND; THENCE N77°45'52"W 1400.51' TO A ROD FOUND; THENCE LEAVING THE RIGHT-OF-WAY OF CSX TRANSPORTATION RAILROAD N11°46'08"E 50.00' TO A ROD SET; THENCE N77\12745'52"W 449.73' TO A ROD FOUND; THENCE N11°46'08"E 936.88' TO A POINT; THENCE N56\12746'08"E 636.00' TO A POINT; THENCE N33°13'52"W 250.00' TO A POINT; THENCE N56\12746'08"E 935.00' TO A POINT; THENCE S33\12713'52"E 2673.79' BACK TO THE POINT OF BEGINNING. SAID PARCEL CONTAINS 94.157 ACRES LESS AND EXCEPT PARCEL 2 WHICH CONTAINS 6.326 ACRES.

EXHIBIT "B"

LEGAL DESCRIPTION OF PARCEL 2 AS SHOWN ON A PLAT BY GENE WATSON & ASSOCIATES, P.C. DATED NOV. 7, 2001 LAST REVISED APR. 02, 2002

BEGINNING AT THE P.O.B. OF PARCEL 1, SAID POINT BEING ON THE NORTHERN RIGHT-OF-WAY LINE OF BEULAH ROAD 2,200'\128 WEST OF THE CENTERLINE INTERSECTION OF BEULAH ROAD AND PORTUGEE ROAD; THENCE LEAVING SAID P.O.B. N33\12713'52"W 1997.24' TO A POINT; THENCE S56\12746'08"W 238.05' TO THE POINT OF BEGINNING OF PARCEL 2; THENCE ALONG A LINE THAT IS PARALLEL AND APPROXIMATELY 30' EAST OF A CHAIN LINK FENCE, S33\12722'28"E 357.93' TO A POINT; THENCE ALONG A LINE THAT IS PARALLEL AND APPROXIMATELY 30' SOUTH OF A CHAIN LINK FENCE, S56\12742'13"W 769.49' TO A POINT; THENCE N33\12707'48"W 358.98' TO A ROD FOUND; THENCE ALONG A LINE THAT IS PARALLEL AND APPROXIMATELY 30' NORTH OF A CHAIN LINK FENCE N56\12746'55"E 767.96' BACK TO THE POINT OF BEGINNING. SAID PARCEL CONTAINS 6.326 ACRES.

LEGAL DESCRIPTION OF A SIXTY-FOOT RIGHT-OF-WAY TO PARCEL 2 AS SHOWN ON A PLAT BY GENE WATSON & ASSOCIATES, P.C. DATED NOV. 7, 2001 AND LAST REVISED APR. 02, 2002.

BEGINNING AT A POINT ON THE WESTERN PROPERTY LINE OF PARCEL 2, SAID POINT BEING LOCATED S33\12707'48"E 161.38' FROM A ROD FOUND; THENCE ALONG SAID WESTERN PROPERTY LINE S33\12707'48"E 60.83' TO A POINT; THENCE ALONG A CURVE TO THE LEFT HAVING A RADIUS OF 127.14' A DISTANCE OF 102.01' TO A POINT; THENCE S00\12735'44"E 138.62' TO A POINT, SAID POINT BEING OPPOSITE OF A DRIVEWAY CROSSING; THENCE S89\12724'16"W 60.00' TO A POINT; THENCE N00\12735'44"W 138.62' TO A POINT; THENCE ALONG A CURVE TO THE RIGHT HAVING A RADIUS OF 187.14' A DISTANCE OF 162.28' TO THE POINT AND PLACE OF BEGINNING. SAID SIXTY-FOOT RIGHT-OF-WAY CONTAINS 0.373 ACRES.

EXHIBIT "B2"

EXHIBIT

tabbies

C

# RULES & REGULATIONS

Amended on May 25, 1999

Prepared for the Tenants of
Richmond International Airport

Initial Here

Initial Here

# *RULES AND REGULATIONS REGARDING CONDUCT AND ACTIVITIES ON THE PROPERTY OF THE CAPITAL REGION AIRPORT COMMISSION*

The Capital Region Airport Commission, wishing to encourage and foster all aviation activities within its participating subdivisions and the broader Airport service area of the Richmond Metropolitan Region, while recognizing the necessity of protecting the public health, safety and welfare, hereby promulgates and adopts the following Rules and Regulations regarding conduct and activities at its Airports, now owned or hereafter acquired and/or operated.

# RULES & REGULATIONS

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LEASE NO. DACA 65-5-03-0045

# SUPPLEMENTAL AGREEMENT NO. 1 TO ARMY GUARD LEASE

**THIS SUPPLEMENTAL AGREEMENT,** entered into this 13th day of Nov., 2006, by and between the CAPITAL REGION AIRPORT COMMISSION (the "Lessor") and the UNITED STATES OF AMERICA, acting by and through the Department of the Army (the "Government").

## RECITALS:

A. The Lessor and the Government entered into a certain Deed and Agreement of Lease No. 3, dated November 15, 2002, covering certain land at Richmond International Airport (the "Lease").

B. The Lessor and the United States of America, acting by and through the Chief, National Guard Bureau, and the Commonwealth of Virginia, acting by and through its Adjutant General, entered into a certain Airport Joint Use Agreement, dated September 22, 2002, for a term of years expiring June 30, 2005 (the "Joint Use Agreement").

C. Expiration of the Joint Use Agreement without execution of an extension or renewal of the agreement may be an "Event of Default" by the Government under the Lease for which the Lessor may terminate the Lease upon 180 days prior written notice to the Government.

D. The parties have negotiated and are executing contemporaneously herewith a renewal of the Joint Use Agreement having a term of 3 years beginning July 1, 2005.

E. The Lessor has served notice to the Government that the Lease shall terminate on a date specified in its letter dated September 27, 2005 (the "Termination Notice").

F. The parties desire to amend the Lease to give the Lessor the right to terminate the Lease without cause on and after a certain mutually agreeable date in consideration of the withdrawal of the Termination Notice by the Lessor *nunc pro* tunc.

## AGREEMENT:

1. The Lessor hereby withdraws the Termination Notice in its entirety *nunc pro tunc*, and all terms of the Lease shall be and continue to remain in full force and effect.

2. The Lease is hereby modified in the following particulars, but no other:

(A) The text of Paragraph 2(a) is hereby amended by deleting the second sentence and substituting in its stead the following: "Subject to the other provisions of this Lease, the fixed basic term of this Lease shall begin on the Effective Date and shall expire on that date which is the earlier of (1) twenty-five (25) years after the Government takes beneficial occupancy of the facilities currently planned for construction on the Leased Land or (2) October 31, 2032."

(B) The text of Paragraph 2(b) is hereby deleted.

(C) The text of Paragraph 2(c) is hereby amended by deleting the last sentence and substituting in its stead the following: "The Joint Use Agreement between the Lessor and the United States of America dated as of October 4, 2006 remains in full force and effect."

3. All other terms and conditions of the Lease shall be and remain the same.

4. This Supplemental Agreement shall be effective immediately.

**IN WITNESS WHEREOF,** the parties hereto have hereunto subscribed their names as of the date first above written by their duly authorized representatives.

CAPITAL REGION AIRPORT COMMISSION

By: _____
Jon E. Mathiasen

THE UNITED STATES OF AMERICA

By: _____
Dillard H. Horton
Chief Real Estate Office
Norfolk District Corps of Engineers

767128

LEASE NO.DAC65-5-03-0045

# SUPPLEMENTAL AGREEMENT NO. 2

**THIS SUPPLEMENTAL AGREEMENT NO. 2,** entered into this __ day of _____, 2011, by and between the CAPITAL REGION AIRPORT COMMISSION (the "Lessor") and the UNITED STATES OF AMERICA, acting by and through the Department of the Army (the "Government").

## RECITALS:

A. The Lessor and the Government entered into a certain Deed and Agreement of Lease No. 1, dated November 15, 2002, covering certain land at Richmond International Airport (the "Lease").

B. The Lessor and the Government entered Supplemental Agreement No. 1 to the Lease dated August 29, 2006.

B. The Lessor and the United States of America, acting by and through the Chief, National Guard Bureau, and the Commonwealth of Virginia, acting by and through its Adjutant General, entered into a certain Airport Joint Use Agreement, dated September 18, 2008, for a term of years expiring September 30, 2011 (the "Current Joint Use Agreement").

C. The parties have negotiated and are executing contemporaneously herewith a new Joint Use Agreement having a term of three (3) years beginning October 1, 2011, and ending September 30, 2014.

D. The parties desire that certain property consisting of 6.326 acres, more or less, and contiguous to the Leased Land and known as the Air Guard Munitions Facility Parcel, previously leased to the United States of America, acting by and through the Department of the Air Force, under Deed and Agreement of Lease No. 2 dated November 15, 2002, as amended by Supplement No. 1 dated August 29, 2006 ("Munitions Facility Lease") be included within the Leased Land.

## AGREEMENT:

1. The Lease is hereby modified to delete Section 1 and substitute in its place and stead the following:

"1. **Leased Land.** For the term, and subject to the provisions stated herein, the Lessor hereby leases to the Government and the Government leases from the Lessor, on the terms herein set forth, the following described premises, to-wit: Parcel 5

consisting of 87.831 acres, more or less, and Parcel 4 consisting of 6.326 acres, more or less, as shown on the attached plat by NXL, Inc., surveyors and engineers, dated February 3, 2009, attached hereto and marked Exhibit A (the "Plat"), and described by metes and bounds on Exhibit B hereto. Said land (hereinafter called the "Leased Land") is situated at Richmond International Airport (the "Airport"), Henrico County, Virginia.

SUBJECT to the retention by the Lessor of an easement in, and prior right of use of Portugee Road as the same exists on the Leased Land. The general location of said road is shown on Exhibit A. This right of control includes without limitation, the right to install utilities and other facilities (except buildings) of its own in, along, across, over and under said road, and to grant such rights to others, so long as such uses shall not interfere in any material respect with the use of said road by the Government.

By separate agreement, the Lessor has granted the Government the right to use, jointly with others, the "Jointly Used Flying Facilities" as defined in that certain Airport Joint Use Agreement to which Lessor and the Government are parties, dated as of September 18, 2008, in accordance with and subject to the terms of said agreement, and any successor agreement which may be entered into by Lessor and the parties hereto.

The above described Leased Land is to be used only for the following purpose: For the requirements of the United States Government with respect to the use by the Army National Guard of its aircraft, including helicopters and for support for such aviation functions.

2. The Government agrees to succeed to all of the current obligations of the Government under Section 22 "Environmental Matters" of the Munitions Facility Lease.

3. All other terms and conditions of the Lease shall be and remain the same.

4. This Supplemental Agreement No. 2 shall be effective upon the date hereinabove stated.

**IN WITNESS WHEREOF,** the parties hereto have hereunto subscribed their names as of the date first above written by their duly authorized representatives.

CAPITAL REGION AIRPORT COMMISSION

By: _____
Jon E. Mathiasen

THE UNITED STATES OF AMERICA

By: _____

869446

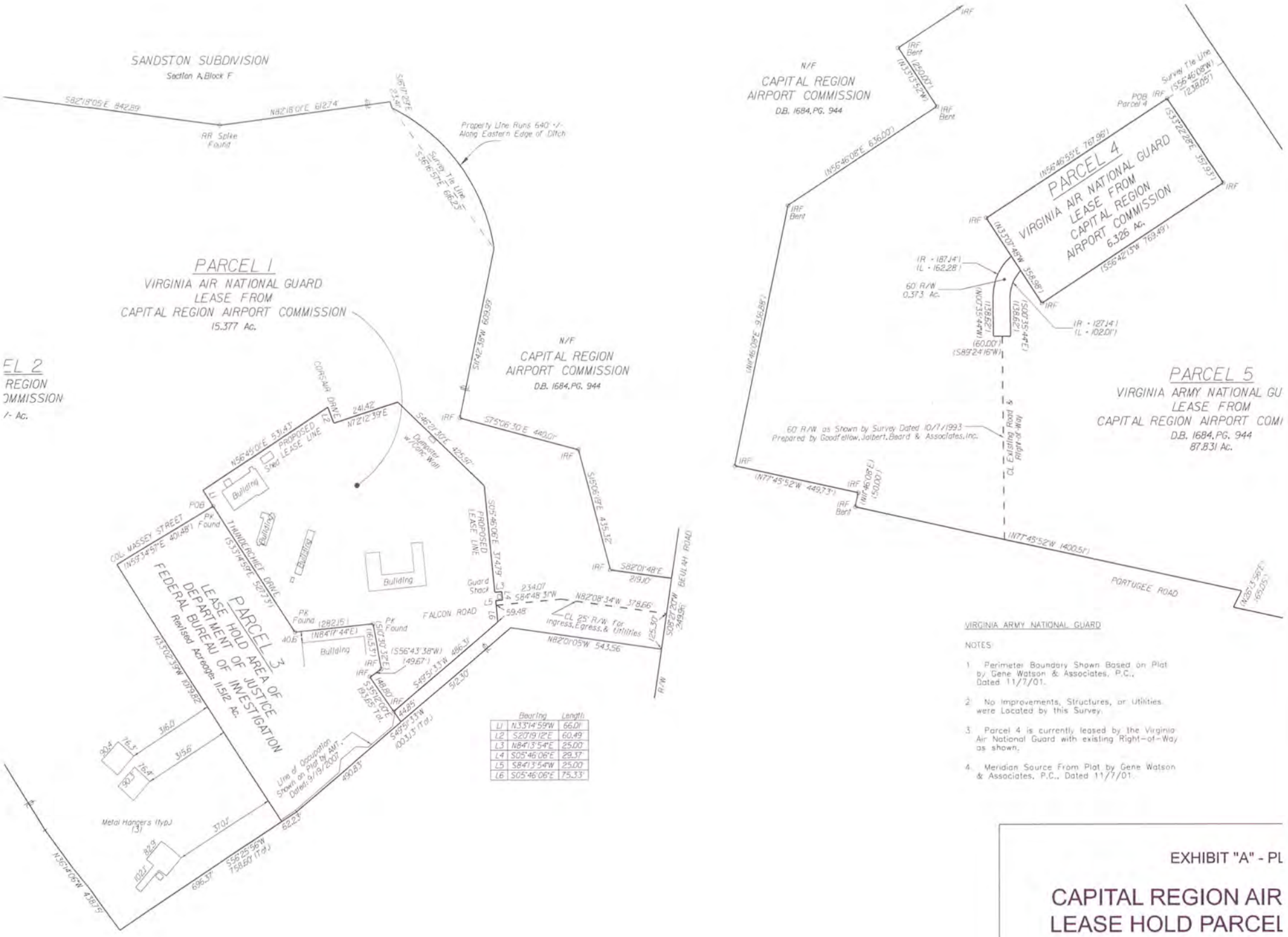


EXHIBIT "A" - PL

# CAPITAL REGION AIR
# LEASE HOLD PARCEL
# THE VIRGINIA AIR N
# AND THE VIRGINIA ARM

Legal Description
**Capital Region Airport Commission-Lease Hold Parcel**
Within the Virginia Army National Guard
Richmond International Airport

**Parcel 4**

**BEGINNING** at an Iron Rod Found at the north east corner of Parcel 4, being located within the boundary of the leasehold parcel of the Virginia Army National Guard, as shown on plat prepared by NXL, Inc. dated February 3, 2009; Thence following the boundary of Parcel 4, the following courses and distances:

S 33°22'28" E, 357.93 feet, to an Iron Rod Found;
S 56°42'13" W, 769.49 feet, to an Iron Rod Found;
N 33°07'48" W, 358.98 feet, to an Iron Rod Found;
N 56°46'55" E, 767.96 feet, to the **Point of Beginning**.

Said Parcel 4 containing **6.326** Acres as shown on Plat prepared by NXL, Inc. dated February 3, 2009 entitled as: Exhibit "A"- Plan Showing CAPTIAL REGION AIRPORT COMMISSION LEASE HOLD PARCELS LOCATED WITHIN THE VIRGINIA AIR NATIONAL GUARD AND THE VIRGINIA ARMY NATIONAL GUARD; Richmond International Airport, Henrico County, Virginia.

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

ARNG-ILE

30 September 2013

MEMORANDUM FOR ARNG-ILI-R (Mr. Ken Parks), 111 S. George Mason Drive, Arlington, VA 22204

SUBJECT: Review of Environmental Documentation for the Proposed Lease Amendment for Army Aviation Support Facility (AASF) at Richmond International Airport, Sandston, Virginia

1. References:

a. Memorandum. EEE Consulting, Inc. 1 May 2013. Subject: Environmental Condition of Property Evaluation, Army Aviation Support Facility, Sandston, Virginia .

b. Phase I Environmental Site Assessment, Air Guard Munitions Facility, Beulah Road, Sandston, Virginia 23250. Department of Military Affairs MRC-Fort Pickett (EEE Consulting, Inc.). 29 April 2008

c. ARNG Record of Environmental Consideration and Environmental Checklist. VAARNG Environmental Office. Subject: AASF 6.3 Acre Lease. 22 January 2013

d. ARNG Record of Environmental Consideration and Environmental Checklist. VAARNG Environmental Office. Subject: AASF License Renewal. 23 January 2013

e. Army Regulation (AR) 200-1, Environmental Protection and Enhancement, Section 15-5, Real Property acquisition, leases, outgrants, and disposal transactions. 3 December 2007

f. The ARNG Environmental Condition of Property (ECOP) Handbook – The ARNG's ECOP Process Handbook, 1 June 2011

g. 32 CFR Part 651, Environmental Analysis of Army Actions, 29 March 2002

h. The ARNG NEPA Handbook – Guidance on Preparing Environmental Documentation for Army National Guard Actions in Compliance with NEPA of 1969, 1 October 2011

2. The VAARNG is seeking to renew and amend lease No. DACA65-5-03-0045 to incorporate 6.326 acres into the AASF at Richmond International Airport in Sandston, VA. The property was previously leased to the Air Guard under lease DACA65-5-03-

0026. The space has been used by the VAARNG since 2008 through a memorandum of agreement.

3. The Records of Environmental Consideration for the action (reference 1c and 1d) documents NEPA compliance and are in accordance with references 1g and 1h.

4. ARNG-ILE reviewed the ECOP documentation in references 1a and 1b and found the existing condition of property is sufficiently documented per the requirements in references 1e and 1f. The following Recognized Environmental Conditions (REC) were identified:

a. Two aboveground heating oil tanks outside of Buildings 3905 and 3906.

b. Oil staining on the concrete floor in the mechanical room of Building 3905.

c. Oil staining on the gravel floor of the metal shed on the property.

d. Old pole-mounted electrical transformer adjacent to the property that may possibly contain Polychlorinated biphenyls (PCB).

e. Potential lead based paint on the buildings.

f. Old leaking underground storage tank (UST) that was removed. Contaminated soil associated with the leaking UST has also been properly disposed.

g. Though not identified as a REC, there are two underground storage tanks (UST) abandoned in place in the fuel farm. Documents related to closure of these tanks were not provided in the ESA or appendices. Provided these were closed per applicable regulations, the USTs would not be considered RECs.

h. Richmond International Airport is on a Formerly Used Defense Site (FUDS) known as Byrd Field (#C03VA0178) a former WWII era Army Air Field. The U.S. Army Corps of Engineers (USACE) made a No Defense Action Intended (NDAI) determination for the Byrd Field FUDS. The Virginia Department of Environmental Quality non-concurred with the USACE determination.

i. Several buildings at the property are suspected to house asbestos containing materials and leads based paint and therefore, per ARNG directorate policy, are designated as qualified parcels.

ARNG-ILE
SUBJECT: Review of Environmental Documentation for the Proposed Lease Amendment for Army Aviation Support Facility (AASF) at Richmond International Airport, Sandston, Virginia

5. None of the items listed in the previous section precludes the proposed real estate action.

6. The point of contact is Ms. Anna Hudson, Eastern Region NEPA PM, DSN 329-7980, 703-601-7980, or anna.m.hudson22.civ@mail.mil.

STEVE STADELMAN
Chief, Training and
Infrastructure Branch

CF:
MAJ Hassler, ARNG-ILI
Mrs Abalahin, ARNG-ILI
Mrs Powell, ARNG-ILI
Ms Clayton, VAARNG

## Powell, Regina A CTR (US)

**From:** Ragan, Sandra W NFG NG VAARNG (US)
**Sent:** Wednesday, March 12, 2014 1:42 PM
**To:** Powell, Regina A CTR (US)
**Subject:** FW: Munitions Storage Area, 6.32 acres, Terminated Air Force Lease DACA65-5-03-0026 (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: FOUO

Sandra Ragan - State Employee
Real Estate Manager
VaARNG, CFMO
Planning, Programming and Real Estate
Building 316, Fort Pickett
Blackstone, VA 23824
Office (434) 292-8258
sandra.w.ragan.nfg@mail.mil

-----Original Message-----
From: Russ L. Peaden [mailto:RPeaden@flyrichmond.com]
Sent: Monday, November 05, 2012 3:51 PM
To: Ragan, Sandra W Ms CIV US NG VA ARNG
Cc: Doug Blum
Subject: RE: Munitions Storage Area, 6.32 acres, Terminated Air Force Lease DACA65-5-03-0026 (UNCLASSIFIED)

Sandra,

Yes, the Commission would like to move forward on this and attempt to work this leasehold into the VA Army National Guard Aviation Facility Lease. Please forward our request to the appropriate person if it is not you.

Russell L. Peaden C.M.
Director Real Estate & Facilities
Capital Region Airport Commission
1 Richard E. Byrd Terminal Drive
Richmond International Airport, VA 23250
804.226.8520 office
804.221.0542 cell

-----Original Message-----
From: Ragan, Sandra W Ms CIV NG VA ARNG [mailto:sandra.ragan@us.army.mil]
Sent: Thursday, October 18, 2012 1:48 PM
To: Russ L. Peaden
Subject: FW: Munitions Storage Area, 6.32 acres, Terminated Air Force Lease DACA65-5-03-0026 (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: FOUO

Mr Peaden, I am new to the Virginia Army National Guard, working in their Real Estate Office. I was recently forwarded your e-mail from April 2011 and asked to follow up on the status of this action. I have researched some of the files here and found a copy of a draft amendment to lease DAC65-5-03-0045. But it does not appear that the action was ever completed. I'm not sure how this fell through, but we are certainly interested in having the property included in our lease.

Can you provide any additional information on the status of this action? I appreciate your assistance. Please feel free to give me a call if you would like to discuss.

Sandra Ragan - State Employee
Real Estate Manager
VaARNG, CFMO Planning, Programming and Real Estate Building 316, Fort Pickett Blackstone, VA 23824 Office (434) 292-8258 sandra.ragan@us.army.mil

From: Russ L. Peaden <RPeaden@flyrichmond.com>
To: Francis, Daryl W COL NGVA; Zollar, James LTC NGVA; Ring, James W LTC NGVA
Cc: Doug Blum <DBlum@flyrichmond.com>
Sent: Thu Apr 14 10:21:48 2011
Subject: RE: Munitions Storage Area, 6.32 acres, Terminated Air Force Lease DACA65-5-03-0026

Gentlemen,

The Airport Commission has recently received a letter from Mr. Elton Wilson, Chief, Real Estate Management Branch of the National Guard Bureau, dated April 6, 2011 informing us that the Air Force has finally terminated their lease of the 6.32 acre Munitions Storage Area dated April 17, 2009. At this time, the Commission desires to work with the Virginia Army National Guard to merge this land into the existing Virginia Army National Guard Aviation Facility Lease. Please direct me to the appropriate person(s) to handle this matter.

Regards,

Russ Peaden, C.M.

Director Real Estate & Facilities

Richmond International Airport, VA 23250

804.226.8520 office

804.221.0542 cell

www.showcase.com/rpeaden@flyrichmond.com
<blockedhttp://www.showcase.com/rpeaden@flyrichmond.com>

This email and any attachments are confidential. If you receive this message in error or are not the intended recipient, you should not retain, distribute, disclose or use any of this information and you should destroy
the email and any attachments or copies. --

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Classification: UNCLASSIFIED
Caveats: FOUO

DEPARTMENT OF THE ARMY
VIRGINIA ARMY NATIONAL GUARD
BUILDING 316, FORT PICKETT
BLACKSTONE, VIRGINIA 23824-6316

REPLY TO
ATTENTION OF

NGVA-FMO-PP

15 March 2013

MEMORANDUM THRU Installations Directorate, ATTN: ARNG-ILI-E, ARNG Readiness Center, 111 South George Mason Drive, Arlington, Virginia 22204-1382

FOR Department of the Army, Norfolk District, Corps of Engineers, ATTN: CENAO-RE-A (Mr. David Parson), Fort Norfolk, 803 Front Street, Norfolk, Virginia 23510-1096

SUBJECT: Request to Amend Lease No. DACA65-5-03-0045, Army Guard Property at Richmond International Airport, Sandston, Virginia

1. Reference:

a. Lease DACA65-5-03-0026, Air Guard Munitions Facility Parcel, Richmond International Airport.

b. Lease DACA65-5-03-0045, Army Guard AASF, Richmond International Airport.

c. Memo, NGB-ARI-RE, 21 Jul 08, subject: Request to Add 6.326 Acres and Buildings 3905, 3906, 3921 through 3932 to the Facility Installations Support Plan (FISP) for Support at Richmond International Airport.

d. E-mail from Capital Region Airport Commission, 14 April 2011, subject: Munitions Storage Area, 6.32 acres, Terminated Air Force Lease, DACA65-5-03-0026 (encl).

e. Real Estate Action Plan, 15 March 2013 (encl).

2. Request amendment to lease DACA65-5-03-0045 to incorporate 6.326 acres into Army Guard AASF property. Property was previously leased to the Air Guard; however, that lease was recently terminated. The AASF is critically short of space and this area provides offices for ARNG full-time staff as well as storage space to relieve overcrowding. The space has been used by the VaARNG since 2008 through a memorandum of agreement and the addition of the facilities to the VaARNG FISP has already been approved by NGB, see reference c.

3. The Capital Region Airport Commission has concurred with this action (e-mail attached).

4. Oral or written communication regarding the above should be directed to Sandra Ragan of this office at the above address, Attn: NGVA-FMO-PP, telephone (434) 292-8258, e-mail sandra.ragan@us.army.mil.

FOR THE ADJUTANT GENERAL:

James Zollar

JAMES ZOLLAR
LTC, EN, VaARNG
ACofS, Facilities Engineering
and Management

Encl

15 March 2013

# Real Estate Action Plan

1. TYPE OF PROPOSED ACTION: Acquisition.

2. DESCRIPTION OF PROPERTY: 6.326 AC and improvements previously leased for the Virginia Air Guard as a munitions facility at Richmond International (RIC) Airport, Sandston, Virginia. The property is adjacent to the Army Aviation Support Facility (AASF).

3. DESCRIPTION OF THE CIRCUMSTANCES PROMPTING A REAL ESTATE ACTION:

a. The Department of the Air Force leased the Air Guard Munitions Facility Parcel from the Capital Region Airport Commission (Lease No. DACA65-5-03-0026). The ANG no longer needs the Munitions Facility and has terminated their lease.

b. In 2008, the VaARNG State Aviation Officer at AASF and the VaANG Cdr 192nd Fighter Wing executed a MOA to allow the ARNG to use the Air Guard Munitions Facility. NGB-ARI approved the action.

c. The Department of the Army leases the Army Guard Property from the Capital Region Airport Commission (Lease No. DACA65-5-03-0045). The VaARNG desires to amend their Lease to add the 6.326 acre Munitions Facility Parcel to their leased premises.

4. LISTING OF POTENTIAL ALTERNATIVES TO THE REAL ESTATE ACTION: None.

5. BASIS FOR INVOLVEMENT OF NGB IN PROPOSED ACTION: Acquisition of federal real property requires NGB-ARI approval.

6. DATE BY WHICH THE PROPOSED REAL ESTATE ACTION MUST BE COMPLETED TO MEET BENEFICIAL OCCUPANCY, POSSESSION, GRANT OF USE, OR DISPOSAL OBJECTIVES: As soon as possible.

7. LISTING OF DOCUMENTS NEEDED TO ACHIEVE PROPOSED ACTION: Supplemental Agreement to Lease No. DACA65-03-0045.

8. KNOWN OR SUSPECTED ENVIRONMENTAL SENSITIVITIES: None.

9. NEPA DOCUMENTATION:

a. DOCUMENTATION TYPE (REC/EA/EIS): ECOP/REC

b. PROPONENT: VaARNG

c. PREPARER: VaARNG

d. DECISION MAKER: VaARNG and NGB

# Real Estate Action Plan

e. ANTICIPATED START AND COMPLETION DATE: 15 March 2013 through 15 June 2013.

10. POINTS OF CONTACT:

a. VaARNG (real estate): Sandra Ragan, (434) 298-6437.

b. NGB-ARI-RE (real estate): Mr. Ken Parks, (703) 607-7179.

d. USACE, Norfolk District (real estate): Mr. David Parson, (757) 201-7736.

11. ANTICIPATED CONSTRUCTION PROJECTS, IF ANY: None.

12. FUNDING SOURCES FOR PROPOSAL: OMNG funds.

13. DISCUSSIONS OF ANY OTHER RELEVANT INFORMATION DEEMED APPROPRIATE: The existing AASF is critically short of space and the Air Guard Munitions Facility provides some offices for ARNG full-time staff as well as storage space to relieve overcrowding at AASF.

James Zollar

JAMES A. ZOLLAR.
LTC, EN, VaARNG
ACofS, Facilities Engineering
and Management

Encls

NGB-ARI-RE Memorandum, 21 JUL 08, Subject: Request to Add 6.326 Acres and Buildings 3905, 3906, 3921 through 3932 to the Facility Installations and Support Plan (FISP) for Support at Richmond International Airport

Lease No. DACA65-5-03-0026

Lease No. DACA65-5-03-0045

E-mail from Russell L. Peaden, Director Real Estate & Facilities, Capital Region Airport Commission

DEPARTMENTS OF THE ARMY AND THE AIR FORCE
OFFICE OF THE ADJUTANT GENERAL OF VIRGINIA
JOINT FORCE HEADQUARTERS - VIRGINIA
BUILDING 316, FORT PICKETT
BLACKSTONE, VIRGINIA 23824-6316

REPLY TO
ATTENTION OF

NGVA-FMO-PP

15 March 2013

MEMORANDUM THRU Installations Directorate, ATTN: ARNG-ILI-E, ARNG Readiness Center,111 South George Mason Drive, Arlington, Virginia 22204-1382

FOR Department of the Army, Norfolk District, Corps of Engineers, ATTN: CENAO-RE-A (Mr. David Parson), Fort Norfolk, 803 Front Street, Norfolk, Virginia 23510-1096

SUBJECT: Request for DA License, Richmond International Airport, Sandston, Virginia

1. The VaARNG has a continuing need for 94.157 acres of federally held property at Richmond International Airport. The property serves as an Army Aviation Support Facility (AASF) and Sandston Armory (Avn). Property is leased from Capital Region Airport Commission under two separate leases: DACA65-5-03-0026, Air Guard Munitions Facility Parcel and DACA65-5-03-0045, Army Guard AASF. A request has been submitted to incorporate both parcels into lease number DACA65-5-03-0045.

2. Request you issue a license to the Commonwealth of Virginia for ARNG training on the property. Also, request the term of the license run concurrent with DA Lease No. 65-5-03-0045, which expires 31 October 2032.

3. An updated Real Property Action Plan (REAP) is enclosed. (Encl)

4. Oral or written communication regarding the above should be directed to Sandra Ragan of this office at the above address, Attn: NGVA-FMO-PP, telephone (434) 292-8258, e-mail sandra.ragan@us.army.mil.

FOR THE ADJUTANT GENERAL:

James Zollar

JAMES ZOLLAR
LTC, EN, VaARNG
ACofS, Facilities Engineering
and Management

Encl

# Real Estate Action Plan

15 March 2013

1. TYPE OF PROPOSED ACTION: Acquisition – DA License.

2. DESCRIPTION OF PROPERTY: 94.157 AC federally owned parcel in Sandston, Virginia.

3. DESCRIPTION OF THE CIRCUMSTANCES PROMPTING A REAL ESTATE ACTION: Property is leased from Capital Region Airport Commission under two separate leases: DACA65-5-03-0026, Air Guard Munitions Facility Parcel and DACA65-5-03-0045, Army Guard AASF. Request has been submitted to incorporate both parcels into lease DACA65-5-03-0045. Prior to the current lease, Commonwealth of Virginia had been issued a concurrent license for use of the property by the Virginia Army National Guard; however, to date a new license has not been issued to correspond to the new lease. AASF has been utilized by the Virginia Guard since 1964. While plans for a new AASF are being developed, timeline for construction of a new facility will require full term of the existing lease The current lease is in effect through 2032.

4. LISTING OF POTENTIAL ALTERNATIVES TO THE REAL ESTATE ACTION: There are no VaARNG properties that could satisfy the requirement for the current or future site of the AASF.

5. BASIS FOR INVOLVEMENT OF NGB IN PROPOSED ACTION: DA license requires NGB concurrence.

6. DATE BY WHICH THE PROPOSED REAL ESTATE ACTION MUST BE COMPLETED TO MEET BENEFICIAL OCCUPANCY, POSSESSION, GRANT OF USE, OR DISPOSAL OBJECTIVES: As soon as possible.

7. LISTING OF DOCUMENTS NEEDED TO ACHIEVE PROPOSED ACTION: DA License.

8. KNOWN OR SUSPECTED ENVIRONMENTAL SENSITIVITIES: None.

9. NEPA DOCUMENTATION:

DOCUMENTATION TYPE (REC/EA/EIS): ECOP/REC.
PROPONENT: VaARNG.
PREPARER: VaARNG.
DECISION MAKER: VaARNG and NGB.
ANTICIPATED START AND COMPLETION DATE: 15 Mar 2013 through 15 Jun 2013

10. POINTS OF CONTACT.

VaARNG (real estate): Sandra Ragan, (434) 292-8258.
NGB (real estate): Mr. Ken Parks, (703) 607-7685.
USACE, Norfolk District: Mr. David Parson, (757) 441-7736.

11. ANTICIPATED CONSTRUCTION PROJECTS, IF ANY: Construction of new AASF is in Long Range Construction Plan.

12. FUNDING SOURCES FOR PROPOSAL: OMNG.

13. DISCUSSIONS OF ANY OTHER RELEVANT INFORMATION DEEMED APPROPRIATE: DACA65-5-03-0026, Air Guard Munitions Facility Parcel and DACA65-5-03-0045, Army Guard AASF, Joint Use Airport Agreement.

James Zollar

JAMES A. ZOLLAR.
LTC, EN, VaARNG
ACofS, Facilities Engineering
and Management

ENCL:

Lease No. DACA65-5-03-0026

Lease No. DACA65-5-03-0045

Airport Use Agreement

## Powell, Regina A CTR (US)

**From:** Fleming, Robert L CTR NG NGB (US)
**Sent:** Wednesday, October 02, 2013 11:07 AM
**To:** Powell, Regina A CTR (US)
**Subject:** RE: Richmond International Airport, Sandston VA (UNCLASSIFIED)
**Attachments:** Memo to NGB on VA AASF Lease.pdf

Regina,

ARNG-AV concurs with approval of the REAP and request to amend lease No. DACA65-5-03-0045 to support a valid requirement at Richmond International Airport, Sandston, VA for 6.326 additional acres and the buildings listed in the attached NGVA-FMO-PP Memorandum dated 15 March 2013. The requirement exists to support the AASF and ARNG aviation units stationed at the Sandston, VA property.

Bob
Robert Fleming,
Contractor S3Inc.
ARNG-AVP
Aviation Facilities Program Manager
PH: 703-607-7752 FAX: 703-607-7788
e-mail: robert.l.fleming.ctr@mail.mil

"Peace is that brief glorious time in history when everybody stands around reloading"
Thomas Jefferson

How are we doing? Click link to our ICE comment card:

http://ice.disa.mil/index.cfm?fa=card&s=785&sp=123611&dep=*DoD

-----Original Message-----
From: Powell, Regina A CTR (US)
Sent: Wednesday, October 02, 2013 9:45 AM
To: Fleming, Robert L CTR NG NGB (US)
Subject: FW: Richmond International Airport, Sandston VA (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Good Morning -

Chief - Would you be so kind to review the attached documentation for Validation? If you require further information, please contact me.

Thank you

Regina Powell
JGMSINC / CONTRACTOR
DSN 327-1177 / 703 607-1177
Real Estate Technician
"It is always a pleasure"

-----Original Message-----
From: Ragan, Sandra W NFG NG VAARNG (US)
Sent: Wednesday, October 02, 2013 9:16 AM
To: Powell, Regina A CTR (US)
Cc: Provost, Adam C CPT USARMY NG VAARNG (US); White, Clifton C CSM USARMY NG VAARNG (US); Zollar, James A LTC USARMY NG VAARNG (US)
Subject: RE: Richmond International Airport, Sandston VA (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Ms Powell, I'm sorry about this confusion, but it looks like you had gotten a draft REAP from Feb 2013. Attached is a copy of the updated submittal from Mar 2013 with all signatures.

Thanks for your help.

Sandra Ragan - State Employee
Real Estate Manager
VaARNG, CFMO
Planning, Programming and Real Estate
Building 316, Fort Pickett
Blackstone, VA 23824
Office (434) 292-8258
sandra.w.ragan.nfg@mail.mil

-----Original Message-----
From: Zollar, James A LTC USARMY NG VAARNG (US)
Sent: Tuesday, October 01, 2013 3:10 PM
To: Ragan, Sandra W NFG NG VAARNG (US)
Cc: Provost, Adam C CPT USARMY NG VAARNG (US); White, Clifton C CSM USARMY NG VAARNG (US)
Subject: Fw: Richmond International Airport, Sandston VA (UNCLASSIFIED)

LTC James A. Zollar
J3, Director of Operations
Joint Force Headquarters - Virginia
Virginia National Guard
DSN: 441-7701
COM: 804-236-7701
CELL: 804-221-0223
NIPRNET: james.a.zollar.mil@mail.mil

----- Original Message -----
From: Powell, Regina A CTR (US)
Sent: Tuesday, October 01, 2013 02:45 PM
To: Zollar, James A LTC USARMY NG VAARNG (US)
Cc: Hassler, Tony L LTC USARMY NG NGB (US)
Subject: RE: Richmond International Airport, Sandston VA (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

LTC Zollar,

The Real Estate Branch, Installations Division has reviewed your Real Estate Action Plan, dated 4 February 2010 and the Environmental Memorandum, dated 30 September 2013. The CFMOs signature is required on the REAP. If there have been any changes to the REAP, it would be appreciated if they are noted within the REAP.

If your require any assistance, I may be reached at 703 607-1177, DSN 327-1177.

Thank you

Regina Powell
JGMSINC/CONTRACTOR
Real Estate Technician
"It is always a pleasure"

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

## Powell, Regina A CTR (US)

**From:** Felix, Mauricio CTR (US)
**Sent:** Wednesday, October 02, 2013 1:54 PM
**To:** Powell, Regina A CTR (US)
**Cc:** Hassler, Tony L LTC USARMY NG NGB (US); Rosado, Walter E CTR (US); Marrow, Eric L II CTR (US); Marr, Melanese C CTR NG NGB (US); Ponte, Malcolm M CIV NG NGB ARNG (US)
**Subject:** RE: Richmond International Airport, Sandston VA (UNCLASSIFIED)
**Attachments:** VA(-) ARNG RPLANS Tab Summary OCT 2013.xls; Memo to NGB on AASF Lease.pdf

**Importance:** High

Classification: UNCLASSIFIED
Caveats: FOUO

Good afternoon Ms. Powell, ILI Master planning concur with the above REAP. Current RPLANS data support this action. VA ARNG have a valid requirements for the catcodes mentioned on this REAP.

Respectfully;

MR. MAURICIO FELIX
ARNG-ILI MASTER PLANNER
CONTRACTOR (Systems Plus, Inc.)
PHONE: 703 601 7615
CELL PHONE: 240 893 1717
DSN: 329 7615
FAX: 703 607 7987
mauricio.felix.mil@mail.mil
mauricio.felix@us.army.mil
mauriciofelix69@yahoo.com

-----Original Message-----
From: Powell, Regina A CTR (US)
Sent: Wednesday, October 02, 2013 12:42 PM
To: Felix, Mauricio CTR (US); Marr, Melanese C CTR NG NGB (US)
Cc: Hassler, Tony L LTC USARMY NG NGB (US)
Subject: FW: Richmond International Airport, Sandston VA (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Good Afternoon,

Would you be so kind to review the attached documents, for a Validated Requirement?

Thank you
Regina Powell
JGMSINC/CONTRACTOR
Real Estate Technician
DSN 327-1177 / 703 607-1177
"It is always a pleasure"

-----Original Message-----
From: Ragan, Sandra W NFG NG VAARNG (US)
Sent: Wednesday, October 02, 2013 9:16 AM
To: Powell, Regina A CTR (US)
Cc: Provost, Adam C CPT USARMY NG VAARNG (US); White, Clifton C CSM USARMY NG VAARNG (US); Zollar, James A LTC USARMY NG VAARNG (US)
Subject: RE: Richmond International Airport, Sandston VA (UNCLASSIFIED)

Classification: UNCLASSIFIED
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Thanks for your help.

Sandra Ragan - State Employee
Real Estate Manager
VaARNG, CFMO
Planning, Programming and Real Estate
Building 316, Fort Pickett
Blackstone, VA 23824
Office (434) 292-8258
sandra.w.ragan.nfg@mail.mil

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Sent: Tuesday, October 01, 2013 3:10 PM
To: Ragan, Sandra W NFG NG VAARNG (US)
Cc: Provost, Adam C CPT USARMY NG VAARNG (US); White, Clifton C CSM USARMY NG VAARNG (US)
Subject: Fw: Richmond International Airport, Sandston VA (UNCLASSIFIED)

LTC James A. Zollar
J3, Director of Operations
Joint Force Headquarters - Virginia
Virginia National Guard
DSN: 441-7701
COM: 804-236-7701
CELL: 804-221-0223
NIPRNET: james.a.zollar.mil@mail.mil

----- Original Message -----
From: Powell, Regina A CTR (US)
Sent: Tuesday, October 01, 2013 02:45 PM
To: Zollar, James A LTC USARMY NG VAARNG (US)
Cc: Hassler, Tony L LTC USARMY NG NGB (US)
Subject: RE: Richmond International Airport, Sandston VA (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

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Thank you

Regina Powell
JGMSINC/CONTRACTOR
Real Estate Technician
"It is always a pleasure"

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: FOUO

DEPARTMENTS OF THE ARMY AND THE AIR FORCE
OFFICE OF THE ADJUTANT GENERAL OF VIRGINIA
JOINT FORCE HEADQUARTERS - VIRGINIA
BUILDING 316, FORT PICKETT
BLACKSTONE, VIRGINIA 23824-6316

REPLY TO
ATTENTION OF

NGVA-FMO-PP

15 March 2013

MEMORANDUM THRU Installations Directorate, ATTN: ARNG-ILI-E, ARNG Readiness Center,111 South George Mason Drive, Arlington, Virginia 22204-1382

FOR Department of the Army, Norfolk District, Corps of Engineers, ATTN: CENAO-RE-A (Mr. David Parson), Fort Norfolk, 803 Front Street, Norfolk, Virginia 23510-1096

SUBJECT: Request for DA License, Richmond International Airport, Sandston, Virginia

1. The VaARNG has a continuing need for 94.157 acres of federally held property at Richmond International Airport. The property serves as an Army Aviation Support Facility (AASF) and Sandston Armory (Avn). Property is leased from Capital Region Airport Commission under two separate leases: DACA65-5-03-0026, Air Guard Munitions Facility Parcel and DACA65-5-03-0045, Army Guard AASF. A request has been submitted to incorporate both parcels into lease number DACA65-5-03-0045.

2. Request you issue a license to the Commonwealth of Virginia for ARNG training on the property. Also, request the term of the license run concurrent with DA Lease No. 65-5-03-0045, which expires 31 October 2032.

3. An updated Real Property Action Plan (REAP) is enclosed. (Encl)

4. Oral or written communication regarding the above should be directed to Sandra Ragan of this office at the above address, Attn: NGVA-FMO-PP, telephone (434) 292-8258, e-mail sandra.ragan@us.army.mil.

FOR THE ADJUTANT GENERAL:

James Zollar

JAMES ZOLLAR
LTC, EN, VaARNG
ACofS, Facilities Engineering
and Management

Encl

# Real Estate Action Plan

**15 March 2013**

1. TYPE OF PROPOSED ACTION: Acquisition – DA License.

2. DESCRIPTION OF PROPERTY: 94.157 AC federally owned parcel in Sandston, Virginia.

3. DESCRIPTION OF THE CIRCUMSTANCES PROMPTING A REAL ESTATE ACTION: Property is leased from Capital Region Airport Commission under two separate leases: DACA65-5-03-0026, Air Guard Munitions Facility Parcel and DACA65-5-03-0045, Army Guard AASF. Request has been submitted to incorporate both parcels into lease DACA65-5-03-0045. Prior to the current lease, Commonwealth of Virginia had been issued a concurrent license for use of the property by the Virginia Army National Guard; however, to date a new license has not been issued to correspond to the new lease. AASF has been utilized by the Virginia Guard since 1964. While plans for a new AASF are being developed, timeline for construction of a new facility will require full term of the existing lease. The current lease is in effect through 2032.

4. LISTING OF POTENTIAL ALTERNATIVES TO THE REAL ESTATE ACTION: There are no VaARNG properties that could satisfy the requirement for the current or future site of the AASF.

5. BASIS FOR INVOLVEMENT OF NGB IN PROPOSED ACTION: DA license requires NGB concurrence.

6. DATE BY WHICH THE PROPOSED REAL ESTATE ACTION MUST BE COMPLETED TO MEET BENEFICIAL OCCUPANCY, POSSESSION, GRANT OF USE, OR DISPOSAL OBJECTIVES: As soon as possible.

7. LISTING OF DOCUMENTS NEEDED TO ACHIEVE PROPOSED ACTION: DA License.

8. KNOWN OR SUSPECTED ENVIRONMENTAL SENSITIVITIES: None.

9. NEPA DOCUMENTATION:

DOCUMENTATION TYPE (REC/EA/EIS): ECOP/REC.
PROPONENT: VaARNG.
PREPARER: VaARNG.
DECISION MAKER: VaARNG and NGB.
ANTICIPATED START AND COMPLETION DATE: 15 Mar 2013 through 15 Jun 2013

10. POINTS OF CONTACT.

VaARNG (real estate): Sandra Ragan, (434) 292-8258.
NGB (real estate): Mr. Ken Parks, (703) 607-7685.
USACE, Norfolk District: Mr. David Parson, (757) 441-7736.

11. ANTICIPATED CONSTRUCTION PROJECTS, IF ANY: Construction of new AASF is in Long Range Construction Plan.

12. FUNDING SOURCES FOR PROPOSAL: OMNG.

13. DISCUSSIONS OF ANY OTHER RELEVANT INFORMATION DEEMED APPROPRIATE: DACA65-5-03-0026, Air Guard Munitions Facility Parcel and DACA65-5-03-0045, Army Guard AASF, Joint Use Airport Agreement.

James Zollar

JAMES A. ZOLLAR.
LTC, EN, VaARNG
ACofS, Facilities Engineering
and Management

ENCL:

Lease No. DACA65-5-03-0026

Lease No. DACA65-5-03-0045

Airport Use Agreement

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

ARNG-ILE-AE 24 March 2014

MEMORANDUM FOR ARNG-ILI-R (Mr. Ken Parks), 111 S. George Mason Drive, Arlington, VA 22204

SUBJECT: REVISION of the 20 September 2013 Memorandum--Review of Environmental Documentation for the Proposed Lease Amendment for Army Aviation Support Facility (AASF) at Richmond International Airport, Sandston, Virginia

1. References:

a. Memorandum. EEE Consulting, Inc. 1 May 2013. Subject: Environmental Condition of Property Evaluation, Army Aviation Support Facility, Sandston, Virginia.

b. Phase I Environmental Site Assessment, Air Guard Munitions Facility, Beulah Road, Sandston, Virginia 23250. Department of Military Affairs MRC-Fort Pickett (EEE Consulting, Inc.). 29 April 2008.

c. ARNG Record of Environmental Consideration and Environmental Checklist. VAARNG Environmental Office. Subject: AASF 6.3 Acre Lease. 22 January 2013.

d. ARNG Record of Environmental Consideration and Environmental Checklist. VAARNG Environmental Office. Subject: AASF License Renewal. 23 January 2013.

e. Army Regulation (AR) 200-1, Environmental Protection and Enhancement, Section 15-5, Real Property acquisition, leases, outgrants, and disposal transactions. 3 December 2007.

f. The Army National Guard Environmental Condition of Property (ECOP) Handbook – The ARNG's ECOP Process Handbook, 1 June 2011.

g. 32 CFR Part 651, Environmental Analysis of Army Actions, 29 March 2002.

h. The National Guard Bureau (NGB) NEPA Handbook – Guidance on Preparing Environmental Documentation for Army National Guard Actions in Compliance with NEPA of 1969, 1 October 2011.

2. The VAARNG is seeking to incorporate 6.326 acres into the 94.57 acres of federally held AASF at Richmond International Airport in Sandston, VA (Lease #DACA65-5-03-0045), and to have a license issued to the Commonwealth of Virginia for the entire 100.896 acres. The 6.326 acre property was previously leased to the Air Guard under

lease DACA65-5-03-0026. The 6.326 acre space has been used by the VAARNG since 2008 through a memorandum of agreement. The VAARNG has used the 94.157 acre AASF property since 1964.

3. The Records of Environmental Consideration for the action (reference 1c and 1d) documents NEPA compliance and are in accordance with references 1g and 1h.

4. ARNG-ILE-AE reviewed the ECOP documentation in references 1a and 1b and found the existing condition of property is sufficiently documented per the requirements in references 1e and 1f. The following Recognized Environmental Conditions (RECs) were identified:

a. Two aboveground heating oil tanks outside of Buildings 3905 and 3906.

b. Oil staining on the concrete floor in the mechanical room of Building 3905.

c. Oil staining on the gravel floor of the metal shed on the property.

d. Old pole-mounted electrical transformer adjacent to the property that may possibly contain Polychlorinated biphenyls (PCB).

e. Potential lead based paint on the buildings.

f. Old leaking underground storage tank (UST) that was removed. Contaminated soil associated with the leaking UST has also been properly disposed.

g. Though not identified as a REC, there are two USTs abandoned in place in the fuel farm. Documents related to closure of these tanks were not provided in the ESA or appendices. Provided these were closed per applicable regulations, the USTs would not be considered RECs.

h. Richmond International Airport is on a Formerly Used Defense Site (FUDS) known as Byrd Field (#C03VA0178) a former WWII era Army Air Field. The U.S. Army Corps of Engineers (USACE) made a No Defense Action Intended (NDAI) determination for the Byrd Field FUDS. The Virginia Department of Environmental Quality non-concurred with the USACE determination.

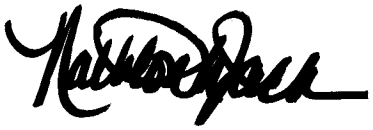
i. Several buildings at the property are suspected to house asbestos containing materials and leads based paint and therefore, per ARNG directorate policy, are designated as qualified parcels.

ARNG-ILE-AE
SUBJECT: REVISION of the 20 September 2013 Memorandum--Review of Environmental Documentation for the Proposed Lease Amendment for Army Aviation Support Facility (AASF) at Richmond International Airport, Sandston, Virginia

j. ILE-AE recommends VAARNG complete an Environmental Baseline Survey compliant with ASTM D6008.

5. None of the items listed in the previous section precludes the proposed real estate action.

6. The point of contact is Ms. Anna Hudson, Eastern Region NEPA PM, DSN 329-7980, 703-601-7980, or anna.m.hudson22.civ@mail.mil.



NATHLON N. JACKSON
LTC, LG
Chief, Assessments and
Evaluation Branch

CF:
LTC Tony Hassler, ARNG-ILI
Mrs. Maia Abalahin, ARNG-ILI
Mrs. Regina Powell, ARNG-ILI
Ms. Katie Clayton, VAARNG
Ms. Sandra Ragan, VAARNG

**NATIONAL GUARD BUREAU**
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

ARNG-ILI-E

22 APR 2014

MEMORANDUM FOR THE US ARMY CORPS OF ENGINEERS NORFOLK DISTRICT ATTN: MR. DAVID PARSON, CENAO-TSD-RE, 803 FRONT STREET, NORFOLK, VA 23219-1832

SUBJECT: Directive to Add 6.326 Acres and 6,707 Square Feet to Lease DACA65-5-03-0045 and Issue License to the Virginia Army National Guard (VAARNG) for the Entire Leased Property for Use as an Army Aviation Support Facility at Richmond International Airport, Sandston, Virginia

1. References:

a. Lease DACA65-5-03-0045, Army Guard Property at Richmond International Airport, 11 September 2003 (enclosure 1).

b. E-mail, Capital Region Airport Commission, Mr. Russell, L. Peaden, 5 November 2012, subject: RE: Munitions Storage Area, 6.326 Acres, Termination Air Force Lease DACA65-5-03-0026 (UNCLASSIFIED) (enclosure 2).

c. Memorandum, Real Estate Action Plan (REAP), NGVA-FMO-PP, 15 March 2013, subject: Request to Amend Lease No. DACA65-5-03-0045, Army Guard Property at Richmond International Airport, Sandston, Virginia (enclosure 3).

d. Memorandum, Real Estate Action Plan (REAP), NGVA-FMO-PP, 15 March 2013, subject: Request for DA License, Richmond International Airport, Sandston, Virginia (enclosure 4).

e. E-mail, ARNG-AVP, Mr. Robert Fleming, 2 October 2013, subject: Richmond International Airport, Sandston, VA (enclosure 5).

f. E-mail, ARNG-ILI-E, Mr. Mauricio Felix, 2 October 2013, subject: Richmond International Airport, Sandston VA (UNCLASSIFIED) (enclosure 6).

g. Memorandum, ARNG-ILE-AE, 24 March 2014, subject: REVISION of the 20 September 2013 Memorandum--Review of Environmental Documentation for the Proposed Lease Amendment for Army Aviation Support Facility (AASF) at Richmond International Airport, Sandston, Virginia (enclosure 7).

ARNG-ILI-E
SUBJECT: Directive to Add 6.326 Acres and 6,707 Square Feet to Lease DACA65-5-03-0045 and Issue License to the Virginia Army National Guard (VAARNG) for the Entire Leased Property for Use as an Army Aviation Support Facility at Richmond International Airport, Sandston, Virginia

2. Request that the US Army Corps of Engineers, Norfolk District modify the existing lease to include the property formerly leased by the Virginia Air National Guard. The lease cost should remain unchanged at $1.00 per annum. In addition, request that the district issue a subsequent license to the VAARNG for use of the total 94.157 acres to run concurrent to the lease. Please provide this office a copy of the completed instruments.

3. Any administrative and utility/municipal service funding requirements are the responsibility of the VAARNG and must be captured in the Facilities Management Budget Tool service requirements.

4. The point of contact is Ms. Regina Powell, Real Estate Technician, Real Estate Branch at DSN 327-1177, 703-607-1177, or regina.a.powell.ctr@mail.mil.

KIMBERLY A. O'KEEFE
COL, EN
Installations Division Chief

7 Encls
1-7. as

CF: (w/encls)
CFMO, VA
USPFO, VA
ARNG-ILI-F

COMMONWEALTH OF VIRGINIA )
: ss
CITY OF )

BEFORE ME, a Notary Public in and for the Commonwealth of Virginia, City of _____, personally appeared Mr. JON E. MATHIASEN, PRESIDENT AND CHIEF EXECUTIVE OFFICER, CAPITAL REGION AIRPORT COMMISSION, to me known to be the identical person and officer whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the said instrument in the capacity therein stated for the purposes therein expressed as the act and deed of the United States of America.

GIVEN under my hand and seal, this 11th day of September, 2003.

NOTARY PUBLIC

(SEAL)

My Commission Expires: 2/28/07

## Powell, Regina A CTR (US)

**From:** Russ L. Peaden [RPeaden@flyrichmond.com]
**Sent:** Monday, November 05, 2012 3:51 PM
**To:** Ragan, Sandra W Ms CIV US NG VA ARNG
**Cc:** Doug Blum
**Subject:** RE: Munitions Storage Area, 6.32 acres, Terminated Air Force Lease DACA65-5-03-0026 (UNCLASSIFIED)

Sandra,

Yes, the Commission would like to move forward on this and attempt to work this leasehold into the VA Army National Guard Aviation Facility Lease. Please forward our request to the appropriate person if it is not you.

Russell L. Peaden C.M.
Director Real Estate & Facilities
Capital Region Airport Commission
1 Richard E. Byrd Terminal Drive
Richmond International Airport, VA 23250
804.226.8520 office
804.221.0542 cell

-----Original Message-----
From: Ragan, Sandra W Ms CIV NG VA ARNG [mailto:sandra.ragan@us.army.mil]
Sent: Thursday, October 18, 2012 1:48 PM
To: Russ L. Peaden
Subject: FW: Munitions Storage Area, 6.32 acres, Terminated Air Force Lease DACA65-5-03-0026 (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: FOUO

Mr Peaden, I am new to the Virginia Army National Guard, working in their Real Estate Office. I was recently forwarded your e-mail from April 2011 and asked to follow up on the status of this action. I have researched some of the files here and found a copy of a draft amendment to lease DAC65-5-03-0045. But it does not appear that the action was ever completed. I'm not sure how this fell through, but we are certainly interested in having the property included in our lease.

Can you provide any additional information on the status of this action? I appreciate your assistance. Please feel free to give me a call if you would like to discuss.

Sandra Ragan - State Employee
Real Estate Manager
VaARNG, CFMO Planning, Programming and Real Estate Building 316, Fort Pickett Blackstone, VA 23824 Office (434) 292-8258 sandra.ragan@us.army.mil

From: Russ L. Peaden <RPeaden@flyrichmond.com>
To: Francis, Daryl W COL NGVA; Zollar, James LTC NGVA; Ring, James W LTC NGVA

DEPARTMENT OF THE ARMY
VIRGINIA ARMY NATIONAL GUARD
BUILDING 316, FORT PICKETT
BLACKSTONE, VIRGINIA 23824-6316

REPLY TO
ATTENTION OF

NGVA-FMO-PP

15 March 2013

MEMORANDUM THRU Installations Directorate, ATTN: ARNG-ILI-E, ARNG Readiness Center, 111 South George Mason Drive, Arlington, Virginia 22204-1382

FOR Department of the Army, Norfolk District, Corps of Engineers, ATTN: CENAO-RE-A (Mr. David Parson), Fort Norfolk, 803 Front Street, Norfolk, Virginia 23510-1096

SUBJECT: Request to Amend Lease No. DACA65-5-03-0045, Army Guard Property at Richmond International Airport, Sandston, Virginia

1. Reference:

a. Lease DACA65-5-03-0026, Air Guard Munitions Facility Parcel, Richmond International Airport.

b. Lease DACA65-5-03-0045, Army Guard AASF, Richmond International Airport.

c. Memo, NGB-ARI-RE, 21 Jul 08, subject: Request to Add 6.326 Acres and Buildings 3905, 3906, 3921 through 3932 to the Facility Installations Support Plan (FISP) for Support at Richmond International Airport.

d. E-mail from Capital Region Airport Commission, 14 April 2011, subject: Munitions Storage Area, 6.32 acres, Terminated Air Force Lease, DACA65-5-03-0026 (encl).

e. Real Estate Action Plan, 15 March 2013 (encl).

2. Request amendment to lease DACA65-5-03-0045 to incorporate 6.326 acres into Army Guard AASF property. Property was previously leased to the Air Guard; however, that lease was recently terminated. The AASF is critically short of space and this area provides offices for ARNG full-time staff as well as storage space to relieve overcrowding. The space has been used by the VaARNG since 2008 through a memorandum of agreement and the addition of the facilities to the VaARNG FISP has already been approved by NGB, see reference c.

3. The Capital Region Airport Commission has concurred with this action (e-mail attached).

4. Oral or written communication regarding the above should be directed to Sandra Ragan of this office at the above address, Attn: NGVA-FMO-PP, telephone (434) 292-8258, e-mail sandra.ragan@us.army.mil.

FOR THE ADJUTANT GENERAL:

James Zollar

JAMES ZOLLAR
LTC, EN, VaARNG
ACofS, Facilities Engineering
and Management

Encl

15 March 2013

# Real Estate Action Plan

1. TYPE OF PROPOSED ACTION: Acquisition.

2. DESCRIPTION OF PROPERTY: 6.326 AC and improvements previously leased for the Virginia Air Guard as a munitions facility at Richmond International (RIC) Airport, Sandston, Virginia. The property is adjacent to the Army Aviation Support Facility (AASF).

3. DESCRIPTION OF THE CIRCUMSTANCES PROMPTING A REAL ESTATE ACTION:

a. The Department of the Air Force leased the Air Guard Munitions Facility Parcel from the Capital Region Airport Commission (Lease No. DACA65-5-03-0026). The ANG no longer needs the Munitions Facility and has terminated their lease.

b. In 2008, the VaARNG State Aviation Officer at AASF and the VaANG Cdr 192nd Fighter Wing executed a MOA to allow the ARNG to use the Air Guard Munitions Facility. NGB-ARI approved the action.

c. The Department of the Army leases the Army Guard Property from the Capital Region Airport Commission (Lease No. DACA65-5-03-0045). The VaARNG desires to amend their Lease to add the 6.326 acre Munitions Facility Parcel to their leased premises.

4. LISTING OF POTENTIAL ALTERNATIVES TO THE REAL ESTATE ACTION: None.

5. BASIS FOR INVOLVEMENT OF NGB IN PROPOSED ACTION: Acquisition of federal real property requires NGB-ARI approval.

6. DATE BY WHICH THE PROPOSED REAL ESTATE ACTION MUST BE COMPLETED TO MEET BENEFICIAL OCCUPANCY, POSSESSION, GRANT OF USE, OR DISPOSAL OBJECTIVES: As soon as possible.

7. LISTING OF DOCUMENTS NEEDED TO ACHIEVE PROPOSED ACTION: Supplemental Agreement to Lease No. DACA65-03-0045.

8. KNOWN OR SUSPECTED ENVIRONMENTAL SENSITIVITIES: None.

9. NEPA DOCUMENTATION:

a. DOCUMENTATION TYPE (REC/EA/EIS): ECOP/REC

b. PROPONENT: VaARNG

c. PREPARER: VaARNG

d. DECISION MAKER: VaARNG and NGB

# Real Estate Action Plan

e. ANTICIPATED START AND COMPLETION DATE: 15 March 2013 through 15 June 2013.

10. POINTS OF CONTACT:

a. VaARNG (real estate): Sandra Ragan, (434) 298-6437.

b. NGB-ARI-RE (real estate): Mr. Ken Parks, (703) 607-7179.

d. USACE, Norfolk District (real estate): Mr. David Parson, (757) 201-7736.

11. ANTICIPATED CONSTRUCTION PROJECTS, IF ANY: None.

12. FUNDING SOURCES FOR PROPOSAL: OMNG funds.

13. DISCUSSIONS OF ANY OTHER RELEVANT INFORMATION DEEMED APPROPRIATE: The existing AASF is critically short of space and the Air Guard Munitions Facility provides some offices for ARNG full-time staff as well as storage space to relieve overcrowding at AASF.

James Zollar

JAMES A. ZOLLAR.
LTC, EN, VaARNG
ACofS, Facilities Engineering
and Management

Encls

NGB-ARI-RE Memorandum, 21 JUL 08, Subject: Request to Add 6.326 Acres and Buildings 3905, 3906, 3921 through 3932 to the Facility Installations and Support Plan (FISP) for Support at Richmond International Airport

Lease No. DACA65-5-03-0026

Lease No. DACA65-5-03-0045

E-mail from Russell L. Peaden, Director Real Estate & Facilities, Capital Region Airport Commission

DEPARTMENTS OF THE ARMY AND THE AIR FORCE
OFFICE OF THE ADJUTANT GENERAL OF VIRGINIA
JOINT FORCE HEADQUARTERS - VIRGINIA
BUILDING 316, FORT PICKETT
BLACKSTONE, VIRGINIA 23824-6316

REPLY TO
ATTENTION OF

NGVA-FMO-PP

15 March 2013

MEMORANDUM THRU Installations Directorate, ATTN: ARNG-ILI-E, ARNG Readiness Center,111 South George Mason Drive, Arlington, Virginia 22204-1382

FOR Department of the Army, Norfolk District, Corps of Engineers, ATTN: CENAO-RE-A (Mr. David Parson), Fort Norfolk, 803 Front Street, Norfolk, Virginia 23510-1096

SUBJECT: Request for DA License, Richmond International Airport, Sandston, Virginia

1. The VaARNG has a continuing need for 94.157 acres of federally held property at Richmond International Airport. The property serves as an Army Aviation Support Facility (AASF) and Sandston Armory (Avn). Property is leased from Capital Region Airport Commission under two separate leases: DACA65-5-03-0026, Air Guard Munitions Facility Parcel and DACA65-5-03-0045, Army Guard AASF. A request has been submitted to incorporate both parcels into lease number DACA65-5-03-0045.

2. Request you issue a license to the Commonwealth of Virginia for ARNG training on the property. Also, request the term of the license run concurrent with DA Lease No. 65-5-03-0045, which expires 31 October 2032.

3. An updated Real Property Action Plan (REAP) is enclosed. (Encl)

4. Oral or written communication regarding the above should be directed to Sandra Ragan of this office at the above address, Attn: NGVA-FMO-PP, telephone (434) 292-8258, e-mail sandra.ragan@us.army.mil.

FOR THE ADJUTANT GENERAL:

James Zollar

JAMES ZOLLAR
LTC, EN, VaARNG
ACofS, Facilities Engineering
and Management

Encl

## Powell, Regina A CTR (US)

**From:** Fleming, Robert L CTR (US)
**Sent:** Tuesday, March 25, 2014 12:08 PM
**To:** Powell, Regina A CTR (US)
**Subject:** FW: Richmond International Airport, Sandston VA (UNCLASSIFIED)
**Attachments:** Memo to NGB on VA AASF Lease.pdf

-----Original Message-----
From: Fleming, Robert L CTR NG NGB (US)
Sent: Wednesday, October 02, 2013 11:07 AM
To: Powell, Regina A CTR (US)
Subject: RE: Richmond International Airport, Sandston VA (UNCLASSIFIED)

Regina,

ARNG-AV concurs with approval of the REAP and request to amend lease No. DACA65-5-03-0045 to support a valid requirement at Richmond International Airport, Sandston, VA for 6.326 additional acres and the buildings listed in the attached NGVA-FMO-PP Memorandum dated 15 March 2013. The requirement exists to support the AASF and ARNG aviation units stationed at the Sandston, VA property.

Bob
Robert Fleming,
Contractor S3Inc.
ARNG-AVP
Aviation Facilities Program Manager
PH: 703-607-7752 FAX: 703-607-7788
e-mail: robert.l.fleming.ctr@mail.mil

"Peace is that brief glorious time in history when everybody stands around reloading"
Thomas Jefferson

How are we doing? Click link to our ICE comment card:

http://ice.disa.mil/index.cfm?fa=card&s=785&sp=123611&dep=*DoD

-----Original Message-----
From: Powell, Regina A CTR (US)
Sent: Wednesday, October 02, 2013 9:45 AM
To: Fleming, Robert L CTR NG NGB (US)
Subject: FW: Richmond International Airport, Sandston VA (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Good Morning -

Chief - Would you be so kind to review the attached documentation for Validation? If you require further information, please contact me.

## Powell, Regina A CTR (US)

**From:** Felix, Mauricio CTR (US)
**Sent:** Tuesday, March 25, 2014 12:03 PM
**To:** Powell, Regina A CTR (US)
**Subject:** FW: Richmond International Airport, Sandston VA (UNCLASSIFIED)
**Attachments:** VA(-) ARNG RPLANS Tab Summary OCT 2013.xls; Memo to NGB on AASF Lease.pdf

**Importance:** High

Classification: UNCLASSIFIED
Caveats: FOUO

Ma'am as requested.

Respectfully;

Mr. MAURICIO FELIX
ARNG-ILI MASTER PLANNING PROGRAM MANAGER CONTRACTOR (Systems Plus, Inc.)
PHONE: 703 601 7615
CELL PHONE: 240 893 1717
DSN: 329 7615
FAX: 703 607 7987
mauricio.felix.ctr@mail.mil
mauricio.felix@us.army.mil
mauriciofelix69@yahoo.com

-----Original Message-----
From: Felix, Mauricio CTR (US)
Sent: Wednesday, October 02, 2013 1:54 PM
To: Powell, Regina A CTR (US)
Cc: Hassler, Tony L LTC USARMY NG NGB (US); Rosado, Walter E CTR (US); Marrow, Eric L II CTR (US); Marr, Melanese C CTR NG NGB (US); Ponte, Malcolm M CIV NG NGB ARNG (US)
Subject: RE: Richmond International Airport, Sandston VA (UNCLASSIFIED)
Importance: High

Classification: UNCLASSIFIED
Caveats: FOUO

Good afternoon Ms. Powell, ILI Master planning concur with the above REAP. Current RPLANS data support this action. VA ARNG have a valid requirements for the catcodes mentioned on this REAP.

Respectfully;

MR. MAURICIO FELIX
ARNG-ILI MASTER PLANNER
CONTRACTOR (Systems Plus, Inc.)
PHONE: 703 601 7615
CELL PHONE: 240 893 1717
DSN: 329 7615
FAX: 703 607 7987
mauricio.felix.mil@mail.mil
mauricio.felix@us.army.mil
mauriciofelix69@yahoo.com

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

ARNG-ILE-AE

24 March 2014

MEMORANDUM FOR ARNG-ILI-R (Mr. Ken Parks), 111 S. George Mason Drive, Arlington, VA 22204

SUBJECT: REVISION of the 20 September 2013 Memorandum--Review of Environmental Documentation for the Proposed Lease Amendment for Army Aviation Support Facility (AASF) at Richmond International Airport, Sandston, Virginia

1. References:

a. Memorandum. EEE Consulting, Inc. 1 May 2013. Subject: Environmental Condition of Property Evaluation, Army Aviation Support Facility, Sandston, Virginia.

b. Phase I Environmental Site Assessment, Air Guard Munitions Facility, Beulah Road, Sandston, Virginia 23250. Department of Military Affairs MRC-Fort Pickett (EEE Consulting, Inc.). 29 April 2008.

c. ARNG Record of Environmental Consideration and Environmental Checklist. VAARNG Environmental Office. Subject: AASF 6.3 Acre Lease. 22 January 2013.

d. ARNG Record of Environmental Consideration and Environmental Checklist. VAARNG Environmental Office. Subject: AASF License Renewal. 23 January 2013.

e. Army Regulation (AR) 200-1, Environmental Protection and Enhancement, Section 15-5, Real Property acquisition, leases, outgrants, and disposal transactions. 3 December 2007.

f. The Army National Guard Environmental Condition of Property (ECOP) Handbook – The ARNG's ECOP Process Handbook, 1 June 2011.

g. 32 CFR Part 651, Environmental Analysis of Army Actions, 29 March 2002.

h. The National Guard Bureau (NGB) NEPA Handbook – Guidance on Preparing Environmental Documentation for Army National Guard Actions in Compliance with NEPA of 1969, 1 October 2011.

2. The VAARNG is seeking to incorporate 6.326 acres into the 94.57 acres of federally held AASF at Richmond International Airport in Sandston, VA (Lease #DACA65-5-03-0045), and to have a license issued to the Commonwealth of Virginia for the entire 100.896 acres. The 6.326 acre property was previously leased to the Air Guard under

lease DACA65-5-03-0026. The 6.326 acre space has been used by the VAARNG since 2008 through a memorandum of agreement. The VAARNG has used the 94.157 acre AASF property since 1964.

3. The Records of Environmental Consideration for the action (reference 1c and 1d) documents NEPA compliance and are in accordance with references 1g and 1h.

4. ARNG-ILE-AE reviewed the ECOP documentation in references 1a and 1b and found the existing condition of property is sufficiently documented per the requirements in references 1e and 1f. The following Recognized Environmental Conditions (RECs) were identified:

a. Two aboveground heating oil tanks outside of Buildings 3905 and 3906.

b. Oil staining on the concrete floor in the mechanical room of Building 3905.

c. Oil staining on the gravel floor of the metal shed on the property.

d. Old pole-mounted electrical transformer adjacent to the property that may possibly contain Polychlorinated biphenyls (PCB).

e. Potential lead based paint on the buildings.

f. Old leaking underground storage tank (UST) that was removed. Contaminated soil associated with the leaking UST has also been properly disposed.

g. Though not identified as a REC, there are two USTs abandoned in place in the fuel farm. Documents related to closure of these tanks were not provided in the ESA or appendices. Provided these were closed per applicable regulations, the USTs would not be considered RECs.

h. Richmond International Airport is on a Formerly Used Defense Site (FUDS) known as Byrd Field (#C03VA0178) a former WWII era Army Air Field. The U.S. Army Corps of Engineers (USACE) made a No Defense Action Intended (NDAI) determination for the Byrd Field FUDS. The Virginia Department of Environmental Quality non-concurred with the USACE determination.

i. Several buildings at the property are suspected to house asbestos containing materials and leads based paint and therefore, per ARNG directorate policy, are designated as qualified parcels.

ARNG-ILE-AE
SUBJECT: REVISION of the 20 September 2013 Memorandum--Review of Environmental Documentation for the Proposed Lease Amendment for Army Aviation Support Facility (AASF) at Richmond International Airport, Sandston, Virginia

j. ILE-AE recommends VAARNG complete an Environmental Baseline Survey compliant with ASTM D6008.

5. None of the items listed in the previous section precludes the proposed real estate action.

6. The point of contact is Ms. Anna Hudson, Eastern Region NEPA PM, DSN 329-7980, 703-601-7980, or anna.m.hudson22.civ@mail.mil.

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2008 Phase I ESA for AASF Munitions Facility

# Phase I
# Environmental Site Assessment

**Air Guard Munitions Facility**
**Beulah Road**
**Sandston, Virginia 23250**

**Prepared for:**
**Department of Military Affairs**
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VAFP-FE, Bldg. 316
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April 29, 2008

3e EEE Consulting, Inc.
Environmental, Engineering and Educational Solutions

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Appendix A - Figures
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## 1.0 SUMMARY

This report presents the process and findings of a Phase I Environmental Site Assessment (ESA) of an approximate 6.326-acre parcel (the property) located at Beulah Road, Sandston Virginia in Henrico County, Virginia. This ESA was performed by EEE Consulting, Inc. (EEE) at the request of the Department of Military Affairs (DMA). This Phase I ESA was performed in response to DMA prospective transfer of the property.

The objective of this Phase I ESA is to conduct all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice as defined in CERCLA, 42 USC Section 9601(35)(B) and identified in the ASTM Standard: Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, E 1527-05. The Phase I ESA is intended to permit the user to satisfy the requirements of the landowner liability protections.

Available public information, including, historical topographic maps, a lease agreement, interviews with persons familiar with the site and documents on file with federal, state, and local regulatory agencies was compiled and reviewed to meet the project objective.

The property is located on Beulah Road which is on the southeast corner of the Richmond International Airport. The property is located in a primarily industrial part of the County and has several buildings on the property that were built in 1965. Building 3905 was the Munitions Office, and has a 1,000 gallon #2 fuel oil Aboveground Storage Tank (AST). Building 3906 was the Munitions Shop, and has a 2,000 gallon #2 fuel oil AST. Buildings 3921-3932 were used for ammunitions storage.

EEE personnel conducted a site reconnaissance of the subject property on April 18, 2008. The following recognized environment conditions (REC) were identified for the site.

- Two aboveground heating oil tanks outside of Buildings 3905 and 3906.
- Oil staining on the concrete floor in the mechanical room of Building 3905.
- Oil staining on the gravel floor of the metal shed on the property.
- Old pole-mounted electrical transformer adjacent to the property that may possibly contain PCBs.
- Potential lead based paint on the buildings.
- Old leaking UST that was removed. Contaminated soil associated with the leaking UST has also been properly disposed.

Although the two heating oil tanks appeared to be in good condition, EEE personnel cannot ascertain if there have been any prior releases from the heating oil tanks. No observed staining on the area around the tanks was observed. The current lease owner, Air National Guard also has a Spill Prevention, Control and Countermeasures (SPCC) Plan which includes the two heating oil tanks. There is no evidence the ASTs have resulted in contamination on the property.

Oil staining was observed on the concrete floor of the mechanical room of Building 3905. It appeared the staining was from the generator situated in the mechanical room. Oil staining was also observed on the gravel floor of the metal shed building. According to facility personnel, the staining was from the equipment (forklift, etc) stored in the metal shed. EEE recommends that the oil-laden gravel be removed and disposed of by the property owner.

An old pole-mounted electrical transformer was also observed adjacent to the property. Due to the age of the transformer, there is the potential that the transformer contains polychlorinated biphenyls (PCBs). It is assumed that Dominion Virginia Power currently owns the transformer, and that maintenance is the responsibility of the electrical company. EEE recommends that Dominion Virginia Power be contacted to determine if the pole-mounted transformer adjacent to the property contains PCBs and whether they have any knowledge of any PCB spills on the property.

Based on a 2001 Environmental Baseline Survey, lead based paint may be present in the buildings. EEE recommends prior to any demolition activities, the presence of lead based paint be confirmed through sampling and analysis.

Historical RECs were also identified for the site. A leaking UST next to building 3906 was removed and contaminated soil associated with the leaking UST was disposed of. The UST was removed in 1996, and the contaminated soil was removed to a soil farm and replaced with new soil.

Several potential recognized environmental conditions were identified near the site. One of the potential recognized environmental conditions identified near the site was the Ellen Jim Property, which has been identified in the Leaking Underground Storage Tank (LUST) Database and the Leaking Tanks (LTANKS) Database. The Ellen Jim Property is located south-southwest from the property on Charles City Road approximately 650 yards from the subject property. Also listed in the LUST and LTANKS databases, another REC near the site was the Mazo Lerch Company, located south-southeast from the property on Lerch Drive approximately 750 yards from the subject property. Because the sites are down gradient from the subject property, they are not expected to pose a significant environmental risk to the subject property.

All of the LUST cases observed during the record search were “closed” by Virginia Department of Environmental Quality (DEQ), and are not considered to be a significant threat to the subject property. EEE recommends that no further action for the LUST cases be taken at this time.

EEE has performed this Phase I ESA of the subject property, in conformance with the scope and limitations of American Society for Testing and Materials (ASTM) Standard E-1527-05 and the EPA All Appropriate Inquiry (AAI) Rule.

## 2.0 INTRODUCTION

This report presents the results of a Phase I Environmental Site Assessment (ESA), of one parcel (the property), located on Beulah Road in Sandston, Virginia. Currently, the Capital Region Airport Commission owns the property, and the Air National Guard (ANG) leases the property. Figure 1 in *Appendix A* shows the property location.

### 2.1 Purpose

The objective of this Phase I ESA is to conduct all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice and ASTM Standard 3 1527-05. The Phase I ESA is intended to permit the user to satisfy the requirements to qualify for one of the landowner liability protections (LLPs) under CERCLA 42 U.S.C. Section 9601.

As part of the all appropriate inquiry, one of the objectives of this evaluation was to determine recognized environmental conditions (RECs) at the site and surrounding properties with regard to potential impacts to human health and the environment. According to the ASTM Standard, a REC is defined as:

> *Recognized Environmental Conditions (REC) means the presence or likely presence of any hazardous substance or petroleum products on the property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. The term includes hazardous substances or petroleum products even under condition in compliance with laws. The term is not intended to include de minimis conditions that generally do not present a threat to human health or the environment.*

Specific objectives of this evaluation include the following:

1. Identification and documentation of past and present site activities that may have resulted in potential impacts to the environment.
2. Identification and documentation of past or present activities at adjacent properties that may pose an environmental risk to the property.

### 2.2 Detailed Scope-of-Services

The following general work tasks were performed to meet the project objectives:

1. Compilation and review of public information on the history of the site and nearby properties.

2. Compilation and review of information on file with appropriate federal, state, and local environmental regulatory agencies.
3. Field survey of the site and surrounding areas. (Photographs included in *Appendix B*)
4. Interviews with past, present owners and occupants

## 2.3 Significant Assumptions

It is assumed that the information provided to EEE by the current lease owners, Air National Guard (ANG), and applicable regulatory agencies is accurate and up to date.

## 2.4 Limitations and Exceptions

In addition to the limitations set forth in various section of the ASTM Standard E1527-05 protocol, the accuracy and completeness of this report is necessarily limited by the following:

| Limitations and Exceptions | Yes | No |
|---|---|---|
| Access Limitations | X | |
| Physical Limitation to observations (i.e. snow, rain, asphalt, buildings, etc) | | X |
| Information requested but not available at time of report preparation. | | X |
| Unique limitation not specified in ASTM Standard. | | X |

Access to the mechanical room in Bldg. 3906 was limited. Site personnel did not have the key for this particular room.

## 2.5 Special Terms and Conditions

This Phase I Environmental Site Assessment (ESA) was performed in accordance with the American Society for Testing and Materials (ASTM) E 1527-05 Standard Practice for Environmental Site Assessments.

## 2.6 User Reliance

This ESA was performed by EEE Consulting, Inc. (EEE) for the Air National Guard (ANG). This report is provided for the sole use of the ANG and their designated representatives. Use of this report by another party is not authorized and will be at such party's own risk. EEE disclaims liability for use or reliance on this report by other parties.

# 3.0 SITE DESCRIPTION

## 3.1 Location and Legal Description

The property is comprised of approximately 6.326 acres and is located on Beulah Road on the Richmond International Airport in Sandston, Virginia. The property can be accessed from the intersection of Beulah Road and Portugee Road in Sandston by heading west on Portugee Road. From East Williamsburg Road, turn right onto Beulah Road and continue for approximately one-mile south until it ends, then turn right onto Portugee Road, and the property is located about a half mile on the right. The property is located on the southeast corner the airport.

A legal description and plat map of the property are included in this report in *Appendix C*.

The property is currently zoned as M-2 General Industrial District according to the Henrico County Planning Department. The property is currently used for general industrial purposes and used to serve as an ammunition holding facility for the Air National Guard.

## 3.2 Site and Vicinity General Characteristics

While elevation throughout the property varies, the USGS Digital Elevation Model (DEM) shows surface elevation at the site to be approximately 158 feet above mean sea level (msl). The property is confined to the northwest by Richmond International Airport and White Oak Swamp to the south. The property tends to be up gradient from other properties to the west, east, and south. The subject property tends to be down gradient from properties to the north as the elevation decreases towards White Oak Swamp to the south. Ultimately, all surface drainage from the site discharges to White Oak Swamp, which is approximately 2,000 feet to the south of the property. It is assumed that groundwater flow is southerly towards White Oak Swamp. The site location and topographic map is illustrated in this report in *Appendix A*.

The property is located in a predominantly industrial and commercial area with most commercial activity occurring on the Richmond International Airport to the northwest.

According to the United States Department of Agriculture's (USDA) Soil Survey, soils on the site consists primarily of Atlee very fine sandy loam, class C. These types of soil have slow infiltration rates. They are typically soils with layers impeding downward movement of water, or soils with moderately fine or fine textures and are moderately well to well drained. These soils typically have intermediate water holding capacity. Depth to the water table is more than 5 feet.

## 3.3 Current Use of the Property

The property is currently unoccupied and is in the process of being transferred from the Air National Guard to the Army National Guard. The property is currently zoned as a general industrial district (M-2). It was used in the past as an industrial site for the Air National Guard as a storage facility for ammunitions.

### 3.4 Description of Site Improvements

The property includes multiple buildings. Building 3905 is located on the south side of the property at the entrance gate. It was used as an office building when the property was occupied. Building 3906 is just north, and used to be the mechanic shop, which was used to work on rockets, ammunition, and vehicles. Buildings 3921-3932 were used as storage areas for ammunitions.

### 3.5 Current Uses of Adjoining Properties

The property is located in a predominantly industrial and agricultural part of the County. The target property is bordered to the North by the Richmond International Airport and to the East, South, and West by the Army National Guard. Surrounding the property is general and light industrial areas, with the exception of the wooded property directly to the West, which is predominately wetland. A railroad track passes approximately 1000 feet south of the property, and on the other side of the tracks are two businesses, Ellen Jim Property and Mazo Lerch Company. The airport runway is approximately 500 feet north of the property, and the Army Aviation owns the property surrounding the target property.

## 4.0 USER PROVIDED INFORMATION

### 4.1 Title Records

The user provided a GIS tax parcel identifying the boundaries of the site. Title Records were not obtained by EEE, due to none being found through a review of public records at the Henrico County Circuit Court. Instead, a Lease Agreement, between the Capital Region Airport Commission and the Department of the Air Force, was obtained from Mr. Kolmer, with the Air National Guard. Copies of the Lease Agreement along with a plat map are included in *Appendix C*.

### 4.2 Environmental Liens/Activity and Use Limitations

According to the legal description of the parcel there are no environmental liens or activity and use limitations on the subject property.

### 4.3 Specialized Knowledge

There was no information of any specialized knowledge or experience that would suggest any recognized environmental conditions in connection with the property.

## 4.4 Commonly Known or Reasonably Ascertainable Information

EEE reviewed recorded land title records and zoning information and information gathered from the Henrico County's online databases. The online databases reported that the property is zoned as General Industrial District (M-2). There were no identified environmental liens or activity and use limitations for the project area located during the review and search process.

## 4.5 Valuation Reduction for Environmental Issues

The property is a government owned property and is currently being leased to the Air National Guard. The Army National Guard is seeking to obtain the lease from the Air National Guard. There is no information to support that there is any valuation reduction on the property due to any environmental contamination.

## 4.6 Owner, Property Manager & Occupant Information

The Virginia Air National Guard is the current lease owners of the property. No one resides on the property, and the property is currently abandoned.
.

## 4.7 Reason for Performing Phase I

This Phase I ESA was performed for the Department of Military Affairs to investigate previous owners and uses of the property. The Phase I was also conducted to determine and locate any possible recognized environmental conditions (REC) located on or within close proximity to the project area.

By definition, the Army National Guard meets the criteria for Landowner Liability Protections (LLPs) under CERCLA as a contiguous property owner; and therefore, does qualify for protection under the LLPs.

The United States of America, Department of the Air Force, leases (Lease No. DACA65-5-02-22) the Air Guard Munitions Facility from the Capital Region Airport Commission, and the lease will expire 31 October 2032. Due to the recent relocation of the 192$^{nd}$ Fighter Wing from Richmond International Airport to Langley Air Force Base, the Air National Guard no longer needs the Munitions Facility which is adjacent to the Army Aviation Support Facility. The Air National Guard wants to assign the lease to the Army National Guard, or the Army National Guard will negotiate a new lease for the AASF to include the Air Guard Munitions Facility, and the Capital Region Airport Commission has agreed to let the Army National Guard use the facility.

# 5.0 RECORDS REVIEW

## 5.1 Standard Environmental Record Sources

The current and past regulatory status of the subject parcel and nearby properties was determined by a review of information on file with the U.S. Environmental Protection Agency (EPA), Henrico County Government, and the Virginia Department of Environmental Quality (DEQ).

## 5.2 Additional Environmental Record Sources

A records search performed by Environmental Data Resources, Inc. (EDR) of Southport, Connecticut was also reviewed. The search distance satisfies the "approximate minimum search distance" requirement of the ASTM standard. The following is a summary of the information gathered during the records search.

There were no sites identified by the EDR report within the ASTM search radius for the following databases:

- Federal National Priority List (Superfund) proposed NPL, CERCLIS, or RCRA large quantity generators within the ASTM search distance.

There was no RCRA Transporters, Storage, or Disposal (TSD) or Voluntary Remediation Program (VRP) sites identified within the ASTM search distance of 0.5 miles.

There were two mappable sites within the ASTM search distance. The EDR report identified two locations that were on the LUST database and LTANKS database. The site for Ellen Jim Property located at 3450 Charles City Road had one LUST report and one LTANKS report. Mazo Lerch Company Inc., located at 363 Lerch Drive, had one LUST report, and Mazo Lerch Corporation, also located at 363 Lerch Drive, had one LTANKS report. All sites have been closed, or removed from ground, except for one 10,000 gallon diesel tank at Mazo Lerch Corporation, which is still currently in use.

In addition to the two mappable sites, the records search identified five “unmappable” sites with regulated environmental activities. Unmappable sites are sites that were not mapped due to insufficient address information. The properties appear on the regulatory listings for SPILLS, HMIRS, and LUST. EEE conducted an address search and an area reconnaissance to attempt to locate orphan sites, and EEE was able to locate all of these sites. Based on the location and distance from the subject property, the orphan sites are not expected to pose a significant environmental risk to the subject property.

There are no private wells listed within one-mile of the property, according to Environmental Data Resources, Inc (EDR).

An Environmental Baseline Survey of the 192nd Fighter Wing was also reviewed from April 2001. In this survey, it was found that asbestos and lead-based paint were used in buildings 3905 and 3906 on the property. The asbestos has been removed, but to our knowledge the lead-based paint has not been removed. Also, a leaking UST was removed in 1996 outside of building 3906, and the contaminated soil from the fuel oil UST was transferred to a soil farm.

### 5.3 Physical Setting Sources

The following sources were used to characterize the physical setting of the site:

- Terraserver, USGS 7.5 Minute topographic quadrangle, "Dutch Gap", Virginia, 1994.
- GIS Information developed by Henrico County.
- Topographic Maps provided by EDR, Inc.

### 5.4 Historical Use Information on the Property

A limited history of the site ownership and usage and surrounding properties was developed through information provided by the client, the owner, historical topographic maps, and a recent survey plat map.

A review of the lease agreement revealed that the Air National Guard obtained the property in 1947 from the Capital Region Airport Commission under a quitclaim deed. Based on a review of the lease, there are no environmental liens on the subject property.

There are no Historical Sanborn Maps recorded for the area.

Historical topographic maps were reviewed from 1894 to 1994. The maps indicate the subject property was developed during the 100 year time period.

### 5.5 Historical Use Information on Adjoining Properties

Historical topographic maps were reviewed from 1895 to 1994. The property was developed in 1965, and the area surrounding the property has undergone major development due to an additional runway built at the Richmond International Airport, the Army Aviation Support Facility being built, and surrounding residential areas.

## 6.0 SITE RECONNAISSANCE

### 6.1 Methodology and Limiting Conditions

Personnel from EEE completed the site reconnaissance on April 18, 2008. EEE personnel met with Mr. Joe Vass, security chief of the Army Aviation Support Facility (AASF) and Mr. Bill Martin, deputy director of the Air National Guard (ANG). Photographs taken during the site reconnaissance are presented in *Appendix B*.

EEE made a visual inspection of the project area. A "drive-by" reconnaissance of the area immediately around the facility and adjoining properties was also conducted along the public roads.

### 6.2 General Site Setting

The subject property is industrial with a wooded area to the West, the Army Aviation Support Facility to the South and East, and the Richmond International Airport to the North. The land generally slopes from the north to the south.

### 6.3 Exterior Observations

The following exterior observations were made during the site reconnaissance:

- Two Aboveground Storage Tanks outside of buildings 3905 and 3906.
- An old pole-mounted electrical transformer just outside of the fence that may contain PCBs.
- Stained gravel floor inside of a metal shed building on the property that is said to be moved soon.
- Debris behind the metal shed lying in the grass.

### 6.4 Interior Observations

The following interior observations were made during the site reconnaissance:

- Oil staining on the concrete floor in the mechanical room of Building 3905.

## 7.0 INTERVIEWS

Information used and provided in, this report was acquired from interviews with several different groups.

### 7.1 Interview with Owner

The current property owner is the Capital Region Airport Commission (CRAC). EEE made an effort to contact Mr. Russ Peadon who is part of the Real Estate Division for CRAC but was unable to get in touch with him. The property is being leased to Air National Guard. Mr. Bill Martin who is the representative of the Air National Guard was interviewed as part of the site inspection. Interview details can be found below.

### 7.2 Interview with Site Manager

The current lease owner is the Air National Guard, and Mr. Bill Martin was interviewed as part of the site inspection. Mr. Martin had no knowledge of any environment liens, activity use limitations, or recognized environmental conditions on the property. According to Mr. Martin, the only past uses of the property have been for ammunition storage for the Air National Guard.

### 7.3 Interview with Occupants

Currently there are no occupants on the subject property. Air National Guard has vacated the property and is waiting to transfer the lease to the Army National Guard.

### 7.4 Interviews with Local Government Officials

EEE did not conduct any interviews with local government officials.

### 7.5 Interviews with Others

EEE also interviewed the following individuals for information about the site:

**Joe Vass** – Army Aviation Support Facility – Security Chief
Contact Info: tambler@albemarle.org

**Doug Hamm –** Environmental Program Manager – Department of Military Affairs
Contact Info: (434) 298-6413
doug.hamm@us.army.mil

**Cpt. Tony Costanzo** – Environmental Manager – Virginia Air National Guard
Contact Info: (804) 236-6581
Anthony.Costanzo@varich.ang.af.mil

**Maj. Dave Kolmer** – Base Civil Engineer – Virginia Air National Guard
Contact Info: (804) 236-6441

## 8.0 FINDINGS

There were several suspected RECs identified for the site. Oil staining was observed on the concrete floor of the mechanical room of Building 3905. The staining was observed to have

come from the generator situated in the mechanical room. Oil staining was also observed on the gravel floor of the metal shed building. According to facility personnel, the staining was from the equipment (forklift, etc) stored in the metal shed. EEE recommends that the oil-laden gravel be removed and disposed of the property owner accordingly.

Based on a 2001 Environmental Baseline Survey, lead based paint may be present in the buildings. EEE recommends prior to any demolition activities, the presence of lead based paint be confirmed through sampling and analysis.

The old pole-mounted electrical transformer just outside of the fence could possibly contain PCBs, and poses a potential to encounter contamination at the target property. EEE recommends that Dominion Virginia Power, owners of the transformer, be contacted to determine if the pole-mounted transformer adjacent to the property contains PCBs and whether they have any knowledge of any PCB spills on the property.

Historical RECs identified for the site such as the leaking UST next to building 3906 have been removed so there are no historical hazards on site.

There are no activity use limitations for the subject property.

## 9.0 OPINION

EEE recommends that the RECs identified on the subject property be appropriately addressed as in Section 8.

## 10.0 CONCLUSIONS

EEE performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E 1527-05. Any exceptions to, or deletions from, this practice are described in Section 2.4 of this report. The assessment has revealed multiple potential recognized environmental conditions in connection with the property. Performing the task listed in section 8 is recommended prior to acquisition of the property.

## 11.0 DEVIATIONS

Below is a list of the data gaps or deviations from the Phase I ESA standard:

- The current property owners were not interviewed.
- A title search and valuation of the property was not provided by Henrico County.

## 12.0 ADDITIONAL SERVICES

No additional services (i.e. wetlands delineation or asbestos/lead-based paint survey) were provided as part of the Phase I ESA.

## 13.0 REFERENCES

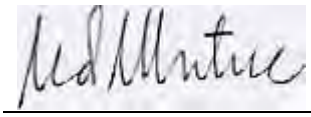
The following is a list of references used for the Phase I ESA:

- Historic Topographic maps of the area, dated 1894, 1943, 1944, 1952, 1969, 1981, 1986, and 1994 supplied by Environmental Data Resources, Inc.
- GIS Data obtained from the NRCS (Aerial and Flood Data)

## 14.0 SIGNATURES OF ENVIRONMENTAL PROFESSIONALS

"We declare that, to the best of our professional knowledge and belief, we meet the definition of Environmental professional as defined in §312.10 of 40 CFR 312., and we have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. We have developed and performed the all appropriate inquires in conformance with the standards and practices set forth in 40 CFR Part 312."

Michael E. Easter
Environmental Scientist



Maria Mutuc, PE
Environmental Engineer

## 15.0 QUALIFICATIONS OF ENVIRONMENTAL PROFESSIONALS

The following individuals from EEE Consulting, Inc. were involved in the preparation of this Phase I ESA:

**Michael Easter**

B.S., 2007, Environmental Studies, Virginia Commonwealth University

**Maria Mutuc, PE**

M.S., 2005, Environmental Engineering, Virginia Polytechnic Institute and State University
B.S., 1999, Chemical Engineering, University of the Philippines

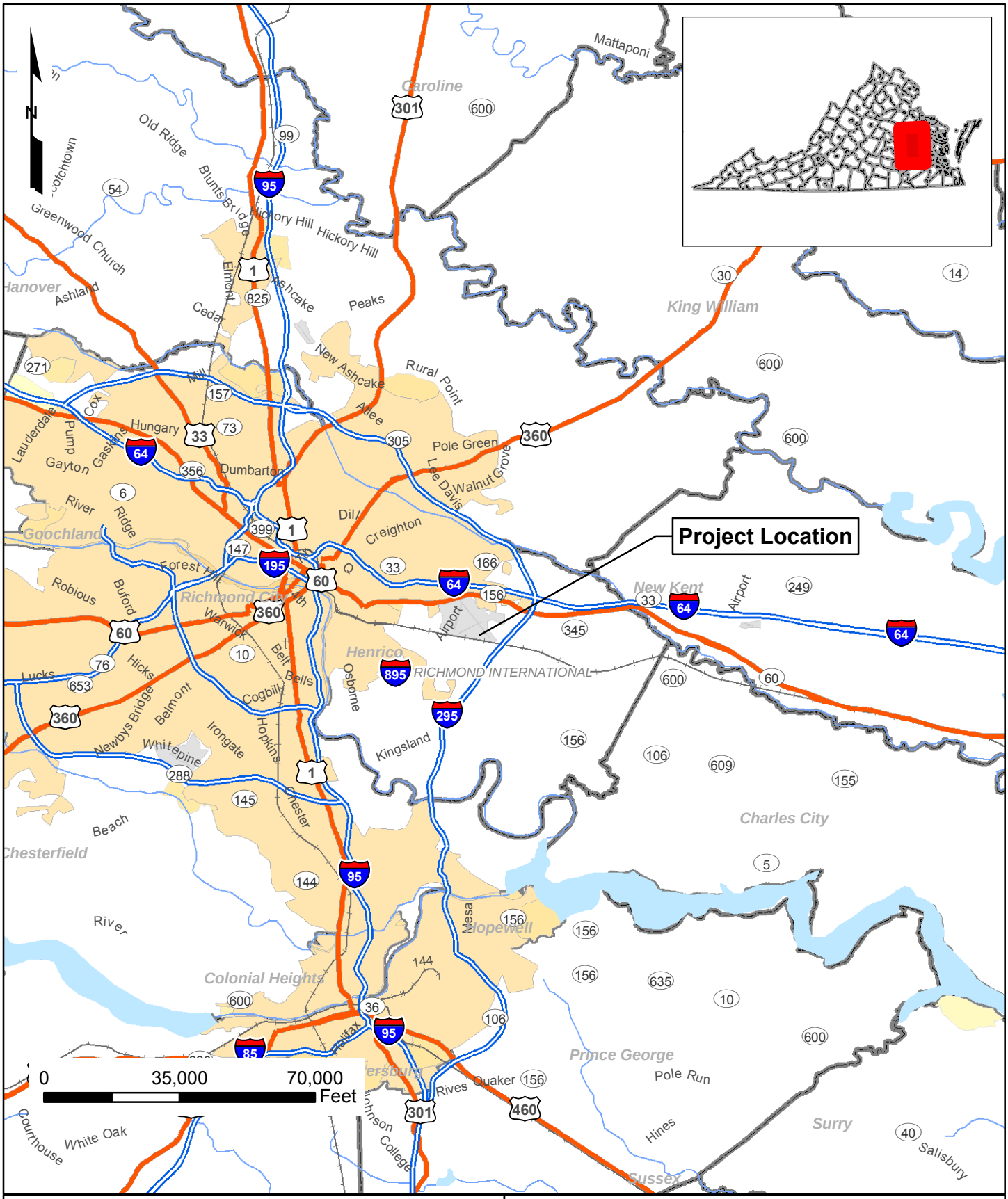
Ms. Mutuc has 5 years of experience as an environmental engineer with environmental consulting companies. Ms. Mutuc has substantial experience with assessing, and implementing solutions to meet environmental regulations. Her experience also includes monitoring and measuring the fate and transport of chemicals in the environment and evaluating the environmental impact of new facilities.

**Areas of Expertise**

- Environmental Site Assessments
- Environmental Impact Studies
- Monitoring and Measuring, Fate and Transport of Chemicals in the Environment
- Ozone Depleting Substances
- Air Monitoring

# APPENDIX A
## FIGURES

PROJECT LOCATION
SITE LOCATION AND TOPOGRAPHY
AERIAL PHOTOGRAPHY OF SITE AND SURROUNDING AREA

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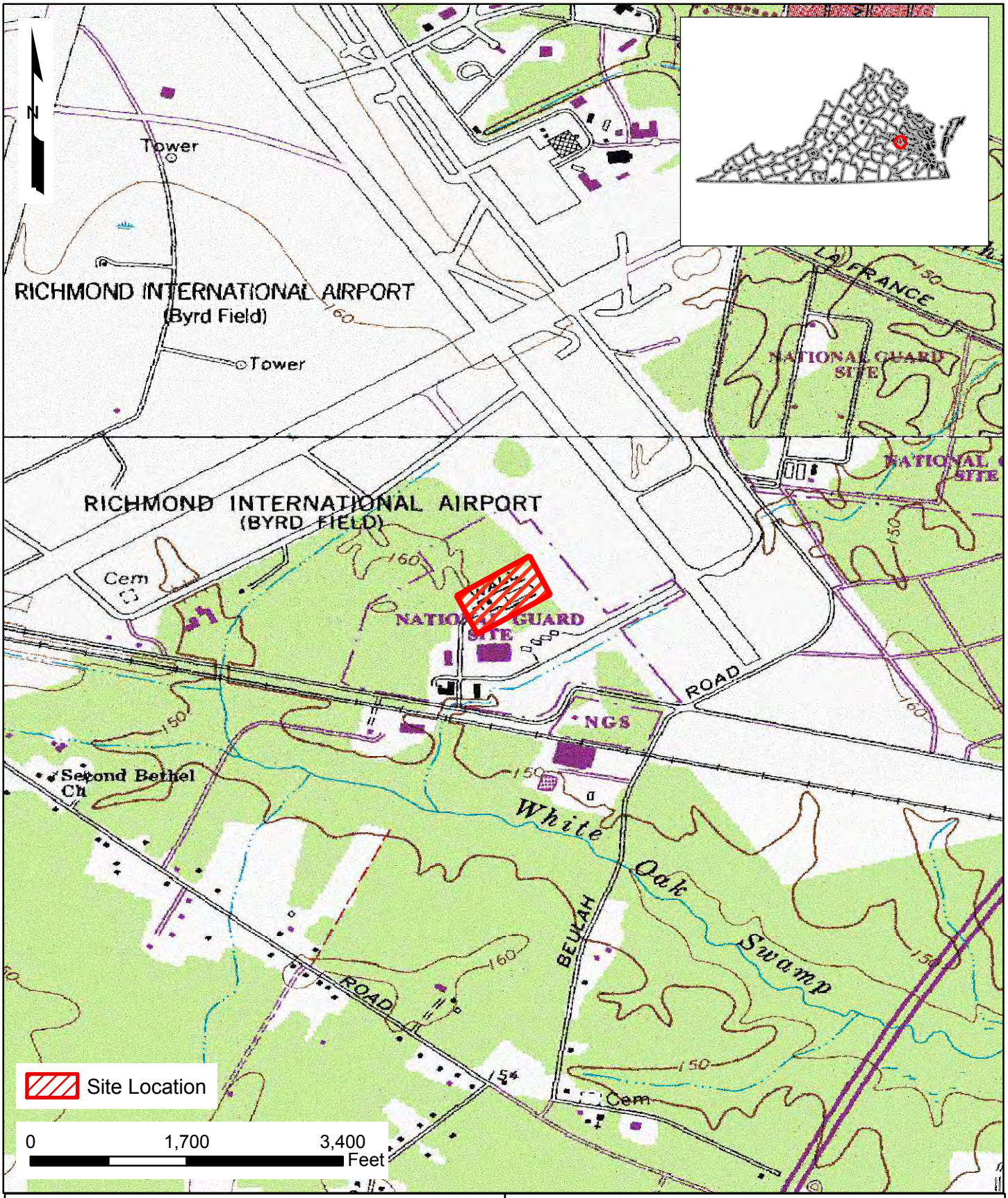
Environmental, Engineering and Educational Solutions

**Figure 1**
**Project Location**
Phase I - Environmental Site Assessment
Air Guard Munitions Facility
Henrico County, Virginia

08-042




3e EEE Consulting, Inc.
Environmental, Engineering and Educational Solutions

**Figure 2**
**Site Location**
Phase I - Environmental Site Assessment
Air Guard Munitions Facility
Henrico County, Virginia

08-042

3e EEE Consulting, Inc.
Environmental, Engineering and Educational Solutions

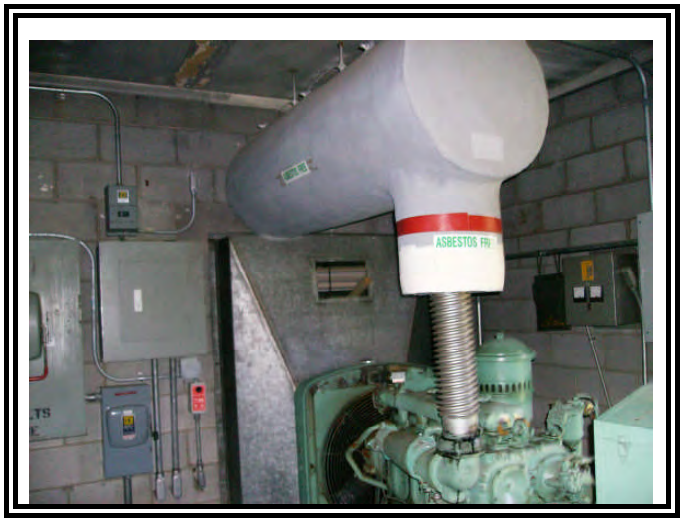
**Figure 3**
**Aerial Photography of Site and Surrounding Area**
Phase I - Environmental Site Assessment
Air Guard Munitions Facility
Henrico County, Virginia
08-042

# APPENDIX B
## SITE PHOTOGRAPHS

**Photograph No. 1.** 1,000 gallon Aboveground Storage Tank outside of building 3905. (South)

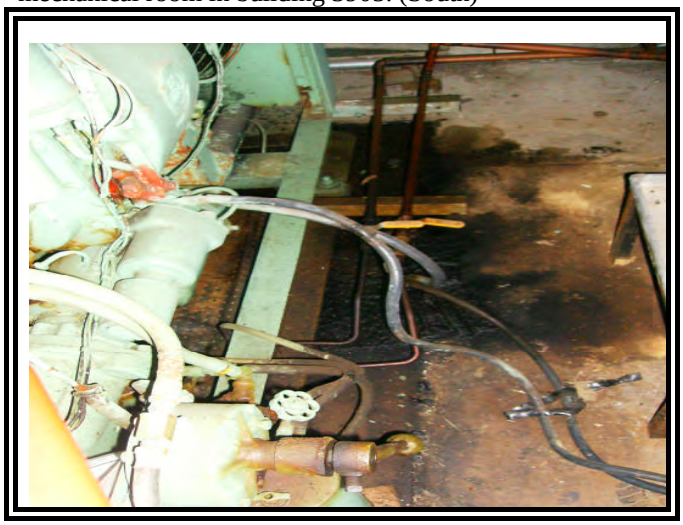
**Photograph No. 2.** Storm drainage ditch outside of building 3905 at entrance of property on the southside. (Southeast)

**Photograph No. 3.** Inside of building 3905 showing empty room. (North)




**Photograph No. 4.** Mechanical room of 3905 showing old generator. (Southwest)

**Photograph No. 5.** Floor staining around the drain of mechanical room in building 3905. (South)



**Photograph No. 6.** Oil staining on floor in mechanical room of building 3905, next to the generator. (South)

**Photograph No. 7.** Empty room in building 3906. (North)

**Photograph No. 8.** 2,000 gallon Aboveground Storage Tank outside of building 3906. (Southeast)

**Photograph No. 9.** Building 3921-3932 – Segregated Magazine Storage. (Northwest)

**Photograph No. 10.** Inside of building 3921-3932, showing they are empty. (East)

**Photograph No. 11.** Storage shed located on property, said to be moved to different location. (North)

**Photograph No. 12.** Showing oil staining on gravel floor of storage shed. (Northeast)

**Photograph No. 13.** Debris on ground behind storage shed. (Southeast)

**Photograph No. 14.** Oil staining on gravel floor of storage shed. (North)

**Photograph No. 15.** Old transformer outside of entrance to facility possibly containing Polychlorinated Biphenyls. (Southwest)

# APPENDIX C
## HISTORICAL RESEARCH DOCUMENTATION

HISTORICAL AERIAL PHOTOGRAPHS
HISTORIC TOPOGRAPHIC MAPS
MUNITIONS FACILITY LEASE AGREEMENT
LEGAL DESCRIPTION OF THE PARCEL
UST HISTORICAL DOCUMENTATION
PLAT MAP OF FACILITY

## Date EDR Searched Historical Sources:

Aerial Photography April 10, 2008

## Target Property:

Beulah Road

Sandston, VA 23250

| ***Year*** | ***Scale*** | ***Details*** | ***Source*** |
|---|---|---|---|
| 1947 | Aerial Photograph. Scale: 1"=750' | Panel #: 2437077-D3/Flight Date: April 01, 1947 | EDR |
| 1959 | Aerial Photograph. Scale: 1"=750' | Panel #: 2437077-D3/Flight Date: March 29, 1959 | EDR |
| 1965 | Aerial Photograph. Scale: 1"=750' | Panel #: 2437077-D3/Flight Date: June 05, 1965 | EDR |
| 1972 | Aerial Photograph. Scale: 1"=750' | Panel #: 2437077-D3/Flight Date: October 01, 1972 | EDR |
| 1981 | Aerial Photograph. Scale: 1"=750' | Panel #: 2437077-D3/Flight Date: March 26, 1981 | EDR |
| 1989 | Aerial Photograph. Scale: 1"=750' | Panel #: 2437077-D3/Flight Date: March 11, 1989 | EDR |

INQUIRY #: 2191780.5
YEAR: 1947
= 750'
N

INQUIRY #: 2191780.5
YEAR: 1959
= 750'
N

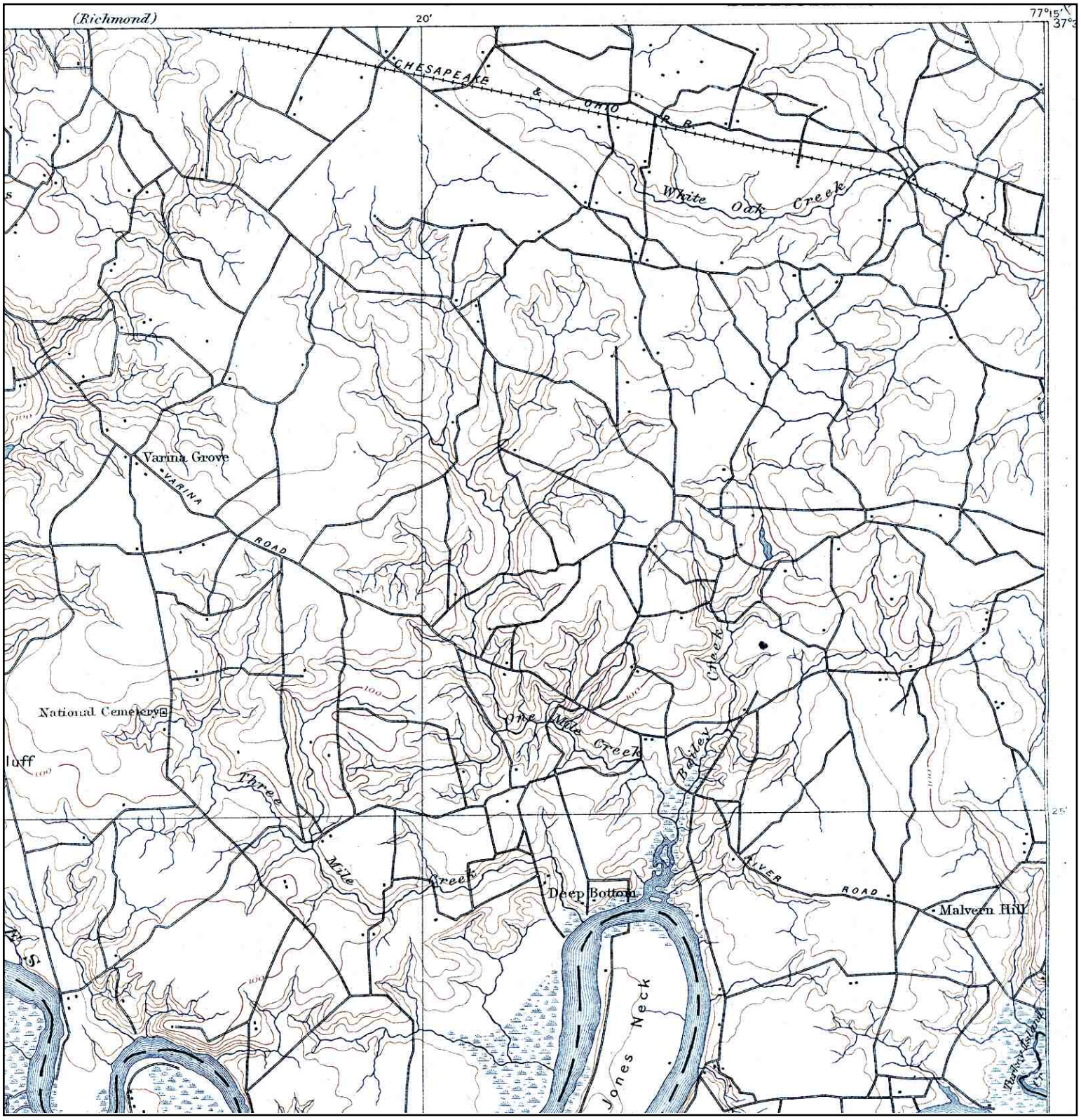
INQUIRY #: 2191780.5
YEAR: 1965
= 750'
N

INQUIRY #: 2191780.5
YEAR: 1972
= 750'
N

INQUIRY #: 2191780.5
YEAR: 1981
= 750'
N

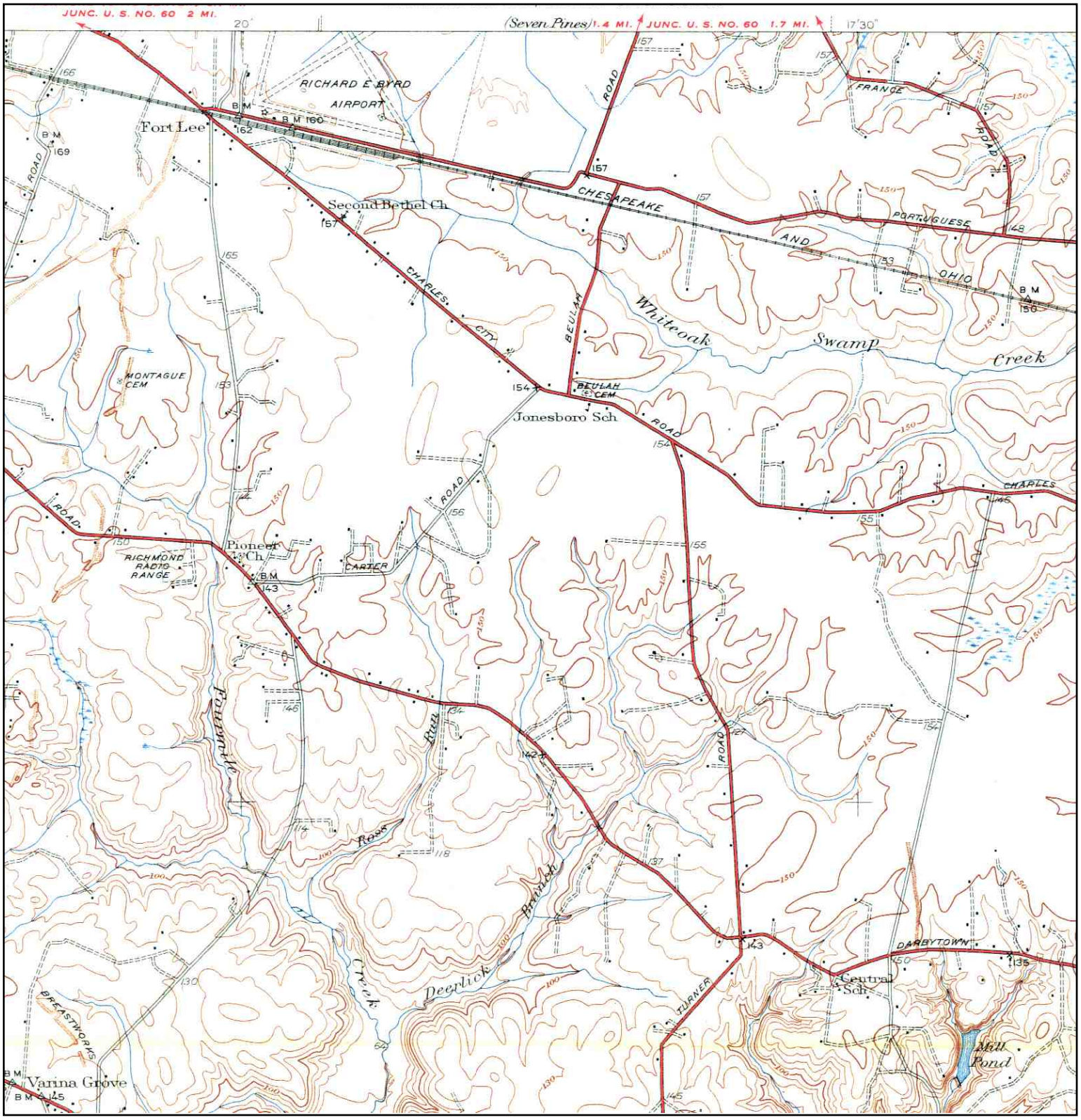
INQUIRY #: 2191780.5
YEAR: 1989
= 750'
N

# Historical Topographic Map




| | | | |
|---|---|---|---|
| N | TARGET QUAD<br>NAME: BERMUDA HUNDRED<br>MAP YEAR: 1894<br><br>SERIES: 15<br>SCALE: 1:62500 | SITE NAME: Air Guard Munitions Facility<br>ADDRESS: Beulah Road<br>Sandston, VA 23250<br>LAT/LONG: 37.4957 / 77.3129 | CLIENT: EEE Consulting<br>CONTACT: Michael Easter<br>INQUIRY#: 2191780.4<br>RESEARCH DATE: 04/10/2008 |

# Historical Topographic Map




| | | | |
|---|---|---|---|
| N | TARGET QUAD<br>NAME: DUTCH GAP<br>MAP YEAR: 1943<br><br>SERIES: 7.5<br>SCALE: 1:31680 | SITE NAME: Air Guard Munitions Facility<br>ADDRESS: Beulah Road<br>Sandston, VA 23250<br>LAT/LONG: 37.4957 / 77.3129 | CLIENT: EEE Consulting<br>CONTACT: Michael Easter<br>INQUIRY#: 2191780.4<br>RESEARCH DATE: 04/10/2008 |

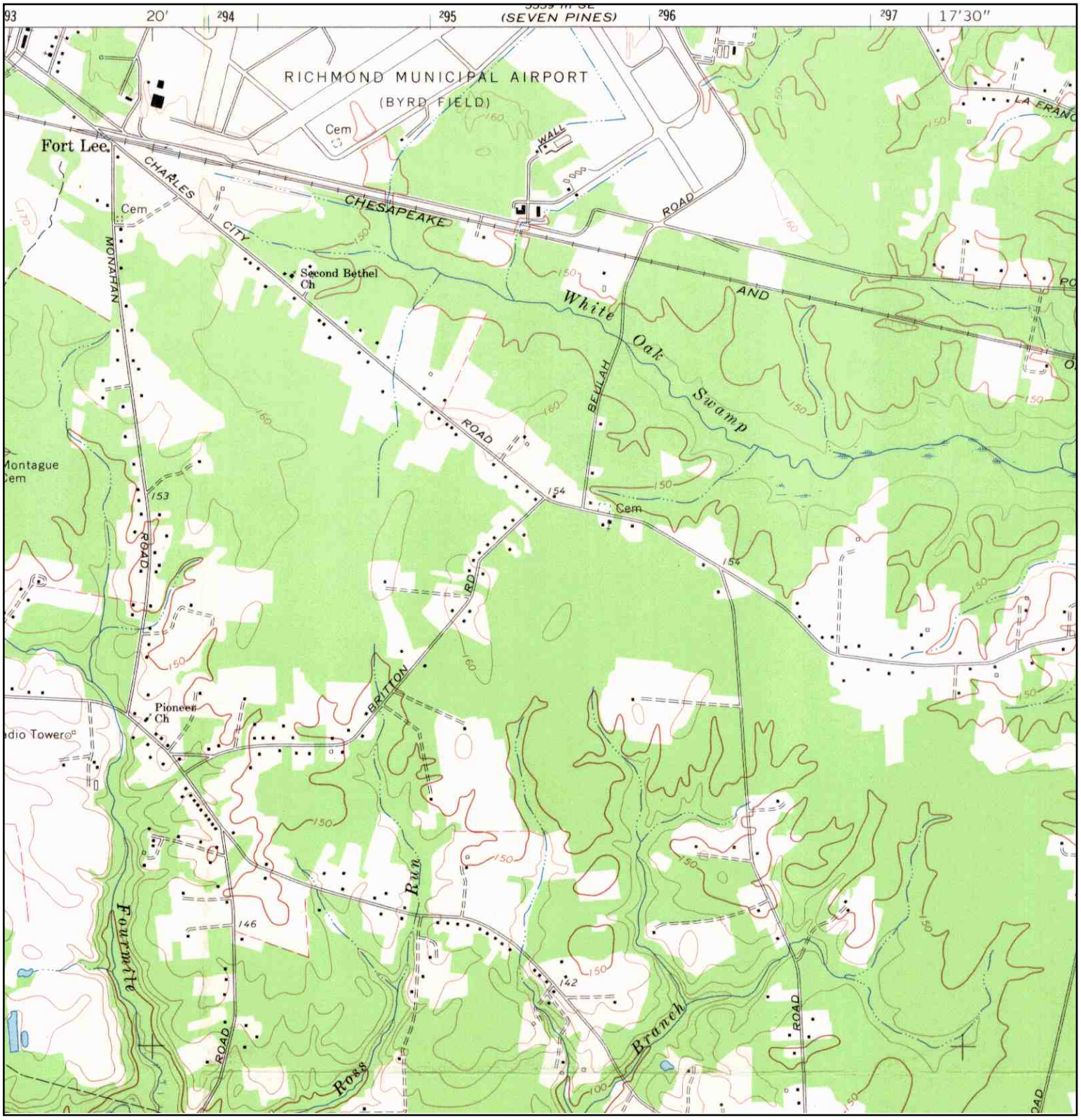
# Historical Topographic Map

| | | | |
|---|---|---|---|
| N | TARGET QUAD<br>NAME: BERMUDA HUNDRED<br>MAP YEAR: 1944<br><br>SERIES: 15<br>SCALE: 1:50000 | SITE NAME: Air Guard Munitions Facility<br>ADDRESS: Beulah Road<br>Sandston, VA 23250<br>LAT/LONG: 37.4957 / 77.3129 | CLIENT: EEE Consulting<br>CONTACT: Michael Easter<br>INQUIRY#: 2191780.4<br>RESEARCH DATE: 04/10/2008 |

# Historical Topographic Map

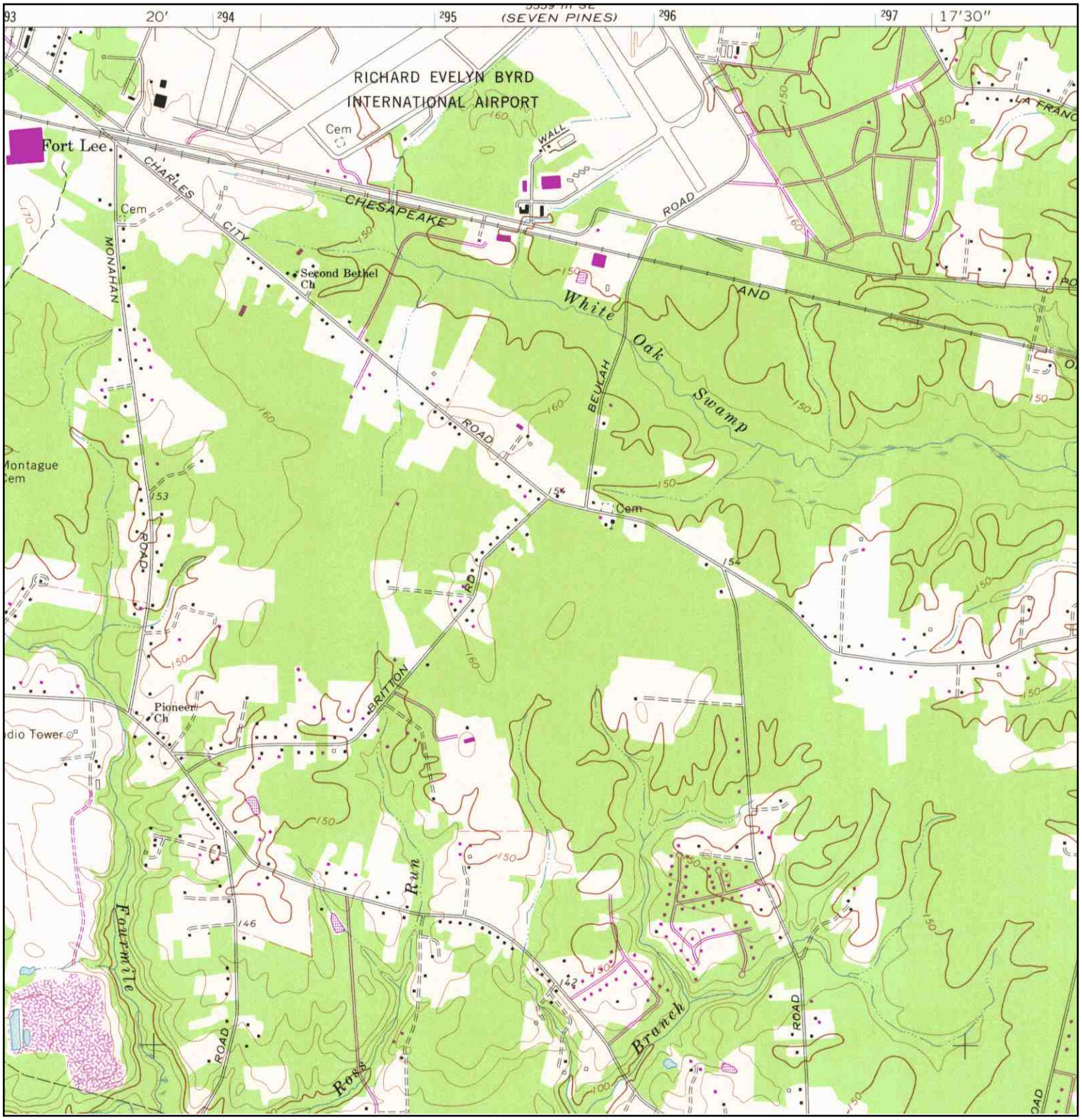
| | | | |
|---|---|---|---|
| N | TARGET QUAD<br>NAME: DUTCH GAP<br>MAP YEAR: 1952<br><br>SERIES: 7.5<br>SCALE: 1:24000 | SITE NAME: Air Guard Munitions Facility<br>ADDRESS: Beulah Road<br>Sandston, VA 23250<br>LAT/LONG: 37.4957 / 77.3129 | CLIENT: EEE Consulting<br>CONTACT: Michael Easter<br>INQUIRY#: 2191780.4<br>RESEARCH DATE: 04/10/2008 |

# Historical Topographic Map



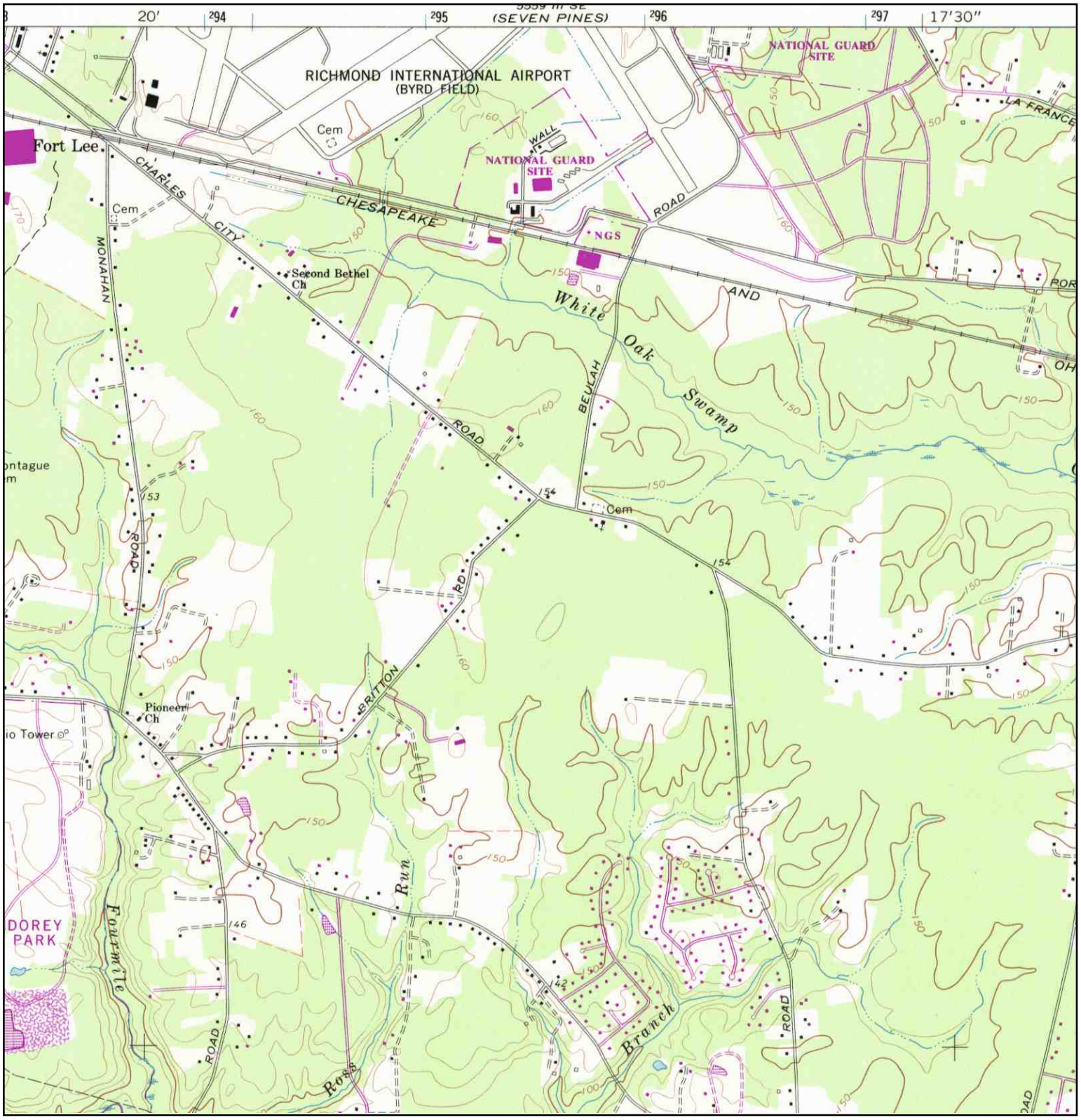

| | | | |
|---|---|---|---|
| N | TARGET QUAD<br>NAME: DUTCH GAP<br>MAP YEAR: 1969<br><br>SERIES: 7.5<br>SCALE: 1:24000 | SITE NAME: Air Guard Munitions Facility<br>ADDRESS: Beulah Road<br>Sandston, VA 23250<br>LAT/LONG: 37.4957 / 77.3129 | CLIENT: EEE Consulting<br>CONTACT: Michael Easter<br>INQUIRY#: 2191780.4<br>RESEARCH DATE: 04/10/2008 |

# Historical Topographic Map



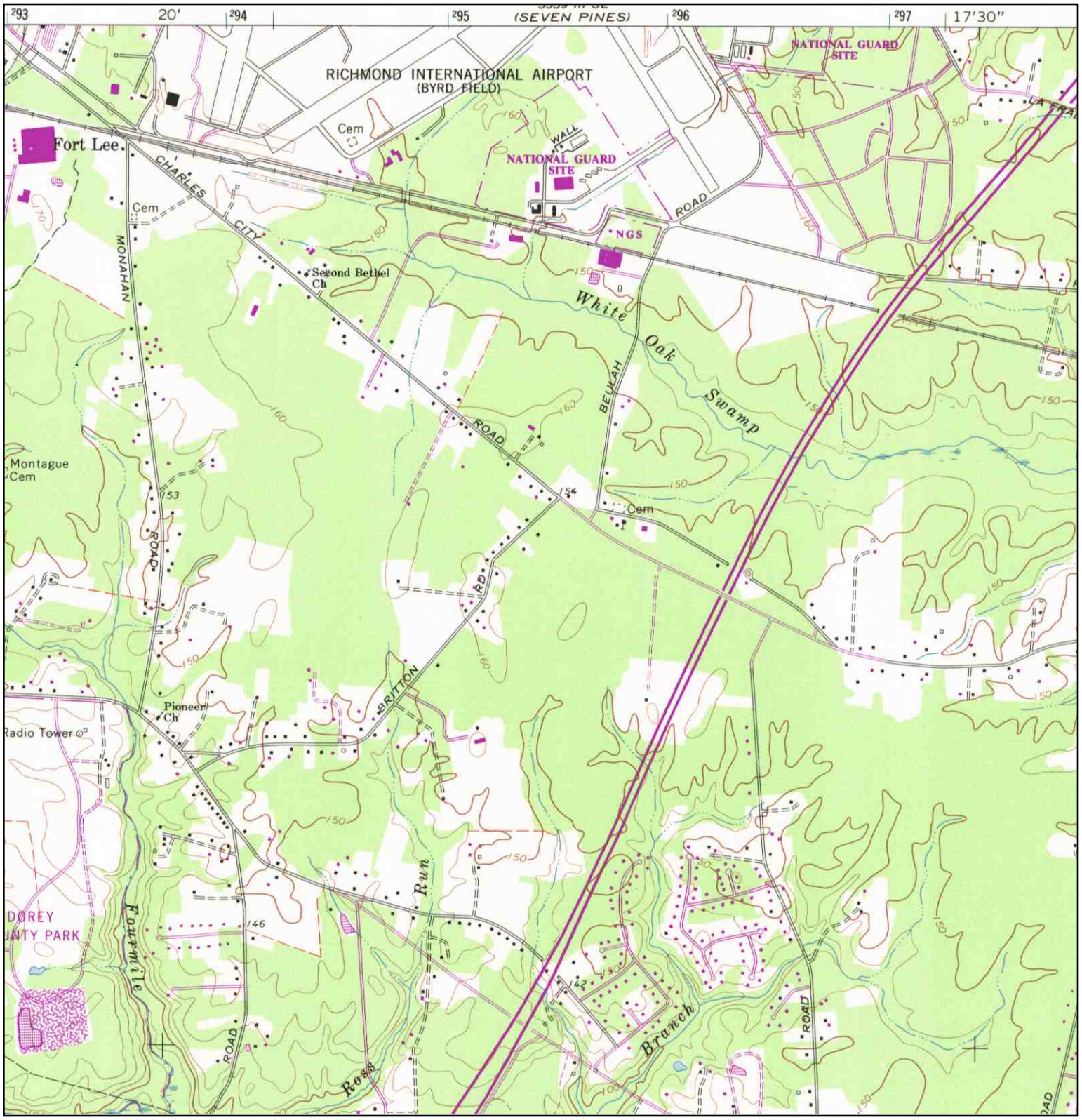

| | | | |
|---|---|---|---|
| N | TARGET QUAD<br>NAME: DUTCH GAP<br>MAP YEAR: 1981<br>PHOTOREVISED FROM:1969<br>SERIES: 7.5<br>SCALE: 1:24000 | SITE NAME: Air Guard Munitions Facility<br>ADDRESS: Beulah Road<br>Sandston, VA 23250<br>LAT/LONG: 37.4957 / 77.3129 | CLIENT: EEE Consulting<br>CONTACT: Michael Easter<br>INQUIRY#: 2191780.4<br>RESEARCH DATE: 04/10/2008 |

# Historical Topographic Map



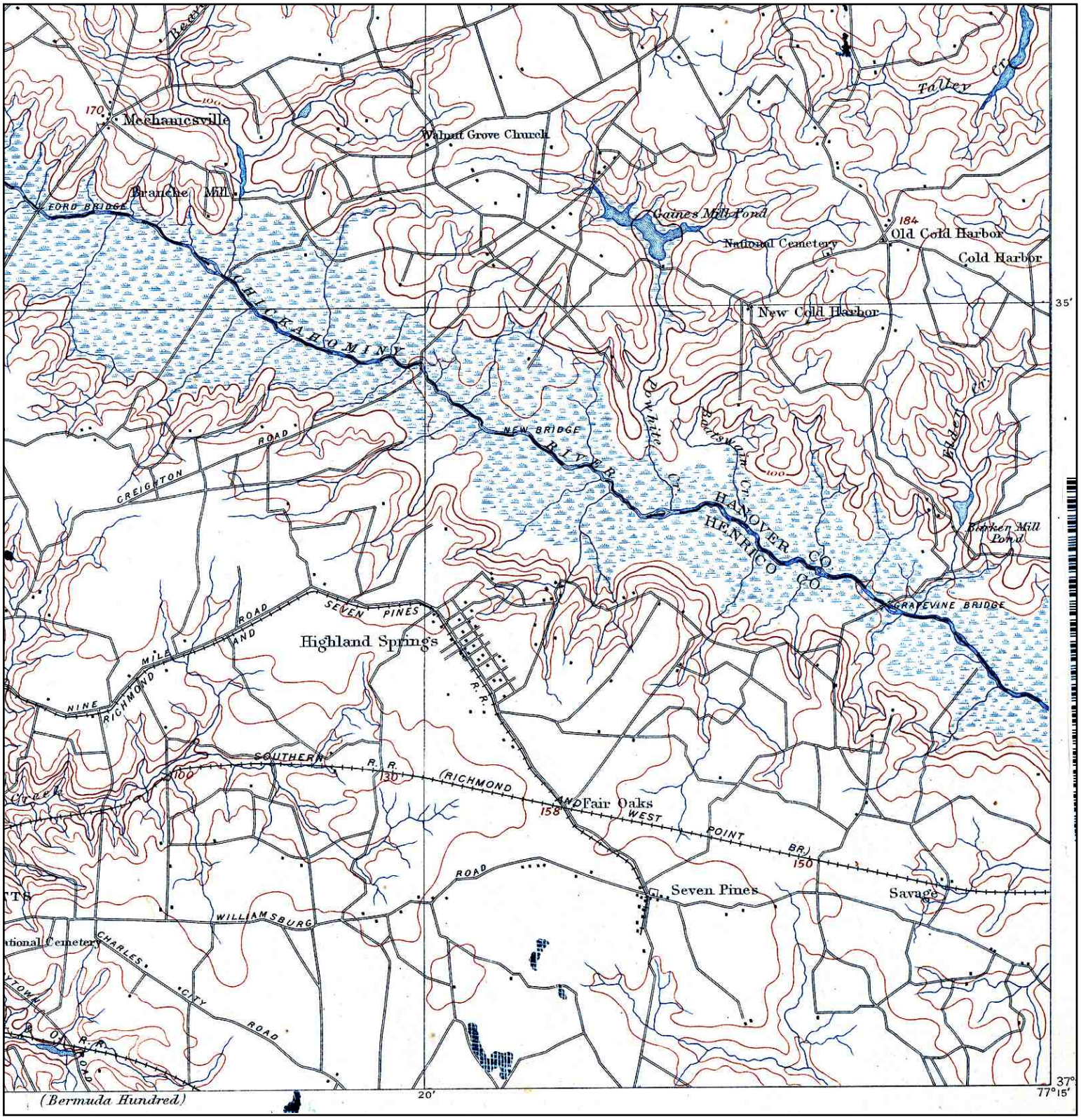

| | | | |
|---|---|---|---|
| N | TARGET QUAD<br>NAME: DUTCH GAP<br>MAP YEAR: 1986<br>PHOTOREVISED FROM:1969<br>SERIES: 7.5<br>SCALE: 1:24000 | SITE NAME: Air Guard Munitions Facility<br>ADDRESS: Beulah Road<br>Sandston, VA 23250<br>LAT/LONG: 37.4957 / 77.3129 | CLIENT: EEE Consulting<br>CONTACT: Michael Easter<br>INQUIRY#: 2191780.4<br>RESEARCH DATE: 04/10/2008 |

# Historical Topographic Map



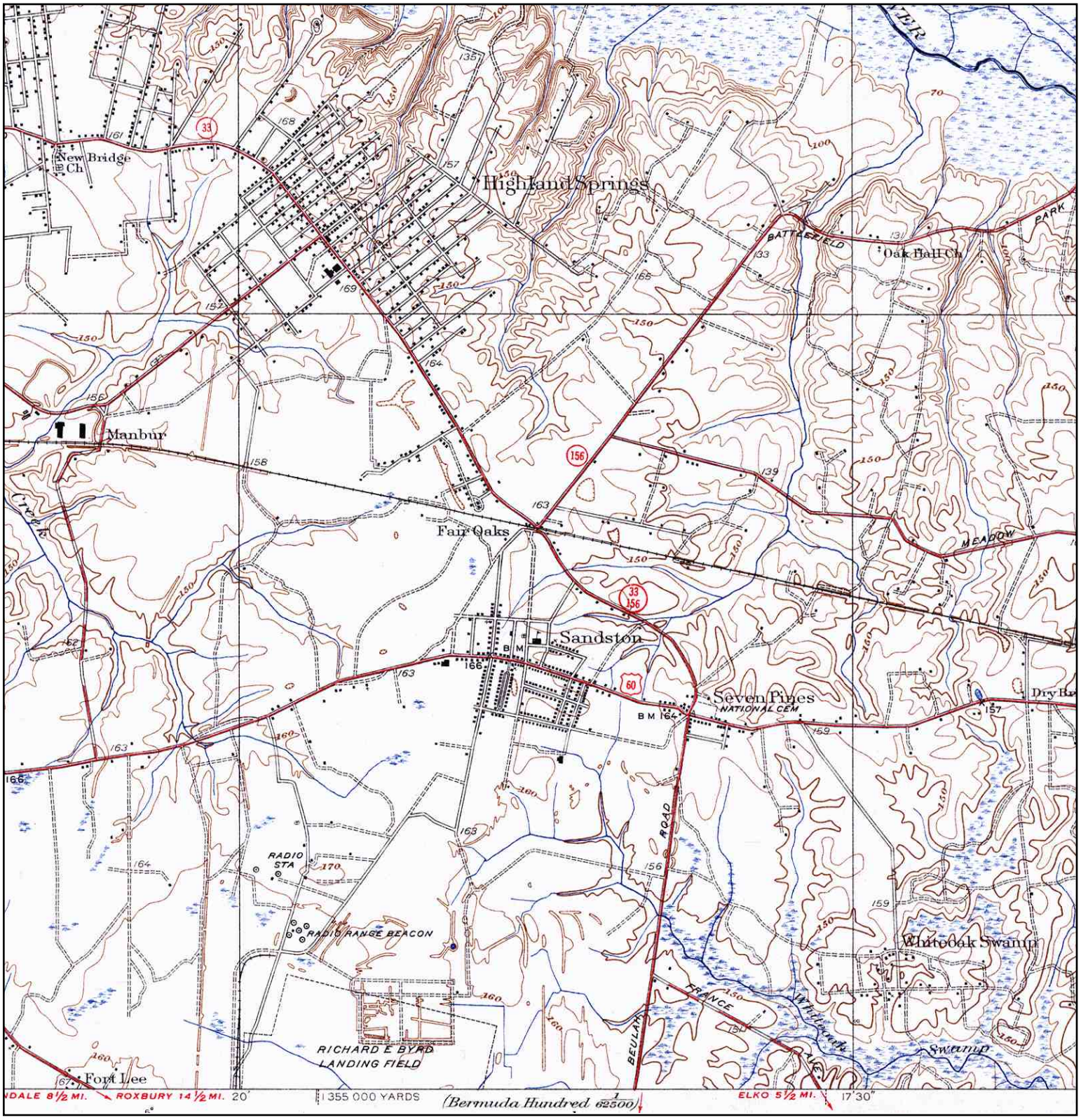

| | | | |
|---|---|---|---|
| N | TARGET QUAD<br>NAME: DUTCH GAP<br>MAP YEAR: 1994<br>REVISED FROM:1969<br>SERIES: 7.5<br>SCALE: 1:24000 | SITE NAME: Air Guard Munitions Facility<br>ADDRESS: Beulah Road<br>Sandston, VA 23250<br>LAT/LONG: 37.4957 / 77.3129 | CLIENT: EEE Consulting<br>CONTACT: Michael Easter<br>INQUIRY#: 2191780.4<br>RESEARCH DATE: 04/10/2008 |

# Historical Topographic Map




| | | | |
|---|---|---|---|
| N | ADJOINING QUAD<br>NAME: RICHMOND<br>MAP YEAR: 1895<br><br>SERIES: 15<br>SCALE: 1:62500 | SITE NAME: Air Guard Munitions Facility<br>ADDRESS: Beulah Road<br>Sandston, VA 23250<br>LAT/LONG: 37.4957 / 77.3129 | CLIENT: EEE Consulting<br>CONTACT: Michael Easter<br>INQUIRY#: 2191780.4<br>RESEARCH DATE: 04/10/2008 |

# Historical Topographic Map




| | | | |
|---|---|---|---|
| N | ADJOINING QUAD<br>NAME: SEVEN PINES<br>MAP YEAR: 1938<br><br>SERIES: 7.5<br>SCALE: 1:31680 | SITE NAME: Air Guard Munitions Facility<br>ADDRESS: Beulah Road<br>Sandston, VA 23250<br>LAT/LONG: 37.4957 / 77.3129 | CLIENT: EEE Consulting<br>CONTACT: Michael Easter<br>INQUIRY#: 2191780.4<br>RESEARCH DATE: 04/10/2008 |

LEASE NO. DACA65-5-03-0026

# SUPPLEMENTAL AGREEMENT NO. 1

**THIS SUPPLEMENTAL AGREEMENT,** entered into this 29th day of August, 2006, by and between the CAPITAL REGION AIRPORT COMMISSION (the "Lessor") and the UNITED STATES OF AMERICA, acting by and through the Department of the Air Force (the "Government").

## RECITALS:

A. The Lessor and the Government entered into a certain Deed and Agreement of Lease No. 2, dated November 15, 2002, covering certain land at Richmond International Airport known as the Air Guard Munitions Facility Parcel (the "Lease").

B. The Lessor and the United States of America, acting by and through the Chief, National Guard Bureau, and the Commonwealth of Virginia, acting by and through its Adjutant General, entered into a certain Airport Joint Use Agreement, dated September 22, 2002, for a term of years expiring June 30, 2005 (the "Joint Use Agreement").

C. Expiration of the Joint Use Agreement without execution of an extension or renewal of the agreement may be an "Event of Default" by the Government under the Lease for which the Lessor may terminate the Lease upon 180 days prior written notice to the Government.

D. The parties have negotiated and are executing contemporaneously herewith a renewal of the Joint Use Agreement having a term of 3 years beginning July 1, 2005.

E. The parties recognize that military mission requirements of the Government may require the Government to vacate the land it currently occupies under the Lease prior to its expiration date.

F. The Lessor has served notice to the Government that the Lease shall terminate on a date specified in its letter dated September 27, 2005 (the "Termination Notice").

G. The parties desire to amend the Lease to give the Lessor the right to terminate the Lease without cause on and after a certain mutually agreeable date in consideration of the withdrawal of the Termination Notice by the Lessor *nunc pro tunc*.

## AGREEMENT:

1. The Lessor hereby withdraws the Termination Notice in its entirety *nunc pro tunc*, and all terms of the Lease shall be and continue to remain in full force and effect.

2. The Lease is hereby modified in the following particular, but no other:

The text of Paragraph 2(a) is hereby amended by adding at the conclusion thereof the following: "Notwithstanding the foregoing and the provisions of Paragraph 2(b) below, the Lessor shall have the right to terminate the Lease at its option, without cause, upon One Hundred Twenty (120) days prior written notice to the Government on and after September 30, 2011."

3. All other terms and conditions of the Lease shall be and remain the same.

4. This Supplemental Agreement shall be effective immediately.

**IN WITNESS WHEREOF,** the parties hereto have hereunto subscribed their names as of the date first above written by their duly authorized representatives.

CAPITAL REGION AIRPORT COMMISSION

By: _____
Jon E. Mathiasen

THE UNITED STATES OF AMERICA

By: _____ 9 Oct 06

11/15/02

File 65
Feb

DACA65-5-03-002
BYRD FIELD
AIR FORCE LEASE
6.326 ACRES

# DEED AND AGREEMENT OF LEASE

**By and Between**

**CAPITAL REGION AIRPORT COMMISSION**

**and**

**THE UNITED STATES OF AMERICA**

## AIR GUARD MUNITIONS FACILITY PARCEL AT

## RICHMOND INTERNATIONAL AIRPORT

Dated as of November 15, 2002

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11/15/02

**THIS DEED AND AGREEMENT OF LEASE No. 2** (this "Lease"), made and entered into this 15th day of November, 2002 by and between the **CAPITAL REGION AIRPORT COMMISSION**, a political subdivision of the Commonwealth of Virginia, whose interest in the property hereinafter described is that of owner and operator of Richmond International Airport, hereinafter called "Lessor", and **THE UNITED STATES OF AMERICA**, acting by and through the Department of the Air Force, hereinafter called the "Government":

**WITNESSETH:**

The parties hereto for the consideration hereinafter mentioned covenant and agree as follows:

1. **Leased Land.** For the term, and subject to the matters, herein specified, the Lessor hereby leases to the Government and the Government leases from the Lessor, on the terms herein set forth, the following described premises, to-wit:

Approximately 6.326 acres as shown as Parcel 2 on the attached plat by Gene Watson & Associates, P.C. dated November 7, 2001, last revised April 2, 2002, attached hereto and marked Exhibit A, and described by metes and bounds on Exhibit B-1 hereto. Said land (hereinafter called the "Leased Land") is situated at Richmond International Airport (the "Airport"), Henrico County, Virginia. Together with a non-exclusive 60-foot right of way, for pedestrian and vehicular ingress to and egress from the Leased land, to be used in common with Lessor and the Army Guard, said right-of-way being shown on Exhibit A and described by metes and bounds on Exhibit B-2 hereto.

By separate agreement, the Lessor has granted the Government the right to use, jointly with others, the "Jointly Used Flying Facilities" as defined in that certain Airport Joint Use Agreement to which Lessor and the Government are parties, dated as of July 1, 1997 (the "Joint Use Agreement"), in accordance with and subject to the terms of said agreement, and any successor agreement which may be entered into by Lessor and the parties thereto.

The above described Leased Land is to be used only for the following purpose: For the requirements of the United States Government with respect to support for the use of Air National Guard ("Guard") type aircraft and Guard helicopter service. No other use shall be permitted without the express prior written consent of Lessor, in its sole discretion.

2. (a) **Effective Time; Term**. This Lease shall commence and become effective upon, and subject to, (i) completion of execution hereof and (ii) proper release by other agencies of the Government to Lessor of Buildings Nos. 2732, 2734 and 2738 at the Airport in condition satisfactory to Lessor (such time herein called the "Effective Date"). Subject to the other provisions of this Lease, the fixed basic term of this Lease shall begin on the effective date and shall expire at midnight on the last day of October, 2032.

(b) **Extension Provisions**. Provided that this Lease is in full force and effect and no "Event of Default" (as hereinafter defined) by Lessee has occurred and is continuing on the effective date of any extension, the term of this Lease thereafter shall continue for four (4) successive extension periods of five (5) years each, subject to the right of either the Lessor or the Government to nullify such extensions as follows: By

written notice to the other, given as provided in subsection 25(g) hereof, not later than 90 days prior to the expiration of the 5th year of the fixed basic term, either party shall have the right to terminate this lease effective at the end of said fixed basic term (e.g., the end of the 30th year of this lease). Absent the giving of this notice, thereafter, by similar written notice given not later than 90 days prior to the expiration of the 10th year of the basic term either party shall have the right to terminate this lease effective at the end of the 35th year of this lease. Absent the giving of a prior termination notice, either party shall have the right to terminate this lease effective at the end of the 40th year of this lease by similar written notice given not later than 90 days prior to the expiration of the 15th year of the basic term. Absent the giving of a prior termination notice, either party shall have the right to terminate this lease effective at the end of the 45th year of this lease by similar written notice given not later than ninety (90) days prior to the expiration of the 20th year of the basic term.

3. **Rent**. Subject to the provisions set forth in the next sentence, the Government shall pay the Lessor $1.00 per year for the use and occupancy of the Leased Land. However, the rent initially to be paid by the Government is based upon use of the Leased Land by military units with aeronautical missions and such rental shall at all times comply with (i) the current requirements of applicable law and regulation, including without limitation the policy and procedures concerning the use of airport revenue established by the Federal Aviation Administration or successor agency and (ii) common practice with respect to rentals for similarly situated facilities leased by the Government. Should applicable law and regulation, or a different use of the Leased Land permitted by Lessor, or common practice, require payment by the Government of

additional rent, then the rent required by this Lease shall be increased to an amount which will satisfy such applicable law or regulation, reflect such different use, or conform to the then common practice, as the case may be.

4. **Fixtures; Structures.** Subject to the provisions of this Lease, the Government shall have the right, during the existence of this Lease, to attach fixtures, and erect structures or signs, in or upon the Leased Land, which fixtures and structures, or signs, so placed in, upon or attached to the Leased Land shall be and remain the property of the Government and may be removed or otherwise disposed of by the Government.

5. **Certain Use Restrictions.** Unless required for National Defense, no pilotless aircraft or guided missile shall be operated by the Government. Munitions, fuel, and "Hazardous Materials" (as hereinafter defined) may be stored in or on the Leased Premises, subject to any and all applicable federal, state, local and military rules and regulations, and subject also to "Environmental Laws" as specified in Paragraph 22 hereof.

6. **Brokerage.** The Lessor warrants that no person or selling agency has been employed or retained to solicit or secure this Lease upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee. For breach or violation of this warranty the Government shall have the right to annul this Lease without liability or in its discretion to deduct from the rental payable hereunder the full amount of such commission, percentage, brokerage, or contingent fee.

7. **No Congressional Benefit Disclosure.** No member of or Delegate to Congress or Resident Commissioner shall be admitted to any share or part of this

Lease or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this Lease if made with a corporation for its general benefit.

8. **Termination of Right to Proceed.** (a) The Government may, by written notice to the Lessor, terminate the right of the Lessor to proceed under this lease if it is found, after notice and hearing, by the Secretary of the Air Force or his duly authorized representative, that gratuities (in the form of entertainment, gifts or otherwise) were offered or given by the Lessor, or any agent or representative of the Lessor, to any officer or employee of the Government with a view toward securing this Lease or securing favorable treatment with respect to the awarding or amending, or the making of any determinations with respect to the performing of this Lease; provided, that the existence of facts upon which the Secretary of the Air Force or his duly authorized representative makes such findings shall be in issue and may be reviewed in any competent court.

(b) In the event this Lease is terminated as provided in subparagraph (a) above, the Government shall be entitled (i) to pursue the same remedies against the Lessor as it could pursue in the event of a breach of the Lease by the Lessor, and (ii) as a penalty in addition to any other damages to which it may be entitled by law, to exemplary damages in an amount (as determined by the Secretary of the Air Force or his duly authorized representative) which shall be not less than three nor more than ten times the costs incurred by the Lessor in providing any such gratuities to any such officer or employee.

(c) The rights and remedies of the Government provided in this Paragraph shall not be exclusive and are in addition to any other rights and remedies provided by law or under this Lease.

9. **Government Work.** (a) In addition to the rights contained in Section 4, the Government shall also have the right, subject to the provisions of this Lease, to connect to utility and distribution systems situated on the Airport and also the right to make extensions and/or additions to existing runways, roadways, aprons and taxiways. It is agreed, however, that no construction of buildings, structures, utility connections, runways, roadways, aprons, taxiways, or other facilities (collectively "Improvements") shall be initiated by the Government under any of the provisions of this Lease unless such construction has the prior approval of the Lessor. The Lessor's authorized representatives shall have access to the construction areas other than classified areas during construction; provided, such approval by the Lessor will not be unreasonably withheld, and may include consideration of the availability of funds for such construction.

(b) It is mutually recognized that the extensions and improvements of runways, aprons, taxiways, and, subject to Lessor's specific approval in each instance, other portions of the Airport and appurtenant facilities accomplished by the Government under the provisions of subsection (a) above, will become integral parts of Jointly Used Flying Facilities, and it is agreed that during the existence of this Lease they shall remain in place for such joint use, provided that this provision shall not apply to those facilities to be used exclusively by the Government and to be erected on the Leased Land described in Section 1 above. It is also further agreed that at the termination or

expiration of this Lease the Government shall have the option of transferring said extensions and improvements to runways, aprons, and taxiways to the Lessor in lieu of their removal, provided, however that same are then in good condition, normal wear and tear excepted.

(c) The Government shall surrender possession of the Leased Land upon the expiration or termination of this Lease and it is further agreed that the Government shall have the option of transferring the Improvements situated thereon (collectively the "Improvements") to the Lessor in lieu of their removal, provided, however, that Lessor need not accept, and the Government shall remove at its sole cost and expense, any such Improvements, which are in violation of the provisions of Section 22 hereof or which are in disrepair, provided further, that if the Government gives written notice thereof to the Lessor at least 60 days before the expiration or termination of this Lease, the Government shall have the right to make a mutually acceptable cash settlement with Lessor in lieu of performance of its obligation to effect repairs (but not in lieu of its obligations under Section 22).

10. **Use of Airport Roads.** (a) The Government acknowledges that the "Leased Land" is landlocked within a parcel contemporaneously to be leased by Lessor for Army National Guard purposes, and that even with the right of way granted in Paragraph 1, the Government has no direct access hereunder to the Airport road network or public roads. Subject to its obtaining of access over intervening Army Guard land by separate arrangement with the Army Guard, the Government shall have reasonable use, in common with others, over such Airport road or roads outside of the Leased Land as the Lessor from time to time may designate or other areas of the

Airport designated for the purpose. The use of the Airport by vehicles of the Government beyond the boundaries of the Leased Land shall be subject to the rules and regulations of the Lessor, as same may be amended from time to time.

(b) The Lessor, at any time, may temporarily or permanently close or consent to or request the closing of any Airport roadway outside the Leased Land and any other area at the Airport presently or hereafter used as such, so long as a reasonably equivalent means of ingress and egress, as provided above, remains available to the Government, which hereby releases and discharges the Lessor, its successors and assigns, of and from any and all claims, demands or causes of action the Government may have against the Lessor by reason of the exercise of any of the powers reserved to the Lessor under this subsection (b).

11. **Utilities**. (a) As long as such services are then being provided by the Lessor to Airport tenants, but expressly subject to subsection (b) below, the Lessor shall furnish water and sewer services at presently existing locations in the vicinity of the Leased Premises upon the terms and conditions hereinafter set forth. The Government shall accept such services and agrees to pay, as additional rent, (i) a monthly fee for the operation and maintenance of the facilities affording such service, and (ii) water and sewer connection fees, all the foregoing as from time to time specified and determined pursuant to Lessor's Rules and Regulations. A copy of the current edition of such Rules and Regulations, as amended through May 25, 1999, is attached hereto as Exhibit C.

**A. Water.**

(1) Water shall be delivered at the point of delivery in such quantity and of such quality and at such pressure as the quantity, quality and pressure exists in the distribution system on the Airport at the point and time of delivery.

(2) The Lessor will not be required to repair or maintain any portion or component of the water distribution system within the boundaries of the Leased Land, which responsibility will be solely that of the Government; nor be required to enlarge, extend or alter in any manner the existing water distribution system on the Airport or any part thereof in order to supply water to the Government, which shall accept only water supplied by Lessor and at such points of delivery as shall be designated by Lessor.

(3) The water delivered shall be used exclusively for the purposes and operations of the Government and it shall not use water so delivered nor authorize or permit water so delivered to be used directly or indirectly for any other purpose.

(4) The Lessor will install a meter or meters of such make, kind and size and at such place or places as it shall determine necessary to adequately measure the quantity of water delivered to the Government under this Lease, and all water delivered and used shall be measured through such meter or meters. The Government shall reimburse the Lessor for the cost of such meter or meters and the installation thereof. The meter or meters so installed shall be the property of the Lessor.

(5) The Government will comply fully with the Lessor's backflow prevention and cross-connection control program for the Airport and will pay the cost of

any backflow prevention devices or separation equipment required pursuant to that program.

**B. Sewer.**

(1) The Government shall have the right to discharge sanitary sewage originating on the Leased Premises into the existing sanitary sewer system on the Airport, which feeds into the County of Henrico system. The discharge of the Government's sanitary sewage shall not interfere with or impair the disposal of all other sanitary sewage originating on the Airport; nor shall the Lessor be required to extend or enlarge its existing sanitary sewage collection system.

(2) The Government will not permit storm water, surface water, subsurface water or any effluent of any character other than permissible sanitary sewage to be discharged into the system.

(3) The Government will not permit sewage to be discharged into the system which damages or overcharges or is likely to damage or overcharge it, or which is detrimental to public health and safety or which is in violation of the requirements of applicable laws or regulations, including those promulgated by the County of Henrico.

(4) The Government will not permit water used for any purpose other than that of the Government to be discharged into the system.

(5) The Lessor will not be required to repair or maintain any portion or component of the sanitary sewer system within the boundaries of the Leased Land, which responsibility will be that of the Government, or the County of Henrico, as the case may be; nor be required to enlarge, extend or alter in any manner the existing

sewage distribution on the Airport or any part thereof in order to provide sewer service to the Government.

**C. Other Utilities.**

The Government shall arrange with the appropriate utility or service companies, or municipalities, or other suppliers, supplying utilities and services in the area, for the supply to the Leased Premises of all other services, including electric power and telephone service. The Government shall pay the appropriate utilities or service companies for the supply of such service.

(b) Anything to the contrary in this Lease notwithstanding, by that date which is no later than the last day of March 2004 the Government shall arrange for its own water and sewer services, either directly from the County of Henrico or through another provider. Thereafter the Lessor shall no longer be obligated to provide such services.

12. **Maintenance and Operation of Airport.** The Lessor will maintain and operate the Airport in the manner and to the extent required by and subject to the terms, conditions, and provisions of the quitclaim deed dated July 1, 1947, from the War Assets Administration to the City of Richmond (the "Quitclaim Deed") recorded in the office of the Clerk of the Circuit Court of the County of Henrico, Virginia, in Deed Book 398 at page 209. Nothing in this Lease shall be construed to change, restrict or otherwise alter any such provision of the Quitclaim Deed.

13. **Runway; Taxiway Maintenance.** The Lessor shall not be required or obligated to maintain any of the runway, apron or taxiway extensions and/or additions constructed or improved by the Government pursuant to subsection 9(a) hereof during

the term of this Lease unless and until they are first constructed or improved by the Government in a manner satisfactory to the Executive Director of the Lessor and are part of the Jointly Used Flying Facilities.

14. **Certain Definitions.** In and throughout this Lease, the following words shall have the following meanings, respectively, unless the context shall clearly require otherwise, to-wit:

(a) "Airport" means the Richmond International Airport, aforesaid;

(b) "Laws" means all federal, state, regional, county and local laws, ordinances, resolutions, orders, directions and regulations, including without limitation those pertaining to environmental matters, applicable to the Government, to its construction and to its operations in and on and use of the Leased Land and to its performance of its undertakings set forth in this Lease.

(c) "Leased Premises" means the Leased Land and the "Improvements" (as defined in subsection 9(a)) heretofore or hereafter constructed by Lessee on the Leased Land.

15. **Government Construction.** (a) If the Government constructs, fabricates, installs and/or equips any Improvements on the Leased Land (all of which collectively hereinafter referred to as "constructed" or "construction"), such construction (i) shall comply with the provisions of Section 9 hereof; (ii) shall entail no detriment to the Airport and its facilities; (iii) shall conform in all respects with a master plan which has been submitted to Lessor; and (iv) shall comply with subsection (b) next following. Neither Lessor, nor anyone on its behalf, shall have any responsibility whatsoever as to the technical sufficiency or adequacy or safety of the Improvements or any of their

component parts or of any other physical condition or feature pertaining to the Improvements.

(b) All necessary approvals from governmental authorities shall be obtained by the Government prior to constructing the Improvements, and such improvements shall be constructed strictly in compliance with applicable Laws. Upon completion of construction of the Improvements, all required occupancy permits and authorizations from appropriate authorities authorizing the occupancy, possession and use of the Improvements for their intended purposes shall also be obtained by the Government and no use shall be made of the Improvements without such permits and authorizations.

16. **Quiet Possession; Land Leased "As Is"; Permitted Activities.** (a) Upon and subject to the other terms and provisions hereof, and unless an "Event of Default" by it shall have occurred hereunder, the Government shall be suffered and permitted to have the use, peaceful possession and quiet enjoyment of the Leased Premises during the term of this Lease, subject to the matters hereinbefore and hereinafter set forth.

(b) The Government acknowledges that the Leased Land is leased in its present condition; and that it has examined same and leases same "as is" in such condition, without any representations or warranties on the part of the Lessor whatsoever.

(c) The Leased Land is leased by the Lessor to the Government solely for the activities described in Section 1 hereof, and for no other purpose without the prior written consent of the Lessor, in its sole discretion. Without the prior written consent of

the Lessor, in its sole discretion, no permitted activities shall be conducted by any person or entity other than the specified branch of the military; nor shall any activities other than permitted activities be conducted from or upon the Leased Premises.

(d) The Lessor reserves the right for it, and for its contractors, engineers and architects, to enter upon the Leased Land where necessary and without unreasonable interference with the Government's use of the Leased Land, for the purpose of constructing, installing and/or maintaining under the surface of the ground any portion of the Lessor's systems which presently pass or hereafter may pass through the Leased Land.

17. **Maintenance by Lessor.** The Lessor agrees to operate, maintain and keep in good repair, or cause to be maintained and kept in good repair, the areas and facilities provided by the Lessor for the public in accordance with the practices of a reasonably prudent airport operator. The Lessor agrees to use its best efforts reasonably necessary for the safe, convenient and proper use of the Airport by those who are authorized to use the same and, in particular, to maintain and operate the Airport in accordance with all applicable standards, rules and regulations of the Federal Aviation Administration ("FAA") and any other regulatory authority having jurisdiction.

18. **Maintenance by Government.** (a) The Government at all times shall keep in a clean and orderly condition and appearance (including grounds maintenance), the Leased Premises and all of the Government's fixtures, equipment and personal property which are located in or upon any part thereof.

(b) Additionally, the Government shall –

(i) take good care of the Leased Premises and shall maintain the same at all times in good condition.

(ii) maintain and repair all utility service lines located in, on, and upon the Leased Premises to the extent used by the Government exclusively, except to the extent that such maintenance or repair is the obligation of the utility company providing such utility service.

(c) The Government shall provide at its sole cost and expense the necessary arrangements for adequate sanitary handling and disposal away from the Airport of all trash, garbage and other refuse which results from the Government's operations. The Government shall provide at its sole cost and expense the necessary receptacles for all such trash, garbage and other refuse. The piling of boxes, cartons, barrels or other similar receptacles or the maintenance of unsightly items such as damaged aircraft or equipment in disrepair, on or about the Leased Land is prohibited.

19. **Compliance With Regulations.** (a) The Government shall comply with all applicable FAA regulations, as the same may be amended from time to time, and shall comply with all other applicable present or future Laws.

(b) The Government covenants and agrees to observe and obey (and to require its personnel and employees to observe and obey and to exercise its best effort to require guests and invitees and those doing business with it to observe and obey) (i) the Rules and Regulations of the Lessor (including future amendments and supplements thereto) governing the conduct and operations of the Government and others on the Leased Premises and the Airport, including without limitation the Rules and Regulations and security requirements of the Lessor set forth in Exhibits C and D

attached hereto and (ii) such future reasonable rules and regulations as, from time to time during the term hereof, may be promulgated by the Lessor, including without limitation those promulgated for reasons of safety, health, sanitation, compliance with environmental laws and regulations, and good order; provided that any such rules and regulations shall not be inconsistent with the provisions of this Lease or with the rules and regulations of the FAA and shall be uniform in their application to others at the Airport similarly situated. The provisions of Exhibits C and D are incorporated herein by reference. The obligation of the Government to exercise its best efforts to require such observance on the part of its guests, invitees and business visitors shall apply only while such persons are on the Leased Premises. The Government shall (i) comply with the provisions of any storm water discharge permits pertaining to the Airport and (ii) pay its equitable share of the permitting, monitoring and compliance costs with respect to any general permit obtained by the Lessor, all as reasonably established by the Lessor.

20. **Indemnification**. To the fullest extent permitted by law, the Government shall indemnify, defend and hold the Lessor, its Commissioners, officers, agents and employees harmless from and against any and all claims, actions, damages, liabilities and expenses, including reasonable attorney's and other professional fees, arising from or caused by the acts or negligence of the Government's employees or agents.

21. **Contractor and Subcontractor Insurance Requirements**. At all times during the term of this Lease the Government shall prescribe Federal Acquisition Regulation (FAR) clause 52.228-5, *Insurance-Work on a Government Installation*, or comparable provision(s), in all Government contracts that exceed the simplified acquisition threshold as prescribed in FAR Part 13 that require work on the Leased

Premises. Government contractors and their subcontractors shall maintain and provide evidence of at least the following insurance and liability coverage: workman's compensation and employer's liability, $100,000; general liability, $500,000 per occurrence; and automobile liability, $200,000 per person, $500,000 per occurrence for bodily injury, and $20,000 per occurrence for property damages. The Government shall notify the Lessor of all such contractors within 30 days after the award of contract.

22. **Environmental Matters.** (a) The Government shall comply with all Environmental Laws (defined below), pertaining to the leasehold and to its possession and use of the Leased Premises and its use of the right of way hereinabove granted, and it shall timely obtain and maintain all permits, approvals or other authorizations and timely make all notifications, registrations, and filings required by such Environmental Laws. Copies of such permits, approvals or other authorizations and all notifications and registrations of petroleum storage tanks shall be provided promptly to the Lessor. The Government further covenants and agrees that its storage, accumulation, and other management and use of Hazardous Materials on the Leased Premises shall also be in accordance with Paragraph 5 of this Lease.

(b) If the Government fails to take timely and proper corrective action pursuant to this Lease or any Environmental Laws regarding any release of Hazardous Materials, the Lessor, at its option, may declare such failure to constitute an "Event of Default" hereunder, and/or the Lessor, at its option may, but shall not be obligated to, do whatever is necessary to eliminate such Hazardous Materials from the Leased Premises or right of way, or otherwise comply with Environmental Laws, and the cost thereof (including the Lessor's reasonable fees, costs and expenses incurred in

connection therewith) shall be so much additional rent hereunder which shall become immediately due and payable without notice. The Government shall give to the Lessor and its agents and employees reasonable access to the Leased Premises and right of way for such purposes and hereby specifically grants to the Lessor a license, effective upon expiration of a reasonable time for cure or the applicable specified cure period, as the case may be, to remove the Hazardous Materials. Except as prohibited by the Federal Tort Claims Act, the Government shall indemnify the Lessor and hold it harmless from and against all loss, damage, and expense (including, without limitation, reasonable attorney fees and costs incurred in the investigation, defense, and settlement of claims) that the Lessor may incur as a result of or in connection with the assertion against the Lessor of any claim relating directly or indirectly, in whole or in part, to matters for which the Government has responsibility under this paragraph 22, and such indemnification shall survive the expiration or sooner termination of this Lease. The Government covenants and agrees that no Hazardous Materials shall be stored on the Leased Premises, except as specifically provided in Paragraph 5 hereof.

(c) The Government shall promptly notify the Lessor in writing of any order or pending or threatened action by any regulatory agency or other governmental body, or any claims made by any third party, relating to Hazardous Materials on, or emanations from, the Leased Premises or said right of way, and shall promptly furnish the Lessor with copies of any correspondence or legal pleadings in connection therewith. The Government shall immediately notify the Executive Director of the Lessor of any releases, spills, overfills, leaks, discharges or emissions of any Hazardous Materials. The Government shall make, and shall provide Lessor's

Executive Director with copies of, all required filings and notifications to federal, state and local authorities related to any such release or other occurrences set forth in the preceding sentence or related to its use or management of Clause (D) Substances. In addition, the Lessor shall have the right, but shall not be obligated, to notify any state, federal or local governmental authority of information which may come to its attention with respect to Hazardous Materials on or emanating from the Leased Premises or said right of way and the Government irrevocably releases the Lessor from any claims of loss, damage, liability, expense or injury relating to or arising from, directly or indirectly, any such disclosure.

(d) If at any time during the term of this Lease the Lessor has reasonable basis to suspect the presence of Hazardous Materials on the Leased Premises or said right of way in violation of the provisions of this Paragraph 22, and in all events upon the termination of this Lease or upon the occurrence of an "Event of Default" (as defined in Paragraph 23), the Lessor may require the Government (i) to provide the Lessor, at the Government's expense, with a full or partial environmental inspection or audit of the Leased Premises, or said right of way, as the case may be, prepared by a qualified consultant approved by the Lessor, certifying as to the presence or absence of Hazardous Materials, or, alternatively, at the Lessor's option (ii) to permit the Lessor to so inspect or audit the Leased Premises and right of way at the Government's expense. The Government hereby grants the Lessor, its employees, agents and independent contractors the right to enter upon the Leased Premises and right of way for the purposes of conducting tests, soil borings, the installation of monitoring wells and such

other tests as the Lessor deems necessary or desirable, and the Government agrees to cooperate fully with respect to such matters.

(e) For the purposes of this Lease:

(A) "Environmental Laws" shall mean all federal, state, and local laws, regulations, ordinances, rules, orders or decrees, and permits and approvals, all as amended, relating to the regulation or protection of human health, the environment, natural resources, or historical/cultural resources, including without limitation (1) those addressing the emission, discharge, release, generation, transportation, storage, disposal, distribution, or other management of Hazardous Materials; the reporting, notification, or disclosure of the presence or release of Hazardous Materials; and underground or aboveground storage tanks, related tank systems and connected piping; and (2) specifically including without limitation the Comprehensive Environmental, Response, Compensation, and Liability Act of 1980, as amended; the Resource Conservation and Recovery Act, as amended; the Toxic Substances Control Act, as amended; the Federal Water Pollution Control Act, as amended; the Clean Air Act, as amended; the Occupational Safety and Health Act, as amended; all regulations and rules issued thereunder; and their state and local counterparts, as amended.

(B) "Hazardous Materials" shall mean any (1) petroleum products or used or waste petroleum products, flammables, explosives, radioactive materials, asbestos in any form, urea formaldehyde insulation, polychlorinated biphenyls, radon gas, discarded tires, discarded batteries or parts thereof, or construction or demolition debris; (2) any chemicals, emissions, materials, substances, pollutants, discharges, or wastes which are defined or characterized as "solid" "hazardous," "toxic," "special,"

"medical," "biohazard," or other words of similar import, pursuant to any Environmental Laws; and (3) any other chemical, material, substance, waste, emission, discharge, or pollutant, exposure to which is prohibited, limited, or regulated by any governmental authority, or shown to be a carcinogen, mutagen, or otherwise is adverse to human health or the environment.

23. **Events of Default.** The following shall be "Events of Default" as to the Government under this Lease and the term "Event of Default" shall mean, whenever it is used in this Lease, any one or more of the following events:

(a) Failure by the Government to pay or cause to be paid within 30 days after written notice of the non receipt of same, any rental or any other monetary amount required to be paid by the Government hereunder.

(b) Failure by the Government to observe and perform any covenant, condition or agreement on its part to be observed or performed other than as referred to in subparagraph (a) next above, for a period of 45 days after written notice, specifying such failure and requesting that it be remedied, given to the Government by the Lessor.

(c) An Event of Default under that certain land lease (Lease No. 1) between the parties of even date with this Lease.

(d) Any other matter herein specifically defined as an Event of Default.

(e) A material default by the United States of America under the Joint Use Agreement referred to in Section 1, or expiration of such agreement without execution by the parties thereto of an extension or renewal of such agreement which is satisfactory to such parties in their sole discretion. Lessor's right of termination of this

Lease pursuant to this subsection (e) shall be upon 180 days prior written notice to the Government.

(f) Whenever any Event of Default referred to in this Lease shall have occurred and be continuing, the Lessor may, but shall not be obligated to, take any one or more of the following remedial steps as against the Government:

(1) The Lessor may terminate this Lease.

(2) The Lessor may take whatever other action at law or in equity as may appear necessary or desirable to collect the rent and other sums due hereunder, or to enforce performance and observance of any obligation, agreement or covenant of the Government under this Lease.

(g) No remedy herein conferred upon or reserved to the Lessor is intended to be exclusive of any other available remedy or remedies, but each and every such remedy shall be cumulative and shall be in addition to every other remedy given under this Lease or hereafter existing under law or in equity. No delay or omission to exercise any right or power accruing upon any Event of Default shall impair any such right or power or shall be construed to be a waiver thereof, but any such right and power may be exercised from time to time and as often as may be deemed expedient.

(h) In the event any covenant contained in this Lease should be breached by either party and thereafter waived by the other party, such waiver, to be effective, must be in writing and shall be limited to the particular breach so waived and shall not be deemed to waive any other breach hereunder.

24. **Assignments**. (a) The Lessor may transfer or assign this Lease to any successor in interest to the Lessor to whom the Airport may be transferred. The Lessor

shall thereupon be released from any further liability hereunder, provided, however, that the successor in interest shall execute and deliver to the Lessor, with a copy to the Government, an instrument assuming the lawful obligations of the Lessor under this Lease.

(b) The Government shall not make any transfer or assignment of, or sublet or encumber, the Leased Premises or any part thereof, or its interest in this Lease, including any transfer by operation of law, or grant to others, including without limitation any other branch of the military, any use, easement or other rights in or with respect to the Leased Premises, without the written consent of the Lessor in each specific instance and in the Lessor's sole discretion.

25. **Miscellaneous.** (a) The Lessor, its officers and employees, shall have the right at reasonable times, upon prior notice and in accordance with the Government's security requirements, to enter upon the Leased Premises for the purpose of inspecting the same, and for the doing of any act or thing which the Lessor may be obligated or have the right to do under this Lease.

(b) Without limiting the generality of the foregoing, the Lessor shall have the right, for its own benefit or for the benefit of the Government and others at the Airport, to maintain existing and future utilities systems or portions thereof on the Leased Land, including therein without limitation thereto, systems for the supply of heat, water, gas, fuel and electricity, and for the furnishing of fire alarm, fire protection, sprinkler, sewage, drainage, telephone and telegraph service, including all lines, pipes, mains, wires, conduits and equipment connected with or appurtenant thereto, and to make such repairs, replacements or alterations as, in the opinion of the Lessor, may be

deemed necessary or advisable and, from time to time, to construct or install over, in or under the Leased Land new systems or parts thereof, including lines, pipes, mains, wires, conduits and equipment; provided, however, that in exercising such rights the Lessor shall not unreasonably interfere with the Government's operations on the Leased Land or abridge the rights conferred on Government by this Lease.

(c) Neither the Lessor nor the Government shall be deemed in violation of this Lease if it is prevented from performing any of its obligations hereunder by reason of strikes, boycotts, labor disputes, embargoes, shortage of materials, acts of God, acts of the public enemy, acts of superior governmental authority, weather conditions, floods, riots, rebellions, sabotage, or any other circumstances for which it is not responsible or which is not in its control, and the time for performance shall be automatically extended by the period the party is prevented from performing its obligations hereunder. Lack of funds shall not be a circumstance entitling a party to an extension of time pursuant to this subparagraph.

(d) This Lease is subject to and subordinate to applicable easements, agreements, conditions and restrictions, including but not limited to each and every term, condition, reservation and restriction contained in (i) the Quitclaim Deed and (ii) the deed and agreement, dated January 1, 1976, by and between the City of Richmond, the County of Henrico, and the Lessor, recorded in the Clerk's Office, Circuit Court, Henrico County, Virginia, in Deed Book 1684, Page 944. This Lease is also subject to and subordinate to the provisions of any existing or future agreement between the Lessor and the United States of America relative to the operation and maintenance of the Airport, the execution of which has been or may be required as a

condition precedent to the expenditure of federal funds for the development of the Airport.

(e) This Lease shall not be recorded. Either party shall, at the request of the other, execute, acknowledge and deliver, a memorandum or short form of lease prepared by the requesting party; provided, however, that the relations between the Lessor and the Government shall be governed solely by the provisions of this Lease and not by any short form or memorandum which may be executed, delivered and recorded.

(f) If any word, phrase, clause, paragraph, section or other part of this Lease shall ever be held to be invalid or unconstitutional by any court of competent jurisdiction, the remainder of this Lease and the application of such word, phrase, clause, sentence, paragraph, section or other part of this Lease to any other person or circumstances shall not be affected thereby.

(g) Notices provided for in this Lease shall be sufficient if sent by registered or certified mail, postage prepaid, addressed, if to the Lessor: 1 Richard E. Byrd Terminal Drive, Richmond International Airport, Virginia 23250-2400, Attention: President, or to such other address and person as the Lessor may direct in writing; and if to the Government: Norfolk District Corps of Engineers, 803 Front Street, Norfolk, VA 23510-1096, Attention: Real Estate Branch, or to such other address and person as the Government may direct in writing.

(h) The laws of the State of Virginia and United States of America shall govern the construction of this Lease, which contains the entire understanding and all representations, warranties, covenants or undertakings of the parties with respect to the

leasing of the Leased Land. There are no oral agreements between the parties hereto affecting this Lease, which supersedes and cancels any and all previous negotiations, discussions and understandings between the parties hereto with respect to the leasing of the Leased Land.

26. **Changed Circumstances**. In the event either the Commission or the Government desires to adjust the configuration of the Leased Land, or the Government desires to change the use as specified in Section 1 hereof, such party, by written notice to the other, may request discussion of the subject. Such discussion shall be held at an agreed time and place not later than 30 days from the aforesaid notice. Such discussion shall be completely without obligation.

**IN WITNESS WHEREOF**, the parties hereto have hereunto subscribed their names as of the date first above written by their duly authorized representatives.

**CAPITAL REGION AIRPORT COMMISSION** By _____
Jon E. Mathiasen
President and Chief Executive Officer

**THE UNITED STATES OF AMERICA** By _____
PATRICIA L. WALTON
ACTING CHIEF
Real Estate Division
Air Force Real Property Agency

## EXHIBITS

Exhibit A - Plat of Leased Land and right of way by Gene Watson & Associates, P.C. dated November 7, 2001, last revised April 2, 2002.

Exhibit B-1 - Metes and bounds description of the Leased Land

Exhibit B-2 - Metes and bounds description of right of way

Exhibit C - Rules and Regulations of the Lessor as amended through May 25, 1999

Exhibit D - Security Requirements of the Lessor (contract)

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EXHIBIT
tabbies
B-1

LEGAL DESCRIPTION OF PARCEL 2 AS SHOWN ON A PLAT BY GENE WATSON & ASSOCIATES, P.C. DATED NOV. 7, 2001 LAST REVISED APR. 02, 2002

BEGINNING AT THE P.O.B. OF PARCEL 1, SAID POINT BEING ON THE NORTHERN RIGHT-OF-WAY LINE OF BEULAH ROAD 2,200'± WEST OF THE CENTERLINE INTERSECTION OF BEULAH ROAD AND PORTUGEE ROAD; THENCE LEAVING SAID P.O.B. N33°13'52"W 1997.24' TO A POINT; THENCE S56°46'08"W 238.05' TO THE POINT OF BEGINNING OF PARCEL 2; THENCE ALONG A LINE THAT IS PARALLEL AND APPROXIMATELY 30' EAST OF A CHAIN LINK FENCE, S33°22'28"E 357.93' TO A POINT; THENCE ALONG A LINE THAT IS PARALLEL AND APPROXIMATELY 30' SOUTH OF A CHAIN LINK FENCE, S56°42'13"W 769.49' TO A POINT; THENCE N33°07'48"W 358.98' TO A ROD FOUND; THENCE ALONG A LINE THAT IS PARALLEL AND APPROXIMATELY 30' NORTH OF A CHAIN LINK FENCE N56°46'55"E 767.96' BACK TO THE POINT OF BEGINNING. SAID PARCEL CONTAINS 6.326 ACRES.

EXHIBIT
tabbies
B-2

LEGAL DESCRIPTION OF A SIXTY-FOOT RIGHT-OF-WAY TO PARCEL 2 AS SHOWN ON A PLAT BY GENE WATSON & ASSOCIATES, P.C. DATED NOV. 7, 2001 AND LAST REVISED APR. 02, 2002.

BEGINNING AT A POINT ON THE WESTERN PROPERTY LINE OF PARCEL 2, SAID POINT BEING LOCATED S33°07'48"E 161.38' FROM A ROD FOUND; THENCE ALONG SAID WESTERN PROPERTY LINE S33°07'48"E 60.83' TO A POINT; THENCE ALONG A CURVE TO THE LEFT HAVING A RADIUS OF 127.14' A DISTANCE OF 102.01' TO A POINT; THENCE S00°35'44"E 138.62' TO A POINT, SAID POINT BEING OPPOSITE OF A DRIVEWAY CROSSING; THENCE S89°24'16"W 60.00' TO A POINT; THENCE N00°35'44"W 138.62' TO A POINT; THENCE ALONG A CURVE TO THE RIGHT HAVING A RADIUS OF 187.14' A DISTANCE OF 162.28' TO THE POINT AND PLACE OF BEGINNING. SAID SIXTY-FOOT RIGHT-OF-WAY CONTAINS 0.373 ACRES.

Initial Here

Initial Here

ATCH 4
(1 OF 2)

RESOURCE
INTERNATIONAL, LTD.
ENVIRONMENTAL CONSULTANTS & DESIGNERS

February 11, 1997

P.N. 91057.C08

Mr. Russell Dudley
Commonwealth of Virginia
Department of Military Affairs
Attn: VAFM-E PRN-160
600 East Broad Street
Richmond, VA 23219

**RE: AASF Emergency Generator UST Removal and Tank Closure Report**

Dear Mr. Dudley:

Resource International, Ltd. (Resource) is pleased to provide this report of underground storage tank (UST) closure activities at the Army Aviation Support Facility (AASF) in Sandston, Virginia, located as shown on Figure 1. These services have been provided in accordance with the Virginia Department of Military Affairs (VDMA) scope of work dated August 13, 1996, and per the terms of Resource's open end environmental contract with VDMA.

## SUMMARY OF UST CLOSURE ACTIVITIES

### UST Description

One UST was closed at the facility. The UST is reported to have been an approximately 300 gallon capacity tank of steel construction containing diesel fuel. The UST was located under grass near the south end of the Virginia Air National Guard (VaANG) Maintenance Building, beside the emergency generator (see Figure 2).

### Preparation Activities

The UST closure contractor selected by VDMA was Rickmond Environmental, Inc. (Rickmond), 1643 Merrimac Trail, Williamsburg, Virginia, 23185. Prior to UST removal, a new aboveground storage tank (AST) was installed as a replacement for the UST. UST removal occurred on January 3, 1997. Before UST removal, Rickmond personnel pumped the tank contents into the new AST and the remainder into a portable tank brought onto the site for that purpose.

**UST Closure**

A Resource engineer was on site to observe the UST closure. The UST was removed by a backhoe and placed adjacent to the excavation. Excavated soils were placed to the northeast of the excavation on plastic sheeting on the ground. The 300 gallon tank was located five to six feet below the ground surface in a reddish clay soil backfill. The surrounding soil at the tank sides and bottom was a gray clay. The UST was oriented parallel to the VaANG Building, in an east-west direction. Photos of the excavation and the UST are attached. Excavation was complicated because the tank was bordered on the east by buried electrical conduit, and on the west by the generator foundation. Care was exercised by the contractor to expose the tank within this small area only to the degree necessary.

**Observations During Excavation**

Prior to the excavation beginning, the new AST was installed and the old pipes to the UST were disconnected. As the tank was being exposed, the piping was cut and plugged so that no line spillage could occur. Connections to the tank included a fill port, a suction pipe, a return pipe, a vent pipe and a level probe electrical conduit. Piping was pulled from the ground except for the horizontal run of vent line. No signs of staining or sheen were noted on the soil or on the small amount of water which was at the very bottom of the excavation. No strong odors of petroleum were present. The excavation soil was placed on plastic sheeting, and the tank was lifted onto the top of the spoil pile.

While hoisted, the bottom of the tank was observed, and no sign of damage or leaks was noted. Likewise, the tank sides were observed and no sign of damage, pitting, or leaks was noted. Very minor surface rust was noted in a few spots on the tank. The tank had obviously been coated with an asphalt mastic type of corrosion protection material. In the area of the tank below the fill spout, it was obvious that the coating had softened, and the soil clinging to that area had a petroleum odor.

**Soil Sample Collection and Screening**

Resource personnel collected soil samples from the UST pit and from the excavated soils on the afternoon of January 3, 1997. Figure 2 depicts the general sample locations, and a sample description follows:

#001 (Pit Bottom): Collected at approximately 1:00 P.M. from the excavation at a point corresponding to the center of the UST, at an approximate depth of 9 feet. This depth corresponded to approximately the base of the UST. This sample exhibited no definitive petroleum odor. Part of the sample was put into a sample bottle for lab analysis, and another part was put into a plastic

bag and allowed to warm. The vapor space in the bag was tested with a PID meter and registered a maximum reading of 57.2 ppm.

#002 (Composite): A composite sample was taken from the excavated soil piles at approximately 1:10 P.M. This sample exhibited a slight petroleum odor. Part of the composite included soil taken from very close to the tank.

Soil sample # 001 was screened for volatile organic compounds (VOCs) using a Photovac Microtip HL 2000 photo-ionization detector (PID). Atmospheric readings taken at several locations on the soil piles at approximately 1 inch from the surface showed a maximum of approximately 10 ppm, which was near the surface of the tank. The screening results were as follows:

| Sample Identification | VOC Concentration by PID |
|---|---|
| Pit Bottom #001 | 57.2 ppm |
| Beside Removed Tank | 10.0 ppm |

For comparison, the ambient air in the work zone exhibited a uniform VOC concentration of 0.8 ppm, as measured by the PID Meter.

**Laboratory Analyses**

The soil samples were placed on ice and transported under chain of custody procedures to Enviro Compliance Laboratories in Ashland, Virginia, for analysis for total petroleum hydrocarbons (TPH) by EPA Method 8015M (semi-volatile range). The test results are summarized below:

| Sample Identification | TPH by EPA 8015M (Semi-volatile Range) |
|---|---|
| Pit Bottom #001 | 40.8 mg/kg |
| Excavated Material Composite #002 | 189.0 mg/kg |

**UST Disposition**

The UST disposition was provided by Rickmond, which should provide VDMA with a certificate of disposal/destruction.

**Excavated Soils**

Based on the apparent absence of staining, free product, sheens, excessive PID (VOC) results, or strong odors, the excavated soils were used as backfill.

## CONCLUSIONS

Although no visible sheens, stains or strong odors were observed, a small amount of oil was present in the soil, based on PID readings at the site. Laboratory results, noted above, confirmed that the storage system had experienced some localized spillage. Considering the observations of the tank's integrity, it is apparent that the spillage did not come from a leak in the tank itself. Since the tank is used for emergency generator service only, it is unlikely that leaks from the pump-around loop (supply and return to the generator) created the loss, as the system is rarely used, and is not maintained in a pressurized state. The most likely scenario for loss from this small tank is that it was due to possible one-time or occasional overfill spillage. In the absence of any staining or sheen, it is unlikely that there was anything more than a small overfill which ran along the side of the tank (softening the coating). Another possible spill source could have been the screwed connection of the fill tube into the tank.

It is the conclusion of Resource that since soils at the bottom of the excavation were below regulatory limits and only a minor presence of localized petroleum hydrocarbons in backfill exists, this site does not indicate a need for further action. The size and function of the tank, plus observations on the lack of staining, free product, or sheen, indicate that it is unlikely that any significant, non-localized contamination has resulted from this tank. Also, the tank was situated at a location which is well removed from potential receptors. Resource does not consider this situation to be a reportable event. Since the UST has been removed, it is our opinion that a copy of this report should be forwarded to the Virginia Department of Environmental Quality (VDEQ), along with a UST closure notification form.

## ATTACHMENTS

The following materials are attached to this letter to provide VDMA with a complete description of the UST closure.

1. Photographs of UST Closure
2. Area Location Map (Figure 1)
3. Soil Sample Location Map (Figure 2)
4. Chain of Custody Document
5. Laboratory Certificate of Analysis

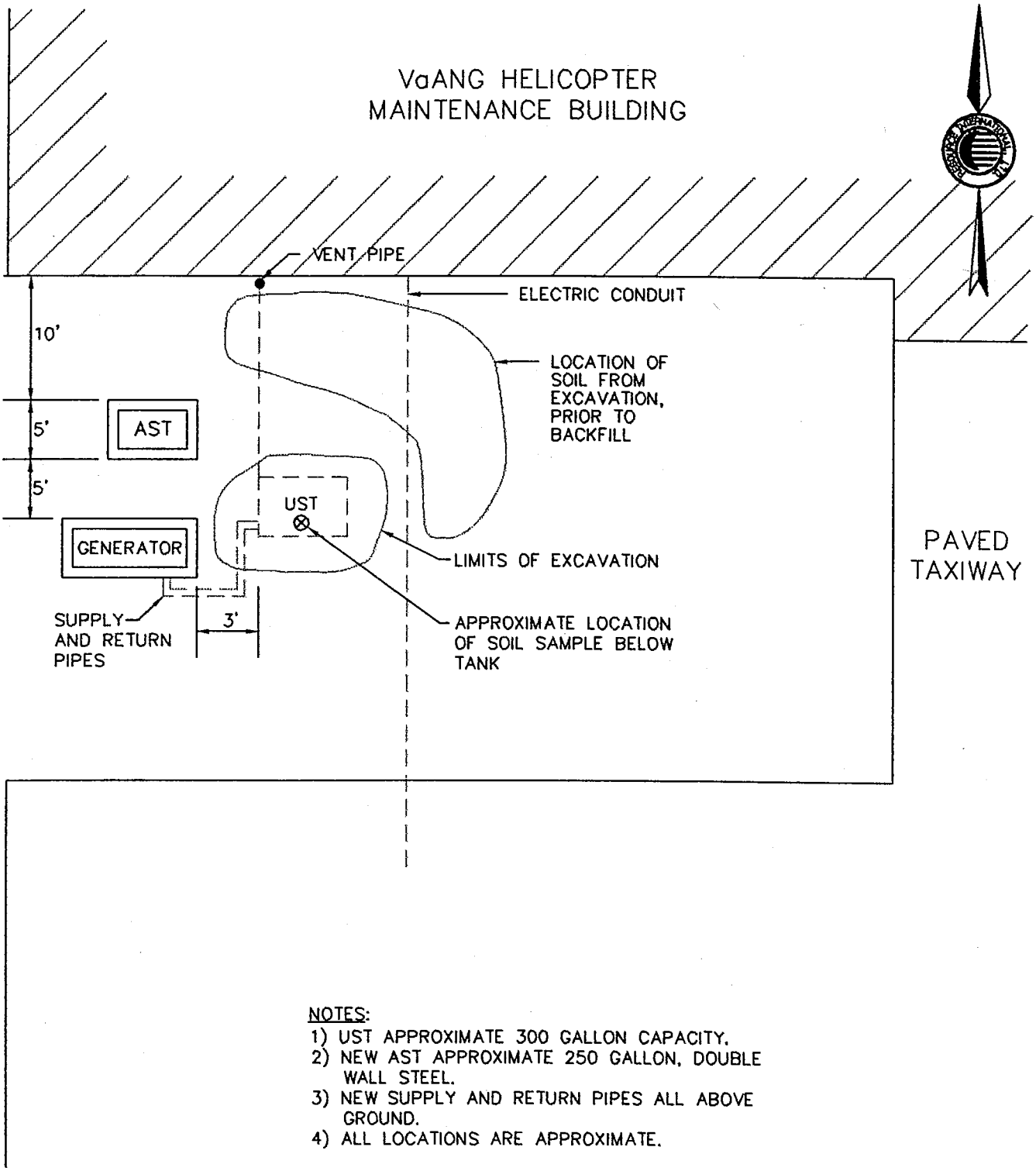
As noted above, the provision of the certificate of UST disposal/destruction is the responsibility of Rickmond. Please feel welcome to contact me at 804/550-9243 if you have any questions or comments.

Sincerely,

B. Meredith Winn, Jr., P.E.
Senior Process Engineer

/pst

Attachments




NOTES:

1) UST APPROXIMATE 300 GALLON CAPACITY.
2) NEW AST APPROXIMATE 250 GALLON, DOUBLE WALL STEEL.
3) NEW SUPPLY AND RETURN PIPES ALL ABOVE GROUND.
4) ALL LOCATIONS ARE APPROXIMATE.

FIGURE 2

SITE MAP

AASF
EMERGENCY GENERATOR DIESEL FUEL
UST REMOVAL
HENRICO COUNTY, VIRGINIA

P.N. 91057.C08

RESOURCE INTERNATIONAL, LTD.
ENVIRONMENTAL CONSULTANTS & DESIGNERS
9560 KINGS CHARTER DRIVE ◦ P.O. BOX 6160 ◦ ASHLAND, VA 23005
(804) 550-9200 ◦ FAX (804)550-9259

# 6 Preliminary Assessment Findings and Conclusions

## 6.1 Summary of Preliminary Assessment Findings

The AASF is located at the Richmond International Airport in eastern Henrico County, Virginia. The city of Richmond is approximately 5 mi west of the AASF, and the small towns of Sandston and Highland Springs are about 1 mi north. Originally constructed in the 1960s as an active Air Force interceptor base, the 91.5-acre AASF is now used as an aviation maintenance and training facility by Army National Guard units located in Virginia, including its tenant organizations, Detachment 4 of HHC headquarters; Company A, Company B, and Company D of the 2nd Battalion, 224th Aviation; Detachment 1 of Company D of the 1st Battalion, 132nd Aviation; RAID Virginia (drug interdiction); and Detachment 1 of the 986th Medical Company. Approximately 420 personnel are assigned to the facility. The aircraft inventory includes UH1 utility helicopters (29), UH60 utility helicopters (15), OH58 observation helicopters (7), and one C12 transport plane.

Hazardous materials used and stored at the facility include JP-4, diesel fuel, gasoline, liquid propane gas, heating oil, and motor oil. Total storage capacity of these materials is approximately 73,000 gal. The jet fuel tank farm in the southern portion of the property is the location of the largest storage tanks. Two 25,000-gal aboveground tanks, enclosed within an earthen, asphalt-covered berm, contain JP-4. Adjacent to the JP-4 fuel farm are two 5,000-gal tanks for diesel fuel and gasoline. These tanks and associated dispensing pumps are within metal containment basins. North of the fuel farm, in the aircraft maintenance area, heating oil is stored in two USTs of 2,000-gal and 5,000-gal capacity. These tanks are of double-wall construction with automatic leak detection systems. Two small single-walled USTs of 550-gal capacity are located near Building 3903 and Building 3990 for storage, respectively, of heating oil No. 2 and diesel fuel to power an emergency electric generator. Five 1,000-gal and one 550-gal aboveground tanks store propane.

A preliminary assessment of Byrd Field AASF was performed to determine the potential for hazardous constituents present on site as a result of current or past operations to migrate beyond the property boundary to areas of human or environmental concern. The primary ESOs associated with the property are (1) fuel storage and dispensing; (2) hazardous materials/hazardous waste storage; and (3) aircraft, vehicle, and equipment washing. Groundwater is used in the vicinity of the AASF as a source of potable water. Surface water drainage from the property is to

the White Oak Swamp Creek, which flows south of the property and feeds the Chickahominy River and the James River. These represent the principal receptors for potential contamination from ESOs at the AASF.

Shallow groundwater from the upper water table aquifer is used by many individuals in the region as a source of potable water. The primary migration pathway for contaminants to the shallow groundwater is via infiltration of precipitation transporting contaminants (principally fuel) released to the surface and near-surface soils of the site. Containment mechanisms are in place to reduce the potential for major releases of fuel through tank or fuel line rupture. Minor spills (primarily fuel) have occurred at the facility. Appropriate and rapid spill response actions have limited the potential for adverse impact to the shallow groundwater. Infiltration of contaminants to the deeper aquifers is effectively prevented by overlying confining clay units.

Of particular concern as a potential source of contamination are the two 25,000-gal aboveground JP-4 tanks enclosed in an earthen berm. The 3.5-ft-high sides of the berm are covered with asphalt, and the base is compacted soils. The compacted soil base of the containment berm is not impermeable, but it does form an effective barrier, adequately slowing migration of fuel from the spill location so that cleanup can proceed. Past sampling at the JP-4 fuel farm, located in the downgradient portion of the AASF property, in response to former fuel spill events, has indicated that no contamination of the groundwater has occurred. On August 23, 1989, after construction of a storm drainage ditch south of the fuel farm, water appeared to be seeping into the ditch from beneath the tank farm (Williams 1989a). Analytical results indicated that no petroleum hydrocarbons were present in the sample collected (Williams 1989b). On October 2, 1990, three piezometers were installed within the bermed fuel farm area (VGS 1990). The drilled holes, approximately 4 in. in diameter, ranged from 4.24 to 4.83 ft in depth. Water was not encountered. A photoionization detector (HNu) was used to detect the presence of contaminants in the cuttings from the borings and in the airspace within each piezometer. The HNu readings were 10 ppm or less in soils (i.e., within the range expected in the proximity of fuel-related activities) and substantially less than the action level criterion established by the EPA, at which a corrective measure study is recommended. The action level criteria in soil for the two fuel constituents toluene and xylene are 20,000 ppm and 200,000 ppm, respectively (EPA 1990). No fuel release to groundwater has been indicated during subsequent inspections of the monitoring locations.

The potential for migration of contaminants from the AASF via surface water flows has been minimized by the installation of oil-water separators to filter drainage from the areas of the facility with the highest potential for contamination, including the storm water drainage from the

JP-4 fuel farm. Drainage from the fuel transfer location, the hot refueling point, the aircraft/vehicle wash areas, the maintenance work bays, and the waste drum storage area is filtered through oil-water separators before discharge to the sanitary sewer system. Construction upgrading the facility fueling system has recently been completed. Monitoring of the facility's oil-water separator is underway to determine the appropriate cleaning schedule.

## 6.2 Recommendations for Further Action

The PA is designed to characterize the site accurately and determine the need for further action by examining site activities, quantities of hazardous substances present, and potential pathways by which contamination could affect public health and the environment. The primary objective of the PA is to identify and evaluate ESOs that would result in either (1) immediate action, (2) site investigation, or (3) no further PA/IRP action. The available information indicates that the AASF is generally well maintained and poses minimal potential threat to human health and the environment. No further PA/IRP action is warranted.

June 19, 2001

Ms. Liana Shrader
*Environmental Program Analyst*
VAFM-E (PRN 160)
Building 316
Fort Pickett
Blackstone, Virginia 23824

Re: Non-Regulated Heating Oil UST Removal
VANG, AASF
Sandston, Virginia
MM&A Project No. VA561

Dear Ms. Shrader:

On May 21, 2001, Marshall Miller and Associates (MM&A) supervised the excavation and removal of a 550-gallon non-regulated heating oil underground storage tank (UST) at the Army Aviation Support Facility (AASF) in Sandston, Virginia. The UST was formerly associated with heating building 3903 and was not in use at the time of the removal. A Vicinity Map and General Site Map for the location of the UST are presented in **Attachment I.**

Prior to removal, approximately 190 gallons of diesel petroleum were pumped from the UST. A copy of the Certificate of Disposal for liquid is found in **Attachment II.** The UST was then removed and physically inspected. The UST appeared to be in poor condition with signs of pitting and corrosion. Three holes (less than 0.25 inch in diameter) were identified in the tank. The holes were located on the top and side portion of the UST. Photographs of the UST and pit basin are included with this letter in **Attachment III.** Tim Evans Inc. of Richmond, Virginia transported the UST to their facility for proper disposal. A copy of the UST Disposal Certificate is provided in **Attachment IV.**

One-soil sample was collected from the bottom of the UST pit and was analyzed by EnviroCompliance Laboratories of Glen Allen, Virginia for total petroleum hydrocarbons – diesel range organics (TPH-DRO). The sample collected from the bottom of the UST pit was approximately nine feet below surface grade and one foot below the former UST.

The sample collected from the bottom of the UST pit revealed a TPH-DRO concentration of 19.4 milligrams per kilogram (mg/kg), which is below the Virginia Department of Environmental Quality's (VDEQ) reporting limit of 100 mg/kg. Based on observations during the UST removal, it appeared that there was no petroleum impact in UST basin. The Certificate of Analysis and Chain of Custody for the sample is included in **Attachment V**.

This information has been submitted for documentation. The Virginia Department of Military Affairs (VDMA) is not required to notify the VDEQ since the heating oil UST was non-regulated and no indication of a release was confirmed.

MM&A Sincerely appreciates having the opportunity to provide the VDMA with these environmental services. Please call us at 804-798-6525 should you have any questions or need additional information.

Sincerely,

**MARSHALL MILLER AND ASSOCIATES, Inc.**

**Daniel E. Marsh**
*Environmental Technician*

**Joe B. Vance C.P.G.**
*Vice President*

MARSHALL MILLER & ASSOCIATES

AASF

# COMMONWEALTH of VIRGINIA

JOHN G. CASTLES
MAJOR GENERAL
THE ADJUTANT GENERAL

*Department of Military Affairs*
*Adjutant General's Office*
*501 E. Franklin Street*

RICHMOND, VIRGINIA 23219-2317

February 19, 1992

2 x 5K GASOLINE TANKS LOCATED @ BLDG 3903

VAFM-E

Mr. Russ Ellison
Virginia Water Control Board
UST Program
P.O. Box 11143
Richmond, Virginia 23230

Dear Mr. Ellison:

Attached is a copy of the UST reporting from, sample map, sample analyses and disposal receipts for two underground storage tanks which were removed from the Army Aviation Support Facility site in Sandston, Virginia. These tanks were replaced with above ground tanks.

Soil samples exhibited total petroleum hydrocarbon concentrations well below the 100 ppm standard; therefore, soil was used on site as backfill.

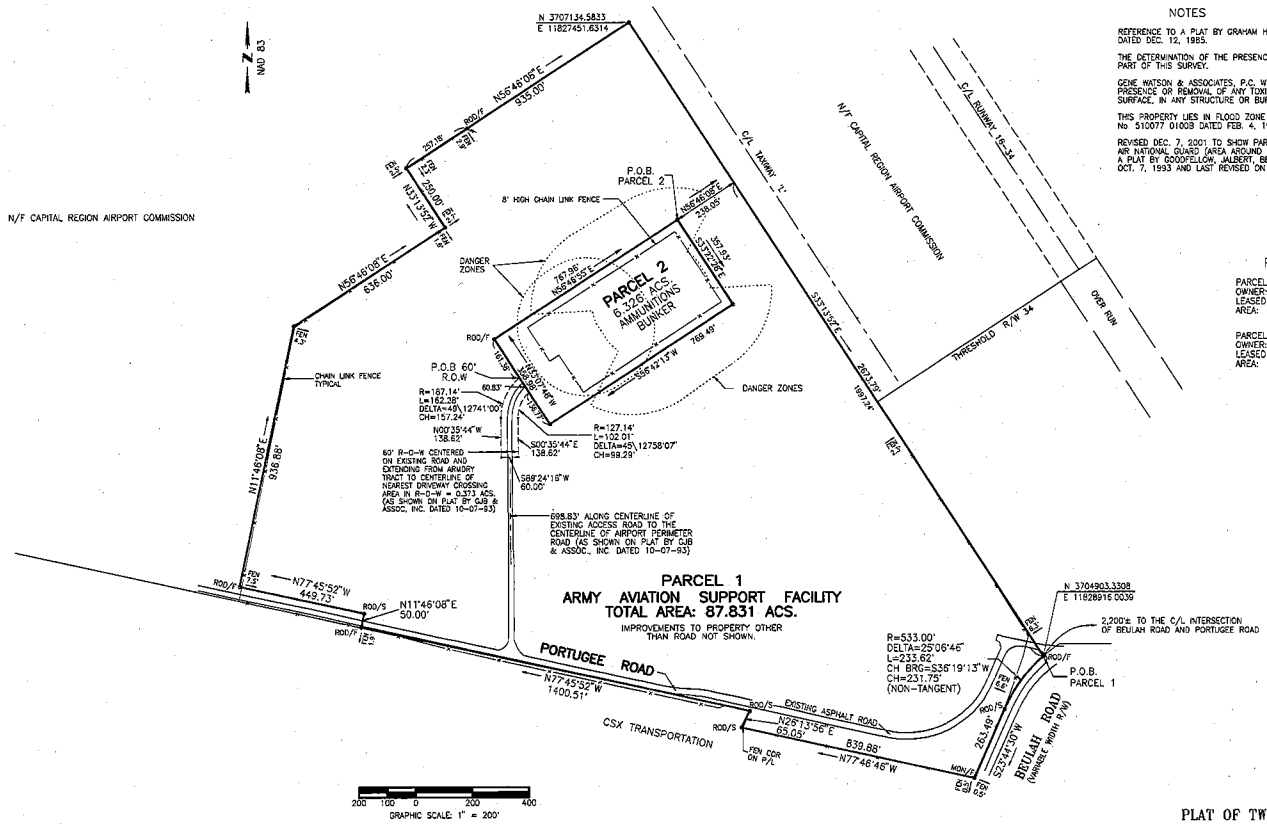
If you have any questions, please contact Mark Hodges or Eileen Williams at 804/225-4728.

Sincerely,

Lloyd R. Scott

Lloyd R. Scott
Colonel, Virginia National Guard
Assistant Chief of Staff
Facilities Engineering and
Management

cc: VWCB-UST Program, Richmond
Piedmont Regional Office




## NOTES

REFERENCE TO A PLAT BY GRAHAM HENDERSON & ASSOCIATES DATED DEC. 12, 1985.

THE DETERMINATION OF THE PRESENCE OF WETLANDS, IF ANY, WAS NOT A PART OF THIS SURVEY.

GENE WATSON & ASSOCIATES, P.C. WILL NOT BE RESPONSIBLE FOR THE PRESENCE OR REMOVAL OF ANY TOXIC WASTES OR MATERIALS ON THE SURFACE, IN ANY STRUCTURE OR BURIED BENEATH THE SURFACE.

THIS PROPERTY LIES IN FLOOD ZONE C AS SHOWN ON FEMA FLOOD MAP No 510077 0100B DATED FEB. 4, 1981

REVISED DEC. 7, 2001 TO SHOW PARCEL 2 LEASED AREA TO THE VIRGINIA AIR NATIONAL GUARD (AREA AROUND AMMUNITIONS BUNKER) REFERENCE TO A PLAT BY GOODFELLOW, JALBERT, BEARD, & ASSOCIATES, INC. DATED OCT. 7, 1993 AND LAST REVISED ON AUG. 28, 2001.

## PARCEL INFORMATION

PARCEL 1
OWNER: CAPITAL REGION AIRPORT COMMISSION
LEASED BY: VIRGINIA ARMY NATIONAL GUARD
AREA: 87.831 ACS.

PARCEL 2
OWNER: CAPITAL REGION AIRPORT COMMISSION
LEASED BY: VIRGINIA AIR NATIONAL GUARD
AREA: 6.326 ACS.

COMMONWEALTH OF VIRGINIA
GENE R. WATSON
NO.1635
LAND SURVEYOR

# PLAT OF TWO PARCELS OF LAND LEASED BY THE VIRGINIA ARMY NATIONAL GUARD AND THE VIRGINIA AIR NATIONAL GUARD LOCATED AT THE RICHMOND INTERNATIONAL AIRPORT IN THE VARINA DISTRICT, HENRICO COUNTY, VIRGINIA

SCALE: 1" = 200'

GENE WATSON & ASSOCIATES, P.C.
4221 BONNIE BANK RD
RICHMOND, VIRGINIA 23234
(804) 271-8038

JN 5283A

REV.: 04-02-02
REV.: 12-07-01
DATE: 11-07-01

FILE: HPT-5059A

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# APPENDIX D
## REGULATORY RECORDS DOCUMENTATION

EDR RADIUS MAP WITH GEOCHECK

# TABLE OF CONTENTS


| SECTION | PAGE |
|---|---|
| Executive Summary | ES1 |
| Overview Map | 2 |
| Detail Map | 3 |
| Map Findings Summary | 4 |
| Map Findings | 6 |
| Orphan Summary | 8 |
| Government Records Searched/Data Currency Tracking | GR-1 |

**GEOCHECK ADDENDUM**

| | |
|---|---|
| Physical Setting Source Addendum | A-1 |
| Physical Setting Source Summary | A-2 |
| Physical Setting SSURGO Soil Map | A-5 |
| Physical Setting Source Map | A-10 |
| Physical Setting Source Map Findings | A-11 |
| Physical Setting Source Records Searched | A-14 |


***Thank you for your business.***
Please contact EDR at 1-800-352-0050
with any questions or comments.


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# EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-05) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

## TARGET PROPERTY INFORMATION

### ADDRESS

BEULAH ROAD
SANDSTON, VA 23250

### COORDINATES

| | |
|---|---|
| Latitude (North): | 37.495740 - 37° 29' 44.7'' |
| Longitude (West): | 77.312850 - 77° 18' 46.3'' |
| Universal Tranverse Mercator: | Zone 18 |
| UTM X (Meters): | 295535.8 |
| UTM Y (Meters): | 4152177.0 |
| Elevation: | 158 ft. above sea level |

### USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

| | |
|---|---|
| Target Property Map: | 37077-D3 DUTCH GAP, VA |
| Most Recent Revision: | 1994 |
| North Map: | 37077-E3 SEVEN PINES, VA |
| Most Recent Revision: | 1994 |

### TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

### DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

### FEDERAL RECORDS

**NPL** ---------- National Priority List
**Proposed NPL** ---------- Proposed National Priority List Sites
**Delisted NPL** ---------- National Priority List Deletions
**NPL LIENS** ---------- Federal Superfund Liens
**CERCLIS** ---------- Comprehensive Environmental Response, Compensation, and Liability Information System
**CERC-NFRAP** ---------- CERCLIS No Further Remedial Action Planned
**LIENS 2** ---------- CERCLA Lien Information

# EXECUTIVE SUMMARY

**CORRACTS** Corrective Action Report
**RCRA-TSDF** RCRA - Transporters, Storage and Disposal
**RCRA-LQG** RCRA - Large Quantity Generators
**RCRA-SQG** RCRA - Small Quantity Generators
**RCRA-CESQG** RCRA - Conditionally Exempt Small Quantity Generator
**RCRA-NonGen** RCRA - Non Generators
**US ENG CONTROLS** Engineering Controls Sites List
**US INST CONTROL** Sites with Institutional Controls
**ERNS** Emergency Response Notification System
**HMIRS** Hazardous Materials Information Reporting System
**DOT OPS** Incident and Accident Data
**US CDL** Clandestine Drug Labs
**US BROWNFIELDS** A Listing of Brownfields Sites
**DOD** Department of Defense Sites
**FUDS** Formerly Used Defense Sites
**LUCIS** Land Use Control Information System
**CONSENT** Superfund (CERCLA) Consent Decrees
**ROD** Records Of Decision
**UMTRA** Uranium Mill Tailings Sites
**ODI** Open Dump Inventory
**DEBRIS REGION 9** Torres Martinez Reservation Illegal Dump Site Locations
**MINES** Mines Master Index File
**TRIS** Toxic Chemical Release Inventory System
**TSCA** Toxic Substances Control Act
**FTTS** FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
**HIST FTTS** FIFRA/TSCA Tracking System Administrative Case Listing
**SSTS** Section 7 Tracking Systems
**ICIS** Integrated Compliance Information System
**PADS** PCB Activity Database System
**MLTS** Material Licensing Tracking System
**RADINFO** Radiation Information Database
**FINDS** Facility Index System/Facility Registry System
**RAATS** RCRA Administrative Action Tracking System

**STATE AND LOCAL RECORDS**

**SHWS** This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.
**SWF/LF** Solid Waste Management Facilities
**UST** Registered Petroleum Storage Tanks
**AST** Registered Petroleum Storage Tanks
**SPILLS** Pollution Complaint Database
**ENG CONTROLS** Engineering Controls Sites Listing
**INST CONTROL** Voluntary Remediation Program Database
**VCP** Voluntary Remediation Program
**DRYCLEANERS** Drycleaner List
**BROWNFIELDS** Brownfields Site Specific Assessments
**ENF** Enforcement Actions Data
**NPDES** Comprehensive Environmental Data System
**AIRS** Permitted Airs Facility List

**TRIBAL RECORDS**

**INDIAN RESERV** Indian Reservations

# EXECUTIVE SUMMARY

**INDIAN ODI** Report on the Status of Open Dumps on Indian Lands
**INDIAN LUST** Leaking Underground Storage Tanks on Indian Land
**INDIAN UST** Underground Storage Tanks on Indian Land

**EDR PROPRIETARY RECORDS**

**Manufactured Gas Plants** EDR Proprietary Manufactured Gas Plants
**EDR Historical Auto Stations** EDR Proprietary Historic Gas Stations
**EDR Historical Cleaners** EDR Proprietary Historic Dry Cleaners

**SURROUNDING SITES: SEARCH RESULTS**

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

**STATE AND LOCAL RECORDS**

**LUST:** The Leaking Underground Storage Tank Database.

A review of the LUST list, as provided by EDR, and dated 05/18/2004 has revealed that there are 2 LUST sites within approximately 0.5 miles of the target property.

| Lower Elevation | Address | Dist / Dir | Map ID | Page |
|---|---|---|---|---|
| ***ELLEN JIM PROPERTY*** | ***3450 CHARLES CITY RD*** | ***1/4 - 1/2 SSW*** | ***1*** | ***6*** |
| MAZO LERCH COMPANY INC | 363 LERCH DR | 1/4 - 1/2 SSE | A2 | 6 |

**LTANKS:** The Leaking Tanks Database contains current Leaking petroleum tanks. The data comes from the Department of Environmental Quality.

A review of the LTANKS list, as provided by EDR, and dated 12/05/2007 has revealed that there are 2 LTANKS sites within approximately 0.5 miles of the target property.

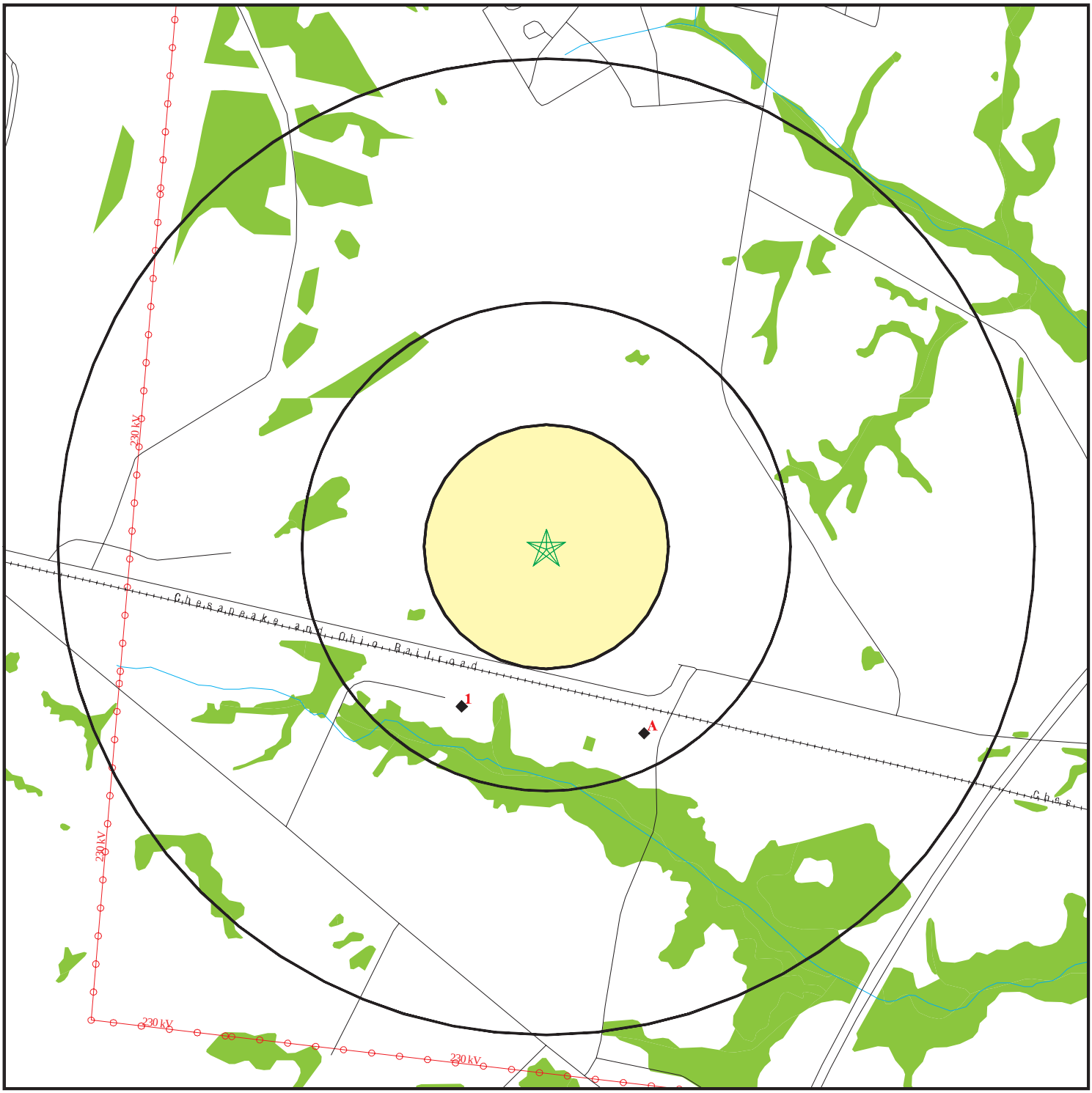
| Lower Elevation | Address | Dist / Dir | Map ID | Page |
|---|---|---|---|---|
| ***ELLEN JIM PROPERTY*** | ***3450 CHARLES CITY RD*** | ***1/4 - 1/2 SSW*** | ***1*** | ***6*** |
| Facility Status: Closed | | | | |
| ***MAZO LERCH CORPORATION*** | ***363 LERCH DR*** | ***1/4 - 1/2 SSE*** | ***A3*** | ***6*** |
| Facility Status: Closed | | | | |

# EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped:

| Site Name | Database(s) |
|---|---|
| VIRGINIA AIR NATIONAL GUARD BOWSER HOLDI | LUST |
| VIRGINIA AIR NATIONAL GUARD | LUST |
| AIR CARGO TERMINAL | HMIRS |
| AIR CARGO TERMINAL | HMIRS |
| VDOT TESTING FACILITY | SPILLS |

# OVERVIEW MAP - 2191780.2s




0 1/4 1/2 1 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Oil & Gas pipelines
- National Wetland Inventory

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

| | |
|---|---|
| SITE NAME: Air Guard Munitions Facility<br>ADDRESS: Beulah Road<br>Sandston VA 23250<br>LAT/LONG: 37.4957 / 77.3128 | CLIENT: EEE Consulting<br>CONTACT: Michael Easter<br>INQUIRY #: 2191780.2s<br>DATE: April 10, 2008 1:07 pm |

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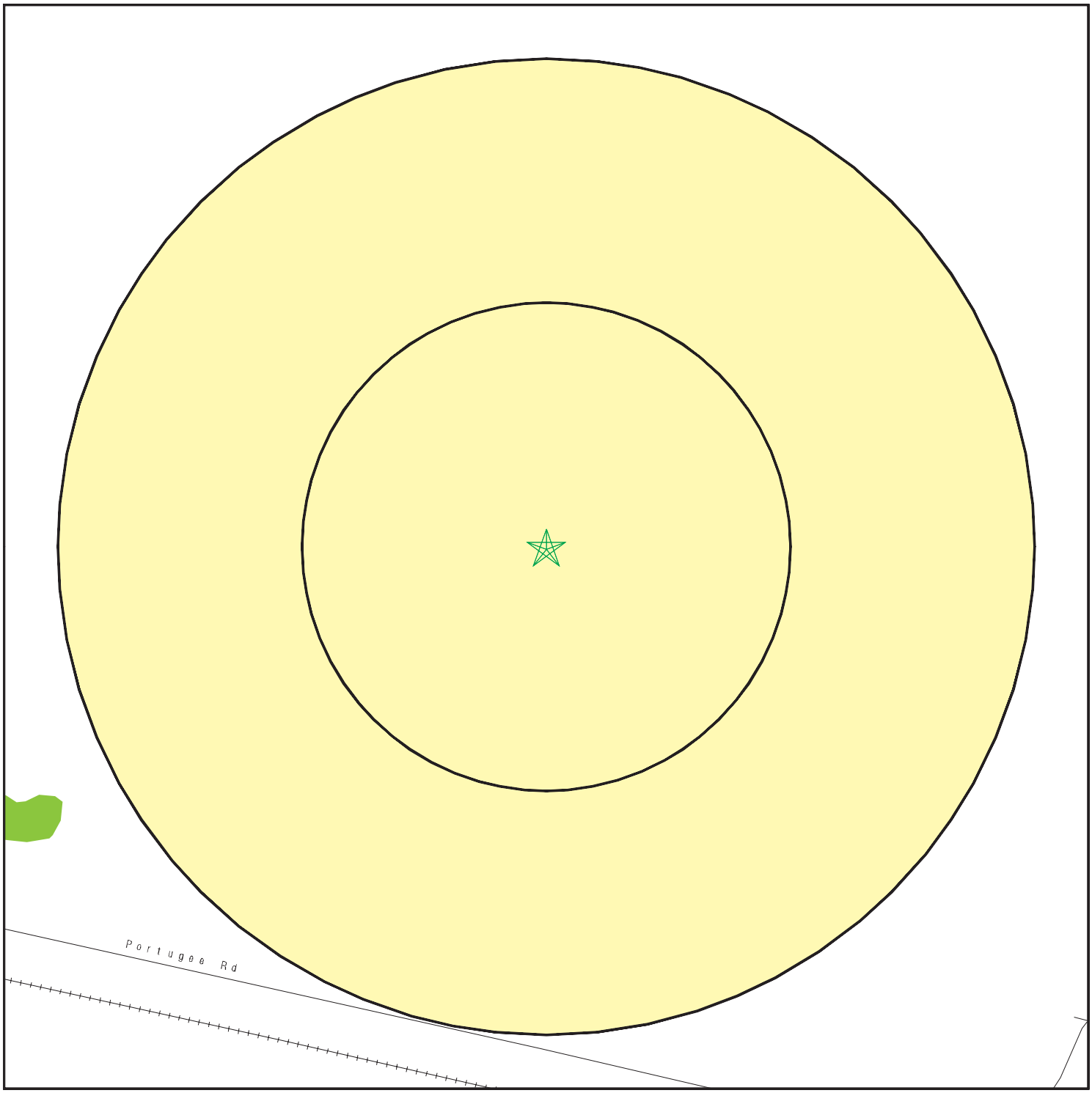
# DETAIL MAP - 2191780.2s




- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Oil & Gas pipelines
- National Wetland Inventory

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

| | |
|---|---|
| SITE NAME: Air Guard Munitions Facility | CLIENT: EEE Consulting |
| ADDRESS: Beulah Road<br>Sandston VA 23250 | CONTACT: Michael Easter<br>INQUIRY #: 2191780.2s |
| LAT/LONG: 37.4957 / 77.3128 | DATE: April 10, 2008 1:08 pm |

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# MAP FINDINGS SUMMARY

| Database | Target Property | Search Distance (Miles) | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| **FEDERAL RECORDS** | | | | | | | | |
| NPL | | 1.000 | 0 | 0 | 0 | 0 | NR | 0 |
| Proposed NPL | | 1.000 | 0 | 0 | 0 | 0 | NR | 0 |
| Delisted NPL | | 1.000 | 0 | 0 | 0 | 0 | NR | 0 |
| NPL LIENS | | TP | NR | NR | NR | NR | NR | 0 |
| CERCLIS | | 0.500 | 0 | 0 | 0 | NR | NR | 0 |
| CERC-NFRAP | | 0.500 | 0 | 0 | 0 | NR | NR | 0 |
| LIENS 2 | | TP | NR | NR | NR | NR | NR | 0 |
| CORRACTS | | 1.000 | 0 | 0 | 0 | 0 | NR | 0 |
| RCRA-TSDF | | 0.500 | 0 | 0 | 0 | NR | NR | 0 |
| RCRA-LQG | | 0.250 | 0 | 0 | NR | NR | NR | 0 |
| RCRA-SQG | | 0.250 | 0 | 0 | NR | NR | NR | 0 |
| RCRA-CESQG | | 0.250 | 0 | 0 | NR | NR | NR | 0 |
| RCRA-NonGen | | TP | NR | NR | NR | NR | NR | 0 |
| US ENG CONTROLS | | 0.500 | 0 | 0 | 0 | NR | NR | 0 |
| US INST CONTROL | | 0.500 | 0 | 0 | 0 | NR | NR | 0 |
| ERNS | | TP | NR | NR | NR | NR | NR | 0 |
| HMIRS | | TP | NR | NR | NR | NR | NR | 0 |
| DOT OPS | | TP | NR | NR | NR | NR | NR | 0 |
| US CDL | | TP | NR | NR | NR | NR | NR | 0 |
| US BROWNFIELDS | | 0.500 | 0 | 0 | 0 | NR | NR | 0 |
| DOD | | 1.000 | 0 | 0 | 0 | 0 | NR | 0 |
| FUDS | | 1.000 | 0 | 0 | 0 | 0 | NR | 0 |
| LUCIS | | 0.500 | 0 | 0 | 0 | NR | NR | 0 |
| CONSENT | | 1.000 | 0 | 0 | 0 | 0 | NR | 0 |
| ROD | | 1.000 | 0 | 0 | 0 | 0 | NR | 0 |
| UMTRA | | 0.500 | 0 | 0 | 0 | NR | NR | 0 |
| ODI | | 0.500 | 0 | 0 | 0 | NR | NR | 0 |
| DEBRIS REGION 9 | | 0.500 | 0 | 0 | 0 | NR | NR | 0 |
| MINES | | 0.250 | 0 | 0 | NR | NR | NR | 0 |
| TRIS | | TP | NR | NR | NR | NR | NR | 0 |
| TSCA | | TP | NR | NR | NR | NR | NR | 0 |
| FTTS | | TP | NR | NR | NR | NR | NR | 0 |
| HIST FTTS | | TP | NR | NR | NR | NR | NR | 0 |
| SSTS | | TP | NR | NR | NR | NR | NR | 0 |
| ICIS | | TP | NR | NR | NR | NR | NR | 0 |
| PADS | | TP | NR | NR | NR | NR | NR | 0 |
| MLTS | | TP | NR | NR | NR | NR | NR | 0 |
| RADINFO | | TP | NR | NR | NR | NR | NR | 0 |
| FINDS | | TP | NR | NR | NR | NR | NR | 0 |
| RAATS | | TP | NR | NR | NR | NR | NR | 0 |
| **STATE AND LOCAL RECORDS** | | | | | | | | |
| SHWS | | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| SWF/LF | | 0.500 | 0 | 0 | 0 | NR | NR | 0 |
| LUST | | 0.500 | 0 | 0 | 2 | NR | NR | 2 |
| LTANKS | | 0.500 | 0 | 0 | 2 | NR | NR | 2 |
| UST | | 0.250 | 0 | 0 | NR | NR | NR | 0 |

# MAP FINDINGS SUMMARY

| Database | Target Property | Search Distance (Miles) | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| AST | | 0.250 | 0 | 0 | NR | NR | NR | 0 |
| SPILLS | | TP | NR | NR | NR | NR | NR | 0 |
| ENG CONTROLS | | 0.500 | 0 | 0 | 0 | NR | NR | 0 |
| INST CONTROL | | 0.500 | 0 | 0 | 0 | NR | NR | 0 |
| VCP | | 0.500 | 0 | 0 | 0 | NR | NR | 0 |
| DRYCLEANERS | | 0.250 | 0 | 0 | NR | NR | NR | 0 |
| BROWNFIELDS | | 0.500 | 0 | 0 | 0 | NR | NR | 0 |
| ENF | | TP | NR | NR | NR | NR | NR | 0 |
| NPDES | | TP | NR | NR | NR | NR | NR | 0 |
| AIRS | | TP | NR | NR | NR | NR | NR | 0 |
| **TRIBAL RECORDS** | | | | | | | | |
| INDIAN RESERV | | 1.000 | 0 | 0 | 0 | 0 | NR | 0 |
| INDIAN ODI | | 0.500 | 0 | 0 | 0 | NR | NR | 0 |
| INDIAN LUST | | 0.500 | 0 | 0 | 0 | NR | NR | 0 |
| INDIAN UST | | 0.250 | 0 | 0 | NR | NR | NR | 0 |
| **EDR PROPRIETARY RECORDS** | | | | | | | | |
| Manufactured Gas Plants | | 1.000 | 0 | 0 | 0 | 0 | NR | 0 |
| EDR Historical Auto Stations | | 0.250 | 0 | 0 | NR | NR | NR | 0 |
| EDR Historical Cleaners | | 0.250 | 0 | 0 | NR | NR | NR | 0 |

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

N/A = This State does not maintain a SHWS list. See the Federal CERCLIS list.

**1**
**SSW**
**1/4-1/2**
**0.370 mi.**
**1953 ft.**

**ELLEN JIM PROPERTY** — **LUST** **S105623806**
**3450 CHARLES CITY RD** — **LTANKS** **N/A**
**RICHMOND, VA 23231**

**Relative:**
**Lower**

**Actual:**
**150 ft.**

LUST:
Region: PD
Pollution Complaint #: 20034171
**Status: Closed**
Reg Code: PRO

LTANKS:
CEDS Facility Id: 200000208347
Pollution Complaint #: 20034171
Reported: 29-Oct-2002
**Case Status: Closed**

---

**A2**
**SSE**
**1/4-1/2**
**0.431 mi.**
**2278 ft.**

**MAZO LERCH COMPANY INC** — **LUST** **S103837304**
**363 LERCH DR** — **N/A**
**SANDSTON, VA 23150**

**Site 1 of 2 in cluster A**

**Relative:**
**Lower**

**Actual:**
**151 ft.**

LUST:
Region: PD
Pollution Complaint #: 19911663
**Status: Closed**
Reg Code: PRO

---

**A3**
**SSE**
**1/4-1/2**
**0.431 mi.**
**2278 ft.**

**MAZO LERCH CORPORATION** — **UST** **U003683504**
**363 LERCH DR** — **LTANKS** **N/A**
**SANDSTON, VA 23150**

**Site 2 of 2 in cluster A**

**Relative:**
**Lower**

**Actual:**
**151 ft.**

UST:

Facility:
Facility Id: 4004129
CEDS Facility ID: 200000163138
Facility Type: COMMERCIAL
UST Status: Not reported
AST Status: Not reported
Owner ID: 31293
Owner Name: MAZO-LERCH COMPANY, INC
Owner Address: 3100 Big Beaver Rd
Owner Address 2: Not reported
Owner City,St,Zip: Troy, MI 48084

Federally Regulated: Yes
Tank Number: 3
Tank Capacity: 10000
Tank Contents: DIESEL
**Tank Status: CURR IN USE**
Tank Type: UST

Federally Regulated: Yes

**MAZO LERCH CORPORATION (Continued)** **U003683504**

Tank Number: R1
Tank Capacity: 4000
Tank Contents: DIESEL
**Tank Status: REM FROM GRD**
Tank Type: UST

Federally Regulated: Yes
Tank Number: R2
Tank Capacity: 4000
Tank Contents: DIESEL
**Tank Status: REM FROM GRD**
Tank Type: UST

LTANKS:
CEDS Facility Id: 200000163138
Pollution Complaint #: 19911663
Reported: 23-May-1991
**Case Status: Closed**

ORPHAN SUMMARY

| City | EDR ID | Site Name | Site Address | Zip | Database(s) |
|---|---|---|---|---|---|
| HENRICO COUNTY | S105383730 | VDOT TESTING FACILITY | 6200 ELKO TRACT ROAD | | SPILLS |
| SANDSTON | 2007705895 | AIR CARGO TERMINAL | AIR CARGO TERMINAL | | HMIRS |
| SANDSTON | 2005700030 | AIR CARGO TERMINAL | AIR CARGO TERMINAL | | HMIRS |
| SANDSTON | S106059389 | VIRGINIA AIR NATIONAL GUARD BOWSER HOLDI | 192 FIGHTER GROUP | 23150 | LUST |
| SANDSTON | S105984176 | VIRGINIA AIR NATIONAL GUARD | 192 FIGHTER GROUP | 23150 | LUST |

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

**Number of Days to Update:** Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

## FEDERAL RECORDS

**NPL:** National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 01/31/2008
Date Data Arrived at EDR: 02/08/2008
Date Made Active in Reports: 03/17/2008
Number of Days to Update: 38

Source: EPA
Telephone: N/A
Last EDR Contact: 01/28/2008
Next Scheduled EDR Contact: 04/28/2008
Data Release Frequency: Quarterly

**NPL Site Boundaries**

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 3
Telephone 215-814-5418

EPA Region 4
Telephone 404-562-8033

EPA Region 5
Telephone 312-886-6686

EPA Region 10
Telephone 206-553-8665

EPA Region 6
Telephone: 214-655-6659

EPA Region 7
Telephone: 913-551-7247

EPA Region 8
Telephone: 303-312-6774

EPA Region 9
Telephone: 415-947-4246

**Proposed NPL:** Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 01/31/2008
Date Data Arrived at EDR: 02/04/2008
Date Made Active in Reports: 03/17/2008
Number of Days to Update: 42

Source: EPA
Telephone: N/A
Last EDR Contact: 01/28/2008
Next Scheduled EDR Contact: 04/28/2008
Data Release Frequency: Quarterly

**DELISTED NPL:** National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 01/31/2008
Date Data Arrived at EDR: 02/08/2008
Date Made Active in Reports: 03/17/2008
Number of Days to Update: 38

Source: EPA
Telephone: N/A
Last EDR Contact: 01/28/2008
Next Scheduled EDR Contact: 04/28/2008
Data Release Frequency: Quarterly

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

**NPL LIENS:** Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 02/19/2008
Next Scheduled EDR Contact: 05/19/2008
Data Release Frequency: No Update Planned

**CERCLIS:** Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 01/09/2008
Date Data Arrived at EDR: 02/05/2008
Date Made Active in Reports: 02/20/2008
Number of Days to Update: 15

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 03/20/2008
Next Scheduled EDR Contact: 06/16/2008
Data Release Frequency: Quarterly

**CERCLIS-NFRAP:** CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 12/03/2007
Date Data Arrived at EDR: 12/06/2007
Date Made Active in Reports: 02/20/2008
Number of Days to Update: 76

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 03/17/2008
Next Scheduled EDR Contact: 06/16/2008
Data Release Frequency: Quarterly

**LIENS 2:** CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/08/2008
Date Data Arrived at EDR: 03/07/2008
Date Made Active in Reports: 03/20/2008
Number of Days to Update: 13

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 02/15/2008
Next Scheduled EDR Contact: 05/19/2008
Data Release Frequency: Varies

**CORRACTS:** Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 12/12/2007
Date Data Arrived at EDR: 12/18/2007
Date Made Active in Reports: 02/20/2008
Number of Days to Update: 64

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 03/03/2008
Next Scheduled EDR Contact: 06/02/2008
Data Release Frequency: Quarterly

**RCRA-TSDF:** RCRA - Transporters, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 09/11/2007
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 12/28/2007
Number of Days to Update: 25

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 03/06/2008
Next Scheduled EDR Contact: 05/19/2008
Data Release Frequency: Quarterly

**RCRA-LQG:** RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/11/2007
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 12/28/2007
Number of Days to Update: 25

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 03/06/2008
Next Scheduled EDR Contact: 05/19/2008
Data Release Frequency: Quarterly

**RCRA-SQG:** RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 09/11/2007
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 12/28/2007
Number of Days to Update: 25

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 03/06/2008
Next Scheduled EDR Contact: 05/19/2008
Data Release Frequency: Quarterly

**RCRA-CESQG:** RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/11/2007
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 12/28/2007
Number of Days to Update: 25

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 03/06/2008
Next Scheduled EDR Contact: 05/19/2008
Data Release Frequency: Varies

**RCRA-NonGen:** RCRA - Non Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 09/11/2007
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 12/28/2007
Number of Days to Update: 25

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 03/06/2008
Next Scheduled EDR Contact: 05/19/2008
Data Release Frequency: Varies

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

**US ENG CONTROLS:** Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 01/18/2008
Date Data Arrived at EDR: 01/31/2008
Date Made Active in Reports: 03/17/2008
Number of Days to Update: 46

Source: Environmental Protection Agency
Telephone: 703-603-8905
Last EDR Contact: 03/31/2008
Next Scheduled EDR Contact: 06/30/2008
Data Release Frequency: Varies

**US INST CONTROL:** Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 01/18/2008
Date Data Arrived at EDR: 01/31/2008
Date Made Active in Reports: 03/17/2008
Number of Days to Update: 46

Source: Environmental Protection Agency
Telephone: 703-603-8905
Last EDR Contact: 03/31/2008
Next Scheduled EDR Contact: 06/30/2008
Data Release Frequency: Varies

**ERNS:** Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/2007
Date Data Arrived at EDR: 01/23/2008
Date Made Active in Reports: 03/17/2008
Number of Days to Update: 54

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 01/23/2008
Next Scheduled EDR Contact: 04/21/2008
Data Release Frequency: Annually

**HMIRS:** Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 10/31/2007
Date Data Arrived at EDR: 01/17/2008
Date Made Active in Reports: 03/17/2008
Number of Days to Update: 60

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 01/17/2008
Next Scheduled EDR Contact: 04/14/2008
Data Release Frequency: Annually

**DOT OPS:** Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 02/14/2008
Date Data Arrived at EDR: 02/27/2008
Date Made Active in Reports: 03/20/2008
Number of Days to Update: 22

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 02/27/2008
Next Scheduled EDR Contact: 05/26/2008
Data Release Frequency: Varies

**CDL:** Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 09/01/2007
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 12/28/2007
Number of Days to Update: 25

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/28/2008
Next Scheduled EDR Contact: 06/23/2008
Data Release Frequency: Quarterly

**US BROWNFIELDS:** A Listing of Brownfields Sites

Included in the listing are brownfields properties addresses by Cooperative Agreement Recipients and brownfields properties addressed by Targeted Brownfields Assessments. Targeted Brownfields Assessments-EPA's Targeted Brownfields Assessments (TBA) program is designed to help states, tribes, and municipalities--especially those without EPA Brownfields Assessment Demonstration Pilots--minimize the uncertainties of contamination often associated with brownfields. Under the TBA program, EPA provides funding and/or technical assistance for environmental assessments at brownfields sites throughout the country. Targeted Brownfields Assessments supplement and work with other efforts under EPA's Brownfields Initiative to promote cleanup and redevelopment of brownfields. Cooperative Agreement Recipients-States, political subdivisions, territories, and Indian tribes become Brownfields Cleanup Revolving Loan Fund (BCRLF) cooperative agreement recipients when they enter into BCRLF cooperative agreements with the U.S. EPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process. BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities.

Date of Government Version: 01/03/2008
Date Data Arrived at EDR: 01/17/2008
Date Made Active in Reports: 02/20/2008
Number of Days to Update: 34

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 01/17/2008
Next Scheduled EDR Contact: 03/10/2008
Data Release Frequency: Semi-Annually

**DOD:** Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 703-692-8801
Last EDR Contact: 02/08/2008
Next Scheduled EDR Contact: 05/05/2008
Data Release Frequency: Semi-Annually

**FUDS:** Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/2006
Date Data Arrived at EDR: 08/31/2007
Date Made Active in Reports: 10/11/2007
Number of Days to Update: 41

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 04/03/2008
Next Scheduled EDR Contact: 06/30/2008
Data Release Frequency: Varies

**LUCIS:** Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 12/09/2005
Date Data Arrived at EDR: 12/11/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 31

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 03/10/2008
Next Scheduled EDR Contact: 06/09/2008
Data Release Frequency: Varies

**CONSENT:** Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 09/01/2007
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 12/28/2007
Number of Days to Update: 25

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 01/21/2008
Next Scheduled EDR Contact: 04/21/2008
Data Release Frequency: Varies

**ROD:** Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 01/14/2008
Date Data Arrived at EDR: 01/22/2008
Date Made Active in Reports: 01/30/2008
Number of Days to Update: 8

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 03/31/2008
Next Scheduled EDR Contact: 06/30/2008
Data Release Frequency: Annually

**UMTRA:** Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 07/13/2007
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 03/17/2008
Next Scheduled EDR Contact: 06/16/2008
Data Release Frequency: Varies

**DEBRIS REGION 9:** Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 12/28/2007
Date Data Arrived at EDR: 12/28/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 27

Source: EPA, Region 9
Telephone: 415-972-3336
Last EDR Contact: 03/24/2008
Next Scheduled EDR Contact: 06/23/2008
Data Release Frequency: Varies

**ODI:** Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

**MINES:** Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 11/20/2007
Date Data Arrived at EDR: 01/03/2008
Date Made Active in Reports: 02/20/2008
Number of Days to Update: 48

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 03/26/2008
Next Scheduled EDR Contact: 06/23/2008
Data Release Frequency: Semi-Annually

**TRIS:** Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 04/27/2007
Date Made Active in Reports: 07/05/2007
Number of Days to Update: 69

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 02/29/2008
Next Scheduled EDR Contact: 06/16/2008
Data Release Frequency: Annually

**TSCA:** Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2002
Date Data Arrived at EDR: 04/14/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 46

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 01/28/2008
Next Scheduled EDR Contact: 04/14/2008
Data Release Frequency: Every 4 Years

**FTTS:** FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 01/15/2008
Date Data Arrived at EDR: 01/22/2008
Date Made Active in Reports: 01/30/2008
Number of Days to Update: 8

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 03/17/2008
Next Scheduled EDR Contact: 06/16/2008
Data Release Frequency: Quarterly

**FTTS INSP:** FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 01/15/2008
Date Data Arrived at EDR: 01/22/2008
Date Made Active in Reports: 01/30/2008
Number of Days to Update: 8

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 03/17/2008
Next Scheduled EDR Contact: 06/16/2008
Data Release Frequency: Quarterly

**HIST FTTS:** FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

**HIST FTTS INSP:** FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

**SSTS:** Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 03/13/2007
Date Made Active in Reports: 04/27/2007
Number of Days to Update: 45

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 01/28/2008
Next Scheduled EDR Contact: 04/14/2008
Data Release Frequency: Annually

**ICIS:** Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 07/27/2007
Date Data Arrived at EDR: 08/13/2007
Date Made Active in Reports: 10/11/2007
Number of Days to Update: 59

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 02/07/2008
Next Scheduled EDR Contact: 04/14/2008
Data Release Frequency: Quarterly

**PADS:** PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 12/04/2007
Date Data Arrived at EDR: 02/07/2008
Date Made Active in Reports: 03/17/2008
Number of Days to Update: 39

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 02/07/2008
Next Scheduled EDR Contact: 05/05/2008
Data Release Frequency: Annually

**MLTS:** Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 01/15/2008
Date Data Arrived at EDR: 02/07/2008
Date Made Active in Reports: 03/17/2008
Number of Days to Update: 39

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 03/31/2008
Next Scheduled EDR Contact: 06/30/2008
Data Release Frequency: Quarterly

**RADINFO:** Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 01/29/2008
Date Data Arrived at EDR: 01/31/2008
Date Made Active in Reports: 03/17/2008
Number of Days to Update: 46

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 01/31/2008
Next Scheduled EDR Contact: 04/28/2008
Data Release Frequency: Quarterly

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

**FINDS:** Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 01/04/2008
Date Data Arrived at EDR: 01/10/2008
Date Made Active in Reports: 02/20/2008
Number of Days to Update: 41

Source: EPA
Telephone: (215) 814-5000
Last EDR Contact: 03/31/2008
Next Scheduled EDR Contact: 06/30/2008
Data Release Frequency: Quarterly

**RAATS:** RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 03/03/2008
Next Scheduled EDR Contact: 06/02/2008
Data Release Frequency: No Update Planned

**BRS:** Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 03/06/2007
Date Made Active in Reports: 04/13/2007
Number of Days to Update: 38

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 03/13/2008
Next Scheduled EDR Contact: 06/09/2008
Data Release Frequency: Biennially

**STATE AND LOCAL RECORDS**

**SHWS:** This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: Department of Environmental Quality
Telephone: 804-698-4236
Last EDR Contact: 01/15/2008
Next Scheduled EDR Contact: 04/14/2008
Data Release Frequency: N/A

**SWF/LF:** Solid Waste Management Facilities

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 04/03/2007
Date Data Arrived at EDR: 04/04/2007
Date Made Active in Reports: 05/04/2007
Number of Days to Update: 30

Source: Department of Environmental Quality
Telephone: 804-698-4238
Last EDR Contact: 03/31/2008
Next Scheduled EDR Contact: 06/30/2008
Data Release Frequency: Quarterly

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

**LUST REG NO:** Leaking Underground Storage Tank Tracking Database

Leaking underground storage tank site locations. Includes: counties of Arlington, Caroline, Culpeper, Fairfax, Fauquier, King George, Loudoun, Louisa, Madison, Orange, Prince William, Rappahannock, Spotsylvania, Stafford; cities of Alexandria, Fairfax, Falls Church, Fredericksburg, Manassas, Manassas Park.

Date of Government Version: 05/18/2004
Date Data Arrived at EDR: 05/22/2004
Date Made Active in Reports: 07/09/2004
Number of Days to Update: 48

Source: Department of Environmental Quality Northern Regional Office
Telephone: 703-583-3800
Last EDR Contact: 03/24/2008
Next Scheduled EDR Contact: 06/23/2008
Data Release Frequency: No Update Planned

**LUST REG PD:** Leaking Underground Storage Tank Sites

Leaking underground storage tank site locaitons. Includes: counties of Amelia, Brunswick, Charles City, Chesterfield, Dinwiddie, Essex, Gloucester, Goochland, Greensville, Hanover, Henrico, King and Queen, King William, Lancaster, Mathews, Middlesex, New Kent, Northumberland, Powhatan, Prince George, Richmond, Surry, Sussex, Westmoreland; cities of Colonial Heights, Emporia, Hopewell, Petersburg.

Date of Government Version: 02/11/2008
Date Data Arrived at EDR: 02/12/2008
Date Made Active in Reports: 03/18/2008
Number of Days to Update: 35

Source: Department of Environmental Quality Piedmont Regional Office
Telephone: 804-527-5020
Last EDR Contact: 02/25/2008
Next Scheduled EDR Contact: 05/26/2008
Data Release Frequency: Quarterly

**LUST REG SC:** Leaking Underground Storage Tanks

Leaking underground storage tank site locations. Includes: counties of Amherst, Appomattox, Buckingham, Campbell, Charlotte, Cumberland, Halifax, Lunenburg, Mecklenburg, Nottoway, Pittsylvania, Prince Deward; cities of Danville, Lynchburg.

Date of Government Version: 01/15/2008
Date Data Arrived at EDR: 01/16/2008
Date Made Active in Reports: 01/31/2008
Number of Days to Update: 15

Source: Department of Environmental Quality, South Central Region
Telephone: 434-582-5120
Last EDR Contact: 03/24/2008
Next Scheduled EDR Contact: 06/23/2008
Data Release Frequency: Semi-Annually

**LUST REG SW:** Leaking Underground Storage Tank Database

Leaking underground storage tank site locations. Includes: counties of Bland, Buchanan, Carroll, Dickenson, Grayson, Lee, Russell, Scott, Smyth, Tazewell, Washington, Wise, Wythe; cities of Bristol, Galax, Norton.

Date of Government Version: 02/25/2008
Date Data Arrived at EDR: 02/28/2008
Date Made Active in Reports: 03/18/2008
Number of Days to Update: 19

Source: Department of Environmental Quality Southwest Regional Office
Telephone: 276-676-4800
Last EDR Contact: 02/04/2008
Next Scheduled EDR Contact: 05/05/2008
Data Release Frequency: No Update Planned

**LUST REG TD:** Leaking Underground Storage Tank Sites

Leaking underground storage tank site locations. Includes: counties of Accomack, Isle of Wight, James City, Northampton, Southampton, York; cities of Chesapeake, Franklin, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, Williamsburg.

Date of Government Version: 12/31/2007
Date Data Arrived at EDR: 01/03/2008
Date Made Active in Reports: 01/31/2008
Number of Days to Update: 28

Source: Department of Environmental Quality Tidewater Regional Office
Telephone: 757-518-2198
Last EDR Contact: 03/24/2008
Next Scheduled EDR Contact: 06/23/2008
Data Release Frequency: Quarterly

**LUST REG VA:** Leaking Underground Storage Tank List

Leaking underground storage tank site locations. Includes: counties of Albemarle, Augusta, Bath, Clarke, Fluvanna, Frederick, Greene, Highland, Nelson, Page, Rockbridge, Rockingham, Shenandoah, Warren; cities of Buena Vista, Charlottesville, Harrisonburg, Lexington, Staunton, Waynesboro, Winchester.

Date of Government Version: 08/01/2001
Date Data Arrived at EDR: 08/22/2001
Date Made Active in Reports: 09/19/2001
Number of Days to Update: 28

Source: Department of Environmental Quality Valley Regional Office
Telephone: 540-574-7800
Last EDR Contact: 03/24/2008
Next Scheduled EDR Contact: 06/23/2008
Data Release Frequency: No Update Planned

**LUST REG WC:** Leaking Underground Storage Tank List

Leaking underground storage tank site locations. Includes: counties of Alleghany, Bedford, Botetourt, Craig, Floyd, Franklin, Giles, Henry, Montgomery, Patrick, Pulaski, Roanoke; cities of Bedford, Clifton Forge, Covington, Martinsville, Radford, Roanoke, Salem.

Date of Government Version: 12/31/2007
Date Data Arrived at EDR: 01/16/2008
Date Made Active in Reports: 01/31/2008
Number of Days to Update: 15

Source: Department of Environmental Quality West Central Regional Office
Telephone: 540-562-6700
Last EDR Contact: 03/24/2008
Next Scheduled EDR Contact: 06/23/2008
Data Release Frequency: No Update Planned

**LTANKS:** Leaking Petroleum Storage Tanks

Includes releases of petroleum from underground storage tanks and aboveground storage tanks.

Date of Government Version: 12/05/2007
Date Data Arrived at EDR: 01/03/2008
Date Made Active in Reports: 02/14/2008
Number of Days to Update: 42

Source: Department of Environmental Quality
Telephone: Please call the
Last EDR Contact: 03/26/2008
Next Scheduled EDR Contact: 06/23/2008
Data Release Frequency: Quarterly

**UST:** Registered Petroleum Storage Tanks

Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 12/06/2007
Date Data Arrived at EDR: 01/03/2008
Date Made Active in Reports: 02/08/2008
Number of Days to Update: 36

Source: Department of Environmental Quality
Telephone: 804-527-5249
Last EDR Contact: 03/26/2008
Next Scheduled EDR Contact: 06/23/2008
Data Release Frequency: Semi-Annually

**AST:** Registered Petroleum Storage Tanks

Registered Aboveground Storage Tanks.

Date of Government Version: 12/06/2007
Date Data Arrived at EDR: 01/03/2008
Date Made Active in Reports: 02/08/2008
Number of Days to Update: 36

Source: Department of Environmental Quality
Telephone: 804-698-4317
Last EDR Contact: 03/26/2008
Next Scheduled EDR Contact: 06/23/2008
Data Release Frequency: Semi-Annually

**SPILLS VA:** PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 12/29/2007
Date Data Arrived at EDR: 02/07/2008
Date Made Active in Reports: 02/14/2008
Number of Days to Update: 7

Source: Department of Environmental Quality, Valley Regional Office
Telephone: 540-574-7800
Last EDR Contact: 03/24/2008
Next Scheduled EDR Contact: 06/23/2008
Data Release Frequency: Quarterly

**SPILLS TD:** PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 12/11/2007
Date Data Arrived at EDR: 01/22/2008
Date Made Active in Reports: 01/31/2008
Number of Days to Update: 9

Source: Department of Environmental Quality, Tidewater Region
Telephone: 757-518-2177
Last EDR Contact: 03/24/2008
Next Scheduled EDR Contact: 06/23/2008
Data Release Frequency: Quarterly

**SPILLS PD:** PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 04/25/2002
Date Data Arrived at EDR: 05/01/2002
Date Made Active in Reports: 05/31/2002
Number of Days to Update: 30

Source: Department of Environmental Quality, Piedmont Region
Telephone: 804-527-5020
Last EDR Contact: 03/10/2008
Next Scheduled EDR Contact: 05/26/2008
Data Release Frequency: Quarterly

**SPILLS WC:** Prep Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 01/09/2008
Date Data Arrived at EDR: 01/30/2008
Date Made Active in Reports: 02/14/2008
Number of Days to Update: 15

Source: Department of Environmental Quality, West Central Region
Telephone: 540-562-6700
Last EDR Contact: 03/24/2008
Next Scheduled EDR Contact: 06/23/2008
Data Release Frequency: No Update Planned

**SPILLS SW:** Reportable Spills

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 02/25/2008
Date Data Arrived at EDR: 02/28/2008
Date Made Active in Reports: 03/18/2008
Number of Days to Update: 19

Source: Department of Environmental Quality, Southwest Region
Telephone: 276-676-4839
Last EDR Contact: 02/04/2008
Next Scheduled EDR Contact: 05/05/2008
Data Release Frequency: No Update Planned

**SPILLS NO:** PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 01/14/2008
Date Data Arrived at EDR: 01/25/2008
Date Made Active in Reports: 01/31/2008
Number of Days to Update: 6

Source: Department of Environmental Quality, Northern Region
Telephone: 703-583-3864
Last EDR Contact: 03/24/2008
Next Scheduled EDR Contact: 06/23/2008
Data Release Frequency: No Update Planned

**SPILLS:** Pollution Complaint Database

Pollution Complaints Database. The pollution reports contained in the PC database include the initial release reporting of Leaking Underground Storage Tanks and all other releases of petroleum to the environment as well as releases to state waters. The database is current through 12/1/93. Since that time, all spill and pollution reporting information has been collected and tracked through the DEQ regional offices.

Date of Government Version: 06/01/1996
Date Data Arrived at EDR: 10/22/1996
Date Made Active in Reports: 11/21/1996
Number of Days to Update: 30

Source: Department of Environmental Quality
Telephone: 804-698-4297
Last EDR Contact: 09/25/1996
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

**ENG CONTROLS:** Engineering Controls Sites Listing

A listing of sites with Engineering Controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 01/23/2008
Date Data Arrived at EDR: 01/25/2008
Date Made Active in Reports: 01/31/2008
Number of Days to Update: 6

Source: Department of Environmental Quality
Telephone: 804-698-4228
Last EDR Contact: 01/22/2008
Next Scheduled EDR Contact: 04/21/2008
Data Release Frequency: Quarterly

**INST CONTROL:** Voluntary Remediation Program Database
Sites included in the Voluntary Remediation Program database that have deed restrictions.

Date of Government Version: 01/23/2008
Date Data Arrived at EDR: 01/25/2008
Date Made Active in Reports: 01/31/2008
Number of Days to Update: 6

Source: Department of Environmental Quality
Telephone: 804-698-4228
Last EDR Contact: 01/22/2008
Next Scheduled EDR Contact: 04/21/2008
Data Release Frequency: Quarterly

**VRP:** Voluntary Remediation Program
The Voluntary Cleanup Program encourages owners of elected contaminated sites to take the initiative and conduct voluntary cleanups that meet state environmental standards.

Date of Government Version: 01/23/2008
Date Data Arrived at EDR: 01/25/2008
Date Made Active in Reports: 01/31/2008
Number of Days to Update: 6

Source: Department of Environmental Quality
Telephone: 804-698-4228
Last EDR Contact: 01/22/2008
Next Scheduled EDR Contact: 04/21/2008
Data Release Frequency: Quarterly

**DRYCLEANERS:** Drycleaner List
A listing of registered drycleaners.

Date of Government Version: 01/31/2008
Date Data Arrived at EDR: 02/01/2008
Date Made Active in Reports: 02/14/2008
Number of Days to Update: 13

Source: Department of Environmental Quality
Telephone: 804-698-4407
Last EDR Contact: 03/24/2008
Next Scheduled EDR Contact: 06/23/2008
Data Release Frequency: Varies

**BROWNFIELDS:** Brownfields Site Specific Assessments
To qualify for Brownfields Assessment, the site must meet the Federal definition of a Brownfields and should have contaminant issues that need to be addressed and a redevelopment plan supported by the local government and community. Virginia's Department of Environmental Quality performs brownfields assessments under a cooperative agreement with the U.S. Environmental Protection Agency at no cost to communities, property owners or, prospective purchasers. The assessment is an evaluation of environmental impacts caused by previous site uses similar to a Phase II Environmental Assessment.

Date of Government Version: 12/13/2007
Date Data Arrived at EDR: 01/07/2008
Date Made Active in Reports: 01/31/2008
Number of Days to Update: 24

Source: Department of Environmental Quality
Telephone: 804-698-4207
Last EDR Contact: 03/17/2008
Next Scheduled EDR Contact: 05/19/2008
Data Release Frequency: Varies

**ENFORCEMENT:** Enforcement Actions Data
A listing of enforcement actions.

Date of Government Version: 12/21/2007
Date Data Arrived at EDR: 01/30/2008
Date Made Active in Reports: 02/14/2008
Number of Days to Update: 15

Source: Department of Environmental Quality
Telephone: 804-698-4031
Last EDR Contact: 03/31/2008
Next Scheduled EDR Contact: 06/30/2008
Data Release Frequency: Varies

**CEDS:** Comprehensive Environmental Data System
Virginia Water Protection Permits, Virginia Pollution Discharge System (point discharge) permits and Virginia Pollution Abatement (no point discharge) permits.

Date of Government Version: 01/08/2008
Date Data Arrived at EDR: 01/10/2008
Date Made Active in Reports: 01/31/2008
Number of Days to Update: 21

Source: Department of Environmental Quality
Telephone: 804-698-4077
Last EDR Contact: 03/31/2008
Next Scheduled EDR Contact: 06/30/2008
Data Release Frequency: Semi-Annually

**AIRS:** Permitted Airs Facility List
A listing of permitted Airs facilities.

Date of Government Version: 01/03/2008
Date Data Arrived at EDR: 01/04/2008
Date Made Active in Reports: 01/31/2008
Number of Days to Update: 27

Source: Department of Environmental Quality
Telephone: 804-698-4000
Last EDR Contact: 03/24/2008
Next Scheduled EDR Contact: 06/23/2008
Data Release Frequency: Varies

**TRIBAL RECORDS**

**INDIAN RESERV:** Indian Reservations
This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 02/08/2008
Next Scheduled EDR Contact: 05/05/2008
Data Release Frequency: Semi-Annually

**INDIAN ODI:** Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 02/25/2008
Next Scheduled EDR Contact: 05/26/2008
Data Release Frequency: Varies

**INDIAN LUST R8:** Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 02/20/2008
Date Data Arrived at EDR: 03/04/2008
Date Made Active in Reports: 03/17/2008
Number of Days to Update: 13

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 02/15/2008
Next Scheduled EDR Contact: 05/19/2008
Data Release Frequency: Quarterly

**INDIAN LUST R9:** Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 02/25/2008
Date Data Arrived at EDR: 02/26/2008
Date Made Active in Reports: 03/17/2008
Number of Days to Update: 20

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 02/15/2008
Next Scheduled EDR Contact: 05/19/2008
Data Release Frequency: Quarterly

**INDIAN LUST R6:** Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 02/28/2008
Date Data Arrived at EDR: 02/29/2008
Date Made Active in Reports: 03/17/2008
Number of Days to Update: 17

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 02/15/2008
Next Scheduled EDR Contact: 05/19/2008
Data Release Frequency: Varies

**INDIAN LUST R7:** Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 06/01/2007
Date Data Arrived at EDR: 06/14/2007
Date Made Active in Reports: 07/05/2007
Number of Days to Update: 21

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 02/15/2008
Next Scheduled EDR Contact: 05/19/2008
Data Release Frequency: Varies

**INDIAN LUST R1:** Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 03/12/2008
Date Data Arrived at EDR: 03/14/2008
Date Made Active in Reports: 03/20/2008
Number of Days to Update: 6

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 02/15/2008
Next Scheduled EDR Contact: 05/19/2008
Data Release Frequency: Varies

**INDIAN LUST R4:** Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 09/05/2007
Date Data Arrived at EDR: 10/02/2007
Date Made Active in Reports: 10/11/2007
Number of Days to Update: 9

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 02/15/2008
Next Scheduled EDR Contact: 05/19/2008
Data Release Frequency: Semi-Annually

**INDIAN LUST R10:** Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 02/21/2008
Date Data Arrived at EDR: 02/26/2008
Date Made Active in Reports: 03/20/2008
Number of Days to Update: 23

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 02/15/2008
Next Scheduled EDR Contact: 05/19/2008
Data Release Frequency: Quarterly

**INDIAN UST R4:** Underground Storage Tanks on Indian Land
No description is available for this data

Date of Government Version: 09/05/2007
Date Data Arrived at EDR: 10/02/2007
Date Made Active in Reports: 10/11/2007
Number of Days to Update: 9

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 02/15/2008
Next Scheduled EDR Contact: 05/19/2008
Data Release Frequency: Semi-Annually

**INDIAN UST R5:** Underground Storage Tanks on Indian Land
No description is available for this data

Date of Government Version: 12/21/2007
Date Data Arrived at EDR: 12/21/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 34

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 12/21/2007
Next Scheduled EDR Contact: 05/19/2008
Data Release Frequency: Varies

**INDIAN UST R10:** Underground Storage Tanks on Indian Land
No description is available for this data

Date of Government Version: 02/21/2008
Date Data Arrived at EDR: 02/26/2008
Date Made Active in Reports: 03/20/2008
Number of Days to Update: 23

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 02/15/2008
Next Scheduled EDR Contact: 05/19/2008
Data Release Frequency: Quarterly

**INDIAN UST R8:** Underground Storage Tanks on Indian Land
No description is available for this data

Date of Government Version: 02/20/2008
Date Data Arrived at EDR: 03/04/2008
Date Made Active in Reports: 03/17/2008
Number of Days to Update: 13

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 02/15/2008
Next Scheduled EDR Contact: 05/19/2008
Data Release Frequency: Quarterly

**INDIAN UST R1:** Underground Storage Tanks on Indian Land
A listing of underground storage tank locations on Indian Land.

Date of Government Version: 03/12/2008
Date Data Arrived at EDR: 03/14/2008
Date Made Active in Reports: 03/20/2008
Number of Days to Update: 6

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 02/15/2008
Next Scheduled EDR Contact: 05/19/2008
Data Release Frequency: Varies

**INDIAN UST R6:** Underground Storage Tanks on Indian Land
No description is available for this data

Date of Government Version: 02/28/2008
Date Data Arrived at EDR: 02/29/2008
Date Made Active in Reports: 03/17/2008
Number of Days to Update: 17

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 02/15/2008
Next Scheduled EDR Contact: 05/19/2008
Data Release Frequency: Semi-Annually

**INDIAN UST R9:** Underground Storage Tanks on Indian Land
No description is available for this data

Date of Government Version: 02/25/2008
Date Data Arrived at EDR: 02/26/2008
Date Made Active in Reports: 03/20/2008
Number of Days to Update: 23

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 02/15/2008
Next Scheduled EDR Contact: 05/19/2008
Data Release Frequency: Quarterly

**INDIAN UST R7:** Underground Storage Tanks on Indian Land
No description is available for this data

Date of Government Version: 06/01/2007
Date Data Arrived at EDR: 06/14/2007
Date Made Active in Reports: 07/05/2007
Number of Days to Update: 21

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 02/15/2008
Next Scheduled EDR Contact: 05/19/2008
Data Release Frequency: Varies

**EDR PROPRIETARY RECORDS**

**Manufactured Gas Plants:** EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

**EDR Historical Auto Stations:** EDR Proprietary Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

**EDR Historical Cleaners:** EDR Proprietary Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

**OTHER DATABASE(S)**

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

**CT MANIFEST:** Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 06/15/2007
Date Made Active in Reports: 08/20/2007
Number of Days to Update: 66

Source: Department of Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 03/14/2008
Next Scheduled EDR Contact: 06/09/2008
Data Release Frequency: Annually

**NJ MANIFEST:** Manifest Information

Hazardous waste manifest information.

Date of Government Version: 09/30/2007
Date Data Arrived at EDR: 12/04/2007
Date Made Active in Reports: 12/31/2007
Number of Days to Update: 27

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 04/03/2008
Next Scheduled EDR Contact: 06/30/2008
Data Release Frequency: Annually

**NY MANIFEST:** Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 02/15/2008
Date Data Arrived at EDR: 02/28/2008
Date Made Active in Reports: 04/09/2008
Number of Days to Update: 41

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 02/28/2008
Next Scheduled EDR Contact: 05/26/2008
Data Release Frequency: Annually

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

**PA MANIFEST:** Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2006
Date Data Arrived at EDR: 12/21/2007
Date Made Active in Reports: 01/10/2008
Number of Days to Update: 20

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 03/10/2008
Next Scheduled EDR Contact: 06/09/2008
Data Release Frequency: Annually

**RI MANIFEST:** Manifest information
Hazardous waste manifest information

Date of Government Version: 10/01/2007
Date Data Arrived at EDR: 11/09/2007
Date Made Active in Reports: 01/15/2008
Number of Days to Update: 67

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 03/17/2008
Next Scheduled EDR Contact: 06/16/2008
Data Release Frequency: Annually

**WI MANIFEST:** Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2006
Date Data Arrived at EDR: 04/27/2007
Date Made Active in Reports: 06/08/2007
Number of Days to Update: 42

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 04/07/2008
Next Scheduled EDR Contact: 07/07/2008
Data Release Frequency: Annually

**Oil/Gas Pipelines:** This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

**Electric Power Transmission Line Data**
Source: PennWell Corporation
Telephone: (800) 823-6277
This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

**Sensitive Receptors:** There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

**AHA Hospitals:**
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

**Medical Centers: Provider of Services Listing**
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

**Nursing Homes**
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

**Public Schools**
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

**Private Schools**
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

**Daycare Centers: Licensed Facilities**
Source: Department of Social Services
Telephone: 804-692-1900

**Flood Zone Data:** This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

**NWI:** National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

**Virginia Public Water Supplies**
Source: Department of Health, Office of Water Programs
Telephone: 804-786-1756

**Scanned Digital USGS 7.5' Topographic Map (DRG)**
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

**STREET AND ADDRESS INFORMATION**

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# GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

**TARGET PROPERTY ADDRESS**

AIR GUARD MUNITIONS FACILITY
BEULAH ROAD
SANDSTON, VA 23250

**TARGET PROPERTY COORDINATES**

| | |
|---|---|
| Latitude (North): | 37.49574 - 37° 29' 44.7'' |
| Longitude (West): | 77.31285 - 77° 18' 46.3'' |
| Universal Tranverse Mercator: | Zone 18 |
| UTM X (Meters): | 295535.8 |
| UTM Y (Meters): | 4152177.0 |
| Elevation: | 158 ft. above sea level |

**USGS TOPOGRAPHIC MAP**

| | |
|---|---|
| Target Property Map: | 37077-D3 DUTCH GAP, VA |
| Most Recent Revision: | 1994 |
| North Map: | 37077-E3 SEVEN PINES, VA |
| Most Recent Revision: | 1994 |

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**GROUNDWATER FLOW DIRECTION INFORMATION**

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

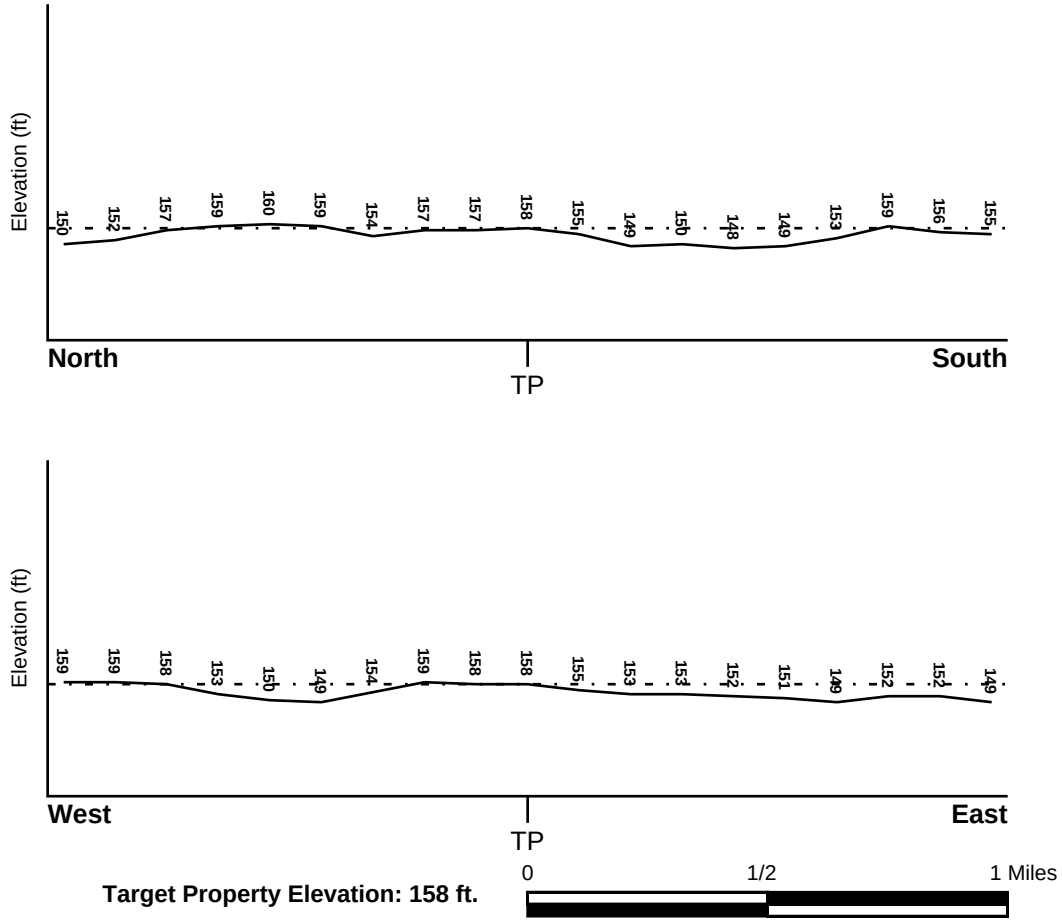
**TOPOGRAPHIC INFORMATION**

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

**TARGET PROPERTY TOPOGRAPHY**

General Topographic Gradient: General SSE

**SURROUNDING TOPOGRAPHY: ELEVATION PROFILES**




**Target Property Elevation: 158 ft.**

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

## HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

### FEMA FLOOD ZONE

| Target Property County | FEMA Flood Electronic Data |
|---|---|
| HENRICO, VA | Not Available |

Flood Plain Panel at Target Property: Not Reported

Additional Panels in search area: Not Reported

### NATIONAL WETLAND INVENTORY

| NWI Quad at Target Property | NWI Electronic Data Coverage |
|---|---|
| DUTCH GAP | YES - refer to the Overview Map and Detail Map |

## HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

***Site-Specific Hydrogeological Data*:***

| | |
|---|---|
| Search Radius: | 1.25 miles |
| Status: | Not found |

## AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

| MAP ID | LOCATION FROM TP | GENERAL DIRECTION GROUNDWATER FLOW |
|---|---|---|
| Not Reported | | |

* ©1996 Site−specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**GROUNDWATER FLOW VELOCITY INFORMATION**

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

**GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY**

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

**ROCK STRATIGRAPHIC UNIT**

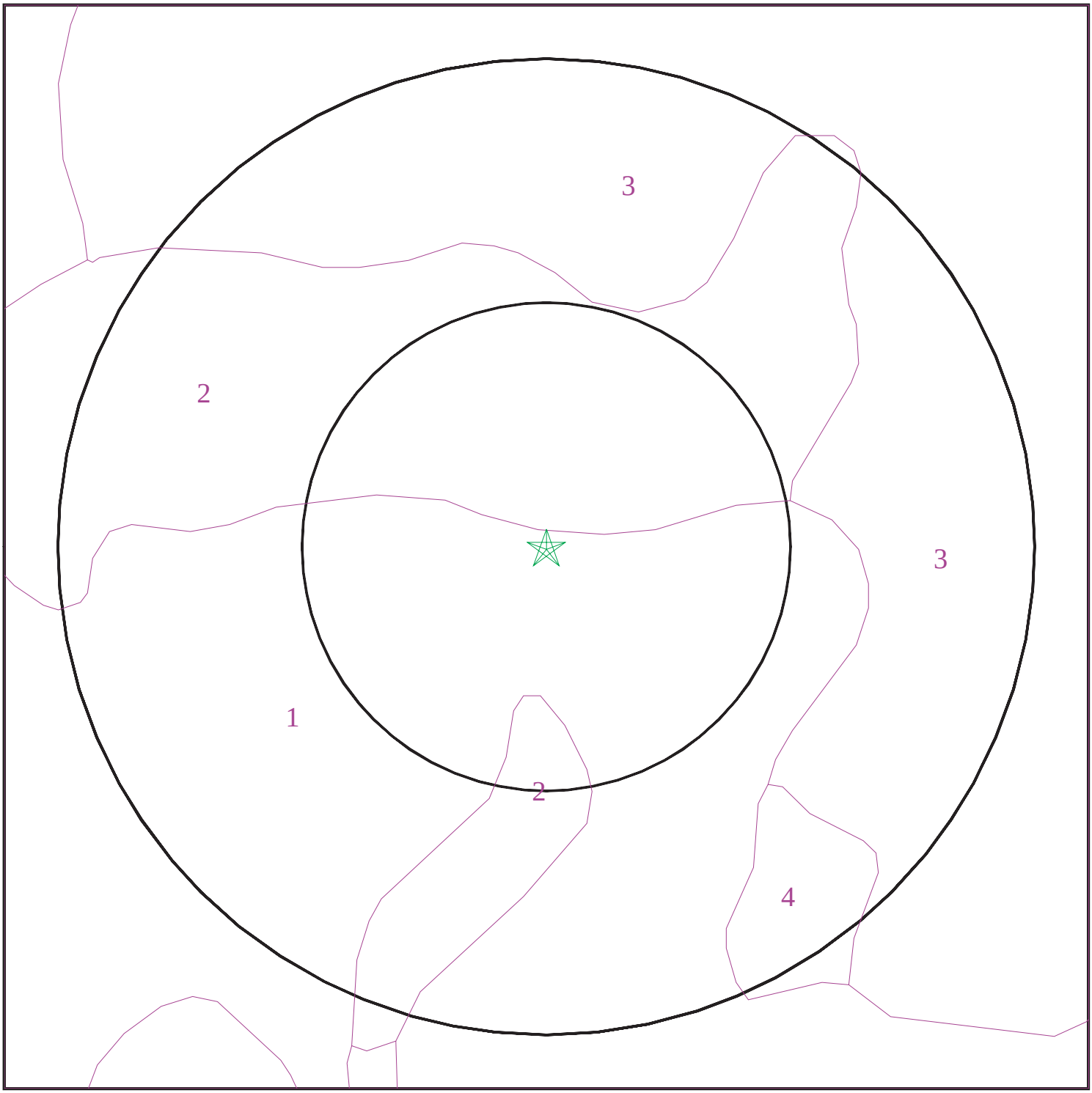
| | |
|---|---|
| Era: | Cenozoic |
| System: | Tertiary |
| Series: | Miocene |
| Code: | Tm *(decoded above as Era, System & Series)* |

**GEOLOGIC AGE IDENTIFICATION**

Category: Stratified Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

# SSURGO SOIL MAP - 2191780.2s




Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

| | | | |
|---|---|---|---|
| SITE NAME: | Air Guard Munitions Facility | CLIENT: | EEE Consulting |
| ADDRESS: | Beulah Road<br>Sandston VA 23250 | CONTACT: | Michael Easter |
| LAT/LONG: | 37.4957 / 77.3128 | INQUIRY #: | 2191780.2s |
| | | DATE: | April 10, 2008 1:08 pm |

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# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY**

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

---

**Soil Map ID: 1**

Soil Component Name: Atlee

Soil Surface Texture: very fine sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 61 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 11 inches | very fine sandy loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 14<br>Min: 1.4 | Max: 5.5<br>Min: 3.6 |
| 2 | 11 inches | 22 inches | clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 14<br>Min: 1.4 | Max: 5.5<br>Min: 3.6 |
| 3 | 22 inches | 53 inches | clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 14<br>Min: 1.4 | Max: 5.5<br>Min: 3.6 |
| 4 | 53 inches | 78 inches | clay | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 14<br>Min: 1.4 | Max: 5.5<br>Min: 3.6 |

**Soil Map ID: 2**

Soil Component Name: Lenoir

Soil Surface Texture: silt loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Somewhat poorly drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 38 inches

**Soil Layer Information**

| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
|---|---|---|---|---|---|---|---|
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 5 inches | silt loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 1.4<br>Min: 0.42 | Max: 5.5<br>Min: 3.6 |
| 2 | 5 inches | 78 inches | silty clay | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 1.4<br>Min: 0.42 | Max: 5.5<br>Min: 3.6 |

**Soil Map ID: 3**

Soil Component Name: Lynchburg

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Somewhat poorly drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 31 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 14 inches | fine sandy loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 14<br>Min: 4 | Max: 5.5<br>Min: 3.6 |
| 2 | 14 inches | 78 inches | clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 14<br>Min: 4 | Max: 5.5<br>Min: 3.6 |

---

**Soil Map ID: 4**

Soil Component Name: Coxville

Soil Surface Texture: silt loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Poorly drained

Hydric Status: All hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 15 inches

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 7 inches | silt loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 4<br>Min: 1.4 | Max: 5.5<br>Min: 3.6 |
| 2 | 7 inches | 78 inches | clay | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 4<br>Min: 1.4 | Max: 5.5<br>Min: 3.6 |

**LOCAL / REGIONAL WATER AGENCY RECORDS**

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

**WELL SEARCH DISTANCE INFORMATION**

| DATABASE | SEARCH DISTANCE (miles) |
|---|---|
| Federal USGS | 1.000 |
| Federal FRDS PWS | Nearest PWS within 1 mile |
| State Database | 1.000 |

**FEDERAL USGS WELL INFORMATION**

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| No Wells Found | | |

**FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION**

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| 1 | VA4087670 | 1/4 - 1/2 Mile SSE |

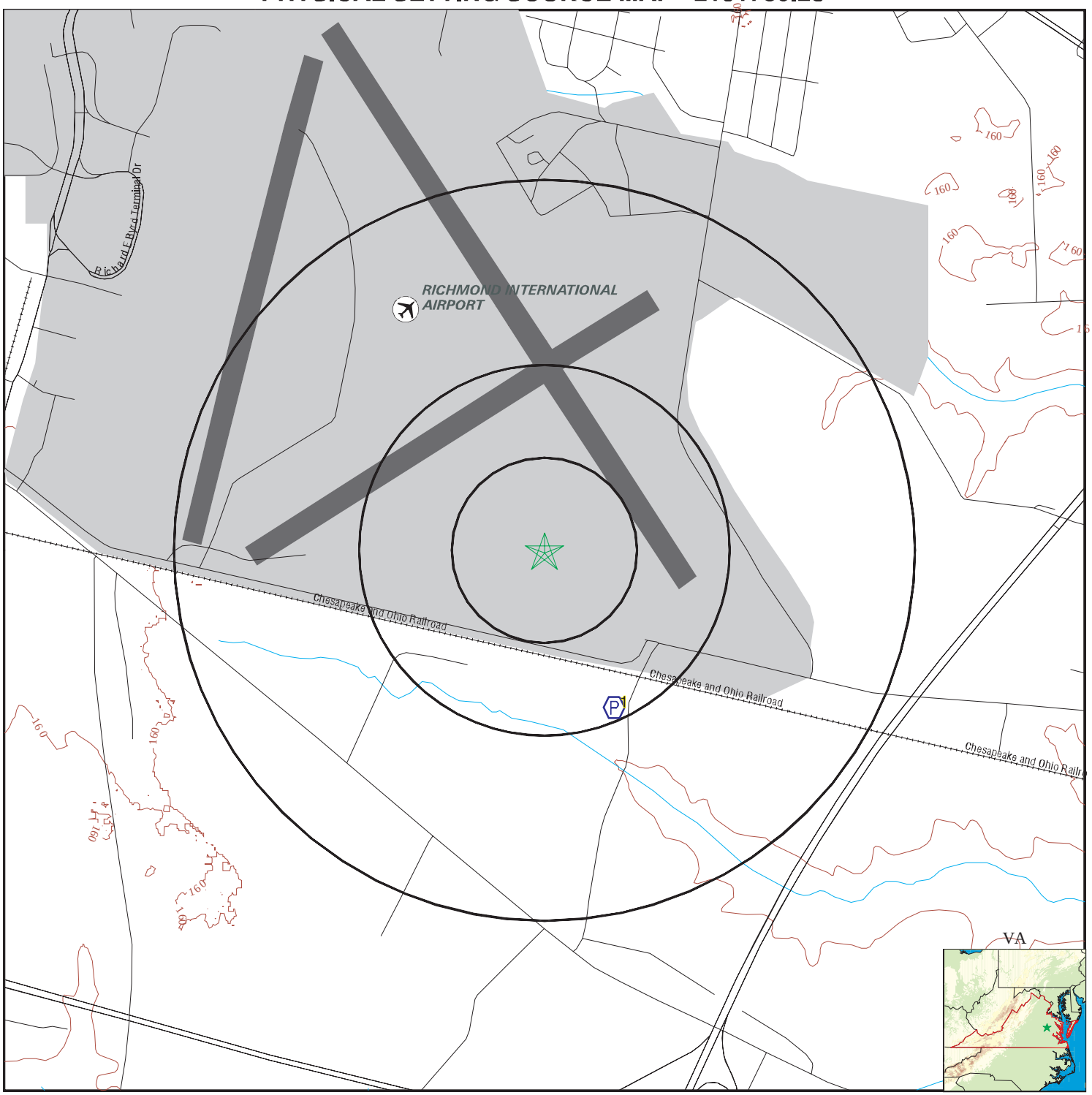
Note: PWS System location is not always the same as well location.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**STATE DATABASE WELL INFORMATION**

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| No Wells Found | | |

# PHYSICAL SETTING SOURCE MAP - 2191780.2s




0 1/4 1/2 1 Miles

- County Boundary
- Major Roads
- Contour Lines
- Airports
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- HD Closest Hydrogeological Data

| | |
|---|---|
| SITE NAME: Air Guard Munitions Facility | CLIENT: EEE Consulting |
| ADDRESS: Beulah Road | CONTACT: Michael Easter |
| Sandston VA 23250 | INQUIRY #: 2191780.2s |
| LAT/LONG: 37.4957 / 77.3128 | DATE: April 10, 2008 1:08 pm |

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# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

**1**
**SSE** | **FRDS PWS** | **VA4087670**
**1/4 - 1/2 Mile**
**Lower**

| | | | |
|---|---|---|---|
| PWS ID: | VA4087670 | PWS Status: | Active |
| Date Initiated: | 8906 | Date Deactivated: | Not Reported |
| PWS Name: | MAZOLERCH COMPANY<br>MARVIN DODD-MEAT MGR<br>363 LERCH DR<br>SANDSTON, VA 23150 | | |
| Addressee / Facility: | System Owner/Responsible Party<br>MR GARY LERCH OPERATIONS MGR<br>MAZO LERCH COMPANY INC<br>363 LERCH DR<br>SANDSTON, VA 23150 | | |
| Facility Latitude: | 37 29 22 | Facility Longitude: | 077 18 35 |
| City Served: | HENRICO | | |
| Treatment Class: | Untreated | Population: | 00000060 |

PWS currently has or had major violation(s) or enforcement: YES

**VIOLATIONS INFORMATION:**

| | | | | | |
|---|---|---|---|---|---|
| Violation ID: | 94V0001 | Source ID: | Not Reported | PWS Phone: | Not Reported |
| Vio. beginning Date: | 05/01/94 | Vio. end Date: | 05/31/94 | Vio. Period: | 001 Months |
| Num required Samples: | Not Reported | Number of Samples Taken: | | Not Reported | |
| Analysis Result: | Not Reported | Maximum Contaminant Level: | | Not Reported | |
| Analysis Method: | Not Reported | | | | |
| Violation Type: | MCL, Monthly (TCR) | | | | |
| Contaminant: | COLIFORM (TCR) | | | | |
| Vio. Awareness Date: | Not Reported | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Violation ID: | 93V0001 | Source ID: | Not Reported | PWS Phone: | 8047372891 |
| Vio. beginning Date: | 04/01/92 | Vio. end Date: | 03/31/93 | Vio. Period: | 012 Months |
| Num required Samples: | Not Reported | Number of Samples Taken: | | Not Reported | |
| Analysis Result: | 000024600000000 | Maximum Contaminant Level: | | Not Reported | |
| Analysis Method: | Not Reported | | | | |
| Violation Type: | MCL, Average | | | | |
| Contaminant: | BENZENE | | | | |
| Vio. Awareness Date: | 020493 | | | | |

**ENFORCEMENT INFORMATION:**

| | | | |
|---|---|---|---|
| System Name: | MAZOLERCH COMPANY | | |
| Violation Type: | MCL, Monthly (TCR) | | |
| Contaminant: | COLIFORM (TCR) | | |
| Compliance Period: | 1994-05-01 - 1994-05-31 | | |
| Violation ID: | 9400001V | | |
| Enforcement Date: | 1994-08-01 | Enf. Action: | State Public Notif Requested |

**ENFORCEMENT INFORMATION:**

| | | | |
|---|---|---|---|
| System Name: | MAZOLERCH COMPANY | | |
| Violation Type: | MCL, Monthly (TCR) | | |
| Contaminant: | COLIFORM (TCR) | | |
| Compliance Period: | 1994-05-01 - 1994-05-31 | | |
| Violation ID: | 9400001V | | |
| Enforcement Date: | 1994-08-01 | Enf. Action: | State Formal NOV Issued |
| System Name: | MAZOLERCH COMPANY | | |
| Violation Type: | MCL, Monthly (TCR) | | |
| Contaminant: | COLIFORM (TCR) | | |
| Compliance Period: | 1994-05-01 - 1994-05-31 | | |
| Violation ID: | 9400001V | | |
| Enforcement Date: | 1994-08-15 | Enf. Action: | State Public Notif Received |

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
# RADON

**AREA RADON INFORMATION**

Federal EPA Radon Zone for HENRICO County: 3

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

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Federal Area Radon Information for HENRICO COUNTY, VA

Number of sites tested: 49

| Area | Average Activity | % <4 pCi/L | % 4-20 pCi/L | % >20 pCi/L |
|---|---|---|---|---|
| Living Area - 1st Floor | 1.021 pCi/L | 100% | 0% | 0% |
| Living Area - 2nd Floor | Not Reported | Not Reported | Not Reported | Not Reported |
| Basement | 3.480 pCi/L | 80% | 20% | 0% |

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

## TOPOGRAPHIC INFORMATION

**USGS 7.5' Digital Elevation Model (DEM)**
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

**Scanned Digital USGS 7.5' Topographic Map (DRG)**
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

## HYDROLOGIC INFORMATION

**Flood Zone Data:** This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

**NWI:** National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

## HYDROGEOLOGIC INFORMATION

**AQUIFLOW$^{R}$ Information System**
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

## GEOLOGIC INFORMATION

**Geologic Age and Rock Stratigraphic Unit**
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

**STATSGO:** State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

**SSURGO: Soil Survey Geographic Database**
Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

## LOCAL / REGIONAL WATER AGENCY RECORDS

### FEDERAL WATER WELLS

**PWS:** Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

**PWS ENF:** Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

**USGS Water Wells:** USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

### STATE RECORDS

**Virginia Public Water Supplies**
Source: Department of Health, Office of Water Programs
Telephone: 804-786-1756

## OTHER STATE DATABASE INFORMATION

### RADON

**Area Radon Information**
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

**EPA Radon Zones**
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

**EPA Region 3 Statistical Summary Readings**
Source: Region 3 EPA
Telephone: 215-814-2082
Radon readings for Delaware, D.C., Maryland, Pennsylvania, Virginia and West Virginia.

### OTHER

**Airport Landing Facilities:** Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

**Epicenters:** World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

**STREET AND ADDRESS INFORMATION**

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# APPENDIX E
## INTERVIEW DOCUMENTATION

INTERVIEWS
USER PROVIDED LEASE QUESTIONNAIRE

| **EEE Consulting, Inc.**<br>P.O. Box 354<br>Montpelier, Virginia 23192<br>Phone: 804. 883-0016<br>Fax: 804. 883-0018 | **PHASE I**<br>**Environmental Site Assessment**<br><br>**CHECKLIST** |
|---|---|
| Project Number: 08-042 | Site: Air Guard Munitions Facility |
| Client: Department of Military Affairs | Location: Sandston, VA |
| Date of Site Visit: April 18, 2007 | Investigators: Michael Easter<br>Maria Mutuc, EIT |

**SITE INTERVIEWS**

| **INTERVIEW WITH THE OWNER** | |
|---|---|
| Name: *Mr. Bill Martin, on behalf of the Air National Guard*<br><br>Position: Deputy Director of the Air National Guard<br><br>Telephone #: (804)236-6504<br><br>Date: *April 18, 2008* | |
| ENVIRONMENTAL LIENS OR ACTIVITY/USE LIMITATIONS ON PROPERTY? *No.* | |
| IF YES, EXPLAIN: | |
| KNOWLEDGE OF ANY RECs ON THE PROPERTY? *N/A* | |
| IF YES, EXPLAIN: | |
| CURRENT SITE USE: *Abandoned Facility* | PAST SITE USES: *Ammunition Storage for the Air National Guard* |
| **INTERVIEW WITH ADJACENT PROPERTY OCCUPANT** | |
| Name*: Mr. Joe Vass*<br><br>Position: Army Aviation Support Facility – *Security Chief*<br><br>Telephone #:<br><br>Date: *April 18, 2008* | |

| |
|---|
| ENVIRONMENTAL LIENS OR ACTIVITY/USE LIMITATIONS ON PROPERTY? *No.* |
| IF YES, EXPLAIN: |
| KNOWLEDGE OF ANY RECs ON THE PROPERTY?<br>*No.* |
| IF YES, EXPLAIN: |
| **INTERVIEW WITH ADJACENT PROPERTY OCCUPANT** |
| Name: *N/A*<br><br>Position:<br><br>Telephone #:<br><br>Date: |
| ENVIRONMENTAL LIENS OR ACTIVITY/USE LIMITATIONS ON PROPERTY? |
| IF YES, EXPLAIN: |
| KNOWLEDGE OF ANY RECs ON THE PROPERTY? |
| IF YES, EXPLAIN: |

## User Provided Information

In order to qualify for one of the *Landowner Liability Protections identified in the Phase I ESA Standard 1527-05,* the *user* must provide the following information (if available) to the *environmental professional*. Failure to provide this information could result in a determination that "*all appropriate inquiry*" is not complete for the Phase I ESA.

Please fill out the questionnaire below and attach any pertinent information.

| YES | NO | QUESTION | IF "YES" PLEASE DESCRIBE |
|---|---|---|---|
| ☐ | ☒ | Are you aware of any environmental cleanup liens against the property that are recognized under law (federal, state, and/or local)? | |
| ☐ | ☒ | Are you aware of any activity or use limitations that are in place at the site and/or have been recorded in a registry under law? | |
| ☒ | ☐ | As the user of this ESA do you have any specialized knowledge or experience related to the property or nearby properties and its respective use? | EMPLOYED AS ENVIRONMENTAL COMPLIANCE MANAGER FOR 5+ YEARS; ENVIRONMENTAL PROGRAM MANAGER FOR <1 YEAR. |
| ☐ | ☐ | Does the proposed purchase price paid for the property reasonably reflect the fair market value? If you conclude that there is a difference, have you considered the reason for the lower purchase including possible contamination? | N/A – GOVERNMENT LEASE |
| ☒ | ☐ | Do you know the past uses of the property? | AIR GUARD USED FOR MUNITIONS STORAGE; |
| ☐ | ☒ | Do you know of specific chemicals that are currently or once were present on the property? | |
| ☐ | ☒ | Do you know of any spills or other chemical releases that have been taken place at the property? | |
| ☐ | ☒ | Do you know of any environmental cleanups that have taken place at the property? | |
| ☐ | ☒ | As the user of this ESA, based on your knowledge and experience related to the property are there any obvious indicators that point to the presence or likely presence of contamination on the property? | |
| ☒ | ☐ | Are there helpful documents available that could inform us about past and current uses on the property? (Such information could be MSDS, environmental permits and reports, tank registrations, safety plans, etc.) *If "yes" is there the possibility of obtaining a copy?* | PREVIOUS ENVIRONMENTAL BASELINE SURVEY FOR THIS & SURROUNDING PARCELS. DATED CIRCA 2001. PROVIDED TO EEE, INC. |
| ☒ | ☐ | Is there a legal description and recorded plat available? If "yes" please provide Deed Book/Plat Book and Page Number if possible. | PROVIDED IN ORIGINAL WORK ORDER REQUEST; SITE PLAN WITH PROPERTY BOUNDARIES. |

| YES | NO | QUESTION | IF "YES" PLEASE DESCRIBE |
|---|---|---|---|
| ☒ | ☐ | Do you have the current property owner's contact information? *If "yes" please provide.* | ROSS PEADON - POINT OF CONTACT FOR CRAC, REAL ESTATE DIVISION, 226-8520 |
| ☐ | ☐ | How is the property currently zoned? Commercial, residential, industrial, mixed use? Are there any zoning restrictions the limit the activity use of the property? (i.e. Chesapeake Bay Preservation Area, Groundwater Protection Area, 50 or 100 year Flood zone). | UNKNOWN. LIKELY COMMERCIAL/INDUSTRIAL (AIRPORT). |

Name: DOUG HAMM Title/Position: ENVIRONMENTAL PROGRAM MANAGER

Organization: VAARNG-FM-E Date: 4.23.08

1 May 2013

MEMORANDUM FOR RECORD

SUBJECT: Environmental Condition of Property Evaluation
Army Aviation Support Facility (AASF)
Sandston, Virginia

1. This memorandum documents an Environmental Condition of Property (ECOP) evaluation for the subject property. The evaluation was performed in accordance with VAARNG SOW dated 15 January 2013, EEE Proposal dated 16 January 2013 and correspondences dated 04 January 2013.

2. BACKGROUND AND SETTING

   a. The proposed action is to acquire a license for a 94.157-acre federally owned parcel in Sandston, Virginia for the Army Aviation Support Facility (AASF). Currently, the subject property is leased from Capital Region Airport Commission under two separate leases: DACA65-5-03-0026, Air Guard Munitions Facility Parcel and DACA65-5-03-0045, Army Guard AASF. Request has been submitted to incorporate both parcels into lease DACA65-5-03-0045. Prior to the current lease, the Commonwealth of Virginia had been issued a concurrent license for use of the property by the Virginia Army National Guard; however, to date no license has been issued. AASF has been utilized by the Virginia National Guard since 1964. While plans for a new AASF are being developed, timeline for construction of a new facility will require the full term of the existing lease. The current lease is in effect through 2032.

   b. The subject property is located at 700 Portugee Road Sandston, VA. A site location map is attached as Figure 1.

   c. The activities performed at the AASF facility include military training; maintenance and repair of military helicopters and aircraft and hazardous materials storage.

3. SITE RECONAISSANCE

   a. A site reconnaissance was conducted by EEE Consulting, Inc. (EEE) on 22 March 2013. Mr. Allen Liszeski, AASF Grounds Manager accompanied EEE during the site visit. Visual inspections of the interiors of all accessible buildings and the facility's exterior grounds were conducted during the reconnaissance. Pertinent photographs taken during the site reconnaissance are attached. An aerial site map is also attached as Figure 2.

   b. The observations related to areas of potential environmental concern that were evaluated during site inspection are presented below.

      i. Use and Storage of CERCLA Hazardous Substances – The facility stores chemicals routinely used at the facility for the maintenance and repair of military helicopters in several flammable cabinets located in Hangar 3990, Building 3910, fuel farm pump house, and the metal shed in the former munitions supply area. The flammable cabinets contained paints, oil cans and other new products. Five hazardous materials storage areas were situated outside Hangar 3990.

ii. Disposal and Release of Hazardous Substances – Potential hazardous waste that the facility typically generates and appropriately disposes of through a contractor include aerosol cans residual waste, parts washer wastes, and used filters. The facility is registered as a Small Quantity Generator (SQG) with an EPA ID number VAD981732662. The facility stores their hazardous wastes inside Hangar 3990 and in the hazardous materials storage areas outside of Hangar 3990.

iii. Petroleum Product Storage - The facility has a fuel farm that is located at the southeast corner of the property. The fuel farm contains four aboveground storage tanks (ASTs) which include two 25,000-gallon JP-8 ASTs that have a concrete secondary containment; one 5,000-gallon JP-8 AST; and one 5,000-gallon motor gasoline (MOGAS) AST. There are two diesel fuel ASTs onsite which include a 300-gallon AST for Building 3901; 300-gallon AST for Building 3990. A 2,000-gallon fuel oil AST is also located next to Building 3906. All of the tanks appeared to be in good condition and no evidence of leaks or spills were observed near the tanks.

The fuel farm also has an old 8,000-gallon underground storage tank (UST) for recovery of JP-8 fuel in case of a spill that was abandoned in place on February 11, 2013. An old 10,000-gallon oil/water separator was also abandoned in place on February 11, 2013. The fuel farm has a newly constructed 75,000-gallon oil/water separator system. The facility has another 200-gallon oil/water separator located at the wash pad.

Based on the site visit, the facility also has two 2,000-gallon commercial type tankers and two 2,500-gallon heavy expanded mobility tactical trucks (HEMTT) tankers. These mobile fuel tankers are located at the fuel farm. All of the mobile refuelers appeared to be in good condition and no evidence of leaks or spills were observed during the site inspection.

The facility also stores used oil in 55-gallon drums located in Hangar 3990 and inside the hazardous materials storage areas outside Hangar 3990. All of the tanks and oil storage containers appeared to be in good condition. No visual or olfactory evidence of any leaks or spills from the petroleum product storages were observed.

The facility has an Integrated Contingency Plan (ICP) in place which provides a comprehensive document to assist in the prevention of discharges of oil, chemicals, and other types of potential pollutants from AASF. The ICP also includes a list of the facility's spill history which is summarized below. The recorded spills were appropriately addressed and are considered historical RECs (HRECs). It appears that the facility is managing their petroleum product storage accordingly.

Table 1. Spill History at AASF

| Date | Substance | Quantity (gallons) | Incident Details |
|---|---|---|---|
| 3/9/1992 | JP-4 fuel | 15-20 | UH-1 aircraft spill occurred. Sorbents were applied and contaminated soil and material were removed and placed in barrels. |
| 8/7/1994 | JP-8 fuel | 45 | Fuel Farm filter separator valve was stuck open. Contaminated soil was placed on tarp to dissipate vapors then returned to spill site. Personnel were briefed on incident. |
| 11/21/1994 | JP-8 fuel | 100 | Fuel Farm recovery UST overflowed during storm event due to open valve. Sorbents were applied along storm drainage system and contaminated soil and material were containerized. Preventative measures included: Fuel Farm OWS and UST valves modified; personnel briefed on proper use of valves; instruction signs placed at valves; and UST cleaned out and checked regularly. |
| 3/31/1995 | JP-8 fuel | 3 | Spill occurred at flightline area on concrete pad. JP-8 fuel was contained on the concrete and cleaned up with sorbents. |

iv. PCB Containing Equipment – Several pole-mounted transformers were observed on the subject property. The pole-mounted transformers are owned by Dominion Virginia Power. No visual or olfactory evidence of any leaks or spills from the transformers were observed.

v. Asbestos and Lead – During the site inspection, it was noted that the age of the buildings presents the potential for Asbestos Containing Material (ACM) and Lead Based Paint (LBP) to exist. Asbestos reports for AASF were provided by VAARNG. A discussion on the records review is included in Section 4.e.

vi. According to VAARNG, no evaluation for LBP has been conducted for any of the structures at AASF.

vii. Wetlands - Potential wetlands were observed southwest of the property. According to Mr. Liszeski, there is ongoing wetland delineation in these areas. According to VAARNG, the wetland delineation has been confirmed by USACE and is 100% complete. VAARNG provided EEE with a map of the wetlands boundaries and is included in the attachment.

viii. Others – Several cargo containers were onsite and were not accessible during the time of the site visit. There was no visual or olfactory evidence of any leaks, spills or environmental conditions observed in the area where the containers were situated.

ix. The facility is bounded immediately to the south by the Chesapeake & Ohio (C&O) railroad right-of-way and the Richmond International Airport to the north, east, and west. The surrounding properties consist of sparse rural residences and White Oak Swamp Creek to the south, a taxiway (which connects the AASF airport parking apron

with the airport) to the northeast, and airport runways and taxiways to the north, east and west.

c. Several AASF personnel occupying the facility were interviewed during the site inspection. None of the personnel were aware of any chemical leaks, spills, or other environmental conditions associated with the subject property or neighboring sites.

4. RECORDS SEARCH/REVIEW

a. A review was completed of all reasonably obtainable Federal, State, and Local Government records for the subject property and surrounding properties, where there has been a release or likely release of hazardous substances or any petroleum product that is likely to cause or contribute to a release or threatened release of any hazardous substance or any petroleum product on the Federal real property. An Environmental Data Resources (EDR) report was acquired for the subject property on March 12, 2013. The EDR report includes a regulatory database summary which consolidates standard Federal, State, Local, and Tribal environmental record sources based on ASTM recommended minimum search distances from the Site. A summary of the EDR findings is outlined in Table 2 and a copy of the complete EDR report is attached.

Table 2. Summary of EDR Findings

| Regulatory Database | Approximate Minimum Search Distance | Project Site Listed? | Total # of Sites Listed |
|---|---|---|---|
| ***FEDERAL*** | | | |
| National Priority List (NPL) | 1.0 mile | No | 0 |
| Delisted National Priority List (DNPL) | 1.0 mile | No | 0 |
| Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) | 0.50 mile | No | 0 |
| CERCLIS Further Remedial Action Planned (CERC-NFRAP) | 0.50 mile | No | 0 |
| Resource Conservation and Recovery Act Information System – Corrective Action (CORRACTS) | 1.0 mile | No | 0 |
| Resource Conservation and Recovery Act Information System – Treatment, Storage, or Disposal Facility (RCRA TSDF) | 1.0 mile | No | 0 |
| Resource Conservation and Recovery Act – Large Quantity Generator (RCRA-LQG) | 0.250 mile | No | 0 |
| Resource Conservation and Recovery Act – Small Quantity Generator (RCRA-SQG) | 0.250 mile | No | 0 |
| Resource Conservation and Recovery Act – Conditionally Exempt Quantity Generator (RCRA-CESQG) | 0.250 mile | No | 0 |
| Federal Institutional controls/Engineering Controls Registries (US ENG CONTROLS; UST INST CONTROLS; LUCIS) | 0.250 mile | No | 0 |
| ***STATE (Virginia)*** | | | |
| State Hazardous Waste Sites (SHWS) | NA | NA | NA |
| State and Tribal Landfill and or Solid Waste Disposal Site (SWF) | 0.50 mile | No | 0 |
| Leaking Underground Storage Tanks (LUST) | 0.50 mile | No | 1 |
| Leaking Petroleum Storage Tanks (LTANKS) | 0.50 mile | No | 1 |
| Underground Storage Tanks (USTs) | 0.250 mile | No | 0 |
| Above Ground Storage Tanks (ASTs) | 0.250 mile | No | 0 |

| | | | |
|---|---|---|---|
| VA Institutional / Engineering Controls Registry | 0.50 mile | No | 0 |
| Voluntary Remediation Program (VRP) | 0.50 mile | No | 0 |
| State and Tribal Brownfields Site (BROWNFIELDS) | 0.50 mile | No | 0 |
| ***Additional Environmental Records*** | | | |
| Formerly Used Defense Sites (FUDS) | 1.0 mile | No | 1 |
| Records of Decision (RODS) | 1.0 mile | No | 0 |
| ***EDR Proprietary Records*** | | | |
| Manufactured Gas Plants | 1.0 mile | No | 0 |
| EDR Historical Auto Stations | 0.250 mile | No | 0 |
| EDR Historical Cleaners | 0.250 mile | No | 0 |

b. The EDR report revealed one site within 0.5 miles of the target property that is listed on both the Leaking Underground Storage Tank (LUST) Database and the Leaking Tanks (LTANKS) Database. The facility's name is US FoodService Inc. and is located at 363 Lech Drive, approximately 0.280 miles southeast of the property. Pollution complaints (PC) have been issued to this facility in 1991 and 2009. Both PCs are closed. Based on the distance from the subject property and given that these cases are closed; this site does not appear to represent a REC.

c. The EDR report also revealed one site in the Formerly Used Defense Site (FUDS) listing. This listing includes locations of Formerly Used Defense Sites where the U.S. Army Corps of Engineers (USACE) is actively working or will take necessary cleanup actions. The site listed is Byrd Field. EEE contacted VDEQ to obtain more information about the site. The USACE has made a No Defense Action Intended (NDAI) determination for the Byrd Field FUDS. On June 26, 2007, VDEQ conducted a sampling event for the Byrd Field FUDS and collected soil/sediment samples for analysis. The results of sampling event indicated exceedances of EPA Region III residential Risk-Based Concentrations (RBCs) for aluminum, arsenic, iron, lead, vanadium, and a total of six (6) SVOCs. Based on the sampling event conducted by VDEQ on June 2007, VDEQ did not concur with the USACE NDAI determination and recommended a Preliminary Assessment for purposes of defining extent of contamination and ultimately addressing the potential adverse risk to human health. Attached is VDEQ's letter to USACE as well as the Byrd Field Sampling Report. Due to the proximity of the Byrd Field FUDS to the subject property, the identified contamination at this FUDS represents a REC. However, because the REC is being reviewed by VDEQ and USACE, no further investigation is recommended.

d. The EDR database search yielded five (5) unmappable orphan sites. Orphan sites are those with insufficient address information such that they can only be identified as within the zip code of the target property. Reasonable efforts were made to located these sites and assess their relevance to this report. Further research was conducted using Google Maps. The orphan sites were identified in the following databases: UST, AST, SWF/LF, and Financial Assurance. All orphan sites were found to be located more than one mile from the subject property; therefore, they are not considered to have a significant impact to the property.

e. A review of the asbestos reports for AASF provided by VAARNG show that asbestos inspections were conducted for Buildings 3901, 3903, 3904, 3990, 3991, 3992, 3993, and 3994 prepared by Industrial Training Company (ITC) on February 17, 2000 and re-inspections were done for the same buildings by Froehling & Robertson, Inc (F&R) on September 29, 2011. The presence of ACMs inside the structures was confirmed for Buildings 3901, 3903, 3904, and 3990. No ACMs were identified inside Buildings 3991, 3992, 3993, and 3994. Materials on the exterior of the

building structures were not included in the survey. The findings of the reports are summarized in Table 3.

The facility also has Asbestos Operations and Maintenance (O&M) Plans for Buildings 3901 and 3990 dated September 29, 2011. The O&M Plan outlines procedures to properly manage the ACBM in place, how to protect employees from asbestos health risk, and how to respond to asbestos emergencies. The asbestos reports are included in the attachment.

f. The EDR report also includes area radon information. The federal EPA Radon Zone for Henrico is 3, indoor average level of less than 2 pCi/L.

Table 3. Summary of Asbestos Inspection Findings

| Recommendations | Material | Location | Amount | Condition | Hazard Ranking* | %Asbestos |
|---|---|---|---|---|---|---|
| | | ***Building 3901*** | | | | |
| The boiler breeching and HVAC duct work were observed to be damaged in several locations. Immediate repair of damage is recommended. Remaining asbestos containing building materials (ACBM) was in good condition where observed. Refer to O & M Plan on how to manage these materials. | 12" x 12" Cream floor tile w/ brown specks Mastic only | Alpha Co. Training room, 1st Flr. Hall, 1st Flr. copy room | 7750 ft2 | Good | 1 | Trace |
| | White caulking | 1st Flr. office | 400 linear ft. | Good | 1 | 5% chrysotile<br>Trace Amosite |
| | White drywall | 1st. Flr. and 2nd Flr. hallways | 48,000 ft2 | Good | 1 | Trace |
| | Gray and white large diameter 5' tank | Boiler room | 175 ft2 | Fair<br>Some damage | 3 | 2% chrysotile<br>30% amosite |
| | Gray and white small diameter 2' tank | Boiler room | 32 ft2 | Good | 1 | 15% chrysotile<br>10% amosite |
| | Gray and white desile gen. muffler | Boiler room | 16" diameter<br>35 linear ft. | Good | 1 | 10% chrysotile<br>25% amosite |
| | Gray and white boiler breeching | Boiler room | 16" diameter<br>30 linear ft. | Fair Some damage | 4 | 20% chrysotile |
| | Gray and white HVAC duct work | Boiler room | 40 linear ft. | Good | 1 | 4% chrysotile |
| | White window glazing | Exterior, east side | 2500 linear ft. | Poor | 4 | Trace<br>2% chrysotile |
| | White window and glazing door caulking | Exterior windows, east side | 1000 linear ft. | Fair | 3 | 2% chrysotile |
| | | ***Building 3903*** | | | | |
| The interior window glazing was observed to be significantly damaged and friable. Immediate removal of this material is recommended. All of the other ACBM was observed to be in good is in fair condition. | 9" x 9" Light brown Floor tile w/ white streaks and black mastic | Supply office | 244 ft2 | Fair | 2 | 10% chrysotile<br>5% chrysotile |
| | Interior window glazing | Work shop, Union office | 300 linear ft. | Fair | 2 | 2% chrysotile |

*Hazard Ranking: 1=least hazardous; 7=most hazardous

Table 3. Summary of Asbestos Inspection Findings (continued)

| *Recommendations* | *Material* | *Location* | *Amount* | *Condition* | *Hazard Ranking* | *%Asbestos* |
|---|---|---|---|---|---|---|
| | | ***Building 3904*** | | | | |
| All the ACBM is in good condition. No immediate responses are recommended at this time. | White, black, and brown 12" x12" floor tile | Main hall, Rear hall, Training area | 1300 ft2 | Good | 1 | 3% chrysotile |
| | White w/ beige specks 12" x 12" floor tile | Mail room | 10 ft2 | Good | 1 | 2% chrysotile |
| | | ***Hangar 3990*** | | | | |
| All the remaining accessible ACBM is in good to fair condition. No immediate responses are recommended at this time. | White with brown specks 12" x 12" Floor tile *Mastic only | QC office | 275 ft2 | Fair | 2 | 10 % chrysotile |
| | White with black and brown specks 12" x12" Floor tile | Supervisor's office | 1300 ft2 | Fair | 2 | 5% chrysotile |
| | White Drywall (joint compound) | Sheet Metal Shop | 2900 ft2 | Good | 1 | <1% chrysotile Trace |
| | | ***Buildings 3991-3994*** | | | | |
| No ACBMS were identified within these structures. Therefore, no recommendations required at this time. | N/A | N/A | N/A | N/A | N/A | N/A |

*Hazard Ranking: 1=least hazardous; 7=most hazardous

5. UPDATE TO THE 2008 MUNITIONS FACILITY PHASE I ESA

   a. In 2008, at the request of VAARNG, EEE Consulting conducted a Phase I ESA for the Munitions Facility at AASF.

   b. A site reconnaissance was conducted for the former munitions supply (MSA) area on 22 March 2013. Not all of the buildings were accessible during the time of the site visit.

      i. The old munitions bunkers now serve as equipment storage for the different units at AASF. Several of the bunkers were inspected and there were no observed RECs associated with the inspected bunkers. Not all bunkers were accessible at the time of the site inspection.

      ii. The metal shed serves equipment storage for the units occupying AASF. An empty flammable cabinet was observed inside the metal shed. No observed RECs associated with the metal shed.

      iii. As mentioned in Section 3.b.iii., there is a 2,000-gallon fuel oil tank outside Building 3906. The tank appeared to be in good condition and no visual or olfactory evidence of any leaks or spills from the AST was observed.

      iv. As mentioned in the 2008, Phase I ESA, an HERC is identified for the former MSA which is the LUST next to Building 3906 which has been removed.

      v. As mentioned in the 2008 Phase I ESA, a pole mounted transformer just outside the fence of the former MSA could potentially contain PCBs. No visual or olfactory evidence of any leaks or spills from the transformer was observed.

      vi. As mentioned in the 2008 Phase I ESA, LBP may be present in the buildings. VAARNG did not provide EEE with any information regarding any work done on these structures related to LBP.

      vii. Several cargo containers were situated within the former MSA and were inaccessible during the site inspection.

   c. The site reconnaissance conducted on 22 March 2013, revealed one HREC at the former munitions supply area which is the LUST next to Building 3906 which has been removed.

   d. A discussion of the records review is included in Section 4.

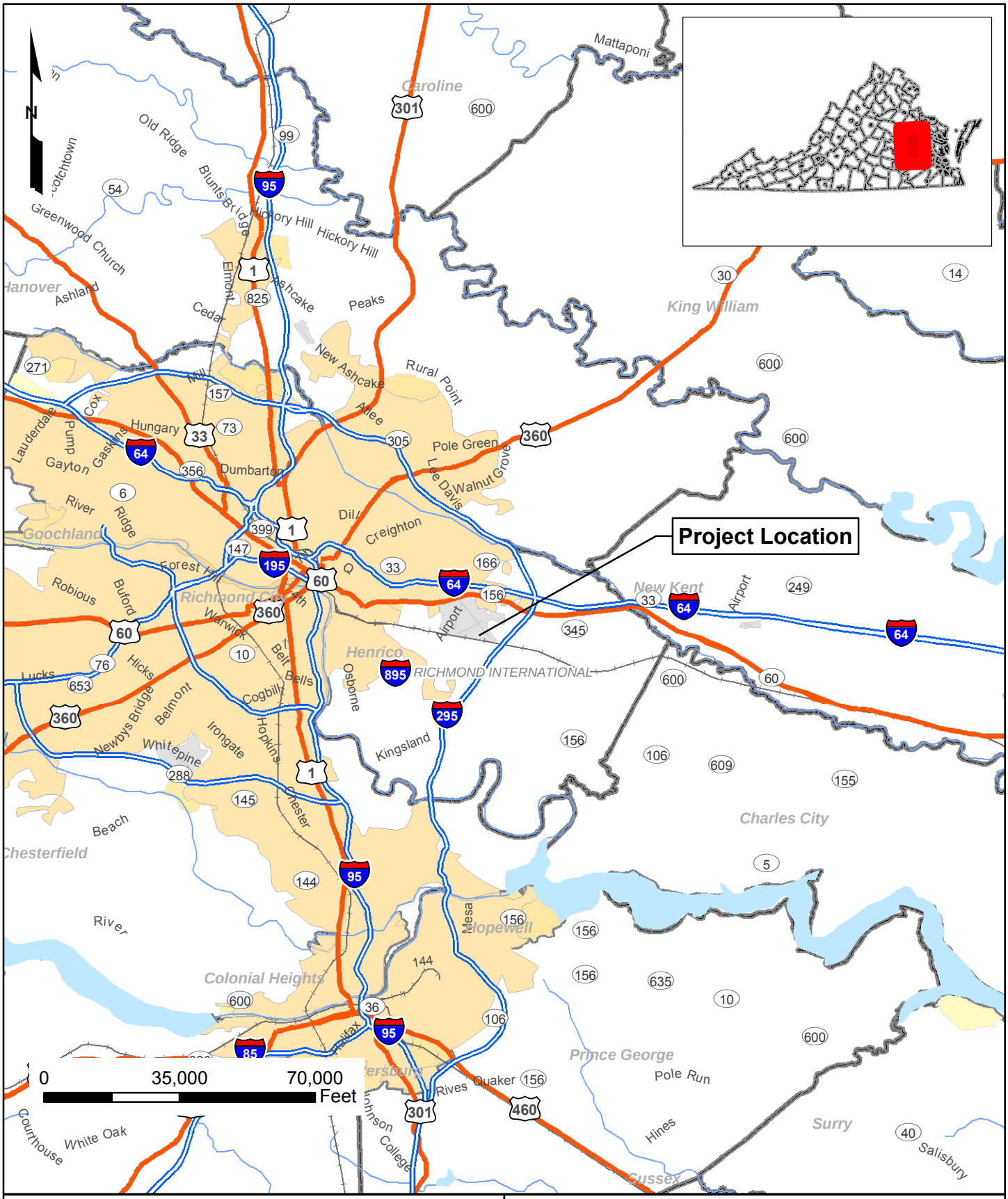
6. The records search and the site inspection for the proposed real estate action at the subject property has revealed two HRECs which include the past spills that have occurred onsite which have all been properly addressed and the LUST next to Building 3906 in the former MSA which has been removed. No further investigations in relation to the HRECs are recommended. Due to the proximity of the Byrd Field FUDS to the subject property, the identified contamination at this FUDS represents a REC. However, because the REC is being reviewed by VDEQ and USACE, no further investigation is recommended.

7. Additional environmental concerns identified include: confirmed presence of ACM in Buildings 3901, 3903, 3904 and 3990; potential LBP in the buildings; potential PCBs in transformers and identified wetlands located southwest of the property.

8. Should you have any questions or require additional information, please contact the undersigned at (804) 442-3330 ext. 211 or mmutuc@eee-consulting.com.

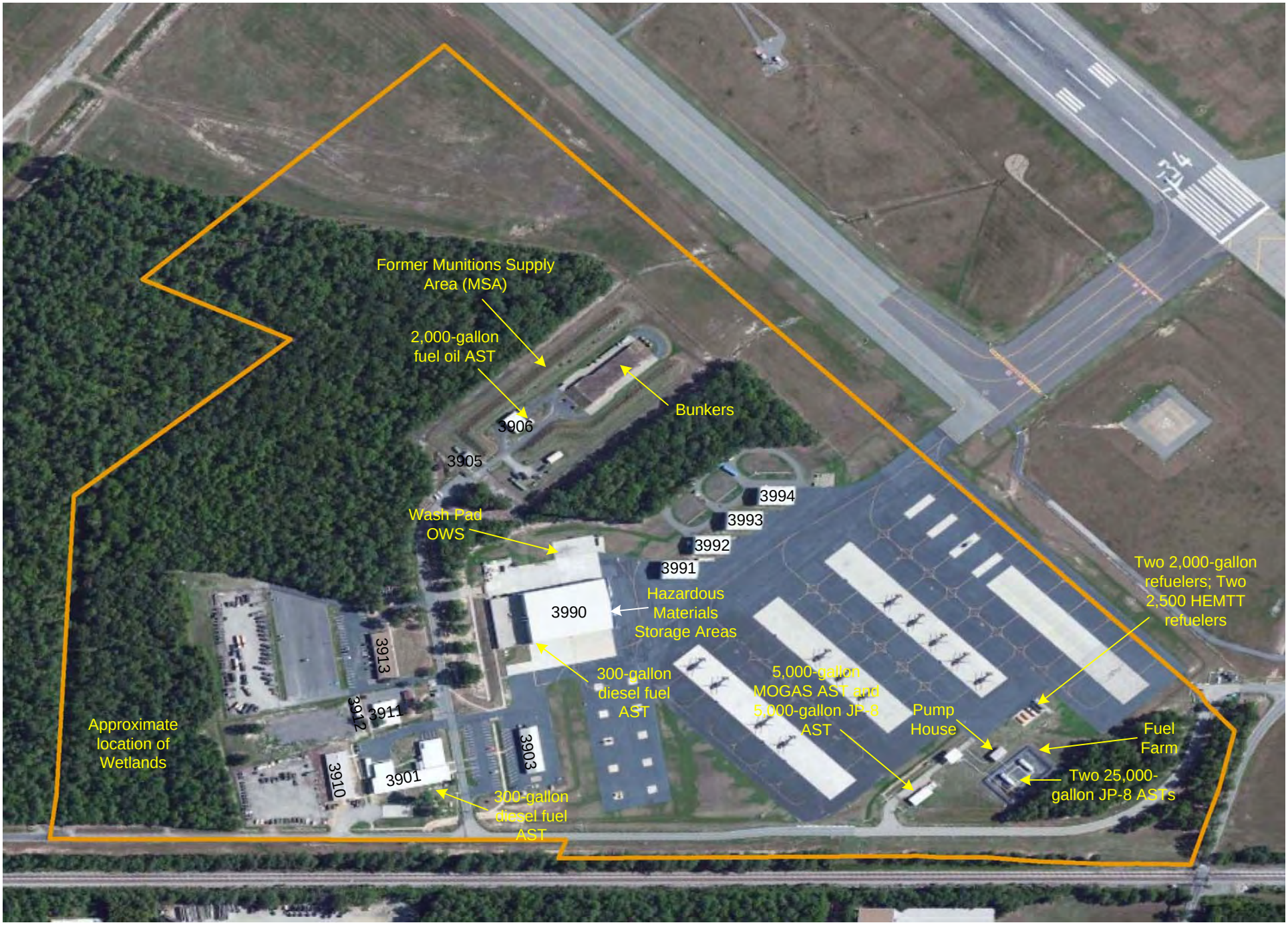
Maria Mutuc, PE
EEE Consulting, Inc.

Attachments:
Figure 1. Site Location Map
Figure 2. Aerial Site Map
Wetland Boundaries Map
Selected Photographs
EDR Report, March 2013
VDEQ Letter to Army Corps of Engineers and FUDS sampling report
Asbestos Reports for AASF
2008 Phase I ESA for AASF Munitions Facility




3e EEE Consulting, Inc.
Environmental, Engineering and Educational Solutions

**Figure 1**
**Project Location**
Environmental Condition of Property
Army Aviation Support Facility
Henrico County, Virginia


Former Munitions Supply Area (MSA)
2,000-gallon fuel oil AST
Bunkers
3906
3905
3994
3993
3992
3991
Wash Pad OWS
3990
Hazardous Materials Storage Areas
Two 2,000-gallon refuelers; Two 2,500 HEMTT refuelers
300-gallon diesel fuel AST
5,000-gallon MOGAS AST and 5,000-gallon JP-8 AST
Pump House
Fuel Farm
Two 25,000-gallon JP-8 ASTs
3913
3912
3911
3910
3901
3903
300-gallon diesel fuel AST
Approximate location of Wetlands

## LEGEND:

- APPROXIMATE WETLAND LIMITS
- APPROXIMATE STREAM CHANNEL LIMITS
- APPROXIMATE CONCRETE CHANNEL LIMITS
- PROJECT LIMITS
- 5 — DATA POINT LOCATION
- A-8 — FLAG NUMBER
- FLOW DIRECTION ARROW

## SITE DATA:

| | |
|---|---|
| PROJECT AREA | 90.98 ACRES ± |
| WETLANDS | 1.50 ACRES ± |
| STREAM CHANNELS | 0.02 ACRES ±(539 L.F. ±) |
| CONCRETE CHANNELS | 0.08 ACRES ±(513 L.F. ±) |

NOTE: THE LIMITS OF WETLANDS AND OTHER WATERS OF THE U.S. SHOWN ON THIS MAP HAVE BEEN FIELD LOCATED BY MEANS OF SUB-METER GPS TECHNOLOGY AND ARE FOR PLANNING PURPOSES ONLY.

RICHMOND INTERNATIONAL AIRPORT

C-1/CA-8

C-9/CA-1

CC-1/CD-7

CC-7/CD-1

AC-(1-35)

AC-14

A-48

AD-(1-8)

AB-(1-13)

A-(1-60)

OFF-SITE RIP-RAP CHANNEL

BB-14/BB-15

BB-(1-31)

ON-SITE FEATURES IN SOUTHERN PORTION OF SITE DRAIN TO WHITE OAK SWAMP VIA REINFORCED CHANNELS

PORTUGEE ROAD

BEULAH ROAD

WHITE OAK SWAMP

CONTOUR INTERVAL = 2 FEET

200' 0' 100' 200' 400' 600'


5209 Center Street
Williamsburg, Virginia 23188
(757) 220-6869

1011 Boulder Springs Drive, Suite 225
Richmond, Virginia 23225
(804) 267-3474

150 Riverside Parkway, Suite 301
Fredericksburg, Virginia 22406
(540) 785-5544

WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants


# DELINEATION MAP
# AASF BYRD FIELD
# HENRICO COUNTY, VIRGINIA

DATE: JANUARY 14, 2013
REVISED: MARCH 12, 2013
JOB NUMBER: 4824
SCALE: 1 INCH = 200 FEET
SOURCE: BASE MAP PROVIDED BY HENRICO COUNTY GIS AND VGIN

W:\WMBGcad\4800s\4824-AASF Byrd Field\Ecology\Delineation\4824 - Delineation (REV 03-12-13).dwg

Selected Photographs

Flammable cabinets containing new products such as paint and oils in Hangar 3990

Aerosol can residual wastes inside Hangar 3990

Hazardous materials storage areas outside Hangar 3990

Used oil drums inside hazardous materials storage outside Hangar 3990

300-gallon diesel fuel AST and pole mounted transformer next to Hangar 3990

Two 25,000-gallon JP-8 ASTs located at the fuel farm

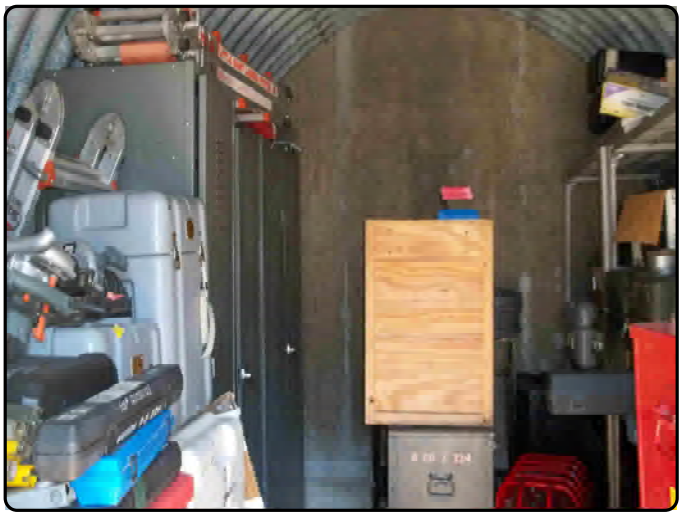
5,000-gallon JP-8 AST and 5,000-gallon MOGAS AST located at the fuel farm

Two 2,000-gallon commercial refueler and two 2,500-gallon HEMTT refueler

Flammable cabinet inside fuel farm pump house containing old equipment spare parts

2,000-gallon fuel oil tank within former MSA

Metal shed within former MSA serves as equipment storage



Former munitions bunker currently used as storage for equipment

Identified wetlands on the southwest corner of the property

EDR Report, March 2013

**AASF**
700-799 PORTUGEE RD
Richmond, VA 23250

Inquiry Number: 3542256.23s
March 12, 2013

# The EDR Radius Map™ Report with GeoCheck®

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
Toll Free: 800.352.0050
www.edrnet.com

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| Government Records Searched/Data Currency Tracking | GR-1 |

**GEOCHECK ADDENDUM**

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***Thank you for your business.***
Please contact EDR at 1-800-352-0050
with any questions or comments.


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# EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-05) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

## TARGET PROPERTY INFORMATION

### ADDRESS

700-799 PORTUGEE RD
RICHMOND, VA 23250

### COORDINATES

| | |
|---|---|
| Latitude (North): | 37.4933000 - 37° 29' 35.88'' |
| Longitude (West): | 77.3125000 - 77° 18' 45.00'' |
| Universal Tranverse Mercator: | Zone 18 |
| UTM X (Meters): | 295560.1 |
| UTM Y (Meters): | 4151905.5 |
| Elevation: | 150 ft. above sea level |

### USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

| | |
|---|---|
| Target Property Map: | 37077-D3 DUTCH GAP, VA |
| Most Recent Revision: | 1994 |
| North Map: | 37077-E3 SEVEN PINES, VA |
| Most Recent Revision: | 1994 |

### AERIAL PHOTOGRAPHY IN THIS REPORT

| | |
|---|---|
| Photo Year: | 2011 |
| Source: | USDA |

## TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

## DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

## STANDARD ENVIRONMENTAL RECORDS

### *Federal NPL site list*

NPL---------- National Priority List

# EXECUTIVE SUMMARY

Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

***Federal Delisted NPL site list***

Delisted NPL ---------- National Priority List Deletions

***Federal CERCLIS list***

CERCLIS ---------- Comprehensive Environmental Response, Compensation, and Liability Information System
FEDERAL FACILITY ---------- Federal Facility Site Information listing

***Federal CERCLIS NFRAP site List***

CERC-NFRAP ---------- CERCLIS No Further Remedial Action Planned

***Federal RCRA CORRACTS facilities list***

CORRACTS ---------- Corrective Action Report

***Federal RCRA non-CORRACTS TSD facilities list***

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

***Federal RCRA generators list***

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-SQG ---------- RCRA - Small Quantity Generators
RCRA-CESQG ---------- RCRA - Conditionally Exempt Small Quantity Generator

***Federal institutional controls / engineering controls registries***

US ENG CONTROLS ---------- Engineering Controls Sites List
US INST CONTROL ---------- Sites with Institutional Controls
LUCIS ---------- Land Use Control Information System

***Federal ERNS list***

ERNS ---------- Emergency Response Notification System

***State- and tribal - equivalent CERCLIS***

SHWS ---------- This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

***State and tribal landfill and/or solid waste disposal site lists***

SWF/LF ---------- Solid Waste Management Facilities

***State and tribal leaking storage tank lists***

INDIAN LUST ---------- Leaking Underground Storage Tanks on Indian Land

***State and tribal registered storage tank lists***

UST ---------- Registered Petroleum Storage Tanks

# EXECUTIVE SUMMARY

AST ---------- Registered Petroleum Storage Tanks
INDIAN UST ---------- Underground Storage Tanks on Indian Land
FEMA UST ---------- Underground Storage Tank Listing

***State and tribal institutional control / engineering control registries***

ENG CONTROLS ---------- Engineering Controls Sites Listing
INST CONTROL ---------- Voluntary Remediation Program Database

***State and tribal voluntary cleanup sites***

VCP ---------- Voluntary Remediation Program
INDIAN VCP ---------- Voluntary Cleanup Priority Listing

***State and tribal Brownfields sites***

BROWNFIELDS ---------- Brownfields Site Specific Assessments

**ADDITIONAL ENVIRONMENTAL RECORDS**

***Local Brownfield lists***

US BROWNFIELDS ---------- A Listing of Brownfields Sites

***Local Lists of Landfill / Solid Waste Disposal Sites***

DEBRIS REGION 9 ---------- Torres Martinez Reservation Illegal Dump Site Locations
ODI ---------- Open Dump Inventory
INDIAN ODI ---------- Report on the Status of Open Dumps on Indian Lands

***Local Lists of Hazardous waste / Contaminated Sites***

US CDL ---------- Clandestine Drug Labs
US HIST CDL ---------- National Clandestine Laboratory Register

***Local Land Records***

LIENS 2 ---------- CERCLA Lien Information

***Records of Emergency Release Reports***

HMIRS ---------- Hazardous Materials Information Reporting System
SPILLS ---------- Pollution Complaint Database

***Other Ascertainable Records***

RCRA NonGen / NLR ---------- RCRA - Non Generators
DOT OPS ---------- Incident and Accident Data
DOD ---------- Department of Defense Sites
CONSENT ---------- Superfund (CERCLA) Consent Decrees
ROD ---------- Records Of Decision
UMTRA ---------- Uranium Mill Tailings Sites
US MINES ---------- Mines Master Index File
TRIS ---------- Toxic Chemical Release Inventory System

# EXECUTIVE SUMMARY

| | |
|---|---|
| TSCA | Toxic Substances Control Act |
| FTTS | FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act) |
| HIST FTTS | FIFRA/TSCA Tracking System Administrative Case Listing |
| SSTS | Section 7 Tracking Systems |
| ICIS | Integrated Compliance Information System |
| PADS | PCB Activity Database System |
| MLTS | Material Licensing Tracking System |
| RADINFO | Radiation Information Database |
| FINDS | Facility Index System/Facility Registry System |
| RAATS | RCRA Administrative Action Tracking System |
| RMP | Risk Management Plans |
| UIC | Underground Injection Control Wells |
| DRYCLEANERS | Drycleaner List |
| ENF | Enforcement Actions Data |
| NPDES | Comprehensive Environmental Data System |
| AIRS | Permitted Airs Facility List |
| TIER 2 | Tier 2 Information Listing |
| INDIAN RESERV | Indian Reservations |
| SCRD DRYCLEANERS | State Coalition for Remediation of Drycleaners Listing |
| 2020 COR ACTION | 2020 Corrective Action Program List |
| Financial Assurance | Financial Assurance Information Listing |
| COAL ASH EPA | Coal Combustion Residues Surface Impoundments List |
| COAL ASH DOE | Steam-Electric Plant Operation Data |
| COAL ASH | Coal Ash Disposal Sites |
| PCB TRANSFORMER | PCB Transformer Registration Database |
| US FIN ASSUR | Financial Assurance Information |
| EPA WATCH LIST | EPA WATCH LIST |
| PRP | Potentially Responsible Parties |
| US AIRS | Aerometric Information Retrieval System Facility Subsystem |

**EDR HIGH RISK HISTORICAL RECORDS**

***EDR Exclusive Records***

| | |
|---|---|
| EDR MGP | EDR Proprietary Manufactured Gas Plants |
| EDR US Hist Auto Stat | EDR Exclusive Historic Gas Stations |
| EDR US Hist Cleaners | EDR Exclusive Historic Dry Cleaners |

**SURROUNDING SITES: SEARCH RESULTS**

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

# EXECUTIVE SUMMARY

## STANDARD ENVIRONMENTAL RECORDS

### *State and tribal leaking storage tank lists*

LUST: The Leaking Underground Storage Tank Database.

A review of the LUST list, as provided by EDR, and dated 05/18/2004 has revealed that there is 1 LUST site within approximately 0.5 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***US FOODSERVICE INC***<br>Facility Status: Closed | ***363 LERCH DR*** | ***SE 1/4 - 1/2 (0.280 mi.)*** | ***1*** | ***7*** |

LTANKS: The Leaking Tanks Database contains current Leaking petroleum tanks. The data comes from the Department of Environmental Quality.

A review of the LTANKS list, as provided by EDR, and dated 11/01/2012 has revealed that there is 1 LTANKS site within approximately 0.5 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***US FOODSERVICE INC***<br>Facility Status: Closed | ***363 LERCH DR*** | ***SE 1/4 - 1/2 (0.280 mi.)*** | ***1*** | ***7*** |

## ADDITIONAL ENVIRONMENTAL RECORDS

### *Other Ascertainable Records*

FUDS: The Listing includes locations of Formerly Used Defense Sites Properties where the US Army Corps Of Engineers is actively working or will take necessary cleanup actions.

A review of the FUDS list, as provided by EDR, and dated 12/31/2009 has revealed that there is 1 FUDS site within approximately 1 mile of the target property.

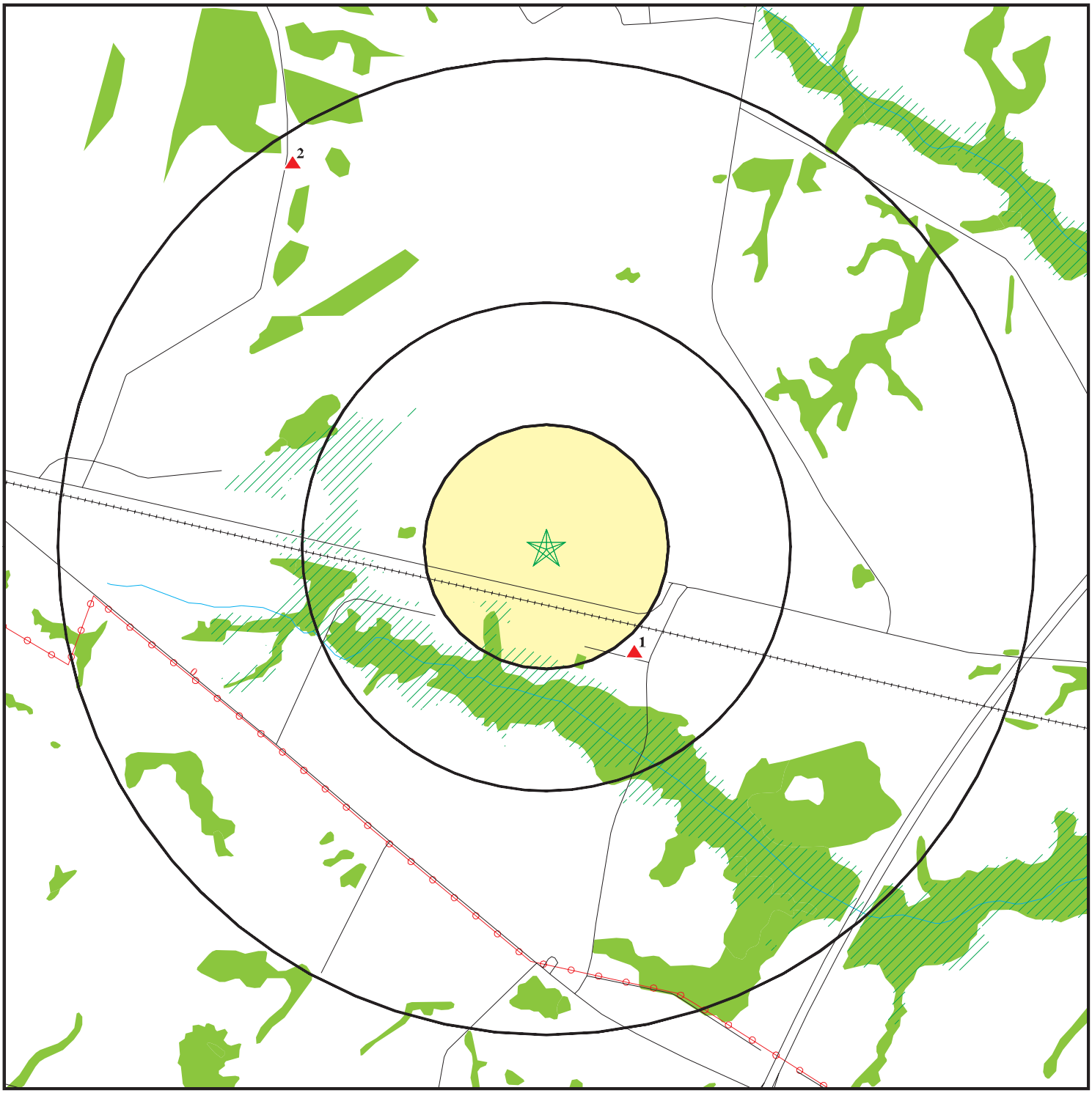
| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| BYRD FIELD | | NNW 1/2 - 1 (0.944 mi.) | 2 | 7 |

# EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 5 records.

| Site Name | Database(s) |
|---|---|
| BFI CHARLES CITY ROAD LANDFILL | SWF/LF, Financial Assurance |
| NEWCOMB JAMES | UST |
| SADLER MATERIALS CORPORATION | UST |
| 100 PORTUGEE RD | AST |
| PORTUGEE AND LISLE RD | AST |

# OVERVIEW MAP - 3542256.23s




- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory

0 1/4 1/2 1 Miles

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

| | |
|---|---|
| SITE NAME: AASF | CLIENT: EEE Consulting |
| ADDRESS: 700-799 PORTUGEE RD<br>Richmond VA 23250 | CONTACT: Jennifer Jones |
| LAT/LONG: 37.4933 / 77.3125 | INQUIRY #: 3542256.23s<br>DATE: March 12, 2013 3:05 pm |

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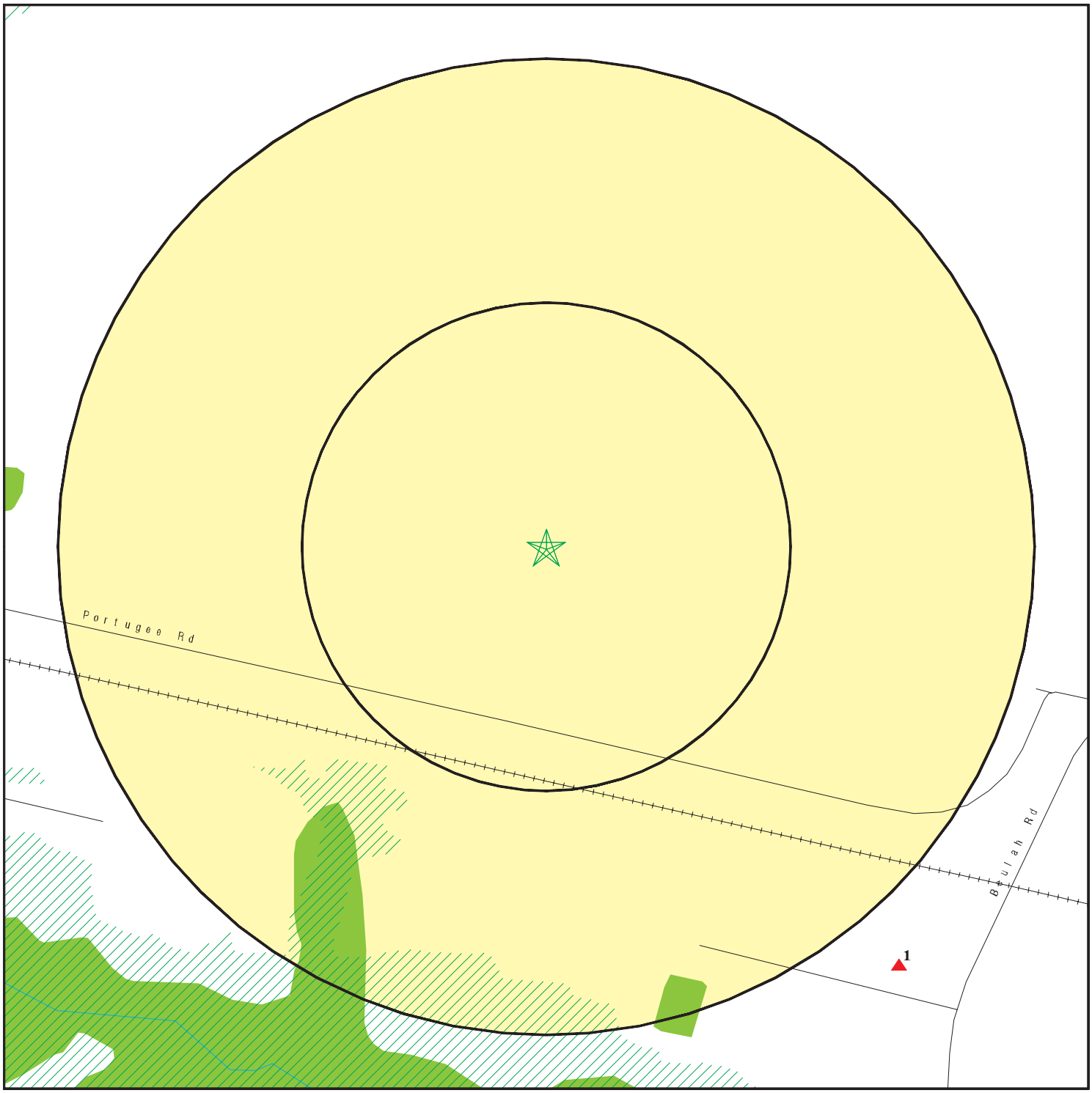
# DETAIL MAP - 3542256.23s




0 1/16 1/8 1/4 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

| | |
|---|---|
| SITE NAME: AASF | CLIENT: EEE Consulting |
| ADDRESS: 700-799 PORTUGEE RD<br>Richmond VA 23250 | CONTACT: Jennifer Jones |
| LAT/LONG: 37.4933 / 77.3125 | INQUIRY #: 3542256.23s<br>DATE: March 12, 2013 3:05 pm |

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# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| **STANDARD ENVIRONMENTAL RECORDS** | | | | | | | | |
| ***Federal NPL site list*** | | | | | | | | |
| NPL | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| Proposed NPL | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| NPL LIENS | TP | | NR | NR | NR | NR | NR | 0 |
| ***Federal Delisted NPL site list*** | | | | | | | | |
| Delisted NPL | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ***Federal CERCLIS list*** | | | | | | | | |
| CERCLIS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| FEDERAL FACILITY | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Federal CERCLIS NFRAP site List*** | | | | | | | | |
| CERC-NFRAP | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Federal RCRA CORRACTS facilities list*** | | | | | | | | |
| CORRACTS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ***Federal RCRA non-CORRACTS TSD facilities list*** | | | | | | | | |
| RCRA-TSDF | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Federal RCRA generators list*** | | | | | | | | |
| RCRA-LQG | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| RCRA-SQG | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| RCRA-CESQG | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| ***Federal institutional controls / engineering controls registries*** | | | | | | | | |
| US ENG CONTROLS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| US INST CONTROL | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| LUCIS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Federal ERNS list*** | | | | | | | | |
| ERNS | TP | | NR | NR | NR | NR | NR | 0 |
| ***State- and tribal - equivalent CERCLIS*** | | | | | | | | |
| SHWS | N/A | | N/A | N/A | N/A | N/A | N/A | N/A |
| ***State and tribal landfill and/or solid waste disposal site lists*** | | | | | | | | |
| SWF/LF | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***State and tribal leaking storage tank lists*** | | | | | | | | |
| LUST | 0.500 | | 0 | 0 | 1 | NR | NR | 1 |
| LTANKS | 0.500 | | 0 | 0 | 1 | NR | NR | 1 |
| INDIAN LUST | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***State and tribal registered storage tank lists*** | | | | | | | | |
| UST | 0.250 | | 0 | 0 | NR | NR | NR | 0 |

# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| AST | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| INDIAN UST | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| FEMA UST | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| ***State and tribal institutional control / engineering control registries*** | | | | | | | | |
| ENG CONTROLS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| INST CONTROL | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***State and tribal voluntary cleanup sites*** | | | | | | | | |
| VCP | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| INDIAN VCP | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***State and tribal Brownfields sites*** | | | | | | | | |
| BROWNFIELDS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| **ADDITIONAL ENVIRONMENTAL RECORDS** | | | | | | | | |
| ***Local Brownfield lists*** | | | | | | | | |
| US BROWNFIELDS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Local Lists of Landfill / Solid Waste Disposal Sites*** | | | | | | | | |
| DEBRIS REGION 9 | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ODI | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| INDIAN ODI | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Local Lists of Hazardous waste / Contaminated Sites*** | | | | | | | | |
| US CDL | TP | | NR | NR | NR | NR | NR | 0 |
| US HIST CDL | TP | | NR | NR | NR | NR | NR | 0 |
| ***Local Land Records*** | | | | | | | | |
| LIENS 2 | TP | | NR | NR | NR | NR | NR | 0 |
| ***Records of Emergency Release Reports*** | | | | | | | | |
| HMIRS | TP | | NR | NR | NR | NR | NR | 0 |
| SPILLS | TP | | NR | NR | NR | NR | NR | 0 |
| ***Other Ascertainable Records*** | | | | | | | | |
| RCRA NonGen / NLR | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| DOT OPS | TP | | NR | NR | NR | NR | NR | 0 |
| DOD | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| FUDS | 1.000 | | 0 | 0 | 0 | 1 | NR | 1 |
| CONSENT | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ROD | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| UMTRA | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| US MINES | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| TRIS | TP | | NR | NR | NR | NR | NR | 0 |
| TSCA | TP | | NR | NR | NR | NR | NR | 0 |

# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| FTTS | TP | | NR | NR | NR | NR | NR | 0 |
| HIST FTTS | TP | | NR | NR | NR | NR | NR | 0 |
| SSTS | TP | | NR | NR | NR | NR | NR | 0 |
| ICIS | TP | | NR | NR | NR | NR | NR | 0 |
| PADS | TP | | NR | NR | NR | NR | NR | 0 |
| MLTS | TP | | NR | NR | NR | NR | NR | 0 |
| RADINFO | TP | | NR | NR | NR | NR | NR | 0 |
| FINDS | TP | | NR | NR | NR | NR | NR | 0 |
| RAATS | TP | | NR | NR | NR | NR | NR | 0 |
| RMP | TP | | NR | NR | NR | NR | NR | 0 |
| UIC | TP | | NR | NR | NR | NR | NR | 0 |
| DRYCLEANERS | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| ENF | TP | | NR | NR | NR | NR | NR | 0 |
| NPDES | TP | | NR | NR | NR | NR | NR | 0 |
| AIRS | TP | | NR | NR | NR | NR | NR | 0 |
| TIER 2 | TP | | NR | NR | NR | NR | NR | 0 |
| INDIAN RESERV | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| SCRD DRYCLEANERS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| 2020 COR ACTION | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| Financial Assurance | TP | | NR | NR | NR | NR | NR | 0 |
| COAL ASH EPA | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| COAL ASH DOE | TP | | NR | NR | NR | NR | NR | 0 |
| COAL ASH | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| PCB TRANSFORMER | TP | | NR | NR | NR | NR | NR | 0 |
| US FIN ASSUR | TP | | NR | NR | NR | NR | NR | 0 |
| EPA WATCH LIST | TP | | NR | NR | NR | NR | NR | 0 |
| PRP | TP | | NR | NR | NR | NR | NR | 0 |
| US AIRS | TP | | NR | NR | NR | NR | NR | 0 |

**EDR HIGH RISK HISTORICAL RECORDS**

***EDR Exclusive Records***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| EDR MGP | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| EDR US Hist Auto Stat | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| EDR US Hist Cleaners | 0.250 | | 0 | 0 | NR | NR | NR | 0 |

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

N/A = This State does not maintain a SHWS list. See the Federal CERCLIS list.

**1**
**SE**
**1/4-1/2**
**0.280 mi.**
**1478 ft.**

**US FOODSERVICE INC** **LUST S103837304**
**363 LERCH DR** **LTANKS N/A**
**SANDSTON, VA 23150**

**Relative:**
**Higher**

**Actual:**
**150 ft.**

LUST REG PD:
Region: PD
**Status:** **Closed**
Pollution Complaint #: 20094567
Reg Code: PRO

Region: PD
**Status:** **Closed**
Pollution Complaint #: 19911663
Reg Code: PRO

LTANKS:
Region: PRO
CEDS Facility Id: 200000163138
**Case Status:** **Closed**
Pollution Complaint #: 19911663
Reported: 05/23/1991

Region: PRO
CEDS Facility Id: 200000163138
**Case Status:** **Closed**
Pollution Complaint #: 20094567
Reported: 06/01/2009

---

**2**
**NNW**
**1/2-1**
**0.944 mi.**
**4982 ft.**

**BYRD FIELD** **FUDS 1010309659**
**N/A**
**SANDSTON, VA**

**Relative:**
**Higher**

**Actual:**
**158 ft.**

FUDS:
Federal Facility ID: VA9799F1653
FUDS #: C03VA0178
INST ID: 57843
Facility Name: BYRD FIELD
City: Sandston
State: VA
EPA Region: 3
County: HENRICO
Congressional District: 03
US Army District: Baltimore District (NAB)
Fiscal Year: 2009
Telephone: 410-962-2809
NPL Status: Not Listed
RAB: Not reported
CTC: Not reported
Current Owner: CITY

FUDS Description Details:
STRUCTURES ON SITE HAVE HAD NO KNOWN BENEFICAL USE BY THE CURRENT OCCUPANT.

FUDS History Details:

**BYRD FIELD (Continued)** **1010309659**

MAJORITY OF THE SITE UNDER CONTROL OF CAPITOL REGION AIRPORT COMMISSION OF RICHMOND, VA. WAS FORMER RICHMOND ARMY AIR BASE APPROX. 3219 ARCE TO SUPPORT WWII EFFORT

FUDS Current Program Details:

FUDS Future Program Details:

Count: 5 records. ORPHAN SUMMARY

| City | EDR ID | Site Name | Site Address | Zip | Database(s) |
|---|---|---|---|---|---|
| RICHMOND | U003684341 | NEWCOMB JAMES | RT 1 | 23231 | UST |
| RICHMOND | S109848247 | BFI CHARLES CITY ROAD LANDFILL | CHARLES CITY RD | 23231 | SWF/LF, Financial Assurance |
| RICHMOND | A100307772 | 100 PORTUGEE RD | 100 PORTUGEE RD | 23231 | AST |
| SANDSTON | U003683210 | SADLER MATERIALS CORPORATION | RT 5 | 23150 | UST |
| SANDSTON | A100225564 | PORTUGEE AND LISLE RD | PORTUGEE AND LISLE RD | 23150 | AST |

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

**Number of Days to Update:** Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

**STANDARD ENVIRONMENTAL RECORDS**

***Federal NPL site list***

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 10/01/2012
Date Data Arrived at EDR: 10/11/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 70

Source: EPA
Telephone: N/A
Last EDR Contact: 03/01/2013
Next Scheduled EDR Contact: 04/22/2013
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 10/01/2012
Date Data Arrived at EDR: 10/11/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 70

Source: EPA
Telephone: N/A
Last EDR Contact: 03/01/2013
Next Scheduled EDR Contact: 04/22/2013
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

***Federal Delisted NPL site list***

DELISTED NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 10/01/2012
Date Data Arrived at EDR: 10/11/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 70

Source: EPA
Telephone: N/A
Last EDR Contact: 03/01/2013
Next Scheduled EDR Contact: 04/22/2013
Data Release Frequency: Quarterly

***Federal CERCLIS list***

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 11/02/2012
Date Data Arrived at EDR: 11/28/2012
Date Made Active in Reports: 01/07/2013
Number of Days to Update: 40

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 03/01/2013
Next Scheduled EDR Contact: 06/10/2013
Data Release Frequency: Quarterly

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 10/09/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 72

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 01/11/2013
Next Scheduled EDR Contact: 04/22/2013
Data Release Frequency: Varies

***Federal CERCLIS NFRAP site List***

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 11/02/2012
Date Data Arrived at EDR: 11/28/2012
Date Made Active in Reports: 01/07/2013
Number of Days to Update: 40

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 01/04/2013
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Quarterly

***Federal RCRA CORRACTS facilities list***

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 02/12/2013
Date Data Arrived at EDR: 02/21/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 6

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 02/08/2013
Next Scheduled EDR Contact: 05/27/2013
Data Release Frequency: Quarterly

***Federal RCRA non-CORRACTS TSD facilities list***

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 02/12/2013
Date Data Arrived at EDR: 02/15/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 12

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 02/15/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Quarterly

***Federal RCRA generators list***

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 02/12/2013
Date Data Arrived at EDR: 02/15/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 12

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 02/15/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 02/12/2013
Date Data Arrived at EDR: 02/15/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 12

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 02/15/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 02/12/2013
Date Data Arrived at EDR: 02/15/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 12

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 02/15/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Varies

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

***Federal institutional controls / engineering controls registries***

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 12/19/2012
Date Data Arrived at EDR: 12/26/2012
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 03/11/2013
Next Scheduled EDR Contact: 06/24/2013
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 12/19/2012
Date Data Arrived at EDR: 12/26/2012
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 03/11/2013
Next Scheduled EDR Contact: 06/24/2013
Data Release Frequency: Varies

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 12/09/2005
Date Data Arrived at EDR: 12/11/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 31

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 02/18/2013
Next Scheduled EDR Contact: 06/03/2013
Data Release Frequency: Varies

***Federal ERNS list***

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 01/17/2013
Date Made Active in Reports: 02/15/2013
Number of Days to Update: 29

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 01/17/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Annually

***State- and tribal - equivalent CERCLIS***

SHWS: This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: Department of Environmental Quality
Telephone: 804-698-4236
Last EDR Contact: 12/18/2012
Next Scheduled EDR Contact: 04/08/2013
Data Release Frequency: N/A

***State and tribal landfill and/or solid waste disposal site lists***

SWF/LF: Solid Waste Management Facilities

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 09/21/2012
Date Data Arrived at EDR: 09/21/2012
Date Made Active in Reports: 10/11/2012
Number of Days to Update: 20

Source: Department of Environmental Quality
Telephone: 804-698-4238
Last EDR Contact: 03/11/2013
Next Scheduled EDR Contact: 06/24/2013
Data Release Frequency: Quarterly

***State and tribal leaking storage tank lists***

LUST REG SW: Leaking Underground Storage Tank Database

Leaking underground storage tank site locations. Includes: counties of Bland, Buchanan, Carroll, Dickenson, Grayson, Lee, Russell, Scott, Smyth, Tazewell, Washington, Wise, Wythe; cities of Bristol, Galax, Norton.

Date of Government Version: 01/23/2013
Date Data Arrived at EDR: 01/24/2013
Date Made Active in Reports: 02/19/2013
Number of Days to Update: 26

Source: Department of Environmental Quality Southwest Regional Office
Telephone: 276-676-4800
Last EDR Contact: 01/14/2013
Next Scheduled EDR Contact: 04/29/2013
Data Release Frequency: No Update Planned

LUST REG SC: Leaking Underground Storage Tanks

Leaking underground storage tank site locations. Includes: counties of Amherst, Appomattox, Buckingham, Campbell, Charlotte, Cumberland, Halifax, Lunenburg, Mecklenburg, Nottoway, Pittsylvania, Prince Deward; cities of Danville, Lynchburg.

Date of Government Version: 12/05/2012
Date Data Arrived at EDR: 12/06/2012
Date Made Active in Reports: 02/19/2013
Number of Days to Update: 75

Source: Department of Environmental Quality, South Central Region
Telephone: 434-582-5120
Last EDR Contact: 03/04/2013
Next Scheduled EDR Contact: 06/17/2013
Data Release Frequency: Semi-Annually

LUST REG PD: Leaking Underground Storage Tank Sites

Leaking underground storage tank site locaitons. Includes: counties of Amelia, Brunswick, Charles City, Chesterfield, Dinwiddie, Essex, Gloucester, Goochland, Greensville, Hanover, Henrico, King and Queen, King William, Lancaster, Mathews, Middlesex, New Kent, Northumberland, Powhatan, Prince George, Richmond, Surry, Sussex, Westmoreland; cities of Colonial Heights, Emporia, Hopewell, Petersburg.

Date of Government Version: 12/05/2012
Date Data Arrived at EDR: 12/06/2012
Date Made Active in Reports: 02/19/2013
Number of Days to Update: 75

Source: Department of Environmental Quality Piedmont Regional Office
Telephone: 804-527-5020
Last EDR Contact: 03/04/2013
Next Scheduled EDR Contact: 06/17/2013
Data Release Frequency: Quarterly

LUST REG NO: Leaking Underground Storage Tank Tracking Database

Leaking underground storage tank site locations. Includes: counties of Arlington, Caroline, Culpeper, Fairfax, Fauquier, King George, Loudoun, Louisa, Madison, Orange, Prince William, Rappahannock, Spotsylvania, Stafford; cities of Alexandria, Fairfax, Falls Church, Fredericksburg, Manassas, Manassas Park.

Date of Government Version: 05/18/2004
Date Data Arrived at EDR: 05/22/2004
Date Made Active in Reports: 07/09/2004
Number of Days to Update: 48

Source: Department of Environmental Quality Northern Regional Office
Telephone: 703-583-3800
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG TD: Leaking Underground Storage Tank Sites
Leaking underground storage tank site locations. Includes: counties of Accomack, Isle of Wight, James City, Northampton, Southampton, York; cities of Chesapeake, Franklin, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, Williamsburg.

Date of Government Version: 01/03/2013
Date Data Arrived at EDR: 01/04/2013
Date Made Active in Reports: 02/19/2013
Number of Days to Update: 46

Source: Department of Environmental Quality Tidewater Regional Office
Telephone: 757-518-2198
Last EDR Contact: 01/02/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Quarterly

LUST REG WC: Leaking Underground Storage Tank List
Leaking underground storage tank site locations. Includes: counties of Alleghany, Bedford, Botetourt, Craig, Floyd, Franklin, Giles, Henry, Montgomery, Patrick, Pulaski, Roanoke; cities of Bedford, Clifton Forge, Covington, Martinsville, Radford, Roanoke, Salem.

Date of Government Version: 12/07/2012
Date Data Arrived at EDR: 12/12/2012
Date Made Active in Reports: 02/19/2013
Number of Days to Update: 69

Source: Department of Environmental Quality West Central Regional Office
Telephone: 540-562-6700
Last EDR Contact: 03/04/2013
Next Scheduled EDR Contact: 06/17/2013
Data Release Frequency: No Update Planned

LUST REG VA: Leaking Underground Storage Tank List
Leaking underground storage tank site locations. Includes: counties of Albemarle, Augusta, Bath, Clarke, Fluvanna, Frederick, Greene, Highland, Nelson, Page, Rockbridge, Rockingham, Shenandoah, Warren; cities of Buena Vista, Charlottesville, Harrisonburg, Lexington, Staunton, Waynesboro, Winchester.

Date of Government Version: 12/06/2011
Date Data Arrived at EDR: 12/08/2011
Date Made Active in Reports: 01/16/2012
Number of Days to Update: 39

Source: Department of Environmental Quality Valley Regional Office
Telephone: 540-574-7800
Last EDR Contact: 03/04/2013
Next Scheduled EDR Contact: 06/17/2013
Data Release Frequency: No Update Planned

LTANKS: Leaking Petroleum Storage Tanks
Includes releases of petroleum from underground storage tanks and aboveground storage tanks.

Date of Government Version: 11/01/2012
Date Data Arrived at EDR: 12/05/2012
Date Made Active in Reports: 02/19/2013
Number of Days to Update: 76

Source: Department of Environmental Quality
Telephone: 804-698-4010
Last EDR Contact: 03/17/2013
Next Scheduled EDR Contact: 06/17/2013
Data Release Frequency: Quarterly

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 09/12/2011
Date Data Arrived at EDR: 09/13/2011
Date Made Active in Reports: 11/11/2011
Number of Days to Update: 59

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 01/28/2013
Next Scheduled EDR Contact: 05/13/2013
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 08/17/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 49

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/28/2013
Next Scheduled EDR Contact: 05/13/2013
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 08/27/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 49
Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 01/28/2013
Next Scheduled EDR Contact: 05/13/2013
Data Release Frequency: Quarterly

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/12/2012
Date Data Arrived at EDR: 05/09/2012
Date Made Active in Reports: 07/10/2012
Number of Days to Update: 62
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 02/01/2013
Next Scheduled EDR Contact: 05/13/2013
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 08/01/2012
Date Data Arrived at EDR: 08/02/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 75
Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 10/30/2012
Next Scheduled EDR Contact: 05/13/2013
Data Release Frequency: Quarterly

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 12/14/2011
Date Data Arrived at EDR: 12/15/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 26
Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 01/28/2013
Next Scheduled EDR Contact: 05/13/2013
Data Release Frequency: Semi-Annually

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 09/06/2012
Date Data Arrived at EDR: 09/07/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 39
Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 01/28/2013
Next Scheduled EDR Contact: 05/13/2013
Data Release Frequency: Quarterly

***State and tribal registered storage tank lists***

UST: Registered Petroleum Storage Tanks
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 11/01/2012
Date Data Arrived at EDR: 12/05/2012
Date Made Active in Reports: 02/15/2013
Number of Days to Update: 72
Source: Department of Environmental Quality
Telephone: 804-698-4010
Last EDR Contact: 03/07/2013
Next Scheduled EDR Contact: 06/17/2013
Data Release Frequency: Semi-Annually

AST: Registered Petroleum Storage Tanks
Registered Aboveground Storage Tanks.

Date of Government Version: 11/01/2012
Date Data Arrived at EDR: 12/05/2012
Date Made Active in Reports: 02/19/2013
Number of Days to Update: 76

Source: Department of Environmental Quality
Telephone: 804-698-4010
Last EDR Contact: 03/07/2013
Next Scheduled EDR Contact: 06/17/2013
Data Release Frequency: Semi-Annually

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 04/12/2012
Date Data Arrived at EDR: 05/02/2012
Date Made Active in Reports: 07/16/2012
Number of Days to Update: 75

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 02/01/2013
Next Scheduled EDR Contact: 05/13/2013
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 12/14/2011
Date Data Arrived at EDR: 12/15/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 26

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 01/28/2013
Next Scheduled EDR Contact: 05/13/2013
Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 08/02/2012
Date Data Arrived at EDR: 08/03/2012
Date Made Active in Reports: 11/05/2012
Number of Days to Update: 94

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 01/28/2013
Next Scheduled EDR Contact: 05/13/2013
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 05/10/2011
Date Data Arrived at EDR: 05/11/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 34

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 01/28/2013
Next Scheduled EDR Contact: 05/13/2013
Data Release Frequency: Semi-Annually

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 08/17/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 49

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/28/2013
Next Scheduled EDR Contact: 05/13/2013
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 08/27/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 49

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 01/28/2013
Next Scheduled EDR Contact: 05/13/2013
Data Release Frequency: Quarterly

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 08/01/2012
Date Data Arrived at EDR: 08/02/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 75

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/28/2013
Next Scheduled EDR Contact: 05/13/2013
Data Release Frequency: Quarterly

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 09/06/2012
Date Data Arrived at EDR: 09/07/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 39

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 01/28/2013
Next Scheduled EDR Contact: 05/13/2013
Data Release Frequency: Quarterly

FEMA UST: Underground Storage Tank Listing

A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010
Date Data Arrived at EDR: 02/16/2010
Date Made Active in Reports: 04/12/2010
Number of Days to Update: 55

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 01/14/2013
Next Scheduled EDR Contact: 04/29/2013
Data Release Frequency: Varies

***State and tribal institutional control / engineering control registries***

ENG CONTROLS: Engineering Controls Sites Listing

A listing of sites with Engineering Controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 01/07/2013
Date Data Arrived at EDR: 01/10/2013
Date Made Active in Reports: 02/15/2013
Number of Days to Update: 36

Source: Department of Environmental Quality
Telephone: 804-698-4228
Last EDR Contact: 01/02/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Quarterly

INST CONTROL: Voluntary Remediation Program Database

Sites included in the Voluntary Remediation Program database that have deed restrictions.

Date of Government Version: 01/07/2013
Date Data Arrived at EDR: 01/10/2013
Date Made Active in Reports: 02/15/2013
Number of Days to Update: 36

Source: Department of Environmental Quality
Telephone: 804-698-4228
Last EDR Contact: 01/02/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Quarterly

***State and tribal voluntary cleanup sites***

VRP: Voluntary Remediation Program

The Voluntary Cleanup Program encourages owners of elected contaminated sites to take the initiative and conduct voluntary cleanups that meet state environmental standards.

Date of Government Version: 01/07/2013
Date Data Arrived at EDR: 01/10/2013
Date Made Active in Reports: 02/15/2013
Number of Days to Update: 36

Source: Department of Environmental Quality
Telephone: 804-698-4228
Last EDR Contact: 01/02/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Quarterly

INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 09/28/2012
Date Data Arrived at EDR: 10/02/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 14

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 01/04/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

***State and tribal Brownfields sites***

BROWNFIELDS: Brownfields Site Specific Assessments

To qualify for Brownfields Assessment, the site must meet the Federal definition of a Brownfields and should have contaminant issues that need to be addressed and a redevelopment plan supported by the local government and community. Virginia's Department of Environmental Quality performs brownfields assessments under a cooperative agreement with the U.S. Environmental Protection Agency at no cost to communities, property owners or, prospective purchasers. The assessment is an evaluation of environmental impacts caused by previous site uses similar to a Phase II Environmental Assessment.

Date of Government Version: 01/29/2013
Date Data Arrived at EDR: 02/01/2013
Date Made Active in Reports: 02/19/2013
Number of Days to Update: 18

Source: Department of Environmental Quality
Telephone: 804-698-4207
Last EDR Contact: 01/29/2013
Next Scheduled EDR Contact: 05/13/2013
Data Release Frequency: Varies

**ADDITIONAL ENVIRONMENTAL RECORDS**

***Local Brownfield lists***

US BROWNFIELDS: A Listing of Brownfields Sites

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 12/10/2012
Date Data Arrived at EDR: 12/11/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 9

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 02/14/2013
Next Scheduled EDR Contact: 04/08/2013
Data Release Frequency: Semi-Annually

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

***Local Lists of Landfill / Solid Waste Disposal Sites***

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137
Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 01/28/2013
Next Scheduled EDR Contact: 05/13/2013
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39
Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52
Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 02/05/2013
Next Scheduled EDR Contact: 05/20/2013
Data Release Frequency: Varies

***Local Lists of Hazardous waste / Contaminated Sites***

US CDL: Clandestine Drug Labs
A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 11/14/2012
Date Data Arrived at EDR: 12/11/2012
Date Made Active in Reports: 02/15/2013
Number of Days to Update: 66
Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/04/2013
Next Scheduled EDR Contact: 06/17/2013
Data Release Frequency: Quarterly

US HIST CDL: National Clandestine Laboratory Register
A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 09/01/2007
Date Data Arrived at EDR: 11/19/2008
Date Made Active in Reports: 03/30/2009
Number of Days to Update: 131
Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

***Local Land Records***

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/16/2012
Date Data Arrived at EDR: 03/26/2012
Date Made Active in Reports: 06/14/2012
Number of Days to Update: 80

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 01/28/2013
Next Scheduled EDR Contact: 05/13/2013
Data Release Frequency: Varies

***Records of Emergency Release Reports***

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 55

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Annually

SPILLS PD: PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 10/20/2009
Date Data Arrived at EDR: 10/29/2009
Date Made Active in Reports: 12/03/2009
Number of Days to Update: 35

Source: Department of Environmental Quality, Piedmont Region
Telephone: 804-527-5020
Last EDR Contact: 02/06/2012
Next Scheduled EDR Contact: 05/21/2012
Data Release Frequency: Quarterly

SPILLS: Prep/Spills Database Listing

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment. PREP staff often work to assist local emergency responders, other state agencies, federal agencies, and responsible parties, as may be needed, to manage pollution incidents. Oil spills, fish kills, and hazardous materials spills are examples of incidents that may involve the DEQ's PREP Program.

Date of Government Version: 11/01/2012
Date Data Arrived at EDR: 12/05/2012
Date Made Active in Reports: 02/19/2013
Number of Days to Update: 76

Source: Department of Environmental Quality
Telephone: 804-698-4287
Last EDR Contact: 03/07/2013
Next Scheduled EDR Contact: 06/17/2013
Data Release Frequency: Varies

SPILLS BRL: Prep/Spills Database Listing

A listing of spills locations located in the Blue Ridge Regional area, Lynchburg.

Date of Government Version: 09/18/2009
Date Data Arrived at EDR: 09/18/2009
Date Made Active in Reports: 10/06/2009
Number of Days to Update: 18

Source: DEQ, Blue Ridge Regional Office
Telephone: 434-582-6218
Last EDR Contact: 11/28/2011
Next Scheduled EDR Contact: 03/12/2012
Data Release Frequency: Varies

SPILLS TD: PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 09/17/2009
Date Data Arrived at EDR: 09/23/2009
Date Made Active in Reports: 10/06/2009
Number of Days to Update: 13

Source: Department of Environmental Quality, Tidewater Region
Telephone: 757-518-2177
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: Quarterly

SPILLS WC: Prep Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 09/21/2009
Date Data Arrived at EDR: 09/29/2009
Date Made Active in Reports: 10/30/2009
Number of Days to Update: 31

Source: Department of Environmental Quality, West Central Region
Telephone: 540-562-6700
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

SPILLS VA: PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 08/08/2012
Date Data Arrived at EDR: 08/09/2012
Date Made Active in Reports: 10/05/2012
Number of Days to Update: 57

Source: Department of Environmental Quality, Valley Regional Office
Telephone: 540-574-7800
Last EDR Contact: 02/04/2013
Next Scheduled EDR Contact: 05/20/2013
Data Release Frequency: Quarterly

PC-SPILLS: Pollution Complaint Database

Pollution Complaints Database. The pollution reports contained in the PC database include the initial release reporting of Leaking Underground Storage Tanks and all other releases of petroleum to the environment as well as releases to state waters. The database is current through 12/1/93. Since that time, all spill and pollution reporting information has been collected and tracked through the DEQ regional offices.

Date of Government Version: 06/01/1996
Date Data Arrived at EDR: 10/22/1996
Date Made Active in Reports: 11/21/1996
Number of Days to Update: 30

Source: Department of Environmental Quality
Telephone: 804-698-4287
Last EDR Contact: 03/08/2010
Next Scheduled EDR Contact: 06/21/2010
Data Release Frequency: No Update Planned

SPILLS NO: PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 09/23/2009
Date Data Arrived at EDR: 09/29/2009
Date Made Active in Reports: 10/30/2009
Number of Days to Update: 31

Source: Department of Environmental Quality, Northern Region
Telephone: 703-583-3864
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

SPILLS SW: Reportable Spills

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 01/21/2010
Date Data Arrived at EDR: 01/22/2010
Date Made Active in Reports: 02/16/2010
Number of Days to Update: 25

Source: Department of Environmental Quality, Southwest Region
Telephone: 276-676-4839
Last EDR Contact: 07/13/2012
Next Scheduled EDR Contact: 10/29/2012
Data Release Frequency: No Update Planned

***Other Ascertainable Records***

RCRA NonGen / NLR: RCRA - Non Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 02/12/2013
Date Data Arrived at EDR: 02/15/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 12

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 02/15/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Varies

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/07/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 42

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 02/05/2013
Next Scheduled EDR Contact: 05/20/2013
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 01/17/2013
Next Scheduled EDR Contact: 04/29/2013
Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 08/12/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 112

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 03/11/2013
Next Scheduled EDR Contact: 06/24/2013
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 10/01/2012
Date Data Arrived at EDR: 10/19/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 62

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 12/28/2012
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Varies

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 02/27/2012
Date Data Arrived at EDR: 03/14/2012
Date Made Active in Reports: 06/14/2012
Number of Days to Update: 92

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 12/11/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010
Date Data Arrived at EDR: 10/07/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 146

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 02/25/2013
Next Scheduled EDR Contact: 06/10/2013
Data Release Frequency: Varies

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 08/18/2011
Date Data Arrived at EDR: 09/08/2011
Date Made Active in Reports: 09/29/2011
Number of Days to Update: 21

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 03/06/2013
Next Scheduled EDR Contact: 06/17/2013
Data Release Frequency: Semi-Annually

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 09/01/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 131

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 02/26/2013
Next Scheduled EDR Contact: 06/10/2013
Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2006
Date Data Arrived at EDR: 09/29/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 64

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 12/28/2012
Next Scheduled EDR Contact: 04/08/2013
Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 02/25/2013
Next Scheduled EDR Contact: 06/10/2013
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 02/25/2013
Next Scheduled EDR Contact: 06/10/2013
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 01/28/2013
Next Scheduled EDR Contact: 05/13/2013
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 07/20/2011
Date Data Arrived at EDR: 11/10/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 01/17/2013
Next Scheduled EDR Contact: 04/29/2013
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 11/01/2010
Date Data Arrived at EDR: 11/10/2010
Date Made Active in Reports: 02/16/2011
Number of Days to Update: 98

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 01/16/2013
Next Scheduled EDR Contact: 04/29/2013
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 06/21/2011
Date Data Arrived at EDR: 07/15/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 60

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 03/11/2013
Next Scheduled EDR Contact: 06/24/2013
Data Release Frequency: Quarterly

RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 10/02/2012
Date Data Arrived at EDR: 10/02/2012
Date Made Active in Reports: 11/05/2012
Number of Days to Update: 34

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 01/09/2013
Next Scheduled EDR Contact: 04/22/2013
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 10/23/2011
Date Data Arrived at EDR: 12/13/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 79

Source: EPA
Telephone: (215) 814-5000
Last EDR Contact: 12/11/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 05/08/2012
Date Data Arrived at EDR: 05/25/2012
Date Made Active in Reports: 07/10/2012
Number of Days to Update: 46
Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 01/28/2013
Next Scheduled EDR Contact: 05/13/2013
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 03/01/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 62
Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 02/26/2013
Next Scheduled EDR Contact: 06/10/2013
Data Release Frequency: Biennially

UIC: Underground Injection Control Wells

A listing of underground injection controls wells.

Date of Government Version: 01/17/2013
Date Data Arrived at EDR: 02/07/2013
Date Made Active in Reports: 02/19/2013
Number of Days to Update: 12
Source: Department of Mines, Minerals and Energy
Telephone: 276-415-9700
Last EDR Contact: 01/09/2013
Next Scheduled EDR Contact: 05/20/2013
Data Release Frequency: Varies

DRYCLEANERS: Drycleaner List

A listing of registered drycleaners.

Date of Government Version: 11/23/2010
Date Data Arrived at EDR: 11/24/2010
Date Made Active in Reports: 12/09/2010
Number of Days to Update: 15
Source: Department of Environmental Quality
Telephone: 804-698-4407
Last EDR Contact: 01/14/2013
Next Scheduled EDR Contact: 04/29/2013
Data Release Frequency: Varies

ENFORCEMENT: Enforcement Actions Data

A listing of enforcement actions.

Date of Government Version: 12/17/2012
Date Data Arrived at EDR: 12/17/2012
Date Made Active in Reports: 02/15/2013
Number of Days to Update: 60
Source: Department of Environmental Quality
Telephone: 804-698-4031
Last EDR Contact: 03/11/2013
Next Scheduled EDR Contact: 06/24/2013
Data Release Frequency: Varies

CEDS: Comprehensive Environmental Data System

Virginia Water Protection Permits, Virginia Pollution Discharge System (point discharge) permits and Virginia Pollution Abatement (no point discharge) permits.

Date of Government Version: 12/11/2012
Date Data Arrived at EDR: 12/12/2012
Date Made Active in Reports: 02/19/2013
Number of Days to Update: 69
Source: Department of Environmental Quality
Telephone: 804-698-4077
Last EDR Contact: 03/11/2013
Next Scheduled EDR Contact: 06/24/2013
Data Release Frequency: Semi-Annually

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

AIRS: Permitted Airs Facility List
A listing of permitted Airs facilities.

Date of Government Version: 12/03/2012
Date Data Arrived at EDR: 12/05/2012
Date Made Active in Reports: 02/19/2013
Number of Days to Update: 76
Source: Department of Environmental Quality
Telephone: 804-698-4000
Last EDR Contact: 03/04/2013
Next Scheduled EDR Contact: 06/17/2013
Data Release Frequency: Varies

TIER 2: Tier 2 Information Listing
A listing of facilities which store or manufacture hazardous materials and submit a chemical inventory report.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 12/21/2012
Date Made Active in Reports: 02/19/2013
Number of Days to Update: 60
Source: Department of Environmental Quality
Telephone: 804-698-4159
Last EDR Contact: 12/18/2012
Next Scheduled EDR Contact: 04/08/2013
Data Release Frequency: Annually

INDIAN RESERV: Indian Reservations
This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34
Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 01/17/2013
Next Scheduled EDR Contact: 04/29/2013
Data Release Frequency: Semi-Annually

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing
The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54
Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 01/21/2013
Next Scheduled EDR Contact: 05/06/2013
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011
Date Data Arrived at EDR: 10/19/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 83
Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 02/01/2013
Next Scheduled EDR Contact: 05/13/2013
Data Release Frequency: Varies

COAL ASH: Coal Ash Disposal Sites
A listing of facilities with coal ash impoundments.

Date of Government Version: 07/29/2009
Date Data Arrived at EDR: 07/31/2009
Date Made Active in Reports: 08/21/2009
Number of Days to Update: 21
Source: Department of Environmental Protection
Telephone: 804-698-4285
Last EDR Contact: 03/11/2013
Next Scheduled EDR Contact: 06/24/2013
Data Release Frequency: Varies

FEDLAND: Federal and Indian Lands
Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 01/17/2013
Next Scheduled EDR Contact: 04/29/2013
Data Release Frequency: N/A

COAL ASH DOE: Sleam-Electric Plan Operation Data

A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 01/15/2013
Next Scheduled EDR Contact: 04/29/2013
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 08/17/2010
Date Data Arrived at EDR: 01/03/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 77

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 12/11/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing

A listing of financial assurance information for underground storage tank facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 12/06/2012
Date Data Arrived at EDR: 12/06/2012
Date Made Active in Reports: 02/15/2013
Number of Days to Update: 71

Source: Department of Environmental Quality
Telephone: 804-698-4205
Last EDR Contact: 03/05/2013
Next Scheduled EDR Contact: 06/17/2013
Data Release Frequency: Varies

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 11/11/2011
Date Data Arrived at EDR: 05/18/2012
Date Made Active in Reports: 05/25/2012
Number of Days to Update: 7

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 02/15/2013
Next Scheduled EDR Contact: 05/27/2013
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information listing

Solid waste financial assurance information.

Date of Government Version: 11/05/2012
Date Data Arrived at EDR: 11/08/2012
Date Made Active in Reports: 12/11/2012
Number of Days to Update: 33

Source: Department of Environmental Quality
Telephone: 804-698-4123
Last EDR Contact: 02/04/2013
Next Scheduled EDR Contact: 05/20/2013
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 11/20/2012
Date Data Arrived at EDR: 11/30/2012
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 89

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 02/19/2013
Next Scheduled EDR Contact: 06/03/2013
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/13/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 36

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 02/12/2013
Next Scheduled EDR Contact: 05/27/2013
Data Release Frequency: Quarterly

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 10/01/2012
Date Data Arrived at EDR: 10/04/2012
Date Made Active in Reports: 11/05/2012
Number of Days to Update: 32

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Quarterly

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 11/15/2012
Date Data Arrived at EDR: 11/16/2012
Date Made Active in Reports: 02/15/2013
Number of Days to Update: 91

Source: EPA
Telephone: 202-564-5962
Last EDR Contact: 12/28/2012
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 11/15/2012
Date Data Arrived at EDR: 11/16/2012
Date Made Active in Reports: 02/15/2013
Number of Days to Update: 91

Source: EPA
Telephone: 202-564-5962
Last EDR Contact: 12/28/2012
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Annually

**EDR HIGH RISK HISTORICAL RECORDS**

***EDR Exclusive Records***

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR US Hist Auto Stat: EDR Exclusive Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Cleaners: EDR Exclusive Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Cleaners: EDR Proprietary Historic Dry Cleaners - Cole

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: N/A
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Auto Stat: EDR Proprietary Historic Gas Stations - Cole

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: N/A
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

**OTHER DATABASE(S)**

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 11/19/2012
Date Data Arrived at EDR: 11/19/2012
Date Made Active in Reports: 01/03/2013
Number of Days to Update: 45

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 02/18/2013
Next Scheduled EDR Contact: 06/03/2013
Data Release Frequency: Annually

NJ MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/19/2012
Date Made Active in Reports: 08/28/2012
Number of Days to Update: 40

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 01/15/2013
Next Scheduled EDR Contact: 04/29/2013
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 11/01/2012
Date Data Arrived at EDR: 11/07/2012
Date Made Active in Reports: 12/11/2012
Number of Days to Update: 34

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 02/07/2013
Next Scheduled EDR Contact: 05/20/2013
Data Release Frequency: Annually

PA MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/23/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 57

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 01/21/2013
Next Scheduled EDR Contact: 05/06/2013
Data Release Frequency: Annually

RI MANIFEST: Manifest information

Hazardous waste manifest information

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 06/22/2012
Date Made Active in Reports: 07/31/2012
Number of Days to Update: 39

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 02/25/2013
Next Scheduled EDR Contact: 06/10/2013
Data Release Frequency: Annually

WI MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/19/2012
Date Made Active in Reports: 09/27/2012
Number of Days to Update: 70

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 12/13/2012
Next Scheduled EDR Contact: 04/01/2013
Data Release Frequency: Annually

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data

Source: Rextag Strategies Corp.
Telephone: (281) 769-2247
U.S. Electric Transmission and Power Plants Systems Digital GIS Data

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 804-692-1900

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

**STREET AND ADDRESS INFORMATION**

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# GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

**TARGET PROPERTY ADDRESS**

AASF
700-799 PORTUGEE RD
RICHMOND, VA 23250

**TARGET PROPERTY COORDINATES**

| | |
|---|---|
| Latitude (North): | 37.4933 - 37° 29' 35.88'' |
| Longitude (West): | 77.3125 - 77° 18' 45.00'' |
| Universal Tranverse Mercator: | Zone 18 |
| UTM X (Meters): | 295560.1 |
| UTM Y (Meters): | 4151905.5 |
| Elevation: | 150 ft. above sea level |

**USGS TOPOGRAPHIC MAP**

| | |
|---|---|
| Target Property Map: | 37077-D3 DUTCH GAP, VA |
| Most Recent Revision: | 1994 |
| | |
| North Map: | 37077-E3 SEVEN PINES, VA |
| Most Recent Revision: | 1994 |

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**GROUNDWATER FLOW DIRECTION INFORMATION**

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

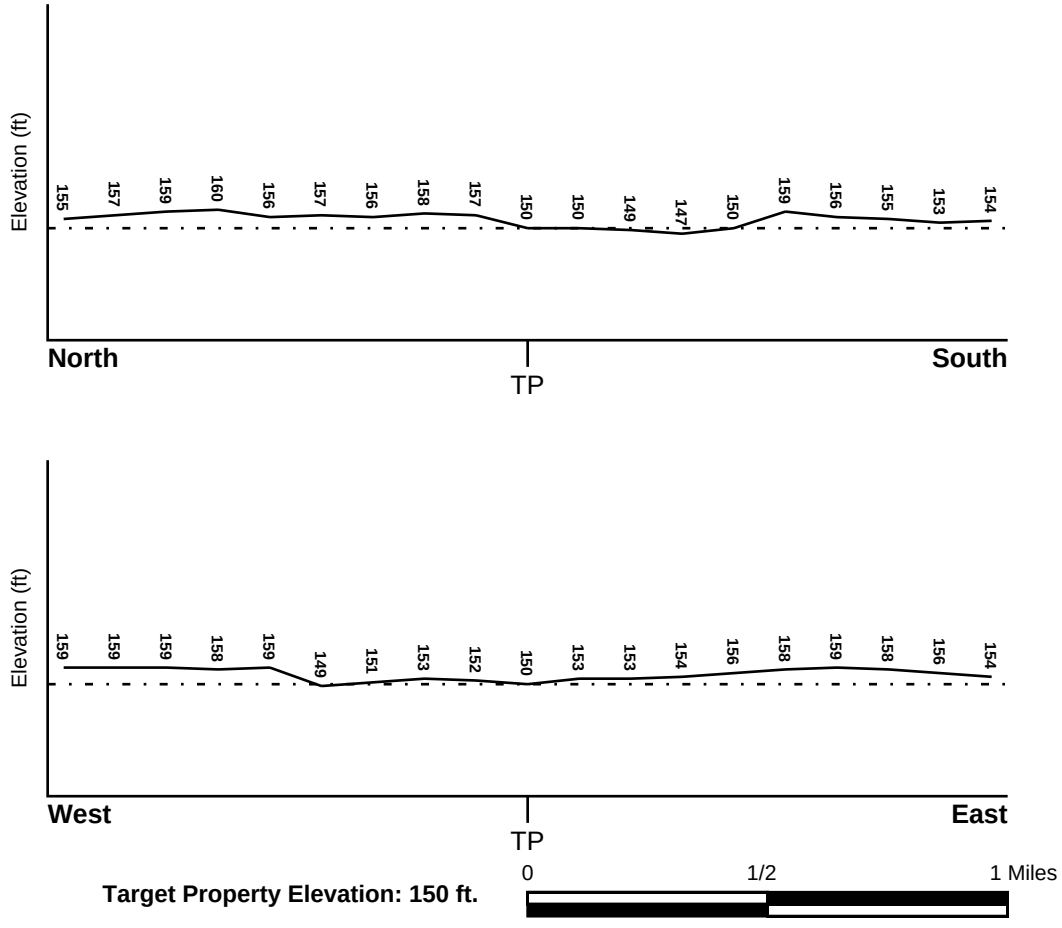
**TOPOGRAPHIC INFORMATION**

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

**TARGET PROPERTY TOPOGRAPHY**

General Topographic Gradient: General South

**SURROUNDING TOPOGRAPHY: ELEVATION PROFILES**




Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**HYDROLOGIC INFORMATION**

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

**FEMA FLOOD ZONE**

| Target Property County | FEMA Flood Electronic Data |
|---|---|
| HENRICO, VA | YES - refer to the Overview Map and Detail Map |

Flood Plain Panel at Target Property: 51087C - FEMA DFIRM Flood data

Additional Panels in search area: Not Reported

**NATIONAL WETLAND INVENTORY**

| NWI Quad at Target Property | NWI Electronic Data Coverage |
|---|---|
| DUTCH GAP | YES - refer to the Overview Map and Detail Map |

**HYDROGEOLOGIC INFORMATION**

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

***Site-Specific Hydrogeological Data*:***

Search Radius: 1.25 miles
Status: Not found

**AQUIFLOW®**

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

| MAP ID | LOCATION FROM TP | GENERAL DIRECTION GROUNDWATER FLOW |
|---|---|---|
| Not Reported | | |

* ©1996 Site−specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**GROUNDWATER FLOW VELOCITY INFORMATION**

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

**GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY**

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

**ROCK STRATIGRAPHIC UNIT**

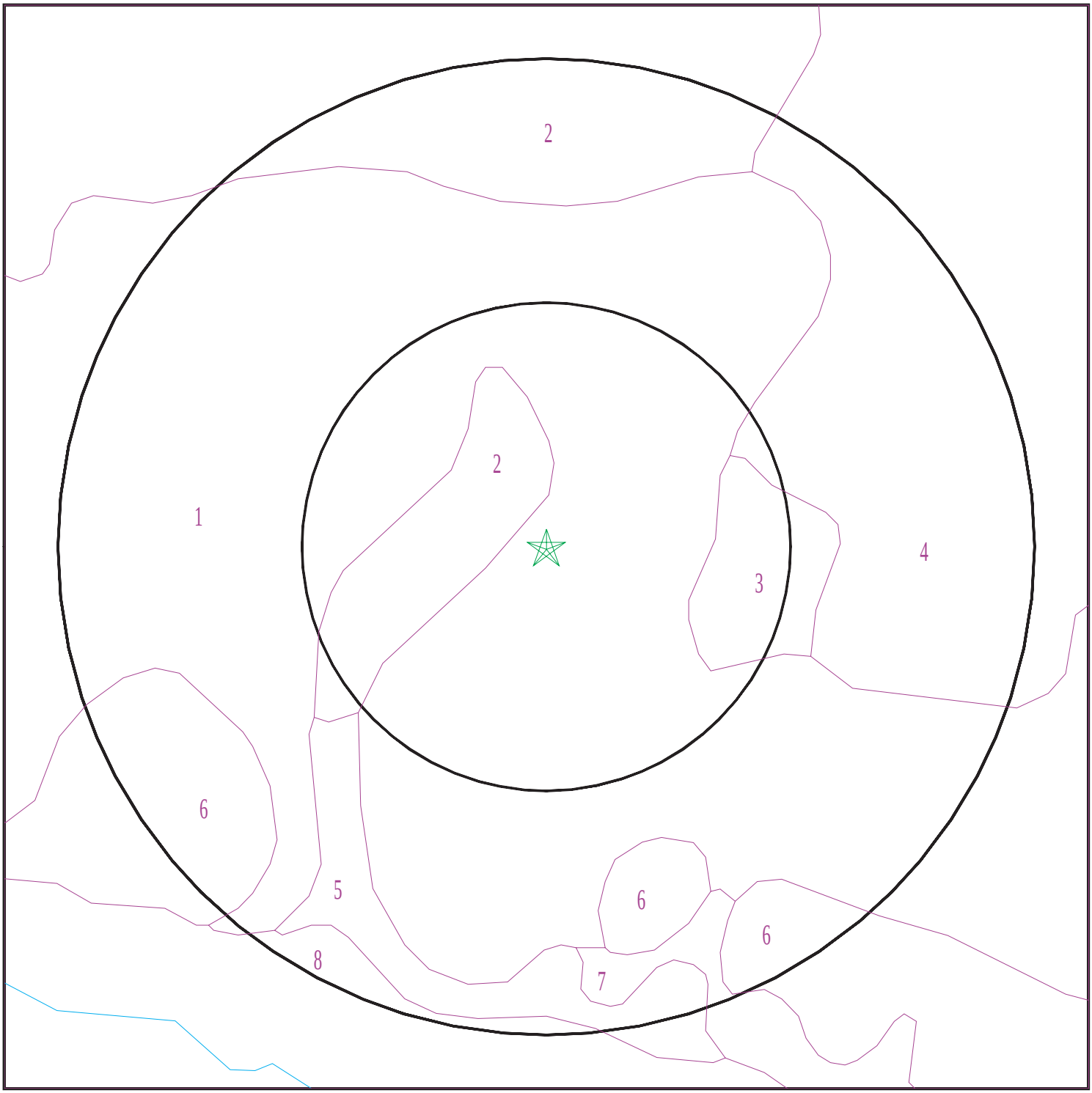
| | |
|---|---|
| Era: | Cenozoic |
| System: | Tertiary |
| Series: | Miocene |
| Code: | Tm *(decoded above as Era, System & Series)* |

**GEOLOGIC AGE IDENTIFICATION**

Category: Stratified Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

# SSURGO SOIL MAP - 3542256.23s




Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

| | | | |
|---|---|---|---|
| SITE NAME: | AASF | CLIENT: | EEE Consulting |
| ADDRESS: | 700-799 PORTUGEE RD<br>Richmond VA 23250 | CONTACT: | Jennifer Jones |
| | | INQUIRY #: | 3542256.23s |
| LAT/LONG: | 37.4933 / 77.3125 | DATE: | March 12, 2013 3:06 pm |

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# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY**

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

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**Soil Map ID: 1**

Soil Component Name: Atlee

Soil Surface Texture: very fine sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 61 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 11 inches | very fine sandy loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 14<br>Min: 1.4 | Max: 5.5<br>Min: 3.6 |
| 2 | 11 inches | 22 inches | clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 14<br>Min: 1.4 | Max: 5.5<br>Min: 3.6 |
| 3 | 22 inches | 53 inches | clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 14<br>Min: 1.4 | Max: 5.5<br>Min: 3.6 |
| 4 | 53 inches | 78 inches | clay | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 14<br>Min: 1.4 | Max: 5.5<br>Min: 3.6 |

**Soil Map ID: 2**

Soil Component Name: Lenoir

Soil Surface Texture: silt loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Somewhat poorly drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 38 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 5 inches | silt loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 1.4<br>Min: 0.42 | Max: 5.5<br>Min: 3.6 |
| 2 | 5 inches | 78 inches | silty clay | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 1.4<br>Min: 0.42 | Max: 5.5<br>Min: 3.6 |

**Soil Map ID: 3**

Soil Component Name: Coxville

Soil Surface Texture: silt loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Poorly drained

Hydric Status: All hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 15 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 7 inches | silt loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 4<br>Min: 1.4 | Max: 5.5<br>Min: 3.6 |
| 2 | 7 inches | 78 inches | clay | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 4<br>Min: 1.4 | Max: 5.5<br>Min: 3.6 |

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**Soil Map ID: 4**

Soil Component Name: Lynchburg

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Somewhat poorly drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 31 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 14 inches | fine sandy loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 14<br>Min: 4 | Max: 5.5<br>Min: 3.6 |
| 2 | 14 inches | 78 inches | clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 14<br>Min: 4 | Max: 5.5<br>Min: 3.6 |

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**Soil Map ID: 5**

Soil Component Name: Chewacla

Soil Surface Texture: silt loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Somewhat poorly drained

Hydric Status: All hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 60 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 9 inches | silt loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils. | COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. | Max: 14<br>Min: 4 | Max: 5.5<br>Min: 4.5 |

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 2 | 9 inches | 46 inches | clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils. | COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. | Max: 14 Min: 4 | Max: 5.5 Min: 4.5 |
| 3 | 46 inches | 78 inches | sandy clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils. | COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. | Max: 14 Min: 4 | Max: 5.5 Min: 4.5 |

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**Soil Map ID: 6**

Soil Component Name: Kempsville

Soil Surface Texture: very fine sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 11 inches | very fine sandy loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 141 Min: 0.42 | Max: 6 Min: 4.5 |

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 2 | 11 inches | 59 inches | sandy clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 141 Min: 0.42 | Max: 6 Min: 4.5 |
| 3 | 59 inches | 78 inches | clay | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 141 Min: 0.42 | Max: 6 Min: 4.5 |

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**Soil Map ID: 7**

Soil Component Name: Duplin

Soil Surface Texture: very fine sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 60 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 7 inches | very fine sandy loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 4 Min: 1.4 | Max: 5.5 Min: 4.5 |

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 2 | 7 inches | 78 inches | clay | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 4<br>Min: 1.4 | Max: 5.5<br>Min: 4.5 |

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**Soil Map ID: 8**

Soil Component Name: Kinston

Soil Surface Texture: silt loam

Hydrologic Group: Class B/D - Drained/undrained hydrology class of soils that can be drained and are classified.

Soil Drainage Class: Poorly drained

Hydric Status: All hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 15 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 5 inches | silt loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand. | Max: 14<br>Min: 4 | Max: 5.5<br>Min: 4.5 |
| 2 | 5 inches | 74 inches | clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand. | Max: 14<br>Min: 4 | Max: 5.5<br>Min: 4.5 |

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 3 | 74 inches | 78 inches | sandy loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand. | Max: 14<br>Min: 4 | Max: 5.5<br>Min: 4.5 |

**LOCAL / REGIONAL WATER AGENCY RECORDS**

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

**WELL SEARCH DISTANCE INFORMATION**

| DATABASE | SEARCH DISTANCE (miles) |
|---|---|
| Federal USGS | 1.000 |
| Federal FRDS PWS | Nearest PWS within 1 mile |
| State Database | 1.000 |

**FEDERAL USGS WELL INFORMATION**

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| No Wells Found | | |

**FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION**

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| 1 | VA4087670 | 1/4 - 1/2 Mile SSE |

Note: PWS System location is not always the same as well location.

**STATE DATABASE WELL INFORMATION**

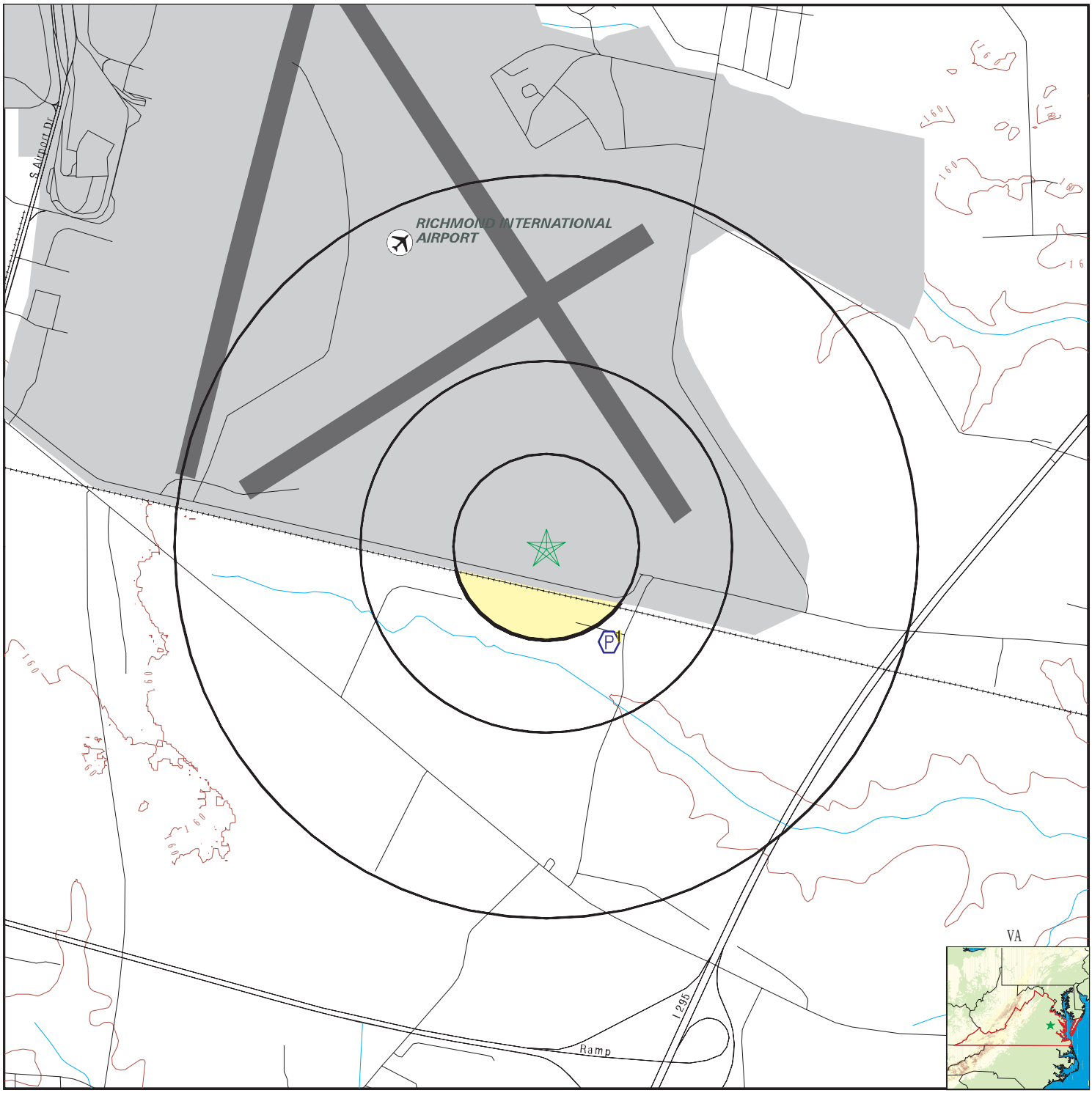
| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**STATE DATABASE WELL INFORMATION**

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| No Wells Found | | |

# PHYSICAL SETTING SOURCE MAP - 3542256.23s




- County Boundary
- Major Roads
- Contour Lines
- Airports
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- HD Closest Hydrogeological Data

| | | | |
|---|---|---|---|
| SITE NAME: | AASF | CLIENT: | EEE Consulting |
| ADDRESS: | 700-799 PORTUGEE RD<br>Richmond VA 23250 | CONTACT: | Jennifer Jones |
| | | INQUIRY #: | 3542256.23s |
| LAT/LONG: | 37.4933 / 77.3125 | DATE: | March 12, 2013 3:05 pm |

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# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

**1**
**SSE** **FRDS PWS** **VA4087670**
**1/4 - 1/2 Mile**
**Higher**

| | | | |
|---|---|---|---|
| PWS ID: | VA4087670 | | |
| Date Initiated: | 8906 | Date Deactivated: | Not Reported |
| PWS Name: | MAZOLERCH COMPANY<br>MARVIN DODD-MEAT MGR<br>363 LERCH DR<br>SANDSTON, VA 23150 | | |
| Addressee / Facility: | System Owner/Responsible Party<br>MR GARY LERCH OPERATIONS MGR<br>MAZO LERCH COMPANY INC<br>363 LERCH DR<br>SANDSTON, VA 23150 | | |
| Facility Latitude: | 37 29 22 | Facility Longitude: | 077 18 35 |
| City Served: | HENRICO | | |
| Treatment Class: | Untreated | Population: | 00000060 |

PWS currently has or had major violation(s) or enforcement: YES

**VIOLATIONS INFORMATION:**

| | | | | | |
|---|---|---|---|---|---|
| Violation ID: | 93V0001 | Source ID: | Not Reported | PWS Phone: | 8047372891 |
| Vio. beginning Date: | 04/01/92 | Vio. end Date: | 03/31/93 | Vio. Period: | 012 Months |
| Num required Samples: | Not Reported | Number of Samples Taken: | | Not Reported | |
| Analysis Result: | 000024600000000 | Maximum Contaminant Level: | | Not Reported | |
| Analysis Method: | Not Reported | | | | |
| Violation Type: | MCL, Average | | | | |
| Contaminant: | BENZENE | | | | |
| Vio. Awareness Date: | 020493 | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Violation ID: | 94V0001 | Source ID: | Not Reported | PWS Phone: | Not Reported |
| Vio. beginning Date: | 05/01/94 | Vio. end Date: | 05/31/94 | Vio. Period: | 001 Months |
| Num required Samples: | Not Reported | Number of Samples Taken: | | Not Reported | |
| Analysis Result: | Not Reported | Maximum Contaminant Level: | | Not Reported | |
| Analysis Method: | Not Reported | | | | |
| Violation Type: | MCL, Monthly (TCR) | | | | |
| Contaminant: | COLIFORM (TCR) | | | | |
| Vio. Awareness Date: | Not Reported | | | | |

**ENFORCEMENT INFORMATION:**

| | | | |
|---|---|---|---|
| System Name: | MAZOLERCH COMPANY | | |
| Violation Type: | MCL, Monthly (TCR) | | |
| Contaminant: | COLIFORM (TCR) | | |
| Compliance Period: | 1994-05-01 - 1994-05-31 | | |
| Violation ID: | 9400001V | | |
| Enforcement Date: | 1994-08-01 | Enf. Action: | State Public Notif Requested |

**ENFORCEMENT INFORMATION:**

| | | | |
|---|---|---|---|
| System Name: | MAZOLERCH COMPANY | | |
| Violation Type: | MCL, Monthly (TCR) | | |
| Contaminant: | COLIFORM (TCR) | | |
| Compliance Period: | 1994-05-01 - 1994-05-31 | | |
| Violation ID: | 9400001V | | |
| Enforcement Date: | 1994-08-01 | Enf. Action: | State Formal NOV Issued |
| System Name: | MAZOLERCH COMPANY | | |
| Violation Type: | MCL, Monthly (TCR) | | |
| Contaminant: | COLIFORM (TCR) | | |
| Compliance Period: | 1994-05-01 - 1994-05-31 | | |
| Violation ID: | 9400001V | | |
| Enforcement Date: | 1994-08-15 | Enf. Action: | State Public Notif Received |

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
# RADON

**AREA RADON INFORMATION**

Federal EPA Radon Zone for HENRICO County: 3

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

---

Federal Area Radon Information for HENRICO COUNTY, VA

Number of sites tested: 49

| Area | Average Activity | % <4 pCi/L | % 4-20 pCi/L | % >20 pCi/L |
|---|---|---|---|---|
| Living Area - 1st Floor | 1.021 pCi/L | 100% | 0% | 0% |
| Living Area - 2nd Floor | Not Reported | Not Reported | Not Reported | Not Reported |
| Basement | 3.480 pCi/L | 80% | 20% | 0% |

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

## TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

## HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

## HYDROGEOLOGIC INFORMATION

AQUIFLOW$^{R}$ Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

## GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

## LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Virginia Public Water Supplies
Source: Department of Health, Office of Water Programs
Telephone: 804-786-1756

## OTHER STATE DATABASE INFORMATION

Virginia Oil and Gas Wells
Source: Department of Mines, Minerals and Energy
Telephone: 804-692-3200
A listing of oil and gas well locations

RADON

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

EPA Region 3 Statistical Summary Readings
Source: Region 3 EPA
Telephone: 215-814-2082
Radon readings for Delaware, D.C., Maryland, Pennsylvania, Virginia and West Virginia.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

**STREET AND ADDRESS INFORMATION**

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VDEQ Letter to Army Corps of Engineers
and FUDS Sampling Report

# COMMONWEALTH of VIRGINIA

*DEPARTMENT OF ENVIRONMENTAL QUALITY*
*Street address:* 629 East Main Street, Richmond, Virginia 23219
*Mailing address:* P.O. Box 10009, Richmond, Virginia 23240
Fax (804) 698-4500 TDD (804) 698-4021
www.deq.virginia.gov

L. Preston Bryant, Jr.
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482


January 4, 2008

Ms. Adriane B. James, FUDS Program Manager
U. S. Army Corps of Engineers – Norfolk District
803 Front Street
Norfolk, Virginia 23510-7875

RE: Results of Byrd Field FUDS Sampling Trip Report and NDAI Determination (#CO3VA0178). Henrico County, Virginia

Dear Ms. James:

The Virginia Department of Environmental Quality (VDEQ) – Office of Remediation Programs, working in conjunction with our contractor TechLaw, Inc., conducted a joint site inspection/sampling event at the former Byrd Field Formerly Used Defense Site (FUDS). The predominant portion of the former Byrd Field FUDS which was investigated on June 26, 2007, is located contiguous to the Richmond International Airport, in Henrico County. A site inspection/sampling event was also conducted on the referenced date at Building 1310, which is located within the confines of the Richmond International Airport.

As you're aware, the former Byrd Field consisted of approximately 3,219 acres, and functioned as an Army Airfield from during World War II. Documentation indicates that this FUDS was acquired in 1942 by the United States. Subsequent to it's utilization as an Army Airfield, the majority of this property was deeded to the City of Richmond in 1947. The former Byrd Field consisted of storage warehouses and vaults, hangars, hardstands, barracks, runways and an underground fuel distribution system. Subsequent to World War II, available files indicate that the both the Virginia Air Guard and Army National Guard used various facilities of the Byrd Field FUDS.

During the referenced site inspection/sampling event, remnants of several concrete foundations, former roads, and a suspected base sign/marker, and Building 1310 were identified. It is suspected that Building 1310 may have functioned as a loading/unloading point for ordnance.

On June 26, 2007, soil/sediment was sampled at six (6) locations at depths of 6 – 18 inches below ground surface. Two (2) samples (one of which was a duplicate) were collected adjacent to a foundation near a suspected base sign/marker. One (1) sample was collected within a nearby drainage ditch and nearby culvert. One (1) sample was collected adjacent to a suspected barracks foundation. One (1) sample was collected in a ditch near the suspected former barracks. One (1) sample was collected adjacent to a suspected Administration Building foundation. Two (2) samples were collected adjacent to Building 1310 (located within confines of Richmond International Airport).

All soil/sediment samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), explosives, polychlorinated biphenyls, target analyte list metals and mercury.

All soil/sediment results were screened against EPA Region III residential/industrial Risk Based Concentrations (RBCs) and EPA Region III Soil Screening Levels (SSLs).

The results of the June 26, 2007 sampling event indicated exceedances of EPA Region III residential RBCs for aluminum, arsenic, iron, lead, vanadium, and a total of six (6) SVOCs. Exceedances of EPA Region III industrial/commercial RBCs were as follows: arsenic, lead, and a total of five (5) SVOCs. Please be aware that the RBC for mercuric chloride should be used as a surrogate for mercury. Although not identified in the attached draft report, several constituents exceeded there corresponding SSLs.

In Table 5-1 and Table 5-2 of the attached report, exceedences of residential and commercial/industrial RBCs are illustrated. Please be aware that some RBC exceedences were not defined in these tables.

Based upon the application of industrial risk-based concentrations, along with some internal risk calculations performed by our VDEQ Toxicologist, samples collected near a suspected former barracks, and in the ditch and adjacent culvert near the suspected barracks, samples adjacent to Building 1310, the sample adjacent to the suspected Administration Building, and the sample location near the suspected base sign/marker presented an unacceptable or adverse risk to human health

Therefore, based upon data collected/screened from both sampling events, the VDEQ cannot concur with the previous Department of Defense "NDAI" determination for the Byrd Field FUDS. As a result of our NDAI non-concurrence, VDEQ recommends that the United States Army Corps of Engineers conduct a Preliminary Assessment for purposes of defining the extent of contamination and ultimately addressing the potential adverse risk to human health. Please note that these determinations were based upon limited sampling.

Should you have any concerns/comments with this letter, please contact me @ 804/698-4427.

Sincerely,

Eric J. Salopek
Remedial Project Manager

Cc: Durwood H. Willis; VDEQ ORP
Patricia A. McMurray; VDEQ ORP
Rob Timmins; VDEQ TRO
Dawn Fulsher; EPA Region III
Lawrence A. Salzman; Salzman Real Estate SVCS

TechLaw
Quality & Integrity

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(703) 818-8813 FAX
www.techlawinc.com

August 21, 2007 **VA-12941-T6-ID-018**

Mr. Eric J. Salopek
FUDS Project Manager
Office of Remediation Programs
Virginia Department of Environmental Quality (VDEQ)
629 East Main Street
Richmond, VA 23219

**Reference: VDEQ Contract No. 12941; Task Order Number 6 (01247.006.03); Byrd Field, Property No. CO3VA0178; Richmond, VA; Sampling Trip Report**

Dear Mr. Salopek:

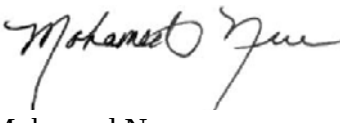
Enclosed please find the Sampling Trip Report for the Byrd Field sampling event that occurred on June 26, 2007.

Samples were collected from the Byrd Field site at two geographically separate locations: the former barracks area and Building 1310. Sample results were screened against the EPA Region 3 Risk Based Concentration (RBC) levels and EPA Region 3 Soil Screening Levels (SSLs). The screening indicated several compounds were present above the residential and/or industrial RBCs and several compounds were present above the SSL values. Only those results exceeding RBC levels are summarized in this report.

Results of the screening indicated that four semi-volatile organic compounds (SVOCs) exceeded industrial RBCs at the site: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene in sample BF-FBR-1 (collected in a ditch near the former barracks area next to the roadway). In addition, several SVOCs exceeded residential RBCs: benzo(k)fluoranthene in sample BF-FBR-1, benzo(a)pyrene in sample BF-FB-1 (collected in the former barracks area), benzo(a)pyrene and benzo(b)fluoranthene in sample BF-C-1 (collected at the exit of a culvert in former barracks area), and benzo(a)pyrene in both sample locations near Building 1310. Additionally, arsenic was detected at values ranging from 1.3 mg/kg to 5.7 mg/kg in all sample locations. All of these detections exceeded the residential RBC for arsenic of 0.43 mg/kg, and some exceeded the industrial RBC for arsenic of 1.91 mg/kg.

One copy of this Sampling Trip Report is being sent to you in a Adobe pdf format. In addition, two bound copies will also be forwarded to you via U.S. regular mail. Should you have any questions, please call me at (703) 818-3244 or Jana Dawson at (703) 818-3254.

Sincerely,



Mohamed Nur
Program Manager

cc: R. Sherfey/TL Central Files
J. Dawson, Project Manager

**VA-12941-T6-ID-018**

# BYRD FIELD
# VDEQ PROPERTY # C03VA0178
# RICHMOND, VA

## BYRD FIELD
## SAMPLING TRIP REPORT

Submitted to:

Mr. Eric J. Salopek
FUDS Project Manager
Office of Remediation Programs
Virginia Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23219

Submitted by:

TechLaw, Inc.
14500 Avion Parkway
Suite 300
Chantilly, VA 20151

| | |
|---|---|
| Task Order No. | 006 |
| Contract No. | 12941 |
| TechLaw PM | Jana Dawson |
| Telephone No. | 703-818-3254 |
| VDEQ PM | Eric J. Salopek |
| Telephone No. | 804-698-4427 |

August 21, 2007

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ATTACHMENTS

Attachment A: Figure 1 - Site Location Map
Attachment B: Field Log
Attachment C: Photographic Log
Attachment D: Screened Data Summary
Attachment E: Sample Results Summary

## 1.0 INTRODUCTION

Under the Virginia Department of Environmental Quality (VDEQ) Contract No. 12941, Task Order No. 06, TechLaw, Inc. (TechLaw) was directed to conduct soil sampling at the Byrd Field site, Property No. CO3VA0178 located in Richmond, Virginia, as part of a review of Formerly Used Defense Sites (FUDS).

TechLaw was tasked to collect soil samples from locations selected by Eric J. Salopek of the VDEQ. The areas of interest identified for sampling at the property included two separate geographic locations: the former barracks area and an area surrounding Building 1310. All samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), explosives, polychlorinated biphenyls (PCBs), target analyte list (TAL) metals including mercury.

This trip report presents a summary of these activities. Figure 1, Site Location Map, depicts the location of the Richmond International Airport with Byrd Field adjacent to the airport boundary in Henrico County, Richmond, Virginia. This map is provided in Attachment A.

## 2.0 BACKGROUND/SITE DESCRIPTION

Byrd Field is located adjacent to the Richmond International Airport in Henrico County, Richmond, Virginia. Little information is available about the history of Byrd Field; however, the site is also referred to as the Former Richmond Army Airfield. As evidenced from the remnants of concrete foundations and other attributes at the site, several buildings/barracks, roads, and a railroad/railcar system formerly existed at the site. Additionally, it is probable that this facility was utilized as a military airport in some capacity. All structures have been removed from the site with the exception of Buidling1310, which is currently a working building that supports operations at the Richmond International Airport. Building 1310 is located adjacent to former railroad tracks/carline, and it is suspected that Building 1310 may have been used in the loading and unloading of ordnance.

## 3.0 FIELD PERSONNEL

Mr. Harry C. Wheeler, Jr. of TechLaw conducted sampling activities at Byrd Field on June 26, 2007.

## 4.0 FIELD AND SAMPLING ACTIVITIES

### 4.1 Introduction

This section summarizes the sampling activities conducted on June 26, 2007. Field logs were maintained to document the field activities. A copy of the field logs are provided in Attachment B.

## 4.2 Sampling Activities

On June 26, 2007, Harry C. Wheeler, Jr., of TechLaw, met with Mr. Eric Salopek, of VDEQ, at 8:40 a.m. in the Engineering offices of Richmond International (Byrd) Airport with Mr. Rutledge in order to discuss the location of the former Richmond Army Airfield (Byrd Field). Discussion centered on two geographically separate locations: the former barracks area and Building 1310. Both locations were outside of the current Richmond International Airport property boundary.

Mr. Salopek and Mr. Wheeler mobilized to the first of the identified suspect locations which was located in a wooded area adjacent to the current airport, just outside the fenced runway. At the entrance to the former Richmond Army Airfield, the remnants of a suspected base sign, administration building and barracks area were noted.

The weather was overcast and humid with a temperature of $85^0$F and light winds.

Grab samples were collected using a stainless steel trowel and bowl. Appropriate sample containers were then filled in the following order: VOCs, SVOCs, explosives, PCBs, TAL metals and mercury.

The first samples, BF-E-1 and duplicate sample BF-E-1D, were collected adjacent to the entrance at the foundation of what was suspected to be a base sign at 10:30 a.m. at an interval between 6 to 12 inches below ground surface (bgs). The second grab sample, BF-C-1, was collected at he exit of a culvert at 11:30 a.m. at an interval between 6 to 18 inches bgs. A matrix spike and matrix spike duplicate were collected at this location.

Three samples were collected near a suspected barracks building and ditch next to the barracks road. The first sample, BF-FB-1 was collected at an interval between 6 to 12 inches bgs near the foundation of one of the former barracks buildings. The second sample, BF-FBR-1, was collected in a ditch next to a roadway near the former barracks, at an interval between 6 and 12 inches bgs. The third sample, BF-ADM-1, was collected next to the suspected administration building at an interval between 6 and 12 inches bgs.

Mr. Wheeler and Mr. Salopek then mobilized to Building 1310, a suspected former munitions facility, to collect samples from two locations adjacent to the exterior of the building.

The first sample, BF-1310-1, was collected adjacent to the air conditioning unit and building foundation at 2:30 p.m. at an interval between 6 to 12 inches bgs. The second sample, BF-1310-2, was collected from the northwest corner of the building at an interval between 6 to 12 inches bgs.

After each sample collection, Mr. Wheeler labeled, securely bagged, and placed the samples in a cooler with ice.

All samples were shipped to GPL Laboratories via Federal Express and arrived intact at the appropriate temperature.

### 4.3 Health and Safety Plan

Field activities were conducted according to the procedures described in TechLaw's Health and Safety Plan for Reconnaissance and Sampling at Formerly Utilized Defense Sites (FUDS) and Federal Facilities within the Commonwealth of Virginia, October 6, 2006.

### 4.4 Sample Analysis

The laboratory and analytical methods used for the June 26, 2007, sampling event are listed below:

GPL Laboratories

- VOCs by SW-846 8260
- SVOCs by SW-846 8270C
- Explosives by SW-846 8330A
- PCBs by SW-846 8082
- TAL Metals by 6010B
- Mercury by 7470A/7471A

## 5.0 RESULTS OF DATA SCREENING

Analytical results for soil samples collected at Byrd Field were screened against industrial and residential EPA Region 3 Risk Based Concentrations (RBCs) and against EPA Region 3 Soil Screening Levels (SSLs) with a Dilution Attenuation Factor (DAF) of 1 and 20. The results of this screening are provided in an excel spreadsheet in Attachment D. For the purposes of this report, only those results that exceeded residential and/or industrial RBCs have been summarized. Based on this data screening assessment, sample BF-FBR-1, collected near a former roadway next to the remnants of the former barracks buildings, reported four SVOCs above the industrial RBCs and one SVOC above the residential RBCs. Sample BF-FB-1, collected near the former barracks, reported one SVOC above the residential RBCs. Sample BF-C-1, collected at the exit of a culvert in the former barracks area, reported two SVOCs above residential RBCs. In addition, samples collected near the Building 1310 at sample locations BF-1310-1 and BF-1310-2 reported one SVOC above the residential RBCs. The only metal element to exceed RBCs was arsenic. Arsenic exceeded its industrial RBC near the former barracks, the suspected former administration building, and near building 1310. Additionally, arsenic exceeded its residential RBC near the exit of the culvert and the entrance to the Former Richmond Army Airfield. Results are presented in Tables 5-1 and 5-2 below.

**Table 5-1: SVOC RBC Exceedances**

| Sample Number | Analyte | Result (ug/kg) | Residential RBC[1] (ug/kg) | Industrial RBC[1] (ug/kg) |
|---|---|---|---|---|
| BF-FBR-1 | Benzo(a)anthracene | 8800 | 220 | 3920 |
| BF-FBR-1 | Benzo(a)pyrene | 7200 | 22 | 392 |
| BF-FBR-1 | Benzo(b)fluoranthene | 11000 | 220 | 3920 |
| BF-FBR-1 | Dibenz(a,h)anthracene | 530 | 22 | 392 |
| BF-FBR-1 | Benzo(k)fluoranthene | 8000 | 2200 | 39200 |
| BF-FB-1 | Benzo(a)pyrene | 51 | 22 | 392 |
| BF-C-1 | Benzo(a)pyrene | 170 | 22 | 392 |
| BF-C-1 | Benzo(b)fluoranthene | 230 | 220 | 3920 |
| BF-1310-1 | Benzo(a)pyrene | 73 | 22 | 392 |
| BF-1310-2 | Benzo(a)pyrene | 44 | 22 | 392 |

1 - EPA Region 3 RBC Table, April 2007

**Table 5-2: Arsenic RBC Exceedances**

| Sample Number | Analyte | Result (mg/kg) | Residential RBC[1] (mg/kg) | Industrial RBC[1] (mg/kg) |
|---|---|---|---|---|
| BF-FBR-1 | Arsenic | 2.3 | 0.43 | 1.91 |
| BF-FB-1 | Arsenic | 2.4 | 0.43 | 1.91 |
| BF-E-1 | Arsenic | 1.3 | 0.43 | 1.91 |
| BF-E-1D | Arsenic | 1.5 | 0.43 | 1.91 |
| BF-C-1 | Arsenic | 1.8 | 0.43 | 1.91 |
| BF-ADM-1 | Arsenic | 2.5 | 0.43 | 1.91 |
| BF-1310-1 | Arsenic | 5.7 | 0.43 | 1.91 |
| BF-1310-2 | Arsenic | 3.8 | 0.43 | 1.91 |

1 - EPA Region 3 RBC Table, April 2007

Complete analytical results are provided in Attachment E.

## 6.0 REFERENCES

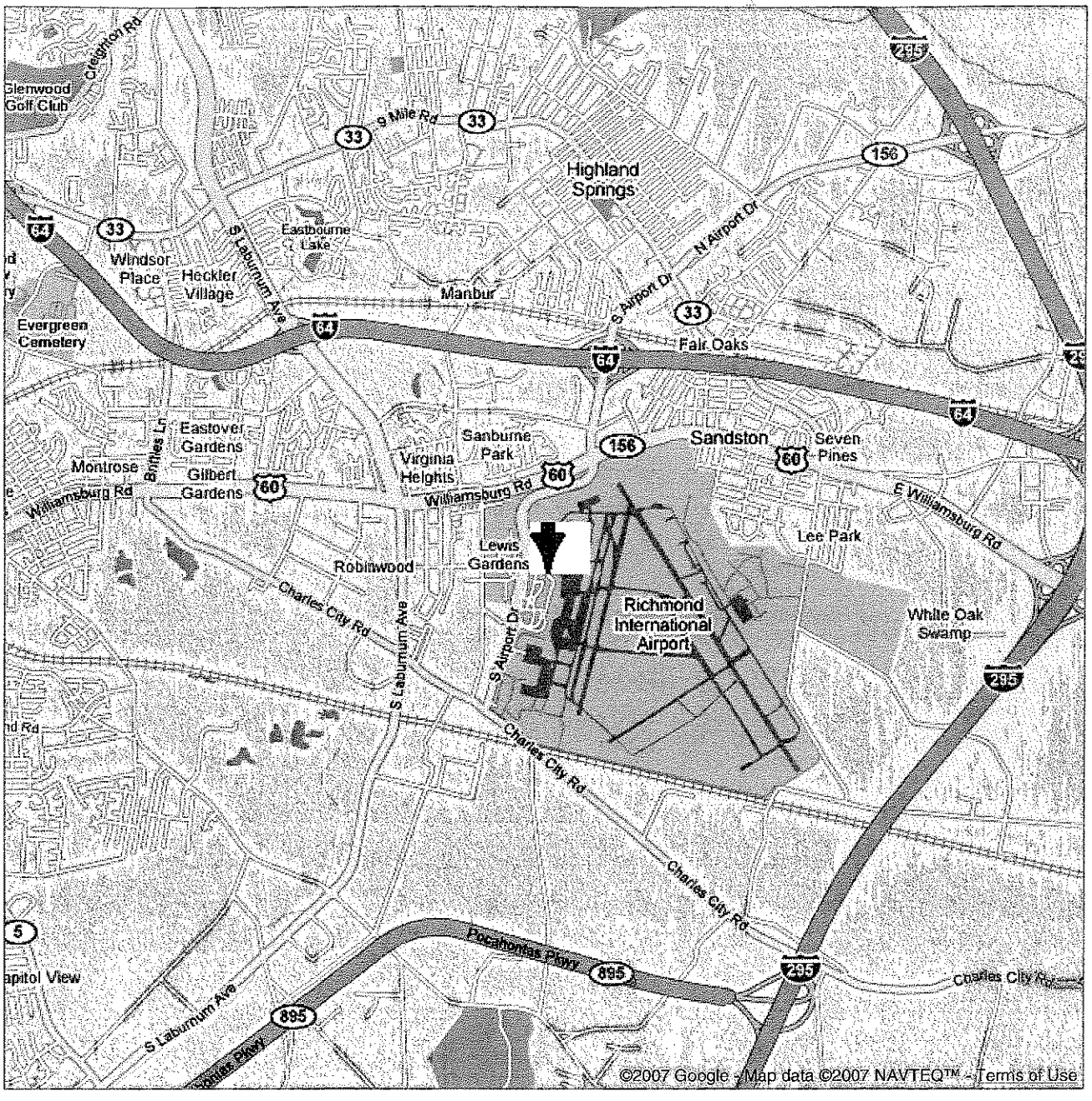
TechLaw, 2007. Field Log Book. June 26, 2007
TechLaw, October 2006. FUDS Health and Safety Plan. October 2006

**BYRD FIELD, PROPERTY NO. CO3VA0178**
**RICHMOND, VA**

# ATTACHMENT A:
# FIGURE 1 - SITE LOCATION MAP

**JUNE 26, 2007 SAMPLING EVENT**

Address **RIC - Richmond Intl Airport**
**Uninc Hanover County, VA**



**BYRD FIELD, PROPERTY NO. CO3VA0178**
**RICHMOND, VA**

# ATTACHMENT B:
# FIELD LOG

## JUNE 26, 2007 SAMPLING EVENT

"Rite in the Rain®"
ALL-WEATHER WRITING PAPER

Name Harry C. Wheeler, Jr.
662 Todd Trail

Address
Newport News, VA. 23602

Phone 757-870-6384

Project Byrd Field
VDEQ Site 6

Clear Vinyl Protective Slipcovers (Item No. 30) are available for this style of notebook. Helps protect your notebook from wear & tear. Contact your dealer or the J. L. Darling Corporation

CONTENTS


| PAGE | REFERENCE | DATE |
|---|---|---|
| 1 | Byrd Field | 6/25/07 |

OVERCAST - HUMID - 85°F 6-5MPH WIND

0700 LEAVE HOME FOR RICHMOND AIRPORT

0940 ARRIVE @ ENGINEERING OFFICE MEET WITH MR RUTLEDGE AND ERIC.

9:20 DRIVE TO FORMER RICHMOND ARMY AIRFIELD

10:10 ARRIVE AT POSSIBLE BASE SIGN & ADMINISTRATION AREA. TAKE PHOTO OF FORMER BASE SIGN.

10 30 TAKE FIRST SAMPLE @ ENTRANCE TO FORMER BYRD FIELD BF-E-1 & BF-E-1D BETWEEN 6" - 12" IN DEPTH. LT BROWN SAND & S.I.T. ERIC CHOSE LOCATION.



PHOTO LOG

#1 POSSIBLE BASE SIGN LOCATION.

#2 BF-E-1 & BF-E-1D SAMPLE LOCATION

#3 BF-C-1 SAMPLE LOCATION MATRIX SPIKE & DUPLICATE SPIKE LOCATION.

#4 CULVERT & BF-C-1 SAMPLE LOCATION

#5 FORMER ROADWAY LEADING TO CULVERT & BF-C-1 SAMPLE LOCATION.

#6 ROADWAY BEHIND POSSIBLE FORMER BARRACKS

#7 FOUNDATION OF FORMER BARRACKS

#8 FOUNDATION SAMPLE BF-FB-1

#9 FOUNDATION ROADWAY SAMPLE BF-RB-1

#10 POSSIBLE ADMINISTRATION BUILDING SAMPLE LOCATION BF-ABM-1

1130 Take Sample BF-C-1 with Matrix Spike & Matrix Duplicate Spike 6" to 18" Deep. Brown in Color with Sand, Silt and Organic Material at Foot of Culvert

1220 Take Sample BF-FB-1 6"-12" Deep Brown to Grey Sand Silt & Rock.

1245 Take Sample BF-FDR-1 6"-12" in Depth Brown Sand Silt & Rock.

1330 Sample Administration Building South BF-Adm-1 6"-18" Deep.

1430 Sample Building B10-1 Next To AC Unit. & Foundation 6"-12" Brown in Color

1515 Sample Building B10-2 Next To Northwest Corner of Building 6"-12" Deep



Photo Log

#11 11 Street

#12 Former Brenham Rd looking North

#13 Former Brenham Rd looking South

#14 N Street

#15 Sample Building B10-1

#16 Building B10 West Side of Building

#17 Building B10-2 NW Corner Sample

#18 Deer 5550 D over Sample Point BF-1310-2

1530 Leave Richmond For Home to Bag Tag & FedEx Samples to Lab.

1700 Arrive @ Home to Bag & Tag Samples For Shipment to Lab

1820 Load Sample Coolers For Shipment To GPL Lab & Drive to Fed Ex.

1850 Arrive @ FedEx & Make Shipment.

1920 Arrive Back Home & End For The Day.

**BYRD FIELD, PROPERTY NO. CO3VA0178**
**RICHMOND, VA**

# ATTACHMENT C:
# PHOTOGRAPHIC LOG

## JUNE 26, 2007 SAMPLING EVENT

**BYRD FIELD, Property No. CO3VA0178**
**June 26, 2007 Sampling Event**
**Photographic Log**

Photo 1: Possible former Army Base sign.

Photo 2 (log book photo 5):  Former Roadway leading to Culvert and BF-C-1 sample location.

Photo 3 (log book photo 6):  Roadway behind possible location of barracks.

Photo 4 (log book photo 7):  Foundation of Former Barracks.

Photo 5 (log book photo 8):  Sample BF-FB-1, Foundation of Former Barracks.

Photo 6 (log book photo 9):  Sample BF-RB-1, Roadway next to Former Barracks foundation.

Photo 7 (log book photo 10):  Sample BF-ADM-1, Possible Administration Building location.

Photo 8 (log book photo 11):  Former ‘U’ Street.

Photo 9 (log book photo 12):  Former Beulah Road, looking North.

Photo 10 (log book photo 13):  Former Beulah Road, looking South.

Photo 11 (log book photo 14):  Former ‘N’ Street.

Photo 12 (log book photo 15):  Sample BF-1310-1, Building 1310.

Photo 13 (log book photo 16):  West side of Building 1310.

Photo 14 (log book photo 17):  Sample BF-1310-2, Sample location - Northwest corner of Building 1310.

Photo 15 (log book photo 18): Sample BF-1310-2, Door 5550D, over sample point at Northwest Corner of Building 1310.

Photo 16 (log book photo 19):  Looking south along Building 1310 and Former Railroad Track.

**BYRD FIELD, PROPERTY NO. CO3VA0178**
**RICHMOND, VA**

# ATTACHMENT D:
# SCREENED DATA SUMMARY

## JUNE 26, 2007 SAMPLING EVENT

| CLIENT_SAMPLE_ID | LAB_SAMPLE_NO | PARAMETERS | REPORTING_RESULT | QUALIFIER | UNITS |
|---|---|---|---|---|---|
| BF-1310-1 | 706149-007-014-1/1 | 2-Methylnaphthalene | 71 | J | ug/kg |
| BF-C-1 | 706149-003-018-1/3 | Acenaphthylene | 96 | J | ug/kg |
| BF-FBR-1 | 706149-005-012-1/1 | Acenaphthylene | 4200 | | ug/kg |
| BF-1310-1 | 706149-007-024-1/1 | Aluminum | 15300 | | mg/kg |
| BF-1310-2 | 706149-008-025-1/1 | Aluminum | 15800 | | mg/kg |
| BF-ADM-1 | 706149-006-023-1/1 | Aluminum | 17300 | | mg/kg |
| BF-C-1 | 706149-003-028-1/3 | Aluminum | 5920 | | mg/kg |
| BF-E-1 | 706149-001-026-1/1 | Aluminum | 8850 | | mg/kg |
| BF-E-1D | 706149-002-027-1/1 | Aluminum | 9440 | | mg/kg |
| BF-FB-1 | 706149-004-021-1/1 | Aluminum | 11100 | | mg/kg |
| BF-FBR-1 | 706149-005-022-1/1 | Aluminum | 7260 | | mg/kg |
| BF-FBR-1 | 706149-005-012-1/1 | Anthracene | 2200 | J | ug/kg |
| BF-C-1 | 706149-003-028-1/3 | Antimony | 0.31 | JN | mg/kg |
| BF-FB-1 | 706149-004-021-1/1 | Antimony | 0.32 | JN | mg/kg |
| BF-FBR-1 | 706149-005-022-1/1 | Antimony | 0.44 | JN | mg/kg |
| BF-1310-1 | 706149-007-024-1/1 | Arsenic | 5.7 | | mg/kg |
| BF-1310-2 | 706149-008-025-1/1 | Arsenic | 3.8 | | mg/kg |
| BF-ADM-1 | 706149-006-023-1/1 | Arsenic | 2.5 | | mg/kg |
| BF-C-1 | 706149-003-028-1/3 | Arsenic | 1.8 | | mg/kg |
| BF-E-1 | 706149-001-026-1/1 | Arsenic | 1.3 | J | mg/kg |
| BF-E-1D | 706149-002-027-1/1 | Arsenic | 1.5 | J | mg/kg |
| BF-FB-1 | 706149-004-021-1/1 | Arsenic | 2.4 | | mg/kg |
| BF-FBR-1 | 706149-005-022-1/1 | Arsenic | 2.3 | | mg/kg |
| BF-1310-1 | 706149-007-024-1/1 | Barium | 250 | | mg/kg |
| BF-1310-2 | 706149-008-025-1/1 | Barium | 89.5 | | mg/kg |
| BF-ADM-1 | 706149-006-023-1/1 | Barium | 30.1 | | mg/kg |
| BF-C-1 | 706149-003-028-1/3 | Barium | 16.8 | | mg/kg |
| BF-E-1 | 706149-001-026-1/1 | Barium | 25.8 | | mg/kg |
| BF-E-1D | 706149-002-027-1/1 | Barium | 28.3 | | mg/kg |
| BF-FB-1 | 706149-004-021-1/1 | Barium | 36.3 | | mg/kg |
| BF-FBR-1 | 706149-005-022-1/1 | Barium | 15.5 | | mg/kg |
| BF-1310-1 | 706149-007-014-1/1 | Benzo(a)anthracene | 100 | J | ug/kg |
| BF-1310-2 | 706149-008-015-1/1 | Benzo(a)anthracene | 34 | J | ug/kg |
| BF-C-1 | 706149-003-018-1/3 | Benzo(a)anthracene | 210 | J | ug/kg |
| BF-FB-1 | 706149-004-011-1/1 | Benzo(a)anthracene | 61 | J | ug/kg |
| BF-FBR-1 | 706149-005-012-1/1 | Benzo(a)anthracene | 8800 | | ug/kg |
| BF-1310-1 | 706149-007-014-1/1 | Benzo(a)pyrene | 73 | J | ug/kg |
| BF-1310-2 | 706149-008-015-1/1 | Benzo(a)pyrene | 44 | J | ug/kg |
| BF-C-1 | 706149-003-018-1/3 | Benzo(a)pyrene | 170 | J | ug/kg |
| BF-FB-1 | 706149-004-011-1/1 | Benzo(a)pyrene | 51 | J | ug/kg |
| BF-FBR-1 | 706149-005-012-1/1 | Benzo(a)pyrene | 7200 | | ug/kg |
| BF-1310-1 | 706149-007-014-1/1 | Benzo(b)fluoranthene | 120 | J | ug/kg |
| BF-1310-2 | 706149-008-015-1/1 | Benzo(b)fluoranthene | 64 | J | ug/kg |
| BF-C-1 | 706149-003-018-1/3 | Benzo(b)fluoranthene | 230 | J | ug/kg |
| BF-FB-1 | 706149-004-011-1/1 | Benzo(b)fluoranthene | 86 | J | ug/kg |
| BF-FBR-1 | 706149-005-012-1/1 | Benzo(b)fluoranthene | 11000 | | ug/kg |
| BF-FBR-1 | 706149-005-012-1/1 | Benzo(g,h,i)perylene | 5400 | | ug/kg |
| BF-1310-1 | 706149-007-014-1/1 | Benzo(k)fluoranthene | 74 | J | ug/kg |
| BF-1310-2 | 706149-008-015-1/1 | Benzo(k)fluoranthene | 43 | J | ug/kg |

| CLIENT_SAMPLE_ID | LAB_SAMPLE_NO | PARAMETERS | REPORTING_RESULT | QUALIFIER | UNITS |
|---|---|---|---|---|---|
| BF-C-1 | 706149-003-018-1/3 | Benzo(k)fluoranthene | 90 | J | ug/kg |
| BF-FB-1 | 706149-004-011-1/1 | Benzo(k)fluoranthene | 34 | J | ug/kg |
| BF-FBR-1 | 706149-005-012-1/1 | Benzo(k)fluoranthene | 8000 | | ug/kg |
| BF-1310-1 | 706149-007-014-1/1 | Benzyl Butyl Phthalate | 47 | J | ug/kg |
| BF-1310-1 | 706149-007-024-1/1 | Beryllium | 0.37 | | mg/kg |
| BF-1310-2 | 706149-008-025-1/1 | Beryllium | 0.32 | | mg/kg |
| BF-ADM-1 | 706149-006-023-1/1 | Beryllium | 0.23 | | mg/kg |
| BF-C-1 | 706149-003-028-1/3 | Beryllium | 0.13 | J | mg/kg |
| BF-E-1 | 706149-001-026-1/1 | Beryllium | 0.18 | | mg/kg |
| BF-E-1D | 706149-002-027-1/1 | Beryllium | 0.18 | | mg/kg |
| BF-FB-1 | 706149-004-021-1/1 | Beryllium | 0.26 | | mg/kg |
| BF-FBR-1 | 706149-005-022-1/1 | Beryllium | 0.27 | | mg/kg |
| BF-1310-1 | 706149-007-014-1/1 | bis(2-ethylhexyl) phthalate | 110 | J | ug/kg |
| BF-1310-2 | 706149-008-015-1/1 | bis(2-ethylhexyl) phthalate | 320 | J | ug/kg |
| BF-1310-1 | 706149-007-024-1/1 | Cadmium | 0.36 | J | mg/kg |
| BF-1310-2 | 706149-008-025-1/1 | Cadmium | 0.28 | J | mg/kg |
| BF-C-1 | 706149-003-028-1/3 | Cadmium | 0.11 | J | mg/kg |
| BF-E-1 | 706149-001-026-1/1 | Cadmium | 0.023 | J | mg/kg |
| BF-FB-1 | 706149-004-021-1/1 | Cadmium | 0.046 | J | mg/kg |
| BF-1310-1 | 706149-007-024-1/1 | Calcium | 1260 | | mg/kg |
| BF-1310-2 | 706149-008-025-1/1 | Calcium | 2150 | | mg/kg |
| BF-ADM-1 | 706149-006-023-1/1 | Calcium | 84.9 | | mg/kg |
| BF-C-1 | 706149-003-028-1/3 | Calcium | 278 | | mg/kg |
| BF-E-1 | 706149-001-026-1/1 | Calcium | 455 | | mg/kg |
| BF-E-1D | 706149-002-027-1/1 | Calcium | 586 | | mg/kg |
| BF-FB-1 | 706149-004-021-1/1 | Calcium | 241 | | mg/kg |
| BF-FBR-1 | 706149-005-022-1/1 | Calcium | 249 | | mg/kg |
| BF-1310-1 | 706149-007-024-1/1 | Chromium | 18.5 | | mg/kg |
| BF-1310-2 | 706149-008-025-1/1 | Chromium | 18.1 | | mg/kg |
| BF-ADM-1 | 706149-006-023-1/1 | Chromium | 19.5 | | mg/kg |
| BF-C-1 | 706149-003-028-1/3 | Chromium | 6.8 | | mg/kg |
| BF-E-1 | 706149-001-026-1/1 | Chromium | 9.6 | | mg/kg |
| BF-E-1D | 706149-002-027-1/1 | Chromium | 10.4 | | mg/kg |
| BF-FB-1 | 706149-004-021-1/1 | Chromium | 14.4 | | mg/kg |
| BF-FBR-1 | 706149-005-022-1/1 | Chromium | 15.4 | | mg/kg |
| BF-1310-1 | 706149-007-014-1/1 | Chrysene | 100 | J | ug/kg |
| BF-1310-2 | 706149-008-015-1/1 | Chrysene | 46 | J | ug/kg |
| BF-C-1 | 706149-003-018-1/3 | Chrysene | 220 | J | ug/kg |
| BF-FB-1 | 706149-004-011-1/1 | Chrysene | 74 | J | ug/kg |
| BF-FBR-1 | 706149-005-012-1/1 | Chrysene | 11000 | | ug/kg |
| BF-1310-1 | 706149-007-024-1/1 | Cobalt | 1.7 | | mg/kg |
| BF-1310-2 | 706149-008-025-1/1 | Cobalt | 1.6 | | mg/kg |
| BF-ADM-1 | 706149-006-023-1/1 | Cobalt | 2 | | mg/kg |
| BF-C-1 | 706149-003-028-1/3 | Cobalt | 0.53 | | mg/kg |
| BF-E-1 | 706149-001-026-1/1 | Cobalt | 1.1 | | mg/kg |
| BF-E-1D | 706149-002-027-1/1 | Cobalt | 1.2 | | mg/kg |
| BF-FB-1 | 706149-004-021-1/1 | Cobalt | 1.1 | | mg/kg |
| BF-FBR-1 | 706149-005-022-1/1 | Cobalt | 0.83 | | mg/kg |
| BF-1310-1 | 706149-007-024-1/1 | Copper | 8.6 | | mg/kg |

| CLIENT_SAMPLE_ID | LAB_SAMPLE_NO | PARAMETERS | REPORTING_RESULT | QUALIFIER | UNITS |
|---|---|---|---|---|---|
| BF-1310-2 | 706149-008-025-1/1 | Copper | 10.4 | | mg/kg |
| BF-ADM-1 | 706149-006-023-1/1 | Copper | 4.8 | | mg/kg |
| BF-C-1 | 706149-003-028-1/3 | Copper | 7.2 | | mg/kg |
| BF-E-1 | 706149-001-026-1/1 | Copper | 2.5 | | mg/kg |
| BF-E-1D | 706149-002-027-1/1 | Copper | 2.9 | | mg/kg |
| BF-FB-1 | 706149-004-021-1/1 | Copper | 6.1 | | mg/kg |
| BF-FBR-1 | 706149-005-022-1/1 | Copper | 4.8 | | mg/kg |
| BF-FBR-1 | 706149-005-012-1/1 | Dibenz(a,h)Anthracene | 530 | J | ug/kg |
| BF-1310-1 | 706149-007-014-1/1 | Fluoranthene | 130 | J | ug/kg |
| BF-C-1 | 706149-003-018-1/3 | Fluoranthene | 300 | J | ug/kg |
| BF-FB-1 | 706149-004-011-1/1 | Fluoranthene | 48 | J | ug/kg |
| BF-FBR-1 | 706149-005-012-1/1 | Fluoranthene | 6800 | | ug/kg |
| BF-1310-1 | 706149-007-014-1/1 | HMX | 1800 | | ug/kg |
| BF-1310-1 | 706149-007-014-1/1 | Indeno(1,2,3-c,d)Pyrene | 53 | J | ug/kg |
| BF-C-1 | 706149-003-018-1/3 | Indeno(1,2,3-c,d)Pyrene | 130 | J | ug/kg |
| BF-FBR-1 | 706149-005-012-1/1 | Indeno(1,2,3-c,d)Pyrene | 4900 | | ug/kg |
| BF-1310-1 | 706149-007-024-1/1 | Iron | 18200 | | mg/kg |
| BF-1310-2 | 706149-008-025-1/1 | Iron | 31000 | | mg/kg |
| BF-ADM-1 | 706149-006-023-1/1 | Iron | 15200 | | mg/kg |
| BF-C-1 | 706149-003-028-1/3 | Iron | 5260 | | mg/kg |
| BF-E-1 | 706149-001-026-1/1 | Iron | 7640 | | mg/kg |
| BF-E-1D | 706149-002-027-1/1 | Iron | 8420 | | mg/kg |
| BF-FB-1 | 706149-004-021-1/1 | Iron | 10500 | | mg/kg |
| BF-FBR-1 | 706149-005-022-1/1 | Iron | 8670 | | mg/kg |
| BF-1310-1 | 706149-007-024-1/1 | Lead | 1160 | | mg/kg |
| BF-1310-2 | 706149-008-025-1/1 | Lead | 281 | | mg/kg |
| BF-ADM-1 | 706149-006-023-1/1 | Lead | 12.3 | | mg/kg |
| BF-C-1 | 706149-003-028-1/3 | Lead | 48.5 | | mg/kg |
| BF-E-1 | 706149-001-026-1/1 | Lead | 11 | | mg/kg |
| BF-E-1D | 706149-002-027-1/1 | Lead | 12.2 | | mg/kg |
| BF-FB-1 | 706149-004-021-1/1 | Lead | 62.1 | | mg/kg |
| BF-FBR-1 | 706149-005-022-1/1 | Lead | 15.8 | | mg/kg |
| BF-1310-1 | 706149-007-024-1/1 | Magnesium | 455 | | mg/kg |
| BF-1310-2 | 706149-008-025-1/1 | Magnesium | 462 | | mg/kg |
| BF-ADM-1 | 706149-006-023-1/1 | Magnesium | 682 | | mg/kg |
| BF-C-1 | 706149-003-028-1/3 | Magnesium | 239 | | mg/kg |
| BF-E-1 | 706149-001-026-1/1 | Magnesium | 345 | | mg/kg |
| BF-E-1D | 706149-002-027-1/1 | Magnesium | 365 | | mg/kg |
| BF-FB-1 | 706149-004-021-1/1 | Magnesium | 305 | | mg/kg |
| BF-FBR-1 | 706149-005-022-1/1 | Magnesium | 160 | | mg/kg |
| BF-1310-1 | 706149-007-024-1/1 | Manganese | 44 | | mg/kg |
| BF-1310-2 | 706149-008-025-1/1 | Manganese | 42.6 | | mg/kg |
| BF-ADM-1 | 706149-006-023-1/1 | Manganese | 41.2 | | mg/kg |
| BF-C-1 | 706149-003-028-1/3 | Manganese | 11.4 | | mg/kg |
| BF-E-1 | 706149-001-026-1/1 | Manganese | 24.6 | | mg/kg |
| BF-E-1D | 706149-002-027-1/1 | Manganese | 29 | | mg/kg |
| BF-FB-1 | 706149-004-021-1/1 | Manganese | 20.3 | | mg/kg |
| BF-FBR-1 | 706149-005-022-1/1 | Manganese | 12 | | mg/kg |
| BF-1310-1 | 706149-007-024-1/1 | Mercury | 1.4 | | mg/kg |

| CLIENT_SAMPLE_ID | LAB_SAMPLE_NO | PARAMETERS | REPORTING_RESULT | QUALIFIER | UNITS |
|---|---|---|---|---|---|
| BF-1310-2 | 706149-008-025-1/1 | Mercury | 0.075 | | mg/kg |
| BF-ADM-1 | 706149-006-023-1/1 | Mercury | 0.036 | | mg/kg |
| BF-C-1 | 706149-003-028-1/3 | Mercury | 0.051 | | mg/kg |
| BF-E-1 | 706149-001-026-1/1 | Mercury | 0.032 | J | mg/kg |
| BF-E-1D | 706149-002-027-1/1 | Mercury | 0.029 | J | mg/kg |
| BF-FB-1 | 706149-004-021-1/1 | Mercury | 0.046 | | mg/kg |
| BF-FBR-1 | 706149-005-022-1/1 | Mercury | 0.028 | J | mg/kg |
| BF-1310-1 | 706149-007-004-1/1 | Methylene Chloride | 40 | | ug/kg |
| BF-1310-2 | 706149-008-005-1/1 | Methylene Chloride | 21 | | ug/kg |
| BF-C-1 | 706149-003-008-1/3 | Methylene Chloride | 32 | | ug/kg |
| BF-E-1 | 706149-001-006-1/1 | Methylene Chloride | 4.6 | J | ug/kg |
| BF-E-1D | 706149-002-007-1/1 | Methylene Chloride | 26 | | ug/kg |
| BF-FB-1 | 706149-004-001-1/1 | Methylene Chloride | 29 | | ug/kg |
| BF-FBR-1 | 706149-005-002-1/1RE | Methylene Chloride | 9.1 | J | ug/kg |
| BF-1310-1 | 706149-007-014-1/1 | Naphthalene | 39 | J | ug/kg |
| BF-1310-1 | 706149-007-024-1/1 | Nickel | 4.6 | | mg/kg |
| BF-1310-2 | 706149-008-025-1/1 | Nickel | 3.4 | | mg/kg |
| BF-ADM-1 | 706149-006-023-1/1 | Nickel | 4.5 | | mg/kg |
| BF-C-1 | 706149-003-028-1/3 | Nickel | 2.7 | | mg/kg |
| BF-E-1 | 706149-001-026-1/1 | Nickel | 3.1 | | mg/kg |
| BF-E-1D | 706149-002-027-1/1 | Nickel | 3.4 | | mg/kg |
| BF-FB-1 | 706149-004-021-1/1 | Nickel | 3.5 | | mg/kg |
| BF-FBR-1 | 706149-005-022-1/1 | Nickel | 6 | | mg/kg |
| BF-FBR-1 | 706149-005-012-1/1 | Nitrobenzene | 280 | | ug/kg |
| BF-E-1 | 706149-001-016-1/1 | PCB-1254 | 30 | P | ug/kg |
| BF-1310-1 | 706149-007-014-1/1 | Phenanthrene | 110 | J | ug/kg |
| BF-C-1 | 706149-003-018-1/3 | Phenanthrene | 210 | J | ug/kg |
| BF-FBR-1 | 706149-005-012-1/1 | Phenanthrene | 1700 | J | ug/kg |
| BF-1310-1 | 706149-007-024-1/1 | Potassium | 593 | | mg/kg |
| BF-1310-2 | 706149-008-025-1/1 | Potassium | 401 | | mg/kg |
| BF-ADM-1 | 706149-006-023-1/1 | Potassium | 442 | | mg/kg |
| BF-C-1 | 706149-003-028-1/3 | Potassium | 289 | | mg/kg |
| BF-E-1 | 706149-001-026-1/1 | Potassium | 220 | | mg/kg |
| BF-E-1D | 706149-002-027-1/1 | Potassium | 236 | | mg/kg |
| BF-FB-1 | 706149-004-021-1/1 | Potassium | 246 | | mg/kg |
| BF-FBR-1 | 706149-005-022-1/1 | Potassium | 198 | | mg/kg |
| BF-1310-1 | 706149-007-014-1/1 | Pyrene | 160 | J | ug/kg |
| BF-1310-2 | 706149-008-015-1/1 | Pyrene | 76 | J | ug/kg |
| BF-1310-2 | 706149-008-015-1/1 | Pyrene | 68 | J | ug/kg |
| BF-C-1 | 706149-003-018-1/3 | Pyrene | 530 | | ug/kg |
| BF-FB-1 | 706149-004-011-1/1 | Pyrene | 110 | J | ug/kg |
| BF-FBR-1 | 706149-005-012-1/1 | Pyrene | 17000 | | ug/kg |
| BF-ADM-1 | 706149-006-023-1/1 | Selenium | 0.32 | J | mg/kg |
| BF-C-1 | 706149-003-028-1/3 | Selenium | 0.39 | J | mg/kg |
| BF-E-1 | 706149-001-026-1/1 | Selenium | 0.37 | J | mg/kg |
| BF-FB-1 | 706149-004-021-1/1 | Selenium | 0.47 | J | mg/kg |
| BF-FBR-1 | 706149-005-022-1/1 | Selenium | 0.36 | J | mg/kg |
| BF-1310-2 | 706149-008-025-1/1 | Sodium | 107 | JD | mg/kg |
| BF-ADM-1 | 706149-006-023-1/1 | Sodium | 70.6 | J | mg/kg |

| CLIENT_SAMPLE_ID | LAB_SAMPLE_NO | PARAMETERS | REPORTING_RESULT | QUALIFIER | UNITS |
|---|---|---|---|---|---|
| BF-C-1 | 706149-003-028-1/3 | Sodium | 67.5 | J | mg/kg |
| BF-E-1 | 706149-001-026-1/1 | Sodium | 73 | J | mg/kg |
| BF-E-1D | 706149-002-027-1/1 | Sodium | 70.8 | J | mg/kg |
| BF-FB-1 | 706149-004-021-1/1 | Sodium | 67.2 | J | mg/kg |
| BF-FBR-1 | 706149-005-022-1/1 | Sodium | 62.7 | J | mg/kg |
| BF-1310-1 | 706149-007-024-1/1 | Vanadium | 35.8 | | mg/kg |
| BF-1310-2 | 706149-008-025-1/1 | Vanadium | 47.7 | | mg/kg |
| BF-ADM-1 | 706149-006-023-1/1 | Vanadium | 35.1 | | mg/kg |
| BF-C-1 | 706149-003-028-1/3 | Vanadium | 15.9 | | mg/kg |
| BF-E-1 | 706149-001-026-1/1 | Vanadium | 18.9 | | mg/kg |
| BF-E-1D | 706149-002-027-1/1 | Vanadium | 20.9 | | mg/kg |
| BF-FB-1 | 706149-004-021-1/1 | Vanadium | 27.5 | | mg/kg |
| BF-FBR-1 | 706149-005-022-1/1 | Vanadium | 19.9 | | mg/kg |
| BF-1310-1 | 706149-007-024-1/1 | Zinc | 989 | D | mg/kg |
| BF-1310-2 | 706149-008-025-1/1 | Zinc | 356 | D | mg/kg |
| BF-ADM-1 | 706149-006-023-1/1 | Zinc | 20 | | mg/kg |
| BF-C-1 | 706149-003-028-1/3 | Zinc | 40 | | mg/kg |
| BF-E-1 | 706149-001-026-1/1 | Zinc | 12.4 | | mg/kg |
| BF-E-1D | 706149-002-027-1/1 | Zinc | 14.3 | | mg/kg |
| BF-FB-1 | 706149-004-021-1/1 | Zinc | 39.1 | | mg/kg |
| BF-FBR-1 | 706149-005-022-1/1 | Zinc | 12.9 | | mg/kg |

Sample qualifier definitions are provided in the summary results of Attachment E

| | |
|---|---|
| | Exceeds Commercial RBC |
| | Exceeds Residential RBC |
| | Exceeds SSL, DAF=1 |
| | Exceeds SSL, DAF=20 |
| | No screening level was found |

**BYRD FIELD, PROPERTY NO. CO3VA0178**
**RICHMOND, VA**

# ATTACHMENT E:
# SAMPLE RESULTS SUMMARY

## JUNE 26, 2007 SAMPLING EVENT

# Analytical Report For 706149

**for**

## TechLaw

**Project Manager : Jana Dawson**

**Project Name : VA FUDS Site 1-8**

**July 9, 2007**

***GPL***

*Laboratories*

**GPL Laboratories, LLLP Certifies that the test results meet all requirements of the NELAC Standards unless otherwise noted.**

| Reviewed by, Project Manager | Approved by, Laboratory Director |
|---|---|

**7210A Corporate CT Frederick, MD 21703 Phone (301) 694-5310 Fax: (301) 620-0731**
**www.gplab.com**

## Summary of Analytical Results

Client ID: BF-E-1
GPL ID: 706149-001-026-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method:
Prep Date:
Prep Time:
Prep Batch:

Analytical Method: CLP_SOLIDS
Date Analyzed: 06/30/2007
Time Analyzed: 13:25
Analysis Batch: 103551

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Percent Solids | 92 | 1.0 | % | | 1 |

## Summary of Analytical Results

Client ID: BF-E-1D
GPL ID: 706149-002-027-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method:
Prep Date:
Prep Time:
Prep Batch:

Analytical Method: CLP_SOLIDS
Date Analyzed: 06/30/2007
Time Analyzed: 13:25
Analysis Batch: 103551

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Percent Solids | 82 | 1.0 | % | | 1 |

## Summary of Analytical Results

Client ID: BF-C-1
GPL ID: 706149-003-028-1/3
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method:
Prep Date:
Prep Time:
Prep Batch:

Analytical Method: CLP_SOLIDS
Date Analyzed: 06/30/2007
Time Analyzed: 13:25
Analysis Batch: 103551

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Percent Solids | 90 | 1.0 | % | | 1 |

## Summary of Analytical Results

Client ID: BF-FB-1
GPL ID: 706149-004-021-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method:
Prep Date:
Prep Time:
Prep Batch:

Analytical Method: CLP_SOLIDS
Date Analyzed: 06/30/2007
Time Analyzed: 13:25
Analysis Batch: 103551

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Percent Solids | 88 | 1.0 | % | | 1 |

## Summary of Analytical Results

Client ID: BF-FBR-1
GPL ID: 706149-005-022-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method:
Prep Date:
Prep Time:
Prep Batch:

Analytical Method: CLP_SOLIDS
Date Analyzed: 06/30/2007
Time Analyzed: 13:25
Analysis Batch: 103551

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Percent Solids | 93 | 1.0 | % | | 1 |

## Summary of Analytical Results

Client ID: BF-ADM-1
GPL ID: 706149-006-023-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method:
Prep Date:
Prep Time:
Prep Batch:

Analytical Method: CLP_SOLIDS
Date Analyzed: 06/30/2007
Time Analyzed: 13:25
Analysis Batch: 103551

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Percent Solids | 92 | 1.0 | % | | 1 |

## Summary of Analytical Results

Client ID: BF-1310-1
GPL ID: 706149-007-024-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method:
Prep Date:
Prep Time:
Prep Batch:

Analytical Method: CLP_SOLIDS
Date Analyzed: 06/30/2007
Time Analyzed: 13:25
Analysis Batch: 103551

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Percent Solids | 84 | 1.0 | % | | 1 |

## Summary of Analytical Results

Client ID: BF-1310-2
GPL ID: 706149-008-025-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method:
Prep Date:
Prep Time:
Prep Batch:

Analytical Method: CLP_SOLIDS
Date Analyzed: 06/30/2007
Time Analyzed: 13:25
Analysis Batch: 103551

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Percent Solids | 88 | 1.0 | % | | 1 |

## Summary of Analytical Results

Client ID: BF-E-1
GPL ID: 706149-001-026-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3050B
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 99056

Analytical Method: SW6010B
Date Analyzed: 06/28/2007
Time Analyzed: 02:30
Analysis Batch: 103780

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Aluminum | 8850 | 16 | mg/kg | | 1 |
| Antimony | BQL | 1.6 | mg/kg | UN | 1 |
| Arsenic | 1.3 | 1.6 | mg/kg | J | 1 |
| Barium | 25.8 | .4 | mg/kg | | 1 |
| Beryllium | 0.18 | .16 | mg/kg | | 1 |
| Cadmium | 0.023 | .48 | mg/kg | J | 1 |
| Calcium | 455 | 80.1 | mg/kg | | 1 |
| Chromium | 9.6 | .4 | mg/kg | | 1 |
| Cobalt | 1.1 | .4 | mg/kg | | 1 |
| Copper | 2.5 | .8 | mg/kg | | 1 |
| Iron | 7640 | 12 | mg/kg | | 1 |
| Lead | 11.0 | .8 | mg/kg | | 1 |
| Magnesium | 345 | 20 | mg/kg | | 1 |
| Manganese | 24.6 | .4 | mg/kg | | 1 |
| Nickel | 3.1 | .8 | mg/kg | | 1 |
| Potassium | 220 | 20 | mg/kg | | 1 |
| Selenium | 0.37 | 1.6 | mg/kg | J | 1 |
| Silver | BQL | .4 | mg/kg | U | 1 |
| Sodium | 73.0 | 200 | mg/kg | J | 1 |
| Thallium | BQL | 2.4 | mg/kg | U | 1 |
| Vanadium | 18.9 | .8 | mg/kg | | 1 |
| Zinc | 12.4 | 1.6 | mg/kg | | 1 |

## Summary of Analytical Results

Client ID: BF-E-1D
GPL ID: 706149-002-027-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3050B
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 99056

Analytical Method: SW6010B
Date Analyzed: 06/28/2007
Time Analyzed: 02:38
Analysis Batch: 103780

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Aluminum | 9440 | 17.8 | mg/kg | | 1 |
| Antimony | BQL | 1.8 | mg/kg | UN | 1 |
| Arsenic | 1.5 | 1.8 | mg/kg | J | 1 |
| Barium | 28.3 | .45 | mg/kg | | 1 |
| Beryllium | 0.18 | .18 | mg/kg | | 1 |
| Cadmium | BQL | .54 | mg/kg | U | 1 |
| Calcium | 586 | 89.2 | mg/kg | | 1 |
| Chromium | 10.4 | .45 | mg/kg | | 1 |
| Cobalt | 1.2 | .45 | mg/kg | | 1 |
| Copper | 2.9 | .89 | mg/kg | | 1 |
| Iron | 8420 | 13.4 | mg/kg | | 1 |
| Lead | 12.2 | .89 | mg/kg | | 1 |
| Magnesium | 365 | 22.3 | mg/kg | | 1 |
| Manganese | 29.0 | .45 | mg/kg | | 1 |
| Nickel | 3.4 | .89 | mg/kg | | 1 |
| Potassium | 236 | 22.3 | mg/kg | | 1 |
| Selenium | BQL | 1.8 | mg/kg | U | 1 |
| Silver | BQL | .45 | mg/kg | U | 1 |
| Sodium | 70.8 | 223 | mg/kg | J | 1 |
| Thallium | BQL | 2.7 | mg/kg | U | 1 |
| Vanadium | 20.9 | .89 | mg/kg | | 1 |
| Zinc | 14.3 | 1.8 | mg/kg | | 1 |

## Summary of Analytical Results

Client ID: BF-C-1
GPL ID: 706149-003-028-1/3
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3050B
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 99056

Analytical Method: SW6010B
Date Analyzed: 06/28/2007
Time Analyzed: 02:47
Analysis Batch: 103780

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Aluminum | 5920 | 16.5 | mg/kg | | 1 |
| Antimony | 0.31 | 1.6 | mg/kg | JN | 1 |
| Arsenic | 1.8 | 1.6 | mg/kg | | 1 |
| Barium | 16.8 | .41 | mg/kg | | 1 |
| Beryllium | 0.13 | .16 | mg/kg | J | 1 |
| Cadmium | 0.11 | .49 | mg/kg | J | 1 |
| Calcium | 278 | 82.4 | mg/kg | | 1 |
| Chromium | 6.8 | .41 | mg/kg | | 1 |
| Cobalt | 0.53 | .41 | mg/kg | | 1 |
| Copper | 7.2 | .82 | mg/kg | | 1 |
| Iron | 5260 | 12.4 | mg/kg | | 1 |
| Lead | 48.5 | .82 | mg/kg | | 1 |
| Magnesium | 239 | 20.6 | mg/kg | | 1 |
| Manganese | 11.4 | .41 | mg/kg | | 1 |
| Nickel | 2.7 | .82 | mg/kg | | 1 |
| Potassium | 289 | 20.6 | mg/kg | | 1 |
| Selenium | 0.39 | 1.6 | mg/kg | J | 1 |
| Silver | BQL | .41 | mg/kg | U | 1 |
| Sodium | 67.5 | 206 | mg/kg | J | 1 |
| Thallium | BQL | 2.5 | mg/kg | U | 1 |
| Vanadium | 15.9 | .82 | mg/kg | | 1 |
| Zinc | 40.0 | 1.6 | mg/kg | | 1 |

## Summary of Analytical Results

Client ID: BF-FB-1
GPL ID: 706149-004-021-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3050B
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 99056

Analytical Method: SW6010B
Date Analyzed: 06/28/2007
Time Analyzed: 03:28
Analysis Batch: 103780

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Aluminum | 11100 | 16 | mg/kg | | 1 |
| Antimony | 0.32 | 1.6 | mg/kg | JN | 1 |
| Arsenic | 2.4 | 1.6 | mg/kg | | 1 |
| Barium | 36.3 | .4 | mg/kg | | 1 |
| Beryllium | 0.26 | .16 | mg/kg | | 1 |
| Cadmium | 0.046 | .48 | mg/kg | J | 1 |
| Calcium | 241 | 80 | mg/kg | | 1 |
| Chromium | 14.4 | .4 | mg/kg | | 1 |
| Cobalt | 1.1 | .4 | mg/kg | | 1 |
| Copper | 6.1 | .8 | mg/kg | | 1 |
| Iron | 10500 | 12 | mg/kg | | 1 |
| Lead | 62.1 | .8 | mg/kg | | 1 |
| Magnesium | 305 | 20 | mg/kg | | 1 |
| Manganese | 20.3 | .4 | mg/kg | | 1 |
| Nickel | 3.5 | .8 | mg/kg | | 1 |
| Potassium | 246 | 20 | mg/kg | | 1 |
| Selenium | 0.47 | 1.6 | mg/kg | J | 1 |
| Silver | BQL | .4 | mg/kg | U | 1 |
| Sodium | 67.2 | 200 | mg/kg | J | 1 |
| Thallium | BQL | 2.4 | mg/kg | U | 1 |
| Vanadium | 27.5 | .8 | mg/kg | | 1 |
| Zinc | 39.1 | 1.6 | mg/kg | | 1 |

## Summary of Analytical Results

Client ID: BF-FBR-1
GPL ID: 706149-005-022-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3050B
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 99056

Analytical Method: SW6010B
Date Analyzed: 06/28/2007
Time Analyzed: 03:37
Analysis Batch: 103780

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Aluminum | 7260 | 16.3 | mg/kg | | 1 |
| Antimony | 0.44 | 1.6 | mg/kg | JN | 1 |
| Arsenic | 2.3 | 1.6 | mg/kg | | 1 |
| Barium | 15.5 | .41 | mg/kg | | 1 |
| Beryllium | 0.27 | .16 | mg/kg | | 1 |
| Cadmium | BQL | .49 | mg/kg | U | 1 |
| Calcium | 249 | 81.4 | mg/kg | | 1 |
| Chromium | 15.4 | .41 | mg/kg | | 1 |
| Cobalt | 0.83 | .41 | mg/kg | | 1 |
| Copper | 4.8 | .81 | mg/kg | | 1 |
| Iron | 8670 | 12.2 | mg/kg | | 1 |
| Lead | 15.8 | .81 | mg/kg | | 1 |
| Magnesium | 160 | 20.4 | mg/kg | | 1 |
| Manganese | 12.0 | .41 | mg/kg | | 1 |
| Nickel | 6.0 | .81 | mg/kg | | 1 |
| Potassium | 198 | 20.4 | mg/kg | | 1 |
| Selenium | 0.36 | 1.6 | mg/kg | J | 1 |
| Silver | BQL | .41 | mg/kg | U | 1 |
| Sodium | 62.7 | 204 | mg/kg | J | 1 |
| Thallium | BQL | 2.4 | mg/kg | U | 1 |
| Vanadium | 19.9 | .81 | mg/kg | | 1 |
| Zinc | 12.9 | 1.6 | mg/kg | | 1 |

## Summary of Analytical Results

Client ID: BF-ADM-1
GPL ID: 706149-006-023-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3050B
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 99056

Analytical Method: SW6010B
Date Analyzed: 06/28/2007
Time Analyzed: 03:45
Analysis Batch: 103780

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Aluminum | 17300 | 16.4 | mg/kg | | 1 |
| Antimony | BQL | 1.6 | mg/kg | UN | 1 |
| Arsenic | 2.5 | 1.6 | mg/kg | | 1 |
| Barium | 30.1 | .41 | mg/kg | | 1 |
| Beryllium | 0.23 | .16 | mg/kg | | 1 |
| Cadmium | BQL | .49 | mg/kg | U | 1 |
| Calcium | 84.9 | 82 | mg/kg | | 1 |
| Chromium | 19.5 | .41 | mg/kg | | 1 |
| Cobalt | 2.0 | .41 | mg/kg | | 1 |
| Copper | 4.8 | .82 | mg/kg | | 1 |
| Iron | 15200 | 12.3 | mg/kg | | 1 |
| Lead | 12.3 | .82 | mg/kg | | 1 |
| Magnesium | 682 | 20.5 | mg/kg | | 1 |
| Manganese | 41.2 | .41 | mg/kg | | 1 |
| Nickel | 4.5 | .82 | mg/kg | | 1 |
| Potassium | 442 | 20.5 | mg/kg | | 1 |
| Selenium | 0.32 | 1.6 | mg/kg | J | 1 |
| Silver | BQL | .41 | mg/kg | U | 1 |
| Sodium | 70.6 | 205 | mg/kg | J | 1 |
| Thallium | BQL | 2.5 | mg/kg | U | 1 |
| Vanadium | 35.1 | .82 | mg/kg | | 1 |
| Zinc | 20.0 | 1.6 | mg/kg | | 1 |

## Summary of Analytical Results

Client ID: BF-1310-1
GPL ID: 706149-007-024-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3050B
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 99056

Analytical Method: SW6010B
Date Analyzed: 06/28/2007
Time Analyzed: 04:10
Analysis Batch: 103780

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Aluminum | 15300 | 17.9 | mg/kg | | 1 |
| Antimony | BQL | 1.8 | mg/kg | UN | 1 |
| Arsenic | 5.7 | 1.8 | mg/kg | | 1 |
| Barium | 250 | .45 | mg/kg | | 1 |
| Beryllium | 0.37 | .18 | mg/kg | | 1 |
| Cadmium | 0.36 | .54 | mg/kg | J | 1 |
| Calcium | 1260 | 89.3 | mg/kg | | 1 |
| Chromium | 18.5 | .45 | mg/kg | | 1 |
| Cobalt | 1.7 | .45 | mg/kg | | 1 |
| Copper | 8.6 | .89 | mg/kg | | 1 |
| Iron | 18200 | 13.4 | mg/kg | | 1 |
| Lead | 1160 | .89 | mg/kg | | 1 |
| Magnesium | 455 | 22.3 | mg/kg | | 1 |
| Manganese | 44.0 | .45 | mg/kg | | 1 |
| Nickel | 4.6 | .89 | mg/kg | | 1 |
| Potassium | 593 | 22.3 | mg/kg | | 1 |
| Selenium | BQL | 1.8 | mg/kg | U | 1 |
| Silver | BQL | .45 | mg/kg | U | 1 |
| Thallium | BQL | 2.7 | mg/kg | U | 1 |
| Vanadium | 35.8 | .89 | mg/kg | | 1 |

## Summary of Analytical Results

Client ID: BF-1310-1
GPL ID: 706149-007-024-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3050B
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 99056

Analytical Method: SW6010B
Date Analyzed: 06/28/2007
Time Analyzed: 18:40
Analysis Batch: 103781

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Sodium | BQL | 2230 | mg/kg | UD | 10 |
| Zinc | 989 | 17.9 | mg/kg | D | 10 |

## Summary of Analytical Results

Client ID: BF-1310-2
GPL ID: 706149-008-025-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3050B
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 99056

Analytical Method: SW6010B
Date Analyzed: 06/28/2007
Time Analyzed: 04:19
Analysis Batch: 103780

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Aluminum | 15800 | 15.8 | mg/kg | | 1 |
| Antimony | BQL | 1.6 | mg/kg | UN | 1 |
| Arsenic | 3.8 | 1.6 | mg/kg | | 1 |
| Barium | 89.5 | .4 | mg/kg | | 1 |
| Beryllium | 0.32 | .16 | mg/kg | | 1 |
| Cadmium | 0.28 | .48 | mg/kg | J | 1 |
| Calcium | 2150 | 79.2 | mg/kg | | 1 |
| Chromium | 18.1 | .4 | mg/kg | | 1 |
| Cobalt | 1.6 | .4 | mg/kg | | 1 |
| Copper | 10.4 | .79 | mg/kg | | 1 |
| Iron | 31000 | 11.9 | mg/kg | | 1 |
| Lead | 281 | .79 | mg/kg | | 1 |
| Magnesium | 462 | 19.8 | mg/kg | | 1 |
| Manganese | 42.6 | .4 | mg/kg | | 1 |
| Nickel | 3.4 | .79 | mg/kg | | 1 |
| Potassium | 401 | 19.8 | mg/kg | | 1 |
| Selenium | BQL | 1.6 | mg/kg | U | 1 |
| Silver | BQL | .4 | mg/kg | U | 1 |
| Thallium | BQL | 2.4 | mg/kg | U | 1 |
| Vanadium | 47.7 | .79 | mg/kg | | 1 |

## Summary of Analytical Results

Client ID: BF-1310-2
GPL ID: 706149-008-025-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3050B
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 99056

Analytical Method: SW6010B
Date Analyzed: 06/28/2007
Time Analyzed: 18:48
Analysis Batch: 103781

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Sodium | 107 | 991 | mg/kg | JD | 5 |
| Zinc | 356 | 7.9 | mg/kg | D | 5 |

## Summary of Analytical Results

Client ID: BF-E-1
GPL ID: 706149-001-026-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW7471_DIG
Prep Date: 07/03/2007
Prep Time: 09:00
Prep Batch: 99009

Analytical Method: SW7471A
Date Analyzed: 07/05/2007
Time Analyzed: 11:10
Analysis Batch: 103779

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Mercury | 0.032 | .034 | mg/kg | J | 1 |

## Summary of Analytical Results

Client ID: BF-E-1D
GPL ID: 706149-002-027-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW7471_DIG
Prep Date: 07/03/2007
Prep Time: 09:00
Prep Batch: 99009

Analytical Method: SW7471A
Date Analyzed: 07/05/2007
Time Analyzed: 11:13
Analysis Batch: 103779

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Mercury | 0.029 | .04 | mg/kg | J | 1 |

## Summary of Analytical Results

Client ID: BF-C-1
GPL ID: 706149-003-028-1/3
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW7471_DIG
Prep Date: 07/03/2007
Prep Time: 09:00
Prep Batch: 99009

Analytical Method: SW7471A
Date Analyzed: 07/05/2007
Time Analyzed: 11:16
Analysis Batch: 103779

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Mercury | 0.051 | .036 | mg/kg | | 1 |

## Summary of Analytical Results

Client ID: BF-FB-1
GPL ID: 706149-004-021-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW7471_DIG
Prep Date: 07/03/2007
Prep Time: 09:00
Prep Batch: 99009

Analytical Method: SW7471A
Date Analyzed: 07/05/2007
Time Analyzed: 11:33
Analysis Batch: 103779

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Mercury | 0.046 | .037 | mg/kg | | 1 |

## Summary of Analytical Results

Client ID: BF-FBR-1
GPL ID: 706149-005-022-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW7471_DIG
Prep Date: 07/03/2007
Prep Time: 09:00
Prep Batch: 99009

Analytical Method: SW7471A
Date Analyzed: 07/05/2007
Time Analyzed: 11:36
Analysis Batch: 103779

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Mercury | 0.028 | .033 | mg/kg | J | 1 |

## Summary of Analytical Results

Client ID: BF-ADM-1
GPL ID: 706149-006-023-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW7471_DIG
Prep Date: 07/03/2007
Prep Time: 09:00
Prep Batch: 99009

Analytical Method: SW7471A
Date Analyzed: 07/05/2007
Time Analyzed: 11:39
Analysis Batch: 103779

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Mercury | 0.036 | .035 | mg/kg | | 1 |

# *GPL LABORATORIES, LLLP*

## Summary of Analytical Results

Client ID: BF-1310-1
GPL ID: 706149-007-024-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW7471_DIG
Prep Date: 07/03/2007
Prep Time: 09:00
Prep Batch: 99009

Analytical Method: SW7471A
Date Analyzed: 07/05/2007
Time Analyzed: 11:43
Analysis Batch: 103779

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Mercury | 1.4 | .038 | mg/kg | | 1 |

## Summary of Analytical Results

Client ID: BF-1310-2
GPL ID: 706149-008-025-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW7471_DIG
Prep Date: 07/03/2007
Prep Time: 09:00
Prep Batch: 99009

Analytical Method: SW7471A
Date Analyzed: 07/05/2007
Time Analyzed: 11:46
Analysis Batch: 103779

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Mercury | 0.075 | .034 | mg/kg | | 1 |

## Summary of Analytical Results

Client ID: BF-E-1
GPL ID: 706149-001-016-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3550
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98938

Analytical Method: SW8082
Date Analyzed: 06/29/2007
Time Analyzed: 13:29
Analysis Batch: 103572

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| PCB-1016 | BQL | 18 | ug/kg | U | 1 |
| PCB-1221 | BQL | 18 | ug/kg | U | 1 |
| PCB-1232 | BQL | 18 | ug/kg | U | 1 |
| PCB-1242 | BQL | 18 | ug/kg | U | 1 |
| PCB-1248 | BQL | 18 | ug/kg | U | 1 |
| PCB-1254 | 30 | 18 | ug/kg | P | 1 |
| PCB-1260 | BQL | 18 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-E-1D
GPL ID: 706149-002-017-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3550
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98938

Analytical Method: SW8082
Date Analyzed: 06/28/2007
Time Analyzed: 15:05
Analysis Batch: 103572

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| PCB-1016 | BQL | 20 | ug/kg | U | 1 |
| PCB-1221 | BQL | 20 | ug/kg | U | 1 |
| PCB-1232 | BQL | 20 | ug/kg | U | 1 |
| PCB-1242 | BQL | 20 | ug/kg | U | 1 |
| PCB-1248 | BQL | 20 | ug/kg | U | 1 |
| PCB-1254 | BQL | 20 | ug/kg | U | 1 |
| PCB-1260 | BQL | 20 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-C-1
GPL ID: 706149-003-018-1/3
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3550
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98938

Analytical Method: SW8082
Date Analyzed: 06/28/2007
Time Analyzed: 15:36
Analysis Batch: 103572

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| PCB-1016 | BQL | 18 | ug/kg | U | 1 |
| PCB-1221 | BQL | 18 | ug/kg | U | 1 |
| PCB-1232 | BQL | 18 | ug/kg | U | 1 |
| PCB-1242 | BQL | 18 | ug/kg | U | 1 |
| PCB-1248 | BQL | 18 | ug/kg | U | 1 |
| PCB-1254 | BQL | 18 | ug/kg | U | 1 |
| PCB-1260 | BQL | 18 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-FB-1
GPL ID: 706149-004-011-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3550
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98938

Analytical Method: SW8082
Date Analyzed: 06/28/2007
Time Analyzed: 17:08
Analysis Batch: 103572

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| PCB-1016 | BQL | 19 | ug/kg | U | 1 |
| PCB-1221 | BQL | 19 | ug/kg | U | 1 |
| PCB-1232 | BQL | 19 | ug/kg | U | 1 |
| PCB-1242 | BQL | 19 | ug/kg | U | 1 |
| PCB-1248 | BQL | 19 | ug/kg | U | 1 |
| PCB-1254 | BQL | 19 | ug/kg | U | 1 |
| PCB-1260 | BQL | 19 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-FBR-1
GPL ID: 706149-005-012-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3550
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98938

Analytical Method: SW8082
Date Analyzed: 06/28/2007
Time Analyzed: 17:39
Analysis Batch: 103572

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| PCB-1016 | BQL | 18 | ug/kg | U | 1 |
| PCB-1221 | BQL | 18 | ug/kg | U | 1 |
| PCB-1232 | BQL | 18 | ug/kg | U | 1 |
| PCB-1242 | BQL | 18 | ug/kg | U | 1 |
| PCB-1248 | BQL | 18 | ug/kg | U | 1 |
| PCB-1254 | BQL | 18 | ug/kg | U | 1 |
| PCB-1260 | BQL | 18 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-ADM-1
GPL ID: 706149-006-013-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3550
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98938

Analytical Method: SW8082
Date Analyzed: 06/28/2007
Time Analyzed: 18:09
Analysis Batch: 103572

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| PCB-1016 | BQL | 18 | ug/kg | U | 1 |
| PCB-1221 | BQL | 18 | ug/kg | U | 1 |
| PCB-1232 | BQL | 18 | ug/kg | U | 1 |
| PCB-1242 | BQL | 18 | ug/kg | U | 1 |
| PCB-1248 | BQL | 18 | ug/kg | U | 1 |
| PCB-1254 | BQL | 18 | ug/kg | U | 1 |
| PCB-1260 | BQL | 18 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-1310-1
GPL ID: 706149-007-014-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3550
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98938

Analytical Method: SW8082
Date Analyzed: 06/28/2007
Time Analyzed: 19:41
Analysis Batch: 103572

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| PCB-1016 | BQL | 20 | ug/kg | U | 1 |
| PCB-1221 | BQL | 20 | ug/kg | U | 1 |
| PCB-1232 | BQL | 20 | ug/kg | U | 1 |
| PCB-1242 | BQL | 20 | ug/kg | U | 1 |
| PCB-1248 | BQL | 20 | ug/kg | U | 1 |
| PCB-1254 | BQL | 20 | ug/kg | U | 1 |
| PCB-1260 | BQL | 20 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-1310-2
GPL ID: 706149-008-015-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3550
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98938

Analytical Method: SW8082
Date Analyzed: 06/28/2007
Time Analyzed: 20:12
Analysis Batch: 103572

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| PCB-1016 | BQL | 19 | ug/kg | U | 1 |
| PCB-1221 | BQL | 19 | ug/kg | U | 1 |
| PCB-1232 | BQL | 19 | ug/kg | U | 1 |
| PCB-1242 | BQL | 19 | ug/kg | U | 1 |
| PCB-1248 | BQL | 19 | ug/kg | U | 1 |
| PCB-1254 | BQL | 19 | ug/kg | U | 1 |
| PCB-1260 | BQL | 19 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-E-1
GPL ID: 706149-001-006-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW5030B
Prep Date: 06/28/2007
Prep Time: 08:58
Prep Batch: 98970

Analytical Method: SW8260B
Date Analyzed: 06/28/2007
Time Analyzed: 12:54
Analysis Batch: 103527

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | BQL | 5.4 | ug/kg | U | 1 |
| 1,1,1-Trichloroethane | BQL | 5.4 | ug/kg | U | 1 |
| 1,1,2,2-Tetrachloroethane | BQL | 5.4 | ug/kg | U | 1 |
| 1,1,2-Trichloroethane | BQL | 5.4 | ug/kg | U | 1 |
| 1,1-Dichloroethane | BQL | 5.4 | ug/kg | U | 1 |
| 1,1-Dichloroethene | BQL | 5.4 | ug/kg | U | 1 |
| 1,1-Dichloropropene | BQL | 5.4 | ug/kg | U | 1 |
| 1,2,3-Trichlorobenzene | BQL | 5.4 | ug/kg | U | 1 |
| 1,2,3-Trichloropropane | BQL | 5.4 | ug/kg | U | 1 |
| 1,2,4-Trichlorobenzene | BQL | 5.4 | ug/kg | U | 1 |
| 1,2,4-Trimethylbenzene | BQL | 5.4 | ug/kg | U | 1 |
| 1,2-Dibromo-3-Chloropropane | BQL | 5.4 | ug/kg | U | 1 |
| 1,2-Dichlorobenzene | BQL | 5.4 | ug/kg | U | 1 |
| 1,2-Dichloroethane | BQL | 5.4 | ug/kg | U | 1 |
| 1,2-Dichloropropane | BQL | 5.4 | ug/kg | U | 1 |
| 1,3,5-trimethylbenzene | BQL | 5.4 | ug/kg | U | 1 |
| 1,3-Dichlorobenzene | BQL | 5.4 | ug/kg | U | 1 |
| 1,3-Dichloropropane | BQL | 5.4 | ug/kg | U | 1 |
| 1,4-Dichlorobenzene | BQL | 5.4 | ug/kg | U | 1 |
| 1-Chlorohexane | BQL | 5.4 | ug/kg | U | 1 |
| 2,2-Dichloropropane | BQL | 5.4 | ug/kg | U | 1 |
| 2-Butanone | BQL | 11 | ug/kg | U | 1 |
| 2-Chloroethyl Vinyl Ether | BQL | 11 | ug/kg | U | 1 |
| 2-Chlorotoluene | BQL | 5.4 | ug/kg | U | 1 |
| 2-Hexanone | BQL | 11 | ug/kg | U | 1 |
| 4-Chlorotoluene | BQL | 5.4 | ug/kg | U | 1 |
| 4-Isopropyltoluene | BQL | 5.4 | ug/kg | U | 1 |
| 4-Methyl-2-Pentanone | BQL | 11 | ug/kg | U | 1 |
| Acetone | BQL | 11 | ug/kg | U | 1 |
| Acrolein | BQL | 54 | ug/kg | U | 1 |
| Acrylonitrile | BQL | 54 | ug/kg | U | 1 |
| Benzene | BQL | 5.4 | ug/kg | U | 1 |
| Bromobenzene | BQL | 5.4 | ug/kg | U | 1 |
| Bromochloromethane | BQL | 5.4 | ug/kg | U | 1 |
| Bromodichloromethane | BQL | 5.4 | ug/kg | U | 1 |
| Bromoform | BQL | 5.4 | ug/kg | U | 1 |
| Bromomethane | BQL | 11 | ug/kg | U | 1 |
| Carbon Disulfide | BQL | 5.4 | ug/kg | U | 1 |
| Carbon Tetrachloride | BQL | 5.4 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-E-1
GPL ID: 706149-001-006-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW5030B
Prep Date: 06/28/2007
Prep Time: 08:58
Prep Batch: 98970

Analytical Method: SW8260B
Date Analyzed: 06/28/2007
Time Analyzed: 12:54
Analysis Batch: 103527

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Chlorobenzene | BQL | 5.4 | ug/kg | U | 1 |
| Chloroethane | BQL | 11 | ug/kg | U | 1 |
| Chloroform | BQL | 5.4 | ug/kg | U | 1 |
| Chloromethane | BQL | 11 | ug/kg | U | 1 |
| Cyclohexane | BQL | 5.4 | ug/kg | U | 1 |
| Dibromochloromethane | BQL | 5.4 | ug/kg | U | 1 |
| Dibromomethane | BQL | 5.4 | ug/kg | U | 1 |
| Dichlorodifluoromethane | BQL | 5.4 | ug/kg | U | 1 |
| Ethyl Methacrylate | BQL | 5.4 | ug/kg | U | 1 |
| Ethylbenzene | BQL | 5.4 | ug/kg | U | 1 |
| Hexachlorobutadiene | BQL | 5.4 | ug/kg | U | 1 |
| Isopropylbenzene | BQL | 5.4 | ug/kg | U | 1 |
| Methyl Acetate | BQL | 5.4 | ug/kg | U | 1 |
| Methylcyclohexane | BQL | 5.4 | ug/kg | U | 1 |
| Methylene Chloride | 4.6 | 11 | ug/kg | J | 1 |
| Naphthalene | BQL | 5.4 | ug/kg | U | 1 |
| Sec-Butylbenzene | BQL | 5.4 | ug/kg | U | 1 |
| Styrene | BQL | 5.4 | ug/kg | U | 1 |
| Tetrachloroethylene | BQL | 5.4 | ug/kg | U | 1 |
| Toluene | BQL | 5.4 | ug/kg | U | 1 |
| Trichloroethene | BQL | 5.4 | ug/kg | U | 1 |
| Trichlorofluoromethane | BQL | 5.4 | ug/kg | U | 1 |
| Vinyl Acetate | BQL | 5.4 | ug/kg | U | 1 |
| Vinyl Chloride | BQL | 11 | ug/kg | U | 1 |
| cis-1,2-Dichloroethene | BQL | 5.4 | ug/kg | U | 1 |
| cis-1,3-Dichloropropene | BQL | 5.4 | ug/kg | U | 1 |
| m,p-Xylenes | BQL | 5.4 | ug/kg | U | 1 |
| n-Butylbenzene | BQL | 5.4 | ug/kg | U | 1 |
| n-Propylbenzene | BQL | 5.4 | ug/kg | U | 1 |
| o-Xylene | BQL | 5.4 | ug/kg | U | 1 |
| tert-Butylbenzene | BQL | 5.4 | ug/kg | U | 1 |
| tert-butyl methyl ether | BQL | 5.4 | ug/kg | U | 1 |
| trans-1,2-dichloroethene | BQL | 5.4 | ug/kg | U | 1 |
| trans-1,3-dichloropropene | BQL | 5.4 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-E-1D
GPL ID: 706149-002-007-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW5030B
Prep Date: 06/27/2007
Prep Time: 11:30
Prep Batch: 98968

Analytical Method: SW8260B
Date Analyzed: 06/27/2007
Time Analyzed: 15:25
Analysis Batch: 103526

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | BQL | 6.1 | ug/kg | U | 1 |
| 1,1,1-Trichloroethane | BQL | 6.1 | ug/kg | U | 1 |
| 1,1,2,2-Tetrachloroethane | BQL | 6.1 | ug/kg | U | 1 |
| 1,1,2-Trichloroethane | BQL | 6.1 | ug/kg | U | 1 |
| 1,1-Dichloroethane | BQL | 6.1 | ug/kg | U | 1 |
| 1,1-Dichloroethene | BQL | 6.1 | ug/kg | U | 1 |
| 1,1-Dichloropropene | BQL | 6.1 | ug/kg | U | 1 |
| 1,2,3-Trichlorobenzene | BQL | 6.1 | ug/kg | U | 1 |
| 1,2,3-Trichloropropane | BQL | 6.1 | ug/kg | U | 1 |
| 1,2,4-Trichlorobenzene | BQL | 6.1 | ug/kg | U | 1 |
| 1,2,4-Trimethylbenzene | BQL | 6.1 | ug/kg | U | 1 |
| 1,2-Dibromo-3-Chloropropane | BQL | 6.1 | ug/kg | U | 1 |
| 1,2-Dichlorobenzene | BQL | 6.1 | ug/kg | U | 1 |
| 1,2-Dichloroethane | BQL | 6.1 | ug/kg | U | 1 |
| 1,2-Dichloropropane | BQL | 6.1 | ug/kg | U | 1 |
| 1,3,5-trimethylbenzene | BQL | 6.1 | ug/kg | U | 1 |
| 1,3-Dichlorobenzene | BQL | 6.1 | ug/kg | U | 1 |
| 1,3-Dichloropropane | BQL | 6.1 | ug/kg | U | 1 |
| 1,4-Dichlorobenzene | BQL | 6.1 | ug/kg | U | 1 |
| 1-Chlorohexane | BQL | 6.1 | ug/kg | U | 1 |
| 2,2-Dichloropropane | BQL | 6.1 | ug/kg | U | 1 |
| 2-Butanone | BQL | 12 | ug/kg | U | 1 |
| 2-Chloroethyl Vinyl Ether | BQL | 12 | ug/kg | U | 1 |
| 2-Chlorotoluene | BQL | 6.1 | ug/kg | U | 1 |
| 2-Hexanone | BQL | 12 | ug/kg | U | 1 |
| 4-Chlorotoluene | BQL | 6.1 | ug/kg | U | 1 |
| 4-Isopropyltoluene | BQL | 6.1 | ug/kg | U | 1 |
| 4-Methyl-2-Pentanone | BQL | 12 | ug/kg | U | 1 |
| Acetone | BQL | 12 | ug/kg | U | 1 |
| Acrolein | BQL | 61 | ug/kg | U | 1 |
| Acrylonitrile | BQL | 61 | ug/kg | U | 1 |
| Benzene | BQL | 6.1 | ug/kg | U | 1 |
| Bromobenzene | BQL | 6.1 | ug/kg | U | 1 |
| Bromochloromethane | BQL | 6.1 | ug/kg | U | 1 |
| Bromodichloromethane | BQL | 6.1 | ug/kg | U | 1 |
| Bromoform | BQL | 6.1 | ug/kg | U | 1 |
| Bromomethane | BQL | 12 | ug/kg | U | 1 |
| Carbon Disulfide | BQL | 6.1 | ug/kg | U | 1 |
| Carbon Tetrachloride | BQL | 6.1 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-E-1D
GPL ID: 706149-002-007-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW5030B
Prep Date: 06/27/2007
Prep Time: 11:30
Prep Batch: 98968

Analytical Method: SW8260B
Date Analyzed: 06/27/2007
Time Analyzed: 15:25
Analysis Batch: 103526

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Chlorobenzene | BQL | 6.1 | ug/kg | U | 1 |
| Chloroethane | BQL | 12 | ug/kg | U | 1 |
| Chloroform | BQL | 6.1 | ug/kg | U | 1 |
| Chloromethane | BQL | 12 | ug/kg | U | 1 |
| Cyclohexane | BQL | 6.1 | ug/kg | U | 1 |
| Dibromochloromethane | BQL | 6.1 | ug/kg | U | 1 |
| Dibromomethane | BQL | 6.1 | ug/kg | U | 1 |
| Dichlorodifluoromethane | BQL | 6.1 | ug/kg | U | 1 |
| Ethyl Methacrylate | BQL | 6.1 | ug/kg | U | 1 |
| Ethylbenzene | BQL | 6.1 | ug/kg | U | 1 |
| Hexachlorobutadiene | BQL | 6.1 | ug/kg | U | 1 |
| Isopropylbenzene | BQL | 6.1 | ug/kg | U | 1 |
| Methyl Acetate | BQL | 6.1 | ug/kg | U | 1 |
| Methylcyclohexane | BQL | 6.1 | ug/kg | U | 1 |
| Methylene Chloride | 26 | 12 | ug/kg | | 1 |
| Naphthalene | BQL | 6.1 | ug/kg | U | 1 |
| Sec-Butylbenzene | BQL | 6.1 | ug/kg | U | 1 |
| Styrene | BQL | 6.1 | ug/kg | U | 1 |
| Tetrachloroethylene | BQL | 6.1 | ug/kg | U | 1 |
| Toluene | BQL | 6.1 | ug/kg | U | 1 |
| Trichloroethene | BQL | 6.1 | ug/kg | U | 1 |
| Trichlorofluoromethane | BQL | 6.1 | ug/kg | U | 1 |
| Vinyl Acetate | BQL | 6.1 | ug/kg | U | 1 |
| Vinyl Chloride | BQL | 12 | ug/kg | U | 1 |
| cis-1,2-Dichloroethene | BQL | 6.1 | ug/kg | U | 1 |
| cis-1,3-Dichloropropene | BQL | 6.1 | ug/kg | U | 1 |
| m,p-Xylenes | BQL | 6.1 | ug/kg | U | 1 |
| n-Butylbenzene | BQL | 6.1 | ug/kg | U | 1 |
| n-Propylbenzene | BQL | 6.1 | ug/kg | U | 1 |
| o-Xylene | BQL | 6.1 | ug/kg | U | 1 |
| tert-Butylbenzene | BQL | 6.1 | ug/kg | U | 1 |
| tert-butyl methyl ether | BQL | 6.1 | ug/kg | U | 1 |
| trans-1,2-dichloroethene | BQL | 6.1 | ug/kg | U | 1 |
| trans-1,3-dichloropropene | BQL | 6.1 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-C-1
GPL ID: 706149-003-008-1/3
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW5030B
Prep Date: 06/27/2007
Prep Time: 11:30
Prep Batch: 98968

Analytical Method: SW8260B
Date Analyzed: 06/27/2007
Time Analyzed: 16:05
Analysis Batch: 103526

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | BQL | 5.5 | ug/kg | U | 1 |
| 1,1,1-Trichloroethane | BQL | 5.5 | ug/kg | U | 1 |
| 1,1,2,2-Tetrachloroethane | BQL | 5.5 | ug/kg | U | 1 |
| 1,1,2-Trichloroethane | BQL | 5.5 | ug/kg | U | 1 |
| 1,1-Dichloroethane | BQL | 5.5 | ug/kg | U | 1 |
| 1,1-Dichloroethene | BQL | 5.5 | ug/kg | U | 1 |
| 1,1-Dichloropropene | BQL | 5.5 | ug/kg | U | 1 |
| 1,2,3-Trichlorobenzene | BQL | 5.5 | ug/kg | U | 1 |
| 1,2,3-Trichloropropane | BQL | 5.5 | ug/kg | U | 1 |
| 1,2,4-Trichlorobenzene | BQL | 5.5 | ug/kg | U | 1 |
| 1,2,4-Trimethylbenzene | BQL | 5.5 | ug/kg | U | 1 |
| 1,2-Dibromo-3-Chloropropane | BQL | 5.5 | ug/kg | U | 1 |
| 1,2-Dichlorobenzene | BQL | 5.5 | ug/kg | U | 1 |
| 1,2-Dichloroethane | BQL | 5.5 | ug/kg | U | 1 |
| 1,2-Dichloropropane | BQL | 5.5 | ug/kg | U | 1 |
| 1,3,5-trimethylbenzene | BQL | 5.5 | ug/kg | U | 1 |
| 1,3-Dichlorobenzene | BQL | 5.5 | ug/kg | U | 1 |
| 1,3-Dichloropropane | BQL | 5.5 | ug/kg | U | 1 |
| 1,4-Dichlorobenzene | BQL | 5.5 | ug/kg | U | 1 |
| 1-Chlorohexane | BQL | 5.5 | ug/kg | U | 1 |
| 2,2-Dichloropropane | BQL | 5.5 | ug/kg | U | 1 |
| 2-Butanone | BQL | 11 | ug/kg | U | 1 |
| 2-Chloroethyl Vinyl Ether | BQL | 11 | ug/kg | U | 1 |
| 2-Chlorotoluene | BQL | 5.5 | ug/kg | U | 1 |
| 2-Hexanone | BQL | 11 | ug/kg | U | 1 |
| 4-Chlorotoluene | BQL | 5.5 | ug/kg | U | 1 |
| 4-Isopropyltoluene | BQL | 5.5 | ug/kg | U | 1 |
| 4-Methyl-2-Pentanone | BQL | 11 | ug/kg | U | 1 |
| Acetone | BQL | 11 | ug/kg | U | 1 |
| Acrolein | BQL | 55 | ug/kg | U | 1 |
| Acrylonitrile | BQL | 55 | ug/kg | U | 1 |
| Benzene | BQL | 5.5 | ug/kg | U | 1 |
| Bromobenzene | BQL | 5.5 | ug/kg | U | 1 |
| Bromochloromethane | BQL | 5.5 | ug/kg | U | 1 |
| Bromodichloromethane | BQL | 5.5 | ug/kg | U | 1 |
| Bromoform | BQL | 5.5 | ug/kg | U | 1 |
| Bromomethane | BQL | 11 | ug/kg | U | 1 |
| Carbon Disulfide | BQL | 5.5 | ug/kg | U | 1 |
| Carbon Tetrachloride | BQL | 5.5 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-C-1
GPL ID: 706149-003-008-1/3
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW5030B
Prep Date: 06/27/2007
Prep Time: 11:30
Prep Batch: 98968

Analytical Method: SW8260B
Date Analyzed: 06/27/2007
Time Analyzed: 16:05
Analysis Batch: 103526

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Chlorobenzene | BQL | 5.5 | ug/kg | U | 1 |
| Chloroethane | BQL | 11 | ug/kg | U | 1 |
| Chloroform | BQL | 5.5 | ug/kg | U | 1 |
| Chloromethane | BQL | 11 | ug/kg | U | 1 |
| Cyclohexane | BQL | 5.5 | ug/kg | U | 1 |
| Dibromochloromethane | BQL | 5.5 | ug/kg | U | 1 |
| Dibromomethane | BQL | 5.5 | ug/kg | U | 1 |
| Dichlorodifluoromethane | BQL | 5.5 | ug/kg | U | 1 |
| Ethyl Methacrylate | BQL | 5.5 | ug/kg | U | 1 |
| Ethylbenzene | BQL | 5.5 | ug/kg | U | 1 |
| Hexachlorobutadiene | BQL | 5.5 | ug/kg | U | 1 |
| Isopropylbenzene | BQL | 5.5 | ug/kg | U | 1 |
| Methyl Acetate | BQL | 5.5 | ug/kg | U | 1 |
| Methylcyclohexane | BQL | 5.5 | ug/kg | U | 1 |
| Methylene Chloride | 32 | 11 | ug/kg | | 1 |
| Naphthalene | BQL | 5.5 | ug/kg | U | 1 |
| Sec-Butylbenzene | BQL | 5.5 | ug/kg | U | 1 |
| Styrene | BQL | 5.5 | ug/kg | U | 1 |
| Tetrachloroethylene | BQL | 5.5 | ug/kg | U | 1 |
| Toluene | BQL | 5.5 | ug/kg | U | 1 |
| Trichloroethene | BQL | 5.5 | ug/kg | U | 1 |
| Trichlorofluoromethane | BQL | 5.5 | ug/kg | U | 1 |
| Vinyl Acetate | BQL | 5.5 | ug/kg | U | 1 |
| Vinyl Chloride | BQL | 11 | ug/kg | U | 1 |
| cis-1,2-Dichloroethene | BQL | 5.5 | ug/kg | U | 1 |
| cis-1,3-Dichloropropene | BQL | 5.5 | ug/kg | U | 1 |
| m,p-Xylenes | BQL | 5.5 | ug/kg | U | 1 |
| n-Butylbenzene | BQL | 5.5 | ug/kg | U | 1 |
| n-Propylbenzene | BQL | 5.5 | ug/kg | U | 1 |
| o-Xylene | BQL | 5.5 | ug/kg | U | 1 |
| tert-Butylbenzene | BQL | 5.5 | ug/kg | U | 1 |
| tert-butyl methyl ether | BQL | 5.5 | ug/kg | U | 1 |
| trans-1,2-dichloroethene | BQL | 5.5 | ug/kg | U | 1 |
| trans-1,3-dichloropropene | BQL | 5.5 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-C-1RE
GPL ID: 706149-003-008-1/3RE
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW5030B
Prep Date: 06/28/2007
Prep Time: 08:58
Prep Batch: 98970

Analytical Method: SW8260B
Date Analyzed: 06/28/2007
Time Analyzed: 13:35
Analysis Batch: 103527

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | BQL | 5.5 | ug/kg | U | 1 |
| 1,1,1-Trichloroethane | BQL | 5.5 | ug/kg | U | 1 |
| 1,1,2,2-Tetrachloroethane | BQL | 5.5 | ug/kg | U | 1 |
| 1,1,2-Trichloroethane | BQL | 5.5 | ug/kg | U | 1 |
| 1,1-Dichloroethane | BQL | 5.5 | ug/kg | U | 1 |
| 1,1-Dichloroethene | BQL | 5.5 | ug/kg | U | 1 |
| 1,1-Dichloropropene | BQL | 5.5 | ug/kg | U | 1 |
| 1,2,3-Trichlorobenzene | BQL | 5.5 | ug/kg | U | 1 |
| 1,2,3-Trichloropropane | BQL | 5.5 | ug/kg | U | 1 |
| 1,2,4-Trichlorobenzene | BQL | 5.5 | ug/kg | U | 1 |
| 1,2,4-Trimethylbenzene | BQL | 5.5 | ug/kg | U | 1 |
| 1,2-Dibromo-3-Chloropropane | BQL | 5.5 | ug/kg | U | 1 |
| 1,2-Dichlorobenzene | BQL | 5.5 | ug/kg | U | 1 |
| 1,2-Dichloroethane | BQL | 5.5 | ug/kg | U | 1 |
| 1,2-Dichloropropane | BQL | 5.5 | ug/kg | U | 1 |
| 1,3,5-trimethylbenzene | BQL | 5.5 | ug/kg | U | 1 |
| 1,3-Dichlorobenzene | BQL | 5.5 | ug/kg | U | 1 |
| 1,3-Dichloropropane | BQL | 5.5 | ug/kg | U | 1 |
| 1,4-Dichlorobenzene | BQL | 5.5 | ug/kg | U | 1 |
| 1-Chlorohexane | BQL | 5.5 | ug/kg | U | 1 |
| 2,2-Dichloropropane | BQL | 5.5 | ug/kg | U | 1 |
| 2-Butanone | BQL | 11 | ug/kg | U | 1 |
| 2-Chloroethyl Vinyl Ether | BQL | 11 | ug/kg | U | 1 |
| 2-Chlorotoluene | BQL | 5.5 | ug/kg | U | 1 |
| 2-Hexanone | BQL | 11 | ug/kg | U | 1 |
| 4-Chlorotoluene | BQL | 5.5 | ug/kg | U | 1 |
| 4-Isopropyltoluene | BQL | 5.5 | ug/kg | U | 1 |
| 4-Methyl-2-Pentanone | BQL | 11 | ug/kg | U | 1 |
| Acetone | BQL | 11 | ug/kg | U | 1 |
| Acrolein | BQL | 55 | ug/kg | U | 1 |
| Acrylonitrile | BQL | 55 | ug/kg | U | 1 |
| Benzene | BQL | 5.5 | ug/kg | U | 1 |
| Bromobenzene | BQL | 5.5 | ug/kg | U | 1 |
| Bromochloromethane | BQL | 5.5 | ug/kg | U | 1 |
| Bromodichloromethane | BQL | 5.5 | ug/kg | U | 1 |
| Bromoform | BQL | 5.5 | ug/kg | U | 1 |
| Bromomethane | BQL | 11 | ug/kg | U | 1 |
| Carbon Disulfide | BQL | 5.5 | ug/kg | U | 1 |
| Carbon Tetrachloride | BQL | 5.5 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-C-1RE
GPL ID: 706149-003-008-1/3RE
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW5030B
Prep Date: 06/28/2007
Prep Time: 08:58
Prep Batch: 98970

Analytical Method: SW8260B
Date Analyzed: 06/28/2007
Time Analyzed: 13:35
Analysis Batch: 103527

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Chlorobenzene | BQL | 5.5 | ug/kg | U | 1 |
| Chloroethane | BQL | 11 | ug/kg | U | 1 |
| Chloroform | BQL | 5.5 | ug/kg | U | 1 |
| Chloromethane | BQL | 11 | ug/kg | U | 1 |
| Cyclohexane | BQL | 5.5 | ug/kg | U | 1 |
| Dibromochloromethane | BQL | 5.5 | ug/kg | U | 1 |
| Dibromomethane | BQL | 5.5 | ug/kg | U | 1 |
| Dichlorodifluoromethane | BQL | 5.5 | ug/kg | U | 1 |
| Ethyl Methacrylate | BQL | 5.5 | ug/kg | U | 1 |
| Ethylbenzene | BQL | 5.5 | ug/kg | U | 1 |
| Hexachlorobutadiene | BQL | 5.5 | ug/kg | U | 1 |
| Isopropylbenzene | BQL | 5.5 | ug/kg | U | 1 |
| Methyl Acetate | BQL | 5.5 | ug/kg | U | 1 |
| Methylcyclohexane | BQL | 5.5 | ug/kg | U | 1 |
| Methylene Chloride | BQL | 11 | ug/kg | U | 1 |
| Naphthalene | BQL | 5.5 | ug/kg | U | 1 |
| Sec-Butylbenzene | BQL | 5.5 | ug/kg | U | 1 |
| Styrene | BQL | 5.5 | ug/kg | U | 1 |
| Tetrachloroethylene | BQL | 5.5 | ug/kg | U | 1 |
| Toluene | BQL | 5.5 | ug/kg | U | 1 |
| Trichloroethene | BQL | 5.5 | ug/kg | U | 1 |
| Trichlorofluoromethane | BQL | 5.5 | ug/kg | U | 1 |
| Vinyl Acetate | BQL | 5.5 | ug/kg | U | 1 |
| Vinyl Chloride | BQL | 11 | ug/kg | U | 1 |
| cis-1,2-Dichloroethene | BQL | 5.5 | ug/kg | U | 1 |
| cis-1,3-Dichloropropene | BQL | 5.5 | ug/kg | U | 1 |
| m,p-Xylenes | BQL | 5.5 | ug/kg | U | 1 |
| n-Butylbenzene | BQL | 5.5 | ug/kg | U | 1 |
| n-Propylbenzene | BQL | 5.5 | ug/kg | U | 1 |
| o-Xylene | BQL | 5.5 | ug/kg | U | 1 |
| tert-Butylbenzene | BQL | 5.5 | ug/kg | U | 1 |
| tert-butyl methyl ether | BQL | 5.5 | ug/kg | U | 1 |
| trans-1,2-dichloroethene | BQL | 5.5 | ug/kg | U | 1 |
| trans-1,3-dichloropropene | BQL | 5.5 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-FB-1
GPL ID: 706149-004-001-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW5030B
Prep Date: 06/27/2007
Prep Time: 11:30
Prep Batch: 98968

Analytical Method: SW8260B
Date Analyzed: 06/27/2007
Time Analyzed: 18:06
Analysis Batch: 103526

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | BQL | 5.7 | ug/kg | U | 1 |
| 1,1,1-Trichloroethane | BQL | 5.7 | ug/kg | U | 1 |
| 1,1,2,2-Tetrachloroethane | BQL | 5.7 | ug/kg | U | 1 |
| 1,1,2-Trichloroethane | BQL | 5.7 | ug/kg | U | 1 |
| 1,1-Dichloroethane | BQL | 5.7 | ug/kg | U | 1 |
| 1,1-Dichloroethene | BQL | 5.7 | ug/kg | U | 1 |
| 1,1-Dichloropropene | BQL | 5.7 | ug/kg | U | 1 |
| 1,2,3-Trichlorobenzene | BQL | 5.7 | ug/kg | U | 1 |
| 1,2,3-Trichloropropane | BQL | 5.7 | ug/kg | U | 1 |
| 1,2,4-Trichlorobenzene | BQL | 5.7 | ug/kg | U | 1 |
| 1,2,4-Trimethylbenzene | BQL | 5.7 | ug/kg | U | 1 |
| 1,2-Dibromo-3-Chloropropane | BQL | 5.7 | ug/kg | U | 1 |
| 1,2-Dichlorobenzene | BQL | 5.7 | ug/kg | U | 1 |
| 1,2-Dichloroethane | BQL | 5.7 | ug/kg | U | 1 |
| 1,2-Dichloropropane | BQL | 5.7 | ug/kg | U | 1 |
| 1,3,5-trimethylbenzene | BQL | 5.7 | ug/kg | U | 1 |
| 1,3-Dichlorobenzene | BQL | 5.7 | ug/kg | U | 1 |
| 1,3-Dichloropropane | BQL | 5.7 | ug/kg | U | 1 |
| 1,4-Dichlorobenzene | BQL | 5.7 | ug/kg | U | 1 |
| 1-Chlorohexane | BQL | 5.7 | ug/kg | U | 1 |
| 2,2-Dichloropropane | BQL | 5.7 | ug/kg | U | 1 |
| 2-Butanone | BQL | 11 | ug/kg | U | 1 |
| 2-Chloroethyl Vinyl Ether | BQL | 11 | ug/kg | U | 1 |
| 2-Chlorotoluene | BQL | 5.7 | ug/kg | U | 1 |
| 2-Hexanone | BQL | 11 | ug/kg | U | 1 |
| 4-Chlorotoluene | BQL | 5.7 | ug/kg | U | 1 |
| 4-Isopropyltoluene | BQL | 5.7 | ug/kg | U | 1 |
| 4-Methyl-2-Pentanone | BQL | 11 | ug/kg | U | 1 |
| Acetone | BQL | 11 | ug/kg | U | 1 |
| Acrolein | BQL | 57 | ug/kg | U | 1 |
| Acrylonitrile | BQL | 57 | ug/kg | U | 1 |
| Benzene | BQL | 5.7 | ug/kg | U | 1 |
| Bromobenzene | BQL | 5.7 | ug/kg | U | 1 |
| Bromochloromethane | BQL | 5.7 | ug/kg | U | 1 |
| Bromodichloromethane | BQL | 5.7 | ug/kg | U | 1 |
| Bromoform | BQL | 5.7 | ug/kg | U | 1 |
| Bromomethane | BQL | 11 | ug/kg | U | 1 |
| Carbon Disulfide | BQL | 5.7 | ug/kg | U | 1 |
| Carbon Tetrachloride | BQL | 5.7 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-FB-1
GPL ID: 706149-004-001-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW5030B
Prep Date: 06/27/2007
Prep Time: 11:30
Prep Batch: 98968

Analytical Method: SW8260B
Date Analyzed: 06/27/2007
Time Analyzed: 18:06
Analysis Batch: 103526

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Chlorobenzene | BQL | 5.7 | ug/kg | U | 1 |
| Chloroethane | BQL | 11 | ug/kg | U | 1 |
| Chloroform | BQL | 5.7 | ug/kg | U | 1 |
| Chloromethane | BQL | 11 | ug/kg | U | 1 |
| Cyclohexane | BQL | 5.7 | ug/kg | U | 1 |
| Dibromochloromethane | BQL | 5.7 | ug/kg | U | 1 |
| Dibromomethane | BQL | 5.7 | ug/kg | U | 1 |
| Dichlorodifluoromethane | BQL | 5.7 | ug/kg | U | 1 |
| Ethyl Methacrylate | BQL | 5.7 | ug/kg | U | 1 |
| Ethylbenzene | BQL | 5.7 | ug/kg | U | 1 |
| Hexachlorobutadiene | BQL | 5.7 | ug/kg | U | 1 |
| Isopropylbenzene | BQL | 5.7 | ug/kg | U | 1 |
| Methyl Acetate | BQL | 5.7 | ug/kg | U | 1 |
| Methylcyclohexane | BQL | 5.7 | ug/kg | U | 1 |
| Methylene Chloride | 29 | 11 | ug/kg | | 1 |
| Naphthalene | BQL | 5.7 | ug/kg | U | 1 |
| Sec-Butylbenzene | BQL | 5.7 | ug/kg | U | 1 |
| Styrene | BQL | 5.7 | ug/kg | U | 1 |
| Tetrachloroethylene | BQL | 5.7 | ug/kg | U | 1 |
| Toluene | BQL | 5.7 | ug/kg | U | 1 |
| Trichloroethene | BQL | 5.7 | ug/kg | U | 1 |
| Trichlorofluoromethane | BQL | 5.7 | ug/kg | U | 1 |
| Vinyl Acetate | BQL | 5.7 | ug/kg | U | 1 |
| Vinyl Chloride | BQL | 11 | ug/kg | U | 1 |
| cis-1,2-Dichloroethene | BQL | 5.7 | ug/kg | U | 1 |
| cis-1,3-Dichloropropene | BQL | 5.7 | ug/kg | U | 1 |
| m,p-Xylenes | BQL | 5.7 | ug/kg | U | 1 |
| n-Butylbenzene | BQL | 5.7 | ug/kg | U | 1 |
| n-Propylbenzene | BQL | 5.7 | ug/kg | U | 1 |
| o-Xylene | BQL | 5.7 | ug/kg | U | 1 |
| tert-Butylbenzene | BQL | 5.7 | ug/kg | U | 1 |
| tert-butyl methyl ether | BQL | 5.7 | ug/kg | U | 1 |
| trans-1,2-dichloroethene | BQL | 5.7 | ug/kg | U | 1 |
| trans-1,3-dichloropropene | BQL | 5.7 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-FB-1RE
GPL ID: 706149-004-001-1/1RE
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW5030B
Prep Date: 06/28/2007
Prep Time: 08:58
Prep Batch: 98970

Analytical Method: SW8260B
Date Analyzed: 06/28/2007
Time Analyzed: 15:35
Analysis Batch: 103527

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | BQL | 5.7 | ug/kg | U | 1 |
| 1,1,1-Trichloroethane | BQL | 5.7 | ug/kg | U | 1 |
| 1,1,2,2-Tetrachloroethane | BQL | 5.7 | ug/kg | U | 1 |
| 1,1,2-Trichloroethane | BQL | 5.7 | ug/kg | U | 1 |
| 1,1-Dichloroethane | BQL | 5.7 | ug/kg | U | 1 |
| 1,1-Dichloroethene | BQL | 5.7 | ug/kg | U | 1 |
| 1,1-Dichloropropene | BQL | 5.7 | ug/kg | U | 1 |
| 1,2,3-Trichlorobenzene | BQL | 5.7 | ug/kg | U | 1 |
| 1,2,3-Trichloropropane | BQL | 5.7 | ug/kg | U | 1 |
| 1,2,4-Trichlorobenzene | BQL | 5.7 | ug/kg | U | 1 |
| 1,2,4-Trimethylbenzene | BQL | 5.7 | ug/kg | U | 1 |
| 1,2-Dibromo-3-Chloropropane | BQL | 5.7 | ug/kg | U | 1 |
| 1,2-Dichlorobenzene | BQL | 5.7 | ug/kg | U | 1 |
| 1,2-Dichloroethane | BQL | 5.7 | ug/kg | U | 1 |
| 1,2-Dichloropropane | BQL | 5.7 | ug/kg | U | 1 |
| 1,3,5-trimethylbenzene | BQL | 5.7 | ug/kg | U | 1 |
| 1,3-Dichlorobenzene | BQL | 5.7 | ug/kg | U | 1 |
| 1,3-Dichloropropane | BQL | 5.7 | ug/kg | U | 1 |
| 1,4-Dichlorobenzene | BQL | 5.7 | ug/kg | U | 1 |
| 1-Chlorohexane | BQL | 5.7 | ug/kg | U | 1 |
| 2,2-Dichloropropane | BQL | 5.7 | ug/kg | U | 1 |
| 2-Butanone | BQL | 11 | ug/kg | U | 1 |
| 2-Chloroethyl Vinyl Ether | BQL | 11 | ug/kg | U | 1 |
| 2-Chlorotoluene | BQL | 5.7 | ug/kg | U | 1 |
| 2-Hexanone | BQL | 11 | ug/kg | U | 1 |
| 4-Chlorotoluene | BQL | 5.7 | ug/kg | U | 1 |
| 4-Isopropyltoluene | BQL | 5.7 | ug/kg | U | 1 |
| 4-Methyl-2-Pentanone | BQL | 11 | ug/kg | U | 1 |
| Acetone | BQL | 11 | ug/kg | U | 1 |
| Acrolein | BQL | 57 | ug/kg | U | 1 |
| Acrylonitrile | BQL | 57 | ug/kg | U | 1 |
| Benzene | BQL | 5.7 | ug/kg | U | 1 |
| Bromobenzene | BQL | 5.7 | ug/kg | U | 1 |
| Bromochloromethane | BQL | 5.7 | ug/kg | U | 1 |
| Bromodichloromethane | BQL | 5.7 | ug/kg | U | 1 |
| Bromoform | BQL | 5.7 | ug/kg | U | 1 |
| Bromomethane | BQL | 11 | ug/kg | U | 1 |
| Carbon Disulfide | BQL | 5.7 | ug/kg | U | 1 |
| Carbon Tetrachloride | BQL | 5.7 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-FB-1RE
GPL ID: 706149-004-001-1/1RE
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW5030B
Prep Date: 06/28/2007
Prep Time: 08:58
Prep Batch: 98970

Analytical Method: SW8260B
Date Analyzed: 06/28/2007
Time Analyzed: 15:35
Analysis Batch: 103527

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Chlorobenzene | BQL | 5.7 | ug/kg | U | 1 |
| Chloroethane | BQL | 11 | ug/kg | U | 1 |
| Chloroform | BQL | 5.7 | ug/kg | U | 1 |
| Chloromethane | BQL | 11 | ug/kg | U | 1 |
| Cyclohexane | BQL | 5.7 | ug/kg | U | 1 |
| Dibromochloromethane | BQL | 5.7 | ug/kg | U | 1 |
| Dibromomethane | BQL | 5.7 | ug/kg | U | 1 |
| Dichlorodifluoromethane | BQL | 5.7 | ug/kg | U | 1 |
| Ethyl Methacrylate | BQL | 5.7 | ug/kg | U | 1 |
| Ethylbenzene | BQL | 5.7 | ug/kg | U | 1 |
| Hexachlorobutadiene | BQL | 5.7 | ug/kg | U | 1 |
| Isopropylbenzene | BQL | 5.7 | ug/kg | U | 1 |
| Methyl Acetate | BQL | 5.7 | ug/kg | U | 1 |
| Methylcyclohexane | BQL | 5.7 | ug/kg | U | 1 |
| Methylene Chloride | 6.4 | 11 | ug/kg | J | 1 |
| Naphthalene | BQL | 5.7 | ug/kg | U | 1 |
| Sec-Butylbenzene | BQL | 5.7 | ug/kg | U | 1 |
| Styrene | BQL | 5.7 | ug/kg | U | 1 |
| Tetrachloroethylene | BQL | 5.7 | ug/kg | U | 1 |
| Toluene | BQL | 5.7 | ug/kg | U | 1 |
| Trichloroethene | BQL | 5.7 | ug/kg | U | 1 |
| Trichlorofluoromethane | BQL | 5.7 | ug/kg | U | 1 |
| Vinyl Acetate | BQL | 5.7 | ug/kg | U | 1 |
| Vinyl Chloride | BQL | 11 | ug/kg | U | 1 |
| cis-1,2-Dichloroethene | BQL | 5.7 | ug/kg | U | 1 |
| cis-1,3-Dichloropropene | BQL | 5.7 | ug/kg | U | 1 |
| m,p-Xylenes | BQL | 5.7 | ug/kg | U | 1 |
| n-Butylbenzene | BQL | 5.7 | ug/kg | U | 1 |
| n-Propylbenzene | BQL | 5.7 | ug/kg | U | 1 |
| o-Xylene | BQL | 5.7 | ug/kg | U | 1 |
| tert-Butylbenzene | BQL | 5.7 | ug/kg | U | 1 |
| tert-butyl methyl ether | BQL | 5.7 | ug/kg | U | 1 |
| trans-1,2-dichloroethene | BQL | 5.7 | ug/kg | U | 1 |
| trans-1,3-dichloropropene | BQL | 5.7 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-FBR-1
GPL ID: 706149-005-002-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW5030B
Prep Date: 06/27/2007
Prep Time: 11:30
Prep Batch: 98968

Analytical Method: SW8260B
Date Analyzed: 06/27/2007
Time Analyzed: 18:46
Analysis Batch: 103526

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | BQL | 5.4 | ug/kg | U | 1 |
| 1,1,1-Trichloroethane | BQL | 5.4 | ug/kg | U | 1 |
| 1,1,2,2-Tetrachloroethane | BQL | 5.4 | ug/kg | U | 1 |
| 1,1,2-Trichloroethane | BQL | 5.4 | ug/kg | U | 1 |
| 1,1-Dichloroethane | BQL | 5.4 | ug/kg | U | 1 |
| 1,1-Dichloroethene | BQL | 5.4 | ug/kg | U | 1 |
| 1,1-Dichloropropene | BQL | 5.4 | ug/kg | U | 1 |
| 1,2,3-Trichlorobenzene | BQL | 5.4 | ug/kg | U | 1 |
| 1,2,3-Trichloropropane | BQL | 5.4 | ug/kg | U | 1 |
| 1,2,4-Trichlorobenzene | BQL | 5.4 | ug/kg | U | 1 |
| 1,2,4-Trimethylbenzene | BQL | 5.4 | ug/kg | U | 1 |
| 1,2-Dibromo-3-Chloropropane | BQL | 5.4 | ug/kg | U | 1 |
| 1,2-Dichlorobenzene | BQL | 5.4 | ug/kg | U | 1 |
| 1,2-Dichloroethane | BQL | 5.4 | ug/kg | U | 1 |
| 1,2-Dichloropropane | BQL | 5.4 | ug/kg | U | 1 |
| 1,3,5-trimethylbenzene | BQL | 5.4 | ug/kg | U | 1 |
| 1,3-Dichlorobenzene | BQL | 5.4 | ug/kg | U | 1 |
| 1,3-Dichloropropane | BQL | 5.4 | ug/kg | U | 1 |
| 1,4-Dichlorobenzene | BQL | 5.4 | ug/kg | U | 1 |
| 1-Chlorohexane | BQL | 5.4 | ug/kg | U | 1 |
| 2,2-Dichloropropane | BQL | 5.4 | ug/kg | U | 1 |
| 2-Butanone | BQL | 11 | ug/kg | U | 1 |
| 2-Chloroethyl Vinyl Ether | BQL | 11 | ug/kg | U | 1 |
| 2-Chlorotoluene | BQL | 5.4 | ug/kg | U | 1 |
| 2-Hexanone | BQL | 11 | ug/kg | U | 1 |
| 4-Chlorotoluene | BQL | 5.4 | ug/kg | U | 1 |
| 4-Isopropyltoluene | BQL | 5.4 | ug/kg | U | 1 |
| 4-Methyl-2-Pentanone | BQL | 11 | ug/kg | U | 1 |
| Acetone | BQL | 11 | ug/kg | U | 1 |
| Acrolein | BQL | 54 | ug/kg | U | 1 |
| Acrylonitrile | BQL | 54 | ug/kg | U | 1 |
| Benzene | BQL | 5.4 | ug/kg | U | 1 |
| Bromobenzene | BQL | 5.4 | ug/kg | U | 1 |
| Bromochloromethane | BQL | 5.4 | ug/kg | U | 1 |
| Bromodichloromethane | BQL | 5.4 | ug/kg | U | 1 |
| Bromoform | BQL | 5.4 | ug/kg | U | 1 |
| Bromomethane | BQL | 11 | ug/kg | U | 1 |
| Carbon Disulfide | BQL | 5.4 | ug/kg | U | 1 |
| Carbon Tetrachloride | BQL | 5.4 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-FBR-1
GPL ID: 706149-005-002-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW5030B
Prep Date: 06/27/2007
Prep Time: 11:30
Prep Batch: 98968

Analytical Method: SW8260B
Date Analyzed: 06/27/2007
Time Analyzed: 18:46
Analysis Batch: 103526

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Chlorobenzene | BQL | 5.4 | ug/kg | U | 1 |
| Chloroethane | BQL | 11 | ug/kg | U | 1 |
| Chloroform | BQL | 5.4 | ug/kg | U | 1 |
| Chloromethane | BQL | 11 | ug/kg | U | 1 |
| Cyclohexane | BQL | 5.4 | ug/kg | U | 1 |
| Dibromochloromethane | BQL | 5.4 | ug/kg | U | 1 |
| Dibromomethane | BQL | 5.4 | ug/kg | U | 1 |
| Dichlorodifluoromethane | BQL | 5.4 | ug/kg | U | 1 |
| Ethyl Methacrylate | BQL | 5.4 | ug/kg | U | 1 |
| Ethylbenzene | BQL | 5.4 | ug/kg | U | 1 |
| Hexachlorobutadiene | BQL | 5.4 | ug/kg | U | 1 |
| Isopropylbenzene | BQL | 5.4 | ug/kg | U | 1 |
| Methyl Acetate | BQL | 5.4 | ug/kg | U | 1 |
| Methylcyclohexane | BQL | 5.4 | ug/kg | U | 1 |
| Methylene Chloride | 28 | 11 | ug/kg | | 1 |
| Naphthalene | BQL | 5.4 | ug/kg | U | 1 |
| Sec-Butylbenzene | BQL | 5.4 | ug/kg | U | 1 |
| Styrene | BQL | 5.4 | ug/kg | U | 1 |
| Tetrachloroethylene | BQL | 5.4 | ug/kg | U | 1 |
| Toluene | BQL | 5.4 | ug/kg | U | 1 |
| Trichloroethene | BQL | 5.4 | ug/kg | U | 1 |
| Trichlorofluoromethane | BQL | 5.4 | ug/kg | U | 1 |
| Vinyl Acetate | BQL | 5.4 | ug/kg | U | 1 |
| Vinyl Chloride | BQL | 11 | ug/kg | U | 1 |
| cis-1,2-Dichloroethene | BQL | 5.4 | ug/kg | U | 1 |
| cis-1,3-Dichloropropene | BQL | 5.4 | ug/kg | U | 1 |
| m,p-Xylenes | BQL | 5.4 | ug/kg | U | 1 |
| n-Butylbenzene | BQL | 5.4 | ug/kg | U | 1 |
| n-Propylbenzene | BQL | 5.4 | ug/kg | U | 1 |
| o-Xylene | BQL | 5.4 | ug/kg | U | 1 |
| tert-Butylbenzene | BQL | 5.4 | ug/kg | U | 1 |
| tert-butyl methyl ether | BQL | 5.4 | ug/kg | U | 1 |
| trans-1,2-dichloroethene | BQL | 5.4 | ug/kg | U | 1 |
| trans-1,3-dichloropropene | BQL | 5.4 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-FBR-1RE
GPL ID: 706149-005-002-1/1RE
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW5030B
Prep Date: 06/28/2007
Prep Time: 08:58
Prep Batch: 98970

Analytical Method: SW8260B
Date Analyzed: 06/28/2007
Time Analyzed: 16:16
Analysis Batch: 103527

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | BQL | 5.4 | ug/kg | U | 1 |
| 1,1,1-Trichloroethane | BQL | 5.4 | ug/kg | U | 1 |
| 1,1,2,2-Tetrachloroethane | BQL | 5.4 | ug/kg | U | 1 |
| 1,1,2-Trichloroethane | BQL | 5.4 | ug/kg | U | 1 |
| 1,1-Dichloroethane | BQL | 5.4 | ug/kg | U | 1 |
| 1,1-Dichloroethene | BQL | 5.4 | ug/kg | U | 1 |
| 1,1-Dichloropropene | BQL | 5.4 | ug/kg | U | 1 |
| 1,2,3-Trichlorobenzene | BQL | 5.4 | ug/kg | U | 1 |
| 1,2,3-Trichloropropane | BQL | 5.4 | ug/kg | U | 1 |
| 1,2,4-Trichlorobenzene | BQL | 5.4 | ug/kg | U | 1 |
| 1,2,4-Trimethylbenzene | BQL | 5.4 | ug/kg | U | 1 |
| 1,2-Dibromo-3-Chloropropane | BQL | 5.4 | ug/kg | U | 1 |
| 1,2-Dichlorobenzene | BQL | 5.4 | ug/kg | U | 1 |
| 1,2-Dichloroethane | BQL | 5.4 | ug/kg | U | 1 |
| 1,2-Dichloropropane | BQL | 5.4 | ug/kg | U | 1 |
| 1,3,5-trimethylbenzene | BQL | 5.4 | ug/kg | U | 1 |
| 1,3-Dichlorobenzene | BQL | 5.4 | ug/kg | U | 1 |
| 1,3-Dichloropropane | BQL | 5.4 | ug/kg | U | 1 |
| 1,4-Dichlorobenzene | BQL | 5.4 | ug/kg | U | 1 |
| 1-Chlorohexane | BQL | 5.4 | ug/kg | U | 1 |
| 2,2-Dichloropropane | BQL | 5.4 | ug/kg | U | 1 |
| 2-Butanone | BQL | 11 | ug/kg | U | 1 |
| 2-Chloroethyl Vinyl Ether | BQL | 11 | ug/kg | U | 1 |
| 2-Chlorotoluene | BQL | 5.4 | ug/kg | U | 1 |
| 2-Hexanone | BQL | 11 | ug/kg | U | 1 |
| 4-Chlorotoluene | BQL | 5.4 | ug/kg | U | 1 |
| 4-Isopropyltoluene | BQL | 5.4 | ug/kg | U | 1 |
| 4-Methyl-2-Pentanone | BQL | 11 | ug/kg | U | 1 |
| Acetone | BQL | 11 | ug/kg | U | 1 |
| Acrolein | BQL | 54 | ug/kg | U | 1 |
| Acrylonitrile | BQL | 54 | ug/kg | U | 1 |
| Benzene | BQL | 5.4 | ug/kg | U | 1 |
| Bromobenzene | BQL | 5.4 | ug/kg | U | 1 |
| Bromochloromethane | BQL | 5.4 | ug/kg | U | 1 |
| Bromodichloromethane | BQL | 5.4 | ug/kg | U | 1 |
| Bromoform | BQL | 5.4 | ug/kg | U | 1 |
| Bromomethane | BQL | 11 | ug/kg | U | 1 |
| Carbon Disulfide | BQL | 5.4 | ug/kg | U | 1 |
| Carbon Tetrachloride | BQL | 5.4 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-FBR-1RE
GPL ID: 706149-005-002-1/1RE
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW5030B
Prep Date: 06/28/2007
Prep Time: 08:58
Prep Batch: 98970

Analytical Method: SW8260B
Date Analyzed: 06/28/2007
Time Analyzed: 16:16
Analysis Batch: 103527

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Chlorobenzene | BQL | 5.4 | ug/kg | U | 1 |
| Chloroethane | BQL | 11 | ug/kg | U | 1 |
| Chloroform | BQL | 5.4 | ug/kg | U | 1 |
| Chloromethane | BQL | 11 | ug/kg | U | 1 |
| Cyclohexane | BQL | 5.4 | ug/kg | U | 1 |
| Dibromochloromethane | BQL | 5.4 | ug/kg | U | 1 |
| Dibromomethane | BQL | 5.4 | ug/kg | U | 1 |
| Dichlorodifluoromethane | BQL | 5.4 | ug/kg | U | 1 |
| Ethyl Methacrylate | BQL | 5.4 | ug/kg | U | 1 |
| Ethylbenzene | BQL | 5.4 | ug/kg | U | 1 |
| Hexachlorobutadiene | BQL | 5.4 | ug/kg | U | 1 |
| Isopropylbenzene | BQL | 5.4 | ug/kg | U | 1 |
| Methyl Acetate | BQL | 5.4 | ug/kg | U | 1 |
| Methylcyclohexane | BQL | 5.4 | ug/kg | U | 1 |
| Methylene Chloride | 9.1 | 11 | ug/kg | J | 1 |
| Naphthalene | BQL | 5.4 | ug/kg | U | 1 |
| Sec-Butylbenzene | BQL | 5.4 | ug/kg | U | 1 |
| Styrene | BQL | 5.4 | ug/kg | U | 1 |
| Tetrachloroethylene | BQL | 5.4 | ug/kg | U | 1 |
| Toluene | BQL | 5.4 | ug/kg | U | 1 |
| Trichloroethene | BQL | 5.4 | ug/kg | U | 1 |
| Trichlorofluoromethane | BQL | 5.4 | ug/kg | U | 1 |
| Vinyl Acetate | BQL | 5.4 | ug/kg | U | 1 |
| Vinyl Chloride | BQL | 11 | ug/kg | U | 1 |
| cis-1,2-Dichloroethene | BQL | 5.4 | ug/kg | U | 1 |
| cis-1,3-Dichloropropene | BQL | 5.4 | ug/kg | U | 1 |
| m,p-Xylenes | BQL | 5.4 | ug/kg | U | 1 |
| n-Butylbenzene | BQL | 5.4 | ug/kg | U | 1 |
| n-Propylbenzene | BQL | 5.4 | ug/kg | U | 1 |
| o-Xylene | BQL | 5.4 | ug/kg | U | 1 |
| tert-Butylbenzene | BQL | 5.4 | ug/kg | U | 1 |
| tert-butyl methyl ether | BQL | 5.4 | ug/kg | U | 1 |
| trans-1,2-dichloroethene | BQL | 5.4 | ug/kg | U | 1 |
| trans-1,3-dichloropropene | BQL | 5.4 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-ADM-1
GPL ID: 706149-006-003-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW5030B
Prep Date: 06/28/2007
Prep Time: 08:58
Prep Batch: 98970

Analytical Method: SW8260B
Date Analyzed: 06/28/2007
Time Analyzed: 16:56
Analysis Batch: 103527

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | BQL | 5.5 | ug/kg | U | 1 |
| 1,1,1-Trichloroethane | BQL | 5.5 | ug/kg | U | 1 |
| 1,1,2,2-Tetrachloroethane | BQL | 5.5 | ug/kg | U | 1 |
| 1,1,2-Trichloroethane | BQL | 5.5 | ug/kg | U | 1 |
| 1,1-Dichloroethane | BQL | 5.5 | ug/kg | U | 1 |
| 1,1-Dichloroethene | BQL | 5.5 | ug/kg | U | 1 |
| 1,1-Dichloropropene | BQL | 5.5 | ug/kg | U | 1 |
| 1,2,3-Trichlorobenzene | BQL | 5.5 | ug/kg | U | 1 |
| 1,2,3-Trichloropropane | BQL | 5.5 | ug/kg | U | 1 |
| 1,2,4-Trichlorobenzene | BQL | 5.5 | ug/kg | U | 1 |
| 1,2,4-Trimethylbenzene | BQL | 5.5 | ug/kg | U | 1 |
| 1,2-Dibromo-3-Chloropropane | BQL | 5.5 | ug/kg | U | 1 |
| 1,2-Dichlorobenzene | BQL | 5.5 | ug/kg | U | 1 |
| 1,2-Dichloroethane | BQL | 5.5 | ug/kg | U | 1 |
| 1,2-Dichloropropane | BQL | 5.5 | ug/kg | U | 1 |
| 1,3,5-trimethylbenzene | BQL | 5.5 | ug/kg | U | 1 |
| 1,3-Dichlorobenzene | BQL | 5.5 | ug/kg | U | 1 |
| 1,3-Dichloropropane | BQL | 5.5 | ug/kg | U | 1 |
| 1,4-Dichlorobenzene | BQL | 5.5 | ug/kg | U | 1 |
| 1-Chlorohexane | BQL | 5.5 | ug/kg | U | 1 |
| 2,2-Dichloropropane | BQL | 5.5 | ug/kg | U | 1 |
| 2-Butanone | BQL | 11 | ug/kg | U | 1 |
| 2-Chloroethyl Vinyl Ether | BQL | 11 | ug/kg | U | 1 |
| 2-Chlorotoluene | BQL | 5.5 | ug/kg | U | 1 |
| 2-Hexanone | BQL | 11 | ug/kg | U | 1 |
| 4-Chlorotoluene | BQL | 5.5 | ug/kg | U | 1 |
| 4-Isopropyltoluene | BQL | 5.5 | ug/kg | U | 1 |
| 4-Methyl-2-Pentanone | BQL | 11 | ug/kg | U | 1 |
| Acetone | BQL | 11 | ug/kg | U | 1 |
| Acrolein | BQL | 55 | ug/kg | U | 1 |
| Acrylonitrile | BQL | 55 | ug/kg | U | 1 |
| Benzene | BQL | 5.5 | ug/kg | U | 1 |
| Bromobenzene | BQL | 5.5 | ug/kg | U | 1 |
| Bromochloromethane | BQL | 5.5 | ug/kg | U | 1 |
| Bromodichloromethane | BQL | 5.5 | ug/kg | U | 1 |
| Bromoform | BQL | 5.5 | ug/kg | U | 1 |
| Bromomethane | BQL | 11 | ug/kg | U | 1 |
| Carbon Disulfide | BQL | 5.5 | ug/kg | U | 1 |
| Carbon Tetrachloride | BQL | 5.5 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-ADM-1
GPL ID: 706149-006-003-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW5030B
Prep Date: 06/28/2007
Prep Time: 08:58
Prep Batch: 98970

Analytical Method: SW8260B
Date Analyzed: 06/28/2007
Time Analyzed: 16:56
Analysis Batch: 103527

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Chlorobenzene | BQL | 5.5 | ug/kg | U | 1 |
| Chloroethane | BQL | 11 | ug/kg | U | 1 |
| Chloroform | BQL | 5.5 | ug/kg | U | 1 |
| Chloromethane | BQL | 11 | ug/kg | U | 1 |
| Cyclohexane | BQL | 5.5 | ug/kg | U | 1 |
| Dibromochloromethane | BQL | 5.5 | ug/kg | U | 1 |
| Dibromomethane | BQL | 5.5 | ug/kg | U | 1 |
| Dichlorodifluoromethane | BQL | 5.5 | ug/kg | U | 1 |
| Ethyl Methacrylate | BQL | 5.5 | ug/kg | U | 1 |
| Ethylbenzene | BQL | 5.5 | ug/kg | U | 1 |
| Hexachlorobutadiene | BQL | 5.5 | ug/kg | U | 1 |
| Isopropylbenzene | BQL | 5.5 | ug/kg | U | 1 |
| Methyl Acetate | BQL | 5.5 | ug/kg | U | 1 |
| Methylcyclohexane | BQL | 5.5 | ug/kg | U | 1 |
| Methylene Chloride | BQL | 11 | ug/kg | U | 1 |
| Naphthalene | BQL | 5.5 | ug/kg | U | 1 |
| Sec-Butylbenzene | BQL | 5.5 | ug/kg | U | 1 |
| Styrene | BQL | 5.5 | ug/kg | U | 1 |
| Tetrachloroethylene | BQL | 5.5 | ug/kg | U | 1 |
| Toluene | BQL | 5.5 | ug/kg | U | 1 |
| Trichloroethene | BQL | 5.5 | ug/kg | U | 1 |
| Trichlorofluoromethane | BQL | 5.5 | ug/kg | U | 1 |
| Vinyl Acetate | BQL | 5.5 | ug/kg | U | 1 |
| Vinyl Chloride | BQL | 11 | ug/kg | U | 1 |
| cis-1,2-Dichloroethene | BQL | 5.5 | ug/kg | U | 1 |
| cis-1,3-Dichloropropene | BQL | 5.5 | ug/kg | U | 1 |
| m,p-Xylenes | BQL | 5.5 | ug/kg | U | 1 |
| n-Butylbenzene | BQL | 5.5 | ug/kg | U | 1 |
| n-Propylbenzene | BQL | 5.5 | ug/kg | U | 1 |
| o-Xylene | BQL | 5.5 | ug/kg | U | 1 |
| tert-Butylbenzene | BQL | 5.5 | ug/kg | U | 1 |
| tert-butyl methyl ether | BQL | 5.5 | ug/kg | U | 1 |
| trans-1,2-dichloroethene | BQL | 5.5 | ug/kg | U | 1 |
| trans-1,3-dichloropropene | BQL | 5.5 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-1310-1
GPL ID: 706149-007-004-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW5030B
Prep Date: 06/27/2007
Prep Time: 11:30
Prep Batch: 98968

Analytical Method: SW8260B
Date Analyzed: 06/27/2007
Time Analyzed: 20:07
Analysis Batch: 103526

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | BQL | 6.0 | ug/kg | U | 1 |
| 1,1,1-Trichloroethane | BQL | 6.0 | ug/kg | U | 1 |
| 1,1,2,2-Tetrachloroethane | BQL | 6.0 | ug/kg | U | 1 |
| 1,1,2-Trichloroethane | BQL | 6.0 | ug/kg | U | 1 |
| 1,1-Dichloroethane | BQL | 6.0 | ug/kg | U | 1 |
| 1,1-Dichloroethene | BQL | 6.0 | ug/kg | U | 1 |
| 1,1-Dichloropropene | BQL | 6.0 | ug/kg | U | 1 |
| 1,2,3-Trichlorobenzene | BQL | 6.0 | ug/kg | U | 1 |
| 1,2,3-Trichloropropane | BQL | 6.0 | ug/kg | U | 1 |
| 1,2,4-Trichlorobenzene | BQL | 6.0 | ug/kg | U | 1 |
| 1,2,4-Trimethylbenzene | BQL | 6.0 | ug/kg | U | 1 |
| 1,2-Dibromo-3-Chloropropane | BQL | 6.0 | ug/kg | U | 1 |
| 1,2-Dichlorobenzene | BQL | 6.0 | ug/kg | U | 1 |
| 1,2-Dichloroethane | BQL | 6.0 | ug/kg | U | 1 |
| 1,2-Dichloropropane | BQL | 6.0 | ug/kg | U | 1 |
| 1,3,5-trimethylbenzene | BQL | 6.0 | ug/kg | U | 1 |
| 1,3-Dichlorobenzene | BQL | 6.0 | ug/kg | U | 1 |
| 1,3-Dichloropropane | BQL | 6.0 | ug/kg | U | 1 |
| 1,4-Dichlorobenzene | BQL | 6.0 | ug/kg | U | 1 |
| 1-Chlorohexane | BQL | 6.0 | ug/kg | U | 1 |
| 2,2-Dichloropropane | BQL | 6.0 | ug/kg | U | 1 |
| 2-Butanone | BQL | 12 | ug/kg | U | 1 |
| 2-Chloroethyl Vinyl Ether | BQL | 12 | ug/kg | U | 1 |
| 2-Chlorotoluene | BQL | 6.0 | ug/kg | U | 1 |
| 2-Hexanone | BQL | 12 | ug/kg | U | 1 |
| 4-Chlorotoluene | BQL | 6.0 | ug/kg | U | 1 |
| 4-Isopropyltoluene | BQL | 6.0 | ug/kg | U | 1 |
| 4-Methyl-2-Pentanone | BQL | 12 | ug/kg | U | 1 |
| Acetone | BQL | 12 | ug/kg | U | 1 |
| Acrolein | BQL | 60 | ug/kg | U | 1 |
| Acrylonitrile | BQL | 60 | ug/kg | U | 1 |
| Benzene | BQL | 6.0 | ug/kg | U | 1 |
| Bromobenzene | BQL | 6.0 | ug/kg | U | 1 |
| Bromochloromethane | BQL | 6.0 | ug/kg | U | 1 |
| Bromodichloromethane | BQL | 6.0 | ug/kg | U | 1 |
| Bromoform | BQL | 6.0 | ug/kg | U | 1 |
| Bromomethane | BQL | 12 | ug/kg | U | 1 |
| Carbon Disulfide | BQL | 6.0 | ug/kg | U | 1 |
| Carbon Tetrachloride | BQL | 6.0 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-1310-1
GPL ID: 706149-007-004-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW5030B
Prep Date: 06/27/2007
Prep Time: 11:30
Prep Batch: 98968

Analytical Method: SW8260B
Date Analyzed: 06/27/2007
Time Analyzed: 20:07
Analysis Batch: 103526

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Chlorobenzene | BQL | 6.0 | ug/kg | U | 1 |
| Chloroethane | BQL | 12 | ug/kg | U | 1 |
| Chloroform | BQL | 6.0 | ug/kg | U | 1 |
| Chloromethane | BQL | 12 | ug/kg | U | 1 |
| Cyclohexane | BQL | 6.0 | ug/kg | U | 1 |
| Dibromochloromethane | BQL | 6.0 | ug/kg | U | 1 |
| Dibromomethane | BQL | 6.0 | ug/kg | U | 1 |
| Dichlorodifluoromethane | BQL | 6.0 | ug/kg | U | 1 |
| Ethyl Methacrylate | BQL | 6.0 | ug/kg | U | 1 |
| Ethylbenzene | BQL | 6.0 | ug/kg | U | 1 |
| Hexachlorobutadiene | BQL | 6.0 | ug/kg | U | 1 |
| Isopropylbenzene | BQL | 6.0 | ug/kg | U | 1 |
| Methyl Acetate | BQL | 6.0 | ug/kg | U | 1 |
| Methylcyclohexane | BQL | 6.0 | ug/kg | U | 1 |
| Methylene Chloride | 40 | 12 | ug/kg | | 1 |
| Naphthalene | BQL | 6.0 | ug/kg | U | 1 |
| Sec-Butylbenzene | BQL | 6.0 | ug/kg | U | 1 |
| Styrene | BQL | 6.0 | ug/kg | U | 1 |
| Tetrachloroethylene | BQL | 6.0 | ug/kg | U | 1 |
| Toluene | BQL | 6.0 | ug/kg | U | 1 |
| Trichloroethene | BQL | 6.0 | ug/kg | U | 1 |
| Trichlorofluoromethane | BQL | 6.0 | ug/kg | U | 1 |
| Vinyl Acetate | BQL | 6.0 | ug/kg | U | 1 |
| Vinyl Chloride | BQL | 12 | ug/kg | U | 1 |
| cis-1,2-Dichloroethene | BQL | 6.0 | ug/kg | U | 1 |
| cis-1,3-Dichloropropene | BQL | 6.0 | ug/kg | U | 1 |
| m,p-Xylenes | BQL | 6.0 | ug/kg | U | 1 |
| n-Butylbenzene | BQL | 6.0 | ug/kg | U | 1 |
| n-Propylbenzene | BQL | 6.0 | ug/kg | U | 1 |
| o-Xylene | BQL | 6.0 | ug/kg | U | 1 |
| tert-Butylbenzene | BQL | 6.0 | ug/kg | U | 1 |
| tert-butyl methyl ether | BQL | 6.0 | ug/kg | U | 1 |
| trans-1,2-dichloroethene | BQL | 6.0 | ug/kg | U | 1 |
| trans-1,3-dichloropropene | BQL | 6.0 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-1310-1RE
GPL ID: 706149-007-004-1/1RE
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW5030B
Prep Date: 06/28/2007
Prep Time: 08:58
Prep Batch: 98970

Analytical Method: SW8260B
Date Analyzed: 06/28/2007
Time Analyzed: 17:36
Analysis Batch: 103527

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | BQL | 6.0 | ug/kg | U | 1 |
| 1,1,1-Trichloroethane | BQL | 6.0 | ug/kg | U | 1 |
| 1,1,2,2-Tetrachloroethane | BQL | 6.0 | ug/kg | U | 1 |
| 1,1,2-Trichloroethane | BQL | 6.0 | ug/kg | U | 1 |
| 1,1-Dichloroethane | BQL | 6.0 | ug/kg | U | 1 |
| 1,1-Dichloroethene | BQL | 6.0 | ug/kg | U | 1 |
| 1,1-Dichloropropene | BQL | 6.0 | ug/kg | U | 1 |
| 1,2,3-Trichlorobenzene | BQL | 6.0 | ug/kg | U | 1 |
| 1,2,3-Trichloropropane | BQL | 6.0 | ug/kg | U | 1 |
| 1,2,4-Trichlorobenzene | BQL | 6.0 | ug/kg | U | 1 |
| 1,2,4-Trimethylbenzene | BQL | 6.0 | ug/kg | U | 1 |
| 1,2-Dibromo-3-Chloropropane | BQL | 6.0 | ug/kg | U | 1 |
| 1,2-Dichlorobenzene | BQL | 6.0 | ug/kg | U | 1 |
| 1,2-Dichloroethane | BQL | 6.0 | ug/kg | U | 1 |
| 1,2-Dichloropropane | BQL | 6.0 | ug/kg | U | 1 |
| 1,3,5-trimethylbenzene | BQL | 6.0 | ug/kg | U | 1 |
| 1,3-Dichlorobenzene | BQL | 6.0 | ug/kg | U | 1 |
| 1,3-Dichloropropane | BQL | 6.0 | ug/kg | U | 1 |
| 1,4-Dichlorobenzene | BQL | 6.0 | ug/kg | U | 1 |
| 1-Chlorohexane | BQL | 6.0 | ug/kg | U | 1 |
| 2,2-Dichloropropane | BQL | 6.0 | ug/kg | U | 1 |
| 2-Butanone | BQL | 12 | ug/kg | U | 1 |
| 2-Chloroethyl Vinyl Ether | BQL | 12 | ug/kg | U | 1 |
| 2-Chlorotoluene | BQL | 6.0 | ug/kg | U | 1 |
| 2-Hexanone | BQL | 12 | ug/kg | U | 1 |
| 4-Chlorotoluene | BQL | 6.0 | ug/kg | U | 1 |
| 4-Isopropyltoluene | BQL | 6.0 | ug/kg | U | 1 |
| 4-Methyl-2-Pentanone | BQL | 12 | ug/kg | U | 1 |
| Acetone | BQL | 12 | ug/kg | U | 1 |
| Acrolein | BQL | 60 | ug/kg | U | 1 |
| Acrylonitrile | BQL | 60 | ug/kg | U | 1 |
| Benzene | BQL | 6.0 | ug/kg | U | 1 |
| Bromobenzene | BQL | 6.0 | ug/kg | U | 1 |
| Bromochloromethane | BQL | 6.0 | ug/kg | U | 1 |
| Bromodichloromethane | BQL | 6.0 | ug/kg | U | 1 |
| Bromoform | BQL | 6.0 | ug/kg | U | 1 |
| Bromomethane | BQL | 12 | ug/kg | U | 1 |
| Carbon Disulfide | BQL | 6.0 | ug/kg | U | 1 |
| Carbon Tetrachloride | BQL | 6.0 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-1310-1RE
GPL ID: 706149-007-004-1/1RE
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW5030B
Prep Date: 06/28/2007
Prep Time: 08:58
Prep Batch: 98970

Analytical Method: SW8260B
Date Analyzed: 06/28/2007
Time Analyzed: 17:36
Analysis Batch: 103527

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Chlorobenzene | BQL | 6.0 | ug/kg | U | 1 |
| Chloroethane | BQL | 12 | ug/kg | U | 1 |
| Chloroform | BQL | 6.0 | ug/kg | U | 1 |
| Chloromethane | BQL | 12 | ug/kg | U | 1 |
| Cyclohexane | BQL | 6.0 | ug/kg | U | 1 |
| Dibromochloromethane | BQL | 6.0 | ug/kg | U | 1 |
| Dibromomethane | BQL | 6.0 | ug/kg | U | 1 |
| Dichlorodifluoromethane | BQL | 6.0 | ug/kg | U | 1 |
| Ethyl Methacrylate | BQL | 6.0 | ug/kg | U | 1 |
| Ethylbenzene | BQL | 6.0 | ug/kg | U | 1 |
| Hexachlorobutadiene | BQL | 6.0 | ug/kg | U | 1 |
| Isopropylbenzene | BQL | 6.0 | ug/kg | U | 1 |
| Methyl Acetate | BQL | 6.0 | ug/kg | U | 1 |
| Methylcyclohexane | BQL | 6.0 | ug/kg | U | 1 |
| Methylene Chloride | 13 | 12 | ug/kg | | 1 |
| Naphthalene | BQL | 6.0 | ug/kg | U | 1 |
| Sec-Butylbenzene | BQL | 6.0 | ug/kg | U | 1 |
| Styrene | BQL | 6.0 | ug/kg | U | 1 |
| Tetrachloroethylene | BQL | 6.0 | ug/kg | U | 1 |
| Toluene | BQL | 6.0 | ug/kg | U | 1 |
| Trichloroethene | BQL | 6.0 | ug/kg | U | 1 |
| Trichlorofluoromethane | BQL | 6.0 | ug/kg | U | 1 |
| Vinyl Acetate | BQL | 6.0 | ug/kg | U | 1 |
| Vinyl Chloride | BQL | 12 | ug/kg | U | 1 |
| cis-1,2-Dichloroethene | BQL | 6.0 | ug/kg | U | 1 |
| cis-1,3-Dichloropropene | BQL | 6.0 | ug/kg | U | 1 |
| m,p-Xylenes | BQL | 6.0 | ug/kg | U | 1 |
| n-Butylbenzene | BQL | 6.0 | ug/kg | U | 1 |
| n-Propylbenzene | BQL | 6.0 | ug/kg | U | 1 |
| o-Xylene | BQL | 6.0 | ug/kg | U | 1 |
| tert-Butylbenzene | BQL | 6.0 | ug/kg | U | 1 |
| tert-butyl methyl ether | BQL | 6.0 | ug/kg | U | 1 |
| trans-1,2-dichloroethene | BQL | 6.0 | ug/kg | U | 1 |
| trans-1,3-dichloropropene | BQL | 6.0 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-1310-2
GPL ID: 706149-008-005-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW5030B
Prep Date: 06/27/2007
Prep Time: 11:30
Prep Batch: 98968

Analytical Method: SW8260B
Date Analyzed: 06/27/2007
Time Analyzed: 20:47
Analysis Batch: 103526

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | BQL | 5.7 | ug/kg | U | 1 |
| 1,1,1-Trichloroethane | BQL | 5.7 | ug/kg | U | 1 |
| 1,1,2,2-Tetrachloroethane | BQL | 5.7 | ug/kg | U | 1 |
| 1,1,2-Trichloroethane | BQL | 5.7 | ug/kg | U | 1 |
| 1,1-Dichloroethane | BQL | 5.7 | ug/kg | U | 1 |
| 1,1-Dichloroethene | BQL | 5.7 | ug/kg | U | 1 |
| 1,1-Dichloropropene | BQL | 5.7 | ug/kg | U | 1 |
| 1,2,3-Trichlorobenzene | BQL | 5.7 | ug/kg | U | 1 |
| 1,2,3-Trichloropropane | BQL | 5.7 | ug/kg | U | 1 |
| 1,2,4-Trichlorobenzene | BQL | 5.7 | ug/kg | U | 1 |
| 1,2,4-Trimethylbenzene | BQL | 5.7 | ug/kg | U | 1 |
| 1,2-Dibromo-3-Chloropropane | BQL | 5.7 | ug/kg | U | 1 |
| 1,2-Dichlorobenzene | BQL | 5.7 | ug/kg | U | 1 |
| 1,2-Dichloroethane | BQL | 5.7 | ug/kg | U | 1 |
| 1,2-Dichloropropane | BQL | 5.7 | ug/kg | U | 1 |
| 1,3,5-trimethylbenzene | BQL | 5.7 | ug/kg | U | 1 |
| 1,3-Dichlorobenzene | BQL | 5.7 | ug/kg | U | 1 |
| 1,3-Dichloropropane | BQL | 5.7 | ug/kg | U | 1 |
| 1,4-Dichlorobenzene | BQL | 5.7 | ug/kg | U | 1 |
| 1-Chlorohexane | BQL | 5.7 | ug/kg | U | 1 |
| 2,2-Dichloropropane | BQL | 5.7 | ug/kg | U | 1 |
| 2-Butanone | BQL | 11 | ug/kg | U | 1 |
| 2-Chloroethyl Vinyl Ether | BQL | 11 | ug/kg | U | 1 |
| 2-Chlorotoluene | BQL | 5.7 | ug/kg | U | 1 |
| 2-Hexanone | BQL | 11 | ug/kg | U | 1 |
| 4-Chlorotoluene | BQL | 5.7 | ug/kg | U | 1 |
| 4-Isopropyltoluene | BQL | 5.7 | ug/kg | U | 1 |
| 4-Methyl-2-Pentanone | BQL | 11 | ug/kg | U | 1 |
| Acetone | BQL | 11 | ug/kg | U | 1 |
| Acrolein | BQL | 57 | ug/kg | U | 1 |
| Acrylonitrile | BQL | 57 | ug/kg | U | 1 |
| Benzene | BQL | 5.7 | ug/kg | U | 1 |
| Bromobenzene | BQL | 5.7 | ug/kg | U | 1 |
| Bromochloromethane | BQL | 5.7 | ug/kg | U | 1 |
| Bromodichloromethane | BQL | 5.7 | ug/kg | U | 1 |
| Bromoform | BQL | 5.7 | ug/kg | U | 1 |
| Bromomethane | BQL | 11 | ug/kg | U | 1 |
| Carbon Disulfide | BQL | 5.7 | ug/kg | U | 1 |
| Carbon Tetrachloride | BQL | 5.7 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-1310-2
GPL ID: 706149-008-005-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW5030B
Prep Date: 06/27/2007
Prep Time: 11:30
Prep Batch: 98968

Analytical Method: SW8260B
Date Analyzed: 06/27/2007
Time Analyzed: 20:47
Analysis Batch: 103526

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Chlorobenzene | BQL | 5.7 | ug/kg | U | 1 |
| Chloroethane | BQL | 11 | ug/kg | U | 1 |
| Chloroform | BQL | 5.7 | ug/kg | U | 1 |
| Chloromethane | BQL | 11 | ug/kg | U | 1 |
| Cyclohexane | BQL | 5.7 | ug/kg | U | 1 |
| Dibromochloromethane | BQL | 5.7 | ug/kg | U | 1 |
| Dibromomethane | BQL | 5.7 | ug/kg | U | 1 |
| Dichlorodifluoromethane | BQL | 5.7 | ug/kg | U | 1 |
| Ethyl Methacrylate | BQL | 5.7 | ug/kg | U | 1 |
| Ethylbenzene | BQL | 5.7 | ug/kg | U | 1 |
| Hexachlorobutadiene | BQL | 5.7 | ug/kg | U | 1 |
| Isopropylbenzene | BQL | 5.7 | ug/kg | U | 1 |
| Methyl Acetate | BQL | 5.7 | ug/kg | U | 1 |
| Methylcyclohexane | BQL | 5.7 | ug/kg | U | 1 |
| Methylene Chloride | 21 | 11 | ug/kg | | 1 |
| Naphthalene | BQL | 5.7 | ug/kg | U | 1 |
| Sec-Butylbenzene | BQL | 5.7 | ug/kg | U | 1 |
| Styrene | BQL | 5.7 | ug/kg | U | 1 |
| Tetrachloroethylene | BQL | 5.7 | ug/kg | U | 1 |
| Toluene | BQL | 5.7 | ug/kg | U | 1 |
| Trichloroethene | BQL | 5.7 | ug/kg | U | 1 |
| Trichlorofluoromethane | BQL | 5.7 | ug/kg | U | 1 |
| Vinyl Acetate | BQL | 5.7 | ug/kg | U | 1 |
| Vinyl Chloride | BQL | 11 | ug/kg | U | 1 |
| cis-1,2-Dichloroethene | BQL | 5.7 | ug/kg | U | 1 |
| cis-1,3-Dichloropropene | BQL | 5.7 | ug/kg | U | 1 |
| m,p-Xylenes | BQL | 5.7 | ug/kg | U | 1 |
| n-Butylbenzene | BQL | 5.7 | ug/kg | U | 1 |
| n-Propylbenzene | BQL | 5.7 | ug/kg | U | 1 |
| o-Xylene | BQL | 5.7 | ug/kg | U | 1 |
| tert-Butylbenzene | BQL | 5.7 | ug/kg | U | 1 |
| tert-butyl methyl ether | BQL | 5.7 | ug/kg | U | 1 |
| trans-1,2-dichloroethene | BQL | 5.7 | ug/kg | U | 1 |
| trans-1,3-dichloropropene | BQL | 5.7 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: TRIP BLANK
GPL ID: 706149-009-031-1/1
Matrix: WATER
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW5030B
Prep Date: 06/28/2007
Prep Time: 08:58
Prep Batch: 98970

Analytical Method: SW8260B
Date Analyzed: 06/28/2007
Time Analyzed: 12:14
Analysis Batch: 103527

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | BQL | 5.0 | ug/L | U | 1 |
| 1,1,1-Trichloroethane | BQL | 5.0 | ug/L | U | 1 |
| 1,1,2,2-Tetrachloroethane | BQL | 5.0 | ug/L | U | 1 |
| 1,1,2-Trichloroethane | BQL | 5.0 | ug/L | U | 1 |
| 1,1-Dichloroethane | BQL | 5.0 | ug/L | U | 1 |
| 1,1-Dichloroethene | BQL | 5.0 | ug/L | U | 1 |
| 1,1-Dichloropropene | BQL | 5.0 | ug/L | U | 1 |
| 1,2,3-Trichlorobenzene | BQL | 5.0 | ug/L | U | 1 |
| 1,2,3-Trichloropropane | BQL | 5.0 | ug/L | U | 1 |
| 1,2,4-Trichlorobenzene | BQL | 5.0 | ug/L | U | 1 |
| 1,2,4-Trimethylbenzene | BQL | 5.0 | ug/L | U | 1 |
| 1,2-Dibromo-3-Chloropropane | BQL | 5.0 | ug/L | U | 1 |
| 1,2-Dichlorobenzene | BQL | 5.0 | ug/L | U | 1 |
| 1,2-Dichloroethane | BQL | 5.0 | ug/L | U | 1 |
| 1,2-Dichloropropane | BQL | 5.0 | ug/L | U | 1 |
| 1,3,5-trimethylbenzene | BQL | 5.0 | ug/L | U | 1 |
| 1,3-Dichlorobenzene | BQL | 5.0 | ug/L | U | 1 |
| 1,3-Dichloropropane | BQL | 5.0 | ug/L | U | 1 |
| 1,4-Dichlorobenzene | BQL | 5.0 | ug/L | U | 1 |
| 1-Chlorohexane | BQL | 5.0 | ug/L | U | 1 |
| 2,2-Dichloropropane | BQL | 5.0 | ug/L | U | 1 |
| 2-Butanone | BQL | 10 | ug/L | U | 1 |
| 2-Chloroethyl Vinyl Ether | BQL | 20 | ug/L | U | 1 |
| 2-Chlorotoluene | BQL | 5.0 | ug/L | U | 1 |
| 2-Hexanone | BQL | 10 | ug/L | U | 1 |
| 4-Chlorotoluene | BQL | 5.0 | ug/L | U | 1 |
| 4-Isopropyltoluene | BQL | 5.0 | ug/L | U | 1 |
| 4-Methyl-2-Pentanone | BQL | 10 | ug/L | U | 1 |
| Acetone | BQL | 10 | ug/L | U | 1 |
| Acrolein | BQL | 25 | ug/L | U | 1 |
| Acrylonitrile | BQL | 50 | ug/L | U | 1 |
| Benzene | BQL | 5.0 | ug/L | U | 1 |
| Bromobenzene | BQL | 5.0 | ug/L | U | 1 |
| Bromochloromethane | BQL | 5.0 | ug/L | U | 1 |
| Bromodichloromethane | BQL | 5.0 | ug/L | U | 1 |
| Bromoform | BQL | 5.0 | ug/L | U | 1 |
| Bromomethane | BQL | 10 | ug/L | U | 1 |
| Carbon Disulfide | BQL | 5.0 | ug/L | U | 1 |
| Carbon Tetrachloride | BQL | 5.0 | ug/L | U | 1 |

## Summary of Analytical Results

Client ID: TRIP BLANK
GPL ID: 706149-009-031-1/1
Matrix: WATER
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW5030B
Prep Date: 06/28/2007
Prep Time: 08:58
Prep Batch: 98970

Analytical Method: SW8260B
Date Analyzed: 06/28/2007
Time Analyzed: 12:14
Analysis Batch: 103527

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Chlorobenzene | BQL | 5.0 | ug/L | U | 1 |
| Chloroethane | BQL | 10 | ug/L | U | 1 |
| Chloroform | BQL | 5.0 | ug/L | U | 1 |
| Chloromethane | BQL | 10 | ug/L | U | 1 |
| Cyclohexane | BQL | 5.0 | ug/L | U | 1 |
| Dibromochloromethane | BQL | 5.0 | ug/L | U | 1 |
| Dibromomethane | BQL | 5.0 | ug/L | U | 1 |
| Dichlorodifluoromethane | BQL | 5.0 | ug/L | U | 1 |
| Ethyl Methacrylate | BQL | 5.0 | ug/L | U | 1 |
| Ethylbenzene | BQL | 5.0 | ug/L | U | 1 |
| Hexachlorobutadiene | BQL | 5.0 | ug/L | U | 1 |
| Isopropylbenzene | BQL | 5.0 | ug/L | U | 1 |
| Methyl Acetate | BQL | 5.0 | ug/L | U | 1 |
| Methylcyclohexane | BQL | 5.0 | ug/L | U | 1 |
| Methylene Chloride | BQL | 10 | ug/L | U | 1 |
| Naphthalene | BQL | 5.0 | ug/L | U | 1 |
| Sec-Butylbenzene | BQL | 5.0 | ug/L | U | 1 |
| Styrene | BQL | 5.0 | ug/L | U | 1 |
| Tetrachloroethylene | BQL | 5.0 | ug/L | U | 1 |
| Toluene | BQL | 5.0 | ug/L | U | 1 |
| Trichloroethene | BQL | 5.0 | ug/L | U | 1 |
| Trichlorofluoromethane | BQL | 5.0 | ug/L | U | 1 |
| Vinyl Acetate | BQL | 10 | ug/L | U | 1 |
| Vinyl Chloride | BQL | 10 | ug/L | U | 1 |
| cis-1,2-Dichloroethene | BQL | 5.0 | ug/L | U | 1 |
| cis-1,3-Dichloropropene | BQL | 5.0 | ug/L | U | 1 |
| m,p-Xylenes | BQL | 5.0 | ug/L | U | 1 |
| n-Butylbenzene | BQL | 5.0 | ug/L | U | 1 |
| n-Propylbenzene | BQL | 5.0 | ug/L | U | 1 |
| o-Xylene | BQL | 5.0 | ug/L | U | 1 |
| tert-Butylbenzene | BQL | 5.0 | ug/L | U | 1 |
| tert-butyl methyl ether | BQL | 5.0 | ug/L | U | 1 |
| trans-1,2-dichloroethene | BQL | 5.0 | ug/L | U | 1 |
| trans-1,3-dichloropropene | BQL | 5.0 | ug/L | U | 1 |

## Summary of Analytical Results

Client ID: BF-E-1
GPL ID: 706149-001-016-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3550
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98922

Analytical Method: SW8270C
Date Analyzed: 07/05/2007
Time Analyzed: 11:28
Analysis Batch: 103710

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,1- Biphenyl | BQL | 360 | ug/kg | U | 1 |
| 2,2-Oxybis(1-chloropropane) | BQL | 360 | ug/kg | U | 1 |
| 2,4,5-Trichlorophenol | BQL | 360 | ug/kg | U | 1 |
| 2,4,6-Trichlorophenol | BQL | 360 | ug/kg | U | 1 |
| 2,4-Dichlorophenol | BQL | 360 | ug/kg | U | 1 |
| 2,4-Dimethylphenol | BQL | 360 | ug/kg | U | 1 |
| 2,4-Dinitrophenol | BQL | 730 | ug/kg | U | 1 |
| 2,4-Dinitrotoluene | BQL | 360 | ug/kg | U | 1 |
| 2,6-Dinitrotoluene | BQL | 360 | ug/kg | U | 1 |
| 2-Chloronaphthalene | BQL | 360 | ug/kg | U | 1 |
| 2-Chlorophenol | BQL | 360 | ug/kg | U | 1 |
| 2-Methylnaphthalene | BQL | 360 | ug/kg | U | 1 |
| 2-Nitroaniline | BQL | 360 | ug/kg | U | 1 |
| 2-Nitrophenol | BQL | 360 | ug/kg | U | 1 |
| 2-methylphenol | BQL | 360 | ug/kg | U | 1 |
| 3,3-Dichlorobenzidine | BQL | 730 | ug/kg | U | 1 |
| 3-Nitroaniline | BQL | 360 | ug/kg | U | 1 |
| 4,6-dinitro-2-methyl phenol | BQL | 730 | ug/kg | U | 1 |
| 4-Bromophenyl-phenylether | BQL | 360 | ug/kg | U | 1 |
| 4-Chloroaniline | BQL | 360 | ug/kg | U | 1 |
| 4-Chlorophenyl Phenyl Ether | BQL | 360 | ug/kg | U | 1 |
| 4-Nitroaniline | BQL | 360 | ug/kg | U | 1 |
| 4-Nitrophenol | BQL | 730 | ug/kg | U | 1 |
| 4-chloro-3-methylphenol | BQL | 360 | ug/kg | U | 1 |
| 4-methylphenol | BQL | 360 | ug/kg | U | 1 |
| Acenaphthene | BQL | 360 | ug/kg | U | 1 |
| Acenaphthylene | BQL | 360 | ug/kg | U | 1 |
| Acetophenone | BQL | 360 | ug/kg | U | 1 |
| Anthracene | BQL | 360 | ug/kg | U | 1 |
| Atrazine | BQL | 360 | ug/kg | U | 1 |
| Benzaldehyde | BQL | 360 | ug/kg | U | 1 |
| Benzo(a)anthracene | BQL | 360 | ug/kg | U | 1 |
| Benzo(a)pyrene | BQL | 360 | ug/kg | U | 1 |
| Benzo(b)fluoranthene | BQL | 360 | ug/kg | U | 1 |
| Benzo(g,h,i)perylene | BQL | 360 | ug/kg | U | 1 |
| Benzo(k)fluoranthene | BQL | 360 | ug/kg | U | 1 |
| Benzyl Butyl Phthalate | BQL | 360 | ug/kg | U | 1 |
| Caprolactam | BQL | 360 | ug/kg | U | 1 |
| Carbazole | BQL | 360 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-E-1
GPL ID: 706149-001-016-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3550
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98922

Analytical Method: SW8270C
Date Analyzed: 07/05/2007
Time Analyzed: 11:28
Analysis Batch: 103710

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Chrysene | BQL | 360 | ug/kg | U | 1 |
| Dibenz(a,h)Anthracene | BQL | 360 | ug/kg | U | 1 |
| Dibenzofuran | BQL | 360 | ug/kg | U | 1 |
| Diethyl Phthalate | BQL | 360 | ug/kg | U | 1 |
| Dimethyl Phthalate | BQL | 360 | ug/kg | U | 1 |
| Fluoranthene | BQL | 360 | ug/kg | U | 1 |
| Fluorene | BQL | 360 | ug/kg | U | 1 |
| Hexachlorobenzene | BQL | 360 | ug/kg | U | 1 |
| Hexachlorobutadiene | BQL | 360 | ug/kg | U | 1 |
| Hexachlorocyclopentadiene | BQL | 360 | ug/kg | U | 1 |
| Hexachloroethane | BQL | 360 | ug/kg | U | 1 |
| Indeno(1,2,3-c,d)Pyrene | BQL | 360 | ug/kg | U | 1 |
| Isophorone | BQL | 360 | ug/kg | U | 1 |
| Naphthalene | BQL | 360 | ug/kg | U | 1 |
| Nitrobenzene | BQL | 360 | ug/kg | U | 1 |
| Pentachlorophenol | BQL | 730 | ug/kg | U | 1 |
| Phenanthrene | BQL | 360 | ug/kg | U | 1 |
| Phenol | BQL | 360 | ug/kg | U | 1 |
| Pyrene | BQL | 360 | ug/kg | U | 1 |
| bis(2-chloroethoxy) methane | BQL | 360 | ug/kg | U | 1 |
| bis(2-chloroethyl) ether | BQL | 360 | ug/kg | U | 1 |
| bis(2-ethylhexyl) phthalate | BQL | 360 | ug/kg | U | 1 |
| di-n-Butyl Phthalate | BQL | 360 | ug/kg | U | 1 |
| di-n-Octyl Phthalate | BQL | 360 | ug/kg | U | 1 |
| n-Nitrosodi-n-Propylamine | BQL | 360 | ug/kg | U | 1 |
| n-Nitrosodiphenylamine | BQL | 360 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-E-1D
GPL ID: 706149-002-017-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3550
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98922

Analytical Method: SW8270C
Date Analyzed: 07/01/2007
Time Analyzed: 15:40
Analysis Batch: 103611

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,1- Biphenyl | BQL | 410 | ug/kg | U | 1 |
| 2,2-Oxybis(1-chloropropane) | BQL | 410 | ug/kg | U | 1 |
| 2,4,5-Trichlorophenol | BQL | 410 | ug/kg | U | 1 |
| 2,4,6-Trichlorophenol | BQL | 410 | ug/kg | U | 1 |
| 2,4-Dichlorophenol | BQL | 410 | ug/kg | U | 1 |
| 2,4-Dimethylphenol | BQL | 410 | ug/kg | U | 1 |
| 2,4-Dinitrophenol | BQL | 820 | ug/kg | U | 1 |
| 2,4-Dinitrotoluene | BQL | 410 | ug/kg | U | 1 |
| 2,6-Dinitrotoluene | BQL | 410 | ug/kg | U | 1 |
| 2-Chloronaphthalene | BQL | 410 | ug/kg | U | 1 |
| 2-Chlorophenol | BQL | 410 | ug/kg | U | 1 |
| 2-Methylnaphthalene | BQL | 410 | ug/kg | U | 1 |
| 2-Nitroaniline | BQL | 410 | ug/kg | U | 1 |
| 2-Nitrophenol | BQL | 410 | ug/kg | U | 1 |
| 2-methylphenol | BQL | 410 | ug/kg | U | 1 |
| 3,3-Dichlorobenzidine | BQL | 820 | ug/kg | U | 1 |
| 3-Nitroaniline | BQL | 410 | ug/kg | U | 1 |
| 4,6-dinitro-2-methyl phenol | BQL | 820 | ug/kg | U | 1 |
| 4-Bromophenyl-phenylether | BQL | 410 | ug/kg | U | 1 |
| 4-Chloroaniline | BQL | 410 | ug/kg | U | 1 |
| 4-Chlorophenyl Phenyl Ether | BQL | 410 | ug/kg | U | 1 |
| 4-Nitroaniline | BQL | 410 | ug/kg | U | 1 |
| 4-Nitrophenol | BQL | 820 | ug/kg | U | 1 |
| 4-chloro-3-methylphenol | BQL | 410 | ug/kg | U | 1 |
| 4-methylphenol | BQL | 410 | ug/kg | U | 1 |
| Acenaphthene | BQL | 410 | ug/kg | U | 1 |
| Acenaphthylene | BQL | 410 | ug/kg | U | 1 |
| Acetophenone | BQL | 410 | ug/kg | U | 1 |
| Anthracene | BQL | 410 | ug/kg | U | 1 |
| Atrazine | BQL | 410 | ug/kg | U | 1 |
| Benzaldehyde | BQL | 410 | ug/kg | U | 1 |
| Benzo(a)anthracene | BQL | 410 | ug/kg | U | 1 |
| Benzo(a)pyrene | BQL | 410 | ug/kg | U | 1 |
| Benzo(b)fluoranthene | BQL | 410 | ug/kg | U | 1 |
| Benzo(g,h,i)perylene | BQL | 410 | ug/kg | U | 1 |
| Benzo(k)fluoranthene | BQL | 410 | ug/kg | U | 1 |
| Benzyl Butyl Phthalate | BQL | 410 | ug/kg | U | 1 |
| Caprolactam | BQL | 410 | ug/kg | U | 1 |
| Carbazole | BQL | 410 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-E-1D
GPL ID: 706149-002-017-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3550
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98922

Analytical Method: SW8270C
Date Analyzed: 07/01/2007
Time Analyzed: 15:40
Analysis Batch: 103611

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Chrysene | BQL | 410 | ug/kg | U | 1 |
| Dibenz(a,h)Anthracene | BQL | 410 | ug/kg | U | 1 |
| Dibenzofuran | BQL | 410 | ug/kg | U | 1 |
| Diethyl Phthalate | BQL | 410 | ug/kg | U | 1 |
| Dimethyl Phthalate | BQL | 410 | ug/kg | U | 1 |
| Fluoranthene | BQL | 410 | ug/kg | U | 1 |
| Fluorene | BQL | 410 | ug/kg | U | 1 |
| Hexachlorobenzene | BQL | 410 | ug/kg | U | 1 |
| Hexachlorobutadiene | BQL | 410 | ug/kg | U | 1 |
| Hexachlorocyclopentadiene | BQL | 410 | ug/kg | U | 1 |
| Hexachloroethane | BQL | 410 | ug/kg | U | 1 |
| Indeno(1,2,3-c,d)Pyrene | BQL | 410 | ug/kg | U | 1 |
| Isophorone | BQL | 410 | ug/kg | U | 1 |
| Naphthalene | BQL | 410 | ug/kg | U | 1 |
| Nitrobenzene | BQL | 410 | ug/kg | U | 1 |
| Pentachlorophenol | BQL | 820 | ug/kg | U | 1 |
| Phenanthrene | BQL | 410 | ug/kg | U | 1 |
| Phenol | BQL | 410 | ug/kg | U | 1 |
| Pyrene | BQL | 410 | ug/kg | U | 1 |
| bis(2-chloroethoxy) methane | BQL | 410 | ug/kg | U | 1 |
| bis(2-chloroethyl) ether | BQL | 410 | ug/kg | U | 1 |
| bis(2-ethylhexyl) phthalate | BQL | 410 | ug/kg | U | 1 |
| di-n-Butyl Phthalate | BQL | 410 | ug/kg | U | 1 |
| di-n-Octyl Phthalate | BQL | 410 | ug/kg | U | 1 |
| n-Nitrosodi-n-Propylamine | BQL | 410 | ug/kg | U | 1 |
| n-Nitrosodiphenylamine | BQL | 410 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-C-1
GPL ID: 706149-003-018-1/3
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3550
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98922

Analytical Method: SW8270C
Date Analyzed: 07/05/2007
Time Analyzed: 15:52
Analysis Batch: 103710

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,1- Biphenyl | BQL | 370 | ug/kg | U | 1 |
| 2,2-Oxybis(1-chloropropane) | BQL | 370 | ug/kg | U | 1 |
| 2,4,5-Trichlorophenol | BQL | 370 | ug/kg | U | 1 |
| 2,4,6-Trichlorophenol | BQL | 370 | ug/kg | U | 1 |
| 2,4-Dichlorophenol | BQL | 370 | ug/kg | U | 1 |
| 2,4-Dimethylphenol | BQL | 370 | ug/kg | U | 1 |
| 2,4-Dinitrophenol | BQL | 740 | ug/kg | U | 1 |
| 2,4-Dinitrotoluene | BQL | 370 | ug/kg | U | 1 |
| 2,6-Dinitrotoluene | BQL | 370 | ug/kg | U | 1 |
| 2-Chloronaphthalene | BQL | 370 | ug/kg | U | 1 |
| 2-Chlorophenol | BQL | 370 | ug/kg | U | 1 |
| 2-Methylnaphthalene | BQL | 370 | ug/kg | U | 1 |
| 2-Nitroaniline | BQL | 370 | ug/kg | U | 1 |
| 2-Nitrophenol | BQL | 370 | ug/kg | U | 1 |
| 2-methylphenol | BQL | 370 | ug/kg | U | 1 |
| 3,3-Dichlorobenzidine | BQL | 740 | ug/kg | U | 1 |
| 3-Nitroaniline | BQL | 370 | ug/kg | U | 1 |
| 4,6-dinitro-2-methyl phenol | BQL | 740 | ug/kg | U | 1 |
| 4-Bromophenyl-phenylether | BQL | 370 | ug/kg | U | 1 |
| 4-Chloroaniline | BQL | 370 | ug/kg | U | 1 |
| 4-Chlorophenyl Phenyl Ether | BQL | 370 | ug/kg | U | 1 |
| 4-Nitroaniline | BQL | 370 | ug/kg | U | 1 |
| 4-Nitrophenol | BQL | 740 | ug/kg | U | 1 |
| 4-chloro-3-methylphenol | BQL | 370 | ug/kg | U | 1 |
| 4-methylphenol | BQL | 370 | ug/kg | U | 1 |
| Acenaphthene | BQL | 370 | ug/kg | U | 1 |
| Acenaphthylene | 96 | 370 | ug/kg | J | 1 |
| Acetophenone | BQL | 370 | ug/kg | U | 1 |
| Anthracene | BQL | 370 | ug/kg | U | 1 |
| Atrazine | BQL | 370 | ug/kg | U | 1 |
| Benzaldehyde | BQL | 370 | ug/kg | U | 1 |
| Benzo(a)anthracene | 210 | 370 | ug/kg | J | 1 |
| Benzo(a)pyrene | 170 | 370 | ug/kg | J | 1 |
| Benzo(b)fluoranthene | 230 | 370 | ug/kg | J | 1 |
| Benzo(g,h,i)perylene | BQL | 370 | ug/kg | U | 1 |
| Benzo(k)fluoranthene | 90 | 370 | ug/kg | J | 1 |
| Benzyl Butyl Phthalate | BQL | 370 | ug/kg | U | 1 |
| Caprolactam | BQL | 370 | ug/kg | U | 1 |
| Carbazole | BQL | 370 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-C-1
GPL ID: 706149-003-018-1/3
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3550
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98922

Analytical Method: SW8270C
Date Analyzed: 07/05/2007
Time Analyzed: 15:52
Analysis Batch: 103710

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Chrysene | 220 | 370 | ug/kg | J | 1 |
| Dibenz(a,h)Anthracene | BQL | 370 | ug/kg | U | 1 |
| Dibenzofuran | BQL | 370 | ug/kg | U | 1 |
| Diethyl Phthalate | BQL | 370 | ug/kg | U | 1 |
| Dimethyl Phthalate | BQL | 370 | ug/kg | U | 1 |
| Fluoranthene | 300 | 370 | ug/kg | J | 1 |
| Fluorene | BQL | 370 | ug/kg | U | 1 |
| Hexachlorobenzene | BQL | 370 | ug/kg | U | 1 |
| Hexachlorobutadiene | BQL | 370 | ug/kg | U | 1 |
| Hexachlorocyclopentadiene | BQL | 370 | ug/kg | U | 1 |
| Hexachloroethane | BQL | 370 | ug/kg | U | 1 |
| Indeno(1,2,3-c,d)Pyrene | 130 | 370 | ug/kg | J | 1 |
| Isophorone | BQL | 370 | ug/kg | U | 1 |
| Naphthalene | BQL | 370 | ug/kg | U | 1 |
| Nitrobenzene | BQL | 370 | ug/kg | U | 1 |
| Pentachlorophenol | BQL | 740 | ug/kg | U | 1 |
| Phenanthrene | 210 | 370 | ug/kg | J | 1 |
| Phenol | BQL | 370 | ug/kg | U | 1 |
| Pyrene | 530 | 370 | ug/kg | | 1 |
| bis(2-chloroethoxy) methane | BQL | 370 | ug/kg | U | 1 |
| bis(2-chloroethyl) ether | BQL | 370 | ug/kg | U | 1 |
| bis(2-ethylhexyl) phthalate | BQL | 370 | ug/kg | U | 1 |
| di-n-Butyl Phthalate | BQL | 370 | ug/kg | U | 1 |
| di-n-Octyl Phthalate | BQL | 370 | ug/kg | U | 1 |
| n-Nitrosodi-n-Propylamine | BQL | 370 | ug/kg | U | 1 |
| n-Nitrosodiphenylamine | BQL | 370 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-FB-1
GPL ID: 706149-004-011-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3550
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98922

Analytical Method: SW8270C
Date Analyzed: 07/05/2007
Time Analyzed: 12:05
Analysis Batch: 103710

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,1- Biphenyl | BQL | 380 | ug/kg | U | 1 |
| 2,2-Oxybis(1-chloropropane) | BQL | 380 | ug/kg | U | 1 |
| 2,4,5-Trichlorophenol | BQL | 380 | ug/kg | U | 1 |
| 2,4,6-Trichlorophenol | BQL | 380 | ug/kg | U | 1 |
| 2,4-Dichlorophenol | BQL | 380 | ug/kg | U | 1 |
| 2,4-Dimethylphenol | BQL | 380 | ug/kg | U | 1 |
| 2,4-Dinitrophenol | BQL | 760 | ug/kg | U | 1 |
| 2,4-Dinitrotoluene | BQL | 380 | ug/kg | U | 1 |
| 2,6-Dinitrotoluene | BQL | 380 | ug/kg | U | 1 |
| 2-Chloronaphthalene | BQL | 380 | ug/kg | U | 1 |
| 2-Chlorophenol | BQL | 380 | ug/kg | U | 1 |
| 2-Methylnaphthalene | BQL | 380 | ug/kg | U | 1 |
| 2-Nitroaniline | BQL | 380 | ug/kg | U | 1 |
| 2-Nitrophenol | BQL | 380 | ug/kg | U | 1 |
| 2-methylphenol | BQL | 380 | ug/kg | U | 1 |
| 3,3-Dichlorobenzidine | BQL | 760 | ug/kg | U | 1 |
| 3-Nitroaniline | BQL | 380 | ug/kg | U | 1 |
| 4,6-dinitro-2-methyl phenol | BQL | 760 | ug/kg | U | 1 |
| 4-Bromophenyl-phenylether | BQL | 380 | ug/kg | U | 1 |
| 4-Chloroaniline | BQL | 380 | ug/kg | U | 1 |
| 4-Chlorophenyl Phenyl Ether | BQL | 380 | ug/kg | U | 1 |
| 4-Nitroaniline | BQL | 380 | ug/kg | U | 1 |
| 4-Nitrophenol | BQL | 760 | ug/kg | U | 1 |
| 4-chloro-3-methylphenol | BQL | 380 | ug/kg | U | 1 |
| 4-methylphenol | BQL | 380 | ug/kg | U | 1 |
| Acenaphthene | BQL | 380 | ug/kg | U | 1 |
| Acenaphthylene | BQL | 380 | ug/kg | U | 1 |
| Acetophenone | BQL | 380 | ug/kg | U | 1 |
| Anthracene | BQL | 380 | ug/kg | U | 1 |
| Atrazine | BQL | 380 | ug/kg | U | 1 |
| Benzaldehyde | BQL | 380 | ug/kg | U | 1 |
| Benzo(a)anthracene | 61 | 380 | ug/kg | J | 1 |
| Benzo(a)pyrene | 51 | 380 | ug/kg | J | 1 |
| Benzo(b)fluoranthene | 86 | 380 | ug/kg | J | 1 |
| Benzo(g,h,i)perylene | BQL | 380 | ug/kg | U | 1 |
| Benzo(k)fluoranthene | 34 | 380 | ug/kg | J | 1 |
| Benzyl Butyl Phthalate | BQL | 380 | ug/kg | U | 1 |
| Caprolactam | BQL | 380 | ug/kg | U | 1 |
| Carbazole | BQL | 380 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-FB-1
GPL ID: 706149-004-011-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3550
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98922

Analytical Method: SW8270C
Date Analyzed: 07/05/2007
Time Analyzed: 12:05
Analysis Batch: 103710

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Chrysene | 74 | 380 | ug/kg | J | 1 |
| Dibenz(a,h)Anthracene | BQL | 380 | ug/kg | U | 1 |
| Dibenzofuran | BQL | 380 | ug/kg | U | 1 |
| Diethyl Phthalate | BQL | 380 | ug/kg | U | 1 |
| Dimethyl Phthalate | BQL | 380 | ug/kg | U | 1 |
| Fluoranthene | 48 | 380 | ug/kg | J | 1 |
| Fluorene | BQL | 380 | ug/kg | U | 1 |
| Hexachlorobenzene | BQL | 380 | ug/kg | U | 1 |
| Hexachlorobutadiene | BQL | 380 | ug/kg | U | 1 |
| Hexachlorocyclopentadiene | BQL | 380 | ug/kg | U | 1 |
| Hexachloroethane | BQL | 380 | ug/kg | U | 1 |
| Indeno(1,2,3-c,d)Pyrene | BQL | 380 | ug/kg | U | 1 |
| Isophorone | BQL | 380 | ug/kg | U | 1 |
| Naphthalene | BQL | 380 | ug/kg | U | 1 |
| Nitrobenzene | BQL | 380 | ug/kg | U | 1 |
| Pentachlorophenol | BQL | 760 | ug/kg | U | 1 |
| Phenanthrene | BQL | 380 | ug/kg | U | 1 |
| Phenol | BQL | 380 | ug/kg | U | 1 |
| Pyrene | 110 | 380 | ug/kg | J | 1 |
| bis(2-chloroethoxy) methane | BQL | 380 | ug/kg | U | 1 |
| bis(2-chloroethyl) ether | BQL | 380 | ug/kg | U | 1 |
| bis(2-ethylhexyl) phthalate | BQL | 380 | ug/kg | U | 1 |
| di-n-Butyl Phthalate | BQL | 380 | ug/kg | U | 1 |
| di-n-Octyl Phthalate | BQL | 380 | ug/kg | U | 1 |
| n-Nitrosodi-n-Propylamine | BQL | 380 | ug/kg | U | 1 |
| n-Nitrosodiphenylamine | BQL | 380 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-FBR-1DL
GPL ID: 706149-005-012-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3550
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98922

Analytical Method: SW8270C
Date Analyzed: 07/05/2007
Time Analyzed: 14:33
Analysis Batch: 103710

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,1- Biphenyl | BQL | 3600 | ug/kg | U | 10 |
| 2,2-Oxybis(1-chloropropane) | BQL | 3600 | ug/kg | U | 10 |
| 2,4,5-Trichlorophenol | BQL | 3600 | ug/kg | U | 10 |
| 2,4,6-Trichlorophenol | BQL | 3600 | ug/kg | U | 10 |
| 2,4-Dichlorophenol | BQL | 3600 | ug/kg | U | 10 |
| 2,4-Dimethylphenol | BQL | 3600 | ug/kg | U | 10 |
| 2,4-Dinitrophenol | BQL | 7200 | ug/kg | U | 10 |
| 2,4-Dinitrotoluene | BQL | 3600 | ug/kg | U | 10 |
| 2,6-Dinitrotoluene | BQL | 3600 | ug/kg | U | 10 |
| 2-Chloronaphthalene | BQL | 3600 | ug/kg | U | 10 |
| 2-Chlorophenol | BQL | 3600 | ug/kg | U | 10 |
| 2-Methylnaphthalene | BQL | 3600 | ug/kg | U | 10 |
| 2-Nitroaniline | BQL | 3600 | ug/kg | U | 10 |
| 2-Nitrophenol | BQL | 3600 | ug/kg | U | 10 |
| 2-methylphenol | BQL | 3600 | ug/kg | U | 10 |
| 3,3-Dichlorobenzidine | BQL | 7200 | ug/kg | U | 10 |
| 3-Nitroaniline | BQL | 3600 | ug/kg | U | 10 |
| 4,6-dinitro-2-methyl phenol | BQL | 7200 | ug/kg | U | 10 |
| 4-Bromophenyl-phenylether | BQL | 3600 | ug/kg | U | 10 |
| 4-Chloroaniline | BQL | 3600 | ug/kg | U | 10 |
| 4-Chlorophenyl Phenyl Ether | BQL | 3600 | ug/kg | U | 10 |
| 4-Nitroaniline | BQL | 3600 | ug/kg | U | 10 |
| 4-Nitrophenol | BQL | 7200 | ug/kg | U | 10 |
| 4-chloro-3-methylphenol | BQL | 3600 | ug/kg | U | 10 |
| 4-methylphenol | BQL | 3600 | ug/kg | U | 10 |
| Acenaphthene | BQL | 3600 | ug/kg | U | 10 |
| Acenaphthylene | 4200 | 3600 | ug/kg | | 10 |
| Acetophenone | BQL | 3600 | ug/kg | U | 10 |
| Anthracene | 2200 | 3600 | ug/kg | J | 10 |
| Atrazine | BQL | 3600 | ug/kg | U | 10 |
| Benzaldehyde | BQL | 3600 | ug/kg | U | 10 |
| Benzo(a)anthracene | 8800 | 3600 | ug/kg | | 10 |
| Benzo(a)pyrene | 7200 | 3600 | ug/kg | | 10 |
| Benzo(b)fluoranthene | 11000 | 3600 | ug/kg | | 10 |
| Benzo(g,h,i)perylene | 5400 | 3600 | ug/kg | | 10 |
| Benzo(k)fluoranthene | 8000 | 3600 | ug/kg | | 10 |
| Benzyl Butyl Phthalate | BQL | 3600 | ug/kg | U | 10 |
| Caprolactam | BQL | 3600 | ug/kg | U | 10 |
| Carbazole | BQL | 3600 | ug/kg | U | 10 |

## Summary of Analytical Results

Client ID: BF-FBR-1DL
GPL ID: 706149-005-012-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3550
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98922

Analytical Method: SW8270C
Date Analyzed: 07/05/2007
Time Analyzed: 14:33
Analysis Batch: 103710

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Chrysene | 11000 | 3600 | ug/kg | | 10 |
| Dibenz(a,h)Anthracene | 530 | 3600 | ug/kg | J | 10 |
| Dibenzofuran | BQL | 3600 | ug/kg | U | 10 |
| Diethyl Phthalate | BQL | 3600 | ug/kg | U | 10 |
| Dimethyl Phthalate | BQL | 3600 | ug/kg | U | 10 |
| Fluoranthene | 6800 | 3600 | ug/kg | | 10 |
| Fluorene | BQL | 3600 | ug/kg | U | 10 |
| Hexachlorobenzene | BQL | 3600 | ug/kg | U | 10 |
| Hexachlorobutadiene | BQL | 3600 | ug/kg | U | 10 |
| Hexachlorocyclopentadiene | BQL | 3600 | ug/kg | U | 10 |
| Hexachloroethane | BQL | 3600 | ug/kg | U | 10 |
| Indeno(1,2,3-c,d)Pyrene | 4900 | 3600 | ug/kg | | 10 |
| Isophorone | BQL | 3600 | ug/kg | U | 10 |
| Naphthalene | BQL | 3600 | ug/kg | U | 10 |
| Nitrobenzene | BQL | 3600 | ug/kg | U | 10 |
| Pentachlorophenol | BQL | 7200 | ug/kg | U | 10 |
| Phenanthrene | 1700 | 3600 | ug/kg | J | 10 |
| Phenol | BQL | 3600 | ug/kg | U | 10 |
| Pyrene | 17000 | 3600 | ug/kg | | 10 |
| bis(2-chloroethoxy) methane | BQL | 3600 | ug/kg | U | 10 |
| bis(2-chloroethyl) ether | BQL | 3600 | ug/kg | U | 10 |
| bis(2-ethylhexyl) phthalate | BQL | 3600 | ug/kg | U | 10 |
| di-n-Butyl Phthalate | BQL | 3600 | ug/kg | U | 10 |
| di-n-Octyl Phthalate | BQL | 3600 | ug/kg | U | 10 |
| n-Nitrosodi-n-Propylamine | BQL | 3600 | ug/kg | U | 10 |
| n-Nitrosodiphenylamine | BQL | 3600 | ug/kg | U | 10 |

## Summary of Analytical Results

Client ID: BF-ADM-1
GPL ID: 706149-006-013-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3550
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98922

Analytical Method: SW8270C
Date Analyzed: 07/01/2007
Time Analyzed: 17:31
Analysis Batch: 103611

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,1- Biphenyl | BQL | 360 | ug/kg | U | 1 |
| 2,2-Oxybis(1-chloropropane) | BQL | 360 | ug/kg | U | 1 |
| 2,4,5-Trichlorophenol | BQL | 360 | ug/kg | U | 1 |
| 2,4,6-Trichlorophenol | BQL | 360 | ug/kg | U | 1 |
| 2,4-Dichlorophenol | BQL | 360 | ug/kg | U | 1 |
| 2,4-Dimethylphenol | BQL | 360 | ug/kg | U | 1 |
| 2,4-Dinitrophenol | BQL | 730 | ug/kg | U | 1 |
| 2,4-Dinitrotoluene | BQL | 360 | ug/kg | U | 1 |
| 2,6-Dinitrotoluene | BQL | 360 | ug/kg | U | 1 |
| 2-Chloronaphthalene | BQL | 360 | ug/kg | U | 1 |
| 2-Chlorophenol | BQL | 360 | ug/kg | U | 1 |
| 2-Methylnaphthalene | BQL | 360 | ug/kg | U | 1 |
| 2-Nitroaniline | BQL | 360 | ug/kg | U | 1 |
| 2-Nitrophenol | BQL | 360 | ug/kg | U | 1 |
| 2-methylphenol | BQL | 360 | ug/kg | U | 1 |
| 3,3-Dichlorobenzidine | BQL | 730 | ug/kg | U | 1 |
| 3-Nitroaniline | BQL | 360 | ug/kg | U | 1 |
| 4,6-dinitro-2-methyl phenol | BQL | 730 | ug/kg | U | 1 |
| 4-Bromophenyl-phenylether | BQL | 360 | ug/kg | U | 1 |
| 4-Chloroaniline | BQL | 360 | ug/kg | U | 1 |
| 4-Chlorophenyl Phenyl Ether | BQL | 360 | ug/kg | U | 1 |
| 4-Nitroaniline | BQL | 360 | ug/kg | U | 1 |
| 4-Nitrophenol | BQL | 730 | ug/kg | U | 1 |
| 4-chloro-3-methylphenol | BQL | 360 | ug/kg | U | 1 |
| 4-methylphenol | BQL | 360 | ug/kg | U | 1 |
| Acenaphthene | BQL | 360 | ug/kg | U | 1 |
| Acenaphthylene | BQL | 360 | ug/kg | U | 1 |
| Acetophenone | BQL | 360 | ug/kg | U | 1 |
| Anthracene | BQL | 360 | ug/kg | U | 1 |
| Atrazine | BQL | 360 | ug/kg | U | 1 |
| Benzaldehyde | BQL | 360 | ug/kg | U | 1 |
| Benzo(a)anthracene | BQL | 360 | ug/kg | U | 1 |
| Benzo(a)pyrene | BQL | 360 | ug/kg | U | 1 |
| Benzo(b)fluoranthene | BQL | 360 | ug/kg | U | 1 |
| Benzo(g,h,i)perylene | BQL | 360 | ug/kg | U | 1 |
| Benzo(k)fluoranthene | BQL | 360 | ug/kg | U | 1 |
| Benzyl Butyl Phthalate | BQL | 360 | ug/kg | U | 1 |
| Caprolactam | BQL | 360 | ug/kg | U | 1 |
| Carbazole | BQL | 360 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-ADM-1
GPL ID: 706149-006-013-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3550
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98922

Analytical Method: SW8270C
Date Analyzed: 07/01/2007
Time Analyzed: 17:31
Analysis Batch: 103611

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Chrysene | BQL | 360 | ug/kg | U | 1 |
| Dibenz(a,h)Anthracene | BQL | 360 | ug/kg | U | 1 |
| Dibenzofuran | BQL | 360 | ug/kg | U | 1 |
| Diethyl Phthalate | BQL | 360 | ug/kg | U | 1 |
| Dimethyl Phthalate | BQL | 360 | ug/kg | U | 1 |
| Fluoranthene | BQL | 360 | ug/kg | U | 1 |
| Fluorene | BQL | 360 | ug/kg | U | 1 |
| Hexachlorobenzene | BQL | 360 | ug/kg | U | 1 |
| Hexachlorobutadiene | BQL | 360 | ug/kg | U | 1 |
| Hexachlorocyclopentadiene | BQL | 360 | ug/kg | U | 1 |
| Hexachloroethane | BQL | 360 | ug/kg | U | 1 |
| Indeno(1,2,3-c,d)Pyrene | BQL | 360 | ug/kg | U | 1 |
| Isophorone | BQL | 360 | ug/kg | U | 1 |
| Naphthalene | BQL | 360 | ug/kg | U | 1 |
| Nitrobenzene | BQL | 360 | ug/kg | U | 1 |
| Pentachlorophenol | BQL | 730 | ug/kg | U | 1 |
| Phenanthrene | BQL | 360 | ug/kg | U | 1 |
| Phenol | BQL | 360 | ug/kg | U | 1 |
| Pyrene | BQL | 360 | ug/kg | U | 1 |
| bis(2-chloroethoxy) methane | BQL | 360 | ug/kg | U | 1 |
| bis(2-chloroethyl) ether | BQL | 360 | ug/kg | U | 1 |
| bis(2-ethylhexyl) phthalate | BQL | 360 | ug/kg | U | 1 |
| di-n-Butyl Phthalate | BQL | 360 | ug/kg | U | 1 |
| di-n-Octyl Phthalate | BQL | 360 | ug/kg | U | 1 |
| n-Nitrosodi-n-Propylamine | BQL | 360 | ug/kg | U | 1 |
| n-Nitrosodiphenylamine | BQL | 360 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-1310-1
GPL ID: 706149-007-014-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3550
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98922

Analytical Method: SW8270C
Date Analyzed: 07/05/2007
Time Analyzed: 12:42
Analysis Batch: 103710

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,1- Biphenyl | BQL | 400 | ug/kg | U | 1 |
| 2,2-Oxybis(1-chloropropane) | BQL | 400 | ug/kg | U | 1 |
| 2,4,5-Trichlorophenol | BQL | 400 | ug/kg | U | 1 |
| 2,4,6-Trichlorophenol | BQL | 400 | ug/kg | U | 1 |
| 2,4-Dichlorophenol | BQL | 400 | ug/kg | U | 1 |
| 2,4-Dimethylphenol | BQL | 400 | ug/kg | U | 1 |
| 2,4-Dinitrophenol | BQL | 800 | ug/kg | U | 1 |
| 2,4-Dinitrotoluene | BQL | 400 | ug/kg | U | 1 |
| 2,6-Dinitrotoluene | BQL | 400 | ug/kg | U | 1 |
| 2-Chloronaphthalene | BQL | 400 | ug/kg | U | 1 |
| 2-Chlorophenol | BQL | 400 | ug/kg | U | 1 |
| 2-Methylnaphthalene | 71 | 400 | ug/kg | J | 1 |
| 2-Nitroaniline | BQL | 400 | ug/kg | U | 1 |
| 2-Nitrophenol | BQL | 400 | ug/kg | U | 1 |
| 2-methylphenol | BQL | 400 | ug/kg | U | 1 |
| 3,3-Dichlorobenzidine | BQL | 800 | ug/kg | U | 1 |
| 3-Nitroaniline | BQL | 400 | ug/kg | U | 1 |
| 4,6-dinitro-2-methyl phenol | BQL | 800 | ug/kg | U | 1 |
| 4-Bromophenyl-phenylether | BQL | 400 | ug/kg | U | 1 |
| 4-Chloroaniline | BQL | 400 | ug/kg | U | 1 |
| 4-Chlorophenyl Phenyl Ether | BQL | 400 | ug/kg | U | 1 |
| 4-Nitroaniline | BQL | 400 | ug/kg | U | 1 |
| 4-Nitrophenol | BQL | 800 | ug/kg | U | 1 |
| 4-chloro-3-methylphenol | BQL | 400 | ug/kg | U | 1 |
| 4-methylphenol | BQL | 400 | ug/kg | U | 1 |
| Acenaphthene | BQL | 400 | ug/kg | U | 1 |
| Acenaphthylene | BQL | 400 | ug/kg | U | 1 |
| Acetophenone | BQL | 400 | ug/kg | U | 1 |
| Anthracene | BQL | 400 | ug/kg | U | 1 |
| Atrazine | BQL | 400 | ug/kg | U | 1 |
| Benzaldehyde | BQL | 400 | ug/kg | U | 1 |
| Benzo(a)anthracene | 100 | 400 | ug/kg | J | 1 |
| Benzo(a)pyrene | 73 | 400 | ug/kg | J | 1 |
| Benzo(b)fluoranthene | 120 | 400 | ug/kg | J | 1 |
| Benzo(g,h,i)perylene | BQL | 400 | ug/kg | U | 1 |
| Benzo(k)fluoranthene | 74 | 400 | ug/kg | J | 1 |
| Benzyl Butyl Phthalate | 47 | 400 | ug/kg | J | 1 |
| Caprolactam | BQL | 400 | ug/kg | U | 1 |
| Carbazole | BQL | 400 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-1310-1
GPL ID: 706149-007-014-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3550
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98922

Analytical Method: SW8270C
Date Analyzed: 07/05/2007
Time Analyzed: 12:42
Analysis Batch: 103710

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Chrysene | 100 | 400 | ug/kg | J | 1 |
| Dibenz(a,h)Anthracene | BQL | 400 | ug/kg | U | 1 |
| Dibenzofuran | BQL | 400 | ug/kg | U | 1 |
| Diethyl Phthalate | BQL | 400 | ug/kg | U | 1 |
| Dimethyl Phthalate | BQL | 400 | ug/kg | U | 1 |
| Fluoranthene | 130 | 400 | ug/kg | J | 1 |
| Fluorene | BQL | 400 | ug/kg | U | 1 |
| Hexachlorobenzene | BQL | 400 | ug/kg | U | 1 |
| Hexachlorobutadiene | BQL | 400 | ug/kg | U | 1 |
| Hexachlorocyclopentadiene | BQL | 400 | ug/kg | U | 1 |
| Hexachloroethane | BQL | 400 | ug/kg | U | 1 |
| Indeno(1,2,3-c,d)Pyrene | 53 | 400 | ug/kg | J | 1 |
| Isophorone | BQL | 400 | ug/kg | U | 1 |
| Naphthalene | 39 | 400 | ug/kg | J | 1 |
| Nitrobenzene | BQL | 400 | ug/kg | U | 1 |
| Pentachlorophenol | BQL | 800 | ug/kg | U | 1 |
| Phenanthrene | 110 | 400 | ug/kg | J | 1 |
| Phenol | BQL | 400 | ug/kg | U | 1 |
| Pyrene | 160 | 400 | ug/kg | J | 1 |
| bis(2-chloroethoxy) methane | BQL | 400 | ug/kg | U | 1 |
| bis(2-chloroethyl) ether | BQL | 400 | ug/kg | U | 1 |
| bis(2-ethylhexyl) phthalate | 110 | 400 | ug/kg | J | 1 |
| di-n-Butyl Phthalate | BQL | 400 | ug/kg | U | 1 |
| di-n-Octyl Phthalate | BQL | 400 | ug/kg | U | 1 |
| n-Nitrosodi-n-Propylamine | BQL | 400 | ug/kg | U | 1 |
| n-Nitrosodiphenylamine | BQL | 400 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-1310-2
GPL ID: 706149-008-015-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3550
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98922

Analytical Method: SW8270C
Date Analyzed: 07/01/2007
Time Analyzed: 19:58
Analysis Batch: 103611

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,1- Biphenyl | BQL | 380 | ug/kg | U | 1 |
| 2,2-Oxybis(1-chloropropane) | BQL | 380 | ug/kg | U | 1 |
| 2,4,5-Trichlorophenol | BQL | 380 | ug/kg | U | 1 |
| 2,4,6-Trichlorophenol | BQL | 380 | ug/kg | U | 1 |
| 2,4-Dichlorophenol | BQL | 380 | ug/kg | U | 1 |
| 2,4-Dimethylphenol | BQL | 380 | ug/kg | U | 1 |
| 2,4-Dinitrophenol | BQL | 760 | ug/kg | U | 1 |
| 2,4-Dinitrotoluene | BQL | 380 | ug/kg | U | 1 |
| 2,6-Dinitrotoluene | BQL | 380 | ug/kg | U | 1 |
| 2-Chloronaphthalene | BQL | 380 | ug/kg | U | 1 |
| 2-Chlorophenol | BQL | 380 | ug/kg | U | 1 |
| 2-Methylnaphthalene | BQL | 380 | ug/kg | U | 1 |
| 2-Nitroaniline | BQL | 380 | ug/kg | U | 1 |
| 2-Nitrophenol | BQL | 380 | ug/kg | U | 1 |
| 2-methylphenol | BQL | 380 | ug/kg | U | 1 |
| 3,3-Dichlorobenzidine | BQL | 760 | ug/kg | U | 1 |
| 3-Nitroaniline | BQL | 380 | ug/kg | U | 1 |
| 4,6-dinitro-2-methyl phenol | BQL | 760 | ug/kg | U | 1 |
| 4-Bromophenyl-phenylether | BQL | 380 | ug/kg | U | 1 |
| 4-Chloroaniline | BQL | 380 | ug/kg | U | 1 |
| 4-Chlorophenyl Phenyl Ether | BQL | 380 | ug/kg | U | 1 |
| 4-Nitroaniline | BQL | 380 | ug/kg | U | 1 |
| 4-Nitrophenol | BQL | 760 | ug/kg | U | 1 |
| 4-chloro-3-methylphenol | BQL | 380 | ug/kg | U | 1 |
| 4-methylphenol | BQL | 380 | ug/kg | U | 1 |
| Acenaphthene | BQL | 380 | ug/kg | U | 1 |
| Acenaphthylene | BQL | 380 | ug/kg | U | 1 |
| Acetophenone | BQL | 380 | ug/kg | U | 1 |
| Anthracene | BQL | 380 | ug/kg | U | 1 |
| Atrazine | BQL | 380 | ug/kg | U | 1 |
| Benzaldehyde | BQL | 380 | ug/kg | U | 1 |
| Benzo(a)anthracene | 34 | 380 | ug/kg | J | 1 |
| Benzo(a)pyrene | 44 | 380 | ug/kg | J | 1 |
| Benzo(b)fluoranthene | 64 | 380 | ug/kg | J | 1 |
| Benzo(g,h,i)perylene | BQL | 380 | ug/kg | U | 1 |
| Benzo(k)fluoranthene | 43 | 380 | ug/kg | J | 1 |
| Benzyl Butyl Phthalate | BQL | 380 | ug/kg | U | 1 |
| Caprolactam | BQL | 380 | ug/kg | U | 1 |
| Carbazole | BQL | 380 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-1310-2
GPL ID: 706149-008-015-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3550
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98922

Analytical Method: SW8270C
Date Analyzed: 07/01/2007
Time Analyzed: 19:58
Analysis Batch: 103611

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Chrysene | 46 | 380 | ug/kg | J | 1 |
| Dibenz(a,h)Anthracene | BQL | 380 | ug/kg | U | 1 |
| Dibenzofuran | BQL | 380 | ug/kg | U | 1 |
| Diethyl Phthalate | BQL | 380 | ug/kg | U | 1 |
| Dimethyl Phthalate | BQL | 380 | ug/kg | U | 1 |
| Fluoranthene | BQL | 380 | ug/kg | U | 1 |
| Fluorene | BQL | 380 | ug/kg | U | 1 |
| Hexachlorobenzene | BQL | 380 | ug/kg | U | 1 |
| Hexachlorobutadiene | BQL | 380 | ug/kg | U | 1 |
| Hexachlorocyclopentadiene | BQL | 380 | ug/kg | U | 1 |
| Hexachloroethane | BQL | 380 | ug/kg | U | 1 |
| Indeno(1,2,3-c,d)Pyrene | BQL | 380 | ug/kg | U | 1 |
| Isophorone | BQL | 380 | ug/kg | U | 1 |
| Naphthalene | BQL | 380 | ug/kg | U | 1 |
| Nitrobenzene | BQL | 380 | ug/kg | U | 1 |
| Pentachlorophenol | BQL | 760 | ug/kg | U | 1 |
| Phenanthrene | BQL | 380 | ug/kg | U | 1 |
| Phenol | BQL | 380 | ug/kg | U | 1 |
| Pyrene | 76 | 380 | ug/kg | J | 1 |
| bis(2-chloroethoxy) methane | BQL | 380 | ug/kg | U | 1 |
| bis(2-chloroethyl) ether | BQL | 380 | ug/kg | U | 1 |
| bis(2-ethylhexyl) phthalate | 320 | 380 | ug/kg | J | 1 |
| di-n-Butyl Phthalate | BQL | 380 | ug/kg | U | 1 |
| di-n-Octyl Phthalate | BQL | 380 | ug/kg | U | 1 |
| n-Nitrosodi-n-Propylamine | BQL | 380 | ug/kg | U | 1 |
| n-Nitrosodiphenylamine | BQL | 380 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-1310-2RE
GPL ID: 706149-008-015-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3550
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98922

Analytical Method: SW8270C
Date Analyzed: 07/05/2007
Time Analyzed: 13:19
Analysis Batch: 103710

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,1- Biphenyl | BQL | 380 | ug/kg | U | 1 |
| 2,2-Oxybis(1-chloropropane) | BQL | 380 | ug/kg | U | 1 |
| 2,4,5-Trichlorophenol | BQL | 380 | ug/kg | U | 1 |
| 2,4,6-Trichlorophenol | BQL | 380 | ug/kg | U | 1 |
| 2,4-Dichlorophenol | BQL | 380 | ug/kg | U | 1 |
| 2,4-Dimethylphenol | BQL | 380 | ug/kg | U | 1 |
| 2,4-Dinitrophenol | BQL | 760 | ug/kg | U | 1 |
| 2,4-Dinitrotoluene | BQL | 380 | ug/kg | U | 1 |
| 2,6-Dinitrotoluene | BQL | 380 | ug/kg | U | 1 |
| 2-Chloronaphthalene | BQL | 380 | ug/kg | U | 1 |
| 2-Chlorophenol | BQL | 380 | ug/kg | U | 1 |
| 2-Methylnaphthalene | BQL | 380 | ug/kg | U | 1 |
| 2-Nitroaniline | BQL | 380 | ug/kg | U | 1 |
| 2-Nitrophenol | BQL | 380 | ug/kg | U | 1 |
| 2-methylphenol | BQL | 380 | ug/kg | U | 1 |
| 3,3-Dichlorobenzidine | BQL | 760 | ug/kg | U | 1 |
| 3-Nitroaniline | BQL | 380 | ug/kg | U | 1 |
| 4,6-dinitro-2-methyl phenol | BQL | 760 | ug/kg | U | 1 |
| 4-Bromophenyl-phenylether | BQL | 380 | ug/kg | U | 1 |
| 4-Chloroaniline | BQL | 380 | ug/kg | U | 1 |
| 4-Chlorophenyl Phenyl Ether | BQL | 380 | ug/kg | U | 1 |
| 4-Nitroaniline | BQL | 380 | ug/kg | U | 1 |
| 4-Nitrophenol | BQL | 760 | ug/kg | U | 1 |
| 4-chloro-3-methylphenol | BQL | 380 | ug/kg | U | 1 |
| 4-methylphenol | BQL | 380 | ug/kg | U | 1 |
| Acenaphthene | BQL | 380 | ug/kg | U | 1 |
| Acenaphthylene | BQL | 380 | ug/kg | U | 1 |
| Acetophenone | BQL | 380 | ug/kg | U | 1 |
| Anthracene | BQL | 380 | ug/kg | U | 1 |
| Atrazine | BQL | 380 | ug/kg | U | 1 |
| Benzaldehyde | BQL | 380 | ug/kg | U | 1 |
| Benzo(a)anthracene | 46 | 380 | ug/kg | J | 1 |
| Benzo(a)pyrene | 40 | 380 | ug/kg | J | 1 |
| Benzo(b)fluoranthene | 64 | 380 | ug/kg | J | 1 |
| Benzo(g,h,i)perylene | BQL | 380 | ug/kg | U | 1 |
| Benzo(k)fluoranthene | 48 | 380 | ug/kg | J | 1 |
| Benzyl Butyl Phthalate | BQL | 380 | ug/kg | U | 1 |
| Caprolactam | BQL | 380 | ug/kg | U | 1 |
| Carbazole | BQL | 380 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-1310-2RE
GPL ID: 706149-008-015-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: SW3550
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98922

Analytical Method: SW8270C
Date Analyzed: 07/05/2007
Time Analyzed: 13:19
Analysis Batch: 103710

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| Chrysene | 36 | 380 | ug/kg | J | 1 |
| Dibenz(a,h)Anthracene | BQL | 380 | ug/kg | U | 1 |
| Dibenzofuran | BQL | 380 | ug/kg | U | 1 |
| Diethyl Phthalate | BQL | 380 | ug/kg | U | 1 |
| Dimethyl Phthalate | BQL | 380 | ug/kg | U | 1 |
| Fluoranthene | BQL | 380 | ug/kg | U | 1 |
| Fluorene | BQL | 380 | ug/kg | U | 1 |
| Hexachlorobenzene | BQL | 380 | ug/kg | U | 1 |
| Hexachlorobutadiene | BQL | 380 | ug/kg | U | 1 |
| Hexachlorocyclopentadiene | BQL | 380 | ug/kg | U | 1 |
| Hexachloroethane | BQL | 380 | ug/kg | U | 1 |
| Indeno(1,2,3-c,d)Pyrene | BQL | 380 | ug/kg | U | 1 |
| Isophorone | BQL | 380 | ug/kg | U | 1 |
| Naphthalene | BQL | 380 | ug/kg | U | 1 |
| Nitrobenzene | BQL | 380 | ug/kg | U | 1 |
| Pentachlorophenol | BQL | 760 | ug/kg | U | 1 |
| Phenanthrene | BQL | 380 | ug/kg | U | 1 |
| Phenol | BQL | 380 | ug/kg | U | 1 |
| Pyrene | 68 | 380 | ug/kg | J | 1 |
| bis(2-chloroethoxy) methane | BQL | 380 | ug/kg | U | 1 |
| bis(2-chloroethyl) ether | BQL | 380 | ug/kg | U | 1 |
| bis(2-ethylhexyl) phthalate | 310 | 380 | ug/kg | J | 1 |
| di-n-Butyl Phthalate | BQL | 380 | ug/kg | U | 1 |
| di-n-Octyl Phthalate | BQL | 380 | ug/kg | U | 1 |
| n-Nitrosodi-n-Propylamine | BQL | 380 | ug/kg | U | 1 |
| n-Nitrosodiphenylamine | BQL | 380 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-E-1
GPL ID: 706149-001-016-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: EXT_SW8330
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98932

Analytical Method: SW8330
Date Analyzed: 06/29/2007
Time Analyzed: 04:25
Analysis Batch: 103700

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,3,5-Trinitrobenzene | BQL | 20000 | ug/kg | U | 1 |
| 1,3-Dinitrobenzene | BQL | 20000 | ug/kg | U | 1 |
| 2,4,6-Trinitrotoluene | BQL | 20000 | ug/kg | U | 1 |
| 2,4-Dinitrotoluene | BQL | 20000 | ug/kg | U | 1 |
| 2,6-Dinitrotoluene | BQL | 20000 | ug/kg | U | 1 |
| 2-Amino-4,6-Dinitrotoluene | BQL | 20000 | ug/kg | U | 1 |
| 4-Amino-2,6-Dinitrotoluene | BQL | 20000 | ug/kg | U | 1 |
| HMX | BQL | 40000 | ug/kg | U | 1 |
| Nitrobenzene | BQL | 20000 | ug/kg | U | 1 |
| RDX | BQL | 40000 | ug/kg | U | 1 |
| Tetryl | BQL | 40000 | ug/kg | U | 1 |
| m-Nitrotoluene | BQL | 40000 | ug/kg | U | 1 |
| o-Nitrotoluene | BQL | 40000 | ug/kg | U | 1 |
| p-Nitrotoluene | BQL | 40000 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-E-1D
GPL ID: 706149-002-017-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: EXT_SW8330
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98932

Analytical Method: SW8330
Date Analyzed: 06/29/2007
Time Analyzed: 05:22
Analysis Batch: 103700

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,3,5-Trinitrobenzene | BQL | 100 | ug/kg | U | 1 |
| 1,3-Dinitrobenzene | BQL | 100 | ug/kg | U | 1 |
| 2,4,6-Trinitrotoluene | BQL | 100 | ug/kg | U | 1 |
| 2,4-Dinitrotoluene | BQL | 100 | ug/kg | U | 1 |
| 2,6-Dinitrotoluene | BQL | 100 | ug/kg | U | 1 |
| 2-Amino-4,6-Dinitrotoluene | BQL | 100 | ug/kg | U | 1 |
| 4-Amino-2,6-Dinitrotoluene | BQL | 100 | ug/kg | U | 1 |
| HMX | BQL | 200 | ug/kg | U | 1 |
| Nitrobenzene | BQL | 100 | ug/kg | U | 1 |
| RDX | BQL | 200 | ug/kg | U | 1 |
| Tetryl | BQL | 200 | ug/kg | U | 1 |
| m-Nitrotoluene | BQL | 200 | ug/kg | U | 1 |
| o-Nitrotoluene | BQL | 200 | ug/kg | U | 1 |
| p-Nitrotoluene | BQL | 200 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-C-1
GPL ID: 706149-003-018-1/3
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: EXT_SW8330
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98932

Analytical Method: SW8330
Date Analyzed: 06/29/2007
Time Analyzed: 06:19
Analysis Batch: 103700

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,3,5-Trinitrobenzene | BQL | 100 | ug/kg | U | 1 |
| 1,3-Dinitrobenzene | BQL | 100 | ug/kg | U | 1 |
| 2,4,6-Trinitrotoluene | BQL | 100 | ug/kg | U | 1 |
| 2,4-Dinitrotoluene | BQL | 100 | ug/kg | U | 1 |
| 2,6-Dinitrotoluene | BQL | 100 | ug/kg | U | 1 |
| 2-Amino-4,6-Dinitrotoluene | BQL | 100 | ug/kg | U | 1 |
| 4-Amino-2,6-Dinitrotoluene | BQL | 100 | ug/kg | U | 1 |
| HMX | BQL | 200 | ug/kg | U | 1 |
| Nitrobenzene | BQL | 100 | ug/kg | U | 1 |
| RDX | BQL | 200 | ug/kg | U | 1 |
| Tetryl | BQL | 200 | ug/kg | U | 1 |
| m-Nitrotoluene | BQL | 200 | ug/kg | U | 1 |
| o-Nitrotoluene | BQL | 200 | ug/kg | U | 1 |
| p-Nitrotoluene | BQL | 200 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-FB-1
GPL ID: 706149-004-011-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: EXT_SW8330
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98932

Analytical Method: SW8330
Date Analyzed: 06/29/2007
Time Analyzed: 07:16
Analysis Batch: 103700

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,3,5-Trinitrobenzene | BQL | 100 | ug/kg | U | 1 |
| 1,3-Dinitrobenzene | BQL | 100 | ug/kg | U | 1 |
| 2,4,6-Trinitrotoluene | BQL | 100 | ug/kg | U | 1 |
| 2,4-Dinitrotoluene | BQL | 100 | ug/kg | U | 1 |
| 2,6-Dinitrotoluene | BQL | 100 | ug/kg | U | 1 |
| 2-Amino-4,6-Dinitrotoluene | BQL | 100 | ug/kg | U | 1 |
| 4-Amino-2,6-Dinitrotoluene | BQL | 100 | ug/kg | U | 1 |
| HMX | BQL | 200 | ug/kg | U | 1 |
| Nitrobenzene | BQL | 100 | ug/kg | U | 1 |
| RDX | BQL | 200 | ug/kg | U | 1 |
| Tetryl | BQL | 200 | ug/kg | U | 1 |
| m-Nitrotoluene | BQL | 200 | ug/kg | U | 1 |
| o-Nitrotoluene | BQL | 200 | ug/kg | U | 1 |
| p-Nitrotoluene | BQL | 200 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-FBR-1
GPL ID: 706149-005-012-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: EXT_SW8330
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98932

Analytical Method: SW8330
Date Analyzed: 06/29/2007
Time Analyzed: 08:12
Analysis Batch: 103700

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,3,5-Trinitrobenzene | BQL | 99 | ug/kg | U | 1 |
| 1,3-Dinitrobenzene | BQL | 99 | ug/kg | U | 1 |
| 2,4,6-Trinitrotoluene | BQL | 99 | ug/kg | U | 1 |
| 2,4-Dinitrotoluene | BQL | 99 | ug/kg | U | 1 |
| 2,6-Dinitrotoluene | BQL | 99 | ug/kg | U | 1 |
| 2-Amino-4,6-Dinitrotoluene | BQL | 99 | ug/kg | U | 1 |
| 4-Amino-2,6-Dinitrotoluene | BQL | 99 | ug/kg | U | 1 |
| HMX | BQL | 200 | ug/kg | U | 1 |
| Nitrobenzene | 280 | 99 | ug/kg | | 1 |
| RDX | BQL | 200 | ug/kg | U | 1 |
| Tetryl | BQL | 200 | ug/kg | U | 1 |
| m-Nitrotoluene | BQL | 200 | ug/kg | U | 1 |
| o-Nitrotoluene | BQL | 200 | ug/kg | U | 1 |
| p-Nitrotoluene | BQL | 200 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-ADM-1
GPL ID: 706149-006-013-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: EXT_SW8330
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98932

Analytical Method: SW8330
Date Analyzed: 06/29/2007
Time Analyzed: 09:09
Analysis Batch: 103700

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,3,5-Trinitrobenzene | BQL | 99 | ug/kg | U | 1 |
| 1,3-Dinitrobenzene | BQL | 99 | ug/kg | U | 1 |
| 2,4,6-Trinitrotoluene | BQL | 99 | ug/kg | U | 1 |
| 2,4-Dinitrotoluene | BQL | 99 | ug/kg | U | 1 |
| 2,6-Dinitrotoluene | BQL | 99 | ug/kg | U | 1 |
| 2-Amino-4,6-Dinitrotoluene | BQL | 99 | ug/kg | U | 1 |
| 4-Amino-2,6-Dinitrotoluene | BQL | 99 | ug/kg | U | 1 |
| HMX | BQL | 200 | ug/kg | U | 1 |
| Nitrobenzene | BQL | 99 | ug/kg | U | 1 |
| RDX | BQL | 200 | ug/kg | U | 1 |
| Tetryl | BQL | 200 | ug/kg | U | 1 |
| m-Nitrotoluene | BQL | 200 | ug/kg | U | 1 |
| o-Nitrotoluene | BQL | 200 | ug/kg | U | 1 |
| p-Nitrotoluene | BQL | 200 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-1310-1
GPL ID: 706149-007-014-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: EXT_SW8330
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98932

Analytical Method: SW8330
Date Analyzed: 06/29/2007
Time Analyzed: 10:06
Analysis Batch: 103700

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,3,5-Trinitrobenzene | BQL | 100 | ug/kg | U | 1 |
| 1,3-Dinitrobenzene | BQL | 100 | ug/kg | U | 1 |
| 2,4,6-Trinitrotoluene | BQL | 100 | ug/kg | U | 1 |
| 2,4-Dinitrotoluene | BQL | 100 | ug/kg | U | 1 |
| 2,6-Dinitrotoluene | BQL | 100 | ug/kg | U | 1 |
| 2-Amino-4,6-Dinitrotoluene | BQL | 100 | ug/kg | U | 1 |
| 4-Amino-2,6-Dinitrotoluene | BQL | 100 | ug/kg | U | 1 |
| HMX | 1800 | 200 | ug/kg | | 1 |
| Nitrobenzene | BQL | 100 | ug/kg | U | 1 |
| RDX | BQL | 200 | ug/kg | U | 1 |
| Tetryl | BQL | 200 | ug/kg | U | 1 |
| m-Nitrotoluene | BQL | 200 | ug/kg | U | 1 |
| o-Nitrotoluene | BQL | 200 | ug/kg | U | 1 |
| p-Nitrotoluene | BQL | 200 | ug/kg | U | 1 |

## Summary of Analytical Results

Client ID: BF-1310-2
GPL ID: 706149-008-015-1/1
Matrix: SOIL
Date Collected: 06/25/2007
Date Received: 06/26/2007

Prep Method: EXT_SW8330
Prep Date: 06/27/2007
Prep Time: 00:00
Prep Batch: 98932

Analytical Method: SW8330
Date Analyzed: 06/29/2007
Time Analyzed: 11:03
Analysis Batch: 103700

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|---|---|---|---|---|---|
| 1,3,5-Trinitrobenzene | BQL | 100 | ug/kg | U | 1 |
| 1,3-Dinitrobenzene | BQL | 100 | ug/kg | U | 1 |
| 2,4,6-Trinitrotoluene | BQL | 100 | ug/kg | U | 1 |
| 2,4-Dinitrotoluene | BQL | 100 | ug/kg | U | 1 |
| 2,6-Dinitrotoluene | BQL | 100 | ug/kg | U | 1 |
| 2-Amino-4,6-Dinitrotoluene | BQL | 100 | ug/kg | U | 1 |
| 4-Amino-2,6-Dinitrotoluene | BQL | 100 | ug/kg | U | 1 |
| HMX | BQL | 200 | ug/kg | U | 1 |
| Nitrobenzene | BQL | 100 | ug/kg | U | 1 |
| RDX | BQL | 200 | ug/kg | U | 1 |
| Tetryl | BQL | 200 | ug/kg | U | 1 |
| m-Nitrotoluene | BQL | 200 | ug/kg | U | 1 |
| o-Nitrotoluene | BQL | 200 | ug/kg | U | 1 |
| p-Nitrotoluene | BQL | 200 | ug/kg | U | 1 |

GPL LABORATORIES, LLP
ANALYTICAL RESULTS

Project Name : VA FUDS Site 1-8

Date Printed July 9, 2007

| GPL ID | Client ID |
|---|---|
| 706149-007-004-1/1 | BF-1310-1 |
| 706149-007-014-1/1 | BF-1310-1 |
| 706149-007-024-1/1 | BF-1310-1 |
| 706149-007-004-1/1RE | BF-1310-1RE |
| 706149-008-005-1/1 | BF-1310-2 |
| 706149-008-015-1/1 | BF-1310-2 |
| 706149-008-025-1/1 | BF-1310-2 |
| 706149-008-015-1/1 | BF-1310-2RE |
| 706149-006-003-1/1 | BF-ADM-1 |
| 706149-006-013-1/1 | BF-ADM-1 |
| 706149-006-023-1/1 | BF-ADM-1 |
| 706149-003-008-1/3 | BF-C-1 |
| 706149-003-018-1/3 | BF-C-1 |
| 706149-003-028-1/3 | BF-C-1 |
| 706149-003-008-1/3RE | BF-C-1RE |
| 706149-001-006-1/1 | BF-E-1 |
| 706149-001-016-1/1 | BF-E-1 |
| 706149-001-026-1/1 | BF-E-1 |
| 706149-002-007-1/1 | BF-E-1D |
| 706149-002-017-1/1 | BF-E-1D |
| 706149-002-027-1/1 | BF-E-1D |
| 706149-004-001-1/1 | BF-FB-1 |
| 706149-004-011-1/1 | BF-FB-1 |
| 706149-004-021-1/1 | BF-FB-1 |
| 706149-004-001-1/1RE | BF-FB-1RE |
| 706149-005-002-1/1 | BF-FBR-1 |
| 706149-005-012-1/1 | BF-FBR-1 |
| 706149-005-022-1/1 | BF-FBR-1 |
| 706149-005-012-1/1 | BF-FBR-1DL |
| 706149-005-002-1/1RE | BF-FBR-1RE |
| 706149-009-031-1/1 | TRIP BLANK |

# GPL LABORATORIES, LLLP

## Qualifier Definitions

U = Indicates that the compound was analyzed for but not detected at or above the reporting limit

**Organics:**

B = Indicates that the analyte was found in the associated blank as well as in the sample

D = Indicates that the analyte was reported from a diluted analysis

E = Indicates that the concentration detected exceeded the calibration range of the instrument

J = Value is less than the reporting limits but greater than the MDL

P = Indicates that there is greater than 25% difference for detected pesticide/Aroclor results between the two GC columns

**Metals:**

B = Indicates that the reported value was less than the reporting limit but greater than or equal to the IDL/MDL

E = Indicates that reported value is estimated because of the possible presence of interference (i.e., the serial dilution not within control limits)

H = Indicates that the element was found in the associated blank as well as in the sample and the value is greater than or equal to the reporting limit

N = Spiked sample recovery not within control limits

* = Duplicate analysis not within control limits

Asbestos Reports for AASF

SINCE 1881

**FROEHLING & ROBERTSON, INC.**

**ENGINEERING • ENVIRONMENTAL • GEOTECHNICAL**

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# ASBESTOS REINSPECTION REPORT

**SANDSTON ARMORY – BUILDING 3901**
**700 Portugee Road**
**Sandston, VA 23150**

Prepared For:
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Department of Military Affairs
Fort Pickett, Building 316
Blackstone, Virginia 23229
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Prepared By:
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F&R Project Number 68N-0510

September 29, 2011

Prepared By:

Michael Baum
Industrial Hygienist

Reviewed By:

Herman Garcia
Senior Project Manager

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**2.0 Methodology ..... 1**
**3.0 Reporting ..... 2**
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**APPENDICES**

Appendix A – Modified ITC Inspection Report and Reinspection Table

Appendix B – Site Drawing

Appendix C – EPA Document 700/B-92001 Forms 1 and 2

## 1.0 Introduction

Froehling and Robertson (F&R) was contracted by the Department of Military Affairs to perform a limited, non-destructive asbestos reinspection of Sandston Armory Building 3901, located at 700 Portugee Road, Sandston, Virginia. The reinspection was performed by Commonwealth of Virginia licensed Asbestos Inspector and Management Planner, Mr. Michael Baum (VA Inspector License #3303 002651, VA Management Planner License #3304 001550), on August 25, 2011. The structure was occupied at the time of the survey. The survey was conducted for the purpose of reassessing the presence or condition of known asbestos-containing materials inside the structure.

The scope of the asbestos reinspection of Sandston Armory Building 3901 consisted of the following items only:

- Review the report of a previous asbestos inspection conducted of the Armory by Mr. James Madison of the Industrial Training Company (ITC) on February 16, 2000.

- Visually survey asbestos-containing materials (ACMs) identified inside the structure in the previous inspection report, noting their presence or absence, and assessing their current condition. Materials on the exterior of the structure were not included in this survey.

- If additional suspect materials are identified that were not sampled in the previous surveys, contact Mr. James Williams of the Department of Military Affairs to determine whether to sample those materials.

- Document the reinspection results by recording changes on the previous inspection report, and by utilizing EPA document 700/B-92001 Forms 1 and 2.

Notes:

1. F&R was furnished with an electronic copy of the report of a previous asbestos inspection conducted of the Armory by Mr. James Madison of the Industrial Training Company (ITC) on February 16, 2000. However, the electronic copy did not contain Sample Location Drawings, Laboratory Results or Photographs. As a result, assumptions have been made by F&R regarding locations of previously identified asbestos-containing materials, locations of previous samples collected, and the physical appearance of certain suspect materials.
2. The following areas were inaccessible for assessment during this survey: All 2$^{nd}$ Floor Quarters, Several First Floor Offices.

## 2.0 Methodology

This project was a non-invasive visual reinspection and sampling for suspect ACM. If additional suspect materials were identified and sampling of such materials was approved by Mr. Williams, then sampling was conducted at the above referenced site. When samples were collected, such samples were collected in general accordance with EPA-AHERA protocols and submitted under chain of custody to Environmental Hazards Laboratory, LLC (EHS) located in Richmond, Virginia, for analysis. EHS is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) to analyze suspect

asbestos-containing bulk materials. F&R was instructed by Mr. Williams not to presume as ACBM suspect materials that were not sampled during the original survey.

**No additional samples were authorized to be collected during this survey.**

## 3.0 Reporting

Results of the reinspection have been presented in the modified ITC report presented in Appendix A. Deletion of information from the previous report has been indicated by striking through the information to be deleted. Addition of information to the previous report has been indicated by red lettering in Calibri font.

EPA document 700/B-92001 Forms 1 and 2 for each identified ACM have been presented in Appendix B.

## 4.0 Limitations

This report has been prepared for the exclusive use by the Department of Military Affairs and its associates. This service was performed in accordance with generally accepted environmental practices. No other warranty, expressed or implied, is made.

Our conclusions and recommendations are based, in part, upon information provided to us by others and on our site observations. We have not verified the completeness or accuracy of the information provided by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards. During F&R's non-invasive inspection, accessible areas were visually surveyed for the presence of suspected ACM. Inaccessible areas, such as behind solid walls or above solid ceilings, were not surveyed and therefore suspected ACM may be present in those areas. Areas inspected for the above-referenced materials were limited to those designated by the client.

During this study, suspect material samples may have been analyzed for asbestos. As with any similar survey of this nature, actual conditions exist only at the precise locations from which suspect samples were collected. Certain inferences are based on the results of this sampling and related testing to form a professional opinion of conditions in areas beyond those from which the samples were collected. No other warranty, expressed or implied, is made.

Under this scope of services, F&R assumes no responsibility regarding response actions (e.g. O&M Plans, Encapsulation, Abatement, Removal, Notifications, etc.) initiated as a result of these findings. F&R assumes no liability for the duties and responsibilities of the Client with respect to compliance with these regulations. Compliance with regulations is the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, whichever is more stringent. All abatement activities or response actions should be performed by appropriately qualified and licensed-personnel and/or companies, as warranted.

Froehling & Robertson, Inc. by virtue of providing the services described in this report, does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that may present a potential danger to public health, safety, or the environment. The client agrees to notify the appropriate

local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. The contents of the report should not be construed in any way as a recommendation to purchase, sell, or develop the project site.

## APPENDIX A

## MODIFIED ITC INSPECTION REPORT AND REINSPECTION TABLE

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Executive Summary

Methodology and Analysis

Results

Recommendations

Disclaimer

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Appendix 2 - Sample Location Diagram

Appendix 3 - Laboratory Results

Appendix 4 - Photographs

Appendix 5 - Summary of Qualifications

# EXECUTIVE SUMMARY

The Industrial Training Company (ITC) was contracted by Environmental Resource Management (ERM) to conduct an asbestos inspection of the Sandston AASF Building 3901 Armory. The armory is located at in Sandston, Virginia. On February 16, 2000, the armory was inspected by Mr. James A. Madison (Virginia Asbestos Inspector License # 3303-002174) for the presence of asbestos containing building materials (ACBM). The inspection was limited to asbestos that was accessible through non-destructive methods and did not identify asbestos containing material located within walls, concrete decks, subfloors, chases or otherwise generally inaccessible areas. The inspection also excluded electrical equipment (wires, junction boxes, etc.).

Sandston Armory Building 3901 was reinspected by Commonwealth of Virginia licensed Asbestos Inspector and Management Planner, Mr. Michael Baum (VA Inspector License #3303 002651, VA Management Planner License #3304 001550), on August 25, 2011. The structure was occupied at the time of the survey. The survey was conducted for the purpose of reassessing the presence or condition of known asbestos-containing materials inside the structure.

A total of 79 suspect materials were collected and forwarded for analysis to Scientific Laboratories, Inc., located at 13635 Genito Road, Richmond, Virginia. In some instances, samples were divided into distinctive layers for regulatory and analytical purposes (i.e floor tile and mastic). Also, in some situations the laboratory was asked to implement a "Positive Stop Procedure". According to this method, the laboratory identified at least one positive sample within the group and assumed all other samples of the same material to contain asbestos also. The laboratory analyzed a total of 66 samples. The bulk samples were analyzed via Polarized Light Microscopy (PLM) using the EPA Interim Method for the Determination of Asbestos in Bulk Samples (EPA-600/R-93/116). Suspect material analyzed and found to contain greater than one percent asbestos is considered to be an ACBM.

The inspection and subsequent analysis determined the following materials to be ACBM:

- The mastic associated w/ the 12"x 12" cream floor tile with brown specks located throughout the first floor main structure hall and adjacent offices. ~~in the alpha company training room, hallway, and copy room 1st floor.~~ Note: This material was observed to be still present in good or enclosed condition.
- The white caulking located in the 1st floor office. Note: This material was not observed during the reinspection.
- The white drywall located in the 1st and 2nd floor hallways. Note: Sample results indicated trace (<1%) asbestos concentration within the joint compound. Therefore, this material is not classified as ACBM by the EPA. However, the Occupational Safety and Health Administration (OSHA) still regulates these materials as interpreted by a memo they issued on November 24, 2003 (Compliance Requirements For Renovation Work Involving Materials Containing Less Than 1% Asbestos; See Appendix for OSHA Interpretation). This material was observed to be still present and in good condition, but was not assessed. Asbestos was not identified in the drywall wallboard.

# EXECUTIVE SUMMARY

- The large diameter gray and white 5’ tank located in the boiler room. Note: This material has been removed.
- The small diameter gray and white 2’ tank located in the boiler room. Note: This material was observed to be still present in good condition.
- The gray and white diesel ~~desile~~ gen. muffler located in the boiler room. Note: This material was observed to be still present in good condition.
- The gray and white boiler breeching located in the boiler room. Note: This material was observed to be still present. Damage was observed in several locations.
- The gray and white HVAC duct work located in the boiler room. Note: This material was observed to be still present. Damage was observed in several locations.
- The black mastic on elbows located above ceiling in mess hall and kitchen. Note: This material was observed to be still present in good condition.
- Asbestos-cement board (transite) wall panels located throughout the hallways on the first and second floors of the main structure. This material was observed to be in good condition.
- The white window glazing on the eastern exterior of the building. Note: Exterior materials were not included in this reinspection. Therefore, this material was not assessed.
- The white window caulking on the eastern exterior of the building. Note: Exterior materials were not included in this reinspection. Therefore, this material was not assessed.

The boiler breeching and HVAC duct work in the boiler room were observed to be damaged in several locations. Immediate repair of the damaged areas is recommended. Remaining ACBM was in good condition where observed. ~~Most all of the ACBM is in good to fair condition with the exception of the exterior window glazing which is in poor condition.~~ Please refer to the Operations and Maintenance Plan (O & M) on how to properly manage the ACM.

# METHODOLOGY AND ANALYSIS

The inspection consisted of a preliminary walk-through of the building to identify suspect materials. The suspect materials were grouped into homogeneous areas and sampled in accordance with the Environmental Protection Agency's (EPA) "Asbestos Hazard Emergency Response Act" (AHERA). Assessments were made to determine the condition of the material. In some circumstances, upon observation of the material, a determination was made that the material was non-suspect and assumed to be asbestos-free. When this assumption could not be made, samples were secured with precautions being taken to avoid unnecessary damage to the materials. Roofing materials were excluded from the inspection.

The samples were forwarded for analysis to Scientific Laboratories, Inc., a Virginia licensed laboratory, located at 13635 Genito Road, Richmond, Virginia. The samples were analyzed via Polarized Light Microscopy (PLM) using the EPA Interim Method for the Determination of Asbestos in Bulk Samples (EPA-600/R-93/116).

This inspection was limited to suspect material accessible through non-destructive methods. It does not identify asbestos-containing material located within walls, concrete decks, sub-floors, chases or otherwise generally inaccessible areas. Also, sample locations indicate specific locations only where materials were found and sampled.

# ASBESTOS REINSPECTION TABLE

**Building:** Sandston Armory Building 3901

**Inspection Date:** February 16, 2000
**Reinspection Date:** August 25, 2011

| Material | Location | Amount | AHERA Assessment Category | Sample Number(s) | % Asbestos | Condition/ Friability (2000 Insp.) | Condition/ Friability (2011 Insp.) | Hazard Ranking (2000 Insp.) | Hazard Ranking (2011 Insp.) |
|---|---|---|---|---|---|---|---|---|---|
| 12" x 12" Cream floor tile w/ brown specks **Mastic only** | 1st Flr. Hall and adjacent offices | 6,400 $ft^2$ | X | 26-S-AASF-02M | Trace | Good/ Not Given | Good/ Non-Friable | 1 | 1 |
| White caulking | NOT OBSERVED | 400 lf. | N/A | 26-S-AASF-30 | 5% chrysotile Trace Amosite | Good/ Not Given | N/A | 1 | N/R |
| White drywall | 1st. Flr. and 2nd Flr. hallways | 48,000 $ft^2$ | X | 26-S-AASF-39 26-S-AASF-40 | Trace Trace | Good/ Not Given | Good/ Non-Friable | 1 | 1 |
| Gray and white large diameter 5' tank | REMOVED | N/A | N/A | 26-S-AASF-47 | 2% chrysotile 30% amosite | Fair/ Not Given | N/A | 3 | N/R |
| Gray and white small diameter 2' tank | Boiler room | 32 $ft^2$ | 5 | 26-S-AASF-50 | 15% chrysotile 10% amosite | Good/ Not Given | Good/ Friable | 1 | 2 |
| Gray and white diesel gen. muffler | Boiler room | 35 lf. | 5 | 26-S-AASF-53 | 10% chrysotile 25% amosite | Good/ Not Given | Good/ Friable | 1 | 3 |
| Gray and white boiler breeching | Boiler room | 30 lf. | 1 | 26-S-AASF-56 | 20% chrysotile | Fair/ Not Given | Damaged/ Friable | 4 | 5 |
| Gray and white HVAC duct work | Boiler room | 40 lf. | 1 | 26-S-AASF-60 | 4% chrysotile | Good/ Not Given | Damaged/ Friable | 1 | 5 |
| Black mastic on elbows | Above ceiling in mess hall, kitchen | 13 $ft^2$ | X | 26-S-AASF-68 | 8% chrysotile | Good/ Not Given | Good/ Non-Friable | 1 | 1 |

**Assessment Categories:**
1 = Damaged or Significantly Damaged TSI ACBM
2 = Damaged Friable Surfacing ACM
3 = Significantly Damaged Friable Surfacing ACBM
4 = Damaged or Significantly Damaged Friable Miscellaneous ACBM
5 = ACBM With Potential For Damage
6 = ACBM With Potential For Significant Damage
7 = Any Remaining Friable ACBM or Friable Suspected ACBM
X = Not Applicable (material is nonfriable, and does not require assessment)
N/A = Not Assessed (material was inaccessible or was not included in the scope of work)

**Hazard Rankings:**
7 = Friable ACBM With Significant Damage
6 = Damaged ACBM With Potential for Significant Damage
5 = Damaged ACBM With Moderate Potential for Further Damage
4 = Damaged ACBM With Low Potential for Further Damage
3 = ACBM With Potential for Significant Damage
2 = ACBM With Moderate Potential for Damage
1 = ACBM With Low Potential for Damage
N/R = Not Ranked (material was inaccessible or was not included in the scope of work)

# ASBESTOS REINSPECTION TABLE

**Building:** Sandston Armory Building 3901

**Inspection Date:** February 16, 2000
**Reinspection Date:** August 25, 2011

| Material | Location | Amount | AHERA Assessment Category | Sample Number(s) | % Asbestos | Condition/ Friability (2000 Insp.) | Condition/ Friability (2011 Insp.) | Hazard Ranking (2000 Insp.) | Hazard Ranking (2011 Insp.) |
|---|---|---|---|---|---|---|---|---|---|
| Asbestos Cement Board (Transite) Wall Panels | First and Second Floor Halls (lower 4' of walls) | 2,500 s.f. | X | N/A | N/A | Not Identified | Good/ Non-Friable | Not Identified | 1 |
| White window glazing | Exterior, east side | 2500 lf. | N/A | 26-S-AASF-74<br>26-S-AASF-75 | Trace<br>2% chrysotile | Poor/ Not Given | N/A | 4 | N/R |
| White window and door caulking | Exterior windows, east side | 1000 lf. | N/A | 26-S-AASF-77 | 2% chrysotile | Fair/ Not Given | N/A | 3 | N/R |

**Assessment Categories:**
1 = Damaged or Significantly Damaged TSI ACBM
2 = Damaged Friable Surfacing ACM
3 = Significantly Damaged Friable Surfacing ACBM
4 = Damaged or Significantly Damaged Friable Miscellaneous ACBM
5 = ACBM With Potential For Damage
6 = ACBM With Potential For Significant Damage
7 = Any Remaining Friable ACBM or Friable Suspected ACBM
X = Not Applicable (material is nonfriable, and does not require assessment)
N/A = Not Assessed (material was inaccessible or was not included in the scope of work)

**Hazard Rankings:**
7 = Friable ACBM With Significant Damage
6 = Damaged ACBM With Potential for Significant Damage
5 = Damaged ACBM With Moderate Potential for Further Damage
4 = Damaged ACBM With Low Potential for Further Damage
3 = ACBM With Potential for Significant Damage
2 = ACBM With Moderate Potential for Damage
1 = ACBM With Low Potential for Damage
N/R = Not Ranked (material was inaccessible or was not included in the scope of work)

# RESULTS

**Sandston AASF Building 3901 Armory**
**Sandston, VA**

| Material | Location | Amount | Condition | Hazard Ranking | Sample Number(s) | % Asbestos |
|---|---|---|---|---|---|---|
| 12" x 12" Cream floor tile w/ brown specks **Mastic only** | Alpha Co. Training room, 1st Flr. Hall, 1st Flr. copy room | 7750 $ft^2$ | Good | 1 | 26-S-AASF-02M | Trace |
| White caulking | 1st Flr. office | 400 linear ft. | Good | 1 | 26-S-AASF-30 | 5% chrysotile<br>Trace Amosite |
| White drywall | 1st. Flr. and 2nd Flr. hallways | 48,000 $ft^2$ | Good | 1 | 26-S-AASF-39<br>26-S-AASF-40 | Trace<br>Trace |
| Gray and white large diameter 5' tank | Boiler room | 175 $ft^2$ | Fair<br>Some damage | 3 | 26-S-AASF-47 | 2% chrysotile<br>30% amosite |
| Gray and white small diameter 2' tank | Boiler room | 32 $ft^2$ | Good | 1 | 26-S-AASF-50 | 15% chrysotile<br>10% amosite |
| Gray and white desile gen. muffler | Boiler room | 16" diameter<br>35 linear ft. | Good | 1 | 26-S-AASF-53 | 10% chrysotile<br>25% amosite |
| Gray and white boiler breeching | Boiler room | 16" diameter<br>30 linear ft. | Fair<br>Some damage | 4 | 26-S-AASF-56 | 20% chrysotile |
| Gray and white HVAC duct work | Boiler room | 40 linear ft. | Good | 1 | 26-S-AASF-60 | 4% chrysotile |
| Black mastic on elbows | Above ceiling in mess hall, kitchen | 13 $ft^2$ | Good | 1 | 26-S-AASF-68 | 8% chrysotile |

**Hazard Ranking: #1= least hazardous, #7=most hazardous**

# RESULTS



| Material | Location | Amount | Condition | Hazard Ranking | Sample Number(s) | % Asbestos |
|---|---|---|---|---|---|---|
| White window glazing | Exterior, east side | 2500 linear ft. | Poor | 4 | 26-S-AASF-74<br>26-S-AASF-75 | Trace<br>2% chrysotile |
| White window and door caulking | Exterior windows, east side | 1000 linear ft. | Fair | 3 | 26-S-AASF-77 | 2% chrysotile |

**Hazard ranking: #1=least hazardous, #7=most hazardous**

# RECOMMENDATIONS

The boiler breeching and HVAC duct work in the boiler room were observed to be damaged in several locations. Immediate repair of the damaged areas is recommended. Remaining ACBM was in good condition where observed. ~~All the ACBM is in fair to good condition with the exception of the window glazing which is in poor condition.~~ Please refer to the O& M Plan on how to manage these materials.

If any of the ACBM will be disturbed through maintenance activities, becomes damaged or otherwise changes in condition, the state wide Virginia Department of Military Affair's Operations and Maintenance Plan (O&M) should be consulted to determine proper procedures on managing the material. The O&M outlines procedures to properly manage the ACBM in place, how to protect employees from asbestos health risk, and how to respond to asbestos emergencies.

# DISCLAIMER

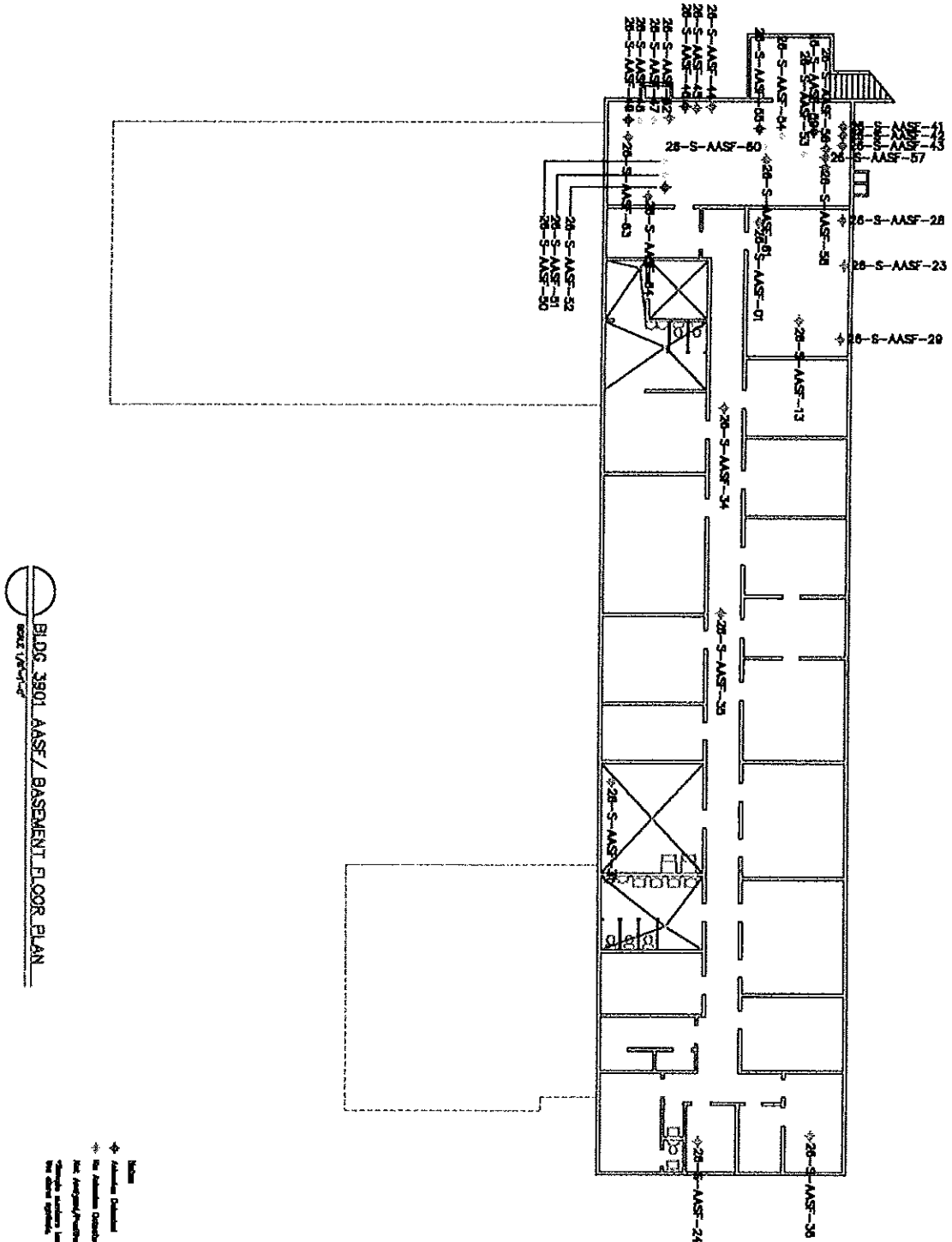
This inspection and report is written for and intended for the use of the Virginia Department of Military Affairs only. The Industrial Training Company is not responsible nor will be held liable for any interpretations made, opinions formed, or conclusions drawn by any third party as a result of examining the lab results, inspection results or this report. Any interpretations, opinions, and conclusions will be those made, formed, and drawn solely by that third party.

The inspection of the Sandston AASF Building 3901 Armory located in Sandston,Virginia was performed by an asbestos inspector properly trained and licensed in the Commonwealth of Virginia to perform asbestos inspections. There were no available records pertaining to past inspections or response actions. Such information, if it had been available and qualified for use, would have been used to both plan and supplement the inspection when feasible. Every attempt was made to gain access to all areas or to assess representative materials entering or leaving such areas. The Industrial Training Company accepts no liability nor makes any claims regarding ACBM which was not accessible during the inspection process if such material was located behind or within walls, concrete decks, sub-floors, chases, or was otherwise generally inaccessible without destructive sampling.

Estimates of the amounts of ACBM in this report are field estimates only and can vary in accuracy. They should not replace accurate measurements made in the actual design of response action projects and contracts. Removal costs can vary, depending upon time of year, response time required, contractor availability, and many other factors. Prior to taking response actions accurate estimates should be obtained from a licensed contractor.

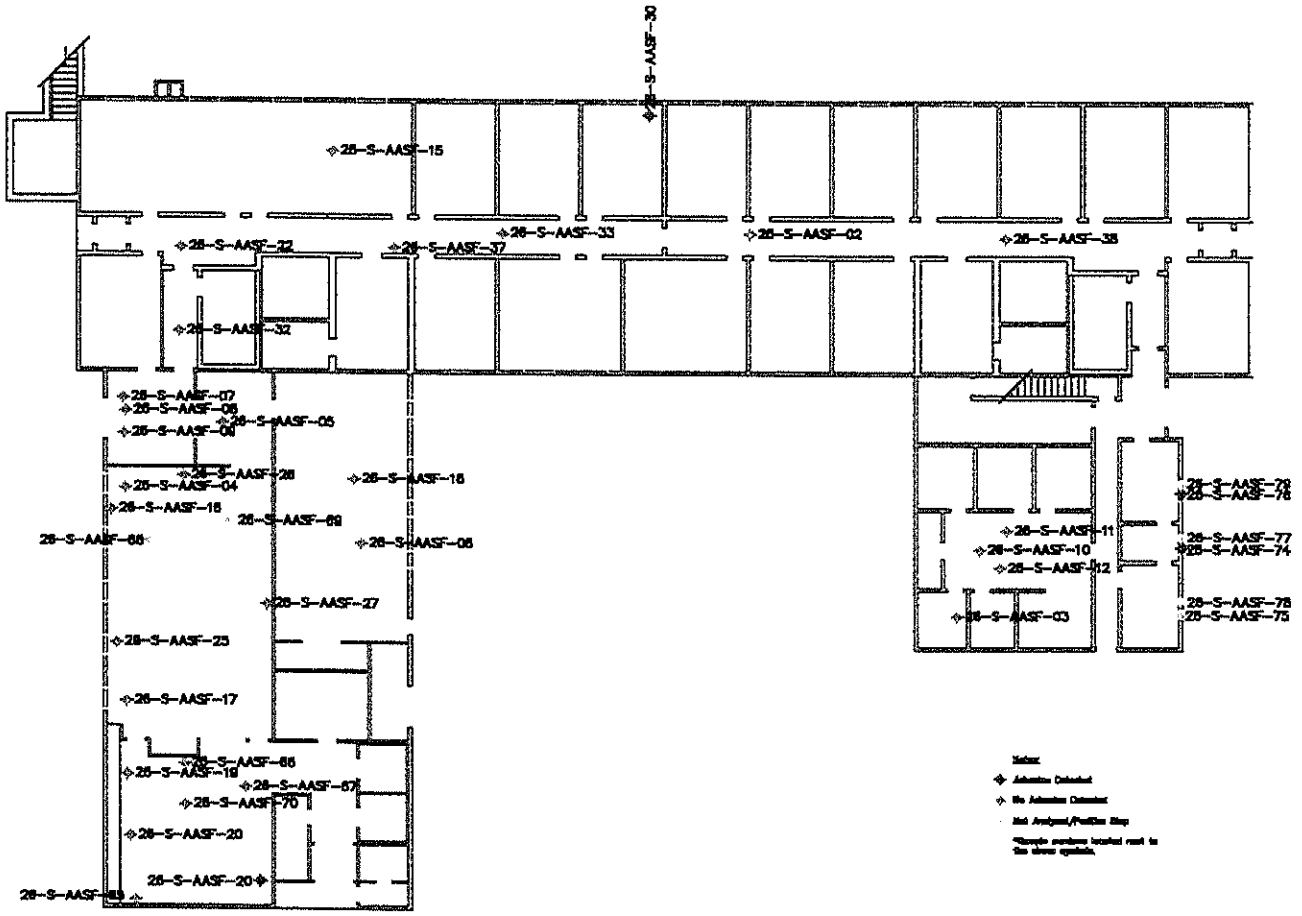
# APPENDIX B

# SITE DRAWING




BLDG 3901 AASF/ BASEMENT FLOOR PLAN

| | | | |
|---|---|---|---|
| 191 | DWG NO A3 | BLDG 3901 AASF/ BASEMENT FLOOR PLAN | |
| | DATE REVISED | FACILITIES ENGINEERING AND MANAGEMENT DEPARTMENT OF MILITARY AFFAIRS | COMMONWEALTH OF VIRGINIA |




BLDG 3901 AASF/ FIRST FLOOR PLAN

SCALE 1"=25'-0"

BLDG 3901 AASF/ FIRST FLOOR PLAN

FACILITIES ENGINEERING AND MANAGEMENT
DEPARTMENT OF MILITARY AFFAIRS

COMMONWEALTH OF VIRGINIA

DRAWING NO
A1

1 of 1

BLDG 3901 AASF/ SECOND FLOOR PLAN

SCALE 1=25'-0"

BLDG 3901 AASF/ SECOND FLOOR PLAN

DATE REVISED

FACILITIES ENGINEERING AND MANAGEMENT
DEPARTMENT OF MILITARY AFFAIRS

COMMONWEALTH OF VIRGINIA

DWG NO
A1

1 of 1

# APPENDIX C

# EPA DOCUMENT 700/B-92001 FORMS 1 AND 2

Sample Reinspection Form 1. Original AHERA Inspection Information Abstracted from the Management Plan



School SANDSTON ARMORY Building 3901 Date(s) of Original AHERA Inspection 2/16/2000

| Homogeneous sampling areas | | Material category | Asbestos content | Friability | AHERA assessment category (1-7, X, None) | Recorded locations of material for each assessment category | Response actions taken/ renovations/other comments |
|---|---|---|---|---|---|---|---|
| ID number | Material description | | | | | | |
| HA-1 | MASTIC ASSOCIATED WITH 12"X12" CREAM/WHITE SPECKS FLOOR TILE | TSI Surf. (Misc.) | Assumed (Yes) No | F (NF) X | NONE | ALPHA CO. TRAINING ROOM, 1st FL. HALL, 1st FL. GREY ROOM | O&M PLAN |
| HA-10 | CAULKING | TSI Surf. (Misc.) | Assumed (Yes) No | F (NF) X | NONE | 1st FL. OFFICE | O&M PLAN |
| HA-12 | JOINT COMPOUND | TSI Surf. (Misc.) | Assumed (Yes) No | F (NF) X | NONE | 1st & 2nd FL. HALLWAYS | O&M PLAN |
| HA-15 | LARGE DIAMETER 5' TANK | (TSI) Surf. Misc. | Assumed (Yes) No | (F) NF X | NONE | BOILER ROOM | REMOVED |
| HA-16 | SMALL DIAMETER 2' TANK | (TSI) Surf. Misc. | Assumed (Yes) No | (F) NF X | NONE | BOILER ROOM | O&M PLAN |
| HA-17 | DIESEL GENERATOR MUFFLER | (TSI) Surf. Misc. | Assumed (Yes) No | (F) NF X | NONE | BOILER ROOM | O&M PLAN |

Information abstracted by MICHAEL BAUM Date 8/25/11

Friability: F = friable, NF = nonfriable, X = not applicable (material is non-ACBM)

AHERA assessment category: 1 = Damaged or significantly damaged TSI ACBM, 2 = Damaged friable surfacing ACBM, 3 = Significantly damaged friable surfacing ACBM, 4 = Damaged or significantly damaged friable miscellaneous ACBM, 5 = ACBM with potential for damage, 6 = ACBM with potential for significant damage, 7 = Any remaining friable ACBM or friable suspected ACBM, X = not applicable (material is non-ACBM or nonfriable surfacing or miscellaneous material), None = No assessment category provided in original inspection.

Sample Reinspection Form 1. Original AHERA Inspection Information Abstracted from the Management Plan



School SANOSTEE ARMORY Building 3901 Date(s) of Original AHERA Inspection 2/16/2000

| Homogeneous sampling areas | | Material category | Asbestos content | Friability | AHERA assessment category (1-7, X, None) | Recorded locations of material for each assessment category | Response actions taken/ renovations/other comments |
|---|---|---|---|---|---|---|---|
| ID number | Material description | | | | | | |
| HA-18 | BOILER BREECHING | (TSI) Surf. Misc. | Assumed (Yes) No | (F) NF X | NONE | BOILER ROOM | O&M PLAN |
| HA-19 | HVAC DUCT WORK | (TSI) Surf. Misc. | Assumed (Yes) No | (F) NF X | NONE | BOILER ROOM | O&M PLAN |
| HA-22 | BLACK MASTIC ON ELBOWS | TSI Surf. (Misc.) | Assumed (Yes) No | F (NF) X | NONE | ABOVE CEILING IN MESS KITCHEN | O&M PLAN |
| | | TSI Surf. Misc. | Assumed Yes No | F NF X | | | |
| | | TSI Surf. Misc. | Assumed Yes No | F NF X | | | |
| | | TSI Surf. Misc. | Assumed Yes No | F NF X | | | |

Information abstracted by MICHAEL BAUM Date 8/25/11

Friability: F = friable, NF = nonfriable, X = not applicable (material is non-ACBM)

AHERA assessment category: 1 = Damaged or significantly damaged TSI ACBM, 2 = Damaged friable surfacing ACBM, 3 = Significantly damaged friable surfacing ACBM, 4 = Damaged or significantly damaged friable miscellaneous ACBM, 5 = ACBM with potential for damage, 6 = ACBM with potential for significant damage, 7 = Any remaining friable ACBM or friable suspected ACBM, X = not applicable (material is non-ACBM or nonfriable surfacing or miscellaneous material), None = No assessment category provided in original inspection.

Sample Reinspection Form 2. Reinspection of ACBM: Findings and Management Planner Recommendations



School SANDSTON ARMORY Building 3901 Date(s) of Reinspection 8/25/11

Homogeneous Sampling Area: Material Description MASTIC ASSOCIATED WITH 12"X12" CREAM FLOOR TILE (WITH BROWN SPECKS ID Number HA-1

| REINSPECTION FINDINGS FOR ACBM | | | | | | MANAGEMENT PLANNER RECOMMENDATIONS | | |
|---|---|---|---|---|---|---|---|---|
| Location(s) of ACBM by assessment category | Quantity | Friability | Assessment category (1-7, X) | Justification of assessment category | Change in assessment | Preventive measures, response actions, and initial/additional cleanings | Schedule: Begin | Schedule: Complete |
| FIRST FLOOR - MAIN STRUCTURE WALL & ADJACENT OFFICES | 6,400 SF | F (NF) | X | NON-FRIABLE MISCELLANEOUS | Yes (No) | CONTINUE O&M | CONTINUE | UNTIL MATERIAL IS REMOVED |
| | | F NF | | | Yes No | | | |
| | | F NF | | | Yes No | | | |

Were additional samples of this ACBM collected? Yes No

Date of management planner review: 9/28/2011

Inspector name MICHAEL BAUM

Inspector signature

Accreditation #/State 3303002651/VA

Expiration date 6/30/2012

Management planner name MICHAEL BAUM

Management planner signature

Accreditation #/State 3304001550/VA

Expiration date 7/31/2012

I, the LEA's Designated Person, have read and understood the recommendations made above: Date:

Sample Reinspection Form 2. Reinspection of ACBM: Findings and Management Planner Recommendations



School SANDSTON ARMORY Building 3901 Date(s) of Reinspection 8/25/11

Homogeneous Sampling Area: Material Description WHITE CAULKING ID Number HA-10

| REINSPECTION FINDINGS FOR ACBM | | | | | | MANAGEMENT PLANNER RECOMMENDATIONS | | |
|---|---|---|---|---|---|---|---|---|
| Location(s) of ACBM by assessment category | Quantity | Friability | Assessment category (1-7, X) | Justification of assessment category | Change in assessment | Preventive measures, response actions, and initial/additional cleanings | Schedule: Begin | Schedule: Complete |
| 1ST FLOOR OFFICE | 400 L.F. | F / NF | | N/A | Yes / No | NOT OBSERVED - MAY HAVE BEEN REMOVED. | N/A | N/A |
| | | F / NF | | | Yes / No | | | |
| | | F / NF | | | Yes / No | | | |

Were additional samples of this ACBM collected? Yes (No)

Date of management planner review: 9/28/2011

Inspector name MICHAEL BAUM

Inspector signature [signature]

Accreditation #/State 3303002651 / VA

Expiration date 6/30/2012

Management planner name MICHAEL BAUM

Management planner signature [signature]

Accreditation #/State 3304001550/VA

Expiration date 7/31/2012

I, the LEA's Designated Person, have read and understood the recommendations made above: _____ Date: _____

Sample Reinspection Form 2. Reinspection of ACBM: Findings and Management Planner Recommendations



School SANDSTON ARMORY Building 3901 Date(s) of Reinspection 8/25/11

Homogeneous Sampling Area: Material Description GRAY AND WHITE LARGE DIAMETER 5' TANK ID Number HA-15

| REINSPECTION FINDINGS FOR ACBM | | | | | | MANAGEMENT PLANNER RECOMMENDATIONS | | |
|---|---|---|---|---|---|---|---|---|
| Location(s) of ACBM by assessment category | Quantity | Friability | Assessment category (1-7, X) | Justification of assessment category | Change in assessment | Preventive measures, response actions, and initial/additional cleanings | Schedule: Begin | Schedule: Complete |
| BOILER ROOM | N/A | N/A F / NF | N/A | REMOVED | Yes / No | MATERIAL HAS BEEN REMOVED | N/A | N/A |
| | | F / NF | | | Yes / No | | | |
| | | F / NF | | | Yes / No | | | |

Were additional samples of this ACBM collected? Yes (No)

Date of management planner review: 9/28/2011

Inspector name MICHAEL BAUM

Inspector signature [signature]

Accreditation #/State 3303002651/VA

Expiration date 6/30/2012

Management planner name MICHAEL BAUM

Management planner signature [signature]

Accreditation #/State 3304001550/VA

Expiration date 7/31/2012

I, the LEA's Designated Person, have read and understood the recommendations made above: _____ Date: _____

Sample Reinspection Form 2. Reinspection of ACBM: Findings and Management Planner Recommendations



School SANDSTON ARMORY Building 3901 Date(s) of Reinspection 8/25/11

Homogeneous Sampling Area: Material Description GRAY AND WHITE SMALL DIAMETER 2' TANK ID Number WA-16

| REINSPECTION FINDINGS FOR ACBM | | | | | | MANAGEMENT PLANNER RECOMMENDATIONS | | |
|---|---|---|---|---|---|---|---|---|
| Location(s) of ACBM by assessment category | Quantity | Friability | Assessment category (1-7, X) | Justification of assessment category | Change in assessment | Preventive measures, response actions, and initial/additional cleanings | Schedule: Begin | Schedule: Complete |
| BOILER ROOM | 32A2 | (F) / NF | 5 | GOOD CONDITION BUT HAS POTENTIAL FOR DAMAGE | (Yes) / No | CONTINUE O&M | CONTINUE | UNTIL MATERIAL IS REMOVED |
| | | F / NF | | | Yes / No | | | |
| | | F / NF | | | Yes / No | | | |

Were additional samples of this ACBM collected? Yes (No)

Date of management planner review: 9/28/2011

Inspector name MICHAEL BAUM

Inspector signature [signature]

Accreditation #/State 3303002651/VA

Expiration date 6/30/2012

Management planner name MICHAEL BAUM

Management planner signature [signature]

Accreditation #/State 3304001550/VA

Expiration date 7/31/2012

I, the LEA's Designated Person, have read and understood the recommendations made above: _____ Date: _____

C-2

Sample Reinspection Form 2. Reinspection of ACBM: Findings and Management Planner Recommendations



School SANDSTON ARMORY Building 3901 Date(s) of Reinspection 8/25/11

Homogeneous Sampling Area: Material Description GRAY AND WHITE DIESEL GENERATOR MUFFLER ID Number HA-17

| REINSPECTION FINDINGS FOR ACBM | | | | | | MANAGEMENT PLANNER RECOMMENDATIONS | | |
|---|---|---|---|---|---|---|---|---|
| Location(s) of ACBM by assessment category | Quantity | Friability | Assessment category (1-7, X) | Justification of assessment category | Change in assessment | Preventive measures, response actions, and initial/additional cleanings | Schedule: Begin | Schedule: Complete |
| BOILER ROOM | 35 L.F. 16" DIAM. | (F) / NF | 5 | GOOD CONDITION BUT WAS POTENTIAL FOR DAMAGE | (Yes) / No | CONTINUE O&M | CONTINUE | UNTIL MATERIAL IS REMOVED |
| | | F / NF | | | Yes / No | | | |
| | | F / NF | | | Yes / No | | | |

Were additional samples of this ACBM collected? Yes (No)

Date of management planner review: 9/28/2011

Inspector name MICHAEL BAUM

Inspector signature [signature]

Accreditation #/State 3303002651/VA

Expiration date 6/30/2012

Management planner name MICHAEL BAUM

Management planner signature [signature]

Accreditation #/State 3304001550/VA

Expiration date 7/31/2012

I, the LEA's Designated Person, have read and understood the recommendations made above: _____ Date: _____

C-2

Sample Reinspection Form 2. Reinspection of ACBM: Findings and Management Planner Recommendations



School SANDSTON ARMORY Building 3901 Date(s) of Reinspection 8/25/11

Homogeneous Sampling Area: Material Description BOILER BREECHING - 16" DIAM. ID Number HA-18

| REINSPECTION FINDINGS FOR ACBM | | | | | | MANAGEMENT PLANNER RECOMMENDATIONS | | |
|---|---|---|---|---|---|---|---|---|
| Location(s) of ACBM by assessment category | Quantity | Friability | Assessment category (1-7, X) | Justification of assessment category | Change in assessment | Preventive measures, response actions, and initial/additional cleanings | Schedule: Begin | Schedule: Complete |
| BOILER ROOM | 30 L.F. | (F) / NF | 1 | DAMAGE OBSERVED AT 3 LOCATIONS | (Yes) / No | REPAIR DAMAGED AREAS. CONTINUE O&M | IMMED. | UNTIL MATERIAL IS REMOVED |
| | | F / NF | | | Yes / No | | | |
| | | F / NF | | | Yes / No | | | |

Were additional samples of this ACBM collected? Yes (No)

Date of management planner review: 9/28/2011

Inspector name MICHAEL RAUM

Inspector signature [signature]

Accreditation #/State 330300265! / VA

Expiration date 6/30/2012

Management planner name MICHAEL RAUM

Management planner signature [signature]

Accreditation #/State 3304001550/VA

Expiration date 7/31/2012

I, the LEA's Designated Person, have read and understood the recommendations made above: _____ Date: _____

C-2

Sample Reinspection Form 2. Reinspection of ACBM: Findings and Management Planner Recommendations



School SANDSTON ARMORY Building 3901 Date(s) of Reinspection 8/25/11

Homogeneous Sampling Area: Material Description GRAY AND WHITE HVAC DUCTWORK ID Number HA-19

| REINSPECTION FINDINGS FOR ACBM | | | | | | MANAGEMENT PLANNER RECOMMENDATIONS | | |
|---|---|---|---|---|---|---|---|---|
| Location(s) of ACBM by assessment category | Quantity | Friability | Assessment category (1-7, X) | Justification of assessment category | Change in assessment | Preventive measures, response actions, and initial/additional cleanings | Schedule: Begin | Schedule: Complete |
| BOILER ROOM | 40 L.F. | (F) NF | 1 | DAMAGE OBSERVED. | (Yes) No | REPAIR DAMAGE. CONTINUE O&M | IMMED. | UNTIL MATERIAL IS REMOVED |
| | | F NF | | | Yes No | | | |
| | | F NF | | | Yes No | | | |

Were additional samples of this ACBM collected? Yes (No)

Date of management planner review: 9/28/2011

Inspector name MICHAEL RAUM

Inspector signature [signature]

Accreditation #/State 3303002651/VA

Expiration date 6/30/2012

Management planner name MICHAEL RAUM

Management planner signature [signature]

Accreditation #/State 3304001550/VA

Expiration date 7/31/2012

I, the LEA's Designated Person, have read and understood the recommendations made above: _____ Date: _____

Sample Reinspection Form 2. Reinspection of ACBM: Findings and Management Planner Recommendations



School SANDSTON ARMORY Building 3901 Date(s) of Reinspection 8/25/11

Homogeneous Sampling Area: Material Description BLACK MASTIC ON DIPE ELBOWS ID Number HA-22

| REINSPECTION FINDINGS FOR ACBM | | | | | | MANAGEMENT PLANNER RECOMMENDATIONS | | |
|---|---|---|---|---|---|---|---|---|
| Location(s) of ACBM by assessment category | Quantity | Friability | Assessment category (1-7, X) | Justification of assessment category | Change in assessment | Preventive measures, response actions, and initial/additional cleanings | Schedule: Begin | Schedule: Complete |
| ABOVE CEILING IN MESS HALL, KITCHEN | 13 ea. | F (NF) | X | NON FRIABLE MISCELLANEOUS | Yes (No) | CONTINUE O&M | CONTINUE | UNTIL MATERIAL IS REMOVED |
| | | F NF | | | Yes No | | | |
| | | F NF | | | Yes No | | | |

Were additional samples of this ACBM collected? Yes (No)

Date of management planner review: 9/28/2011

Inspector name MICHAEL BAUM

Inspector signature

Accreditation #/State 3303002651/VA

Expiration date 6/30/2012

Management planner name MICHAEL BAUM

Management planner signature

Accreditation #/State 3304001550/VA

Expiration date 7/31/2012

I, the LEA's Designated Person, have read and understood the recommendations made above: _____ Date: _____

Sample Reinspection Form 2. Reinspection of ACBM: Findings and Management Planner Recommendations



School SANDSTON ARMORY Building 3901 Date(s) of Reinspection 8/25/11

Homogeneous Sampling Area: Material Description ASBESTOS CEMENT-BOARD (TRANSITE) FLAT WALL PANELS ID Number HA-26

NOTE: THIS MATERIAL WAS NOT IDENTIFIED IN PREVIOUS INSPECTION. PRESUMED TO CONTAIN ASBESTOS.

| REINSPECTION FINDINGS FOR ACBM | | | | | | MANAGEMENT PLANNER RECOMMENDATIONS | | |
|---|---|---|---|---|---|---|---|---|
| Location(s) of ACBM by assessment category | Quantity | Friability | Assessment category (1-7, X) | Justification of assessment category | Change in assessment | Preventive measures, response actions, and initial/additional cleanings | Schedule: Begin | Schedule: Complete |
| FIRST AND SECOND FLOOR WALLS | 2,480 s.f. | F (NF) | X | NON-FRIABLE MISCELLANEOUS | Yes (No) | PLACE UNDER O&M PLAN | IMMED. | UNTIL MATERIAL IS REMOVED |
| | | F NF | | | Yes No | | | |
| | | F NF | | | Yes No | | | |

Were additional samples of this ACBM collected? Yes (No)

Date of management planner review: 9/28/2011

Inspector name MICHAEL BAUM

Inspector signature [signature]

Accreditation #/State 3303002651/VA

Expiration date 6/30/2012

Management planner name MICHAEL BAUM

Management planner signature [signature]

Accreditation #/State 3304001550/VA

Expiration date 7/31/2012

I, the LEA's Designated Person, have read and understood the recommendations made above: _____ Date: _____

C-2

SINCE 1881

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# ASBESTOS REINSPECTION REPORT

**SANDSTON ARMORY – BUILDING 3903**
**700 Portugee Road**
**Sandston, VA 23150**

Prepared For:
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Department of Military Affairs
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Prepared By:
Froehling & Robertson, Inc.
3015 Dumbarton Road
Richmond, Virginia 23228

F&R Project Number 68N-0510

September 29, 2011

Prepared By:

Michael Baum
Industrial Hygienist

Reviewed By:

Herman Garcia
Senior Project Manager

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**1.0 Introduction ..... 1**
**2.0 Methodology ..... 1**
**3.0 Reporting ..... 2**
**4.0 Limitations ..... 2**

**APPENDICES**

Appendix A – Modified ITC Inspection Report and Reinspection Table

Appendix B – Site Drawing

Appendix C – EPA Document 700/B-92001 Forms 1 and 2

## 1.0 Introduction

Froehling and Robertson (F&R) was contracted by the Department of Military Affairs to perform a limited, non-destructive asbestos reinspection of Sandston Armory Building 3903, located at 700 Portugee Road, Sandston, Virginia. The reinspection was performed by Commonwealth of Virginia licensed Asbestos Inspector and Management Planner, Mr. Michael Baum (VA Inspector License #3303 002651, VA Management Planner License #3304 001550), on August 25, 2011. The structure was occupied at the time of the survey. The survey was conducted for the purpose of reassessing the presence or condition of known asbestos-containing materials inside the structure.

The scope of the asbestos reinspection of Sandston Armory Building 3903 consisted of the following items only:

- Review the report of a previous asbestos inspection conducted of the Armory by Mr. James Madison of the Industrial Training Company (ITC) on February 17, 2000.

- Visually survey asbestos-containing materials (ACMs) identified inside the structure in the previous inspection report, noting their presence or absence, and assessing their current condition. Materials on the exterior of the structure were not included in this survey.

- If additional suspect materials are identified that were not sampled in the previous surveys, contact Mr. James Williams of the Department of Military Affairs to determine whether to sample those materials.

- Document the reinspection results by recording changes on the previous inspection report, and by utilizing EPA document 700/B-92001 Forms 1 and 2.

Notes:

1. F&R was furnished with an electronic copy of the report of a previous asbestos inspection conducted of the Armory by Mr. James Madison of the Industrial Training Company (ITC) on February 17, 2000. However, the electronic copy did not contain Sample Location Drawings, Laboratory Results or Photographs. As a result, assumptions have been made by F&R regarding locations of previously identified asbestos-containing materials, locations of previous samples collected, and the physical appearance of certain suspect materials.
2. The following areas were inaccessible for assessment during this survey: None

## 2.0 Methodology

This project was a non-invasive visual reinspection and sampling for suspect ACM. If additional suspect materials were identified and sampling of such materials was approved by Mr. Williams, then sampling was conducted at the above referenced site. When samples were collected, such samples were collected in general accordance with EPA-AHERA protocols and submitted under chain of custody to Environmental Hazards Laboratory, LLC (EHS) located in Richmond, Virginia, for analysis. EHS is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) to analyze suspect asbestos-containing bulk materials. F&R was instructed by Mr. Williams not to presume as ACBM suspect materials that were not sampled during the original survey.

**No additional samples were authorized to be collected during this survey.**

## 3.0 Reporting

Results of the reinspection have been presented in the modified ITC report presented in Appendix A. Deletion of information from the previous report has been indicated by striking through the information to be deleted. Addition of information to the previous report has been indicated by red lettering in Calibri font.

EPA document 700/B-92001 Forms 1 and 2 for each identified ACM have been presented in Appendix B.

## 4.0 Limitations

This report has been prepared for the exclusive use by the Department of Military Affairs and its associates. This service was performed in accordance with generally accepted environmental practices. No other warranty, expressed or implied, is made.

Our conclusions and recommendations are based, in part, upon information provided to us by others and on our site observations. We have not verified the completeness or accuracy of the information provided by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards. During F&R's non-invasive inspection, accessible areas were visually surveyed for the presence of suspected ACM. Inaccessible areas, such as behind solid walls or above solid ceilings, were not surveyed and therefore suspected ACM may be present in those areas. Areas inspected for the above-referenced materials were limited to those designated by the client.

During this study, suspect material samples may have been analyzed for asbestos. As with any similar survey of this nature, actual conditions exist only at the precise locations from which suspect samples were collected. Certain inferences are based on the results of this sampling and related testing to form a professional opinion of conditions in areas beyond those from which the samples were collected. No other warranty, expressed or implied, is made.

Under this scope of services, F&R assumes no responsibility regarding response actions (e.g. O&M Plans, Encapsulation, Abatement, Removal, Notifications, etc.) initiated as a result of these findings. F&R assumes no liability for the duties and responsibilities of the Client with respect to compliance with these regulations. Compliance with regulations is the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, whichever is more stringent. All abatement activities or response actions should be performed by appropriately qualified and licensed-personnel and/or companies, as warranted.

Froehling & Robertson, Inc. by virtue of providing the services described in this report, does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that may present a potential danger to public health, safety, or the environment. The client agrees to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the

environment. The contents of the report should not be construed in any way as a recommendation to purchase, sell, or develop the project site.

## APPENDIX A

## MODIFIED ITC INSPECTION REPORT AND REINSPECTION TABLE

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Executive Summary

Methodology and Analysis

Results

Recommendations

Disclaimer

Appendix 1 - Summary of Samples

Appendix 2 - Sample Location Diagram

Appendix 3 - Laboratory Results

Appendix 4 - Photographs

Appendix 5 - Summary of Qualifications

# EXECUTIVE SUMMARY

The Industrial Training Company (ITC) was contracted by Environmental Resource Management (ERM) to conduct an asbestos inspection of the Sandston AASF Building 3903 Armory. The armory is located at in Sandston, Virginia. On February 17, 2000, the armory was inspected by Mr. James A. Madison (Virginia Asbestos Inspector License # 3303-002174) for the presence of asbestos containing building materials (ACBM). The inspection was limited to asbestos that was accessible through non-destructive methods and did not identify asbestos containing material located within walls, concrete decks, subfloors, chases or otherwise generally inaccessible areas. The inspection also excluded electrical equipment (wires, junction boxes, etc.).

Sandston Armory Building 3903 was reinspected by Commonwealth of Virginia licensed Asbestos Inspector and Management Planner, Mr. Michael Baum (VA Inspector License #3303 002651, VA Management Planner License #3304 001550), on August 25, 2011. The structure was occupied at the time of the survey. The survey was conducted for the purpose of reassessing the presence or condition of known asbestos-containing materials inside the structure.

A total of 30 suspect materials were collected and forwarded for analysis to Scientific Laboratories, Inc., located at 13635 Genito Road, Richmond, Virginia. In some instances, samples were divided into distinctive layers for regulatory and analytical purposes (i.e floor tile and mastic). Also, in some situations the laboratory was asked to implement a "Positive Stop Procedure". According to this method, the laboratory identified at least one positive sample within the group and assumed all other samples of the same material to contain asbestos also. The laboratory analyzed a total of 34 samples. The bulk samples were analyzed via Polarized Light Microscopy (PLM) using the EPA Interim Method for the Determination of Asbestos in Bulk Samples (EPA-600/R-93/116). Suspect material analyzed and found to contain greater than one percent asbestos is considered to be an ACBM.

The inspection and subsequent analysis determined the following materials to be ACBM:

- The 9"x 9" light brown floor tile with white streaks and associated black mastic located in the supply office. Note: This material was observed to be still present in good condition.
- The white interior window glazing sampled at the work shop and union office. Note: This material was observed to be still present in significantly damaged condition.

The interior window glazing was observed to be significantly damaged and friable. Immediate removal of this material is recommended. All of the other ACBM was observed to be in good ~~is in fair~~ condition and no other immediate action is required at this time. Please refer to the Operations and Maintenance Plan (O & M) on how to properly manage the ACM.

# METHODOLOGY AND ANALYSIS

The inspection consisted of a preliminary walk-through of the building to identify suspect materials. The suspect materials were grouped into homogeneous areas and sampled in accordance with the Environmental Protection Agency's (EPA) "Asbestos Hazard Emergency Response Act" (AHERA). Assessments were made to determine the condition of the material. In some circumstances, upon observation of the material, a determination was made that the material was non-suspect and assumed to be asbestos-free. When this assumption could not be made, samples were secured with precautions being taken to avoid unnecessary damage to the materials. Roofing materials were excluded from the inspection.

The samples were forwarded for analysis to Scientific Laboratories, Inc., a Virginia licensed laboratory, located at 13635 Genito Road, Richmond, Virginia. The samples were analyzed via Polarized Light Microscopy (PLM) using the EPA Interim Method for the Determination of Asbestos in Bulk Samples (EPA-600/R-93/116).

This inspection was limited to suspect material accessible through non-destructive methods. It does not identify asbestos-containing material located within walls, concrete decks, sub-floors, chases or otherwise generally inaccessible areas. Also, sample locations indicate specific locations only where materials were found and sampled.

# ASBESTOS REINSPECTION TABLE

**Building:** Sandston Armory Building 3903

**Inspection Date:** February 17, 2000
**Reinspection Date:** August 25, 2011

| Material | Location | Amount | AHERA Assessment Category | Sample Number(s) | % Asbestos | Condition/ Friability (2000 Insp.) | Condition/ Friability (2011 Insp.) | Hazard Ranking (2000 Insp.) | Hazard Ranking (2011 Insp.) |
|---|---|---|---|---|---|---|---|---|---|
| 9" x 9" Light brown Floor tile w/ white streaks and black mastic | Supply office | 244 $ft^2$ | X | 26-S-AASF-86 26-S-AASF-86M | 10% chrysotile 5% chrysotile | Fair/ Not Given | Good/ Non-Friable | 2 | 2 |
| Interior window glazing | Work shop, Union office | 300 linear ft. | 4 | 26-S-AASF-104 | 2% chrysotile | Fair/ Not Given | Significantly Damaged/ Friable | 2 | 7 |

**Assessment Categories:**
1 = Damaged or Significantly Damaged TSI ACBM
2 = Damaged Friable Surfacing ACM
3 = Significantly Damaged Friable Surfacing ACBM
4 = Damaged or Significantly Damaged Friable Miscellaneous ACBM
5 = ACBM With Potential For Damage
6 = ACBM With Potential For Significant Damage
7 = Any Remaining Friable ACBM or Friable Suspected ACBM
X = Not Applicable (material is nonfriable, and does not require assessment)
N/A = Not Assessed (material was inaccessible or was not included in the scope of work)

**Hazard Rankings:**
7 = Friable ACBM With Significant Damage
6 = Damaged ACBM With Potential for Significant Damage
5 = Damaged ACBM With Moderate Potential for Further Damage
4 = Damaged ACBM With Low Potential for Further Damage
3 = ACBM With Potential for Significant Damage
2 = ACBM With Moderate Potential for Damage
1 = ACBM With Low Potential for Damage
N/R = Not Ranked (material was inaccessible or was not included in the scope of work)

# RESULTS

**Sandston AASF Building 3903 Armory**
**Sandston, VA**

| Material | Location | Amount | Condition | Hazard Ranking | Sample Number(s) | % Asbestos |
|---|---|---|---|---|---|---|
| 9” x 9” Light brown Floor tile w/ white streaks and black mastic | Supply office | 244 $ft^2$ | Fair | 2 | 26-S-AASF-86<br>26-S-AASF-86M | 10% chrysotile<br>5% chrysotile |
| Interior window glazing | Work shop, Union office | 300 linear ft. | Fair | 2 | 26-S-AASF-104 | 2% chrysotile |

**Hazard ranking: #1=least hazardous, #7=most hazardous**

# RECOMMENDATIONS

The interior window glazing was observed to be significantly damaged and friable. Immediate removal of this material is recommended. All of the other ACBM was observed to be in good ~~is in fair~~ condition.

If any of the ACBM will be disturbed through maintenance activities, becomes damaged or otherwise changes in condition, the state wide Virginia Department of Military Affair's Operations and Maintenance Plan (O&M) should be consulted to determine proper procedures on managing the material. The O&M outlines procedures to properly manage the ACBM in place, how to protect employees from asbestos health risk, and how to respond to asbestos emergencies.

# DISCLAIMER

This inspection and report is written for and intended for the use of the Virginia Department of Military Affairs only. The Industrial Training Company is not responsible nor will be held liable for any interpretations made, opinions formed, or conclusions drawn by any third party as a result of examining the lab results, inspection results or this report. Any interpretations, opinions, and conclusions will be those made, formed, and drawn solely by that third party.

The inspection of the Sandston AASF Building 3903 Armory located in Sandston,Virginia was performed by an asbestos inspector properly trained and licensed in the Commonwealth of Virginia to perform asbestos inspections. There were no available records pertaining to past inspections or response actions. Such information, if it had been available and qualified for use, would have been used to both plan and supplement the inspection when feasible. Every attempt was made to gain access to all areas or to assess representative materials entering or leaving such areas. The Industrial Training Company accepts no liability nor makes any claims regarding ACBM which was not accessible during the inspection process if such material was located behind or within walls, concrete decks, sub-floors, chases, or was otherwise generally inaccessible without destructive sampling.

Estimates of the amounts of ACBM in this report are field estimates only and can vary in accuracy. They should not replace accurate measurements made in the actual design of response action projects and contracts. Removal costs can vary, depending upon time of year, response time required, contractor availability, and many other factors. Prior to taking response actions accurate estimates should be obtained from a licensed contractor.

# APPENDIX B

# SITE DRAWING

Notes:

- Asbestos Detected
- No Asbestos Detected
- Not Analyzed/Positive Stop

*Sample numbers located next to the above symbols.




BLDG 3903 AASF/ FLOOR PLAN
NOT TO SCALE

SANDSTON BUILDING 3903

FACILITIES ENGINEERING AND MANAGEMENT
DEPARTMENT OF MILITARY AFFAIRS
COMMONWEALTH OF VIRGINIA

DWG NO A1

1 of 1

# APPENDIX C

# EPA DOCUMENT 700/B-92001 FORMS 1 AND 2

Sample Reinspection Form 1. Original AHERA Inspection Information Abstracted from the Management Plan



School SANDSTON ARMORY Building 3903 Date(s) of Original AHERA Inspection 2/17/2000

| Homogeneous sampling areas | | Material category | Asbestos content | Friability | AHERA assessment category (1-7, X, None) | Recorded locations of material for each assessment category | Response actions taken/ renovations/other comments |
|---|---|---|---|---|---|---|---|
| ID number | Material description | | | | | | |
| HA-2 | 9"X9" LIGHT BROWN FLOOR TILE WITH WHITE STREAKS AND ASSOCIATED MASTIC | TSI Surf. (Misc.) | Assumed (Yes) No | F (NF) X | NONE | SUPPLY OFFICE | INCLUDED IN O&M |
| HA-8 | INTERIOR WINDOW GLAZING | TSI Surf. (Misc.) | Assumed (Yes) No | (F) NF X | NONE | WORKSHOP, UNION OFFICE | INCLUDED IN O&M |
| | | TSI Surf. Misc. | Assumed Yes No | F NF X | | | |
| | | TSI Surf. Misc. | Assumed Yes No | F NF X | | | |
| | | TSI Surf. Misc. | Assumed Yes No | F NF X | | | |
| | | TSI Surf. Misc. | Assumed Yes No | F NF X | | | |

Information abstracted by MICHAEL BAUM Date 8/25/11

Friability: F = friable, NF = nonfriable, X = not applicable (material is non-ACBM)

AHERA assessment category: 1 = Damaged or significantly damaged TSI ACBM, 2 = Damaged friable surfacing ACBM, 3 = Significantly damaged friable surfacing ACBM, 4 = Damaged or significantly damaged friable miscellaneous ACBM, 5 = ACBM with potential for damage, 6 = ACBM with potential for significant damage, 7 = Any remaining friable ACBM or friable suspected ACBM, X = not applicable (material is non-ACBM or nonfriable surfacing or miscellaneous material), None = No assessment category provided in original inspection.

Sample Reinspection Form 2. Reinspection of ACBM: Findings and Management Planner Recommendations



School SANDSTON ARMORY Building 3903 Date(s) of Reinspection 8/25/11

Homogeneous Sampling Area: Material Description 9"x9" LIGHT BROWN FLOOR TILE WITH WHITE STREAKS AND ASSOCIATED MASTIC ID Number HA-2

| REINSPECTION FINDINGS FOR ACBM | | | | | | MANAGEMENT PLANNER RECOMMENDATIONS | | |
|---|---|---|---|---|---|---|---|---|
| Location(s) of ACBM by assessment category | Quantity | Friability | Assessment category (1-7, X) | Justification of assessment category | Change in assessment | Preventive measures, response actions, and initial/additional cleanings | Schedule: Begin | Schedule: Complete |
| SUPPLY OFFICE | 244 s.f. | F (NF) | X | NON-FRIABLE MISCELLANEOUS | Yes (No) | CONTINUE O&M | CONTINUE | UNTIL MATERIAL IS REMOVED |
| | | F NF | | | Yes No | | | |
| | | F NF | | | Yes No | | | |

Were additional samples of this ACBM collected? Yes (No)

Date of management planner review: 9/28/2011

Inspector name MICHAEL RAUM

Inspector signature

Accreditation #/State 3303002651/VA

Expiration date 6/30/2012

Management planner name MICHAEL RAUM

Management planner signature

Accreditation #/State 3304001550/VA

Expiration date 7/31/2012

I, the LEA's Designated Person, have read and understood the recommendations made above: _____ Date: _____

C-2

Sample Reinspection Form 2. Reinspection of ACBM: Findings and Management Planner Recommendations



School SANDSTON ARMORY Building 3903 Date(s) of Reinspection 8/25/11

Homogeneous Sampling Area: Material Description INTERIOR WINDOW GLAZING ID Number HA-8

| REINSPECTION FINDINGS FOR ACBM | | | | | | MANAGEMENT PLANNER RECOMMENDATIONS | | |
|---|---|---|---|---|---|---|---|---|
| Location(s) of ACBM by assessment category | Quantity | Friability | Assessment category (1-7, X) | Justification of assessment category | Change in assessment | Preventive measures, response actions, and initial/additional cleanings | Schedule: Begin | Schedule: Complete |
| THROUGHOUT | 300 L.F. | (F) / NF | 4 | SIGNIFICANTLY DAMAGED FRIABLE MISCELLANEOUS MATERIAL | (Yes) / No | REMOVE. | IMMED. | WITHIN 3 MONTHS |
| | | F / NF | | | Yes / No | | | |
| | | F / NF | | | Yes / No | | | |

Were additional samples of this ACBM collected? Yes (No)

Date of management planner review: 9/28/2011

Inspector name MICHAEL BAUM

Inspector signature [signature]

Accreditation #/State 3303002651/VA

Expiration date 6/30/2012

Management planner name MICHAEL BAUM

Management planner signature [signature]

Accreditation #/State 3304001550/VA

Expiration date 7/31/2012

I, the LEA's Designated Person, have read and understood the recommendations made above: _____ Date: _____

C-2

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# ASBESTOS REINSPECTION REPORT

**SANDSTON ARMORY – BUILDING 3904**
**700 Portugee Road**
**Sandston, VA 23150**

Prepared For:
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james.williams102@us.army.mil

Prepared By:
Froehling & Robertson, Inc.
3015 Dumbarton Road
Richmond, Virginia 23228

F&R Project Number 68N-0510

September 29, 2011

Prepared By:

Michael Baum
Industrial Hygienist

Reviewed By:

Herman Garcia
Senior Project Manager

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**4.0 Limitations ..... 2**

**APPENDICES**

Appendix A – Modified ITC Inspection Report and Reinspection Table

Appendix B – Site Drawing

Appendix C – EPA Document 700/B-92001 Forms 1 and 2

## 1.0 Introduction

Froehling and Robertson (F&R) was contracted by the Department of Military Affairs to perform a limited, non-destructive asbestos reinspection of Sandston Armory Building 3904, located at 700 Portugee Road, Sandston, Virginia. The reinspection was performed by Commonwealth of Virginia licensed Asbestos Inspector and Management Planner, Mr. Michael Baum (VA Inspector License #3303 002651, VA Management Planner License #3304 001550), on August 25, 2011. The structure was occupied at the time of the survey. The survey was conducted for the purpose of reassessing the presence or condition of known asbestos-containing materials inside the structure.

The scope of the asbestos reinspection of Sandston Armory Building 3904 consisted of the following items only:

- Review the report of a previous asbestos inspection conducted of the Armory by Mr. James Madison of the Industrial Training Company (ITC) on February 18, 2000.

- Visually survey asbestos-containing materials (ACMs) identified inside the structure in the previous inspection report, noting their presence or absence, and assessing their current condition. Materials on the exterior of the structure were not included in this survey.

- If additional suspect materials are identified that were not sampled in the previous surveys, contact Mr. James Williams of the Department of Military Affairs to determine whether to sample those materials.

- Document the reinspection results by recording changes on the previous inspection report, and by utilizing EPA document 700/B-92001 Forms 1 and 2.

Notes:

1. F&R was furnished with an electronic copy of the report of a previous asbestos inspection conducted of the Armory by Mr. James Madison of the Industrial Training Company (ITC) on February 18, 2000. However, the electronic copy did not contain Sample Location Drawings, Laboratory Results or Photographs. As a result, assumptions have been made by F&R regarding locations of previously identified asbestos-containing materials, locations of previous samples collected, and the physical appearance of certain suspect materials.
2. The following areas were inaccessible for assessment during this survey: None

## 2.0 Methodology

This project was a non-invasive visual reinspection and sampling for suspect ACM. If additional suspect materials were identified and sampling of such materials was approved by Mr. Williams, then sampling was conducted at the above referenced site. When samples were collected, such samples were collected in general accordance with EPA-AHERA protocols and submitted under chain of custody to Environmental Hazards Laboratory, LLC (EHS) located in Richmond, Virginia, for analysis. EHS is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) to analyze suspect asbestos-containing bulk materials. F&R was instructed by Mr. Williams not to presume as ACBM suspect materials that were not sampled during the original survey.

**No additional samples were authorized to be collected during this survey.**

## 3.0 Reporting

Results of the reinspection have been presented in the modified ITC report presented in Appendix A. Deletion of information from the previous report has been indicated by striking through the information to be deleted. Addition of information to the previous report has been indicated by red lettering in Calibri font.

EPA document 700/B-92001 Forms 1 and 2 for each identified ACM have been presented in Appendix B.

## 4.0 Limitations

This report has been prepared for the exclusive use by the Department of Military Affairs and its associates. This service was performed in accordance with generally accepted environmental practices. No other warranty, expressed or implied, is made.

Our conclusions and recommendations are based, in part, upon information provided to us by others and on our site observations. We have not verified the completeness or accuracy of the information provided by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards. During F&R's non-invasive inspection, accessible areas were visually surveyed for the presence of suspected ACM. Inaccessible areas, such as behind solid walls or above solid ceilings, were not surveyed and therefore suspected ACM may be present in those areas. Areas inspected for the above-referenced materials were limited to those designated by the client.

During this study, suspect material samples may have been analyzed for asbestos. As with any similar survey of this nature, actual conditions exist only at the precise locations from which suspect samples were collected. Certain inferences are based on the results of this sampling and related testing to form a professional opinion of conditions in areas beyond those from which the samples were collected. No other warranty, expressed or implied, is made.

Under this scope of services, F&R assumes no responsibility regarding response actions (e.g. O&M Plans, Encapsulation, Abatement, Removal, Notifications, etc.) initiated as a result of these findings. F&R assumes no liability for the duties and responsibilities of the Client with respect to compliance with these regulations. Compliance with regulations is the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, whichever is more stringent. All abatement activities or response actions should be performed by appropriately qualified and licensed-personnel and/or companies, as warranted.

Froehling & Robertson, Inc. by virtue of providing the services described in this report, does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that may present a potential danger to public health, safety, or the environment. The client agrees to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the

environment. The contents of the report should not be construed in any way as a recommendation to purchase, sell, or develop the project site.

## APPENDIX A

## MODIFIED ITC INSPECTION REPORT AND REINSPECTION TABLE

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# EXECUTIVE SUMMARY

The Industrial Training Company (ITC) was contracted by Environmental Resource Management (ERM) to conduct an asbestos inspection of the Sandston A.A.S.F. 3904 Flight Operations. The A.A.S.F. is located in Sandston, Virginia. On February 18, 2000, the A.A.S.F. was inspected by Mr. James A. Madison (Virginia Asbestos Inspector License # 3303-002174) for the presence of asbestos containing building materials (ACBM). The inspection was limited to asbestos that was accessible through non-destructive methods and did not identify asbestos containing material located within walls, concrete decks, subfloors, chases or otherwise generally inaccessible areas. The inspection also excluded electrical equipment (wires, junction boxes, etc.).

Sandston Armory Building 3904 was reinspected by Commonwealth of Virginia licensed Asbestos Inspector and Management Planner, Mr. Michael Baum (VA Inspector License #3303 002651, VA Management Planner License #3304 001550), on August 25, 2011. The structure was occupied at the time of the survey. The survey was conducted for the purpose of reassessing the presence or condition of known asbestos-containing materials inside the structure.

A total of 43 suspect materials were collected and forwarded for analysis to Scientific Laboratories, Inc., located at 13635 Genito Road, Richmond, Virginia. In some instances, samples were divided into distinctive layers for regulatory and analytical purposes (i.e floor tile and mastic). Also, in some situations the laboratory was asked to implement a "Positive Stop Procedure". According to this method, the laboratory identified at least one positive sample within the group and assumed all other samples of the same material to contain asbestos also. The laboratory analyzed a total of 42 samples. The bulk samples were analyzed via Polarized Light Microscopy (PLM) using the EPA Interim Method for the Determination of Asbestos in Bulk Samples (EPA-600/R-93/116). Suspect material analyzed and found to contain greater than one percent asbestos is considered to be an ACBM.

The inspection and subsequent analysis determined the following materials to be ACBM:

- ~~White exterior window and door caulking~~

- 12" x 12" white/black/brown floor tile located in the main hall, rear hall and training areas. This material was observed to remain in good condition.

- 12" x 12" white with beige specks floor tile located in the copier nook (formerly mail room). This material was observed to remain in good condition.

All the ACBM is in good condition and no immediate response actions are recommended at this time. Please refer to the Operations and Maintenance Plan on how to properly manage the ACM.

# METHODOLOGY AND ANALYSIS

The inspection consisted of a preliminary walk-through of the building to identify suspect materials. The suspect materials were grouped into homogeneous areas (HGAs). An (HGA) is material that is alike in color, texture, date of installation and appears to be identical in every other aspect. Materials fall into three seperate categories: (1) Thermal System Insulation (TSI): material that controls heat and/or condensations (2) Surfacing Material (Surf): material that is trowelled or sprayed on a surface and (3) Miscellaneous Material (Misc): any material that is not TSI or Surfacing. The materials were sampled in accordance with the Environmental Protection Agency's (EPA) "Asbestos Hazard Emergency Response Act" (AHERA). Sample locations identified by their number and demarcated on the sample location drawing. Assessments were made to determine the condition of the material. In some circumstances, upon observation of the material, a determination was made that the material was non-suspect and assumed to be asbestos-free. When this assumption could not be made, samples were secured with precautions being taken to avoid unnecessary damage to the materials. Roofing materials were excluded from the inspection.

The samples were forwarded for analysis to Scientific Laboratories, Inc., a Virginia licensed laboratory, located at 13635 Genito Road, Richmond, Virginia. The samples were analyzed via Polarized Light Microscopy (PLM) using the EPA Interim Method for the Determination of Asbestos in Bulk Samples (EPA-600/R-93/116).

This inspection was limited to suspect material accessible through non-destructive methods. It does not identify asbestos-containing material located within walls, concrete decks, sub-floors, chases or otherwise generally inaccessible areas. Also, sample locations indicate specific locations only where materials were sampled.

# ASBESTOS REINSPECTION TABLE

**Building:** Sandston Armory Building 3904

**Inspection Date:** February 18, 2000
**Reinspection Date:** August 25, 2011

| Material | Location | Amount | AHERA Assessment Category | Sample Number(s) | % Asbestos | Condition/ Friability (2000 Insp.) | Condition/ Friability (2011 Insp.) | Hazard Ranking (2000 Insp.) | Hazard Ranking (2011 Insp.) |
|---|---|---|---|---|---|---|---|---|---|
| White, black, and brown 12" x12" floor tile | Main hall, Rear hall, Training area | 1300 $ft^2$ | X | 26-S-AASF-142 | 3% chrysotile | Good/ Not Given | Good/ Non-Friable | 1 | 1 |
| White w/ beige specks 12" x 12" floor tile | Mail room | 4 $ft^2$ | X | 26-S-AASF-154 | 2% chrysotile | Good/ Not Given | Good/ Non-Friable | 1 | 1 |

**Assessment Categories:**
1 = Damaged or Significantly Damaged TSI ACBM
2 = Damaged Friable Surfacing ACM
3 = Significantly Damaged Friable Surfacing ACBM
4 = Damaged or Significantly Damaged Friable Miscellaneous ACBM
5 = ACBM With Potential For Damage
6 = ACBM With Potential For Significant Damage
7 = Any Remaining Friable ACBM or Friable Suspected ACBM
X = Not Applicable (material is nonfriable, and does not require assessment)
N/A = Not Assessed (material was inaccessible or was not included in the scope of work)

**Hazard Rankings:**
7 = Friable ACBM With Significant Damage
6 = Damaged ACBM With Potential for Significant Damage
5 = Damaged ACBM With Moderate Potential for Further Damage
4 = Damaged ACBM With Low Potential for Further Damage
3 = ACBM With Potential for Significant Damage
2 = ACBM With Moderate Potential for Damage
1 = ACBM With Low Potential for Damage
N/R = Not Ranked (material was inaccessible or was not included in the scope of work)

# RESULTS

**Sandston A.A.S.F.**
**3904 Flight Operations**
**Sandston ,VA**

| Material | Location | Amount | Condition | Hazard Ranking | Sample Number(s) | % Asbestos |
|---|---|---|---|---|---|---|
| White, black, and brown 12” x12” floor tile | Main hall, Rear hall, Training area | 1300 $ft^2$ | Good | 1 | 26-S-AASF-142 | 3% chrysotile |
| White w/ beige specks 12” x 12” floor tile | Mail room | 10 $ft^2$ | Good | 1 | 26-S-AASF-154 | 2% chrysotile |

**Hazard ranking: #1=least hazardous, #7=most hazardous**

# RECOMMENDATIONS

All the ACBM is in good condition. No immediate responses are recommended at this time.

If any of the ACBM will be disturbed through maintenance activities, becomes damaged or otherwise changes in condition, the state wide Virginia Department of Military Affair's Operations and Maintenance Plan (O&M) should be consulted to determine proper procedures on managing the material. The O&M outlines procedures to properly manage the ACBM in place, how to protect employees from asbestos health risk, and how to respond to asbestos emergencies.

# DISCLAIMER

This inspection and report is written for and intended for the use of the Virginia Department of Military Affairs only. The Industrial Training Company is not responsible nor will be held liable for any interpretations made, opinions formed, or conclusions drawn by any third party as a result of examining the lab results, inspection results or this report. Any interpretations, opinions, and conclusions will be those made, formed, and drawn solely by that third party.

The inspection of the Sandston A.A.S.F 3904 Flight Operations located in Sandston, Virginia was performed by an asbestos inspector properly trained and licensed in the Commonwealth of Virginia to perform asbestos inspections. There were available records pertaining to past inspections or response actions. This information was available and used to both plan and supplement the inspection when feasible. Every attempt was made to gain access to all areas or to assess representative materials entering or leaving such areas. The Industrial Training Company accepts no liability nor makes any claims regarding ACBM which was not accessible during the inspection process if such material was located behind or within walls, concrete decks, sub-floors, chases, or was otherwise generally inaccessible without destructive sampling.

Estimates of the amounts of ACBM in this report are field estimates only and can vary in accuracy. They should not replace accurate measurements made in the actual design of response action projects and contracts. Removal costs can vary, depending upon time of year, response time required, contractor availability, and many other factors. Prior to taking response actions accurate estimates should be obtained from a licensed contractor.

# APPENDIX B

# SITE DRAWING

Notes:

- Asbestos Detected
- No Asbestos Detected
- Not Analyzed/Positive Stop

*Sample numbers located next to the above symbols.

A1 / 1 BUILDING 3904 FLOOR LAYOUT

APPROXIMATE SCALE = 1" = 45'

SANDSTON BUILDING 3904

FACILITIES ENGINEERING AND MANAGEMENT
DEPARTMENT OF MILITARY AFFAIRS
COMMONWEALTH OF VIRGINIA

DWG NO A1

1 of 1

# APPENDIX C

# EPA DOCUMENT 700/B-92001 FORMS 1 AND 2

Sample Reinspection Form 1. Original AHERA Inspection Information Abstracted from the Management Plan



School SANDSTON ARMORY Building 3904 Date(s) of Original AHERA Inspection 2/18/2000

| Homogeneous sampling areas | | Material category | Asbestos content | Friability | AHERA assessment category (1-7, X, None) | Recorded locations of material for each assessment category | Response actions taken/ renovations/other comments |
|---|---|---|---|---|---|---|---|
| ID number | Material description | | | | | | |
| HA-1 | 12"x12" WHITE/ BLACK/BROWN FLOOR TILE | TSI Surf. (Misc.) | Assumed (Yes) No | F (NF) X | NONE | MAIN HALL REAR HALL TRAINING AREA | O&M PLAN |
| HA-5 | 12"x12" WHITE W/ BEIGE SPECKS FLOOR TILE | TSI Surf. (Misc.) | Assumed (Yes) No | F (NF) X | NONE | MAIL ROOM (NOW COPIER NOOK) | O&M PLAN |
| | | TSI Surf. Misc. | Assumed Yes No | F NF X | | | |
| | | TSI Surf. Misc. | Assumed Yes No | F NF X | | | |
| | | TSI Surf. Misc. | Assumed Yes No | F NF X | | | |
| | | TSI Surf. Misc. | Assumed Yes No | F NF X | | | |

Information abstracted by MICHAEL BAUM Date 8/25/2011

Friability: F = friable, NF = nonfriable, X = not applicable (material is non-ACBM)

AHERA assessment category: 1 = Damaged or significantly damaged TSI ACBM, 2 = Damaged friable surfacing ACBM, 3 = Significantly damaged friable surfacing ACBM, 4 = Damaged or significantly damaged friable miscellaneous ACBM, 5 = ACBM with potential for damage, 6 = ACBM with potential for significant damage, 7 = Any remaining friable ACBM or friable suspected ACBM, X = not applicable (material is non-ACBM or nonfriable surfacing or miscellaneous material), None = No assessment category provided in original inspection.

Sample Reinspection Form 2. Reinspection of ACBM: Findings and Management Planner Recommendations



School SANDSTON ARMORY Building 3904 Date(s) of Reinspection 8/25/2011

Homogeneous Sampling Area: Material Description 12"X12" WHITE/BLACK/BROWN FLOOR TILE ID Number WA-1

| REINSPECTION FINDINGS FOR ACBM | | | | | | MANAGEMENT PLANNER RECOMMENDATIONS | | |
|---|---|---|---|---|---|---|---|---|
| Location(s) of ACBM by assessment category | Quantity | Friability | Assessment category (1-7, X) | Justification of assessment category | Change in assessment | Preventive measures, response actions, and initial/additional cleanings | Schedule: Begin | Schedule: Complete |
| MAIN HALL<br>REAR HALL<br>TRAINING AREA | 1,300sf. | F<br>(NF) | X | NON-FRIABLE MISCELLANEOUS | Yes<br>(No) | CONTINUE O&M | CONTINUE | UNTIL MATERIAL IS REMOVED |
| | | F<br>NF | | | Yes<br>No | | | |
| | | F<br>NF | | | Yes<br>No | | | |

Were additional samples of this ACBM collected? Yes (No)

Date of management planner review: 9/28/2011

Inspector name MICHAEL BAUM

Inspector signature [signature]

Accreditation #/State 3303002651/VA

Expiration date 6/30/2012

Management planner name MICHAEL BAUM

Management planner signature [signature]

Accreditation #/State 3304001550/VA

Expiration date 7/31/2012

I, the LEA's Designated Person, have read and understood the recommendations made above: _____ Date: _____

C-2

Sample Reinspection Form 2. Reinspection of ACBM: Findings and Management Planner Recommendations



School SANDSTON ARMORY Building 3904 Date(s) of Reinspection 8/25/2011

Homogeneous Sampling Area: Material Description 12"x12" WHITE W/ BEIGE SPECKS FLOOR TILE ID Number WA-5

| REINSPECTION FINDINGS FOR ACBM | | | | | | MANAGEMENT PLANNER RECOMMENDATIONS | | |
|---|---|---|---|---|---|---|---|---|
| Location(s) of ACBM by assessment category | Quantity | Friability | Assessment category (1-7, X) | Justification of assessment category | Change in assessment | Preventive measures, response actions, and initial/additional cleanings | Schedule: Begin | Schedule: Complete |
| COPIER NOOK (FORMERLY MAIL ROOM) | 45 s.f. | F (NF) | X | NON-FRIABLE MISCELLANEOUS | Yes (No) | CONTINUE O&M | CONTINUE | UNTIL MATERIAL IS REMOVED |
| | | F NF | | | Yes No | | | |
| | | F NF | | | Yes No | | | |

Were additional samples of this ACBM collected? Yes (No)

Date of management planner review: 9/28/2011

Inspector name MICHAEL RAUM

Inspector signature [signature]

Accreditation #/State 3303002651/VA

Expiration date 6/30/2012

Management planner name MICHAEL RAUM

Management planner signature [signature]

Accreditation #/State 3304001550/VA

Expiration date 7/31/2012

I, the LEA's Designated Person, have read and understood the recommendations made above: _____ Date: _____

C2

SINCE 1881

**FROEHLING & ROBERTSON, INC.**

**ENGINEERING • ENVIRONMENTAL • GEOTECHNICAL**

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# ASBESTOS REINSPECTION REPORT

**SANDSTON ARMORY – BUILDING 3990**
**700 Portugee Road**
**Sandston, VA 23150**

Prepared For:
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Prepared By:
Froehling & Robertson, Inc.
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F&R Project Number 68N-0510

September 29, 2011

Prepared By:

Michael Baum
Industrial Hygienist

Reviewed By:

Herman Garcia
Senior Project Manager

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**2.0 Methodology ..... 1**
**3.0 Reporting ..... 2**
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**APPENDICES**

Appendix A – Modified ITC Inspection Report and Reinspection Table

Appendix B – Site Drawing

Appendix C – EPA Document 700/B-92001 Forms 1 and 2

## 1.0 Introduction

Froehling and Robertson (F&R) was contracted by the Department of Military Affairs to perform a limited, non-destructive asbestos reinspection of Sandston Armory Building 3990, located at 700 Portugee Road, Sandston, Virginia. The reinspection was performed by Commonwealth of Virginia licensed Asbestos Inspector and Management Planner, Mr. Michael Baum (VA Inspector License #3303 002651, VA Management Planner License #3304 001550), on August 25, 2011. The structure was occupied at the time of the survey. The survey was conducted for the purpose of reassessing the presence or condition of known asbestos-containing materials inside the structure.

The scope of the asbestos reinspection of Sandston Armory Building 3990 consisted of the following items only:

- Review the report of a previous asbestos inspection conducted of the Armory by Mr. James Madison of the Industrial Training Company (ITC) on February 17, 2000.

- Visually survey asbestos-containing materials (ACMs) identified inside the structure in the previous inspection report, noting their presence or absence, and assessing their current condition. Materials on the exterior of the structure were not included in this survey.

- If additional suspect materials are identified that were not sampled in the previous surveys, contact Mr. James Williams of the Department of Military Affairs to determine whether to sample those materials.

- Document the reinspection results by recording changes on the previous inspection report, and by utilizing EPA document 700/B-92001 Forms 1 and 2.

Notes:

1. F&R was furnished with an electronic copy of the report of a previous asbestos inspection conducted of the Armory by Mr. James Madison of the Industrial Training Company (ITC) on February 17, 2000. However, the electronic copy did not contain Sample Location Drawings, Laboratory Results or Photographs. As a result, assumptions have been made by F&R regarding locations of previously identified asbestos-containing materials, locations of previous samples collected, and the physical appearance of certain suspect materials.
2. The following areas were inaccessible for assessment during this survey: Vault

## 2.0 Methodology

This project was a non-invasive visual reinspection and sampling for suspect ACM. If additional suspect materials were identified and sampling of such materials was approved by Mr. Williams, then sampling was conducted at the above referenced site. When samples were collected, such samples were collected in general accordance with EPA-AHERA protocols and submitted under chain of custody to Environmental Hazards Laboratory, LLC (EHS) located in Richmond, Virginia, for analysis. EHS is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) to analyze suspect asbestos-containing bulk materials. F&R was instructed by Mr. Williams not to presume as ACBM suspect materials that were not sampled during the original survey.

**No additional samples were authorized to be collected during this survey.**

## 3.0 Reporting

Results of the reinspection have been presented in the modified ITC report presented in Appendix A. Deletion of information from the previous report has been indicated by striking through the information to be deleted. Addition of information to the previous report has been indicated by red lettering in Calibri font.

EPA document 700/B-92001 Forms 1 and 2 for each identified ACM have been presented in Appendix B.

## 4.0 Limitations

This report has been prepared for the exclusive use by the Department of Military Affairs and its associates. This service was performed in accordance with generally accepted environmental practices. No other warranty, expressed or implied, is made.

Our conclusions and recommendations are based, in part, upon information provided to us by others and on our site observations. We have not verified the completeness or accuracy of the information provided by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards. During F&R's non-invasive inspection, accessible areas were visually surveyed for the presence of suspected ACM. Inaccessible areas, such as behind solid walls or above solid ceilings, were not surveyed and therefore suspected ACM may be present in those areas. Areas inspected for the above-referenced materials were limited to those designated by the client.

During this study, suspect material samples may have been analyzed for asbestos. As with any similar survey of this nature, actual conditions exist only at the precise locations from which suspect samples were collected. Certain inferences are based on the results of this sampling and related testing to form a professional opinion of conditions in areas beyond those from which the samples were collected. No other warranty, expressed or implied, is made.

Under this scope of services, F&R assumes no responsibility regarding response actions (e.g. O&M Plans, Encapsulation, Abatement, Removal, Notifications, etc.) initiated as a result of these findings. F&R assumes no liability for the duties and responsibilities of the Client with respect to compliance with these regulations. Compliance with regulations is the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, whichever is more stringent. All abatement activities or response actions should be performed by appropriately qualified and licensed-personnel and/or companies, as warranted.

Froehling & Robertson, Inc. by virtue of providing the services described in this report, does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that may present a potential danger to public health, safety, or the environment. The client agrees to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the

environment. The contents of the report should not be construed in any way as a recommendation to purchase, sell, or develop the project site.

## APPENDIX A

## MODIFIED ITC INSPECTION REPORT AND REINSPECTION TABLE

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Executive Summary

Methodology and Analysis

Results

Recommendations

Disclaimer

Appendix 1 - Summary of Samples

Appendix 2 - Sample Location Diagram

Appendix 3 - Laboratory Results

Appendix 4 - Photographs

Appendix 5 - Summary of Qualifications

# EXECUTIVE SUMMARY

The Industrial Training Company (ITC) was contracted by Environmental Resource Management (ERM) to conduct an asbestos inspection of the Sandston Hangar 3990. The Hangar is located in Sandston, Virginia. On February 17, 2000, the Hangar was inspected by Mr. James A. Madison (Virginia Asbestos Inspector License # 3303-002174) for the presence of asbestos containing building materials (ACBM). The inspection was limited to asbestos that was accessible through non-destructive methods and did not identify asbestos containing material located within walls, concrete decks, subfloors, chases or otherwise generally inaccessible areas. The inspection also excluded electrical equipment (wires, junction boxes, etc.).

Sandston Armory Building 3990 was reinspected by Commonwealth of Virginia licensed Asbestos Inspector and Management Planner, Mr. Michael Baum (VA Inspector License #3303 002651, VA Management Planner License #3304 001550), on August 25, 2011. The structure was occupied at the time of the survey. The survey was conducted for the purpose of reassessing the presence or condition of known asbestos-containing materials inside the structure.

A total of 30 suspect materials were collected and forwarded for analysis to Scientific Laboratories, Inc., located at 13635 Genito Road, Richmond, Virginia. In some instances, samples were divided into distinctive layers for regulatory and analytical purposes (i.e floor tile and mastic). Also, in some situations the laboratory was asked to implement a "Positive Stop Procedure". According to this method, the laboratory identified at least one positive sample within the group and assumed all other samples of the same material to contain asbestos also. The laboratory analyzed a total of 29 samples. The bulk samples were analyzed via Polarized Light Microscopy (PLM) using the EPA Interim Method for the Determination of Asbestos in Bulk Samples (EPA-600/R-93/116). Suspect material analyzed and found to contain greater than one percent asbestos is considered to be an ACBM.

The inspection and subsequent analysis determined the following materials to be ACBM:

- White with brown specks 12" x 12" Floor tile Black MASTIC only located in the QC office. Note: This tile has been removed and replaced. However, the black mastic is still presumed to be present beneath the new tile.
- White with brown and black specks 12" x 12" Floor tile located in the supervisor's office and Avionics Shop. Note: This material was observed to be still present.
- ~~White drywall (possibly Joint Compound only) located in sheet metal shop.~~ Note: Sample results indicated trace (<1%) asbestos concentration within the joint compound. Therefore, this material is not classified as ACBM by the EPA. However, the Occupational Safety and Health Administration (OSHA) still regulates these materials as interpreted by a memo they issued on November 24, 2003 (Compliance Requirements For Renovation Work Involving Materials Containing Less Than 1% Asbestos; See Appendix for OSHA Interpretation). This material was observed to be still present and in good condition, but was not assessed. Asbestos was not identified in the drywall wallboard. All the remaining ACBM was observed to be in good condition ~~is in good to fair condition~~ and no immediate response actions are

recommended at this time. Please refer to the Operations and Maintenance Plan on how to properly manage the ACM.

# METHODOLOGY AND ANALYSIS

The inspection consisted of a preliminary walk-through of the building to identify suspect materials. The suspect materials were grouped into homogeneous areas (HGAs). An (HGA) is material that is alike in color, texture, date of installation and appears to be identical in every other aspect. Materials fall into three seperate categories: (1) Thermal System Insulation (TSI): material that controls heat and/or condensations (2) Surfacing Material (Surf): material that is trowelled or sprayed on a surface and (3) Miscellaneous Material (Misc): any material that is not TSI or Surfacing. The materials were sampled in accordance with the Environmental Protection Agency's (EPA) "Asbestos Hazard Emergency Response Act" (AHERA). Sample locations identified by their number and demarcated on the sample location drawing. Assessments were made to determine the condition of the material. In some circumstances, upon observation of the material, a determination was made that the material was non-suspect and assumed to be asbestos-free. When this assumption could not be made, samples were secured with precautions being taken to avoid unnecessary damage to the materials. Roofing materials were excluded from the inspection.

The samples were forwarded for analysis to Scientific Laboratories, Inc., a Virginia licensed laboratory, located at 13635 Genito Road, Richmond, Virginia. The samples were analyzed via Polarized Light Microscopy (PLM) using the EPA Interim Method for the Determination of Asbestos in Bulk Samples (EPA-600/R-93/116).

This inspection was limited to suspect material accessible through non-destructive methods. It does not identify asbestos-containing material located within walls, concrete decks, sub-floors, chases or otherwise generally inaccessible areas. Also, sample locations indicate specific locations only where materials were sampled.

# ASBESTOS REINSPECTION TABLE

**Building:** Sandston Armory Building 3990

**Inspection Date:** February 17, 2000
**Reinspection Date:** August 25, 2011

| Material | Location | Amount | AHERA Assessment Category | Sample Number(s) | % Asbestos | Condition/ Friability (2000 Insp.) | Condition/ Friability (2011 Insp.) | Hazard Ranking (2000 Insp.) | Hazard Ranking (2011 Insp.) |
|---|---|---|---|---|---|---|---|---|---|
| White with brown specks 12" x 12" Floor tile *Mastic only | QC office Note: Floor Tile has been removed. Presume mastic is still present under new tile | 275 $ft^2$ | X | 26-S-AASF-113B | 10 % chrysotile | Fair/ Not Given | Enclosed/ N/A | 2 | N/R |
| White with black and brown specks 12" x12" Floor tile | Supervisor's office | 1300 $ft^2$ | X | 26-S-AASF-119 | 5% chrysotile | Fair/ Not Given | Good/ Non-Friable | 2 | 2 |
| White Drywall (joint compound) | Sheet Metal Shop | 2900 $ft^2$ | X | 26-S-AASF-138 | <1% chrysotile Trace | Good/ Not Given | Good/ Non-Friable | 1 | 2 |

**Assessment Categories:**
1 = Damaged or Significantly Damaged TSI ACBM
2 = Damaged Friable Surfacing ACM
3 = Significantly Damaged Friable Surfacing ACBM
4 = Damaged or Significantly Damaged Friable Miscellaneous ACBM
5 = ACBM With Potential For Damage
6 = ACBM With Potential For Significant Damage
7 = Any Remaining Friable ACBM or Friable Suspected ACBM
X = Not Applicable (material is nonfriable, and does not require assessment)
N/A = Not Assessed (material was inaccessible or was not included in the scope of work)

**Hazard Rankings:**
7 = Friable ACBM With Significant Damage
6 = Damaged ACBM With Potential for Significant Damage
5 = Damaged ACBM With Moderate Potential for Further Damage
4 = Damaged ACBM With Low Potential for Further Damage
3 = ACBM With Potential for Significant Damage
2 = ACBM With Moderate Potential for Damage
1 = ACBM With Low Potential for Damage
N/R = Not Ranked (material was inaccessible or was not included in the scope of work)

# RESULTS

**Sandston A.A.S.F. Hangar 3990**
**Sandston ,VA**

| Material | Location | Amount | Condition | Hazard Ranking | Sample Number(s) | % Asbestos |
|---|---|---|---|---|---|---|
| White with brown specks 12” x 12” Floor tile *Mastic only | QC office | 275 $ft^2$ | Fair | 2 | 26-S-AASF-113B | 10 % chrysotile |
| White with black and brown specks 12” x12” Floor tile | Supervisor’s office | 1300 $ft^2$ | Fair | 2 | 26-S-AASF-119 | 5% chrysotile |
| White Drywall (joint compound) | Sheet Metal Shop | 2900 $ft^2$ | Good | 1 | 26-S-AASF-138 | <1% chrysotile Trace |

**Hazard ranking: #1=least hazardous, #7=most hazardous**

# RECOMMENDATIONS

All the remaining accessible ACBM is in good ~~to fair~~ condition. No immediate responses are recommended at this time.

If any of the ACBM will be disturbed through maintenance activities, becomes damaged or otherwise changes in condition, the state wide Virginia Department of Military Affair's Operations and Maintenance Plan (O&M) should be consulted to determine proper procedures on managing the material. The O&M outlines procedures to properly manage the ACBM in place, how to protect employees from asbestos health risk, and how to respond to asbestos emergencies.

# DISCLAIMER

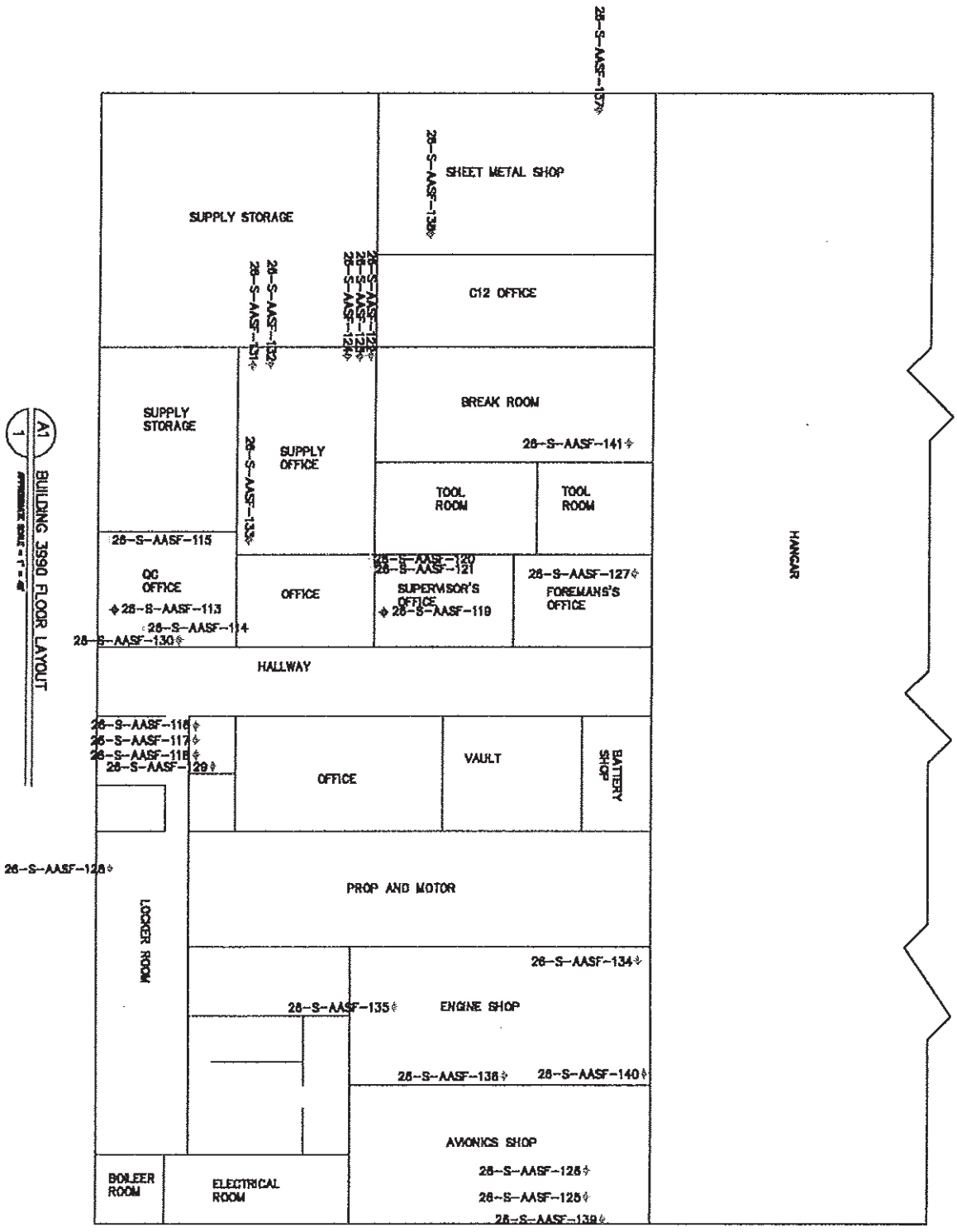
This inspection and report is written for and intended for the use of the Virginia Department of Military Affairs only. The Industrial Training Company is not responsible nor will be held liable for any interpretations made, opinions formed, or conclusions drawn by any third party as a result of examining the lab results, inspection results or this report. Any interpretations, opinions, and conclusions will be those made, formed, and drawn solely by that third party.

The inspection of the Sandston AASF Hangar 3990 located in Sandston, Virginia was performed by an asbestos inspector properly trained and licensed in the Commonwealth of Virginia to perform asbestos inspections. There were available records pertaining to past inspections or response actions. This information was available and to both plan and supplement the inspection when feasible. Every attempt was made to gain access to all areas or to assess representative materials entering or leaving such areas. The Industrial Training Company accepts no liability nor makes any claims regarding ACBM which was not accessible during the inspection process if such material was located behind or within walls, concrete decks, sub-floors, chases, or was otherwise generally inaccessible without destructive sampling.

Estimates of the amounts of ACBM in this report are field estimates only and can vary in accuracy. They should not replace accurate measurements made in the actual design of response action projects and contracts. Removal costs can vary, depending upon time of year, response time required, contractor availability, and many other factors. Prior to taking response actions accurate estimates should be obtained from a licensed contractor.

# APPENDIX B

# SITE DRAWING




| DWG NO A1 | SANDSTON BUILDING 3990 | |
|---|---|---|
| 1 of 1 | 74041 | |
| DATE REVISED | FACILITIES ENGINEERING AND MANAGEMENT<br>DEPARTMENT OF MILITARY AFFAIRS | COMMONWEALTH OF VIRGINIA |

# APPENDIX C

# EPA DOCUMENT 700/B-92001 FORMS 1 AND 2

Sample Reinspection Form 1. Original AHERA Inspection Information Abstracted from the Management Plan



School SANDSTEN ARMORY Building 3990 Date(s) of Original AHERA Inspection 2/17/2000

| Homogeneous sampling areas | | Material category | Asbestos content | Friability | AHERA assessment category (1-7, X, None) | Recorded locations of material for each assessment category | Response actions taken/ renovations/other comments |
|---|---|---|---|---|---|---|---|
| ID number | Material description | | | | | | |
| HA-1 | MASTIC ASSOCIATED WITH 12"x12" WHITE/ BROWN SPECKS FLOOR TILE | TSI Surf. (Misc.) | Assumed (Yes) No | F (NF) X | NONE | QC OFFICE | FLOOR TILE HAS BEEN REPLACED, BUT MASTIC MAY REMAIN UNDER NEW FLOOR TILE - COULD NOT CONFIRM |
| HA-3 | 12"x12" FLOOR TILE - WHITE WITH BROWN AND BLACK SPECKS | TSI Surf. (Misc.) | Assumed (Yes) No | F (NF) X | NONE | SUPERVISORS OFFICE | O&M PLAN NOTE: ALSO OBSERVED IN AVIONICS SHOP |
| HA-8 | JOINT COMPOUND | TSI Surf. (Misc.) | Assumed (Yes) No | F (NF) X | NONE | SHEET METAL SHOP | O&M PLAN NOTE: LAB RESULTS INDICATE TRACE LEVELS OF ASBESTOS. |
| | | TSI Surf. Misc. | Assumed Yes No | F NF X | | | |
| | | TSI Surf. Misc. | Assumed Yes No | F NF X | | | |
| | | TSI Surf. Misc. | Assumed Yes No | F NF X | | | |

Information abstracted by MICHAEL BAUM Date 8/25/2011

Friability: F = friable, NF = nonfriable, X = not applicable (material is non-ACBM)

AHERA assessment category: 1 = Damaged or significantly damaged TSI ACBM, 2 = Damaged friable surfacing ACBM, 3 = Significantly damaged friable surfacing ACBM, 4 = Damaged or significantly damaged friable miscellaneous ACBM, 5 = ACBM with potential for damage, 6 = ACBM with potential for significant damage, 7 = Any remaining friable ACBM or friable suspected ACBM, X = not applicable (material is non-ACBM or nonfriable surfacing or miscellaneous material), None = No assessment category provided in original inspection.

Sample Reinspection Form 2. Reinspection of ACBM: Findings and Management Planner Recommendations



School SANDSTON ARMORY Building 3990 Date(s) of Reinspection 8/25/2011

Homogeneous Sampling Area: Material Description MASTIC ASSOCIATED WITH 12"X12" WHITE/BROWN SPECKS FLOOR TILE ID Number HA-1

| REINSPECTION FINDINGS FOR ACBM | | | | | | MANAGEMENT PLANNER RECOMMENDATIONS | | |
|---|---|---|---|---|---|---|---|---|
| Location(s) of ACBM by assessment category | Quantity | Friability | Assessment category (1-7, X) | Justification of assessment category | Change in assessment | Preventive measures, response actions, and initial/additional cleanings | Schedule: Begin | Schedule: Complete |
| QC OFFICE | 275 s.f. | F (NF) | X | NON-FRIABLE MISCELLANEOUS | Yes (No) | TILE REPLACED. ASSUME MASTIC STILL PRESENT AND CONTINUE O&M | CONTINUE | UNTIL MATERIAL IS REMOVED |
| | | F NF | | | Yes No | | | |
| | | F NF | | | Yes No | | | |

Were additional samples of this ACBM collected? Yes (No)

Date of management planner review: 9/28/2011

Inspector name MICHAEL BAUM

Inspector signature [signature]

Accreditation #/State 3303002651/VA

Expiration date 6/30/2012

Management planner name MICHAEL BAUM

Management planner signature [signature]

Accreditation #/State 3304001550/VA

Expiration date 7/31/2012

I, the LEA's Designated Person, have read and understood the recommendations made above: _____ Date: _____

Sample Reinspection Form 2. Reinspection of ACBM: Findings and Management Planner Recommendations



School SANDSTON ARMORY Building 3990 Date(s) of Reinspection 8/25/2011

Homogeneous Sampling Area: Material Description 12"X12" FLOOR TILE- WHITE WITH BROWN AND BLACK SPECKS ID Number HA-3

| REINSPECTION FINDINGS FOR ACBM | | | | | | MANAGEMENT PLANNER RECOMMENDATIONS | | |
|---|---|---|---|---|---|---|---|---|
| Location(s) of ACBM by assessment category | Quantity | Friability | Assessment category (1-7, X) | Justification of assessment category | Change in assessment | Preventive measures, response actions, and initial/additional cleanings | Schedule: Begin | Schedule: Complete |
| SUPERVISORS OFFICE AVIONICS SHOP | 1,300 s.f. | F (NF) | X | NON-FRIABLE MISCELLANEOUS | Yes (No) | CONTINUE O&M | CONTINUE | UNTIL MATERIAL IS REMOVED |
| | | F NF | | | Yes No | | | |
| | | F NF | | | Yes No | | | |

Were additional samples of this ACBM collected? Yes (No)

Date of management planner review: 9/28/2011

Inspector name MICHAEL BAUM

Inspector signature

Accreditation #/State 3303002651/VA

Expiration date 6/30/2012

Management planner name MICHAEL BAUM

Management planner signature

Accreditation #/State 3304001550/VA

Expiration date 7/31/2012

I, the LEA's Designated Person, have read and understood the recommendations made above: _____ Date: _____

SINCE 1881

**FROEHLING & ROBERTSON, INC.**

**ENGINEERING • ENVIRONMENTAL • GEOTECHNICAL**

3015 DUMBARTON ROAD, RICHMOND VA 23228 USA

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# ASBESTOS REINSPECTION REPORT

**SANDSTON ARMORY – BUILDINGS 3991, 3992, 3993, 3994**
**700 Portugee Road**
**Sandston, VA 23150**

Prepared For:
James Williams
Department of Military Affairs
Fort Pickett, Building 316
Blackstone, Virginia 23229
(434) 294-1464
james.williams102@us.army.mil

Prepared By:
Froehling & Robertson, Inc.
3015 Dumbarton Road
Richmond, Virginia 23228

F&R Project Number 68N-0510

September 29, 2011

Prepared By:

Michael Baum
Industrial Hygienist

Reviewed By:

Herman Garcia
Senior Project Manager

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**1.0 Introduction ..... 1**
**2.0 Methodology ..... 1**
**3.0 Reporting ..... 2**
**4.0 Limitations ..... 2**

**APPENDICES**

Appendix A – Modified ITC Inspection Report and Reinspection Table

Appendix B – Site Drawing

Appendix C – EPA Document 700/B-92001 Forms 1 and 2

## 1.0 Introduction

Froehling and Robertson (F&R) was contracted by the Department of Military Affairs to perform a limited, non-destructive asbestos reinspection of Sandston Armory Buildings 3991, 3992, 3993, and 3994, located at 700 Portugee Road, Sandston, Virginia. The reinspection was performed by Commonwealth of Virginia licensed Asbestos Inspector and Management Planner, Mr. Michael Baum (VA Inspector License #3303 002651, VA Management Planner License #3304 001550), on August 26, 2011. The structures were unoccupied at the time of the survey. The survey was conducted for the purpose of reassessing the presence or condition of known asbestos-containing materials inside the structures.

The scope of the asbestos reinspection of Sandston Armory Buildings 3991, 3992, 3993, and 3994 consisted of the following items only:

- Review the report of a previous asbestos inspection conducted of the Armory buildings by Mr. James Madison of the Industrial Training Company (ITC) on February 17, 2000.

- Visually survey asbestos-containing materials (ACMs) identified inside the structure in the previous inspection report, noting their presence or absence, and assessing their current condition. Materials on the exterior of the structure were not included in this survey.

- If additional suspect materials are identified that were not sampled in the previous surveys, contact Mr. James Williams of the Department of Military Affairs to determine whether to sample those materials.

- Document the reinspection results by recording changes on the previous inspection report, and by utilizing EPA document 700/B-92001 Forms 1 and 2.

Notes:

1. F&R was furnished with an electronic copy of the report of a previous asbestos inspection conducted of the Armory buildings by Mr. James Madison of the Industrial Training Company (ITC) on February 17, 2000. However, the electronic copy did not contain Sample Location Drawings, Laboratory Results or Photographs. As a result, assumptions have been made by F&R regarding locations of previously identified asbestos-containing materials, locations of previous samples collected, and the physical appearance of certain suspect materials.
2. The following areas were inaccessible for assessment during this survey: None

## 2.0 Methodology

This project was a non-invasive visual reinspection and sampling for suspect ACM. If additional suspect materials were identified and sampling of such materials was approved by Mr. Williams, then sampling was conducted at the above referenced site. When samples were collected, such samples were collected in general accordance with EPA-AHERA protocols and submitted under chain of custody to Environmental Hazards Laboratory, LLC (EHS) located in Richmond, Virginia, for analysis. EHS is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) to analyze suspect

asbestos-containing bulk materials. F&R was instructed by Mr. Williams not to presume as ACBM suspect materials that were not sampled during the original survey.

**No additional samples were authorized to be collected during this survey.**

## 3.0 Reporting

Results of the reinspection have been presented in the modified ITC report presented in Appendix A. Deletion of information from the previous report has been indicated by striking through the information to be deleted. Addition of information to the previous report has been indicated by red lettering in Calibri font.

EPA document 700/B-92001 Forms 1 and 2 for each identified ACM have been presented in Appendix B.

## 4.0 Limitations

This report has been prepared for the exclusive use by the Department of Military Affairs and its associates. This service was performed in accordance with generally accepted environmental practices. No other warranty, expressed or implied, is made.

Our conclusions and recommendations are based, in part, upon information provided to us by others and on our site observations. We have not verified the completeness or accuracy of the information provided by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards. During F&R's non-invasive inspection, accessible areas were visually surveyed for the presence of suspected ACM. Inaccessible areas, such as behind solid walls or above solid ceilings, were not surveyed and therefore suspected ACM may be present in those areas. Areas inspected for the above-referenced materials were limited to those designated by the client.

During this study, suspect material samples may have been analyzed for asbestos. As with any similar survey of this nature, actual conditions exist only at the precise locations from which suspect samples were collected. Certain inferences are based on the results of this sampling and related testing to form a professional opinion of conditions in areas beyond those from which the samples were collected. No other warranty, expressed or implied, is made.

Under this scope of services, F&R assumes no responsibility regarding response actions (e.g. O&M Plans, Encapsulation, Abatement, Removal, Notifications, etc.) initiated as a result of these findings. F&R assumes no liability for the duties and responsibilities of the Client with respect to compliance with these regulations. Compliance with regulations is the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, whichever is more stringent. All abatement activities or response actions should be performed by appropriately qualified and licensed-personnel and/or companies, as warranted.

Froehling & Robertson, Inc. by virtue of providing the services described in this report, does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that may present a potential danger to public health, safety, or the environment. The client agrees to notify the appropriate

local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. The contents of the report should not be construed in any way as a recommendation to purchase, sell, or develop the project site.

## APPENDIX A

## MODIFIED ITC INSPECTION REPORT AND REINSPECTION TABLE

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Executive Summary

Methodology and Analysis

Results

Recommendations

Disclaimer

Appendix 1 - Summary of Samples

Appendix 2 - Sample Location Diagram

Appendix 3 - Laboratory Results

Appendix 4 - Photographs

Appendix 5 - Summary of Qualifications

# EXECUTIVE SUMMARY

The Industrial Training Company (ITC) was contracted by Environmental Resource Management (ERM) to conduct an asbestos inspection of the Sandston Armory AASF Buildings 3991, 3992, 3993, and 3994. The buildings are located in Sandston, Virginia. On February 17, 2000, the armory was inspected by Mr. James A. Madison (Virginia Asbestos Inspector License # 3303-002174) for the presence of asbestos containing building materials (ACBM). The inspection was limited to asbestos that was accessible through non-destructive methods and did not identify asbestos containing material located within walls, concrete decks, subfloors, chases or otherwise generally inaccessible areas. The inspection also excluded electrical equipment (wires, junction boxes, etc.).

Sandston Armory Buildings 3991, 3992, 3993 and 3994 were reinspected by Commonwealth of Virginia licensed Asbestos Inspector and Management Planner, Mr. Michael Baum (VA Inspector License #3303 002651, VA Management Planner License #3304 001550), on August 25, 2011. The structures were unoccupied at the time of the survey. The survey was conducted for the purpose of reassessing the presence or condition of known asbestos-containing materials inside the structures.

A total of 3 suspect materials were collected and forwarded for analysis to Scientific Laboratories, Inc., located at 13635 Genito Road, Richmond, Virginia. In some instances, samples were divided into distinctive layers for regulatory and analytical purposes (i.e floor tile and mastic). Also, in some situations the laboratory was asked to implement a "Positive Stop Procedure". According to this method, the laboratory identified at least one positive sample within the group and assumed all other samples of the same material to contain asbestos also. The laboratory analyzed a total of 3 samples. The bulk samples were analyzed via Polarized Light Microscopy (PLM) using the EPA Interim Method for the Determination of Asbestos in Bulk Samples (EPA-600/R-93/116). Suspect material analyzed and found to contain greater than one percent asbestos is considered to be an ACBM.

**The inspection and subsequent analysis determined NO materials to be ACBM**.

Please refer to the Operations and Maintenance Plan (O & M) for any information on how to properly manage ACM.

# METHODOLOGY AND ANALYSIS

The inspection consisted of a preliminary walk-through of the building to identify suspect materials. The suspect materials were grouped into homogeneous areas and sampled in accordance with the Environmental Protection Agency's (EPA) "Asbestos Hazard Emergency Response Act" (AHERA). Assessments were made to determine the condition of the material. In some circumstances, upon observation of the material, a determination was made that the material was non-suspect and assumed to be asbestos-free. When this assumption could not be made, samples were secured with precautions being taken to avoid unnecessary damage to the materials. Roofing materials were excluded from the inspection.

The samples were forwarded for analysis to Scientific Laboratories, Inc., a Virginia licensed laboratory, located at 13635 Genito Road, Richmond, Virginia. The samples were analyzed via Polarized Light Microscopy (PLM) using the EPA Interim Method for the Determination of Asbestos in Bulk Samples (EPA-600/R-93/116).

This inspection was limited to suspect material accessible through non-destructive methods. It does not identify asbestos-containing material located within walls, concrete decks, sub-floors, chases or otherwise generally inaccessible areas. Also, sample locations indicate specific locations only where materials were found and sampled.

# ASBESTOS REINSPECTION TABLE

**Building:** Sandston Armory Building 3991-3994

**Inspection Date:** February 17, 2000
**Reinspection Date:** August 25, 2011

| Material | Location | Amount | AHERA Assessment Category | Sample Number(s) | % Asbestos | Condition/ Friability (2000 Insp.) | Condition/ Friability (2011 Insp.) | Hazard Ranking (2000 Insp.) | Hazard Ranking (2011 Insp.) |
|---|---|---|---|---|---|---|---|---|---|
| None Identified | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

| **Assessment Categories:** | **Hazard Rankings:** |
|---|---|
| 1 = Damaged or Significantly Damaged TSI ACBM | 7 = Friable ACBM With Significant Damage |
| 2 = Damaged Friable Surfacing ACM | 6 = Damaged ACBM With Potential for Significant Damage |
| 3 = Significantly Damaged Friable Surfacing ACBM | 5 = Damaged ACBM With Moderate Potential for Further Damage |
| 4 = Damaged or Significantly Damaged Friable Miscellaneous ACBM | 4 = Damaged ACBM With Low Potential for Further Damage |
| 5 = ACBM With Potential For Damage | 3 = ACBM With Potential for Significant Damage |
| 6 = ACBM With Potential For Significant Damage | 2 = ACBM With Moderate Potential for Damage |
| 7 = Any Remaining Friable ACBM or Friable Suspected ACBM | 1 = ACBM With Low Potential for Damage |
| X = Not Applicable (material is nonfriable, and does not require assessment) | N/R = Not Ranked (material was inaccessible or was not included in the scope of work) |
| N/A = Not Assessed (material was inaccessible or was not included in the scope of work) | |

# RESULTS

# RECOMMENDATIONS

No ACBMS were identified within these structures. Therefore, No recommendations required at this time.

~~Please refer to the O& M Plan on how to manage these materials.~~

If any of the ACBM will be disturbed through maintenance activities, becomes damaged or otherwise changes in condition, the state wide Virginia Department of Military Affair's Operations and Maintenance Plan (O&M) should be consulted to determine proper procedures on managing the material. The O&M outlines procedures to properly manage the ACBM in place, how to protect employees from asbestos health risk, and how to respond to asbestos emergencies.

# DISCLAIMER

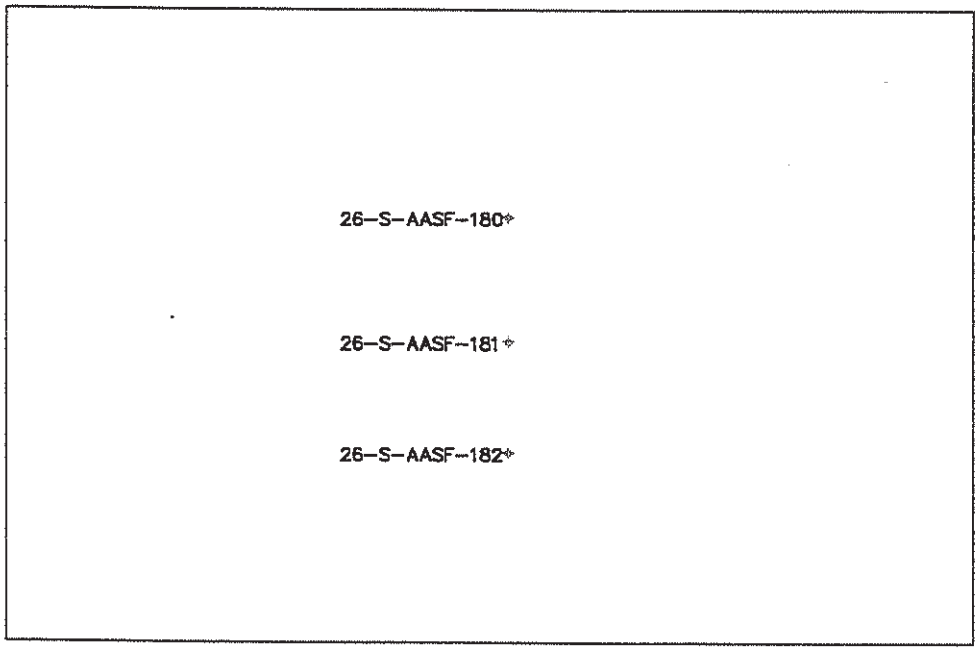
This inspection and report is written for and intended for the use of the Virginia Department of Military Affairs only. The Industrial Training Company is not responsible nor will be held liable for any interpretations made, opinions formed, or conclusions drawn by any third party as a result of examining the lab results, inspection results or this report. Any interpretations, opinions, and conclusions will be those made, formed, and drawn solely by that third party.

The inspection of the Sandston Armory AASF Buildings 3991, 3992, 3993, and 3994 located in Sandston,Virginia was performed by an asbestos inspector properly trained and licensed in the Commonwealth of Virginia to perform asbestos inspections. There were no available records pertaining to past inspections or response actions. Such information, if it had been available and qualified for use, would have been used to both plan and supplement the inspection when feasible. Every attempt was made to gain access to all areas or to assess representative materials entering or leaving such areas. The Industrial Training Company accepts no liability nor makes any claims regarding ACBM which was not accessible during the inspection process if such material was located behind or within walls, concrete decks, sub-floors, chases, or was otherwise generally inaccessible without destructive sampling.

Estimates of the amounts of ACBM in this report are field estimates only and can vary in accuracy. They should not replace accurate measurements made in the actual design of response action projects and contracts. Removal costs can vary, depending upon time of year, response time required, contractor availability, and many other factors. Prior to taking response actions accurate estimates should be obtained from a licensed contractor.

# APPENDIX B

# SITE DRAWING




A1
1
HANGAR 3993
NOT TOT SCALE

Notes:

* Asbestos Detected
* No Asbestos Detected

Not Analyzed/Positive Stop

*Sample numbers located next to the above symbols.

SANDSTON HANGAR 3993

FACILITIES ENGINEERING AND MANAGEMENT
DEPARTMENT OF MILITARY AFFAIRS
COMMONWEALTH OF VIRGINIA

DWG NO
A1

1 of 1

# APPENDIX C

# EPA DOCUMENT 700/B-92001 FORMS 1 AND 2

Sample Reinspection Form 1. Original AHERA Inspection Information Abstracted from the Management Plan



School SANDSTON ARMORY Building 3991, 3992, 3993, 3994 Date(s) of Original AHERA Inspection 2/17/2000

| Homogeneous sampling areas | | Material category | Asbestos content | Friability | AHERA assessment category (1-7, X, None) | Recorded locations of material for each assessment category | Response actions taken/ renovations/other comments |
|---|---|---|---|---|---|---|---|
| ID number | Material description | | | | | | |
| N/A | NO ACMS IDENTIFIED IN ORIGINAL SURVEY | TSI Surf. Misc. | Assumed Yes No | F NF X | N/A | N/A | N/A |
| | | TSI Surf. Misc. | Assumed Yes No | F NF X | | | |
| | | TSI Surf. Misc. | Assumed Yes No | F NF X | | | |
| | | TSI Surf. Misc. | Assumed Yes No | F NF X | | | |
| | | TSI Surf. Misc. | Assumed Yes No | F NF X | | | |
| | | TSI Surf. Misc. | Assumed Yes No | F NF X | | | |

Information abstracted by MICHAEL BAUM Date 8/26/11

Friability: F = friable, NF = nonfriable, X = not applicable (material is non-ACBM)

AHERA assessment category: 1 = Damaged or significantly damaged TSI ACBM, 2 = Damaged friable surfacing ACBM, 3 = Significantly damaged friable surfacing ACBM, 4 = Damaged or significantly damaged friable miscellaneous ACBM, 5 = ACBM with potential for damage, 6 = ACBM with potential for significant damage, 7 = Any remaining friable ACBM or friable suspected ACBM, X = not applicable (material is non-ACBM or nonfriable surfacing or miscellaneous material), None = No assessment category provided in original inspection.

Sample Reinspection Form 2. Reinspection of ACBM: Findings and Management Planner Recommendations



School SANDSTON ARMORY Building 3991, 3992, 3993, 3994 Date(s) of Reinspection 8/26/11

Homogeneous Sampling Area: Material Description NO ACMs IDENTIFIED ID Number N/A

| REINSPECTION FINDINGS FOR ACBM | | | | | | MANAGEMENT PLANNER RECOMMENDATIONS | | |
|---|---|---|---|---|---|---|---|---|
| Location(s) of ACBM by assessment category | Quantity | Friability | Assessment category (1-7, X) | Justification of assessment category | Change in assessment | Preventive measures, response actions, and initial/additional cleanings | Schedule: Begin | Schedule: Complete |
| N/A | N/A | F / NF | N/A | N/A | Yes / No | N/A | N/A | N/A |
| | | F / NF | | | Yes / No | | | |
| | | F / NF | | | Yes / No | | | |

Were additional samples of this ACBM collected? Yes (No)

Date of management planner review: 9/28/2011

Inspector name MICHAEL BAUM

Inspector signature

Accreditation #/State 3303002651/VA

Expiration date 6/30/2012

Management planner name MICHAEL BAUM

Management planner signature

Accreditation #/State 3304001550/VA

Expiration date 7/31/2012

I, the LEA's Designated Person, have read and understood the recommendations made above: _____ Date: _____

C-2

SINCE 1881

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# ASBESTOS OPERATIONS AND MAINTENANCE (O&M) PLAN

**SANDSTON ARMORY BUILDING 3901**
**700 Portugee Road**
**Sandston, VA 23150**

Prepared For:
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james.williams102@us.army.mil

Prepared By:
Froehling & Robertson, Inc.
3015 Dumbarton Road
Richmond, Virginia 23228

F&R Project Number 68N-0510

September 29, 2011

Prepared By:

Michael Baum
Industrial Hygienist

Reviewed By:

Herman Garcia
Senior Project Manager

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**3.0 Limitations..... 1**

**APPENDICES**

Appendix A – Operations & Maintenance (O&M) Plan

Appendix B – Licenses and Qualifications

## 1.0 Introduction

Froehling and Robertson (F&R) was contracted by the Department of Military Affairs to review and, if necessary, revise the Operations & Maintenance (O&M) Plan for Sandston Armory Building 3901, located at 700 Portugee Road, Sandston, Virginia. The revision was performed by Commonwealth of Virginia licensed asbestos management planner, Mr. Michael Baum (License #3304 001550), on September 29, 2011, and reviewed by Commonwealth of Virginia licensed asbestos management planner, Mr. Herman Garcia (License #3304 001586). The revision was conducted for the purpose of ensuring that the O&M plan is in compliance with current asbestos regulations, and reflects the status of asbestos-containing materials (ACMs) identified within the structure during the reinspection performed by F&R on August 25, 2011.

The scope of the asbestos O&M Plan revision for Sandston Armory Building 3901 consisted of the following items only:

- Review the report of the asbestos reinspection of the Armory performed by F&R on August 25, 2011.
- Review existing asbestos regulations.
- Review and revise the existing O&M Plan provided by Mr. James Williams of the Department of Military Affairs. The O&M plan was not dated, and the name of the author and/or company that provided the original O&M was not stated within the O&M Plan.
- Document the O&M Plan review by recording changes on the previous O&M Plan.

Notes:

1. F&R was furnished with an electronic copy of the existing O&M Plan by Mr. James Williams of the Department of Military Affairs. However, the O&M plan was not dated, and the name of the author and/or company that provided the original O&M was not stated within the O&M Plan.

## 2.0 Reporting

The revised O&M Plan has been presented in Appendix A. Per client request, deletion of information from the previous report has been indicated by striking through the information to be deleted. Addition of information to the previous report has been indicated by red lettering in Calibri font.

## 3.0 Limitations

This plan has been prepared for the exclusive use by the Department of Military Affairs and its associates. This service was performed in accordance with generally accepted environmental practices. No other warranty, expressed or implied, is made.

Under this scope of services, F&R assumes no responsibility regarding response actions (e.g. Encapsulation, Abatement, Removal, Notifications, etc.) initiated as a result of these findings. F&R assumes no liability for the duties and responsibilities of the Client with respect to compliance with

these regulations. Compliance with regulations is the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, whichever is more stringent. All abatement activities or response actions should be performed by appropriately qualified and licensed-personnel and/or companies, as warranted.

Froehling & Robertson, Inc. by virtue of providing the services described in this report, does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that may present a potential danger to public health, safety, or the environment. The client agrees to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. The contents of the report should not be construed in any way as a recommendation to purchase, sell, or develop the project site.

# APPENDIX A

# ASBESTOS OPERATIONS AND MAINTENANCE (O&M) PLAN

# Operations & Maintenance Plan

## 1.0 INTRODUCTION

This Operations and Maintenance (O&M) Program has been prepared expressly for the Sandston Building 3901 and is designed to meet their requirements, as well as compliance with the Occupational Safety and Health Administration (OSHA) and the Asbestos School Hazard Abatement and Reauthorization Act (ASHARA) which extends the training requirement of the Asbestos Hazard Emergency Response Act (AHERA) to all public and commercial buildings. The Sandston Building 3901 shall designate a person that will implement the following operations, maintenance, and repair program in those areas where asbestos containing building materials (ACBM) are present.

Through this program, the Sandston Building 3901 Designee will institute work practices that maintain the ACBM in good condition, ensure cleanup of asbestos fibers previously released and prevent further released by minimizing and controlling disturbance or damage to the ACBM. Additionally, a program to monitor the condition of all ACBM is included. This program should continue until all ACBM is abated.

The O&M Plan is not a permanent option. It should be implemented as part of this overall asbestos management plan that has as its goal the eventual elimination of all potentially hazardous ACM within the facility. The O&M plan likewise is not a means by which full-scale abatement can be accomplished. Operations and Maintenance activities involve areas containing ACM in quantities less than 3 square feet, less than 3 linear feet or small-scale short duration activities. To perform these activities require 16-hours of Operations and Maintenance (O&M) training. If the Armories choose not to have their staff trained then only appropriately trained and qualified third parties should perform any activities that may disturb the asbestos containing materials (ACM). Large removal projects that require extensive planning and technical expertise are not detailed in this plan and must be designed by an accredited project designer and conducted by accredited personnel or contractors.

## 2.0 BACKGROUND INFORMATION

The term Asbestos covers a group of minerals including actinolite, amosite, antrophlite, chrysotile, crocidolite, and tremolite that are related to each other as fibrous inorganic hydrated mineral silicates. These minerals have been valued as a natural resource with hundreds of applications in manufacturing, construction and consumer products. Their fibrous forms allow them to be made into cloth, felt, gaskets, rope, or to be used for reinforcement in cements, asphalt, and plastic. They are non-flammable, withstand high temperature, and have a high tensile strength.

Typically, asbestos has been used in buildings for its insulation and fire resistant qualities. As a result it appears in three major categories of building material: (1) surfacing materials; (2) thermal system insulation materials; and (3) miscellaneous materials such as ceiling tiles, floor tiles, and shingles.

The adverse health effects from asbestos materials are primarily associated with the respiratory system. The respiratory system plays the key role in removing and filtering foreign materials inhaled into our system, but due to the small size of asbestos fibers, not all can be filtered. Due to this problem, asbestos related diseases have occurred and continue to occur from exposure to asbestos fibers. However, most of the diseases associated with asbestos exposure take ~~at least 20 years or more~~ ten to forty years to show symptoms ~~for~~ from the initial exposure.

The major types of asbestos related diseases are:

Asbestosis - A scarring (fibrosis) of the lung. The disease is associated with those workers who have been exposed to high doses such as miners, insulators and manufacturers of asbestos. The disease is progressive and continues even though the exposure has ceased.

Lung Cancer - A malignant tumor of the bronchi covering, this tumor grows and obstructs the air passage. Although there are many causes of lung cancer, there has been shown an increased risk with people who work with asbestos.

Mesothelioma - A cancer of the mesothelium-the linings of the abdominal wall. This disease is a true indicator of asbestos exposure. By the time the disease is diagnosed, it is almost always fatal.

It has also been shown, for those who have worked with asbestos and smoke, that they have an 80 times greater risk of developing lung cancer than those people who do not smoke or work with asbestos. This is due to a synergistic effect that the two materials have with each other. The potential health problems occur as a result of inhalation of asbestos fibers.

Therefore, protection of the facilities, workers, and visitors are directed at maintaining ACM in

an intact non-friable condition.

Those materials not removed from the Sandston Building 3901 will be incorporated into this routine
O & M program to prevent release of asbestos fibers by minimizing and controlling disturbance or damage of friable ACBM. Health impacts can thereby be minimized to the greatest degree possible.

# 3.0 SUMMARY OF ASBESTOS REGULATIONS

Regulations affecting the staff of the Sandston Building 3901 and their response to asbestos containing materials in the building have been promulgated by the EPA, OSHA, and the Commonwealth of Virginia. This section summarizes EPA regulations directed at identification and response to asbestos in facilities and OSHA regulations directed at worker protection as they affect the anticipated activities under this Operations and Management Program. Major regulatory programs potentially impacting operations are summarized below.

## 3.1 NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPS) (40 CFR 61, Subpart M).

EPA's first regulations on asbestos industries were issued in 1973 under the Clean Air Act. These regulations and subsequent amendments in 1975, 1978, and 1990 included regulations for asbestos industries, as well as laws governing spray applied asbestos and procedures to follow during building demolition to minimize uncontrolled asbestos fiber release. The important part of this regulation to facilities are those directed at control of asbestos release during building renovation and demolition. Briefly, these regulations require that advance notice be given to EPA and/or the equivalent state agency when a building renovation is conducted that results in disturbance of more that 260 linear fee, 160 square feet, or 35 cubic feet of asbestos containing material. These regulations further specify appropriate removal, transportation and disposal techniques to minimize emission of asbestos fibers during renovation or demolition.

In summary, facilities undergoing renovation or demolition must comply with this EPA air emission regulation.

## 3.2 OSHA WORKER PROTECTION STANDARDS

OSHA initially issued regulations in 1972 to protect workers engaged in industrial operations involving asbestos. In 1994 regulations known as the Asbestos Construction Standard (29 CFR 1926.1101) specify airborne exposure standards for asbestos workers, engineering and administrative controls, work place practices and medical surveillance and worker protection practices for industrial settings. These regulations include comprehensive requirements for asbestos abatement projects including reporting requirements, exposure limits, air monitoring, engineering controls and work practices, respiratory protection and protective equipment, medical surveillance, employee training and record keeping. Any organization conducting asbestos abatement, operations, maintenance and repair must follow these extended requirements for its employees, unless the activity is defined as a small scale, short duration project.

## 3.3 ASBESTOS HAZARD EMERGENCY RESPONSE ACT (AHERA)

The Asbestos Hazard Emergency Response Act (AHERA) was signed into law in October, 1986. The Act directed the EPA to establish laws and regulations that governed identifying, evaluating and controlling asbestos containing materials in schools. The laws also established training requirements and pertained to schools (K-12) only.

## 3.4 ASBESTOS SCHOOL HAZARD ABATEMENT AND REAUTHORIZATION ACT (ASHARA)

ASHARA extended the training requirements of AHERA to all public and commercial buildings. Under the definitions of ASHARA, the Sandston Building 3901 may be classified as a public and commercial building.

# 4.0 ADMINISTRATIVE PROCEDURES

## 4.1 ASBESTOS LOCATION

The Sandston Building 3901 Designee shall ensure that the exact location of all ACM is indicated on building documents (plans, specifications, and drawings). These documents will be used for all training as well as becoming part of the permanent record for the Armory. All outside contractors (see paragraph 4.4) and new employees should review these documents prior to commencing work.

## 4.2 NEW EMPLOYEE BRIEFINGS

The Sandston Building 3901 Designee will brief all new employees on the asbestos situation prior to their reporting to work. This briefing shall cover the same basic information included in the two- hour awareness training. Documentation of this briefing shall be made a part of the employee's permanent personal record. This briefing need not be as in-depth as the training given the maintenance and custodial staff but shall be of sufficient detail to ensure non-maintenance personnel do not inadvertently create a fiber release. Emphasis should be given to the prohibited activities covered in section 8.0 of this O&M plan.

## 4.3 OUTSIDE CONTRACTORS

The Sandston Building 3901 Designee shall develop a form requiring work orders be reviewed by an asbestos responsible person prior to all renovation or demolition, except in an emergency. This procedure should prevent any untrained person from inadvertently disturbing asbestos containing material. Additionally, a letter advising outside contractors of the location of all asbestos containing materials shall be developed and made a part of all contracts. Outside contractors (plumbers, electricians, painters, etc.) should be required to acknowledge receipt of this letter prior to commencing work in the Sandston Building 3901.

## 4.4 WARNING SIGNS

Sandston Building 3901 Designee shall attach a warning label immediately adjacent to any friable and non-friable asbestos containing material located in routine maintenance areas of the Sandston Building 3901 (such as above ceilings). All labels shall be prominently displayed in readily visible locations and shall remain posted until the ACM is removed. The warning label shall read, in print which is readily visible because of large size or bright color, as follows:

**CAUTION: ASBESTOS, HAZARDOUS**
**DO NOT DISTURB WITHOUT PROPER**
**TRAINING AND EQUIPMENT**

## 4.5 PERIODIC SURVEILLANCE

At least once every 6 months after this Operations and Maintenance plan is in effect, the Sandston Building 3901 Designee (or his trained representative) shall conduct periodic surveillance of all asbestos containing building material identified in this report. This surveillance shall include:

1. Visual inspections of the material.

2. Recording the date the surveillance, the name of the person conducting the surveillance, and any changes in the condition of the material.

3. Maintaining that record as part of the Operations and Maintenance plan.

## 5.0 SMALL SCALE, SHORT DURATION ACTIVITIES WITH OPERATIONS AND MAINTINANCE (O&M) TRAINING

This O&M Program is directed at the small-scale, short duration activities expected to be conducted in the Sandston Building 3901 by an in house staff with the appropriate 16-hours of Operations and Maintenance training or by appropriately trained and qualified third parties. These activities include the following:

1. Removal of small quantities of asbestos containing window and door caulking.

   **A:** The window and door caulking may remain in place. Its condition should be monitored during the 6-month periodic surveillance.

   **B:** In the event of a damaged window or door the caulking should be kept wet and access to the area restricted until appropriately trained and qualified personnel are dispatched to perform the required response action.

   **C**: Any person or persons conducting any activities that may disturb the window caulking should be notified of its asbestos content.

2. Removal of small quantities of asbestos containing pipe, tank, generator muffler and boiler breaching on the piping above the ceilings and in the boiler room area..

   **A:** The insulation may remain in place. Its condition should be monitored during the 6-month periodic surveillance.

   **B:** In the event of any damage to the insulation it should be kept wet and access to the area restricted until appropriately trained and qualified personnel are dispatched to perform the required response action.

   **C**: Any person or persons conducting any activities that may disturb the insulation should be notified of its asbestos content.

3. Removal of small quantities of asbestos containing floor tile.

   **A:** The floor tile may remain in place. Its condition should be monitored during the 6-month periodic surveillance.

   **B:** In the event of any damage to the floor tile it should be kept wet and access to the area restricted until appropriately trained and qualified personnel are dispatched to perform the required response action.

   **C**: Any person or persons conducting any activities that may disturb the floor tile

should be notified of its asbestos content.

4. Removal of small quantities of asbestos containing drywall.

**A:** The drywall plaster may remain in place. Its condition should be monitored during the 6 month periodic surveillance.

**B:** In the event of any damage to the drywall it should be kept wet and access to the area restricted until appropriately trained and qualified personnel are dispatched to perform the required response action.

**C**: Any person or persons conducting any activities that may disturb the drywall should be notified of its asbestos content.

5. Removal of small quantities of asbestos containing insulation on the HVAC ductwork in the boiler room.

**A:** The insulation may remain in place. Its condition should be monitored during the 6-month periodic surveillance.

**B:** In the event of any damage to the insulation it should be kept wet and access to the area restricted until appropriately trained and qualified personnel are dispatched to perform the required response action.

**C**: Any person or persons conducting any activities that may disturb the insulation should be notified of its asbestos content.

Small scale, short duration maintenance activities are further defined, for the purpose of this O&M plan by the following considerations:

(1) Maintenance or renovation tasks, where the removal of asbestos containing materials
is not the primary goal of the job (e.g., repairing a valve which entails the removal of asbestos, repairing an electrical light that is secured to an asbestos containing ceiling).

(2) Activities where employee's exposure to asbestos can be kept below the permissible exposure level via worker isolation techniques, such as glove bags or other methods.

(3) Non-repetitive operations (ie.: not a series of small scale jobs, which if performed at one time would have resulted in a large-scale removal).

All of the requirements in paragraphs (1) through (3) above must be met in order for a job to be considered a small-scale, short duration operation.

OSHA has also considered EPA's interpretation in Appendix B to subpart E of their standard, 40 CFR Part 763 in which small-scale short duration is defined as:

- removal of asbestos containing thermal system insulation not to exceed amounts greater than those which can be contained in a single glove bag, or

- repairs, involving encapsulation, enclosure or removal, to small amounts of friable asbestos containing materials only if required in the performance of emergency or routine maintenance activity and not intended solely as asbestos abatement. Such work may not exceed amounts greater than those which can be contained in a single prefabricated mini-enclosure.

# 6.0 CLEANING PROGRAM

## 6.1 INITIAL CLEANING

The Sandston Building 3901 Designee will ensure that all areas of the Sandston Building 3901 where friable ACM, (below access hatches to areas above ceilings) be cleaned immediately (unless such areas have been previously cleaned.)

The specific procedures followed for O&M activities will depend on the activity performed. However, the Asbestos Designee will ensure that the following general procedures, to protect building occupants, be followed for any operations and maintenance activities disturbing the floor covering or other building material that have been proven or assumed to contain asbestos. Flooring and other building materials that are known not to contain asbestos may be maintained by common custodial practices:

1. Restrict entry into the area by persons other than those necessary to perform the maintenance project either by physically isolating the area or by scheduling.

2. Post signs to prevent entry by unauthorized person.

3. Shut off or temporarily modify the air handling system and restrict other sources of air movement if a possibility of fiber release exists.

4. Use work practices or other controls, such as, wet methods, protective clothing, HEPA vacuums, mini enclosures, glove bags, as necessary to inhibit the spread of any released fibers.

5. Clean all fixtures or other components in the immediate work area.

6. Place the asbestos debris and other cleaning materials in a sealed, leak tight container.

7. Dispose of debris and material as asbestos-containing waste in accordance with Section 11 of this plan.

## 6.2 CLEANING

These procedures apply to cleaning surfaces after small amounts of asbestos-containing materials (ACM) have been inadvertently disturbed. These procedures are not intended to apply to major fiber release episodes where large deposits have fallen with possible gross contamination of large areas. Major fiber release episode cleaning should be conducted by accredited personnel or qualified contractors.

(1) Dust. Dust of ACM can be cleaned with damp rags by gently wiping surfaces, and folding the rag inward until it is dirty and a new rag is needed. Place the contaminated rag immediately into a labeled disposal bag. When the dust is all cleaned up, wipe the surfaces again with clean, damp rags and put these into the plastic bag. Any milky film remaining on the affected surface when it dries has asbestos fibers in it, and the surface is not clean. Repeat the cleaning. Immediately after finishing the work, wash your hands and face.

(2) Small Pieces of ACM - debris can be picked up by gently placing a wet rag over the ACM and gathering the edges of the rag toward the center while folding them under. Pick up the "bundle", and place it immediately into a labeled disposable bag. When all material has been picked up this way, gently wipe the surfaces with a damp rag, folding it together, and put it immediately into the disposable bag. Finally, re-wipe all surfaces with clean damp rags and put these in the disposal bag. All cleaning materials are contaminated waste and shall be disposed of as such. Immediately after finishing the work, wash your hands and face.

(3) Large Chunks of ACM - These should be sprayed with amended water. The material should then be placed immediately into a labeled disposal bag. Complete the cleaning according to item (2) above. If the surface cannot be wetted because this will cause more damage to the surface of the ACM, then pick up the chunk with a wet rag first. Place the chunk immediately into a labeled disposable bag.

(4) Wet or Damp Mopping - can be used to clean larger floor areas. Wet and ring out the mop, then gently mop the floor area. Use slow motion, and do not swing or raise mop. The mop can be rinsed for additional mopping and the rinse water shall be treated as contaminated waste. Any milky film on the floor when it dries contains asbestos. The floor must be cleaned again. Mop heads shall not be allowed to dry out and shall be disposed of, while wet, as contaminated waste.

(5) Using the HEPA Vacuum - these are used for clean-up of accidental spills, and must be done with some judgement to avoid stirring dust and fiber in the act of cleaning. Clean-up dust, debris, and chunks of ACM before using the vacuum. The vacuum must not be used on wet material or puddles because that will destroy the HEPA filter. Some surfaces, for example carpet, cannot be mopped and the vacuum is the best method. If

traffic on the affected carpet is necessary to reach the main spill, then vacuum the carpet repeatedly ahead of your footsteps. The vacuum is good for getting dust out of cracks and crevices before wet wiping is done. The use of a HEPA vacuum requires training in operation and emptying the vacuum. Material collected by the HEPA vacuum must be handled and disposed of as contaminated waste.

## 7.0 ASBESTOS FLOORING

This procedure applies to maintenance and minor replacement (3 square feet or less) of asbestos flooring at any given time.

(1)Inform all members of the maintenance and custodial staffs about the locations of the VAT.

(2)The buffing and polishing equipment shall be examined for mechanical or performance defects which could cause damage to the VAT surface.

(3)Prior to each use, all buffing and polishing equipment shall be examined for mechanical or performance defects which could cause damage to the VAT surface.

(4)Drilling, sanding, cutting, gouging or any other action likely to cause the destruction of the VAT surface integrity shall be avoided.

(5)Damaged VAT shall be replaced with non-asbestos vinyl floor tiles. In the interim period before the replacement, the sanding of the asbestos backing material remaining on the floor shall be avoided.

(6)To reduce fiber release and to protect personnel involved in the replacement activities, these procedures should be followed:

a) Use only trained personnel.

b) Restrict entry into the area. Only persons necessary to perform the replacement activity shall be allowed into the area.

c) Using an instrument sharp enough to score through the tile and mastic, make an outline of the tile to be replaced.

d) Wet the tile with water or amended water to loosen the tile from its adhesive.

e) Pry the tile from the floor using a blunt knife.

f) Wet mop the area where the tile was removed and the surrounding areas or HEPA vacuum the area.

g) Place fresh non-asbestos adhesive and non-asbestos vinyl floor tile on the floor.

h) Deposit the HEPA filters, the replaced tiles and any other contaminated material in a 6-mil thick bag. Place this bag into another 6 mil thick bag and seal it shut.

I) Place warning labels on the bags and deposit in waste disposal drum with label to be disposed of in an approved landfill.

j) Provide a written report of the incident to the Asbestos Coordinator, for incorporation into the management plans. This report shall be submitted within seven (7) days of the occurrence.

## 7.1 FLOORING MAINTENANCE

Since improperly performed flooring maintenance procedures can result in asbestos exposure, EPA recommends the following guidelines for stripping asbestos-containing floors:

1. Avoid stripping floors. Stripping of floors could be done as infrequently as possible-perhaps once or twice or less per year depending on circumstances. The frequency should be carefully considered as floor maintenance schedules or contracts are written or renewed.

2. Properly train staff. Custodial or maintenance staff who strip floors should be trained to operate properly and safely the machines, pads and floor care chemicals used at the facility.

3. Follow appropriate work practices. Custodial or maintenance staff who strip floors should follow appropriate work practices, such as those recommended here, under informed supervision. Directions from floor tile and floor wax product manufacturers on proper maintenance procedures should be consulted.

4. Strip floors while wet. The floor should be kept adequately wet during the stripping operation. Do not perform dry stripping. Prior to machine operation, an emulsion of chemical stripper in water is commonly applied to the floor with a mop to soften the wax or finish coat. After stripping and before application of the new wax, the floor should be thoroughly cleaned while wet.

5. Run machine at slow speed. If the machine used to remove the wax or finish coat has variable speeds, it should be run at slow speed (about 175-190 rpm) during the stripping operation.

6. Select the least abrasive pad possible. The machine should be equipped with the least abrasive pad possible to strip wax or finish coat from asbestos-containing floors.

7. Do not over strip floors. Stop stripping when the old surface coat is removed. Over stripping can damage the floor and may cause the release of asbestos fibers. Do not operate a floor machine with an abrasive pad on unwaxed or unfinished floors.

EPA recommends that you leave asbestos-containing floor covering in place, provided the material is in good condition. However, proper maintenance procedures, such as those outlined above, should always be followed

## 8.0 FRIABLE AND NON-FRIABLE ASBESTOS MATERIALS

To avoid damage to friable and non-friable ACM, ensure that everyone has noted the following prohibited activities:

1. Do not drill holes in asbestos containing materials.

2. Do not sand asbestos containing flooring.

3. Do not damage asbestos containing materials while moving furniture or other objects.

4. Do not install curtains, drapes, or dividers in such a way that they damage asbestos containing materials.

5. Do not dust floors, ceilings, moldings or other surfaces in asbestos contaminated environments with a dry broom.

6. Do not use an ordinary vacuum to clean up asbestos containing debris. Use a HEPA filtered vacuum.

7. Do not remove asbestos containing material without wearing the proper respiratory protection, clearing the area of other people, and observing asbestos removal waste disposal procedures.

This section addresses the appropriate response actions needed to address fiber releases in the Sandston Building 3901. Two release episodes are addressed:

1. Minor release episodes involving less than three square feet or three linear feet of friable ACM.

2. Major release episodes involving greater than three square feet or three linear feet of friable ACM.

Procedures for responses are provided below.

## 8.1 MINOR FIBER RELEASE EPISODES

Minor release episodes are those defined as falling or dislodging of three (3) square or linear feet or less of friable ACM. Procedures to follow should a minor release occur are:

1. Thoroughly saturate the debris using wet methods.

2. Clean the area.

3. Place the asbestos debris in a sealed, leak tight container and dispose of as indicated in section 11.

4. Repair the area or damaged ACM with materials such as asbestos free spackling, plaster cement, or insulation or sealed with latex paint or an encapsulant, or immediately have the appropriate response action implemented.

## 8.2 MAJOR FIBER RELEASE EPISODES

Major release episodes are those defined as falling or dislodging of more than three (3) square or linear feet of ACM. Procedures to follow should a release occur are:

1. Restrict entry into the area and post signs to prevent entry into the area by persons other than those necessary to perform the response actions.

2. Shutoff or temporarily modify the air handling system to prevent the distribution of fibers to other areas in the building.

3. The response action for any major fiber release episode must be conducted by persons accredited to conduct response actions. The following procedures for the initial cleaning will be utilized:

# 9.0 RESPIRATORY PROTECTION PROGRAM

During abatement or maintenance activities involving friable asbestos-containing material, employees may be exposed to various concentrations of asbestos fibers. The employer must ensure that anytime an employee faces the possibility of asbestos exposure above the OSHA Permissible Exposure Limit (PEL), he/she will be equipped with respiratory equipment. In addition to providing respiratory equipment, the employer has the responsibility of implementing a Respiratory Protection Program. The following sections provide for the establishment of standard operating procedures for the respiratory protection of employees. For the purposes of this program, the only hazard considered is airborne asbestos fibers. Sandston Building 3901 may elect to utilize contractors to perform these services and would not be required to implement a respiratory protection program.

## 9.1 DESIGNATION OF A PROGRAM ADMINISTRATOR

A program administrator shall be selected by the Sandston Building 3901 to be responsible for the implementation of, and adherence to, the provisions of the Respiratory Protection Program.

## 9.2 SELECTION AND USE OF RESPIRATORY PROTECTIVE EQUIPMENT

Respirators used shall be selected from those approved by the National Institute for Occupational Safety and Health (NIOSH) for use in atmospheres containing asbestos fibers. A NIOSH approved respirator contains the following: an assigned identification number placed on each unit, a label identifying the type of hazard the respirator is designed to protect against, and additional information on the label which indicates limitations and identifies the component parts approved for use with the basic unit.

The approved respirator shall be worn for the existing working conditions specified as follows:

> Air-purifying respirators: A Powered air-purifying respirator shall be used as the minimum respiratory protective devise when worker exposure to asbestos is 0.1 fibers per cubic centimeter (f/cc) for an 8-hour time weighted average (TWA).

## 9.3 SURVEILLANCE

Only those individuals who are appropriately trained and medically able to wear respiratory protective equipment shall be issued one. Before being issued a respirator, an employee will receive pertinent tests for medical and physical conditions. Medical tests to be considered by a physician include: pulmonary function tests (FVC and FEV), chest x-ray, and any others

deemed appropriate by the examining physician. Medical factors to be considered by a physician include: emphysema, asthma, chronic bronchitis, heart disease, anemia, hemophilia, poor eyesight, poor hearing, hernia, lack of use of fingers or hands, epileptic seizures, and other factors which might inhibit the ability of an employee to wear respiratory equipment.

## 9.4 RESPIRATOR FIT-TESTS

Each employee determined medically fit to wear a respirator will be qualitatively fit-tested upon receiving the equipment and annually thereafter. The type of fit-test conducted depends on the respirator type. The manufacturer's literature should be consulted to determine the proper fit-test.

Problems in fitting a respirator can result if facial hair prevents a good seal from forming between the skin and sealing surface. Corrective lenses that have temple bars or straps may prevent proper sealing and should not be used when a full-face respirator is worn. An adapter kit to accommodate eyeglasses may be purchased from the manufacturer. Contact lenses should not be worn while wearing a respirator. A properly fitted respirator may stretch the skin around the eyes, thus increasing the possibility that the contact lens will fall out. Fit-tests shall be conducted by a qualified individual. Fit-test will be documented and documentation shall be maintained as part of the Respiratory Protection Program.

## 9.5 RESPIRATOR ASSIGNMENT AND MAINTENANCE

When practicable, respirators should be assigned to individual workers for their exclusive use. A system of record-keeping should be established to document all employees who have respiratory protection equipment and the periodic cleaning and maintenance of equipment.

Respirators shall be regularly cleaned and disinfected. Those issued for the exclusive use of one worker shall cleaned after each use and more often if necessary. Those used by more than on worker shall be thoroughly cleaned and disinfected after each use. This procedure is described as follows:

A. Before leaving the work area, each user must "wipe-down" the respirator with a wet cloth to remove any asbestos-containing material which may have settled on the equipment.

B. Respiratory equipment shall be washed with detergent in warm water using a brush. If possible, detergents containing a bactericide should be used. Organic solvents should not be used as they deteriorate the rubber face piece. If bactericide detergent is not available, the detergent wash should be followed with a disinfecting rinse. Two types of disinfectants may be made from readily available household solutions. A hypochlorite solution (50 ppm) can be made by adding two tablespoons of chlorine bleach to one gallon of water. An aqueous solution of iodine (50

p.m.) can be made by adding one teaspoon of tincture of iodine to one gallon of water. A two minute immersion of the respirator into either solution is sufficient for disinfecting during cleaning. The primary defects to look for in the inspection of component parts of the respiratory equipment and appropriate corrective actions are itemized below:

C. Respiratory equipment shall be thoroughly rinsed in warm clean water (120 F maximum) to remove all traces of detergent, cleaner, sanitize, and disinfectant.

D. Respiratory equipment shall be allowed to air dry on a clean surface or hung from a horizontal wire.

When not in use, respiratory equipment shall be placed in plastic bags and stored in a single layer with the face piece and exhalation valve in a non-distorted position. A metal cabinet with shelves is well suited for this purpose.

Repair or replacement of component parts must be done by qualified individuals. Substitution of parts from a different brand or type of respirator will invalidate the approval of the respirator.

Inspection for defects of respiratory equipment must be done before and after each use. Specific defects may include:

A. Air-purifying respirators (half-mask and full face piece)

1. Rubber face piece - check for:
   - excessive dirt (clean all dirt from face piece)
   - cracks, tears, or holes (obtain new face piece)
   - distortion (allow face piece to "sit" free from any constraints and see if distortion disappears; if not, obtain new face piece)
   - cracked, scratched, or loose fitting lenses (contact respirator manufacturer to see if replacement is possible; otherwise obtain new face piece)

2. Head straps - check for:
   - breaks or tears (replace head straps)
   - loss of elasticity (replace head straps)
   - broken or malfunctioning buckles or attachments (obtain new buckles)
   - face piece slipping (replace head strap)

3. Inhalation valve, exhalation valve - check for:

- detergent residue, dust particles, or dirt on valve or valve seat (clean residue with soap and water)
- cracks, tears, or distortion in the valve material or valve seat (contact manufacturer for instructions)
- missing or defective valve cover (obtain valve cover from manufacturer)

4. Filter element(s) - check for:

- proper filter for the hazard approval designation
- missing or worn gaskets (contact manufacturer for replacement)
- worn threads - both filter threads and face piece threads (replace filter or face piece, whichever is applicable)

B. Atmosphere Supplying Respirators

1. Check face piece, head strap, valves, and breathing tube (same as air-purifying respirators).

2. Air supply system - check for:

- breathing air quality
- breaks or kinks in air supply hoses and end fitting attachments (replace hose and/or fitting)
- tightness of connections
- proper setting of regulators and valves (consult manufacturer's recommendations)
- correct operation of air-purifying elements and carbon monoxide or high-temperature alarms

## 9.6 EMPLOYEE TRAINING PROGRAM

Each employee designated to wear a respirator will be issued a copy of Respirator Protection Program. Employee must be given adequate time to read and understand the material. A brief training session, with required employee attendance, will be conducted by the supervisor or other qualified personnel to ensure that employees understand the limitations, use, and maintenance of respiratory equipment, and other important aspects of the Respiratory Protection Program.

## 9.7 SURVEILLANCE OF WORKING CONDITIONS

Air sampling will be conducted before, during, and after selected projects requiring respiratory equipment. Respiratory equipment used must be suitable for the asbestos concentrations expected to occur in the work area. Employees shall be instructed to immediately leave the work area should they experience physical stress such as difficulty in breathing or dizziness.

## 9.8 RESPIRATOR PROGRAM SUPERVISION

The Respirator Protection Program shall be evaluated at least annually with program adjustments, as appropriate, made to reflect the evaluation results. Compliance with the aforementioned points of the program should be reviewed: respirator selection, purchase of approved equipment, medical screening of employees, fit-testing, assurance of equipment and associated maintenance, storage, repair, and inspection, and appropriate surveillance of work area conditions.

Attention should be given to proper record-keeping. Records which should be kept include: employees who are trained in respirator use; documentation of the care and maintenance of respirators; medical records of each respirator user, airborne concentrations of asbestos fibers \ before, during, and after work is conducted, and any problems encountered during maintenance activities.

# 10.0 MEDICAL SURVEILLANCE PROGRAM

Implementation of a Medical Surveillance Program provides for the assessment of an employee's medical status and compliance with OSHA standards. Medical surveillance is required under the OSHA Standard [29 CFR 1926.1101] for all personnel who may be exposed to asbestos fibers in concentrations greater than 0.1 fibers/cc (8-hour, time-weighted average). This generally applies to all workers who may come into contact with ACM or its debris and be exposed to anything in excess of negligible levels. Additionally, any employee who wears a respirator as a routine part of his or her job must also be medically evaluated on a regular basis. Although medical surveillance may be optional for employees who infrequently wear a respirator during exposure below the OSHA standards, a medical exam of these employees may also be prudent.

It may be advantageous to designate a core group of employees who will handle all functions requiring a respirator. For these employees, a Medical Surveillance Program will be used to determine their baseline health status (health status before beginning work), to monitor their health during the duration of their employment, and also to provide documentation of their health status along with their work history upon completion of their employment. Therefore, employees in this surveillance program will be given pre-placement, annual, and termination examinations unless there is documentation the employee has had an equivalent examination within the past one-year period.

The medical examination will include, as a minimum, an occupational/environmental history, a chest x-ray (posterior-anterior, 14 x 17 inches), a medical history to determine the presence of any possible respiratory diseases, and pulmonary function evaluations including forced vital capacity (FVC) and forced expiratory volume at one second (FEV 1.0). OSHA requires, on initial examination, that a standardized questionnaire be completed. In addition, a periodic medical questionnaire is required by OSHA to be completed on annual examination.

The examining physician will be provided a copy of the Asbestos Construction Standard (29 CFR 1926.1101) a description of the employees' duties, the employees' representative exposure level or anticipated exposure level, a description of personal protective and respiratory equipment to be used, and information from previous medical examinations. The examining physician will sign a statement that the medical examination given is consistent with OSHA requirements and the examined employee is physically able to perform the required work which may include wearing an air-purifying respirator.

All records will be maintained on file for at least 30 years and be available to each employee participating in the Medical Surveillance Program.

# 11.0 DISPOSAL OF ASBESTOS CONTAINING MATERIAL

This section describes the disposal of asbestos-containing materials. Disposal includes packaging of asbestos-containing waste materials. It is recommended the Asbestos Coordinator of the Sandston Building 3901 package the material and then contact a reputable abatement contractor to handle transportation to the landfill.

All asbestos must be sealed in a 6 mil thick leak-tight polyethylene bag labeled with text as follows:

First Label: Provide in accordance with 29 CFR 1926.1101 (k) of OSHA's Asbestos Standard:

**DANGER**
**CONTAINS ASBESTOS FIBERS**
**AVOID CREATING DUST**
**CANCER AND LUNG DISEASE HAZARD**
**BREATHING AIRBORNE ASBESTOS FIBERS**

Second Label: Provide in accordance with U.S. Department of Transportation regulations on hazardous waste marking. 49 CFR parts 171 and 172. Hazardous Substance: Final Rule. Published November 21, 1986 and revised February 17, 1987.

**RQ HAZARDOUS**
**SUBSTANCE,**
**SOLID, NOS,**
**ORM-E, NA 9188**
**(ASBESTOS)**

If the Sandston Building 3901 elects to handle its own disposal, the following procedures must be adhered to:

1. All waste is to be hauled by a waste hauler with all required licenses from all state and local authorities with jurisdiction.

2. Load all asbestos-containing waste material in disposal bags or leak-tight drums. All materials are to be contained in one of the following:

    a. Two 6 mil disposal bags

    b. Two 6 mil disposal bags and a fiberboard drum

3. Carefully load containerized waste in fully enclosed dumpsters, trucks or other appropriate vehicles for transport. Exercise care before and during transport, to ensure that no unauthorized persons have access to the material.

4. Do not store containerized materials in an area where the general public has access. Take containers from the work area directly to a sealed truck or dumpster.

5. Do not transport disposal bagged materials in open trucks. Label drums with same warning labels as bags. Uncontaminated drums may be reused. Treat drums that have been contaminated as asbestos-containing waste and dispose of in accordance with these directions.

6. Advise the landfill operator or processor of the quantity of material to be delivered. Do this as soon as possible.

7. At a disposal site, sealed plastic bags must be carefully unloaded by hand from the truck by employees dressed in proper personnel protective equipment. If bags are broken or damaged, repair with duct tape and/or put in new unbroken bags. Clean entire truck and contents.

8. At a processing site, truck and loading dock are arranged as a controlled work area and containerized waste is transferred to storage area by site personnel. All bags including broken ones will be transferred. Clean truck.

9. Retain receipts from landfill or processor for materials disposed.

# APPENDIX B

# LICENSES AND QUALIFICATIONS

## DEPARTMENT OF PROFESSIONAL AND OCCUPATIONAL REGULATION
## COMMONWEALTH OF VIRGINIA

EXPIRES ON
06-30-2012

9960 Mayland Dr., Suite 400, Richmond, VA 23233
Telephone: (804) 367-8500

NUMBER
3303 002651

VIRGINIA ASBESTOS LICENSE
INSPECTOR LICENSE

MICHAEL ALLEN BAUM
5003 HALLMARK COURT

RICHMOND, VA 23234

Gordon N. Dixon, Director

ALTERATION OF THIS DOCUMENT, USE AFTER EXPIRATION, OR USE BY PERSONS OR FIRMS OTHER THAN THOSE NAMED MAY RESULT IN CRIMINAL PROSECUTION UNDER THE CODE OF VIRGINIA.

(SEE REVERSE SIDE FOR NAME AND/OR ADDRESS CHANGE)

## DEPARTMENT OF PROFESSIONAL AND OCCUPATIONAL REGULATION
## COMMONWEALTH OF VIRGINIA

EXPIRES ON
07-31-2012

9960 Mayland Dr., Suite 400, Richmond, VA 23233
Telephone: (804) 367-8500

NUMBER
3304 001550

VIRGINIA ASBESTOS LICENSE
MANAGEMENT PLANNER LICENSE

MICHAEL ALLEN BAUM
5003 HALLMARK COURT

RICHMOND, VA 23234

Gordon N. Dixon, Director

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## DEPARTMENT OF PROFESSIONAL AND OCCUPATIONAL REGULATION
## COMMONWEALTH OF VIRGINIA

EXPIRES ON
01-31-2012

9960 Mayland Dr., Suite 400, Richmond, VA 23233
Telephone: (804) 367-8500

NUMBER
3303 002143

VIRGINIA ASBESTOS LICENSE
INSPECTOR LICENSE

HERMAN GARCIA
12434 IVY RIDGE TERRACE

CHESTER, VA 23831

Gordon N. Dixon, Director

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## DEPARTMENT OF PROFESSIONAL AND OCCUPATIONAL REGULATION
## COMMONWEALTH OF VIRGINIA

EXPIRES ON
03-31-2012

9960 Mayland Dr., Suite 400, Richmond, VA 23233
Telephone: (804) 367-8500

NUMBER
3304 001586

VIRGINIA ASBESTOS LICENSE
MANAGEMENT PLANNER LICENSE

HERMAN GARCIA
12434 IVY RIDGE TERRACE

CHESTER, VA 23831

Gordon N. Dixon, Director

ALTERATION OF THIS DOCUMENT, USE AFTER EXPIRATION, OR USE BY PERSONS OR FIRMS OTHER THAN THOSE NAMED MAY RESULT IN CRIMINAL PROSECUTION UNDER THE CODE OF VIRGINIA.

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SINCE 1881

**FROEHLING & ROBERTSON, INC.**

**ENGINEERING • ENVIRONMENTAL • GEOTECHNICAL**

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# ASBESTOS OPERATIONS AND MAINTENANCE (O&M) PLAN

**SANDSTON ARMORY BUILDING 3990**
**700 Portugee Road**
**Sandston, VA 23150**

Prepared For:
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Department of Military Affairs
Fort Pickett, Building 316
Blackstone, Virginia 23229
(434) 294-1464
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Prepared By:
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F&R Project Number 68N-0510

September 29, 2011

Prepared By:

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Industrial Hygienist

Reviewed By:

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Senior Project Manager

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**APPENDICES**

Appendix A – Operations & Maintenance (O&M) Plan

Appendix B – Licenses and Qualifications

## 1.0 Introduction

Froehling and Robertson (F&R) was contracted by the Department of Military Affairs to review and, if necessary, revise the Operations & Maintenance (O&M) Plan for Sandston Armory Building 3990, located at 700 Portugee Road, Sandston, Virginia. The revision was performed by Commonwealth of Virginia licensed asbestos management planner, Mr. Michael Baum (License #3304 001550), on September 29, 2011, and reviewed by Commonwealth of Virginia licensed asbestos management planner, Mr. Herman Garcia (License #3304 001586). The revision was conducted for the purpose of ensuring that the O&M plan is in compliance with current asbestos regulations, and reflects the status of asbestos-containing materials (ACMs) identified within the structure during the reinspection performed by F&R on August 25, 2011.

The scope of the asbestos O&M Plan revision for Sandston Armory Building 3990 consisted of the following items only:

- Review the report of the asbestos reinspection of the Armory performed by F&R on August 25, 2011.
- Review existing asbestos regulations.
- Review and revise the existing O&M Plan provided by Mr. James Williams of the Department of Military Affairs. The O&M plan was not dated, and the name of the author and/or company that provided the original O&M was not stated within the O&M Plan.
- Document the O&M Plan review by recording changes on the previous O&M Plan.

Notes:

1. F&R was furnished with an electronic copy of the existing O&M Plan by Mr. James Williams of the Department of Military Affairs. However, the O&M plan was not dated, and the name of the author and/or company that provided the original O&M was not stated within the O&M Plan.

## 2.0 Reporting

The revised O&M Plan has been presented in Appendix A. Per client request, deletion of information from the previous report has been indicated by striking through the information to be deleted. Addition of information to the previous report has been indicated by red lettering in Calibri font.

## 3.0 Limitations

This plan has been prepared for the exclusive use by the Department of Military Affairs and its associates. This service was performed in accordance with generally accepted environmental practices. No other warranty, expressed or implied, is made.

Under this scope of services, F&R assumes no responsibility regarding response actions (e.g. Encapsulation, Abatement, Removal, Notifications, etc.) initiated as a result of these findings. F&R assumes no liability for the duties and responsibilities of the Client with respect to compliance with

these regulations. Compliance with regulations is the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, whichever is more stringent. All abatement activities or response actions should be performed by appropriately qualified and licensed-personnel and/or companies, as warranted.

Froehling & Robertson, Inc. by virtue of providing the services described in this report, does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that may present a potential danger to public health, safety, or the environment. The client agrees to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. The contents of the report should not be construed in any way as a recommendation to purchase, sell, or develop the project site.

# APPENDIX A

# ASBESTOS OPERATIONS AND MAINTENANCE (O&M) PLAN

# Operations & Maintenance Plan

## 1.0 INTRODUCTION

This Operations and Maintenance (O&M) Program has been prepared expressly for the Sandston Hanger 3990 and is designed to meet their requirements, as well as compliance with the Occupational Safety and Health Administration (OSHA) and the Asbestos School Hazard Abatement and Reauthorization Act (ASHARA) which extends the training requirement of the Asbestos Hazard Emergency Response Act (AHERA) to all public and commercial buildings. The Sandston Hanger 3990 shall designate a person that will implement the following operations, maintenance, and repair program in those areas where asbestos containing building materials (ACBM) are present.

Through this program, the Sandston Hanger 3990 Designee will institute work practices that maintain the ACBM in good condition, ensure cleanup of asbestos fibers previously released and prevent further released by minimizing and controlling disturbance or damage to the ACBM. Additionally, a program to monitor the condition of all ACBM is included. This program should continue until all ACBM is abated.

The O&M Plan is not a permanent option. It should be implemented as part of this overall asbestos management plan that has as its goal the eventual elimination of all potentially hazardous ACM within the facility. The O&M plan likewise is not a means by which full-scale abatement can be accomplished. Operations and Maintenance activities involve areas containing ACM in quantities less than 3 square feet, less than 3 linear feet or small-scale short duration activities. To perform these activities require 16-hours of Operations and Maintenance (O&M) training. If the Armories choose not to have their staff trained then only appropriately trained and qualified third parties should perform any activities that may disturb the asbestos containing materials (ACM). Large removal projects that require extensive planning and technical expertise are not detailed in this plan and must be designed by an accredited project designer and conducted by accredited personnel or contractors.

## 2.0 BACKGROUND INFORMATION

The term Asbestos covers a group of minerals including actinolite, amosite, antrophlite, chrysotile, crocidolite, and tremolite that are related to each other as fibrous inorganic hydrated mineral silicates. These minerals have been valued as a natural resource with hundreds of applications in manufacturing, construction and consumer products. Their fibrous forms allow them to be made into cloth, felt, gaskets, rope, or to be used for reinforcement in cements, asphalt, and plastic. They are non-flammable, withstand high temperature, and have a high tensile strength.

Typically, asbestos has been used in buildings for its insulation and fire resistant qualities. As a result it appears in three major categories of building material: (1) surfacing materials; (2) thermal system insulation materials; and (3) miscellaneous materials such as ceiling tiles, floor tiles, and shingles.

The adverse health effects from asbestos materials are primarily associated with the respiratory system. The respiratory system plays the key role in removing and filtering foreign materials inhaled into our system, but due to the small size of asbestos fibers, not all can be filtered. Due to this problem, asbestos related diseases have occurred and continue to occur from exposure to asbestos fibers. However, most of the diseases associated with asbestos exposure take ~~at least 20 years or more~~ ten to forty years to show symptoms ~~for~~ from the initial exposure.

The major types of asbestos related diseases are:

Asbestosis - A scarring (fibrosis) of the lung. The disease is associated with those workers who have been exposed to high doses such as miners, insulators and manufacturers of asbestos. The disease is progressive and continues even though the exposure has ceased.

Lung Cancer - A malignant tumor of the bronchi covering, this tumor grows and obstructs the air passage. Although there are many causes of lung cancer, there has been shown an increased risk with people who work with asbestos.

Mesothelioma - A cancer of the mesothelium-the linings of the abdominal wall. This disease is a true indicator of asbestos exposure. By the time the disease is diagnosed, it is almost always fatal.

It has also been shown, for those who have worked with asbestos and smoke, that they have an 80 times greater risk of developing lung cancer than those people who do not smoke or work with asbestos. This is due to a synergistic effect that the two materials have with each other. The potential health problems occur as a result of inhalation of asbestos fibers.

Therefore, protection of the facilities, workers, and visitors are directed at maintaining ACM in

an intact non-friable condition.

Those materials not removed from the Sandston Hanger 3990 will be incorporated into this routine
O & M program to prevent release of asbestos fibers by minimizing and controlling disturbance or damage of friable ACBM. Health impacts can thereby be minimized to the greatest degree possible.

# 3.0 SUMMARY OF ASBESTOS REGULATIONS

Regulations affecting the staff of the Sandston Hanger 3990 and their response to asbestos containing materials in the building have been promulgated by the EPA, OSHA, and the Commonwealth of Virginia. This section summarizes EPA regulations directed at identification and response to asbestos in facilities and OSHA regulations directed at worker protection as they affect the anticipated activities under this Operations and Management Program. Major regulatory programs potentially impacting operations are summarized below.

## 3.1 NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPS) (40 CFR 61, Subpart M).

EPA's first regulations on asbestos industries were issued in 1973 under the Clean Air Act. These regulations and subsequent amendments in 1975, 1978, and 1990 included regulations for asbestos industries, as well as laws governing spray applied asbestos and procedures to follow during building demolition to minimize uncontrolled asbestos fiber release. The important part of this regulation to facilities are those directed at control of asbestos release during building renovation and demolition. Briefly, these regulations require that advance notice be given to EPA and/or the equivalent state agency when a building renovation is conducted that results in disturbance of more that 260 linear fee, 160 square feet, or 35 cubic feet of asbestos containing material. These regulations further specify appropriate removal, transportation and disposal techniques to minimize emission of asbestos fibers during renovation or demolition.

In summary, facilities undergoing renovation or demolition must comply with this EPA air emission regulation.

## 3.2 OSHA WORKER PROTECTION STANDARDS

OSHA initially issued regulations in 1972 to protect workers engaged in industrial operations involving asbestos. In 1994 regulations known as the Asbestos Construction Standard (29 CFR 1926.1101) specify airborne exposure standards for asbestos workers, engineering and administrative controls, work place practices and medical surveillance and worker protection practices for industrial settings. These regulations include comprehensive requirements for asbestos abatement projects including reporting requirements, exposure limits, air monitoring, engineering controls and work practices, respiratory protection and protective equipment, medical surveillance, employee training and record keeping. Any organization conducting asbestos abatement, operations, maintenance and repair must follow these extended requirements for its employees, unless the activity is defined as a small scale, short duration project.

## 3.3 ASBESTOS HAZARD EMERGENCY RESPONSE ACT (AHERA)

The Asbestos Hazard Emergency Response Act (AHERA) was signed into law in October, 1986. The Act directed the EPA to establish laws and regulations that governed identifying, evaluating and controlling asbestos containing materials in schools. The laws also established training requirements and pertained to schools (K-12) only.

## 3.4 ASBESTOS SCHOOL HAZARD ABATEMENT AND REAUTHORIZATION ACT (ASHARA)

ASHARA extended the training requirements of AHERA to all public and commercial buildings. Under the definitions of ASHARA, the Sandston Hanger 3990 may be classified as a public and commercial building.

# 4.0 ADMINISTRATIVE PROCEDURES

## 4.1 ASBESTOS LOCATION

The Sandston Hanger 3990 Designee shall ensure that the exact location of all ACM is indicated on building documents (plans, specifications, and drawings). These documents will be used for all training as well as becoming part of the permanent record for the Armory. All outside contractors (see paragraph 4.4) and new employees should review these documents prior to commencing work.

## 4.2 NEW EMPLOYEE BRIEFINGS

The Sandston Hanger 3990 Designee will brief all new employees on the asbestos situation prior to their reporting to work. This briefing shall cover the same basic information included in the two- hour awareness training. Documentation of this briefing shall be made a part of the employee's permanent personal record. This briefing need not be as in-depth as the training given the maintenance and custodial staff but shall be of sufficient detail to ensure non-maintenance personnel do not inadvertently create a fiber release. Emphasis should be given to the prohibited activities covered in section 8.0 of this O&M plan.

## 4.3 OUTSIDE CONTRACTORS

The Sandston Hanger 3990 Designee shall develop a form requiring work orders be reviewed by an asbestos responsible person prior to all renovation or demolition, except in an emergency. This procedure should prevent any untrained person from inadvertently disturbing asbestos containing material. Additionally, a letter advising outside contractors of the location of all asbestos containing materials shall be developed and made a part of all contracts. Outside contractors (plumbers, electricians, painters, etc.) should be required to acknowledge receipt of this letter prior to commencing work in the Sandston Hanger 3990.

## 4.4 WARNING SIGNS

Sandston Hanger 3990 Designee shall attach a warning label immediately adjacent to any friable and non-friable asbestos containing material located in routine maintenance areas of the Sandston Hanger 3990 (such as above ceilings). All labels shall be prominently displayed in readily visible locations and shall remain posted until the ACM is removed. The warning label shall read, in print which is readily visible because of large size or bright color, as follows:

**CAUTION: ASBESTOS, HAZARDOUS**
**DO NOT DISTURB WITHOUT PROPER**
**TRAINING AND EQUIPMENT**

## 4.5 PERIODIC SURVEILLANCE

At least once every 6 months after this Operations and Maintenance plan is in effect, the Sandston Hanger 3990 Designee (or his trained representative) shall conduct periodic surveillance of all asbestos containing building material identified in this report. This surveillance shall include:

1. Visual inspections of the material.

2. Recording the date the surveillance, the name of the person conducting the surveillance, and any changes in the condition of the material.

3. Maintaining that record as part of the Operations and Maintenance plan.

## 5.0 SMALL SCALE, SHORT DURATION ACTIVITIES WITH OPERATIONS AND MAINTINANCE (O&M) TRAINING

This O&M Program is directed at the small-scale, short duration activities expected to be conducted in the Sandston Hanger 3990 by an in house staff with the appropriate 16-hours of Operations and Maintenance training or by appropriately trained and qualified third parties. These activities include the following:

~~1. Removal of small quantities of asbestos containing floor tile.~~

~~**A:** The floor tile may remain in place. Its condition should be monitored during the 6 month periodic surveillance.~~

~~**B:** In the event of any damage to the floor tile it should be kept wet and access to the area restricted until appropriately trained and qualified personnel are dispatched to perform the required response action.~~

~~**C**: Any person or persons conducting any activities that may disturb the floor tile should be notified of its asbestos content.~~

~~(1)~~

~~(2)~~

~~5.0 4. Minor repairs to the above mentioned materials that do not require removal.~~

2. Removal of small quantities of asbestos containing floor tile.

**A:** The floor tile may remain in place. Its condition should be monitored during the 6-month periodic surveillance.

**B:** In the event of any damage to the floor tile it should be kept wet and access to the area restricted until appropriately trained and qualified personnel are dispatched to perform the required response action.

**C**: Any person or persons conducting any activities that may disturb the floor tile should be notified of its asbestos content.

3. Removal of small quantities of asbestos containing drywall.

**A:** The drywall plaster may remain in place. Its condition should be monitored during the 6 month periodic surveillance.

**B:** In the event of any damage to the drywall it should be kept wet and access to the area restricted until appropriately trained and qualified personnel are dispatched to perform the required response action.

**C**: Any person or persons conducting any activities that may disturb the drywall should be notified of its asbestos content.

Small scale, short duration maintenance activities are further defined, for the purpose of this O&M plan by the following considerations:

(3) Maintenance or renovation tasks, where the removal of asbestos containing materials
is not the primary goal of the job (e.g., repairing a valve which entails the removal of asbestos, repairing an electrical light that is secured to an asbestos containing ceiling).

(4) Activities where employee's exposure to asbestos can be kept below the permissible exposure level via worker isolation techniques, such as glove bags or other methods.

(5) Non-repetitive operations (ie.: not a series of small scale jobs, which if performed at one time would have resulted in a large-scale removal).

All of the requirements in paragraphs (1) through (3) above must be met in order for a job to be considered a small-scale, short duration operation.

OSHA has also considered EPA's interpretation in Appendix B to subpart E of their standard, 40 CFR Part 763 in which small-scale short duration is defined as:

- removal of asbestos containing thermal system insulation not to exceed amounts greater than those which can be contained in a single glove bag, or

- repairs, involving encapsulation, enclosure or removal, to small amounts of friable asbestos containing materials only if required in the performance of emergency or routine maintenance activity and not intended solely as asbestos abatement. Such work may not exceed amounts greater than those which can be contained in a single prefabricated mini-enclosure.

# 6.0 CLEANING PROGRAM

## 6.1 INITIAL CLEANING

The Sandston Hanger 3990 Designee will ensure that all areas of the Sandston Hanger 3990 where friable ACM, (below access hatches to areas above ceilings) be cleaned immediately (unless such areas have been previously cleaned.)

The specific procedures followed for O&M activities will depend on the activity performed. However, the Asbestos Designee will ensure that the following general procedures, to protect building occupants, be followed for any operations and maintenance activities disturbing the floor covering or other building material that have been proven or assumed to contain asbestos. Flooring and other building materials that are known not to contain asbestos may be maintained by common custodial practices:

1. Restrict entry into the area by persons other than those necessary to perform the maintenance project either by physically isolating the area or by scheduling.

2. Post signs to prevent entry by unauthorized person.

3. Shut off or temporarily modify the air handling system and restrict other sources of air movement if a possibility of fiber release exists.

4. Use work practices or other controls, such as, wet methods, protective clothing, HEPA vacuums, mini enclosures, glove bags, as necessary to inhibit the spread of any released fibers.

5. Clean all fixtures or other components in the immediate work area.

6. Place the asbestos debris and other cleaning materials in a sealed, leak tight container.

7. Dispose of debris and material as asbestos-containing waste in accordance with Section 11 of this plan.

## 6.2 CLEANING

These procedures apply to cleaning surfaces after small amounts of asbestos-containing materials (ACM) have been inadvertently disturbed. These procedures are not intended to apply to major fiber release episodes where large deposits have fallen with possible gross contamination of large areas. Major fiber release episode cleaning should be conducted by accredited personnel or qualified contractors.

(1) Dust. Dust of ACM can be cleaned with damp rags by gently wiping surfaces, and folding the rag inward until it is dirty and a new rag is needed. Place the contaminated rag immediately into a labeled disposal bag. When the dust is all cleaned up, wipe the surfaces again with clean, damp rags and put these into the plastic bag. Any milky film remaining on the affected surface when it dries has asbestos fibers in it, and the surface is not clean. Repeat the cleaning. Immediately after finishing the work, wash your hands and face.

(2) Small Pieces of ACM - debris can be picked up by gently placing a wet rag over the ACM and gathering the edges of the rag toward the center while folding them under. Pick up the "bundle", and place it immediately into a labeled disposable bag. When all material has been picked up this way, gently wipe the surfaces with a damp rag, folding it together, and put it immediately into the disposable bag. Finally, re-wipe all surfaces with clean damp rags and put these in the disposal bag. All cleaning materials are contaminated waste and shall be disposed of as such. Immediately after finishing the work, wash your hands and face.

(3) Large Chunks of ACM - These should be sprayed with amended water. The material should then be placed immediately into a labeled disposal bag. Complete the cleaning according to item (2) above. If the surface cannot be wetted because this will cause more damage to the surface of the ACM, then pick up the chunk with a wet rag first. Place the chunk immediately into a labeled disposable bag.

(4) Wet or Damp Mopping - can be used to clean larger floor areas. Wet and ring out the mop, then gently mop the floor area. Use slow motion, and do not swing or raise mop. The mop can be rinsed for additional mopping and the rinse water shall be treated as contaminated waste. Any milky film on the floor when it dries contains asbestos. The floor must be cleaned again. Mop heads shall not be allowed to dry out and shall be disposed of, while wet, as contaminated waste.

(5) Using the HEPA Vacuum - these are used for clean-up of accidental spills, and must be done with some judgement to avoid stirring dust and fiber in the act of cleaning. Clean-up dust, debris, and chunks of ACM before using the vacuum. The vacuum must not be used on wet material or puddles because that will destroy the HEPA filter. Some surfaces, for example carpet, cannot be mopped and the vacuum is the best method. If

traffic on the affected carpet is necessary to reach the main spill, then vacuum the carpet repeatedly ahead of your footsteps. The vacuum is good for getting dust out of cracks and crevices before wet wiping is done. The use of a HEPA vacuum requires training in operation and emptying the vacuum. Material collected by the HEPA vacuum must be handled and disposed of as contaminated waste.

## 7.0 ASBESTOS FLOORING

This procedure applies to maintenance and minor replacement (3 square feet or less) of asbestos flooring at any given time.

(1)Inform all members of the maintenance and custodial staffs about the locations of the VAT.

(2)The buffing and polishing equipment shall be examined for mechanical or performance defects which could cause damage to the VAT surface.

(3)Prior to each use, all buffing and polishing equipment shall be examined for mechanical or performance defects which could cause damage to the VAT surface.

(4)Drilling, sanding, cutting, gouging or any other action likely to cause the destruction of the VAT surface integrity shall be avoided.

(5)Damaged VAT shall be replaced with non-asbestos vinyl floor tiles. In the interim period before the replacement, the sanding of the asbestos backing material remaining on the floor shall be avoided.

(6)To reduce fiber release and to protect personnel involved in the replacement activities, these procedures should be followed:

a) Use only trained personnel.

b) Restrict entry into the area. Only persons necessary to perform the replacement activity shall be allowed into the area.

c) Using an instrument sharp enough to score through the tile and mastic, make an outline of the tile to be replaced.

d) Wet the tile with water or amended water to loosen the tile from its adhesive.

e) Pry the tile from the floor using a blunt knife.

f) Wet mop the area where the tile was removed and the surrounding areas or HEPA vacuum the area.

g) Place fresh non-asbestos adhesive and non-asbestos vinyl floor tile on the floor.

h) Deposit the HEPA filters, the replaced tiles and any other contaminated material in a 6-mil thick bag. Place this bag into another 6 mil thick bag and seal it shut.

I) Place warning labels on the bags and deposit in waste disposal drum with label to be disposed of in an approved landfill.

j) Provide a written report of the incident to the Asbestos Coordinator, for incorporation into the management plans. This report shall be submitted within seven (7) days of the occurrence.

## 7.1 FLOORING MAINTENANCE

Since improperly performed flooring maintenance procedures can result in asbestos exposure, EPA recommends the following guidelines for stripping asbestos-containing floors:

1. Avoid stripping floors. Stripping of floors could be done as infrequently as possible-perhaps once or twice or less per year depending on circumstances. The frequency should be carefully considered as floor maintenance schedules or contracts are written or renewed.

2. Properly train staff. Custodial or maintenance staff who strip floors should be trained to operate properly and safely the machines, pads and floor care chemicals used at the facility.

3. Follow appropriate work practices. Custodial or maintenance staff who strip floors should follow appropriate work practices, such as those recommended here, under informed supervision. Directions from floor tile and floor wax product manufacturers on proper maintenance procedures should be consulted.

4. Strip floors while wet. The floor should be kept adequately wet during the stripping operation. Do not perform dry stripping. Prior to machine operation, an emulsion of chemical stripper in water is commonly applied to the floor with a mop to soften the wax or finish coat. After stripping and before application of the new wax, the floor should be thoroughly cleaned while wet.

5. Run machine at slow speed. If the machine used to remove the wax or finish coat has variable speeds, it should be run at slow speed (about 175-190 rpm) during the stripping operation.

6. Select the least abrasive pad possible. The machine should be equipped with the least abrasive pad possible to strip wax or finish coat from asbestos-containing floors.

7. Do not over strip floors. Stop stripping when the old surface coat is removed. Over stripping can damage the floor and may cause the release of asbestos fibers. Do not operate a floor machine with an abrasive pad on unwaxed or unfinished floors.

EPA recommends that you leave asbestos-containing floor covering in place, provided the material is in good condition. However, proper maintenance procedures, such as those outlined above, should always be followed

## 8.0 FRIABLE AND NON-FRIABLE ASBESTOS MATERIALS

To avoid damage to friable and non-friable ACM, ensure that everyone has noted the following prohibited activities:

1. Do not drill holes in asbestos containing materials.

2. Do not sand asbestos containing flooring.

3. Do not damage asbestos containing materials while moving furniture or other objects.

4. Do not install curtains, drapes, or dividers in such a way that they damage asbestos containing materials.

5. Do not dust floors, ceilings, moldings or other surfaces in asbestos contaminated environments with a dry broom.

6. Do not use an ordinary vacuum to clean up asbestos containing debris. Use a HEPA filtered vacuum.

7. Do not remove asbestos containing material without wearing the proper respiratory protection, clearing the area of other people, and observing asbestos removal waste disposal procedures.

This section addresses the appropriate response actions needed to address fiber releases in the Sandston Hanger 3990. Two release episodes are addressed:

1. Minor release episodes involving less than three square feet or three linear feet of friable ACM.

2. Major release episodes involving greater than three square feet or three linear feet of friable ACM.

Procedures for responses are provided below.

## 8.1 MINOR FIBER RELEASE EPISODES

Minor release episodes are those defined as falling or dislodging of three (3) square or linear feet or less of friable ACM. Procedures to follow should a minor release occur are:

1. Thoroughly saturate the debris using wet methods.

2. Clean the area.

3. Place the asbestos debris in a sealed, leak tight container and dispose of as indicated in section 11.

4. Repair the area or damaged ACM with materials such as asbestos free spackling, plaster cement, or insulation or sealed with latex paint or an encapsulant, or immediately have the appropriate response action implemented.

## 8.2 MAJOR FIBER RELEASE EPISODES

Major release episodes are those defined as falling or dislodging of more than three (3) square or linear feet of ACM. Procedures to follow should a release occur are:

1. Restrict entry into the area and post signs to prevent entry into the area by persons other than those necessary to perform the response actions.

2. Shutoff or temporarily modify the air handling system to prevent the distribution of fibers to other areas in the building.

3. The response action for any major fiber release episode must be conducted by persons accredited to conduct response actions. The following procedures for the initial cleaning will be utilized:

# 9.0 RESPIRATORY PROTECTION PROGRAM

During abatement or maintenance activities involving friable asbestos-containing material, employees may be exposed to various concentrations of asbestos fibers. The employer must ensure that anytime an employee faces the possibility of asbestos exposure above the OSHA Permissible Exposure Limit (PEL), he/she will be equipped with respiratory equipment. In addition to providing respiratory equipment, the employer has the responsibility of implementing a Respiratory Protection Program. The following sections provide for the establishment of standard operating procedures for the respiratory protection of employees. For the purposes of this program, the only hazard considered is airborne asbestos fibers. Sandston Hanger 3990 may elect to utilize contractors to perform these services and would not be required to implement a respiratory protection program.

## 9.1 DESIGNATION OF A PROGRAM ADMINISTRATOR

A program administrator shall be selected by the Sandston Hanger 3990 to be responsible for the implementation of, and adherence to, the provisions of the Respiratory Protection Program.

## 9.2 SELECTION AND USE OF RESPIRATORY PROTECTIVE EQUIPMENT

Respirators used shall be selected from those approved by the National Institute for Occupational Safety and Health (NIOSH) for use in atmospheres containing asbestos fibers. A NIOSH approved respirator contains the following: an assigned identification number placed on each unit, a label identifying the type of hazard the respirator is designed to protect against, and additional information on the label which indicates limitations and identifies the component parts approved for use with the basic unit.

The approved respirator shall be worn for the existing working conditions specified as follows:

> Air-purifying respirators: A Powered air-purifying respirator shall be used as the minimum respiratory protective devise when worker exposure to asbestos is 0.1 fibers per cubic centimeter (f/cc) for an 8-hour time weighted average (TWA).

## 9.3 SURVEILLANCE

Only those individuals who are appropriately trained and medically able to wear respiratory protective equipment shall be issued one. Before being issued a respirator, an employee will receive pertinent tests for medical and physical conditions. Medical tests to be considered by a physician include: pulmonary function tests (FVC and FEV), chest x-ray, and any others

deemed appropriate by the examining physician. Medical factors to be considered by a physician include: emphysema, asthma, chronic bronchitis, heart disease, anemia, hemophilia, poor eyesight, poor hearing, hernia, lack of use of fingers or hands, epileptic seizures, and other factors which might inhibit the ability of an employee to wear respiratory equipment.

## 9.4 RESPIRATOR FIT-TESTS

Each employee determined medically fit to wear a respirator will be qualitatively fit-tested upon receiving the equipment and annually thereafter. The type of fit-test conducted depends on the respirator type. The manufacturer's literature should be consulted to determine the proper fit-test.

Problems in fitting a respirator can result if facial hair prevents a good seal from forming between the skin and sealing surface. Corrective lenses that have temple bars or straps may prevent proper sealing and should not be used when a full-face respirator is worn. An adapter kit to accommodate eyeglasses may be purchased from the manufacturer. Contact lenses should not be worn while wearing a respirator. A properly fitted respirator may stretch the skin around the eyes, thus increasing the possibility that the contact lens will fall out. Fit-tests shall be conducted by a qualified individual. Fit-test will be documented and documentation shall be maintained as part of the Respiratory Protection Program.

## 9.5 RESPIRATOR ASSIGNMENT AND MAINTENANCE

When practicable, respirators should be assigned to individual workers for their exclusive use. A system of record-keeping should be established to document all employees who have respiratory protection equipment and the periodic cleaning and maintenance of equipment.

Respirators shall be regularly cleaned and disinfected. Those issued for the exclusive use of one worker shall cleaned after each use and more often if necessary. Those used by more than on worker shall be thoroughly cleaned and disinfected after each use. This procedure is described as follows:

A. Before leaving the work area, each user must "wipe-down" the respirator with a wet cloth to remove any asbestos-containing material which may have settled on the equipment.

B. Respiratory equipment shall be washed with detergent in warm water using a brush. If possible, detergents containing a bactericide should be used. Organic solvents should not be used as they deteriorate the rubber face piece. If bactericide detergent is not available, the detergent wash should be followed with a disinfecting rinse. Two types of disinfectants may be made from readily available household solutions. A hypochlorite solution (50 ppm) can be made by adding two tablespoons of chlorine bleach to one gallon of water. An aqueous solution of iodine (50

p.m.) can be made by adding one teaspoon of tincture of iodine to one gallon of water. A two minute immersion of the respirator into either solution is sufficient for disinfecting during cleaning. The primary defects to look for in the inspection of component parts of the respiratory equipment and appropriate corrective actions are itemized below:

C. Respiratory equipment shall be thoroughly rinsed in warm clean water (120 F maximum) to remove all traces of detergent, cleaner, sanitize, and disinfectant.

D. Respiratory equipment shall be allowed to air dry on a clean surface or hung from a horizontal wire.

When not in use, respiratory equipment shall be placed in plastic bags and stored in a single layer with the face piece and exhalation valve in a non-distorted position. A metal cabinet with shelves is well suited for this purpose.

Repair or replacement of component parts must be done by qualified individuals. Substitution of parts from a different brand or type of respirator will invalidate the approval of the respirator.

Inspection for defects of respiratory equipment must be done before and after each use. Specific defects may include:

A. Air-purifying respirators (half-mask and full face piece)

1. Rubber face piece - check for:
   - excessive dirt (clean all dirt from face piece)
   - cracks, tears, or holes (obtain new face piece)
   - distortion (allow face piece to "sit" free from any constraints and see if distortion disappears; if not, obtain new face piece)
   - cracked, scratched, or loose fitting lenses (contact respirator manufacturer to see if replacement is possible; otherwise obtain new face piece)

2. Head straps - check for:
   - breaks or tears (replace head straps)
   - loss of elasticity (replace head straps)
   - broken or malfunctioning buckles or attachments (obtain new buckles)
   - face piece slipping (replace head strap)

3. Inhalation valve, exhalation valve - check for:

- detergent residue, dust particles, or dirt on valve or valve seat (clean residue with soap and water)
- cracks, tears, or distortion in the valve material or valve seat (contact manufacturer for instructions)
- missing or defective valve cover (obtain valve cover from manufacturer)

4. Filter element(s) - check for:

- proper filter for the hazard approval designation
- missing or worn gaskets (contact manufacturer for replacement)
- worn threads - both filter threads and face piece threads (replace filter or face piece, whichever is applicable)

B. Atmosphere Supplying Respirators

1. Check face piece, head strap, valves, and breathing tube (same as air-purifying respirators).

2. Air supply system - check for:

- breathing air quality
- breaks or kinks in air supply hoses and end fitting attachments (replace hose and/or fitting)
- tightness of connections
- proper setting of regulators and valves (consult manufacturer's recommendations)
- correct operation of air-purifying elements and carbon monoxide or high-temperature alarms

## 9.6 EMPLOYEE TRAINING PROGRAM

Each employee designated to wear a respirator will be issued a copy of Respirator Protection Program. Employee must be given adequate time to read and understand the material. A brief training session, with required employee attendance, will be conducted by the supervisor or other qualified personnel to ensure that employees understand the limitations, use, and maintenance of respiratory equipment, and other important aspects of the Respiratory Protection Program.

## 9.7 SURVEILLANCE OF WORKING CONDITIONS

Air sampling will be conducted before, during, and after selected projects requiring respiratory equipment. Respiratory equipment used must be suitable for the asbestos concentrations expected to occur in the work area. Employees shall be instructed to immediately leave the work area should they experience physical stress such as difficulty in breathing or dizziness.

## 9.8 RESPIRATOR PROGRAM SUPERVISION

The Respirator Protection Program shall be evaluated at least annually with program adjustments, as appropriate, made to reflect the evaluation results. Compliance with the aforementioned points of the program should be reviewed: respirator selection, purchase of approved equipment, medical screening of employees, fit-testing, assurance of equipment and associated maintenance, storage, repair, and inspection, and appropriate surveillance of work area conditions.

Attention should be given to proper record-keeping. Records which should be kept include: employees who are trained in respirator use; documentation of the care and maintenance of respirators; medical records of each respirator user, airborne concentrations of asbestos fibers \ before, during, and after work is conducted, and any problems encountered during maintenance activities.

# 10.0 MEDICAL SURVEILLANCE PROGRAM

Implementation of a Medical Surveillance Program provides for the assessment of an employee's medical status and compliance with OSHA standards. Medical surveillance is required under the OSHA Standard [29 CFR 1926.1101] for all personnel who may be exposed to asbestos fibers in concentrations greater than 0.1 fibers/cc (8-hour, time-weighted average). This generally applies to all workers who may come into contact with ACM or its debris and be exposed to anything in excess of negligible levels. Additionally, any employee who wears a respirator as a routine part of his or her job must also be medically evaluated on a regular basis. Although medical surveillance may be optional for employees who infrequently wear a respirator during exposure below the OSHA standards, a medical exam of these employees may also be prudent.

It may be advantageous to designate a core group of employees who will handle all functions requiring a respirator. For these employees, a Medical Surveillance Program will be used to determine their baseline health status (health status before beginning work), to monitor their health during the duration of their employment, and also to provide documentation of their health status along with their work history upon completion of their employment. Therefore, employees in this surveillance program will be given pre-placement, annual, and termination examinations unless there is documentation the employee has had an equivalent examination within the past one-year period.

The medical examination will include, as a minimum, an occupational/environmental history, a chest x-ray (posterior-anterior, 14 x 17 inches), a medical history to determine the presence of any possible respiratory diseases, and pulmonary function evaluations including forced vital capacity (FVC) and forced expiratory volume at one second (FEV 1.0). OSHA requires, on initial examination, that a standardized questionnaire be completed. In addition, a periodic medical questionnaire is required by OSHA to be completed on annual examination.

The examining physician will be provided a copy of the Asbestos Construction Standard (29 CFR 1926.1101) a description of the employees' duties, the employees' representative exposure level or anticipated exposure level, a description of personal protective and respiratory equipment to be used, and information from previous medical examinations. The examining physician will sign a statement that the medical examination given is consistent with OSHA requirements and the examined employee is physically able to perform the required work which may include wearing an air-purifying respirator.

All records will be maintained on file for at least 30 years and be available to each employee participating in the Medical Surveillance Program.

# 11.0 DISPOSAL OF ASBESTOS CONTAINING MATERIAL

This section describes the disposal of asbestos-containing materials. Disposal includes packaging of asbestos-containing waste materials. It is recommended the Asbestos Coordinator of the Sandston Hanger 3990 package the material and then contact a reputable abatement contractor to handle transportation to the landfill.

All asbestos must be sealed in a 6 mil thick leak-tight polyethylene bag labeled with text as follows:

First Label: Provide in accordance with 29 CFR 1926.1101 (k) of OSHA's Asbestos Standard:

**DANGER**
**CONTAINS ASBESTOS FIBERS**
**AVOID CREATING DUST**
**CANCER AND LUNG DISEASE HAZARD**
**BREATHING AIRBORNE ASBESTOS FIBERS**

Second Label: Provide in accordance with U.S. Department of Transportation regulations on hazardous waste marking. 49 CFR parts 171 and 172. Hazardous Substance: Final Rule. Published November 21, 1986 and revised February 17, 1987.

**RQ HAZARDOUS**
**SUBSTANCE,**
**SOLID, NOS,**
**ORM-E, NA 9188**
**(ASBESTOS)**

If the Sandston Hanger 3990 elects to handle its own disposal, the following procedures must be adhered to:

1. All waste is to be hauled by a waste hauler with all required licenses from all state and local authorities with jurisdiction.

2. Load all asbestos-containing waste material in disposal bags or leak-tight drums. All materials are to be contained in one of the following:

    a. Two 6 mil disposal bags

    b. Two 6 mil disposal bags and a fiberboard drum

3. Carefully load containerized waste in fully enclosed dumpsters, trucks or other appropriate vehicles for transport. Exercise care before and during transport, to ensure that no unauthorized persons have access to the material.

4. Do not store containerized materials in an area where the general public has access. Take containers from the work area directly to a sealed truck or dumpster.

5. Do not transport disposal bagged materials in open trucks. Label drums with same warning labels as bags. Uncontaminated drums may be reused. Treat drums that have been contaminated as asbestos-containing waste and dispose of in accordance with these directions.

6. Advise the landfill operator or processor of the quantity of material to be delivered. Do this as soon as possible.

7. At a disposal site, sealed plastic bags must be carefully unloaded by hand from the truck by employees dressed in proper personnel protective equipment. If bags are broken or damaged, repair with duct tape and/or put in new unbroken bags. Clean entire truck and contents.

8. At a processing site, truck and loading dock are arranged as a controlled work area and containerized waste is transferred to storage area by site personnel. All bags including broken ones will be transferred. Clean truck.

9. Retain receipts from landfill or processor for materials disposed.

# APPENDIX B

# LICENSES AND QUALIFICATIONS

## DEPARTMENT OF PROFESSIONAL AND OCCUPATIONAL REGULATION
## COMMONWEALTH OF VIRGINIA

EXPIRES ON
06-30-2012

9960 Mayland Dr., Suite 400, Richmond, VA 23233
Telephone: (804) 367-8500

NUMBER
3303 002651

VIRGINIA ASBESTOS LICENSE
INSPECTOR LICENSE

MICHAEL ALLEN BAUM
5003 HALLMARK COURT

RICHMOND, VA 23234

Gordon N. Dixon, Director

ALTERATION OF THIS DOCUMENT, USE AFTER EXPIRATION, OR USE BY PERSONS OR FIRMS OTHER THAN THOSE NAMED MAY RESULT IN CRIMINAL PROSECUTION UNDER THE CODE OF VIRGINIA.

(SEE REVERSE SIDE FOR NAME AND/OR ADDRESS CHANGE)

## DEPARTMENT OF PROFESSIONAL AND OCCUPATIONAL REGULATION
## COMMONWEALTH OF VIRGINIA

EXPIRES ON
07-31-2012

9960 Mayland Dr., Suite 400, Richmond, VA 23233
Telephone: (804) 367-8500

NUMBER
3304 001550

VIRGINIA ASBESTOS LICENSE
MANAGEMENT PLANNER LICENSE

MICHAEL ALLEN BAUM
5003 HALLMARK COURT

RICHMOND, VA 23234

Gordon N. Dixon, Director

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(SEE REVERSE SIDE FOR NAME AND/OR ADDRESS CHANGE)

## DEPARTMENT OF PROFESSIONAL AND OCCUPATIONAL REGULATION
## COMMONWEALTH OF VIRGINIA

EXPIRES ON
01-31-2012

9960 Mayland Dr., Suite 400, Richmond, VA 23233
Telephone: (804) 367-8500

NUMBER
3303 002143

VIRGINIA ASBESTOS LICENSE
INSPECTOR LICENSE

HERMAN GARCIA
12434 IVY RIDGE TERRACE

CHESTER, VA 23831

Gordon N. Dixon, Director

ALTERATION OF THIS DOCUMENT, USE AFTER EXPIRATION, OR USE BY PERSONS OR FIRMS OTHER THAN THOSE NAMED MAY RESULT IN CRIMINAL PROSECUTION UNDER THE CODE OF VIRGINIA.

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## DEPARTMENT OF PROFESSIONAL AND OCCUPATIONAL REGULATION
## COMMONWEALTH OF VIRGINIA

EXPIRES ON
03-31-2012

9960 Mayland Dr., Suite 400, Richmond, VA 23233
Telephone: (804) 367-8500

NUMBER
3304 001586

VIRGINIA ASBESTOS LICENSE
MANAGEMENT PLANNER LICENSE

HERMAN GARCIA
12434 IVY RIDGE TERRACE

CHESTER, VA 23831

Gordon N. Dixon, Director

ALTERATION OF THIS DOCUMENT, USE AFTER EXPIRATION, OR USE BY PERSONS OR FIRMS OTHER THAN THOSE NAMED MAY RESULT IN CRIMINAL PROSECUTION UNDER THE CODE OF VIRGINIA.

(SEE REVERSE SIDE FOR NAME AND/OR ADDRESS CHANGE)

The following is a secured document and will be provided separately from this Byrd Field Complete Appendix A PDF-

- 2016 Final Perfluorinated Compounds Preliminary Assessment Site Visit Report, Former Richmond Air National Guard Base, Richmond, Virginia

NGVA-FMO-ENV 6 April 2017

MEMORANDUM FOR RECORD

SUBJECT: Environmental Condition of Property Evaluation, Army Aviation Support Facility (AASF), Sandston, Virginia.

1. This memorandum documents an update to the Environmental Condition of Property (ECOP) evaluation for the subject property. The evaluation was performed in accordance with NGB email guidance dated 21 March 2017.

2. BACKGROUND AND SETTING

a. The proposed action is to acquire a license for a 94.157-acre federally owned parcel in Sandston, Virginia for the Army Aviation Support Facility (AASF). Currently, the subject property is leased from Capital Region Airport Commission under two separate leases: DACA65-5-03-0026, Air Guard Munitions Facility Parcel and DACA65-5-03-0045, Army Guard AASF. Request has been submitted to incorporate both parcels into lease DACA65-5-03-0045. Prior to the current lease, the Commonwealth of Virginia had been issued a concurrent license for use of the property by the Virginia Army National Guard; however, to date no license has been issued. AASF has been utilized by the Virginia National Guard since 1964. While plans for a new AASF are being developed, timeline for construction of a new facility will require the full term of the existing lease. The current lease is in effect through 2032.

b. The subject property is located at 700 Portugee Road Sandston, VA. A site location map is attached as Figure 1.

c. The activities performed at the AASF facility include military training; maintenance and repair of military helicopters and aircraft and hazardous materials storage.

d. The original Phase I Environmental Site Assessment was completed by EEE Consulting, Inc. and dated 29 April 2008. An ECOP Memorandum for Record to update the 2008 ECOP was completed by EEE Consulting, Inc. and dated 1 May 2013.

3. SITE RECONAISSANCE

a. A site reconnaissance was conducted by Ms. Pam Coleman on 1 March 2017 during the annual Environmental Performance Assessment System (EPAS) site visit. A visual inspection of the interiors of all accessible buildings and the facility's exterior grounds were conducted. A project map and aerial site map is attached as Figure 1 & 2. Photographs taken during the site reconnaissance are attached. A Photographic Log is attached as Figure 3.

b. The site reconnaissance did not indicate any substantial changes from the previous ECOP Memorandum for Record dated 1 May 2013.

4. DOCUMENT REVIEW

a. A document review of the facility's Integrated Contingency Plan (ICP), Hazardous Waste Management Plan (HWMP) and associated documents was completed during the EPAS site visit on 1 March 2017.

b. The site reconnaissance/document review did not indicated any substantial changes from the previous ECOP Memorandum for Record dated 1 May 2013.

5. INTERVIEWS WITH AASF PERSONNEL

a. Interviews with various staff members during the EPAS site visit on 1 March 2017 did not identify any changes to the environmental condition of property since the 2013 ECOP memorandum for record.

b. Interviews were completed with Mr. Allen Liszeski, Site Superintendent, and MSG Harry Newman, Aircraft Mechanic Supervisor. The interviews were conducted on 4 April 2017. These interviews did not identify any changes to the environmental condition of property since the 2013 ECOP memorandum for record.

6. CONCLUSION – Based on site reconnaissance, document review and interviews with AASF personnel, there do not appear to be any changes to the environmental condition of property since the 2013 ECOP memorandum for record.

7. If additional information is needed, all correspondence shall go through the undersigned at 434-298-6445 or pamela.w.coleman.nfg@mail.mil.

Encl

PAMELA W. COLEMAN
Environmental Program Manager
Facilities Engineering and
Management

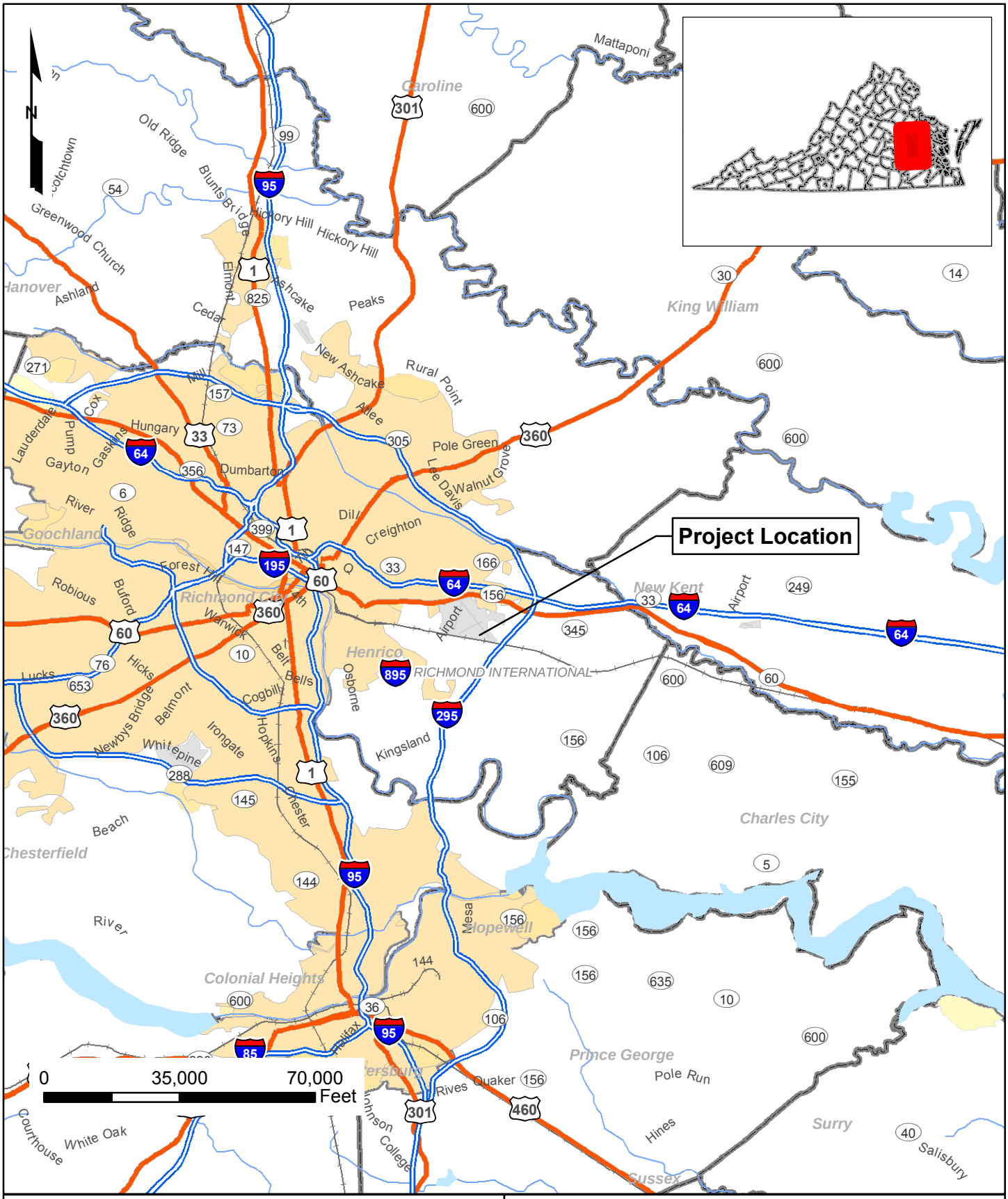
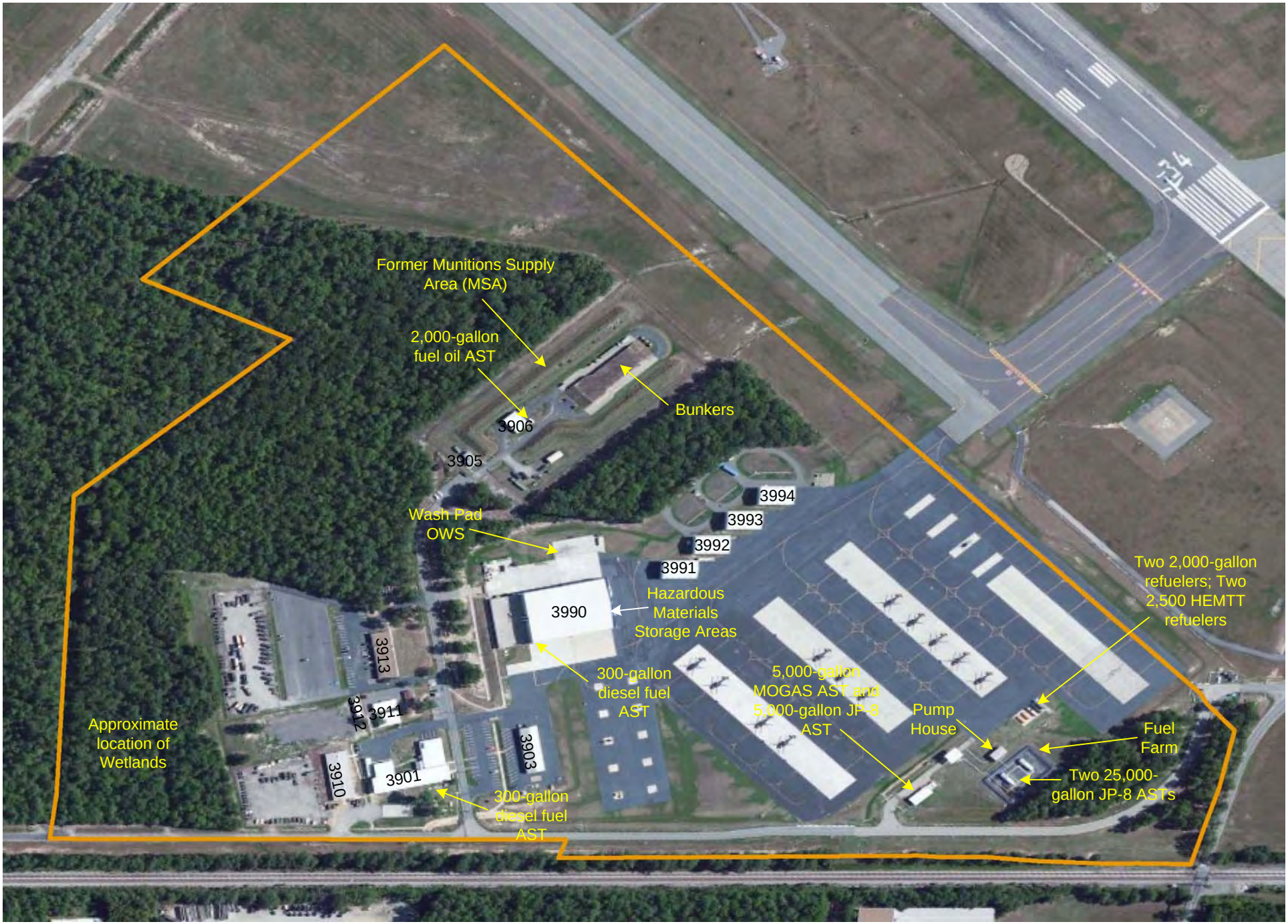



**Figure 1**
**Project Location**
Environmental Condition of Property
Army Aviation Support Facility
Henrico County, Virginia


Former Munitions Supply Area (MSA)
2,000-gallon fuel oil AST
Bunkers
3906
3905
3994
3993
3992
3991
Wash Pad OWS
3990
Hazardous Materials Storage Areas
Two 2,000-gallon refuelers; Two 2,500 HEMTT refuelers
300-gallon diesel fuel AST
5,000-gallon MOGAS AST and 5,000-gallon JP-8 AST
Pump House
Fuel Farm
Two 25,000-gallon JP-8 ASTs
Approximate location of Wetlands
3913
3912
3911
3910
3901
3903
300-gallon diesel fuel AST

Building 3906 at the Former Munition Supply Area

2,000 gallon heating oil tank beside Building 3906

Left view of the ammo bunkers in the Former Munition Supply Area

Right view of the ammo bunkers in the Former Munition Supply Area

Storage Building at the Former Munition Supply Area

Interior view of the Storage Building at the Former Munition Supply Area

300 gallon diesel fuel AST at Building 3990

Aerosol can waste  inside Building 3990

Hazardous Materials storage area outside of Building 3990

Washrack located outside of Building 3990

Building 3991, 3992, 3992 & 3994 used for material storage

25,000 gallon JP-24 AST's located at the fuel farm

5,000 gallon AST's (MOGAS, JP-24) located at the fuel farm

Fuel station located at the fuel farm

# 2018 Groundwater Monitoring Report
# Site 1 Basewide Groundwater Operable Unit (OU1)
# Former Virginia Air National Guard Base
# Sandston, Virginia

## Final

**Site:**
Site 1 Basewide Groundwater Operable Unit (OU1)
Former Virginia Air National Guard Base
Sandston, Virginia

**Prepared for:**
Air National Guard Headquarters
NGB/A7OR
Shepperd Hall, 3501 Fetchet Avenue
Andrews Air Force Base, MD 20762

**Prepared by:**
AECOM
3101 Wilson Boulevard,
Suite 900
Arlington, Virginia 22201

Contract #: W9133L-14-D-0001
Task Order #: 0009

December 2018

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# Acronyms and Abbreviations

| | |
|---|---|
| ABC+ | Anaerobic Biochem Plus |
| ANG | Air National Guard |
| BRAC | Base Realignment and Closure |
| bgs | below ground surface |
| $^{0}C$ | Degree Celsius |
| $CaCO_3$ | Calcium Carbonate |
| CCR | Construction Completion Report |
| cells/mL | cells per milliliter |
| cis-DCE | cis-1,2-Dichloroethene |
| COC | Contaminant of Concern |
| CRAC | Capital Region Airport Commission |
| CVOC | Chlorinated Volatile Organic Compound |
| 1,1-DCE | 1,1-dichloroethene |
| DHC | Dehalococcoides |
| DO | Dissolved Oxygen |
| DPT | Direct-Push Technology |
| ERD | Enhanced Reductive Dechlorination |
| EVO | Emulsified Vegetable Oil |
| FFS | Focused Feasibility Study |
| ft | feet |
| FS | Feasibility Study |
| gal | Gallon |
| GRL | Groundwater Recirculation Loop |
| HPT | Hydraulic Profile Tool |
| IDS | Injection Delivery System |
| IRA | Interim Remedial Action |
| IRG | Interim Remediation Goal |
| ISCO | In-situ Chemical Oxidation |
| J | Estimated value |
| LTM | Long Term Monitoring |
| MCL | Maximum Contaminant Level |
| mS/cm | millisiemens per centimeter |
| mg/L | milligrams per liter |
| MIP | Membrane Interface Probe |
| MNA | Monitored Natural Attenuation |
| mV | millivolt |
| ND | Non-detect |
| O&M | Operation and Maintenance |

| | |
|---|---|
| ORP | Oxidation-Reduction Potential |
| OU1 | Site 1 Basewide Groundwater Operable Unit |
| Q1 | First Quarter |
| Q2 | Second Quarter |
| Q3 | Third Quarter |
| Q4 | Fourth Quarter |
| Q5 | Fifth Quarter |
| RI | Remedial Investigation |
| SSA/HSI | Supplemental Source Area/Hot Spot Investigation |
| TCE | Trichloroethene |
| TDS | Total Dissolved Solids |
| TOC | Total Organic Carbon |
| µg/L | micrograms per liter |
| USEPA | United States Environmental Protection Agency |
| VANGB | Virginia Air National Guard Base |
| VC | Vinyl Chloride |
| VDEQ | Virginia Department of Environmental Quality |
| VOC | Volatile Organic Compound |

# Executive Summary

This 2018 Groundwater Monitoring Report is intended to summarize the findings of the comprehensive groundwater monitoring event performed in April 2018 at Site 1 Basewide Groundwater Operable Unit (OU1) at the former Virginia Air National Guard base (VANGB) in Sandston, Virginia. The objectives of the April 2018 groundwater monitoring event were to: (1) assess the remediation progress and current state of the source area portion of the site groundwater that exceeds interim remedial goals (IRGs), (2) monitor the downgradient groundwater IRG plume and determine the current concentrations of contaminants of concern (COCs) within its footprint, (3) assess the continued effectiveness of historical injection activities undertaken at former VANGB, (4) monitor the site groundwater that is less than IRGs but greater than the United States Environmental Protection Agency (USEPA) maximum contaminant levels (MCLs) for COCs, and (5) sample the temporary wells to fill data gaps and determine any changes in the boundary of the plume. Groundwater samples were collected from 59 permanent monitoring wells and 14 temporary wells and analyzed for volatile organic compounds (VOCs). Groundwater samples from select monitoring wells were also analyzed for monitored natural attenuation (MNA) and microbiological parameters (AECOM, 2018).

The data obtained during this April 2018 groundwater monitoring event, as well as the performance monitoring, is consistent with the findings of the previous IRG plume monitoring and IRA performance monitoring events. The following conclusions can be drawn from an evaluation of the analytical results:

1. The general south-southeast groundwater flow direction for the upper and lower surficial aquifers remains unchanged from the previous monitoring events.

2. TCE continues to be detected above the IRG of 160 micrograms per liter (µg/L) within OU1 groundwater with exceedances at monitoring wells MW-01-26 (271 µg/L) and MW-11-09 (199 µg/L). Additionally, vinyl chloride (VC) now exceeds the IRG of 113 µg/L at MW-11-09 (196 µg/L) and MW-13-20 (122 µg/L). No other COCs including benzene, 1,1-DCE, or cis-DCE exceed their respective IRGs within groundwater at OU1.

3. Temporary well TW-11, located in the downgradient IRG plume, has a detection of TCE (571 µg/L) above the IRG of 160 µg/L. The location of TW-11 may indicate the occurrence of a hotspot since monitoring well MW-11-09 is located approximately 200 feet (ft) downgradient from TW-11 and has a rebound TCE concentration above the IRG at 199 µg/L.

4. TCE concentrations are elevated at wells downgradient veering east from injection area Transect 5 (MW-01-23, MW-01-24, and MW-01-13), indicating some rebound in concentration.

5. It has been confirmed that the reducing redox conditions established within the source area groundwater IRG plume continues to be sustained through April 2018.

6. Based on the model results, it is estimated that the plume in the aquifer will extend approximately 400 to 800 ft within 5 to 7 years. Assuming no additional remediation, the plume is predicted to contract and MW-11-09 will attain the MCL of 5 µg/L in approximately 60 years.

7. Enhanced Reductive Dechlorination (ERD) has been established and is occurring successfully within the source area groundwater IRG plume as is evident by multiple lines of evidence including favorable geochemistry (elevated pH, low dissolved oxygen [DO] and low Oxidation-Reduction Potential [ORP]), increased production of dissolved gases (methane and ethene), increased microbial populations of DHC and its subspecies, and the production of degradation products cis-DCE, 1,1-DCE and VC and associated decrease in TCE concentrations.

8. The shape, orientation and extent remain mostly stable for both the upper and lower surficial aquifer IRG plumes within the downgradient groundwater plume, consistent with historical sampling events. The temporary wells placed in the existing data gap locations help to further delineate the OU1 MCL plume and provided support for a TCE MCL plume with a thinner midsection and a downgradient plume veering slightly more southwest.

9. The OU1 MCL plume remains stable and substantially delineated for both the upper and lower aquifers. The most downgradient extent of the MCL groundwater plume continues to go beyond the former VANGB's southern property boundary, but the plume remains confined within the Capital Region Airport Commission's (CRAC) property boundary.

10. The portion of the groundwater plume that exceeds the MCL for cis-DCE and VC, which are degradation products of TCE, remains confined to the IRG plume, both in the upper and lower aquifer. The portion of the groundwater plume that exceeds the MCL for benzene remains stable.

In summary, the final remedy for the source area groundwater is in place, functioning effectively, and has effectively reduced COC concentrations to below IRGs with the exception of MW-11-09 and MW-01-26.

# 1 Introduction

This 2018 Groundwater Monitoring Report for OU1 is intended to summarize the findings of the comprehensive groundwater monitoring event performed by AECOM in April 2018 at the former VANGB in Sandston, Virginia. Initially, the site was planned to achieve IRGs for groundwater throughout the OU1 through active remediation followed by MNA and long-term monitoring (LTM) to achieve remedial goals. The specified timeline to meet groundwater IRGs are by December 31, 2018 or earlier. COCs had previously been identified for this site and are provided below along with the groundwater IRGs, which were established in the Final Interim Decision Document (Ch2MHill, 2007). The final remedial goals are the MCL and have been submitted to the Virginia Department of Environmental Quality (VDEQ) in the Final Record of Decision (ANG, 2018). The current COCs and their respective cleanup criteria are presented in **Table 1-1** below.

**Table 1-1: Contaminants of Concern and Cleanup Criteria**

| Contaminant of Concern | Interim Remedial Goal (µg/L) | Maximum Contaminant Level (µg/L) |
|---|---|---|
| Benzene | 319 | 5 |
| 1,1-Dichloroethene | 4,840 | 7 |
| cis-1,2-Dichloroethene | 3,570 | 70 |
| Total 1,2-Dichloroethene | 3,010 | 70 |
| Trichloroethene | 160 | 5 |
| Vinyl chloride | 113 | 2 |

**Note:**
µg/L = micrograms per liter

## 1.1 Site Description and Background

The former VANGB is located adjacent to the Richmond International Airport in Henrico County, approximately 4 miles east of the City of Richmond in the Commonwealth of Virginia (Figure 1). During its operational history, the facility occupied 143 acres and was home to the 192nd Fighter Wing, which was active beginning in 1947 and serviced a variety of military aircraft. Air National Guard (ANG) operations at the former VANGB ceased in December 2008 as part of the Base Realignment and Closure (BRAC) program. The Base was formally closed in 2011 and the organization that controls and operates the Richmond International Airport, the CRAC, took control of the former VANGB and is currently redeveloping this site for future aviation-related businesses.

Operations at the facility had involved the storage of aircraft on two circular concrete pads called hardstands. Reportedly, chlorinated solvents, including TCE were used to prevent plant growth around the edges of the hardstands. The use and management of TCE at these locations likely resulted in the current chlorinated volatile organic compounds (CVOC) groundwater contamination in OU1.

The OU1 extends southeasterly approximately 4,500 ft from the hardstand area to beyond the former VANGB's southern property boundary (Figure 2). The migration of CVOCs in this area is occurring within the Yorktown aquifer, which is a shallow water table aquifer that is comprised of fine-grained quartz sand interbedded with silt and clay laminae. Data from previous investigations indicate that the aquifer is semi-confined due to the generally impermeable nature of the 20 ft of overlying soil. The base of the aquifer has been identified locally at depths of approximately 47 to 48 ft below ground surface (bgs). Contaminant migration has been observed in two distinct portions of the aquifer, referred to as the upper surficial and lower surficial aquifers. The mean hydraulic conductivity of the upper surficial aquifer is approximately 2.41 ft/day, while the mean hydraulic conductivity of the lower surficial aquifer is approximately 9.65 ft/day. Groundwater flow in both portions of the aquifer is generally southeastward from the area of Site 1 toward White Oak Swamp Creek, which is generally consistent with the overall orientation of the CVOC plume. Once at White Oak Swamp Creek, the OU1 plume orientation tends to follow the White Oak Swamp Creek eastward. One of the primary objectives of the April 2018 groundwater monitoring event was to monitor the groundwater plume above IRGs at OU1. The TCE IRG plume is divided into two regions: (1) the "spine", which is also the core of the TCE plume, having the maximum TCE concentration (2) the "diffused periphery", which is the area of the plume on both sides of the spine (east and west).

## 1.2 Site History and Previous Investigations

A preliminary assessment conducted in 1989 recommended further investigation of Site 1 associated with the hardstands area located north of the former facility boundary. Based on the reported use of TCE in this area, the potential TCE release was estimated to be up to 250 gallons (gals). This resulted in the completion of a Remedial Investigation (RI)/Feasibility Study (FS) in 2001 and a Focused Feasibility Study (FFS) in 2004. Benzene was first detected in groundwater at Site 1 during the RI in 2001, and is likely the result of releases of petroleum from hydrants or during fueling and fuel transfer operations at the facility. Following the completion of the FFS in 2004, Site 1 was expanded into OU1 to include the groundwater contaminant plume extending downgradient from the hardstands area (CH2MHill, 2004).

Between September 1992 and March 2009, various soil, soil-gas, groundwater, and surface water samples had been collected to assess the contamination at the OU1. IRAs previously performed include in-situ chemical oxidation (ISCO) injections using base-activated sodium persulfate, and the injection of the ERD substrates, EHC® and Anerobic Biochem Plus (ABC+) in 2007. While COC concentrations decreased in some areas, an increase in COC concentrations was observed in the northernmost monitoring wells, indicating the likelihood of a contaminant source upgradient of the treatment zones. During the Data Gap Investigation conducted in 2009, TCE was detected in the northern portion of OU1 in the historical sampling point DPT-04 at 2,700 µg/L from 22 to 26 feet below ground surface (ft bgs) and at 7,000 µg/L from 26 to 30 ft bgs (CH2MHill, 2010).

In March and April 2011, a supplemental source area/hot spot investigation (SSA/HSI) was conducted to characterize the suspected source area near DPT-04. The SSA/HSI involved the use of a membrane interface probe (MIP), direct push technology (DPT) sampling, and new monitoring wells in the vicinity of DPT-04 to further define the source area. During this investigation, it was determined that the source area was present approximately 382 ft northwest (upgradient) of DPT-04 and had much higher TCE concentrations than those detected in groundwater at DPT-04. Additional monitoring wells, MIP, DPT, hydraulic profile tool (HPT), and a geophysical survey were used to delineate this newly identified source. When the study was completed, a new source was confirmed in a relatively confined area in the vicinity of historic sampling location MIP-33. The source was associated with a former storage shed that is theorized to have stored solvents. The levels of TCE in groundwater detected at this new source area were almost an order of magnitude higher than had previously been detected at OU1. The results of the SSA/HSI were presented in the Final SSA/HSI and Baseline/Semi-Annual Sampling Report (AECOM, 2012). A summary table of field activities undertaken by AECOM are provided in **Table A-1** (located at the end of the report.).

A source area soils IRA was then undertaken at the former VANGB in January 2013. The source area soils IRA included: (1) excavation of the source area contaminated soils, (2) backfill with an in situ bioremediation substrate (HRC-X®), (3) installation of an injection delivery system (IDS) consisting of an infiltration bed with injection piping, and (4) installation of a groundwater recirculation loop (GRL). The objectives of the source area soils IRA were to remove the source of contamination and establish reducing conditions within the source area groundwater, which is defined as groundwater beneath the excavation area and 100 ft downgradient till the monitoring well MW-11-05, beyond which the CVOC groundwater plume dives vertically downwards into the deeper portions of the surficial aquifer. Additional details about the source area soils IRA implemented at former VANGB during January – April 2013 can be found in the Final Interim Remedial Action Completion Report (AECOM, 2014b). The source area soils IRA was followed by a baseline groundwater monitoring event performed in April 2013 (AECOM, 2013c) to establish baseline conditions. Quarterly performance monitoring and operation and maintenance (O&M) of the GRL was to be completed until reducing conditions were established within the source area groundwater. The GRL was permanently shut down in the last week of November 2013 due to the onset of winter.

In December 2013, after the shutdown of the GRL, final remedial activities were undertaken for source area groundwater as an IRA in accordance with Chapter 3 of the *Final Remedial Action Work Plan* (AECOM, 2013a). The source area groundwater IRA involved the injection of ERD substrate ABC+ at twenty-five direct push injection locations to reduce the COC concentrations to below IRGs within the source area groundwater. The field activities associated with the December 2013 source area groundwater IRA are summarized in the *Final Source Area Groundwater Construction Completion Report* (AECOM, 2014a). Although the remediation of source area groundwater as outlined in Chapter 3 of the *Final Remedial Action Work Plan* (AECOM, 2013a) was undertaken as an IRA, it represented the implementation of the final remedy for the source area groundwater; thus the Final Source Area Groundwater Construction Completion Report (CCR) (AECOM, 2014a) documented the achievement of RIP for the source area groundwater for OU1. Reducing conditions were established within the source area groundwater following the IRA and it was concluded that the GRL did not need to be restarted once the weather became warmer since the objectives of the source area soils IRA had also been achieved.

An annual site-wide groundwater monitoring event was undertaken in April 2014 to confirm the progress of source area groundwater IRG plume remediation and its effects on downgradient groundwater IRG plume as well as to monitor the OU1 MCL plume. The associated field activities and analytical results were summarized in the April 2014 Groundwater Monitoring Report (AECOM, 2014c). The April 2014 Groundwater Monitoring Report concluded that the reducing redox conditions established at the end in December 2013 were sustained and ERD was occurring successfully within the source area groundwater IRG plume with TCE concentrations at or below 713 µg/L. Thus, the “spine” of the plume that was detected at up to 2,500 ug/L for TCE in

November 2013 had been remediated successfully by the December 2013 source area groundwater IRA involving ABC+ injections. Only three (3) source area groundwater monitoring wells had TCE concentrations detected above the IRG which were anticipated to reduce below IRGs as time progressed. No other COCs including the degradation products of TCE were detected above IRGs (AECOM, 2014c). These findings were subsequently confirmed again during the June 2014 IRA Fifth Quarter (Q5) Performance Monitoring Event associated with the source area soils IRA which concluded that reducing redox conditions favorable for ERD had been established throughout source area groundwater IRGs plume. The June 2014 IRA Q5 Performance Monitoring Report further concluded that the source area soils IRA's objectives had been met and recommended that quarterly performance monitoring associated with the IRA and GRL be terminated (AECOM, 2014d).

Subsequently, remedial activities have been undertaken for the downgradient groundwater IRGs plume in accordance with Chapter 4 of the *Final Remedial Action Work Plan* (AECOM, 2013a) and the *Full Scale Injections Letter Work Plan* (AECOM, 2015). The remediation of downgradient groundwater IRGs plume was implemented via two IRAs – (1) emulsified vegetable oil (EVO) and sodium bicarbonate injections in Transect 2 and Transect 5 injection wells in May 2014 and (2) ABC+ injections in Transects 2S, 3, 4, 5S, 6 and 7 via DPT in October 2015. Although the remediation of the downgradient groundwater plume was also undertaken as IRAs, it represented the implementation of the final remedy at OU1. Following the final remedy implementation, a CCR was issued that summarized the remedial activities undertaken for the downgradient groundwater plume in May 2014 and October 2015 and also documented the achievement of RIP for entire OU1 at the former VANGB.

Since the initiation of final remedial activities at the downgradient groundwater IRGs plume, performance monitoring events involving sampling and analysis of groundwater from select monitoring wells have been undertaken in October 2014, May 2015, August 2016 and September 2016. Annual comprehensive groundwater monitoring events across OU1 were completed in February 2016 and April 2017 to confirm the effectiveness of IRGs plume remedial activities as well as current state of the MCLs plume.

The results of the April 2018 site-wide monitoring event are summarized and presented in this 2018 Groundwater Monitoring Report.

**Table 1-2** below summarizes the field activities undertaken at OU1 by AECOM to date.

**Table 1-2: Historic field events and results**

| Duration | Field Event | Rationale/Activity |
|---|---|---|
| March – February 2012 | SSA/HSI Investigation | Vadose Zone source identified, slug tests, IRG and MCL plume delineation |
| November 2011 | November 2011 Groundwater Monitoring Event | IRG plume monitoring |
| April 2012 | April 2012 Groundwater Monitoring Event | IRG and MCL plume monitoring |
| April 2012 | Pilot Study Injections | Pilot Test of ABC+ Injections |
| November 2012 | November 2012 Groundwater Monitoring Event | IRG plume monitoring |
| January – April 2013 | Source Area Soils IRA | Vadose Zone Source Excavation, Installation of IDS during backfill |
| April 2013 | April 2014 Groundwater/IRA Baseline Monitoring Event | Establish baseline geochemical conditions, IRG and MCL plume monitoring |
| Q1 (Quarter 1): April – June 2013 | June 2013: IRA Q1 Performance Monitoring Event | Evaluate effectiveness of Source Area soils excavation |
| Q2 (Quarter 2): July – September 2013 | July 2013: Installation & Startup of GRL;<br>August – September 2013: O&M of GRL;<br>September 2013: IRA Q2 Performance Monitoring Event | Evaluate effectiveness of Source Area Soils IRA and associated GRL |
| Q3 (Quarter 3): October – December 2013 | October – November 2013: O&M and Shutdown of GRL;<br>November 2013: IRA Q3 Performance Monitoring Event | Evaluate effectiveness of Source Area Soils IRA and associated GRL |
| November 2013 | November 2013 Groundwater Monitoring Event | Evaluate effectiveness of source area groundwater remediation, IRG plume monitoring |

| Duration | Field Event | Rationale/Activity |
|---|---|---|
| December 2013 | Source Area Groundwater IRA | Direct Push ABC+ injections |
| Q4 (Quarter 4): January – March 2014 | January 2014: IRA Q4 Performance Monitoring Event | Evaluate effectiveness of source area soils IRA and source area groundwater IRA |
| April 2014 | April 2014 Groundwater Monitoring Event | Evaluate effectiveness of source area groundwater remediation, IRG and MCL plume monitoring |
| May 2014 | First Downgradient Groundwater IRA | Conduct downgradient Transects 2 and 5 EVO and sodium bicarbonate injections to reduce COC concentrations to below IRGs. |
| Q5 (Quarter 5): April – June 2014 | June 2014: IRA Q5 Performance Monitoring Event | Evaluate effectiveness of Source Area Soils IRA, Source Area Groundwater IRA and Downgradient Groundwater IRA |
| October 2014 | First Performance Monitoring Event | Evaluate effectiveness of Source Area Soils IRA, Source Area Groundwater IRA and Downgradient Groundwater IRA |
| May 2015 | Second Performance Monitoring Event | Evaluate effectiveness of Source Area Soils IRA, Source Area Groundwater IRA and Downgradient Groundwater IRA |
| October 2015 | Second Downgradient Groundwater IRA | Transects 2S, 3, 4, 5S, 6 and 7 ABC+ DPT Injections |
| February 2016 | 2016 Groundwater Monitoring Event | Evaluate effectiveness of IRGs plume remediation at OU1, IRG and MCL Plume Monitoring |
| August 2016 | Third Performance Monitoring Event | Evaluate effectiveness of Downgradient Groundwater IRA |
| September 2016 | Fourth Performance Monitoring Event | Evaluate effectiveness of Downgradient Groundwater IRA |
| December 2016 | Fifth Performance Monitoring Event | Evaluate effectiveness of Downgradient Groundwater IRA |
| January 2017 | Sixth Performance Monitoring Event | Evaluate effectiveness of Downgradient Groundwater IRA |
| February 2017 | Seventh Performance Monitoring Event | Evaluate effectiveness of Downgradient Groundwater IRA |
| April 2017 | 2017 Groundwater Monitoring Event | Evaluate effectiveness of IRGs plume remediation at OU1, IRG and MCL Plume Monitoring |
| April 2018 | 2018 Groundwater Monitoring Event | Evaluate effectiveness of IRGs plume remediation at OU1, IRG and MCL Plume Monitoring |

## 1.3 April 2018 groundwater monitoring event

The April 2018 groundwater monitoring event was conducted between 2 and 9 April 2018 and according to the Groundwater Monitoring Work Plan (AECOM, 2018).

The objectives of the April 2018 groundwater monitoring event were to:

- Establish baseline groundwater concentrations to determine scope and effectiveness of future remedial actions;
- Assess the remediation progress and current state of the OU1 IRGs groundwater plume; and
- Monitor any changes in the boundary of the OU1 MCL groundwater plume and fill data gaps through the sampling of both temporary wells and newly installed monitoring wells.

Groundwater samples were collected from 59 monitoring wells where historical data indicated COCs were present in excess of IRGs and MCLs, at locations cross-gradient and downgradient to determine if the IRG and MCL plume is shrinking, increasing, or stable, and in areas of historical injections of sodium persulfate, EHC, and ABC+. Additionally, a total of 14 temporary wells, including ten from the lower aquifer (TW-1 through TW-10) and four from the upper aquifer (TW-11 through TW-14) were installed and sampled at various locations with existing data gaps. The temporary wells were installed by drilling subcontractor Cascade Technical Services, LLC using direct-push technology to a depth of 25 ft bgs for upper surficial aquifer wells and 45 ft bgs for lower surficial aquifer wells.

A list of wells sampled during this investigation, along with the analyses conducted, is presented in **Table A-1**. Groundwater samples were collected according to the procedures outlined in the Work Plan (AECOM, 2018) and analyzed at an independent, off-site laboratory (GCAL). Additionally, Bio-Trap® samplers were used to determine the presence or absence of the Dehalococcoides (DHC) family of bacteria, as well as the presence of the functional genes responsible for reducing TCE to ethene via cis-DCE and VC. Bio-Trap® samplers were placed in the screened intervals of four upper and one lower surficial aquifer wells within the IRGs plume for a 30-60 day period and then analyzed at an independent, off-site laboratory (Microbial Insights).

The monitoring well sample collection forms and daily instrument calibration logs are provided in Appendices A and B respectively. Groundwater monitoring laboratory analytical data are provided in **Appendix D**. Trend charts of monitoring well concentration are provided in **Appendix E**.

## 1.4 Deviations from Work Plan

The following deviations occurred from the work plan during the April 2018 groundwater monitoring event:

- The following monitoring wells that were destroyed or damaged, and thus could not be sampled included: BG-MW-08, BG-MW-09, and S4-MW52. It is unknown when these wells were destroyed, but presumably it occurred during land redevelopment by CRAC.

- Temporary wells were installed and sampled at 14 locations instead of 15 to optimize the sampling event as discussed with VDEQ.

- Temporary wells TW-2, TW-5, and TW-7 were sampled at intervals less than 40 to 45 ft bgs (as outlined in the WP) to obtain better flow rate.

# 2 Summary of Analytical Results

A summary of the analytical results of the April 2018 groundwater sampling event are provided below and detailed tables are provided in **Appendix A**. The laboratory analytical data is provided in **Appendix D**. Trend charts showing COC concentrations for all wells where historical analytical data is available are included in **Appendix E**.

Data review and validation were performed on the entire definitive-level data set for VOCs by USEPA Method SW8260B. A data validation narrative is provided at the beginning of **Appendix D**. The definitive-level analytical data were validated according to the guidelines and procedures outlined in Region III Modifications to *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (USEPA, 2008). The reviewer's professional judgment was used to evaluate data quality when called for in the Functional Guidelines and in instances where there is no clear policy or conflicting guidance on how the data should be qualified.

The data review and validation performed on the entire definitive-level data set for USEPA Method SW8260B indicate the overall high quality of the definitive-level data included in this report. None of the SW8260B data were qualified as rejected. Results qualified as estimated are generally for VOCs that are not COCs for this project, and the qualifications do not impact the data analyses or conclusions stated in this report.

## 2.1 April 2018 Groundwater Monitoring Event

### 2.1.1 Contaminants of Concern

Of the 59 permanent monitoring wells sampled during the April 2018 groundwater monitoring event, two wells had TCE groundwater concentrations detected above the IRG of 160 µg/L (MW-01-26 and MW-11-09) and two wells had VC groundwater concentrations detected above the IRG of 113 µg/L (MW-11-09 and MW-13-20). A summary of the groundwater results is provided below in **Table 2-1**.

**Table 2-1: Summary of groundwater concentrations**

| Contaminant of Concern | IRG (µg/L) | # of Wells Exceeding IRGs | # of Wells with Detections | Maximum Concentration (µg/L) | Location of Maximum Concentration |
|---|---|---|---|---|---|
| Trichloroethene | 160 | 2 | 39 | 271 | MW-01-26 |
| 1,1-Dichloroethene | 4,840 | 0 | 8 | 6.10 J | MW-11-09 |
| cis-1.2-Dichloroethene | 3,570 | 0 | 38 | 478 | MW-11-09 |
| Total 1,2-Dichlorothene | 3,010 | 0 | 38 | 478 | MW-11-09 |
| Vinyl Chloride | 113 | 2 | 20 | 196 | MW-11-09 |
| Benzene | 319 | 0 | 15 | 211 | MW-01-09 |

**Notes:**
µg/L = micrograms per liter J = Estimated Value

**Figure 2** provides a map of all the groundwater monitoring wells and temporary wells sampled during this event. A list of monitoring wells sampled and their analytes is found on **Table A-1**. A complete list of monitoring wells currently present at the VANGB site including the type, location, ground surface elevation, top of casing elevation and screen information for each well is provided in **Table A-2**.

Groundwater potentiometric maps were developed for the upper and lower surficial aquifers (**Figures 3 and 4**). **Table A-3** provides the water level elevations for the upper surficial and lower surficial aquifers used to create the potentiometric maps. **Table A-4** provides the water quality parameters pH, specific conductivity, DO, ORP, turbidity, and temperature collected from each monitoring well after stabilization during sampling. **Table A-5** provides the concentrations of COCs measured at each well sampled during the April 2018 groundwater monitoring event.

**Figures 5 and 6** provide the outlines of the plume where TCE exceeds the IRG of 160 µg/L in the upper and lower surficial aquifers, respectively. Plume boundaries where TCE exceeds the MCL of 5 µg/L in the upper and lower surficial aquifers are displayed on **Figures 7 and 8**, respectively. **Figures 9 and 10** provide isocontours of TCE concentrations detected in the upper and lower surficial aquifers, respectively. **Figures 5 – 10** incorporate data from the April 2018 sampling event; however, for wells that were not sampled in 2018, the most recent sample result was used, as noted on the inset tables in each figure.

### 2.1.2 Source Area Groundwater IRG Plume

Six source area groundwater monitoring wells were sampled during the April 2018 groundwater monitoring event. Groundwater from two of the six wells had detections of TCE. The monitoring wells within the source area have TCE concentrations below historical values, indicating successful remediation of the groundwater source plume.

The decreases in TCE concentrations and its degradation products (cis-DCE, 1,1-DCE and VC) indicate that ERD is occurring successfully within the source area groundwater following the ABC+ injections conducted in December 2013. The highest TCE, DCE and VC concentrations within the source area groundwater are all associated with the same monitoring well (MW-13-05). The highest concentrations of degradation products cis-DCE and VC detected within source area groundwater are still well below their respective IRGs. The TCE concentrations within the source area monitoring well MW-13-05 decreased from 183 µg/L in July 2017 to 147 µg/L in April 2018, which is now below the IRG of 160 µg/L.

A summary of the April 2018 data for the six source area groundwater monitoring wells is provided below in **Table 2-2**. Trend charts showing COC concentrations for all wells where historical analytical data is available are included in **Appendix E**.

**Table 2-2: Summary of Groundwater Data for Source Area Wells**

| Contaminant of Concern | IRG (µg/L) | # of Source Area Groundwater Wells Exceeding IRGs | # of Source Area Groundwater Wells with Detections | Maximum Concentration (µg/L) | Location of Maximum Concentration |
|---|---|---|---|---|---|
| Trichloroethene | 160 | 0 | 2 | 147 | MW-13-05 |
| 1,1-Dichloroethene | 4,840 | 0 | 0 | ND | - |
| cis-1.2-Dichloroethene | 3,570 | 0 | 5 | 105 | MW-13-05 |
| Total 1,2-Dichlorothene | 3,010 | 0 | 5 | 105.6 | MW-13-05 |
| Vinyl Chloride | 113 | 0 | 4 | 11.4 | MW-13-05 |
| Benzene | 319 | 0 | 3 | 0.458 J | MW-11-05 |

**Notes:**
µg/L = micrograms per liter ND = non-detect J = Estimated Value

### 2.1.3 Downgradient Groundwater IRG plume

#### 2.1.3.1 Upper Surficial Aquifer

A total of twelve downgradient groundwater IRG plume monitoring wells within the upper surficial aquifer were sampled during the April 2018 groundwater monitoring event. The highest TCE, DCE and VC concentrations within the source area groundwater are all associated with the same monitoring well (MW-11-09). The TCE (199 µg/L) and VC (196 µg/L) concentrations at MW-11-09 were detected above their respective IRGs.

The most upgradient portion of the plume (BG-MW-05 and BG-MW-06) had non-detect to very low TCE concentrations in the upper surficial aquifer. TCE concentrations in groundwater increased at BG-MW-05, MW-11-06, and MW-11-09, when compared to the April 2017 monitoring event. Most notably, the TCE concentrations at MW-11-09 increased from 44.7 µg/L in April 2017 to 199 µg/L in April 2018. These increases in TCE concentrations might be associated with a rebound in concentrations along the historic spine of the plume.

A summary of the April 2018 data from the twelve wells is provided below in **Table 2-3**. Trend charts showing COC concentrations for all wells where historical analytical data is available are included in **Appendix E**.

**Table 2-3: Summary of Groundwater Data for Downgradient Wells in the Upper Aquifer**

| Contaminant of Concern | IRG (µg/L) | # of Upper Surficial Wells Exceeding IRGs | # of Upper Surficial Wells with Detections | Maximum Concentration (µg/L) | Location of Maximum Concentration |
|---|---|---|---|---|---|
| Trichloroethene | 160 | 1 | 8 | 199 | MW-11-09 |
| 1,1-Dichloroethene | 4,840 | 0 | 3 | 6.10 J | MW-11-09 |
| cis-1.2-Dichloroethene | 3,570 | 0 | 11 | 478 | MW-11-09 |
| Total 1,2-Dichlorothene | 3,010 | 0 | 11 | 478 | MW-11-09 |
| Vinyl Chloride | 113 | 1 | 8 | 196 | MW-11-09 |
| Benzene | 319 | 0 | 4 | 211 | MW-01-09 |

**Notes:**
µg/L = micrograms per liter J = Estimated Value

#### 2.1.3.2 Lower Surficial Aquifer

A total of five downgradient groundwater IRG plume monitoring wells screened within the lower surficial aquifer were sampled during the April 2018 groundwater monitoring event. TCE concentrations in groundwater increased significantly at MW-01-26 and MW-11-08, when compared to the April 2017 monitoring event. These increases in TCE concentrations might be associated with a rebound in concentrations along the historic spine of the plume. The highest TCE detection was at MW-01-26 at a concentration of 271µg/L. MW-01-26 was located immediately downgradient of the historic spine of the TCE plume.

Concentrations of TCE decreased while concentrations of its daughter products, cis-DCE and trans-DCE, increased in monitoring wells MW-11-01, MW-11-08 and MW-11-10 when compared to the April 2017 groundwater monitoring event. This indicates effective reductive dechlorination in these three monitoring wells in the downgradient IRG plume.

A summary of the April 2018 data is provided below in **Table 2-4**. Trend charts showing COC concentrations for all wells where historical analytical data is available are included in **Appendix E**.

**Table 2-4: Summary of Groundwater Data for Downgradient Wells in the Lower Aquifer**

| Contaminant of Concern | IRG (µg/L) | # of Lower Surficial Wells Exceeding IRGs | # of Lower Surficial Wells with Detections | Maximum Concentration (µg/L) | Location of Maximum Concentration |
|---|---|---|---|---|---|
| Trichloroethene | 160 | 1 | 5 | 271 | MW-01-26 |
| 1,1-Dichloroethene | 4,840 | 0 | 0 | ND | MW-11-01 |
| cis-1.2-Dichloroethene | 3,570 | 0 | 5 | 136 | MW-11-01 |
| Total 1,2-Dichlorothene | 3,010 | 0 | 5 | 136 | MW-11-01 |
| Vinyl Chloride | 113 | 0 | 4 | 63.3 | MW-01-26 |
| Benzene | 319 | 0 | 2 | 6.16 | MW-01-26 |

**Notes:**
µg/L = micrograms per liter ND = Non-detect

### 2.1.4 Temporary Wells

One of the primary objectives of the April 2018 groundwater monitoring event was to fill the data gaps by analyzing grab samples from temporary wells. Temporary wells TW-3, TW-8, TW-11, and TW-13 were placed along the historic TCE plume spine to check for any rebound of TCE concentrations after the injection events between 2013 and 2015. Other temporary wells were placed outside the IRG groundwater plume to assist in the continued monitoring of the OU1 plume and boundary of the plume.

A total of fourteen temporary wells were installed and sampled during the April 2018 groundwater monitoring event. The highest TCE, DCE and VC concentrations within the source area groundwater are all associated with the same temporary well (TW-11).

The TCE concentration at TW-11 was detected above the IRG. TW-11 is located along the 1000 µg/L historic TCE plume spine in the upper surficial aquifer. Concentrations from temporary wells were not used for generating the plume figures 5 through 8.

A summary of the April 2018 data is provided below in **Table 2-5**.

**Table 2-5: Summary of Groundwater Data for Temporary Wells**

| Contaminant of Concern | IRG (µg/L) | # of Temporary Wells Exceeding IRGs | # of Temporary Wells with Detections | Maximum Concentration (µg/L) | Location of Maximum Concentration |
|---|---|---|---|---|---|
| Trichloroethene | 160 | 1 | 11 | 571 | TW-11 |
| 1,1-Dichloroethene | 4,840 | 0 | 0 | ND | - |
| cis-1.2-Dichloroethene | 3,570 | 0 | 8 | 202 | TW-11 |
| Total 1,2-Dichlorothene | 3,010 | 0 | 8 | 202 | TW-11 |
| Vinyl Chloride | 113 | 0 | 1 | 2.35 J | TW-11 |
| Benzene | 319 | 0 | 2 | 2.43 | TW-13 |

**Notes:**
µg/L = micrograms per liter ND = Non-detect J = Estimated Value

### 2.1.5 Monitored Natural Attenuation Parameters

In addition to sampling for VOCs, fourteen groundwater monitoring wells were also sampled for various MNA parameters for the purposes of evaluating the effectiveness of remedial injections. Baseline geochemistry, redox state, and indigenous microbiology for source area groundwater in the upper surficial aquifers had been established in the April 2013 Groundwater/IRA Baseline Monitoring Report (AECOM, 2013b).

**Table A-6** provides the TOC and total alkalinity as calcium carbonate ($CaCO_3$) measured in groundwater from the fourteen monitoring wells sampled during the April 2018 groundwater monitoring event. **Table A-7** (at the end of the report) provides additional MNA parameters analyzed for the ten out of the fourteen wells in April 2018, including dissolved gases (total carbon dioxide, ethane, ethene and methane), total metals (arsenic, iron and manganese), dissolved metals (iron and manganese), laboratory pH, and total dissolved solids (TDS). **Table A-8** (at the end of the report) provides the April-June 2018 results of microbiology analyses from the 3-month Bio-Trap® samplers at five of the wells sampled for MNA parameters to determine the presence or absence of the DHC family of bacteria as well as the functional genes responsible for reducing TCE to ethene via cis-DCE and VC.

A summary table of the analytical results for the 2018 MNA parameters analyzed with comparison to the April 2017 values is provided below in **Table 2-6**.

**Table 2-6: Summary of MNA Parameters**

| Parameter | Units | # of Wells Sampled | # of Wells with Detects | Minimum Value | Maximum Value | April 2017 Range |
|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 13 | 12 | 91.4 | 588 | 131 – 756 |
| Total Organic Carbon | mg/L | 14 | 14 | 5.31 | 655 | 2.49 J – 1310 |
| Carbon Dioxide, Total | mg/L | 12 | 12 | 143 | 776 | 160 – 4050 |
| Ethane | µg/L | 12 | 10 | 0.286 J | 8.98 | 1.05 – 53 |
| Ethene | µg/L | 12 | 11 | 0.252 J | 90.6 | 1.52 – 48.2 |
| Methane | µg/L | 12 | 12 | 2.76 | 15400 | 2.83 J – 14600 |
| Arsenic | µg/L | 10 | 9 | 0.32 J | 5.45 | 3.47 J – 7.57 |
| Iron, Total | µg/L | 10 | 10 | 562 | 199000 | 471 – 282000 |

| Parameter | Units | # of Wells Sampled | # of Wells with Detects | Minimum Value | Maximum Value | April 2017 Range |
|---|---|---|---|---|---|---|
| Iron, Dissolved | µg/L | 10 | 9 | 55.8 J | 108000 | 17.3 – 147000 |
| Manganese, Total | µg/L | 10 | 10 | 4.45 J | 1660 | 5.52 – 831 |
| Manganese, Dissolved | µg/L | 10 | 10 | 3.76 J | 1320 | 1.59 – 716 |
| Dehalococchoides | cells/mL | 5 | 4 | ND | $2.46 \times 10^4$ | 28.8 |
| TCE Reductase (tceA) | cells/mL | 5 | 4 | ND | $4.66 \times 10^4$ | ND |
| VC Reductase (vcrA) | cells/mL | 5 | 1 | ND | $2.89 \times 10^1$ | ND |
| VC Reductase (bvcA) | cells/mL | 5 | 1 | ND | $3.25 \times 10^1$ | ND |

**Notes:**
mg/L = milligrams per liter µg/L = micrograms per liter cells/mL = cells per milliliter $CaCO_3$ = Calcium Carbonate J = estimated value
< = No Detect at the Limit of Quantification Reported; ND = non-detect

The MNA parameter results provide further evidence of sustained ERD in groundwater. Although some parameters were measured below the April 2017 range, the ethene and methane production have increased. The ethene production is expected to increase as the ERD process progresses through cis-DCE to VC and eventually to ethene and ethane. Elevated methane concentrations indicate the sustained presence of methanogenesis.

The concentrations of DHC and its subspecies have increased substantially since the April 2017 sampling event, providing evidence of effective ERD process. The Dehalococcoides concentration is now above the recommended concentration of $10^4$ cells/mL for effective rate of reductive dechlorination (Lu et al., 2006).

The MNA parameter results provide mixed evidence of sustained ERD in groundwater conditions. The alkalinity, total organic carbon, total carbon-dioxide, arsenic, and total and dissolved iron have measured concentrations below the baseline range, indicating less favorable conditions for ERD. The ethane production has decreased, but the ethene and methane production have increased. The ethane and ethene production is expected to increase as the ERD process progresses through cis-DCE to VC and eventually to ethene and ethane. Elevated methane concentrations indicate the sustained presence of methanogenesis.

The concentrations of DHC and its subspecies have increased substantially since the April 2017 sampling event, providing evidence of effective ERD process. The Dehalococcoides concentration is now above the recommended concentration of $10^4$ cells/mL for effective rate of reductive dechlorination (Lu et al., 2006).

### 2.1.6 Water Quality Field Parameters

Water quality parameters such as pH, specific conductivity, DO, ORP, turbidity and temperature were collected from each well during the April 2018 Groundwater Monitoring event after stabilization during sampling. A summary table is presented below in **Table 2-7**, details are included in **Table A-4** and field forms are provided in **Appendix B**. The summary table of the water quality parameters presented below shows the difference in parameter ranges between the source area groundwater IRG plume and the downgradient groundwater IRG plume and outside the IRG plume. Certain anomalous readings have been excluded while calculating the general ranges of field parameters to avoid biasing or skewing the comparison and are provided as footnotes.

The pH and specific conductivity are elevated while the DO and ORP are lower in the source area groundwater IRG plume as compared to the downgradient groundwater IRG plume or wells located outside the IRG plume where the parameter ranges are more representative of background/natural subsurface conditions. The elevated pH combined with lower DO and ORP are favorable and representative of ERD occurring within the source area groundwater IRG plume.

**Table 2-7: Summary of Geochemical Data**

| Parameter | Units | Source Area IRG Groundwater | | Downgradient Groundwater IRG plume | | Outside IRG plume | |
|---|---|---|---|---|---|---|---|
| | | Min Value | Max Value | Min Value | Max Value | Min Value | Max Value |
| pH | -- | 5.77 | 6.51 | 4.72 | 6.80 | 3.46 | 6.54 |
| Dissolved Oxygen | mg/L | 0.18 | 4.06 | 0.09 | 4.05[1] | 0.17 | 7.82[2] |
| Oxidation Reduction Potential | mV | -64.6 | 39.1 | -164.8 | 318.7 | -34.40 | 382.20 |
| Temperature | $^0$C | 11.85 | 15.84 | 12.72 | 16.19 | 11.67 | 19.86 |
| Specific Conductivity | mS/cm | 0.370 | 0.880 | 0.030 | 1.969 | 0.03 | 0.33 |

**Notes:** mg/L = milligrams per liter mV = millivolts $^0$C = degree Celsius mS/cm = millisiemens per centimeter
1 With the exception of one well MW-11-03 with DO = 9.60 mg/L (Above saturation level, which indicates that the DO meter was not working properly for these readings)
2 With the exception of one well S4-MW47 with DO = 10.15 mg/L (Above saturation level)

### 2.1.7 Fate and Transport

Fate and transport conditions were modeled using BIOCHLOR (2000), a screening model developed in conjunction with the Air Force Center for Environmental Excellence technology transfer division and Groundwater Services, Inc. BIOCHLOR implements the Domenico Single Species Analytical Model (1987) with Martin-Hayden and Robbins (1997). The model simulates advection, dispersion, adsorption and decay reactions that have been shown to be the dominant biodegradation processes. Reductive dechlorination is assumed to occur under anaerobic conditions and dissolved solvent degradation is assumed to follow a sequential first-order decay process.

BIOCHLOR primarily models reductive dechlorination, which is assumed to follow sequential first order kinetics. Parameters selected for use in the model were based on actual field determined values whenever possible. The main objectives of the BIOCHLOR model were to:

- Predict the maximum extent of dissolved-phase plume migration without any remediation.
- Determine if natural attenuation is occurring at sufficient rates and estimate the time to achieve MCL.

#### 2.1.7.1 Upper Aquifer

Well locations used for the upper surficial aquifer were MW-11-09 and MW-01-09. The hydraulic conductivity of the upper surficial aquifer ranges from approximately 1 ft/day to 6 ft/day with a geometric mean of 2.4 ft/day. The analytical data used for the model included data collected between 2013 through 2018 excluding 2014, which reflected an increase in TCE concentrations. The various treatments have enhanced the aquifer first order decay process. Groundwater concentrations from the April 2018 event was input into the model and was allowed to run to determine the distance and duration required for the plume to migrate and to achieve a concentration 5 µg/L. The model results are depicted in **Appendix F**.

Based on the model results, it is estimated that the plume in this portion of the aquifer will extend approximately 400 to 800 ft within 5 to 7 years. Assuming no additional remediation, the plume is predicted to contract and MW-11-09 will MCL of 5 µg/L in approximately 60 years.

#### 2.1.7.2 Lower Aquifer

Well locations used for the lower surficial aquifer were MW-11-08, MW-11-01 and MW-13-20. The hydraulic conductivity of the lower surficial aquifer ranges from approximately 3.5 ft/day to 24 ft/day with a geometric mean of 9.7 ft/day. The analytical data used for the model included data collected between 2013 through 2018 excluding 2014, which reflected an increase in TCE concentrations. The various treatments have enhanced the aquifer first order decay process. Similar model was run to

determine the distance and duration required for the plume to migrate and to achieve a concentration of 5 µg/L. The model results are depicted in **Appendix F**.

Based on the model results, it is estimated that the plume in this portion of the aquifer will extend approximately 200 to 400 ft within 2 to 4 years. Assuming no additional remediation, the plume is predicted to contract and MW-11-08 will attain the MCL of 5 µg/L in approximately 25 years.

# 3 Discussion of Analytical Results

A discussion of the analytical results of the April 2018 and other sampling events are provided below. The laboratory analytical data can be found in **Appendix D** and a summary of the analytical results is provided in Section 2. Trend charts showing historical analytical results COCs for the upper and lower surficial aquifer monitoring wells are provided in **Appendix E**.

## 3.1 April 2018 Groundwater Monitoring Event – Groundwater Elevation and Flow Direction

Depth to groundwater data was collected from the 59 monitoring wells sampled during the April 2018 groundwater monitoring event and generally indicated similar flow directions as presented historically. The upper surficial aquifer potentiometric map developed (**Figure 3**) shows the groundwater flow direction to be towards the south-southeast until the White Oak Swamp Creek is encountered, at which point the groundwater flow follows the direction of the creek, to the east initially, and then to the south. The lower surficial aquifer potentiometric map developed for the event (**Figure 4**) shows the same general flow direction as the upper surficial aquifer.

## 3.2 IRG Plume Monitoring

The COCs detected above IRGs within the OU1 groundwater were TCE and VC. One of the primary objectives of the April 2018 groundwater monitoring event was to monitor the groundwater plume above IRGs at OU1. The TCE IRG plume is divided into two regions: (1) the “spine”, which is also the core of the TCE plume, having the maximum TCE concentration (2) the “diffused periphery”, which is the area of the plume on both sides of the spine (east and west). The following discussion focuses exclusively on the source area and downgradient groundwater IRG plume.

### 3.2.1 Source area groundwater IRG plume

The updated source area groundwater IRG plume is shown in **Figure 5**. Within the source area groundwater IRG plume, the TCE concentrations detected are all below the MCL of 5 μg/L, with the exception of MW-13-05. MW-13-05 is being monitored and TCE was detected at 147 μg/L during the April 2018 sampling event. No COCs were detected above IRGs.

Multiple lines of evidence indicate favorable conditions for ERD within the source area groundwater, although it is no longer being sustained at the same rate as previous monitoring events. The subsurface redox conditions within the source area groundwater IRG plume remain mostly anaerobic and favorable for ERD with DO less than 0.5 mg/L in four out of the six wells and negative ORP values in five out of the six wells; with the exception of MW-13-05. Although, the field water quality parameters are more favorable in the previous April 2017 monitoring event (higher pH, lower DO, and lower ORP), the overall observed decreases in TCE and its degradation products indicate successful remediation of the source area groundwater.

### 3.2.2 Downgradient Groundwater IRG Plume

The updated upper and lower surficial aquifer plumes within the downgradient groundwater IRG plume are shown in **Figures 5** and 6 respectively. TCE concentrations have rebounded in downgradient groundwater IRG monitoring wells MW-01-26, MW-11-08, and MW-11-09. MW-11-08 and MW-11-09 are both located within the historic spine of the plume, while MW-01-26 is located further downgradient and side-gradient of remedial injection transect 5. Monitoring wells located immediately downgradient of Transect 5 show increased reductions than wells located more side-gradient from the trajectory path.

Concentrations of TCE were lower and concentrations of its daughter products were higher in the lower surficial aquifer wells MW-11-01, MW-11-08 and MW-11-10 when compared to the 2017 monitoring event, indicating effective reductive dechlorination. The subsurface redox conditions within the downgradient groundwater IRG plume remain mostly anaerobic and favorable for ERD with DO less than 0.5 mg/L in eleven out of the seventeen wells and negative ORP values in twelve out of the seventeen wells. Microbial populations were elevated with Dehalococcoides measured above $10^4$ cells/mL at MW-11-08 and MW-11-09. However, favorable conditions for ERD are possibly no longer being sustained at the same rate as in previous monitoring events. Generally, there are decreases in the measurements of dissolved gases, alkalinity, TOC, pH and specific conductivity when compared to the 2017 monitoring event.

## 3.3 Monitoring Effectiveness of Historical Injection Activity

Direct push injections for ABC+ and sodium bicarbonate at Transects 2S, 3, 4, 5S, 6 and 7 were performed between 2013 and 2015. Geochemical conditions favorable for ERD have been established throughout the downgradient groundwater IRGs plume, as observed from the water quality parameters for the downgradient wells.

Results from the various 2018 groundwater monitoring events show significant decreases in TCE concentrations when compared to February 2016, with the exception of MW-01-05, MW-01-13 and MW-11-09. As stated previously, this is primarily due to targeted injections of ABC+ within the source area and downgradient portion of the IRG plume area. Based on the results to date, injection of ABC+ appears to have been most effective in reducing COCs to below IRG levels. Additional details on the various remedial actions completed within OU1 can be found in the Remedial Construction Completion Report (AECOM, 2016).

## 3.4 OU1 MCL Plume Monitoring

One of the objectives of the April 2018 groundwater monitoring event was to assess the current state of the entire OU1 groundwater plume and monitor any changes in the boundary of the plume.

The TCE MCL plume in the upper and lower surficial aquifer originates near the former vadose zone soil source area near the northern hardstand and extends southeasterly approximately 4,500 feet to beyond the former VANGB's southern property boundary. The MCL plumes of the other three COCs (i.e. benzene, cis-DCE, and VC) lie within the footprint of the TCE MCL plume. The southern toe of the TCE MCL upper and lower surficial aquifer plumes are delineated and contained within CRAC property boundaries. The following subsections provide further analysis based on data obtained during the April 2018 groundwater monitoring event.

### 3.4.1 Benzene MCL Plume in OU1

Historically, the benzene MCL plume was delineated above its MCL of 5 μg/L around wells MW-01-09 and MW-01-23 with detections in all peripheral wells below MCLs. Both wells had decreased benzene concentrations, and the overall benzene plume remains stable. Based on the current benzene concentrations, the benzene plume footprint is shrinking and remains delineated in the vicinity of monitoring wells MW-01-09 and MW-01-23.

### 3.4.2 TCE MCL Plume in OU1

The TCE MCL plumes in the upper and lower surficial aquifers in OU1 are shown in **Figures 7 and 8**. The TCE MCL plume in the upper surficial aquifer is bound at its southern-most extent by well MW-03-01, where TCE concentrations remain below the MCL for TCE (5 µg/L) since 2013. The TCE MCL plume in the lower surficial aquifer is bound at its southern-most extent by well S4-MW49, where the TCE concentration is also below the MCL (5 µg/L). TCE concentrations are elevated at wells downgradient veering east from Transect 5 (MW-01-23, MW-01-24, and MW-01-13), indicating some rebound in concentration.

In general, no significant changes were observed to the TCE MCL plumes in the upper and lower surficial aquifers. The TCE MCL plumes remain substantially delineated and remain confined within CRAC's property boundaries. The OU1 TCE plume remains delineated consistent with historical sampling events. ERD is occurring successfully within the source area IRG plume by the production of degradation products cis-DCE, 1,1-DCE and VC, and associated decrease in TCE concentrations.

### 3.4.3 cis-DCE MCL Plume in OU1

The degradation product cis-DCE was detected above its MCL of 70 µg/L within the confines of the TCE IRG plume in both the upper and lower surficial aquifers. In the upper surficial aquifer, cis-DCE was detected above its MCL in six wells with the MCL plume originating near MW-13-05 and running along the former spine of the TCE IRG plume footprint. Within the lower surficial aquifer, cis-DCE was detected above its MCL of 70 µg/L in groundwater in four monitoring wells.

Since cis-1,2-DCE is a daughter degradation product of TCE in a 1:1 molar ratio, it is stoichiometrically consistent with the fact that higher cis-1,2-DCE concentrations are detected in wells with high TCE concentrations and the footprint of the cis-1,2-DCE plume lies within the footprint of the TCE plume. The OU1 cis-DCE plume remains delineated consistent with historical sampling events. Levels of 1,2-DCE are expected to decrease across OU1 while increasing in limited areas with historically higher TCE levels although the levels will remain well below the IRG. Areas of increasing cis-DCE will eventually begin decreasing as the cis-DCE is attenuated to VC through reductive dechlorination.

### 3.4.4 VC MCL Plume in OU1

VC, the degradation product of cis-DCE, was detected above its MCL of 2 µg/L in both the upper and lower surficial aquifers. There were more detections of VC in previous events, indicating that reductive dechlorination of TCE and DCE is occurring. VC was detected above its MCL in groundwater in seven upper surficial aquifer monitoring wells and five lower surficial aquifer wells. Additionally, upper surficial well MW-11-09 and lower surficial well MW-13-20 had VC detected above its IRG. Consistent with results from previous sampling events, the VC plume above its MCL is located in the vicinity of wells MW-13-05, immediately downgradient of the source area groundwater where ERD has been established and is leading to limited VC production from cis-DCE degradation. The OU1 VC plume remains delineated consistent with historical sampling events. Similar to cis-DCE, levels of VC are expected to continue decreasing across OU1 while increasing in limited areas with historically higher TCE levels. Areas of increasing VC will eventually begin decreasing as the VC is attenuated to ethene.

## 3.5 Temporary Well Plume Monitoring

Temporary well TW-11, located in the downgradient IRG plume, has a detection of TCE (571 µg/L) above the IRG of 160 µg/L. The location of TW-11 may indicate the occurrence of a hotspot, since monitoring well MW-11-09 is located approximately 200 ft downgradient from TW-11 and has a rebound TCE concentration (199 µg/L) above the IRG.

The temporary wells placed in the existing data gap locations help to further delineate the TCE MCL plume and identify any TCE rebound along the historic spine. In the downgradient midsection of the plume, temporary wells TW-10 and TW-9 did not have any TCE concentration detected above the MCL. Further downgradient, TCE was detected below the MCL at both TW-1 and TW-12. These observations provide support for a TCE MCL plume with a thinner midsection and a downgradient plume veering slightly more southwest.

# 4 Conclusions and Recommendations

The data obtained during the April 2018 and performance monitoring events conducted throughout the year are consistent with the findings of previous monitoring events. The following conclusions can be drawn from an analysis and discussion of the analytical results:

1. The general south-southeast groundwater flow direction for the upper and lower surficial aquifers remains unchanged from the previous monitoring events.

2. TCE continues to be detected above the IRG of 160 µg/L within OU1 groundwater with exceedances at monitoring wells MW-01-26 (271 µg/L) and MW-11-09 (199 µg/L). Additionally, VC now exceeds the IRG of 113 µg/L at MW-11-09 (196 µg/L) and MW-13-20 (122 µg/L). No other COCs including benzene, 1,1-DCE, or cis-DCE exceed their respective IRGs within groundwater at OU1.

3. Temporary well TW-11, located in the downgradient IRG plume, has a detection of TCE (571 µg/L) above the IRG of 160 µg/L. The location of TW-11 may indicate the occurrence of a hotspot, since monitoring well MW-11-09 is located approximately 200 ft downgradient from TW-11 and has a rebound TCE concentration above the IRG at 199 µg/L.

4. TCE concentrations are elevated at wells downgradient veering east from injection area Transect 5 (MW-01-23, MW-01-24, and MW-01-13), indicating some rebound in concentration.

5. It has been confirmed that the reducing redox conditions established within the source area groundwater IRG plume continues to be sustained through April 2018.

6. Based on the model results, it is estimated that the plume in the aquifer will extend approximately 400 to 800 ft within 5 to 7 years. Assuming no additional remediation, the plume is predicted to contract and MW-11-09 will attain the MCL of 5 µg/L in approximately 60 years.

7. ERD has been established and is occurring successfully within the source area groundwater IRG plume as is evident by multiple lines of evidence including favorable geochemistry (elevated pH, low dissolved oxygen [DO] and low ORP), increased production of dissolved gases (methane and ethene), increased microbial populations of DHC and its subspecies, and the production of degradation products cis-DCE, 1,1-DCE and VC and associated decrease in TCE concentrations.

8. The shape, orientation and extent remain mostly stable for both the upper and lower surficial aquifer IRG plumes within the downgradient groundwater plume, consistent with historical sampling events. The temporary wells placed in the existing data gap locations help to further delineate the OU1 MCL plume and provided support for a TCE MCL plume with a thinner midsection and a downgradient plume veering slightly more southwest.

9. The OU1 MCL plume remains stable and substantially delineated for both the upper and lower aquifers. The most downgradient extent of the MCL groundwater plume continues to go beyond the former VANGB's southern property boundary, but the plume remains confined within the CRAC's property boundary.

10. The portion of the groundwater plume that exceeds the MCL for cis-DCE and VC, which are degradation products of TCE, remains confined to the IRG plume, both in the upper and lower aquifer. The portion of the groundwater plume that exceeds the MCL for benzene remains stable.

In summary, the final remedy for the source area groundwater is in place and functioning effectively and has effectively reduced COCs to below IRGs with the exception of MW-11-09 and MW-01-26. It is recommended that an additional ERD injection be considered especially in rebound areas to maintain reducing redox conditions, further enhance the Dehalococchoides population, and reduce COC concentrations to reduce the life-cycle of the overall plume.

# 5 References


AECOM 2018. *Baseline Groundwater Monitoring Work Plan, Site 1 Basewide Groundwater Operable Unit, Former Virginia Air National Guard Base.* February.

AECOM 2017. *Groundwater Monitoring Work Plan 2017, Site 1 Basewide Groundwater Operable Unit, Former Virginia Air National Guard Base*. December.

AECOM 2016. *Draft Remedial Construction Completion Report, Site 1 Basewide Groundwater Operable Unit, Former Virginia Air National Guard Base, Sandston, Virginia*. September.

AECOM 2015. *Full Scale Injections Letter Work Plan, Remediation of the Site 1 Basewide Groundwater Operable Unit, Former Virginia Air National Guard Base, Sandston, Virginia. September*

AECOM 2014b. *Interim Remedial Action Completion Report, Site 1 Basewide Groundwater Operable Unit, Former Virginia Air National Guard Base*. January.

AECOM 2014a. *Source Area Groundwater Construction Completion Report, Site 1 Basewide Groundwater Operable Unit, Former Virginia Air National Guard Base*. February.

AECOM 2014c. *April 2014 Groundwater Monitoring Report, Site 1 Basewide Groundwater Operable Unit, Former Virginia Air National Guard Base, Sandston, Virginia.* April.

AECOM 2014d. *IRA Q5 Performance Monitoring Report, Site 1 Basewide Groundwater Operable Unit (OU1), Former Virginia Air National Guard Base, Sandston, Virginia*. June.

AECOM 2013a. *Proposed Plan of Remedial Action, Site 1 Basewide Groundwater Operable Unit, Former Virginia Air National Guard Base, Sandston, Virginia*. July.

AECOM 2013b. *April 2013 Groundwater/IRA Baseline Monitoring Report, Site 1 Basewide Groundwater Operable Unit (OU1), Former Virginia Air National Guard Base, Sandston, Virginia*. September.

AECOM 2013c. *IRA Q1 Performance Monitoring Report, Site 1 Basewide Groundwater Operable Unit (OU1), Former Virginia Air National Guard Base, Sandston, Virginia*. September.

AECOM 2013d. *IRA Work Plan (Amended) , Site 1 Basewide Groundwater Operable Unit (OU1), Former Virginia Air National Guard Base, Sandston, Virginia*. January.

AECOM 2012. *Supplemental Source Area/Hot Spot Investigation, Northern Source Area Investigation, and Baseline/Semi-Annual Groundwater Monitoring Report.* (*Former VANGB), Sandston, Virginia*. May.

AECOM 2011. *Supplemental Source Area/Hot Spot Investigation Work Plan (VANGB), Sandston, Virginia.* March.

CH2MHill 2010. *Data Gap Investigation Report, Site 1 Groundwater Operable Unit, 192nd Fighter Wing, Virginia Air National Guard, Richmond, Virginia.* July.

Ch2MHill 2007. *Interim Decision Document, Site 1 Groundwater Operable Unit, 192nd Fighter Wing, Virginia Air National Guard, Richmond, Virginia.* January.

CH2MHill 2004. *Focused Feasibility Study of Current Conditions, Basewide Groundwater Operable Unit, Virginia ANG, Sandston, Virginia*. July.

Domenico P.A 1987. *An Analytical model for multidimensional transport of a decaying contaminant species, Journal of Hydrology (Pages 49-58). May*

Martin-Hayden J.M., G.A. Robbins, 1997. *Plume distortion and apparent attenuation due to concentration averaging in monitoring wells, Ground Water 35(2), 339-346.*

Lu et al. 2006. *Relationship between Dehalococcoides DNA in groundwater and rates of reductive dechlorination at field scale. Water Research 40 no. 16: 3131-3140.*

USEPA 2008. *USEPA Contract Laboratory Program, National Functional Guidelines for Superfund Organic Methods Data Review. OSWER 9240.1-48; USEPA-540-R-08-01.* June.

# Figures

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FORMER VIRGINIA AIR NATIONAL GUARD BASE, SANDSTON, VIRGINIA

Figure 1
Site Location Map
2018 Groundwater Monitoring Report
Site 1 Basewide Groundwater Operable Unit (OU1)
Former Virginia Air National Guard Base, Sandston, Virginia

| CONTRACT NO | DO #: |
|---|---|
| W9133L-14-D-0001 | 0009 |
| DESIGNED BY: K. Weber | DRAWN BY: K. Weber |
| CHECKED BY: A. Gupta | DATE: July 2018 |
| SCALE: 1" = 1,500' | SHEET: 1 of 1 |
| Fig_1_Former_VANGB_Location.mxd | |

\\arlington.na.aecomnet.com\Arlington\DCS\GIS\GIS_Data\60278122_60164134_NGB_Richmond\MXDs\2018_GW_Monitoring_Report\Fig_1_Former_VANGB_Location.mxd

BG-MW-04
MW-01-03
BG-MW-01
MW-01-20
TZ-4
MW-01-23
TZ-5
MW-01-24
MW-01-12
MW-01-36
White Oak Swamp Creek
MW-01-11
MW-01-21
S4-MW54
RD5-MW01
MW-01-13
RD5-MW03
MW-01-33
MW-01-10
MW-01-25
MW-01-16
TZ-6
MW-01-18
MW-01-19
MW-01-34
MW-01-35
TW-10
TZ-7
S4-MW64
TZ-8
S4-MW56
S4-MW57
S4-MW53
S4-MW52
TZ-9
S4-MW58
S4-MW59
S4-MW60
TW-4
S4-MW55
BG-PZ-01
S4-MW61
S4-MW30
S4-MW39
S4-MW62
TZ-10
S4-MW07
TW-9
PZ-03-01
TW-2
TW-12
S4-MW63
TZ-11
S4-MW22
S4-MW27
S4-MW31
TZ-12
S4-MW33
S4-MW13
S4-MW32
MW-03-02
PZ-03-02
S4-MW26
S4-MW51
S4-MW21
MW-03-01
S4-MW16
TW-5
S4-MW23
S4-MW25
S4-MW38
S4-MW50
S4-MW24
S4-MW45
S4-MW44
TW-14
S4-MW42
S4-MW41
PZ-02-02
PZ-02-03
TW-6
TW-7
S4-MW49
S4-MW28
BG-PZ-02
TW-1
S4-MW48
MW-02-01
MW-02-03
S4-MW37
PZ-02-01
S4-MW47
S4-MW46
BG-MW-03
BG-MW-02
N
0 225 450 900
Feet

BG-MW-09
BG-MW-08
PZ-01-01
PZ-01-02
MW-13-02
IW-4
MW-13-01
MW-11-04R
IW-3
MW-13-03
IW-1
IW-2
MW-13-05
MW-13-07
MW-13-12
EW-1
MW-13-15
MW-13-06
MW-13-14
MW-13-17
MW-13-18
MW-13-08
MW-13-10
MW-13-19
T2-13-03
MW-11-05
EW-4
T2-13-07
MW-13-09
T2-13-02
T2-13-01
T1
T2-13-06
EW-3
T2-13-05
EW-2
T2S
T2-13-04
BG-MW-06
MW-13-11
BG-MW-05
BG-MW-07
TW-8
Well IDs highlighted in yellow were sampled.
Well IDs highlighted in white were not sampled.
Refer to Table 1a in the 2018 Groundwater Monitoring Report for the sampling matrix.
0 30 60
Feet
T1
T2S
T3
MW-11-10
MW-11-06
MW-11-03
T4
MW-01-02
MW-11-07
MW-11-08
RD5-MW02
MW-01-30
MW-01-29
MW-11-01
MW-01-06
T6
MW-01-31
MW-01-32
MW-11-02
MW-01-27
TW-11
MW-01-04
MW-01-05
MW-01-28
T7
MW-11-09
MW-01-07
TW-3
TW-13
T7-4
MW-01-08
MW-01-22
T5S
MW-13-20
MW-01-14
MW-01-15
MW-01-09
MW-01-26
0 100 200
Feet

**Legend**

- Lower Aquifer Temporary Monitoring Well
- Upper Aquifer Temporary Monitoring Well
- Existing Lower Aquifer Monitoring Well
- Existing Upper Aquifer Monitoring Well
- Lost and/or Destroyed Monitoring Well
- Extraction Wells
- Injection Wells
- Virginia Air National Guard Base Boundary
- Source Area Soil Excavation
- Source Area Groundwater
- 5 ppb Historic TCE Upper Aquifer Footprint
- 160 ppb Historic TCE Upper Aquifer Footprint
- 1000 ppb Historic TCE Upper Aquifer Footprint
- Enhanced Reductive Dechlorination (ERD) Treatment
- In Situ Chemical Oxidation (ISCO) Treatment

FORMER VIRGINIA AIR NATIONAL GUARD BASE, SANDSTON, VIRGINIA

Figure 2
Groundwater Sampling Locations
2018 Groundwater Monitoring Report
Former Virginia Air National Guard Base
Sandston, Virginia

| CONTRACT NO | DO#: |
|---|---|
| W9133L-14-D-0001 | 0009 |
| DESIGNED BY: B. Perrigo | DRAWN BY: B. Perrigo |
| CHECKED BY: S. Chatterjee | DATE: August 2018 |
| SCALE: As Shown | SHEET: 1 of 1 |
| Fig_2_GW_Sampling_Location.mxd | |

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MW-01-03
154.2
154
153
MW-11-03
149.81
MW-11-07
150.539
MW-01-29
150.424
MW-11-02
149.772
MW-01-27
149.799
MW-11-09
149.882
MW-01-09
149.2
149
MW-01-06
149.762
MW-01-05
149.52
MW-01-07
148.99
MW-01-23
148.72
RD5-MW01
148.019
MW-01-10
148.34
148
MW-01-16
148.315
147
White Oak Swamp Creek
S4-MW59
146.277
146
S4-MW61
145.863
145
144
143
S4-MW27
140.66
142
MW-03-01
142.84
S4-MW24
142.15
141
S4-MW41
142.118
S4-MW37
140.948
140
S4-MW48
137.085
139
138
S4-MW46
137.944
BG-MW-03
141.54
52
N
0 225 450 900
Feet
153
MW-13-02
151.64
MW-11-04R
152.22
MW-13-05
152.14
MW-13-07
151.36
MW-13-17
151.7
MW-13-08
151.89
MW-13-19
151.38
MW-11-05
151.957
152
BG-MW-05
151.687
BG-MW-06
150.508
MW-13-11
149.95
MW-11-06
150.049
151
0 25 50 100
Feet

**Legend**

- Upper Aquifer Monitoring Well
- Soure Area Soil Excavation
- 2018 Upper Aquifer Potentiometric Groundwater Contour (1ft interval)
- Approximate Groundwater Flow Direction

Notes: Units are ft amsl. See Table 4 for Upper Surficial Aquifer Water Level Elevations.

FORMER VIRGINIA AIR NATIONAL GUARD BASE, SANDSTON, VIRGINIA

Figure 3
Upper Surficial Aquifer Potentiometric Map
2018 Groundwater Monitoring Report
Former Virginia Air National Guard Base
Sandston, Virginia

| CONTRACT NO | DO#: |
|---|---|
| W9133L-14-D-0001 | 0009 |
| DESIGNED BY: B. Perrigo | DRAWN BY: B. Perrigo |
| CHECKED BY: S. Chatterjee | DATE: August 2018 |
| SCALE: As Shown | SHEET: 1 of 1 |
| Fig_3_Upper_Aquifer_Pot_Map.mxd | |

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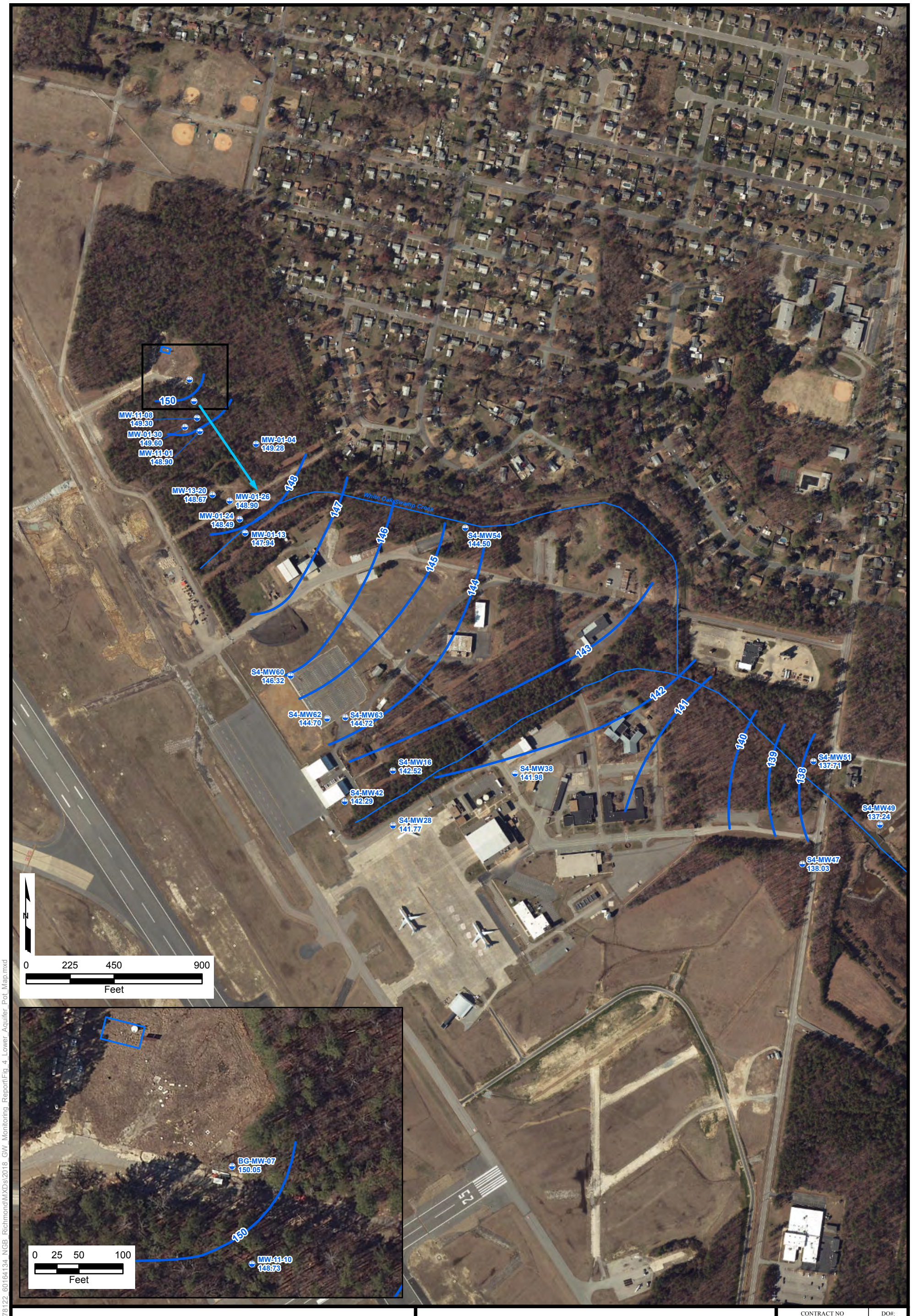


**Legend**

- Lower Aquifer Monitoring Well
- Soure Area Soil Excavation
- 2018 Lower Aquifier Potentiometric Groundwater Contours (1 ft interval)
- Approximate Groundwater Flow Direction

Notes: Units are ft amsl. See Table 4 for Lower Surficial Aquifer Water Level Elevations.

FORMER VIRGINIA AIR NATIONAL GUARD BASE, SANDSTON, VIRGINIA

Figure 4
Lower Surficial Aquifer Potentiometric Map
2018 Groundwater Monitoring Report
Former Virginia Air National Guard Base
Sandston, Virginia

| CONTRACT NO | DO#: |
|---|---|
| W9133L-14-D-0001 | 0009 |
| DESIGNED BY: B. Perrigo | DRAWN BY: B. Perrigo |
| CHECKED BY: S. Chatterjee | DATE: August 2018 |
| SCALE: As Shown | SHEET: 1 of 1 |
| Fig_4_Lower_Aquifer_Pot_Map.mxd | |

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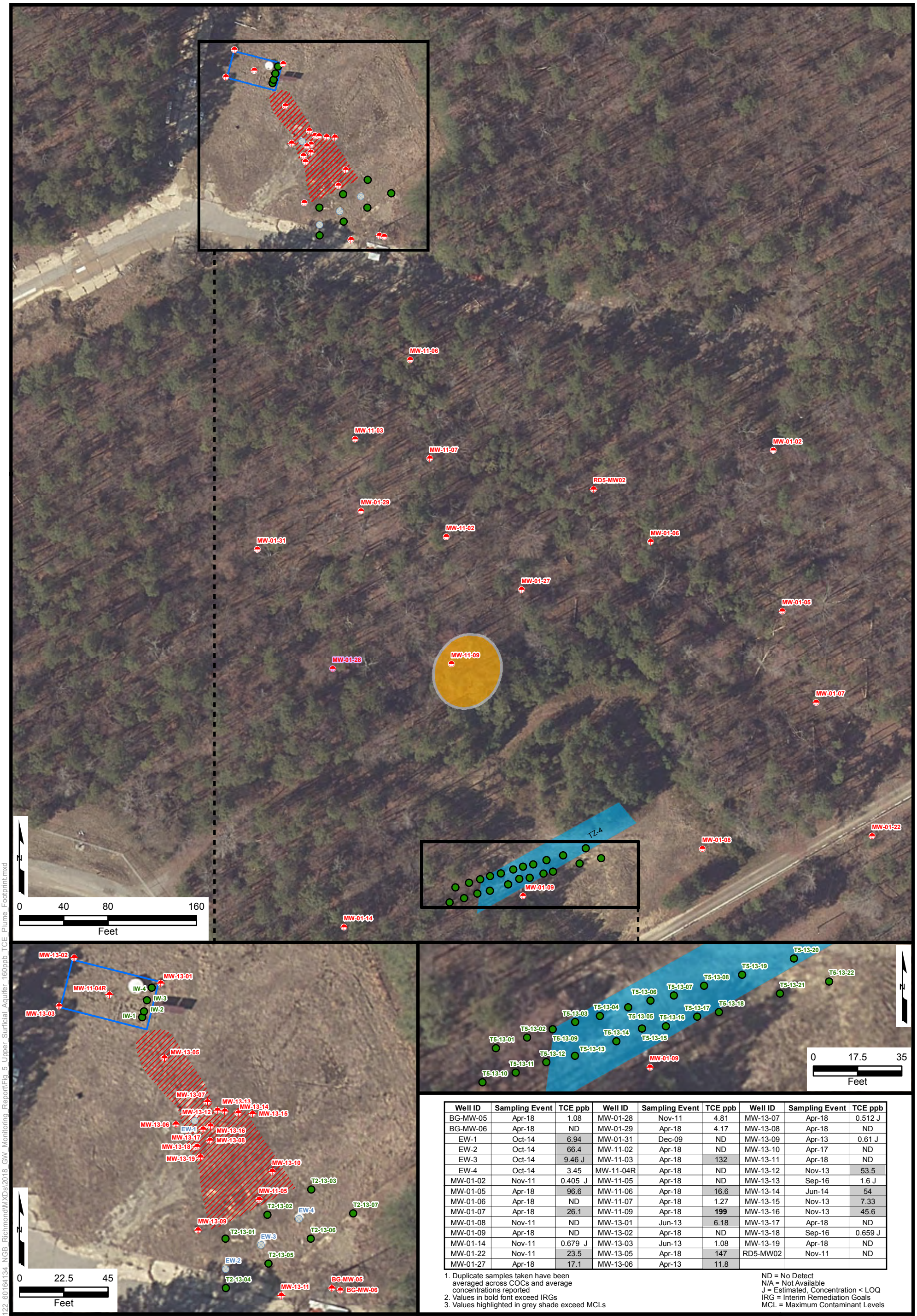


| Well ID | Sampling Event | TCE ppb | Well ID | Sampling Event | TCE ppb | Well ID | Sampling Event | TCE ppb |
|---|---|---|---|---|---|---|---|---|
| BG-MW-05 | Apr-18 | 1.08 | MW-01-28 | Nov-11 | 4.81 | MW-13-07 | Apr-18 | 0.512 J |
| BG-MW-06 | Apr-18 | ND | MW-01-29 | Apr-18 | 4.17 | MW-13-08 | Apr-18 | ND |
| EW-1 | Oct-14 | 6.94 | MW-01-31 | Dec-09 | ND | MW-13-09 | Apr-13 | 0.61 J |
| EW-2 | Oct-14 | 66.4 | MW-11-02 | Apr-18 | ND | MW-13-10 | Apr-17 | ND |
| EW-3 | Oct-14 | 9.46 J | MW-11-03 | Apr-18 | 132 | MW-13-11 | Apr-18 | ND |
| EW-4 | Oct-14 | 3.45 | MW-11-04R | Apr-18 | ND | MW-13-12 | Nov-13 | 53.5 |
| MW-01-02 | Nov-11 | 0.405 J | MW-11-05 | Apr-18 | ND | MW-13-13 | Sep-16 | 1.6 J |
| MW-01-05 | Apr-18 | 96.6 | MW-11-06 | Apr-18 | 16.6 | MW-13-14 | Jun-14 | 54 |
| MW-01-06 | Apr-18 | ND | MW-11-07 | Apr-18 | 1.27 | MW-13-15 | Nov-13 | 7.33 |
| MW-01-07 | Apr-18 | 26.1 | MW-11-09 | Apr-18 | **199** | MW-13-16 | Nov-13 | 45.6 |
| MW-01-08 | Nov-11 | ND | MW-13-01 | Jun-13 | 6.18 | MW-13-17 | Apr-18 | ND |
| MW-01-09 | Apr-18 | ND | MW-13-02 | Apr-18 | ND | MW-13-18 | Sep-16 | 0.659 J |
| MW-01-14 | Nov-11 | 0.679 J | MW-13-03 | Jun-13 | 1.08 | MW-13-19 | Apr-18 | ND |
| MW-01-22 | Nov-11 | 23.5 | MW-13-05 | Apr-18 | 147 | RD5-MW02 | Nov-11 | ND |
| MW-01-27 | Apr-18 | 17.1 | MW-13-06 | Apr-13 | 11.8 | | | |

1. Duplicate samples taken have been averaged across COCs and average concentrations reported
2. Values in bold font exceed IRGs
3. Values highlighted in grey shade exceed MCLs

ND = No Detect
N/A = Not Available
J = Estimated, Concentration < LOQ
IRG = Interim Remediation Goals
MCL = Maximum Contaminant Levels

**Legend**

- Existing Upper Aquifer Monitoring Well
- Lost/Destroyed Upper Aquifer Monitoring Well
- Injection Well
- Extraction Well
- Soure Area Soil Excavation
- In Situ Chemical Oxidation (ISCO) Treatment
- Source Area Groundwater
- 160 ppb TCE Upper Aquifer Footprint

FORMER VIRGINIA AIR NATIONAL GUARD BASE, SANDSTON, VIRGINIA

Figure 5
Upper Surficial Aquifer TCE 160 ppb Plume Map
2018 Groundwater Monitoring Report
Former Virginia Air National Guard Base
Sandston, Virginia

| | |
|---|---|
| CONTRACT NO W9133L-14-D-0001 | DO#: 0009 |
| DESIGNED BY B. Perrigo | DRAWN BY B. Perrigo |
| CHECKED BY S. Chatterjee | DATE August 2018 |
| SCALE As Shown | SHEET 1 of 1 |

Fig_5_Upper_Surficial_Aquifer_160ppb_TCE_Plume_Footprint.mxd

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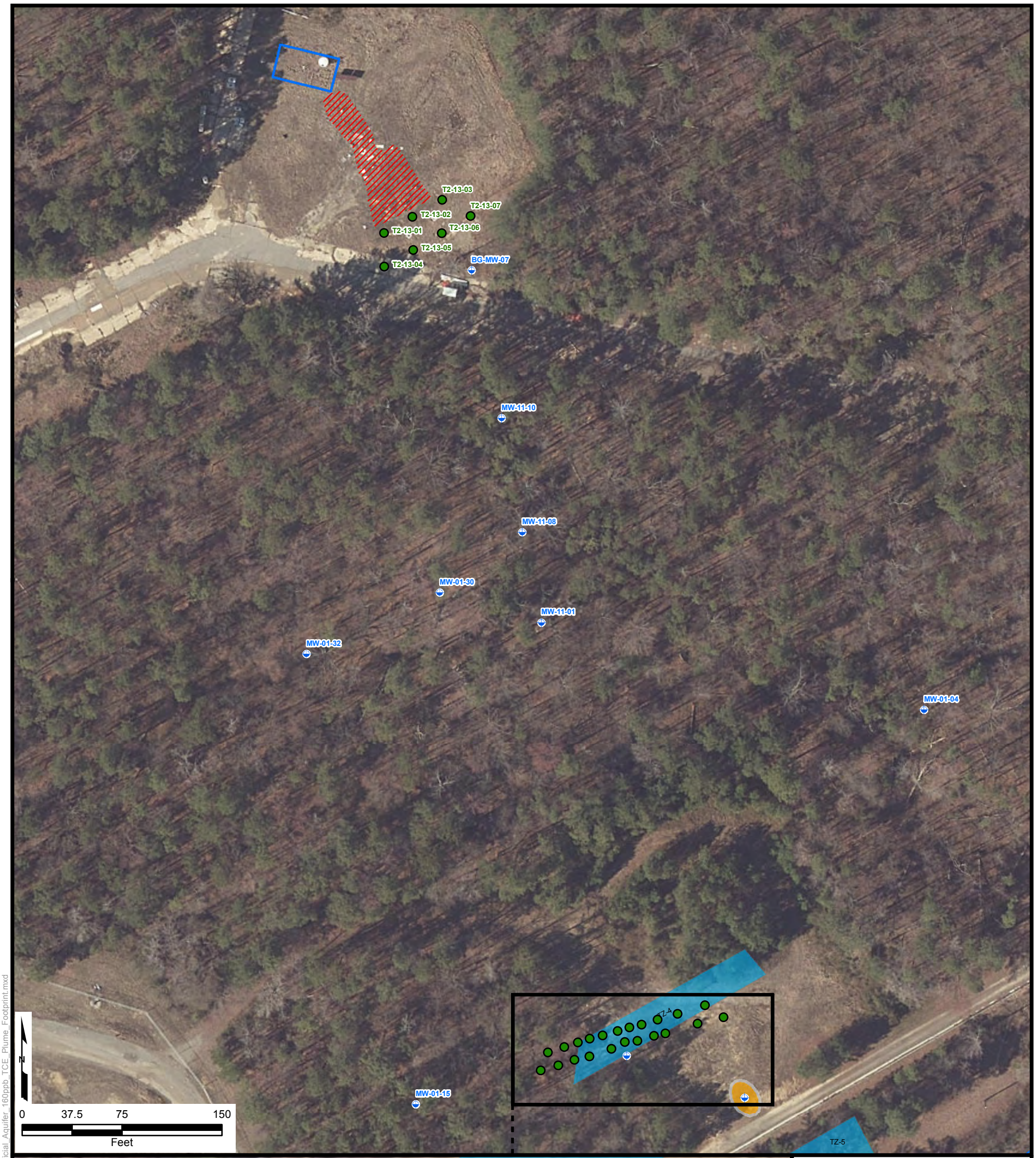


| Well ID | Sampling Event | TCE ppb |
|---|---|---|
| BG-MW-07 | Apr-18 | ND |
| MW-01-04 | Apr-18 | 4.02 |
| MW-01-15 | Apr-13 | ND |
| MW-01-26 | Apr-18 | **271** |
| MW-01-30 | Apr-18 | 52.6 |
| MW-01-32 | Apr-14 | ND |
| MW-11-01 | Apr-18 | 30.3 |
| MW-11-08 | Apr-18 | 73.1 |
| MW-11-10 | Apr-18 | 14.1 |
| MW-13-20 | Apr-18 | ND |

Notes:
1. Duplicate samples taken have been averaged across COCs and average concentrations reported
2. Values in bold font exceed IRGs
3. Values highlighted in grey shade exceed MCLs

ND = No Detect
J = Estimated, Concentration < LOQ
IRG = Interim Remediation Goals
MCL = Maximum Contaminant Levels

**Legend**

- Existing Lower Aquifer Monitoring Well
- Injection Well
- Source Area Soil Excavation
- In Situ Chemical Oxidation (ISCO) Treatment
- Source Area Groundwater
- 160 ppb TCE Lower Aquifer Plume Footprint

FORMER VIRGINIA AIR NATIONAL GUARD BASE, SANDSTON, VIRGINIA

Figure 6
Lower Surficial Aquifer TCE 160 ppb Plume Map
2018 Groundwater Monitoring Report
Former Virginia Air National Guard Base
Sandston, Virginia

| | |
|---|---|
| CONTRACT NO W9133L-14-D-0001 | DO#: 0009 |
| DESIGNED BY B. Perrigo | DRAWN BY B. Perrigo |
| CHECKED BY S. Chatterjee | DATE August 2018 |
| SCALE As Shown | SHEET 1 of 1 |
| Fig_6_Lower_Surficial_Aquifer_160ppb_TCE_Plume_Footprint.mxd | |

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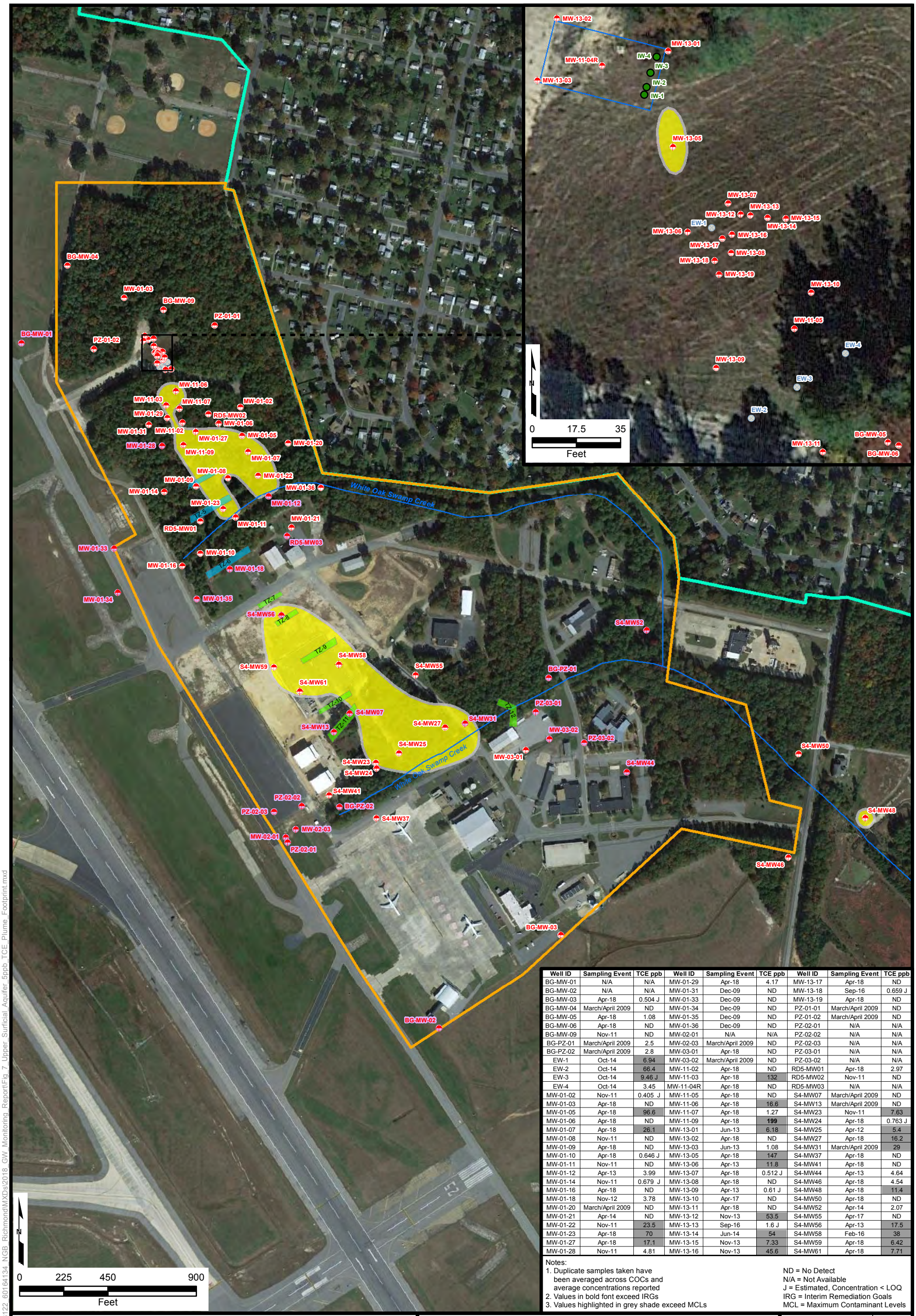


| Well ID | Sampling Event | TCE ppb | Well ID | Sampling Event | TCE ppb | Well ID | Sampling Event | TCE ppb |
|---|---|---|---|---|---|---|---|---|
| BG-MW-01 | N/A | N/A | MW-01-29 | Apr-18 | 4.17 | MW-13-17 | Apr-18 | ND |
| BG-MW-02 | N/A | N/A | MW-01-31 | Dec-09 | ND | MW-13-18 | Sep-16 | 0.659 J |
| BG-MW-03 | Apr-18 | 0.504 J | MW-01-33 | Dec-09 | ND | MW-13-19 | Apr-18 | ND |
| BG-MW-04 | March/April 2009 | ND | MW-01-34 | Dec-09 | ND | PZ-01-01 | March/April 2009 | ND |
| BG-MW-05 | Apr-18 | 1.08 | MW-01-35 | Dec-09 | ND | PZ-01-02 | March/April 2009 | ND |
| BG-MW-06 | Apr-18 | ND | MW-01-36 | Dec-09 | ND | PZ-02-01 | N/A | N/A |
| BG-MW-09 | Nov-11 | ND | MW-02-01 | N/A | N/A | PZ-02-02 | N/A | N/A |
| BG-PZ-01 | March/April 2009 | 2.5 | MW-02-03 | March/April 2009 | ND | PZ-02-03 | N/A | N/A |
| BG-PZ-02 | March/April 2009 | 2.8 | MW-03-01 | Apr-18 | ND | PZ-03-01 | N/A | N/A |
| EW-1 | Oct-14 | 6.94 | MW-03-02 | March/April 2009 | ND | PZ-03-02 | N/A | N/A |
| EW-2 | Oct-14 | 66.4 | MW-11-02 | Apr-18 | ND | RD5-MW01 | Apr-18 | 2.97 |
| EW-3 | Oct-14 | 9.46 J | MW-11-03 | Apr-18 | 132 | RD5-MW02 | Nov-11 | ND |
| EW-4 | Oct-14 | 3.45 | MW-11-04R | Apr-18 | ND | RD5-MW03 | N/A | N/A |
| MW-01-02 | Nov-11 | 0.405 J | MW-11-05 | Apr-18 | ND | S4-MW07 | March/April 2009 | ND |
| MW-01-03 | Apr-18 | ND | MW-11-06 | Apr-18 | 16.6 | S4-MW13 | March/April 2009 | ND |
| MW-01-05 | Apr-18 | 96.6 | MW-11-07 | Apr-18 | 1.27 | S4-MW23 | Nov-11 | 7.63 |
| MW-01-06 | Apr-18 | ND | MW-11-09 | Apr-18 | **199** | S4-MW24 | Apr-18 | 0.763 J |
| MW-01-07 | Apr-18 | 26.1 | MW-13-01 | Jun-13 | 6.18 | S4-MW25 | Apr-12 | 5.4 |
| MW-01-08 | Nov-11 | ND | MW-13-02 | Apr-18 | ND | S4-MW27 | Apr-18 | 16.2 |
| MW-01-09 | Apr-18 | ND | MW-13-03 | Jun-13 | 1.08 | S4-MW31 | March/April 2009 | 29 |
| MW-01-10 | Apr-18 | 0.646 J | MW-13-05 | Apr-18 | 147 | S4-MW37 | Apr-18 | ND |
| MW-01-11 | Nov-11 | ND | MW-13-06 | Apr-13 | 11.8 | S4-MW41 | Apr-18 | ND |
| MW-01-12 | Apr-13 | 3.99 | MW-13-07 | Apr-18 | 0.512 J | S4-MW44 | Apr-13 | 4.64 |
| MW-01-14 | Nov-11 | 0.679 J | MW-13-08 | Apr-18 | ND | S4-MW46 | Apr-18 | 4.54 |
| MW-01-16 | Apr-18 | ND | MW-13-09 | Apr-13 | 0.61 J | S4-MW48 | Apr-18 | 11.4 |
| MW-01-18 | Nov-12 | 3.78 | MW-13-10 | Apr-17 | ND | S4-MW50 | Apr-18 | ND |
| MW-01-20 | March/April 2009 | ND | MW-13-11 | Apr-18 | ND | S4-MW52 | Apr-14 | 2.07 |
| MW-01-21 | Apr-14 | ND | MW-13-12 | Nov-13 | 53.5 | S4-MW55 | Apr-17 | ND |
| MW-01-22 | Nov-11 | 23.5 | MW-13-13 | Sep-16 | 1.6 J | S4-MW56 | Apr-13 | 17.5 |
| MW-01-23 | Apr-18 | 70 | MW-13-14 | Jun-14 | 54 | S4-MW58 | Feb-16 | 38 |
| MW-01-27 | Apr-18 | 17.1 | MW-13-15 | Nov-13 | 7.33 | S4-MW59 | Apr-18 | 6.42 |
| MW-01-28 | Nov-11 | 4.81 | MW-13-16 | Nov-13 | 45.6 | S4-MW61 | Apr-18 | 7.71 |

Notes:
1. Duplicate samples taken have been averaged across COCs and average concentrations reported
2. Values in bold font exceed IRGs
3. Values highlighted in grey shade exceed MCLs

ND = No Detect
N/A = Not Available
J = Estimated, Concentration < LOQ
IRG = Interim Remediation Goals
MCL = Maximum Contaminant Levels

**Legend**

- Existing Upper Aquifer Monitoring Well
- Lost/Destroyed Upper Aquifer Monitoring Well
- Injection Well
- Extraction Well
- Source Area Soil Excavation
- Enhanced Reductive Dechlorination (ERD) Treatment
- In Situ Chemical Oxidation (ISCO) Treatment
- 5 ppb TCE Upper Aquifer Footprint
- Virginia Air National Guard Base Boundary
- CRAC Property Boundary

FORMER VIRGINIA AIR NATIONAL GUARD BASE, SANDSTON, VIRGINIA

Figure 7
Upper Surficial Aquifer 5 ppb Plume Map
2018 Groundwater Monitoring Report
Former Virginia Air National Guard Base
Sandston, Virginia

| | |
|---|---|
| CONTRACT NO: W9133L-14-D-0001 | DO#: 0009 |
| DESIGNED BY: B. Perrigo | DRAWN BY: B. Perrigo |
| CHECKED BY: S. Chatterjee | DATE: August 2018 |
| SCALE: As Shown | SHEET: 1 of 1 |

Fig_7_Upper_Surficial_Aquifer_5pp_TCE_Plume_Footprint.mxd

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| Well ID | Sampling Event | TCE ppb | Well ID | Sampling Event | TCE ppb |
|---|---|---|---|---|---|
| BG-MW-07 | Apr-18 | ND | S4-MW28 | Apr-18 | 0.737 J |
| BG-MW-08 | Nov-11 | ND | S4-MW30 | March/April 2009 | 12 |
| MW-01-04 | Apr-18 | 4.02 | S4-MW32 | March/April 2009 | 54 |
| MW-01-13 | Apr-18 | 112 | S4-MW33 | Nov-11 | 14.9 |
| MW-01-15 | Apr-13 | ND | S4-MW38 | Apr-18 | 41.4 |
| MW-01-19 | Nov-12 | 5.99 | S4-MW39 | Dec-09 | 11 |
| MW-01-24 | Apr-18 | 9.83 | S4-MW42 | Apr-18 | ND |
| MW-01-25 | Nov-11 | 8.82 | S4-MW45 | Apr-14 | ND |
| MW-01-26 | Apr-18 | **271** | S4-MW47 | Apr-18 | 6.12 |
| MW-01-30 | Apr-18 | 52.6 | S4-MW49 | Apr-18 | 1.98 |
| MW-01-32 | Apr-14 | ND | S4-MW51 | Apr-18 | 4.24 |
| MW-11-01 | Apr-18 | 30.3 | S4-MW53 | Apr-14 | 0.751 J |
| MW-11-08 | Apr-18 | 73.1 | S4-MW54 | Apr-18 | 4.08 |
| MW-11-10 | Apr-18 | 14.1 | S4-MW57 | Apr-12 | 0.623 J |
| MW-13-20 | Apr-18 | ND | S4-MW60 | Apr-18 | 3.5 |
| S4-MW16 | Apr-18 | 30.5 | S4-MW62 | Apr-18 | 15.1 |
| S4-MW21 | March/April 2009 | 31 | S4-MW63 | Apr-18 | 18.7 |
| S4-MW22 | Apr-12 | 61.7 | S4-MW64 | Apr-13 | 40.9 |
| S4-MW26 | Apr-12 | 52.2 | | | |

Notes:
1. Duplicate samples taken have been averaged across COCs and average concentrations reported
2. Values in bold font exceed IRGs
3. Values highlighted in grey shade exceed MCLs

ND = No Detect
J = Estimated, Concentration < LOQ
IRG = Interim Remediation Goals
MCL = Maximum Contaminant Levels

**Legend**

- Existing Lower Aquifer Monitoring Well
- Lost/Destroyed Lower Aquifer Monitoring Well
- Source Area Soil Excavation
- Enhanced Reductive Dechlorination (ERD) Treatment
- In Situ Chemical Oxidation (ISCO) Treatment
- 5 ppb TCE Lower Aquifer Footprint
- Virginia Air National Guard Base Boundary
- CRAC Property Boundary

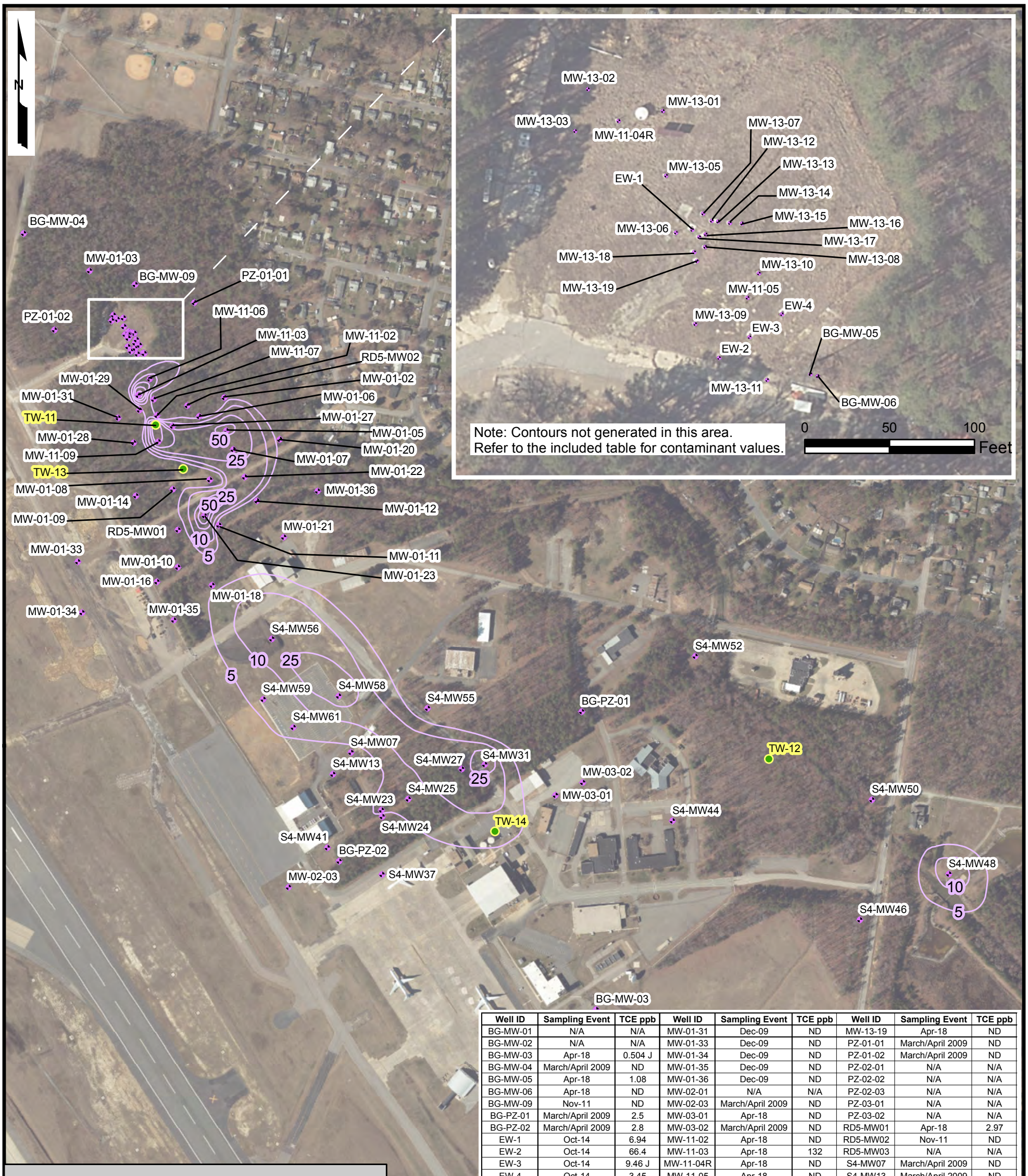
FORMER VIRGINIA AIR NATIONAL GUARD BASE, SANDSTON, VIRGINIA

Figure 8
Lower Surficial Aquifer 5 ppb Plume Map
2018 Groundwater Monitoring Report
Former Virginia Air National Guard Base
Sandston, Virginia

| CONTRACT NO | DO#: |
|---|---|
| W9133L-14-D-0001 | 0009 |
| DESIGNED BY: B. Perrigo | DRAWN BY: B. Perrigo |
| CHECKED BY: S. Chatterjee | DATE: August 2018 |
| SCALE: As Shown | SHEET: 1 of 1 |

Fig_8_Lower_Surficial_Aquifer_5ppb_TCE_Plume_Footprint.mxd

L:\DCS\GIS\GIS_Data\60278122_60164134_NGB_Richmond\MXDs\2018_GW_Monitoring_Report\Fig_8_Lower_Surficial_Aquifer_5ppb_TCE_Plume_Footprint.mxd




| Well ID | Sampling Event | TCE ppb | Well ID | Sampling Event | TCE ppb | Well ID | Sampling Event | TCE ppb |
|---|---|---|---|---|---|---|---|---|
| BG-MW-01 | N/A | N/A | MW-01-31 | Dec-09 | ND | MW-13-19 | Apr-18 | ND |
| BG-MW-02 | N/A | N/A | MW-01-33 | Dec-09 | ND | PZ-01-01 | March/April 2009 | ND |
| BG-MW-03 | Apr-18 | 0.504 J | MW-01-34 | Dec-09 | ND | PZ-01-02 | March/April 2009 | ND |
| BG-MW-04 | March/April 2009 | ND | MW-01-35 | Dec-09 | ND | PZ-02-01 | N/A | N/A |
| BG-MW-05 | Apr-18 | 1.08 | MW-01-36 | Dec-09 | ND | PZ-02-02 | N/A | N/A |
| BG-MW-06 | Apr-18 | ND | MW-02-01 | N/A | N/A | PZ-02-03 | N/A | N/A |
| BG-MW-09 | Nov-11 | ND | MW-02-03 | March/April 2009 | ND | PZ-03-01 | N/A | N/A |
| BG-PZ-01 | March/April 2009 | 2.5 | MW-03-01 | Apr-18 | ND | PZ-03-02 | N/A | N/A |
| BG-PZ-02 | March/April 2009 | 2.8 | MW-03-02 | March/April 2009 | ND | RD5-MW01 | Apr-18 | 2.97 |
| EW-1 | Oct-14 | 6.94 | MW-11-02 | Apr-18 | ND | RD5-MW02 | Nov-11 | ND |
| EW-2 | Oct-14 | 66.4 | MW-11-03 | Apr-18 | 132 | RD5-MW03 | N/A | N/A |
| EW-3 | Oct-14 | 9.46 J | MW-11-04R | Apr-18 | ND | S4-MW07 | March/April 2009 | ND |
| EW-4 | Oct-14 | 3.45 | MW-11-05 | Apr-18 | ND | S4-MW13 | March/April 2009 | ND |
| MW-01-02 | Nov-11 | 0.405 J | MW-11-06 | Apr-18 | 16.6 | S4-MW23 | Nov-11 | 7.63 |
| MW-01-03 | Apr-18 | ND | MW-11-07 | Apr-18 | 1.27 | S4-MW24 | Apr-18 | 0.763 J |
| MW-01-05 | Apr-18 | 96.6 | MW-11-09 | Apr-18 | **199** | S4-MW25 | Apr-12 | 5.4 |
| MW-01-06 | Apr-18 | ND | MW-13-01 | Jun-13 | 6.18 | S4-MW27 | Apr-18 | 16.2 |
| MW-01-07 | Apr-18 | 26.1 | MW-13-02 | Apr-18 | ND | S4-MW31 | March/April 2009 | 29 |
| MW-01-08 | Nov-11 | ND | MW-13-03 | Jun-13 | 1.08 | S4-MW37 | Apr-18 | ND |
| MW-01-09 | Apr-18 | ND | MW-13-05 | Apr-18 | 147 | S4-MW41 | Apr-18 | ND |
| MW-01-10 | Apr-18 | 0.646 J | MW-13-06 | Apr-13 | 11.8 | S4-MW44 | Apr-13 | 4.64 |
| MW-01-11 | Nov-11 | ND | MW-13-07 | Apr-18 | 0.512 J | S4-MW46 | Apr-18 | 4.54 |
| MW-01-12 | Apr-13 | 3.99 | MW-13-08 | Apr-18 | ND | S4-MW48 | Apr-18 | 11.4 |
| MW-01-14 | Nov-11 | 0.679 J | MW-13-09 | Apr-13 | 0.61 J | S4-MW50 | Apr-18 | ND |
| MW-01-16 | Apr-18 | ND | MW-13-10 | Apr-17 | ND | S4-MW52 | Apr-14 | 2.07 |
| MW-01-18 | Nov-12 | 3.78 | MW-13-11 | Apr-18 | ND | S4-MW55 | Apr-17 | ND |
| MW-01-20 | March/April 2009 | ND | MW-13-12 | Nov-13 | 53.5 | S4-MW56 | Apr-13 | 17.5 |
| MW-01-21 | Apr-14 | ND | MW-13-13 | Sep-16 | 1.6 J | S4-MW58 | Feb-16 | 38 |
| MW-01-22 | Nov-11 | 23.5 | MW-13-14 | Jun-14 | 54 | S4-MW59 | Apr-18 | 6.42 |
| MW-01-23 | Apr-18 | 70 | MW-13-15 | Nov-13 | 7.33 | S4-MW61 | Apr-18 | 7.71 |
| MW-01-27 | Apr-18 | 17.1 | MW-13-16 | Nov-13 | 45.6 | TW-11 | Apr-18 | 571 |
| MW-01-28 | Nov-11 | 4.81 | MW-13-17 | Apr-18 | ND | TW-12 | Apr-18 | 0.551 J |
| MW-01-29 | Apr-18 | 4.17 | MW-13-18 | Sep-16 | 0.659 J | TW-13 | Apr-18 | 1.43 |
| | | | | | | TW-14 | Apr-18 | 9.29 |

**Note**
ND = No Detect
N/A = Not Available
J = Estimated, Concentration < LOQ

**Legend**

Well Name — Upper Surficial Aquifer Well

Well Name — Temporary Upper Surficial Aquifer Well

5, 10, 25, 50, 100, 200 — TCE Isocontours (parts per billion)

0 337.5 675 1,350 Feet

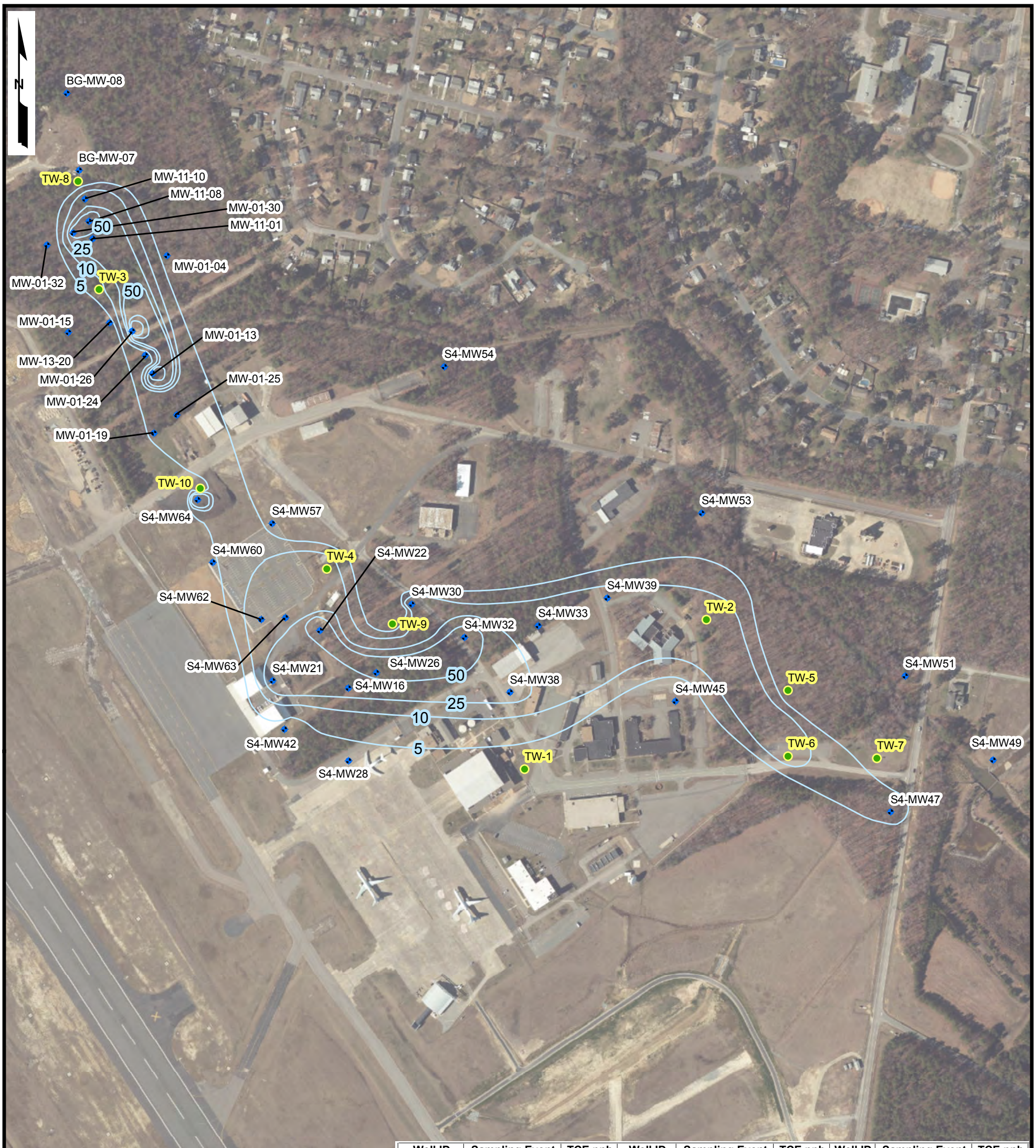
FORMER VIRGINIA AIR NATIONAL GUARD BASE, SANDSTON, VIRGINIA

Upper Surficial Aquifer
Groundwater TCE Concentration Isocontours

**Figure 9**

Former Virginia Air National Guard Base
Sandston, Virginia

| | |
|---|---|
| CONTRACT NO W9133L-14-D-0001 | DO#: DK01 |
| DESIGNED BY P. Donahoe | DRAWN BY P. Donahoe |
| CHECKED BY B. McGuinness | DATE December 2018 |
| SCALE As Shown | SHEET 1 of 1 |
| TCE_Isocontour_upper_Dec2018.mxd | |




| Well ID | Sampling Event | TCE ppb | Well ID | Sampling Event | TCE ppb | Well ID | Sampling Event | TCE ppb |
|---|---|---|---|---|---|---|---|---|
| BG-MW-07 | Apr-18 | ND | S4-MW26 | Apr-12 | 52.2 | TW-1 | Apr-18 | 0.5 U |
| MW-01-30 | Apr-18 | 52.6 | S4-MW28 | Apr-18 | 0.737 J | TW-2 | Apr-18 | 21.3 |
| MW-11-01 | Apr-18 | 30.3 | S4-MW30 | March/April 2009 | 12 | TW-3 | Apr-18 | 7.82 |
| MW-11-08 | Apr-18 | 73.1 | S4-MW32 | March/April 2009 | 54 | TW-4 | Apr-18 | 23.8 |
| MW-11-10 | Apr-18 | 14.1 | S4-MW33 | Nov-11 | 14.9 | TW-5 | Apr-18 | 4.63 |
| MW-13-20 | Apr-18 | ND | S4-MW38 | Apr-18 | 41.4 | TW-6 | Apr-18 | 15.8 |
| BG-MW-08 | Nov-11 | ND | S4-MW39 | Dec-09 | 11 | TW-7 | Apr-18 | 0.5 U |
| MW-01-04 | Apr-18 | 4.02 | S4-MW42 | Apr-18 | ND | TW-8 | Apr-18 | 0.5 U |
| MW-01-13 | Apr-18 | 112 | S4-MW45 | Apr-14 | ND | TW-9 | Apr-18 | 1.08 |
| MW-01-15 | Apr-13 | ND | S4-MW47 | Apr-18 | 6.12 | TW-10 | Apr-18 | 0.795 J |
| MW-01-19 | Nov-12 | 5.99 | S4-MW49 | Apr-18 | 1.98 | | | |
| MW-01-24 | Apr-18 | 9.83 | S4-MW51 | Apr-18 | 4.24 | | | |
| MW-01-25 | Nov-11 | 8.82 | S4-MW53 | Apr-14 | 0.751 J | | | |
| MW-01-26 | Apr-18 | 271 | S4-MW54 | Apr-18 | 4.08 | | | |
| MW-01-30 | Apr-18 | 52.6 | S4-MW57 | Apr-12 | 0.623 J | | | |
| MW-01-32 | Apr-14 | ND | S4-MW60 | Apr-18 | 3.5 | | | |
| S4-MW16 | Apr-18 | 30.5 | S4-MW62 | Apr-18 | 15.1 | | | |
| S4-MW21 | March/April 2009 | 31 | S4-MW63 | Apr-18 | 18.7 | | | |
| S4-MW22 | Apr-12 | 61.7 | S4-MW64 | Apr-13 | 40.9 | | | |

**Note**
ND = No Detect
J = Estimated, Concentration < LOQ

**Legend**

Well Name — Lower Surficial Aquifer Well

Well Name — Temporary Lower Surficial Aquifer Well

5, 10, 25, 50, 100, 200 — TCE Isocontours (parts per billion)

0 300 600 1,200 Feet

FORMER VIRGINIA AIR NATIONAL GUARD BASE, SANDSTON, VIRGINIA

Lower Surficial Aquifer
Groundwater TCE Concentration Isocontours

**Figure 10**

Former Virginia Air National Guard Base
Sandston, Virginia

| | |
|---|---|
| CONTRACT NO W9133L-14-D-0001 | DO#: DK01 |
| DESIGNED BY P. Donahoe | DRAWN BY P. Donahoe |
| CHECKED BY B. McGuinness | DATE December 2018 |
| SCALE As Shown | SHEET 1 of 1 |
| TCE_Isocontour_lower_Dec2018.mxd | |

# Appendix A

# Supporting Tables

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Table A-1: List of Wells Sampled and Analytes
April 2018 Groundwater Monitoring Event
Former Virginia Air National Guard Base, Sandston, VA

| Well ID | Portion of Aquifer | VOCs and Water Levels | Natural Attenuation Parameters | | |
|---|---|---|---|---|---|
| | | | TOC & Alkalinity Analysis | Metals & Gases Analysis* | Microbiology Samples |
| **Permanent Monitoring wells** | | | | | |
| BG-MW-03 | Upper | X | | | |
| BG-MW-05 | Upper | X | X | | |
| BG-MW-06 | Upper | X | X | | |
| BG-MW-07 | Lower | X | | | |
| MW-01-03 | Upper | X | | | |
| MW-01-04 | Lower | X | | | |
| MW-01-05 | Upper | X | | | |
| MW-01-06 | Upper | X | | | |
| MW-01-07 | Upper | X | | | |
| MW-01-09 | Upper | X | X | X | X |
| MW-01-10 | Upper | X | | | |
| MW-01-13 | Lower | X | | | |
| MW-01-16 | Upper | X | | | |
| MW-01-23 | Upper | X | | | |
| MW-01-24 | Lower | X | | | |
| MW-01-26 | Lower | X | | | |
| MW-01-27 | Upper | X | | | |
| MW-01-29 | Upper | X | | | |
| MW-01-30 | Lower | X | | | |
| MW-03-01 | Upper | X | | | |
| MW-11-01 | Lower | X | X | X | |
| MW-11-02 | Upper | X | X | X | |
| MW-11-03 | Upper | X | X | | |
| MW-11-04R | Upper | X | | | |
| MW-11-05 | Upper | X | | | |
| MW-11-06 | Upper | X | X | X | |
| MW-11-07 | Upper | X | X | X | X |
| MW-11-08 | Lower | X | X | X | X |
| MW-11-09 | Upper | X | X | X | X |
| MW-11-10 | Lower | X | X | X | |
| MW-13-02 | Upper | X | | | |
| MW-13-05 | Upper | X | | | |
| MW-13-07 | Upper | X | | | |
| MW-13-08 | Upper | X | | | |
| MW-13-11 | Upper | X | X | X | X |
| MW-13-17 | Upper | X | | | |
| MW-13-19 | Upper | X | | | |
| MW-13-20 | Lower | X | X | | |
| RD5-MW-01 | Upper | X | X | X | |
| S4-MW16 | Lower | X | | | |
| S4-MW24 | Upper | X | | | |
| S4-MW27 | Upper | X | | | |
| S4-MW28 | Lower | X | | | |
| S4-MW37 | Upper | X | | | |
| S4-MW38 | Lower | X | | | |
| S4-MW41 | Upper | X | | | |
| S4-MW42 | Lower | X | | | |
| S4-MW46 | Upper | X | | | |
| S4-MW47 | Lower | X | | | |
| S4-MW48 | Upper | X | | | |
| S4-MW49 | Lower | X | | | |
| S4-MW50 | Upper | X | | | |
| S4-MW51 | Lower | X | | | |
| S4-MW54 | Lower | X | | | |
| S4-MW59 | Upper | X | | | |
| S4-MW60 | Lower | X | | | |
| S4-MW61 | Upper | X | | | |
| S4-MW62 | Lower | X | | | |
| S4-MW63 | Lower | X | | | |
| **Temporary wells** | | | | | |
| TW-1 | Lower | X | | | |
| TW-2 | Lower | X | | | |
| TW-3 | Lower | X | | | |
| TW-4 | Lower | X | | | |
| TW-5 | Lower | X | | | |
| TW-6 | Lower | X | | | |
| TW-7 | Lower | X | | | |
| TW-8 | Lower | X | | | |
| TW-9 | Lower | X | | | |
| TW-10 | Lower | X | | | |
| TW-11 | Upper | X | | | |
| TW-12 | Upper | X | | | |
| TW-13 | Upper | X | | | |
| TW-14 | Upper | X | | | |

Note:
**The metals analyzed for were total and dissolved iron, total and dissolved manganese and arsenic;the gases analyzed for were carbon-dioxide, methane, ethane and ethene.

Table A-2: Current Monitoring Wells Location and Screen Information
April 2018 Groundwater Monitoring Event
Former Virginia Air National Guard Base, Sandston, VA

| Well ID | Northing | Easting | Portion of Aquifer | Ground Surface Elevation (ft amsl) | Top of Casing Elevation (ft amsl) | Top of Screen (ft bgs) | Bottom of Screen (ft bgs) |
|---|---|---|---|---|---|---|---|
| BG-MW-03 | 3710487.85 | 11828358.13 | Upper | 153.24 | 152.86 | 12.60 | 22.60 |
| BG-MW-05 | 3713369.13 | 11826370.49 | Upper | 160.29 | 163.60 | 12.00 | 27.00 |
| BG-MW-06 | 3713368.01 | 11826374.74 | Upper | 160.59 | 163.45 | 27.00 | 37.00 |
| BG-MW-07 | 3713366.33 | 11826382.10 | Lower | 160.43 | 163.41 | 37.00 | 52.00 |
| MW-01-03 | 3713731.48 | 11826134.85 | Upper | 164.12 | 166.95 | 10.00 | 20.00 |
| MW-01-04 | 3713036.64 | 11826721.74 | Lower | 157.13 | 159.38 | 36.50 | 46.50 |
| MW-01-05 | 3713029.36 | 11826734.92 | Upper | 156.98 | 159.48 | 13.00 | 23.00 |
| MW-01-06 | 3713091.97 | 11826615.91 | Upper | 157.21 | 159.47 | 13.00 | 23.00 |
| MW-01-07 | 3712946.82 | 11826765.59 | Upper | 157.04 | 159.90 | 13.00 | 23.00 |
| MW-01-09 | 3712771.75 | 11826500.32 | Upper | 159.96 | 162.43 | 13.00 | 23.00 |
| MW-01-10 | 3712430.09 | 11826522.08 | Upper | 157.52 | 160.20 | 13.00 | 23.00 |
| MW-01-13 | 3712581.62 | 11826665.74 | Lower | 156.67 | 159.48 | 35.00 | 45.00 |
| MW-01-16 | 3712365.79 | 11826430.80 | Upper | 155.66 | 159.06 | 10.00 | 25.00 |
| MW-01-23 | 3712656.19 | 11826638.63 | Upper | 156.28 | 159.30 | 10.00 | 25.00 |
| MW-01-24 | 3712651.41 | 11826637.81 | Lower | 156.44 | 159.03 | 30.00 | 45.00 |
| MW-01-26 | 3712745.44 | 11826587.04 | Lower | 158.63 | 161.39 | 32.00 | 47.00 |
| MW-01-27 | 3713048.76 | 11826499.07 | Upper | 158.18 | 161.41 | 12.00 | 27.00 |
| MW-01-29 | 3713119.85 | 11826353.85 | Upper | 158.93 | 162.01 | 12.00 | 27.00 |
| MW-01-30 | 3713124.44 | 11826358.21 | Lower | 159.26 | 162.21 | 35.00 | 50.00 |
| MW-03-01 | 3711428.92 | 11828180.42 | Upper | 155.55 | 155.24 | 13.00 | 23.00 |
| MW-11-01 | 3713102.04 | 11826434.48 | Lower | 159.14 | 161.60 | 34.89 | 45.20 |
| MW-11-02 | 3713096.53 | 11826431.02 | Upper | 158.95 | 162.00 | 15.14 | 25.40 |
| MW-11-03 | 3713184.82 | 11826348.62 | Upper | 159.93 | 162.12 | 24.66 | 34.90 |
| MW-11-04R | 3713518.35 | 11826257.32 | Upper | 161.90 | 164.30 | 20.00 | 30.00 |
| MW-11-05 | 3713414.15 | 11826333.46 | Upper | 160.88 | 162.77 | 17.91 | 27.90 |
| MW-11-06 | 3713256.62 | 11826398.37 | Upper | 160.08 | 162.02 | 18.25 | 28.30 |
| MW-11-07 | 3713167.31 | 11826416.10 | Upper | 159.21 | 160.84 | 15.71 | 25.70 |
| MW-11-08 | 3713169.85 | 11826420.06 | Lower | 159.12 | 160.95 | 34.75 | 44.80 |
| MW-11-09 | 3712981.58 | 11826435.63 | Upper | 157.92 | 159.63 | 17.90 | 27.90 |
| MW-11-10 | 3713255.42 | 11826404.67 | Lower | 160.17 | 162.53 | 28.88 | 38.90 |
| MW-13-02 | 3713537.10 | 11826239.36 | Upper | 161.70 | 164.00 | 18.00 | 28.00 |
| MW-13-05 | 3713486.14 | 11826285.37 | Upper | 161.80 | 164.70 | 17.50 | 27.50 |
| MW-13-07 | 3713463.78 | 11826307.19 | Upper | 161.50 | 164.10 | 18.00 | 28.00 |
| MW-13-08 | 3713444.21 | 11826308.43 | Upper | 161.50 | 164.00 | 18.00 | 28.00 |
| MW-13-11 | 3713365.75 | 11826344.97 | Upper | 160.30 | 159.90 | 18.00 | 28.00 |
| MW-13-17 | 3713449.90 | 11826304.93 | Upper | 161.29 | 161.02 | 18.00 | 28.00 |
| MW-13-19 | 3713435.69 | 11826303.63 | Upper | 161.29 | 160.97 | 18.00 | 28.00 |
| MW-13-20 | 3712777.06 | 11826498.52 | Lower | 159.98 | 162.22 | 35.00 | 50.00 |
| RD5-MW01 | 3712593.83 | 11826522.68 | Upper | 155.07 | 157.25 | (2) | (2) |
| S4-MW16 | 3711365.29 | 11827421.90 | Lower | 156.38 | 158.66 | 29.50 | 39.50 |
| S4-MW24 | 3711335.08 | 11827419.20 | Upper | 155.75 | 158.64 | 13.00 | 23.00 |
| S4-MW27 | 3711544.38 | 11827768.79 | Upper | 153.59 | 156.35 | 13.00 | 23.00 |
| S4-MW28 | 3711084.46 | 11827423.03 | Lower | 158.80 | 158.51 | 35.00 | 45.00 |
| S4-MW37 | 3711081.01 | 11827418.41 | Upper | 158.84 | 158.51 | 12.00 | 27.00 |
| S4-MW38 | 3711350.13 | 11828046.78 | Lower | 156.63 | 156.13 | 35.00 | 50.00 |
| S4-MW41 | 3711198.90 | 11827178.65 | Upper | 157.26 | 160.22 | 13.00 | 28.00 |
| S4-MW42 | 3711206.49 | 11827174.93 | Lower | 157.35 | 160.13 | 32.00 | 47.00 |
| S4-MW46 | 3710881.97 | 11829516.80 | Upper | 150.79 | 153.44 | 17.00 | 32.00 |
| S4-MW47 | 3710887.68 | 11829516.85 | Lower | 150.82 | 153.73 | 32.00 | 47.00 |
| S4-MW48 | 3711083.32 | 11829907.83 | Upper | 145.05 | 148.14 | 12.00 | 27.00 |
| S4-MW49 | 3711087.44 | 11829913.25 | Lower | 145.18 | 147.98 | 28.00 | 33.00 |
| S4-MW50 | 3711409.10 | 11829569.16 | Upper | 145.63 | 148.32 | 15.00 | 30.00 |
| S4-MW51 | 3711412.67 | 11829573.55 | Lower | 145.46 | 148.44 | 30.00 | 40.00 |
| S4-MW54 | 3712607.76 | 11827792.35 | Lower | 153.78 | 156.58 | 32.00 | 47.00 |
| S4-MW59 | 3711850.04 | 11826896.68 | Upper | 158.48 | 158.23 | 25.10 | 35.10 |
| S4-MW60 | 3711851.03 | 11826898.44 | Lower | 158.40 | 158.22 | 34.60 | 44.60 |
| S4-MW61 | 3711727.21 | 11827028.89 | Upper | 159.74 | 159.43 | 25.00 | 35.00 |
| S4-MW62 | 3711631.35 | 11827085.03 | Lower | 158.40 | 158.17 | 35.50 | 45.50 |
| S4-MW63 | 3711637.36 | 11827178.95 | Lower | 157.15 | 156.92 | 35.00 | 45.00 |

Notes:
(1) Survey Data not available to AECOM
(2) Screen Information not available to AECOM
ft amsl = feet above mean sea level
ft bgs = feet below ground surface

Table A-3: Water Level Elevations
April 2018 Groundwater Monitoring Event
Former Virginia Air National Guard Base, Sandston, VA

| Well/Point | Portion of Aquifer | Top of Casing Elevation (ft amsl) | Depth to Groundwater (ft btoc) | Groundwater Elevation (ft amsl) |
|---|---|---|---|---|
| BG-MW-03 | Upper | 152.86 | 11.32 | 141.54 |
| BG-MW-05 | Upper | 163.60 | 11.91 | 151.687 |
| BG-MW-06 | Upper | 163.45 | 12.94 | 150.508 |
| BG-MW-07 | Lower | 163.41 | 13.36 | 150.05 |
| MW-01-03 | Upper | 166.95 | 12.75 | 154.2 |
| MW-01-04 | Lower | 159.38 | 10.10 | 149.28 |
| MW-01-05 | Upper | 159.48 | 9.96 | 149.52 |
| MW-01-06 | Upper | 159.47 | 9.71 | 149.762 |
| MW-01-07 | Upper | 159.90 | 10.91 | 148.99 |
| MW-01-09 | Upper | 162.43 | 13.23 | 149.2 |
| MW-01-10 | Upper | 160.20 | 11.86 | 148.34 |
| MW-01-13 | Lower | 159.48 | 11.54 | 147.94 |
| MW-01-16 | Upper | 159.06 | 10.74 | 148.315 |
| MW-01-23 | Upper | 159.30 | 10.58 | 148.72 |
| MW-01-24 | Lower | 159.03 | 10.54 | 148.49 |
| MW-01-26 | Lower | 161.39 | 12.49 | 148.904 |
| MW-01-27 | Upper | 161.41 | 11.61 | 149.799 |
| MW-01-29 | Upper | 162.01 | 11.59 | 150.424 |
| MW-01-30 | Lower | 162.21 | 12.61 | 149.599 |
| MW-03-01 | Upper | 155.24 | 12.4 | 142.84 |
| MW-11-01 | Lower | 161.60 | 12.7 | 148.9 |
| MW-11-02 | Upper | 162.00 | 12.23 | 149.772 |
| MW-11-03 | Upper | 162.12 | 12.31 | 149.81 |
| MW-11-04R | Upper | 164.30 | 12.08 | 152.22 |
| MW-11-05 | Upper | 162.77 | 10.81 | 151.957 |
| MW-11-06 | Upper | 162.02 | 11.97 | 150.049 |
| MW-11-07 | Upper | 160.84 | 10.3 | 150.539 |
| MW-11-08 | Lower | 160.95 | 11.65 | 149.301 |
| MW-11-09 | Upper | 159.63 | 9.75 | 149.882 |
| MW-11-10 | Lower | 162.53 | 13.8 | 148.733 |
| MW-13-02 | Upper | 164.00 | 12.36 | 151.64 |
| MW-13-05 | Upper | 164.70 | 12.56 | 152.14 |
| MW-13-07 | Upper | 164.10 | 12.74 | 151.36 |
| MW-13-08 | Upper | 164.00 | 12.11 | 151.89 |
| MW-13-11 | Upper | 159.90 | 9.95 | 149.95 |
| MW-13-17 | Upper | 161.02 | 9.32 | 151.7 |
| MW-13-19 | Upper | 160.97 | 9.59 | 151.38 |
| MW-13-20 | Lower | 162.22 | 13.55 | 148.67 |
| RD5-MW-01 | Upper | 157.25 | 9.23 | 148.019 |
| S4-MW16 | Lower | 158.66 | 16.14 | 142.52 |
| S4-MW24 | Upper | 158.64 | 16.49 | 142.15 |
| S4-MW27 | Upper | 156.35 | 15.69 | 140.66 |
| S4-MW28 | Lower | 158.51 | 16.74 | 141.77 |
| S4-MW37 | Upper | 158.51 | 17.56 | 140.948 |
| S4-MW38 | Lower | 156.13 | 14.15 | 141.983 |
| S4-MW41 | Upper | 160.22 | 18.1 | 142.118 |
| S4-MW42 | Lower | 160.13 | 17.84 | 142.289 |
| S4-MW46 | Upper | 153.44 | 15.5 | 137.944 |
| S4-MW47 | Lower | 153.73 | 15.7 | 138.034 |
| S4-MW48 | Upper | 148.14 | 11.05 | 137.085 |
| S4-MW49 | Lower | 147.98 | 10.74 | 137.244 |
| S4-MW50 | Lower | 148.32 | 10.62 | 137.704 |
| S4-MW51 | Lower | 148.44 | 10.73 | 137.707 |
| S4-MW54 | Lower | 156.58 | 12.08 | 144.499 |
| S4-MW59 | Upper | 158.23 | 11.95 | 146.277 |
| S4-MW60 | Lower | 158.22 | 11.9 | 146.319 |
| S4-MW61 | Upper | 159.43 | 13.57 | 145.863 |
| S4-MW62 | Lower | 158.17 | 13.47 | 144.7 |
| S4-MW63 | Lower | 156.92 | 12.2 | 144.716 |

Table A-4: Field Parameters
April 2018 Groundwater Monitoring Event
Former Virginia Air National Guard Base, Sandston, VA

| Well/Point | Portion of Aquifer | Date | pH | Conductivity (mS/cm) | Dissolved Oxygen (mg/L) | ORP (mV) | Turbidity (NTU) | Temperature (°C) |
|---|---|---|---|---|---|---|---|---|
| BG-MW-03 | Upper | 4/6/2018 | 5.41 | 0.098 | 7.23 | 244.5 | 38.7 | 16.76 |
| BG-MW-05 | Upper | 4/3/2018 | 6.07 | 0.946 | 0.18 | -59.7 | 6.1 | 14.8 |
| BG-MW-06 | Upper | 4/3/2018 | 5.82 | 0.353 | 0.16 | -13.8 | 0.2 | 15.6 |
| BG-MW-07 | Lower | 4/2/2018 | 5.86 | 0.135 | 4.25 | 49.8 | 37 | 14.95 |
| MW-01-03 | Upper | 4/3/2018 | 3.53 | 0.043 | 7.03 | 109.8 | 10.2 | 13.01 |
| MW-01-04 | Lower | 4/2/2018 | 5.27 | 0.086 | 3.98 | 382.2 | 13.7 | 14.67 |
| MW-01-05 | Upper | 4/2/2018 | 4.62 | 0.05 | 2.17 | 320.7 | 48 | 13.02 |
| MW-01-06 | Upper | 4/5/2018 | 5.79 | 0.102 | 0.26 | -34.4 | -166.8 | 14.28 |
| MW-01-07 | Upper | 4/5/2018 | 5.76 | 0.116 | 1.08 | 189.5 | -167.4 | 13.03 |
| MW-01-09 | Upper | 4/3/2018 | 6.8 | 1.736 | 0.19 | -138.3 | 34.3 | 13.48 |
| MW-01-10 | Upper | 4/6/2018 | 4.74 | 0.046 | 1.16 | 184.2 | 10.6 | 14.02 |
| MW-01-13 | Lower | 4/6/2018 | 5.91 | 0.188 | 0.3 | 152.3 | 101.8 | 15.36 |
| MW-01-16 | Upper | 4/6/2018 | 4.84 | 0.035 | 0.57 | 215 | 18.2 | 14.6 |
| MW-01-23 | Upper | 4/6/2018 | 4.4 | 0.08 | 1.2 | 165.3 | 15.9 | 12.97 |
| MW-01-24 | Lower | 4/3/2018 | 5.95 | 0.222 | 0.18 | 15.8 | 5.4 | 15.2 |
| MW-01-26 | Lower | 4/3/2018 | 6.16 | 0.486 | 0.22 | -11.6 | 30.1 | 15.26 |
| MW-01-27 | Upper | 4/6/2018 | 4.72 | 0.03 | 4.05 | 318.7 | 16.5 | 12.72 |
| MW-01-29 | Upper | 4/3/2018 | 4.23 | 0.049 | 3.31 | 28.8 | 37.9 | 13.53 |
| MW-01-30 | Lower | 4/3/2018 | 4.82 | 0.042 | 7.82 | 47 | 238.5 | 13.90 |
| MW-03-01 | Upper | 4/4/2018 | 3.46 | 0.040 | 7.15 | 156.7 | 12.4 | 15.68 |
| MW-11-01 | Lower | 4/5/2018 | 6.30 | 0.489 | 0.12 | -105.1 | 15.9 | 15.02 |
| MW-11-02 | Upper | 4/5/2018 | 6.27 | 1.267 | 0.09 | -119.3 | 69.9 | 13.99 |
| MW-11-03 | Upper | 4/6/2018 | 5.12 | 0.047 | 9.60 | 235.9 | 2.2 | 14.49 |
| MW-11-04R | Upper | 4/2/2018 | 4.81 | 0.079 | 0.17 | 73 | 43.8 | 14.43 |
| MW-11-05 | Upper | 4/2/2018 | 6.02 | 0.653 | 0.21 | -55.2 | 39.3 | 15.19 |
| MW-11-06 | Upper | 4/5/2018 | 6.12 | 0.375 | 0.19 | -67.9 | -10.8 | 15.56 |
| MW-11-07 | Upper | 4/3/2018 | 6.52 | 0.846 | 0.24 | -97.7 | 0 | 12.92 |
| MW-11-08 | Lower | 4/3/2018 | 6.60 | 0.510 | 0.41 | -87.9 | 0 | 14.16 |
| MW-11-09 | Upper | 4/3/2018 | 6.37 | 1.969 | 0.19 | -164.8 | 14.2 | 14.24 |
| MW-11-10 | Lower | 4/5/2018 | 5.75 | 0.282 | 0.14 | -27.4 | 5.7 | 16.19 |
| MW-13-02 | Upper | 4/9/2018 | 5.67 | 0.092 | 0.77 | 85.7 | 96.8 | 11.67 |
| MW-13-05 | Upper | 4/3/2018 | 5.78 | 0.370 | 3.99 | 39.1 | 587.3 | 13.75 |
| MW-13-07 | Upper | 4/9/2018 | 6.33 | 0.683 | 0.50 | -32.5 | 7.1 | 11.85 |
| MW-13-08 | Upper | 4/2/2018 | 6.15 | 0.701 | 0.18 | -64.6 | 17.5 | 14.97 |
| MW-13-11 | Upper | 4/5/2018 | 6.32 | 0.759 | 2.66 | -32.7 | 146.5 | 14.05 |
| MW-13-17 | Upper | 4/6/2018 | 6.51 | 0.881 | 4.06 | -42.9 | 62.3 | 15.84 |
| MW-13-19 | Upper | 4/9/2018 | 5.77 | 0.374 | 0.76 | -11.8 | 7.4 | 13.77 |
| MW-13-20 | Lower | 4/6/2018 | 6.54 | 0.332 | 0.26 | -25.4 | 20.5 | 15.00 |
| RD5-MW-01 | Upper | 4/5/2018 | 3.59 | 0.069 | 1.61 | 159.9 | 30.7 | 12.09 |
| S4-MW16 | Lower | 4/4/2018 | 5.10 | 0.082 | 0.92 | 318.2 | 27.9 | 15.72 |
| S4-MW24 | Upper | 4/4/2018 | 4.77 | 0.039 | 0.68 | 317.1 | 4.5 | 15.05 |
| S4-MW27 | Upper | 4/4/2018 | 4.91 | 0.033 | 2.38 | 321.6 | 9.3 | 15.68 |
| S4-MW28 | Lower | 4/5/2018 | 4.96 | 0.033 | 6.66 | 262.4 | 2.3 | 17.48 |
| S4-MW37 | Upper | 4/5/2018 | 4.58 | 0.036 | 2.01 | 269.1 | 9.7 | 18.38 |
| S4-MW38 | Lower | 4/4/2018 | 4.68 | 0.060 | 0.20 | 115.9 | 10.7 | 18.35 |
| S4-MW41 | Upper | 4/4/2018 | 3.75 | 0.060 | 2.33 | 141.4 | 28.1 | 16.57 |
| S4-MW42 | Lower | 4/4/2018 | 4.45 | 0.049 | 1.71 | 146.7 | 24.4 | 17.10 |
| S4-MW46 | Upper | 4/5/2018 | 4.90 | 0.029 | 7.34 | 267.8 | 31.3 | 15.26 |
| S4-MW47 | Lower | 4/5/2018 | 5.05 | 0.031 | 10.15 | 263.4 | 12.4 | 15.00 |
| S4-MW48 | Upper | 4/5/2018 | 4.53 | 0.047 | 2.51 | 339.7 | -11.5 | 15.94 |
| S4-MW49 | Lower | 4/5/2018 | 4.64 | 0.056 | 2.50 | 317.8 | -10.8 | 15.71 |
| S4-MW50 | Upper | 4/5/2018 | 4.67 | 0.092 | 2.82 | 341.3 | -125.4 | 12.74 |
| S4-MW51 | Lower | 4/5/2018 | 4.74 | 0.040 | 2.99 | 311.3 | -188.4 | 14.17 |
| S4-MW54 | Lower | 4/4/2018 | 4.66 | 0.027 | 7.76 | 277.2 | 1.8 | 16.08 |
| S4-MW59 | Upper | 4/4/2018 | 4.75 | 0.047 | 1.04 | 335.5 | 11.5 | 17.62 |
| S4-MW60 | Lower | 4/4/2018 | 4.70 | 0.049 | 2.28 | 336.1 | 9.6 | 17.62 |
| S4-MW61 | Upper | 4/4/2018 | 4.72 | 0.064 | 0.34 | 341.2 | -13.8 | 19.45 |
| S4-MW62 | Lower | 4/4/2018 | 4.84 | 0.127 | 0.26 | 218.3 | 18.8 | 19.86 |
| S4-MW63 | Lower | 4/4/2018 | 5.93 | 0.241 | 0.22 | -3.3 | 6 | 18.89 |

Notes:

mg/L = milligrams per liter

mV = millivolt

mS/cm = millisiemens per centimeter

ORP = oxidation-reduction potential

NTU = nephelometric turbidity units

$^{0}$C = degree centigrade

Table A-5 Analytical Results for COCs
April 2018 Groundwater Monitoring Event
Former Virginia Air National Guard Base, Sandston, VA

| Monitoring Well | Portion of Plume | Portion of Aquifer | Date | 1,1-Dichloroethene | Benzene | cis-1,2-Dichloroethene | trans-1,2-Dichloroethene | Dichloroethene, 1,2- (total) | Trichloroethene | Vinyl chloride |
|---|---|---|---|---|---|---|---|---|---|---|
| Units | | | | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| IRG | | | | 4840 | 319 | 3570 | N/A | 3010 | 160 | 113 |
| MCL | | | | 7 | 5 | 70 | 100 | 70 | 5 | 2 |
| MW-01-26 | Downgradient IRGs Plume | Lower | 4/3/2018 | 1.0 U | 6.16 | 112 | 3.03 | 115.03 | **271** | 63.3 |
| MW-01-04 | Downgradient IRGs Plume | Lower | 4/2/2018 | 0.5 U | 0.5 U | 3.19 | 0.5 U | 3.19 | 4.02 | 0.5 U |
| MW-11-01 | Downgradient IRGs Plume | Lower | 4/5/2018 | 0.463 J | 0.891 J | 136 | 0.5 U | 136 | 30.3 | 1.87 |
| MW-11-08 | Downgradient IRGs Plume | Lower | 4/3/2018 | 0.5 U | 0.5 U | 78 | 0.327 J | 78.3 | 73.1 | 61.5 |
| MW-11-10 | Downgradient IRGs Plume | Lower | 4/5/2018 | 0.5 U | 0.5 U | 27.1 | 0.5 U | 27.1 | 14.1 | 10.3 |
| TW-3 | Downgradient IRGs Plume | Lower | 4/3/2018 | 0.5 U | 0.5 U | 25.9 | 0.5 U | 25.9 | 7.82 | 0.5 U |
| TW-8 | Downgradient IRGs Plume | Lower | 4/3/2018 | 0.5 U | 0.5 U | 0.754 J | 0.5 U | 0.754 J | 0.5 U | 0.5 U |
| BG-MW-05 | Downgradient IRGs Plume | Upper | 4/3/2018 | 0.5 U | 0.339 J | 18 | 1.02 | 19.02 | 1.08 | 3.77 |
| BG-MW-06 | Downgradient IRGs Plume | Upper | 4/3/2018 | 0.5 U | 0.5 U | 12.9 | 0.5 U | 12.9 | 0.5 U | 2.64 |
| MW-01-05 | Downgradient IRGs Plume | Upper | 4/2/2018 | 0.549 J | 0.5 U | 123 | 0.786 J | 123.8 J | 96.6 | 0.313 J |
| MW-01-07 | Downgradient IRGs Plume | Upper | 4/5/2018 | 0.5 U | 0.5 U | 2.43 | 0.5 U | 2.43 | 26.1 | 0.5 U |
| MW-01-09 | Downgradient IRGs Plume | Upper | 4/3/2018 | 12.5 U | 211 | 29.8 | 12.5 U | 29.8 | 12.5 U | 12.5 U |
| MW-01-27 | Downgradient IRGs Plume | Upper | 4/6/2018 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 17.1 | 0.5 U |
| MW-11-02 | Downgradient IRGs Plume | Upper | 4/5/2018 | 0.5 U | 0.456 J | 196 | 0.439 J | 196.4 | 0.5 U | 2.59 |
| MW-11-03 | Downgradient IRGs Plume | Upper | 4/6/2018 | 0.5 U | 0.5 U | 18.5 | 0.5 U | 18.5 | 132 | 0.5 U |
| MW-11-06 | Downgradient IRGs Plume | Upper | 4/5/2018 | 0.5 U | 0.5 U | 30.7 | 0.5 U | 30.7 | 16.6 | 72.4 |
| MW-11-07 | Downgradient IRGs Plume | Upper | 4/3/2018 | 0.439 J | 0.401 J | 78.7 | 0.5 U | 78.7 | 1.27 | 109 |
| MW-11-09 | Downgradient IRGs Plume | Upper | 4/3/2018 | 6.10 J | 5.0 U | 478 | 5.0 U | 478 | **199** | **196** |
| MW-13-11 | Downgradient IRGs Plume | Upper | 4/5/2018 | 0.5 U | 0.5 U | 152 | 0.695 J | 152.7 | 0.5 U | 41.5 |
| TW-11 | Downgradient IRGs Plume | Upper | 4/3/2018 | 2.5 U | 2.5 U | 202 | 2.5 U | 202 | **571** | 2.35 J |
| TW-13 | Downgradient IRGs Plume | Upper | 4/3/2018 | 0.5 U | 2.43 | 0.703 J | 0.5 U | 0.703 J | 1.43 | 0.5 U |
| BG-MW-07 | MCL Plume | Lower | 4/2/2018 | 0.5 U | 0.5 U | 0.416 J | 0.5 U | 0.416 J | 0.5 U | 0.739 J |
| MW-01-13 | MCL Plume | Lower | 4/6/2018 | 0.5 U | 1.15 | 21.7 | 0.5 U | 21.7 | 112 | 1.27 |
| MW-01-23 | MCL Plume | Upper | 4/6/2018 | 0.5 U | 25.6 | 2.97 | 0.5 U | 2.97 | 70 | 0.5 U |
| MW-01-24 | MCL Plume | Lower | 4/3/2018 | 0.5 U | 1.31 | 6.46 | 0.5 U | 6.46 | 9.83 | 10.6 |
| MW-01-29 | MCL Plume | Upper | 4/3/2018 | 0.5 U | 0.5 U | 2.34 | 0.5 U | 2.34 | 4.17 | 0.5 U |
| MW-01-30 | MCL Plume | Lower | 4/3/2018 | 0.5 U | 0.5 U | 17.85 | 0.5 U | 17.85 | 52.6 | 0.5 U |
| S4-MW-27 | MCL Plume | Upper | 4/4/2018 | 0.5 U | 0.5 U | 1.43 | 0.5 U | 1.43 | 16.2 | 0.5 U |
| S4-MW-61 | MCL Plume | Upper | 4/4/2018 | 3.81 | 3.9 | 0.5 U | 0.5 U | 0.5 U | 7.71 | 0.5 U |
| S4-MW-62 | MCL Plume | Lower | 4/4/2018 | 0.5 U | 0.5 U | 0.488 J | 0.5 U | 0.488 J | 15.1 | 0.5 U |
| TW-4 | MCL Plume | Lower | 4/4/2018 | 0.5 U | 0.5 U | 5.01 | 0.5 U | 5.01 | 23.8 | 0.5 U |
| TW-9 | MCL Plume | Lower | 4/4/2018 | 0.5 U | 0.650 J | 0.516 J | 0.5 U | 0.516 J | 1.08 | 0.5 U |
| TW-10 | MCL Plume | Lower | 4/3/2018 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.795 J | 0.5 U |
| TW-5 | MCL Plume | Lower | 4/4/2018 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 4.63 | 0.5 U |
| TW-7 | MCL Plume | Lower | 4/5/2018 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |
| TW-14 | MCL Plume | Upper | 4/4/2018 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 9.29 | 0.5 U |
| TW-2 | MCL Plume | Lower | 4/4/2018 | 0.5 U | 0.5 U | 1.21 | 0.5 U | 1.21 | 21.3 | 0.5 U |
| S4-MW-16 | MCL Plume | Lower | 4/4/2018 | 0.712 J | 0.561 J | 5.38 | 0.5 U | 5.38 | 30.5 | 0.5 U |
| S4-MW-24 | MCL Plume | Upper | 4/4/2018 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.763 J | 0.5 U |
| S4-MW-38 | MCL Plume | Lower | 4/4/2018 | 0.5 U | 0.5 U | 4.06 | 0.5 U | 4.06 | 41.4 | 0.5 U |
| S4-MW-46 | MCL Plume | Upper | 4/5/2018 | 0.5 U | 0.5 U | 0.885 J | 0.5 U | 0.885 J | 4.54 | 0.5 U |
| S4-MW-47 | MCL Plume | Lower | 4/5/2018 | 0.5 U | 0.5 U | 1.07 | 0.5 U | 1.07 | 6.12 | 0.5 U |
| S4-MW-63 | MCL Plume | Lower | 4/4/2018 | 0.684 J | 0.5 U | 2.23 | 0.5 U | 2.23 | 18.7 | 0.5 U |
| MW-13-20 | Outside MCL Plume | Lower | 4/6/2018 | 0.5 U | 0.358 J | 2.12 | 0.5 U | 2.12 | 0.5 U | **122** |
| RD5-MW-01 | Outside MCL Plume | Upper | 4/5/2018 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.97 | 0.5 U |
| S4-MW-60 | Outside MCL Plume | Lower | 4/4/2018 | 0.5 U | 0.5 U | 0.530 J | 0.5 U | 0.530 J | 3.5 | 0.5 U |
| BG-MW-03 | Outside MCL Plume | Upper | 4/6/2018 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.504 J | 0.5 U |
| MW-01-03 | Outside MCL Plume | Upper | 4/3/2018 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |
| MW-01-06 | Outside MCL Plume | Upper | 4/5/2018 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |
| MW-01-10 | Outside MCL Plume | Upper | 4/6/2018 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.646 J | 0.5 U |
| MW-01-16 | Outside MCL Plume | Upper | 4/6/2018 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |
| MW-03-01 | Outside MCL Plume | Upper | 4/4/2018 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |
| MW-11-04R | Outside MCL Plume | Upper | 4/2/2018 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |
| MW-13-02 | Outside MCL Plume | Upper | 4/9/2018 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |
| S4-MW-28 | Outside MCL Plume | Lower | 4/5/2018 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.737 J | 0.5 U |
| S4-MW-37 | Outside MCL Plume | Upper | 4/5/2018 | 5.11 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |
| S4-MW-41 | Outside MCL Plume | Upper | 4/4/2018 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |
| S4-MW-42 | Outside MCL Plume | Lower | 4/4/2018 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |
| S4-MW-48 | Outside MCL Plume | Upper | 4/5/2018 | 0.5 U | 0.5 U | 0.416 J | 0.5 U | 0.416 J | 11.4 | 0.5 U |
| S4-MW-49 | Outside MCL Plume | Lower | 4/5/2018 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 1.98 | 0.5 U |
| S4-MW-50 | Outside MCL Plume | Upper | 4/5/2018 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |
| S4-MW-51 | Outside MCL Plume | Lower | 4/5/2018 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 4.24 | 0.5 U |
| S4-MW-54 | Outside MCL Plume | Lower | 4/4/2018 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 4.08 | 0.5 U |
| S4-MW-59 | Outside MCL Plume | Upper | 4/4/2018 | 0.5 U | 0.5 U | 0.576 J | 0.5 U | 0.576 J | 6.42 | 0.5 U |
| TW-1 | Outside MCL Plume | Lower | 4/4/2018 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |
| TW-6 | Outside MCL Plume | Lower | 4/5/2018 | 0.5 U | 0.5 U | 0.682 J | 0.5 U | 0.682 J | 15.8 | 0.5 U |
| TW-12 | Outside MCL Plume | Upper | 4/4/2018 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.551 J | 0.5 U |
| MW-11-05 | Source Area Groundwater IRGs Plume | Upper | 4/2/2018 | 0.5 U | 0.458 J | 0.428 J | 0.866 J | 1.294 J | 0.5 U | 0.5 U |
| MW-13-05 | Source Area Groundwater IRGs Plume | Upper | 4/3/2018 | 0.5 U | 0.5 U | 105 | 0.566 J | 105.6 | 147 | 11.4 |
| MW-13-07 | Source Area Groundwater IRGs Plume | Upper | 4/9/2018 | 0.5 U | 0.430 J | 0.615 J | 0.5 U | 0.615 J | 0.512 J | 0.459 J |
| MW-13-08 | Source Area Groundwater IRGs Plume | Upper | 4/2/2018 | 0.5 U | 0.5 U | 0.876 J | 0.511 J | 1.387 J | 0.5 U | 1.86 |
| MW-13-17 | Source Area Groundwater IRGs Plume | Upper | 4/6/2018 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |
| MW-13-19 | Source Area Groundwater IRGs Plume | Upper | 4/9/2018 | 0.5 U | 0.359 J | 0.420 J | 0.5 U | 0.420 J | 0.5 U | 0.364 J |
| Total Number of Detects | | | | 8 | 17 | 46 | 9 | 46 | 50 | 21 |
| Maximum Concentration Dectected | | | | 6.10 J | 211 | 478 | 3.03 | 478 | 571 | 196 |

Notes:
1. Duplicate samples taken have been averaged across COCs and average concentrations reported
2. Values highlighted in bold font exceed IRGs
3. Values highlighted in grey shade exceed MCLs

U = Non Detect
J = Estimated
ug/L = Micrograms per Liter

N/A = Not Applicable
COC = Contaminants of Concern

# Table A-6: Analytical Results for TOC and Alkalinity
## April 2018 Groundwater Monitoring Event
## Former Virginia Air National Guard Base, Sandston, VA

| Monitoring Well | Portion of Aquifer | Date | Alkalinity, Total (as $CaCO_3$) | Total Organic Carbon |
|---|---|---|---|---|
| **Units** | | | **mg/L** | **mg/L** |
| BG-MW-05 | Upper | 4/3/2018 | 372 | 64.1 |
| BG-MW-06 | Upper | 4/3/2018 | 128 | 24 |
| MW-01-09 | Upper | 4/3/2018 | 588 | 655 |
| MW-11-01 | Lower | 4/5/2018 | 164 | 19 |
| MW-11-02 | Upper | 4/5/2018 | 474 | 108 |
| MW-11-03 | Upper | 4/6/2018 | | 5.31 |
| MW-11-06 | Upper | 4/5/2018 | 120 | 29 |
| MW-11-07 | Upper | 4/3/2018 | 202 | 36.3 |
| MW-11-08 | Lower | 4/3/2018 | 233 | 15 |
| MW-11-09 | Upper | 4/3/2018 | 309 | 579 |
| MW-11-10 | Lower | 4/5/2018 | 102 | 17.3 |
| MW-13-11 | Upper | 4/5/2018 | 182 | 12.8 |
| MW-13-20 | Lower | 4/6/2018 | 91.4 | 13.9 |
| RD5-MW01 | Upper | 4/5/2018 | 0.5 U | 5.61 |
| **Total Number of Detects** | | | **12** | **14** |
| **Maximum Concentration Dectected** | | | **588** | **655** |

Notes:

U = Non Detect

J = Estimated

mg/L = Milligrams per Liter

CACO3 = Calcium Carbonate

# Table A-7: Analytical Results for MNA Parameters
# April 2018 Groundwater Monitoring Event
# Former Virginia Air National Guard Base, Sandston, VA

| Monitoring Well | Portion of Aquifer | Date | Carbon dioxide, total | Ethane | Ethene | Methane | Laboratory pH | Total Dissolved Solids |
|---|---|---|---|---|---|---|---|---|
| **Units** | | | **mg/L** | **µg/L** | **µg/L** | **µg/L** | **--** | **mg/L** |
| BG-MW-05 | Upper | 4/3/2018 | 776 | 1.2 | 6.14 | 12700 | 6.17 | 478 |
| BG-MW-06 | Upper | 4/3/2018 | 550 | 0.410 J | 3.42 | 13600 | 6.03 | 113 |
| MW-01-09-21 | Upper | 4/3/2018 | 346 | 0.5 J | 0.252 J | 15300 | 6.46 | 1680 |
| MW-11-01-21 | Lower | 4/5/2018 | 143 | 132 U | 2.98 | 13800 | 6.6 | 184 |
| MW-11-02-21 | Upper | 4/5/2018 | 304 | 8.98 | 3.01 | 15200 | 6.53 | 705 |
| MW-11-06-21 | Upper | 4/5/2018 | 264 | 3.21 | 4.1 | 8500 | 6.28 | 181 |
| MW-11-07-21 | Upper | 4/3/2018 | 396.5 | 3.64 | 9.69 | 10750 | 6.29 | 648.5 |
| MW-11-08-21 | Lower | 4/3/2018 | 214 | 1.44 | 5.55 | 15400 | 6.56 | 194 |
| MW-11-09-21 | Upper | 4/3/2018 | 576 | 42 | 90.6 | 11900 | 6.22 | 1700 |
| MW-11-10-21 | Lower | 4/5/2018 | 350 | 0.342 J | 0.497 J | 7090 | 6.03 | 156 |
| MW-13-11-21 | Upper | 4/5/2018 | 366 | 0.286 J | 2.26 | 10700 | 6.22 | 248 |
| RD5-MW01-21 | Upper | 4/5/2018 | 174 | 0.22 U | 0.29 U | 2.76 | 4.58 | 65 |
| **Total Number of Detects** | | | **12** | **10** | **11** | **12** | **12** | **12** |
| **Maximum Concentration Dectected** | | | **776** | **42** | **90.6** | **15400** | **6.6** | **1700** |

| Monitoring Well | Portion of Aquifer | Date | Arsenic | Total Iron | Dissolved Iron | Total Manganese | Dissolved Manganese |
|---|---|---|---|---|---|---|---|
| **Units** | | | **µg/L** | **µg/L** | **µg/L** | **µg/L** | **µg/L** |
| MW-01-09-21 | Upper | 4/3/2018 | 3.05 | 86400 | 50 U | 8.13 | 4.34 J |
| MW-11-01-21 | Lower | 4/5/2018 | 1.24 | 25000 | 964 | 1660 | 1320 |
| MW-11-02-21 | Upper | 4/5/2018 | 2.72 | 94000 | 12000 | 42.5 | 36.7 |
| MW-11-06-21 | Upper | 4/5/2018 | 0.84 J | 44900 | 24600 | 7.95 | 6.79 |
| MW-11-07-21 | Upper | 4/3/2018 | 5.45 | 81650 | 6902 | 28 | 18.95 |
| MW-11-08-21 | Lower | 4/3/2018 | 0.32 J | 10900 | 1270 | 179 | 161 |
| MW-11-09-21 | Upper | 4/3/2018 | 1.36 | 199000 | 108000 | 894 | 814 |
| MW-11-10-21 | Lower | 4/5/2018 | 0.78 J | 16400 | 13600 | 150 | 137 |
| MW-13-11-21 | Upper | 4/5/2018 | 2.41 | 95600 | 11400 | 64.9 | 42.5 |
| RD5-MW01-21 | Upper | 4/5/2018 | 0.5 U | 562 | 55.8 J | 4.45 J | 3.76 J |
| **Total Number of Detects** | | | **9** | **10** | **9** | **10** | **10** |
| **Maximum Concentration Dectected** | | | **5.45** | **199000** | **108000** | **1660** | **1320** |

Notes:
U = Non Detect
J = Estimated
mg/L = Milligrams per Liter
ug/L = Micrograms per Liter
N = Nitrogen
SO4 = Sulfate
CACO3 = Calcium Carbonate

# Table A-8: Analytical Results for Microbiology
# April 2018 Groundwater Monitoring Event
# Former Virginia Air National Guard Base, Sandston, VA

| Monitoring Well | Portion of Aquifer | Date | Dehalococcoides | BAV1 Vinyl Chloride Reductase | tceA Reductase | Vinyl Chloride Reductase |
|---|---|---|---|---|---|---|
| **Units** | | | **cells/mL** | **cells/mL** | **cells/mL** | **cells/mL** |
| MW-01-09 | Upper | 5/17/2018 | < $2.5 \times 10^{1}$ | < $2.5 \times 10^{1}$ | < $2.5 \times 10^{1}$ | < $2.5 \times 10^{1}$ |
| MW-11-07 | Upper | 5/17/2018 | $7.65 \times 10^{3}$ | $3.25 \times 10^{1}$ | $1.74 \times 10^{4}$ | < $2.5 \times 10^{1}$ |
| MW-11-08 | Upper | 5/17/2018 | $1.09 \times 10^{4}$ | < $2.5 \times 10^{1}$ | $1.84 \times 10^{4}$ | < $2.5 \times 10^{1}$ |
| MW-11-09 | Lower | 5/17/2018 | $2.46 \times 10^{4}$ | < $2.5 \times 10^{1}$ | $4.66 \times 10^{4}$ | < $2.5 \times 10^{1}$ |
| MW-13-11 | Upper | 5/17/2018 | $3.56 \times 10^{2}$ | < $2.5 \times 10^{1}$ | $6.85 \times 10^{2}$ | $2.89 \times 10^{1}$ |
| Total Number of Detects | | | 4 | 1 | 4 | 1 |
| Maximum Concentration Dectected | | | $2.46 \times 10^{4}$ | $3.25 \times 10^{1}$ | $4.66 \times 10^{4}$ | $2.89 \times 10^{1}$ |

Notes:

< = No Detect at the Limit of Quantification Reported

N/A = Not Applicable

Unit of cells/bead assumed to equal cells/mL (typically fall within 1 order of magnitude)

# Appendix B

# Completed Field Forms

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AECOM

# Monitoring Well Sample Collection Form

| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: BG-MW-03 | Date: 4.6.18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: AL Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 10346 | | Controller/Compressor: QED MP50 # 27886 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# 035574 | Water Quality Meter Type: YSI6920 Sonde ID: 10968 | Handset ID: R12831 |
| | PID Type/ID#: Mini RAE 3000, ID# Borrowed | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Monitoring Well | Screen Interval (BTOC): 13.0 to 23.0 | Initial Depth to Water (BTOC): 11.32 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: not available | | Total Depth (BTOC): | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 18.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (Liters/gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.6.18 | 1040 | 11.50 | — | .200 | 16.53 | 0.120 | 7.29 | 5.51 | 176.4 | 154.5 | 10/5 | 15 | |
| | 1045 | 11.65 | 1.0 | | 16.40 | 0.137 | 6.18 | 5.39 | 194.6 | 146.1 | | | |
| | 1050 | 11.75 | 2.0 | | 16.50 | 0.142 | 6.56 | 5.52 | 194.7 | 126.4 | | | |
| | 1055 | 11.85 | 3.0 | | 16.43 | 0.140 | 6.79 | 5.57 | 200.3 | 139.6 | | | |
| | 1100 | 11.90 | 4.0 | | 16.46 | 0.134 | 6.96 | 5.57 | 206.4 | 78.9 | | | |
| | 1105 | — | 5.0 | | 16.31 | 0.129 | 6.91 | 5.52 | 215.3 | 120.6 | | | |
| | 1110 | 11.95 | 6.0 | | 16.33 | 0.127 | 6.81 | 5.50 | 220.1 | 61.4 | | | |
| | 1115 | | 7.0 | | 16.25 | 0.116 | 6.70 | 5.43 | 227.2 | 38.2 | | | |
| | 1120 | | 8.0 | | 16.23 | 0.113 | 6.77 | 5.41 | 232.4 | 41.6 | | | |
| | 1125 | | 9.0 | | 16.31 | 0.101 | 6.94 | 5.42 | 236.6 | 28.4 | | | |
| | 1130 | | 10.0 | | 16.37 | 0.098 | 7.16 | 5.38 | 243.7 | 32.8 | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| BG-MW-03-21 @ 1140 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

# MONITORING WELL SAMPLE COLLECTION FORM

| LOCATION | Site: Vasey | LocID: ~~60553852~~ BC-MW-03 |
|---|---|---|
| | Project Name: GW Sampling #21 | Project #: 60553852 |

| Date | Time (24 hr) | Method (pump, bail) | Water Level (FTOC) | Volume Removed (L) | Pumping Rate (Lpm) | Temp. (C) | pH | Conduc-tivity (mS/cm) | DO (mg/L) | Turb. (NTU) | Sed. (mg/L) | ORP | Remarks (odor, clarity, etc.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.6.18 | 1135 | Pump | 11.95 | 11.0 | .200 | 16.76 | 5.41 | 0.098 | 7.23 | 38.7 | — | 244.5 | |
| | (1140) | Sample | | | | | | | | | | | |
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**Pump Rate:** <=0.5 L/min **Drawdown:** < 0.33 ft **Measurements:** 3-5 min **Stabilization:** +/- 0.5 C, +/- 0.1 pH, +/- 3% conductivity, +/- 10% DO, +/- 10% turb (<= 10 NTU ideal) for 3 consecutive readings

# Monitoring Well Sample Collection Form

AECOM



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: BG-MW-05 | Date: 04-03-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MAT Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 20116 | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# 033178 | Water Quality Meter Type: YSI6920 Sonde ID: 11167 | Handset ID: R12819 |
| | PID Type/ID#: ~~Mini RAE 3000~~ 2000 ID# 4523 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-Up, Monitoring Well | Screen Interval (BTOC): 12.0 to 27.0 | Initial Depth to Water (BTOC): 11.91 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 10 sec; Discharge = 5 sec; at 20 (psi); Rate = .170 mL/min | | Total Depth (BTOC): | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 20.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - Field DUP | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04-03-18 | 0932 | 13.03 | 0.9 | 0.35 | 13.84 | 0.740 | 0.49 | 6.16 | -63.4 | 28.4 | 10.0/5.0 | 40 | |
| | 0937 | 13.04 | 1.35 | | 14.13 | 0.738 | 0.37 | 6.16 | -64.4 | 21.0 | | | |
| | 0942 | 13.11 | 1.80 | | 14.35 | 0.744 | 0.31 | 6.10 | -61.7 | 14.0 | | | |
| | 0947 | 13.11 | 2.25 | | 14.49 | 0.763 | 0.27 | 6.08 | -61.2 | 11.6 | | | |
| | 0952 | 13.12 | 2.70 | | 14.68 | 0.808 | 0.25 | 6.05 | -60.1 | 8.8 | | | |
| | 0957 | 13.10 | 3.15 | | 14.71 | 0.834 | 0.23 | 6.05 | -60.2 | 9.0 | | | |
| | 1002 | 13.12 | ~~3.60~~ | | 14.70 | 0.854 | 0.21 | 6.06 | -60.7 | 8.4 | | | |
| | ~~1003~~ 1007 | 13.10 | 4.05 | | 14.65 | 0.879 | 0.20 | 6.06 | -61.5 | 7.8 | | | |
| | 1012 | 13.11 | 4.50 | | 14.77 | 0.923 | 0.19 | 6.06 | -62.1 | 6.6 | | | |
| | 1017 | 13.13 | 4.95 | | 14.81 | 0.932 | 0.19 | 6.07 | -61.2 | 6.7 | | | |
| | 1022 | 13.14 | 4.40 | | 14.80 | 0.946 | 0.18 | 6.07 | -59.7 | 6.1 | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| BG-MW-05-21 / 1027 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
| | ~~1 - 250 mL Poly~~ 1 - 500mL Poly | None | Alkalinity (SM 2320B) |
| | ~~1 - 250 mL Poly~~ 2 - 40mL Glass Vial | $H_2SO_4$ | TOC (9060A) |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: BG-MW-06 | Date: 04-03-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MAS Checked By: |
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 2016 | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# 033178 | Water Quality Meter Type: YSI6920 Sonde ID: 11167 | Handset ID: RH819 |
| | PID Type/ID#: Mini RAE ~~3000~~ 2000, ID# 4523 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-Up, Monitoring Well | Screen Interval (BTOC): 27.0 to 37.0 | Initial Depth to Water (BTOC): 12.94 |
| | Historic Pump Settings: Refill = 9 sec; Discharge = 6 sec; at 30 (psi); Rate = .200 mL/min | | Total Depth (BTOC): |
| | Condition of Well/Comments: | | |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04-03-18 | 1115 | 13.59 | 0.7 | 0.27 | 15.09 | 0.271 | 0.33 | 5.76 | 10.2 | 1.3 | 10.0/5.0 | 30 | |
| | 1120 | 13.59 | 1.05 | | 15.32 | 0.305 | 0.27 | 5.77 | 4.1 | 2.0 | | | |
| | 1125 | 13.58 | 1.40 | | 15.33 | 0.319 | 0.25 | 5.78 | -0.1 | 1.1 | | | |
| | 1130 | 13.55 | 1.75 | | 15.38 | 0.333 | 0.22 | 5.78 | -2.8 | 0.8 | | | |
| | 1135 | 13.59 | 2.10 | | 15.47 | 0.341 | 0.20 | 5.78 | -5.5 | 0.9 | | | |
| | 1140 | 13.58 | 2.45 | | 15.48 | 0.343 | 0.19 | 5.79 | -7.6 | 0.7 | | | |
| | 1145 | 13.58 | 2.80 | | 15.52 | 0.350 | 0.18 | 5.79 | -9.2 | 0.7 | | | |
| | 1150 | 13.57 | 3.15 | | 15.49 | 0.354 | ~~0.18~~ MAS 0.17 | 5.79 | -11.1 | 0.4 | | | |
| | 1155 | 13.58 | 3.50 | | 15.56 | 0.352 | 0.17 | 5.79 | -11.7 | 0.3 | | | |
| | 1200 | 13.58 | 3.85 | | 15.60 | 0.353 | 0.16 | 5.82 | -13.8 | 0.2 | | | |
| | | | | | | | | | | | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| BG-MW-06-21/1205 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
| | ~~1 - 250 mL Poly~~ MAS 1 - 500 mL Poly | None | Alkalinity (SM 2320B) |
| | ~~1 - 250 mL Poly~~ MAS 2 - 40 mL Glass VOA | ~~$H_2SO_4$~~ MAS HCl | TOC (9060A) |
| | | | |
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AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: BG-MW-07 | Date: 4/2/18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: DB Checked By: 1 |

| | | | | |
|---|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# ~~A00727~~ MP30-1315 | Controller/Compressor: QED MP50 | | |
| | Water Level Indicator Type/ID#: Solinst 101, ID# A00727 | Water Quality Meter Type: YSI6920 Sonde ID: 27080 | | Handset ID: 5982 |
| | PID Type/ID#: Mini RAE 3000, ID# R19164 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Lower, Stick-Up, Monitoring Well | Screen Interval (BTOC): 37.0 to 52.0 | Initial Depth to Water (BTOC): 13.36 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 10 sec; Discharge = 5 sec; at 30 (psi); Rate = .200 mL/min | | Total Depth (BTOC): 55.66 | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 45.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/2/18 | 1625 | 13.43 | 4.0 | ~~0.3~~ 0.4 | 15.06 | 0.216 | 1.35 | 5.96 | 46.4 | 71.5 | 10-5 | 40 | |
| " | 1630 | 13.42 | 6.0 | 0.4 | 15.09 | 0.207 | 1.49 | 5.94 | 46.6 | 70.2 | 10-5 | 40 | |
| " | 1635 | 13.43 | 8.0 | 0.4 | 15.06 | 0.188 | 2.03 | 5.92 | 44.2 | 71.8 | 10-5 | 40 | |
| " | 1640 | 13.44 | 10.0 | 0.4 | 15.01 | 0.175 | 2.58 | 5.91 | 43.8 | 75.1 | 10-5 | 40 | |
| " | 1645 | 13.43 | 12.0 | 0.4 | 14.98 | 0.162 | 3.00 | 5.89 | 43.6 | 74.4 | 10-5 | 40 | |
| " | 1650 | 13.43 | 14.0 | 0.4 | 14.99 | 0.154 | 3.39 | 5.89 | 44.0 | 67.8 | 10-5 | 40 | |
| " | 1655 | 13.43 | 16.0 | 0.4 | 14.99 | 0.140 | 3.83 | 5.84 | 46.9 | 50.2 | 10-5 | 40 | |
| " | 1700 | 13.43 | 18.0 | 0.4 | 14.97 | 0.138 | 4.04 | 5.86 | 47.2 | 45.9 | 10-5 | 40 | |
| " | 1705 | 13.43 | 20.0 | 0.4 | 14.95 | 0.134 | 4.21 | 5.86 | 49.2 | 36.7 | 10-5 | 40 | |
| " | 1710 | 13.43 | 22.0 | 0.4 | 14.95 | 0.135 | 4.25 | 5.82 | 49.8 | 37.0 | 10-5 | 40 | |
| " | 1715 | — | Sample | — | | | | | | | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| MW-BG-07<br>1715 Sample Time<br>DB | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: **VANG** | LocID: **BG-MW-09** | Date: |
| | Project Name: **Virginia ANG** | Project Number: **60278122** | Recorded By: Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: **QED Sample Pro Bladder Pump - ID#** | | Controller/Compressor: **QED MP50** |
| | Water Level Indicator Type/ID#: **Solinst 101, ID#** | Water Quality Meter Type: **YSI6920** Sonde ID: | Handset ID: |
| | PID Type/ID#: **Mini RAE 3000, ID#** | Equipment Decon: **Potable Water/Liquinox wash, potable water rinse, DI rinse** | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | **This is a 2-inch Upper, Stick-up, Monitoring Well** | Screen Interval (BTOC): **12.0 to 27.0** | Initial Depth to Water (BTOC): | Ambient PID (ppm): |
| | Historic Pump Settings: **not available** | | Total Depth (BTOC): | Well Head PID (ppm): |
| | Condition of Well/Comments: Well damaged; can't sample | | | Pump Inlet Depth (BTOC): **20.0** |
| | NOTE: **Please note any significant location information; Sampling note(s) - .** | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
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Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; **Measurements:** every 3 - 5 min; **Stabilization is defined as the following for 3 consecutive readings:** ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
| | | | |
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# AECOM Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-01-03 | Date: 4/3/18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: DB Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# mp50 ~1315 | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# A00727 | Water Quality Meter Type: YSI6920 Sonde ID: 27080 | Handset ID: 5989 |
| | PID Type/ID#: Mini RAE 3000, ID# R19164 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-up, Monitoring Well | Screen Interval (BTOC): 10.0 to 20.0 | Initial Depth to Water (BTOC): 12.75 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: not available | | Total Depth (BTOC): 22.00 | Well Head PID (ppm): 0.6 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 15.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . DVP | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed L (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/3/18 | 1535 | 13.05 | 4.0 | 0.4 | 13.01 | 0045 | 7.52 | 3.21 | 125.5 | 20.7 | 10-5 | 40 | |
| | 1540 | 13.15 | 6.0 | 0.4 | 13.01 | 0.044 | 7.29 | 3.17 | 125.8 | 19.7 | 10-5 | 40 | |
| | 1545 | 13.17 | 8.0 | 0.4 | 13.03 | 0044 | 7.08 | 3.20 | 125.3 | 20.3 | 10-5 | 40 | |
| | 1550 | 13.14 | 10.0 | 0.4 | 13.03 | 0.044 | 6.92 | 3.24 | 125.5 | 19.4 | 10-5 | 40 | |
| | 1555 | 13.15 | 12.0 | 0.4 | 13.01 | 0.043 | 7.00 | 3.29 | 123.5 | 17.0 | 10-5 | 40 | |
| | 1600 | 13.15 | 14.0 | 0.4 | 12.97 | 0.043 | 6.95 | 3.33 | 122.1 | 15.2 | 10-5 | 40 | |
| | 1605 | 13.15 | 16.0 | 0.4 | 12.97 | 0.043 | 6.97 | 3.36 | 121.5 | 11.6 | 10-5 | 40 | |
| | 1610 | 13.15 | 18.0 | 0.4 | 13.01 | 0.043 | 6.93 | 3.42 | 118.4 | 11.7 | 10-5 | 40 | |
| | 1615 | 13.15 | 20.0 | 0.4 | 13.04 | 0.043 | 7.07 | 3.55 | 112.2 | 9.4 | 10-5 | 40 | |
| | 1620 | 13.15 | 22.0 | 0.4 | 13.01 | 0.043 | 7.03 | 3.53 | 109.8 | 10.2 | 10-5 | 40 | |
| | 1625 | | Sample | | | | | | | | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ±0.5°C, ±3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| MW-01-03 - Dup<br>1625 Sample Time<br>DB | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-01-04 | Date: 4-2-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: AG/MK Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 030510 | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# 19012 | Water Quality Meter Type: YSI6920 Sonde ID: 3328 | Handset ID: A12642 |
| | PID Type/ID#: Mini RAE 3000, ID# 3974 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Lower, Stick-up, Monitoring Well | Screen Interval (BTOC): 37.0 to 47.0 | Initial Depth to Water (BTOC): 10.10 | Ambient PID (ppm): 1.1 |
| | Historic Pump Settings: not available | | Total Depth (BTOC): | Well Head PID (ppm): 1.1 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 42.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/2/18 | 1535 | 10.15 | | 190 | 21.15 | 0.004 | 8.85 | 4.67 | 273.2 | -12.7 | 10/5 | 30 | |
| | 1540 | | | | 14.20 | 0.087 | 5.26 | 5.33 | 256.7 | 264.5 | | | |
| | 1545 | 16.18 | | | 14.13 | 0.088 | 4.55 | 4.97 | 304.6 | 307.4 | | | |
| | 1550 | 10.17 | | | 14.09 | 0.088 | 4.36 | 5.25 | 318.5 | 218.5 | | | |
| | 1555 | 10.19 | | | 14.19 | 0.087 | 4.24 | 5.29 | 333.4 | 59.4 | | | |
| | 1600 | 10.17 | | | 14.48 | 0.087 | 4.17 | 5.29 | 344.4 | 2.1 | | | |
| | 1605 | 10.18 | | | 15.00 | 0.087 | 4.12 | 5.31 | 343.8 | 2.9 | | | |
| | 1610 | 10.17 | | | 14.93 | 0.087 | 4.05 | 5.29 | 350.5 | 0.7 | | | |
| | 1615 | 10.16 | | | 14.97 | 0.087 | 4.03 | 5.30 | 357.1 | 0.6 | | | |
| | 1620 | 10.17 | | | 14.68 | 0.087 | 4.00 | 5.29 | 369.6 | 25.5 | | | |
| | 1625 | | | | 14.67 | 0.086 | 3.94 | 5.27 | 382.2 | 13.7 | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time 1630 | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-01-05 | Date: 4-2-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: AG/MK Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# d30510 | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# 19012 | Water Quality Meter Type: YSI6920 Sonde ID: | Handset ID: |
| | PID Type/ID#: Mini RAE 3000, ID# 3974 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-up, Monitoring Well | Screen Interval (BTOC): 13.0 to 23.0 | Initial Depth to Water (BTOC): 9.94 | Ambient PID (ppm): 1.4 |
| | Historic Pump Settings: not available | | Total Depth (BTOC): | Well Head PID (ppm): 1.7 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 18.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - Field Dup/MS/MSD | Start purge 1345 w/ pump + turbidity sensor issues. Restart at 1400 | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed ~~(gallons)~~ L | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~4/2~~ 4/02/18 | 1400 | 10.42 | 2.00 | 210 | 13.45 | 0.143 | 3.21 | 4.55 | 26.4 | 34.3 | 10 15 | 15 | |
| | 1405 | 10.45 | 3.00 | 210 | 13.23 | 0.099 | 2.70 | 4.20 | 302.5 | 25.7 | | | |
| | 1410 | 10.42 | | 210 | 13.15 | 0.077 | 2.72 | 4.40 | 299.0 | 19.4 | | | |
| | 1415 | 10.45 | | 210 | 13.15 | 0.061 | 2.68 | 4.55 | 299.1 | 37.9 | | | |
| | 1420 | 10.47 | | 210 | 13.16 | 0.057 | 2.60 | 4.60 | 301.9 | 58.9 | | | |
| | 1425 | 10.50 | | 210 | 13.15 | 0.055 | 2.49 | 4.62 | 306.9 | 69.9 | | | |
| | 1430 | 10.47 | | 210 | 13.09 | 0.052 | 2.27 | 4.60 | 311.8 | 51.7 | | | |
| | 1435 | 10.46 | | 210 | 13.09 | 0.052 | 2.39 | 4.63 | 313.4 | 66.8 | | | |
| | 1440 | 10.51 | | 210 | 13.04 | 0.051 | 2.16 | 4.61 | 317.2 | 55.4 | | | |
| | 1445 | 10.48 | | 210 | 13.06 | 0.050 | 2.23 | 4.62 | 318.9 | 52.4 | | | |
| | 1450 | | | | 13.02 | 0.050 | 2.17 | 4.62 | 320.7 | 48.0 | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time 1455 | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-01-06 | Date: 4-5-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MK Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# | Water Quality Meter Type: YSI6920 Sonde ID: | Handset ID: |
| | PID Type/ID#: Mini RAE 3000, ID# | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a -inch Upper, Stick-Up, Monitoring Well | Screen Interval (BTOC): 13.0 to 23.0 | Initial Depth to Water (BTOC): 9.71 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: not available | | Total Depth (BTOC): | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 18.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - Record pump settings during next event. | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-5-18 | 1450 | 10.51 | | 120 | 14.22 | 0.102 | 1.56 | 5.72 | -3.9 | -124.9 | 10/5 | 14 | |
| | 1455 | 10.79 | | 120 | 13.97 | 0.101 | 0.68 | 5.77 | -15.5 | -144.1 | 10/5 | 14 | |
| | 1500 | 10.84 | | | 13.98 | 0.101 | 0.47 | 5.80 | -21.1 | -151.4 | | | |
| | 1505 | 10.87 | | | 13.99 | 0.100 | 0.38 | 5.77 | -23.2 | -153.8 | | | |
| | 1510 | 10.89 | | | 14.26 | 0.100 | 0.35 | 5.80 | -27.7 | -156.8 | | | |
| | 1515 | 10.92 | | | 14.20 | 0.101 | 0.32 | 5.79 | -30.3 | -159.1 | | | |
| | 1520 | 10.90 | | | 14.32 | 0.101 | 0.29 | 5.79 | -32.1 | -160.0 | | | |
| | 1525 | 10.91 | | | 14.29 | 0.101 | 0.29 | 5.79 | -33.3 | -163.9 | | | |
| | 1530 | 10.92 | | | 14.39 | 0.101 | 0.28 | 5.79 | -34.1 | -164.9 | | | |
| | 1535 | 10.93 | | | 14.28 | 0.102 | 0.26 | 5.79 | -34.4 | -166.8 | | | |
| | | | | | | | | | | | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ±0.5°C, ±3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time 1540 | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
| | | | |
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AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-01-07 | Date: 4-5-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MK Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# | Water Quality Meter Type: YSI6920 Sonde ID: | Handset ID: |
| | PID Type/ID#: Mini RAE 3000, ID# | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-up, Monitoring Well | Screen Interval (BTOC): 13.0 to 23.0 | Initial Depth to Water (BTOC): 10.91 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 12.4 sec; Discharge = 2.6 sec; at 18 (psi); Rate = 100 mL/min | | Total Depth (BTOC): | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 18.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-5-18 | 1235 | 11.55 | | 170 | 13.39 | 0.098 | 2.43 | 5.55 | 237.1 | -146.5 | 10/5 | 15 | |
| | 1240 | 11.74 | | 170 | 12.91 | 0.103 | 0.80 | 5.43 | 240.5 | -150.2 | 10/5 | 15 | |
| | 1245 | 11.77 | | 160 | 12.86 | 0.115 | 0.60 | 5.57 | 215.7 | -162.7 | 10/5 | 14 | |
| | 1250 | 11.79 | | 160 | 12.87 | 0.121 | 0.63 | 5.71 | 198.2 | -168.3 | 10/5 | 14 | |
| | 1255 | 11.82 | | | 12.81 | 0.122 | 0.63 | 5.73 | 193.2 | -170.2 | | | |
| | 1300 | 11.83 | | | 12.88 | 0.121 | 0.68 | 5.74 | 193.4 | -168.9 | | | |
| | 1305 | 11.84 | | | 12.87 | 0.120 | 0.74 | 5.75 | 193.6 | -168.4 | | | |
| | 1310 | 11.86 | | | 12.93 | 0.120 | 0.79 | 5.75 | 193.0 | -169.1 | | | |
| | 1315 | 11.86 | | | 12.95 | 0.119 | 0.85 | 5.75 | 192.8 | -169.7 | | | |
| | 1320 | 11.86 | | | 12.95 | 0.119 | 0.91 | 5.75 | 191.9 | -170.3 | | | |
| | 1325 | 11.84 | | | 13.03 | 0.118 | 0.95 | 5.75 | 191.4 | -169.4 | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ±0.5°C, ±3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time 13:45 | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

# MONITORING WELL SAMPLE COLLECTION FORM

| LOCATION | Site: VANG | LocID: MW-01-07 |
|---|---|---|
| | Project Name: Virginia ANG | Project #: |

| Date | Time (24 hr) | Method (pump, bail) | Water Level (FTOC) | Volume Removed (L) | Pumping Rate (Lpm) | Temp. (C) | pH | Conduc-tivity (mS/cm) | DO (mg/L) | Turb. (NTU) | Sed. (mg/L) | ORP | Remarks (odor, clarity, etc.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-5-18 | 1330 | | 11.85 | | 160 | 13.09 | 5.76 | 0.117 | 1.00 | -169.0 | | 190.4 | |
| | 1335 | | 11.83 | | | 13.07 | 5.76 | 0.117 | 1.04 | -168.9 | | 189.9 | |
| | 1340 | | 11.82 | | | 13.03 | 5.76 | 0.116 | 1.08 | -167.4 | | 189.5 | |

**Pump Rate:** <=0.5 L/min **Drawdown:** < 0.33 ft **Measurements:** 3-5 min **Stabilization:** +/- 0.5 C, +/- 0.1 pH, +/- 3% conductivity, +/- 10% DO, +/- 10% turb (<= 10 NTU ideal) for 3 consecutive readings

# Monitoring Well Sample Collection Form

AECOM



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-01-09 | Date: 4.3.18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: AC, MK Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# | Water Quality Meter Type: YSI6920 Sonde ID: | Handset ID: |
| | PID Type/ID#: Mini RAE 3000, ID# | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-Up, Monitoring Well | Screen Interval (BTOC): 13.0 to 23.0 | Initial Depth to Water (BTOC): 13.25 | Ambient PID (ppm): 1.6 |
| | Historic Pump Settings: Refill = 11 sec; Discharge = 4 sec; at 18 (psi); Rate = .200 mL/min | | Total Depth (BTOC): | Well Head PID (ppm): 44.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 18.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - MS/MSD | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.3.18 | 1340 | 15.00 | — | 200 | 13.36 | 1.522 | 0.77 | 6.77 | -62.5 | 111.8 | 10\|5 | 15 | lowered rate due to drawn down |
| | 1345 | 15.25 | | 110 | 13.26 | 1.529 | 0.44 | 6.78 | -78.8 | 84.3 | | | |
| | 1350 | | | | | | | | | | | | pump failure compressor issues |
| | 1355 | 15.38 | | ~~13.18~~ 180 110 | 13.18 | 1.568 | 0.31 | 6.80 | -103.7 | 74.2 | | | |
| | 1400 | 15.53 | | 180 | 13.20 | 1.593 | 0.29 | 6.81 | -111.8 | 72.0 | | | |
| | 1405 | 15.47 | | 140 | 13.27 | 1.623 | 0.24 | 6.81 | -119.9 | 63.9 | | | |
| | 1410 | 15.41 | | 140 | 13.26 | 1.661 | 0.22 | 6.81 | -126.6 | 56.3 | | | |
| | 1415 | 15.36 | | 140 | 13.26 | 1.692 | 0.22 | 6.81 | -131.0 | 50.0 | | | |
| | 1420 | 15.38 | | 140 | 13.27 | 1.710 | 0.21 | 6.80 | -134.2 | 43.0 | | | |
| | 1425 | 15.37 | | 140 | 13.32 | 1.731 | 0.20 | 6.80 | -136.9 | 37.3 | | | |
| | 1430 | 15.37 | | 140 | 13.48 | 1.736 | 0.19 | 6.80 | -138.3 | 34.3 | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time 1440 | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) 3 |
| | 2 - 40 mL Glass VOA | HCl | Dissolved Gasses (RSK175) 2 |
| | 1 - 250 mL Poly | $HNO_3$ | Total Fe, Mn, As (SM 6010C) 1 |
| | 1 - 250 mL Poly | None | Dissolved Fe, Mn (SM 6010C) 1 |
| | 1 - 250 mL Poly | None | Alkalinity (SM 2320B), Dis $CO_2$, pH, TDS (SM 4500D) 1 |
| | 1 - 250 mL Poly | $H_2SO_4$ | TOC (9060A) |
| | | | Deploy Biotrap |
| | | | |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-01-10 | Date: 04-06-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MAB Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 20116 | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# 033178 | Water Quality Meter Type: YSI6920 Sonde ID: 11167 | Handset ID: R128I9 |
| | PID Type/ID#: Mini RAE ~~3000~~ 3000 PGM-7, ID# 4523 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-up, Monitoring Well | Screen Interval (BTOC): 13.0 to 23.0 | Initial Depth to Water (BTOC): 11.86 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 10 sec; Discharge = 5 sec; at 18 (psi); Rate = 140 mL/min | | Total Depth (BTOC): | Well Head PID (ppm): 1.4 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 18.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04-06-18 | 0855 | 12.04 | 0.45 | 0.17 | 13.31 | 0.048 | 2.46 | 5.17 | 207.1 | 50.1 | 2.0/3.0 | 20 | |
| | 0900 | 12.06 | 0.68 | | 13.48 | 0.045 | 2.89 | 4.83 | 189.1 | 37.0 | | | |
| | 0905 | 12.08 | 0.90 | | 13.54 | 0.044 | 1.74 | 4.75 | 189.9 | 32.2 | | | |
| | 0910 | 12.06 | 1.13 | | 13.56 | 0.044 | 1.62 | 4.73 | 181.7 | 28.4 | | | |
| | 0915 | 12.06 | 1.35 | | 13.62 | 0.045 | 1.47 | 4.72 | 181.6 | 23.5 | | | |
| | 0920 | 12.01 | 1.58 | | 13.64 | 0.045 | 1.39 | 4.73 | 181.9 | 18.9 | | | |
| | 0925 | 12.03 | 1.80 | | 13.68 | 0.046 | 1.34 | 4.73 | 182.8 | 22.1 | | | |
| | 0930 | 12.03 | 2.03 | | 13.90 | 0.046 | 1.26 | 4.73 | 183.8 | 15.8 | | | |
| | 0935 | 12.06 | 2.25 | | 13.95 | 0.046 | 1.20 | 4.74 | 183.9 | 12.0 | | | |
| | 0940 | 12.04 | 4.48 | | 14.02 | 0.046 | 1.16 | 4.74 | 184.2 | 10.6 | | | |
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Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| MW-01-10-21/0945 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
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AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: **VANG** | LocID: **MW-01-13** | Date: 4-6-16 |
| | Project Name: **Virginia ANG** | Project Number: **60278122** | Recorded By: MK Checked By: |
| **EQUIPMENT** | Sampling Equipment - Pump: **QED Sample Pro Bladder Pump - ID#** | | Controller/Compressor: **QED 3020** |
| | Water Level Indicator Type/ID#: **Solinst 101, ID#** | Water Quality Meter Type: **YSI6920** Sonde ID: | Handset ID: |
| | PID Type/ID#: **Mini RAE 3000, ID#** | Equipment Decon: **Potable Water/Liquinox wash, potable water rinse, DI rinse** | |
| **WELL & SAMPLING INFO** | **This is a 2-inch Lower, Stick-up, Monitoring Well** | Screen Interval (BTOC): **35.0 to 45.0** | Initial Depth to Water (BTOC): 11.54 |
| | Historic Pump Settings: **Refill = 10 sec; Discharge = 5 sec; at 70 (psi); Rate = 100 mL/min** | | Total Depth (BTOC): |
| | Condition of Well/Comments: | | |
| | NOTE: **Please note any significant location information; Sampling note(s) - Previous sampling collection said 70 psi was too high** | | |

| Ambient PID (ppm): | 0.0 |
|---|---|
| Well Head PID (ppm): | 0.0 |
| Pump Inlet Depth (BTOC): | 40.0 |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-6-16 | 10:45 | 11.79 | | 200 | 14.55 | 0.153 | 1.60 | 6.32 | 165.7 | 787.6 | 10/5 | 25 | |
| | 10:50 | 11.76 | | | 14.35 | 0.158 | 0.69 | 6.35 | 154.2 | 186.9 | | | |
| | 10:55 | 11.74 | | | 14.39 | 0.161 | 0.46 | 6.34 | 147.9 | 900.0 | | | |
| | 11:00 | 11.75 | | | 14.46 | 0.162 | 0.41 | 6.31 | 145.8 | 131.5 | | | |
| | 11:05 | 11.76 | | | 14.42 | 0.165 | 0.36 | 6.23 | 144.6 | 328.5 | | | |
| | 11:10 | 11.72 | | | 14.42 | 0.169 | 0.34 | 6.11 | 142.7 | 389.1 | | | |
| | 11:15 | 11.74 | | | 14.33 | 0.177 | 0.32 | 6.00 | 138.1 | 339.3 | | | |
| | 11:20 | 11.71 | | | 14.30 | 0.183 | 0.31 | 5.92 | 134.7 | 280.4 | | | |
| | 11:25 | 11.69 | | | 14.32 | 0.185 | 0.29 | 5.91 | 134.0 | 242.7 | | | |
| | 11:30 | 11.71 | | | 14.37 | 0.187 | 0.29 | 5.88 | 136.3 | 234.2 | | | |
| | 11:35 | 11.73 | | | 14.69 | 0.187 | 0.29 | 5.89 | 136.7 | 167.7 | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; **Measurements:** every 3 - 5 min; **Stabilization is defined as the following for 3 consecutive readings:** ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
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# MONITORING WELL SAMPLE COLLECTION FORM

| LOCATION | Site: VANG | LocID: MW-01-13 |
|---|---|---|
| | Project Name: Virginia ANG | Project #: |

| Date | Time (24 hr) | Method (pump, bail) | Water Level (FTOC) | Volume Removed (L) | Pumping Rate (Lpm) | Temp. (C) | pH | Conduc-tivity (mS/cm) | DO (mg/L) | Turb. (NTU) | Sed. (mg/L) | ORP | Remarks (odor, clarity, etc.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-6-18 | 11:40 | | 11.72 | | 200 | 14.89 | 5.89 | 0.187 | 0.28 | 189.4 | | 137.8 | |
| | 11:45 | | 11.69 | | | 14.87 | 5.89 | 0.188 | 0.28 | 172.6 | | 138.8 | |
| | 11:50 | | 11.71 | | | 14.98 | 5.89 | 0.188 | 0.28 | 104.0 | | 141.9 | |
| | 11:55 | | 11.72 | | | 15.21 | 5.90 | 0.188 | 0.26 | 33.4 | | 142.2 | |
| | 12:00 | | 11.66 | | | 15.31 | 5.90 | 0.188 | 0.28 | 47.9 | | 143.6 | |
| | 12:05 | | 11.73 | | | 15.36 | 5.89 | 0.189 | 0.28 | 79.9 | | 146.6 | |
| | 12:10 | | 11.71 | | | 15.38 | 5.88 | 0.189 | 0.30 | 106.3 | | 150.1 | |
| | 12:15 | | 11.70 | | | 15.28 | 5.90 | 0.189 | 0.30 | 115.3 | | 150.5 | |
| | 12:20 | | 11.71 | | | 15.32 | 5.91 | 0.188 | 0.30 | 103.5 | | 150.6 | |
| | 12:25 | | 11.68 | | | 15.36 | 5.91 | 0.189 | 0.30 | 101.8 | | 152.3 | |

**Pump Rate:** <=0.5 L/min **Drawdown:** < 0.33 ft **Measurements:** 3-5 min **Stabilization:** +/- 0.5 C, +/- 0.1 pH, +/- 3% conductivity, +/- 10% DO, +/- 10% turb (<= 10 NTU ideal) for 3 consecutive readings

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-01-16 | Date: 04-06-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MAT3 Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 20116 | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# 033178 | Water Quality Meter Type: YSI6920 Sonde ID: 11167 | Handset ID: R11819 |
| | PID Type/ID#: Mini RAE ~~3000~~ 2000 ID# 4523 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-up, Monitoring Well | Screen Interval (BTOC): 10.0 to 25.0 | Initial Depth to Water (BTOC): 10.74 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: not available | | Total Depth (BTOC): | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 18.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04-06-18 | 1040 | 10.75 | 0.4 | 0.16 | 14.11 | 0.032 | 1.26 | 4.74 | 223.9 | 154.0 | 12.5/2.5 | 20 | |
| | 1045 | 10.74 | 0.6 | | 14.29 | 0.032 | 1.16 | 4.73 | 230.1 | 230.2 | | | |
| | 1050 | 10.72 | 0.8 | | 14.24 | 0.032 | 1.06 | 4.74 | 232.3 | 114.6 | | | |
| | 1055 | 10.76 | 1.0 | | 14.20 | 0.033 | 1.02 | 4.75 | 232.2 | 100.5 | | | |
| | 1100 | 10.72 | 1.2 | | 14.27 | 0.033 | 0.96 | 4.77 | 234 | 58.2 | | | |
| | 1105 | 10.71 | 1.4 | | 14.22 | 0.033 | 0.89 | ~~4.74~~ 4.78 | 228.5 | 43.0 | | | |
| | 1110 | 10.71 | 1.6 | | 14.24 | 0.033 | 0.80 | 4.79 | 226.8 | 86.3 | | | |
| | 1115 | 10.71 | 1.8 | | 14.17 | 0.034 | 0.74 | ~~4.84~~ 4.81 | 223.8 | 88.7 | | | |
| | 1120 | 10.72 | 2.0 | | 14.14 | 0.034 | 0.68 | 4.81 | 222.0 | 66.3 | | | |
| | 1125 | 10.73 | 2.2 | | 14.17 | 0.034 | 0.62 | 4.82 | 220.2 | 58.9 | | | |
| | 1130 | 10.71 | 2.4 | | 14.38 | 0.035 | 0.58 | 4.83 | 217.3 | 29.3 | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; **Measurements:** every 3 - 5 min; **Stabilization is defined as the following for 3 consecutive readings:** ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| MW-01-16-21 1140 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

# MONITORING WELL SAMPLE COLLECTION FORM

| LOCATION | Site: VANG | LocID: MW-01-16 |
|---|---|---|
| | Project Name: Virginia ANG | Project #: 60278122 |

| Date | Time (24 hr) | Method (pump, bail) | Water Level (FTOC) | Volume Removed (L) | Pumping Rate (Lpm) | Temp. (C) | pH | Conduc-tivity (mS/cm) | DO (mg/L) | Turb. (NTU) | Sed. (mg/L) | ORP | Remarks (odor, clarity, etc.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04-06-16 | 1135 | pump | 10.72 | 2.6 | 0.16 | 14.60 | 4.84 | 0.035 | 0.57 | 18.1 | | 215.0 | |
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**Pump Rate:** <=0.5 L/min **Drawdown:** < 0.33 ft **Measurements:** 3-5 min **Stabilization:** +/- 0.5 C, +/- 0.1 pH, +/- 3% conductivity, +/- 10% DO, +/- 10% turb (<= 10 NTU ideal) for 3 consecutive readings

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-01-23 | Date: 4/6/18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: DB Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 1315 | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# A00727 | Water Quality Meter Type: YSI6920 Sonde ID: 27068 | Handset ID: 5989 |
| | PID Type/ID#: Mini RAE 3000, ID# 219164 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-up, Monitoring Well | Screen Interval (BTOC): 10.0 to 25.0 | Initial Depth to Water (BTOC): 10.58 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 10 sec; Discharge = 5 sec; at 15 (psi); Rate = 150 mL/min | | Total Depth (BTOC): 28.0 | Well Head PID (ppm): |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 18.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - previous pump inlet depth 25' btoc | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/6/18 | 0840 | 10.75 | 4.0 | 0.4 | 12.65 | 0.087 | 3.28 | 4.57 | 163.4 | 243.0 | 10-5 | 40 | |
| | 0845 | 10.76 | 6.0 | 0.4 | 12.72 | 0.082 | 2.67 | 4.54 | 163.2 | 161.9 | 10-5 | 40 | |
| | 0850 | 10.79 | 8.0 | 0.4 | 12.77 | 0.083 | 2.25 | 4.50 | 163.8 | 107.3 | 10-5 | 40 | |
| | 0855 | 10.75 | 10.0 | 0.4 | 12.79 | 0.084 | 2.07 | 4.41 | 164.9 | 81.4 | 10-5 | 40 | |
| | 0900 | 10.78 | 12.0 | 0.4 | 12.85 | 0.083 | 1.75 | 4.47 | 165.6 | 51.4 | 10-5 | 40 | |
| | 0905 | 10.78 | 14.0 | 0.4 | 12.87 | 0.082 | 1.56 | 4.46 | 165.3 | 36.8 | 10-5 | 40 | |
| | ~~1000~~0910 | 10.78 | 16.0 | 0.4 | 12.89 | 0.080 | 1.49 | 4.43 | 165.8 | 30.2 | 10-5 | 40 | |
| | ~~1005~~0915 | 10.78 | 18.0 | 0.4 | 12.94 | 0.080 | 1.31 | 4.45 | 165.2 | 21.6 | 10-5 | 40 | |
| | 0920 | 10.78 | 20.0 | 0.4 | 12.94 | 0.080 | 1.21 | 4.42 | 165.2 | 16.2 | 10-5 | 40 | |
| | 0925 | 10.78 | 22.0 | 0.4 | 12.97 | 0.080 | 1.20 | 4.4 | 165.3 | 15.9 | 10-5 | 40 | |
| | 0930 | — | Sample | | | | | | | | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| MW-01-23-21 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
| 0930 Sample time | | | |
| DB | | | |

# AECOM Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-01-24 | Date: 04-03-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MAB Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 20116 | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# 033178 | Water Quality Meter Type: YSI6920 Sonde ID: 11167 | Handset ID: R2819 |
| | PID Type/ID#: Mini RAE ~~3000~~ PGM-7320, ID# 4523 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Lower, Stick-up, Monitoring Well | Screen Interval (BTOC): 30.0 to 45.0 | Initial Depth to Water (BTOC): 10.54 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 10.4 sec; Discharge = 4.6 sec; at 27 (psi); Rate = 120 mL/min | | Total Depth (BTOC): | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 38.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | | |

| Date (MM/DD/YY) | Time (24 hr) | ~~Depth to~~ Water (BTOC) | ~~Volume~~ Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04-03-18 | 1530 | 0.7 | 10.54 | 0.28 | 14.83 | 0.167 | 1.02 | 5.51 | 124.3 | 67.2 | 10.5/4.5 | 30 | |
| | 1535 | 1.05 | ~~10.54~~ 10.57 | | 14.93 | 0.178 | 0.81 | 5.51 | 115.1 | 74.6 | | | |
| | 1540 | 1.40 | 10.58 | | 14.96 | 0.198 | 0.52 | 5.66 | 78.0 | 73.1 | | | |
| | 1545 | 1.75 | 10.58 | | 14.98 | 0.208 | 0.40 | 5.78 | 47.6 | 63.5 | | | |
| | 1550 | 1.10 | 10.56 | | 15.00 | 0.212 | 0.34 | 5.86 | 30.0 | 43.3 | | | |
| | 1555 | 1.45 | 10.59 | | 15.03 | 0.212 | 0.28 | 5.86 | 26.9 | 33.7 | | | |
| | 1600 | 1.80 | 10.56 | | 15.00 | 0.214 | 0.24 | 5.90 | 23.2 | 21.1 | | | |
| | 1605 | 2.15 | 10.63 | | 15.11 | 0.216 | 0.22 | 5.90 | 21.8 | 15.5 | | | |
| | 1610 | 2.50 | 10.58 | | 15.11 | 0.218 | 0.20 | 5.92 | 20.2 | 11.2 | | | |
| | 1615 | 2.85 | 10.58 | | 15.20 | 0.220 | 0.19 | 5.94 | 16.6 | 8.6 | | | |
| | 1620 | 3.20 | 10.57 | | 15.20 | 0.222 | 0.18 | 5.95 | 15.8 | 5.4 | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| MW-01-24-21/1625 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-01-26 | Date: 04-03-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MAB Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 20116 | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# 033178 | Water Quality Meter Type: YSI6920 Sonde ID: 11167 | Handset ID: 21819 |
| | PID Type/ID#: ~~Mini RAE 3000~~ MAB ID# 4523 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Lower, Stick-up, Monitoring Well | Screen Interval (BTOC): 32.0 to 47.0 | Initial Depth to Water (BTOC): 12.49 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: N/A | | Total Depth (BTOC): | Well Head PID (ppm): 4.1 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 40.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . MS/MSD | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04-03-18 | 1340 | 12.54 | 0.5 | 0.19 | 15.23 | 0.420 | 1.20 | 5.92 | 52.5 | 94.2 | 12.0/3.0 | 40 | |
| | 1345 | 12.60 | 0.75 | | 15.23 | 0.451 | 0.70 | 6.02 | 28.0 | 74.8 | | | |
| | 1350 | 12.52 | 1.00 | | 15.20 | 0.468 | 0.46 | 6.09 | 12.3 | 52.3 | | | |
| | 1355 | 12.54 | 1.25 | | 15.21 | 0.474 | 0.40 | 6.11 | 6.7 | 54.4 | | | |
| | 1400 | 12.53 | 1.50 | | 15.22 | 0.478 | 0.33 | 6.13 | 1.9 | 47.1 | | | |
| | 1405 | 12.54 | 1.75 | | 15.26 | 0.477 | 0.29 | 6.14 | -2.3 | 42.0 | | | |
| | 1410 | 12.53 | 2.0 | | 15.21 | 0.477 | 0.26 | 6.14 | -4.2 | 39.5 | | | |
| | 1415 | 12.56 | 2.25 | | 15.26 | 0.482 | 0.24 | 6.15 | -6.9 | 35.1 | | | |
| | 1420 | 12.54 | 2.5 | | 15.22 | 0.483 | 0.23 | 6.15 | -8.7 | 31.5 | | | |
| | 1425 | 12.56 | 2.75 | | 15.26 | 0.486 | 0.22 | 6.16 | -11.6 | 30.1 | | | |
| | | | | | | | | | | | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| MW-01-26-21/ 1430 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
| MW-01-26-21MS/ 1430 | 3-40mL Glass VOA | HCl | Volatiles (8260C) |
| MW-01-26-21MSD/1430 | 3-40mL Glass VOA | HCl | Volatiles (8260C) |
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AECOM

# Monitoring Well Sample Collection Form



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|---|---|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-01-27 | Date: 4-6-18 | | |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MK | Checked By: | |
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# | | Controller/Compressor: QED MP50 | | |
| | Water Level Indicator Type/ID#: Solinst 101, ID# | Water Quality Meter Type: YSI6920 | Sonde ID: | Handset ID: | |
| | PID Type/ID#: Mini RAE 3000, ID# | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | | | |
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-up, Monitoring Well | Screen Interval (BTOC): 12.0 to 27.0 | Initial Depth to Water (BTOC): 11.61 | Ambient PID (ppm): 0.0 | |
| | Historic Pump Settings: Refill = 10.3 sec; Discharge = 4.7 sec; at 15 (psi); Rate = 125 mL/min | | Total Depth (BTOC): | Well Head PID (ppm): 0.2 | |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 20.0 | |
| | NOTE: Please note any significant location information; Sampling note(s) - previous pump inlet depth 27' btoc | | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-6-18 | 0900 | 11.79 | | 200 | 11.90 | 0.045 | 5.71 | 4.95 | 293.1 | 210.6 | 10/5 | 15 | |
| | 0905 | 11.84 | | 200 | 12.22 | 0.031 | 4.92 | 4.74 | 266.3 | 162.8 | | | |
| | 0910 | 11.86 | | 200 | 12.23 | 0.030 | 4.63 | 4.73 | 279.0 | 120.4 | | | |
| | 0915 | 11.88 | | | 12.21 | 0.030 | 4.42 | 4.72 | 288.9 | 83.0 | | | |
| | 0920 | 11.91 | | | 12.27 | 0.030 | 4.34 | 4.72 | 295.7 | 64.4 | | | |
| | 0925 | 11.89 | | | 12.32 | 0.030 | 4.22 | 4.72 | 300.9 | 52.7 | | | |
| | 0930 | 11.90 | | | 12.44 | 0.030 | 4.18 | 4.72 | 306.1 | 35.9 | | | |
| | 0935 | 11.91 | | | 12.54 | 0.030 | 4.13 | 4.72 | 310.0 | 27.2 | | | |
| | 0940 | 11.88 | | | 12.63 | 0.030 | 4.10 | 4.73 | 312.2 | 22.4 | | | |
| | 0945 | 11.90 | | | 12.66 | 0.030 | 4.07 | 4.73 | 315.9 | 20.2 | | | |
| | 0950 | | | | 12.72 | 0.030 | 4.05 | 4.72 | 318.7 | 16.5 | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time 0955 | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-01-29 | Date: 4/3/18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: DB Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# MPS6 -1315 | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# A00727 | Water Quality Meter Type: YSI6920 Sonde ID: 27080 | Handset ID: 5989 |
| | PID Type/ID#: Mini RAE 3000, ID# R19164 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a -inch Upper, Stick-Up, Monitoring Well | Screen Interval (BTOC): 12.0 to 27.0 | Initial Depth to Water (BTOC): 11.59 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 10.7 sec; Discharge = 4.3 sec; at 18 (psi); Rate = .140 mL/min | | Total Depth (BTOC): 30.80 | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 22.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . DUP | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/3/18 | 1050 | 12.24 | 4.0 | 0.4 | 13.39 | 0.049 | 3.26 | 4.14 | 31.1 | 147.8 | 10-5 | 40 | |
| | 1055 | 12.29 | 6.0 | 0.4 | 13.45 | 0.049 | 3.18 | 4.27 | 23.9 | 99.8 | 10-5 | 40 | |
| | 1100 | 12.29 | 8.0 | 0.4 | 13.44 | 0.049 | 3.15 | 4.27 | 23.7 | 85.0 | 10-5 | 40 | |
| | 1105 | 12.28 | 10.0 | 0.4 | 13.44 | 0.049 | 3.17 | 4.29 | 22.1 | 63.4 | 10-5 | 40 | |
| | 1110 | 12.29 | 12.0 | 0.4 | 13.46 | 0.049 | 3.21 | 4.30 | 23.7 | 52.6 | 10-5 | 40 | |
| | 1115 | 12.29 | 14.0 | 0.4 | 13.49 | 0.049 | 3.28 | 4.27 | 25.4 | 46.6 | 10-5 | 40 | |
| | 1120 | 12.29 | 16.0 | 0.4 | 13.52 | 0.049 | 3.34 | 4.24 | 26.9 | 41.8 | 10-5 | 40 | |
| | 1125 | 12.26 | 18.0 | 0.4 | 13.58 | 0.049 | 3.35 | 4.26 | 26.5 | 38.7 | 10-5 | 40 | |
| | 1130 | 12.29 | 20.0 | 0.4 | 13.54 | 0.049 | 3.34 | 4.24 | 27.8 | 39.5 | 10-5 | 40 | |
| | 1135 | 12.29 | 22.0 | 0.4 | 13.53 | 0.049 | 3.31 | 4.23 | 28.8 | 37.9 | 10-5 | 40 | |
| | 1140 | — | Sample | — | | | | | | | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ±0.5°C, ±3% Conductivity; ± 10% DO; ±0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| MW-01-29 + Dup | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
| 1140 Sample Time | | | |
| DB | | | |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-01-30 | Date: 4/3/18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: OB Checked By: |
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# MP50-1315 | Controller/Compressor: QED MP50 | |
| | Water Level Indicator Type/ID#: Solinst 101, ID# A 00727 | Water Quality Meter Type: YSI6920 Sonde ID: 27086 | Handset ID: 5981 |
| | PID Type/ID#: Mini RAE 3000, ID# R19164 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |
| **WELL & SAMPLING INFO** | This is a 2-inch Lower, Stick-Up, Monitoring Well | Screen Interval (BTOC): 35.0 to 50.0 | Initial Depth to Water (BTOC): 12.61 |
| | Historic Pump Settings: Refill = 10.4 sec; Discharge = 4.6 sec; at 22 (psi); Rate = .100 mL/min | Total Depth (BTOC): 53.5 | Ambient PID (ppm): 0.0 |
| | Condition of Well/Comments: | | Well Head PID (ppm): 0.1 |
| | NOTE: Please note any significant location information; Sampling note(s): DUP | | Pump Inlet Depth (BTOC): 43.0 |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed L (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/3/18 | 0900 | 12.72 | 3.5 | 0.350 | 13.52 | 0.050 | 8.89 | 5.18 | 37.5 | 508.4 | 10-5 | 40 | |
| | 0905 | 12.60 | 5.25 | 0.350 | 13.68 | 0.048 | 8.16 | 5.00 | 42.0 | 362.1 | 10-5 | 40 | |
| | 0910 | 12.55 | 7.0 | 0.350 | 13.69 | 0.047 | 8.03 | 4.97 | 42.2 | 362.6 | 10-5 | 40 | |
| | 0915 | 12.60 | 8.75 | 0.350 | 13.73 | 0.047 | 7.99 | 4.95 | 44.1 | 310.5 | 10-5 | 40 | |
| | 0920 | 12.65 | 10.5 | 0.350 | 13.70 | 0.047 | 7.94 | 4.92 | 45.8 | 299.5 | 10-5 | 40 | |
| | 0925 | 12.68 | 12.25 | 0.350 | 13.85 | 0.047 | 8.12 | 4.84 | 52.7 | 336.5 | 10-5 | 40 | |
| | 0930 | 12.68 | 14.00 | 0.350 | 13.83 | 0.047 | 8.06 | 4.84 | 51.1 | 301.7 | 10-5 | 40 | |
| | 0935 | 12.72 | 15.75 | 0.350 | 13.86 | 0.047 | 7.83 | 4.83 | 48.1 | 261.5 | 10-5 | 40 | |
| | 0940 | 12.73 | 17.5 | 0.350 | 13.91 | 0.047 | 7.81 | 4.82 | 47.4 | 243.7 | 10-5 | 40 | |
| | 0945 | 12.71 | 19.25 | 0.350 | 13.90 | 0.047 | 7.82 | 4.82 | 47.0 | 238.5 | 10-5 | 40 | |
| | 0950 | — | Sample | — | | | | | | | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| MW-01-30 + Dupe | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
| 0950 Sample Time | | | |
| DB | | | |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-03-01 | Date: 4/4/18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: DB Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 1315 | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# A00727 | Water Quality Meter Type: YSI6920 Sonde ID: 27080 | Handset ID: 5989 |
| | PID Type/ID#: Mini RAE 3000, ID# K19164 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Flushmount, Monitoring Well | Screen Interval (BTOC): 13.0 to 23.0 | Initial Depth to Water (BTOC): 12.40 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: not available | | Total Depth (BTOC): 22.0 | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 18.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/4/18 | 1315 | 12.85 | 4.0 | 0.4 | 15.89 | 0.040 | 8.07 | 3.01 | 181.7 | 229.0 | 10-5 | 40 | |
| | 1320 | 12.89 | 6.0 | 0.4 | 16.19 | 0.040 | 7.85 | 2.99 | 180.7 | 65.9 | | | |
| | 1325 | 12.89 | 8.0 | 0.4 | 15.95 | 0.039 | 7.62 | 3.08 | 177.9 | 51.5 | | | |
| | 1330 | 12.95 | 10.0 | 0.4 | 15.74 | 0.039 | 7.54 | 3.14 | 175.0 | 32.0 | | | |
| | 1335 | 12.97 | 12.0 | 0.4 | 15.57 | 0.040 | 7.35 | 3.17 | 173.1 | 24.1 | | | |
| | 1340 | 12.98 | 14.0 | 0.4 | 15.46 | 0.039 | 7.34 | 3.20 | 172.7 | 23.2 | | | |
| | 1345 | 13.02 | 16.0 | 0.4 | 15.55 | 0.040 | 7.26 | 3.28 | 167.6 | 16.4 | | | |
| | 1350 | 13.03 | 18.0 | 0.4 | 15.63 | 0.040 | 7.21 | 3.36 | 164.5 | 15.1 | | | |
| | 1355 | 13.04 | 20.0 | 0.4 | 15.65 | 0.040 | 7.19 | 3.42 | 155.3 | 13.5 | | | |
| | 1400 | 13.04 | 22.0 | 0.4 | 15.68 | 0.040 | 7.15 | 3.46 | 156.7 | 12.4 | | | |
| | 1405 | | | | | | | | | | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| MW-03-01<br>1405 Sample time<br>DB | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-11-01 | Date: 4/5/18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 215 | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# A00727 | Water Quality Meter Type: YSI6920 Sonde ID: 27080 | Handset ID: 5989 |
| | PID Type/ID#: Mini RAE 3000, ID# R19164 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Lower, Stick-Up, Monitoring Well | Screen Interval (BTOC): 35.0 to 45.0 | Initial Depth to Water (BTOC): 12.70' | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 10 sec; Discharge = 5 sec; at 30 (psi); Rate = .170 mL/min | | Total Depth (BTOC): 48.00' | Well Head PID (ppm): 0.1 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 40.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed L (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/5/18 | 1400 | 13.09 | 4.0 | 0.4 | 14.80 | 0.891 | 1.10 | 6.33 | -94.0 | 16.4 | 10-5 | 40 | |
| | 1405 | 13.09 | 6.0 | 0.4 | 14.73 | 0.891 | 0.68 | 6.25 | -94.6 | 33.5 | 10-5 | 40 | |
| | 1410 | 13.07 | 8.0 | 0.4 | 14.77 | 0.797 | 0.33 | 6.24 | -102.4 | 30.8 | 10-5 | 40 | |
| | 1415 | 13.05 | 10.0 | 0.4 | 14.87 | 0.705 | 0.25 | 6.24 | -103.9 | 25.8 | 10-5 | 40 | |
| | 1420 | 13.05 | 12.0 | 0.4 | 14.87 | 0.618 | 0.19 | 6.29 | -105.7 | 23.0 | 10-5 | 40 | |
| | 1425 | 13.05 | 14.0 | 0.4 | 14.95 | 0.564 | 0.16 | 6.30 | -106.1 | 20.8 | 10-5 | 40 | |
| | 1430 | 13.06 | 16.0 | 0.4 | 15.04 | 0.525 | 0.14 | 6.33 | -105.4 | 21.1 | 10-5 | 40 | |
| | 1435 | 13.05 | 18.0 | 0.4 | 14.96 | 0.505 | 0.13 | 6.29 | -105.9 | 17.5 | 10-5 | 40 | |
| | 1440 | 13.05 | 20.0 | 0.4 | 14.99 | 0.497 | 0.13 | 6.30 | -105.2 | 15.5 | 10-5 | 40 | |
| | 1445 | 13.05 | 22.0 | 0.4 | 15.02 | 0.489 | 0.12 | 6.30 | -105.1 | 15.9 | 10-5 | 40 | |
| | 1450 | — Sample | | | | | | | | | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| MW-11-01-21 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
| 1450 sample time | 2 - 40 mL Glass VOA | HCl | Dissolved Gasses (RSK175) |
| DB | 1 - 250 mL Poly | $HNO_3$ | Total Fe, Mn, As (SM 6010C) |
| | 1 - 250 mL Poly | None | Dissolved Fe, Mn (SM 6010C) |
| | 1 - 250 mL Poly | None | Alkalinity (SM 2320B), Dis $CO_2$, pH, TDS (SM 4500D) |
| | ~~1 - 250 mL Poly~~ 40mL VOA - | $H_2SO_4$ | TOC (9060A) |
| | | | |
| | | | |
| | | | |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-11-02 | Date: 4/5/18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: DB Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 1315 | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# AW727 | Water Quality Meter Type: YSI6920 Sonde ID: 27080 | Handset ID: 5989 |
| | PID Type/ID#: Mini RAE 3000, ID# R19164 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-Up, Monitoring Well | Screen Interval (BTOC): 15.0 to 25.0 | Initial Depth to Water (BTOC): 12.23 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 10 sec; Discharge = 5 sec; at 20 (psi); Rate = .210 mL/min | | Total Depth (BTOC): 28.30 | Well Head PID (ppm): 0.1 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 20.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/5/18 | 1220 | 13.69 | 4.0 | 0.4 | 13.76 | 0.949 | 0.50 | 5.47 | -34.2 | 233.6 | 10-5 | 40 | |
| | 1225 | 14.05 | 6.0 | 0.4 | 13.81 | 0.963 | 0.39 | 5.63 | -42.5 | 215.2 | 10-5 | 40 | |
| | 1230 | 14.05 | 8.0 | 0.4 | 13.96 | 1.058 | 0.20 | 6.06 | -93.8 | 177.9 | 10-5 | 40 | |
| | 1235 | 14.05 | 10.0 | 0.4 | 13.95 | 1.073 | 0.18 | 6.12 | -96.8 | 146.7 | 10-5 | 40 | |
| | 1240 | 14.05 | 12.0 | 0.4 | 14.03 | 1.131 | 0.14 | 6.22 | -109.6 | 137.8 | 10-5 | 40 | |
| | 1245 | 14.07 | 14.0 | 0.4 | 14.00 | 1.195 | 0.11 | 6.21 | -116.4 | 94.6 | 10-5 | 40 | |
| | 1250 | 14.07 | 16.0 | 0.4 | 13.97 | 1.217 | 0.11 | 6.23 | -116.9 | 81.4 | 10-5 | 40 | |
| | 1255 | 14.07 | 18.0 | 0.4 | 13.99 | 1.239 | 0.10 | 6.24 | -118.8 | 73.2 | 10-5 | 40 | |
| | 1300 | 14.08 | 20.0 | 0.4 | 14.00 | 1.253 | 0.09 | 6.26 | -119.1 | 71.5 | 10-5 | 40 | |
| | 1305 | | 22.0 | 0.4 | 13.99 | 1.267 | 0.09 | 6.27 | -119.3 | 69.9 | 10-5 | 40 | |
| | 1316 | — | Sample | — | — | — | — | — | — | — | — | — | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| MW-11-02-21 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
| 1310 sample time | 2 - 40 mL Glass VOA | HCl | Dissolved Gasses (RSK175) |
| DB | 1 - 250 mL Poly | $HNO_3$ | Total Fe, Mn, As (SM 6010C) |
| | 1 - 250 mL Poly | None | Dissolved Fe, Mn (SM 6010C) |
| | 1 - 250 mL Poly | None | Alkalinity (SM 2320B), Dis $CO_2$, pH, TDS (SM 4500D) |
| | ~~2~~ 1 - ~~250 mL~~ Poly 40ml Vo | $H_2SO_4$ | TOC (9060A) |
| | | | |
| | | | |
| | | | |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-11-03 | Date: 4.6.18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: AG Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 10346 | | Controller/Compressor: QED MP50 # 27886 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# 035574 | Water Quality Meter Type: YSI6920 Sonde ID: 10968 | Handset ID: RVC831 |
| | PID Type/ID#: Mini RAE 3000, ID# ~~749464~~ Borrowed | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-Up, Monitoring Well | Screen Interval (BTOC): 25.0 to 35.0 | Initial Depth to Water (BTOC): 12.31 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 12.2 sec; Discharge = 2.8 sec; at 25 (psi); Rate = .168 mL/min | | Total Depth (BTOC): | Well Head PID (ppm): 0.5 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 30.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . DUP | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed ~~(Liters/gallons)~~ | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.0.18 | 0845 | 12.40 | — | .200 | 12.89 | 0.086 | 10.60 | 6.78 | 187.4 | 40.3 | 10/5 | 19 | |
| | 0850 | 12.45 | 1.0 | | 13.59 | 0.067 | 10.30 | 5.64 | 190.6 | 37.4 | | | |
| | 0855 | | 2.0 | | 13.98 | 0.056 | 9.98 | 5.35 | 198.3 | 18.3 | | | |
| | 0900 | | 3.0 | | 13.97 | 0.053 | 9.16 | 5.26 | 207.1 | 18.2 | | | |
| | 0905 | | 4.0 | | 14.02 | 0.052 | 9.62 | 5.23 | 213.8 | 18.0 | | | |
| | 0910 | | 5.0 | | 14.07 | 0.051 | 10.00 | 5.19 | 220.6 | 18.7 | | | |
| | 0915 | | 6.0 | | 14.19 | 0.050 | 9.62 | 5.17 | 226.1 | 28.6 | | | |
| | 0920 | | 7.0 | | 14.22 | 0.049 | 9.76 | 5.18 | 228.1 | 14.9 | | | |
| | 0925 | | 8.0 | | 14.23 | 0.049 | 9.60 | 5.16 | 231.0 | 1.9 | | | |
| | 0930 | | 9.0 | | 14.49 | 0.047 | 9.60 | 5.12 | 235.9 | 2.2 | | | |
| | 0935 | Sample | | | | | | | | | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| with Dupe<br>MW-11-03-21<br>w1<br>MW-11-03-21 DUP<br>@ 0935 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
| | 1 - 250 mL Poly | None | Alkalinity (SM 2320B) |
| | 1 - 250 mL Poly | $H_2SO_4$ | TOC (9060A) |
| | | | |
| | | | |
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| | | | |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-11-04R | Date: 4/2/18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: DB Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# MP50-1315 | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# A00727 | Water Quality Meter Type: YSI6920 Sonde ID: 27080 | Handset ID: 5982 |
| | PID Type/ID#: Mini RAE 3000, ID# R19164 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-Up, Monitoring Well | Screen Interval (BTOC): 20.0 to 30.0 | Initial Depth to Water (BTOC): 12.08' | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 10 sec; Discharge = 5 sec; at 13 (psi); Rate = .130 mL/min | | Total Depth (BTOC): 33.09' | Well Head PID (ppm): 0.1 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 25.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (L) (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *04/02/18 | 1345 | 13.10' | 4.0 | 0.4 | 14.36 | 0.076 | 0.52 | 3.71 | 132.2 | 184.6 | 10-5 | 40 | |
| 04/02/18 | 1350 | 12.30 | 6.0 | 0.4 | 14.70 | 0.077 | 0.25 | 4.03 | 118.7 | 115.2 | 10-5 | 40 | |
| " " | 1355 | 12.30 | 8.0 | 0.4 | 14.62 | 0.077 | 0.23 | 4.12 | 114.1 | 111.6 | 10-5 | 40 | |
| " " | 1400 | 12.30 | 10 | 0.4 | 14.53 | 0.077 | 0.21 | 4.26 | 108.8 | 102.1 | 10-5 | 40 | |
| " " | 1405 | 12.27 | 12 | 0.4 | 14.56 | 0.079 | 0.19 | 4.44 | 96.9 | 69.9 | 10-5 | 40 | |
| " " | 1410 | 12.26 | ~~14~~ 14 | 0.4 | 14.59 | 0.074 | 0.19 | 4.53 | 91.4 | 59.6 | 10-5 | 40 | |
| " " | 1415 | 12.26 | ~~16~~ 16 | 0.4 | 14.54 | 0.079 | 0.19 | 4.69 | 81.7 | 57.5 | 10-5 | 40 | |
| " " | 1420 | 12.26 | ~~18~~ 18 | 0.4 | 14.53 | 0.079 | 0.19 | 4.73 | 78.2 | 50.3 | 10-5 | 40 | |
| " " | 1425 | 12.26 | 20 | 0.4 | 14.50 | 0.079 | 0.18 | 4.77 | 75.7 | 50.1 | 10-5 | 40 | |
| " " | 1430 | 12.26 | 22 | 0.4 | 14.43 | 0.079 | 0.17 | 4.81 | 73.0 | 43.8 | 10-5 | 40 | |
| " " | 1435 | — Sample | | | | | | | | | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| MW-11-04R-21 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
| 1435 sample Time | | | |
| 1015 | | | |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-11-05 | Date: 04-02-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MAT Checked By: |
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 2016 | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# 053178 | Water Quality Meter Type: YSI6920 Sonde ID: 11167 | Handset ID: KH819 |
| | PID Type/ID#: Mini RAE ~~3000~~ 2000 ID# 4523 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-Up, Monitoring Well | Screen Interval (BTOC): 18.0 to 28.0 | Initial Depth to Water (BTOC): 10.81 |
| | Historic Pump Settings: Refill = 11.5 sec; Discharge = 3.5 sec; at 18 (psi); Rate = .160 mL/min | | Total Depth (BTOC): |
| | Condition of Well/Comments: initial depth to water and first reading are inaccurate. Probe gave a false positive | | Ambient PID (ppm): 0.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | Well Head PID (ppm): 0.0 |
| | | | Pump Inlet Depth (BTOC): 23.0 |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~04-02-18~~ 04-02-18 | 1335 | 10.89 | 0.4 | 0.15 | 14.76 | 0.627 | 0.58 | 5.98 | -51.1 | 52.2 | 11.5/3.5 | 20 | |
| | 1340 | 12.53 | | 0.15 | 15.19 | 0.635 | 0.44 | 5.98 | -50.1 | 61.4 | 11.5/3.5 | 20 | |
| | 1345 | 12.54 | | 0.15 | 14.91 | 0.632 | 0.37 | 6.01 | -51.2 | 92.4 | 11.5/3.5 | 20 | |
| | 1350 | 12.65 | | 0.15 | 14.77 | 0.633 | 0.31 | 6.00 | -50.3 | 22.3 | 11.5/3.5 | 20 | |
| | 1355 | ~~12.65~~ 12.68 | | 0.15 | 15.24 | 0.641 | 0.28 | 6.00 | -50.7 | 22.0 | 11.5/3.5 | 20 | |
| | 1400 | 12.71 | | 0.15 | 15.21 | 0.644 | 0.26 | 6.02 | -53.3 | 34.4 | 11.5/3.5 | 20 | |
| | 1405 | 12.76 | | 0.15 | 15.25 | 0.646 | 0.25 | 6.02 | -53.5 | 32.9 | 11.5/3.5 | 20 | |
| | 1410 | 12.76 | | 0.15 | 15.24 | 0.647 | 0.23 | 6.03 | -53.9 | 39.5 | 11.5/3.5 | 20 | |
| | 1415 | 12.77 | | 0.15 | 15.17 | 0.650 | 0.22 | 6.02 | -54.4 | 31.1 | 11.5/3.5 | 20 | |
| | 1420 | 12.79 | | 0.15 | 15.19 | 0.653 | 0.21 | 6.02 | -55.2 | 39.3 | 11.5/3.5 | 20 | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| MW-11-05-21 / 1425 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-11-06 | Date: 04-05-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MAB Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 20116 | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# 033178 | Water Quality Meter Type: YSI6920 Sonde ID: 11167 | Handset ID: R24819 |
| | PID Type/ID#: ~~Mini RAE 3000~~ MAB 3000; ID# 4573 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-Up, Monitoring Well | Screen Interval (BTOC): 18.0 to 28.0 | Initial Depth to Water (BTOC): 11.97 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 10 sec; Discharge = 5 sec; at 19 (psi); Rate = .240 mL/min | | Total Depth (BTOC): | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 23.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-05-18 | 1330 | 12.37 | 0.5 | 0.2 | 15.05 | 0.339 | 0.58 | 5.85 | -42.6 | -3.7 | 11.0/4.0 | 19.0 | |
| | 1335 | 12.38 | 0.75 | | 15.03 | 0.332 | 0.42 | 5.87 | -43.5 | -3.4 | | | |
| | 1340 | 12.39 | 1.00 | | 15.06 | 0.343 | 0.37 | 5.92 | -48.5 | -3.7 | | | |
| | 1345 | 12.42 | 1.25 | | 15.43 | 0.329 | 0.34 | 6.02 | -53.4 | -1.8 | | | |
| | 1350 | 12.39 | 1.50 | | 15.14 | 0.351 | 0.31 | 6.03 | -58.0 | -3.0 | | | |
| | ~~1355~~ MAB 1355 | 12.41 | 1.75 | | 15.13 | 0.348 | 0.28 | 6.02 | -56.1 | -2.5 | | | |
| | 1400 | 12.39 | 2.00 | | 15.16 | 0.350 | 0.26 | 6.03 | -56.4 | -4.1 | | | |
| | 1405 | 12.41 | 2.25 | | 15.68 | 0.341 | 0.25 | 6.08 | -59.9 | -6.8 | | | |
| | 1410 | 12.36 | 2.50 | | 15.27 | 0.356 | 0.24 | 6.07 | -60.1 | -8.8 | | | |
| | 1415 | 12.39 | 2.75 | | 15.28 | 0.372 | 0.23 | 6.08 | -62.0 | -10.4 | | | |
| | 1420 | 12.38 | 3.00 | | 15.28 | 0.378 | 0.29 | 6.11 | -66.4 | -8.7 | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| MW-11-06-21 / 1450 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
| | 2 - 40 mL Glass VOA | ~~HCl~~ MAB None | Dissolved Gasses (RSK175) |
| | ~~1 - 250 mL Poly~~ MAB 1 - 125mL Poly | $HNO_3$ | Total Fe, Mn, As (SM 6010C) |
| | ~~1 - 250 mL Poly~~ MAB 1 - 125mL Poly | None | Dissolved Fe, Mn (SM 6010C) |
| | ~~1 - 250 mL Poly~~ MAB 1 - 500mL Poly | None | Alkalinity (SM 2320B), Dis $CO_2$, pH, TDS (SM 4500D) |
| | ~~1 - 250 mL Poly~~ MAB 2 - 40mL Glass VOA | ~~$H_2SO_4$~~ HCl | TOC (9060A) |
| | | | |
| | | | |
| | | | |

# MONITORING WELL SAMPLE COLLECTION FORM

| LOCATION | Site: VANG | LocID: MW-11-06 |
|---|---|---|
| | Project Name: Virginia ANG | Project #: 60278144 |

| Date | Time (24 hr) | Method (pump, bail) | Water Level (FTOC) | Volume Removed (L) | Pumping Rate (Lpm) | Temp. (C) | pH | Conduc-tivity (mS/cm) | DO (mg/L) | Turb. (NTU) | Sed. (mg/L) | ORP | Remarks (odor, clarity, etc.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04-05-18 | 1425 | pump | 12.38 | 3.25 | 0.2 | 15.36 | 6.09 | 0.360 | 0.23 | -9.4 | | -63.1 | |
| | 1430 | | 12.35 | 3.50 | | 15.35 | 6.07 | 0.361 | 0.21 | -10.1 | | -61.9 | |
| | 1435 | | 12.37 | 3.75 | | 15.46 | 6.08 | 0.366 | 0.19 | -10.3 | | -62.9 | |
| | 1440 | | 12.37 | 4.00 | | 15.51 | 6.09 | 0.377 | 0.19 | -10.7 | | -64.4 | |
| | 1445 | | 12.35 | 4.25 | | 15.56 | 6.12 | 0.375 | 0.19 | -10.8 | | -67.9 | |

**Pump Rate:** <=0.5 L/min **Drawdown:** < 0.33 ft **Measurements:** 3-5 min **Stabilization:** +/- 0.5 C, +/- 0.1 pH, +/- 3% conductivity, +/- 10% DO, +/- 10% turb (<= 10 NTU ideal) for 3 consecutive readings

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-11-07 | Date: 4-3-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: AG Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# 19012 | Water Quality Meter Type: YSI6920 Sonde ID: 3328 | Handset ID: R12842 |
| | PID Type/ID#: Mini RAE 3000, ID# 3974 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-Up, Monitoring Well | Screen Interval (BTOC): 16.0 to 26.0 | Initial Depth to Water (BTOC): 10.80 | Ambient PID (ppm): |
| | Historic Pump Settings: Refill = 11 sec; Discharge = 4 sec; at 20 (psi); Rate = .250 mL/min | | Total Depth (BTOC): | Well Head PID (ppm): |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 21.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - DUP | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-3-18 | 0930 | 10.45 | — | .200 | 11.63 | 1.223 | 3.15 | 6.46 | -80.2 | 27.5 | 10/5 | 17 | |
| | 0935 | 10.80 | 1.0 | | 12.34 | 1.216 | 0.73 | 6.56 | -91.2 | 10.4 | 10/5 | 17 | |
| | 0940 | 11.25 | 2.0 | | 12.59 | 1.035 | 0.45 | 6.53 | -92.4 | 4.4 | | | |
| | 0945 | 11.25 | 3.0 | | 12.62 | 1.033 | 0.41 | 6.54 | -92.9 | 5.6 | | | |
| | 0950 | | 4.0 | | 12.64 | 1.005 | 0.34 | 6.55 | -93.9 | 5.2 | | | |
| | 0955 | | 5.0 | | 12.70 | 0.954 | 0.32 | 6.54 | -95.1 | 6.1 | | | |
| | 1000 | | 6.0 | | 12.79 | 0.926 | 0.30 | 6.54 | -95.9 | 2.3 | | | |
| | 1005 | | 7.0 | | 12.84 | 0.887 | 0.29 | 6.53 | -96.5 | 1.9 | | | |
| | 1010 | | 8.0 | | 12.87 | 0.864 | 0.27 | 6.53 | -97.0 | 1.4 | | | |
| | 1015 | | 9.0 | | 12.96 | 0857 | 0.25 | 6.52 | -97.6 | 0.2 | | | |
| | 1020 | | 10.0 | | 12.92 | 0.846 | 0.24 | 6.52 | -97.7 | 0.0 | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| 1025 w/DUP | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
| | 2 - 40 mL Glass VOA | HCl | Dissolved Gasses (RSK175) |
| | 1 - 250 mL Poly | $HNO_3$ | Total Fe, Mn, As (SM 6010C) |
| | 1 - 250 mL Poly | None | Dissolved Fe, Mn (SM 6010C) |
| | 1 - 250 mL Poly | None | Alkalinity (SM 2320B), Dis $CO_2$, pH, TDS (SM 4500D) |
| | 1 - 250 mL Poly | $H_2SO_4$ | TOC (9060A) |
| | | | Deploy Biotrap |
| | | | |
| | | | |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-11-08 | Date: 4.3.18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: AG Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# | Water Quality Meter Type: YSI6920 Sonde ID: 3328 | Handset ID: |
| | PID Type/ID#: Mini RAE 3000, ID# 3974 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Lower, Stick-Up, Monitoring Well | Screen Interval (BTOC): 35.0 to 45.0 | Initial Depth to Water (BTOC): 11.65 | Ambient PID (ppm): 2.7 |
| | Historic Pump Settings: Refill = 10 sec; Discharge = 5 sec; at 25 (psi); Rate = .146 mL/min | | Total Depth (BTOC): | Well Head PID (ppm): 0.2 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 40.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed ~~(gallons)~~ | Pumping Rate mL(Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.3.18 | 1105 | 11.74 | — | .200 | 13.37 | 1.164 | 0.82 | 7.17 | -146.5 | 17.9 | 10/5 | 22 | |
| | 1110 | 11.75 | 1.00 | 200 | 13.57 | 1.206 | 0.45 | 7.27 | -161.2 | 16.4 | | | |
| | 1115 | 11.76 | 2.00 | 200 | 13.72 | 1.210 | 0.35 | 7.28 | -168.3 | 16.1 | | | |
| | 1120 | 11.75 | 3.00 | 200 | 13.65 | 1.214 | 0.30 | 7.27 | -172.0 | 14.6 | | | |
| | 1125 | 11.76 | 4.00 | 200 | 13.73 | 1.219 | 0.27 | 7.25 | -174.1 | 12.5 | | | |
| | 1130 | 11.75 | 5.00 | 200 | 13.82 | 1.241 | 0.25 | 7.14 | -170.4 | 8.9 | | | |
| | 1135 | 11.74 | 6.00 | 200 | 13.76 | 1.283 | 0.25 | 7.03 | -164.4 | 3.1 | | | |
| | 1140 | 11.77 | 7.00 | 200 | 13.74 | 1.274 | 0.24 | 6.98 | -159.8 | 2.1 | | | |
| | 1145 | 11.75 | 8.00 | 200 | 13.72 | 1.232 | 0.23 | 6.97 | -155.4 | 1.6 | | | |
| | 1150 | 11.77 | 9.00 | ↓ | 13.84 | 1.180 | 0.24 | 6.95 | -149.9 | 1.3 | | | |
| | 1155 | | 10.00 | ↓ | 13.90 | 1.132 | 0.24 | 6.92 | -144.6 | 1.7 | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| 1240 Sample | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
| | 2 - 40 mL Glass VOA | HCl | Dissolved Gasses (RSK175) |
| | 1 - 250 mL Poly | $HNO_3$ | Total Fe, Mn, As (SM 6010C) |
| | 1 - 250 mL Poly | None | Dissolved Fe, Mn (SM 6010C) |
| | 1 - 250 mL Poly | None | Alkalinity (SM 2320B), Dis $CO_2$, pH, TDS (SM 4500D) |
| | 1 - 250 mL Poly | $H_2SO_4$ | TOC (9060A) |
| | | | Deploy Biotrap |
| | | | |
| | | | |

# MONITORING WELL SAMPLE COLLECTION FORM

| LOCATION | Site: Vance | LocID: MW-11-08-21 |
|---|---|---|
| | Project Name: GW Sampling Event #2.1 | Project #: |

| Date | Time (24 hr) | Method (pump, bail) | Water Level (FTOC) | Volume Removed (L) | Pumping Rate (Lpm) | Temp. (C) | pH | Conduc-tivity (mS/cm) | DO (mg/L) | Turb. (NTU) | Sed. (mg/L) | ORP | Remarks (odor, clarity, etc.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-3-18 | 1200 | Bladder | 11.75 | 11.00 | 200 | 13.99 | 6.90 | 1.049 | 0.25 | 1.5 | — | -136.2 | |
| | 1205 | ↓ | ↓ | 12.00 | ↓ | 14.00 | 6.86 | 0.944 | 0.30 | 1.0 | ↓ | -131.5 | |
| | 1210 | | | 13.00 | | 14.01 | 6.81 | 0.828 | 0.31 | 0.2 | | -122.0 | |
| | 1215 | | | 14.00 | | 14.01 | 6.78 | 0.761 | 0.32 | 0.5 | | -115.4 | |
| | 1220 | | | 15.00 | | 14.05 | 6.74 | 0.687 | 0.33 | 0.0 | | -107.8 | |
| | 1225 | | | 16.00 | | 14.01 | 6.68 | 0.615 | 0.36 | 0.0 | | -99.5 | |
| | 1230 | | | 17.00 | | 14.07 | 6.63 | 0.548 | 0.38 | 0.0 | | -92.8 | |
| | 1235 | | | 18.00 | ↓ | 14.16 | 6.60 | 0.510 | 0.41 | 0.0 | ↓ | -87.7 | |
| | 1240 | Sample | | | | | | | | | | | Conductivity Issues |

**Pump Rate:** <=0.5 L/min **Drawdown:** < 0.33 ft **Measurements:** 3-5 min **Stabilization:** +/- 0.5 C, +/- 0.1 pH, +/- 3% conductivity, +/- 10% DO, +/- 10% turb (<= 10 NTU ideal) for 3 consecutive readings

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-11-09 | Date: 4-3-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MK Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# | Water Quality Meter Type: YSI6920 | Sonde ID: Handset ID: |
| | PID Type/ID#: Mini RAE 3000, ID# | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-Up, Monitoring Well | Screen Interval (BTOC): 18.0 to 28.0 | Initial Depth to Water (BTOC): 9.75 | Ambient PID (ppm): ~~0.0~~ 0.9 |
| | Historic Pump Settings: Refill = 10 sec; Discharge = 5 sec; at 20 (psi); Rate = .200 mL/min | | Total Depth (BTOC): | Well Head PID (ppm): 0.9 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 23.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - Field Dup/MS/MSD | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-3-18 | 1655 | 10.52 | | 200 | 16.60 | 1.973 | 1.94 | 6.64 | -176.2 | 4.5 | 10/5 | 20 | |
| | 1700 | 11.03 | | 200 | 15.12 | 1.986 | 0.65 | 6.58 | -183.8 | -1.8 | | | |
| | 1705 | 11.27 | | 200 | 14.49 | 1.971 | 0.37 | 6.53 | -187.1 | 40.1 | | | |
| | 1710 | 11.39 | | 200 | 14.39 | 1.978 | 0.30 | 6.54 | -189.4 | 41.9 | | | |
| | 1715 | 11.24 | | 200 | 14.31 | 1.956 | 0.26 | 6.53 | -188.9 | 36.1 | | | |
| | 1720 | 11.49 | | 200 | 14.30 | 1.987 | 0.24 | 6.49 | -181.3 | 26.3 | | | |
| | 1725 | 11.52 | | 200 | 14.29 | 1.994 | 0.22 | 6.47 | -178.8 | 23.2 | | | |
| | 1730 | 11.54 | | 200 | 14.33 | 2.000 | 0.21 | 6.41 | -171.4 | 19.6 | | | |
| | 1735 | 11.53 | | 200 | 14.26 | 1.994 | 0.20 | 6.36 | -162.2 | 13.2 | | | |
| | 1740 | 11.51 | | 200 | 14.24 | 1.969 | 0.19 | 6.37 | -164.6 | 14.2 | | | |
| | | | | | | | | | | | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ±0.5°C, ±3% Conductivity; ± 10% DO; ±0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time 1750 | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
| | 2 - 40 mL Glass VOA | HCl | Dissolved Gasses (RSK175) |
| | 1 - 250 mL Poly | $HNO_3$ | Total Fe, Mn, As (SM 6010C) |
| | 1 - 250 mL Poly | None | Dissolved Fe, Mn (SM 6010C) |
| | 1 - 250 mL Poly | None | Alkalinity (SM 2320B), Dis $CO_2$, pH, TDS (SM 4500D) |
| | 1 - 250 mL Poly | $H_2SO_4$ | TOC (9060A) |
| | | | Deploy Biotrap |
| | | | |

# Monitoring Well Sample Collection Form

AECOM



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-11-10 | Date: 4-5-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MJB Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 20116 | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# 033178 | Water Quality Meter Type: YSI6920 Sonde ID: 11167 | Handset ID: R 12819 |
| | PID Type/ID#: Mini RAE ~~3000~~ 2000 MJB ID# 4523 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Lower, Stick-Up, Monitoring Well | Screen Interval (BTOC): 29.0 to 39.0 | Initial Depth to Water (BTOC): 13.80 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 10 sec; Discharge = 5 sec; at 30 (psi); Rate = .180 mL/min | | Total Depth (BTOC): | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 34.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04-05-18 | 1550 | 13.96 | 0.9 | 0.35 | 16.09 | 0.208 | 0.38 | 5.87 | 23.8 | 24.5 | 10.0/5.0 | 30 | |
| | ~~1555~~ MJB 1555 | 13.92 | 1.35 | | 16.09 | 0.227 | 0.32 | 5.89 | 19.4 | 27.8 | | | |
| | 1600 | 13.90 | 1.80 | | 16.18 | 0.689 | 0.27 | 6.05 | -39.9 | 15.9 | | | |
| | 1605 | 13.94 | 2.25 | | 16.22 | 0.797 | 0.22 | 6.16 | -78.0 | 14.5 | | | |
| | 1610 | 13.92 | 2.70 | | 16.17 | 0.686 | 0.20 | 6.25 | -76.5 | 11.4 | | | |
| | 1615 | 13.94 | 3.15 | | 16.18 | 0.620 | 0.19 | 6.22 | -71.8 | 9.6 | | | |
| | 1620 | 13.93 | 3.60 | | 16.22 | 0.535 | 0.17 | 6.16 | -65.1 | 7.3 | | | |
| | 1625 | 13.95 | ~~3~~ MJB 4.05 | | 16.19 | 0.467 | 0.17 | 6.09 | -58.1 | 4.7 | | | |
| | 1630 | 13.96 | 4.50 | | 16.23 | 0.420 | 0.16 | 6.01 | -49.5 | 3.5 | | | |
| | 1635 | 13.92 | 4.95 | | 16.21 | 0.395 | 0.16 | 5.97 | -46.2 | 4.8 | | | |
| | 1640 | 13.91 | 5.40 | | 16.22 | 0.379 | 0.15 | 5.94 | -43.4 | 2.9 | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| MW-11-10-21 / 1715 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
| | 2 - 40 mL Glass VOA | ~~HCl~~ MJB None | Dissolved Gasses (RSK175) |
| | ~~1 - 250 mL Poly~~ MJB 1 - 125mL Poly | $HNO_3$ | Total Fe, Mn, As (SM 6010C) |
| | ~~1 - 250 mL Poly~~ MJB 1 - 125mL Poly | None | Dissolved Fe, Mn (SM 6010C) |
| | ~~1 - 250 mL Poly~~ MJB 1 - 500mL Poly | None | Alkalinity (SM 2320B), Dis $CO_2$, pH, TDS (SM 4500D) |
| | ~~1 - 250 mL Poly~~ MJB 2 - 40mL Glass Vial | ~~$H_2SO_4$~~ MJB HCl | TOC (9060A) |
| | | | |
| | | | |
| | | | |

# MONITORING WELL SAMPLE COLLECTION FORM

| LOCATION | Site: VANG | LocID: MW-11-10 |
|---|---|---|
| | Project Name: Virginia ANG | Project #: 60278122 |

| Date | Time (24 hr) | Method (pump, bail) | Water Level (FTOC) | Volume Removed (L) | Pumping Rate (Lpm) | Temp. (C) | pH | Conduc-tivity (mS/cm) | DO (mg/L) | Turb. (NTU) | Sed. (mg/L) | ORP | Remarks (odor, clarity, etc.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04-05-18 | 1645 | pump | 13.97 | 5.85 | 0.35 | 16.22 | 5.87 | 0.336 | 0.15 | 2.6 | | -38.8 | |
| | 1650 | | 13.94 | 6.30 | | 16.22 | 5.83 | 0.316 | 0.14 | 3.5 | | -35.0 | |
| | 1655 | | 13.97 | 6.75 | | 16.18 | 5.80 | 0.299 | 0.15 | 4.2 | | -31.7 | |
| | 1700 | | 13.99 | 7.20 | | 16.22 | 5.78 | 0.288 | 0.14 | 6.0 | | -29.8 | |
| | 1705 | | 13.97 | 7.65 | | 16.17 | 5.76 | 0.282 | 0.14 | 9.3 | | -29.0 | |
| | 1710 | | 19.95 | 8.10 | | 16.19 | 5.75 | 0.282 | 0.14 | 5.7 | | -27.4 | |

**Pump Rate:** <=0.5 L/min **Drawdown:** < 0.33 ft **Measurements:** 3-5 min **Stabilization:** +/- 0.5 C, +/- 0.1 pH, +/- 3% conductivity, +/- 10% DO, +/- 10% turb (<= 10 NTU ideal) for 3 consecutive readings

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-13-02 | Date: 4/9/18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 8814 | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# A00727 | Water Quality Meter Type: YSI6920 Sonde ID: 27080 | Handset ID: 5982 |
| | PID Type/ID#: Mini RAE 3000, ID# ~~5982~~ MG / R19164 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-up, Monitoring Well | Screen Interval (BTOC): 18.0 to 28.0 | Initial Depth to Water (BTOC): 12.36 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: not available | | Total Depth (BTOC): ~~42~~ MG | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 23.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/9/18 | 0950 | 13.57 | initial | 240 | 11.85 | 0.159 | 4.43 | 6.04 | 77.6 | 332 | 6/4 | 20 | |
| | 0955 | 14.23 | | | 11.95 | 0.137 | 3.83 | 5.95 | 77.1 | 340 | | | |
| | 1000 | 14.49 | | | 12.29 | 0.093 | 2.11 | 5.80 | 80.1 | 260 | | | |
| | 1005 | 14.10 | | 150 | 11.70 | 0.093 | 1.70 | 5.73 | 84.4 | 178 | 7.5/2.5 | 20 | |
| | 1010 | 13.90 | | | 11.60 | 0.095 | 1.43 | 5.56 | 93.4 | 154 | | | |
| | 1015 | 13.90 | | | 11.66 | 0.097 | 1.26 | 5.51 | 94.7 | 145 | | | |
| | 1020 | 13.73 | | | 11.54 | 0.098 | 1.13 | 5.60 | 88.9 | 140 | | | |
| | 1025 | 13.68 | | | 11.50 | 0.097 | 1.04 | 5.62 | 88.0 | 132 | | | |
| | 1030 | 13.66 | | | 11.49 | 0.097 | 0.97 | 5.61 | 88.2 | 130 | | | |
| | 1035 | 13.64 | | | 11.43 | 0.097 | 0.88 | 5.60 | 88.6 | 124 | | | |
| | 1040 | 13.62 | ~2.5 | | 11.53 | 0.096 | 0.84 | 5.63 | 86.8 | 116 | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| MW-13-02-21 @ 1110 | ✓ 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

# MONITORING WELL SAMPLE COLLECTION FORM

| LOCATION | Site: VANG | LocID: MW-13-02 |
|---|---|---|
| | Project Name: | Project #: |

| Date | Time (24 hr) | Method (pump / ~~bail~~) | Water Level (FTOC) | Volume Removed (L) | Pumping Rate (Lpm) | Temp. (C) | pH | Conductivity (mS/cm) | DO (mg/L) | Turb. (NTU) | Sed. (mg/L) | ORP | Remarks (odor, clarity, etc.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/9/18 | 1045 | | 13.60 | | 150 | 11.68 | 5.69 | 0.095 | 0.84 | 112 | — | 84.3 | |
| | 1050 | | 13.59 | | ↓ | 11.69 | 5.74 | 0.098 | 0.83 | 101 | | 82.2 | |
| | 1055 | | 13.59 | | | 11.67 | 5.72 | 0.093 | 0.81 | 98.9 | | 83.3 | |
| | 1100 | | 13.59 | | | 11.63 | 5.70 | 0.092 | 0.79 | 97.1 | | 84.1 | |
| | 1105 | | 13.59 | 3.0 | ↓ | 11.67 | 5.67 | 0.092 | 0.77 | 96.8 | | 85.7 | |
| | 1110 | | COLLECT | | | SAMPLE | | | — | — | — | — | |

**Pump Rate:** <=0.5 L/min **Drawdown:** < 0.33 ft **Measurements:** 3-5 min **Stabilization:** +/- 0.5 C, +/- 0.1 pH, +/- 3% conductivity, +/- 10% DO, +/- 10% turb (<= 10 NTU ideal) for 3 consecutive readings

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-13-05 | Date: 4/3/18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: DB Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# MP50 -1315 | Controller/Compressor: QED MP50 | |
| | Water Level Indicator Type/ID#: Solinst 101, ID# A00727 | Water Quality Meter Type: YSI6920 Sonde ID: 27080 | Handset ID: 5989 |
| | PID Type/ID#: Mini RAE 3000, ID# R19164 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO.** | This is a 2-inch Upper, Stick-Up, Monitoring Well | Screen Interval (BTOC): 18.0 to 28.0 | Initial Depth to Water (BTOC): 12.56 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 10 sec; Discharge = 5 sec; at 20 (psi); Rate = .170 mL/min | | Total Depth (BTOC): 29.90 | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 23.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . DUP | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/3/18 | 1325 | 12.90 | 4.0 | 0.4 | 13.50 | 0.427 | 4.46 | 5.36 | 42.3 | 1119.9 | 10-5 | 40 | |
| | 1330 | 13.05 | 6.0 | 0.4 | 13.55 | 0.410 | 4.37 | 5.50 | 39.0 | 1120.1 | 10-5 | 40 | |
| | 1335 | 13.30 | 8.0 | 0.4 | 13.58 | 0.394 | 4.31 | 5.59 | 38.0 | 1120.4 | 10-5 | 40 | |
| | 1340 | 13.33 | 10.0 | 0.4 | 13.61 | 0.388 | 4.19 | 5.66 | 38.3 | 1120.9 | 10-5 | 40 | |
| | 1345 | 13.50 | 12.0 | 0.4 | 13.63 | 0.382 | 4.25 | 5.72 | 38.1 | 1120.9 | 10-5 | 40 | |
| | 1350 | 13.52 | 14.0 | 0.4 | 13.66 | 0.377 | 4.15 | 5.75 | 38.5 | 1069.1 | 10-5 | 40 | |
| | 1355 | 13.55 | 16.0 | 0.4 | 13.67 | 0.376 | 4.07 | 5.74 | 38.6 | 941.7 | 10-5 | 40 | |
| | 1400 | 13.56 | 18.0 | 0.4 | 13.74 | 0.371 | 4.00 | 5.78 | 39.0 | 614.0 | 10-5 | 40 | |
| | 1405 | 13.56 | 20.0 | 0.4 | 13.77 | 0.370 | 3.99 | 5.79 | 38.9 | 595.0 | 10-5 | 40 | |
| | 1410 | 13.57 | 22.0 | 0.4 | 13.75 | 0.370 | 3.99 | 5.78 | 39.1 | 587.3 | 10-5 | 40 | |
| | 1415 | | Sample | | | | | | | | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| MW-13-05 + Dup | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
| Sample time | | | |
| DB | | | |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-13-07 | Date: 4/9/18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MG Checked By: |

| | | | | |
|---|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# B814 | | Controller/Compressor: QED MP50 | |
| | Water Level Indicator Type/ID#: Solinst 101, ID# A00727 | Water Quality Meter Type: YSI6920 | Sonde ID: 27080 | Handset ID: 5982 |
| | PID Type/ID#: Mini RAE 3000, ID# R19164 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-up, Monitoring Well | Screen Interval (BTOC): 18.0 to 28.0 | Initial Depth to Water (BTOC): 12.74 | Ambient PID (ppm): * |
| | Historic Pump Settings: Refill = 7 sec; Discharge = 3 sec; at 21 (psi); Rate = .160 mL/min | | Total Depth (BTOC): | Well Head PID (ppm): * |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 23.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/9/18 | 1200 | 13.04 | initial | 0.155 | 10.99 | 0.722 | 5.32 | 6.06 | 70.2 | 42.0 | 7/3 | 20 | |
| | 1205 | 12.95 | | | 11.16 | 0.726 | 3.28 | 6.23 | 38.2 | 27.0 | | | |
| | 1210 | 12.95 | | | 11.64 | 0.722 | 2.15 | 6.30 | 20.0 | 22.0 | | | |
| | 1215 | 12.95 | | | 11.96 | 0.728 | 1.45 | 6.37 | 3.3 | 16.3 | | | |
| | 1220 | 12.95 | | | 12.10 | 0.729 | 1.10 | 6.39 | -7.3 | 14.3 | | | |
| | 1225 | 12.95 | | | 11.76 | 0.719 | 0.99 | 6.39 | -16.6 | 13.2 | | | |
| | 1230 | 12.95 | | | 11.80 | 0.708 | 0.86 | 6.36 | -20.4 | 11.1 | | | |
| | 1235 | 12.95 | | | 11.86 | 0.704 | 0.68 | 6.35 | -24.8 | 9.7 | | | |
| | 1240 | 12.95 | | | 11.74 | 0.694 | 0.59 | 6.34 | -28.9 | 8.9 | | | |
| | 1245 | 12.95 | | | 11.83 | 0.687 | 0.53 | 6.33 | -30.6 | 9.2 | | | |
| | 1250 | 12.95 | ~2.25 | | 11.85 | 0.683 | 0.50 | 6.33 | -32.5 | 7.1 | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ±0.5°C, ±3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| MW-13-07-21<br>1255 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

* PID malfunction

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-13-08 | Date: 04-02-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MAB Checked By: |
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 2016 | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# 033178 | Water Quality Meter Type: YSI6920 Sonde ID: 11167 | Handset ID: R12819 |
| | PID Type/ID#: Mini RAE ~~3000~~ 3000, ID# 4523 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-Up, Monitoring Well | Screen Interval (BTOC): 18.0 to 28.0 | Initial Depth to Water (BTOC): 12.11 |
| | Historic Pump Settings: Refill = 10 sec; Discharge = 5 sec; at 18 (psi); Rate = .204 mL/min | Total Depth (BTOC): | Ambient PID (ppm): 0.0 |
| | Condition of Well/Comments: | | Well Head PID (ppm): 0.2 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | Pump Inlet Depth (BTOC): 23.0 |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04-02-18 | ~~1545~~ 1540 | ~~MAB~~ 12.28 | 0.4 | 0.15 | 14.37 | 0.652 | 0.38 | 6.10 | -47.9 | 76.2 | 10/5 | 18 | |
| | 1545 | 12.28 | 0.6 | | 14.42 | 0.659 | 0.32 | 6.12 | -50.8 | 59.9 | | | |
| | 1550 | 12.32 | 0.8 | | 14.48 | 0.665 | 0.29 | 6.12 | -53.2 | 48.0 | | | |
| | 1555 | 12.28 | 1.0 | | 14.55 | 0.672 | 0.26 | 6.13 | -55.6 | 40.9 | | | |
| | 1600 | 12.29 | 1.2 | | 14.62 | 0.677 | 0.25 | 6.13 | -57.5 | 18.8 | | | |
| | 1605 | 12.28 | 1.4 | | 15.10 | 0.689 | 0.22 | 6.15 | -60.9 | 18.2 | | | |
| | 1610 | 12.28 | 1.6 | | 14.94 | 0.688 | 0.21 | 6.15 | -62.2 | 21.8 | | | |
| | 1615 | 12.28 | 1.8 | | 14.99 | 0.689 | 0.20 | 6.14 | -62.3 | 28.8 | | | |
| | 1620 | 12.28 | 2.0 | | 14.98 | 0.691 | 0.19 | 6.14 | -63.0 | 24.4 | | | |
| | 1625 | 12.28 | 2.2 | | 14.97 | 0.701 | 0.18 | 6.15 | -64.6 | 17.5 | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| MW-13-08-21/1630 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-13-11 | Date: 4/5/18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: DB Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 1315 | Controller/Compressor: QED MP50 | |
| | Water Level Indicator Type/ID#: Solinst 101, ID# A00727 | Water Quality Meter Type: YSI6920 Sonde ID: 27080 | Handset ID: 5989 |
| | PID Type/ID#: Mini RAE 3000, ID# R19164 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | ~~This is a 2-inch Upper, Stick-Up, Monitoring Well~~ | Screen Interval (BTOC): 18.0 to 28.0 | Initial Depth to Water (BTOC): 9.95 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 11 sec; Discharge = 4 sec; at 18 (psi); Rate = .125 mL/min | | Total Depth (BTOC): 20.10 | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 23.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . Flush mount | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/5/18 | 0955 | 10.75 | 4.0 | 0.4 | 13.24 | 0.872 | 2.59 | 6.38 | 41.4 | 324.5 | 10-5 | 40 | |
| | 1000 | 10.80 | 6.0 | 0.4 | 13.52 | 0.875 | 2.59 | 6.40 | 19.0 | 324.7 | 10-5 | 40 | |
| | 1005 | 11.20 | 8.0 | 0.4 | 13.58 | 0.853 | 2.64 | 6.42 | 0.0 | 269.6 | 10-5 | 40 | |
| | 1010 | 11.29 | 10.0 | 0.4 | 13.65 | 0.839 | 2.87 | 6.41 | -15.4 | 129.9 | 10-5 | 40 | |
| | 1015 | 11.31 | 12.0 | 0.4 | 13.82 | 0.830 | 2.80 | 6.41 | -22.2 | 110.5 | 10-5 | 40 | |
| | 1020 | 11.30 | 14.0 | 0.4 | 13.92 | 0.818 | 2.79 | 6.39 | -27.7 | 145.9 | 10-5 | 40 | |
| | 1025 | 11.30 | 16.0 | 0.4 | 13.90 | 0.795 | 2.78 | 6.37 | -30.6 | 99.3 | 10-5 | 40 | |
| | 1030 | 11.31 | 18.0 | 0.4 | 14.02 | 0.761 | 2.75 | 6.36 | -32.6 | 147.8 | 10-5 | 40 | |
| | 1035 | 11.29 | 20.0 | 0.4 | 14.04 | 0.758 | 2.67 | 6.37 | -32.7 | 156.3 | 10-5 | 40 | |
| | 1040 | 11.30 | 22.0 | 0.4 | 14.05 | 0.759 | 2.66 | 6.32 | -32.7 | 146.5 | 10-5 | 40 | |
| | 1045 | Sample | | | | | | | | | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| MW-13-11-21 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
| 1045 Sample Time | 2 - 40 mL Glass VOA | HCl | Dissolved Gasses (RSK175) |
| DB | 1 - 250 mL Poly | $HNO_3$ | Total Fe, Mn, As (SM 6010C) |
| | 1 - 250 mL Poly | None | Dissolved Fe, Mn (SM 6010C) - Filter |
| | 1 - 250 mL Poly | None | Alkalinity (SM 2320B), Dis $CO_2$, pH, TDS (SM 4500D) |
| | 2 - 250 mL Poly | $H_2SO_4$ | TOC (9060A) |
| | | | Deploy Biotrap |
| | | | |
| | | | |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-13-17 | Date: 4/6/18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: DB Checked By: |
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 1315 | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# A00727 | Water Quality Meter Type: YSI6920 Sonde ID: 27080 | Handset ID: 5985 |
| | PID Type/ID#: Mini RAE 3000, ID# R19164 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |
| **WELL & SAMPLING INFO** | This is a -inch Upper, Flushmount, Monitoring Well | Screen Interval (BTOC): 18.0 to 28.0 | Initial Depth to Water (BTOC): 9.32 / Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 10 sec; Discharge = 5 sec; at 20 (psi); Rate = .200 mL/min | | Total Depth (BTOC): 26.80 / Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | Pump Inlet Depth (BTOC): 23.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . MS/MSD | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed L (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/6/18 | 1155 | 11.48 | 3.0 | 0.3 | 15.25 | 0.635 | 5.65 | 6.34 | 6.4 | 61.4 | 10-5 | 40 | |
| | 1200 | 11.69 | 4.5 | 0.3 | 15.42 | 0.668 | 5.40 | 6.35 | -16.0 | 45.3 | 10-5 | 40 | |
| | 1205 | 11.83 | 6.0 | 0.3 | 15.44 | 0.679 | 5.33 | 6.43 | -18.7 | 43.9 | 10-5 | 40 | |
| | 1210 | 11.97 | 7.5 | 0.3 | 15.63 | 0.756 | 4.95 | 6.46 | -29.4 | 50.5 | 10-5 | 40 | |
| | 1215 | 12.05 | 9.0 | 0.3 | 15.61 | 0.778 | 4.83 | 6.51 | -32.1 | 54.5 | 10-5 | 40 | |
| | 1220 | 12.09 | 10.5 | 0.3 | 15.66 | 0.813 | 4.65 | 6.50 | -35.5 | 64.7 | 10-5 | 40 | |
| | 1225 | 12.17 | 12.0 | 0.3 | 15.75 | 0.846 | 4.34 | 6.51 | -41.9 | 69.7 | 10-5 | 40 | |
| | 1230 | 12.18 | 13.5 | 0.3 | 15.79 | 0.860 | 4.19 | 6.51 | -40.8 | 67.1 | 10-5 | 40 | |
| | 1235 | 12.18 | 15.0 | 0.3 | 15.80 | 0.876 | 4.12 | 6.51 | -41.7 | 65.4 | 10-5 | 40 | |
| | 1240 | 12.19 | 16.5 | 0.3 | 15.84 | 0.881 | 4.06 | 6.51 | -42.9 | 62.3 | 10-5 | 40 | |
| | 1245 | — Sample | | | | | | | | | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| MW-13-17-21<br>MW-13-17-21-MS<br>MW-13-17-21-MSD<br>1245 Sample Time<br>DB | 9 x 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

# Monitoring Well Sample Collection Form

AECOM



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-13-19 | Date: 4/9/18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MG Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 8814 | Controller/Compressor: QED MP50 | |
| | Water Level Indicator Type/ID#: Solinst 101, ID# A00727 | Water Quality Meter Type: YSI6920 Sonde ID: 27080 | Handset ID: 5982 |
| | PID Type/ID#: Mini RAE 3000, ID# R19164 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | |
|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Flushmount, Monitoring Well | Screen Interval (BTOC): 18.0 to 28.0 | Initial Depth to Water (BTOC): 9.59 BTOC |
| | Historic Pump Settings: not available | Total Depth (BTOC): | Ambient PID (ppm): * |
| | Condition of Well/Comments: | | Well Head PID (ppm): * |
| | NOTE: Please note any significant location information; Sampling note(s) - Field Dup | | Pump Inlet Depth (BTOC): ~~23.0~~ 23.5 |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/9/18 | 1355 | 9.78 | initial | 0.125 | 13.96 | 0.441 | 6.18 | 6.03 | 26.6 | 28.1 | 7/3 | 20 | |
| | 1400 | 9.78 | | | 13.57 | 0.439 | 3.77 | 5.64 | 24.2 | 13.7 | | | |
| | 1405 | 9.78 | | | 13.54 | 0.429 | 2.56 | 5.55 | 16.0 | 9.3 | | | |
| | 1410 | 9.78 | | | 13.54 | 0.419 | 1.88 | 5.58 | 8.0 | 6.4 | | | |
| | 1415 | 9.78 | | | 13.76 | 0.404 | 1.30 | 5.75 | -7.2 | 9.1 | | | |
| | 1420 | 9.78 | | | 13.79 | 0.396 | 1.11 | 5.79 | -10.8 | 6.9 | | | |
| | 1425 | 9.78 | | | 13.87 | 0.388 | 0.94 | 5.80 | -12.2 | 5.1 | | | |
| | 1430 | 9.78 | | | 13.95 | 0.381 | 0.83 | 5.78 | -12.4 | 4.7 | | | |
| | 1435 | 9.78 | | | 13.93 | 0.377 | 0.78 | 5.80 | -13.3 | 4.5 | | | |
| | 1440 | 9.78 | ~2.0 | | 13.77 | 0.374 | 0.76 | 5.77 | -11.8 | 7.4 | | | |
| | 1445 | COLLECT | | | SAMPLE | | | | | | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ±0.5°C, ±3% Conductivity; ± 10% DO; ±0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| MW-13-19-21<br>1445 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

*PID malfunction

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: MW-13-20 | Date: 4/6/18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: DB Checked By: |
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 1315 | Controller/Compressor: QED MP50 | |
| | Water Level Indicator Type/ID#: Solinst 101, ID# A00727 | Water Quality Meter Type: YSI6920 Sonde ID: 27080 | Handset ID: 5989 |
| | PID Type/ID#: Mini RAE 3000, ID# R19164 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |
| **WELL & SAMPLING INFO** | This is a 2-inch Lower, Flushmount, Monitoring Well | Screen Interval (BTOC): 35.0 to 50.0 | Initial Depth to Water (BTOC): 13.55 |
| | Historic Pump Settings: Refill = 8 sec; Discharge = 7 sec; at 20 (psi); Rate = .150 mL/min | | Total Depth (BTOC): 51.95 |
| | Condition of Well/Comments: | | |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | |

| Ambient PID (ppm): | 0.0 |
|---|---|
| Well Head PID (ppm): | 0.0 |
| Pump Inlet Depth (BTOC): | 43.0 |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/6/18 | 1010 | 13.59 | 3.0 | 0.3 | 14.82 | 0.328 | 1.26 | 6.21 | 51.6 | 78.5 | 10-5 | 40 | |
| | 1015 | 13.60 | 4.5 | 0.3 | 14.78 | 0.332 | 0.73 | 6.35 | 36.0 | 67.3 | 10-5 | 40 | |
| | 1020 | 13.60 | 6.0 | 0.3 | 14.75 | 0.333 | 0.54 | 6.40 | 26.5 | 67.4 | 10-5 | 40 | |
| | 1025 | 13.62 | 7.5 | 0.3 | 14.89 | 0.333 | 0.44 | 6.43 | 17.6 | 62.9 | 10-5 | 40 | |
| | 1030 | 13.63 | 9.0 | 0.3 | 14.96 | 0.334 | 0.37 | 6.49 | 3.3 | 45.4 | 10-5 | 40 | |
| | 1035 | 13.58 | 10.5 | 0.3 | 14.82 | 0.335 | 0.33 | 6.51 | -4.2 | 39.0 | 10-5 | 40 | |
| | 1040 | 13.59 | 12.0 | 0.3 | 14.80 | 0.333 | 0.31 | 6.50 | -10.4 | 35.7 | 10-5 | 40 | |
| | 1045 | 13.59 | 13.5 | 0.3 | 15.00 | 0.332 | 0.29 | 6.49 | -15.5 | 29.3 | 10-5 | 40 | |
| | 1050 | 13.58 | 15.0 | 0.3 | 14.97 | 0.331 | 0.27 | 6.53 | -17.9 | 22.9 | 10-5 | 40 | |
| | 1055 | 13.59 | 16.5 | 0.3 | 15.00 | 0.332 | 0.26 | 6.54 | -25.4 | 20.5 | 10-5 | 40 | |
| | 1100 | Sample | | | | | | | | | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| mw-13-20-21 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
| 1100 sample time | 1 - 250 mL Poly | None | Alkalinity (SM 2320B) |
| DB | 1 - 250 mL Poly | $H_2SO_4$ | TOC (9060A) |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: **VANG** | LocID: **RD5-MW01** | Date: 4/5/18 |
| | Project Name: **Virginia ANG** | Project Number: **60278122** | Recorded By: DB Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: **QED Sample Pro Bladder Pump - ID#** 1315 | Controller/Compressor: **QED MP50** | |
| | Water Level Indicator Type/ID#: **Solinst 101, ID#** A00727 | Water Quality Meter Type: **YSI6920** Sonde ID: 27080 | Handset ID: 5989 |
| | PID Type/ID#: **Mini RAE 3000, ID#** R19164 | Equipment Decon: **Potable Water/Liquinox wash, potable water rinse, DI rinse** | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | **This is a 2-inch Upper, Stick-Up, Monitoring Well** | Screen Interval (BTOC): **13.0 to 23.0** | Initial Depth to Water (BTOC): 9.23 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: **Refill = 11.5 sec; Discharge = 3.5 sec; at 18 (psi); Rate = .200 mL/min** | | Total Depth (BTOC): 23.40 | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): **18.0** |
| | NOTE: **Please note any significant location information; Sampling note(s) - .** | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/5/18 | 1545 | 9.46 | 4.0 | 0.4 | 12.15 | 0.073 | 2.04 | 3.36 | 149.5 | 65.0 | 10-5 | 40 | |
| | 1550 | 9.54 | 6.0 | 0.4 | 12.01 | 0.073 | 2.80 | 3.40 | 153.9 | 51.9 | 10-5 | 40 | |
| | 1555 | 9.55 | 8.0 | 0.4 | 12.02 | 0.073 | 2.65 | 3.32 | 158.7 | 44.7 | 10-5 | 40 | |
| | 1600 | 9.54 | 10.0 | 0.4 | 11.95 | 0.073 | 2.49 | 3.42 | 159.0 | 43.6 | 10-5 | 40 | |
| | 1605 | 9.54 | 12.0 | 0.4 | 11.97 | 0.072 | 2.13 | 3.44 | 160.5 | 41.2 | 10-5 | 40 | |
| | 1610 | 9.54 | 14.0 | 0.4 | 11.99 | 0.071 | 1.87 | 3.50 | 159.5 | 39.3 | 10-5 | 40 | |
| | 1615 | 9.54 | 16.0 | 0.4 | 12.04 | 0.070 | 1.68 | 3.56 | 159.2 | 38.0 | 10-5 | 40 | |
| | 1620 | 9.54 | 18.0 | 0.4 | 12.03 | 0.070 | 1.70 | 3.58 | 160.5 | 32.5 | 10-5 | 40 | |
| | 1625 | 9.54 | 20.0 | 0.4 | 12.04 | 0.069 | 1.62 | 3.58 | 159.8 | 31.1 | 10-5 | 40 | |
| | 1630 | 9.54 | 22.0 | 0.4 | 12.09 | 0.069 | 1.61 | 3.59 | 159.9 | 30.7 | 10-5 | 40 | |
| | 1635 | — Sample | | | | | | | | | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| RD5-MW01-21 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
| 1635 sample time | 2 - 40 mL Glass VOA | HCl | Dissolved Gasses (RSK175) |
| DB | 1 - 250 mL Poly | $HNO_3$ | Total Fe, Mn, As (SM 6010C) |
| | 1 - 250 mL Poly | None | Dissolved Fe, Mn (SM 6010C) - Filtered |
| | 1 - 250 mL Poly | None | Alkalinity (SM 2320B), Dis $CO_2$, pH, TDS (SM 4500D) |
| | ~~2 - 250 mL Poly~~ 40 mL VOA | $H_2SO_4$ | TOC (9060A) |
| | | | |
| | | | |
| | | | |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: S4-MW16 | Date: 4-4-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MK Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# | | Controller/Compressor: QED 3020 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# | Water Quality Meter Type: YSI6920 | Sonde ID: Handset ID: |
| | PID Type/ID#: Mini RAE 3000, ID# | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Lower, Stick-up, Monitoring Well | Screen Interval (BTOC): 29.5 to 39.5 | Initial Depth to Water (BTOC): 16.14 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 10 sec; Discharge = 5 sec; at 20 (psi); Rate = 130 mL/min | | Total Depth (BTOC): | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 35.5 |
| | NOTE: Please note any significant location information; Sampling note(s) - Field Dup/MS/MSD | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-4-18 | 0920 | 16.24 | | 140 | 16.50 | 0.073 | 5.24 | 5.37 | 194.8 | -1.7 | 10/5 | 18 | |
| | 0925 | 16.38 | | 200 | 15.37 | 0.058 | 3.92 | 4.93 | 245.9 | -1.1 | | 20 | |
| | 0930 | 16.34 | | | 15.42 | 0.057 | 3.60 | 4.93 | 246.6 | -1.8 | | | |
| | 0935 | 16.32 | | | 15.46 | 0.059 | 2.39 | 5.15 | 234.3 | -1.7 | | | |
| | 0940 | 16.37 | | | 15.49 | 0.063 | 1.69 | 5.17 | 235.7 | -0.1 | | | |
| | 0945 | 16.38 | | | 15.62 | 0.071 | 1.49 | 5.14 | 258.5 | 8.7 | | | |
| | 0950 | 16.34 | | | 15.64 | 0.076 | 1.20 | 5.12 | 281.8 | 20.2 | | | |
| | 0955 | 16.37 | | | 15.72 | 0.079 | 1.09 | 5.11 | 303.8 | 27.8 | | | |
| | 1000 | 16.35 | | | 15.86 | 0.081 | 1.01 | 5.11 | 311.6 | 22.8 | | | |
| | 1005 | 16.36 | | | 15.90 | 0.081 | 0.93 | 5.11 | 317.8 | 30.1 | | | |
| | 1010 | | | | 15.72 | 0.082 | 0.92 | 5.10 | 318.2 | 27.9 | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time 1015 | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: S4-MW24 | Date: 4-4-16 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MK Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# | Water Quality Meter Type: YSI6920 Sonde ID: | Handset ID: |
| | PID Type/ID#: Mini RAE 3000, ID# | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-up, Monitoring Well | Screen Interval (BTOC): 13.0 to 23.0 | Initial Depth to Water (BTOC): 16.49 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: not available | | Total Depth (BTOC): | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 18.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - Conductivity remained the same through purging - passed test with calibration buffer | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-4-16 | 1105 | 16.72 | | 300 | 15.91 | 0.044 | 3.82 | 4.97 | 221.6 | 151.1 | 10/5 | 20 | |
| | 1110 | 16.69 | | 140 | 14.45 | 0.039 | 2.51 | 4.30 | 316.5 | 89.5 | | 15 | |
| | 1115 | 16.73 | | 200 | 14.39 | 0.039 | 2.30 | 4.39 | 322.7 | 90.1 | | 18 | |
| | 1120 | 16.68 | | 200 | 14.36 | 0.039 | 1.85 | 4.55 | 321.1 | 71.1 | | 18 | |
| | 1125 | 16.64 | | | 14.52 | 0.039 | 1.55 | 4.65 | 318.9 | 55.7 | | | |
| | 1130 | 16.67 | | | 14.64 | 0.039 | 1.23 | 4.70 | 318.0 | 39.7 | | | |
| | 1135 | 16.66 | | | 14.67 | 0.039 | 1.03 | 4.72 | 317.1 | 26.3 | | | |
| | 1140 | 16.73 | | | 14.77 | 0.039 | 0.89 | 4.73 | 316.9 | 17.6 | | | |
| | 1145 | 16.68 | | | 14.89 | 0.039 | 0.78 | 4.75 | 316.8 | 12.4 | | | |
| | 1150 | 16.71 | | | 14.95 | 0.039 | 0.71 | 4.75 | 317.0 | 8.8 | | | |
| | 1155 | 16.69 | | | 15.05 | 0.039 | 0.68 | 4.77 | 317.1 | 4.5 | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| 1205 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: S4-MW27 | Date: 4-4-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MK Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# | Water Quality Meter Type: YSI6920 Sonde ID: | Handset ID: |
| | PID Type/ID#: Mini RAE 3000, ID# | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-up, Monitoring Well | Screen Interval (BTOC): 13.0 to 23.0 | Initial Depth to Water (BTOC): 15.69 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: not available | | Total Depth (BTOC): | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 18.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-4-18 | 1450 | 16.27 | | 160 | 15.08 | 0.033 | 1.51 | 4.47 | 458.4 | 26.3 | 10/5 | 15 | |
| | 1455 | 16.96 | | 200 | 14.27 | 0.033 | 0.97 | 4.45 | 499.1 | 9.9 | | 17 | |
| | 1500 | 17.68 | | | 13.82 | 0.033 | 1.16 | 4.70 | 275.9 | 7.9 | | | |
| | 1505 | 17.71 | | | 14.33 | 0.032 | 2.18 | 4.90 | 260.0 | 27.1 | | | |
| | 1510 | 17.70 | | | 14.71 | 0.032 | 3.04 | 4.92 | 274.4 | 16.7 | | | |
| | 1515 | 17.72 | | | 15.11 | 0.032 | 3.38 | 4.97 | 284.9 | 12.8 | | | |
| | 1520 | 17.70 | | | 15.16 | 0.032 | 3.39 | 4.97 | 295.9 | 8.7 | | | |
| | 1525 | 17.67 | | | 15.27 | 0.032 | 3.09 | 4.87 | 306.2 | 6.7 | | | |
| | 1530 | 17.69 | | | 15.34 | 0.033 | 2.90 | 4.87 | 308.3 | 6.1 | | | |
| | 1535 | 17.64 | | | 15.38 | 0.033 | 2.71 | 4.81 | 314.4 | 8.1 | | | |
| | 1540 | 17.73 | | | 15.47 | 0.033 | 2.56 | 4.84 | 317.3 | 16.7 | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ±0.5°C, ±3% Conductivity; ±10% DO; ±0.1 pH; ±10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time 1605 | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
| | | | |
| | | | |
| | | | |
| | | | |
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| | | | |

# MONITORING WELL SAMPLE COLLECTION FORM

| LOCATION | Site: VANG | LocID: S4-MW27-21 |
|---|---|---|
| | Project Name: VANG Sampling Event #21 | Project #: |

| Date | Time (24 hr) | Method (pump, bail) | Water Level (FTOC) | Volume Removed (L) | Pumping Rate (Lpm) | Temp. (C) | pH | Conduc-tivity (mS/cm) | DO (mg/L) | Turb. (NTU) | Sed. (mg/L) | ORP | Remarks (odor, clarity, etc.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-4-16 | 1545 | | | | 200 | 15.78 | 4.87 | 0.033 | 2.48 | 14.8 | | 317.3 | |
| | 1550 | | | | | 15.84 | 4.83 | 0.033 | 2.39 | 12.1 | | 327.3 | |
| | 1555 | | | | | 15.68 | 4.91 | 0.033 | 2.38 | 9.3 | | 321.6 | |
| | 1600 | | | | | | | | | | | | |

**Pump Rate:** <=0.5 L/min **Drawdown:** < 0.33 ft **Measurements:** 3-5 min **Stabilization:** +/- 0.5 C, +/- 0.1 pH, +/- 3% conductivity, +/- 10% DO, +/- 10% turb (<= 10 NTU ideal) for 3 consecutive readings

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: S4-MW28 | Date: 4.5.18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: AC Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 10346 | | Controller/Compressor: QED MP50 # 27886 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# 035574 | Water Quality Meter Type: YSI 6820 | Sonde ID: 10968 Handset ID: R12831 |
| | PID Type/ID#: Mini RAE 3000, ID# R19164 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a -inch Lower, Flushmount, Monitoring Well | Screen Interval (BTOC): 35.0 to 45.0 | Initial Depth to Water (BTOC): 16.74 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: not available | | Total Depth (BTOC): | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: Both bolts broken | | | Pump Inlet Depth (BTOC): 40.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - Record pump settings during next event. | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1040 | 16.80 | — | .150 | 13.75 | 0.002 | 11.64 | 4.82 | 235.6 | 20.7 | 10 | 15 | 23 |
| | 1045 | | .750 | | 18.05 | 0.034 | 5.84 | 5.04 | 230.3 | 18.9 | | | |
| | 1050 | | 1.5 | | 17.94 | 0.034 | 5.60 | 5.01 | 239.8 | 4.9 | | | |
| | 1055 | | 2.25 | | 18.07 | 0.034 | 5.87 | 4.98 | 247.7 | 1.4 | | | |
| | 1100 | | 3.0 | | 17.95 | 0.034 | 5.92 | 4.97 | 249.7 | 1.7 | | | |
| | 1105 | | 3.75 | | 17.92 | 0.034 | 6.14 | 4.96 | 252.1 | 2.8 | | | |
| | 1110 | | 4.5 | | 17.87 | 0.033 | 6.39 | 4.95 | 257.3 | 3.6 | | | |
| | 1115 | | 5.25 | | 17.99 | 0.033 | 6.59 | 4.98 | 257.5 | 3.2 | | | |
| | 1120 | | 6.0 | | 17.88 | 0.033 | 6.62 | 5.00 | 258.5 | 2.6 | | | |
| | 1125 | | 6.75 | | 17.48 | 0.033 | 6.66 | 4.96 | 262.4 | 2.3 | | | |
| | 1130 | Sample | | | | | | | | | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| S4-MW28-21 @1130 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: S4-MW37 | Date: 4.5.18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: AG Checked By: |
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 10346 | Controller/Compressor: QED 3020 # 27886 | |
| | Water Level Indicator Type/ID#: Solinst 101, ID# 035574 | Water Quality Meter Type: YSI6820 Sonde ID: 10968 | Handset ID: R12831 |
| | PID Type/ID#: Mini RAE 3000, ID# R19164 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-up, Monitoring Well | Screen Interval (BTOC): 12.0 to 27.0 | Initial Depth to Water (BTOC): 17.56 |
| | Historic Pump Settings: not available | | Total Depth (BTOC): |
| | Condition of Well/Comments: one broken bolt, mud in vault. | | Ambient PID (ppm): 0.0 |
| | | | Well Head PID (ppm): 0.0 |
| | | | Pump Inlet Depth (BTOC): ~~20.0~~ 24 |
| | NOTE: Please note any significant location information; Sampling note(s).. H2O level was below screen when first gauged. lowered pump inlet depth as a result. | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed ~~liter(gallons)~~ | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.5.18 | ~~0825~~ 0925 | 17.75 | — | .150 | 16.19 | 0.087 | 5.53 | 6.57 | 178.9 | 139.6 | 10 15 | 17 | |
| | 0930 | 17.80 | .750 | | 16.77 | 0.047 | 3.04 | 5.39 | 194.4 | 140.4 | | | |
| | 0935 | 17.80 | 1.5 | | 17.87 | 0.040 | 2.68 | 4.93 | 214.9 | 125.8 | | | |
| | 0940 | 17.85 | 2.25 | | 18.00 | 0.038 | 2.58 | 4.75 | 228.1 | 73.3 | | | |
| | 0945 | | 3.0 | | 18.14 | 0.037 | 2.45 | 4.69 | 241.9 | 36.5 | | | |
| | 0950 | | 3.75 | | 18.29 | 0.037 | 2.31 | 4.65 | 248.2 | 24.1 | | | |
| | 0955 | | 4.5 | | 18.44 | 0.036 | 2.28 | 4.65 | 253.3 | 21.0 | | | |
| | 1000 | | 5.25 | | 18.48 | 0.036 | 2.09 | 4.61 | 260.5 | 14.6 | | | |
| | 1005 | | 6.0 | | 18.34 | 0.036 | 2.00 | 4.62 | 265.0 | 12.6 | | | |
| | 1010 | | 6.75 | | 18.38 | 0.036 | 2.01 | 4.58 | 269.1 | 9.7 | | | |
| | 1015 | Sample | | | | | | | | | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; **Measurements:** every 3 - 5 min; **Stabilization is defined as the following for 3 consecutive readings:** ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| S4-MW37-21 @1015 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: S4-MW38 | Date: 4/4/18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: DB Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 1315 | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# A00727 | Water Quality Meter Type: YSI6920 Sonde ID: 27080 | Handset ID: 5989 |
| | PID Type/ID#: Mini RAE 3000, ID# R19164 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Lower, Flushmount, Monitoring Well | Screen Interval (BTOC): 35.0 to 50.0 | Initial Depth to Water (BTOC): 14.15 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 10 sec; Discharge = 5 sec; at 70 (psi); Rate = 110 mL/min | | Total Depth (BTOC): 50.8 | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 43.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - Previous sampling said 70 psi was too high | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/4/18 | 1510 | 14.28 | 3.0 | 0.3 | 18.41 | 0.071 | 0.43 | 4.68 | 130.5 | 75.4 | 10-5 | 40 | |
| | 1515 | 14.27 | 4.5 | 0.3 | 18.49 | 0.070 | 0.36 | 4.74 | 125.8 | 61.4 | 10-5 | 40 | |
| | 1520 | 14.27 | 6.0 | 0.3 | 18.36 | 0.067 | 0.29 | 4.76 | 122.1 | 38.3 | 10-5 | 40 | |
| | 1525 | 14.27 | 7.5 | 0.3 | 18.41 | 0.066 | 0.27 | 4.72 | 122.9 | 31.4 | 10-5 | 40 | |
| | 1530 | 14.26 | 9.0 | 0.3 | 18.38 | 0.063 | 0.24 | 4.66 | 121.2 | 21.8 | 10-5 | 40 | |
| | 1535 | 14.28 | 10.5 | 0.3 | 18.34 | 0.062 | 0.22 | 4.67 | 121.0 | 16.6 | 10-5 | 40 | |
| | 1540 | 14.28 | 12.0 | 0.3 | 18.40 | 0.062 | 0.22 | 4.70 | 120.3 | 14.8 | 10-5 | 40 | |
| | 1545 | 14.28 | 13.5 | 0.3 | 18.52 | 0.061 | 0.21 | 4.76 | 114.4 | 12.5 | 10-5 | 40 | |
| | 1550 | 14.28 | 15.0 | 0.3 | 18.47 | 0.060 | 0.20 | 4.67 | 115.7 | 11.0 | 10-5 | 40 | |
| | 1555 | 14.28 | 16.5 | 0.3 | 18.35 | 0.060 | 0.20 | 4.68 | 115.9 | 10.7 | 10-5 | 40 | |
| | 1600 | | | | | | | | | | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| S4-MW38<br>1600 Sample time<br>DB | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: S4-MW41 | Date: 4/4/18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: DB Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 131 | | Controller/Compressor: QED 3020 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# A00727 | Water Quality Meter Type: YSI6920 Sonde ID: 27080 | Handset ID: 5989 |
| | PID Type/ID#: Mini RAE 3000, ID# 219164 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-up, Monitoring Well | Screen Interval (BTOC): 13.0 to 28.0 | Initial Depth to Water (BTOC): 18.1 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 12 sec; Discharge = 3 sec; at 12 (psi); Rate = 50 mL/min | | Total Depth (BTOC): 31.2 | Well Head PID (ppm): 0.1 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 21.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . Top of stickup is bent. does not fit properly over well. | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/4/18 | 1045 | 18.47 | 4.0 | 0.4 | 16.24 | 0.061 | 3.14 | 3.65 | 163.0 | 135.4 | 10-5 | 40 | |
| | 1050 | 18.51 | 6.0 | 0.4 | 16.29 | 0.060 | 2.77 | 3.48 | 169.9 | 192.3 | 10-5 | 40 | |
| | 1055 | 18.55 | 8.0 | 0.4 | 16.32 | 0.060 | 2.48 | 3.42 | 163.5 | 129.8 | 10-5 | 40 | |
| | 1100 | 18.59 | 10.0 | 0.4 | 16.39 | 0.060 | 2.53 | 3.50 | 159.0 | 107.9 | 10-5 | 40 | |
| | 1105 | 18.60 | 12.0 | 0.4 | 16.41 | 0.060 | 2.36 | 3.64 | 152.2 | 87.3 | 10-5 | 40 | |
| | 1110 | 18.59 | 14.0 | 0.4 | 16.37 | 0.060 | 2.52 | 3.70 | 146.9 | 65.2 | 10-5 | 40 | |
| | 1115 | 18.59 | 16.0 | 0.4 | 16.43 | 0.060 | 2.08 | 3.69 | 147.0 | 47.9 | 10-5 | 40 | |
| | 1120 | 18.60 | 18.0 | 0.4 | 16.51 | 0.060 | 2.37 | 3.68 | 144.8 | 38.7 | 10-5 | 40 | |
| | 1125 | 18.60 | 20.0 | 0.4 | 16.55 | 0.060 | 2.24 | 3.73 | 143.5 | 29.5 | 10-5 | 40 | |
| | 1130 | 18.60 | 22.0 | 0.4 | 16.57 | 0.060 | 2.33 | 3.75 | 141.4 | 28.1 | 10-5 | 40 | |
| | 1135 | — | Sample | — | | | | | | | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| S4-MW41<br>1135 Sample time<br>DB | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: S4-MW42 | Date: 4/4/18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: DB Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 1315 | Controller/Compressor: QED MP50 | |
| | Water Level Indicator Type/ID#: Solinst 101, ID# A00727 | Water Quality Meter Type: YSI6920 Sonde ID: 27080 | Handset ID: 5989 |
| | PID Type/ID#: Mini RAE 3000, ID# R19164 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Lower, Stick-up, Monitoring Well | Screen Interval (BTOC): 32.0 to 47.0 | Initial Depth to Water (BTOC): 17.84 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 10.5 sec; Discharge = 4.5 sec; at 23 (psi); Rate = 60 mL/min | | Total Depth (BTOC): 50.70 | Well Head PID (ppm): 0.1 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 40.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - Field Dup; Previous pump inlet depth 47' btoc | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/4/18 | 0905 | 18.01 | 1.5 | 0.350 | 16.98 | 0.052 | 1.90 | 3.88 | 193.0 | 252.4 | 10-5 | 40 | |
| | 0910 | 18.01 | 5.25 | 0.350 | 17.00 | 0.051 | 1.88 | 4.08 | 175.2 | 83.4 | 10-5 | 40 | |
| | 0915 | 18.00 | 7.0 | 0.350 | 17.02 | 0.050 | 1.85 | 4.20 | 167.0 | 65.7 | 10-5 | 40 | |
| | 0920 | 18.01 | 8.75 | 0.350 | 17.02 | 0.050 | 1.83 | 4.25 | 163.3 | 53.4 | 10-5 | 40 | |
| | 0925 | 18.01 | 10.5 | 0.350 | 17.02 | 0.050 | 1.80 | 4.34 | 157.1 | 43.1 | 10-5 | 40 | |
| | 0930 | 18.01 | 12.25 | 0.350 | 17.05 | 0.049 | 1.79 | 4.33 | 157.2 | 41.6 | 10-5 | 40 | |
| | 0935 | 18.00 | 14.00 | 0.350 | 17.04 | 0.049 | 1.76 | 4.37 | 153.8 | 32.7 | 10-5 | 40 | |
| | 0940 | 18.00 | 15.75 | 0.350 | 17.08 | 0.049 | 1.74 | 4.41 | 150.7 | 24.4 | 10-5 | 40 | |
| | 0945 | 18.00 | 17.50 | 0.350 | 17.09 | 0.049 | 1.73 | 4.41 | 149.1 | 25.1 | 10-5 | 40 | |
| | 0950 | 18.00 | 19.25 | 0.350 | 17.10 | 0.049 | 1.71 | 4.45 | 146.7 | 24.4 | 10-5 | 40 | |
| | 0955 | | Sample | | | | | | | | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ±0.5°C, ±3% Conductivity; ±10% DO; ±0.1 pH; ±10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| S4-MW42-21 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
| 0955 Sample Time | | | |
| DB | | | |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: S4-MW46 | Date: 4.5.18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: AG Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 10346 | Controller/Compressor: QED 3020 # 27886 | |
| | Water Level Indicator Type/ID#: Solinst 101, ID# 035574 | Water Quality Meter Type: YSI6820 Sonde ID: 10968 | Handset ID: R12831 |
| | PID Type/ID#: Mini RAE 3000, ID# R19164 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-up, Monitoring Well | Screen Interval (BTOC): 17.0 to 32.0 | Initial Depth to Water (BTOC): 15.50 ? | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 10 sec; Discharge = 5 sec; at 20 (psi); Rate = 170 mL/min | | Total Depth (BTOC): | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 25.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | water level indicator not working. Got level to work but had to let it sit in water for 60sec + then it would make noise. | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (~~liters~~ gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.5.18 | 1220 | 2 | — | .200 | 15.19 | 0.034 | 10.90 | 5.46 | 202.7 | 143.6 | 10/5 | 17 | |
| | 1225 | ↓ | 1.0 | ↓ | 15.30 | 0.029 | 9.70 | 4.65 | 254.5 | 92.4 | 10/5 | ↓ | |
| | 1230 | | 2.0 | | 15.41 | 0.029 | 9.32 | 4.79 | 252.0 | 79.2 | ↓ | | |
| | 1235 | | 3.0 | | 15.48 | 0.029 | 9.03 | 4.86 | 252.7 | 67.2 | | | |
| | 1240 | ↓ | 4.0 | | 15.46 | 0.029 | 8.67 | 4.95 | 252.7 | 56.7 | | | |
| | 1245 | | 5.0 | | 15.63 | 0.029 | 8.32 | 4.95 | 255.0 | 48.0 | | | |
| | 1250 | 15.50 | 6.0 | | 15.62 | 0.029 | 8.06 | 4.95 | 258.3 | 40.2 | | | |
| | 1255 | ↓ | 7.0 | | 15.26 | 0.029 | 7.74 | 4.87 | 266.2 | 33.9 | | | |
| | 1300 | | 8.0 | | 15.33 | 0.029 | 7.54 | 4.90 | 266.6 | 35.9 | | | |
| | 1305 | ↓ | 9.0 | ↓ | 15.26 | 0.029 | 7.34 | 4.90 | 267.8 | 31.3 | ↓ | ↓ | |
| | 1310 | | | | | | | | | | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ±0.5°C, ±3% Conductivity; ± 10% DO; ±0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| S4-MW46-21 @1310 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: S4-MW47 | Date: 4.5.17 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: AG Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 10346 | | Controller/Compressor: QED 3020 # 27886 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# 035574 | Water Quality Meter Type: YSI 6920 Sonde ID: 10968 | Handset ID: R12831 |
| | PID Type/ID#: Mini RAE 3000, ID# R19164 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Lower, Stick-up, Monitoring Well | Screen Interval (BTOC): 32.0 to 47.0 | Initial Depth to Water (BTOC): 15.70 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 10 sec; Discharge = 5 sec; at 30 (psi); Rate = 160 mL/min | | Total Depth (BTOC): | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 40.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | H2O Indicator not working properly. Must leave in water for few minutes for any noice indication. (15.90 is questionable due to probe) | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.5.17 | 1350 | 15.90 ? | — | 1200 | 15.03 | 0.033 | 7.24 | 5.25 | 192.1 | 31.6 | 10/5 | 23 | |
| | 1355 | | 1.0 | .200 | 15.03 | 0.031 | 7.86 | 4.81 | 230.6 | 35.4 | | | |
| | 1400 | | 2.0 | | 14.99 | 0.030 | 9.93 | 4.73 | 249.1 | 69.9 | | | |
| | 1405 | | 3.0 | | 14.93 | 0.031 | 9.90 | 4.88 | 248.9 | 67.0 | | | |
| | 1410 | | 4.0 | | 14.91 | 0.031 | 9.83 | 4.94 | 251.8 | 80.9 | | | |
| | 1415 | | 5.0 | | 14.77 | 0.031 | 9.77 | 4.94 | 255.9 | 9.0 | | | (turbidity) Strange low reading "Cleaning sensors" |
| | 1420 | | 6.0 | | 14.82 | 0.031 | 9.93 | 4.95 | 258.1 | 67.0 | | | |
| | 1425 | | 7.0 | | 14.86 | 0.031 | 9.99 | 5.01 | 256.0 | 9.7 | | | |
| | 1430 | | 8.0 | | 14.92 | 0.031 | 9.37 | 5.03 | 261.9 | 8.8 | | | |
| | 1435 | | 9.0 | | 15.00 | 0.031 | 9.10.15 | 5.05 | 263.4 | 12.4 | | | |
| | 1440 | Sample | | | | | | | | | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| S4-MW47-21 @1440 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: S4-MW48 | Date: 04-05-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MHB Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 20116 | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# 033178 | Water Quality Meter Type: YSI6920 Sonde ID: 11167 | Handset ID: ~~15819~~ R4819 |
| | PID Type/ID#: Mini RAE ~~3000~~ 4523 ID# 4523 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-Up, Monitoring Well | Screen Interval (BTOC): 12.0 to 27.0 | Initial Depth to Water (BTOC): 11.05 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 11 sec; Discharge = 4 sec; at 20 (psi); Rate = .160 mL/min | | Total Depth (BTOC): | Well Head PID (ppm): 0.3 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 20.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - Field Dup//MS/MSD | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04-05-18 | 1050 | 11.09 | 0.7 | 0.25 | 15.70 | 0.047 | 2.73 | 4.57 | 305.9 | -8.2 | 11.0/4.0 | 20 | |
| | 1055 | 11.07 | 1.05 | | ~~15.78~~ 15.76 | 0.047 | 2.68 | 4.49 | 38.3 | -9.0 | | | |
| | 1100 | 11.08 | 1.40 | | 15.83 | 0.047 | 2.63 | 4.50 | 323.0 | -9.8 | | | |
| | 1105 | 11.11 | 1.75 | | 15.79 | 0.047 | 2.59 | 4.53 | 325.6 | -10.5 | | | |
| | 1110 | 11.10 | 2.10 | | 15.77 | 0.047 | 2.59 | 4.51 | 329.8 | -10.8 | | | |
| | 1115 | 11.11 | 2.45 | | 15.82 | 0.047 | 2.59 | 4.53 | 332.3 | -10.7 | | | |
| | 1120 | 11.11 | 2.80 | | 15.85 | 0.047 | 2.56 | 4.54 | 334.0 | -11.1 | | | |
| | 1125 | 11.10 | 3.15 | | 15.82 | 0.047 | 2.55 | 4.56 | 334.4 | -11.4 | | | |
| | 1130 | 11.11 | 3.50 | | 15.85 | 0.047 | 2.54 | 4.54 | 337.4 | -11.4 | | | |
| | 1135 | | 3.85 | | 15.94 | 0.047 | 2.51 | 4.53 | 339.7 | -11.5 | | | |
| | | | | | | | | | | | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| S4-MW48-21/1140 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: S4-MW49 | Date: 04-05-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MAS Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 20116 | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# 033178 | Water Quality Meter Type: YSI6920 Sonde ID: 11167 | Handset ID: R12819 |
| | PID Type/ID#: ~~Mini RAE 3000~~ 200 MAS ID# 4523 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Lower, Stick-Up, Monitoring Well | Screen Interval (BTOC): 28.0 to 33.0 | Initial Depth to Water (BTOC): 10.74 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 10 sec; Discharge = 5 sec; at 25 (psi); Rate = .180 mL/min | | Total Depth (BTOC): | Well Head PID (ppm): 8.2 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 31.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . Moisture was built up on the inside of the well (could have caused higher PID reading) | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04-05-18 | 0923 | 10.85 | 0.9 | 0.34 | 15.36 | 0.056 | 2.83 | 4.82 | 255.1 | -9.4 | 10.0/5.0 | 25 | |
| | 0928 | 10.83 | 1.35 | | 15.31 | 0.056 | 2.70 | 4.75 | 267.8 | -9.4 | | | |
| | 0933 | 10.82 | 1.80 | | 15.50 | 0.056 | 2.64 | 4.71 | 278.4 | -9.7 | | | |
| | 0938 | 10.82 | 2.25 | | 15.53 | 0.056 | 2.59 | 4.69 | 285.7 | -9.9 | | | |
| | 0943 | 10.82 | ~~2.70~~ 2.70 | | 15.64 | 0.056 | 2.56 | 4.67 | 294.4 | -10.1 | | | |
| | 0948 | 10.88 | 3.15 | | 15.66 | 0.056 | 2.55 | 4.68 | 299.0 | -10.2 | | | |
| | 0953 | 10.83 | 3.60 | | 15.62 | 0.056 | 2.55 | 4.66 | 304.2 | -10.4 | | | |
| | 0958 | 10.84 | 4.05 | | 15.67 | 0.056 | 2.52 | 4.65 | 309.3 | -10.5 | | | |
| | 1003 | 10.83 | 4.50 | | 15.64 | 0.056 | 2.50 | 4.65 | 314.1 | -10.7 | | | |
| | 1008 | 10.85 | 4.95 | | 15.71 | 0.056 | 2.50 | 4.64 | 317.8 | -10.8 | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| S4-MW49-21/1013 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: S4-MW50 | Date: 4-5-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MK Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# | | Controller/Compressor: QED 3020 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# | Water Quality Meter Type: YSI6920 Sonde ID: | Handset ID: |
| | PID Type/ID#: Mini RAE 3000, ID# | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Stick-up, Monitoring Well | Screen Interval (BTOC): 15.0 to 30.0 | Initial Depth to Water (BTOC): 10.62 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 10 sec; Discharge = 5 sec; at 50 (psi); Rate = 130 mL/min | | Total Depth (BTOC): | Well Head PID (ppm): ~~0~~ 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 23.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . checked turbidity with calibration solution - passed | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-5-18 | 09:20 | 10.69 | | 300 | 11.73 | 0.200 | 5.14 | 4.87 | 249.8 | 242.2 | 10/5 | 20 | |
| | 09:25 | 10.63 | | 200 | 12.47 | 0.101 | 3.27 | 4.66 | 279.7 | 72.1 | | 16 | |
| | 09:30 | 10.64 | | | 12.53 | 0.094 | 3.08 | 4.67 | 297.3 | -24.0 | | | |
| | 09:35 | 10.64 | | | 12.50 | 0.092 | 3.02 | 4.66 | 308.5 | -57.1 | | | |
| | 09:40 | 10.64 | | | 12.66 | 0.091 | 2.98 | 4.66 | 317.9 | -83.7 | | | |
| | 09:45 | 10.63 | | | 12.61 | 0.091 | 2.93 | 4.66 | 325.3 | -94.6 | | | |
| | 09:50 | 10.63 | | | 12.71 | 0.091 | ~~2.98~~ 2.88 | 4.66 | 330.6 | -100.8 | | | |
| | 09:55 | 10.64 | | | 12.55 | 0.092 | 2.85 | 4.66 | 335.2 | -164.1 | | | |
| | 10:00 | 10.63 | | | 12.61 | 0.092 | 2.84 | 4.66 | 337.4 | -121.2 | | | |
| | 10:05 | 10.65 | | | 12.74 | 0.092 | 2.82 | 4.67 | 341.3 | -125.4 | | | |
| | | | | | | | | | | | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; **Measurements:** every 3 - 5 min; **Stabilization is defined as the following for 3 consecutive readings:** ±0.5°C, ±3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time 10:10 | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
| | | | |
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AECOM

# Monitoring Well Sample Collection Form



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|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: S4-MW51 | Date: 4-5-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MK Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# | | Controller/Compressor: QED 3020 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# | Water Quality Meter Type: YSI6920 Sonde ID: | Handset ID: |
| | PID Type/ID#: Mini RAE 3000, ID# | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Lower, Stick-up, Monitoring Well | Screen Interval (BTOC): 30.0 to 40.0 | Initial Depth to Water (BTOC): 10.73 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 10 sec; Discharge = 5 sec; at 50 (psi); Rate = 800 mL/min | | Total Depth (BTOC): | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 35.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-5-18 | 1050 | 10.75 | | 160 | 14.22 | 0.053 | 4.89 | 5.23 | 215.1 | -187.6 | 10/5 | 20 | |
| | 1055 | 16.74 | | 200 | 14.00 | 0.041 | 3.26 | 4.64 | 268.7 | -188.2 | | 22 | |
| | 1100 | 10.74 | | | 13.96 | 0.041 | 3.11 | 4.73 | 279.4 | -188.8 | | | |
| | 1105 | 10.74 | | | 14.01 | 0.040 | 2.94 | 4.75 | 288.9 | -188.8 | | | |
| | 1110 | 10.75 | | | 14.10 | 0.040 | 2.98 | 4.75 | 295.3 | -188.3 | | | |
| | 1115 | 10.74 | | | 14.18 | 0.040 | 3.00 | 4.74 | 301.5 | -189.9 | | | |
| | 1120 | 10.74 | | | 14.20 | 0.040 | 3.01 | 4.73 | 305.1 | -189.7 | | | |
| | 1125 | 10.73 | | | 14.24 | 0.040 | 2.99 | 4.74 | 307.1 | -190.0 | | | |
| | 1130 | 10.74 | | | 14.21 | 0.040 | 2.99 | 4.74 | 309.2 | -189.0 | | | |
| | 1135 | 10.73 | | | 14.17 | 0.040 | 2.99 | 4.74 | 311.3 | -188.4 | | | |
| | | | | | | | | | | | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| 1140 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
| | | | |
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AECOM

# Monitoring Well Sample Collection Form



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|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: S4-MW54 | Date: 04-04-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MAB Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 20116 | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# 033178 | Water Quality Meter Type: YSI6920 Sonde ID: 11167 | Handset ID: R4819 |
| | PID Type/ID#: Mini RAE ~~3000~~ 2000 ID# 4523 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Lower, Stick-Up, Monitoring Well | Screen Interval (BTOC): 32.0 to 47.0 | Initial Depth to Water (BTOC): 12.08 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 10 sec; Discharge = 5 sec; at 25 (psi); Rate = .175 mL/min | | Total Depth (BTOC): | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 40.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04-04-18 | 1555 | 12.08 | 0.5 | 0.20 | 16.28 | 0.027 | 8.75 | 4.76 | 18.5 | 21.3 | 10.0/5.0 | 20 | |
| | 1600 | 12.09 | ~~0.75 1.00 1.25~~ 0.8 | | 16.24 | 0.027 | 8.32 | 4.66 | 204.5 | 14.2 | | | |
| | 1605 | 12.08 | 1.0 | | 16.19 | 0.027 | 8.15 | 4.58 | 225.5 | 9.7 | | | |
| | 1610 | 12.15 | 1.25 | | 16.23 | 0.027 | 8.12 | 4.55 | 238.8 | 7.8 | | | |
| | 1615 | 12.15 | 1.50 | | 16.28 | 0.027 | 8.05 | 4.55 | 248.6 | 6.0 | | | |
| | 1620 | 12.14 | 1.75 | | 16.22 | 0.027 | 8.04 | 4.59 | 254.0 | 4.6 | | | |
| | 1625 | 12.13 | 2.00 | | 16.20 | 0.027 | 7.82 | 4.62 | 260.4 | 3.6 | | | |
| | 1630 | 12.14 | 2.25 | | 16.18 | 0.027 | 7.88 | 4.64 | 264.8 | 2.8 | | | |
| | 1635 | 12.15 | 2.50 | | 16.09 | 0.027 | 7.83 | 4.65 | 269.9 | 2.5 | | | |
| | 1640 | 12.15 | 2.75 | | 16.08 | 0.027 | 7.77 | 4.64 | 275.1 | 2.1 | | | |
| | 1645 | 12.15 | 3.00 | | 16.08 | 0.027 | 7.76 | 4.66 | 277.2 | 1.8 | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| S4-MW54-21 / 1650 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: S4-MW59 | Date: 04-04-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MAB Checked By: |

| | | | | |
|---|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 20116 | | Controller/Compressor: QED ~~MP40~~ MP50 (MAB) | |
| | Water Level Indicator Type/ID#: Solinst 101, ID# 033178 | Water Quality Meter Type: YSI6920 | Sonde ID: 11167 | Handset ID: 512819 |
| | PID Type/ID#: Mini RAE ~~3000~~ 2000 (MAB), ID# 4523 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Flushmount, Monitoring Well | Screen Interval (BTOC): 25.1 to 35.1 | Initial Depth to Water (BTOC): 11.95 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 10 sec; Discharge = 5 sec; at 20 (psi); Rate = 150 mL/min | | Total Depth (BTOC): | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 30.1 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04-04-18 | 0900 | 11.95 | 0.6 | 0.25 | 17.34 | 0.032 | 3.96 | 4.99 | 271.8 | -1.4 | 10.0/5.0 | 20 | |
| | 0905 | 11.97 | 0.9 | | 17.30 | 0.035 | 0.58 | 4.78 | 305.1 | 5.2 | | | |
| | 0910 | 11.95 | 1.2 | | 17.30 | 0.035 | 0.56 | 4.78 | 306.7 | 5.2 | | | |
| | 0915 | 11.94 | 1.5 | | ~~17.40~~ 17.40 | 0.039 | 0.52 | 4.73 | 317.1 | 8.0 | | | |
| | 0920 | 11.99 | 1.8 | | 17.40 | 0.042 | 0.62 | 4.73 | 322.1 | 10.0 | | | |
| | 0925 | 11.94 | 2.1 | | 17.39 | 0.044 | 0.70 | 4.73 | 325.8 | 11.0 | | | |
| | 0930 | 11.96 | 2.4 | | 17.50 | 0.046 | 0.80 | 4.73 | 328.5 | 12.0 | | | |
| | 0935 | 11.93 | 2.7 | | 17.46 | 0.046 | 0.85 | 4.74 | 331.6 | 12.1 | | | |
| | 0940 | 11.91 | 3.0 | | 17.55 | 0.047 | 0.94 | 4.74 | 335.0 | 12.6 | | | |
| | 0945 | 11.94 | 3.3 | | 17.60 | 0.047 | 0.98 | 4.74 | 335.1 | 12.4 | | | |
| | 0950 | 11.97 | 3.6 | | 17.62 | 0.047 | 1.04 | 4.75 | 335.5 | 11.5 | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| S4-MW59-21/0955 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: S4-MW60 | Date: 04-04-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MAB Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 20116 | | Controller/Compressor: QED ~~3020~~ MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# 033178 | Water Quality Meter Type: YSI6920 Sonde ID: 11167 | Handset ID: R12819 |
| | PID Type/ID#: Mini RAE ~~3000~~ 2000 PGM, ID# 4523 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Lower, Flushmount, Monitoring Well | Screen Interval (BTOC): 34.6 to 44.6 | Initial Depth to Water (BTOC): 11.90 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: not available | | Total Depth (BTOC): | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 40.6 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04-04-18 | 1030 | 11.94 | 0.4 | 0.17 | 18.09 | 0.049 | 3.01 | 4.81 | 326.2 | 223.7 | 14.0/3.0 | 35 | |
| | 1035 | 11.91 | 0.6 | | 17.86 | 0.049 | 2.72 | 4.45 | 332.7 | 135.0 | | | |
| | 1040 | 11.91 | 0.8 | | 17.89 | 0.049 | 2.60 | 4.53 | 332.0 | 93.7 | | | |
| | 1045 | 11.93 | 1.0 | | 17.92 | 0.049 | 2.57 | 4.66 | 327.5 | 49.8 | | | |
| | 1050 | 11.92 | 1.2 | | 18.01 | 0.049 | 2.53 | 4.74 | 325.2 | 32.4 | | | |
| | 1055 | 11.93 | 1.4 | | 17.80 | 0.050 | 2.47 | 4.76 | 326.6 | 25.7 | | | |
| | 1100 | 11.91 | 1.6 | | 17.78 | 0.050 | 2.38 | 4.74 | 329.4 | 23.9 | | | |
| | 1105 | 11.92 | 1.8 | | 17.75 | 0.049 | 2.36 | 4.74 | 330.9 | 15.7 | | | |
| | 1110 | 11.91 | 2.0 | | 17.63 | 0.049 | 2.34 | 4.72 | 333.6 | 12.7 | | | |
| | 1115 | 11.91 | 2.2 | | 17.62 | 0.049 | 2.28 | 4.70 | 336.1 | 9.6 | | | |
| | | | | | | | | | | | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| S4-MW60-21/1120 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: S4-MW61 | Date: 4-4-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MK Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# | | Controller/Compressor: QED MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# | Water Quality Meter Type: YSI6920 Sonde ID: | Handset ID: |
| | PID Type/ID#: Mini RAE 3000, ID# | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a 2-inch Upper, Flushmount, Monitoring Well | Screen Interval (BTOC): 25.0 to 35.0 | Initial Depth to Water (BTOC): 13.57 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: not available | | Total Depth (BTOC): | Well Head PID (ppm): 15.3 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 30.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-4-18 | 13:05 | 13.81 | | 160 | 21.00 | 0.072 | 1.98 | 4.82 | 238.9 | 155.1 | 10/5 | 20 | |
| | 13:10 | 13.78 | | 220 | 19.47 | 0.065 | 0.80 | 4.68 | 286.5 | 68.3 | | 22 | |
| | 13:15 | 13.84 | | 200 | 19.47 | 0.063 | 0.57 | 4.64 | 303.5 | 41.9 | | 21 | |
| | 13:20 | 13.87 | | 200 | 19.76 | 0.063 | 0.45 | 4.70 | 308.5 | -10.6 | | 21 | |
| | 13:25 | 13.82 | | | 19.93 | 0.064 | 0.41 | 4.73 | 313.8 | 13.0 | | | |
| | 13:30 | 13.86 | | | 19.39 | 0.065 | 0.38 | 4.73 | 324.7 | 6.2 | | | |
| | 13:35 | 13.83 | | | 19.19 | 0.065 | 0.36 | 4.72 | 331.1 | 1.9 | | | |
| | 13:40 | 13.82 | | | 18.93 | 0.065 | 0.35 | 4.71 | 339.9 | 0.6 | | | |
| | 13:45 | 13.85 | | | 19.07 | 0.065 | 0.34 | 4.70 | 345.1 | -1.2 | | | |
| | 13:50 | 13.81 | | | 19.45 | 0.064 | 0.34 | 4.72 | 341.2 | -13.8 | | | |
| | | | | | | | | | | | | | |

Pumping Rate: ≥0.1 and ≤0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time 1400 | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
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AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: S4-MW62 | Date: 04-04-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MAB Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 20116 | Controller/Compressor: QED MP50 | |
| | Water Level Indicator Type/ID#: Solinst 101, ID# ~~MAB~~ 073178 | Water Quality Meter Type: YSI6920 Sonde ID: 11167 | Handset ID: R12819 |
| | PID Type/ID#: Mini RAE ~~3000~~ 4000, ID# 4523 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a -inch Lower, Flushmount, Monitoring Well | Screen Interval (BTOC): 36.0 to 46.0 | Initial Depth to Water (BTOC): ~~MAB 13.47~~ 13.47 | Ambient PID (ppm): |
| | Historic Pump Settings: Refill = 10 sec; Discharge = 5 sec; at 20 (psi); Rate = .140 mL/min | | Total Depth (BTOC): | Well Head PID (ppm): |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 41.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04-04-18 | 1230 | ~~MAB~~ 13.49 | 0.8 | 0.30 | 19.87 | 0.118 | 0.80 | 4.63 | 241.4 | 102.5 | 10.0/5.0 | 30 | |
| | 1235 | 13.51 | 1.2 | | 19.99 | 0.122 | 0.50 | 4.71 | 232.0 | 101.0 | | | |
| | 1240 | 13.52 | 1.6 | | 19.93 | 0.123 | 0.44 | 4.77 | 227.1 | 13.4 | | | |
| | 1245 | 13.49 | 2.0 | | 20.24 | 0.124 | 0.40 | 4.83 | 221.7 | 9.5 | | | |
| | 1250 | 13.53 | 2.4 | | 20.13 | 0.125 | 0.35 | 4.89 | 217.4 | 6.3 | | | |
| | 1255 | 13.51 | 2.8 | | 20.02 | 0.126 | 0.31 | 4.90 | 216.1 | 39.7 | | | |
| | 1300 | 13.49 | 3.2 | | 19.85 | 0.126 | 0.29 | 4.86 | 217.7 | 32.8 | | | |
| | 1305 | 13.54 | 3.6 | | 19.76 | 0.126 | 0.28 | 4.81 | 220.4 | 29.6 | | | |
| | 1310 | 13.46 | 4.0 | | 19.77 | 0.126 | 0.27 | 4.81 | 220.2 | 23.3 | | | |
| | 1315 | 13.49 | 4.4 | | 19.86 | 0.127 | 0.26 | 4.84 | 218.3 | 18.8 | | | |
| | | | | | | | | | | | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| S4-MW62-21/1320 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |

AECOM

# Monitoring Well Sample Collection Form



| | | | |
|---|---|---|---|
| **LOCATION** | Site: VANG | LocID: S4-MW63 | Date: 04-04-18 |
| | Project Name: Virginia ANG | Project Number: 60278122 | Recorded By: MAZ Checked By: |

| | | | |
|---|---|---|---|
| **EQUIPMENT** | Sampling Equipment - Pump: QED Sample Pro Bladder Pump - ID# 20116 | | Controller/Compressor: QED ~~3020~~ MP50 |
| | Water Level Indicator Type/ID#: Solinst 101, ID# 033178 | Water Quality Meter Type: YSI6920 Sonde ID: 11167 | Handset ID: R12819 |
| | PID Type/ID#: Mini RAE ~~3000~~ MP3 ID# 4523 | Equipment Decon: Potable Water/Liquinox wash, potable water rinse, DI rinse | |

| | | | | |
|---|---|---|---|---|
| **WELL & SAMPLING INFO** | This is a -inch Lower, Flushmount, Monitoring Well | Screen Interval (BTOC): 35.0 to 45.0 | Initial Depth to Water (BTOC): 12.20 | Ambient PID (ppm): 0.0 |
| | Historic Pump Settings: Refill = 10 sec; Discharge = 5 sec; at 60 (psi); Rate = 100 mL/min | | Total Depth (BTOC): | Well Head PID (ppm): 0.0 |
| | Condition of Well/Comments: | | | Pump Inlet Depth (BTOC): 40.0 |
| | NOTE: Please note any significant location information; Sampling note(s) - . | | | |

| Date (MM/DD/YY) | Time (24 hr) | Depth to Water (BTOC) | Volume Removed (gallons) | Pumping Rate (Lpm) | Temp (°C) | Specific Conductivity (mS/cm) | DO (mg/L) | pH | ORP (mV) | Turbidity (NTU) | Pump Refill/ Discharge (seconds) | Pump Pressure (PSI) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04-04-18 | 1410 | 12.23 | 0.7 | 0.25 | 19.20 | 0.235 | 0.55 | 5.57 | 53.6 | 55.0 | 100/5.0 | 30 | |
| | 1415 | 12.23 | 1.05 | | 19.21 | 0.237 | 0.46 | 5.69 | 37.6 | 35.6 | | | |
| | 1420 | 12.22 | 1.40 | | 19.26 | 0.238 | 0.37 | 5.82 | 21.8 | 22.3 | | | |
| | 1425 | 12.27 | 1.75 | | 19.25 | 0.239 | 0.35 | 5.88 | 13.3 | 15.6 | | | |
| | 1430 | 12.32 | 2.10 | | 19.19 | 0.240 | 0.31 | 5.92 | 6.7 | 11.9 | | | |
| | 1435 | 12.23 | 2.45 | | 19.12 | 0.240 | 0.29 | 5.92 | 3.8 | 10.5 | | | |
| | 1440 | 12.27 | 2.80 | | 18.95 | 0.240 | 0.26 | 5.91 | 2.3 | 9.0 | | | |
| | 1445 | 12.25 | 3.15 | | 18.80 | 0.241 | 0.24 | 5.86 | 3.1 | 7.3 | | | |
| | 1450 | 12.24 | 3.50 | | 18.83 | 0.242 | 0.23 | 5.88 | 0.3 | 7.0 | | | |
| | 1455 | 12.27 | 3.85 | | 18.89 | 0.241 | 0.22 | 5.93 | -3.3 | 6.0 | | | |
| | | | | | | | | | | | | | |

Pumping Rate: ≥ 0.1 and ≤ 0.5 L/min; Measurements: every 3 - 5 min; Stabilization is defined as the following for 3 consecutive readings: ± 0.5°C, ± 3% Conductivity; ± 10% DO; ± 0.1 pH; ± 10mV ORP; Turbidity low as possible

| Sample ID Numbers and Sample Time | Container Count, Volume & Type | Preservative | Parameter(s) |
|---|---|---|---|
| S4-MW63-21 / 1500 | 3 - 40 mL Glass VOA | HCl | Volatiles (8260C) |
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# Field Sample Log

AECOM

| LOCATION | Project Name: ~~Camp Hero Remedial Investigation~~ VANG | Project #: 60553852 |
|---|---|---|
| | Area of Concern: TW-1 | |

| Sample ID (List Duplicate, MS/MSD samples) | Sample Date | Sample Time | Sample Matrix | Sample Depth | Sampled By | Sample Type (Composite/Discrete) | Field Screening (Y - Result/N) | Analytical Parameters |
|---|---|---|---|---|---|---|---|---|
| TW-1-21 | 4.4.19 | 1155 | GW | 40-45 | AG | — | — | VOC (8260B) |
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Comments

Sampled w/ Dupe TW-1-21 DUP

only exposed 4ft of 5ft screen.

well pumped well. Approx 4 gallons removed.

* location offset from original location due to being within a secure area. Moved outside of fence.

General Location Sketch (show all sample locations, including QC samples)

# Field Sample Log

AECOM

| LOCATION | Project Name: ~~Camp Hero Remedial Investigation~~ VANG | Project #: 60553852 |
|---|---|---|
| | Area of Concern: TW-2 | |

| Sample ID (List Duplicate, MS/MSD samples) | Sample Date | Sample Time | Sample Matrix | Sample Depth | Sampled By | Sample Type (Composite/Discrete) | Field Screening (Y - Result/N) | Analytical Parameters |
|---|---|---|---|---|---|---|---|---|
| TW-2-21 | 4.4.18 | 1350 | GW | ~~40-45~~ 36-41 | AG | — | — | VOC (8260B) |
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Comments

No H2O at 40-45 ft bgs. let sit + recharge for 10 min then tried again

*Decided to come up 4-5 feet to see if we get ~~H2O~~ H2O new depth (36-41 ft)
At this depth we got H2O.

General Location Sketch (show all sample locations, including QC samples)

# Field Sample Log

AECOM

| LOCATION | Project Name: ~~Camp Hero Remedial Investigation~~ VANG | Project #: 60553852 |
|---|---|---|
| | Area of Concern: | |

| Sample ID (List Duplicate, MS/MSD samples) | Sample Date | Sample Time | Sample Matrix | Sample Depth | Sampled By | Sample Type (Composite/Discrete) | Field Screening (Y - Result/N) | Analytical Parameters |
|---|---|---|---|---|---|---|---|---|
| TW-3-21 | 040318 | 1230 | GW | 40-45 | SC | — | — | VOCs (8260B) - 3x40mL VOAs |
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Comments

Turbidity clearing up after few minutes of purging.

General Location Sketch (show all sample locations, including QC samples)

# Field Sample Log

AECOM

| LOCATION | Project Name: ~~Camp Hero Remedial Investigation~~ VANCE | Project #: |
|---|---|---|
| | ~~Area of Concern:~~ | |

| Sample ID (List Duplicate, MS/MSD samples) | Sample Date | Sample Time | Sample Matrix | Sample Depth | Sampled By | Sample Type (Composite/Discrete) | Field Screening (Y - Result/N) | Analytical Parameters |
|---|---|---|---|---|---|---|---|---|
| TW-4-21 | 4-4-19 | 0815 | GW | 40-45 | AG | — | — | VOC (8260B) |
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Comments

Grey color H2O that cleared semi-well.
3 gallons removed before sampling.

General Location Sketch (show all sample locations, including QC samples)

# Field Sample Log

AECOM

| LOCATION | Project Name: ~~Camp Hero Remedial Investigation~~ VANC |
|---|---|
| | Area of Concern: TW-5 |

Project #: 60552853

| Sample ID (List Duplicate, MS/MSD samples) | Sample Date | Sample Time | Sample Matrix | Sample Depth | Sampled By | Sample Type (Composite/Discrete) | Field Screening (Y - Result/N) | Analytical Parameters |
|---|---|---|---|---|---|---|---|---|
| TW-5-21 | 4.4.18 | 1410 | GW | ~~40-45~~ 38-33 | AG | — | — | VOC (8260B) |
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Comments

Temp well dry at 40-45. Decide to let sit for recharge; still no H2O.

Decide to pull up 4ft in effort to get groundwater in tempwell (41-36)
- still no water

Decide to pull up 2 more feet to get H2O
no water

TW5 come up 1 more foot — Got H2O
(38-33 ft)

General Location Sketch (show all sample locations, including QC samples)

# Field Sample Log

AECOM

| LOCATION | Project Name: ~~Camp Hero Remedial Investigation~~ VANG | Project #: 60553852 |
|---|---|---|
| | Area of Concern: | |

| Sample ID (List Duplicate, MS/MSD samples) | Sample Date | Sample Time | Sample Matrix | Sample Depth | Sampled By | Sample Type (Composite/Discrete) | Field Screening (Y - Result/N) | Analytical Parameters |
|---|---|---|---|---|---|---|---|---|
| TW6-21 | 040518 | 0900 | GW | 40-45 | SC | — | — | VOCs (8260B) |
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Comments

General Location Sketch (show all sample locations, including QC samples)

# Field Sample Log

AECOM

| LOCATION | Project Name: ~~Camp Hero Remedial Investigation~~ VANG | Project #: 60553852 |
|---|---|---|
| | Area of Concern: | |

| Sample ID (List Duplicate, MS/MSD samples) | Sample Date | Sample Time | Sample Matrix | Sample Depth | Sampled By | Sample Type (Composite/Discrete) | Field Screening (Y - Result/N) | Analytical Parameters |
|---|---|---|---|---|---|---|---|---|
| TW-7-21 | 040518 | 1000 | GW | ~~[illegible]~~ 35-40 | SC | — | — | VOCs (8260B) |
| | | | | | | | | |
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Comments

No water at 45 ft depth, changed screen to 35-40 ft bgs.

General Location Sketch (show all sample locations, including QC samples)

# Field Sample Log

AECOM

| LOCATION | Project Name: ~~Camp Hero Remedial Investigation~~ VANG | Project #: 60553852 |
|---|---|---|
| | Area of Concern: TW-8 | |

| Sample ID (List Duplicate, MS/MSD samples) | Sample Date | Sample Time | Sample Matrix | Sample Depth | Sampled By | Sample Type (Composite/Discrete) | Field Screening (Y - Result/N) | Analytical Parameters |
|---|---|---|---|---|---|---|---|---|
| TW-8-21 | 4.3.18 | 1525 | GW | 40-45 | AG | — | — | VOC (8260B) |
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Comments

General Location Sketch (show all sample locations, including QC samples)

# Field Sample Log

AECOM

| LOCATION | Project Name: ~~Camp Hero Remedial Investigation~~ VANC |
|---|---|
| | ~~Area of Concern:~~ TW-9 |

Project #: 60553352

| Sample ID (List Duplicate, MS/MSD samples) | Sample Date | Sample Time | Sample Matrix | Sample Depth | Sampled By | Sample Type (Composite/Discrete) | Field Screening (Y - Result/N) | Analytical Parameters |
|---|---|---|---|---|---|---|---|---|
| TW-9-21 | 4.4.18 | 0935 | GW | 40-45 | AC | — | — | VOC (8260B) |
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Comments

~~Took Dupe with this location.~~

~~(TW-9-21DUP)~~

Very little H2O produced. Might be more clays in deposit.

Didn't take Dup at this location due to poor H2O production.

Had to sample one vol at a time using the check-valve. Couldn't use peri-pump to flow H2O.

General Location Sketch (show all sample locations, including QC samples)

# Field Sample Log

AECOM

| LOCATION | Project Name: ~~Camp Hero Remedial Investigation~~ Vasey | Project #: |
|---|---|---|
| | Area of Concern: | |

| Sample ID (List Duplicate, MS/MSD samples) | Sample Date | Sample Time | Sample Matrix | Sample Depth | Sampled By | Sample Type (Composite/Discrete) | Field Screening (Y - Result/N) | Analytical Parameters |
|---|---|---|---|---|---|---|---|---|
| TW-10-21 | 4.3.19 | 1645 | GW | 40-45 | AG | — | — | VOC (8260B) |
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Comments

Very turbid. Trouble getting steady flow.

General Location Sketch (show all sample locations, including QC samples)

# Field Sample Log

AECOM

| LOCATION | Project Name: ~~Camp Hero Remedial Investigation~~ VANG | Project #: 60553852 |
|---|---|---|
| | Area of Concern: | |

| Sample ID (List Duplicate, MS/MSD samples) | Sample Date | Sample Time | Sample Matrix | Sample Depth | Sampled By | Sample Type (Composite/Discrete) | Field Screening (Y - Result/N) | Analytical Parameters |
|---|---|---|---|---|---|---|---|---|
| TW-11-21 | 040318 | 1430 | GW | 20-25 | SC | — | — | VOCs (8200B). |
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Comments

taken w/ Dupe

TW-11-21 DUP

General Location Sketch (show all sample locations, including QC samples)

# Field Sample Log

AECOM

| LOCATION | Project Name: ~~Camp Hero Remedial Investigation~~ VANG | Project #: 60553852 |
|---|---|---|
| | Area of Concern: TW-12 | |

| Sample ID (List Duplicate, MS/MSD samples) | Sample Date | Sample Time | Sample Matrix | Sample Depth | Sampled By | Sample Type (Composite/Discrete) | Field Screening (Y - Result/N) | Analytical Parameters |
|---|---|---|---|---|---|---|---|---|
| TW-12-21 | 4.4.18 | 1450 | GW | 20-25 | AG | — | — | VOC (8260B) |
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Comments

Water was very turbid, purged approx. 3 gallons without clearing.

General Location Sketch (show all sample locations, including QC samples)

# Field Sample Log

AECOM

| LOCATION | Project Name: ~~Camp Howze Remedial Investigation~~ VANG | Project #: 60553852 |
|---|---|---|
| | Area of Concern: | |

| Sample ID (List Duplicate, MS/MSD samples) | Sample Date | Sample Time | Sample Matrix | Sample Depth | Sampled By | Sample Type (Composite/Discrete) | Field Screening (Y - Result/N) | Analytical Parameters |
|---|---|---|---|---|---|---|---|---|
| TW-13-21 | 040318 | 1000 | GW | 20-25 | SC | — | — | VOCs (8260B) – 3x40mL VOAs |
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Comments

Very turbid sampling; wait to recharge.

General Location Sketch (show all sample locations, including QC samples)

# Field Sample Log

AECOM

| LOCATION | Project Name: ~~Camp Hero Remedial Investigation~~ HNT VANG | Project #: 60553852 |
|---|---|---|
| | ~~Area of Concern~~: TW-14 | |

| Sample ID (List Duplicate, MS/MSD samples) | Sample Date | Sample Time | Sample Matrix | Sample Depth | Sampled By | Sample Type (Composite/Discrete) | Field Screening (Y - Result/N) | Analytical Parameters |
|---|---|---|---|---|---|---|---|---|
| HNT TW-14-21 | 4.4.18 | 1055 | GW | 20-25 | GW | — | — | |
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Comments

Soil seems softer/easier to hammer through

HeD Cleared within 5 minutes. Produced very well.

Took MS/MSD samples here

TW-14-21 MS, TW-14-21 MSD

* location offset from original location due to being within a secure location. Moved outside of fence.

General Location Sketch (show all sample locations, including QC samples)

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# Appendix C

# Daily Instrument Calibration Logs

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# INSTRUMENT QC/ PACKING LIST

| | |
|---|---|
| **Description** | YSI 6920 and 650 MDS display |
| **Sonde ID#** | 27080 |
| **Display ID#** | 5982 |
| **Date Calibrated** | 3-28-18 |

PINE
www.pine-environmental.com

| Standard Items | Prepared | QC check | Received by customer | Returned to Pine |
|---|---|---|---|---|
| YSI 6920 sonde w/ 25' cable and case | ✓ | ✓ | | |
| YSI 650 MDS Display | ✓ | ✓ | | |
| Manual | ✓ | ✓ | | |
| Quick reference card | ✓ | ✓ | | |
| Stand (base, clamp, and rod) | ✓ | ✓ | | |
| Probe Guard | ✓ | ✓ | | |
| Calibration cup w/sponge | ✓ | ✓ | | |
| Flow cell | ✓ | ✓ | | |
| • Cell adapter for older style cell (if applicable) | | | | |
| 2 of each barb size (1/4, 3/8, 1/2) | ✓ | ✓ | | |
| $DO_2$ probe reconditioning kit | N\A | N\A | | |
| Sonde cap | ✓ | ✓ | | |
| 4 C batteries | ✓ | ✓ | | |
| 8 AA batteries | ✓ | ✓ | | |
| 6-series Communications cable | ✓ | ✓ | | |
| YSI Ecowatch Software | ✓ | ✓ | | |
| Calibration kit, pH (4,7,10), conductivity, turb (0 and 126 NTU), and ORP. | ✓ | ✓ | | |
| NIST traceable calibration sheet | ✓ | ✓ | | |

**Prepared by:** SP

**QC checked by:** DP

**Date:** 3-28-18

*This packing list is to ensure that every item needed to operate the unit was sent and received. Upon receiving a shipment, please fill out the "Received by customer" column. Call Pine within 24 hours of receiving the equipment if any pieces are missing, damaged, or malfunctioning. Thank you for choosing Pine Environmental Services LLC*

# INSTRUMENT CALIBRATION REPORT

**Pine Environmental Services LLC**

2225 Tomlynn Street
Richmond, Va. 23230
Toll-free: (866) 801-PINE (7463)

## Pine Environmental Services, Inc.

**Instrument ID** 27080
**Description** YSI 6920 V2
**Calibrated** 3/28/2018 3:13:55PM

**Manufacturer** YSI
**Model Number** 6920 V2
**Serial Number/ Lot Number** 14F101430
**Location** Virginia
**Department**

**State Certified**
**Status** Pass
**Temp °C** 20.9
**Humidity %** 37.2

### Calibration Specifications

**Group #** 1
**Group Name** PH
**Stated Accy** Pct of Reading
**Range Acc %** 0.0000
**Reading Acc %** 3.0000
**Plus/Minus** 0.00

| Nom In Val / In Val | In Type | Out Val | Out Type | Fnd As | Lft As | Dev% | Pass/Fail |
|---|---|---|---|---|---|---|---|
| 7.00 / 7.00 | PH | 7.00 | PH | 7.00 | 7.00 | 0.00% | Pass |
| 4.00 / 4.00 | PH | 4.00 | PH | 4.00 | 4.00 | 0.00% | Pass |
| 10.00 / 10.00 | PH | 10.00 | PH | 10.00 | 10.00 | 0.00% | Pass |

**Group #** 2
**Group Name** Turbidity
**Stated Accy** Pct of Reading
**Range Acc %** 0.0000
**Reading Acc %** 3.0000
**Plus/Minus** 0.0

| Nom In Val / In Val | In Type | Out Val | Out Type | Fnd As | Lft As | Dev% | Pass/Fail |
|---|---|---|---|---|---|---|---|
| 0.0 / 0.0 | NTU | 0.0 | NTU | 0.0 | 0.0 | 0.00% | Pass |
| 126.0 / 126.0 | NTU | 126.0 | NTU | 126.0 | 126.0 | 0.00% | Pass |

**Group #** 3
**Group Name** Conductivity
**Stated Accy** Pct of Reading
**Range Acc %** 0.0000
**Reading Acc %** 3.0000
**Plus/Minus** 0.000

| Nom In Val / In Val | In Type | Out Val | Out Type | Fnd As | Lft As | Dev% | Pass/Fail |
|---|---|---|---|---|---|---|---|
| 1.413 / 1.413 | ms/cm | 1.413 | ms/cm | 1.413 | 1.413 | 0.00% | Pass |

**Group #** 4
**Group Name** Redox (ORP)
**Stated Accy** Pct of Reading
**Range Acc %** 0.0000
**Reading Acc %** 3.0000
**Plus/Minus** 0.0

| Nom In Val / In Val | In Type | Out Val | Out Type | Fnd As | Lft As | Dev% | Pass/Fail |
|---|---|---|---|---|---|---|---|
| 240.0 / 240.0 | mv | 240.0 | mv | 240.0 | 240.0 | 0.00% | Pass |

**Group #** 5
**Group Name** Disolved Oxygen Span
**Stated Accy** Pct of Reading
**Range Acc %** 0.0000
**Reading Acc %** 3.0000
**Plus/Minus** 0.0

| Nom In Val / In Val | In Type | Out Val | Out Type | Fnd As | Lft As | Dev% | Pass/Fail |
|---|---|---|---|---|---|---|---|

# INSTRUMENT CALIBRATION REPORT

**Pine Environmental Services LLC**

2225 Tomlynn Street
Richmond, Va. 23230
Toll-free: (866) 801-PINE (7463)

## Pine Environmental Services, Inc.

**Instrument ID** R19164
**Description** RAE Systems MiniRAE 3000
**Calibrated** 3/30/2018 4:50:08PM

**Manufacturer** Rae Systems
**Model Number** MiniRAE 3000
**Serial Number/ Lot Number** 592-904609
**Location** Virginia
**Department**

**State Certified**
**Status** Pass
**Temp °C** 26
**Humidity %** 37

### Calibration Specifications

**Group #** 1
**Group Name** Isobutylene
**Stated Accy** Pct of Reading

**Range Acc %** 0.0000
**Reading Acc %** 3.0000
**Plus/Minus** 0.00

| Nom In Val / In Val | In Type | Out Val | Out Type | Fnd As | Lft As | Dev% | Pass/Fail |
|---|---|---|---|---|---|---|---|
| 100.00 / 100.00 | PPM | 100.00 | PPM | 100.00 | 100.00 | 0.00% | Pass |

### Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| Test Standard ID | Description | Manufacturer | Model Number | Serial Number / Lot Number | Last Cal Date/ Opened Date | Next Cal Date / Expiration Date |
|---|---|---|---|---|---|---|
| VA ISO 100 PPM - LBH-248-100-4 | ISOBUTYLENE (100 PPM) | Gasco | 31721 | LBH-248-100-4 | | 11/14/2021 |
| VA ZERO AIR - 822863 | ZERO AIR | Calgaz | 31844 | 822863 | | 9/30/2020 |

**Notes about this calibration**

**Calibration Result** Calibration Successful
**Who Calibrated** Teco Peirce

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

**Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment**
**Please call 800-301-9663 for Technical Assistance**

# EQUIPMENT CALIBRATION DAILY LOG

| | |
|---|---|
| Date: 04-02-2018 | Project Name: VANG |
| Project Number: 60553852 | Recorded By: Matt Kent |

| PID | Model: Mini RAE 2000 | | | | Morning Calibration | Evening Check (if necessary) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: 3974 | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 12:15 | Time: 1745 | Time: |
| First Point Calibration | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: 0.0<br>Initials: MK | Value: 0.1<br>Initials: SC | Value:<br>Initials: |
| Second Point Calibration | Vapor conc. (ppm) | Iso (Calibration Gas) | 1/22/22 | BBI-248-100-7 | Value: 100<br>Initials: MK | Value: 100.8<br>Initials: SC | Value:<br>Initials: |

| WATER QUALITY METER | Model: YSI 6920 | | | | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: 3328 | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 1130 | Time: 1715 | Time: |
| First Point Calibration (Auto) | pH | 7 | 8/19 | 7GH1606 | Value: 7 | Value: 7.03 | Value: |
| | Turbidity (NTU) | 0.0 NWANG | 9/18 | C800710 | Value: 0.0 | Value: -5.2 | Value: |
| | Conductivity (mS/cm) | 1.413 | 12/18 | 7GL100 | Value: 1.413 | Value: 1.457 | Value: |
| | ORP (mV) | 240 | 10/22 | 2062 | Value: 240 | Value: 233.2 | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 4 | 9/19 | 7GT006 | Value: 4 | Value: | Value: |
| | Turbidity (NTU) | 126. | 1/19 | 19A1804390I | Value: 126 | Value: | Value: |
| | Conductivity (mS/cm) | | | | Value: | Value: | Value: |
| | | | | | Initials: | Initials: SC | Initials: |

**Additional Remarks:**

# EQUIPMENT CALIBRATION DAILY LOG

| | |
|---|---|
| Date: 04-02-18 | Project Name: Virginia ANG |
| Project Number: 60278142 | Recorded By: M.Bell |

| PID | Model: MiniRAE 2000 | | | | Morning Calibration | Evening Check (if necessary) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: 4523 | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 1235 | Time: 1715 | Time: |
| First Point Calibration | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: 0.0<br>Initials: MAB | Value: 0.0<br>Initials: MAB | Value:<br>Initials: |
| Second Point Calibration | Vapor conc. (ppm) | 100.0<br>(Calibration Gas) | 04/22/2022 | IBI-348-102-7 | Value: 100.0<br>Initials: MAB | Value: 100.0<br>Initials: MAB | Value:<br>Initials: |

| WATER QUALITY METER | Model: YSI 6920 | | | | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: 11167 | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 1130 | Time: MAB 1726 | Time: |
| First Point Calibration (Auto) | pH | 7 | 08/2019 | 76H1000 | Value: 6.99 | Value: 7.07 | Value: |
| | Turbidity (NTU) | 126.0 | 01/2019 | 18A1804330 | Value: 121.6 | Value: 127.4 | Value: |
| | Conductivity (mS/cm) | 1.413 | 12/2018 | 76L100 | Value: 1.309 | Value: 1215 | Value: |
| | ORP (mV) | 240 | 10/2022 | 2062 | Value: 239.3 | Value: 247.7 | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: NA | Value: NA | Value: NA |
| Second Point Calibration | pH | 4 | 09/2019 | 76I006 | Value: 3.99 | Value: | Value: |
| | Turbidity (NTU) | 0 | 01/2019 | 18012741 | Value: 1.9 | Value: | Value: |
| | Conductivity (mS/cm) | | | | Value: | Value: | Value: |
| | | | | | Initials: | Initials: | Initials: |

**Additional Remarks:**

# EQUIPMENT CALIBRATION DAILY LOG

| | | | |
|---|---|---|---|
| Date: | 04022018 | Project Name: | VANG |
| Project Number: | 60553852 | Recorded By: | SC |

| | | | | | | Morning Calibration | Evening Check (if necessary) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|---|
| PID | Model: | | | | | | | |
| | Equipment ID #: | | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | | Time: 1145 | Time: 1730 | Time: |
| First Point Calibration | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | | Value: 0.0<br>Initials: SC | Value: 0<br>Initials: DB | Value:<br>Initials: |
| Second Point Calibration | Vapor conc. (ppm) | 1000 (Calibration Gas) | 07/5/21 | HBH-248-1009 | | Value: 100.0<br>Initials: SC | Value: 100.0<br>Initials: DB | Value:<br>Initials: |

| | | | | | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| WATER QUALITY METER | Model: YSI 6920 V2 | | | | | | |
| | Equipment ID #: 27080 | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 1130 | Time: 1735 | Time: |
| First Point Calibration (Auto) | pH | 7.0 | 08/2019 | 76H1000 | Value: SC | Value: 6.87 | Value: |
| | Turbidity (NTU) | 0.0 | 01/2019 | 18012M1 | Value: SC | Value: 0.0 | Value: |
| | Conductivity (mS/cm) | 1.413 | 08/2018 | 76H921 | Value: SC | Value: 1.482 | Value: |
| | ORP (mV) | 240.0 | 05/31/2021 | 0207 | Value: SC | Value: 240.2 | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: SC | Value: — | Value: |
| Second Point Calibration | pH | 4.0 | 12/31/18 | 662126 | Value: SC | Value: | Value: |
| | Turbidity (NTU) | 126.0 | 04/30/2018 | C796183 | Value: SC | Value: | Value: |
| | Conductivity (mS/cm) | | | | Value: | Value: | Value: |
| | | | | | Initials: | Initials: | Initials: |

**Additional Remarks:**

# EQUIPMENT CALIBRATION DAILY LOG

| | |
|---|---|
| Date: 4.3.18 | Project Name: VANG GW Event #21 |
| Project Number: | Recorded By: AG |

| PID | Model: Mini Rae | | | | Morning Calibration | Evening Check (if necessary) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: 3974 | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 0740 | Time: 1840 | Time: |
| First Point Calibration | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: 0<br>Initials: CAG | Value: 1.00<br>Initials: CAG | Value:<br>Initials: |
| Second Point Calibration | Vapor conc. (ppm) | 100 (Calibration Gas) | 1/22/22 | BBI-241-100-7 | Value: 100<br>Initials: CAG | Value: 92.4<br>Initials: CAG | Value:<br>Initials: |

| WATER QUALITY METER | Model: YSI 6920 | | | | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: 3328 | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 0740 | Time: 1820 | Time: |
| First Point Calibration (Auto) | pH | 4 | 09/2019 | 791006 | Value: 4 | Value: 3.96 | Value: |
| | Turbidity (NTU) | 0 | 09/2018 | C900710 | Value: 0 | Value: -0.3 | Value: |
| | Conductivity (mS/cm) | 1.413 | 12/2019 | 791100 | Value: 1.413 | Value: 1.434 | Value: |
| | ORP (mV) | 240 | 10/2022 | 2062 | Value: 240 | Value: 258 | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 7 | 08/2019 | 791H1000 | Value: 7 | Value: | Value: |
| | Turbidity (NTU) | 126 | 01/2019 | 18A1904S101 | Value: 126 | Value: | Value: |
| | Conductivity (mS/cm) | | | | Value: | Value: | Value: |
| | | | | | Initials: | Initials: | Initials: |

**Additional Remarks:**

# EQUIPMENT CALIBRATION DAILY LOG

| | |
|---|---|
| Date: 02-03-18 | Project Name: Virginia ANG |
| Project Number: 60278122 | Recorded By: MAB |

| PID | Model: Mini RAE 2000 | | | | Morning Calibration | Evening Check (if necessary) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: 4523 | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 0805 | Time: 1700 | Time: |
| First Point Calibration | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: 0.0<br>Initials: MAB | Value: 0.0<br>Initials: MAB | Value:<br>Initials: |
| Second Point Calibration | Vapor conc. (ppm) | 100.0<br>(Calibration Gas) | 04/22/2022 | 183I-248-100-7 | Value: 100<br>Initials: MAB | Value: ~~0.0~~ 100.0<br>Initials: MAB | Value:<br>Initials: |

| WATER QUALITY METER | Model: YSI 6920 | | | | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: 11167 | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 0735 | Time: 1715 | Time: |
| First Point Calibration (Auto) | pH | 7 | 08/2019 | 7GH1000 | Value: 7.17 | Value: 6.72 | Value: |
| | Turbidity (NTU) | 126.0 | 01/2019 | 18A1800222 | Value: 120.2 | Value: 126.1 | Value: |
| | Conductivity (mS/cm) | 1.413 | 12/2018 | 7GL100 | Value: 1.409 | Value: 1.485 | Value: |
| | ORP (mV) | 240 | 10/2022 | 2062 | Value: ~~MAB~~ 250.3 | Value: 227.7 | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 4 | 09/2019 | 7G1006 | Value: 4.02 | Value: | Value: |
| | Turbidity (NTU) | 0 | 01/2019 | 18012741 | Value: -1.0 | Value: | Value: |
| | Conductivity (mS/cm) | | | | Value: | Value: | Value: |
| | | | | | Initials: MAB | Initials: | Initials: |

**Additional Remarks:**

# EQUIPMENT CALIBRATION DAILY LOG

| | |
|---|---|
| Date: 4/3/18 | Project Name: VANG |
| Project Number: 60553452 | Recorded By: DB |

| PID | Model: | | | | Morning Calibration | Evening Check (if necessary) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 0800 | Time: 1700 | Time: |
| First Point Calibration | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: 0.0<br>Initials: DB | Value: 0.0<br>Initials: DB | Value:<br>Initials: |
| Second Point Calibration | Vapor conc. (ppm) | 100.0<br>(Calibration Gas) | 7/25/21 | HBH -248<br>-100-9 | Value: 100<br>Initials: DB | Value: 100<br>Initials: DB | Value:<br>Initials: |

| WATER QUALITY METER | Model: YSI 6920 | | | | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: 27080 | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 0745 | Time: 1707 | Time: |
| First Point Calibration (Auto) | pH | 7.0 | 9/19 | 7G1H1000 | Value: 7.02 | Value: 6.97 | Value: |
| | Turbidity (NTU) | 0 | 1/19 | 18012H1 | Value: 0.0 | Value: 0.0 | Value: |
| | Conductivity (mS/cm) | 1.413 | 8/18 | 7GH921 | Value: 1399 | Value: 1.397 | Value: |
| | ORP (mV) | 240 | 5/31/2021 | 0207 | Value: 240.2 | Value: 240.0 | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 4.0 | 12/31/18 | 6GL126 | Value: 4.08 | Value: | Value: |
| | Turbidity (NTU) | 126 | 04/30/18 | C79615 | Value: 126.0 | Value: | Value: |
| | Conductivity (mS/cm) | | | | Value: | Value: | Value: |
| | | | | | Initials: | Initials: | Initials: |

**Additional Remarks:**

# EQUIPMENT CALIBRATION DAILY LOG

| | |
|---|---|
| Date: 04-04-18 | Project Name: Virginia ANG |
| Project Number: 60678122 | Recorded By: MAB |

| PID | Model: Mini RAE 2000 | | | | Morning Calibration | Evening Check (if necessary) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: 4523 | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 0812 | Time: 1710 | Time: |
| First Point Calibration | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: 0.0<br>Initials: MAB | Value: 0.0<br>Initials: MAB | Value:<br>Initials: |
| Second Point Calibration | Vapor conc. (ppm) | 100<br>(Calibration Gas) | ~~MAB~~<br>04/22/2021 | BBI-248-100-7 | Value: 100<br>Initials: MAB | Value: 100<br>Initials: MAB | Value:<br>Initials: |

| WATER QUALITY METER | Model: YSI 6920 | | | | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: 11167 | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 0745 | Time: 1720 | Time: |
| First Point Calibration (Auto) | pH | 7 | 08/2019 | 761H1000 | Value: 6.81 | Value: 6.88 | Value: |
| | Turbidity (NTU) | 0 | 01/2019 | 18A1804881 | Value: 0.5 | Value: 1.5 | Value: |
| | Conductivity (mS/cm) | 1.413 | 12/2018 | 761A01 | Value: 1354 | Value: 1.482 | Value: |
| | ORP (mV) | 240 | 10/2022 | 2062 | Value: 239.9 | Value: 239.4 | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 4 | 09/2019 | 761006 | Value: ~~4.5~~ 4.17 | Value: | Value: |
| | Turbidity (NTU) | 126 | 01/2019 | 18012741 | Value: 126.0 | Value: | Value: |
| | Conductivity (mS/cm) | | | | Value: | Value: | Value: |
| | | | | | Initials: | Initials: | Initials: |

**Additional Remarks:**

# EQUIPMENT CALIBRATION DAILY LOG

| | |
|---|---|
| Date: 4-4-18 | Project Name: VANG GW Event #21 |
| Project Number: | Recorded By: Matt Kerr |

| PID | Model: PID - MiniRAE | | | | Morning Calibration | Evening Check (if necessary) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: 3274 | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 0830 | Time: 1650 | Time: |
| First Point Calibration | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: 0.0<br>Initials: MK | Value: 0.0<br>Initials: MK | Value:<br>Initials: |
| Second Point Calibration | Vapor conc. (ppm) | 100 (Calibration Gas) | 1-22-22 | BBI 248 100-7 | Value: 99.5<br>Initials: MK | Value: 93.9<br>Initials: MK | Value:<br>Initials: |

| WATER QUALITY METER | Model: YSI 6926 | | | | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: 3328 | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 0750 | Time: 1700 | Time: |
| First Point Calibration (Auto) | pH | 4.00 | 9-19 | 7GI006 | Value: 4.00 | Value: 4.06 | Value: |
| | Turbidity (NTU) | 0.0 | 9-18 | L800710 | Value: 0.2 | Value: 26.9 | Value: |
| | Conductivity (mS/cm) | 1.413 | 12-18 | 7GL100 | Value: 1.413 | Value: 1.342 | Value: |
| | ORP (mV) | 240.0 | 10-22 | 2062 | Value: 229.8 | Value: 235.1 | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 7.00 | 8-19 | 7GH1006 | Value: 6.94 | Value: 7.09 | Value: |
| | Turbidity (NTU) | 126 | 1-19 | 19A18043801 | Value: 115.2 | Value: 124.9 | Value: |
| | Conductivity (mS/cm) | | | | Value: | Value: | Value: |
| | | | | | Initials: MK | Initials: MK | Initials: |

**Additional Remarks:**

# EQUIPMENT CALIBRATION DAILY LOG

| | |
|---|---|
| Date: 4/4/18 | Project Name: VANG |
| Project Number: 60553852 | Recorded By: DB |

| PID | Model: / Equipment ID #: | | | | Morning Calibration | Evening Check (if necessary) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Parameter | Standard | Exp. Date | Lot # | Time: 0800 | Time: 1655 | Time: |
| First Point Calibration | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: 0.0<br>Initials: DB | Value: 0.0<br>Initials: DR | Value:<br>Initials: |
| Second Point Calibration | Vapor conc. (ppm) | 100.0 (Calibration Gas) | 7/25/21 | 110H-248<br>-100-9 | Value: 100<br>Initials: DB | Value: ~~1655~~ 100.0<br>Initials: DR | Value:<br>Initials: |

| WATER QUALITY METER | Model: YSI 6920 / Equipment ID #: 27080 | | | | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Parameter | Standard | Exp. Date | Lot # | Time: 0740 | Time: 1640 | Time: |
| First Point Calibration (Auto) | pH | 7.0 | 8/19 | 7GH1006 | Value: 6.97 | Value: 6.89 | Value: |
| | Turbidity (NTU) | 0 | 1/19 | 18062H1 | Value: 0.0 | Value: 0.0 | Value: |
| | Conductivity (mS/cm) | 1.413 | 8/18 | 7GH921 | Value: 1.419 | Value: 1.415 | Value: |
| | ORP (mV) | 240 | 5/31/21 | 0207 | Value: 240 | Value: 240.3 | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | ~~Value:~~ | ~~Value:~~ | ~~Value:~~ |
| Second Point Calibration | pH | 4.0 | 12/31/19 | 6GL126 | Value: 4.09 | Value: | Value: |
| | Turbidity (NTU) | 126 | 4/30/19 | C796155 | Value: 126.0 | Value: | Value: |
| | ~~Conductivity (mS/cm)~~ | | | | Value: ~~126~~ | ~~Value:~~ | ~~Value:~~ |
| | | | | | Initials: | Initials: | Initials: |

**Additional Remarks:**

# EQUIPMENT CALIBRATION DAILY LOG

| | | | |
|---|---|---|---|
| Date: | 4.5.18 | Project Name: | Vanq |
| Project Number: | 60553852 | Recorded By: | AG |

| PID | Model: Mini Rae 3000 | | | | Morning Calibration | Evening Check (if necessary) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: R19164 | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 0740 | Time: 1545 | Time: |
| First Point Calibration | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: 0<br>Initials: CAG | Value: 0.0<br>Initials: CAG | Value:<br>Initials: |
| Second Point Calibration | Vapor conc. (ppm) | (Calibration Gas) | 7/25/21 | ABH 246-100-9 | Value: 100<br>Initials: CAG | Value: 0.0<br>Initials: CAG<br>* PID failure | Value:<br>Initials: |

| WATER QUALITY METER | Model: YSI 6820 | | | | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: 10 968 | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 0740 | Time: 1548 | Time: |
| First Point Calibration (Auto) | pH | 4 | 09/2019 | 791006 | Value: 4 | Value: 4.10 | Value: |
| | Turbidity (NTU) | 0 | 01/2019 | 18D12741 | Value: 0 | Value: ~~1.3~~ 1.3 | Value: |
| | Conductivity (mS/cm) | 1.413 | 08/2018 | 7GH921 | Value: 1.413 | Value: 1.280 | Value: |
| | ORP (mV) | 240 | 05/2021 | 0207 | Value: 240 | Value: 230.9 | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 7 | 08/2019 | 7GH1000 | Value: 7 | Value: | Value: |
| | Turbidity (NTU) | 120 | 04/2018 | C796155 | Value: 120 | Value: | Value: |
| | Conductivity (mS/cm) | | | | Value: | Value: | Value: |
| | | | | | Initials: CAG | Initials: CAG | Initials: |

**Additional Remarks:**

# EQUIPMENT CALIBRATION DAILY LOG

| | |
|---|---|
| Date: 04-05-18 | Project Name: Virginia ANG |
| Project Number: 60278122 | Recorded By: MAB |

| PID | Model: MiniRAE 2000 | | | | Morning Calibration | Evening Check (if necessary) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: 4523 | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 0750 | Time: 1740 | Time: |
| First Point Calibration | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: 0.0<br>Initials: MAB | Value: 0.0<br>Initials: MAB | Value:<br>Initials: |
| Second Point Calibration | Vapor conc. (ppm) | 100 Isobutylene (Calibration Gas) | 1/22/2022 | BBI-248-100-7 | Value: 100.0<br>Initials: MAB | Value: 100.0<br>Initials: MAB | Value:<br>Initials: |

| WATER QUALITY METER | Model: YSI 6920 | | | | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: 11167 | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 0820 | Time: 1745 | Time: 1530 |
| First Point Calibration (Auto) | pH | 7 | 08/2019 | 7GH1000 | Value: 7.27 | Value: 6.61 | Value: |
| | Turbidity (NTU) | 0 | 01/2019 | 18111818801 | Value: 1.2 | Value: 0.9 | Value: -2.4 |
| | Conductivity (mS/cm) | 1.413 | 12/2018 | 7GL100 | Value: 1,370 | Value: 1,408 | Value: |
| | ORP (mV) | 240.0 | 10/2022 | 2062 | Value: 253.9 | Value: 233.3 | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 4 | 09/2019 | 7GI006 | Value: 3.94 | Value: | Value: |
| | Turbidity (NTU) | 126.0 | 10/2019 | 18012741 | Value: 114.8 | Value: | Value: |
| | Conductivity (mS/cm) | | | | Value: | Value: | Value: |
| | | | | | Initials: | Initials: | Initials: |

**Additional Remarks:**

Evening and additional turbidity calib. was completed wit distilled water

# EQUIPMENT CALIBRATION DAILY LOG

| | |
|---|---|
| Date: 4 - 5 - 16 | Project Name: VANG |
| Project Number: | Recorded By: Matt Kerr |

| PID | Model: Mini RAE2000 | | | | Morning Calibration | Evening Check (if necessary) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: 3974 | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 0816 | Time: 16:37 | Time: |
| First Point Calibration | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: 0.0<br>Initials: MK | Value: 0.0<br>Initials: MK | Value:<br>Initials: |
| Second Point Calibration | Vapor conc. (ppm) | ISO (Calibration Gas) | 1/22/22 | BBI-248-100-7 | Value: 100.0<br>Initials: MK | Value: 95.1<br>Initials: MK | Value:<br>Initials: |

| WATER QUALITY METER | Model: YSI 6920 | | | | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: 3328 | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 07:55 | Time: 16:45 | Time: |
| First Point Calibration (Auto) | pH | 4.00 | 9-19 | 76I006 | Value: 4.00 | Value: 4.001 | Value: |
| | Turbidity (NTU) | 0.0 | 9-18 | C800710 | Value: 0.0 | Value: 17.9 | Value: |
| | Conductivity (mS/cm) | 1.413 | 12-18 | 76L100 | Value: 1.413 | Value: 1.401 | Value: |
| | ORP (mV) | 240.0 | 10-22 | 2062 | Value: 240.0 | Value: 227.4 | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Piont Calibration | pH | 7.00 | 8-19 | | Value: 7.00 | Value: 6.85 | Value: |
| | Turbidity (NTU) | 126 | 1-19 | | Value: 126 | Value: 115.4 | Value: |
| | Conductivity (mS/cm) | | | | Value: | Value: | Value: |
| | | | | | Initials: MK | Initials: MK | Initials: |

**Additional Remarks:**

# EQUIPMENT CALIBRATION DAILY LOG

| | | | |
|---|---|---|---|
| **Date:** | 4/5/18 | **Project Name:** | VANG |
| **Project Number:** | 60553852 | **Recorded By:** | DB |

| PID | Model: | m.n. Rae 2000 | | | Morning Calibration | Evening Check (if necessary) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: | — | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 0815 | Time: 1725 | Time: |
| First Point Calibration | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: 0.0<br>Initials: DB | Value: 0.0<br>Initials: DM | Value:<br>Initials: |
| Second Point Calibration | Vapor conc. (ppm) | 100.0<br>(Calibration Gas) | 7/25/21 | HBH-248<br>-100-9 | Value: 100.0<br>Initials: DB | Value: 100.0<br>Initials: DM | Value:<br>Initials: |

| WATER QUALITY METER | Model: | YSI 6920 | | | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: | 27080 | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 0800 | Time: 1715 | Time: |
| First Point Calibration (Auto) | pH | 7.0 | 8/19 | 7GH1000 | Value: 7.04 | Value: 6.75 | Value: |
| | Turbidity (NTU) | 0.0 | 1/19 | 18012H1 | Value: 0.0 | Value: 0.0 | Value: |
| | Conductivity (mS/cm) | 1.413 | 8/18 | 7GH921 | Value: 1.413 | Value: 1.499 | Value: |
| | ORP (mV) | 240.0 | 5/31/21 | 0207 | Value: 240.0 | Value: 240.0 | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: — | Value: — | Value: |
| Second Point Calibration | pH | 4.0 | 12/31/18 | 6GL126 | Value: 3.98 | Value: — | Value: |
| | Turbidity (NTU) | 126.0 | 4/30/18 | C796155 | Value: 125.9 | Value: — | Value: |
| | Conductivity (mS/cm) | | | | Value: — | Value: — | Value: |
| | | | | | Initials: | Initials: | Initials: |

**Additional Remarks:**

# EQUIPMENT CALIBRATION DAILY LOG

| | |
|---|---|
| Date: 4-6-18 | Project Name: VANG |
| Project Number: | Recorded By: MK |

| PID | Model: M.i. RAE 2000 | | | | Morning Calibration | Evening Check (if necessary) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: 3974 | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 0800 | Time: 1333 | Time: |
| First Point Calibration | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: 0.0<br>Initials: MK | Value: 00<br>Initials: MK | Value:<br>Initials: |
| Second Point Calibration | Vapor conc. (ppm) | 100 (Calibration Gas) | 1-22-22 | BBI - 248 - 600-7 | Value: 99.8<br>Initials: MK | Value: 94.6<br>Initials: MK | Value:<br>Initials: |

| WATER QUALITY METER | Model: YSI 6920 | | | | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: 3328 | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 0740 | Time: 1310 | Time: |
| First Point Calibration (Auto) | pH | 4.00 | 9-19 | 761006 | Value: 4.00 | Value: 4.02 | Value: |
| | Turbidity (NTU) | 126.0 | 1-19 | 15A1804380 | Value: 126 | Value: 121.3 | Value: |
| | Conductivity (mS/cm) | 1.413 | 12-18 | 76L100 | Value: 1.413 | Value: 1.408 | Value: |
| | ORP (mV) | 240.0 | 10-22 | 2062 | Value: 240.0 | Value: 225.6 | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 7.00 | 4-19 | 76H1000 | Value: 7.00 | Value: 7.09 | Value: |
| | Turbidity (NTU) | 0 (filtered water) | 9-5-19 | | Value: 0.0 | Value: 0.2 | Value: |
| | Conductivity (mS/cm) | | | | Value: | Value: | Value: |
| | | | | | Initials: | Initials: | Initials: |

**Additional Remarks:**

# EQUIPMENT CALIBRATION DAILY LOG

| | | | |
|---|---|---|---|
| Date: | 4/6/18 | Project Name: | YANG |
| Project Number: | 60553852 | Recorded By: | DB |

| PID | Model: mini Rae 2000 | | | | Morning Calibration | Evening Check (if necessary) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: ~ | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 0800 | Time: 1315 | Time: |
| First Point Calibration | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: 0.0<br>Initials: DB | Value: 0.0<br>Initials: DB | Value:<br>Initials: |
| Second Point Calibration | Vapor conc. (ppm) | (Calibration Gas) | 7/25/21 | 1TBT-248 -100-5 | Value: 99.3<br>Initials: DB | Value: 88.9<br>Initials: DB | Value:<br>Initials: |

| WATER QUALITY METER | Model: YSI 6920 | | | | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: 27080 | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 075 | Time: 1320 | Time: |
| First Point Calibration (Auto) | pH | 7.0 | 8/18 | 7GH1000 | Value: 6.96 | Value: 7.04 | Value: |
| | Turbidity (NTU) | 0.0 | 1/19 | 18012H1 | Value: 0.0 | Value: 0.0 | Value: |
| | Conductivity (mS/cm) | 1.413 | 8/18 | 7GH921 | Value: 1.418 | Value: 1.457 | Value: |
| | ORP (mV) | 240 | 5/31/21 | 0207 | Value: 240.1 | Value: 237.8 | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 4.0 | 12/31/18 | 6GL12 | Value: 3.99 | Value: | Value: |
| | Turbidity (NTU) | 126.0 | 4/30/19 | CA6155 | Value: 126.0 | Value: | Value: |
| | Conductivity (mS/cm) | | | | Value: | Value: | Value: |
| | | | | | Initials: | Initials: | Initials: |

**Additional Remarks:**

# EQUIPMENT CALIBRATION DAILY LOG

| | |
|---|---|
| Date: 4.6.18 | Project Name: VANC |
| Project Number: 60553952 | Recorded By: AG |

| PID | Model: Not using mine borrowing<br>Equipment ID #: from someone else... | | | | Morning Calibration | Evening Check (if necessary) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Parameter | Standard | Exp. Date | Lot # | Time: | Time: | Time: |
| First Point Calibration | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value:<br>Initials: | Value:<br>Initials: | Value:<br>Initials: |
| Second Point Calibration | Vapor conc. (ppm) | (Calibration Gas) | *look at Dan's Cal info, borrowed his PID. | | Value:<br>Initials: | Value:<br>Initials: | Value:<br>Initials: |

| WATER QUALITY METER | Model: YSI 6820<br>Equipment ID #: 10968 | | | | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Parameter | Standard | Exp. Date | Lot # | Time: 0730 | Time: 1300 | Time: |
| First Point Calibration (Auto) | pH | 4 | 09/2019 | 741006 | Value: 4 | Value: 5.98 | Value: |
| | Turbidity (NTU) | 0 | 01/2019 | 18012741 | Value: 0 | Value: 0.04 | Value: |
| | Conductivity (mS/cm) | 1.413 | 08/2018 | 79H921 | Value: 1.413 | Value: 1.493 | Value: |
| | ORP (mV) | 240 | 05/2021 | 0207 | Value: 240 | Value: 228.0 | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 7 | 08/2019 | 791+1000 | Value: 7 | Value: 8.56 | Value: |
| | Turbidity (NTU) | 126 | 04/2018 | C796155 | Value: 126 | Value: | Value: |
| | Conductivity (mS/cm) | | | | Value: | Value: | Value: |
| | | | | | Initials: CAG | Initials: | Initials: |

**Additional Remarks:**

Evening cal pH has very dif #'s.

# EQUIPMENT CALIBRATION DAILY LOG

| | |
|---|---|
| **Date:** 04-06-18 | **Project Name:** Virginia LNG |
| **Project Number:** 60278122 | **Recorded By:** MJR |

| PID | Model: MiniRAE 2000 | | | | Morning Calibration | Evening Check (if necessary) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: 4523 | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 0730 | Time: 1300 | Time: |
| First Point Calibration | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: 0.0<br>Initials: MJR | Value: 0.0<br>Initials: MJR | Value:<br>Initials: |
| Second Point Calibration | Vapor conc. (ppm) | 100.0 (Calibration Gas) | 1/22/2022 | 18BI-248-100-7 | Value: 100.0<br>Initials: MJR | Value: 100.0<br>Initials: MJR | Value:<br>Initials |

| WATER QUALITY METER | Model: YSI 6920 | | | | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: 11167 | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 0740 | Time: 1240 | Time: |
| First Point Calibration (Auto) | pH | 7 | 08/2019 | 761100 | Value: 6.93 | Value: 6.85 | Value: |
| | Turbidity (NTU) | 0 | ~~01/2019~~ | ~~18A19041321~~ | Value: -2.3 | Value: 0 | Value: |
| | Conductivity (mS/cm) | 1.413 | 12/2018 | 7GL100 | Value: 1410 | Value: 1.433 | Value: |
| | ORP (mV) | 240.0 | 10/2022 | 2062 | Value: 242.6 | Value: 231.7 | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 4 | 09/2019 | 7GI006 | Value: 4.05 | Value: | Value: |
| | Turbidity (NTU) | 126.0 | 01/2019 | 18012741 | Value: 132.5 | Value: | Value: |
| | Conductivity (mS/cm) | | | | Value: | Value: | Value: |
| | | | | | Initials: | Initials: | Initials |

**Additional Remarks:**
Distilled water used to calibrat 0 Turbidity due to the kit issued standard being cloudy

# EQUIPMENT CALIBRATION DAILY LOG

| | |
|---|---|
| Date: 4/9/18 | Project Name: VANG |
| Project Number: | Recorded By: MG |

| PID | Model: | | | | Morning Calibration | Evening Check (if necessary) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: | Time: | Time: |
| First Point Calibration | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value:<br>Initials: | Value:<br>Initials: | Value:<br>Initials: |
| Second Point Calibration | Vapor conc. (ppm) | (Calibration Gas) | | | Value:<br>Initials: | Value:<br>Initials: | Value:<br>Initials: |

| WATER QUALITY METER | Model: YSI 6920 V2 | | | | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | Equipment ID #: 27080 / 5982 | | | | | | |
| | Parameter | Standard | Exp. Date | Lot # | Time: 0940 | Time: 1500 | Time: |
| First Point Calibration (Auto) | pH | 7.0 | 8/2019 | 7GH1000 | Value: MG | Value: 6.91 | Value: |
| | Turbidity (NTU) | 0 | 01/2019 | 18012741 | Value: MG | Value: 3.9 | Value: |
| | Conductivity (mS/cm) | 1.413 | 8/2018 | 7GH921 | Value: MG | Value: 1.446 | Value: |
| | ORP (mV) | 240 | 5/31/21 | 0207 | Value: MG | Value: 217 | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 4.0 | 12/31/18 | 6GL126 | Value: MG | Value: | Value: |
| | Turbidity (NTU) | 126 | 4/30/18 | 0796155 | Value: MG | Value: | Value: |
| | Conductivity (mS/cm) | | | | Value: | Value: | Value: |
| | | | | | Initials: | Initials: | Initials: |

**Additional Remarks:**

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# Appendix D

# Laboratory Analytical Summary Data Packages with Chain of Custody forms

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*NELAP CERTIFICATE NUMBER: 01955*
*DOD ELAP CERTIFICATE NUMBER: L14-243*

# ANALYTICAL RESULTS

**PERFORMED BY**

**GCAL, LLC**
**7979 Innovation Park Dr.**
**Baton Rouge, LA 70820**

**Report Date** 04/23/2018

**GCAL Report** 218040620

***Project*** VANG #60553852

| ***Deliver To*** | ***Additional Recipients*** |
|---|---|
| Naoum Tavantzis<br>AECOM<br>1600 Peremeter Park Drive<br>Suite 400<br>Morrisville, NC 27560<br>919-461-1100 | Sumon Chatterjee, AECOM<br>Megan Donahue, AECOM<br>Andy Gerringer, AECOM |

# Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with GCAL's Standard Operating Procedures.

**Common Abbreviations that may be Utilized in this Report**

| | |
|---|---|
| **ND** | Indicates the result was Not Detected at the specified reporting limit |
| **NO** | Indicates the sample did not ignite when preliminary test performed for EPA Method 1030 |
| **DO** | Indicates the result was Diluted Out |
| **MI** | Indicates the result was subject to Matrix Interference |
| **TNTC** | Indicates the result was Too Numerous To Count |
| **SUBC** | Indicates the analysis was Sub-Contracted |
| **FLD** | Indicates the analysis was performed in the Field |
| **DL** | Detection Limit |
| **LOD** | Limit of Detection |
| **LOQ** | Limit of Quantitation |
| **RE** | Re-analysis |
| **CF** | HPLC or GC Confirmation |
| **00:01** | Reported as a time equivalent to 12:00 AM |

**Reporting Flags that may be Utilized in this Report**

| | |
|---|---|
| **J or I** | Indicates the result is between the MDL and LOQ |
| **J** | DOD flag on analyte in the parent sample for MS/MSD outside acceptance criteria |
| **U** | Indicates the compound was analyzed for but not detected |
| **B or V** | Indicates the analyte was detected in the associated Method Blank |
| **Q** | Indicates a non-compliant QC Result (See Q Flag Application Report) |
| * | Indicates a non-compliant or not applicable QC recovery or RPD – see narrative |
| **E** | Organics - The result is estimated because it exceeded the instrument calibration range |
| **E** | Metals - % diference for the serial dilution is > 10% |
| **L** | Reporting Limits adjusted to meet risk-based limit. |
| **P** | RPD between primary and confirmation result is greater than 40 |
| **DL** | Diluted analysis – when appended to Client Sample ID |

Sample receipt at GCAL is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of GCAL. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with The NELAC Institute (TNI) Standard 2009 and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

_____
Authorized Signature
GCAL Report 218040620

# Certifications

| Certification | Certification Number |
|---|---|
| DOD ELAP | L14-243 |
| Alabama | 01955 |
| Arkansas | 12-060-0 |
| Colorado | 01955 |
| Delaware | 01955 |
| Florida | E87854 |
| Georgia | 01955 |
| Hawaii | 01955 |
| Idaho | 01955 |
| Illinois | 200048 |
| Indiana | 01955 |
| Kansas | E-10354 |
| Kentucky | 95 |
| Louisiana | 01955 |
| Maryland | 01955 |
| Massachusetts | 01955 |
| Michigan | 01955 |
| Mississippi | 01955 |
| Missouri | 01955 |
| Montana | N/A |
| Nebraska | 01955 |
| New Mexico | 01955 |
| North Carolina | 618 |
| North Dakota | R-195 |
| Oklahoma | 9403 |
| South Carolina | 73006001 |
| South Dakota | 01955 |
| Tennessee | 01955 |
| Texas | T104704178 |
| Vermont | 01955 |
| Virginia | 460215 |
| USDA Soil Permit | P330-10-00117 |

# Case Narrative

**Client:** AECOM-East **Report:** 218040620

Gulf Coast Analytical Laboratories received and analyzed the sample(s) listed
on the Report Sample Summary page of this report. Receipt of the sample(s) is documented
by the attached chain of custody. This applies only to the sample(s) listed in this report.
No sample integrity or quality control exceptions were identified unless noted below.

**PROJECT MANAGER COMMENTS**

Per Megan Donahue's email on 4/5/18, any samples marked for CO2 analysis on the COC, needs to be analyzed for RSK (MEE & CO2). (Amanda Cobb 04/06/2018 12:53)

Samples TW-7-21 and TW-6-21 received, but not listed on the COC. Added to workorder for VOC analysis per Megan Donahue's email on 4/6/18. (Amanda Cobb 04/06/2018 16:19)

**VOLATILES GAS CHROMATOGRAPHY**

In the EPA RSK-175 analysis, the recovery for the surrogate is reported as D, diluted out for those analyses performed at a 10 or higher dilution.

**MISCELLANEOUS**

This report was completed in accordance with DOD QSM 5.1 as specified in the contract.

## Q Flag Summary

NO Q FLAGS FOR THIS WORKORDER

# Sample Summary

| GCAL ID | Client ID | Matrix | Collect Date/Time | Receive Date/Time |
|---|---|---|---|---|
| 21804062001 | MW-13-11-21 | Water | 04/05/2018 10:45 | 04/06/2018 09:35 |
| 21804062002 | MW-11-02-21 | Water | 04/05/2018 13:10 | 04/06/2018 09:35 |
| 21804062003 | S4-MW50-21 | Water | 04/05/2018 10:10 | 04/06/2018 09:35 |
| 21804062004 | S4-MW51-21 | Water | 04/05/2018 11:40 | 04/06/2018 09:35 |
| 21804062005 | S4-MW-49-21 | Water | 04/05/2018 10:13 | 04/06/2018 09:35 |
| 21804062006 | S4-MW-48-21 | Water | 04/05/2018 11:40 | 04/06/2018 09:35 |
| 21804062007 | MW-11-06-21 | Water | 04/05/2018 14:50 | 04/06/2018 09:35 |
| 21804062008 | MW-11-10-21 | Water | 04/05/2018 17:15 | 04/06/2018 09:35 |
| 21804062009 | MW-11-01-21 | Water | 04/05/2018 14:50 | 04/06/2018 09:35 |
| 21804062010 | RD5-MW-01-21 | Water | 04/05/2018 16:35 | 04/06/2018 09:35 |
| 21804062011 | MW-01-07-21 | Water | 04/05/2018 13:45 | 04/06/2018 09:35 |
| 21804062012 | S4-MW-46-21 | Water | 04/05/2018 13:10 | 04/06/2018 09:35 |
| 21804062013 | S4-MW-47-21 | Water | 04/05/2018 14:40 | 04/06/2018 09:35 |
| 21804062014 | Trip Blank | Water | 04/05/2018 00:01 | 04/06/2018 09:35 |
| 21804062015 | S4-MW28-21 | Water | 04/05/2018 11:30 | 04/06/2018 09:35 |
| 21804062016 | S4-MW37-21 | Water | 04/05/2018 10:15 | 04/06/2018 09:35 |
| 21804062017 | MW-01-06-21 | Water | 04/05/2018 15:40 | 04/06/2018 09:35 |
| 21804062018 | TW-6-21 | Water | 04/05/2018 09:00 | 04/06/2018 09:35 |
| 21804062019 | TW-7-21 | Water | 04/05/2018 10:00 | 04/06/2018 09:35 |

# Test Summary

| GCAL ID | Client ID | Matrix | Procedure |
|---|---|---|---|
| 21804062001 | MW-13-11-21 | W | SM 2540C TDS |
| 21804062001 | MW-13-11-21 | W | SM 2320B Alkalinity Water |
| 21804062001 | MW-13-11-21 | W | SM 4500 H+B/EPA 9040 pH |
| 21804062001 | MW-13-11-21 | W | EPA 6020A |
| 21804062001 | MW-13-11-21 | W | EPA 6020A Dissolved |
| 21804062001 | MW-13-11-21 | W | EPA 6020 Dissolved Prep |
| 21804062001 | MW-13-11-21 | W | EPA 6020 Water Prep |
| 21804062001 | MW-13-11-21 | W | EPA 8260C DOD |
| 21804062001 | MW-13-11-21 | W | EPA 9060A |
| 21804062001 | MW-13-11-21 | W | EPA RSK 175 |
| 21804062001 | MW-13-11-21 | W | EPA RSK 175 |
| 21804062002 | MW-11-02-21 | W | SM 2540C TDS |
| 21804062002 | MW-11-02-21 | W | SM 2320B Alkalinity Water |
| 21804062002 | MW-11-02-21 | W | SM 4500 H+B/EPA 9040 pH |
| 21804062002 | MW-11-02-21 | W | EPA 6020A |
| 21804062002 | MW-11-02-21 | W | EPA 6020A Dissolved |
| 21804062002 | MW-11-02-21 | W | EPA 6020 Dissolved Prep |
| 21804062002 | MW-11-02-21 | W | EPA 6020 Water Prep |
| 21804062002 | MW-11-02-21 | W | EPA 8260C DOD |
| 21804062002 | MW-11-02-21 | W | EPA 9060A |
| 21804062002 | MW-11-02-21 | W | EPA RSK 175 |
| 21804062002 | MW-11-02-21 | W | EPA RSK 175 |
| 21804062003 | S4-MW50-21 | W | EPA 8260C DOD |
| 21804062004 | S4-MW51-21 | W | EPA 8260C DOD |
| 21804062005 | S4-MW-49-21 | W | EPA 8260C DOD |
| 21804062006 | S4-MW-48-21 | W | EPA 8260C DOD |
| 21804062007 | MW-11-06-21 | W | SM 2540C TDS |
| 21804062007 | MW-11-06-21 | W | SM 2320B Alkalinity Water |
| 21804062007 | MW-11-06-21 | W | SM 4500 H+B/EPA 9040 pH |
| 21804062007 | MW-11-06-21 | W | EPA 6020A |
| 21804062007 | MW-11-06-21 | W | EPA 6020A Dissolved |
| 21804062007 | MW-11-06-21 | W | EPA 6020 Dissolved Prep |
| 21804062007 | MW-11-06-21 | W | EPA 6020 Water Prep |
| 21804062007 | MW-11-06-21 | W | EPA 8260C DOD |
| 21804062007 | MW-11-06-21 | W | EPA 9060A |
| 21804062007 | MW-11-06-21 | W | EPA RSK 175 |
| 21804062007 | MW-11-06-21 | W | EPA RSK 175 |
| 21804062008 | MW-11-10-21 | W | SM 2540C TDS |
| 21804062008 | MW-11-10-21 | W | SM 2320B Alkalinity Water |
| 21804062008 | MW-11-10-21 | W | SM 4500 H+B/EPA 9040 pH |
| 21804062008 | MW-11-10-21 | W | EPA 6020A |
| 21804062008 | MW-11-10-21 | W | EPA 6020A Dissolved |
| 21804062008 | MW-11-10-21 | W | EPA 6020 Dissolved Prep |
| 21804062008 | MW-11-10-21 | W | EPA 6020 Water Prep |
| 21804062008 | MW-11-10-21 | W | EPA 8260C DOD |
| 21804062008 | MW-11-10-21 | W | EPA 9060A |
| 21804062008 | MW-11-10-21 | W | EPA RSK 175 |
| 21804062008 | MW-11-10-21 | W | EPA RSK 175 |
| 21804062009 | MW-11-01-21 | W | SM 2540C TDS |
| 21804062009 | MW-11-01-21 | W | SM 2320B Alkalinity Water |

# Test Summary (Continued)

| GCAL ID | Client ID | Matrix | Procedure |
|---|---|---|---|
| 21804062009 | MW-11-01-21 | W | SM 4500 H+B/EPA 9040 pH |
| 21804062009 | MW-11-01-21 | W | EPA 6020A |
| 21804062009 | MW-11-01-21 | W | EPA 6020A Dissolved |
| 21804062009 | MW-11-01-21 | W | EPA 6020 Dissolved Prep |
| 21804062009 | MW-11-01-21 | W | EPA 6020 Water Prep |
| 21804062009 | MW-11-01-21 | W | EPA 8260C DOD |
| 21804062009 | MW-11-01-21 | W | EPA 9060A |
| 21804062009 | MW-11-01-21 | W | EPA RSK 175 |
| 21804062009 | MW-11-01-21 | W | EPA RSK 175 |
| 21804062010 | RD5-MW-01-21 | W | SM 2540C TDS |
| 21804062010 | RD5-MW-01-21 | W | SM 2320B Alkalinity Water |
| 21804062010 | RD5-MW-01-21 | W | SM 4500 H+B/EPA 9040 pH |
| 21804062010 | RD5-MW-01-21 | W | EPA 6020A |
| 21804062010 | RD5-MW-01-21 | W | EPA 6020A Dissolved |
| 21804062010 | RD5-MW-01-21 | W | EPA 6020 Dissolved Prep |
| 21804062010 | RD5-MW-01-21 | W | EPA 6020 Water Prep |
| 21804062010 | RD5-MW-01-21 | W | EPA 8260C DOD |
| 21804062010 | RD5-MW-01-21 | W | EPA 9060A |
| 21804062010 | RD5-MW-01-21 | W | EPA RSK 175 |
| 21804062010 | RD5-MW-01-21 | W | EPA RSK 175 |
| 21804062011 | MW-01-07-21 | W | EPA 8260C DOD |
| 21804062012 | S4-MW-46-21 | W | EPA 8260C DOD |
| 21804062013 | S4-MW-47-21 | W | EPA 8260C DOD |
| 21804062014 | Trip Blank | W | EPA 8260C DOD |
| 21804062015 | S4-MW28-21 | W | EPA 8260C DOD |
| 21804062016 | S4-MW37-21 | W | EPA 8260C DOD |
| 21804062017 | MW-01-06-21 | W | EPA 8260C DOD |
| 21804062018 | TW-6-21 | W | EPA 8260C DOD |
| 21804062019 | TW-7-21 | W | EPA 8260C DOD |

# Manual Integrations

| GCAL ID | Client ID | Procedure | CAS | Analyte |
|---|---|---|---|---|
| 21804062001 | MW-13-11-21 | EPA RSK-175 | 115-07-1 | Propene |
| 21804062001 | MW-13-11-21 | EPA RSK-175 | 124-38-9 | Carbon Dioxide |
| 21804062001 | MW-13-11-21 | EPA RSK-175 | 74-82-8 | Methane |
| 21804062001 | MW-13-11-21 | EPA RSK-175 | 74-84-0 | Ethane |
| 21804062001 | MW-13-11-21 | EPA RSK-175 | 74-85-1 | Ethene |
| 21804062001DL | MW-13-11-21DL | EPA RSK-175 | 74-82-8 | Methane |
| 21804062002 | MW-11-02-21 | EPA RSK-175 | 115-07-1 | Propene |
| 21804062002 | MW-11-02-21 | EPA RSK-175 | 124-38-9 | Carbon Dioxide |
| 21804062002 | MW-11-02-21 | EPA RSK-175 | 74-82-8 | Methane |
| 21804062002 | MW-11-02-21 | EPA RSK-175 | 74-84-0 | Ethane |
| 21804062002 | MW-11-02-21 | EPA RSK-175 | 74-85-1 | Ethene |
| 21804062002DL | MW-11-02-21DL | EPA RSK-175 | 74-82-8 | Methane |
| 21804062007 | MW-11-06-21 | EPA RSK-175 | 115-07-1 | Propene |
| 21804062007 | MW-11-06-21 | EPA RSK-175 | 124-38-9 | Carbon Dioxide |
| 21804062007 | MW-11-06-21 | EPA RSK-175 | 74-82-8 | Methane |
| 21804062007 | MW-11-06-21 | EPA RSK-175 | 74-84-0 | Ethane |
| 21804062007 | MW-11-06-21 | EPA RSK-175 | 74-85-1 | Ethene |
| 21804062007DL | MW-11-06-21DL | EPA RSK-175 | 74-82-8 | Methane |
| 21804062008 | MW-11-10-21 | EPA RSK-175 | 115-07-1 | Propene |
| 21804062008 | MW-11-10-21 | EPA RSK-175 | 124-38-9 | Carbon Dioxide |
| 21804062008 | MW-11-10-21 | EPA RSK-175 | 74-82-8 | Methane |
| 21804062008 | MW-11-10-21 | EPA RSK-175 | 74-84-0 | Ethane |
| 21804062008 | MW-11-10-21 | EPA RSK-175 | 74-85-1 | Ethene |
| 21804062008DL | MW-11-10-21DL | EPA RSK-175 | 74-82-8 | Methane |
| 21804062009 | MW-11-01-21 | EPA RSK-175 | 115-07-1 | Propene |
| 21804062009 | MW-11-01-21 | EPA RSK-175 | 74-82-8 | Methane |
| 21804062009 | MW-11-01-21 | EPA RSK-175 | 74-85-1 | Ethene |
| 21804062009DL | MW-11-01-21DL | EPA RSK-175 | 74-82-8 | Methane |
| 21804062009DL | MW-11-01-21DL | EPA RSK-175 | 74-84-0 | Ethane |
| 21804062010 | RD5-MW-01-21 | EPA RSK-175 | 115-07-1 | Propene |
| 21804062010 | RD5-MW-01-21 | EPA RSK-175 | 124-38-9 | Carbon Dioxide |
| 21804062010 | RD5-MW-01-21 | EPA RSK-175 | 74-82-8 | Methane |

# Summary of Compounds Detected

| MW-13-11-21 | | | | |
|---|---|---|---|---|
| | **Collect Date** | 04/05/2018 10:45 | **GCAL ID** | 21804062001 |
| | **Receive Date** | 04/06/2018 09:35 | **Matrix** | Water |

## EPA 8260C

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 95-50-1 | 1,2-Dichlorobenzene | 4.75 | 0.200 | 0.500 | 1.00 | ug/L |
| 541-73-1 | 1,3-Dichlorobenzene | 3.67 | 0.200 | 0.500 | 1.00 | ug/L |
| 106-46-7 | 1,4-Dichlorobenzene | 15.7 | 0.200 | 0.500 | 1.00 | ug/L |
| 108-90-7 | Chlorobenzene | 20.7 | 0.200 | 0.500 | 1.00 | ug/L |
| 156-59-2 | cis-1,2-Dichloroethene | 152 | 0.200 | 0.500 | 1.00 | ug/L |
| 95-47-6 | o-Xylene | 0.695J | 0.200 | 0.500 | 1.00 | ug/L |
| 156-60-5 | trans-1,2-Dichloroethene | 0.695J | 0.200 | 0.500 | 1.00 | ug/L |
| 75-01-4 | Vinyl chloride | 41.5 | 0.200 | 0.500 | 1.00 | ug/L |

## EPA RSK-175

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 124-38-9 | Carbon Dioxide | 366000 | 38100 | 116000 | 270000 | ug/L |
| 74-84-0 | Ethane | 0.286J | 0.110 | 0.220 | 1.00 | ug/L |
| 74-85-1 | Ethene | 2.26 | 0.150 | 0.290 | 1.00 | ug/L |
| 74-82-8 | Methane | 10700 | 131 | 327 | 600 | ug/L |

## EPA 6020A

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 7440-38-2 | Arsenic | 2.41 | 0.25 | 0.50 | 1.00 | ug/L |
| 7439-89-6 | Iron | 95600 | 250 | 500 | 1000 | ug/L |
| 7439-96-5 | Manganese | 64.9 | 1.25 | 2.50 | 5.00 | ug/L |

## EPA 6020A Dissolved

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 7439-89-6 | Iron | 11400 | 250 | 500 | 1000 | ug/L |
| 7439-96-5 | Manganese | 42.5 | 1.25 | 2.50 | 5.00 | ug/L |

# Summary of Compounds Detected

## MW-13-11-21

| | | | |
|---|---|---|---|
| **Collect Date** | 04/05/2018 10:45 | **GCAL ID** | 21804062001 |
| **Receive Date** | 04/06/2018 09:35 | **Matrix** | Water |

### EPA 9060A

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| C-012 | Total Organic Carbon | 12800 | 600 | 4000 | 4000 | ug/L |

### SM 2320 B-2011

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 000000-00-5 | Total Alkalinity | 182 | 0.26 | 0.50 | 1.0 | mg/L CaCO3 |

### SM 2540 C-2011

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| WET-035 | Total Dissolved Solids(TDS) | 248000 | 10000 | 10000 | 10000 | ug/L |

### SM 4500-H+ B/EPA 9040C

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| pH | pH | 6.22 | 1.00 | 1.00 | 1.00 | pH unit |

## MW-11-02-21

| | | | |
|---|---|---|---|
| **Collect Date** | 04/05/2018 13:10 | **GCAL ID** | 21804062002 |
| **Receive Date** | 04/06/2018 09:35 | **Matrix** | Water |

### EPA 8260C

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 75-35-4 | 1,1-Dichloroethene | 1.53 | 0.200 | 0.500 | 1.00 | ug/L |
| 95-50-1 | 1,2-Dichlorobenzene | 21.7 | 0.200 | 0.500 | 1.00 | ug/L |
| 541-73-1 | 1,3-Dichlorobenzene | 4.37 | 0.200 | 0.500 | 1.00 | ug/L |
| 106-46-7 | 1,4-Dichlorobenzene | 14.9 | 0.200 | 0.500 | 1.00 | ug/L |
| 78-93-3 | 2-Butanone | 39.8 | 0.200 | 0.500 | 5.00 | ug/L |
| 67-64-1 | Acetone | 10.7 | 0.500 | 1.00 | 5.00 | ug/L |
| 71-43-2 | Benzene | 0.456J | 0.200 | 0.500 | 1.00 | ug/L |
| 108-90-7 | Chlorobenzene | 2.68 | 0.200 | 0.500 | 1.00 | ug/L |
| 156-59-2 | cis-1,2-Dichloroethene | 196 | 0.200 | 0.500 | 1.00 | ug/L |
| 95-47-6 | o-Xylene | 0.452J | 0.200 | 0.500 | 1.00 | ug/L |
| 108-88-3 | Toluene | 8.53 | 0.200 | 0.500 | 1.00 | ug/L |
| 156-60-5 | trans-1,2-Dichloroethene | 0.439J | 0.200 | 0.500 | 1.00 | ug/L |

# Summary of Compounds Detected

| MW-11-02-21 | Collect Date | 04/05/2018 13:10 | GCAL ID | 21804062002 |
|---|---|---|---|---|
| | Receive Date | 04/06/2018 09:35 | Matrix | Water |

## EPA 8260C (Continued)

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 75-01-4 | Vinyl chloride | 2.59 | 0.200 | 0.500 | 1.00 | ug/L |

## EPA RSK-175

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 124-38-9 | Carbon Dioxide | 304000 | 12700 | 38600 | 90000 | ug/L |
| 74-84-0 | Ethane | 8.98 | 0.110 | 0.220 | 1.00 | ug/L |
| 74-85-1 | Ethene | 3.01 | 0.150 | 0.290 | 1.00 | ug/L |
| 74-82-8 | Methane | 15200 | 131 | 327 | 600 | ug/L |

## EPA 6020A

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 7440-38-2 | Arsenic | 2.72 | 0.25 | 0.50 | 1.00 | ug/L |
| 7439-89-6 | Iron | 94000 | 250 | 500 | 1000 | ug/L |
| 7439-96-5 | Manganese | 42.5 | 1.25 | 2.50 | 5.00 | ug/L |

## EPA 6020A Dissolved

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 7439-89-6 | Iron | 12000 | 250 | 500 | 1000 | ug/L |
| 7439-96-5 | Manganese | 36.7 | 1.25 | 2.50 | 5.00 | ug/L |

## EPA 9060A

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| C-012 | Total Organic Carbon | 108000 | 1500 | 10000 | 10000 | ug/L |

## SM 2320 B-2011

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 000000-00-5 | Total Alkalinity | 474 | 0.26 | 0.50 | 1.0 | mg/L CaCO3 |

# Summary of Compounds Detected

## MW-11-02-21

| | | | |
|---|---|---|---|
| **Collect Date** | 04/05/2018 13:10 | **GCAL ID** | 21804062002 |
| **Receive Date** | 04/06/2018 09:35 | **Matrix** | Water |

### SM 2540 C-2011

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| WET-035 | Total Dissolved Solids(TDS) | 705000 | 10000 | 10000 | 10000 | ug/L |

### SM 4500-H+ B/EPA 9040C

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| pH | pH | 6.53 | 1.00 | 1.00 | 1.00 | pH unit |

## S4-MW50-21

| | | | |
|---|---|---|---|
| **Collect Date** | 04/05/2018 10:10 | **GCAL ID** | 21804062003 |
| **Receive Date** | 04/06/2018 09:35 | **Matrix** | Water |

### EPA 8260C

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 67-66-3 | Chloroform | 1.04 | 0.200 | 0.500 | 1.00 | ug/L |

## S4-MW51-21

| | | | |
|---|---|---|---|
| **Collect Date** | 04/05/2018 11:40 | **GCAL ID** | 21804062004 |
| **Receive Date** | 04/06/2018 09:35 | **Matrix** | Water |

### EPA 8260C

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 79-01-6 | Trichloroethene | 4.24 | 0.200 | 0.500 | 1.00 | ug/L |

## S4-MW-49-21

| | | | |
|---|---|---|---|
| **Collect Date** | 04/05/2018 10:13 | **GCAL ID** | 21804062005 |
| **Receive Date** | 04/06/2018 09:35 | **Matrix** | Water |

### EPA 8260C

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 67-66-3 | Chloroform | 0.525J | 0.200 | 0.500 | 1.00 | ug/L |
| 79-01-6 | Trichloroethene | 1.98 | 0.200 | 0.500 | 1.00 | ug/L |

# Summary of Compounds Detected

| S4-MW-48-21 | | | | |
|---|---|---|---|---|
| | **Collect Date** | 04/05/2018 11:40 | **GCAL ID** | 21804062006 |
| | **Receive Date** | 04/06/2018 09:35 | **Matrix** | Water |

## EPA 8260C

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 67-66-3 | Chloroform | 0.604J | 0.200 | 0.500 | 1.00 | ug/L |
| 156-59-2 | cis-1,2-Dichloroethene | 0.416J | 0.200 | 0.500 | 1.00 | ug/L |
| 79-01-6 | Trichloroethene | 11.4 | 0.200 | 0.500 | 1.00 | ug/L |

| MW-11-06-21 | | | | |
|---|---|---|---|---|
| | **Collect Date** | 04/05/2018 14:50 | **GCAL ID** | 21804062007 |
| | **Receive Date** | 04/06/2018 09:35 | **Matrix** | Water |

## EPA 8260C

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 95-50-1 | 1,2-Dichlorobenzene | 3.02 | 0.200 | 0.500 | 1.00 | ug/L |
| 541-73-1 | 1,3-Dichlorobenzene | 0.863J | 0.200 | 0.500 | 1.00 | ug/L |
| 106-46-7 | 1,4-Dichlorobenzene | 1.88 | 0.200 | 0.500 | 1.00 | ug/L |
| 78-93-3 | 2-Butanone | 2.70J | 0.200 | 0.500 | 5.00 | ug/L |
| 108-90-7 | Chlorobenzene | 0.411J | 0.200 | 0.500 | 1.00 | ug/L |
| 156-59-2 | cis-1,2-Dichloroethene | 30.7 | 0.200 | 0.500 | 1.00 | ug/L |
| 79-01-6 | Trichloroethene | 16.6 | 0.200 | 0.500 | 1.00 | ug/L |
| 75-01-4 | Vinyl chloride | 72.4 | 0.200 | 0.500 | 1.00 | ug/L |

## EPA RSK-175

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 124-38-9 | Carbon Dioxide | 264000 | 12700 | 38600 | 90000 | ug/L |
| 74-84-0 | Ethane | 3.21 | 0.110 | 0.220 | 1.00 | ug/L |
| 74-85-1 | Ethene | 4.10 | 0.150 | 0.290 | 1.00 | ug/L |
| 74-82-8 | Methane | 8500 | 261 | 654 | 1200 | ug/L |

## EPA 6020A

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 7440-38-2 | Arsenic | 0.84J | 0.25 | 0.50 | 1.00 | ug/L |
| 7439-89-6 | Iron | 44900 | 250 | 500 | 1000 | ug/L |
| 7439-96-5 | Manganese | 7.95 | 1.25 | 2.50 | 5.00 | ug/L |

# Summary of Compounds Detected

## MW-11-06-21

| | | | |
|---|---|---|---|
| **Collect Date** | 04/05/2018 14:50 | **GCAL ID** | 21804062007 |
| **Receive Date** | 04/06/2018 09:35 | **Matrix** | Water |

### EPA 6020A Dissolved

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 7439-89-6 | Iron | 24600 | 250 | 500 | 1000 | ug/L |
| 7439-96-5 | Manganese | 6.79 | 1.25 | 2.50 | 5.00 | ug/L |

### EPA 9060A

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| C-012 | Total Organic Carbon | 29000 | 300 | 2000 | 2000 | ug/L |

### SM 2320 B-2011

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 000000-00-5 | Total Alkalinity | 120 | 0.26 | 0.50 | 1.0 | mg/L CaCO3 |

### SM 2540 C-2011

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| WET-035 | Total Dissolved Solids(TDS) | 181000 | 10000 | 10000 | 10000 | ug/L |

### SM 4500-H+ B/EPA 9040C

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| pH | pH | 6.28 | 1.00 | 1.00 | 1.00 | pH unit |

## MW-11-10-21

| | | | |
|---|---|---|---|
| **Collect Date** | 04/05/2018 17:15 | **GCAL ID** | 21804062008 |
| **Receive Date** | 04/06/2018 09:35 | **Matrix** | Water |

### EPA 8260C

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 95-50-1 | 1,2-Dichlorobenzene | 1.38 | 0.200 | 0.500 | 1.00 | ug/L |
| 541-73-1 | 1,3-Dichlorobenzene | 0.554J | 0.200 | 0.500 | 1.00 | ug/L |
| 106-46-7 | 1,4-Dichlorobenzene | 1.10 | 0.200 | 0.500 | 1.00 | ug/L |
| 108-90-7 | Chlorobenzene | 0.456J | 0.200 | 0.500 | 1.00 | ug/L |
| 156-59-2 | cis-1,2-Dichloroethene | 27.1 | 0.200 | 0.500 | 1.00 | ug/L |

# Summary of Compounds Detected

| MW-11-10-21 | Collect Date | 04/05/2018 17:15 | GCAL ID | 21804062008 |
|---|---|---|---|---|
| | Receive Date | 04/06/2018 09:35 | Matrix | Water |

## EPA 8260C (Continued)

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 79-01-6 | Trichloroethene | 14.1 | 0.200 | 0.500 | 1.00 | ug/L |
| 75-01-4 | Vinyl chloride | 10.3 | 0.200 | 0.500 | 1.00 | ug/L |

## EPA RSK-175

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 124-38-9 | Carbon Dioxide | 350000 | 12700 | 38600 | 90000 | ug/L |
| 74-84-0 | Ethane | 0.342J | 0.110 | 0.220 | 1.00 | ug/L |
| 74-85-1 | Ethene | 0.497J | 0.150 | 0.290 | 1.00 | ug/L |
| 74-82-8 | Methane | 7090 | 131 | 327 | 600 | ug/L |

## EPA 6020A

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 7440-38-2 | Arsenic | 0.78J | 0.25 | 0.50 | 1.00 | ug/L |
| 7439-89-6 | Iron | 16400 | 250 | 500 | 1000 | ug/L |
| 7439-96-5 | Manganese | 150 | 1.25 | 2.50 | 5.00 | ug/L |

## EPA 6020A Dissolved

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 7439-89-6 | Iron | 13600 | 250 | 500 | 1000 | ug/L |
| 7439-96-5 | Manganese | 137 | 1.25 | 2.50 | 5.00 | ug/L |

## EPA 9060A

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| C-012 | Total Organic Carbon | 17300 | 300 | 2000 | 2000 | ug/L |

## SM 2320 B-2011

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 000000-00-5 | Total Alkalinity | 102 | 0.26 | 0.50 | 1.0 | mg/L CaCO3 |

# Summary of Compounds Detected

| MW-11-10-21 | | | | |
|---|---|---|---|---|
| | Collect Date | 04/05/2018 17:15 | GCAL ID | 21804062008 |
| | Receive Date | 04/06/2018 09:35 | Matrix | Water |

## SM 2540 C-2011

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| WET-035 | Total Dissolved Solids(TDS) | 156000 | 10000 | 10000 | 10000 | ug/L |

## SM 4500-H+ B/EPA 9040C

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| pH | pH | 6.03 | 1.00 | 1.00 | 1.00 | pH unit |

| MW-11-01-21 | | | | |
|---|---|---|---|---|
| | Collect Date | 04/05/2018 14:50 | GCAL ID | 21804062009 |
| | Receive Date | 04/06/2018 09:35 | Matrix | Water |

## EPA 8260C

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 75-35-4 | 1,1-Dichloroethene | 0.463J | 0.200 | 0.500 | 1.00 | ug/L |
| 95-50-1 | 1,2-Dichlorobenzene | 1.35 | 0.200 | 0.500 | 1.00 | ug/L |
| 541-73-1 | 1,3-Dichlorobenzene | 1.01 | 0.200 | 0.500 | 1.00 | ug/L |
| 106-46-7 | 1,4-Dichlorobenzene | 2.26 | 0.200 | 0.500 | 1.00 | ug/L |
| 71-43-2 | Benzene | 0.891J | 0.200 | 0.500 | 1.00 | ug/L |
| 108-90-7 | Chlorobenzene | 0.512J | 0.200 | 0.500 | 1.00 | ug/L |
| 156-59-2 | cis-1,2-Dichloroethene | 136 | 0.200 | 0.500 | 1.00 | ug/L |
| 108-88-3 | Toluene | 2.46 | 0.200 | 0.500 | 1.00 | ug/L |
| 79-01-6 | Trichloroethene | 30.3 | 0.200 | 0.500 | 1.00 | ug/L |
| 75-01-4 | Vinyl chloride | 1.87 | 0.200 | 0.500 | 1.00 | ug/L |

## EPA RSK-175

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 124-38-9 | Carbon Dioxide | 143000 | 2540 | 7720 | 18000 | ug/L |
| 74-85-1 | Ethene | 2.98 | 0.150 | 0.290 | 1.00 | ug/L |
| 74-82-8 | Methane | 13800 | 261 | 654 | 1200 | ug/L |

## EPA 6020A

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 7440-38-2 | Arsenic | 1.24 | 0.25 | 0.50 | 1.00 | ug/L |
| 7439-89-6 | Iron | 25000 | 250 | 500 | 1000 | ug/L |

# Summary of Compounds Detected

| MW-11-01-21 | Collect Date | 04/05/2018 14:50 | GCAL ID | 21804062009 |
|---|---|---|---|---|
| | Receive Date | 04/06/2018 09:35 | Matrix | Water |

## EPA 6020A (Continued)

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 7439-96-5 | Manganese | 1660 | 12.5 | 25.0 | 50.0 | ug/L |

## EPA 6020A Dissolved

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 7439-89-6 | Iron | 964 | 25.0 | 50.0 | 100 | ug/L |
| 7439-96-5 | Manganese | 1320 | 12.5 | 25.0 | 50.0 | ug/L |

## EPA 9060A

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| C-012 | Total Organic Carbon | 19000 | 300 | 2000 | 2000 | ug/L |

## SM 2320 B-2011

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 000000-00-5 | Total Alkalinity | 164 | 0.26 | 0.50 | 1.0 | mg/L CaCO3 |

## SM 2540 C-2011

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| WET-035 | Total Dissolved Solids(TDS) | 184000 | 10000 | 10000 | 10000 | ug/L |

## SM 4500-H+ B/EPA 9040C

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| pH | pH | 6.60 | 1.00 | 1.00 | 1.00 | pH unit |

# Summary of Compounds Detected

| RD5-MW-01-21 | Collect Date | 04/05/2018 16:35 | GCAL ID | 21804062010 |
|---|---|---|---|---|
| | Receive Date | 04/06/2018 09:35 | Matrix | Water |

## EPA 8260C

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 79-01-6 | Trichloroethene | 2.97 | 0.200 | 0.500 | 1.00 | ug/L |

## EPA RSK-175

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 124-38-9 | Carbon Dioxide | 174000 | 6350 | 19300 | 45000 | ug/L |
| 74-82-8 | Methane | 2.76 | 0.435 | 1.09 | 2.00 | ug/L |

## EPA 6020A

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 7439-89-6 | Iron | 562 | 25.0 | 50.0 | 100 | ug/L |
| 7439-96-5 | Manganese | 4.45J | 1.25 | 2.50 | 5.00 | ug/L |

## EPA 6020A Dissolved

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 7439-89-6 | Iron | 55.8J | 25.0 | 50.0 | 100 | ug/L |
| 7439-96-5 | Manganese | 3.76J | 1.25 | 2.50 | 5.00 | ug/L |

## EPA 9060A

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| C-012 | Total Organic Carbon | 5610 | 300 | 2000 | 2000 | ug/L |

## SM 2540 C-2011

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| WET-035 | Total Dissolved Solids(TDS) | 65000 | 10000 | 10000 | 10000 | ug/L |

# Summary of Compounds Detected

## RD5-MW-01-21

| | | | |
|---|---|---|---|
| **Collect Date** | 04/05/2018 16:35 | **GCAL ID** | 21804062010 |
| **Receive Date** | 04/06/2018 09:35 | **Matrix** | Water |

SM 4500-H+ B/EPA 9040C

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| pH | pH | 4.58 | 1.00 | 1.00 | 1.00 | pH unit |

## MW-01-07-21

| | | | |
|---|---|---|---|
| **Collect Date** | 04/05/2018 13:45 | **GCAL ID** | 21804062011 |
| **Receive Date** | 04/06/2018 09:35 | **Matrix** | Water |

EPA 8260C

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 156-59-2 | cis-1,2-Dichloroethene | 2.43 | 0.200 | 0.500 | 1.00 | ug/L |
| 79-01-6 | Trichloroethene | 26.1 | 0.200 | 0.500 | 1.00 | ug/L |

## S4-MW-46-21

| | | | |
|---|---|---|---|
| **Collect Date** | 04/05/2018 13:10 | **GCAL ID** | 21804062012 |
| **Receive Date** | 04/06/2018 09:35 | **Matrix** | Water |

EPA 8260C

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 156-59-2 | cis-1,2-Dichloroethene | 0.885J | 0.200 | 0.500 | 1.00 | ug/L |
| 79-01-6 | Trichloroethene | 4.54 | 0.200 | 0.500 | 1.00 | ug/L |

## S4-MW-47-21

| | | | |
|---|---|---|---|
| **Collect Date** | 04/05/2018 14:40 | **GCAL ID** | 21804062013 |
| **Receive Date** | 04/06/2018 09:35 | **Matrix** | Water |

EPA 8260C

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 156-59-2 | cis-1,2-Dichloroethene | 1.07 | 0.200 | 0.500 | 1.00 | ug/L |
| 79-01-6 | Trichloroethene | 6.12 | 0.200 | 0.500 | 1.00 | ug/L |

# Summary of Compounds Detected

## S4-MW28-21

| | | | |
|---|---|---|---|
| **Collect Date** | 04/05/2018 11:30 | **GCAL ID** | 21804062015 |
| **Receive Date** | 04/06/2018 09:35 | **Matrix** | Water |

EPA 8260C

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 79-01-6 | Trichloroethene | 0.737J | 0.200 | 0.500 | 1.00 | ug/L |

## S4-MW37-21

| | | | |
|---|---|---|---|
| **Collect Date** | 04/05/2018 10:15 | **GCAL ID** | 21804062016 |
| **Receive Date** | 04/06/2018 09:35 | **Matrix** | Water |

EPA 8260C

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 75-34-3 | 1,1-Dichloroethane | 5.11 | 0.200 | 0.500 | 1.00 | ug/L |
| 75-35-4 | 1,1-Dichloroethene | 1.61 | 0.200 | 0.500 | 1.00 | ug/L |

## TW-6-21

| | | | |
|---|---|---|---|
| **Collect Date** | 04/05/2018 09:00 | **GCAL ID** | 21804062018 |
| **Receive Date** | 04/06/2018 09:35 | **Matrix** | Water |

EPA 8260C

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 156-59-2 | cis-1,2-Dichloroethene | 0.682J | 0.200 | 0.500 | 1.00 | ug/L |
| 79-01-6 | Trichloroethene | 15.8 | 0.200 | 0.500 | 1.00 | ug/L |

## TW-7-21

| | | | |
|---|---|---|---|
| **Collect Date** | 04/05/2018 10:00 | **GCAL ID** | 21804062019 |
| **Receive Date** | 04/06/2018 09:35 | **Matrix** | Water |

EPA 8260C

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 75-15-0 | Carbon disulfide | 1.27 | 0.200 | 0.500 | 1.00 | ug/L |

# General Chemistry

| MW-13-11-21 | Collect Date | 04/05/2018 10:45 | GCAL ID | 21804062001 |
|---|---|---|---|---|
| | Receive Date | 04/06/2018 09:35 | Matrix | Water |

## EPA 9060A

| Prep Date | Prep Batch | Prep Method | Dilution | Analysis Date | By | Analytical Batch |
|---|---|---|---|---|---|---|
| NA | NA | NA | 2 | 04/14/2018 23:46 | PLH | 633404 |

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| C-012 | Total Organic Carbon | 12800 | 600 | 4000 | 4000 | ug/L |

## SM 2320 B-2011

| Prep Date | Prep Batch | Prep Method | Dilution | Analysis Date | By | Analytical Batch |
|---|---|---|---|---|---|---|
| NA | NA | NA | 1 | 04/16/2018 09:36 | RYC | 633511 |

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 000000-00-5 | Total Alkalinity | 182 | 0.26 | 0.50 | 1.0 | mg/L CaCO3 |

## SM 2540 C-2011

| Prep Date | Prep Batch | Prep Method | Dilution | Analysis Date | By | Analytical Batch |
|---|---|---|---|---|---|---|
| NA | NA | NA | 1 | 04/11/2018 11:21 | CJS | 633120 |

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| WET-035 | Total Dissolved Solids(TDS) | 248000 | 10000 | 10000 | 10000 | ug/L |

## SM 4500-H+ B/EPA 9040C

| Prep Date | Prep Batch | Prep Method | Dilution | Analysis Date | By | Analytical Batch |
|---|---|---|---|---|---|---|
| NA | NA | NA | 1 | 04/06/2018 14:54 | SLL2 | 632760 |

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| pH | pH | 6.22 | 1.00 | 1.00 | 1.00 | pH unit |

# General Chemistry

| MW-11-02-21 | Collect Date | 04/05/2018 13:10 | GCAL ID | 21804062002 |
|---|---|---|---|---|
| | Receive Date | 04/06/2018 09:35 | Matrix | Water |

## EPA 9060A

| Prep Date | Prep Batch | Prep Method | Dilution | Analysis Date | By | Analytical Batch |
|---|---|---|---|---|---|---|
| NA | NA | NA | 5 | 04/15/2018 00:09 | PLH | 633404 |

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| C-012 | Total Organic Carbon | 108000 | 1500 | 10000 | 10000 | ug/L |

## SM 2320 B-2011

| Prep Date | Prep Batch | Prep Method | Dilution | Analysis Date | By | Analytical Batch |
|---|---|---|---|---|---|---|
| NA | NA | NA | 1 | 04/16/2018 09:36 | RYC | 633511 |

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 000000-00-5 | Total Alkalinity | 474 | 0.26 | 0.50 | 1.0 | mg/L CaCO3 |

## SM 2540 C-2011

| Prep Date | Prep Batch | Prep Method | Dilution | Analysis Date | By | Analytical Batch |
|---|---|---|---|---|---|---|
| NA | NA | NA | 1 | 04/11/2018 11:21 | CJS | 633120 |

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| WET-035 | Total Dissolved Solids(TDS) | 705000 | 10000 | 10000 | 10000 | ug/L |

## SM 4500-H+ B/EPA 9040C

| Prep Date | Prep Batch | Prep Method | Dilution | Analysis Date | By | Analytical Batch |
|---|---|---|---|---|---|---|
| NA | NA | NA | 1 | 04/06/2018 14:54 | SLL2 | 632760 |

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| pH | pH | 6.53 | 1.00 | 1.00 | 1.00 | pH unit |

# General Chemistry

| MW-11-06-21 | Collect Date | 04/05/2018 14:50 | GCAL ID | 21804062007 |
|---|---|---|---|---|
| | Receive Date | 04/06/2018 09:35 | Matrix | Water |

## EPA 9060A

| Prep Date | Prep Batch | Prep Method | Dilution | Analysis Date | By | Analytical Batch |
|---|---|---|---|---|---|---|
| NA | NA | NA | 1 | 04/13/2018 04:05 | PLH | 633269 |

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| C-012 | Total Organic Carbon | 29000 | 300 | 2000 | 2000 | ug/L |

## SM 2320 B-2011

| Prep Date | Prep Batch | Prep Method | Dilution | Analysis Date | By | Analytical Batch |
|---|---|---|---|---|---|---|
| NA | NA | NA | 1 | 04/16/2018 09:36 | RYC | 633511 |

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 000000-00-5 | Total Alkalinity | 120 | 0.26 | 0.50 | 1.0 | mg/L CaCO3 |

## SM 2540 C-2011

| Prep Date | Prep Batch | Prep Method | Dilution | Analysis Date | By | Analytical Batch |
|---|---|---|---|---|---|---|
| NA | NA | NA | 1 | 04/11/2018 11:21 | CJS | 633120 |

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| WET-035 | Total Dissolved Solids(TDS) | 181000 | 10000 | 10000 | 10000 | ug/L |

## SM 4500-H+ B/EPA 9040C

| Prep Date | Prep Batch | Prep Method | Dilution | Analysis Date | By | Analytical Batch |
|---|---|---|---|---|---|---|
| NA | NA | NA | 1 | 04/06/2018 14:54 | SLL2 | 632760 |

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| pH | pH | 6.28 | 1.00 | 1.00 | 1.00 | pH unit |

# General Chemistry

| MW-11-10-21 | Collect Date | 04/05/2018 17:15 | GCAL ID | 21804062008 |
|---|---|---|---|---|
| | Receive Date | 04/06/2018 09:35 | Matrix | Water |

## EPA 9060A

| Prep Date | Prep Batch | Prep Method | Dilution | Analysis Date | By | Analytical Batch |
|---|---|---|---|---|---|---|
| NA | NA | NA | 1 | 04/13/2018 04:33 | PLH | 633269 |

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| C-012 | Total Organic Carbon | 17300 | 300 | 2000 | 2000 | ug/L |

## SM 2320 B-2011

| Prep Date | Prep Batch | Prep Method | Dilution | Analysis Date | By | Analytical Batch |
|---|---|---|---|---|---|---|
| NA | NA | NA | 1 | 04/16/2018 09:36 | RYC | 633511 |

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 000000-00-5 | Total Alkalinity | 102 | 0.26 | 0.50 | 1.0 | mg/L CaCO3 |

## SM 2540 C-2011

| Prep Date | Prep Batch | Prep Method | Dilution | Analysis Date | By | Analytical Batch |
|---|---|---|---|---|---|---|
| NA | NA | NA | 1 | 04/11/2018 11:21 | CJS | 633120 |

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| WET-035 | Total Dissolved Solids(TDS) | 156000 | 10000 | 10000 | 10000 | ug/L |

## SM 4500-H+ B/EPA 9040C

| Prep Date | Prep Batch | Prep Method | Dilution | Analysis Date | By | Analytical Batch |
|---|---|---|---|---|---|---|
| NA | NA | NA | 1 | 04/06/2018 14:54 | SLL2 | 632760 |

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| pH | pH | 6.03 | 1.00 | 1.00 | 1.00 | pH unit |

# General Chemistry

| MW-11-01-21 | Collect Date | 04/05/2018 14:50 | GCAL ID | 21804062009 |
|---|---|---|---|---|
| | Receive Date | 04/06/2018 09:35 | Matrix | Water |

## EPA 9060A

| Prep Date | Prep Batch | Prep Method | Dilution | Analysis Date | By | Analytical Batch |
|---|---|---|---|---|---|---|
| NA | NA | NA | 1 | 04/13/2018 04:56 | PLH | 633269 |

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| C-012 | Total Organic Carbon | 19000 | 300 | 2000 | 2000 | ug/L |

## SM 2320 B-2011

| Prep Date | Prep Batch | Prep Method | Dilution | Analysis Date | By | Analytical Batch |
|---|---|---|---|---|---|---|
| NA | NA | NA | 1 | 04/16/2018 09:36 | RYC | 633511 |

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 000000-00-5 | Total Alkalinity | 164 | 0.26 | 0.50 | 1.0 | mg/L CaCO3 |

## SM 2540 C-2011

| Prep Date | Prep Batch | Prep Method | Dilution | Analysis Date | By | Analytical Batch |
|---|---|---|---|---|---|---|
| NA | NA | NA | 1 | 04/11/2018 11:21 | CJS | 633120 |

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| WET-035 | Total Dissolved Solids(TDS) | 184000 | 10000 | 10000 | 10000 | ug/L |

## SM 4500-H+ B/EPA 9040C

| Prep Date | Prep Batch | Prep Method | Dilution | Analysis Date | By | Analytical Batch |
|---|---|---|---|---|---|---|
| NA | NA | NA | 1 | 04/06/2018 14:54 | SLL2 | 632760 |

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| pH | pH | 6.60 | 1.00 | 1.00 | 1.00 | pH unit |

# General Chemistry

| RD5-MW-01-21 | Collect Date | 04/05/2018 16:35 | GCAL ID | 21804062010 |
|---|---|---|---|---|
| | Receive Date | 04/06/2018 09:35 | Matrix | Water |

## EPA 9060A

| Prep Date | Prep Batch | Prep Method | Dilution | Analysis Date | By | Analytical Batch |
|---|---|---|---|---|---|---|
| NA | NA | NA | 1 | 04/12/2018 02:43 | PLH | 633140 |

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| C-012 | Total Organic Carbon | 5610 | 300 | 2000 | 2000 | ug/L |

## SM 2320 B-2011

| Prep Date | Prep Batch | Prep Method | Dilution | Analysis Date | By | Analytical Batch |
|---|---|---|---|---|---|---|
| NA | NA | NA | 1 | 04/19/2018 11:37 | RYC | 633813 |

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| 000000-00-5 | Total Alkalinity | 0.50U | 0.26 | 0.50 | 1.0 | mg/L CaCO3 |

## SM 2540 C-2011

| Prep Date | Prep Batch | Prep Method | Dilution | Analysis Date | By | Analytical Batch |
|---|---|---|---|---|---|---|
| NA | NA | NA | 1 | 04/11/2018 11:21 | CJS | 633120 |

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| WET-035 | Total Dissolved Solids(TDS) | 65000 | 10000 | 10000 | 10000 | ug/L |

## SM 4500-H+ B/EPA 9040C

| Prep Date | Prep Batch | Prep Method | Dilution | Analysis Date | By | Analytical Batch |
|---|---|---|---|---|---|---|
| NA | NA | NA | 1 | 04/06/2018 14:54 | SLL2 | 632760 |

| CAS# | Parameter | Result | DL | LOD | LOQ | Units |
|---|---|---|---|---|---|---|
| pH | pH | 4.58 | 1.00 | 1.00 | 1.00 | pH unit |

# General Chemistry QC Summary

| Analytical Batch | Client ID | MB633511 | LCS633511 | LCSD633511 |
|---|---|---|---|---|
| 633511 | GCAL ID | 1797788 | 1797789 | 1797790 |
| | Sample Type | MB | LCS | LCSD |
| | Prep Date | NA | NA | NA |
| | Analysis Date | 04/16/2018 09:36 | 04/16/2018 09:36 | 04/16/2018 09:36 |
| | Matrix | Water | Water | Water |

| SM 2320 B-2011 | | Units<br>Result | mg/L CaCO3<br>LOD | Spike<br>Added | Result | %R | Control<br>Limits%R | Spike<br>Added | Result | %R | RPD | RPD<br>Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Alkalinity | 000000-00-5 | 0.50U | 0.50 | 200 | 205 | 103 | 90 - 110 | 200 | 205 | 103 | 0 | 11 |

| Analytical Batch | Client ID | MB633813 | LCS633813 | LCSD633813 |
|---|---|---|---|---|
| 633813 | GCAL ID | 1799199 | 1799200 | 1799201 |
| | Sample Type | MB | LCS | LCSD |
| | Prep Date | NA | NA | NA |
| | Analysis Date | 04/19/2018 11:37 | 04/19/2018 11:37 | 04/19/2018 11:37 |
| | Matrix | Water | Water | Water |

| SM 2320 B-2011 | | Units<br>Result | mg/L CaCO3<br>LOD | Spike<br>Added | Result | %R | Control<br>Limits%R | Spike<br>Added | Result | %R | RPD | RPD<br>Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Alkalinity | 000000-00-5 | 0.50U | 0.50 | 10.0 | 10.3 | 103 | 90 - 110 | 10.0 | 9.7 | 97 | 6 | 11 |

| Analytical Batch | Client ID | MB633120 |
|---|---|---|
| 633120 | GCAL ID | 1795704 |
| | Sample Type | MB |
| | Prep Date | NA |
| | Analysis Date | 04/11/2018 11:21 |
| | Matrix | Water |

| SM 2540 C-2011 | | Units<br>Result | ug/L<br>LOD |
|---|---|---|---|
| Total Dissolved Solids(TDS) | WET-035 | 10000U | 10000 |

| Analytical Batch | Client ID | MB633140 | LCS633140 |
|---|---|---|---|
| 633140 | GCAL ID | 1795851 | 1795852 |
| | Sample Type | MB | LCS |
| | Prep Date | NA | NA |
| | Analysis Date | 04/11/2018 20:42 | 04/11/2018 19:50 |
| | Matrix | Water | Water |

| EPA 9060A | | Units<br>Result | ug/L<br>LOD | Spike<br>Added | Result | %R | Control<br>Limits%R |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon | C-012 | 2000U | 2000 | 50000 | 46900 | 94 | 90 - 110 |

| Analytical Batch | Client ID | MB633269 | LCS633269 |
|---|---|---|---|
| 633269 | GCAL ID | 1796546 | 1796547 |
| | Sample Type | MB | LCS |
| | Prep Date | NA | NA |
| | Analysis Date | 04/12/2018 21:36 | 04/12/2018 20:34 |
| | Matrix | Water | Water |

| EPA 9060A | | Units<br>Result | ug/L<br>LOD | Spike<br>Added | Result | %R | Control<br>Limits%R |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon | C-012 | 2000U | 2000 | 50000 | 47000 | 94 | 90 - 110 |

| Analytical Batch | Client ID | MB633404 | LCS633404 |
|---|---|---|---|
| 633404 | GCAL ID | 1797451 | 1797452 |
| | Sample Type | MB | LCS |
| | Prep Date | NA | NA |
| | Analysis Date | 04/14/2018 23:22 | 04/14/2018 22:28 |
| | Matrix | Water | Water |

| EPA 9060A | | Units<br>Result | ug/L<br>LOD | Spike<br>Added | Result | %R | Control<br>Limits%R |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon | C-012 | 2000U | 2000 | 50000 | 47400 | 95 | 90 - 110 |

# Form I

# Sample Results

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INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-13-11-21 |
| Collect Date: | 04/05/18 Time: 1045 | GCAL Sample ID: | 21804062001 |
| Matrix: | Water % Solids: NA | Instrument ID: | ICPMS1 |
| Sample Amt: | 50 mL | Lab File ID: | 2180417A_MS1.b\054SMPL.d |
| Prep Vol.: | 50 ( mL ) | Dilution Factor: | 1 Analyst: AWG |
| Prep Date: | 04/07/18 | Analysis Date: | 04/17/18 Time: 1456 |
| Prep Batch: | 632823 | Analytical Batch: | 633612 |
| Prep Method: | 3010A | Analytical Method: | EPA 6020A |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Arsenic | 2.41 | ug/L | | 0.25 | 0.50 | 1.00 |
| Manganese | 64.9 | ug/L | | 1.25 | 2.50 | 5.00 |

FORM I - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 21804062001 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 054SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 14:56:04 | **Total Dilution** | 1.0000 |
| **Sample Type** | Sample | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 0.824 | 0.824 | 2.1 | 186071.09 | 500 | |
| Be | 9 | 45 | No Gas | 0.19 | 0.190 | 8.3 | 856.70 | 100 | |
| B | 11 | 45 | No Gas | 9.661 | 9.661 | 2.8 | 26638.20 | 500 | |
| Sr | 88 | 72 | No Gas | 95.332 | 95.332 | 2.2 | 1869710.34 | 100 | |
| Zr | 90 | 72 | No Gas | 1.011 | 1.011 | 3.3 | 13995.12 | 100 | |
| Mo | 95 | 115 | No Gas | 0.48 | 0.480 | 4.9 | 1925.70 | 100 | |
| Ag | 107 | 115 | No Gas | 0.017 | 0.017 | 8.5 | 203.34 | 100 | |
| Cd | 111 | 115 | No Gas | 0.11 | 0.110 | 6.8 | 267.00 | 100 | |
| Sb | 121 | 115 | No Gas | 0.178 | 0.178 | 3.2 | 1743.45 | 200 | |
| Ba | 137 | 115 | No Gas | 70.603 | 70.603 | 1.7 | 203213.49 | 1000 | |
| Tl | 205 | 209 | No Gas | 0.056 | 0.056 | 6.5 | 1371.20 | 100 | |
| Pb | 208 | 209 | No Gas | 3.828 | 3.828 | 1.2 | 103333.73 | 100 | |
| Na | 23 | 45 | He | 78704.98 | 78704.980 | 0.7 | 29728009.56 | 10000 | >LDR |
| Mg | 24 | 45 | He | 2455.897 | 2455.897 | 1.3 | 462251.87 | 10000 | |
| Al | 27 | 45 | He | 1284 | 1284.000 | 0.8 | 71320.18 | 2000 | |
| Si | 29 | 45 | He | 4597.776 | 4597.776 | 1.6 | 8484.84 | 10000 | |
| K | 39 | 45 | He | 1903.965 | 1903.965 | 0.8 | 164843.26 | 10000 | |
| Ca | 44 | 45 | He | 8119.838 | 8119.838 | 2.4 | 37856.50 | 50000 | |
| Ti | 47 | 45 | He | 32.459 | 32.459 | 3.3 | 1284.05 | 100 | |
| V | 51 | 72 | He | 11.007 | 11.007 | 1.6 | 16746.35 | 100 | |
| Cr | 52 | 72 | He | 6.206 | 6.206 | 4.6 | 12768.41 | 100 | |
| Mn | 55 | 72 | He | 64.861 | 64.861 | 0.3 | 55859.49 | 500 | |
| Fe | 57 | 72 | He | 93050.47 | 93050.470 | 0.7 | 3695477.13 | 10000 | >LDR |
| Co | 59 | 72 | He | 18.559 | 18.559 | 1.5 | 66210.90 | 100 | |
| Ni | 60 | 72 | He | 25.413 | 25.413 | 1.7 | 25424.22 | 200 | |
| Cu | 63 | 72 | He | 10.627 | 10.627 | 1.3 | 31007.05 | 100 | |
| Zn | 66 | 72 | He | 49.82 | 49.820 | 2.5 | 16932.25 | 2000 | |
| As | 75 | 72 | He | 2.414 | 2.414 | 7.7 | 606.34 | 100 | |
| Se | 78 | 72 | He | -0.514 | -0.514 | -52.8 | -4.78 | 50 | |
| Sn | 120 | 115 | He | 0.482 | 0.482 | 4.7 | 677.80 | 100 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1178764.25 | 1291085.71 | 91.3 | |
| Ge | 72 | He | 47890.02 | 47456.4966666667 | 100.91 | |
| In | 115 | He | 352388.28 | 372695.226666667 | 94.55 | |
| Lu | 175 | He | 980841.89 | 1029247.51 | 95.3 | |
| Rh | 103 | He | 1466530.50 | 1626201.63666667 | 90.18 | |
| Sc | 45 | He | 106779.52 | 109033.716666667 | 97.93 | |
| Tb | 159 | He | 1785468.31 | 1820531.74333333 | 98.07 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3506562.97 | 3617762.55 | 96.93 | |
| Ge | 72 | No Gas | 635609.44 | 597606.886666667 | 106.36 | |
| In | 115 | No Gas | 3885969.42 | 3893084.07 | 99.82 | |
| Lu | 175 | No Gas | 5996276.16 | 5877008.03666667 | 102.03 | |
| Rh | 103 | No Gas | 3787192.07 | 3958933.73 | 95.66 | |
| Sc | 45 | No Gas | 4222410.94 | 4093118.31 | 103.16 | |
| Tb | 159 | No Gas | 5752284.29 | 5654253.04333333 | 101.73 | |

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INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-13-11-21 DL |
| Collect Date: | 04/05/18 Time: 1045 | GCAL Sample ID: | 21804062001 DL |
| Matrix: | Water % Solids: NA | Instrument ID: | ICPMS1 |
| Sample Amt: | 50 mL | Lab File ID: | 2180417A_MS1.b\053SMPL.d |
| Prep Vol.: | 50 ( mL ) | Dilution Factor: | 10 Analyst: AWG |
| Prep Date: | 04/07/18 | Analysis Date: | 04/17/18 Time: 1451 |
| Prep Batch: | 632823 | Analytical Batch: | 633612 |
| Prep Method: | 3010A | Analytical Method: | EPA 6020A |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Iron | 95600 | ug/L | | 250 | 500 | 1000 |

FORM I - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 21804062001 10X | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 053SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 14:51:41 | **Total Dilution** | 10.0000 |
| **Sample Type** | Sample | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 0.149 | 1.494 | 1.0 | 171546.96 | 500 | |
| Be | 9 | 45 | No Gas | 0.167 | 1.675 | 8.6 | 754.69 | 100 | |
| B | 11 | 45 | No Gas | 6.377 | 63.774 | 1.3 | 17553.03 | 500 | |
| Sr | 88 | 72 | No Gas | 9.84 | 98.404 | 1.6 | 184964.94 | 100 | |
| Zr | 90 | 72 | No Gas | 0.137 | 1.369 | 1.7 | 2165.73 | 100 | |
| Mo | 95 | 115 | No Gas | 0.161 | 1.614 | 6.1 | 683.36 | 100 | |
| Ag | 107 | 115 | No Gas | 0.038 | 0.380 | 15.6 | 438.90 | 100 | |
| Cd | 111 | 115 | No Gas | 0.162 | 1.624 | 11.9 | 388.34 | 100 | |
| Sb | 121 | 115 | No Gas | 0.142 | 1.425 | 8.6 | 1448.98 | 200 | |
| Ba | 137 | 115 | No Gas | 7.04 | 70.399 | 0.4 | 20713.96 | 1000 | |
| Tl | 205 | 209 | No Gas | 0.076 | 0.760 | 5.2 | 1874.59 | 100 | |
| Pb | 208 | 209 | No Gas | 0.468 | 4.685 | 5.1 | 14440.11 | 100 | |
| Na | 23 | 45 | He | 8105.065 | 81050.655 | 1.3 | 3163461.93 | 10000 | |
| Mg | 24 | 45 | He | 255.219 | 2552.195 | 1.9 | 49533.65 | 10000 | |
| Al | 27 | 45 | He | 131.137 | 1311.366 | 1.4 | 7535.72 | 2000 | |
| Si | 29 | 45 | He | 482.07 | 4820.704 | 0.3 | 2131.48 | 10000 | |
| K | 39 | 45 | He | 200.754 | 2007.538 | 3.4 | 24328.66 | 10000 | |
| Ca | 44 | 45 | He | 870.02 | 8700.205 | 3.4 | 4364.00 | 50000 | |
| Ti | 47 | 45 | He | 3.515 | 35.152 | 10.5 | 147.33 | 100 | |
| V | 51 | 72 | He | 1.276 | 12.761 | 2.8 | 2024.60 | 100 | |
| Cr | 52 | 72 | He | 0.657 | 6.575 | 7.9 | 1565.65 | 100 | |
| Mn | 55 | 72 | He | 7.136 | 71.356 | 0.2 | 6216.80 | 500 | |
| Fe | 57 | 72 | He | 9557.973 | 95579.730 | 1.0 | 381827.86 | 10000 | |
| Co | 59 | 72 | He | 1.966 | 19.661 | 2.3 | 7084.94 | 100 | |
| Ni | 60 | 72 | He | 2.895 | 28.951 | 0.9 | 2940.30 | 200 | |
| Cu | 63 | 72 | He | 1.074 | 10.739 | 4.7 | 4205.04 | 100 | |
| Zn | 66 | 72 | He | 6.792 | 67.918 | 6.3 | 2459.11 | 2000 | |
| As | 75 | 72 | He | 0.351 | 3.510 | 6.6 | 97.00 | 100 | |
| Se | 78 | 72 | He | -0.023 | -0.229 | 52.5 | 2.93 | 50 | |
| Sn | 120 | 115 | He | 0.193 | 1.930 | 5.9 | 353.34 | 100 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1286262.85 | 1291085.71 | 99.63 | |
| Ge | 72 | He | 48157.54 | 47456.4966666667 | 101.48 | |
| In | 115 | He | 374624.99 | 372695.226666667 | 100.52 | |
| Lu | 175 | He | 1029016.81 | 1029247.51 | 99.98 | |
| Rh | 103 | He | 1626924.00 | 1626201.63666667 | 100.04 | |
| Sc | 45 | He | 110111.99 | 109033.716666667 | 100.99 | |
| Tb | 159 | He | 1854538.77 | 1820531.74333333 | 101.87 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3705556.61 | 3617762.55 | 102.43 | |
| Ge | 72 | No Gas | 608164.51 | 597606.886666667 | 101.77 | |
| In | 115 | No Gas | 3967027.36 | 3893084.07 | 101.9 | |
| Lu | 175 | No Gas | 6036579.29 | 5877008.03666667 | 102.72 | |
| Rh | 103 | No Gas | 3920354.15 | 3958933.73 | 99.03 | |
| Sc | 45 | No Gas | 4167894.70 | 4093118.31 | 101.83 | |
| Tb | 159 | No Gas | 5782750.33 | 5654253.04333333 | 102.27 | |

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INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-02-21 |
| Collect Date: | 04/05/18 Time: 1310 | GCAL Sample ID: | 21804062002 |
| Matrix: | Water % Solids: NA | Instrument ID: | ICPMS1 |
| Sample Amt: | 50 mL | Lab File ID: | 2180417A_MS1.b\056SMPL.d |
| Prep Vol.: | 50 ( mL ) | Dilution Factor: | 1 Analyst: AWG |
| Prep Date: | 04/07/18 | Analysis Date: | 04/17/18 Time: 1504 |
| Prep Batch: | 632823 | Analytical Batch: | 633612 |
| Prep Method: | 3010A | Analytical Method: | EPA 6020A |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Arsenic | 2.72 | ug/L | | 0.25 | 0.50 | 1.00 |
| Manganese | 42.5 | ug/L | | 1.25 | 2.50 | 5.00 |

FORM I - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 21804062002 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 056SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 15:04:50 | **Total Dilution** | 1.0000 |
| **Sample Type** | Sample | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 0.301 | 0.301 | 0.8 | 180156.34 | 500 | |
| Be | 9 | 45 | No Gas | 0.07 | 0.070 | 5.9 | 378.68 | 100 | |
| B | 11 | 45 | No Gas | 7.585 | 7.585 | 1.4 | 21470.86 | 500 | |
| Sr | 88 | 72 | No Gas | 54.892 | 54.892 | 2.9 | 1098379.91 | 100 | |
| Zr | 90 | 72 | No Gas | 0.163 | 0.163 | 4.8 | 2673.60 | 100 | |
| Mo | 95 | 115 | No Gas | 0.279 | 0.279 | 7.5 | 1124.50 | 100 | |
| Ag | 107 | 115 | No Gas | 0.005 | 0.005 | 14.4 | 81.11 | 100 | |
| Cd | 111 | 115 | No Gas | 0.053 | 0.053 | 15.9 | 144.67 | 100 | |
| Sb | 121 | 115 | No Gas | 0.103 | 0.103 | 6.1 | 1053.39 | 200 | |
| Ba | 137 | 115 | No Gas | 50.176 | 50.176 | 2.2 | 143111.70 | 1000 | |
| Tl | 205 | 209 | No Gas | 0.014 | 0.014 | 10.4 | 523.35 | 100 | |
| Pb | 208 | 209 | No Gas | 0.921 | 0.921 | 2.2 | 25506.63 | 100 | |
| Na | 23 | 45 | He | 226507.693 | 226507.693 | 1.0 | 85572282.06 | 10000 | >LDR |
| Mg | 24 | 45 | He | 2433.255 | 2433.255 | 0.8 | 458197.95 | 10000 | |
| Al | 27 | 45 | He | 642.54 | 642.540 | 1.8 | 35720.84 | 2000 | |
| Si | 29 | 45 | He | 2625.311 | 2625.311 | 0.8 | 5411.57 | 10000 | |
| K | 39 | 45 | He | 1545.088 | 1545.088 | 0.2 | 135146.33 | 10000 | |
| Ca | 44 | 45 | He | 2835.684 | 2835.684 | 3.2 | 13355.60 | 50000 | |
| Ti | 47 | 45 | He | 4.161 | 4.161 | 5.9 | 168.67 | 100 | |
| V | 51 | 72 | He | 2.281 | 2.281 | 1.9 | 3542.65 | 100 | |
| Cr | 52 | 72 | He | 1.18 | 1.180 | 4.4 | 2618.02 | 100 | |
| Mn | 55 | 72 | He | 42.456 | 42.456 | 1.7 | 36667.32 | 500 | |
| Fe | 57 | 72 | He | 90801.834 | 90801.834 | 0.8 | 3614304.84 | 10000 | >LDR |
| Co | 59 | 72 | He | 6.671 | 6.671 | 1.5 | 23878.55 | 100 | |
| Ni | 60 | 72 | He | 3.093 | 3.093 | 7.4 | 3129.23 | 200 | |
| Cu | 63 | 72 | He | 1.05 | 1.050 | 2.5 | 4121.68 | 100 | |
| Zn | 66 | 72 | He | 1.928 | 1.928 | 14.7 | 810.03 | 2000 | |
| As | 75 | 72 | He | 2.718 | 2.718 | 2.5 | 682.69 | 100 | |
| Se | 78 | 72 | He | -0.127 | -0.127 | 206.4 | 1.28 | 50 | |
| Sn | 120 | 115 | He | 0.131 | 0.131 | 6.4 | 258.89 | 100 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1181272.30 | 1291085.71 | 91.49 | |
| Ge | 72 | He | 47992.38 | 47456.4966666667 | 101.13 | |
| In | 115 | He | 353923.94 | 372695.226666667 | 94.96 | |
| Lu | 175 | He | 989156.78 | 1029247.51 | 96.1 | |
| Rh | 103 | He | 1404972.72 | 1626201.63666667 | 86.4 | |
| Sc | 45 | He | 106822.20 | 109033.716666667 | 97.97 | |
| Tb | 159 | He | 1796819.66 | 1820531.74333333 | 98.7 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3475956.51 | 3617762.55 | 96.08 | |
| Ge | 72 | No Gas | 648336.92 | 597606.886666667 | 108.49 | |
| In | 115 | No Gas | 3850322.16 | 3893084.07 | 98.9 | |
| Lu | 175 | No Gas | 6078841.58 | 5877008.03666667 | 103.43 | |
| Rh | 103 | No Gas | 3813916.10 | 3958933.73 | 96.34 | |
| Sc | 45 | No Gas | 4308923.58 | 4093118.31 | 105.27 | |
| Tb | 159 | No Gas | 5772195.54 | 5654253.04333333 | 102.09 | |

I

INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-02-21 DL |
| Collect Date: | 04/05/18 Time: 1310 | GCAL Sample ID: | 21804062002 DL |
| Matrix: | Water % Solids: NA | Instrument ID: | ICPMS1 |
| Sample Amt: | 50 mL | Lab File ID: | 2180417A_MS1.b\055SMPL.d |
| Prep Vol.: | 50 ( mL ) | Dilution Factor: | 10 Analyst: AWG |
| Prep Date: | 04/07/18 | Analysis Date: | 04/17/18 Time: 1500 |
| Prep Batch: | 632823 | Analytical Batch: | 633612 |
| Prep Method: | 3010A | Analytical Method: | EPA 6020A |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Iron | 94000 | ug/L | | 250 | 500 | 1000 |

FORM I - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 21804062002 10X | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 055SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 15:00:27 | **Total Dilution** | 10.0000 |
| **Sample Type** | Sample | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Fail |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | -1.453 | -14.530 | 0.9 | 175131.01 | 500 | |
| Be | 9 | 45 | No Gas | 0.046 | 0.456 | 5.3 | 335.34 | 100 | |
| B | 11 | 45 | No Gas | 3.904 | 39.041 | 3.0 | 13442.39 | 500 | |
| Sr | 88 | 72 | No Gas | 5.984 | 59.837 | 2.2 | 116144.81 | 100 | |
| Zr | 90 | 72 | No Gas | 0.02 | 0.201 | 12.0 | 687.81 | 100 | |
| Mo | 95 | 115 | No Gas | 0.061 | 0.607 | 10.8 | 283.34 | 100 | |
| Ag | 107 | 115 | No Gas | 0.004 | 0.043 | 34.3 | 73.34 | 100 | |
| Cd | 111 | 115 | No Gas | 0.071 | 0.706 | 4.1 | 190.33 | 100 | |
| Sb | 121 | 115 | No Gas | 0.056 | 0.562 | 1.9 | 657.80 | 200 | |
| Ba | 137 | 115 | No Gas | 4.978 | 49.776 | 3.5 | 14912.87 | 1000 | |
| Tl | 205 | 209 | No Gas | 0.016 | 0.163 | 7.1 | 613.36 | 100 | |
| Pb | 208 | 209 | No Gas | 0.125 | 1.254 | 11.5 | 4800.54 | 100 | |
| Na | 23 | 45 | He | 23331.697 | 233316.973 | 1.3 | 9270956.32 | 10000 | >LDR |
| Mg | 24 | 45 | He | 256.123 | 2561.231 | 0.5 | 50720.23 | 10000 | |
| Al | 27 | 45 | He | 67.457 | 674.569 | 1.6 | 3969.17 | 2000 | |
| Si | 29 | 45 | He | 272.375 | 2723.752 | 3.9 | 1830.12 | 10000 | |
| K | 39 | 45 | He | 152.685 | 1526.853 | 0.7 | 20643.48 | 10000 | |
| Ca | 44 | 45 | He | 292.555 | 2925.552 | 4.7 | 1638.45 | 50000 | |
| Ti | 47 | 45 | He | 0.595 | 5.949 | 21.7 | 29.33 | 100 | |
| V | 51 | 72 | He | 0.238 | 2.381 | 5.9 | 460.01 | 100 | |
| Cr | 52 | 72 | He | 0.131 | 1.310 | 7.7 | 514.46 | 100 | |
| Mn | 55 | 72 | He | 4.804 | 48.043 | 1.7 | 4355.09 | 500 | |
| Fe | 57 | 72 | He | 9396.956 | 93969.559 | 0.6 | 389360.31 | 10000 | |
| Co | 59 | 72 | He | 0.712 | 7.118 | 6.8 | 2682.48 | 100 | |
| Ni | 60 | 72 | He | 0.384 | 3.845 | 9.4 | 432.24 | 200 | |
| Cu | 63 | 72 | He | -0.077 | -0.774 | 2.3 | 987.82 | 100 | |
| Zn | 66 | 72 | He | 0.51 | 5.104 | 13.4 | 344.45 | 2000 | |
| As | 75 | 72 | He | 0.339 | 3.394 | 16.9 | 97.67 | 100 | |
| Se | 78 | 72 | He | 0.06 | 0.603 | 29.8 | 4.40 | 50 | |
| Sn | 120 | 115 | He | 16.179 | 161.793 | 1.7 | 21346.83 | 100 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1312835.79 | 1291085.71 | 101.68 | |
| Ge | 72 | He | 49950.47 | 47456.4966666667 | 105.26 | |
| In | 115 | He | 387315.23 | 372695.226666667 | 103.92 | |
| Lu | 175 | He | 1053933.55 | 1029247.51 | 102.4 | |
| Rh | 103 | He | 1654488.27 | 1626201.63666667 | 101.74 | |
| Sc | 45 | He | 112252.61 | 109033.716666667 | 102.95 | |
| Tb | 159 | He | 1878959.09 | 1820531.74333333 | 103.21 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3732301.30 | 3617762.55 | 103.17 | |
| Ge | 72 | No Gas | 627286.17 | 597606.886666667 | 104.97 | |
| In | 115 | No Gas | 4036558.16 | 3893084.07 | 103.69 | |
| Lu | 175 | No Gas | 6195646.99 | 5877008.03666667 | 105.42 | |
| Rh | 103 | No Gas | 4070639.42 | 3958933.73 | 102.82 | |
| Sc | 45 | No Gas | 5501902.14 | 4093118.31 | 134.42 | <70%;>120% |
| Tb | 159 | No Gas | 5927444.70 | 5654253.04333333 | 104.83 | |

I

INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-06-21 |
| Collect Date: | 04/05/18 Time: 1450 | GCAL Sample ID: | 21804062007 |
| Matrix: | Water % Solids: NA | Instrument ID: | ICPMS1 |
| Sample Amt: | 50 mL | Lab File ID: | 2180417A_MS1.b\058SMPL.d |
| Prep Vol.: | 50 ( mL ) | Dilution Factor: | 1 Analyst: AWG |
| Prep Date: | 04/07/18 | Analysis Date: | 04/17/18 Time: 1513 |
| Prep Batch: | 632823 | Analytical Batch: | 633612 |
| Prep Method: | 3010A | Analytical Method: | EPA 6020A |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Arsenic | 0.84 | ug/L | J | 0.25 | 0.50 | 1.00 |
| Manganese | 7.95 | ug/L | | 1.25 | 2.50 | 5.00 |

FORM I - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 21804062007 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 058SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 15:13:34 | **Total Dilution** | 1.0000 |
| **Sample Type** | Sample | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 0.245 | 0.245 | 0.6 | 176674.36 | 500 | |
| Be | 9 | 45 | No Gas | 0.058 | 0.058 | 12.2 | 328.01 | 100 | |
| B | 11 | 45 | No Gas | 5.136 | 5.136 | 1.2 | 14526.76 | 500 | |
| Sr | 88 | 72 | No Gas | 10.625 | 10.625 | 2.6 | 208549.41 | 100 | |
| Zr | 90 | 72 | No Gas | 0.006 | 0.006 | 6.1 | 507.79 | 100 | |
| Mo | 95 | 115 | No Gas | 0.122 | 0.122 | 8.0 | 521.13 | 100 | |
| Ag | 107 | 115 | No Gas | 0.004 | 0.004 | 32.9 | 71.11 | 100 | |
| Cd | 111 | 115 | No Gas | 0.039 | 0.039 | 23.3 | 117.00 | 100 | |
| Sb | 121 | 115 | No Gas | 0.048 | 0.048 | 5.4 | 568.91 | 200 | |
| Ba | 137 | 115 | No Gas | 29.269 | 29.269 | 1.2 | 85651.76 | 1000 | |
| Tl | 205 | 209 | No Gas | 0.004 | 0.004 | 17.9 | 334.45 | 100 | |
| Pb | 208 | 209 | No Gas | 0.064 | 0.064 | 3.9 | 2996.93 | 100 | |
| Na | 23 | 45 | He | 60056.081 | 60056.081 | 1.6 | 22859132.99 | 10000 | >LDR |
| Mg | 24 | 45 | He | 392.818 | 392.818 | 2.6 | 74568.68 | 10000 | |
| Al | 27 | 45 | He | 7.367 | 7.367 | 5.3 | 444.01 | 2000 | |
| Si | 29 | 45 | He | 5117.299 | 5117.299 | 2.5 | 9367.98 | 10000 | |
| K | 39 | 45 | He | 876.745 | 876.745 | 1.9 | 80267.40 | 10000 | |
| Ca | 44 | 45 | He | 764.022 | 764.022 | 3.5 | 3775.51 | 50000 | |
| Ti | 47 | 45 | He | 0.079 | 0.079 | 19.9 | 7.67 | 100 | |
| V | 51 | 72 | He | 0.297 | 0.297 | 8.8 | 532.24 | 100 | |
| Cr | 52 | 72 | He | 0.167 | 0.167 | 4.9 | 567.80 | 100 | |
| Mn | 55 | 72 | He | 7.948 | 7.948 | 0.6 | 6900.42 | 500 | |
| Fe | 57 | 72 | He | 45334.331 | 45334.331 | 1.6 | 1805745.86 | 10000 | >LDR |
| Co | 59 | 72 | He | 3.843 | 3.843 | 1.3 | 13775.88 | 100 | |
| Ni | 60 | 72 | He | 1.017 | 1.017 | 8.1 | 1048.94 | 200 | |
| Cu | 63 | 72 | He | 0.02 | 0.020 | 7.1 | 1223.40 | 100 | |
| Zn | 66 | 72 | He | 1.077 | 1.077 | 1.3 | 522.24 | 2000 | |
| As | 75 | 72 | He | 0.837 | 0.837 | 8.3 | 217.00 | 100 | |
| Se | 78 | 72 | He | -0.025 | -0.025 | 58.4 | 2.89 | 50 | |
| Sn | 120 | 115 | He | 0.014 | 0.014 | 15.0 | 123.34 | 100 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1249115.29 | 1291085.71 | 96.75 | |
| Ge | 72 | He | 48019.32 | 47456.4966666667 | 101.19 | |
| In | 115 | He | 367647.50 | 372695.226666667 | 98.65 | |
| Lu | 175 | He | 1026930.92 | 1029247.51 | 99.77 | |
| Rh | 103 | He | 1564468.76 | 1626201.63666667 | 96.2 | |
| Sc | 45 | He | 107610.38 | 109033.716666667 | 98.69 | |
| Tb | 159 | He | 1842499.56 | 1820531.74333333 | 101.21 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3643957.03 | 3617762.55 | 100.72 | |
| Ge | 72 | No Gas | 635109.65 | 597606.886666667 | 106.28 | |
| In | 115 | No Gas | 3950017.28 | 3893084.07 | 101.46 | |
| Lu | 175 | No Gas | 6165506.37 | 5877008.03666667 | 104.91 | |
| Rh | 103 | No Gas | 3905424.71 | 3958933.73 | 98.65 | |
| Sc | 45 | No Gas | 4249815.52 | 4093118.31 | 103.83 | |
| Tb | 159 | No Gas | 5852913.04 | 5654253.04333333 | 103.51 | |

I

INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-06-21 DL |
| Collect Date: | 04/05/18 Time: 1450 | GCAL Sample ID: | 21804062007 DL |
| Matrix: | Water % Solids: NA | Instrument ID: | ICPMS1 |
| Sample Amt: | 50 mL | Lab File ID: | 2180417A_MS1.b\057SMPL.d |
| Prep Vol.: | 50 ( mL ) | Dilution Factor: | 10 Analyst: AWG |
| Prep Date: | 04/07/18 | Analysis Date: | 04/17/18 Time: 1509 |
| Prep Batch: | 632823 | Analytical Batch: | 633612 |
| Prep Method: | 3010A | Analytical Method: | EPA 6020A |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Iron | 44900 | ug/L | | 250 | 500 | 1000 |

FORM I - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 21804062007 10X | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 057SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 15:09:13 | **Total Dilution** | 10.0000 |
| **Sample Type** | Sample | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 0.053 | 0.534 | 0.6 | 174871.42 | 500 | |
| Be | 9 | 45 | No Gas | 0.039 | 0.387 | 12.2 | 250.67 | 100 | |
| B | 11 | 45 | No Gas | 3.465 | 34.646 | 4.4 | 10090.00 | 500 | |
| Sr | 88 | 72 | No Gas | 1.181 | 11.810 | 1.6 | 23344.58 | 100 | |
| Zr | 90 | 72 | No Gas | 0.007 | 0.071 | 19.1 | 518.91 | 100 | |
| Mo | 95 | 115 | No Gas | 0.033 | 0.326 | 13.1 | 168.89 | 100 | |
| Ag | 107 | 115 | No Gas | 0.003 | 0.027 | 9.2 | 55.56 | 100 | |
| Cd | 111 | 115 | No Gas | 0.039 | 0.395 | 8.8 | 121.33 | 100 | |
| Sb | 121 | 115 | No Gas | 0.035 | 0.353 | 13.8 | 461.12 | 200 | |
| Ba | 137 | 115 | No Gas | 2.988 | 29.882 | 3.9 | 9011.60 | 1000 | |
| Tl | 205 | 209 | No Gas | 0.004 | 0.038 | 3.6 | 351.12 | 100 | |
| Pb | 208 | 209 | No Gas | 0.027 | 0.269 | 4.6 | 2033.49 | 100 | |
| Na | 23 | 45 | He | 6335.367 | 63353.672 | 0.4 | 2543301.84 | 10000 | |
| Mg | 24 | 45 | He | 40.387 | 403.873 | 2.0 | 8105.58 | 10000 | |
| Al | 27 | 45 | He | 0.977 | 9.773 | 26.3 | 90.67 | 2000 | |
| Si | 29 | 45 | He | 487.28 | 4872.804 | 0.4 | 2199.49 | 10000 | |
| K | 39 | 45 | He | 82.199 | 821.989 | 0.9 | 14613.59 | 10000 | |
| Ca | 44 | 45 | He | 117.712 | 1177.116 | 5.9 | 793.37 | 50000 | |
| Ti | 47 | 45 | He | 0.069 | 0.694 | 19.9 | 7.67 | 100 | |
| V | 51 | 72 | He | 0.018 | 0.182 | 21.2 | 113.33 | 100 | |
| Cr | 52 | 72 | He | -0.006 | -0.062 | 20.6 | 226.67 | 100 | |
| Mn | 55 | 72 | He | 0.978 | 9.783 | 7.3 | 925.60 | 500 | |
| Fe | 57 | 72 | He | 4490.296 | 44902.957 | 1.9 | 187222.59 | 10000 | |
| Co | 59 | 72 | He | 0.444 | 4.442 | 4.1 | 1696.78 | 100 | |
| Ni | 60 | 72 | He | 0.152 | 1.521 | 9.6 | 191.11 | 200 | |
| Cu | 63 | 72 | He | -0.254 | -2.543 | 1.1 | 472.24 | 100 | |
| Zn | 66 | 72 | He | 0.402 | 4.019 | 10.8 | 307.79 | 2000 | |
| As | 75 | 72 | He | 0.124 | 1.242 | 15.6 | 42.50 | 100 | |
| Se | 78 | 72 | He | 0.043 | 0.431 | 18.1 | 4.15 | 50 | |
| Sn | 120 | 115 | He | 0.048 | 0.480 | 13.6 | 177.78 | 100 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1360414.20 | 1291085.71 | 105.37 | |
| Ge | 72 | He | 50257.17 | 47456.4966666667 | 105.9 | |
| In | 115 | He | 393503.84 | 372695.226666667 | 105.58 | |
| Lu | 175 | He | 1075208.89 | 1029247.51 | 104.47 | |
| Rh | 103 | He | 1695667.85 | 1626201.63666667 | 104.27 | |
| Sc | 45 | He | 113125.21 | 109033.716666667 | 103.75 | |
| Tb | 159 | He | 1911106.27 | 1820531.74333333 | 104.98 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3786324.32 | 3617762.55 | 104.66 | |
| Ge | 72 | No Gas | 630954.42 | 597606.886666667 | 105.58 | |
| In | 115 | No Gas | 4055227.27 | 3893084.07 | 104.16 | |
| Lu | 175 | No Gas | 6197385.53 | 5877008.03666667 | 105.45 | |
| Rh | 103 | No Gas | 4084668.17 | 3958933.73 | 103.18 | |
| Sc | 45 | No Gas | 4292194.55 | 4093118.31 | 104.86 | |
| Tb | 159 | No Gas | 5859976.58 | 5654253.04333333 | 103.64 | |

I

INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-10-21 |
| Collect Date: | 04/05/18 Time: 1715 | GCAL Sample ID: | 21804062008 |
| Matrix: | Water % Solids: NA | Instrument ID: | ICPMS1 |
| Sample Amt: | 50 mL | Lab File ID: | 2180417A_MS1.b\060SMPL.d |
| Prep Vol.: | 50 ( mL ) | Dilution Factor: | 1 Analyst: AWG |
| Prep Date: | 04/07/18 | Analysis Date: | 04/17/18 Time: 1522 |
| Prep Batch: | 632823 | Analytical Batch: | 633612 |
| Prep Method: | 3010A | Analytical Method: | EPA 6020A |

| ANALYTE | RESULT | UNITS | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| Arsenic | 0.78 | ug/L | J | 0.25 | 0.50 | 1.00 |
| Manganese | 150 | ug/L | | 1.25 | 2.50 | 5.00 |

FORM I - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 21804062008 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 060SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 15:22:20 | **Total Dilution** | 1.0000 |
| **Sample Type** | Sample | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 0.51 | 0.510 | 2.9 | 177347.45 | 500 | |
| Be | 9 | 45 | No Gas | 0.069 | 0.069 | 10.2 | 362.68 | 100 | |
| B | 11 | 45 | No Gas | 5.778 | 5.778 | 2.1 | 15894.52 | 500 | |
| Sr | 88 | 72 | No Gas | 20.48 | 20.480 | 2.3 | 385065.52 | 100 | |
| Zr | 90 | 72 | No Gas | 0.044 | 0.044 | 5.0 | 968.94 | 100 | |
| Mo | 95 | 115 | No Gas | 0.076 | 0.076 | 15.0 | 337.78 | 100 | |
| Ag | 107 | 115 | No Gas | 0.001 | 0.001 | 40.3 | 34.44 | 100 | |
| Cd | 111 | 115 | No Gas | 0.031 | 0.031 | 11.2 | 98.33 | 100 | |
| Sb | 121 | 115 | No Gas | 0.051 | 0.051 | 3.8 | 591.13 | 200 | |
| Ba | 137 | 115 | No Gas | 31.524 | 31.524 | 2.8 | 91478.86 | 1000 | |
| Tl | 205 | 209 | No Gas | 0.003 | 0.003 | 15.2 | 323.34 | 100 | |
| Pb | 208 | 209 | No Gas | 0.207 | 0.207 | 5.5 | 6930.96 | 100 | |
| Na | 23 | 45 | He | 52294.425 | 52294.425 | 0.8 | 19747892.21 | 10000 | >LDR |
| Mg | 24 | 45 | He | 832.629 | 832.629 | 1.5 | 156685.05 | 10000 | |
| Al | 27 | 45 | He | 57.427 | 57.427 | 2.4 | 3218.33 | 2000 | |
| Si | 29 | 45 | He | 4506.66 | 4506.660 | 1.3 | 8338.77 | 10000 | |
| K | 39 | 45 | He | 1408.634 | 1408.634 | 1.4 | 123722.16 | 10000 | |
| Ca | 44 | 45 | He | 1794.016 | 1794.016 | 1.2 | 8519.01 | 50000 | |
| Ti | 47 | 45 | He | 0.459 | 0.459 | 25.1 | 22.67 | 100 | |
| V | 51 | 72 | He | 0.279 | 0.279 | 12.1 | 494.46 | 100 | |
| Cr | 52 | 72 | He | 0.2 | 0.200 | 17.3 | 622.24 | 100 | |
| Mn | 55 | 72 | He | 149.532 | 149.532 | 0.8 | 126748.92 | 500 | |
| Fe | 57 | 72 | He | 15979.323 | 15979.323 | 0.2 | 624835.89 | 10000 | >LDR |
| Co | 59 | 72 | He | 1.87 | 1.870 | 5.2 | 6599.19 | 100 | |
| Ni | 60 | 72 | He | 0.796 | 0.796 | 9.2 | 812.25 | 200 | |
| Cu | 63 | 72 | He | 0.024 | 0.024 | 8.3 | 1213.40 | 100 | |
| Zn | 66 | 72 | He | 0.999 | 0.999 | 10.3 | 486.68 | 2000 | |
| As | 75 | 72 | He | 0.776 | 0.776 | 8.2 | 198.33 | 100 | |
| Se | 78 | 72 | He | 0.171 | 0.171 | 31.2 | 5.89 | 50 | |
| Sn | 120 | 115 | He | -0.002 | -0.002 | 34.3 | 102.23 | 100 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1246422.17 | 1291085.71 | 96.54 | |
| Ge | 72 | He | 47141.15 | 47456.4966666667 | 99.34 | |
| In | 115 | He | 360202.03 | 372695.226666667 | 96.65 | |
| Lu | 175 | He | 1001206.83 | 1029247.51 | 97.28 | |
| Rh | 103 | He | 1537661.36 | 1626201.63666667 | 94.56 | |
| Sc | 45 | He | 106773.44 | 109033.716666667 | 97.93 | |
| Tb | 159 | He | 1825897.47 | 1820531.74333333 | 100.29 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3636048.07 | 3617762.55 | 100.51 | |
| Ge | 72 | No Gas | 608891.99 | 597606.886666667 | 101.89 | |
| In | 115 | No Gas | 3916914.41 | 3893084.07 | 100.61 | |
| Lu | 175 | No Gas | 6140801.78 | 5877008.03666667 | 104.49 | |
| Rh | 103 | No Gas | 3862709.57 | 3958933.73 | 97.57 | |
| Sc | 45 | No Gas | 4151661.50 | 4093118.31 | 101.43 | |
| Tb | 159 | No Gas | 5824047.00 | 5654253.04333333 | 103 | |

I

INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-10-21 DL |
| Collect Date: | 04/05/18 Time: 1715 | GCAL Sample ID: | 21804062008 DL |
| Matrix: | Water % Solids: NA | Instrument ID: | ICPMS1 |
| Sample Amt: | 50 mL | Lab File ID: | 2180417A_MS1.b\059SMPL.d |
| Prep Vol.: | 50 ( mL ) | Dilution Factor: | 10 Analyst: AWG |
| Prep Date: | 04/07/18 | Analysis Date: | 04/17/18 Time: 1517 |
| Prep Batch: | 632823 | Analytical Batch: | 633612 |
| Prep Method: | 3010A | Analytical Method: | EPA 6020A |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Iron | 16400 | ug/L | | 250 | 500 | 1000 |

FORM I - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 21804062008 10X | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 059SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 15:17:57 | **Total Dilution** | 10.0000 |
| **Sample Type** | Sample | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Fail |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | -1.401 | -14.011 | 1.0 | 173899.60 | 500 | |
| Be | 9 | 45 | No Gas | 0.021 | 0.209 | 14.3 | 213.33 | 100 | |
| B | 11 | 45 | No Gas | 2.106 | 21.059 | 9.2 | 7512.01 | 500 | |
| Sr | 88 | 72 | No Gas | 2.093 | 20.935 | 1.9 | 40274.79 | 100 | |
| Zr | 90 | 72 | No Gas | 0.017 | 0.170 | 4.7 | 636.69 | 100 | |
| Mo | 95 | 115 | No Gas | 0.024 | 0.242 | 16.1 | 134.45 | 100 | |
| Ag | 107 | 115 | No Gas | 0.001 | 0.009 | 23.6 | 35.56 | 100 | |
| Cd | 111 | 115 | No Gas | 0.027 | 0.271 | 9.0 | 93.67 | 100 | |
| Sb | 121 | 115 | No Gas | 0.021 | 0.214 | 11.2 | 327.79 | 200 | |
| Ba | 137 | 115 | No Gas | 3.228 | 32.278 | 3.0 | 9714.29 | 1000 | |
| Tl | 205 | 209 | No Gas | 0.002 | 0.018 | 5.9 | 311.12 | 100 | |
| Pb | 208 | 209 | No Gas | 0.028 | 0.282 | 9.6 | 2090.16 | 100 | |
| Na | 23 | 45 | He | 5641.834 | 56418.335 | 0.6 | 2184452.68 | 10000 | |
| Mg | 24 | 45 | He | 86.05 | 860.500 | 5.0 | 16585.35 | 10000 | |
| Al | 27 | 45 | He | 6.428 | 64.283 | 12.0 | 396.68 | 2000 | |
| Si | 29 | 45 | He | 476.121 | 4761.211 | 2.6 | 2102.81 | 10000 | |
| K | 39 | 45 | He | 138.857 | 1388.568 | 2.1 | 18884.74 | 10000 | |
| Ca | 44 | 45 | He | 202.037 | 2020.371 | 14.2 | 1165.07 | 50000 | |
| Ti | 47 | 45 | He | 0.01 | 0.099 | 34.6 | 5.00 | 100 | |
| V | 51 | 72 | He | 0.043 | 0.433 | 11.8 | 150.00 | 100 | |
| Cr | 52 | 72 | He | 0.008 | 0.077 | 21.2 | 251.11 | 100 | |
| Mn | 55 | 72 | He | 15.282 | 152.824 | 3.1 | 13571.23 | 500 | |
| Fe | 57 | 72 | He | 1641.051 | 16410.512 | 0.3 | 67067.79 | 10000 | |
| Co | 59 | 72 | He | 0.187 | 1.875 | 13.0 | 721.14 | 100 | |
| Ni | 60 | 72 | He | 0.069 | 0.691 | 39.3 | 102.22 | 200 | |
| Cu | 63 | 72 | He | -0.254 | -2.542 | 4.5 | 463.34 | 100 | |
| Zn | 66 | 72 | He | 0.358 | 3.580 | 4.0 | 286.68 | 2000 | |
| As | 75 | 72 | He | 0.107 | 1.075 | 6.6 | 37.33 | 100 | |
| Se | 78 | 72 | He | 0.011 | 0.111 | 55.8 | 3.54 | 50 | |
| Sn | 120 | 115 | He | 0.036 | 0.357 | 11.6 | 157.78 | 100 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1339644.04 | 1291085.71 | 103.76 | |
| Ge | 72 | He | 49250.54 | 47456.4966666667 | 103.78 | |
| In | 115 | He | 384656.70 | 372695.226666667 | 103.21 | |
| Lu | 175 | He | 1048200.66 | 1029247.51 | 101.84 | |
| Rh | 103 | He | 1661709.79 | 1626201.63666667 | 102.18 | |
| Sc | 45 | He | 109053.68 | 109033.716666667 | 100.02 | |
| Tb | 159 | He | 1889436.17 | 1820531.74333333 | 103.78 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3825907.24 | 3617762.55 | 105.75 | |
| Ge | 72 | No Gas | 618248.26 | 597606.886666667 | 103.45 | |
| In | 115 | No Gas | 4048414.45 | 3893084.07 | 103.99 | |
| Lu | 175 | No Gas | 6198581.99 | 5877008.03666667 | 105.47 | |
| Rh | 103 | No Gas | 4041102.62 | 3958933.73 | 102.08 | |
| Sc | 45 | No Gas | 5458057.42 | 4093118.31 | 133.35 | <70%;>120% |
| Tb | 159 | No Gas | 5922663.45 | 5654253.04333333 | 104.75 | |

I

INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-01-21 |
| Collect Date: | 04/05/18 Time: 1450 | GCAL Sample ID: | 21804062009 |
| Matrix: | Water % Solids: NA | Instrument ID: | ICPMS1 |
| Sample Amt: | 50 mL | Lab File ID: | 2180417A_MS1.b\062SMPL.d |
| Prep Vol.: | 50 ( mL ) | Dilution Factor: | 1 Analyst: AWG |
| Prep Date: | 04/07/18 | Analysis Date: | 04/17/18 Time: 1531 |
| Prep Batch: | 632823 | Analytical Batch: | 633612 |
| Prep Method: | 3010A | Analytical Method: | EPA 6020A |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Arsenic | 1.24 | ug/L | | 0.25 | 0.50 | 1.00 |

FORM I - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 21804062009 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 062SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 15:31:04 | **Total Dilution** | 1.0000 |
| **Sample Type** | Sample | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 6.745 | 6.745 | 2.7 | 288250.38 | 500 | |
| Be | 9 | 45 | No Gas | 0.048 | 0.048 | 7.5 | 279.34 | 100 | |
| B | 11 | 45 | No Gas | 4.575 | 4.575 | 4.3 | 12678.50 | 500 | |
| Sr | 88 | 72 | No Gas | 24.121 | 24.121 | 1.6 | 451557.80 | 100 | |
| Zr | 90 | 72 | No Gas | 0.122 | 0.122 | 3.1 | 1964.61 | 100 | |
| Mo | 95 | 115 | No Gas | 0.281 | 0.281 | 5.2 | 1137.83 | 100 | |
| Ag | 107 | 115 | No Gas | 0.002 | 0.002 | 4.7 | 41.11 | 100 | |
| Cd | 111 | 115 | No Gas | 0.032 | 0.032 | 16.1 | 99.67 | 100 | |
| Sb | 121 | 115 | No Gas | 0.056 | 0.056 | 5.4 | 625.58 | 200 | |
| Ba | 137 | 115 | No Gas | 375.787 | 375.787 | 2.7 | 1077849.30 | 1000 | |
| Tl | 205 | 209 | No Gas | 0.023 | 0.023 | 8.2 | 725.58 | 100 | |
| Pb | 208 | 209 | No Gas | 0.221 | 0.221 | 4.4 | 7214.38 | 100 | |
| Na | 23 | 45 | He | 64434.039 | 64434.039 | 0.9 | 24877884.63 | 10000 | >LDR |
| Mg | 24 | 45 | He | 793.805 | 793.805 | 0.7 | 152711.89 | 10000 | |
| Al | 27 | 45 | He | 36.457 | 36.457 | 3.7 | 2098.15 | 2000 | |
| Si | 29 | 45 | He | 4425.676 | 4425.676 | 0.4 | 8394.81 | 10000 | |
| K | 39 | 45 | He | 1860.066 | 1860.066 | 0.8 | 164683.69 | 10000 | |
| Ca | 44 | 45 | He | 1278.066 | 1278.066 | 6.1 | 6276.30 | 50000 | |
| Ti | 47 | 45 | He | 0.619 | 0.619 | 19.5 | 29.67 | 100 | |
| V | 51 | 72 | He | 0.865 | 0.865 | 7.7 | 1388.97 | 100 | |
| Cr | 52 | 72 | He | 0.51 | 0.510 | 8.3 | 1257.84 | 100 | |
| Mn | 55 | 72 | He | 1647.631 | 1647.631 | 0.5 | 1416572.30 | 500 | >LDR |
| Fe | 57 | 72 | He | 23340.439 | 23340.439 | 0.7 | 926049.65 | 10000 | >LDR |
| Co | 59 | 72 | He | 49.982 | 49.982 | 0.1 | 178078.50 | 100 | |
| Ni | 60 | 72 | He | 3.349 | 3.349 | 2.7 | 3373.72 | 200 | |
| Cu | 63 | 72 | He | 0.39 | 0.390 | 5.5 | 2259.07 | 100 | |
| Zn | 66 | 72 | He | 2.25 | 2.250 | 2.8 | 914.48 | 2000 | |
| As | 75 | 72 | He | 1.244 | 1.244 | 2.4 | 316.83 | 100 | |
| Se | 78 | 72 | He | -0.182 | -0.182 | 407.5 | 0.42 | 50 | |
| Sn | 120 | 115 | He | 0.02 | 0.020 | 14.9 | 128.89 | 100 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1242188.29 | 1291085.71 | 96.21 | |
| Ge | 72 | He | 47835.42 | 47456.4966666667 | 100.8 | |
| In | 115 | He | 362675.59 | 372695.226666667 | 97.31 | |
| Lu | 175 | He | 1006843.45 | 1029247.51 | 97.82 | |
| Rh | 103 | He | 1542530.87 | 1626201.63666667 | 94.85 | |
| Sc | 45 | He | 109336.74 | 109033.716666667 | 100.28 | |
| Tb | 159 | He | 1839780.96 | 1820531.74333333 | 101.06 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3584198.49 | 3617762.55 | 99.07 | |
| Ge | 72 | No Gas | 606373.26 | 597606.886666667 | 101.47 | |
| In | 115 | No Gas | 3872647.39 | 3893084.07 | 99.48 | |
| Lu | 175 | No Gas | 6058198.66 | 5877008.03666667 | 103.08 | |
| Rh | 103 | No Gas | 3844781.24 | 3958933.73 | 97.12 | |
| Sc | 45 | No Gas | 4142783.73 | 4093118.31 | 101.21 | |
| Tb | 159 | No Gas | 5758544.08 | 5654253.04333333 | 101.84 | |

I

INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-01-21 DL |
| Collect Date: | 04/05/18 Time: 1450 | GCAL Sample ID: | 21804062009 DL |
| Matrix: | Water % Solids: NA | Instrument ID: | ICPMS1 |
| Sample Amt: | 50 mL | Lab File ID: | 2180417A_MS1.b\061SMPL.d |
| Prep Vol.: | 50 ( mL ) | Dilution Factor: | 10 Analyst: AWG |
| Prep Date: | 04/07/18 | Analysis Date: | 04/17/18 Time: 1526 |
| Prep Batch: | 632823 | Analytical Batch: | 633612 |
| Prep Method: | 3010A | Analytical Method: | EPA 6020A |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Iron | 25000 | ug/L | | 250 | 500 | 1000 |
| Manganese | 1660 | ug/L | | 12.5 | 25.0 | 50.0 |

FORM I - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 21804062009 10X | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 061SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 15:26:42 | **Total Dilution** | 10.0000 |
| **Sample Type** | Sample | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Fail |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | -0.568 | -5.682 | 1.8 | 179624.14 | 500 | |
| Be | 9 | 45 | No Gas | 0.031 | 0.311 | 3.8 | 240.00 | 100 | |
| B | 11 | 45 | No Gas | 1.813 | 18.134 | 6.6 | 6178.04 | 500 | |
| Sr | 88 | 72 | No Gas | 2.615 | 26.146 | 3.1 | 49744.83 | 100 | |
| Zr | 90 | 72 | No Gas | 0.054 | 0.535 | 2.8 | 1103.39 | 100 | |
| Mo | 95 | 115 | No Gas | 0.676 | 6.763 | 5.2 | 2773.61 | 100 | |
| Ag | 107 | 115 | No Gas | 0 | 0.003 | 54.5 | 28.89 | 100 | |
| Cd | 111 | 115 | No Gas | 0.032 | 0.318 | 11.7 | 102.67 | 100 | |
| Sb | 121 | 115 | No Gas | 0.028 | 0.275 | 7.1 | 381.12 | 200 | |
| Ba | 137 | 115 | No Gas | 37.537 | 375.365 | 1.7 | 110984.84 | 1000 | |
| Tl | 205 | 209 | No Gas | 0.001 | 0.010 | 21.7 | 285.56 | 100 | |
| Pb | 208 | 209 | No Gas | 0.922 | 9.225 | 0.9 | 27487.89 | 100 | |
| Na | 23 | 45 | He | 6979.784 | 69797.839 | 1.6 | 2685383.92 | 10000 | |
| Mg | 24 | 45 | He | 84.985 | 849.849 | 3.2 | 16295.19 | 10000 | |
| Al | 27 | 45 | He | 5.358 | 53.579 | 5.8 | 334.01 | 2000 | |
| Si | 29 | 45 | He | 438.093 | 4380.927 | 4.2 | 2030.81 | 10000 | |
| K | 39 | 45 | He | 194.073 | 1940.728 | 1.5 | 23430.65 | 10000 | |
| Ca | 44 | 45 | He | 229.829 | 2298.294 | 5.7 | 1288.41 | 50000 | |
| Ti | 47 | 45 | He | 0.194 | 1.936 | 37.4 | 12.33 | 100 | |
| V | 51 | 72 | He | 0.116 | 1.158 | 4.9 | 255.56 | 100 | |
| Cr | 52 | 72 | He | 0.243 | 2.426 | 9.8 | 718.92 | 100 | |
| Mn | 55 | 72 | He | 165.525 | 1655.255 | 0.5 | 142461.87 | 500 | |
| Fe | 57 | 72 | He | 2498.11 | 24981.097 | 0.8 | 99211.78 | 10000 | |
| Co | 59 | 72 | He | 5.353 | 53.534 | 2.4 | 19117.87 | 100 | |
| Ni | 60 | 72 | He | 0.415 | 4.146 | 3.5 | 444.46 | 200 | |
| Cu | 63 | 72 | He | 0.356 | 3.558 | 5.0 | 2163.51 | 100 | |
| Zn | 66 | 72 | He | 1.494 | 14.943 | 13.6 | 661.14 | 2000 | |
| As | 75 | 72 | He | 0.141 | 1.409 | 23.4 | 44.50 | 100 | |
| Se | 78 | 72 | He | 0.039 | 0.387 | 38.4 | 3.87 | 50 | |
| Sn | 120 | 115 | He | 0.049 | 0.493 | 16.8 | 173.34 | 100 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1323441.23 | 1291085.71 | 102.51 | |
| Ge | 72 | He | 47868.98 | 47456.4966666667 | 100.87 | |
| In | 115 | He | 380272.50 | 372695.226666667 | 102.03 | |
| Lu | 175 | He | 1044834.31 | 1029247.51 | 101.51 | |
| Rh | 103 | He | 1647986.67 | 1626201.63666667 | 101.34 | |
| Sc | 45 | He | 108443.63 | 109033.716666667 | 99.46 | |
| Tb | 159 | He | 1888319.35 | 1820531.74333333 | 103.72 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3738625.15 | 3617762.55 | 103.34 | |
| Ge | 72 | No Gas | 612380.41 | 597606.886666667 | 102.47 | |
| In | 115 | No Gas | 3991196.94 | 3893084.07 | 102.52 | |
| Lu | 175 | No Gas | 6116269.07 | 5877008.03666667 | 104.07 | |
| Rh | 103 | No Gas | 3989440.95 | 3958933.73 | 100.77 | |
| Sc | 45 | No Gas | 4960853.97 | 4093118.31 | 121.2 | <70%;>120% |
| Tb | 159 | No Gas | 5838353.25 | 5654253.04333333 | 103.26 | |

I

INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | RD5-MW-01-21 |
| Collect Date: | 04/05/18 Time: 1635 | GCAL Sample ID: | 21804062010 |
| Matrix: | Water % Solids: NA | Instrument ID: | ICPMS1 |
| Sample Amt: | 50 mL | Lab File ID: | 2180417A_MS1.b\067SMPL.d |
| Prep Vol.: | 50 ( mL ) | Dilution Factor: | 1 Analyst: AWG |
| Prep Date: | 04/07/18 | Analysis Date: | 04/17/18 Time: 1553 |
| Prep Batch: | 632823 | Analytical Batch: | 633612 |
| Prep Method: | 3010A | Analytical Method: | EPA 6020A |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Arsenic | 0.50 | ug/L | U | 0.25 | 0.50 | 1.00 |
| Iron | 562 | ug/L | | 25.0 | 50.0 | 100 |
| Manganese | 4.45 | ug/L | J | 1.25 | 2.50 | 5.00 |

FORM I - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 21804062010 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 067SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 15:53:04 | **Total Dilution** | 1.0000 |
| **Sample Type** | Sample | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 1.456 | 1.456 | 1.6 | 199028.44 | 500 | |
| Be | 9 | 45 | No Gas | 0.317 | 0.317 | 3.9 | 1376.07 | 100 | |
| B | 11 | 45 | No Gas | 3.618 | 3.618 | 3.9 | 10416.90 | 500 | |
| Sr | 88 | 72 | No Gas | 4.803 | 4.803 | 3.7 | 92003.80 | 100 | |
| Zr | 90 | 72 | No Gas | 0.061 | 0.061 | 5.0 | 1205.63 | 100 | |
| Mo | 95 | 115 | No Gas | 0.028 | 0.028 | 14.7 | 151.11 | 100 | |
| Ag | 107 | 115 | No Gas | 0.003 | 0.003 | 8.8 | 57.78 | 100 | |
| Cd | 111 | 115 | No Gas | 0.054 | 0.054 | 6.7 | 152.67 | 100 | |
| Sb | 121 | 115 | No Gas | 0.036 | 0.036 | 11.9 | 460.01 | 200 | |
| Ba | 137 | 115 | No Gas | 72.852 | 72.852 | 2.5 | 217298.99 | 1000 | |
| Tl | 205 | 209 | No Gas | 0.024 | 0.024 | 9.7 | 780.03 | 100 | |
| Pb | 208 | 209 | No Gas | 0.815 | 0.815 | 2.6 | 24822.64 | 100 | |
| Na | 23 | 45 | He | 3867.368 | 3867.368 | 2.0 | 1514570.66 | 10000 | |
| Mg | 24 | 45 | He | 146.097 | 146.097 | 2.8 | 28394.92 | 10000 | |
| Al | 27 | 45 | He | 434.466 | 434.466 | 1.3 | 24902.39 | 2000 | |
| Si | 29 | 45 | He | 6373.357 | 6373.357 | 1.8 | 11600.04 | 10000 | |
| K | 39 | 45 | He | 723.096 | 723.096 | 0.9 | 69016.87 | 10000 | |
| Ca | 44 | 45 | He | 262.21 | 262.210 | 12.6 | 1460.10 | 50000 | |
| Ti | 47 | 45 | He | 2.446 | 2.446 | 4.4 | 104.00 | 100 | |
| V | 51 | 72 | He | 0.698 | 0.698 | 2.8 | 1156.73 | 100 | |
| Cr | 52 | 72 | He | 0.401 | 0.401 | 5.2 | 1055.61 | 100 | |
| Mn | 55 | 72 | He | 4.448 | 4.448 | 1.9 | 3930.53 | 500 | |
| Fe | 57 | 72 | He | 562.011 | 562.011 | 1.9 | 22719.95 | 10000 | |
| Co | 59 | 72 | He | 1.403 | 1.403 | 2.2 | 5118.65 | 100 | |
| Ni | 60 | 72 | He | 2.258 | 2.258 | 2.0 | 2323.53 | 200 | |
| Cu | 63 | 72 | He | 0.796 | 0.796 | 2.3 | 3455.96 | 100 | |
| Zn | 66 | 72 | He | 6.703 | 6.703 | 3.8 | 2454.65 | 2000 | |
| As | 75 | 72 | He | 0.203 | 0.203 | 25.8 | 61.17 | 100 | |
| Se | 78 | 72 | He | -0.254 | -0.254 | -200.3 | -0.75 | 50 | |
| Sn | 120 | 115 | He | 0.03 | 0.030 | 21.9 | 146.67 | 100 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1314026.96 | 1291085.71 | 101.78 | |
| Ge | 72 | He | 48689.04 | 47456.4966666667 | 102.6 | |
| In | 115 | He | 375734.89 | 372695.226666667 | 100.82 | |
| Lu | 175 | He | 1026946.31 | 1029247.51 | 99.78 | |
| Rh | 103 | He | 1650874.59 | 1626201.63666667 | 101.52 | |
| Sc | 45 | He | 110148.64 | 109033.716666667 | 101.02 | |
| Tb | 159 | He | 1864063.41 | 1820531.74333333 | 102.39 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3796417.44 | 3617762.55 | 104.94 | |
| Ge | 72 | No Gas | 618436.21 | 597606.886666667 | 103.49 | |
| In | 115 | No Gas | 4026869.09 | 3893084.07 | 103.44 | |
| Lu | 175 | No Gas | 6119284.28 | 5877008.03666667 | 104.12 | |
| Rh | 103 | No Gas | 4030872.90 | 3958933.73 | 101.82 | |
| Sc | 45 | No Gas | 4253264.83 | 4093118.31 | 103.91 | |
| Tb | 159 | No Gas | 5922806.16 | 5654253.04333333 | 104.75 | |

I

INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-13-11-21 |
| Collect Date: | 04/05/18 Time: 1045 | GCAL Sample ID: | 21804062001 |
| Matrix: | Water % Solids: NA | Instrument ID: | ICPMS1 |
| Sample Amt: | 50 mL | Lab File ID: | 2180417A_MS1.b\074SMPL.d |
| Prep Vol.: | 50 ( mL ) | Dilution Factor: | 1 Analyst: AWG |
| Prep Date: | 04/09/18 | Analysis Date: | 04/17/18 Time: 1623 |
| Prep Batch: | 632790 | Analytical Batch: | 633612 |
| Prep Method: | 3005A | Analytical Method: | EPA 6020A Dissol |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Manganese | 42.5 | ug/L | | 1.25 | 2.50 | 5.00 |

FORM I - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 21804062001 D | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 074SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 16:23:38 | **Total Dilution** | 1.0000 |
| **Sample Type** | Sample | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 0.003 | 0.003 | 2.1 | 169921.76 | 500 | |
| Be | 9 | 45 | No Gas | 0.012 | 0.012 | 5.4 | 139.33 | 100 | |
| B | 11 | 45 | No Gas | 5.109 | 5.109 | 3.6 | 14259.83 | 500 | |
| Sr | 88 | 72 | No Gas | 82.869 | 82.869 | 3.4 | 1570130.39 | 100 | |
| Zr | 90 | 72 | No Gas | 0.008 | 0.008 | 7.8 | 514.46 | 100 | |
| Mo | 95 | 115 | No Gas | 0.02 | 0.020 | 28.7 | 114.45 | 100 | |
| Ag | 107 | 115 | No Gas | 0.001 | 0.001 | 48.4 | 30.00 | 100 | |
| Cd | 111 | 115 | No Gas | 0.01 | 0.010 | 11.7 | 52.33 | 100 | |
| Sb | 121 | 115 | No Gas | 0.039 | 0.039 | 8.7 | 481.13 | 200 | |
| Ba | 137 | 115 | No Gas | 33.984 | 33.984 | 1.5 | 98065.10 | 1000 | |
| Tl | 205 | 209 | No Gas | -0.003 | -0.003 | 13.6 | 204.45 | 100 | |
| Pb | 208 | 209 | No Gas | -0.004 | -0.004 | 10.1 | 1100.07 | 100 | |
| Na | 23 | 45 | He | 68520.96 | 68520.960 | 2.0 | 26039632.94 | 10000 | >LDR |
| Mg | 24 | 45 | He | 2082.654 | 2082.654 | 0.8 | 394372.87 | 10000 | |
| Al | 27 | 45 | He | 1.035 | 1.035 | 24.8 | 89.33 | 2000 | |
| Si | 29 | 45 | He | 2496.978 | 2496.978 | 1.5 | 5240.18 | 10000 | |
| K | 39 | 45 | He | 1571.556 | 1571.556 | 0.7 | 138099.59 | 10000 | |
| Ca | 44 | 45 | He | 6598.009 | 6598.009 | 1.6 | 30975.74 | 50000 | |
| Ti | 47 | 45 | He | 0.121 | 0.121 | 48.3 | 9.33 | 100 | |
| V | 51 | 72 | He | 0.041 | 0.041 | 20.3 | 140.00 | 100 | |
| Cr | 52 | 72 | He | 0.329 | 0.329 | 3.2 | 878.92 | 100 | |
| Mn | 55 | 72 | He | 42.478 | 42.478 | 0.9 | 36063.84 | 500 | |
| Fe | 57 | 72 | He | 11746.459 | 11746.459 | 0.7 | 459677.66 | 10000 | >LDR |
| Co | 59 | 72 | He | 9.257 | 9.257 | 1.8 | 32552.24 | 100 | |
| Ni | 60 | 72 | He | 10.861 | 10.861 | 1.5 | 10723.63 | 200 | |
| Cu | 63 | 72 | He | -0.035 | -0.035 | 6.0 | 1048.94 | 100 | |
| Zn | 66 | 72 | He | 2.401 | 2.401 | 0.7 | 952.26 | 2000 | |
| As | 75 | 72 | He | 0.938 | 0.938 | 3.9 | 238.00 | 100 | |
| Se | 78 | 72 | He | 0.055 | 0.055 | 7.2 | 4.08 | 50 | |
| Sn | 120 | 115 | He | -0.007 | -0.007 | 30.7 | 96.67 | 100 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1246272.27 | 1291085.71 | 96.53 | |
| Ge | 72 | He | 47180.07 | 47456.4966666667 | 99.42 | |
| In | 115 | He | 362941.28 | 372695.226666667 | 97.38 | |
| Lu | 175 | He | 1016218.29 | 1029247.51 | 98.73 | |
| Rh | 103 | He | 1554570.01 | 1626201.63666667 | 95.6 | |
| Sc | 45 | He | 107414.57 | 109033.716666667 | 98.52 | |
| Tb | 159 | He | 1827903.88 | 1820531.74333333 | 100.4 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3654235.47 | 3617762.55 | 101.01 | |
| Ge | 72 | No Gas | 613930.04 | 597606.886666667 | 102.73 | |
| In | 115 | No Gas | 3895084.14 | 3893084.07 | 100.05 | |
| Lu | 175 | No Gas | 6096522.20 | 5877008.03666667 | 103.74 | |
| Rh | 103 | No Gas | 3898792.90 | 3958933.73 | 98.48 | |
| Sc | 45 | No Gas | 4192031.36 | 4093118.31 | 102.42 | |
| Tb | 159 | No Gas | 5837011.37 | 5654253.04333333 | 103.23 | |

I

INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-13-11-21 DL |
| Collect Date: | 04/05/18 Time: 1045 | GCAL Sample ID: | 21804062001 DL |
| Matrix: | Water % Solids: NA | Instrument ID: | ICPMS1 |
| Sample Amt: | 50 mL | Lab File ID: | 2180417A_MS1.b\073SMPL.d |
| Prep Vol.: | 50 ( mL ) | Dilution Factor: | 10 Analyst: AWG |
| Prep Date: | 04/09/18 | Analysis Date: | 04/17/18 Time: 1619 |
| Prep Batch: | 632790 | Analytical Batch: | 633612 |
| Prep Method: | 3005A | Analytical Method: | EPA 6020A Dissol |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Iron | 11400 | ug/L | | 250 | 500 | 1000 |

FORM I - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 21804062001 D 10X | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 073SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 16:19:17 | **Total Dilution** | 10.0000 |
| **Sample Type** | Sample | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | -0.132 | -1.325 | 1.7 | 169261.81 | 500 | |
| Be | 9 | 45 | No Gas | 0.006 | 0.055 | 8.0 | 113.33 | 100 | |
| B | 11 | 45 | No Gas | 1.417 | 14.174 | 8.7 | 4420.75 | 500 | |
| Sr | 88 | 72 | No Gas | 7.723 | 77.227 | 2.4 | 148514.34 | 100 | |
| Zr | 90 | 72 | No Gas | 0.006 | 0.064 | 1.7 | 501.13 | 100 | |
| Mo | 95 | 115 | No Gas | 0.24 | 2.399 | 3.8 | 1015.60 | 100 | |
| Ag | 107 | 115 | No Gas | 0 | 0.002 | 34.6 | 27.78 | 100 | |
| Cd | 111 | 115 | No Gas | 0.019 | 0.185 | 11.5 | 74.00 | 100 | |
| Sb | 121 | 115 | No Gas | 0.016 | 0.163 | 5.9 | 278.90 | 200 | |
| Ba | 137 | 115 | No Gas | 3.302 | 33.015 | 2.1 | 9887.71 | 1000 | |
| Tl | 205 | 209 | No Gas | -0.004 | -0.041 | 1.9 | 180.00 | 100 | |
| Pb | 208 | 209 | No Gas | 0.112 | 1.116 | 3.0 | 4500.48 | 100 | |
| Na | 23 | 45 | He | 6810.843 | 68108.430 | 1.1 | 2716609.13 | 10000 | |
| Mg | 24 | 45 | He | 196.755 | 1967.552 | 3.1 | 39023.30 | 10000 | |
| Al | 27 | 45 | He | 1.085 | 10.851 | 17.8 | 96.00 | 2000 | |
| Si | 29 | 45 | He | 209.454 | 2094.536 | 1.4 | 1728.77 | 10000 | |
| K | 39 | 45 | He | 140.16 | 1401.600 | 1.3 | 19585.51 | 10000 | |
| Ca | 44 | 45 | He | 672.022 | 6720.223 | 3.1 | 3490.45 | 50000 | |
| Ti | 47 | 45 | He | 0.135 | 1.347 | 24.4 | 10.33 | 100 | |
| V | 51 | 72 | He | 0.029 | 0.291 | 7.9 | 126.67 | 100 | |
| Cr | 52 | 72 | He | 0.043 | 0.435 | 15.4 | 322.23 | 100 | |
| Mn | 55 | 72 | He | 4.313 | 43.128 | 2.3 | 3820.49 | 500 | |
| Fe | 57 | 72 | He | 1140.456 | 11404.564 | 2.0 | 46162.27 | 10000 | |
| Co | 59 | 72 | He | 0.922 | 9.225 | 1.6 | 3383.73 | 100 | |
| Ni | 60 | 72 | He | 1.115 | 11.148 | 3.8 | 1165.61 | 200 | |
| Cu | 63 | 72 | He | 0.318 | 3.176 | 2.7 | 2094.61 | 100 | |
| Zn | 66 | 72 | He | 1.157 | 11.571 | 6.8 | 557.79 | 2000 | |
| As | 75 | 72 | He | 0.086 | 0.856 | 20.6 | 31.50 | 100 | |
| Se | 78 | 72 | He | 0.008 | 0.077 | 19.7 | 3.46 | 50 | |
| Sn | 120 | 115 | He | 0.063 | 0.631 | 2.6 | 192.23 | 100 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1322295.71 | 1291085.71 | 102.42 | |
| Ge | 72 | He | 48766.90 | 47456.4966666667 | 102.76 | |
| In | 115 | He | 382258.41 | 372695.226666667 | 102.57 | |
| Lu | 175 | He | 1049138.97 | 1029247.51 | 101.93 | |
| Rh | 103 | He | 1659237.47 | 1626201.63666667 | 102.03 | |
| Sc | 45 | He | 112585.29 | 109033.716666667 | 103.26 | |
| Tb | 159 | He | 1891532.47 | 1820531.74333333 | 103.9 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3809707.97 | 3617762.55 | 105.31 | |
| Ge | 72 | No Gas | 621882.49 | 597606.886666667 | 104.06 | |
| In | 115 | No Gas | 4029503.03 | 3893084.07 | 103.5 | |
| Lu | 175 | No Gas | 6178669.07 | 5877008.03666667 | 105.13 | |
| Rh | 103 | No Gas | 4056434.56 | 3958933.73 | 102.46 | |
| Sc | 45 | No Gas | 4236712.61 | 4093118.31 | 103.51 | |
| Tb | 159 | No Gas | 5942067.62 | 5654253.04333333 | 105.09 | |

I

INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-02-21 |
| Collect Date: | 04/05/18 Time: 1310 | GCAL Sample ID: | 21804062002 |
| Matrix: | Water % Solids: NA | Instrument ID: | ICPMS1 |
| Sample Amt: | 50 mL | Lab File ID: | 2180417A_MS1.b\079SMPL.d |
| Prep Vol.: | 50 ( mL ) | Dilution Factor: | 1 Analyst: AWG |
| Prep Date: | 04/09/18 | Analysis Date: | 04/17/18 Time: 1645 |
| Prep Batch: | 632790 | Analytical Batch: | 633612 |
| Prep Method: | 3005A | Analytical Method: | EPA 6020A Dissol |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Manganese | 36.7 | ug/L | | 1.25 | 2.50 | 5.00 |

FORM I - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 21804062002 D | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 079SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 16:45:32 | **Total Dilution** | 1.0000 |
| **Sample Type** | Sample | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | -0.217 | -0.217 | 0.1 | 165703.51 | 500 | |
| Be | 9 | 45 | No Gas | 0 | 0.000 | 9.9 | 90.67 | 100 | |
| B | 11 | 45 | No Gas | 4.419 | 4.419 | 4.0 | 12394.96 | 500 | |
| Sr | 88 | 72 | No Gas | 55.186 | 55.186 | 2.6 | 1029619.15 | 100 | |
| Zr | 90 | 72 | No Gas | 0.268 | 0.268 | 1.8 | 3827.17 | 100 | |
| Mo | 95 | 115 | No Gas | 0.015 | 0.015 | 12.8 | 90.00 | 100 | |
| Ag | 107 | 115 | No Gas | 0.002 | 0.002 | 33.5 | 43.33 | 100 | |
| Cd | 111 | 115 | No Gas | 0 | 0.000 | 24.0 | 30.00 | 100 | |
| Sb | 121 | 115 | No Gas | 0.048 | 0.048 | 1.3 | 545.57 | 200 | |
| Ba | 137 | 115 | No Gas | 34.631 | 34.631 | 2.3 | 97482.75 | 1000 | |
| Tl | 205 | 209 | No Gas | -0.004 | -0.004 | 13.7 | 160.00 | 100 | |
| Pb | 208 | 209 | No Gas | 0.014 | 0.014 | 21.2 | 1536.77 | 100 | |
| Na | 23 | 45 | He | 219715.426 | 219715.426 | 1.1 | 84043503.75 | 10000 | >LDR |
| Mg | 24 | 45 | He | 2399.442 | 2399.442 | 0.8 | 457455.40 | 10000 | |
| Al | 27 | 45 | He | 7.219 | 7.219 | 11.8 | 437.34 | 2000 | |
| Si | 29 | 45 | He | 1495.651 | 1495.651 | 1.4 | 3695.10 | 10000 | |
| K | 39 | 45 | He | 1488.117 | 1488.117 | 1.4 | 132054.38 | 10000 | |
| Ca | 44 | 45 | He | 2735.589 | 2735.589 | 1.0 | 13053.67 | 50000 | |
| Ti | 47 | 45 | He | 0.027 | 0.027 | 20.4 | 5.67 | 100 | |
| V | 51 | 72 | He | 0.023 | 0.023 | 19.3 | 113.34 | 100 | |
| Cr | 52 | 72 | He | 0.352 | 0.352 | 3.1 | 930.04 | 100 | |
| Mn | 55 | 72 | He | 36.722 | 36.722 | 1.0 | 31316.37 | 500 | |
| Fe | 57 | 72 | He | 11907.295 | 11907.295 | 0.6 | 467999.12 | 10000 | >LDR |
| Co | 59 | 72 | He | 4.679 | 4.679 | 0.6 | 16542.86 | 100 | |
| Ni | 60 | 72 | He | 1.42 | 1.420 | 4.5 | 1434.53 | 200 | |
| Cu | 63 | 72 | He | 0.101 | 0.101 | 2.0 | 1433.42 | 100 | |
| Zn | 66 | 72 | He | 1.072 | 1.072 | 16.2 | 513.35 | 2000 | |
| As | 75 | 72 | He | 1.763 | 1.763 | 3.8 | 440.51 | 100 | |
| Se | 78 | 72 | He | 0.074 | 0.074 | 6.5 | 4.38 | 50 | |
| Sn | 120 | 115 | He | 0.004 | 0.004 | 13.9 | 110.00 | 100 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1220798.42 | 1291085.71 | 94.56 | |
| Ge | 72 | He | 47380.79 | 47456.4966666667 | 99.84 | |
| In | 115 | He | 364821.57 | 372695.226666667 | 97.89 | |
| Lu | 175 | He | 1020089.20 | 1029247.51 | 99.11 | |
| Rh | 103 | He | 1517259.38 | 1626201.63666667 | 93.3 | |
| Sc | 45 | He | 108156.52 | 109033.716666667 | 99.2 | |
| Tb | 159 | He | 1817017.37 | 1820531.74333333 | 99.81 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3532812.03 | 3617762.55 | 97.65 | |
| Ge | 72 | No Gas | 604562.72 | 597606.886666667 | 101.16 | |
| In | 115 | No Gas | 3799666.76 | 3893084.07 | 97.6 | |
| Lu | 175 | No Gas | 6020744.70 | 5877008.03666667 | 102.45 | |
| Rh | 103 | No Gas | 3760759.85 | 3958933.73 | 94.99 | |
| Sc | 45 | No Gas | 4185994.97 | 4093118.31 | 102.27 | |
| Tb | 159 | No Gas | 5743002.00 | 5654253.04333333 | 101.57 | |

I

INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-02-21 DL |
| Collect Date: | 04/05/18 Time: 1310 | GCAL Sample ID: | 21804062002 DL |
| Matrix: | Water % Solids: NA | Instrument ID: | ICPMS1 |
| Sample Amt: | 50 mL | Lab File ID: | 2180417A_MS1.b\078SMPL.d |
| Prep Vol.: | 50 ( mL ) | Dilution Factor: | 10 Analyst: AWG |
| Prep Date: | 04/09/18 | Analysis Date: | 04/17/18 Time: 1641 |
| Prep Batch: | 632790 | Analytical Batch: | 633612 |
| Prep Method: | 3005A | Analytical Method: | EPA 6020A Dissol |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Iron | 12000 | ug/L | | 250 | 500 | 1000 |

FORM I - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 21804062002 D 10X | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 078SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 16:41:11 | **Total Dilution** | 10.0000 |
| **Sample Type** | Sample | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | -0.111 | -1.113 | 0.8 | 168351.10 | 500 | |
| Be | 9 | 45 | No Gas | -0.001 | -0.012 | 9.5 | 85.33 | 100 | |
| B | 11 | 45 | No Gas | 1.39 | 13.904 | 5.7 | 4317.43 | 500 | |
| Sr | 88 | 72 | No Gas | 5.59 | 55.900 | 3.2 | 106152.68 | 100 | |
| Zr | 90 | 72 | No Gas | 0.016 | 0.156 | 5.7 | 614.46 | 100 | |
| Mo | 95 | 115 | No Gas | 0.01 | 0.095 | 20.8 | 73.33 | 100 | |
| Ag | 107 | 115 | No Gas | 0.003 | 0.031 | 18.2 | 58.89 | 100 | |
| Cd | 111 | 115 | No Gas | 0.005 | 0.052 | 16.4 | 44.00 | 100 | |
| Sb | 121 | 115 | No Gas | 0.015 | 0.154 | 17.5 | 267.79 | 200 | |
| Ba | 137 | 115 | No Gas | 3.467 | 34.669 | 2.7 | 10309.08 | 1000 | |
| Tl | 205 | 209 | No Gas | -0.005 | -0.052 | 9.9 | 152.23 | 100 | |
| Pb | 208 | 209 | No Gas | -0.005 | -0.047 | 8.1 | 1103.40 | 100 | |
| Na | 23 | 45 | He | 22629.968 | 226299.684 | 0.8 | 8905283.41 | 10000 | >LDR |
| Mg | 24 | 45 | He | 237.788 | 2377.884 | 0.7 | 46642.18 | 10000 | |
| Al | 27 | 45 | He | 0.335 | 3.350 | 20.4 | 52.00 | 2000 | |
| Si | 29 | 45 | He | 135.508 | 1355.081 | 3.0 | 1590.75 | 10000 | |
| K | 39 | 45 | He | 143.462 | 1434.625 | 1.3 | 19649.04 | 10000 | |
| Ca | 44 | 45 | He | 293.082 | 2930.823 | 5.9 | 1626.78 | 50000 | |
| Ti | 47 | 45 | He | 0.024 | 0.237 | 27.0 | 5.67 | 100 | |
| V | 51 | 72 | He | 0.026 | 0.256 | 13.6 | 121.11 | 100 | |
| Cr | 52 | 72 | He | 0.03 | 0.305 | 11.7 | 295.56 | 100 | |
| Mn | 55 | 72 | He | 3.909 | 39.086 | 7.7 | 3461.53 | 500 | |
| Fe | 57 | 72 | He | 1200.017 | 12000.174 | 2.0 | 48516.05 | 10000 | |
| Co | 59 | 72 | He | 0.494 | 4.939 | 4.2 | 1824.57 | 100 | |
| Ni | 60 | 72 | He | 0.178 | 1.785 | 7.4 | 212.22 | 200 | |
| Cu | 63 | 72 | He | -0.179 | -1.793 | 18.4 | 671.13 | 100 | |
| Zn | 66 | 72 | He | 0.208 | 2.077 | 10.8 | 232.23 | 2000 | |
| As | 75 | 72 | He | 0.177 | 1.768 | 5.3 | 54.33 | 100 | |
| Se | 78 | 72 | He | 0.009 | 0.088 | 61.6 | 3.47 | 50 | |
| Sn | 120 | 115 | He | 0.009 | 0.086 | 2.8 | 120.00 | 100 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1298524.93 | 1291085.71 | 100.58 | |
| Ge | 72 | He | 48712.40 | 47456.4966666667 | 102.65 | |
| In | 115 | He | 376948.91 | 372695.226666667 | 101.14 | |
| Lu | 175 | He | 1037018.29 | 1029247.51 | 100.75 | |
| Rh | 103 | He | 1617673.96 | 1626201.63666667 | 99.48 | |
| Sc | 45 | He | 111169.74 | 109033.716666667 | 101.96 | |
| Tb | 159 | He | 1844491.75 | 1820531.74333333 | 101.32 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3728521.30 | 3617762.55 | 103.06 | |
| Ge | 72 | No Gas | 613615.31 | 597606.886666667 | 102.68 | |
| In | 115 | No Gas | 4001160.68 | 3893084.07 | 102.78 | |
| Lu | 175 | No Gas | 6096404.08 | 5877008.03666667 | 103.73 | |
| Rh | 103 | No Gas | 4022736.51 | 3958933.73 | 101.61 | |
| Sc | 45 | No Gas | 4204871.22 | 4093118.31 | 102.73 | |
| Tb | 159 | No Gas | 5883923.87 | 5654253.04333333 | 104.06 | |

I

INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-06-21 |
| Collect Date: | 04/05/18 Time: 1450 | GCAL Sample ID: | 21804062007 |
| Matrix: | Water % Solids: NA | Instrument ID: | ICPMS1 |
| Sample Amt: | 50 mL | Lab File ID: | 2180417A_MS1.b\082SMPL.d |
| Prep Vol.: | 50 ( mL ) | Dilution Factor: | 1 Analyst: AWG |
| Prep Date: | 04/09/18 | Analysis Date: | 04/17/18 Time: 1658 |
| Prep Batch: | 632790 | Analytical Batch: | 633612 |
| Prep Method: | 3005A | Analytical Method: | EPA 6020A Dissol |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Manganese | 6.79 | ug/L | | 1.25 | 2.50 | 5.00 |

FORM I - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 21804062007 D | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 082SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 16:58:39 | **Total Dilution** | 1.0000 |
| **Sample Type** | Sample | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | -0.041 | -0.041 | 1.8 | 171713.68 | 500 | |
| Be | 9 | 45 | No Gas | 0.003 | 0.003 | 16.8 | 104.00 | 100 | |
| B | 11 | 45 | No Gas | 2.89 | 2.890 | 2.2 | 8442.44 | 500 | |
| Sr | 88 | 72 | No Gas | 11.378 | 11.378 | 2.6 | 218951.02 | 100 | |
| Zr | 90 | 72 | No Gas | 0.005 | 0.005 | 8.6 | 478.90 | 100 | |
| Mo | 95 | 115 | No Gas | 0.033 | 0.033 | 21.2 | 166.67 | 100 | |
| Ag | 107 | 115 | No Gas | 0.001 | 0.001 | 56.8 | 36.67 | 100 | |
| Cd | 111 | 115 | No Gas | 0.003 | 0.003 | 6.8 | 39.00 | 100 | |
| Sb | 121 | 115 | No Gas | 0.021 | 0.021 | 11.0 | 320.01 | 200 | |
| Ba | 137 | 115 | No Gas | 21.844 | 21.844 | 3.2 | 63892.78 | 1000 | |
| Tl | 205 | 209 | No Gas | -0.006 | -0.006 | 7.1 | 135.56 | 100 | |
| Pb | 208 | 209 | No Gas | -0.009 | -0.009 | 14.8 | 966.73 | 100 | |
| Na | 23 | 45 | He | 54022.847 | 54022.847 | 0.5 | 20698058.44 | 10000 | >LDR |
| Mg | 24 | 45 | He | 367.527 | 367.527 | 0.4 | 70206.42 | 10000 | |
| Al | 27 | 45 | He | 1.02 | 1.020 | 9.0 | 89.33 | 2000 | |
| Si | 29 | 45 | He | 4497.631 | 4497.631 | 0.6 | 8446.85 | 10000 | |
| K | 39 | 45 | He | 822.415 | 822.415 | 2.1 | 76241.08 | 10000 | |
| Ca | 44 | 45 | He | 759.33 | 759.330 | 4.1 | 3777.18 | 50000 | |
| Ti | 47 | 45 | He | 0.011 | 0.011 | 52.9 | 5.00 | 100 | |
| V | 51 | 72 | He | 0.037 | 0.037 | 31.1 | 136.67 | 100 | |
| Cr | 52 | 72 | He | 0.508 | 0.508 | 4.1 | 1258.96 | 100 | |
| Mn | 55 | 72 | He | 6.793 | 6.793 | 7.0 | 5905.58 | 500 | |
| Fe | 57 | 72 | He | 24882.562 | 24882.562 | 0.1 | 991158.71 | 10000 | >LDR |
| Co | 59 | 72 | He | 3.608 | 3.608 | 0.8 | 12938.52 | 100 | |
| Ni | 60 | 72 | He | 0.847 | 0.847 | 2.7 | 878.92 | 200 | |
| Cu | 63 | 72 | He | -0.041 | -0.041 | 4.1 | 1051.16 | 100 | |
| Zn | 66 | 72 | He | 1.785 | 1.785 | 10.0 | 761.14 | 2000 | |
| As | 75 | 72 | He | 0.214 | 0.214 | 4.9 | 62.83 | 100 | |
| Se | 78 | 72 | He | 0.039 | 0.039 | 31.2 | 3.90 | 50 | |
| Sn | 120 | 115 | He | -0.034 | -0.034 | 10.8 | 64.45 | 100 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1280730.37 | 1291085.71 | 99.2 | |
| Ge | 72 | He | 48025.83 | 47456.4966666667 | 101.2 | |
| In | 115 | He | 369651.37 | 372695.226666667 | 99.18 | |
| Lu | 175 | He | 1032484.54 | 1029247.51 | 100.31 | |
| Rh | 103 | He | 1568763.41 | 1626201.63666667 | 96.47 | |
| Sc | 45 | He | 108293.57 | 109033.716666667 | 99.32 | |
| Tb | 159 | He | 1846075.55 | 1820531.74333333 | 101.4 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3687156.82 | 3617762.55 | 101.92 | |
| Ge | 72 | No Gas | 622730.62 | 597606.886666667 | 104.2 | |
| In | 115 | No Gas | 3947325.50 | 3893084.07 | 101.39 | |
| Lu | 175 | No Gas | 6133407.62 | 5877008.03666667 | 104.36 | |
| Rh | 103 | No Gas | 3886545.26 | 3958933.73 | 98.17 | |
| Sc | 45 | No Gas | 4255929.41 | 4093118.31 | 103.98 | |
| Tb | 159 | No Gas | 5862570.54 | 5654253.04333333 | 103.68 | |

I

INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-06-21 DL |
| Collect Date: | 04/05/18 Time: 1450 | GCAL Sample ID: | 21804062007 DL |
| Matrix: | Water % Solids: NA | Instrument ID: | ICPMS1 |
| Sample Amt: | 50 mL | Lab File ID: | 2180417A_MS1.b\081SMPL.d |
| Prep Vol.: | 50 ( mL ) | Dilution Factor: | 10 Analyst: AWG |
| Prep Date: | 04/09/18 | Analysis Date: | 04/17/18 Time: 1654 |
| Prep Batch: | 632790 | Analytical Batch: | 633612 |
| Prep Method: | 3005A | Analytical Method: | EPA 6020A Dissol |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Iron | 24600 | ug/L | | 250 | 500 | 1000 |

FORM I - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 21804062007 D 10X | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 081SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 16:54:17 | **Total Dilution** | 10.0000 |
| **Sample Type** | Sample | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | -0.251 | -2.512 | 0.8 | 169917.20 | 500 | |
| Be | 9 | 45 | No Gas | 0 | 0.001 | 10.6 | 92.67 | 100 | |
| B | 11 | 45 | No Gas | 1.05 | 10.498 | 4.3 | 3487.16 | 500 | |
| Sr | 88 | 72 | No Gas | 1.187 | 11.872 | 1.6 | 23304.37 | 100 | |
| Zr | 90 | 72 | No Gas | 0.004 | 0.043 | 9.1 | 477.79 | 100 | |
| Mo | 95 | 115 | No Gas | 0.007 | 0.066 | 53.7 | 62.22 | 100 | |
| Ag | 107 | 115 | No Gas | 0.001 | 0.015 | 71.2 | 42.22 | 100 | |
| Cd | 111 | 115 | No Gas | 0.001 | 0.008 | 36.5 | 34.67 | 100 | |
| Sb | 121 | 115 | No Gas | 0.006 | 0.061 | 8.3 | 183.34 | 200 | |
| Ba | 137 | 115 | No Gas | 2.185 | 21.852 | 4.9 | 6614.82 | 1000 | |
| Tl | 205 | 209 | No Gas | -0.007 | -0.069 | 30.9 | 120.00 | 100 | |
| Pb | 208 | 209 | No Gas | -0.001 | -0.007 | 13.1 | 1256.75 | 100 | |
| Na | 23 | 45 | He | 5577.223 | 55772.229 | 1.6 | 2237923.14 | 10000 | |
| Mg | 24 | 45 | He | 37.049 | 370.491 | 5.9 | 7431.93 | 10000 | |
| Al | 27 | 45 | He | 0.251 | 2.513 | 21.7 | 48.00 | 2000 | |
| Si | 29 | 45 | He | 451.006 | 4510.064 | 6.9 | 2138.15 | 10000 | |
| K | 39 | 45 | He | 82.924 | 829.242 | 0.5 | 14663.69 | 10000 | |
| Ca | 44 | 45 | He | 82.59 | 825.898 | 7.7 | 620.03 | 50000 | |
| Ti | 47 | 45 | He | 0.053 | 0.533 | 79.5 | 7.00 | 100 | |
| V | 51 | 72 | He | 0.016 | 0.159 | 22.1 | 108.89 | 100 | |
| Cr | 52 | 72 | He | 0.052 | 0.518 | 15.0 | 346.68 | 100 | |
| Mn | 55 | 72 | He | 0.781 | 7.808 | 10.2 | 741.14 | 500 | |
| Fe | 57 | 72 | He | 2461.148 | 24611.478 | 0.7 | 101781.56 | 10000 | |
| Co | 59 | 72 | He | 0.373 | 3.732 | 2.7 | 1418.97 | 100 | |
| Ni | 60 | 72 | He | 0.161 | 1.611 | 16.8 | 198.89 | 200 | |
| Cu | 63 | 72 | He | -0.128 | -1.275 | 10.8 | 840.03 | 100 | |
| Zn | 66 | 72 | He | 0.506 | 5.063 | 2.5 | 342.23 | 2000 | |
| As | 75 | 72 | He | 0.034 | 0.339 | 20.6 | 18.83 | 100 | |
| Se | 78 | 72 | He | -0.047 | -0.467 | 28.8 | 2.65 | 50 | |
| Sn | 120 | 115 | He | 0.02 | 0.196 | 17.5 | 137.78 | 100 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1347369.93 | 1291085.71 | 104.36 | |
| Ge | 72 | He | 49850.17 | 47456.4966666667 | 105.04 | |
| In | 115 | He | 387610.65 | 372695.226666667 | 104 | |
| Lu | 175 | He | 1060414.91 | 1029247.51 | 103.03 | |
| Rh | 103 | He | 1675968.30 | 1626201.63666667 | 103.06 | |
| Sc | 45 | He | 113016.85 | 109033.716666667 | 103.65 | |
| Tb | 159 | He | 1885115.86 | 1820531.74333333 | 103.55 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3845418.38 | 3617762.55 | 106.29 | |
| Ge | 72 | No Gas | 626635.29 | 597606.886666667 | 104.86 | |
| In | 115 | No Gas | 4065515.47 | 3893084.07 | 104.43 | |
| Lu | 175 | No Gas | 6250518.66 | 5877008.03666667 | 106.36 | |
| Rh | 103 | No Gas | 4088321.09 | 3958933.73 | 103.27 | |
| Sc | 45 | No Gas | 4309130.52 | 4093118.31 | 105.28 | |
| Tb | 159 | No Gas | 5942389.91 | 5654253.04333333 | 105.1 | |

I

INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-10-21 |
| Collect Date: | 04/05/18 Time: 1715 | GCAL Sample ID: | 21804062008 |
| Matrix: | Water % Solids: NA | Instrument ID: | ICPMS1 |
| Sample Amt: | 50 mL | Lab File ID: | 2180417A_MS1.b\084SMPL.d |
| Prep Vol.: | 50 ( mL ) | Dilution Factor: | 1 Analyst: AWG |
| Prep Date: | 04/09/18 | Analysis Date: | 04/17/18 Time: 1707 |
| Prep Batch: | 632790 | Analytical Batch: | 633612 |
| Prep Method: | 3005A | Analytical Method: | EPA 6020A Dissol |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Manganese | 137 | ug/L | | 1.25 | 2.50 | 5.00 |

FORM I - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 21804062008 D | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 084SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 17:07:23 | **Total Dilution** | 1.0000 |
| **Sample Type** | Sample | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 0.052 | 0.052 | 1.6 | 172889.68 | 500 | |
| Be | 9 | 45 | No Gas | 0.026 | 0.026 | 10.5 | 198.00 | 100 | |
| B | 11 | 45 | No Gas | 3.796 | 3.796 | 3.2 | 10870.56 | 500 | |
| Sr | 88 | 72 | No Gas | 18.696 | 18.696 | 2.6 | 359809.38 | 100 | |
| Zr | 90 | 72 | No Gas | 0.005 | 0.005 | 17.4 | 490.01 | 100 | |
| Mo | 95 | 115 | No Gas | 0.038 | 0.038 | 5.2 | 185.56 | 100 | |
| Ag | 107 | 115 | No Gas | 0.001 | 0.001 | 5.4 | 35.56 | 100 | |
| Cd | 111 | 115 | No Gas | 0.003 | 0.003 | 37.4 | 38.67 | 100 | |
| Sb | 121 | 115 | No Gas | 0.028 | 0.028 | 12.3 | 382.23 | 200 | |
| Ba | 137 | 115 | No Gas | 27.779 | 27.779 | 3.1 | 81599.15 | 1000 | |
| Tl | 205 | 209 | No Gas | -0.005 | -0.005 | 22.6 | 165.56 | 100 | |
| Pb | 208 | 209 | No Gas | 0.005 | 0.005 | 4.2 | 1366.75 | 100 | |
| Na | 23 | 45 | He | 48855.866 | 48855.866 | 0.7 | 18854073.05 | 10000 | >LDR |
| Mg | 24 | 45 | He | 762.23 | 762.230 | 1.8 | 146594.11 | 10000 | |
| Al | 27 | 45 | He | 1.388 | 1.388 | 21.9 | 110.67 | 2000 | |
| Si | 29 | 45 | He | 4106.31 | 4106.310 | 2.5 | 7884.55 | 10000 | |
| K | 39 | 45 | He | 1340.455 | 1340.455 | 1.4 | 120653.37 | 10000 | |
| Ca | 44 | 45 | He | 1635.396 | 1635.396 | 3.1 | 7952.04 | 50000 | |
| Ti | 47 | 45 | He | 0.068 | 0.068 | 55.1 | 7.33 | 100 | |
| V | 51 | 72 | He | 0.053 | 0.053 | 11.3 | 162.23 | 100 | |
| Cr | 52 | 72 | He | 0.338 | 0.338 | 8.1 | 925.59 | 100 | |
| Mn | 55 | 72 | He | 136.595 | 136.595 | 0.7 | 119435.07 | 500 | |
| Fe | 57 | 72 | He | 13275.412 | 13275.412 | 1.4 | 535612.77 | 10000 | >LDR |
| Co | 59 | 72 | He | 1.753 | 1.753 | 2.3 | 6380.20 | 100 | |
| Ni | 60 | 72 | He | 0.819 | 0.819 | 6.3 | 862.26 | 200 | |
| Cu | 63 | 72 | He | -0.05 | -0.050 | 2.6 | 1041.16 | 100 | |
| Zn | 66 | 72 | He | 1.583 | 1.583 | 8.5 | 701.14 | 2000 | |
| As | 75 | 72 | He | 0.436 | 0.436 | 0.9 | 119.33 | 100 | |
| Se | 78 | 72 | He | 0.321 | 0.321 | 10.2 | 8.45 | 50 | |
| Sn | 120 | 115 | He | -0.028 | -0.028 | 27.0 | 72.22 | 100 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1276923.08 | 1291085.71 | 98.9 | |
| Ge | 72 | He | 48650.14 | 47456.4966666667 | 102.52 | |
| In | 115 | He | 372706.88 | 372695.226666667 | 100 | |
| Lu | 175 | He | 1037294.36 | 1029247.51 | 100.78 | |
| Rh | 103 | He | 1600243.48 | 1626201.63666667 | 98.4 | |
| Sc | 45 | He | 109074.83 | 109033.716666667 | 100.04 | |
| Tb | 159 | He | 1861557.16 | 1820531.74333333 | 102.25 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3672444.63 | 3617762.55 | 101.51 | |
| Ge | 72 | No Gas | 623185.51 | 597606.886666667 | 104.28 | |
| In | 115 | No Gas | 3964429.33 | 3893084.07 | 101.83 | |
| Lu | 175 | No Gas | 6137979.49 | 5877008.03666667 | 104.44 | |
| Rh | 103 | No Gas | 3990462.48 | 3958933.73 | 100.8 | |
| Sc | 45 | No Gas | 4242994.56 | 4093118.31 | 103.66 | |
| Tb | 159 | No Gas | 5906946.58 | 5654253.04333333 | 104.47 | |

I

INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-10-21 DL |
| Collect Date: | 04/05/18 Time: 1715 | GCAL Sample ID: | 21804062008 DL |
| Matrix: | Water % Solids: NA | Instrument ID: | ICPMS1 |
| Sample Amt: | 50 mL | Lab File ID: | 2180417A_MS1.b\083SMPL.d |
| Prep Vol.: | 50 ( mL ) | Dilution Factor: | 10 Analyst: AWG |
| Prep Date: | 04/09/18 | Analysis Date: | 04/17/18 Time: 1703 |
| Prep Batch: | 632790 | Analytical Batch: | 633612 |
| Prep Method: | 3005A | Analytical Method: | EPA 6020A Dissol |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Iron | 13600 | ug/L | | 250 | 500 | 1000 |

FORM I - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 21804062008 D 10X | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 083SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 17:03:01 | **Total Dilution** | 10.0000 |
| **Sample Type** | Sample | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | -0.183 | -1.832 | 1.9 | 171404.44 | 500 | |
| Be | 9 | 45 | No Gas | -0.001 | -0.009 | 17.5 | 88.67 | 100 | |
| B | 11 | 45 | No Gas | 0.94 | 9.400 | 6.3 | 3187.10 | 500 | |
| Sr | 88 | 72 | No Gas | 1.908 | 19.080 | 2.3 | 37548.13 | 100 | |
| Zr | 90 | 72 | No Gas | 0 | 0.004 | 4.7 | 428.90 | 100 | |
| Mo | 95 | 115 | No Gas | 0.008 | 0.076 | 13.2 | 66.67 | 100 | |
| Ag | 107 | 115 | No Gas | 0.002 | 0.022 | 24.0 | 50.00 | 100 | |
| Cd | 111 | 115 | No Gas | 0.004 | 0.036 | 29.3 | 41.00 | 100 | |
| Sb | 121 | 115 | No Gas | 0.006 | 0.060 | 4.8 | 183.34 | 200 | |
| Ba | 137 | 115 | No Gas | 2.796 | 27.956 | 1.3 | 8479.08 | 1000 | |
| Tl | 205 | 209 | No Gas | -0.007 | -0.073 | 3.5 | 111.12 | 100 | |
| Pb | 208 | 209 | No Gas | -0.012 | -0.118 | 16.1 | 923.39 | 100 | |
| Na | 23 | 45 | He | 5074.575 | 50745.754 | 0.9 | 2051871.48 | 10000 | |
| Mg | 24 | 45 | He | 78.704 | 787.041 | 4.9 | 15828.13 | 10000 | |
| Al | 27 | 45 | He | 0.473 | 4.730 | 46.2 | 61.33 | 2000 | |
| Si | 29 | 45 | He | 341.657 | 3416.571 | 3.9 | 1971.47 | 10000 | |
| K | 39 | 45 | He | 127.996 | 1279.962 | 4.4 | 18764.51 | 10000 | |
| Ca | 44 | 45 | He | 184.66 | 1846.602 | 4.3 | 1130.06 | 50000 | |
| Ti | 47 | 45 | He | -0.037 | -0.365 | 75.5 | 3.33 | 100 | |
| V | 51 | 72 | He | 0.026 | 0.257 | 19.0 | 124.45 | 100 | |
| Cr | 52 | 72 | He | 0.016 | 0.162 | 15.9 | 273.34 | 100 | |
| Mn | 55 | 72 | He | 13.829 | 138.290 | 2.6 | 12494.87 | 500 | |
| Fe | 57 | 72 | He | 1363.186 | 13631.855 | 1.3 | 56678.53 | 10000 | |
| Co | 59 | 72 | He | 0.231 | 2.312 | 3.3 | 896.70 | 100 | |
| Ni | 60 | 72 | He | 0.085 | 0.845 | 11.1 | 120.00 | 200 | |
| Cu | 63 | 72 | He | -0.209 | -2.091 | 7.2 | 603.35 | 100 | |
| Zn | 66 | 72 | He | 0.133 | 1.330 | 14.1 | 212.23 | 2000 | |
| As | 75 | 72 | He | 0.035 | 0.348 | 15.7 | 19.17 | 100 | |
| Se | 78 | 72 | He | -0.002 | -0.019 | 23.3 | 3.40 | 50 | |
| Sn | 120 | 115 | He | 0.009 | 0.090 | 17.8 | 124.45 | 100 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1347663.05 | 1291085.71 | 104.38 | |
| Ge | 72 | He | 50107.75 | 47456.4966666667 | 105.59 | |
| In | 115 | He | 389345.36 | 372695.226666667 | 104.47 | |
| Lu | 175 | He | 1057764.62 | 1029247.51 | 102.77 | |
| Rh | 103 | He | 1674439.10 | 1626201.63666667 | 102.97 | |
| Sc | 45 | He | 113896.84 | 109033.716666667 | 104.46 | |
| Tb | 159 | He | 1902912.42 | 1820531.74333333 | 104.53 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3813755.46 | 3617762.55 | 105.42 | |
| Ge | 72 | No Gas | 631827.39 | 597606.886666667 | 105.73 | |
| In | 115 | No Gas | 4079324.53 | 3893084.07 | 104.78 | |
| Lu | 175 | No Gas | 6174064.91 | 5877008.03666667 | 105.05 | |
| Rh | 103 | No Gas | 4103804.14 | 3958933.73 | 103.66 | |
| Sc | 45 | No Gas | 4314101.91 | 4093118.31 | 105.4 | |
| Tb | 159 | No Gas | 5940239.70 | 5654253.04333333 | 105.06 | |

I

INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-01-21 |
| Collect Date: | 04/05/18 Time: 1450 | GCAL Sample ID: | 21804062009 |
| Matrix: | Water % Solids: NA | Instrument ID: | ICPMS1 |
| Sample Amt: | 50 mL | Lab File ID: | 2180417A_MS1.b\086SMPL.d |
| Prep Vol.: | 50 ( mL ) | Dilution Factor: | 1 Analyst: AWG |
| Prep Date: | 04/09/18 | Analysis Date: | 04/17/18 Time: 1716 |
| Prep Batch: | 632790 | Analytical Batch: | 633612 |
| Prep Method: | 3005A | Analytical Method: | EPA 6020A Dissol |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Iron | 964 | ug/L | | 25.0 | 50.0 | 100 |

FORM I - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 21804062009 D | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 086SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 17:16:08 | **Total Dilution** | 1.0000 |
| **Sample Type** | Sample | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 6.178 | 6.178 | 1.1 | 283733.70 | 500 | |
| Be | 9 | 45 | No Gas | -0.007 | -0.007 | 17.1 | 62.00 | 100 | |
| B | 11 | 45 | No Gas | 2.974 | 2.974 | 2.3 | 8612.53 | 500 | |
| Sr | 88 | 72 | No Gas | 22.548 | 22.548 | 2.3 | 429836.91 | 100 | |
| Zr | 90 | 72 | No Gas | 0.01 | 0.010 | 13.6 | 546.68 | 100 | |
| Mo | 95 | 115 | No Gas | 0.108 | 0.108 | 9.7 | 465.57 | 100 | |
| Ag | 107 | 115 | No Gas | 0 | 0.000 | 25.0 | 26.67 | 100 | |
| Cd | 111 | 115 | No Gas | -0.001 | -0.001 | 8.3 | 30.33 | 100 | |
| Sb | 121 | 115 | No Gas | 0.015 | 0.015 | 9.6 | 263.34 | 200 | |
| Ba | 137 | 115 | No Gas | 259.042 | 259.042 | 1.6 | 756104.08 | 1000 | |
| Tl | 205 | 209 | No Gas | 0.003 | 0.003 | 7.8 | 323.34 | 100 | |
| Pb | 208 | 209 | No Gas | -0.009 | -0.009 | 20.8 | 976.72 | 100 | |
| Na | 23 | 45 | He | 65316.414 | 65316.414 | 2.0 | 25437013.79 | 10000 | >LDR |
| Mg | 24 | 45 | He | 761.629 | 761.629 | 0.3 | 147815.08 | 10000 | |
| Al | 27 | 45 | He | 0.949 | 0.949 | 6.7 | 86.67 | 2000 | |
| Si | 29 | 45 | He | 3841.996 | 3841.996 | 0.5 | 7531.73 | 10000 | |
| K | 39 | 45 | He | 1818.716 | 1818.716 | 2.8 | 162657.04 | 10000 | |
| Ca | 44 | 45 | He | 1206.454 | 1206.454 | 2.0 | 5976.20 | 50000 | |
| Ti | 47 | 45 | He | 0.025 | 0.025 | 44.4 | 5.67 | 100 | |
| V | 51 | 72 | He | 0.09 | 0.090 | 7.1 | 217.78 | 100 | |
| Cr | 52 | 72 | He | 0.331 | 0.331 | 9.4 | 903.37 | 100 | |
| Mn | 55 | 72 | He | 1332.755 | 1332.755 | 0.9 | 1154963.36 | 500 | >LDR |
| Fe | 57 | 72 | He | 964.264 | 964.264 | 1.9 | 38586.38 | 10000 | |
| Co | 59 | 72 | He | 41.842 | 41.842 | 1.3 | 150262.15 | 100 | |
| Ni | 60 | 72 | He | 2.257 | 2.257 | 1.6 | 2301.30 | 200 | |
| Cu | 63 | 72 | He | -0.074 | -0.074 | 5.7 | 962.27 | 100 | |
| Zn | 66 | 72 | He | 1.357 | 1.357 | 9.2 | 618.91 | 2000 | |
| As | 75 | 72 | He | 0.184 | 0.184 | 9.9 | 55.50 | 100 | |
| Se | 78 | 72 | He | 0.029 | 0.029 | 37.1 | 3.75 | 50 | |
| Sn | 120 | 115 | He | -0.019 | -0.019 | 12.7 | 84.45 | 100 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1285176.18 | 1291085.71 | 99.54 | |
| Ge | 72 | He | 48206.45 | 47456.4966666667 | 101.58 | |
| In | 115 | He | 374043.60 | 372695.226666667 | 100.36 | |
| Lu | 175 | He | 1042382.02 | 1029247.51 | 101.28 | |
| Rh | 103 | He | 1618743.61 | 1626201.63666667 | 99.54 | |
| Sc | 45 | He | 110076.14 | 109033.716666667 | 100.96 | |
| Tb | 159 | He | 1874077.63 | 1820531.74333333 | 102.94 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3704543.59 | 3617762.55 | 102.4 | |
| Ge | 72 | No Gas | 617410.38 | 597606.886666667 | 103.31 | |
| In | 115 | No Gas | 3941139.94 | 3893084.07 | 101.23 | |
| Lu | 175 | No Gas | 6141171.99 | 5877008.03666667 | 104.49 | |
| Rh | 103 | No Gas | 3932606.51 | 3958933.73 | 99.33 | |
| Sc | 45 | No Gas | 4227067.47 | 4093118.31 | 103.27 | |
| Tb | 159 | No Gas | 5912213.87 | 5654253.04333333 | 104.56 | |

I

INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-01-21 DL |
| Collect Date: | 04/05/18 Time: 1450 | GCAL Sample ID: | 21804062009 DL |
| Matrix: | Water % Solids: NA | Instrument ID: | ICPMS1 |
| Sample Amt: | 50 mL | Lab File ID: | 2180417A_MS1.b\085SMPL.d |
| Prep Vol.: | 50 ( mL ) | Dilution Factor: | 10 Analyst: AWG |
| Prep Date: | 04/09/18 | Analysis Date: | 04/17/18 Time: 1711 |
| Prep Batch: | 632790 | Analytical Batch: | 633612 |
| Prep Method: | 3005A | Analytical Method: | EPA 6020A Dissol |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Manganese | 1320 | ug/L | | 12.5 | 25.0 | 50.0 |

FORM I - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 21804062009 D 10X | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 085SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 17:11:45 | **Total Dilution** | 10.0000 |
| **Sample Type** | Sample | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 0.312 | 3.120 | 2.5 | 179146.61 | 500 | |
| Be | 9 | 45 | No Gas | -0.006 | -0.065 | 12.4 | 65.33 | 100 | |
| B | 11 | 45 | No Gas | 0.791 | 7.911 | 10.9 | 2753.66 | 500 | |
| Sr | 88 | 72 | No Gas | 2.253 | 22.532 | 0.8 | 44061.61 | 100 | |
| Zr | 90 | 72 | No Gas | 0.002 | 0.016 | 3.4 | 443.35 | 100 | |
| Mo | 95 | 115 | No Gas | 0.015 | 0.154 | 37.1 | 98.89 | 100 | |
| Ag | 107 | 115 | No Gas | 0.001 | 0.008 | 45.7 | 34.45 | 100 | |
| Cd | 111 | 115 | No Gas | -0.001 | -0.009 | 16.1 | 31.00 | 100 | |
| Sb | 121 | 115 | No Gas | 0.008 | 0.079 | 15.7 | 201.11 | 200 | |
| Ba | 137 | 115 | No Gas | 25.825 | 258.252 | 3.1 | 78065.61 | 1000 | |
| Tl | 205 | 209 | No Gas | -0.006 | -0.063 | 38.5 | 133.33 | 100 | |
| Pb | 208 | 209 | No Gas | -0.005 | -0.047 | 8.1 | 1123.40 | 100 | |
| Na | 23 | 45 | He | 6523.028 | 65230.279 | 1.3 | 2696217.77 | 10000 | |
| Mg | 24 | 45 | He | 75.371 | 753.714 | 3.9 | 15524.40 | 10000 | |
| Al | 27 | 45 | He | 0.105 | 1.052 | 45.0 | 41.33 | 2000 | |
| Si | 29 | 45 | He | 231.904 | 2319.042 | 2.2 | 1832.78 | 10000 | |
| K | 39 | 45 | He | 170.198 | 1701.984 | 3.4 | 23053.44 | 10000 | |
| Ca | 44 | 45 | He | 111.946 | 1119.460 | 10.7 | 791.70 | 50000 | |
| Ti | 47 | 45 | He | -0.007 | -0.068 | 32.7 | 4.67 | 100 | |
| V | 51 | 72 | He | 0.073 | 0.727 | 21.8 | 198.89 | 100 | |
| Cr | 52 | 72 | He | 0.009 | 0.088 | 24.3 | 257.78 | 100 | |
| Mn | 55 | 72 | He | 132.341 | 1323.410 | 1.2 | 118956.17 | 500 | |
| Fe | 57 | 72 | He | 100.044 | 1000.437 | 5.0 | 4177.36 | 10000 | |
| Co | 59 | 72 | He | 4.081 | 40.811 | 0.6 | 15227.17 | 100 | |
| Ni | 60 | 72 | He | 0.207 | 2.066 | 22.3 | 246.67 | 200 | |
| Cu | 63 | 72 | He | -0.22 | -2.201 | 1.2 | 570.02 | 100 | |
| Zn | 66 | 72 | He | 0.156 | 1.560 | 15.7 | 220.01 | 2000 | |
| As | 75 | 72 | He | 0.007 | 0.071 | 25.3 | 12.00 | 100 | |
| Se | 78 | 72 | He | 0.039 | 0.395 | 9.8 | 4.07 | 50 | |
| Sn | 120 | 115 | He | 0.006 | 0.057 | 9.6 | 120.01 | 100 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1351496.75 | 1291085.71 | 104.68 | |
| Ge | 72 | He | 49987.26 | 47456.4966666667 | 105.33 | |
| In | 115 | He | 388803.62 | 372695.226666667 | 104.32 | |
| Lu | 175 | He | 1070743.81 | 1029247.51 | 104.03 | |
| Rh | 103 | He | 1643400.49 | 1626201.63666667 | 101.06 | |
| Sc | 45 | He | 116882.93 | 109033.716666667 | 107.2 | |
| Tb | 159 | He | 1906407.06 | 1820531.74333333 | 104.72 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3795186.51 | 3617762.55 | 104.9 | |
| Ge | 72 | No Gas | 628805.18 | 597606.886666667 | 105.22 | |
| In | 115 | No Gas | 4079497.95 | 3893084.07 | 104.79 | |
| Lu | 175 | No Gas | 6238751.16 | 5877008.03666667 | 106.16 | |
| Rh | 103 | No Gas | 4100427.75 | 3958933.73 | 103.57 | |
| Sc | 45 | No Gas | 4280889.41 | 4093118.31 | 104.59 | |
| Tb | 159 | No Gas | 5989297.20 | 5654253.04333333 | 105.93 | |

I

INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | RD5-MW-01-21 |
| Collect Date: | 04/05/18 Time: 1635 | GCAL Sample ID: | 21804062010 |
| Matrix: | Water % Solids: NA | Instrument ID: | ICPMS1 |
| Sample Amt: | 50 mL | Lab File ID: | 2180417A_MS1.b\088SMPL.d |
| Prep Vol.: | 50 ( mL ) | Dilution Factor: | 1 Analyst: AWG |
| Prep Date: | 04/09/18 | Analysis Date: | 04/17/18 Time: 1724 |
| Prep Batch: | 632790 | Analytical Batch: | 633612 |
| Prep Method: | 3005A | Analytical Method: | EPA 6020A Dissol |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Iron | 55.8 | ug/L | J | 25.0 | 50.0 | 100 |
| Manganese | 3.76 | ug/L | J | 1.25 | 2.50 | 5.00 |

FORM I - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 21804062010 D | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 088SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 17:24:54 | **Total Dilution** | 1.0000 |
| **Sample Type** | Sample | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 1.25 | 1.250 | 0.9 | 198064.08 | 500 | |
| Be | 9 | 45 | No Gas | 0.272 | 0.272 | 1.1 | 1210.72 | 100 | |
| B | 11 | 45 | No Gas | 2.046 | 2.046 | 1.4 | 6234.72 | 500 | |
| Sr | 88 | 72 | No Gas | 4.461 | 4.461 | 3.3 | 87089.87 | 100 | |
| Zr | 90 | 72 | No Gas | 0.008 | 0.008 | 8.0 | 523.35 | 100 | |
| Mo | 95 | 115 | No Gas | 0.011 | 0.011 | 33.9 | 78.89 | 100 | |
| Ag | 107 | 115 | No Gas | 0.002 | 0.002 | 25.8 | 46.67 | 100 | |
| Cd | 111 | 115 | No Gas | 0.034 | 0.034 | 14.4 | 108.33 | 100 | |
| Sb | 121 | 115 | No Gas | 0.014 | 0.014 | 1.9 | 262.23 | 200 | |
| Ba | 137 | 115 | No Gas | 65.35 | 65.350 | 2.3 | 196455.79 | 1000 | |
| Tl | 205 | 209 | No Gas | 0.014 | 0.014 | 7.6 | 571.13 | 100 | |
| Pb | 208 | 209 | No Gas | 0.225 | 0.225 | 6.1 | 7817.84 | 100 | |
| Na | 23 | 45 | He | 3780.123 | 3780.123 | 1.4 | 1487029.19 | 10000 | |
| Mg | 24 | 45 | He | 131.077 | 131.077 | 1.8 | 25597.02 | 10000 | |
| Al | 27 | 45 | He | 65.881 | 65.881 | 2.8 | 3819.80 | 2000 | |
| Si | 29 | 45 | He | 5741.738 | 5741.738 | 1.0 | 10634.08 | 10000 | |
| K | 39 | 45 | He | 742.205 | 742.205 | 0.8 | 70954.49 | 10000 | |
| Ca | 44 | 45 | He | 311.703 | 311.703 | 6.1 | 1706.80 | 50000 | |
| Ti | 47 | 45 | He | 0.09 | 0.090 | 45.4 | 8.33 | 100 | |
| V | 51 | 72 | He | 0.146 | 0.146 | 16.7 | 310.01 | 100 | |
| Cr | 52 | 72 | He | 0.434 | 0.434 | 3.1 | 1138.95 | 100 | |
| Mn | 55 | 72 | He | 3.76 | 3.760 | 2.0 | 3377.06 | 500 | |
| Fe | 57 | 72 | He | 55.835 | 55.835 | 1.2 | 2313.61 | 10000 | |
| Co | 59 | 72 | He | 1.291 | 1.291 | 2.1 | 4779.65 | 100 | |
| Ni | 60 | 72 | He | 2.086 | 2.086 | 8.9 | 2181.29 | 200 | |
| Cu | 63 | 72 | He | 0.595 | 0.595 | 3.4 | 2922.52 | 100 | |
| Zn | 66 | 72 | He | 6.355 | 6.355 | 0.6 | 2369.09 | 2000 | |
| As | 75 | 72 | He | 0.049 | 0.049 | 22.2 | 22.50 | 100 | |
| Se | 78 | 72 | He | -0.078 | -0.078 | 12.7 | 2.11 | 50 | |
| Sn | 120 | 115 | He | -0.023 | -0.023 | 4.2 | 80.00 | 100 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1315832.56 | 1291085.71 | 101.92 | |
| Ge | 72 | He | 49363.23 | 47456.4966666667 | 104.02 | |
| In | 115 | He | 381642.58 | 372695.226666667 | 102.4 | |
| Lu | 175 | He | 1041320.27 | 1029247.51 | 101.17 | |
| Rh | 103 | He | 1687114.76 | 1626201.63666667 | 103.75 | |
| Sc | 45 | He | 110578.35 | 109033.716666667 | 101.42 | |
| Tb | 159 | He | 1894366.79 | 1820531.74333333 | 104.06 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3828489.53 | 3617762.55 | 105.82 | |
| Ge | 72 | No Gas | 630169.26 | 597606.886666667 | 105.45 | |
| In | 115 | No Gas | 4058421.22 | 3893084.07 | 104.25 | |
| Lu | 175 | No Gas | 6191616.78 | 5877008.03666667 | 105.35 | |
| Rh | 103 | No Gas | 4126940.39 | 3958933.73 | 104.24 | |
| Sc | 45 | No Gas | 4314847.75 | 4093118.31 | 105.42 | |
| Tb | 159 | No Gas | 5881678.66 | 5654253.04333333 | 104.02 | |

# Form II

# Calibration Verifications

II

INITIAL CALIBRATION VERIFICATION

| | | | |
|---|---|---|---|
| Report No: | 218040620 | GCAL QC ID: | 1600 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180417A_MS1.b\014_ICV.d |
| Analyst: | AWG | Analytical Batch: | 633612 |
| Analysis Date: | 04/17/18 Time: 1104 | Analytical Method: | EPA 6020A |

| *ANALYTE* | *TRUE* | *FOUND* | *%RECOVERY* | *Q* | *UNITS* |
|---|---|---|---|---|---|
| Arsenic | 50.0 | 48.7 | 97 | | ug/L |
| Iron | 5000 | 4950 | 99 | | ug/L |
| Manganese | 50.0 | 49.5 | 99 | | ug/L |

CONTROL LIMITS 90-110%

FORM II - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1600 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 014_ICV.d | **Comment** | ICPMS-1,AWG |
| **Acq Time** | 2018-04-17 11:04:44 | **Total Dilution** | 1.0000 |
| **Sample Type** | ICV | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 242.43 | 242.430 | 2.3 | 4385688.06 | 250 | |
| Be | 9 | 45 | No Gas | 51.186 | 51.186 | 2.5 | 197463.20 | 50 | |
| B | 11 | 45 | No Gas | 233.09 | 233.090 | 2.6 | 602337.14 | 250 | |
| Sr | 88 | 72 | No Gas | 46.037 | 46.037 | 2.5 | 846530.77 | 50 | |
| Zr | 90 | 72 | No Gas | 48.722 | 48.722 | 2.2 | 613230.84 | 50 | |
| Mo | 95 | 115 | No Gas | 48.142 | 48.142 | 2.5 | 186040.49 | 50 | |
| Ag | 107 | 115 | No Gas | 47.538 | 47.538 | 2.5 | 498420.69 | 50 | |
| Cd | 111 | 115 | No Gas | 50.178 | 50.178 | 2.5 | 105684.40 | 50 | |
| Sb | 121 | 115 | No Gas | 48.738 | 48.738 | 2.5 | 436194.04 | 50 | |
| Ba | 137 | 115 | No Gas | 47.306 | 47.306 | 1.5 | 133412.75 | 50 | |
| Tl | 205 | 209 | No Gas | 47.991 | 47.991 | 2.1 | 972232.98 | 50 | |
| Pb | 208 | 209 | No Gas | 49.357 | 49.357 | 2.6 | 1331120.63 | 50 | |
| Na | 23 | 45 | He | 4864.519 | 4864.519 | 0.4 | 1865476.07 | 5000 | |
| Mg | 24 | 45 | He | 4861.655 | 4861.655 | 0.5 | 925113.82 | 5000 | |
| Al | 27 | 45 | He | 769.13 | 769.130 | 0.6 | 43202.79 | 1000 | > +/- 10% |
| Si | 29 | 45 | He | 4899.249 | 4899.249 | 0.6 | 9051.17 | 5000 | |
| K | 39 | 45 | He | 4859.078 | 4859.078 | 1.0 | 414360.02 | 5000 | |
| Ca | 44 | 45 | He | 23933.571 | 23933.571 | 0.8 | 112368.15 | 25000 | |
| Ti | 47 | 45 | He | 48.035 | 48.035 | 3.4 | 1918.45 | 50 | |
| V | 51 | 72 | He | 48.762 | 48.762 | 1.1 | 73315.39 | 50 | |
| Cr | 52 | 72 | He | 48.862 | 48.862 | 1.0 | 98093.02 | 50 | |
| Mn | 55 | 72 | He | 49.46 | 49.460 | 2.0 | 42257.19 | 50 | |
| Fe | 57 | 72 | He | 4952.005 | 4952.005 | 1.4 | 195062.33 | 5000 | |
| Co | 59 | 72 | He | 50.045 | 50.045 | 0.5 | 177021.96 | 50 | |
| Ni | 60 | 72 | He | 99.424 | 99.424 | 0.6 | 98561.85 | 100 | |
| Cu | 63 | 72 | He | 50.772 | 50.772 | 0.5 | 142585.60 | 50 | |
| Zn | 66 | 72 | He | 998.496 | 998.496 | 0.4 | 333577.51 | 1000 | |
| As | 75 | 72 | He | 48.703 | 48.703 | 0.5 | 11939.84 | 50 | |
| Se | 78 | 72 | He | 24.353 | 24.353 | 3.2 | 383.33 | 25 | |
| Sn | 120 | 115 | He | 49.8 | 49.800 | 2.0 | 62357.12 | 50 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1260717.69 | 1291085.71 | 97.65 | |
| Ge | 72 | He | 47485.55 | 47456.4966666667 | 100.06 | |
| In | 115 | He | 368897.25 | 372695.226666667 | 98.98 | |
| Lu | 175 | He | 1026363.42 | 1029247.51 | 99.72 | |
| Rh | 103 | He | 1562079.97 | 1626201.63666667 | 96.06 | |
| Sc | 45 | He | 108023.18 | 109033.716666667 | 99.07 | |
| Tb | 159 | He | 1828509.82 | 1820531.74333333 | 100.44 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3539952.76 | 3617762.55 | 97.85 | |
| Ge | 72 | No Gas | 595770.48 | 597606.886666667 | 99.69 | |
| In | 115 | No Gas | 3807388.67 | 3893084.07 | 97.8 | |
| Lu | 175 | No Gas | 5940781.99 | 5877008.03666667 | 101.09 | |
| Rh | 103 | No Gas | 3818298.74 | 3958933.73 | 96.45 | |
| Sc | 45 | No Gas | 4042348.87 | 4093118.31 | 98.76 | |
| Tb | 159 | No Gas | 5664212.21 | 5654253.04333333 | 100.18 | |

II

LOW LEVEL CONTINUING CALIBRATION VERIFICATION

| | | | |
|---|---|---|---|
| Report No: | 218040620 | GCAL QC ID: | 1803 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180417A_MS1.b\017CCV1.d |
| Analyst: | AWG | Analytical Batch: | 633612 |
| Analysis Date: | 04/17/18 Time: 1117 | Analytical Method: | EPA 6020A |

| *ANALYTE* | *TRUE* | *FOUND* | *%RECOVERY* | *Q* | *UNITS* |
|---|---|---|---|---|---|
| Arsenic | 1.00 | 1.01 | 101 | | ug/L |
| Iron | 100 | 103 | 103 | | ug/L |
| Manganese | 5.00 | 5.12 | 102 | | ug/L |

CONTROL LIMITS 80-120%

FORM II - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1803 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 017CCV1.d | **Comment** | ICPMS-1,AWG |
| **Acq Time** | 2018-04-17 11:17:53 | **Total Dilution** | 1.0000 |
| **Sample Type** | LLCCV1 | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 5.199 | 5.199 | 0.6 | 260639.15 | 5 | |
| Be | 9 | 45 | No Gas | 1.025 | 1.025 | 0.6 | 4138.53 | 1 | |
| B | 11 | 45 | No Gas | 14.738 | 14.738 | 2.7 | 39566.81 | 10 | > +/- 20% |
| Sr | 88 | 72 | No Gas | 1.023 | 1.023 | 3.2 | 19429.08 | 1 | |
| Zr | 90 | 72 | No Gas | 0.903 | 0.903 | 1.2 | 11935.66 | 1 | |
| Mo | 95 | 115 | No Gas | 0.974 | 0.974 | 3.1 | 3882.75 | 1 | |
| Ag | 107 | 115 | No Gas | 1.011 | 1.011 | 3.0 | 10867.16 | 1 | |
| Cd | 111 | 115 | No Gas | 1.005 | 1.005 | 2.9 | 2197.50 | 1 | |
| Sb | 121 | 115 | No Gas | 2.009 | 2.009 | 3.4 | 18515.49 | 2 | |
| Ba | 137 | 115 | No Gas | 0.98 | 0.980 | 6.3 | 2863.64 | 1 | |
| Tl | 205 | 209 | No Gas | 0.943 | 0.943 | 3.0 | 19981.42 | 1 | |
| Pb | 208 | 209 | No Gas | 0.992 | 0.992 | 2.4 | 28835.78 | 1 | |
| Na | 23 | 45 | He | 98.243 | 98.243 | 2.5 | 48895.01 | 100 | |
| Mg | 24 | 45 | He | 96.348 | 96.348 | 2.2 | 19565.35 | 100 | |
| Al | 27 | 45 | He | 19.831 | 19.831 | 5.8 | 1220.06 | 20 | |
| Si | 29 | 45 | He | 196.337 | 196.337 | 4.6 | 1746.77 | 200 | |
| K | 39 | 45 | He | 93.545 | 93.545 | 2.4 | 15841.44 | 100 | |
| Ca | 44 | 45 | He | 621.317 | 621.317 | 1.7 | 3313.73 | 500 | > +/- 20% |
| Ti | 47 | 45 | He | 1.178 | 1.178 | 16.7 | 54.33 | 1 | |
| V | 51 | 72 | He | 0.996 | 0.996 | 1.6 | 1612.33 | 1 | |
| Cr | 52 | 72 | He | 0.996 | 0.996 | 4.2 | 2273.52 | 1 | |
| Mn | 55 | 72 | He | 5.124 | 5.124 | 5.6 | 4518.46 | 5 | |
| Fe | 57 | 72 | He | 102.745 | 102.745 | 10.8 | 4167.36 | 100 | |
| Co | 59 | 72 | He | 1.017 | 1.017 | 0.2 | 3713.80 | 1 | |
| Ni | 60 | 72 | He | 2.12 | 2.120 | 3.6 | 2180.18 | 2 | |
| Cu | 63 | 72 | He | 0.958 | 0.958 | 3.0 | 3912.74 | 1 | |
| Zn | 66 | 72 | He | 21.262 | 21.262 | 3.0 | 7426.22 | 20 | |
| As | 75 | 72 | He | 1.007 | 1.007 | 3.9 | 262.33 | 1 | |
| Se | 78 | 72 | He | 1.027 | 1.027 | 12.8 | 19.73 | 1 | |
| Sn | 120 | 115 | He | 0.934 | 0.934 | 1.6 | 1315.63 | 1 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1318974.85 | 1291085.71 | 102.16 | |
| Ge | 72 | He | 48602.14 | 47456.4966666667 | 102.41 | |
| In | 115 | He | 380978.39 | 372695.226666667 | 102.22 | |
| Lu | 175 | He | 1050008.06 | 1029247.51 | 102.02 | |
| Rh | 103 | He | 1644050.42 | 1626201.63666667 | 101.1 | |
| Sc | 45 | He | 115296.70 | 109033.716666667 | 105.74 | |
| Tb | 159 | He | 1878770.49 | 1820531.74333333 | 103.2 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3656899.01 | 3617762.55 | 101.08 | |
| Ge | 72 | No Gas | 604959.18 | 597606.886666667 | 101.23 | |
| In | 115 | No Gas | 3896143.00 | 3893084.07 | 100.08 | |
| Lu | 175 | No Gas | 6003933.25 | 5877008.03666667 | 102.16 | |
| Rh | 103 | No Gas | 3984776.37 | 3958933.73 | 100.65 | |
| Sc | 45 | No Gas | 4143029.56 | 4093118.31 | 101.22 | |
| Tb | 159 | No Gas | 5735347.00 | 5654253.04333333 | 101.43 | |

II

CONTINUING CALIBRATION VERIFICATION

| | | | |
|---|---|---|---|
| Report No: | 218040620 | GCAL QC ID: | 1800 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180417A_MS1.b\032_CCV.d |
| Analyst: | AWG | Analytical Batch: | 633612 |
| Analysis Date: | 04/17/18 Time: 1227 | Analytical Method: | EPA 6020A |

| *ANALYTE* | *TRUE* | *FOUND* | *%RECOVERY* | *Q* | *UNITS* |
|---|---|---|---|---|---|
| Arsenic | 10.0 | 10.0 | 100 | | ug/L |
| Iron | 1000 | 1000 | 100 | | ug/L |
| Manganese | 50.0 | 50.5 | 101 | | ug/L |

CONTROL LIMITS 90-110%

FORM II - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1800 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 032_CCV.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 12:27:08 | **Total Dilution** | 1.0000 |
| **Sample Type** | CCV | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 52.857 | 52.857 | 1.7 | 1152376.13 | 50 | |
| Be | 9 | 45 | No Gas | 10.182 | 10.182 | 1.2 | 41821.35 | 10 | |
| B | 11 | 45 | No Gas | 56.608 | 56.608 | 2.0 | 155926.85 | 50 | > +/- 10% |
| Sr | 88 | 72 | No Gas | 9.809 | 9.809 | 2.2 | 192236.72 | 10 | |
| Zr | 90 | 72 | No Gas | 10.369 | 10.369 | 1.0 | 139214.12 | 10 | |
| Mo | 95 | 115 | No Gas | 9.554 | 9.554 | 2.5 | 39468.46 | 10 | |
| Ag | 107 | 115 | No Gas | 9.955 | 9.955 | 2.1 | 111511.29 | 10 | |
| Cd | 111 | 115 | No Gas | 9.903 | 9.903 | 2.9 | 22308.59 | 10 | |
| Sb | 121 | 115 | No Gas | 19.251 | 19.251 | 2.6 | 184136.90 | 20 | |
| Ba | 137 | 115 | No Gas | 9.621 | 9.621 | 2.3 | 29017.18 | 10 | |
| Tl | 205 | 209 | No Gas | 9.352 | 9.352 | 1.7 | 201452.97 | 10 | |
| Pb | 208 | 209 | No Gas | 9.718 | 9.718 | 2.4 | 279405.78 | 10 | |
| Na | 23 | 45 | He | 1004.314 | 1004.314 | 0.8 | 403581.67 | 1000 | |
| Mg | 24 | 45 | He | 1011.274 | 1011.274 | 3.0 | 198186.86 | 1000 | |
| Al | 27 | 45 | He | 201.361 | 201.361 | 0.8 | 11671.40 | 200 | |
| Si | 29 | 45 | He | 2091.041 | 2091.041 | 2.2 | 4764.71 | 2000 | |
| K | 39 | 45 | He | 1004.033 | 1004.033 | 1.7 | 93930.44 | 1000 | |
| Ca | 44 | 45 | He | 4872.447 | 4872.447 | 1.7 | 23732.19 | 5000 | |
| Ti | 47 | 45 | He | 9.797 | 9.797 | 9.3 | 406.68 | 10 | |
| V | 51 | 72 | He | 9.678 | 9.678 | 1.8 | 15134.84 | 10 | |
| Cr | 52 | 72 | He | 10.154 | 10.154 | 2.8 | 21287.12 | 10 | |
| Mn | 55 | 72 | He | 50.486 | 50.486 | 0.9 | 44655.81 | 50 | |
| Fe | 57 | 72 | He | 1003.695 | 1003.695 | 1.9 | 40962.08 | 1000 | |
| Co | 59 | 72 | He | 10.216 | 10.216 | 0.3 | 37441.35 | 10 | |
| Ni | 60 | 72 | He | 20.509 | 20.509 | 2.6 | 21075.86 | 20 | |
| Cu | 63 | 72 | He | 10.135 | 10.135 | 1.3 | 30426.03 | 10 | |
| Zn | 66 | 72 | He | 203.466 | 203.466 | 0.8 | 70500.47 | 200 | |
| As | 75 | 72 | He | 10.037 | 10.037 | 1.2 | 2555.37 | 10 | |
| Se | 78 | 72 | He | 10.314 | 10.314 | 2.8 | 169.98 | 10 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1329841.91 | 1291085.71 | 103 | |
| Ge | 72 | He | 49170.45 | 47456.4966666667 | 103.61 | |
| In | 115 | He | 384889.46 | 372695.226666667 | 103.27 | |
| Lu | 175 | He | 1058662.93 | 1029247.51 | 102.86 | |
| Rh | 103 | He | 1642183.79 | 1626201.63666667 | 100.98 | |
| Sc | 45 | He | 111161.05 | 109033.716666667 | 101.95 | |
| Tb | 159 | He | 1867798.93 | 1820531.74333333 | 102.6 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3760238.90 | 3617762.55 | 103.94 | |
| Ge | 72 | No Gas | 634029.68 | 597606.886666667 | 106.09 | |
| In | 115 | No Gas | 4067555.49 | 3893084.07 | 104.48 | |
| Lu | 175 | No Gas | 6191659.91 | 5877008.03666667 | 105.35 | |
| Rh | 103 | No Gas | 4097901.64 | 3958933.73 | 103.51 | |
| Sc | 45 | No Gas | 4296359.55 | 4093118.31 | 104.97 | |
| Tb | 159 | No Gas | 5934280.74 | 5654253.04333333 | 104.95 | |

II

LOW LEVEL CONTINUING CALIBRATION VERIFICATION

| | | | |
|---|---|---|---|
| Report No: | 218040620 | GCAL QC ID: | 1803 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180417A_MS1.b\034LCCV.d |
| Analyst: | AWG | Analytical Batch: | 633612 |
| Analysis Date: | 04/17/18 Time: 1235 | Analytical Method: | EPA 6020A |

| *ANALYTE* | *TRUE* | *FOUND* | *%RECOVERY* | *Q* | *UNITS* |
|---|---|---|---|---|---|
| Arsenic | 1.00 | 1.00 | 100 | | ug/L |
| Iron | 100 | 92.1 | 92 | | ug/L |
| Manganese | 5.00 | 5.40 | 108 | | ug/L |

CONTROL LIMITS 70-130%

FORM II - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1803 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 034LCCV.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 12:35:56 | **Total Dilution** | 1.0000 |
| **Sample Type** | LLCCV | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 5.088 | 5.088 | 1.1 | 264693.61 | 5 | |
| Be | 9 | 45 | No Gas | 1.005 | 1.005 | 2.0 | 4155.21 | 1 | |
| B | 11 | 45 | No Gas | 12.398 | 12.398 | 2.1 | 34155.31 | 10 | |
| Sr | 88 | 72 | No Gas | 1.028 | 1.028 | 5.3 | 20160.12 | 1 | |
| Zr | 90 | 72 | No Gas | 0.9 | 0.900 | 2.5 | 12292.60 | 1 | |
| Mo | 95 | 115 | No Gas | 0.985 | 0.985 | 5.8 | 4008.35 | 1 | |
| Ag | 107 | 115 | No Gas | 0.994 | 0.994 | 3.0 | 10900.53 | 1 | |
| Cd | 111 | 115 | No Gas | 1.002 | 1.002 | 4.4 | 2234.17 | 1 | |
| Sb | 121 | 115 | No Gas | 1.955 | 1.955 | 2.5 | 18380.86 | 2 | |
| Ba | 137 | 115 | No Gas | 0.972 | 0.972 | 1.9 | 2895.87 | 1 | |
| Tl | 205 | 209 | No Gas | 0.915 | 0.915 | 1.6 | 19585.36 | 1 | |
| Pb | 208 | 209 | No Gas | 0.996 | 0.996 | 1.8 | 29202.71 | 1 | |
| Na | 23 | 45 | He | 101.838 | 101.838 | 1.0 | 49128.60 | 100 | |
| Mg | 24 | 45 | He | 100.499 | 100.499 | 2.1 | 19862.53 | 100 | |
| Al | 27 | 45 | He | 20.4 | 20.400 | 7.6 | 1218.06 | 20 | |
| Si | 29 | 45 | He | 241.404 | 241.404 | 4.7 | 1772.77 | 200 | |
| K | 39 | 45 | He | 100.143 | 100.143 | 2.6 | 16018.36 | 100 | |
| Ca | 44 | 45 | He | 666.153 | 666.153 | 5.0 | 3452.09 | 500 | > +/- 30% |
| Ti | 47 | 45 | He | 0.774 | 0.774 | 23.2 | 36.67 | 1 | |
| V | 51 | 72 | He | 0.971 | 0.971 | 1.8 | 1582.32 | 1 | |
| Cr | 52 | 72 | He | 1.063 | 1.063 | 2.7 | 2423.54 | 1 | |
| Mn | 55 | 72 | He | 5.401 | 5.401 | 2.0 | 4782.99 | 5 | |
| Fe | 57 | 72 | He | 92.056 | 92.056 | 2.8 | 3757.26 | 100 | |
| Co | 59 | 72 | He | 1.042 | 1.042 | 1.7 | 3824.94 | 1 | |
| Ni | 60 | 72 | He | 2.105 | 2.105 | 4.9 | 2177.96 | 2 | |
| Cu | 63 | 72 | He | 0.93 | 0.930 | 1.7 | 3851.61 | 1 | |
| Zn | 66 | 72 | He | 21.194 | 21.194 | 1.8 | 7441.78 | 20 | |
| As | 75 | 72 | He | 0.998 | 0.998 | 2.9 | 261.50 | 1 | |
| Se | 78 | 72 | He | 1.099 | 1.099 | 9.0 | 20.99 | 1 | |
| Sn | 120 | 115 | He | 0.962 | 0.962 | 10.1 | 1364.52 | 1 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1328667.58 | 1291085.71 | 102.91 | |
| Ge | 72 | He | 48849.47 | 47456.4966666667 | 102.94 | |
| In | 115 | He | 384557.81 | 372695.226666667 | 103.18 | |
| Lu | 175 | He | 1050834.23 | 1029247.51 | 102.1 | |
| Rh | 103 | He | 1670592.43 | 1626201.63666667 | 102.73 | |
| Sc | 45 | He | 111930.45 | 109033.716666667 | 102.66 | |
| Tb | 159 | He | 1879472.63 | 1820531.74333333 | 103.24 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3692696.51 | 3617762.55 | 102.07 | |
| Ge | 72 | No Gas | 624894.37 | 597606.886666667 | 104.57 | |
| In | 115 | No Gas | 3974056.58 | 3893084.07 | 102.08 | |
| Lu | 175 | No Gas | 6072852.83 | 5877008.03666667 | 103.33 | |
| Rh | 103 | No Gas | 4070865.81 | 3958933.73 | 102.83 | |
| Sc | 45 | No Gas | 4239368.44 | 4093118.31 | 103.57 | |
| Tb | 159 | No Gas | 5878582.62 | 5654253.04333333 | 103.97 | |

II

CONTINUING CALIBRATION VERIFICATION

| | | | |
|---|---|---|---|
| Report No: | 218040620 | GCAL QC ID: | 1800 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180417A_MS1.b\047_CCV.d |
| Analyst: | AWG | Analytical Batch: | 633612 |
| Analysis Date: | 04/17/18 Time: 1401 | Analytical Method: | EPA 6020A |

| *ANALYTE* | *TRUE* | *FOUND* | *%RECOVERY* | *Q* | *UNITS* |
|---|---|---|---|---|---|
| Arsenic | 10.0 | 9.78 | 98 | | ug/L |
| Iron | 1000 | 986 | 99 | | ug/L |
| Manganese | 50.0 | 49.7 | 99 | | ug/L |

CONTROL LIMITS 90-110%

FORM II - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1800 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 047_CCV.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 14:01:23 | **Total Dilution** | 1.0000 |
| **Sample Type** | CCV | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 52.44 | 52.440 | 1.2 | 1131686.86 | 50 | |
| Be | 9 | 45 | No Gas | 9.974 | 9.974 | 1.6 | 40506.14 | 10 | |
| B | 11 | 45 | No Gas | 52.745 | 52.745 | 1.6 | 143675.39 | 50 | |
| Sr | 88 | 72 | No Gas | 9.872 | 9.872 | 2.3 | 188547.80 | 10 | |
| Zr | 90 | 72 | No Gas | 10.075 | 10.075 | 2.4 | 131856.63 | 10 | |
| Mo | 95 | 115 | No Gas | 9.453 | 9.453 | 3.1 | 38676.60 | 10 | |
| Ag | 107 | 115 | No Gas | 9.746 | 9.746 | 2.2 | 108124.83 | 10 | |
| Cd | 111 | 115 | No Gas | 9.739 | 9.739 | 2.9 | 21728.15 | 10 | |
| Sb | 121 | 115 | No Gas | 19.209 | 19.209 | 1.7 | 181959.98 | 20 | |
| Ba | 137 | 115 | No Gas | 9.588 | 9.588 | 2.6 | 28637.56 | 10 | |
| Tl | 205 | 209 | No Gas | 9.271 | 9.271 | 1.8 | 198632.78 | 10 | |
| Pb | 208 | 209 | No Gas | 9.612 | 9.612 | 2.1 | 274862.10 | 10 | |
| Na | 23 | 45 | He | 954.046 | 954.046 | 1.2 | 399013.82 | 1000 | |
| Mg | 24 | 45 | He | 945.476 | 945.476 | 0.7 | 192527.07 | 1000 | |
| Al | 27 | 45 | He | 192.137 | 192.137 | 1.5 | 11576.69 | 200 | |
| Si | 29 | 45 | He | 1964.439 | 1964.439 | 3.5 | 4735.37 | 2000 | |
| K | 39 | 45 | He | 928.598 | 928.598 | 1.0 | 90819.85 | 1000 | |
| Ca | 44 | 45 | He | 4663.817 | 4663.817 | 2.2 | 23590.35 | 5000 | |
| Ti | 47 | 45 | He | 8.72 | 8.720 | 1.5 | 376.68 | 10 | > +/- 10% |
| V | 51 | 72 | He | 9.708 | 9.708 | 0.2 | 15104.80 | 10 | |
| Cr | 52 | 72 | He | 9.974 | 9.974 | 1.7 | 20819.88 | 10 | |
| Mn | 55 | 72 | He | 49.724 | 49.724 | 1.2 | 43773.35 | 50 | |
| Fe | 57 | 72 | He | 986.304 | 986.304 | 2.3 | 40056.42 | 1000 | |
| Co | 59 | 72 | He | 10.032 | 10.032 | 0.8 | 36588.46 | 10 | |
| Ni | 60 | 72 | He | 20.315 | 20.315 | 2.0 | 20776.57 | 20 | |
| Cu | 63 | 72 | He | 10.032 | 10.032 | 3.0 | 29991.89 | 10 | |
| Zn | 66 | 72 | He | 201.817 | 201.817 | 0.7 | 69596.72 | 200 | |
| As | 75 | 72 | He | 9.776 | 9.776 | 0.9 | 2477.19 | 10 | |
| Se | 78 | 72 | He | 10.212 | 10.212 | 6.6 | 167.64 | 10 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1314988.78 | 1291085.71 | 101.85 | |
| Ge | 72 | He | 48931.88 | 47456.4966666667 | 103.11 | |
| In | 115 | He | 380039.18 | 372695.226666667 | 101.97 | |
| Lu | 175 | He | 1048369.00 | 1029247.51 | 101.86 | |
| Rh | 103 | He | 1635923.06 | 1626201.63666667 | 100.6 | |
| Sc | 45 | He | 116021.54 | 109033.716666667 | 106.41 | |
| Tb | 159 | He | 1876460.81 | 1820531.74333333 | 103.07 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3739796.30 | 3617762.55 | 103.37 | |
| Ge | 72 | No Gas | 617964.87 | 597606.886666667 | 103.41 | |
| In | 115 | No Gas | 4028217.04 | 3893084.07 | 103.47 | |
| Lu | 175 | No Gas | 6130300.74 | 5877008.03666667 | 104.31 | |
| Rh | 103 | No Gas | 4011284.15 | 3958933.73 | 101.32 | |
| Sc | 45 | No Gas | 4247646.77 | 4093118.31 | 103.78 | |
| Tb | 159 | No Gas | 5945564.70 | 5654253.04333333 | 105.15 | |

II

LOW LEVEL CONTINUING CALIBRATION VERIFICATION

| | | | |
|---|---|---|---|
| Report No: | 218040620 | GCAL QC ID: | 1803 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180417A_MS1.b\049LCCV.d |
| Analyst: | AWG | Analytical Batch: | 633612 |
| Analysis Date: | 04/17/18 Time: 1410 | Analytical Method: | EPA 6020A |

| *ANALYTE* | *TRUE* | *FOUND* | *%RECOVERY* | *Q* | *UNITS* |
|---|---|---|---|---|---|
| Arsenic | 1.00 | 0.940 | 94 | | ug/L |
| Iron | 100 | 105 | 105 | | ug/L |
| Manganese | 5.00 | 5.29 | 106 | | ug/L |

CONTROL LIMITS 70-130%

FORM II - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1803 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 049LCCV.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 14:10:10 | **Total Dilution** | 1.0000 |
| **Sample Type** | LLCCV | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 5.07 | 5.070 | 0.8 | 262086.50 | 5 | |
| Be | 9 | 45 | No Gas | 0.969 | 0.969 | 1.8 | 3974.49 | 1 | |
| B | 11 | 45 | No Gas | 10.691 | 10.691 | 1.2 | 29275.91 | 10 | |
| Sr | 88 | 72 | No Gas | 0.993 | 0.993 | 2.0 | 19228.79 | 1 | |
| Zr | 90 | 72 | No Gas | 0.867 | 0.867 | 4.1 | 11686.60 | 1 | |
| Mo | 95 | 115 | No Gas | 0.943 | 0.943 | 3.5 | 3823.84 | 1 | |
| Ag | 107 | 115 | No Gas | 1 | 1.000 | 2.3 | 10920.56 | 1 | |
| Cd | 111 | 115 | No Gas | 0.959 | 0.959 | 1.3 | 2130.48 | 1 | |
| Sb | 121 | 115 | No Gas | 1.917 | 1.917 | 3.9 | 17954.78 | 2 | |
| Ba | 137 | 115 | No Gas | 0.986 | 0.986 | 2.3 | 2924.77 | 1 | |
| Tl | 205 | 209 | No Gas | 0.904 | 0.904 | 1.2 | 19551.92 | 1 | |
| Pb | 208 | 209 | No Gas | 0.93 | 0.930 | 1.7 | 27634.64 | 1 | |
| Na | 23 | 45 | He | 102.43 | 102.430 | 0.8 | 48520.66 | 100 | |
| Mg | 24 | 45 | He | 100.175 | 100.175 | 1.8 | 19475.34 | 100 | |
| Al | 27 | 45 | He | 19.687 | 19.687 | 2.7 | 1158.05 | 20 | |
| Si | 29 | 45 | He | 181.576 | 181.576 | 3.5 | 1647.43 | 200 | |
| K | 39 | 45 | He | 107.59 | 107.590 | 2.5 | 16375.14 | 100 | |
| Ca | 44 | 45 | He | 483.972 | 483.972 | 8.2 | 2521.91 | 500 | |
| Ti | 47 | 45 | He | 0.839 | 0.839 | 21.7 | 38.67 | 1 | |
| V | 51 | 72 | He | 0.949 | 0.949 | 3.4 | 1551.21 | 1 | |
| Cr | 52 | 72 | He | 0.989 | 0.989 | 0.7 | 2276.85 | 1 | |
| Mn | 55 | 72 | He | 5.287 | 5.287 | 4.0 | 4692.96 | 5 | |
| Fe | 57 | 72 | He | 104.835 | 104.835 | 2.6 | 4284.07 | 100 | |
| Co | 59 | 72 | He | 1.013 | 1.013 | 7.3 | 3728.25 | 1 | |
| Ni | 60 | 72 | He | 2.073 | 2.073 | 4.2 | 2149.06 | 2 | |
| Cu | 63 | 72 | He | 0.822 | 0.822 | 6.2 | 3551.54 | 1 | |
| Zn | 66 | 72 | He | 20.159 | 20.159 | 4.8 | 7102.76 | 20 | |
| As | 75 | 72 | He | 0.94 | 0.940 | 2.4 | 247.50 | 1 | |
| Se | 78 | 72 | He | 1.236 | 1.236 | 20.1 | 23.24 | 1 | |
| Sn | 120 | 115 | He | 1.015 | 1.015 | 4.6 | 1428.98 | 1 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1310637.82 | 1291085.71 | 101.51 | |
| Ge | 72 | He | 48955.37 | 47456.4966666667 | 103.16 | |
| In | 115 | He | 383114.69 | 372695.226666667 | 102.8 | |
| Lu | 175 | He | 1042533.06 | 1029247.51 | 101.29 | |
| Rh | 103 | He | 1643622.26 | 1626201.63666667 | 101.07 | |
| Sc | 45 | He | 110003.81 | 109033.716666667 | 100.89 | |
| Tb | 159 | He | 1870763.72 | 1820531.74333333 | 102.76 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3728123.59 | 3617762.55 | 103.05 | |
| Ge | 72 | No Gas | 616130.58 | 597606.886666667 | 103.1 | |
| In | 115 | No Gas | 3958314.49 | 3893084.07 | 101.68 | |
| Lu | 175 | No Gas | 6087539.49 | 5877008.03666667 | 103.58 | |
| Rh | 103 | No Gas | 4034214.01 | 3958933.73 | 101.9 | |
| Sc | 45 | No Gas | 4203349.28 | 4093118.31 | 102.69 | |
| Tb | 159 | No Gas | 5865502.20 | 5654253.04333333 | 103.74 | |

II

CONTINUING CALIBRATION VERIFICATION

| | | | |
|---|---|---|---|
| Report No: | 218040620 | GCAL QC ID: | 1800 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180417A_MS1.b\063_CCV.d |
| Analyst: | AWG | Analytical Batch: | 633612 |
| Analysis Date: | 04/17/18 Time: 1535 | Analytical Method: | EPA 6020A |

| *ANALYTE* | *TRUE* | *FOUND* | *%RECOVERY* | *Q* | *UNITS* |
|---|---|---|---|---|---|
| Arsenic | 10.0 | 9.74 | 97 | | ug/L |
| Iron | 1000 | 1010 | 101 | | ug/L |
| Manganese | 50.0 | 50.6 | 101 | | ug/L |

CONTROL LIMITS 90-110%

FORM II - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1800 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 063_CCV.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 15:35:30 | **Total Dilution** | 1.0000 |
| **Sample Type** | CCV | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 53.031 | 53.031 | 0.1 | 1118732.15 | 50 | |
| Be | 9 | 45 | No Gas | 9.867 | 9.867 | 1.6 | 39237.28 | 10 | |
| B | 11 | 45 | No Gas | 53.759 | 53.759 | 1.3 | 143378.71 | 50 | |
| Sr | 88 | 72 | No Gas | 9.909 | 9.909 | 1.0 | 188951.11 | 10 | |
| Zr | 90 | 72 | No Gas | 9.805 | 9.805 | 2.5 | 128131.13 | 10 | |
| Mo | 95 | 115 | No Gas | 9.512 | 9.512 | 3.6 | 38473.89 | 10 | |
| Ag | 107 | 115 | No Gas | 9.852 | 9.852 | 0.9 | 108027.78 | 10 | |
| Cd | 111 | 115 | No Gas | 9.891 | 9.891 | 3.4 | 21815.57 | 10 | |
| Sb | 121 | 115 | No Gas | 19.223 | 19.223 | 2.9 | 180016.06 | 20 | |
| Ba | 137 | 115 | No Gas | 9.909 | 9.909 | 1.6 | 29254.24 | 10 | |
| Tl | 205 | 209 | No Gas | 9.178 | 9.178 | 1.8 | 198010.63 | 10 | |
| Pb | 208 | 209 | No Gas | 9.587 | 9.587 | 0.9 | 276017.79 | 10 | |
| Na | 23 | 45 | He | 1014.576 | 1014.576 | 0.4 | 402761.15 | 1000 | |
| Mg | 24 | 45 | He | 981.289 | 981.289 | 1.9 | 190047.48 | 1000 | |
| Al | 27 | 45 | He | 199.498 | 199.498 | 2.1 | 11423.90 | 200 | |
| Si | 29 | 45 | He | 1944.306 | 1944.306 | 2.6 | 4473.29 | 2000 | |
| K | 39 | 45 | He | 980.547 | 980.547 | 1.8 | 90818.44 | 1000 | |
| Ca | 44 | 45 | He | 4995.967 | 4995.967 | 0.5 | 24037.70 | 5000 | |
| Ti | 47 | 45 | He | 9.896 | 9.896 | 4.9 | 406.01 | 10 | |
| V | 51 | 72 | He | 10.031 | 10.031 | 2.4 | 15433.99 | 10 | |
| Cr | 52 | 72 | He | 10.006 | 10.006 | 2.0 | 20651.94 | 10 | |
| Mn | 55 | 72 | He | 50.649 | 50.649 | 1.2 | 44090.78 | 50 | |
| Fe | 57 | 72 | He | 1006.425 | 1006.425 | 4.7 | 40400.69 | 1000 | |
| Co | 59 | 72 | He | 10.19 | 10.190 | 1.5 | 36753.20 | 10 | |
| Ni | 60 | 72 | He | 20.746 | 20.746 | 0.8 | 20976.82 | 20 | |
| Cu | 63 | 72 | He | 9.918 | 9.918 | 1.7 | 29324.01 | 10 | |
| Zn | 66 | 72 | He | 201.184 | 201.184 | 1.0 | 68605.67 | 200 | |
| As | 75 | 72 | He | 9.737 | 9.737 | 1.1 | 2439.85 | 10 | |
| Se | 78 | 72 | He | 9.581 | 9.581 | 5.0 | 155.71 | 10 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1330004.77 | 1291085.71 | 103.01 | |
| Ge | 72 | He | 48382.56 | 47456.4966666667 | 101.95 | |
| In | 115 | He | 380560.78 | 372695.226666667 | 102.11 | |
| Lu | 175 | He | 1045483.32 | 1029247.51 | 101.58 | |
| Rh | 103 | He | 1642329.20 | 1626201.63666667 | 100.99 | |
| Sc | 45 | He | 109846.82 | 109033.716666667 | 100.75 | |
| Tb | 159 | He | 1870279.77 | 1820531.74333333 | 102.73 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3765604.01 | 3617762.55 | 104.09 | |
| Ge | 72 | No Gas | 616983.64 | 597606.886666667 | 103.24 | |
| In | 115 | No Gas | 3981851.94 | 3893084.07 | 102.28 | |
| Lu | 175 | No Gas | 6141016.37 | 5877008.03666667 | 104.49 | |
| Rh | 103 | No Gas | 4031406.23 | 3958933.73 | 101.83 | |
| Sc | 45 | No Gas | 4159353.45 | 4093118.31 | 101.62 | |
| Tb | 159 | No Gas | 5936362.20 | 5654253.04333333 | 104.99 | |

II

LOW LEVEL CONTINUING CALIBRATION VERIFICATION

| | | | |
|---|---|---|---|
| Report No: | 218040620 | GCAL QC ID: | 1803 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180417A_MS1.b\065LCCV.d |
| Analyst: | AWG | Analytical Batch: | 633612 |
| Analysis Date: | 04/17/18 Time: 1544 | Analytical Method: | EPA 6020A |

| *ANALYTE* | *TRUE* | *FOUND* | *%RECOVERY* | *Q* | *UNITS* |
|---|---|---|---|---|---|
| Arsenic | 1.00 | 0.970 | 97 | | ug/L |
| Iron | 100 | 103 | 103 | | ug/L |
| Manganese | 5.00 | 5.12 | 102 | | ug/L |

CONTROL LIMITS 70-130%

FORM II - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1803 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 065LCCV.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 15:44:19 | **Total Dilution** | 1.0000 |
| **Sample Type** | LLCCV | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 4.956 | 4.956 | 1.0 | 259992.90 | 5 | |
| Be | 9 | 45 | No Gas | 0.974 | 0.974 | 3.2 | 3996.50 | 1 | |
| B | 11 | 45 | No Gas | 11.101 | 11.101 | 1.6 | 30374.63 | 10 | |
| Sr | 88 | 72 | No Gas | 0.969 | 0.969 | 1.2 | 18688.40 | 1 | |
| Zr | 90 | 72 | No Gas | 0.861 | 0.861 | 2.0 | 11569.84 | 1 | |
| Mo | 95 | 115 | No Gas | 0.965 | 0.965 | 5.4 | 3918.31 | 1 | |
| Ag | 107 | 115 | No Gas | 1.004 | 1.004 | 3.3 | 10992.82 | 1 | |
| Cd | 111 | 115 | No Gas | 1.024 | 1.024 | 0.9 | 2277.51 | 1 | |
| Sb | 121 | 115 | No Gas | 1.925 | 1.925 | 3.2 | 18059.38 | 2 | |
| Ba | 137 | 115 | No Gas | 0.972 | 0.972 | 3.7 | 2890.31 | 1 | |
| Tl | 205 | 209 | No Gas | 0.9 | 0.900 | 1.3 | 19663.21 | 1 | |
| Pb | 208 | 209 | No Gas | 0.952 | 0.952 | 5.9 | 28565.56 | 1 | |
| Na | 23 | 45 | He | 109.718 | 109.718 | 1.5 | 51465.89 | 100 | |
| Mg | 24 | 45 | He | 97.453 | 97.453 | 3.4 | 18984.77 | 100 | |
| Al | 27 | 45 | He | 20.188 | 20.188 | 5.6 | 1189.39 | 20 | |
| Si | 29 | 45 | He | 134.124 | 134.124 | 9.1 | 1575.42 | 200 | > +/- 30% |
| K | 39 | 45 | He | 95.895 | 95.895 | 0.8 | 15411.09 | 100 | |
| Ca | 44 | 45 | He | 461.958 | 461.958 | 4.9 | 2420.24 | 500 | |
| Ti | 47 | 45 | He | 0.992 | 0.992 | 21.9 | 45.00 | 1 | |
| V | 51 | 72 | He | 1.004 | 1.004 | 11.0 | 1627.33 | 1 | |
| Cr | 52 | 72 | He | 0.988 | 0.988 | 9.4 | 2261.30 | 1 | |
| Mn | 55 | 72 | He | 5.115 | 5.115 | 2.7 | 4512.90 | 5 | |
| Fe | 57 | 72 | He | 103.243 | 103.243 | 1.7 | 4194.07 | 100 | |
| Co | 59 | 72 | He | 1.033 | 1.033 | 3.4 | 3778.26 | 1 | |
| Ni | 60 | 72 | He | 2.119 | 2.119 | 4.9 | 2182.40 | 2 | |
| Cu | 63 | 72 | He | 0.788 | 0.788 | 6.6 | 3432.63 | 1 | |
| Zn | 66 | 72 | He | 19.78 | 19.780 | 0.3 | 6928.21 | 20 | |
| As | 75 | 72 | He | 0.971 | 0.971 | 5.8 | 253.67 | 1 | |
| Se | 78 | 72 | He | 1.048 | 1.048 | 12.5 | 20.08 | 1 | |
| Sn | 120 | 115 | He | 1.088 | 1.088 | 4.2 | 1503.43 | 1 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1314447.63 | 1291085.71 | 101.81 | |
| Ge | 72 | He | 48654.57 | 47456.4966666667 | 102.52 | |
| In | 115 | He | 378310.47 | 372695.226666667 | 101.51 | |
| Lu | 175 | He | 1046255.61 | 1029247.51 | 101.65 | |
| Rh | 103 | He | 1664214.97 | 1626201.63666667 | 102.34 | |
| Sc | 45 | He | 110221.22 | 109033.716666667 | 101.09 | |
| Tb | 159 | He | 1901068.62 | 1820531.74333333 | 104.42 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3768071.50 | 3617762.55 | 104.15 | |
| Ge | 72 | No Gas | 613660.90 | 597606.886666667 | 102.69 | |
| In | 115 | No Gas | 3965525.58 | 3893084.07 | 101.86 | |
| Lu | 175 | No Gas | 6094048.66 | 5877008.03666667 | 103.69 | |
| Rh | 103 | No Gas | 4060580.81 | 3958933.73 | 102.57 | |
| Sc | 45 | No Gas | 4202534.42 | 4093118.31 | 102.67 | |
| Tb | 159 | No Gas | 5864472.20 | 5654253.04333333 | 103.72 | |

II

CONTINUING CALIBRATION VERIFICATION

| | | | |
|---|---|---|---|
| Report No: | 218040620 | GCAL QC ID: | 1800 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180417A_MS1.b\075_CCV.d |
| Analyst: | AWG | Analytical Batch: | 633612 |
| Analysis Date: | 04/17/18 Time: 1628 | Analytical Method: | EPA 6020A |

| *ANALYTE* | *TRUE* | *FOUND* | *%RECOVERY* | *Q* | *UNITS* |
|---|---|---|---|---|---|
| Arsenic | 10.0 | 9.79 | 98 | | ug/L |
| Iron | 1000 | 996 | 100 | | ug/L |
| Manganese | 50.0 | 49.9 | 100 | | ug/L |

CONTROL LIMITS 90-110%

FORM II - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1800 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 075_CCV.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 16:28:02 | **Total Dilution** | 1.0000 |
| **Sample Type** | CCV | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 52.277 | 52.277 | 0.8 | 1122219.83 | 50 | |
| Be | 9 | 45 | No Gas | 9.708 | 9.708 | 2.3 | 39205.89 | 10 | |
| B | 11 | 45 | No Gas | 52.324 | 52.324 | 2.5 | 141727.91 | 50 | |
| Sr | 88 | 72 | No Gas | 9.8 | 9.800 | 1.8 | 187289.85 | 10 | |
| Zr | 90 | 72 | No Gas | 9.924 | 9.924 | 2.7 | 129984.00 | 10 | |
| Mo | 95 | 115 | No Gas | 9.371 | 9.371 | 1.5 | 38273.46 | 10 | |
| Ag | 107 | 115 | No Gas | 9.675 | 9.675 | 1.1 | 107152.63 | 10 | |
| Cd | 111 | 115 | No Gas | 9.676 | 9.676 | 1.4 | 21549.89 | 10 | |
| Sb | 121 | 115 | No Gas | 19.048 | 19.048 | 2.1 | 180128.74 | 20 | |
| Ba | 137 | 115 | No Gas | 9.535 | 9.535 | 2.5 | 28430.62 | 10 | |
| Tl | 205 | 209 | No Gas | 9.157 | 9.157 | 1.9 | 197342.87 | 10 | |
| Pb | 208 | 209 | No Gas | 9.509 | 9.509 | 2.0 | 273498.98 | 10 | |
| Na | 23 | 45 | He | 1024.799 | 1024.799 | 0.6 | 404310.33 | 1000 | |
| Mg | 24 | 45 | He | 991.77 | 991.770 | 0.9 | 190920.60 | 1000 | |
| Al | 27 | 45 | He | 198.406 | 198.406 | 1.9 | 11295.16 | 200 | |
| Si | 29 | 45 | He | 1985.216 | 1985.216 | 4.1 | 4511.30 | 2000 | |
| K | 39 | 45 | He | 978.773 | 978.773 | 1.5 | 90122.78 | 1000 | |
| Ca | 44 | 45 | He | 4951.974 | 4951.974 | 2.1 | 23683.82 | 5000 | |
| Ti | 47 | 45 | He | 9.692 | 9.692 | 3.4 | 395.34 | 10 | |
| V | 51 | 72 | He | 9.917 | 9.917 | 1.8 | 15358.40 | 10 | |
| Cr | 52 | 72 | He | 9.919 | 9.919 | 1.9 | 20604.06 | 10 | |
| Mn | 55 | 72 | He | 49.886 | 49.886 | 1.3 | 43696.49 | 50 | |
| Fe | 57 | 72 | He | 996.015 | 996.015 | 0.1 | 40253.83 | 1000 | |
| Co | 59 | 72 | He | 10.044 | 10.044 | 1.2 | 36459.20 | 10 | |
| Ni | 60 | 72 | He | 20.118 | 20.118 | 3.6 | 20475.09 | 20 | |
| Cu | 63 | 72 | He | 10.087 | 10.087 | 0.3 | 29996.27 | 10 | |
| Zn | 66 | 72 | He | 200.297 | 200.297 | 0.7 | 68740.86 | 200 | |
| As | 75 | 72 | He | 9.793 | 9.793 | 0.4 | 2469.69 | 10 | |
| Se | 78 | 72 | He | 9.598 | 9.598 | 8.5 | 156.99 | 10 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1311332.17 | 1291085.71 | 101.57 | |
| Ge | 72 | He | 48699.03 | 47456.4966666667 | 102.62 | |
| In | 115 | He | 381228.01 | 372695.226666667 | 102.29 | |
| Lu | 175 | He | 1046198.71 | 1029247.51 | 101.65 | |
| Rh | 103 | He | 1652565.28 | 1626201.63666667 | 101.62 | |
| Sc | 45 | He | 109180.47 | 109033.716666667 | 100.13 | |
| Tb | 159 | He | 1861719.30 | 1820531.74333333 | 102.26 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3761295.47 | 3617762.55 | 103.97 | |
| Ge | 72 | No Gas | 618352.25 | 597606.886666667 | 103.47 | |
| In | 115 | No Gas | 4021374.99 | 3893084.07 | 103.3 | |
| Lu | 175 | No Gas | 6205337.62 | 5877008.03666667 | 105.59 | |
| Rh | 103 | No Gas | 4041228.31 | 3958933.73 | 102.08 | |
| Sc | 45 | No Gas | 4223398.30 | 4093118.31 | 103.18 | |
| Tb | 159 | No Gas | 5935902.41 | 5654253.04333333 | 104.98 | |

II

LOW LEVEL CONTINUING CALIBRATION VERIFICATION

| | | | |
|---|---|---|---|
| Report No: | 218040620 | GCAL QC ID: | 1803 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180417A_MS1.b\077LCCV.d |
| Analyst: | AWG | Analytical Batch: | 633612 |
| Analysis Date: | 04/17/18 Time: 1636 | Analytical Method: | EPA 6020A |

| *ANALYTE* | *TRUE* | *FOUND* | *%RECOVERY* | *Q* | *UNITS* |
|---|---|---|---|---|---|
| Arsenic | 1.00 | 0.940 | 94 | | ug/L |
| Iron | 100 | 99.5 | 99 | | ug/L |
| Manganese | 5.00 | 4.94 | 99 | | ug/L |

CONTROL LIMITS 70-130%

FORM II - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1803 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 077LCCV.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 16:36:49 | **Total Dilution** | 1.0000 |
| **Sample Type** | LLCCV | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 4.956 | 4.956 | 1.3 | 258053.39 | 5 | |
| Be | 9 | 45 | No Gas | 0.982 | 0.982 | 3.2 | 3995.16 | 1 | |
| B | 11 | 45 | No Gas | 10.521 | 10.521 | 2.9 | 28605.10 | 10 | |
| Sr | 88 | 72 | No Gas | 1.015 | 1.015 | 2.2 | 19595.98 | 1 | |
| Zr | 90 | 72 | No Gas | 0.898 | 0.898 | 3.5 | 12070.21 | 1 | |
| Mo | 95 | 115 | No Gas | 0.934 | 0.934 | 3.0 | 3772.72 | 1 | |
| Ag | 107 | 115 | No Gas | 0.973 | 0.973 | 2.6 | 10599.19 | 1 | |
| Cd | 111 | 115 | No Gas | 0.977 | 0.977 | 4.5 | 2164.49 | 1 | |
| Sb | 121 | 115 | No Gas | 1.934 | 1.934 | 2.0 | 18049.38 | 2 | |
| Ba | 137 | 115 | No Gas | 0.96 | 0.960 | 6.5 | 2840.30 | 1 | |
| Tl | 205 | 209 | No Gas | 0.899 | 0.899 | 1.8 | 19485.15 | 1 | |
| Pb | 208 | 209 | No Gas | 0.959 | 0.959 | 1.5 | 28505.36 | 1 | |
| Na | 23 | 45 | He | 106.764 | 106.764 | 0.5 | 50579.83 | 100 | |
| Mg | 24 | 45 | He | 97.489 | 97.489 | 3.2 | 19091.68 | 100 | |
| Al | 27 | 45 | He | 19.904 | 19.904 | 3.7 | 1179.39 | 20 | |
| Si | 29 | 45 | He | 217.497 | 217.497 | 6.2 | 1717.44 | 200 | |
| K | 39 | 45 | He | 97.866 | 97.866 | 0.9 | 15661.28 | 100 | |
| Ca | 44 | 45 | He | 461.382 | 461.382 | 4.9 | 2430.23 | 500 | |
| Ti | 47 | 45 | He | 0.929 | 0.929 | 13.3 | 42.67 | 1 | |
| V | 51 | 72 | He | 0.978 | 0.978 | 7.7 | 1594.54 | 1 | |
| Cr | 52 | 72 | He | 0.917 | 0.917 | 2.2 | 2125.72 | 1 | |
| Mn | 55 | 72 | He | 4.939 | 4.939 | 7.4 | 4383.98 | 5 | |
| Fe | 57 | 72 | He | 99.462 | 99.462 | 5.8 | 4060.67 | 100 | |
| Co | 59 | 72 | He | 1.02 | 1.020 | 6.3 | 3749.36 | 1 | |
| Ni | 60 | 72 | He | 2.067 | 2.067 | 2.7 | 2141.28 | 2 | |
| Cu | 63 | 72 | He | 0.787 | 0.787 | 1.4 | 3447.06 | 1 | |
| Zn | 66 | 72 | He | 20.475 | 20.475 | 1.9 | 7202.81 | 20 | |
| As | 75 | 72 | He | 0.937 | 0.937 | 4.5 | 246.33 | 1 | |
| Se | 78 | 72 | He | 1.008 | 1.008 | 11.4 | 19.56 | 1 | |
| Sn | 120 | 115 | He | 0.973 | 0.973 | 2.5 | 1361.19 | 1 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1315738.26 | 1291085.71 | 101.91 | |
| Ge | 72 | He | 48913.06 | 47456.4966666667 | 103.07 | |
| In | 115 | He | 379422.54 | 372695.226666667 | 101.81 | |
| Lu | 175 | He | 1041394.80 | 1029247.51 | 101.18 | |
| Rh | 103 | He | 1649932.12 | 1626201.63666667 | 101.46 | |
| Sc | 45 | He | 110805.45 | 109033.716666667 | 101.62 | |
| Tb | 159 | He | 1850578.20 | 1820531.74333333 | 101.65 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3736342.97 | 3617762.55 | 103.28 | |
| Ge | 72 | No Gas | 614571.40 | 597606.886666667 | 102.84 | |
| In | 115 | No Gas | 3945271.77 | 3893084.07 | 101.34 | |
| Lu | 175 | No Gas | 6155048.03 | 5877008.03666667 | 104.73 | |
| Rh | 103 | No Gas | 4093851.09 | 3958933.73 | 103.41 | |
| Sc | 45 | No Gas | 4171050.94 | 4093118.31 | 101.9 | |
| Tb | 159 | No Gas | 5846224.70 | 5654253.04333333 | 103.4 | |

II

CONTINUING CALIBRATION VERIFICATION

| | | | |
|---|---|---|---|
| Report No: | 218040620 | GCAL QC ID: | 1800 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180417A_MS1.b\089_CCV.d |
| Analyst: | AWG | Analytical Batch: | 633612 |
| Analysis Date: | 04/17/18 Time: 1729 | Analytical Method: | EPA 6020A |

| *ANALYTE* | *TRUE* | *FOUND* | *%RECOVERY* | *Q* | *UNITS* |
|---|---|---|---|---|---|
| Arsenic | 10.0 | 9.67 | 97 | | ug/L |
| Iron | 1000 | 998 | 100 | | ug/L |
| Manganese | 50.0 | 49.5 | 99 | | ug/L |

CONTROL LIMITS 90-110%

FORM II - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1800 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 089_CCV.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 17:29:17 | **Total Dilution** | 1.0000 |
| **Sample Type** | CCV | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 51.488 | 51.488 | 2.0 | 1123182.49 | 50 | |
| Be | 9 | 45 | No Gas | 9.795 | 9.795 | 2.6 | 40101.93 | 10 | |
| B | 11 | 45 | No Gas | 51.056 | 51.056 | 3.9 | 140225.58 | 50 | |
| Sr | 88 | 72 | No Gas | 9.755 | 9.755 | 2.9 | 189471.78 | 10 | |
| Zr | 90 | 72 | No Gas | 9.861 | 9.861 | 2.6 | 131243.92 | 10 | |
| Mo | 95 | 115 | No Gas | 9.289 | 9.289 | 1.7 | 38492.88 | 10 | |
| Ag | 107 | 115 | No Gas | 9.675 | 9.675 | 1.4 | 108720.08 | 10 | |
| Cd | 111 | 115 | No Gas | 9.612 | 9.612 | 2.6 | 21722.79 | 10 | |
| Sb | 121 | 115 | No Gas | 19.093 | 19.093 | 3.1 | 183211.26 | 20 | |
| Ba | 137 | 115 | No Gas | 9.617 | 9.617 | 3.0 | 29099.54 | 10 | |
| Tl | 205 | 209 | No Gas | 9.008 | 9.008 | 2.2 | 197491.54 | 10 | |
| Pb | 208 | 209 | No Gas | 9.448 | 9.448 | 1.8 | 276445.64 | 10 | |
| Na | 23 | 45 | He | 1006.551 | 1006.551 | 1.4 | 406924.25 | 1000 | |
| Mg | 24 | 45 | He | 983.936 | 983.936 | 0.5 | 194011.10 | 1000 | |
| Al | 27 | 45 | He | 199.353 | 199.353 | 2.3 | 11624.72 | 200 | |
| Si | 29 | 45 | He | 2029.285 | 2029.285 | 5.2 | 4692.02 | 2000 | |
| K | 39 | 45 | He | 982.75 | 982.750 | 0.7 | 92653.11 | 1000 | |
| Ca | 44 | 45 | He | 4942.539 | 4942.539 | 0.8 | 24214.59 | 5000 | |
| Ti | 47 | 45 | He | 9.614 | 9.614 | 2.3 | 401.68 | 10 | |
| V | 51 | 72 | He | 9.85 | 9.850 | 0.7 | 15628.64 | 10 | |
| Cr | 52 | 72 | He | 9.912 | 9.912 | 0.9 | 21096.89 | 10 | |
| Mn | 55 | 72 | He | 49.498 | 49.498 | 1.0 | 44438.39 | 50 | |
| Fe | 57 | 72 | He | 997.709 | 997.709 | 2.5 | 41323.15 | 1000 | |
| Co | 59 | 72 | He | 9.99 | 9.990 | 0.8 | 37157.41 | 10 | |
| Ni | 60 | 72 | He | 20.264 | 20.264 | 1.4 | 21134.78 | 20 | |
| Cu | 63 | 72 | He | 9.963 | 9.963 | 2.2 | 30377.02 | 10 | |
| Zn | 66 | 72 | He | 198.573 | 198.573 | 0.6 | 69832.12 | 200 | |
| As | 75 | 72 | He | 9.665 | 9.665 | 1.7 | 2497.36 | 10 | |
| Se | 78 | 72 | He | 9.787 | 9.787 | 1.1 | 163.91 | 10 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1331545.08 | 1291085.71 | 103.13 | |
| Ge | 72 | He | 49897.13 | 47456.4966666667 | 105.14 | |
| In | 115 | He | 388164.98 | 372695.226666667 | 104.15 | |
| Lu | 175 | He | 1065987.90 | 1029247.51 | 103.57 | |
| Rh | 103 | He | 1684574.52 | 1626201.63666667 | 103.59 | |
| Sc | 45 | He | 111833.22 | 109033.716666667 | 102.57 | |
| Tb | 159 | He | 1904494.09 | 1820531.74333333 | 104.61 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3826261.40 | 3617762.55 | 105.76 | |
| Ge | 72 | No Gas | 628384.19 | 597606.886666667 | 105.15 | |
| In | 115 | No Gas | 4080268.09 | 3893084.07 | 104.81 | |
| Lu | 175 | No Gas | 6213236.37 | 5877008.03666667 | 105.72 | |
| Rh | 103 | No Gas | 4104991.64 | 3958933.73 | 103.69 | |
| Sc | 45 | No Gas | 4281484.55 | 4093118.31 | 104.6 | |
| Tb | 159 | No Gas | 5923688.45 | 5654253.04333333 | 104.77 | |

II

LOW LEVEL CONTINUING CALIBRATION VERIFICATION

| | | | |
|---|---|---|---|
| Report No: | 218040620 | GCAL QC ID: | 1803 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180417A_MS1.b\091LCCV.d |
| Analyst: | AWG | Analytical Batch: | 633612 |
| Analysis Date: | 04/17/18 Time: 1738 | Analytical Method: | EPA 6020A |

| *ANALYTE* | *TRUE* | *FOUND* | *%RECOVERY* | *Q* | *UNITS* |
|---|---|---|---|---|---|
| Arsenic | 1.00 | 0.920 | 92 | | ug/L |
| Iron | 100 | 108 | 108 | | ug/L |
| Manganese | 5.00 | 5.07 | 101 | | ug/L |

CONTROL LIMITS 70-130%

FORM II - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1803 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 091LCCV.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 17:38:03 | **Total Dilution** | 1.0000 |
| **Sample Type** | LLCCV | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 4.775 | 4.775 | 0.7 | 262172.50 | 5 | |
| Be | 9 | 45 | No Gas | 0.969 | 0.969 | 4.1 | 4057.18 | 1 | |
| B | 11 | 45 | No Gas | 10.268 | 10.268 | 3.6 | 28744.76 | 10 | |
| Sr | 88 | 72 | No Gas | 0.983 | 0.983 | 4.6 | 19402.45 | 1 | |
| Zr | 90 | 72 | No Gas | 0.871 | 0.871 | 5.5 | 11981.24 | 1 | |
| Mo | 95 | 115 | No Gas | 0.931 | 0.931 | 3.7 | 3846.07 | 1 | |
| Ag | 107 | 115 | No Gas | 0.977 | 0.977 | 1.6 | 10870.48 | 1 | |
| Cd | 111 | 115 | No Gas | 0.979 | 0.979 | 2.8 | 2216.50 | 1 | |
| Sb | 121 | 115 | No Gas | 1.933 | 1.933 | 3.4 | 18440.98 | 2 | |
| Ba | 137 | 115 | No Gas | 1.023 | 1.023 | 2.2 | 3090.36 | 1 | |
| Tl | 205 | 209 | No Gas | 0.886 | 0.886 | 2.0 | 19552.98 | 1 | |
| Pb | 208 | 209 | No Gas | 0.948 | 0.948 | 1.8 | 28702.10 | 1 | |
| Na | 23 | 45 | He | 110.615 | 110.615 | 1.2 | 51987.72 | 100 | |
| Mg | 24 | 45 | He | 97.993 | 97.993 | 2.3 | 19154.91 | 100 | |
| Al | 27 | 45 | He | 20.397 | 20.397 | 10.8 | 1205.39 | 20 | |
| Si | 29 | 45 | He | 154.262 | 154.262 | 5.0 | 1613.43 | 200 | |
| K | 39 | 45 | He | 89.867 | 89.867 | 0.2 | 14943.95 | 100 | |
| Ca | 44 | 45 | He | 484.971 | 484.971 | 7.6 | 2540.25 | 500 | |
| Ti | 47 | 45 | He | 0.831 | 0.831 | 18.3 | 38.67 | 1 | |
| V | 51 | 72 | He | 1.09 | 1.090 | 5.0 | 1784.57 | 1 | |
| Cr | 52 | 72 | He | 0.964 | 0.964 | 3.3 | 2244.62 | 1 | |
| Mn | 55 | 72 | He | 5.073 | 5.073 | 4.2 | 4544.02 | 5 | |
| Fe | 57 | 72 | He | 107.669 | 107.669 | 11.8 | 4440.79 | 100 | |
| Co | 59 | 72 | He | 1.021 | 1.021 | 7.7 | 3784.93 | 1 | |
| Ni | 60 | 72 | He | 2.091 | 2.091 | 6.3 | 2185.73 | 2 | |
| Cu | 63 | 72 | He | 0.869 | 0.869 | 2.6 | 3716.02 | 1 | |
| Zn | 66 | 72 | He | 20.328 | 20.328 | 3.0 | 7221.68 | 20 | |
| As | 75 | 72 | He | 0.915 | 0.915 | 5.5 | 243.17 | 1 | |
| Se | 78 | 72 | He | 0.976 | 0.976 | 18.4 | 19.24 | 1 | |
| Sn | 120 | 115 | He | 0.966 | 0.966 | 7.7 | 1367.86 | 1 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1314831.62 | 1291085.71 | 101.84 | |
| Ge | 72 | He | 49379.98 | 47456.4966666667 | 104.05 | |
| In | 115 | He | 384123.68 | 372695.226666667 | 103.07 | |
| Lu | 175 | He | 1048431.57 | 1029247.51 | 101.86 | |
| Rh | 103 | He | 1660614.00 | 1626201.63666667 | 102.12 | |
| Sc | 45 | He | 110597.54 | 109033.716666667 | 101.43 | |
| Tb | 159 | He | 1893043.88 | 1820531.74333333 | 103.98 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3804827.55 | 3617762.55 | 105.17 | |
| Ge | 72 | No Gas | 628210.98 | 597606.886666667 | 105.12 | |
| In | 115 | No Gas | 4032247.20 | 3893084.07 | 103.57 | |
| Lu | 175 | No Gas | 6206695.12 | 5877008.03666667 | 105.61 | |
| Rh | 103 | No Gas | 4136148.59 | 3958933.73 | 104.48 | |
| Sc | 45 | No Gas | 4291974.69 | 4093118.31 | 104.86 | |
| Tb | 159 | No Gas | 5960225.12 | 5654253.04333333 | 105.41 | |

II

INITIAL CALIBRATION VERIFICATION

| | | | |
|---|---|---|---|
| Report No: | 218040620 | GCAL QC ID: | 1600 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180416B_MS1.b\008_ICV.d |
| Analyst: | AWG | Analytical Batch: | 633483 |
| Analysis Date: | 04/16/18 Time: 1259 | Analytical Method: | EPA 6020A Dissolved |

| *ANALYTE* | *TRUE* | *FOUND* | *%RECOVERY* | *Q* | *UNITS* |
|---|---|---|---|---|---|
| Iron | 5000 | 5080 | 102 | | ug/L |
| Manganese | 50.0 | 49.4 | 99 | | ug/L |

CONTROL LIMITS 90-110%

FORM II - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1600 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180416B_MS1.b |
| **File Name** | 008_ICV.d | **Comment** | ICPMS-1,AWG |
| **Acq Time** | 2018-04-16 12:59:33 | **Total Dilution** | 1.0000 |
| **Sample Type** | ICV | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 002CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 235.189 | 235.189 | 1.9 | 5085858.57 | 250 | |
| Be | 9 | 45 | No Gas | 49.699 | 49.699 | 3.4 | 222428.89 | 50 | |
| B | 11 | 45 | No Gas | 227.362 | 227.362 | 3.2 | 688315.49 | 250 | |
| Sr | 88 | 72 | No Gas | 44.615 | 44.615 | 2.9 | 886052.69 | 50 | > +/- 10% |
| Zr | 90 | 72 | No Gas | 46.856 | 46.856 | 2.4 | 643267.37 | 50 | |
| Mo | 95 | 115 | No Gas | 46.913 | 46.913 | 3.2 | 196818.98 | 50 | |
| Ag | 107 | 115 | No Gas | 46.513 | 46.513 | 2.4 | 530568.61 | 50 | |
| Cd | 111 | 115 | No Gas | 48.425 | 48.425 | 3.0 | 112698.99 | 50 | |
| Sb | 121 | 115 | No Gas | 48.104 | 48.104 | 3.6 | 452504.95 | 50 | |
| Ba | 137 | 115 | No Gas | 46.549 | 46.549 | 3.0 | 139820.44 | 50 | |
| Tl | 205 | 209 | No Gas | 47.887 | 47.887 | 1.8 | 1036130.90 | 50 | |
| Pb | 208 | 209 | No Gas | 48.88 | 48.880 | 2.1 | 1387570.59 | 50 | |
| Na | 23 | 45 | He | 5031.384 | 5031.384 | 0.3 | 2043639.71 | 5000 | |
| Mg | 24 | 45 | He | 5032.652 | 5032.652 | 0.9 | 996987.77 | 5000 | |
| Al | 27 | 45 | He | 775.172 | 775.172 | 0.7 | 45399.79 | 1000 | > +/- 10% |
| Si | 29 | 45 | He | 5018.636 | 5018.636 | 2.8 | 9833.60 | 5000 | |
| K | 39 | 45 | He | 4909.886 | 4909.886 | 0.5 | 444174.50 | 5000 | |
| Ca | 44 | 45 | He | 24558.14 | 24558.140 | 0.6 | 121652.79 | 25000 | |
| Ti | 47 | 45 | He | 50.573 | 50.573 | 1.8 | 2081.80 | 50 | |
| V | 51 | 72 | He | 50.254 | 50.254 | 1.5 | 79125.90 | 50 | |
| Cr | 52 | 72 | He | 50.532 | 50.532 | 1.7 | 106885.06 | 50 | |
| Mn | 55 | 72 | He | 49.438 | 49.438 | 1.0 | 45483.54 | 50 | |
| Fe | 57 | 72 | He | 5077.075 | 5077.075 | 0.6 | 210206.92 | 5000 | |
| Co | 59 | 72 | He | 50.924 | 50.924 | 1.3 | 189132.78 | 50 | |
| Ni | 60 | 72 | He | 101.458 | 101.458 | 0.6 | 105332.76 | 100 | |
| Cu | 63 | 72 | He | 52.142 | 52.142 | 0.6 | 153254.91 | 50 | |
| Zn | 66 | 72 | He | 1016.001 | 1016.001 | 0.9 | 363898.30 | 1000 | |
| As | 75 | 72 | He | 50.319 | 50.319 | 1.2 | 13400.96 | 50 | |
| Se | 78 | 72 | He | 24.959 | 24.959 | 3.8 | 440.14 | 25 | |
| Sn | 120 | 115 | He | 49.875 | 49.875 | 0.4 | 67937.81 | 50 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1367809.56 | 1434384.40333333 | 95.36 | |
| Ge | 72 | He | 51125.38 | 53494.0666666667 | 95.57 | |
| In | 115 | He | 404928.27 | 422983.593333333 | 95.73 | |
| Lu | 175 | He | 1129214.62 | 1160314.62 | 97.32 | |
| Rh | 103 | He | 1693078.37 | 1802038.33333333 | 93.95 | |
| Sc | 45 | He | 122423.97 | 127114.406666667 | 96.31 | |
| Tb | 159 | He | 1941691.74 | 2010526.84666667 | 96.58 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3820492.44 | 3969825.04666667 | 96.24 | |
| Ge | 72 | No Gas | 643278.91 | 662907.366666667 | 97.04 | |
| In | 115 | No Gas | 4144630.54 | 4246975.92666667 | 97.59 | |
| Lu | 175 | No Gas | 6177919.28 | 6373136.98666667 | 96.94 | |
| Rh | 103 | No Gas | 4100863.31 | 4339714.13333333 | 94.5 | |
| Sc | 45 | No Gas | 4776830.09 | 4929728.14 | 96.9 | |
| Tb | 159 | No Gas | 5900780.95 | 6085949.28333333 | 96.96 | |

II

LOW LEVEL CONTINUING CALIBRATION VERIFICATION

| | | | |
|---|---|---|---|
| Report No: | 218040620 | GCAL QC ID: | 1803 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180416B_MS1.b\011CCV1.d |
| Analyst: | AWG | Analytical Batch: | 633483 |
| Analysis Date: | 04/16/18 Time: 1312 | Analytical Method: | EPA 6020A Dissolved |

| *ANALYTE* | *TRUE* | *FOUND* | *%RECOVERY* | *Q* | *UNITS* |
|---|---|---|---|---|---|
| Iron | 100 | 98.4 | 98 | | ug/L |
| Manganese | 5.00 | 4.69 | 94 | | ug/L |

CONTROL LIMITS 80-120%

FORM II - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1803 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180416B_MS1.b |
| **File Name** | 011CCV1.d | **Comment** | ICPMS-1,AWG |
| **Acq Time** | 2018-04-16 13:12:45 | **Total Dilution** | 1.0000 |
| **Sample Type** | LLCCV1 | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 002CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 5.403 | 5.403 | 0.6 | 308413.34 | 5 | |
| Be | 9 | 45 | No Gas | 1.006 | 1.006 | 3.1 | 4606.65 | 1 | |
| B | 11 | 45 | No Gas | 11.679 | 11.679 | 0.8 | 44609.26 | 10 | |
| Sr | 88 | 72 | No Gas | 0.933 | 0.933 | 6.1 | 19158.72 | 1 | |
| Zr | 90 | 72 | No Gas | 0.851 | 0.851 | 2.9 | 12223.67 | 1 | |
| Mo | 95 | 115 | No Gas | 0.975 | 0.975 | 7.2 | 4143.93 | 1 | |
| Ag | 107 | 115 | No Gas | 1.007 | 1.007 | 3.0 | 11552.07 | 1 | |
| Cd | 111 | 115 | No Gas | 0.99 | 0.990 | 8.1 | 2338.85 | 1 | |
| Sb | 121 | 115 | No Gas | 1.958 | 1.958 | 3.7 | 18968.25 | 2 | |
| Ba | 137 | 115 | No Gas | 1.094 | 1.094 | 3.1 | 3372.64 | 1 | |
| Tl | 205 | 209 | No Gas | 0.93 | 0.930 | 4.2 | 20600.08 | 1 | |
| Pb | 208 | 209 | No Gas | 0.972 | 0.972 | 1.7 | 29375.96 | 1 | |
| Na | 23 | 45 | He | 100.638 | 100.638 | 1.9 | 53789.75 | 100 | |
| Mg | 24 | 45 | He | 102.621 | 102.621 | 2.0 | 20990.47 | 100 | |
| Al | 27 | 45 | He | 20.591 | 20.591 | 6.1 | 1299.39 | 20 | |
| Si | 29 | 45 | He | 204.015 | 204.015 | 2.3 | 1996.80 | 200 | |
| K | 39 | 45 | He | 100.327 | 100.327 | 4.2 | 16218.52 | 100 | |
| Ca | 44 | 45 | He | 495.335 | 495.335 | 3.5 | 2711.95 | 500 | |
| Ti | 47 | 45 | He | 0.877 | 0.877 | 9.1 | 44.33 | 1 | |
| V | 51 | 72 | He | 0.981 | 0.981 | 4.5 | 1889.03 | 1 | |
| Cr | 52 | 72 | He | 1.019 | 1.019 | 5.4 | 2511.34 | 1 | |
| Mn | 55 | 72 | He | 4.689 | 4.689 | 0.8 | 4967.48 | 5 | |
| Fe | 57 | 72 | He | 98.373 | 98.373 | 2.6 | 4297.41 | 100 | |
| Co | 59 | 72 | He | 1.027 | 1.027 | 5.4 | 4004.99 | 1 | |
| Ni | 60 | 72 | He | 2.141 | 2.141 | 3.4 | 2343.53 | 2 | |
| Cu | 63 | 72 | He | 1.021 | 1.021 | 4.1 | 4058.32 | 1 | |
| Zn | 66 | 72 | He | 20.023 | 20.023 | 6.0 | 7676.34 | 20 | |
| As | 75 | 72 | He | 0.968 | 0.968 | 1.0 | 279.33 | 1 | |
| Se | 78 | 72 | He | 1.072 | 1.072 | 16.9 | 23.23 | 1 | |
| Sn | 120 | 115 | He | 1.027 | 1.027 | 4.6 | 1588.99 | 1 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1404667.74 | 1434384.40333333 | 97.93 | |
| Ge | 72 | He | 53407.10 | 53494.0666666667 | 99.84 | |
| In | 115 | He | 417731.03 | 422983.593333333 | 98.76 | |
| Lu | 175 | He | 1142178.21 | 1160314.62 | 98.44 | |
| Rh | 103 | He | 1784903.54 | 1802038.33333333 | 99.05 | |
| Sc | 45 | He | 126082.92 | 127114.406666667 | 99.19 | |
| Tb | 159 | He | 1977447.47 | 2010526.84666667 | 98.35 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3882878.17 | 3969825.04666667 | 97.81 | |
| Ge | 72 | No Gas | 650378.90 | 662907.366666667 | 98.11 | |
| In | 115 | No Gas | 4148989.22 | 4246975.92666667 | 97.69 | |
| Lu | 175 | No Gas | 6161973.03 | 6373136.98666667 | 96.69 | |
| Rh | 103 | No Gas | 4226106.78 | 4339714.13333333 | 97.38 | |
| Sc | 45 | No Gas | 4831950.92 | 4929728.14 | 98.02 | |
| Tb | 159 | No Gas | 5964699.29 | 6085949.28333333 | 98.01 | |

II

CONTINUING CALIBRATION VERIFICATION

| | | | |
|---|---|---|---|
| Report No: | 218040620 | GCAL QC ID: | 1800 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180416B_MS1.b\068_CCV.d |
| Analyst: | AWG | Analytical Batch: | 633483 |
| Analysis Date: | 04/16/18 Time: 1734 | Analytical Method: | EPA 6020A Dissolved |

| *ANALYTE* | *TRUE* | *FOUND* | *%RECOVERY* | *Q* | *UNITS* |
|---|---|---|---|---|---|
| Iron | 1000 | 1010 | 101 | | ug/L |
| Manganese | 50.0 | 50.2 | 100 | | ug/L |

CONTROL LIMITS 90-110%

FORM II - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1800 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180416B_MS1.b |
| **File Name** | 068_CCV.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-16 17:34:33 | **Total Dilution** | 1.0000 |
| **Sample Type** | CCV | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 002CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 54.442 | 54.442 | 3.6 | 1152934.15 | 50 | |
| Be | 9 | 45 | No Gas | 9.801 | 9.801 | 3.5 | 38194.25 | 10 | |
| B | 11 | 45 | No Gas | 55.17 | 55.170 | 3.6 | 151368.58 | 50 | > +/- 10% |
| Sr | 88 | 72 | No Gas | 9.759 | 9.759 | 2.9 | 171392.25 | 10 | |
| Zr | 90 | 72 | No Gas | 9.949 | 9.949 | 2.3 | 120864.80 | 10 | |
| Mo | 95 | 115 | No Gas | 9.294 | 9.294 | 4.1 | 35558.43 | 10 | |
| Ag | 107 | 115 | No Gas | 9.575 | 9.575 | 3.7 | 99531.15 | 10 | |
| Cd | 111 | 115 | No Gas | 9.389 | 9.389 | 2.8 | 19925.13 | 10 | |
| Sb | 121 | 115 | No Gas | 18.933 | 18.933 | 3.7 | 162521.12 | 20 | |
| Ba | 137 | 115 | No Gas | 9.661 | 9.661 | 3.2 | 26497.17 | 10 | |
| Tl | 205 | 209 | No Gas | 9.351 | 9.351 | 3.6 | 188637.54 | 10 | |
| Pb | 208 | 209 | No Gas | 9.747 | 9.747 | 2.5 | 258770.32 | 10 | |
| Na | 23 | 45 | He | 1166.793 | 1166.793 | 0.5 | 421076.79 | 1000 | > +/- 10% |
| Mg | 24 | 45 | He | 1032.79 | 1032.790 | 1.0 | 178441.32 | 1000 | |
| Al | 27 | 45 | He | 208.714 | 208.714 | 2.9 | 10695.44 | 200 | |
| Si | 29 | 45 | He | 2015.72 | 2015.720 | 0.6 | 4281.91 | 2000 | |
| K | 39 | 45 | He | 1029.142 | 1029.142 | 1.2 | 85887.42 | 1000 | |
| Ca | 44 | 45 | He | 5111.102 | 5111.102 | 2.0 | 22206.78 | 5000 | |
| Ti | 47 | 45 | He | 10.132 | 10.132 | 4.2 | 368.68 | 10 | |
| V | 51 | 72 | He | 9.847 | 9.847 | 1.6 | 14140.59 | 10 | |
| Cr | 52 | 72 | He | 9.829 | 9.829 | 1.4 | 18889.81 | 10 | |
| Mn | 55 | 72 | He | 50.247 | 50.247 | 2.2 | 41587.80 | 50 | |
| Fe | 57 | 72 | He | 1012.221 | 1012.221 | 4.1 | 37744.45 | 1000 | |
| Co | 59 | 72 | He | 10.008 | 10.008 | 1.4 | 33451.81 | 10 | |
| Ni | 60 | 72 | He | 19.752 | 19.752 | 2.9 | 18467.20 | 20 | |
| Cu | 63 | 72 | He | 10.076 | 10.076 | 1.2 | 27299.47 | 10 | |
| Zn | 66 | 72 | He | 201.402 | 201.402 | 0.2 | 65020.24 | 200 | |
| As | 75 | 72 | He | 9.844 | 9.844 | 2.1 | 2365.84 | 10 | |
| Se | 78 | 72 | He | 10.042 | 10.042 | 2.2 | 161.22 | 10 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1312843.97 | 1434384.40333333 | 91.53 | |
| Ge | 72 | He | 45998.09 | 53494.0666666667 | 85.99 | |
| In | 115 | He | 373337.31 | 422983.593333333 | 88.26 | |
| Lu | 175 | He | 1051654.36 | 1160314.62 | 90.64 | |
| Rh | 103 | He | 1524772.09 | 1802038.33333333 | 84.61 | |
| Sc | 45 | He | 106762.30 | 127114.406666667 | 83.99 | |
| Tb | 159 | He | 1805828.15 | 2010526.84666667 | 89.82 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3558967.66 | 3969825.04666667 | 89.65 | |
| Ge | 72 | No Gas | 567854.35 | 662907.366666667 | 85.66 | |
| In | 115 | No Gas | 3775308.49 | 4246975.92666667 | 88.89 | |
| Lu | 175 | No Gas | 5726849.08 | 6373136.98666667 | 89.86 | |
| Rh | 103 | No Gas | 3765445.96 | 4339714.13333333 | 86.77 | |
| Sc | 45 | No Gas | 4155044.70 | 4929728.14 | 84.29 | |
| Tb | 159 | No Gas | 5456524.29 | 6085949.28333333 | 89.66 | |

II

LOW LEVEL CONTINUING CALIBRATION VERIFICATION

| | | | |
|---|---|---|---|
| Report No: | 218040620 | GCAL QC ID: | 1803 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180416B_MS1.b\070LCCV.d |
| Analyst: | AWG | Analytical Batch: | 633483 |
| Analysis Date: | 04/16/18 Time: 1743 | Analytical Method: | EPA 6020A Dissolved |

| *ANALYTE* | *TRUE* | *FOUND* | *%RECOVERY* | *Q* | *UNITS* |
|---|---|---|---|---|---|
| Iron | 100 | 99.9 | 100 | | ug/L |
| Manganese | 5.00 | 4.60 | 92 | | ug/L |

CONTROL LIMITS 70-130%

FORM II - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1803 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180416B_MS1.b |
| **File Name** | 070LCCV.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-16 17:43:21 | **Total Dilution** | 1.0000 |
| **Sample Type** | LLCCV | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 002CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 6.033 | 6.033 | 1.6 | 270883.61 | 5 | |
| Be | 9 | 45 | No Gas | 0.964 | 0.964 | 4.9 | 3723.10 | 1 | |
| B | 11 | 45 | No Gas | 11.548 | 11.548 | 5.3 | 37244.89 | 10 | |
| Sr | 88 | 72 | No Gas | 1.005 | 1.005 | 2.4 | 17697.05 | 1 | |
| Zr | 90 | 72 | No Gas | 0.852 | 0.852 | 1.6 | 10507.99 | 1 | |
| Mo | 95 | 115 | No Gas | 0.938 | 0.938 | 1.6 | 3570.45 | 1 | |
| Ag | 107 | 115 | No Gas | 0.96 | 0.960 | 3.7 | 9870.96 | 1 | |
| Cd | 111 | 115 | No Gas | 0.946 | 0.946 | 3.4 | 2003.46 | 1 | |
| Sb | 121 | 115 | No Gas | 1.974 | 1.974 | 4.0 | 17136.16 | 2 | |
| Ba | 137 | 115 | No Gas | 1.049 | 1.049 | 11.5 | 2904.89 | 1 | |
| Tl | 205 | 209 | No Gas | 0.917 | 0.917 | 2.9 | 18539.54 | 1 | |
| Pb | 208 | 209 | No Gas | 0.973 | 0.973 | 0.6 | 26827.46 | 1 | |
| Na | 23 | 45 | He | 172.479 | 172.479 | 1.8 | 71635.66 | 100 | > +/- 30% |
| Mg | 24 | 45 | He | 103.403 | 103.403 | 3.0 | 18103.69 | 100 | |
| Al | 27 | 45 | He | 20.326 | 20.326 | 7.1 | 1098.05 | 20 | |
| Si | 29 | 45 | He | 99.102 | 99.102 | 4.4 | 1557.42 | 200 | > +/- 30% |
| K | 39 | 45 | He | 107.163 | 107.163 | 3.8 | 14416.74 | 100 | |
| Ca | 44 | 45 | He | 547.796 | 547.796 | 4.5 | 2550.25 | 500 | |
| Ti | 47 | 45 | He | 0.787 | 0.787 | 13.0 | 34.67 | 1 | |
| V | 51 | 72 | He | 0.845 | 0.845 | 5.3 | 1428.97 | 1 | |
| Cr | 52 | 72 | He | 1.033 | 1.033 | 7.4 | 2179.06 | 1 | |
| Mn | 55 | 72 | He | 4.6 | 4.600 | 4.9 | 4185.04 | 5 | |
| Fe | 57 | 72 | He | 99.905 | 99.905 | 3.6 | 3742.22 | 100 | |
| Co | 59 | 72 | He | 1.032 | 1.032 | 4.8 | 3452.63 | 1 | |
| Ni | 60 | 72 | He | 2.1 | 2.100 | 3.3 | 1971.25 | 2 | |
| Cu | 63 | 72 | He | 0.967 | 0.967 | 5.8 | 3340.39 | 1 | |
| Zn | 66 | 72 | He | 20.122 | 20.122 | 2.7 | 6612.52 | 20 | |
| As | 75 | 72 | He | 0.975 | 0.975 | 4.4 | 241.33 | 1 | |
| Se | 78 | 72 | He | 1.192 | 1.192 | 18.4 | 21.81 | 1 | |
| Sn | 120 | 115 | He | 1.341 | 1.341 | 5.3 | 1813.47 | 1 | > +/- 30% |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1305823.83 | 1434384.40333333 | 91.04 | |
| Ge | 72 | He | 45796.14 | 53494.0666666667 | 85.61 | |
| In | 115 | He | 373200.69 | 422983.593333333 | 88.23 | |
| Lu | 175 | He | 1045338.27 | 1160314.62 | 90.09 | |
| Rh | 103 | He | 1546736.36 | 1802038.33333333 | 85.83 | |
| Sc | 45 | He | 107921.30 | 127114.406666667 | 84.9 | |
| Tb | 159 | He | 1799889.71 | 2010526.84666667 | 89.52 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3542856.20 | 3969825.04666667 | 89.24 | |
| Ge | 72 | No Gas | 558501.94 | 662907.366666667 | 84.25 | |
| In | 115 | No Gas | 3716760.93 | 4246975.92666667 | 87.52 | |
| Lu | 175 | No Gas | 5642844.08 | 6373136.98666667 | 88.54 | |
| Rh | 103 | No Gas | 3716297.77 | 4339714.13333333 | 85.63 | |
| Sc | 45 | No Gas | 4068924.56 | 4929728.14 | 82.54 | |
| Tb | 159 | No Gas | 5375656.80 | 6085949.28333333 | 88.33 | |

II

CONTINUING CALIBRATION VERIFICATION

| | | | |
|---|---|---|---|
| Report No: | 218040620 | GCAL QC ID: | 1800 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180416B_MS1.b\081_CCV.d |
| Analyst: | AWG | Analytical Batch: | 633483 |
| Analysis Date: | 04/16/18 Time: 1831 | Analytical Method: | EPA 6020A Dissolved |

| *ANALYTE* | *TRUE* | *FOUND* | *%RECOVERY* | *Q* | *UNITS* |
|---|---|---|---|---|---|
| Iron | 1000 | 1000 | 100 | | ug/L |
| Manganese | 50.0 | 49.4 | 99 | | ug/L |

CONTROL LIMITS 90-110%

FORM II - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1800 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180416B_MS1.b |
| **File Name** | 081_CCV.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-16 18:31:30 | **Total Dilution** | 1.0000 |
| **Sample Type** | CCV | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 002CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 54.248 | 54.248 | 2.3 | 1058804.28 | 50 | |
| Be | 9 | 45 | No Gas | 9.801 | 9.801 | 2.8 | 35186.66 | 10 | |
| B | 11 | 45 | No Gas | 50.487 | 50.487 | 3.5 | 128248.49 | 50 | |
| Sr | 88 | 72 | No Gas | 9.873 | 9.873 | 4.2 | 161493.83 | 10 | |
| Zr | 90 | 72 | No Gas | 10.152 | 10.152 | 3.4 | 114846.22 | 10 | |
| Mo | 95 | 115 | No Gas | 9.175 | 9.175 | 3.3 | 33122.08 | 10 | |
| Ag | 107 | 115 | No Gas | 9.526 | 9.526 | 2.1 | 93436.57 | 10 | |
| Cd | 111 | 115 | No Gas | 9.393 | 9.393 | 3.1 | 18815.10 | 10 | |
| Sb | 121 | 115 | No Gas | 18.896 | 18.896 | 3.4 | 153095.94 | 20 | |
| Ba | 137 | 115 | No Gas | 9.709 | 9.709 | 4.0 | 25126.01 | 10 | |
| Tl | 205 | 209 | No Gas | 9.276 | 9.276 | 3.2 | 182142.62 | 10 | |
| Pb | 208 | 209 | No Gas | 9.653 | 9.653 | 4.2 | 249528.26 | 10 | |
| Na | 23 | 45 | He | 1100.223 | 1100.223 | 1.7 | 372581.03 | 1000 | > +/- 10% |
| Mg | 24 | 45 | He | 1008.958 | 1008.958 | 1.5 | 163369.64 | 1000 | |
| Al | 27 | 45 | He | 207.207 | 207.207 | 2.4 | 9949.66 | 200 | |
| Si | 29 | 45 | He | 1966.615 | 1966.615 | 2.9 | 3945.83 | 2000 | |
| K | 39 | 45 | He | 1021.451 | 1021.451 | 1.2 | 79905.52 | 1000 | |
| Ca | 44 | 45 | He | 5117.298 | 5117.298 | 2.1 | 20829.98 | 5000 | |
| Ti | 47 | 45 | He | 10.048 | 10.048 | 3.4 | 342.67 | 10 | |
| V | 51 | 72 | He | 9.516 | 9.516 | 1.5 | 12829.56 | 10 | |
| Cr | 52 | 72 | He | 9.696 | 9.696 | 1.2 | 17484.93 | 10 | |
| Mn | 55 | 72 | He | 49.361 | 49.361 | 0.7 | 38333.31 | 50 | |
| Fe | 57 | 72 | He | 1003.884 | 1003.884 | 2.1 | 35111.85 | 1000 | |
| Co | 59 | 72 | He | 9.971 | 9.971 | 1.6 | 31272.00 | 10 | |
| Ni | 60 | 72 | He | 19.55 | 19.550 | 1.8 | 17146.82 | 20 | |
| Cu | 63 | 72 | He | 9.959 | 9.959 | 0.7 | 25322.91 | 10 | |
| Zn | 66 | 72 | He | 201.763 | 201.763 | 1.1 | 61119.87 | 200 | |
| As | 75 | 72 | He | 9.98 | 9.980 | 0.9 | 2249.99 | 10 | |
| Se | 78 | 72 | He | 9.579 | 9.579 | 2.8 | 144.39 | 10 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1252570.95 | 1434384.40333333 | 87.32 | |
| Ge | 72 | He | 43153.61 | 53494.0666666667 | 80.67 | |
| In | 115 | He | 349278.17 | 422983.593333333 | 82.57 | |
| Lu | 175 | He | 1001158.34 | 1160314.62 | 86.28 | |
| Rh | 103 | He | 1376764.39 | 1802038.33333333 | 76.4 | |
| Sc | 45 | He | 100033.63 | 127114.406666667 | 78.7 | |
| Tb | 159 | He | 1722833.31 | 2010526.84666667 | 85.69 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3464805.68 | 3969825.04666667 | 87.28 | |
| Ge | 72 | No Gas | 528777.48 | 662907.366666667 | 79.77 | |
| In | 115 | No Gas | 3562914.24 | 4246975.92666667 | 83.89 | |
| Lu | 175 | No Gas | 5551886.38 | 6373136.98666667 | 87.11 | |
| Rh | 103 | No Gas | 3484648.06 | 4339714.13333333 | 80.3 | |
| Sc | 45 | No Gas | 3828123.04 | 4929728.14 | 77.65 | |
| Tb | 159 | No Gas | 5251749.20 | 6085949.28333333 | 86.29 | |

II

LOW LEVEL CONTINUING CALIBRATION VERIFICATION

| | | | |
|---|---|---|---|
| Report No: | 218040620 | GCAL QC ID: | 1803 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180416B_MS1.b\083LCCV.d |
| Analyst: | AWG | Analytical Batch: | 633483 |
| Analysis Date: | 04/16/18 Time: 1840 | Analytical Method: | EPA 6020A Dissolved |

| *ANALYTE* | *TRUE* | *FOUND* | *%RECOVERY* | *Q* | *UNITS* |
|---|---|---|---|---|---|
| Iron | 100 | 104 | 104 | | ug/L |
| Manganese | 5.00 | 4.63 | 93 | | ug/L |

CONTROL LIMITS 70-130%

FORM II - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1803 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180416B_MS1.b |
| **File Name** | 083LCCV.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-16 18:40:16 | **Total Dilution** | 1.0000 |
| **Sample Type** | LLCCV | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 002CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 5.604 | 5.604 | 1.1 | 248296.19 | 5 | |
| Be | 9 | 45 | No Gas | 0.975 | 0.975 | 6.5 | 3549.06 | 1 | |
| B | 11 | 45 | No Gas | 9.553 | 9.553 | 4.4 | 30334.62 | 10 | |
| Sr | 88 | 72 | No Gas | 1.005 | 1.005 | 3.2 | 16542.49 | 1 | |
| Zr | 90 | 72 | No Gas | 0.877 | 0.877 | 6.0 | 10108.83 | 1 | |
| Mo | 95 | 115 | No Gas | 0.877 | 0.877 | 3.1 | 3168.13 | 1 | |
| Ag | 107 | 115 | No Gas | 0.958 | 0.958 | 3.4 | 9341.77 | 1 | |
| Cd | 111 | 115 | No Gas | 0.964 | 0.964 | 4.0 | 1934.12 | 1 | |
| Sb | 121 | 115 | No Gas | 1.928 | 1.928 | 3.0 | 15873.72 | 2 | |
| Ba | 137 | 115 | No Gas | 1.037 | 1.037 | 4.4 | 2720.28 | 1 | |
| Tl | 205 | 209 | No Gas | 0.92 | 0.920 | 3.9 | 18145.72 | 1 | |
| Pb | 208 | 209 | No Gas | 0.973 | 0.973 | 1.1 | 26173.64 | 1 | |
| Na | 23 | 45 | He | 151.466 | 151.466 | 0.8 | 59967.24 | 100 | > +/- 30% |
| Mg | 24 | 45 | He | 102.821 | 102.821 | 3.9 | 16829.04 | 100 | |
| Al | 27 | 45 | He | 20.251 | 20.251 | 8.1 | 1022.04 | 20 | |
| Si | 29 | 45 | He | 114.268 | 114.268 | 6.6 | 1475.41 | 200 | > +/- 30% |
| K | 39 | 45 | He | 110.806 | 110.806 | 1.9 | 13742.83 | 100 | |
| Ca | 44 | 45 | He | 534.561 | 534.561 | 1.9 | 2330.21 | 500 | |
| Ti | 47 | 45 | He | 1.091 | 1.091 | 12.0 | 42.67 | 1 | |
| V | 51 | 72 | He | 0.877 | 0.877 | 8.9 | 1377.85 | 1 | |
| Cr | 52 | 72 | He | 1.007 | 1.007 | 5.5 | 1993.48 | 1 | |
| Mn | 55 | 72 | He | 4.634 | 4.634 | 3.7 | 3944.97 | 5 | |
| Fe | 57 | 72 | He | 103.934 | 103.934 | 4.1 | 3643.90 | 100 | |
| Co | 59 | 72 | He | 1.059 | 1.059 | 4.1 | 3315.93 | 1 | |
| Ni | 60 | 72 | He | 2.23 | 2.230 | 2.3 | 1959.03 | 2 | |
| Cu | 63 | 72 | He | 0.948 | 0.948 | 2.1 | 3080.33 | 1 | |
| Zn | 66 | 72 | He | 20.052 | 20.052 | 4.1 | 6173.47 | 20 | |
| As | 75 | 72 | He | 0.935 | 0.935 | 1.0 | 217.00 | 1 | |
| Se | 78 | 72 | He | 1.201 | 1.201 | 15.4 | 20.57 | 1 | |
| Sn | 120 | 115 | He | 1.286 | 1.286 | 4.6 | 1646.78 | 1 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1253938.60 | 1434384.40333333 | 87.42 | |
| Ge | 72 | He | 42877.30 | 53494.0666666667 | 80.15 | |
| In | 115 | He | 352320.99 | 422983.593333333 | 83.29 | |
| Lu | 175 | He | 995091.34 | 1160314.62 | 85.76 | |
| Rh | 103 | He | 1390584.49 | 1802038.33333333 | 77.17 | |
| Sc | 45 | He | 100885.77 | 127114.406666667 | 79.37 | |
| Tb | 159 | He | 1722974.61 | 2010526.84666667 | 85.7 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3455424.64 | 3969825.04666667 | 87.04 | |
| Ge | 72 | No Gas | 522087.70 | 662907.366666667 | 78.76 | |
| In | 115 | No Gas | 3523629.08 | 4246975.92666667 | 82.97 | |
| Lu | 175 | No Gas | 5463714.92 | 6373136.98666667 | 85.73 | |
| Rh | 103 | No Gas | 3495973.75 | 4339714.13333333 | 80.56 | |
| Sc | 45 | No Gas | 3837656.93 | 4929728.14 | 77.85 | |
| Tb | 159 | No Gas | 5185634.51 | 6085949.28333333 | 85.21 | |

# Form III

# Blanks

III

INITIAL CALIBRATION BLANK

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Blank ID: | 1700 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180417A_MS1.b\016_ICB.d |
| Analyst: | AWG | Analytical Batch: | 633612 |
| Analysis Date: | 04/17/18 Time: 1113 | Analytical Method: | EPA 6020A |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Arsenic | 0.50 | ug/L | U | 0.25 | 0.50 | 1.00 |
| Iron | 50.0 | ug/L | U | 25.0 | 50.0 | 100 |
| Manganese | 2.50 | ug/L | U | 1.25 | 2.50 | 5.00 |

FORM III - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1700 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 016_ICB.d | **Comment** | ICPMS-1,AWG |
| **Acq Time** | 2018-04-17 11:13:29 | **Total Dilution** | 1.0000 |
| **Sample Type** | ICB | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 0.163 | 0.163 | 0.3 | 169480.08 | 2.5 | |
| Be | 9 | 45 | No Gas | 0.008 | 0.008 | 7.3 | 120.00 | 0.5 | |
| B | 11 | 45 | No Gas | 6.065 | 6.065 | 5.0 | 16505.31 | 5 | >LOD |
| Sr | 88 | 72 | No Gas | 0.004 | 0.004 | 24.6 | 423.36 | 0.5 | |
| Zr | 90 | 72 | No Gas | 0.002 | 0.002 | 19.4 | 430.01 | 0.5 | |
| Mo | 95 | 115 | No Gas | 0.015 | 0.015 | 28.6 | 93.34 | 0.5 | |
| Ag | 107 | 115 | No Gas | 0.008 | 0.008 | 22.0 | 115.56 | 0.5 | |
| Cd | 111 | 115 | No Gas | 0.008 | 0.008 | 5.2 | 48.33 | 0.5 | |
| Sb | 121 | 115 | No Gas | 0.063 | 0.063 | 4.8 | 702.25 | 1 | |
| Ba | 137 | 115 | No Gas | 0.051 | 0.051 | 14.9 | 183.34 | 0.5 | |
| Tl | 205 | 209 | No Gas | 0.006 | 0.006 | 10.1 | 382.23 | 0.5 | |
| Pb | 208 | 209 | No Gas | 0.011 | 0.011 | 0.7 | 1520.12 | 0.5 | |
| Na | 23 | 45 | He | 1.573 | 1.573 | 6.7 | 9446.31 | 50 | |
| Mg | 24 | 45 | He | 0.366 | 0.366 | 38.3 | 123.34 | 50 | |
| Al | 27 | 45 | He | 0.099 | 0.099 | 6.0 | 38.67 | 10 | |
| Si | 29 | 45 | He | 70.675 | 70.675 | 2.9 | 1492.08 | 100 | |
| K | 39 | 45 | He | -1.622 | -1.622 | 1.4 | 7158.51 | 50 | |
| Ca | 44 | 45 | He | -0.564 | -0.564 | 11.9 | 210.01 | 250 | |
| Ti | 47 | 45 | He | -0.002 | -0.002 | 44.6 | 4.67 | 0.5 | |
| V | 51 | 72 | He | 0.018 | 0.018 | 36.3 | 108.89 | 0.5 | |
| Cr | 52 | 72 | He | 0.019 | 0.019 | 6.5 | 270.01 | 0.5 | |
| Mn | 55 | 72 | He | 0.031 | 0.031 | 13.2 | 66.67 | 2.5 | |
| Fe | 57 | 72 | He | 0.66 | 0.660 | 21.7 | 53.33 | 50 | |
| Co | 59 | 72 | He | 0.005 | 0.005 | 31.5 | 52.22 | 0.5 | |
| Ni | 60 | 72 | He | 0.005 | 0.005 | 46.2 | 35.56 | 1 | |
| Cu | 63 | 72 | He | -0.102 | -0.102 | 26.2 | 886.71 | 0.5 | |
| Zn | 66 | 72 | He | 0.178 | 0.178 | 17.1 | 220.01 | 10 | |
| As | 75 | 72 | He | 0.012 | 0.012 | 30.3 | 12.83 | 0.5 | |
| Se | 78 | 72 | He | 0.06 | 0.060 | 31.5 | 4.23 | 0.5 | |
| Sn | 120 | 115 | He | -0.002 | -0.002 | 13.6 | 106.67 | 0.5 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1309278.26 | 1291085.71 | 101.41 | |
| Ge | 72 | He | 48213.13 | 47456.4966666667 | 101.59 | |
| In | 115 | He | 379969.53 | 372695.226666667 | 101.95 | |
| Lu | 175 | He | 1042321.47 | 1029247.51 | 101.27 | |
| Rh | 103 | He | 1634715.25 | 1626201.63666667 | 100.52 | |
| Sc | 45 | He | 111724.93 | 109033.716666667 | 102.47 | |
| Tb | 159 | He | 1850077.89 | 1820531.74333333 | 101.62 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3633673.28 | 3617762.55 | 100.44 | |
| Ge | 72 | No Gas | 610817.01 | 597606.886666667 | 102.21 | |
| In | 115 | No Gas | 3927912.45 | 3893084.07 | 100.89 | |
| Lu | 175 | No Gas | 5972038.45 | 5877008.03666667 | 101.62 | |
| Rh | 103 | No Gas | 3984157.62 | 3958933.73 | 100.64 | |
| Sc | 45 | No Gas | 4112369.70 | 4093118.31 | 100.47 | |
| Tb | 159 | No Gas | 5751644.71 | 5654253.04333333 | 101.72 | |

III
METHOD BLANK

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Blank ID: | MB1793968 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180417A_MS1.b\029SMPL.d |
| Analyst: | AWG | Analytical Batch: | 633612 |
| Analysis Date: | 04/17/18 Time: 1213 | Analytical Method: | EPA 6020A Dissolved |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Iron | 50.0 | ug/L | U | 25.0 | 50.0 | 100 |

FORM III - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1793968 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 029SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 12:13:59 | **Total Dilution** | 1.0000 |
| **Sample Type** | MBWATER | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 0.02 | 0.020 | 1.7 | 173353.10 | 2.5 | |
| Be | 9 | 45 | No Gas | -0.006 | -0.006 | 27.6 | 67.33 | 0.5 | |
| B | 11 | 45 | No Gas | 1.712 | 1.712 | 5.5 | 5261.02 | 5 | |
| Sr | 88 | 72 | No Gas | 0.031 | 0.031 | 5.9 | 950.08 | 0.5 | |
| Zr | 90 | 72 | No Gas | 0.026 | 0.026 | 5.7 | 758.92 | 0.5 | |
| Mo | 95 | 115 | No Gas | 0.001 | 0.001 | 46.4 | 40.00 | 0.5 | |
| Ag | 107 | 115 | No Gas | 0.002 | 0.002 | 48.2 | 42.22 | 0.5 | |
| Cd | 111 | 115 | No Gas | 0 | 0.000 | 17.6 | 32.33 | 0.5 | |
| Sb | 121 | 115 | No Gas | 0.019 | 0.019 | 11.7 | 297.79 | 1 | |
| Ba | 137 | 115 | No Gas | 0.133 | 0.133 | 9.7 | 428.90 | 0.5 | |
| Tl | 205 | 209 | No Gas | -0.006 | -0.006 | 15.0 | 141.12 | 0.5 | |
| Pb | 208 | 209 | No Gas | 0.023 | 0.023 | 1.8 | 1910.12 | 0.5 | |
| Na | 23 | 45 | He | 20.331 | 20.331 | 4.1 | 17086.08 | 50 | |
| Mg | 24 | 45 | He | 1.605 | 1.605 | 24.9 | 373.35 | 50 | |
| Al | 27 | 45 | He | 1.335 | 1.335 | 10.7 | 112.00 | 10 | |
| Si | 29 | 45 | He | 11.418 | 11.418 | 6.7 | 1416.74 | 100 | |
| K | 39 | 45 | He | -5.531 | -5.531 | 3.6 | 6918.38 | 50 | |
| Ca | 44 | 45 | He | 20.162 | 20.162 | 15.1 | 315.01 | 250 | |
| Ti | 47 | 45 | He | 0.061 | 0.061 | 7.9 | 7.33 | 0.5 | |
| V | 51 | 72 | He | 0.021 | 0.021 | 10.2 | 114.45 | 0.5 | |
| Cr | 52 | 72 | He | 0.003 | 0.003 | 15.5 | 241.12 | 0.5 | |
| Mn | 55 | 72 | He | 0.277 | 0.277 | 12.5 | 284.45 | 2.5 | |
| Fe | 57 | 72 | He | 3.503 | 3.503 | 17.6 | 170.01 | 50 | |
| Co | 59 | 72 | He | 0.003 | 0.003 | 22.9 | 44.44 | 0.5 | |
| Ni | 60 | 72 | He | 0.193 | 0.193 | 19.0 | 228.89 | 1 | |
| Cu | 63 | 72 | He | 0.169 | 0.169 | 3.4 | 1677.89 | 0.5 | |
| Zn | 66 | 72 | He | 0.614 | 0.614 | 5.6 | 373.34 | 10 | |
| As | 75 | 72 | He | -0.003 | -0.003 | 28.0 | 9.17 | 0.5 | |
| Se | 78 | 72 | He | 0.04 | 0.040 | 24.7 | 3.99 | 0.5 | |
| Sn | 120 | 115 | He | 0.013 | 0.013 | 6.8 | 130.00 | 0.5 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1341773.57 | 1291085.71 | 103.93 | |
| Ge | 72 | He | 49025.35 | 47456.4966666667 | 103.31 | |
| In | 115 | He | 389282.48 | 372695.226666667 | 104.45 | |
| Lu | 175 | He | 1058821.88 | 1029247.51 | 102.87 | |
| Rh | 103 | He | 1670980.73 | 1626201.63666667 | 102.75 | |
| Sc | 45 | He | 113301.48 | 109033.716666667 | 103.91 | |
| Tb | 159 | He | 1897743.62 | 1820531.74333333 | 104.24 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3744638.59 | 3617762.55 | 103.51 | |
| Ge | 72 | No Gas | 627200.11 | 597606.886666667 | 104.95 | |
| In | 115 | No Gas | 3986762.96 | 3893084.07 | 102.41 | |
| Lu | 175 | No Gas | 6146725.53 | 5877008.03666667 | 104.59 | |
| Rh | 103 | No Gas | 4092754.14 | 3958933.73 | 103.38 | |
| Sc | 45 | No Gas | 4268924.69 | 4093118.31 | 104.3 | |
| Tb | 159 | No Gas | 5913180.75 | 5654253.04333333 | 104.58 | |

III

CONTINUING CALIBRATION BLANK

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Blank ID: | 1900 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180417A_MS1.b\033_CCB.d |
| Analyst: | AWG | Analytical Batch: | 633612 |
| Analysis Date: | 04/17/18 Time: 1231 | Analytical Method: | EPA 6020A |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Arsenic | 0.50 | ug/L | U | 0.25 | 0.50 | 1.00 |
| Iron | 50.0 | ug/L | U | 25.0 | 50.0 | 100 |
| Manganese | 2.50 | ug/L | U | 1.25 | 2.50 | 5.00 |

FORM III - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1900 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 033_CCB.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 12:31:32 | **Total Dilution** | 1.0000 |
| **Sample Type** | CCB | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | -0.001 | -0.001 | 0.7 | 172071.27 | 2.5 | |
| Be | 9 | 45 | No Gas | 0 | 0.000 | 13.9 | 90.00 | 0.5 | |
| B | 11 | 45 | No Gas | 3.058 | 3.058 | 2.9 | 8882.65 | 5 | |
| Sr | 88 | 72 | No Gas | 0.008 | 0.008 | 10.9 | 506.70 | 0.5 | |
| Zr | 90 | 72 | No Gas | 0.015 | 0.015 | 16.6 | 611.13 | 0.5 | |
| Mo | 95 | 115 | No Gas | 0.019 | 0.019 | 28.4 | 111.11 | 0.5 | |
| Ag | 107 | 115 | No Gas | 0.009 | 0.009 | 13.1 | 125.56 | 0.5 | |
| Cd | 111 | 115 | No Gas | 0.005 | 0.005 | 36.3 | 43.00 | 0.5 | |
| Sb | 121 | 115 | No Gas | 0.041 | 0.041 | 7.6 | 508.91 | 1 | |
| Ba | 137 | 115 | No Gas | 0.017 | 0.017 | 48.7 | 84.44 | 0.5 | |
| Tl | 205 | 209 | No Gas | 0.005 | 0.005 | 15.2 | 363.34 | 0.5 | |
| Pb | 208 | 209 | No Gas | 0.006 | 0.006 | 1.8 | 1386.76 | 0.5 | |
| Na | 23 | 45 | He | 3.342 | 3.342 | 3.9 | 10220.09 | 50 | |
| Mg | 24 | 45 | He | 0.546 | 0.546 | 32.5 | 160.01 | 50 | |
| Al | 27 | 45 | He | 0.245 | 0.245 | 20.0 | 47.33 | 10 | |
| Si | 29 | 45 | He | -2.233 | -2.233 | 8.2 | 1385.40 | 100 | |
| K | 39 | 45 | He | -2.559 | -2.559 | 2.7 | 7131.79 | 50 | |
| Ca | 44 | 45 | He | -4.329 | -4.329 | 22.0 | 193.34 | 250 | |
| Ti | 47 | 45 | He | 0.038 | 0.038 | 48.2 | 6.33 | 0.5 | |
| V | 51 | 72 | He | 0.003 | 0.003 | 36.7 | 86.67 | 0.5 | |
| Cr | 52 | 72 | He | -0.007 | -0.007 | 6.3 | 221.11 | 0.5 | |
| Mn | 55 | 72 | He | 0.018 | 0.018 | 15.6 | 56.67 | 2.5 | |
| Fe | 57 | 72 | He | 0.791 | 0.791 | 60.1 | 60.00 | 50 | |
| Co | 59 | 72 | He | 0.008 | 0.008 | 21.6 | 62.22 | 0.5 | |
| Ni | 60 | 72 | He | 0.016 | 0.016 | 94.7 | 47.78 | 1 | |
| Cu | 63 | 72 | He | -0.158 | -0.158 | 6.5 | 742.25 | 0.5 | |
| Zn | 66 | 72 | He | 0.04 | 0.040 | 13.1 | 176.67 | 10 | |
| As | 75 | 72 | He | 0.006 | 0.006 | 35.7 | 11.67 | 0.5 | |
| Se | 78 | 72 | He | 0.094 | 0.094 | 29.1 | 4.89 | 0.5 | |
| Sn | 120 | 115 | He | -0.001 | -0.001 | 4.6 | 111.11 | 0.5 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1313195.45 | 1291085.71 | 101.71 | |
| Ge | 72 | He | 49292.98 | 47456.4966666667 | 103.87 | |
| In | 115 | He | 386741.29 | 372695.226666667 | 103.77 | |
| Lu | 175 | He | 1052412.12 | 1029247.51 | 102.25 | |
| Rh | 103 | He | 1681726.18 | 1626201.63666667 | 103.41 | |
| Sc | 45 | He | 112602.09 | 109033.716666667 | 103.27 | |
| Tb | 159 | He | 1887516.90 | 1820531.74333333 | 103.68 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3684090.26 | 3617762.55 | 101.83 | |
| Ge | 72 | No Gas | 622974.40 | 597606.886666667 | 104.24 | |
| In | 115 | No Gas | 3996339.23 | 3893084.07 | 102.65 | |
| Lu | 175 | No Gas | 6091665.74 | 5877008.03666667 | 103.65 | |
| Rh | 103 | No Gas | 4096749.42 | 3958933.73 | 103.48 | |
| Sc | 45 | No Gas | 4247099.14 | 4093118.31 | 103.76 | |
| Tb | 159 | No Gas | 5890902.62 | 5654253.04333333 | 104.19 | |

III

CONTINUING CALIBRATION BLANK

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Blank ID: | 1900 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180417A_MS1.b\048_CCB.d |
| Analyst: | AWG | Analytical Batch: | 633612 |
| Analysis Date: | 04/17/18 Time: 1405 | Analytical Method: | EPA 6020A |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Arsenic | 0.50 | ug/L | U | 0.25 | 0.50 | 1.00 |
| Iron | 50.0 | ug/L | U | 25.0 | 50.0 | 100 |
| Manganese | 2.50 | ug/L | U | 1.25 | 2.50 | 5.00 |

FORM III - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1900 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 048_CCB.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 14:05:47 | **Total Dilution** | 1.0000 |
| **Sample Type** | CCB | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 0.032 | 0.032 | 1.1 | 169913.71 | 2.5 | |
| Be | 9 | 45 | No Gas | -0.004 | -0.004 | 8.8 | 73.33 | 0.5 | |
| B | 11 | 45 | No Gas | 1.49 | 1.490 | 3.2 | 4554.10 | 5 | |
| Sr | 88 | 72 | No Gas | 0.004 | 0.004 | 18.6 | 430.02 | 0.5 | |
| Zr | 90 | 72 | No Gas | 0.01 | 0.010 | 7.8 | 541.13 | 0.5 | |
| Mo | 95 | 115 | No Gas | 0.016 | 0.016 | 35.0 | 97.78 | 0.5 | |
| Ag | 107 | 115 | No Gas | 0.006 | 0.006 | 18.8 | 91.11 | 0.5 | |
| Cd | 111 | 115 | No Gas | 0 | 0.000 | 16.0 | 33.00 | 0.5 | |
| Sb | 121 | 115 | No Gas | 0.022 | 0.022 | 6.5 | 324.45 | 1 | |
| Ba | 137 | 115 | No Gas | 0.012 | 0.012 | 26.6 | 68.89 | 0.5 | |
| Tl | 205 | 209 | No Gas | -0.001 | -0.001 | 16.4 | 242.23 | 0.5 | |
| Pb | 208 | 209 | No Gas | -0.001 | -0.001 | 6.6 | 1216.75 | 0.5 | |
| Na | 23 | 45 | He | 2.267 | 2.267 | 4.8 | 9759.92 | 50 | |
| Mg | 24 | 45 | He | 0.362 | 0.362 | 16.9 | 123.34 | 50 | |
| Al | 27 | 45 | He | 0.098 | 0.098 | 16.6 | 38.67 | 10 | |
| Si | 29 | 45 | He | 12.789 | 12.789 | 0.9 | 1405.40 | 100 | |
| K | 39 | 45 | He | -4.238 | -4.238 | 6.0 | 6958.41 | 50 | |
| Ca | 44 | 45 | He | -6.774 | -6.774 | 12.7 | 180.01 | 250 | |
| Ti | 47 | 45 | He | 0.023 | 0.023 | 27.0 | 5.67 | 0.5 | |
| V | 51 | 72 | He | 0.039 | 0.039 | 15.0 | 141.12 | 0.5 | |
| Cr | 52 | 72 | He | 0.006 | 0.006 | 10.2 | 244.45 | 0.5 | |
| Mn | 55 | 72 | He | 0.021 | 0.021 | 12.0 | 57.78 | 2.5 | |
| Fe | 57 | 72 | He | 0.657 | 0.657 | 57.3 | 53.33 | 50 | |
| Co | 59 | 72 | He | 0 | 0.000 | 26.0 | 32.22 | 0.5 | |
| Ni | 60 | 72 | He | 0.004 | 0.004 | 11.2 | 34.45 | 1 | |
| Cu | 63 | 72 | He | -0.241 | -0.241 | 11.2 | 492.24 | 0.5 | |
| Zn | 66 | 72 | He | 0.046 | 0.046 | 15.2 | 175.56 | 10 | |
| As | 75 | 72 | He | 0.015 | 0.015 | 23.8 | 13.67 | 0.5 | |
| Se | 78 | 72 | He | 0.005 | 0.005 | 49.8 | 3.39 | 0.5 | |
| Sn | 120 | 115 | He | -0.009 | -0.009 | 41.6 | 98.89 | 0.5 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1310464.04 | 1291085.71 | 101.5 | |
| Ge | 72 | He | 48445.98 | 47456.4966666667 | 102.09 | |
| In | 115 | He | 381917.90 | 372695.226666667 | 102.47 | |
| Lu | 175 | He | 1039727.98 | 1029247.51 | 101.02 | |
| Rh | 103 | He | 1652750.28 | 1626201.63666667 | 101.63 | |
| Sc | 45 | He | 112343.96 | 109033.716666667 | 103.04 | |
| Tb | 159 | He | 1856178.10 | 1820531.74333333 | 101.96 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3731625.78 | 3617762.55 | 103.15 | |
| Ge | 72 | No Gas | 615185.34 | 597606.886666667 | 102.94 | |
| In | 115 | No Gas | 3947055.19 | 3893084.07 | 101.39 | |
| Lu | 175 | No Gas | 6167910.32 | 5877008.03666667 | 104.95 | |
| Rh | 103 | No Gas | 4051558.73 | 3958933.73 | 102.34 | |
| Sc | 45 | No Gas | 4178902.34 | 4093118.31 | 102.1 | |
| Tb | 159 | No Gas | 5895150.12 | 5654253.04333333 | 104.26 | |

III

METHOD BLANK

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Blank ID: | MB1794155 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180417A_MS1.b\050SMPL.d |
| Analyst: | AWG | Analytical Batch: | 633612 |
| Analysis Date: | 04/17/18 Time: 1438 | Analytical Method: | EPA 6020A |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Arsenic | 0.43 | ug/L | J | 0.25 | 0.50 | 1.00 |
| Iron | 50.0 | ug/L | U | 25.0 | 50.0 | 100 |
| Manganese | 2.50 | ug/L | U | 1.25 | 2.50 | 5.00 |

FORM III - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1794155 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 050SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 14:38:32 | **Total Dilution** | 1.0000 |
| **Sample Type** | MBWATER | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | -0.186 | -0.186 | 0.8 | 166889.73 | 2.5 | |
| Be | 9 | 45 | No Gas | 0.496 | 0.496 | 6.4 | 2078.14 | 0.5 | |
| B | 11 | 45 | No Gas | 0.695 | 0.695 | 3.4 | 2446.93 | 5 | |
| Sr | 88 | 72 | No Gas | 0.145 | 0.145 | 12.2 | 3080.45 | 0.5 | |
| Zr | 90 | 72 | No Gas | 0.003 | 0.003 | 7.9 | 451.12 | 0.5 | |
| Mo | 95 | 115 | No Gas | 0.265 | 0.265 | 6.4 | 1101.16 | 0.5 | |
| Ag | 107 | 115 | No Gas | 0.001 | 0.001 | 10.8 | 35.55 | 0.5 | |
| Cd | 111 | 115 | No Gas | 0.492 | 0.492 | 2.3 | 1111.04 | 0.5 | |
| Sb | 121 | 115 | No Gas | 0.27 | 0.270 | 4.5 | 2635.81 | 1 | |
| Ba | 137 | 115 | No Gas | 0.203 | 0.203 | 7.5 | 632.25 | 0.5 | |
| Tl | 205 | 209 | No Gas | 0.106 | 0.106 | 5.5 | 2525.81 | 0.5 | |
| Pb | 208 | 209 | No Gas | 0.26 | 0.260 | 1.5 | 8648.07 | 0.5 | |
| Na | 23 | 45 | He | 14.827 | 14.827 | 3.7 | 14303.33 | 50 | |
| Mg | 24 | 45 | He | 4.461 | 4.461 | 7.3 | 906.74 | 50 | |
| Al | 27 | 45 | He | 2.46 | 2.460 | 5.8 | 171.33 | 10 | |
| Si | 29 | 45 | He | 6.009 | 6.009 | 4.4 | 1352.73 | 100 | |
| K | 39 | 45 | He | -5.223 | -5.223 | 7.1 | 6674.89 | 50 | |
| Ca | 44 | 45 | He | -3.003 | -3.003 | 31.9 | 193.34 | 250 | |
| Ti | 47 | 45 | He | 0.15 | 0.150 | 35.5 | 10.67 | 0.5 | |
| V | 51 | 72 | He | 0.194 | 0.194 | 11.2 | 373.34 | 0.5 | |
| Cr | 52 | 72 | He | 0.094 | 0.094 | 12.2 | 418.90 | 0.5 | |
| Mn | 55 | 72 | He | 0.503 | 0.503 | 4.6 | 471.12 | 2.5 | |
| Fe | 57 | 72 | He | 0.667 | 0.667 | 88.6 | 53.34 | 50 | |
| Co | 59 | 72 | He | 0.119 | 0.119 | 2.1 | 454.46 | 0.5 | |
| Ni | 60 | 72 | He | 0.268 | 0.268 | 11.0 | 297.79 | 1 | |
| Cu | 63 | 72 | He | 0.006 | 0.006 | 4.5 | 1178.95 | 0.5 | |
| Zn | 66 | 72 | He | 0.794 | 0.794 | 8.7 | 424.46 | 10 | |
| As | 75 | 72 | He | 0.426 | 0.426 | 11.2 | 114.83 | 0.5 | |
| Se | 78 | 72 | He | 0.024 | 0.024 | 3.4 | 3.64 | 0.5 | |
| Sn | 120 | 115 | He | 0.188 | 0.188 | 13.6 | 344.45 | 0.5 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1280836.70 | 1291085.71 | 99.21 | |
| Ge | 72 | He | 47764.08 | 47456.4966666667 | 100.65 | |
| In | 115 | He | 371660.03 | 372695.226666667 | 99.72 | |
| Lu | 175 | He | 1016707.12 | 1029247.51 | 98.78 | |
| Rh | 103 | He | 1646568.55 | 1626201.63666667 | 101.25 | |
| Sc | 45 | He | 108928.95 | 109033.716666667 | 99.9 | |
| Tb | 159 | He | 1854387.16 | 1820531.74333333 | 101.86 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3745009.32 | 3617762.55 | 103.52 | |
| Ge | 72 | No Gas | 611536.97 | 597606.886666667 | 102.33 | |
| In | 115 | No Gas | 3967633.39 | 3893084.07 | 101.91 | |
| Lu | 175 | No Gas | 6090710.74 | 5877008.03666667 | 103.64 | |
| Rh | 103 | No Gas | 3991539.28 | 3958933.73 | 100.82 | |
| Sc | 45 | No Gas | 4202331.78 | 4093118.31 | 102.67 | |
| Tb | 159 | No Gas | 5833244.91 | 5654253.04333333 | 103.17 | |

III

CONTINUING CALIBRATION BLANK

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Blank ID: | 1900 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180417A_MS1.b\064_CCB.d |
| Analyst: | AWG | Analytical Batch: | 633612 |
| Analysis Date: | 04/17/18 Time: 1539 | Analytical Method: | EPA 6020A |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Arsenic | 0.50 | ug/L | U | 0.25 | 0.50 | 1.00 |
| Iron | 50.0 | ug/L | U | 25.0 | 50.0 | 100 |
| Manganese | 2.50 | ug/L | U | 1.25 | 2.50 | 5.00 |

FORM III - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1900 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 064_CCB.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 15:39:53 | **Total Dilution** | 1.0000 |
| **Sample Type** | CCB | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 0.092 | 0.092 | 0.8 | 169807.34 | 2.5 | |
| Be | 9 | 45 | No Gas | 0.02 | 0.020 | 2.5 | 169.33 | 0.5 | |
| B | 11 | 45 | No Gas | 1.856 | 1.856 | 7.4 | 5494.42 | 5 | |
| Sr | 88 | 72 | No Gas | 0.016 | 0.016 | 18.4 | 640.04 | 0.5 | |
| Zr | 90 | 72 | No Gas | 0.009 | 0.009 | 6.6 | 526.68 | 0.5 | |
| Mo | 95 | 115 | No Gas | 0.031 | 0.031 | 11.3 | 156.67 | 0.5 | |
| Ag | 107 | 115 | No Gas | 0.006 | 0.006 | 20.7 | 88.89 | 0.5 | |
| Cd | 111 | 115 | No Gas | 0.028 | 0.028 | 15.2 | 93.33 | 0.5 | |
| Sb | 121 | 115 | No Gas | 0.034 | 0.034 | 3.3 | 440.01 | 1 | |
| Ba | 137 | 115 | No Gas | 0.071 | 0.071 | 25.7 | 241.12 | 0.5 | |
| Tl | 205 | 209 | No Gas | 0.005 | 0.005 | 2.9 | 374.46 | 0.5 | |
| Pb | 208 | 209 | No Gas | 0.014 | 0.014 | 2.4 | 1653.45 | 0.5 | |
| Na | 23 | 45 | He | 20.163 | 20.163 | 2.7 | 16261.79 | 50 | |
| Mg | 24 | 45 | He | 0.315 | 0.315 | 48.1 | 110.00 | 50 | |
| Al | 27 | 45 | He | 0.061 | 0.061 | 28.5 | 35.33 | 10 | |
| Si | 29 | 45 | He | 9.75 | 9.750 | 9.1 | 1350.06 | 100 | |
| K | 39 | 45 | He | -6.169 | -6.169 | 8.6 | 6558.26 | 50 | |
| Ca | 44 | 45 | He | 9.071 | 9.071 | 15.1 | 248.34 | 250 | |
| Ti | 47 | 45 | He | -0.04 | -0.040 | 57.7 | 3.00 | 0.5 | |
| V | 51 | 72 | He | 0.022 | 0.022 | 13.1 | 114.45 | 0.5 | |
| Cr | 52 | 72 | He | -0.004 | -0.004 | 12.3 | 221.12 | 0.5 | |
| Mn | 55 | 72 | He | 0.159 | 0.159 | 20.2 | 177.78 | 2.5 | |
| Fe | 57 | 72 | He | 3.833 | 3.833 | 40.1 | 180.01 | 50 | |
| Co | 59 | 72 | He | 0.011 | 0.011 | 26.2 | 72.22 | 0.5 | |
| Ni | 60 | 72 | He | 0.034 | 0.034 | 35.2 | 64.45 | 1 | |
| Cu | 63 | 72 | He | -0.267 | -0.267 | 14.2 | 416.68 | 0.5 | |
| Zn | 66 | 72 | He | 0.096 | 0.096 | 23.1 | 192.23 | 10 | |
| As | 75 | 72 | He | 0.038 | 0.038 | 45.6 | 19.17 | 0.5 | |
| Se | 78 | 72 | He | -0.075 | -0.075 | 36.5 | 2.11 | 0.5 | |
| Sn | 120 | 115 | He | 0.001 | 0.001 | 4.6 | 111.11 | 0.5 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1311185.63 | 1291085.71 | 101.56 | |
| Ge | 72 | He | 48214.27 | 47456.4966666667 | 101.6 | |
| In | 115 | He | 378453.17 | 372695.226666667 | 101.54 | |
| Lu | 175 | He | 1042328.55 | 1029247.51 | 101.27 | |
| Rh | 103 | He | 1645103.62 | 1626201.63666667 | 101.16 | |
| Sc | 45 | He | 108242.20 | 109033.716666667 | 99.27 | |
| Tb | 159 | He | 1887376.33 | 1820531.74333333 | 103.67 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3761600.47 | 3617762.55 | 103.98 | |
| Ge | 72 | No Gas | 611862.30 | 597606.886666667 | 102.39 | |
| In | 115 | No Gas | 3949688.20 | 3893084.07 | 101.45 | |
| Lu | 175 | No Gas | 6188789.07 | 5877008.03666667 | 105.31 | |
| Rh | 103 | No Gas | 4057043.45 | 3958933.73 | 102.48 | |
| Sc | 45 | No Gas | 4150311.92 | 4093118.31 | 101.4 | |
| Tb | 159 | No Gas | 5893089.91 | 5654253.04333333 | 104.22 | |

III

CONTINUING CALIBRATION BLANK

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Blank ID: | 1900 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180417A_MS1.b\076_CCB.d |
| Analyst: | AWG | Analytical Batch: | 633612 |
| Analysis Date: | 04/17/18 Time: 1632 | Analytical Method: | EPA 6020A |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Arsenic | 0.50 | ug/L | U | 0.25 | 0.50 | 1.00 |
| Iron | 50.0 | ug/L | U | 25.0 | 50.0 | 100 |
| Manganese | 2.50 | ug/L | U | 1.25 | 2.50 | 5.00 |

FORM III - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1900 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 076_CCB.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 16:32:25 | **Total Dilution** | 1.0000 |
| **Sample Type** | CCB | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | -0.088 | -0.088 | 0.4 | 167640.76 | 2.5 | |
| Be | 9 | 45 | No Gas | 0.014 | 0.014 | 16.2 | 144.67 | 0.5 | |
| B | 11 | 45 | No Gas | 1.444 | 1.444 | 3.9 | 4430.76 | 5 | |
| Sr | 88 | 72 | No Gas | 0.021 | 0.021 | 9.0 | 736.72 | 0.5 | |
| Zr | 90 | 72 | No Gas | 0.009 | 0.009 | 6.5 | 527.79 | 0.5 | |
| Mo | 95 | 115 | No Gas | 0.021 | 0.021 | 16.7 | 120.00 | 0.5 | |
| Ag | 107 | 115 | No Gas | 0.003 | 0.003 | 27.1 | 55.56 | 0.5 | |
| Cd | 111 | 115 | No Gas | 0.012 | 0.012 | 13.1 | 58.33 | 0.5 | |
| Sb | 121 | 115 | No Gas | 0.028 | 0.028 | 12.5 | 385.57 | 1 | |
| Ba | 137 | 115 | No Gas | 0.011 | 0.011 | 33.1 | 65.56 | 0.5 | |
| Tl | 205 | 209 | No Gas | 0.002 | 0.002 | 3.8 | 305.56 | 0.5 | |
| Pb | 208 | 209 | No Gas | 0.003 | 0.003 | 11.1 | 1310.08 | 0.5 | |
| Na | 23 | 45 | He | 16.578 | 16.578 | 1.7 | 14890.55 | 50 | |
| Mg | 24 | 45 | He | 0.646 | 0.646 | 26.0 | 173.34 | 50 | |
| Al | 27 | 45 | He | 0.074 | 0.074 | 20.0 | 36.00 | 10 | |
| Si | 29 | 45 | He | -47.764 | -47.764 | 6.7 | 1258.72 | 100 | |
| K | 39 | 45 | He | -1.208 | -1.208 | 2.3 | 6971.72 | 50 | |
| Ca | 44 | 45 | He | 4.821 | 4.821 | 6.3 | 228.34 | 250 | |
| Ti | 47 | 45 | He | 0.002 | 0.002 | 49.5 | 4.67 | 0.5 | |
| V | 51 | 72 | He | 0.044 | 0.044 | 13.5 | 150.00 | 0.5 | |
| Cr | 52 | 72 | He | -0.002 | -0.002 | 3.7 | 227.78 | 0.5 | |
| Mn | 55 | 72 | He | 0.028 | 0.028 | 34.4 | 64.44 | 2.5 | |
| Fe | 57 | 72 | He | 1.882 | 1.882 | 14.8 | 103.34 | 50 | |
| Co | 59 | 72 | He | 0.006 | 0.006 | 12.5 | 53.33 | 0.5 | |
| Ni | 60 | 72 | He | 0.025 | 0.025 | 5.9 | 56.67 | 1 | |
| Cu | 63 | 72 | He | -0.258 | -0.258 | 9.4 | 446.68 | 0.5 | |
| Zn | 66 | 72 | He | 0.042 | 0.042 | 23.7 | 175.56 | 10 | |
| As | 75 | 72 | He | 0.015 | 0.015 | 31.2 | 13.83 | 0.5 | |
| Se | 78 | 72 | He | -0.013 | -0.013 | 52.4 | 3.13 | 0.5 | |
| Sn | 120 | 115 | He | 0 | 0.000 | 28.9 | 110.00 | 0.5 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1315452.43 | 1291085.71 | 101.89 | |
| Ge | 72 | He | 48755.94 | 47456.4966666667 | 102.74 | |
| In | 115 | He | 380971.02 | 372695.226666667 | 102.22 | |
| Lu | 175 | He | 1038338.27 | 1029247.51 | 100.88 | |
| Rh | 103 | He | 1661048.13 | 1626201.63666667 | 102.14 | |
| Sc | 45 | He | 108249.81 | 109033.716666667 | 99.28 | |
| Tb | 159 | He | 1878127.52 | 1820531.74333333 | 103.16 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3705393.48 | 3617762.55 | 102.42 | |
| Ge | 72 | No Gas | 608266.38 | 597606.886666667 | 101.78 | |
| In | 115 | No Gas | 3949346.23 | 3893084.07 | 101.45 | |
| Lu | 175 | No Gas | 6134190.74 | 5877008.03666667 | 104.38 | |
| Rh | 103 | No Gas | 4035814.01 | 3958933.73 | 101.94 | |
| Sc | 45 | No Gas | 4176349.83 | 4093118.31 | 102.03 | |
| Tb | 159 | No Gas | 5822536.37 | 5654253.04333333 | 102.98 | |

III

CONTINUING CALIBRATION BLANK

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Blank ID: | 1900 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180417A_MS1.b\090_CCB.d |
| Analyst: | AWG | Analytical Batch: | 633612 |
| Analysis Date: | 04/17/18 Time: 1733 | Analytical Method: | EPA 6020A |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Arsenic | 0.50 | ug/L | U | 0.25 | 0.50 | 1.00 |
| Iron | 50.0 | ug/L | U | 25.0 | 50.0 | 100 |
| Manganese | 2.50 | ug/L | U | 1.25 | 2.50 | 5.00 |

FORM III - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1900 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 090_CCB.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 17:33:40 | **Total Dilution** | 1.0000 |
| **Sample Type** | CCB | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | -0.236 | -0.236 | 0.8 | 169799.14 | 2.5 | |
| Be | 9 | 45 | No Gas | -0.006 | -0.006 | 18.5 | 69.33 | 0.5 | |
| B | 11 | 45 | No Gas | 1.202 | 1.202 | 8.5 | 3893.92 | 5 | |
| Sr | 88 | 72 | No Gas | 0.005 | 0.005 | 17.3 | 460.03 | 0.5 | |
| Zr | 90 | 72 | No Gas | 0.013 | 0.013 | 17.4 | 594.46 | 0.5 | |
| Mo | 95 | 115 | No Gas | 0.011 | 0.011 | 23.8 | 82.22 | 0.5 | |
| Ag | 107 | 115 | No Gas | 0.005 | 0.005 | 12.0 | 83.33 | 0.5 | |
| Cd | 111 | 115 | No Gas | 0.001 | 0.001 | 10.6 | 35.67 | 0.5 | |
| Sb | 121 | 115 | No Gas | 0.014 | 0.014 | 17.0 | 256.67 | 1 | |
| Ba | 137 | 115 | No Gas | 0.021 | 0.021 | 13.6 | 98.89 | 0.5 | |
| Tl | 205 | 209 | No Gas | -0.003 | -0.003 | 9.1 | 207.78 | 0.5 | |
| Pb | 208 | 209 | No Gas | 0 | 0.000 | 3.2 | 1246.75 | 0.5 | |
| Na | 23 | 45 | He | 13.357 | 13.357 | 4.1 | 14329.90 | 50 | |
| Mg | 24 | 45 | He | 0.299 | 0.299 | 57.4 | 113.34 | 50 | |
| Al | 27 | 45 | He | -0.056 | -0.056 | 26.7 | 30.00 | 10 | |
| Si | 29 | 45 | He | -101.287 | -101.287 | 5.4 | 1232.06 | 100 | |
| K | 39 | 45 | He | -5.645 | -5.645 | 4.5 | 6925.06 | 50 | |
| Ca | 44 | 45 | He | -6.954 | -6.954 | 12.4 | 181.67 | 250 | |
| Ti | 47 | 45 | He | 0.011 | 0.011 | 47.2 | 5.33 | 0.5 | |
| V | 51 | 72 | He | 0.094 | 0.094 | 15.4 | 227.78 | 0.5 | |
| Cr | 52 | 72 | He | 0.006 | 0.006 | 21.4 | 247.78 | 0.5 | |
| Mn | 55 | 72 | He | 0.04 | 0.040 | 10.2 | 75.56 | 2.5 | |
| Fe | 57 | 72 | He | 0.798 | 0.798 | 28.9 | 60.00 | 50 | |
| Co | 59 | 72 | He | 0.001 | 0.001 | 50.2 | 37.78 | 0.5 | |
| Ni | 60 | 72 | He | -0.01 | -0.010 | 24.1 | 21.11 | 1 | |
| Cu | 63 | 72 | He | -0.212 | -0.212 | 16.4 | 584.46 | 0.5 | |
| Zn | 66 | 72 | He | -0.11 | -0.110 | 14.8 | 124.45 | 10 | |
| As | 75 | 72 | He | 0.013 | 0.013 | 12.1 | 13.33 | 0.5 | |
| Se | 78 | 72 | He | -0.013 | -0.013 | 18.6 | 3.15 | 0.5 | |
| Sn | 120 | 115 | He | 0.001 | 0.001 | 2.9 | 113.34 | 0.5 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1323956.70 | 1291085.71 | 102.55 | |
| Ge | 72 | He | 49168.18 | 47456.4966666667 | 103.61 | |
| In | 115 | He | 388708.34 | 372695.226666667 | 104.3 | |
| Lu | 175 | He | 1060968.89 | 1029247.51 | 103.08 | |
| Rh | 103 | He | 1693420.28 | 1626201.63666667 | 104.13 | |
| Sc | 45 | He | 113745.29 | 109033.716666667 | 104.32 | |
| Tb | 159 | He | 1934419.19 | 1820531.74333333 | 106.26 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3782130.15 | 3617762.55 | 104.54 | |
| Ge | 72 | No Gas | 629450.22 | 597606.886666667 | 105.33 | |
| In | 115 | No Gas | 4063280.28 | 3893084.07 | 104.37 | |
| Lu | 175 | No Gas | 6237098.66 | 5877008.03666667 | 106.13 | |
| Rh | 103 | No Gas | 4139831.92 | 3958933.73 | 104.57 | |
| Sc | 45 | No Gas | 4298778.30 | 4093118.31 | 105.02 | |
| Tb | 159 | No Gas | 5967541.99 | 5654253.04333333 | 105.54 | |

III
INITIAL CALIBRATION BLANK

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Blank ID: | 1700 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180416B_MS1.b\010_ICB.d |
| Analyst: | AWG | Analytical Batch: | 633483 |
| Analysis Date: | 04/16/18 Time: 1308 | Analytical Method: | EPA 6020A Dissolved |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Iron | 50.0 | ug/L | U | 25.0 | 50.0 | 100 |
| Manganese | 2.50 | ug/L | U | 1.25 | 2.50 | 5.00 |

FORM III - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1700 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180416B_MS1.b |
| **File Name** | 010_ICB.d | **Comment** | ICPMS-1,AWG |
| **Acq Time** | 2018-04-16 13:08:21 | **Total Dilution** | 1.0000 |
| **Sample Type** | ICB | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 002CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 0.317 | 0.317 | 0.6 | 198882.06 | 2.5 | |
| Be | 9 | 45 | No Gas | 0.009 | 0.009 | 21.8 | 92.67 | 0.5 | |
| B | 11 | 45 | No Gas | 2.894 | 2.894 | 2.6 | 17849.88 | 5 | |
| Sr | 88 | 72 | No Gas | 0.002 | 0.002 | 9.5 | 473.36 | 0.5 | |
| Zr | 90 | 72 | No Gas | 0.008 | 0.008 | 2.2 | 526.68 | 0.5 | |
| Mo | 95 | 115 | No Gas | 0.012 | 0.012 | 25.1 | 97.78 | 0.5 | |
| Ag | 107 | 115 | No Gas | 0.001 | 0.001 | 32.0 | 67.78 | 0.5 | |
| Cd | 111 | 115 | No Gas | 0 | 0.000 | 28.1 | 31.00 | 0.5 | |
| Sb | 121 | 115 | No Gas | 0.151 | 0.151 | 5.3 | 1963.48 | 1 | |
| Ba | 137 | 115 | No Gas | 0.011 | 0.011 | 21.2 | 117.78 | 0.5 | |
| Tl | 205 | 209 | No Gas | 0.005 | 0.005 | 17.2 | 266.67 | 0.5 | |
| Pb | 208 | 209 | No Gas | 0.003 | 0.003 | 8.5 | 1436.76 | 0.5 | |
| Na | 23 | 45 | He | 0.089 | 0.089 | 3.6 | 11988.06 | 50 | |
| Mg | 24 | 45 | He | 0.375 | 0.375 | 40.7 | 130.01 | 50 | |
| Al | 27 | 45 | He | 0.247 | 0.247 | 21.9 | 73.33 | 10 | |
| Si | 29 | 45 | He | 3.317 | 3.317 | 3.4 | 1659.43 | 100 | |
| K | 39 | 45 | He | 3.73 | 3.730 | 4.0 | 7361.95 | 50 | |
| Ca | 44 | 45 | He | -2.08 | -2.080 | 20.3 | 178.34 | 250 | |
| Ti | 47 | 45 | He | 0.025 | 0.025 | 6.9 | 8.33 | 0.5 | |
| V | 51 | 72 | He | -0.047 | -0.047 | 12.0 | 201.12 | 0.5 | |
| Cr | 52 | 72 | He | 0.016 | 0.016 | 5.7 | 298.90 | 0.5 | |
| Mn | 55 | 72 | He | 0.001 | 0.001 | 18.5 | 505.57 | 2.5 | |
| Fe | 57 | 72 | He | 0.012 | 0.012 | 13.3 | 43.33 | 50 | |
| Co | 59 | 72 | He | 0.001 | 0.001 | 39.8 | 25.56 | 0.5 | |
| Ni | 60 | 72 | He | 0.015 | 0.015 | 22.2 | 37.78 | 1 | |
| Cu | 63 | 72 | He | 0.004 | 0.004 | 2.0 | 945.60 | 0.5 | |
| Zn | 66 | 72 | He | 0.09 | 0.090 | 18.8 | 221.11 | 10 | |
| As | 75 | 72 | He | 0.003 | 0.003 | 17.0 | 11.17 | 0.5 | |
| Se | 78 | 72 | He | 0.034 | 0.034 | 6.4 | 4.23 | 0.5 | |
| Sn | 120 | 115 | He | 0.017 | 0.017 | 10.5 | 174.45 | 0.5 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1411596.65 | 1434384.40333333 | 98.41 | |
| Ge | 72 | He | 52916.44 | 53494.0666666667 | 98.92 | |
| In | 115 | He | 421822.23 | 422983.593333333 | 99.73 | |
| Lu | 175 | He | 1152050.48 | 1160314.62 | 99.29 | |
| Rh | 103 | He | 1771474.75 | 1802038.33333333 | 98.3 | |
| Sc | 45 | He | 126238.95 | 127114.406666667 | 99.31 | |
| Tb | 159 | He | 1988700.70 | 2010526.84666667 | 98.91 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3858987.55 | 3969825.04666667 | 97.21 | |
| Ge | 72 | No Gas | 643869.23 | 662907.366666667 | 97.13 | |
| In | 115 | No Gas | 4133115.25 | 4246975.92666667 | 97.32 | |
| Lu | 175 | No Gas | 6197888.24 | 6373136.98666667 | 97.25 | |
| Rh | 103 | No Gas | 4223135.94 | 4339714.13333333 | 97.31 | |
| Sc | 45 | No Gas | 4772443.56 | 4929728.14 | 96.81 | |
| Tb | 159 | No Gas | 6002963.24 | 6085949.28333333 | 98.64 | |

III
CONTINUING CALIBRATION BLANK

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Blank ID: | 1900 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180416B_MS1.b\069_CCB.d |
| Analyst: | AWG | Analytical Batch: | 633483 |
| Analysis Date: | 04/16/18 Time: 1738 | Analytical Method: | EPA 6020A Dissolved |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Iron | 50.0 | ug/L | U | 25.0 | 50.0 | 100 |
| Manganese | 2.50 | ug/L | U | 1.25 | 2.50 | 5.00 |

FORM III - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1900 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180416B_MS1.b |
| **File Name** | 069_CCB.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-16 17:38:58 | **Total Dilution** | 1.0000 |
| **Sample Type** | CCB | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 002CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 1.098 | 1.098 | 1.4 | 181392.04 | 2.5 | |
| Be | 9 | 45 | No Gas | 0.006 | 0.006 | 2.9 | 70.00 | 0.5 | |
| B | 11 | 45 | No Gas | 3.752 | 3.752 | 1.9 | 17209.24 | 5 | |
| Sr | 88 | 72 | No Gas | 0.008 | 0.008 | 8.7 | 500.03 | 0.5 | |
| Zr | 90 | 72 | No Gas | 0.016 | 0.016 | 8.0 | 546.68 | 0.5 | |
| Mo | 95 | 115 | No Gas | 0.013 | 0.013 | 37.6 | 90.00 | 0.5 | |
| Ag | 107 | 115 | No Gas | 0.008 | 0.008 | 9.2 | 127.78 | 0.5 | |
| Cd | 111 | 115 | No Gas | 0 | 0.000 | 8.8 | 28.67 | 0.5 | |
| Sb | 121 | 115 | No Gas | 0.076 | 0.076 | 2.6 | 1113.39 | 1 | |
| Ba | 137 | 115 | No Gas | 0.008 | 0.008 | 9.1 | 96.67 | 0.5 | |
| Tl | 205 | 209 | No Gas | 0.007 | 0.007 | 6.1 | 268.90 | 0.5 | |
| Pb | 208 | 209 | No Gas | -0.001 | -0.001 | 4.3 | 1196.74 | 0.5 | |
| Na | 23 | 45 | He | 94.843 | 94.843 | 1.2 | 43594.07 | 50 | >LOD |
| Mg | 24 | 45 | He | 1.239 | 1.239 | 59.2 | 260.07 | 50 | |
| Al | 27 | 45 | He | 0.048 | 0.048 | 27.7 | 52.00 | 10 | |
| Si | 29 | 45 | He | -77.27 | -77.270 | 3.3 | 1290.73 | 100 | |
| K | 39 | 45 | He | 9.669 | 9.669 | 5.2 | 6698.31 | 50 | |
| Ca | 44 | 45 | He | 18.537 | 18.537 | 18.5 | 240.01 | 250 | |
| Ti | 47 | 45 | He | 0.005 | 0.005 | 50.8 | 6.33 | 0.5 | |
| V | 51 | 72 | He | -0.121 | -0.121 | 20.8 | 70.00 | 0.5 | |
| Cr | 52 | 72 | He | 0.01 | 0.010 | 16.9 | 247.78 | 0.5 | |
| Mn | 55 | 72 | He | -0.14 | -0.140 | 27.0 | 322.23 | 2.5 | |
| Fe | 57 | 72 | He | 2.96 | 2.960 | 55.5 | 146.67 | 50 | |
| Co | 59 | 72 | He | 0.006 | 0.006 | 15.7 | 36.66 | 0.5 | |
| Ni | 60 | 72 | He | 0.03 | 0.030 | 14.3 | 46.67 | 1 | |
| Cu | 63 | 72 | He | 0.005 | 0.005 | 8.9 | 822.26 | 0.5 | |
| Zn | 66 | 72 | He | 0.134 | 0.134 | 1.9 | 205.56 | 10 | |
| As | 75 | 72 | He | -0.001 | -0.001 | 27.0 | 8.50 | 0.5 | |
| Se | 78 | 72 | He | 0.256 | 0.256 | 37.6 | 7.13 | 0.5 | |
| Sn | 120 | 115 | He | 0.015 | 0.015 | 31.5 | 152.23 | 0.5 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1300680.84 | 1434384.40333333 | 90.68 | |
| Ge | 72 | He | 45817.38 | 53494.0666666667 | 85.65 | |
| In | 115 | He | 372455.14 | 422983.593333333 | 88.05 | |
| Lu | 175 | He | 1053816.23 | 1160314.62 | 90.82 | |
| Rh | 103 | He | 1514819.35 | 1802038.33333333 | 84.06 | |
| Sc | 45 | He | 106950.47 | 127114.406666667 | 84.14 | |
| Tb | 159 | He | 1837233.20 | 2010526.84666667 | 91.38 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3501258.28 | 3969825.04666667 | 88.2 | |
| Ge | 72 | No Gas | 551351.19 | 662907.366666667 | 83.17 | |
| In | 115 | No Gas | 3654272.42 | 4246975.92666667 | 86.04 | |
| Lu | 175 | No Gas | 5606289.71 | 6373136.98666667 | 87.97 | |
| Rh | 103 | No Gas | 3687725.13 | 4339714.13333333 | 84.98 | |
| Sc | 45 | No Gas | 4024271.65 | 4929728.14 | 81.63 | |
| Tb | 159 | No Gas | 5282100.86 | 6085949.28333333 | 86.79 | |

III
METHOD BLANK

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Blank ID: | MB1793968 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180416B_MS1.b\075SMPL.d |
| Analyst: | AWG | Analytical Batch: | 633483 |
| Analysis Date: | 04/16/18 Time: 1805 | Analytical Method: | EPA 6020A Dissolved |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Manganese | 2.50 | ug/L | U | 1.25 | 2.50 | 5.00 |

FORM III - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1793968 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180416B_MS1.b |
| **File Name** | 075SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-16 18:05:11 | **Total Dilution** | 1.0000 |
| **Sample Type** | MBWATER | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 002CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 0.562 | 0.562 | 1.0 | 169594.07 | 2.5 | |
| Be | 9 | 45 | No Gas | -0.003 | -0.003 | 32.8 | 34.67 | 0.5 | |
| B | 11 | 45 | No Gas | -0.159 | -0.159 | 3.3 | 7265.19 | 5 | |
| Sr | 88 | 72 | No Gas | 0.082 | 0.082 | 15.0 | 1710.17 | 0.5 | |
| Zr | 90 | 72 | No Gas | -0.002 | -0.002 | 6.3 | 318.90 | 0.5 | |
| Mo | 95 | 115 | No Gas | -0.003 | -0.003 | 12.4 | 31.11 | 0.5 | |
| Ag | 107 | 115 | No Gas | 0 | 0.000 | 7.1 | 46.67 | 0.5 | |
| Cd | 111 | 115 | No Gas | -0.002 | -0.002 | 14.4 | 24.33 | 0.5 | |
| Sb | 121 | 115 | No Gas | -0.017 | -0.017 | 5.9 | 344.45 | 1 | |
| Ba | 137 | 115 | No Gas | 0.22 | 0.220 | 19.3 | 654.47 | 0.5 | |
| Tl | 205 | 209 | No Gas | -0.003 | -0.003 | 14.4 | 83.33 | 0.5 | |
| Pb | 208 | 209 | No Gas | 0.014 | 0.014 | 13.6 | 1616.78 | 0.5 | |
| Na | 23 | 45 | He | 234.134 | 234.134 | 7.3 | 87828.83 | 50 | > 1/2 LOQ |
| Mg | 24 | 45 | He | 2.588 | 2.588 | 8.1 | 466.69 | 50 | |
| Al | 27 | 45 | He | 0.479 | 0.479 | 29.0 | 70.00 | 10 | |
| Si | 29 | 45 | He | -76.331 | -76.331 | 1.5 | 1223.39 | 100 | |
| K | 39 | 45 | He | 12.363 | 12.363 | 2.3 | 6541.54 | 50 | |
| Ca | 44 | 45 | He | 44.415 | 44.415 | 7.1 | 333.34 | 250 | |
| Ti | 47 | 45 | He | 0.005 | 0.005 | 28.9 | 6.00 | 0.5 | |
| V | 51 | 72 | He | -0.106 | -0.106 | 20.4 | 86.67 | 0.5 | |
| Cr | 52 | 72 | He | 0.005 | 0.005 | 6.7 | 224.45 | 0.5 | |
| Mn | 55 | 72 | He | 0.089 | 0.089 | 10.6 | 482.24 | 2.5 | |
| Fe | 57 | 72 | He | 62.984 | 62.984 | 7.7 | 2246.91 | 50 | > 1/2 LOQ |
| Co | 59 | 72 | He | 0.016 | 0.016 | 14.8 | 68.89 | 0.5 | |
| Ni | 60 | 72 | He | 0.183 | 0.183 | 14.1 | 178.89 | 1 | |
| Cu | 63 | 72 | He | -0.025 | -0.025 | 11.7 | 704.47 | 0.5 | |
| Zn | 66 | 72 | He | 0.59 | 0.590 | 4.6 | 333.34 | 10 | |
| As | 75 | 72 | He | -0.002 | -0.002 | 18.4 | 7.83 | 0.5 | |
| Se | 78 | 72 | He | 0.057 | 0.057 | 27.1 | 3.80 | 0.5 | |
| Sn | 120 | 115 | He | -0.041 | -0.041 | 43.1 | 77.78 | 0.5 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1275425.87 | 1434384.40333333 | 88.92 | |
| Ge | 72 | He | 43393.18 | 53494.0666666667 | 81.12 | |
| In | 115 | He | 351597.49 | 422983.593333333 | 83.12 | |
| Lu | 175 | He | 1007812.88 | 1160314.62 | 86.86 | |
| Rh | 103 | He | 1449167.96 | 1802038.33333333 | 80.42 | |
| Sc | 45 | He | 101271.39 | 127114.406666667 | 79.67 | |
| Tb | 159 | He | 1772834.92 | 2010526.84666667 | 88.18 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3548392.13 | 3969825.04666667 | 89.38 | |
| Ge | 72 | No Gas | 534573.87 | 662907.366666667 | 80.64 | |
| In | 115 | No Gas | 3637329.94 | 4246975.92666667 | 85.65 | |
| Lu | 175 | No Gas | 5667491.17 | 6373136.98666667 | 88.93 | |
| Rh | 103 | No Gas | 3628053.61 | 4339714.13333333 | 83.6 | |
| Sc | 45 | No Gas | 3967789.43 | 4929728.14 | 80.49 | |
| Tb | 159 | No Gas | 5362390.54 | 6085949.28333333 | 88.11 | |

III
CONTINUING CALIBRATION BLANK

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Blank ID: | 1900 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180416B_MS1.b\082_CCB.d |
| Analyst: | AWG | Analytical Batch: | 633483 |
| Analysis Date: | 04/16/18 Time: 1835 | Analytical Method: | EPA 6020A Dissolved |

| *ANALYTE* | *RESULT* | *UNITS* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| Iron | 50.0 | ug/L | U | 25.0 | 50.0 | 100 |
| Manganese | 2.50 | ug/L | U | 1.25 | 2.50 | 5.00 |

FORM III - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1900 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180416B_MS1.b |
| **File Name** | 082_CCB.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-16 18:35:53 | **Total Dilution** | 1.0000 |
| **Sample Type** | CCB | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 002CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 0.513 | 0.513 | 0.5 | 162764.94 | 2.5 | |
| Be | 9 | 45 | No Gas | 0 | 0.000 | 14.2 | 45.33 | 0.5 | |
| B | 11 | 45 | No Gas | 0.47 | 0.470 | 2.7 | 8515.83 | 5 | |
| Sr | 88 | 72 | No Gas | 0.011 | 0.011 | 14.5 | 516.70 | 0.5 | |
| Zr | 90 | 72 | No Gas | 0.011 | 0.011 | 21.0 | 453.36 | 0.5 | |
| Mo | 95 | 115 | No Gas | 0.012 | 0.012 | 19.2 | 82.22 | 0.5 | |
| Ag | 107 | 115 | No Gas | 0.006 | 0.006 | 18.2 | 101.11 | 0.5 | |
| Cd | 111 | 115 | No Gas | -0.003 | -0.003 | 19.0 | 21.00 | 0.5 | |
| Sb | 121 | 115 | No Gas | 0.076 | 0.076 | 7.4 | 1075.61 | 1 | |
| Ba | 137 | 115 | No Gas | 0.014 | 0.014 | 21.7 | 107.78 | 0.5 | |
| Tl | 205 | 209 | No Gas | 0.004 | 0.004 | 8.0 | 216.67 | 0.5 | |
| Pb | 208 | 209 | No Gas | -0.007 | -0.007 | 1.5 | 1043.40 | 0.5 | |
| Na | 23 | 45 | He | 65.991 | 65.991 | 1.9 | 31189.59 | 50 | >LOD |
| Mg | 24 | 45 | He | 0.173 | 0.173 | 37.8 | 70.00 | 50 | |
| Al | 27 | 45 | He | 0.332 | 0.332 | 25.6 | 62.00 | 10 | |
| Si | 29 | 45 | He | -85.858 | -85.858 | 2.0 | 1193.38 | 100 | |
| K | 39 | 45 | He | 6.281 | 6.281 | 6.3 | 6004.65 | 50 | |
| Ca | 44 | 45 | He | 16.741 | 16.741 | 23.2 | 216.67 | 250 | |
| Ti | 47 | 45 | He | 0.077 | 0.077 | 38.6 | 8.33 | 0.5 | |
| V | 51 | 72 | He | -0.105 | -0.105 | 35.6 | 88.89 | 0.5 | |
| Cr | 52 | 72 | He | -0.011 | -0.011 | 24.4 | 197.78 | 0.5 | |
| Mn | 55 | 72 | He | -0.184 | -0.184 | 3.1 | 272.23 | 2.5 | |
| Fe | 57 | 72 | He | 1.841 | 1.841 | 36.1 | 100.00 | 50 | |
| Co | 59 | 72 | He | 0.005 | 0.005 | 40.3 | 34.44 | 0.5 | |
| Ni | 60 | 72 | He | 0.007 | 0.007 | 20.8 | 24.44 | 1 | |
| Cu | 63 | 72 | He | -0.104 | -0.104 | 10.1 | 510.02 | 0.5 | |
| Zn | 66 | 72 | He | 0.227 | 0.227 | 11.3 | 223.34 | 10 | |
| As | 75 | 72 | He | -0.002 | -0.002 | 34.8 | 8.00 | 0.5 | |
| Se | 78 | 72 | He | 0.112 | 0.112 | 34.4 | 4.63 | 0.5 | |
| Sn | 120 | 115 | He | 0.01 | 0.010 | 3.8 | 135.56 | 0.5 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1240279.77 | 1434384.40333333 | 86.47 | |
| Ge | 72 | He | 43478.85 | 53494.0666666667 | 81.28 | |
| In | 115 | He | 346233.93 | 422983.593333333 | 81.86 | |
| Lu | 175 | He | 989683.87 | 1160314.62 | 85.29 | |
| Rh | 103 | He | 1409859.04 | 1802038.33333333 | 78.24 | |
| Sc | 45 | He | 99835.78 | 127114.406666667 | 78.54 | |
| Tb | 159 | He | 1724116.28 | 2010526.84666667 | 85.75 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3481698.07 | 3969825.04666667 | 87.7 | |
| Ge | 72 | No Gas | 520018.07 | 662907.366666667 | 78.45 | |
| In | 115 | No Gas | 3507646.50 | 4246975.92666667 | 82.59 | |
| Lu | 175 | No Gas | 5489757.84 | 6373136.98666667 | 86.14 | |
| Rh | 103 | No Gas | 3508235.49 | 4339714.13333333 | 80.84 | |
| Sc | 45 | No Gas | 3827420.12 | 4929728.14 | 77.64 | |
| Tb | 159 | No Gas | 5125073.15 | 6085949.28333333 | 84.21 | |

# Form IV

# Interference Checks

IV
ICPMS INTERFERENCE CHECKS

| | | | |
|---|---|---|---|
| Report No: | 218040620 | ICSA \ AB ID: | 2000 \ 2100 |
| Instrument ID: | ICPMS1 | Analytical Batch: | 633612 |
| Analyst: | AWG | Analytical Method: | EPA 6020A |
| Lab File ID ICSA1: | 2180417A_MS1.b\018ICSA.d | Lab File ID ICSAB1: | 2180417A_MS1.b\019ICSB.d |
| Lab File ID ICSA2: | 2180417A_MS1.b\150ICSA.d | Lab File ID ICSAB2: | 2180417A_MS1.b\151ICSB.d |

*Concentration Units: ug/L*

| | | Analyzed (A/AB): | 04/17/18 1122 | 04/17/18 1126 | | 04/17/18 2156 | 04/17/18 2200 | |
|---|---|---|---|---|---|---|---|---|
| ***ANALYTE*** | ***TRUE A*** | ***TRUE AB*** | ***ICSA1*** | ***ICSAB1*** | ***%R*** | ***ICSA2*** | ***ICSAB2*** | ***%R*** |
| Aluminum | 1000 | 1000 | 1000 | 1020 | 102 | 971 | 975 | 98 |
| Antimony | 0 | 0 | 0.041 | 0.034 | | 0.062 | 0.049 | |
| Arsenic | 0 | 10.0 | -0.0010 | 10.4 | 104 | -0.0060 | 9.79 | 98 |
| Barium | 0 | 0 | 0.034 | 0.027 | | 0.032 | 0.020 | |
| Beryllium | 0 | 0 | -0.0020 | -0.0030 | | -0.010 | -0.013 | |
| Boron | 0 | 20.0 | 4.05 | 25.8 | 129 | 4.01 | 24.1 | 120 |
| Cadmium | 0 | 10.0 | 0.025 | 10.0 | 100 | 0.021 | 9.63 | 96 |
| Calcium | 3000 | 3000 | 2900 | 2980 | 99 | 2850 | 2920 | 97 |
| Chromium | 0 | 20.0 | 0.0050 | 20.4 | 102 | 0.0010 | 20.1 | 100 |
| Cobalt | 0 | 20.0 | 0.0090 | 20.8 | 104 | 0.0090 | 20.2 | 101 |
| Copper | 0 | 20.0 | -0.11 | 20.6 | 103 | 0.056 | 20.5 | 102 |
| Iron | 2500 | 2500 | 2560 | 2530 | 101 | 2460 | 2470 | 99 |
| Lead | 0 | 0 | 0.0060 | 0.0070 | | 0.0020 | 0.0070 | |
| Lithium | 0 | 20.0 | -0.0070 | 21.4 | 107 | -0.17 | 19.7 | 98 |
| Magnesium | 1000 | 1000 | 1010 | 1020 | 102 | 986 | 985 | 98 |
| Manganese | 0 | 20.0 | 0.041 | 20.6 | 103 | 0.079 | 20.2 | 101 |
| Molybdenum | 20.0 | 20.0 | 19.1 | 19.3 | 96 | 18.4 | 18.8 | 94 |
| Nickel | 0 | 20.0 | 0.014 | 20.6 | 103 | 0.036 | 20.7 | 104 |
| Potassium | 1000 | 1000 | 995 | 1010 | 101 | 986 | 1000 | 100 |
| Selenium | 0 | 10.0 | 0.0030 | 9.98 | 100 | -0.019 | 9.72 | 97 |
| Silicon | 0 | 1000 | 12.7 | 1070 | 107 | -67 | 1000 | 100 |
| Silver | 0 | 5.00 | 0.0070 | 5.02 | 100 | 0.010 | 4.89 | 98 |
| Sodium | 2500 | 2500 | 2490 | 2540 | 102 | 2490 | 2470 | 99 |
| Strontium | 0 | 10.0 | 0.10 | 10.1 | 101 | 0.10 | 9.86 | 99 |
| Thallium | 0 | 0 | -0.0010 | -0.0020 | | -0.0050 | -0.0060 | |
| Tin | 0 | 10.0 | 0.022 | 9.81 | 98 | 0.027 | 9.66 | 97 |
| Titanium | 20.0 | 20.0 | 17.8 | 18.5 | 92 | 19.1 | 18.7 | 94 |
| Vanadium | 0 | 20.0 | -0.010 | 17.2 | 86 | 0.015 | 17.2 | 86 |
| Zinc | 0 | 20.0 | 0.082 | 21.1 | 106 | -0.022 | 20.2 | 101 |
| Zirconium | 0 | 20.0 | 0.022 | 19.8 | 99 | 0.025 | 19.4 | 97 |

FORM IV - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 2000 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 018ICSA.d | **Comment** | ICPMS-1,AWG |
| **Acq Time** | 2018-04-17 11:22:15 | **Total Dilution** | 1.0000 |
| **Sample Type** | ICSA | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | -0.007 | -0.007 | 1.9 | 164464.18 | 2.5 | |
| Be | 9 | 45 | No Gas | -0.002 | -0.002 | 8.9 | 79.33 | 0.5 | |
| B | 11 | 45 | No Gas | 4.047 | 4.047 | 0.2 | 11060.66 | 5 | |
| Sr | 88 | 72 | No Gas | 0.101 | 0.101 | 1.4 | 2210.25 | 0.5 | |
| Zr | 90 | 72 | No Gas | 0.022 | 0.022 | 8.4 | 678.91 | 0.5 | |
| Mo | 95 | 115 | No Gas | 19.086 | 19.086 | 2.2 | 75561.22 | 20 | |
| Ag | 107 | 115 | No Gas | 0.007 | 0.007 | 14.1 | 95.56 | 0.5 | |
| Cd | 111 | 115 | No Gas | 0.025 | 0.025 | 14.1 | 85.33 | 0.5 | |
| Sb | 121 | 115 | No Gas | 0.041 | 0.041 | 13.9 | 496.68 | 1 | |
| Ba | 137 | 115 | No Gas | 0.034 | 0.034 | 11.5 | 133.33 | 0.5 | |
| Tl | 205 | 209 | No Gas | -0.001 | -0.001 | 10.3 | 243.34 | 0.5 | |
| Pb | 208 | 209 | No Gas | 0.006 | 0.006 | 2.6 | 1370.08 | 0.5 | |
| Na | 23 | 45 | He | 2487.493 | 2487.493 | 0.6 | 964766.05 | 2500 | |
| Mg | 24 | 45 | He | 1009.443 | 1009.443 | 0.2 | 193444.79 | 1000 | |
| Al | 27 | 45 | He | 1001.344 | 1001.344 | 0.6 | 56624.65 | 1000 | |
| Si | 29 | 45 | He | 12.667 | 12.667 | 3.5 | 1360.73 | 100 | |
| K | 39 | 45 | He | 994.691 | 994.691 | 0.5 | 91054.70 | 1000 | |
| Ca | 44 | 45 | He | 2901.673 | 2901.673 | 3.0 | 13901.05 | 3000 | |
| Ti | 47 | 45 | He | 17.831 | 17.831 | 2.9 | 720.02 | 20 | |
| V | 51 | 72 | He | -0.01 | -0.010 | 12.8 | 65.56 | 0.5 | |
| Cr | 52 | 72 | He | 0.005 | 0.005 | 8.0 | 237.78 | 0.5 | |
| Mn | 55 | 72 | He | 0.041 | 0.041 | 5.2 | 74.45 | 2.5 | |
| Fe | 57 | 72 | He | 2558.224 | 2558.224 | 1.2 | 101461.98 | 2500 | |
| Co | 59 | 72 | He | 0.009 | 0.009 | 52.3 | 64.45 | 0.5 | |
| Ni | 60 | 72 | He | 0.014 | 0.014 | 49.9 | 44.44 | 1 | |
| Cu | 63 | 72 | He | -0.111 | -0.111 | 3.9 | 852.26 | 0.5 | |
| Zn | 66 | 72 | He | 0.082 | 0.082 | 13.7 | 185.56 | 10 | |
| As | 75 | 72 | He | -0.001 | -0.001 | 15.8 | 9.50 | 0.5 | |
| Se | 78 | 72 | He | 0.003 | 0.003 | 37.8 | 3.32 | 0.5 | |
| Sn | 120 | 115 | He | 0.022 | 0.022 | 11.4 | 137.78 | 0.5 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1305575.55 | 1291085.71 | 101.12 | |
| Ge | 72 | He | 47800.82 | 47456.4966666667 | 100.73 | |
| In | 115 | He | 377269.40 | 372695.226666667 | 101.23 | |
| Lu | 175 | He | 1050344.28 | 1029247.51 | 102.05 | |
| Rh | 103 | He | 1609937.96 | 1626201.63666667 | 99 | |
| Sc | 45 | He | 108700.93 | 109033.716666667 | 99.69 | |
| Tb | 159 | He | 1849222.58 | 1820531.74333333 | 101.58 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3636058.90 | 3617762.55 | 100.51 | |
| Ge | 72 | No Gas | 601054.33 | 597606.886666667 | 100.58 | |
| In | 115 | No Gas | 3900241.16 | 3893084.07 | 100.18 | |
| Lu | 175 | No Gas | 5936430.12 | 5877008.03666667 | 101.01 | |
| Rh | 103 | No Gas | 3908947.07 | 3958933.73 | 98.74 | |
| Sc | 45 | No Gas | 4061526.92 | 4093118.31 | 99.23 | |
| Tb | 159 | No Gas | 5738258.25 | 5654253.04333333 | 101.49 | |

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 2100 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 019ICSB.d | **Comment** | ICPMS-1,AWG |
| **Acq Time** | 2018-04-17 11:26:38 | **Total Dilution** | 1.0000 |
| **Sample Type** | ICSB | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 21.359 | 21.359 | 1.4 | 539952.53 | 20 | |
| Be | 9 | 45 | No Gas | -0.003 | -0.003 | 20.1 | 77.33 | 0.5 | |
| B | 11 | 45 | No Gas | 25.794 | 25.794 | 1.5 | 67674.85 | 20 | > +/- 20% |
| Sr | 88 | 72 | No Gas | 10.126 | 10.126 | 1.2 | 189220.38 | 10 | |
| Zr | 90 | 72 | No Gas | 19.77 | 19.770 | 2.2 | 252773.52 | 20 | |
| Mo | 95 | 115 | No Gas | 19.303 | 19.303 | 2.6 | 76572.12 | 20 | |
| Ag | 107 | 115 | No Gas | 5.022 | 5.022 | 2.0 | 54060.38 | 5 | |
| Cd | 111 | 115 | No Gas | 10.046 | 10.046 | 2.5 | 21739.48 | 10 | |
| Sb | 121 | 115 | No Gas | 0.034 | 0.034 | 11.8 | 431.12 | 1 | |
| Ba | 137 | 115 | No Gas | 0.027 | 0.027 | 36.9 | 113.34 | 0.5 | |
| Tl | 205 | 209 | No Gas | -0.002 | -0.002 | 2.3 | 217.78 | 0.5 | |
| Pb | 208 | 209 | No Gas | 0.007 | 0.007 | 12.8 | 1403.43 | 0.5 | |
| Na | 23 | 45 | He | 2535.431 | 2535.431 | 1.0 | 971475.82 | 2500 | |
| Mg | 24 | 45 | He | 1017.833 | 1017.833 | 1.2 | 192739.74 | 1000 | |
| Al | 27 | 45 | He | 1015.513 | 1015.513 | 0.9 | 56741.02 | 1000 | |
| Si | 29 | 45 | He | 1067.913 | 1067.913 | 0.8 | 2998.95 | 1000 | |
| K | 39 | 45 | He | 1013.562 | 1013.562 | 0.9 | 91550.95 | 1000 | |
| Ca | 44 | 45 | He | 2977.525 | 2977.525 | 4.0 | 14089.55 | 3000 | |
| Ti | 47 | 45 | He | 18.531 | 18.531 | 6.9 | 739.35 | 20 | |
| V | 51 | 72 | He | 17.229 | 17.229 | 1.3 | 26083.92 | 20 | |
| Cr | 52 | 72 | He | 20.383 | 20.383 | 1.5 | 41256.87 | 20 | |
| Mn | 55 | 72 | He | 20.604 | 20.604 | 0.6 | 17712.98 | 20 | |
| Fe | 57 | 72 | He | 2525.355 | 2525.355 | 2.9 | 99972.50 | 2500 | |
| Co | 59 | 72 | He | 20.8 | 20.800 | 0.5 | 73955.81 | 20 | |
| Ni | 60 | 72 | He | 20.597 | 20.597 | 0.8 | 20542.94 | 20 | |
| Cu | 63 | 72 | He | 20.605 | 20.605 | 1.2 | 58840.08 | 20 | |
| Zn | 66 | 72 | He | 21.142 | 21.142 | 3.0 | 7251.70 | 20 | |
| As | 75 | 72 | He | 10.354 | 10.354 | 1.4 | 2558.37 | 10 | |
| Se | 78 | 72 | He | 9.984 | 9.984 | 4.5 | 159.83 | 10 | |
| Sn | 120 | 115 | He | 9.814 | 9.814 | 3.2 | 12566.24 | 10 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1297336.91 | 1291085.71 | 100.48 | |
| Ge | 72 | He | 47720.62 | 47456.4966666667 | 100.56 | |
| In | 115 | He | 374590.70 | 372695.226666667 | 100.51 | |
| Lu | 175 | He | 1045368.94 | 1029247.51 | 101.57 | |
| Rh | 103 | He | 1608914.42 | 1626201.63666667 | 98.94 | |
| Sc | 45 | He | 107397.49 | 109033.716666667 | 98.5 | |
| Tb | 159 | He | 1837646.12 | 1820531.74333333 | 100.94 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3622621.30 | 3617762.55 | 100.13 | |
| Ge | 72 | No Gas | 604670.56 | 597606.886666667 | 101.18 | |
| In | 115 | No Gas | 3907404.49 | 3893084.07 | 100.37 | |
| Lu | 175 | No Gas | 6013082.21 | 5877008.03666667 | 102.32 | |
| Rh | 103 | No Gas | 3930342.21 | 3958933.73 | 99.28 | |
| Sc | 45 | No Gas | 4073961.64 | 4093118.31 | 99.53 | |
| Tb | 159 | No Gas | 5758385.95 | 5654253.04333333 | 101.84 | |

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 2000 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 150ICSA.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 21:56:11 | **Total Dilution** | 1.0000 |
| **Sample Type** | ICSA | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | -0.167 | -0.167 | 1.7 | 171607.08 | 2.5 | |
| Be | 9 | 45 | No Gas | -0.01 | -0.010 | 14.4 | 52.67 | 0.5 | |
| B | 11 | 45 | No Gas | 4.013 | 4.013 | 2.9 | 11647.78 | 5 | |
| Sr | 88 | 72 | No Gas | 0.103 | 0.103 | 9.3 | 2370.29 | 0.5 | |
| Zr | 90 | 72 | No Gas | 0.025 | 0.025 | 11.4 | 756.70 | 0.5 | |
| Mo | 95 | 115 | No Gas | 18.437 | 18.437 | 1.5 | 77866.17 | 20 | |
| Ag | 107 | 115 | No Gas | 0.01 | 0.010 | 31.5 | 143.33 | 0.5 | |
| Cd | 111 | 115 | No Gas | 0.021 | 0.021 | 14.9 | 82.67 | 0.5 | |
| Sb | 121 | 115 | No Gas | 0.062 | 0.062 | 10.0 | 734.47 | 1 | |
| Ba | 137 | 115 | No Gas | 0.032 | 0.032 | 23.3 | 136.67 | 0.5 | |
| Tl | 205 | 209 | No Gas | -0.005 | -0.005 | 26.1 | 174.45 | 0.5 | |
| Pb | 208 | 209 | No Gas | 0.002 | 0.002 | 7.8 | 1366.76 | 0.5 | |
| Na | 23 | 45 | He | 2486.713 | 2486.713 | 1.2 | 991338.97 | 2500 | |
| Mg | 24 | 45 | He | 986.083 | 986.083 | 0.9 | 194237.73 | 1000 | |
| Al | 27 | 45 | He | 970.81 | 970.810 | 1.5 | 56429.45 | 1000 | |
| Si | 29 | 45 | He | -66.744 | -66.744 | 4.0 | 1268.06 | 100 | |
| K | 39 | 45 | He | 986.314 | 986.314 | 0.8 | 92864.79 | 1000 | |
| Ca | 44 | 45 | He | 2846.199 | 2846.199 | 4.0 | 14022.83 | 3000 | |
| Ti | 47 | 45 | He | 19.068 | 19.068 | 5.9 | 791.35 | 20 | |
| V | 51 | 72 | He | 0.015 | 0.015 | 10.9 | 107.78 | 0.5 | |
| Cr | 52 | 72 | He | 0.001 | 0.001 | 6.4 | 241.12 | 0.5 | |
| Mn | 55 | 72 | He | 0.079 | 0.079 | 22.3 | 112.23 | 2.5 | |
| Fe | 57 | 72 | He | 2458.903 | 2458.903 | 1.6 | 102266.32 | 2500 | |
| Co | 59 | 72 | He | 0.009 | 0.009 | 32.8 | 66.67 | 0.5 | |
| Ni | 60 | 72 | He | 0.036 | 0.036 | 30.7 | 68.89 | 1 | |
| Cu | 63 | 72 | He | 0.056 | 0.056 | 1.6 | 1384.52 | 0.5 | |
| Zn | 66 | 72 | He | -0.022 | -0.022 | 9.5 | 157.78 | 10 | |
| As | 75 | 72 | He | -0.006 | -0.006 | 14.5 | 8.67 | 0.5 | |
| Se | 78 | 72 | He | -0.019 | -0.019 | 48.1 | 3.12 | 0.5 | |
| Sn | 120 | 115 | He | 0.027 | 0.027 | 26.8 | 146.67 | 0.5 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1338960.08 | 1291085.71 | 103.71 | |
| Ge | 72 | He | 50125.47 | 47456.4966666667 | 105.62 | |
| In | 115 | He | 386069.49 | 372695.226666667 | 103.59 | |
| Lu | 175 | He | 1066012.07 | 1029247.51 | 103.57 | |
| Rh | 103 | He | 1691472.64 | 1626201.63666667 | 104.01 | |
| Sc | 45 | He | 111728.32 | 109033.716666667 | 102.47 | |
| Tb | 159 | He | 1948764.97 | 1820531.74333333 | 107.04 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3920706.19 | 3617762.55 | 108.37 | |
| Ge | 72 | No Gas | 633640.58 | 597606.886666667 | 106.03 | |
| In | 115 | No Gas | 4161026.75 | 3893084.07 | 106.88 | |
| Lu | 175 | No Gas | 6452244.49 | 5877008.03666667 | 109.79 | |
| Rh | 103 | No Gas | 4190024.28 | 3958933.73 | 105.84 | |
| Sc | 45 | No Gas | 4311575.39 | 4093118.31 | 105.34 | |
| Tb | 159 | No Gas | 6177115.53 | 5654253.04333333 | 109.25 | |

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 2100 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 151ICSB.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 22:00:34 | **Total Dilution** | 1.0000 |
| **Sample Type** | ICSB | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 19.712 | 19.712 | 2.0 | 543903.18 | 20 | |
| Be | 9 | 45 | No Gas | -0.013 | -0.013 | 35.0 | 40.00 | 0.5 | |
| B | 11 | 45 | No Gas | 24.133 | 24.133 | 1.6 | 67424.18 | 20 | > +/- 20% |
| Sr | 88 | 72 | No Gas | 9.857 | 9.857 | 2.8 | 191855.17 | 10 | |
| Zr | 90 | 72 | No Gas | 19.437 | 19.437 | 3.2 | 258833.62 | 20 | |
| Mo | 95 | 115 | No Gas | 18.807 | 18.807 | 3.2 | 78350.98 | 20 | |
| Ag | 107 | 115 | No Gas | 4.886 | 4.886 | 3.3 | 55235.47 | 5 | |
| Cd | 111 | 115 | No Gas | 9.632 | 9.632 | 2.9 | 21890.68 | 10 | |
| Sb | 121 | 115 | No Gas | 0.049 | 0.049 | 6.6 | 595.58 | 1 | |
| Ba | 137 | 115 | No Gas | 0.02 | 0.020 | 3.9 | 97.78 | 0.5 | |
| Tl | 205 | 209 | No Gas | -0.006 | -0.006 | 15.2 | 133.34 | 0.5 | |
| Pb | 208 | 209 | No Gas | 0.007 | 0.007 | 6.5 | 1483.43 | 0.5 | |
| Na | 23 | 45 | He | 2467.16 | 2467.160 | 1.0 | 976300.82 | 2500 | |
| Mg | 24 | 45 | He | 984.957 | 984.957 | 0.8 | 192577.40 | 1000 | |
| Al | 27 | 45 | He | 975.146 | 975.146 | 1.3 | 56258.16 | 1000 | |
| Si | 29 | 45 | He | 999.928 | 999.928 | 3.7 | 2986.29 | 1000 | |
| K | 39 | 45 | He | 1000.357 | 1000.357 | 1.5 | 93380.52 | 1000 | |
| Ca | 44 | 45 | He | 2917.003 | 2917.003 | 1.5 | 14254.69 | 3000 | |
| Ti | 47 | 45 | He | 18.674 | 18.674 | 3.9 | 769.35 | 20 | |
| V | 51 | 72 | He | 17.174 | 17.174 | 0.5 | 26848.47 | 20 | |
| Cr | 52 | 72 | He | 20.071 | 20.071 | 1.4 | 41955.24 | 20 | |
| Mn | 55 | 72 | He | 20.192 | 20.192 | 3.2 | 17932.15 | 20 | |
| Fe | 57 | 72 | He | 2470.237 | 2470.237 | 1.1 | 100985.40 | 2500 | |
| Co | 59 | 72 | He | 20.158 | 20.158 | 1.4 | 74014.96 | 20 | |
| Ni | 60 | 72 | He | 20.702 | 20.702 | 0.4 | 21317.26 | 20 | |
| Cu | 63 | 72 | He | 20.483 | 20.483 | 1.1 | 60408.05 | 20 | |
| Zn | 66 | 72 | He | 20.19 | 20.190 | 3.2 | 7161.65 | 20 | |
| As | 75 | 72 | He | 9.789 | 9.789 | 1.7 | 2497.36 | 10 | |
| Se | 78 | 72 | He | 9.716 | 9.716 | 3.4 | 160.73 | 10 | |
| Sn | 120 | 115 | He | 9.661 | 9.661 | 1.0 | 12707.47 | 10 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1329366.93 | 1291085.71 | 102.97 | |
| Ge | 72 | He | 49288.55 | 47456.4966666667 | 103.86 | |
| In | 115 | He | 384805.10 | 372695.226666667 | 103.25 | |
| Lu | 175 | He | 1053643.01 | 1029247.51 | 102.37 | |
| Rh | 103 | He | 1688572.15 | 1626201.63666667 | 103.84 | |
| Sc | 45 | He | 110895.36 | 109033.716666667 | 101.71 | |
| Tb | 159 | He | 1934015.65 | 1820531.74333333 | 106.23 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3831043.80 | 3617762.55 | 105.9 | |
| Ge | 72 | No Gas | 629662.86 | 597606.886666667 | 105.36 | |
| In | 115 | No Gas | 4103178.83 | 3893084.07 | 105.4 | |
| Lu | 175 | No Gas | 6365268.66 | 5877008.03666667 | 108.31 | |
| Rh | 103 | No Gas | 4141376.64 | 3958933.73 | 104.61 | |
| Sc | 45 | No Gas | 4335935.94 | 4093118.31 | 105.93 | |
| Tb | 159 | No Gas | 6048323.04 | 5654253.04333333 | 106.97 | |

IV
ICPMS INTERFERENCE CHECKS

| | | | |
|---|---|---|---|
| Report No: | 218040620 | ICSA \ AB ID: | 2000 \ 2100 |
| Instrument ID: | ICPMS1 | Analytical Batch: | 633483 |
| Analyst: | AWG | Analytical Method: | EPA 6020A Dissolved |
| Lab File ID ICSA1: | 2180416B_MS1.b\012ICSA.d | Lab File ID ICSAB1: | 2180416B_MS1.b\013ICSB.d |
| Lab File ID ICSA2: | | Lab File ID ICSAB2: | |

*Concentration Units: ug/L*

| | | Analyzed (A/AB): | 04/16/18 1317 | 04/16/18 1321 | | | | |
|---|---|---|---|---|---|---|---|---|
| ***ANALYTE*** | ***TRUE A*** | ***TRUE AB*** | ***ICSA1*** | ***ICSAB1*** | ***%R*** | ***ICSA2*** | ***ICSAB2*** | ***%R*** |
| Aluminum | 1000 | 1000 | 989 | 1020 | 102 | | | |
| Antimony | 0 | 0 | 0.080 | 0.053 | | | | |
| Arsenic | 0 | 10.0 | 0.0040 | 10.2 | 102 | | | |
| Barium | 0 | 0 | 0.0 | 0.0060 | | | | |
| Beryllium | 0 | 0 | 0.0 | 0.0010 | | | | |
| Boron | 0 | 20.0 | 1.77 | 24.0 | 120 | | | |
| Cadmium | 0 | 10.0 | 0.022 | 9.83 | 98 | | | |
| Calcium | 3000 | 3000 | 2990 | 2940 | 98 | | | |
| Chromium | 0 | 20.0 | 0.0040 | 20.3 | 102 | | | |
| Cobalt | 0 | 20.0 | 0.016 | 20.7 | 104 | | | |
| Copper | 0 | 20.0 | -0.047 | 20.5 | 102 | | | |
| Iron | 2500 | 2500 | 2540 | 2550 | 102 | | | |
| Lead | 0 | 0 | -0.0030 | 0.0070 | | | | |
| Lithium | 0 | 20.0 | 0.084 | 20.8 | 104 | | | |
| Magnesium | 1000 | 1000 | 1000 | 1030 | 103 | | | |
| Manganese | 0 | 20.0 | -0.43 | 19.8 | 99 | | | |
| Molybdenum | 20.0 | 20.0 | 19.3 | 19.2 | 96 | | | |
| Nickel | 0 | 20.0 | 0.013 | 20.7 | 104 | | | |
| Potassium | 1000 | 1000 | 1020 | 1020 | 102 | | | |
| Selenium | 0 | 10.0 | 0.013 | 9.59 | 96 | | | |
| Silicon | 0 | 1000 | -37 | 1150 | 115 | | | |
| Silver | 0 | 5.00 | 0.0030 | 5.09 | 102 | | | |
| Sodium | 2500 | 2500 | 2480 | 2510 | 100 | | | |
| Strontium | 0 | 10.0 | 0.11 | 9.97 | 100 | | | |
| Thallium | 0 | 0 | 0.0020 | 0.0010 | | | | |
| Tin | 0 | 10.0 | 0.0010 | 9.73 | 97 | | | |
| Titanium | 20.0 | 20.0 | 18.6 | 21.3 | 106 | | | |
| Vanadium | 0 | 20.0 | -0.065 | 17.2 | 86 | | | |
| Zinc | 0 | 20.0 | -0.036 | 20.4 | 102 | | | |
| Zirconium | 0 | 20.0 | 0.016 | 19.0 | 95 | | | |

FORM IV - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 2000 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180416B_MS1.b |
| **File Name** | 012ICSA.d | **Comment** | ICPMS-1,AWG |
| **Acq Time** | 2018-04-16 13:17:09 | **Total Dilution** | 1.0000 |
| **Sample Type** | ICSA | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 002CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 0.084 | 0.084 | 0.5 | 196513.63 | 2.5 | |
| Be | 9 | 45 | No Gas | 0 | 0.000 | 23.2 | 55.33 | 0.5 | |
| B | 11 | 45 | No Gas | 1.768 | 1.768 | 5.1 | 14680.23 | 5 | |
| Sr | 88 | 72 | No Gas | 0.114 | 0.114 | 3.1 | 2737.03 | 0.5 | |
| Zr | 90 | 72 | No Gas | 0.016 | 0.016 | 6.3 | 637.80 | 0.5 | |
| Mo | 95 | 115 | No Gas | 19.332 | 19.332 | 3.2 | 80541.80 | 20 | |
| Ag | 107 | 115 | No Gas | 0.003 | 0.003 | 18.2 | 92.22 | 0.5 | |
| Cd | 111 | 115 | No Gas | 0.022 | 0.022 | 9.2 | 82.67 | 0.5 | |
| Sb | 121 | 115 | No Gas | 0.08 | 0.080 | 1.9 | 1294.52 | 1 | |
| Ba | 137 | 115 | No Gas | 0 | 0.000 | 22.2 | 85.56 | 0.5 | |
| Tl | 205 | 209 | No Gas | 0.002 | 0.002 | 17.2 | 196.67 | 0.5 | |
| Pb | 208 | 209 | No Gas | -0.003 | -0.003 | 9.9 | 1253.41 | 0.5 | |
| Na | 23 | 45 | He | 2477.739 | 2477.739 | 1.0 | 1051745.19 | 2500 | |
| Mg | 24 | 45 | He | 1002.674 | 1002.674 | 2.0 | 206394.76 | 1000 | |
| Al | 27 | 45 | He | 988.855 | 988.855 | 0.6 | 60149.96 | 1000 | |
| Si | 29 | 45 | He | -37.223 | -37.223 | 4.3 | 1602.76 | 100 | |
| K | 39 | 45 | He | 1017.091 | 1017.091 | 1.3 | 101199.70 | 1000 | |
| Ca | 44 | 45 | He | 2987.853 | 2987.853 | 2.2 | 15545.86 | 3000 | |
| Ti | 47 | 45 | He | 18.582 | 18.582 | 0.9 | 799.35 | 20 | |
| V | 51 | 72 | He | -0.065 | -0.065 | 12.6 | 173.34 | 0.5 | |
| Cr | 52 | 72 | He | 0.004 | 0.004 | 8.8 | 273.34 | 0.5 | |
| Mn | 55 | 72 | He | -0.433 | -0.433 | 36.3 | 96.67 | 2.5 | |
| Fe | 57 | 72 | He | 2538.328 | 2538.328 | 1.2 | 108862.15 | 2500 | |
| Co | 59 | 72 | He | 0.016 | 0.016 | 34.6 | 83.34 | 0.5 | |
| Ni | 60 | 72 | He | 0.013 | 0.013 | 37.9 | 35.55 | 1 | |
| Cu | 63 | 72 | He | -0.047 | -0.047 | 7.6 | 793.37 | 0.5 | |
| Zn | 66 | 72 | He | -0.036 | -0.036 | 19.1 | 174.45 | 10 | |
| As | 75 | 72 | He | 0.004 | 0.004 | 24.3 | 11.33 | 0.5 | |
| Se | 78 | 72 | He | 0.013 | 0.013 | 24.5 | 3.85 | 0.5 | |
| Sn | 120 | 115 | He | 0.001 | 0.001 | 30.1 | 151.11 | 0.5 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1408309.56 | 1434384.40333333 | 98.18 | |
| Ge | 72 | He | 52946.44 | 53494.0666666667 | 98.98 | |
| In | 115 | He | 418567.06 | 422983.593333333 | 98.96 | |
| Lu | 175 | He | 1145964.85 | 1160314.62 | 98.76 | |
| Rh | 103 | He | 1729676.84 | 1802038.33333333 | 95.98 | |
| Sc | 45 | He | 127181.30 | 127114.406666667 | 100.05 | |
| Tb | 159 | He | 1970197.16 | 2010526.84666667 | 97.99 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3813767.86 | 3969825.04666667 | 96.07 | |
| Ge | 72 | No Gas | 652889.35 | 662907.366666667 | 98.49 | |
| In | 115 | No Gas | 4114127.43 | 4246975.92666667 | 96.87 | |
| Lu | 175 | No Gas | 6144230.95 | 6373136.98666667 | 96.41 | |
| Rh | 103 | No Gas | 4203634.14 | 4339714.13333333 | 96.86 | |
| Sc | 45 | No Gas | 4833347.86 | 4929728.14 | 98.04 | |
| Tb | 159 | No Gas | 5898153.66 | 6085949.28333333 | 96.91 | |

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 2100 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180416B_MS1.b |
| **File Name** | 013ICSB.d | **Comment** | ICPMS-1,AWG |
| **Acq Time** | 2018-04-16 13:21:33 | **Total Dilution** | 1.0000 |
| **Sample Type** | ICSB | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 002CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 20.772 | 20.772 | 1.1 | 634445.08 | 20 | |
| Be | 9 | 45 | No Gas | 0.001 | 0.001 | 42.7 | 62.00 | 0.5 | |
| B | 11 | 45 | No Gas | 24.005 | 24.005 | 3.1 | 82167.93 | 20 | > +/- 20% |
| Sr | 88 | 72 | No Gas | 9.973 | 9.973 | 1.1 | 203737.24 | 10 | |
| Zr | 90 | 72 | No Gas | 18.994 | 18.994 | 2.6 | 268042.77 | 20 | |
| Mo | 95 | 115 | No Gas | 19.195 | 19.195 | 3.4 | 81795.78 | 20 | |
| Ag | 107 | 115 | No Gas | 5.086 | 5.086 | 1.7 | 58955.45 | 5 | |
| Cd | 111 | 115 | No Gas | 9.831 | 9.831 | 2.3 | 23254.95 | 10 | |
| Sb | 121 | 115 | No Gas | 0.053 | 0.053 | 10.5 | 1067.83 | 1 | |
| Ba | 137 | 115 | No Gas | 0.006 | 0.006 | 11.1 | 105.56 | 0.5 | |
| Tl | 205 | 209 | No Gas | 0.001 | 0.001 | 9.3 | 184.45 | 0.5 | |
| Pb | 208 | 209 | No Gas | 0.007 | 0.007 | 8.7 | 1566.77 | 0.5 | |
| Na | 23 | 45 | He | 2510.187 | 2510.187 | 0.5 | 1051790.24 | 2500 | |
| Mg | 24 | 45 | He | 1029.457 | 1029.457 | 0.8 | 209210.68 | 1000 | |
| Al | 27 | 45 | He | 1016.942 | 1016.942 | 1.1 | 61067.91 | 1000 | |
| Si | 29 | 45 | He | 1150.101 | 1150.101 | 7.6 | 3581.08 | 1000 | |
| K | 39 | 45 | He | 1015.646 | 1015.646 | 0.5 | 99774.34 | 1000 | |
| Ca | 44 | 45 | He | 2940.495 | 2940.495 | 2.5 | 15107.08 | 3000 | |
| Ti | 47 | 45 | He | 21.277 | 21.277 | 2.8 | 902.70 | 20 | |
| V | 51 | 72 | He | 17.171 | 17.171 | 1.1 | 28070.53 | 20 | |
| Cr | 52 | 72 | He | 20.327 | 20.327 | 0.2 | 44504.09 | 20 | |
| Mn | 55 | 72 | He | 19.821 | 19.821 | 2.2 | 19110.09 | 20 | |
| Fe | 57 | 72 | He | 2548.626 | 2548.626 | 1.1 | 108855.10 | 2500 | |
| Co | 59 | 72 | He | 20.711 | 20.711 | 0.7 | 79354.88 | 20 | |
| Ni | 60 | 72 | He | 20.677 | 20.677 | 2.0 | 22163.95 | 20 | |
| Cu | 63 | 72 | He | 20.538 | 20.538 | 0.5 | 62831.60 | 20 | |
| Zn | 66 | 72 | He | 20.449 | 20.449 | 4.2 | 7739.70 | 20 | |
| As | 75 | 72 | He | 10.167 | 10.167 | 1.1 | 2801.24 | 10 | |
| Se | 78 | 72 | He | 9.587 | 9.587 | 4.4 | 176.58 | 10 | |
| Sn | 120 | 115 | He | 9.733 | 9.733 | 1.2 | 13843.97 | 10 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1412264.35 | 1434384.40333333 | 98.46 | |
| Ge | 72 | He | 52741.50 | 53494.0666666667 | 98.59 | |
| In | 115 | He | 419157.76 | 422983.593333333 | 99.1 | |
| Lu | 175 | He | 1142296.78 | 1160314.62 | 98.45 | |
| Rh | 103 | He | 1741055.14 | 1802038.33333333 | 96.62 | |
| Sc | 45 | He | 125554.79 | 127114.406666667 | 98.77 | |
| Tb | 159 | He | 1954110.80 | 2010526.84666667 | 97.19 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3884692.03 | 3969825.04666667 | 97.86 | |
| Ge | 72 | No Gas | 660657.80 | 662907.366666667 | 99.66 | |
| In | 115 | No Gas | 4208109.93 | 4246975.92666667 | 99.08 | |
| Lu | 175 | No Gas | 6227282.41 | 6373136.98666667 | 97.71 | |
| Rh | 103 | No Gas | 4266347.89 | 4339714.13333333 | 98.31 | |
| Sc | 45 | No Gas | 4852006.33 | 4929728.14 | 98.42 | |
| Tb | 159 | No Gas | 6048451.37 | 6085949.28333333 | 99.38 | |

# Form VII

# Lab Control Spikes

VII
LABORATORY CONTROL SAMPLE

| | | | |
|---|---|---|---|
| Report No: | 218040620 | GCAL ID: | 1794156 (LCS) |
| Matrix: | Water | Instrument ID: | ICPMS1 |
| Analyst: | AWG | Lab File ID: | 2180417A_MS1.b\051SMPL.d |
| Prep Date: | 04/07/18 Time: 1050 | Analysis Date: | 04/17/18 Time: 1442 |
| Prep Batch: | 632823 | Analytical Batch: | 633612 |
| Prep Method: | 3010A | Analytical Method: | EPA 6020A |

| *ANALYTE* | *UNITS* | *TRUE* | *FOUND* | *% R* | *Q* | *LCL* | *UCL* |
|---|---|---|---|---|---|---|---|
| Arsenic | ug/L | 50.0 | 51.8 | 104 | | 84 | 116 |
| Iron | ug/L | 5000 | 5270 | 105 | | 87 | 118 |
| Manganese | ug/L | 50.0 | 52.3 | 105 | | 87 | 115 |

FORM VII - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1794156 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 051SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 14:42:55 | **Total Dilution** | 1.0000 |
| **Sample Type** | LCS6020 | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 258.381 | 258.381 | 2.7 | 4729987.33 | 250 | |
| Be | 9 | 45 | No Gas | 52.337 | 52.337 | 2.5 | 204792.88 | 50 | |
| B | 11 | 45 | No Gas | 256.341 | 256.341 | 3.8 | 671855.15 | 250 | |
| Sr | 88 | 72 | No Gas | 51.58 | 51.580 | 2.5 | 949697.67 | 50 | |
| Zr | 90 | 72 | No Gas | 10.728 | 10.728 | 2.4 | 135524.41 | 10 | |
| Mo | 95 | 115 | No Gas | 50.352 | 50.352 | 2.4 | 195294.26 | 50 | |
| Ag | 107 | 115 | No Gas | 49.898 | 49.898 | 1.5 | 525048.23 | 50 | |
| Cd | 111 | 115 | No Gas | 52.087 | 52.087 | 2.3 | 110109.53 | 50 | |
| Sb | 121 | 115 | No Gas | 101.387 | 101.387 | 1.5 | 910541.11 | 100 | |
| Ba | 137 | 115 | No Gas | 50.441 | 50.441 | 1.7 | 142782.58 | 50 | |
| Tl | 205 | 209 | No Gas | 49.172 | 49.172 | 2.2 | 1013541.14 | 50 | |
| Pb | 208 | 209 | No Gas | 50.931 | 50.931 | 2.3 | 1397417.29 | 50 | |
| Na | 23 | 45 | He | 5498.806 | 5498.806 | 0.9 | 2032401.48 | 5000 | |
| Mg | 24 | 45 | He | 5306.144 | 5306.144 | 0.7 | 973642.15 | 5000 | |
| Al | 27 | 45 | He | 1033.307 | 1033.307 | 1.0 | 55956.38 | 1000 | |
| Si | 29 | 45 | He | 5506.113 | 5506.113 | 2.5 | 9652.81 | 5000 | |
| K | 39 | 45 | He | 5219.614 | 5219.614 | 0.9 | 428730.39 | 5000 | |
| Ca | 44 | 45 | He | 25870.471 | 25870.471 | 0.9 | 117138.97 | 25000 | |
| Ti | 47 | 45 | He | 50.448 | 50.448 | 4.8 | 1943.45 | 50 | |
| V | 51 | 72 | He | 52.729 | 52.729 | 0.5 | 77303.01 | 50 | |
| Cr | 52 | 72 | He | 52.841 | 52.841 | 0.8 | 103418.22 | 50 | |
| Mn | 55 | 72 | He | 52.303 | 52.303 | 1.8 | 43579.62 | 50 | |
| Fe | 57 | 72 | He | 5265.677 | 5265.677 | 1.4 | 202280.32 | 5000 | |
| Co | 59 | 72 | He | 53.084 | 53.084 | 0.3 | 183107.97 | 50 | |
| Ni | 60 | 72 | He | 107.325 | 107.325 | 0.8 | 103738.56 | 100 | |
| Cu | 63 | 72 | He | 53.779 | 53.779 | 0.8 | 147221.42 | 50 | |
| Zn | 66 | 72 | He | 1051.587 | 1051.587 | 1.2 | 342553.49 | 1000 | |
| As | 75 | 72 | He | 51.77 | 51.770 | 0.1 | 12375.66 | 50 | |
| Se | 78 | 72 | He | 9.772 | 9.772 | 1.8 | 151.90 | 10 | |
| Sn | 120 | 115 | He | 51.846 | 51.846 | 0.6 | 62598.10 | 50 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1226149.30 | 1291085.71 | 94.97 | |
| Ge | 72 | He | 46315.55 | 47456.4966666667 | 97.6 | |
| In | 115 | He | 355727.21 | 372695.226666667 | 95.45 | |
| Lu | 175 | He | 998288.21 | 1029247.51 | 96.99 | |
| Rh | 103 | He | 1544668.03 | 1626201.63666667 | 94.99 | |
| Sc | 45 | He | 104093.85 | 109033.716666667 | 95.47 | |
| Tb | 159 | He | 1787359.56 | 1820531.74333333 | 98.18 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3601536.20 | 3617762.55 | 99.55 | |
| Ge | 72 | No Gas | 596582.70 | 597606.886666667 | 99.83 | |
| In | 115 | No Gas | 3821642.87 | 3893084.07 | 98.16 | |
| Lu | 175 | No Gas | 6059572.41 | 5877008.03666667 | 103.11 | |
| Rh | 103 | No Gas | 3827763.74 | 3958933.73 | 96.69 | |
| Sc | 45 | No Gas | 4099878.87 | 4093118.31 | 100.17 | |
| Tb | 159 | No Gas | 5698567.41 | 5654253.04333333 | 100.78 | |

VII
LABORATORY CONTROL SAMPLE DUPLICATE

| | | | |
|---|---|---|---|
| Report No: | 218040620 | GCAL ID: | 1794294 (LCSD) |
| Matrix: | Water | Instrument ID: | ICPMS1 |
| Analyst: | AWG | Lab File ID: | 2180417A_MS1.b\052SMPL.d |
| Prep Date: | 04/07/18 Time: 1050 | Analysis Date: | 04/17/18 Time: 1447 |
| Prep Batch: | 632823 | Analytical Batch: | 633612 |
| Prep Method: | 3010A | Analytical Method: | EPA 6020A |

| *ANALYTE* | *UNITS* | *TRUE* | *FOUND* | *% R* | *Q* | *LCL* | *UCL* | *RPD* | *Q* | *RPD CL* |
|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | ug/L | 50.0 | 51.2 | 102 | | 84 | 116 | 1 | | 30 |
| Iron | ug/L | 5000 | 5190 | 104 | | 87 | 118 | 2 | | 30 |
| Manganese | ug/L | 50.0 | 54.7 | 109 | | 87 | 115 | 4 | | 30 |

FORM VII - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1794294 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 052SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 14:47:18 | **Total Dilution** | 1.0000 |
| **Sample Type** | LCS6020 | **Sample Pass/Fail** | Pass |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 256.877 | 256.877 | 1.4 | 4724825.97 | 250 | |
| Be | 9 | 45 | No Gas | 52.099 | 52.099 | 2.1 | 204805.24 | 50 | |
| B | 11 | 45 | No Gas | 254.276 | 254.276 | 2.5 | 669516.39 | 250 | |
| Sr | 88 | 72 | No Gas | 51.638 | 51.638 | 2.5 | 956132.23 | 50 | |
| Zr | 90 | 72 | No Gas | 10.456 | 10.456 | 1.5 | 132843.46 | 10 | |
| Mo | 95 | 115 | No Gas | 50.784 | 50.784 | 2.1 | 197304.17 | 50 | |
| Ag | 107 | 115 | No Gas | 49.838 | 49.838 | 0.6 | 525332.95 | 50 | |
| Cd | 111 | 115 | No Gas | 51.791 | 51.791 | 1.8 | 109667.53 | 50 | |
| Sb | 121 | 115 | No Gas | 102.198 | 102.198 | 2.1 | 919503.40 | 100 | |
| Ba | 137 | 115 | No Gas | 50.57 | 50.570 | 1.8 | 143398.85 | 50 | |
| Tl | 205 | 209 | No Gas | 49.699 | 49.699 | 1.6 | 1015126.90 | 50 | |
| Pb | 208 | 209 | No Gas | 51.293 | 51.293 | 2.0 | 1394642.04 | 50 | |
| Na | 23 | 45 | He | 5336.458 | 5336.458 | 1.1 | 1998740.75 | 5000 | |
| Mg | 24 | 45 | He | 5190.086 | 5190.086 | 1.3 | 964936.78 | 5000 | |
| Al | 27 | 45 | He | 1022.478 | 1022.478 | 0.9 | 56094.88 | 1000 | |
| Si | 29 | 45 | He | 5328.683 | 5328.683 | 1.5 | 9506.06 | 5000 | |
| K | 39 | 45 | He | 5214.947 | 5214.947 | 1.2 | 433989.98 | 5000 | |
| Ca | 44 | 45 | He | 25769.45 | 25769.450 | 1.1 | 118223.20 | 25000 | |
| Ti | 47 | 45 | He | 51.066 | 51.066 | 4.7 | 1991.79 | 50 | |
| V | 51 | 72 | He | 52.296 | 52.296 | 0.8 | 77622.32 | 50 | |
| Cr | 52 | 72 | He | 52.284 | 52.284 | 1.2 | 103607.02 | 50 | |
| Mn | 55 | 72 | He | 54.678 | 54.678 | 0.3 | 46114.12 | 50 | |
| Fe | 57 | 72 | He | 5186.693 | 5186.693 | 1.3 | 201706.06 | 5000 | |
| Co | 59 | 72 | He | 53.012 | 53.012 | 1.0 | 185116.84 | 50 | |
| Ni | 60 | 72 | He | 106.371 | 106.371 | 0.5 | 104097.56 | 100 | |
| Cu | 63 | 72 | He | 53.422 | 53.422 | 0.5 | 148051.49 | 50 | |
| Zn | 66 | 72 | He | 1039.334 | 1039.334 | 0.8 | 342776.61 | 1000 | |
| As | 75 | 72 | He | 51.165 | 51.165 | 1.3 | 12381.84 | 50 | |
| Se | 78 | 72 | He | 9.666 | 9.666 | 4.1 | 152.11 | 10 | |
| Sn | 120 | 115 | He | 51.619 | 51.619 | 1.1 | 62637.10 | 50 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1231151.65 | 1291085.71 | 95.36 | |
| Ge | 72 | He | 46878.30 | 47456.4966666667 | 98.78 | |
| In | 115 | He | 357529.68 | 372695.226666667 | 95.93 | |
| Lu | 175 | He | 995843.00 | 1029247.51 | 96.75 | |
| Rh | 103 | He | 1555198.27 | 1626201.63666667 | 95.63 | |
| Sc | 45 | He | 105474.48 | 109033.716666667 | 96.74 | |
| Tb | 159 | He | 1801102.58 | 1820531.74333333 | 98.93 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3569295.57 | 3617762.55 | 98.66 | |
| Ge | 72 | No Gas | 599982.67 | 597606.886666667 | 100.4 | |
| In | 115 | No Gas | 3828444.53 | 3893084.07 | 98.34 | |
| Lu | 175 | No Gas | 5980924.29 | 5877008.03666667 | 101.77 | |
| Rh | 103 | No Gas | 3869557.90 | 3958933.73 | 97.74 | |
| Sc | 45 | No Gas | 4119018.17 | 4093118.31 | 100.63 | |
| Tb | 159 | No Gas | 5695630.12 | 5654253.04333333 | 100.73 | |

VII
LABORATORY CONTROL SAMPLE

| | | | |
|---|---|---|---|
| Report No: | 218040620 | GCAL ID: | 1793969 (LCS) |
| Matrix: | Water | Instrument ID: | ICPMS1 |
| Analyst: | AWG | Lab File ID: | 2180416B_MS1.b\076SMPL.d |
| Prep Date: | 04/09/18 Time: 0935 | Analysis Date: | 04/16/18 Time: 1809 |
| Prep Batch: | 632790 | Analytical Batch: | 633483 |
| Prep Method: | 3005A | Analytical Method: | EPA 6020A Dissolved |

| *ANALYTE* | *UNITS* | *TRUE* | *FOUND* | *% R* | *Q* | *LCL* | *UCL* |
|---|---|---|---|---|---|---|---|
| Manganese | ug/L | 50.0 | 49.9 | 100 | | 87 | 115 |

FORM VII - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1793969 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180416B_MS1.b |
| **File Name** | 076SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-16 18:09:34 | **Total Dilution** | 1.0000 |
| **Sample Type** | LCS6020 | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 002CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 259.964 | 259.964 | 1.4 | 4520176.81 | 250 | |
| Be | 9 | 45 | No Gas | 49.854 | 49.854 | 2.8 | 180031.49 | 50 | |
| B | 11 | 45 | No Gas | 218.859 | 218.859 | 3.6 | 534868.86 | 250 | |
| Sr | 88 | 72 | No Gas | 50.284 | 50.284 | 2.5 | 814972.12 | 50 | |
| Zr | 90 | 72 | No Gas | 48.681 | 48.681 | 3.8 | 545448.56 | 10 | LCS6020 Main CR1 Failed |
| Mo | 95 | 115 | No Gas | 47.572 | 47.572 | 3.0 | 169146.20 | 50 | |
| Ag | 107 | 115 | No Gas | 48.222 | 48.222 | 2.0 | 466167.85 | 50 | |
| Cd | 111 | 115 | No Gas | 48.451 | 48.451 | 3.1 | 95565.59 | 50 | |
| Sb | 121 | 115 | No Gas | 98.124 | 98.124 | 2.6 | 781795.61 | 100 | |
| Ba | 137 | 115 | No Gas | 49.136 | 49.136 | 1.3 | 125073.99 | 50 | |
| Tl | 205 | 209 | No Gas | 47.451 | 47.451 | 1.8 | 931330.80 | 50 | |
| Pb | 208 | 209 | No Gas | 49.399 | 49.399 | 1.5 | 1272051.90 | 50 | |
| Na | 23 | 45 | He | 5525.162 | 5525.162 | 0.4 | 1827609.40 | 5000 | |
| Mg | 24 | 45 | He | 5225.392 | 5225.392 | 0.4 | 843387.43 | 5000 | |
| Al | 27 | 45 | He | 1027.309 | 1027.309 | 1.5 | 49004.45 | 1000 | |
| Si | 29 | 45 | He | -60.286 | -60.286 | 7.4 | 1226.72 | 5000 | LCS6020 Main CR1 Failed |
| K | 39 | 45 | He | 5100.445 | 5100.445 | 1.8 | 375748.70 | 5000 | |
| Ca | 44 | 45 | He | 26047.788 | 26047.788 | 0.8 | 105113.55 | 25000 | |
| Ti | 47 | 45 | He | 50.546 | 50.546 | 4.7 | 1695.76 | 50 | |
| V | 51 | 72 | He | 50.183 | 50.183 | 2.6 | 66678.63 | 50 | |
| Cr | 52 | 72 | He | 50.023 | 50.023 | 0.4 | 89282.62 | 50 | |
| Mn | 55 | 72 | He | 49.943 | 49.943 | 1.2 | 38771.06 | 50 | |
| Fe | 57 | 72 | He | 5001.564 | 5001.564 | 0.9 | 174744.49 | 5000 | |
| Co | 59 | 72 | He | 50.99 | 50.990 | 0.4 | 159803.77 | 50 | |
| Ni | 60 | 72 | He | 101.22 | 101.220 | 0.9 | 88683.07 | 100 | |
| Cu | 63 | 72 | He | 50.425 | 50.425 | 1.0 | 125086.80 | 50 | |
| Zn | 66 | 72 | He | 1016.727 | 1016.727 | 0.4 | 307295.60 | 1000 | |
| As | 75 | 72 | He | 49.698 | 49.698 | 1.1 | 11168.47 | 50 | |
| Se | 78 | 72 | He | 9.658 | 9.658 | 2.3 | 145.54 | 10 | |
| Sn | 120 | 115 | He | 51.098 | 51.098 | 0.7 | 59323.46 | 50 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1235105.19 | 1434384.40333333 | 86.11 | |
| Ge | 72 | He | 43143.54 | 53494.0666666667 | 80.65 | |
| In | 115 | He | 345138.08 | 422983.593333333 | 81.6 | |
| Lu | 175 | He | 997783.50 | 1160314.62 | 85.99 | |
| Rh | 103 | He | 1371150.26 | 1802038.33333333 | 76.09 | |
| Sc | 45 | He | 99736.55 | 127114.406666667 | 78.46 | |
| Tb | 159 | He | 1751405.91 | 2010526.84666667 | 87.11 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3465559.01 | 3969825.04666667 | 87.3 | |
| Ge | 72 | No Gas | 524983.33 | 662907.366666667 | 79.19 | |
| In | 115 | No Gas | 3512422.37 | 4246975.92666667 | 82.7 | |
| Lu | 175 | No Gas | 5566298.25 | 6373136.98666667 | 87.34 | |
| Rh | 103 | No Gas | 3468771.53 | 4339714.13333333 | 79.93 | |
| Sc | 45 | No Gas | 3854967.35 | 4929728.14 | 78.2 | |
| Tb | 159 | No Gas | 5248917.52 | 6085949.28333333 | 86.25 | |

VII
LABORATORY CONTROL SAMPLE

| | | | |
|---|---|---|---|
| Report No: | 218040620 | GCAL ID: | 1793969 (LCS) |
| Matrix: | Water | Instrument ID: | ICPMS1 |
| Analyst: | AWG | Lab File ID: | 2180417A_MS1.b\030SMPL.d |
| Prep Date: | 04/09/18 Time: 0935 | Analysis Date: | 04/17/18 Time: 1218 |
| Prep Batch: | 632790 | Analytical Batch: | 633612 |
| Prep Method: | 3005A | Analytical Method: | EPA 6020A Dissolved |

| *ANALYTE* | *UNITS* | *TRUE* | *FOUND* | *% R* | *Q* | *LCL* | *UCL* |
|---|---|---|---|---|---|---|---|
| Iron | ug/L | 5000 | 5150 | 103 | | 87 | 118 |

FORM VII - IN

# Sample Report

| | | | |
|---|---|---|---|
| **Sample Name** | 1793969 | **Data Path Name** | C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b |
| **File Name** | 030SMPL.d | **Comment** | ICPMS1,AWG |
| **Acq Time** | 2018-04-17 12:18:21 | **Total Dilution** | 1.0000 |
| **Sample Type** | LCS6020 | **Sample Pass/Fail** | Fail |
| **ISTD Ref FileName** | 008CALB.d | **ISTD Pass/Fail** | Pass |

**Units : ppb**

**QC Analyte Table**

| Name | Mass | ISTD | Mode | MeasValue | Final Conc | RSD | CPS | LDR | QC Flag |
|---|---|---|---|---|---|---|---|---|---|
| Li | 7 | 45 | No Gas | 260.355 | 260.355 | 2.3 | 4958573.99 | 250 | |
| Be | 9 | 45 | No Gas | 51.568 | 51.568 | 2.5 | 209995.57 | 50 | |
| B | 11 | 45 | No Gas | 230.13 | 230.130 | 3.0 | 627705.71 | 250 | |
| Sr | 88 | 72 | No Gas | 50.504 | 50.504 | 2.8 | 975128.29 | 50 | |
| Zr | 90 | 72 | No Gas | 50.224 | 50.224 | 3.1 | 663814.54 | 10 | LCS6020 Main CR1 Failed |
| Mo | 95 | 115 | No Gas | 50.721 | 50.721 | 2.7 | 202254.78 | 50 | |
| Ag | 107 | 115 | No Gas | 50.455 | 50.455 | 2.5 | 545872.01 | 50 | |
| Cd | 111 | 115 | No Gas | 51.26 | 51.260 | 2.5 | 111406.33 | 50 | |
| Sb | 121 | 115 | No Gas | 100.812 | 100.812 | 2.4 | 930929.20 | 100 | |
| Ba | 137 | 115 | No Gas | 50.106 | 50.106 | 2.3 | 145830.37 | 50 | |
| Tl | 205 | 209 | No Gas | 48.31 | 48.310 | 1.9 | 1019032.63 | 50 | |
| Pb | 208 | 209 | No Gas | 50.141 | 50.141 | 1.9 | 1407902.93 | 50 | |
| Na | 23 | 45 | He | 5032.683 | 5032.683 | 0.8 | 2067387.63 | 5000 | |
| Mg | 24 | 45 | He | 4902.063 | 4902.063 | 0.9 | 999392.90 | 5000 | |
| Al | 27 | 45 | He | 964.877 | 964.877 | 0.5 | 58016.54 | 1000 | |
| Si | 29 | 45 | He | -20.347 | -20.347 | 3.0 | 1392.07 | 5000 | LCS6020 Main CR1 Failed |
| K | 39 | 45 | He | 4917.036 | 4917.036 | 1.3 | 449219.53 | 5000 | |
| Ca | 44 | 45 | He | 24512.64 | 24512.640 | 0.5 | 123301.15 | 25000 | |
| Ti | 47 | 45 | He | 49.256 | 49.256 | 2.0 | 2106.48 | 50 | |
| V | 51 | 72 | He | 51.6 | 51.600 | 0.5 | 79830.42 | 50 | |
| Cr | 52 | 72 | He | 51.67 | 51.670 | 0.4 | 106727.46 | 50 | |
| Mn | 55 | 72 | He | 51.642 | 51.642 | 1.2 | 45398.80 | 50 | |
| Fe | 57 | 72 | He | 5145.767 | 5145.767 | 0.4 | 208583.12 | 5000 | |
| Co | 59 | 72 | He | 52.646 | 52.646 | 0.2 | 191622.19 | 50 | |
| Ni | 60 | 72 | He | 106.344 | 106.344 | 1.1 | 108477.63 | 100 | |
| Cu | 63 | 72 | He | 52.982 | 52.982 | 0.9 | 153058.36 | 50 | |
| Zn | 66 | 72 | He | 1032.392 | 1032.392 | 0.4 | 354893.20 | 1000 | |
| As | 75 | 72 | He | 51.233 | 51.233 | 0.5 | 12924.09 | 50 | |
| Se | 78 | 72 | He | 9.624 | 9.624 | 1.2 | 157.90 | 10 | |
| Sn | 120 | 115 | He | 50.061 | 50.061 | 1.8 | 64656.29 | 50 | |

**QC ISTD Table**

**Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8**

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | He | 1291931.65 | 1291085.71 | 100.07 | |
| Ge | 72 | He | 48861.76 | 47456.4966666667 | 102.96 | |
| In | 115 | He | 380512.09 | 372695.226666667 | 102.1 | |
| Lu | 175 | He | 1044118.40 | 1029247.51 | 101.44 | |
| Rh | 103 | He | 1607742.19 | 1626201.63666667 | 98.86 | |
| Sc | 45 | He | 116140.64 | 109033.716666667 | 106.52 | |
| Tb | 159 | He | 1875468.15 | 1820531.74333333 | 103.02 | |

| Name | Mass | Mode | CPS | Ref CPS | Rec | Flag |
|---|---|---|---|---|---|---|
| Bi | 209 | No Gas | 3685707.97 | 3617762.55 | 101.88 | |
| Ge | 72 | No Gas | 625577.91 | 597606.886666667 | 104.68 | |
| In | 115 | No Gas | 3928966.14 | 3893084.07 | 100.92 | |
| Lu | 175 | No Gas | 6161916.37 | 5877008.03666667 | 104.85 | |
| Rh | 103 | No Gas | 3964583.73 | 3958933.73 | 100.14 | |
| Sc | 45 | No Gas | 4266712.75 | 4093118.31 | 104.24 | |
| Tb | 159 | No Gas | 5821389.70 | 5654253.04333333 | 102.96 | |

# Form VIII

# Tunes

VIII
ICP-MS TUNE

| | | | |
|---|---|---|---|
| Report No: | 218040620 | GCAL QC ID: | 1150 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180417A_MS1.b\QCTune\2180417A_MS1-QCTu |
| Analyst: | AWG | Analytical Batch: | 633612 |
| Analysis Date: | 04/17/18 Time: 0902 | Analytical Method: | EPA 6020A |

| ***ELEMENT - MASS*** | ***AVG MEASURED MASS (amu)*** | ***PEAK WIDTH AT 5% PEAK HEIGHT (amu)*** | ***%RSD*** |
|---|---|---|---|
| Be-9 | 8.95 | .7846 | .89 |
| Mg-24 | 23.9 | .7868 | .593 |
| Mg-25 | 24.95 | .783 | 1.1066 |
| Mg-26 | 25.95 | .7842 | 1.0655 |
| Co-59 | 58.95 | .7367 | .5404 |
| In-115 | 115 | .7316 | .9944 |
| Pb-206 | 205.95 | .7726 | .8897 |
| Pb-207 | 206.9 | .7387 | 1.2371 |
| Pb-208 | 207.9 | .7807 | .601 |

FORM VIII - IN

# US EPA Tune Check Sample Report

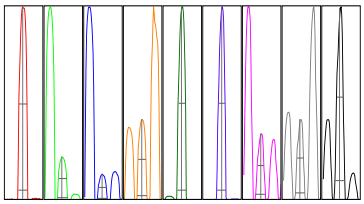
**Batch Folder** C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b
**Report Comment**
**Instrument Name** G3281A JP10280491

**[No Gas]**

| Mass | Count (Mean) | RSD% (Actual) | RSD% (Required) | RSD% (Flag) |
|---|---|---|---|---|
| 9 | 8447 | 0.89 | 5.00 | |
| 24 | 32949 | 0.59 | 5.00 | |
| 25 | 4142 | 1.11 | 5.00 | |
| 26 | 4676 | 1.07 | 5.00 | |
| 59 | 66720 | 0.54 | 5.00 | |
| 115 | 48590 | 0.99 | 5.00 | |
| 206 | 13297 | 0.89 | 5.00 | |
| 207 | 12415 | 1.24 | 5.00 | |
| 208 | 28923 | 0.60 | 5.00 | |

| Mass | Replicate 1 Count | Replicate 2 Count | Replicate 3 Count | Replicate 4 Count | Replicate 5 Count |
|---|---|---|---|---|---|
| 9 | 8386 | 8422 | 8380 | 8555 | 8491 |
| 24 | 33028 | 32784 | 32915 | 33245 | 32774 |
| 25 | 4179 | 4116 | 4139 | 4193 | 4081 |
| 26 | 4684 | 4724 | 4682 | 4592 | 4699 |
| 59 | 67144 | 66916 | 66773 | 66571 | 66194 |
| 115 | 49009 | 48999 | 48806 | 48068 | 48068 |
| 206 | 13469 | 13186 | 13228 | 13232 | 13368 |
| 207 | 12606 | 12190 | 12367 | 12483 | 12430 |
| 208 | 28694 | 28940 | 29083 | 28806 | 29092 |

**Integration Time [sec] =** 0.1



| Mass | Peak Height | Axis (Actual) | Axis (Required) | Axis (Flag) | Width-X% (Actual) | Width-X% (Required) | Width-X% (Flag) |
|---|---|---|---|---|---|---|---|
| 9 | 1374 | 8.95 | 8.9 - 9.1 | | 0.785 | 0.849 | |
| 24 | 5371 | 23.90 | 23.9 - 24.1 | | 0.787 | 0.849 | |
| 25 | 702 | 24.95 | 24.9 - 25.1 | | 0.783 | 0.849 | |
| 26 | 779 | 25.95 | 25.9 - 26.1 | | 0.784 | 0.849 | |
| 59 | 11987 | 58.95 | 58.9 - 59.1 | | 0.737 | 0.849 | |
| 115 | 9272 | 115.00 | 114.9 - 115.1 | | 0.732 | 0.849 | |
| 206 | 2539 | 205.95 | 205.9 - 206.1 | | 0.773 | 0.849 | |
| 207 | 2329 | 206.90 | 206.9 - 207.1 | | 0.739 | 0.849 | |
| 208 | 5571 | 207.90 | 207.9 - 208.1 | | 0.781 | 0.849 | |

**X% =** 5 **Integration Time [sec] =** 0.1 **Acquisition Time [sec] =** 235 **Y Axis =** Linear

**Tune Parameters**

**## Plasma Paramters ##**

| ParameterName | Value | Unit | ParameterName | Value | Unit | ParameterName | Value | Unit |
|---|---|---|---|---|---|---|---|---|
| RF Power | 1550 | W | Carrier Gas | 0.50 | L/min | | | |
| RF Matching | 1.20 | V | Option Gas | 0.0 | % | | | |
| Smpl Depth | 10.0 | mm | Nebulizer Pump | 0.10 | rps | | | |
| S/C Temp | 2 | ℃ | | | | | | |

**## Lenses Parameters ##**

| ParameterName | Value | Unit | ParameterName | Value | Unit | ParameterName | Value | Unit |
|---|---|---|---|---|---|---|---|---|
| Extract 1 | 0.0 | V | Omega Lens | 9.6 | V | | | |
| Extract 2 | -175.0 | V | Cell Entrance | -30 | V | | | |
| Omega Bias | -85 | V | Cell Exit | -50 | V | | | |
| Deflect | 12.4 | V | | | | | | |

**## Cell Parameters ##**

| ParameterName | Value | Unit | ParameterName | Value | Unit | ParameterName | Value | Unit |
|---|---|---|---|---|---|---|---|---|
| Use Gas | false | | 3rd Gas Flow | 0 | % | | | |
| He Flow | 0.0 | mL/min | OctP Bias | -8.0 | V | | | |
| H2 Flow | 0.0 | mL/min | OctP RF | 200 | V | | | |
| Energy Discrimination | 5.0 | V | | | | | | |

VIII
ICP-MS TUNE

| | | | |
|---|---|---|---|
| Report No: | 218040620 | GCAL QC ID: | 1150 |
| Instrument ID: | ICPMS1 | Lab File ID: | 2180416A_MS1.b\QCTune\2180416A_MS1-QCTu |
| Analyst: | AWG | Analytical Batch: | 633483 |
| Analysis Date: | 04/16/18 Time: 1001 | Analytical Method: | EPA 6020A Dissolved |

| ***ELEMENT - MASS*** | ***AVG MEASURED MASS (amu)*** | ***PEAK WIDTH AT 5% PEAK HEIGHT (amu)*** | ***%RSD*** |
|---|---|---|---|
| Be-9 | 9 | .7863 | .4393 |
| Mg-24 | 23.9 | .7884 | .5464 |
| Mg-25 | 24.9 | .785 | .9528 |
| Mg-26 | 25.95 | .7874 | 1.0983 |
| Co-59 | 58.95 | .7768 | .3022 |
| In-115 | 115 | .7695 | .3902 |
| Pb-206 | 205.95 | .7765 | .6961 |
| Pb-207 | 206.95 | .7753 | 1.1309 |
| Pb-208 | 207.95 | .7856 | .7775 |

FORM VIII - IN

# US EPA Tune Check Sample Report

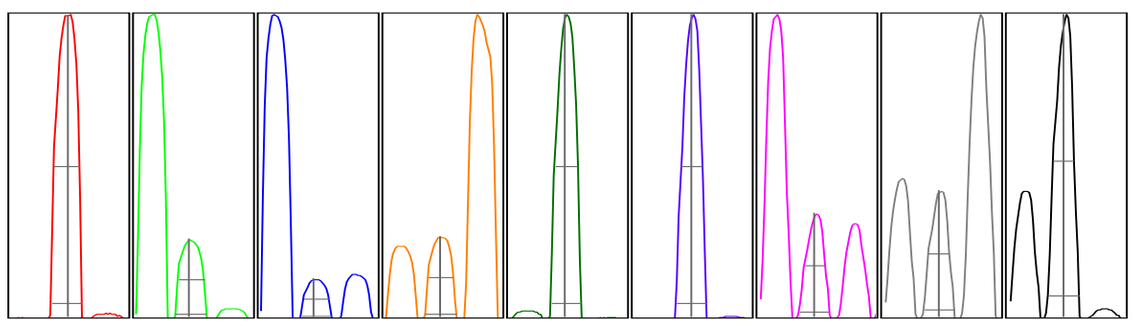
**Batch Folder** C:\Agilent\ICPMH\1\DATA\2180416A_MS1.b
**Report Comment**
**Instrument Name** G3281A JP10280491

**[No Gas]**

| Mass | Count (Mean) | RSD% (Actual) | RSD% (Required) | RSD% (Flag) |
|---|---|---|---|---|
| 9 | 10426 | 0.44 | 5.00 | |
| 24 | 42783 | 0.55 | 5.00 | |
| 25 | 5381 | 0.95 | 5.00 | |
| 26 | 6092 | 1.10 | 5.00 | |
| 59 | 75461 | 0.30 | 5.00 | |
| 115 | 51669 | 0.39 | 5.00 | |
| 206 | 13987 | 0.70 | 5.00 | |
| 207 | 12968 | 1.13 | 5.00 | |
| 208 | 30544 | 0.78 | 5.00 | |

| Mass | Replicate 1 Count | Replicate 2 Count | Replicate 3 Count | Replicate 4 Count | Replicate 5 Count |
|---|---|---|---|---|---|
| 9 | 10435 | 10353 | 10464 | 10463 | 10415 |
| 24 | 42380 | 42915 | 42970 | 42839 | 42812 |
| 25 | 5361 | 5406 | 5361 | 5321 | 5455 |
| 26 | 6197 | 6043 | 6027 | 6088 | 6106 |
| 59 | 75116 | 75438 | 75423 | 75608 | 75717 |
| 115 | 51649 | 51604 | 51923 | 51385 | 51782 |
| 206 | 13970 | 14104 | 13908 | 14068 | 13882 |
| 207 | 12747 | 12936 | 12964 | 13052 | 13139 |
| 208 | 30401 | 30351 | 30938 | 30441 | 30588 |

**Integration Time [sec] =** 0.1



| Mass | Peak Height | Axis (Actual) | Axis (Required) | Axis (Flag) | Width-X% (Actual) | Width-X% (Required) | Width-X% (Flag) |
|---|---|---|---|---|---|---|---|
| 9 | 1685 | 9.00 | 8.9 - 9.1 | | 0.786 | 0.849 | |
| 24 | 6892 | 23.90 | 23.9 - 24.1 | | 0.788 | 0.849 | |
| 25 | 881 | 24.90 | 24.9 - 25.1 | | 0.785 | 0.849 | |
| 26 | 994 | 25.95 | 25.9 - 26.1 | | 0.787 | 0.849 | |
| 59 | 13504 | 58.95 | 58.9 - 59.1 | | 0.777 | 0.849 | |
| 115 | 9759 | 115.00 | 114.9 - 115.1 | | 0.770 | 0.849 | |
| 206 | 2705 | 205.95 | 205.9 - 206.1 | | 0.777 | 0.849 | |
| 207 | 2447 | 206.95 | 206.9 - 207.1 | | 0.775 | 0.849 | |
| 208 | 5867 | 207.95 | 207.9 - 208.1 | | 0.786 | 0.849 | |

**X% =** 5 **Integration Time [sec] =** 0.1 **Acquisition Time [sec] =** 235 **Y Axis =** Linear

**Tune Parameters**

**## Plasma Paramters ##**

| ParameterName | Value | Unit | ParameterName | Value | Unit | ParameterName | Value | Unit |
|---|---|---|---|---|---|---|---|---|
| RF Power | 1550 | W | Carrier Gas | 0.50 | L/min | | | |
| RF Matching | 1.20 | V | Option Gas | 0.0 | % | | | |
| Smpl Depth | 10.0 | mm | Nebulizer Pump | 0.10 | rps | | | |
| S/C Temp | 2 | ℃ | | | | | | |

**## Lenses Parameters ##**

| ParameterName | Value | Unit | ParameterName | Value | Unit | ParameterName | Value | Unit |
|---|---|---|---|---|---|---|---|---|
| Extract 1 | 0.0 | V | Omega Lens | 9.5 | V | | | |
| Extract 2 | -170.0 | V | Cell Entrance | -30 | V | | | |
| Omega Bias | -80 | V | Cell Exit | -50 | V | | | |
| Deflect | 12.8 | V | | | | | | |

**## Cell Parameters ##**

| ParameterName | Value | Unit | ParameterName | Value | Unit | ParameterName | Value | Unit |
|---|---|---|---|---|---|---|---|---|
| Use Gas | false | | 3rd Gas Flow | 0 | % | | | |
| He Flow | 0.0 | mL/min | OctP Bias | -8.0 | V | | | |
| H2 Flow | 0.0 | mL/min | OctP RF | 180 | V | | | |
| Energy Discrimination | 5.0 | V | | | | | | |

# Form X

# MDLs

METHOD DETECTION LIMITS

Lab Name: GCAL

Instrument ID: (MS) ICPMS1/ICPMS2 (AV) HYDRA

Lab Code: LA024

| *Analyte* | *MDL* | *Units* | *Type* |
|---|---|---|---|
| Aluminum | 5 | ug/L | MS |
| Antimony | .5 | ug/L | MS |
| Arsenic | .25 | ug/L | MS |
| Barium | .25 | ug/L | MS |
| Boron | 2.50 | ug/L | MS |
| Beryllium | .25 | ug/L | MS |
| Cadmium | .25 | ug/L | MS |
| Calcium | 125 | ug/L | MS |
| Chromium | .25 | ug/L | MS |
| Cobalt | .25 | ug/L | MS |
| Copper | .25 | ug/L | MS |
| Iron | 25 | ug/L | MS |
| Lead | .25 | ug/L | MS |
| Magnesium | 25 | ug/L | MS |
| Manganese | 1.25 | ug/L | MS |
| Molybdenum | .25 | ug/L | MS |
| Nickel | .5 | ug/L | MS |
| Potassium | 25 | ug/L | MS |
| Selenium | .25 | ug/L | MS |
| Silver | .25 | ug/L | MS |
| Sodium | 25 | ug/L | MS |
| Thallium | .25 | ug/L | MS |
| Titanium | .25 | ug/L | MS |
| Vanadium | .25 | ug/L | MS |
| Zinc | 5 | ug/L | MS |
| Mercury | 0.00007 | mg/L | AV |

FORM X - IN

METHOD DETECTION LIMITS

Lab Name: GCAL

Instrument ID: (MS) ICPMS1/ICPMS2 (AV) HYDRA

Lab Code: LA024

| *Analyte* | *MDL* | *Units* | *Type* |
|---|---|---|---|
| Aluminum | 200 | ug/kg | MS |
| Antimony | 20 | ug/kg | MS |
| Arsenic | 10 | ug/kg | MS |
| Barium | 10 | ug/kg | MS |
| Beryllium | 10 | ug/kg | MS |
| Boron | 100 | ug/kg | MS |
| Cadmium | 10 | ug/kg | MS |
| Calcium | 5000 | ug/kg | MS |
| Chromium | 10 | ug/kg | MS |
| Cobalt | 10 | ug/kg | MS |
| Copper | 10 | ug/kg | MS |
| Iron | 1000 | ug/kg | MS |
| Lead | 10 | ug/kg | MS |
| Magnesium | 1000 | ug/kg | MS |
| Manganese | 50 | ug/kg | MS |
| Nickel | 20 | ug/kg | MS |
| Potassium | 1000 | ug/kg | MS |
| Selenium | 10 | ug/kg | MS |
| Silver | 10 | ug/kg | MS |
| Sodium | 1000 | ug/kg | MS |
| Thallium | 10 | ug/kg | MS |
| Vanadium | 10 | ug/kg | MS |
| Zinc | 200 | ug/kg | MS |
| Mercury | 0.004 | mg/kg | AV |
| Molybdenum | 10 | ug/kg | MS |

FORM X - IN

# Form XIII

# Preparation Logs

XIII
PREPARATION LOG

Report No: 218040620

Prep Method: EPA 3010A Prep Batch: 632823

| *CLIENT SAMPLE ID* | *GCAL SAMPLE ID* | *PREP DATE* | *WEIGHT* | *UNITS* | *VOLUME* | *UNITS* |
|---|---|---|---|---|---|---|
| LCS1794156 | 1794156 | 04/07/18 | | | 50 | mL |
| LCSD1794294 | 1794294 | 04/07/18 | | | 50 | mL |
| MB1794155 | 1794155 | 04/07/18 | | | 50 | mL |
| MW-11-01-21 | 21804062009 | 04/07/18 | | | 50 | mL |
| MW-11-02-21 | 21804062002 | 04/07/18 | | | 50 | mL |
| MW-11-06-21 | 21804062007 | 04/07/18 | | | 50 | mL |
| MW-11-10-21 | 21804062008 | 04/07/18 | | | 50 | mL |
| MW-13-11-21 | 21804062001 | 04/07/18 | | | 50 | mL |
| RD5-MW-01-21 | 21804062010 | 04/07/18 | | | 50 | mL |

FORM XIII - IN

XIII
PREPARATION LOG

Report No: 218040620

Prep Method: EPA 3005A Prep Batch: 632790

| *CLIENT SAMPLE ID* | *GCAL SAMPLE ID* | *PREP DATE* | *WEIGHT* | *UNITS* | *VOLUME* | *UNITS* |
|---|---|---|---|---|---|---|
| LCS1793969 | 1793969 | 04/09/18 | | | 50 | mL |
| MB1793968 | 1793968 | 04/09/18 | | | 50 | mL |
| MW-01-09-21MS | 21804053510 | 04/09/18 | | | 50 | mL |
| MW-01-09-21MSD | 21804053511 | 04/09/18 | | | 50 | mL |
| MW-11-01-21 | 21804062009 | 04/09/18 | | | 50 | mL |
| MW-11-02-21 | 21804062002 | 04/09/18 | | | 50 | mL |
| MW-11-06-21 | 21804062007 | 04/09/18 | | | 50 | mL |
| MW-11-10-21 | 21804062008 | 04/09/18 | | | 50 | mL |
| MW-13-11-21 | 21804062001 | 04/09/18 | | | 50 | mL |
| RD5-MW-01-21 | 21804062010 | 04/09/18 | | | 50 | mL |

FORM XIII - IN

# Form XIV

# Run Logs

XIV
ANALYSIS RUN LOG

Report No: 218040620 | Analytical Batch: 633612 | Start Date: 04/17/18

Instrument ID: ICPMS1 | Analytical Method: EPA 6020A & 6020A Dissolved | End Date: 04/18/18

| CLIENT SAMPLE ID | GCAL SAMPLE ID | PF | D/F | TIME | Analyte Symbols | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Al | Sb | As | Ba | Be | B | Cd | Ca | Cr | Co | Cu | Fe | Pb | Li | Mg | Mn | Hg | Mo | Ni | K | Se | Si | Ag | Na | Sr | Tl | Sn | Ti | V | Zn | Zr | | | | | | |
| ITUNE | 1150 | * | 1 | 0901 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| IICALB | 1300 | * | 1 | 1037 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| IICAL2 | 1302 | * | 1 | 1042 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| IICAL4 | 1304 | * | 1 | 1046 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| IICAL5 | 1305 | * | 1 | 1051 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| IICAL6 | 1306 | * | 1 | 1055 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| IICAL1 | 1301 | * | 1 | 1100 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| ICV | 1600 | * | 1 | 1104 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| ICV | 1600 | * | 1 | 1109 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| ICB | 1700 | * | 1 | 1113 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| LLCCV | 1803 | * | 1 | 1117 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| ICSA | 2000 | * | 1 | 1122 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| ICSAB | 2100 | * | 1 | 1126 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| MB1793968 RE | 1793968 | * | 1 | 1213 | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | |
| LCS1793969 RE | 1793969 | * | 1 | 1218 | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | |
| CCV | 1800 | * | 1 | 1227 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| CCB | 1900 | * | 1 | 1231 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| LLCCV | 1803 | * | 1 | 1235 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| CCV | 1800 | * | 1 | 1401 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| CCB | 1900 | * | 1 | 1405 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| LLCCV | 1803 | * | 1 | 1410 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| MB1794155 | 1794155 | * | 1 | 1438 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| LCS1794156 | 1794156 | * | 1 | 1442 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| LCSD1794294 | 1794294 | * | 1 | 1447 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| MW-13-11-21 DL | 21804062001 | * | 10 | 1451 | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | |
| MW-13-11-21 | 21804062001 | * | 1 | 1456 | | | X | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | |
| MW-11-02-21 DL | 21804062002 | * | 10 | 1500 | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | |
| MW-11-02-21 | 21804062002 | * | 1 | 1504 | | | X | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | |
| MW-11-06-21 DL | 21804062007 | * | 10 | 1509 | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | |

FORM XIV - IN

XIV
ANALYSIS RUN LOG

Report No: 218040620 | Analytical Batch: 633612 | Start Date: 04/17/18

Instrument ID: ICPMS1 | Analytical Method: EPA 6020A & 6020A Dissolved | End Date: 04/18/18

| CLIENT SAMPLE ID | GCAL SAMPLE ID | PF | D/F | TIME | Analyte Symbols | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Al | Sb | As | Ba | Be | B | Cd | Ca | Cr | Co | Cu | Fe | Pb | Li | Mg | Mn | Hg | Mo | Ni | K | Se | Si | Ag | Na | Sr | Tl | Sn | Ti | V | Zn | Zr | | | | | | |
| MW-11-06-21 | 21804062007 | * | 1 | 1513 | | | X | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | |
| MW-11-10-21 DL | 21804062008 | * | 10 | 1517 | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | |
| MW-11-10-21 | 21804062008 | * | 1 | 1522 | | | X | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | |
| MW-11-01-21 DL | 21804062009 | * | 10 | 1526 | | | | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| MW-11-01-21 | 21804062009 | * | 1 | 1531 | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CCV | 1800 | * | 1 | 1535 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| CCB | 1900 | * | 1 | 1539 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| LLCCV | 1803 | * | 1 | 1544 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| RD5-MW-01-21 | 21804062010 | * | 1 | 1553 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| MW-13-11-21 DL | 21804062001 | * | 10 | 1619 | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | |
| MW-13-11-21 | 21804062001 | * | 1 | 1623 | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | |
| CCV | 1800 | * | 1 | 1628 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| CCB | 1900 | * | 1 | 1632 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| LLCCV | 1803 | * | 1 | 1636 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| MW-11-02-21 DL | 21804062002 | * | 10 | 1641 | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | |
| MW-11-02-21 | 21804062002 | * | 1 | 1645 | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | |
| MW-11-06-21 DL | 21804062007 | * | 10 | 1654 | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | |
| MW-11-06-21 | 21804062007 | * | 1 | 1658 | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | |
| MW-11-10-21 DL | 21804062008 | * | 10 | 1703 | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | |
| MW-11-10-21 | 21804062008 | * | 1 | 1707 | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | |
| MW-11-01-21 DL | 21804062009 | * | 10 | 1711 | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | |
| MW-11-01-21 | 21804062009 | * | 1 | 1716 | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | |
| RD5-MW-01-21 | 21804062010 | * | 1 | 1724 | | | | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| CCV | 1800 | * | 1 | 1729 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| CCB | 1900 | * | 1 | 1733 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| LLCCV | 1803 | * | 1 | 1738 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| ICSA | 2000 | * | 1 | 2156 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| ICSAB | 2100 | * | 1 | 2200 | | | X | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | | | | |

FORM XIV - IN

XIV
ANALYSIS RUN LOG

Report No: 218040620 Analytical Batch: 633483 Start Date: 04/16/18

Instrument ID: ICPMS1 Analytical Method: EPA 6020A Dissolved End Date: 04/16/18

| CLIENT SAMPLE ID | GCAL SAMPLE ID | PF | D/F | TIME | Analyte Symbols | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Al | Sb | As | Ba | Be | B | Cd | Ca | Cr | Co | Cu | Fe | Pb | Li | Mg | Mn | Hg | Mo | Ni | K | Se | Si | Ag | Na | Sr | Tl | Sn | Ti | V | Zn | Zr | | | | | |
| ITUNE | 1150 | * | 1 | 1000 | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | |
| IICALB | 1300 | * | 1 | 1232 | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | |
| IICAL2 | 1302 | * | 1 | 1236 | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | |
| IICAL4 | 1304 | * | 1 | 1241 | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | |
| IICAL5 | 1305 | * | 1 | 1245 | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | |
| IICAL6 | 1306 | * | 1 | 1250 | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | |
| IICAL1 | 1301 | * | 1 | 1255 | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | |
| ICV | 1600 | * | 1 | 1259 | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | |
| ICV | 1600 | * | 1 | 1303 | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | |
| ICB | 1700 | * | 1 | 1308 | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | |
| LLCCV | 1803 | * | 1 | 1312 | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | |
| ICSA | 2000 | * | 1 | 1317 | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | |
| ICSAB | 2100 | * | 1 | 1321 | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | |
| CCV | 1800 | * | 1 | 1734 | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | |
| CCB | 1900 | * | 1 | 1738 | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | |
| LLCCV | 1803 | * | 1 | 1743 | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | |
| MB1793968 | 1793968 | * | 1 | 1805 | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | |
| LCS1793969 | 1793969 | * | 1 | 1809 | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | |
| CCV | 1800 | * | 1 | 1831 | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | |
| CCB | 1900 | * | 1 | 1835 | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | |
| LLCCV | 1803 | * | 1 | 1840 | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | |

FORM XIV - IN

# Form XV

# Internal Standards

XV (He)

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Start Date: | 04/17/18 |
| Instrument ID: | ICPMS1 | End Date: | 04/18/18 |
| Analytical Method | EPA 6020A & 6020A Dissolved | Analytical Batch: | 633612 |

| | | | Internal Standards %RI For: | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***CLIENT SAMPLE ID*** | ***GCAL SAMPLE ID*** | ***TIME*** | ***ISTD1*** | ***Q*** | ***ISTD2*** | ***Q*** | ***ISTD3*** | ***Q*** | ***ISTD4*** | ***Q*** | ***ISTD5*** | ***Q*** | ***ISTD6*** | ***Q*** | ***ISTD7*** | ***Q*** |
| MB1793968 RE | 1793968 | 1213 | 104 | | 103 | | 104 | | 103 | | 103 | | 104 | | 104 | |
| LCS1793969 RE | 1793969 | 1218 | 100 | | 103 | | 102 | | 101 | | 99 | | 107 | | 103 | |
| MB1794155 | 1794155 | 1438 | 99 | | 101 | | 100 | | 99 | | 101 | | 100 | | 102 | |
| LCS1794156 | 1794156 | 1442 | 95 | | 98 | | 95 | | 97 | | 95 | | 95 | | 98 | |
| LCSD1794294 | 1794294 | 1447 | 95 | | 99 | | 96 | | 97 | | 96 | | 97 | | 99 | |
| MW-13-11-21 DL | 21804062001 | 1451 | 100 | | 101 | | 101 | | 100 | | 100 | | 101 | | 102 | |
| MW-13-11-21 | 21804062001 | 1456 | 91 | | 101 | | 95 | | 95 | | 90 | | 98 | | 98 | |
| MW-11-02-21 DL | 21804062002 | 1500 | 102 | | 105 | | 104 | | 102 | | 102 | | 103 | | 103 | |
| MW-11-02-21 | 21804062002 | 1504 | 91 | | 101 | | 95 | | 96 | | 86 | | 98 | | 99 | |
| MW-11-06-21 DL | 21804062007 | 1509 | 105 | | 106 | | 106 | | 104 | | 104 | | 104 | | 105 | |
| MW-11-06-21 | 21804062007 | 1513 | 97 | | 101 | | 99 | | 100 | | 96 | | 99 | | 101 | |
| MW-11-10-21 DL | 21804062008 | 1517 | 104 | | 104 | | 103 | | 102 | | 102 | | 100 | | 104 | |
| MW-11-10-21 | 21804062008 | 1522 | 97 | | 99 | | 97 | | 97 | | 95 | | 98 | | 100 | |
| MW-11-01-21 DL | 21804062009 | 1526 | 103 | | 101 | | 102 | | 102 | | 101 | | 99 | | 104 | |
| MW-11-01-21 | 21804062009 | 1531 | 96 | | 101 | | 97 | | 98 | | 95 | | 100 | | 101 | |
| RD5-MW-01-21 | 21804062010 | 1553 | 102 | | 103 | | 101 | | 100 | | 102 | | 101 | | 102 | |
| MW-13-11-21 DL | 21804062001 | 1619 | 102 | | 103 | | 103 | | 102 | | 102 | | 103 | | 104 | |
| MW-13-11-21 | 21804062001 | 1623 | 97 | | 99 | | 97 | | 99 | | 96 | | 99 | | 100 | |
| MW-11-02-21 DL | 21804062002 | 1641 | 101 | | 103 | | 101 | | 101 | | 99 | | 102 | | 101 | |
| MW-11-02-21 | 21804062002 | 1645 | 95 | | 100 | | 98 | | 99 | | 93 | | 99 | | 100 | |
| MW-11-06-21 DL | 21804062007 | 1654 | 104 | | 105 | | 104 | | 103 | | 103 | | 104 | | 104 | |
| MW-11-06-21 | 21804062007 | 1658 | 99 | | 101 | | 99 | | 100 | | 96 | | 99 | | 101 | |
| MW-11-10-21 DL | 21804062008 | 1703 | 104 | | 106 | | 104 | | 103 | | 103 | | 104 | | 105 | |
| MW-11-10-21 | 21804062008 | 1707 | 99 | | 103 | | 100 | | 101 | | 98 | | 100 | | 102 | |
| MW-11-01-21 DL | 21804062009 | 1711 | 105 | | 105 | | 104 | | 104 | | 101 | | 107 | | 105 | |
| MW-11-01-21 | 21804062009 | 1716 | 100 | | 102 | | 100 | | 101 | | 100 | | 101 | | 103 | |
| RD5-MW-01-21 | 21804062010 | 1724 | 102 | | 104 | | 102 | | 101 | | 104 | | 101 | | 104 | |

ISTD 1: Bismuth (He)
ISTD 2: Germanium (He)
ISTD 3: Indium (He)
ISTD 4: Lutetium (He)
ISTD 5: Rhodium (He)
ISTD 6: Scandium (He)
ISTD 7: Terbium (He)

FORM XV - IN

XV (No Gas)

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Start Date: | 04/17/18 |
| Instrument ID: | ICPMS1 | End Date: | 04/18/18 |
| Analytical Method | EPA 6020A & 6020A Dissolved | Analytical Batch: | 633612 |

| | | | Internal Standards %RI For: | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***CLIENT SAMPLE ID*** | ***GCAL SAMPLE ID*** | ***TIME*** | ***ISTD8*** | ***Q*** | ***ISTD9*** | ***Q*** | ***ISTD10*** | ***Q*** | ***ISTD11*** | ***Q*** | ***ISTD12*** | ***Q*** | ***ISTD13*** | ***Q*** | ***ISTD14*** | ***Q*** |
| MB1793968 RE | 1793968 | 1213 | 104 | | 105 | | 102 | | 105 | | 103 | | 104 | | 105 | |
| LCS1793969 RE | 1793969 | 1218 | 102 | | 105 | | 101 | | 105 | | 100 | | 104 | | 103 | |
| MB1794155 | 1794155 | 1438 | 104 | | 102 | | 102 | | 104 | | 101 | | 103 | | 103 | |
| LCS1794156 | 1794156 | 1442 | 100 | | 100 | | 98 | | 103 | | 97 | | 100 | | 101 | |
| LCSD1794294 | 1794294 | 1447 | 99 | | 100 | | 98 | | 102 | | 98 | | 101 | | 101 | |
| MW-13-11-21 DL | 21804062001 | 1451 | 102 | | 102 | | 102 | | 103 | | 99 | | 102 | | 102 | |
| MW-13-11-21 | 21804062001 | 1456 | 97 | | 106 | | 100 | | 102 | | 96 | | 103 | | 102 | |
| MW-11-02-21 DL | 21804062002 | 1500 | 103 | | 105 | | 104 | | 105 | | 103 | | 134 | | 105 | |
| MW-11-02-21 | 21804062002 | 1504 | 96 | | 108 | | 99 | | 103 | | 96 | | 105 | | 102 | |
| MW-11-06-21 DL | 21804062007 | 1509 | 105 | | 106 | | 104 | | 105 | | 103 | | 105 | | 104 | |
| MW-11-06-21 | 21804062007 | 1513 | 101 | | 106 | | 101 | | 105 | | 99 | | 104 | | 104 | |
| MW-11-10-21 DL | 21804062008 | 1517 | 106 | | 103 | | 104 | | 105 | | 102 | | 133 | | 105 | |
| MW-11-10-21 | 21804062008 | 1522 | 101 | | 102 | | 101 | | 104 | | 98 | | 101 | | 103 | |
| MW-11-01-21 DL | 21804062009 | 1526 | 103 | | 102 | | 103 | | 104 | | 101 | | 121 | | 103 | |
| MW-11-01-21 | 21804062009 | 1531 | 99 | | 101 | | 99 | | 103 | | 97 | | 101 | | 102 | |
| RD5-MW-01-21 | 21804062010 | 1553 | 105 | | 103 | | 103 | | 104 | | 102 | | 104 | | 105 | |
| MW-13-11-21 DL | 21804062001 | 1619 | 105 | | 104 | | 104 | | 105 | | 102 | | 104 | | 105 | |
| MW-13-11-21 | 21804062001 | 1623 | 101 | | 103 | | 100 | | 104 | | 98 | | 102 | | 103 | |
| MW-11-02-21 DL | 21804062002 | 1641 | 103 | | 103 | | 103 | | 104 | | 102 | | 103 | | 104 | |
| MW-11-02-21 | 21804062002 | 1645 | 98 | | 101 | | 98 | | 102 | | 95 | | 102 | | 102 | |
| MW-11-06-21 DL | 21804062007 | 1654 | 106 | | 105 | | 104 | | 106 | | 103 | | 105 | | 105 | |
| MW-11-06-21 | 21804062007 | 1658 | 102 | | 104 | | 101 | | 104 | | 98 | | 104 | | 104 | |
| MW-11-10-21 DL | 21804062008 | 1703 | 105 | | 106 | | 105 | | 105 | | 104 | | 105 | | 105 | |
| MW-11-10-21 | 21804062008 | 1707 | 102 | | 104 | | 102 | | 104 | | 101 | | 104 | | 104 | |
| MW-11-01-21 DL | 21804062009 | 1711 | 105 | | 105 | | 105 | | 106 | | 104 | | 105 | | 106 | |
| MW-11-01-21 | 21804062009 | 1716 | 102 | | 103 | | 101 | | 104 | | 99 | | 103 | | 105 | |
| RD5-MW-01-21 | 21804062010 | 1724 | 106 | | 105 | | 104 | | 105 | | 104 | | 105 | | 104 | |

ISTD 8: Bismuth (No Gas)
ISTD 9: Germanium (No Gas)
ISTD 10 Indium (No Gas)
ISTD 11 Lutetium (No Gas)
ISTD 12 Rhodium (No Gas)
ISTD 13 Scandium (No Gas)
ISTD 14 Terbium (No Gas)

FORM XV - IN

XV (He)

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Start Date: | 04/16/18 |
| Instrument ID: | ICPMS1 | End Date: | 04/16/18 |
| Analytical Method | EPA 6020A Dissolved | Analytical Batch: | 633483 |

| | | | Internal Standards %RI For: | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***CLIENT SAMPLE ID*** | ***GCAL SAMPLE ID*** | ***TIME*** | ***ISTD1*** | ***Q*** | ***ISTD2*** | ***Q*** | ***ISTD3*** | ***Q*** | ***ISTD4*** | ***Q*** | ***ISTD5*** | ***Q*** | ***ISTD6*** | ***Q*** | ***ISTD7*** | ***Q*** |
| MB1793968 | 1793968 | 1805 | 89 | | 81 | | 83 | | 87 | | 80 | | 80 | | 88 | |
| LCS1793969 | 1793969 | 1809 | 86 | | 81 | | 82 | | 86 | | 76 | | 78 | | 87 | |

ISTD 1: Bismuth (He)
ISTD 2: Germanium (He)
ISTD 3: Indium (He)
ISTD 4: Lutetium (He)
ISTD 5: Rhodium (He)
ISTD 6: Scandium (He)
ISTD 7: Terbium (He)

FORM XV - IN

XV (No Gas)

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Start Date: | 04/16/18 |
| Instrument ID: | ICPMS1 | End Date: | 04/16/18 |
| Analytical Method | EPA 6020A Dissolved | Analytical Batch: | 633483 |

| | | | Internal Standards %RI For: | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***CLIENT SAMPLE ID*** | ***GCAL SAMPLE ID*** | ***TIME*** | ***ISTD8*** | ***Q*** | ***ISTD9*** | ***Q*** | ***ISTD10*** | ***Q*** | ***ISTD11*** | ***Q*** | ***ISTD12*** | ***Q*** | ***ISTD13*** | ***Q*** | ***ISTD14*** | ***Q*** |
| MB1793968 | 1793968 | 1805 | 89 | | 81 | | 86 | | 89 | | 84 | | 80 | | 88 | |
| LCS1793969 | 1793969 | 1809 | 87 | | 79 | | 83 | | 87 | | 80 | | 78 | | 86 | |

ISTD 8: Bismuth (No Gas)
ISTD 9: Germanium (No Gas)
ISTD 10 Indium (No Gas)
ISTD 11 Lutetium (No Gas)
ISTD 12 Rhodium (No Gas)
ISTD 13 Scandium (No Gas)
ISTD 14 Terbium (No Gas)

FORM XV - IN

# ICPMS ICALs

GCAL ANALYTICAL LABORATORIES, LLC

**ICP-MS**

BY METHODS EPA 200.8/6020A/6020B

Date: 4/16/18
Analyst: AWG

Instrument ID: ICPMS1
HBN: 633483
Batch: 118|3
ICPMS Reference File: 218041 16B_MS1

| | | | |
|---|---|---|---|
| Cal Standard | 316-47-9 | Exp. Date | 4/23/18 |
| ICV Standard | 316-47-11 | Exp. Date | 4/23/18 |
| ICSA Standard | 316-47-10 | Exp. Date | 4/23/18 |
| ICSAB Standard | 316-47-8 | Exp. Date | 4/20/18 |
| Internal Standard | 316-45-5 | Exp. Date | 5/2/18 |
| Tune | 316-46-7 | Exp. Date | 6/23/18 |
| P/A | 316-44-4 | Exp. Date | 6/23/18 |

ICPMS Acid Matrix (Calibration Blank) (2% HNO3/0.5% HCl) 317-36-17 Exp. Date 6/23/18
ICPMS Acid Matrix (5% HNO3/2% HCl) 317-36-16 Exp. Date 5/26/19

**QC Limits:**
Calibration Correlation Coefficient R ≥ 0.998 for 6020A and 200.8
Calibration Correlation Coefficient R ≥ 0.995 for 6020B

| | GCAL Limits |
|---|---|
| ICV | 90-110% |
| LLCCV (initial) | 80-120% DOD and 6020B / 70-130% for 6020A non DOD and 200.8 |
| ICSA/ICSAB | 80-120% |
| LLCCV (continuing) | 70-130% (not applicable for 6020B) |
| CCV | 90-110% |

Revision 005: 02/15/2017

Reviewer/Date: AWG 4/17/18

| Sample | | | | | | |
|---|---|---|---|---|---|---|
| Data File | Acq. Date-Time | Type | Sample Name | Total Dil. | Vial Number | Comment |
| 001SMPL.d | 4/16/2018 12:27 | Sample | Blank | 1 | 5 | |
| 002CALB.d | 4/16/2018 12:32 | CalBlk | 1300 | 1 | 1107 | |
| 003CALS.d | 4/16/2018 12:36 | CalStd | 1302 | 1 | 1105 | |
| 004CALS.d | 4/16/2018 12:41 | CalStd | 1304 | 1 | 1103 | |
| 005CALS.d | 4/16/2018 12:45 | CalStd | 1305 | 1 | 1102 | |
| 006CALS.d | 4/16/2018 12:50 | CalStd | 1306 | 1 | 1101 | |
| 007CALS.d | 4/16/2018 12:55 | CalStd | 1301 | 1 | 1301 | |
| 008_ICV.d | 4/16/2018 12:59 | ICV | 1600 | 1 | 1201 | |
| 009_ICV.d | 4/16/2018 13:03 | ICV | 1600 AI | 1 | 1203 | |
| 010_ICB.d | 4/16/2018 13:08 | ICB | 1700 | 1 | 1107 | |
| 011CCV1.d | 4/16/2018 13:12 | LLCCV1 | 1803 | 1 | 1103 | |
| 012ICSA.d | 4/16/2018 13:17 | ICSA | 2000 | 1 | 1205 | |
| 013ICSB.d | 4/16/2018 13:21 | ICSB | 2100 | 1 | 1206 | |
| 014SMPL.d | 4/16/2018 13:38 | Sample | 1793567 | 1 | 2107 | |
| 015SMPL.d | 4/16/2018 13:42 | Sample | 1793569 | 1 | 2108 | |
| 016SMPL.d | 4/16/2018 13:46 | Sample | 1793789 | 1 | 2109 | |
| 017SMPL.d | 4/16/2018 13:51 | Sample | 21804052101 10X | 10 | 2110 | |
| 018SMPL.d | 4/16/2018 13:55 | Sample | 21804052101 | 1 | 2111 | |
| 019SMPL.d | 4/16/2018 13:59 | Sample | 21804052102 10X | 10 | 2112 | |
| 020SMPL.d | 4/16/2018 14:04 | Sample | 21804052102 | 1 | 2201 | |
| 021SMPL.d | 4/16/2018 14:08 | Sample | 21804052103 10X | 10 | 2202 | |
| 022SMPL.d | 4/16/2018 14:13 | Sample | 21804052103 | 1 | 2203 | |
| 023SMPL.d | 4/16/2018 14:17 | Sample | 21804052104 10X | 10 | 2204 | |
| 024SMPL.d | 4/16/2018 14:21 | Sample | 21804052104 | 1 | 2205 | |
| 025SMPL.d | 4/16/2018 14:26 | Sample | 21804052105 10X | 10 | 2206 | |
| 026SMPL.d | 4/16/2018 14:30 | Sample | 21804052105 | 1 | 2207 | |
| 027_CCV.d | 4/16/2018 14:35 | CCV | 1800 | 1 | 1102 | |
| 028_CCB.d | 4/16/2018 14:39 | CCB | 1900 | 1 | 1107 | |
| 029LCCV.d | 4/16/2018 14:43 | LLCCV | 1803 | 1 | 1103 | |
| 030SMPL.d | 4/16/2018 14:48 | Sample | 21804052106 10X | 10 | 2208 | |
| 031SMPL.d | 4/16/2018 14:52 | Sample | 21804052106 | 1 | 2209 | |
| 032SMPL.d | 4/16/2018 14:56 | Sample | 21804052108 10X | 10 | 2210 | |
| 033SMPL.d | 4/16/2018 15:01 | Sample | 21804052108 | 1 | 2211 | |
| 034SMPL.d | 4/16/2018 15:05 | Sample | 21804052110 10X | 10 | 2212 | |
| 035SMPL.d | 4/16/2018 15:10 | Sample | 21804052110 | 1 | 2301 | |
| 036SMPL.d | 4/16/2018 15:14 | Sample | 21804052112 10X | 10 | 2302 | |
| 037SMPL.d | 4/16/2018 15:18 | Sample | 21804052112 | 1 | 2303 | |
| 038SMPL.d | 4/16/2018 15:23 | Sample | 21804052116 10X | 10 | 2304 | |
| 039SMPL.d | 4/16/2018 15:27 | Sample | 21804052116 | 1 | 2305 | |
| 040_CCV.d | 4/16/2018 15:31 | CCV | 1800 | 1 | 1102 | |
| 041_CCB.d | 4/16/2018 15:36 | CCB | 1900 | 1 | 1107 | |
| 042LCCV.d | 4/16/2018 15:40 | LLCCV | 1803 | 1 | 1103 | |
| 043SMPL.d | 4/16/2018 15:45 | Sample | 21804052001 10X | 10 | 2306 | |
| 044SMPL.d | 4/16/2018 15:49 | Sample | 21804052001 | 1 | 2307 | |
| 045SMPL.d | 4/16/2018 15:53 | Sample | 21804052003 10X | 10 | 2308 | |

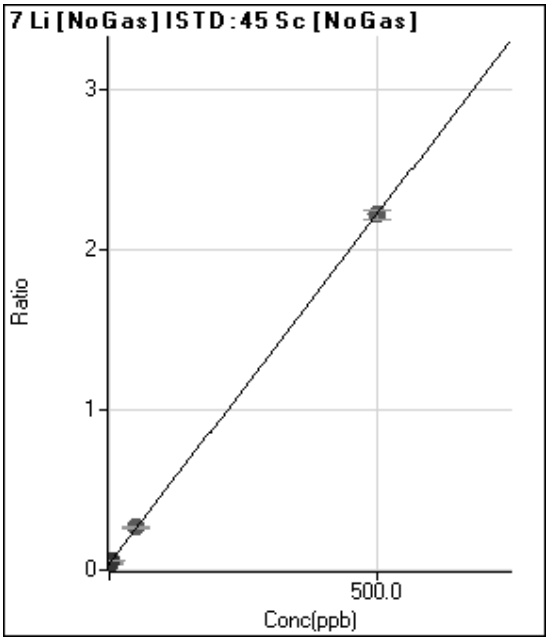
| | | | | | | |
|---|---|---|---|---|---|---|
| 046SMPL.d | 4/16/2018 15:58 | Sample | 21804052003 | 1 | 2309 | |
| 047SMPL.d | 4/16/2018 16:02 | Sample | 21804052005 10X | 10 | 2310 | |
| 048SMPL.d | 4/16/2018 16:07 | Sample | 21804052005 | 1 | 2311 | |
| 049SMPL.d | 4/16/2018 16:11 | Sample | 21804052006 10X | 10 | 2312 | |
| 050SMPL.d | 4/16/2018 16:15 | Sample | 21804052006 | 1 | 2401 | |
| 051_CCV.d | 4/16/2018 16:20 | CCV | 1800 | 1 | 1102 | |
| 052_CCB.d | 4/16/2018 16:24 | CCB | 1900 | 1 | 1107 | |
| 053LCCV.d | 4/16/2018 16:28 | LLCCV | 1803 | 1 | 1103 | |
| 054SMPL.d | 4/16/2018 16:33 | Sample | 21804053507 10X | 10 | 2402 | |
| 055SMPL.d | 4/16/2018 16:37 | Sample | 21804053507 | 1 | 2403 | |
| 056SMPL.d | 4/16/2018 16:42 | Sample | 21804053508 10X | 10 | 2404 | |
| 057SMPL.d | 4/16/2018 16:46 | Sample | 21804053508 | 1 | 2405 | |
| 058SMPL.d | 4/16/2018 16:50 | Sample | 21804053509 10X | 10 | 2406 | |
| 059SMPL.d | 4/16/2018 16:55 | Sample | 21804053510 10X | 10 | 2407 | |
| 060SMPL.d | 4/16/2018 16:59 | Sample | 21804053511 10X | 10 | 2408 | |
| 061SMPL.d | 4/16/2018 17:03 | Sample | 1797702 10X | 10 | 2409 | |
| 062SMPL.d | 4/16/2018 17:08 | Sample | 1797703 10X | 50 | 2410 | |
| 063SMPL.d | 4/16/2018 17:12 | Sample | 21804053509 | 1 | 2411 | |
| 064SMPL.d | 4/16/2018 17:17 | Sample | 21804053510 | 1 | 2412 | |
| 065SMPL.d | 4/16/2018 17:21 | Sample | 21804053511 | 1 | 2501 | |
| 066SMPL.d | 4/16/2018 17:25 | Sample | 1797702 | 1 | 2502 | |
| 067SMPL.d | 4/16/2018 17:30 | Sample | 1797703 | 5 | 2503 | |
| 068_CCV.d | 4/16/2018 17:34 | CCV | 1800 | 1 | 1102 | |
| 069_CCB.d | 4/16/2018 17:38 | CCB | 1900 | 1 | 1107 | |
| 070LCCV.d | 4/16/2018 17:43 | LLCCV | 1803 | 1 | 1103 | |
| 071SMPL.d | 4/16/2018 17:47 | Sample | 21804053512 10X | 10 | 2504 | |
| 072SMPL.d | 4/16/2018 17:52 | Sample | 21804053512 | 1 | 2505 | |
| 073SMPL.d | 4/16/2018 17:56 | Sample | 21804053520 10X | 10 | 2506 | |
| 074SMPL.d | 4/16/2018 18:00 | Sample | 21804053520 | 1 | 2507 | |
| 075SMPL.d | 4/16/2018 18:05 | Sample | 1793968 | 1 | 2508 | |
| 076SMPL.d | 4/16/2018 18:09 | Sample | 1793969 | 1 | 2509 | |
| 077SMPL.d | 4/16/2018 18:13 | Sample | 21804053507 D 10X | 10 | 2510 | |
| 078SMPL.d | 4/16/2018 18:18 | Sample | 21804053507 D | 1 | 2511 | |
| 079SMPL.d | 4/16/2018 18:22 | Sample | 21804053508 D 10X | 10 | 2512 | |
| 080SMPL.d | 4/16/2018 18:27 | Sample | 21804053508 D | 1 | 3101 | |
| 081_CCV.d | 4/16/2018 18:31 | CCV | 1800 | 1 | 1102 | |
| 082_CCB.d | 4/16/2018 18:35 | CCB | 1900 | 1 | 1107 | |
| 083LCCV.d | 4/16/2018 18:40 | LLCCV | 1803 | 1 | 1103 | |
| 084SMPL.d | 4/16/2018 18:44 | Sample | 21804053509 D 10X | 10 | 3102 | |
| 085SMPL.d | 4/16/2018 18:49 | Sample | 21804053510 D 10X | 10 | 3103 | |
| 086SMPL.d | 4/16/2018 18:53 | Sample | 21804053511 D 10X | 10 | 3104 | |
| 087SMPL.d | 4/16/2018 18:57 | Sample | 1797704 10X | 50 | 3105 | |
| 088SMPL.d | 4/16/2018 19:02 | Sample | 21804053509 D | 1 | 3106 | |
| 089SMPL.d | 4/16/2018 19:06 | Sample | 21804053510 D | 1 | 3107 | |
| 090SMPL.d | 4/16/2018 19:10 | Sample | 21804053511 D | 1 | 3108 | |
| 091SMPL.d | 4/16/2018 19:15 | Sample | 1797704 | 5 | 3109 | |
| 092SMPL.d | 4/16/2018 19:19 | Sample | 21804053512 D 10X | 10 | 3110 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 093SMPL.d | 4/16/2018 19:23 | Sample | 21804053512 D | 1 | 3111 | |
| 094SMPL.d | 4/16/2018 19:28 | Sample | 21804053520 D 10X | 10 | 3112 | |
| 095SMPL.d | 4/16/2018 19:32 | Sample | 21804053520 D | 1 | 3201 | |
| 096_CCV.d | 4/16/2018 19:37 | CCV | 1800 | 1 | 1102 | |
| 097_CCB.d | 4/16/2018 19:41 | CCB | 1900 | 1 | 1107 | |
| 098LCCV.d | 4/16/2018 19:45 | LLCCV | 1803 | 1 | 1103 | |
| 099SMPL.d | 4/16/2018 19:50 | Sample | 1796855 | 40 | 4101 | |
| 100SMPL.d | 4/16/2018 19:54 | Sample | 1796856 | 40 | 4102 | |
| 101SMPL.d | 4/16/2018 19:59 | Sample | 21804102701 | 390.625 | 4103 | |
| 102SMPL.d | 4/16/2018 20:03 | Sample | 21804031001 | 400 | 4104 | |
| 103SMPL.d | 4/16/2018 20:07 | Sample | 21804031002 | 400 | 4105 | |
| 104SMPL.d | 4/16/2018 20:12 | Sample | 1797502 | 1 | 3202 | |
| 105SMPL.d | 4/16/2018 20:16 | Sample | 1797503 | 1 | 3203 | |
| 106SMPL.d | 4/16/2018 20:20 | Sample | 21804122601 | 100 | 3204 | |
| 107SMPL.d | 4/16/2018 20:25 | Sample | 21804122602 | 100 | 3205 | |
| 108SMPL.d | 4/16/2018 20:29 | Sample | 21804122901 | 100 | 3206 | |
| 109SMPL.d | 4/16/2018 20:33 | Sample | 21804122902 | 100 | 3207 | |
| 110SMPL.d | 4/16/2018 20:38 | Sample | 21804122903 | 100 | 3208 | |
| 111SMPL.d | 4/16/2018 20:42 | Sample | 21804122904 | 100 | 3209 | |
| 112_CCV.d | 4/16/2018 20:47 | CCV | 1800 | 1 | 1102 | |
| 113_CCB.d | 4/16/2018 20:51 | CCB | 1900 | 1 | 1107 | |
| 114LCCV.d | 4/16/2018 20:55 | LLCCV | 1803 | 1 | 1103 | |
| 115SMPL.d | 4/16/2018 21:00 | Sample | 1797495 | 1 | 3210 | |
| 116SMPL.d | 4/16/2018 21:04 | Sample | 1797496 | 1 | 3211 | |
| 117SMPL.d | 4/16/2018 21:09 | Sample | 21804107501 | 100 | 3212 | |
| 118SMPL.d | 4/16/2018 21:13 | Sample | 21804107601 | 100 | 3301 | |
| 119SMPL.d | 4/16/2018 21:17 | Sample | 21804107701 | 100 | 3302 | |
| 120SMPL.d | 4/16/2018 21:22 | Sample | 21804107801 | 100 | 3303 | |
| 121SMPL.d | 4/16/2018 21:26 | Sample | 21804108101 | 100 | 3304 | |
| 122SMPL.d | 4/16/2018 21:30 | Sample | 21804108102 | 100 | 3305 | |
| 123SMPL.d | 4/16/2018 21:35 | Sample | 21804115501 | 100 | 3306 | |
| 124SMPL.d | 4/16/2018 21:39 | Sample | 1797498 | 100 | 3307 | |
| 125SMPL.d | 4/16/2018 21:43 | Sample | 1797499 | 100 | 3308 | |
| 126SMPL.d | 4/16/2018 21:48 | Sample | 1797757 | 100 | 3309 | |
| 127SMPL.d | 4/16/2018 21:52 | Sample | 1797758 | 500 | 3310 | |
| 128SMPL.d | 4/16/2018 21:57 | Sample | 21804115502 | 100 | 3311 | |
| 129_CCV.d | 4/16/2018 22:01 | CCV | 1800 | 1 | 1102 | |
| 130_CCB.d | 4/16/2018 22:05 | CCB | 1900 | 1 | 1107 | |
| 131LCCV.d | 4/16/2018 22:10 | LLCCV | 1803 | 1 | 1103 | |

| Tune Mode | Mass | Name | ISTD | R | a | b (blank) | DL | BEC | Units |
|---|---|---|---|---|---|---|---|---|---|
| No Gas | 7 | Li | 45 Sc [ No Gas ] | 0.999990556 | 0.004355592 | 0.040295912 | 0.386903323 | 9.251534895 | ppb |
| No Gas | 9 | Be | 45 Sc [ No Gas ] | 0.999999556 | 0.000936566 | 1.15E-05 | 0.008237838 | 0.012255102 | ppb |
| No Gas | 11 | B | 45 Sc [ No Gas ] | 0.999980107 | 0.000625193 | 0.001930664 | 0.207546664 | 3.088107581 | ppb |
| He | 23 | Na | 45 Sc [ He ] | 0.999999988 | 0.003299591 | 0.094668838 | 1.559085985 | 28.6910787 | ppb |
| He | 24 | Mg | 45 Sc [ He ] | 0.999997602 | 0.001618233 | 0.000420623 | 0.179441098 | 0.259927202 | ppb |
| He | 27 | Al | 45 Sc [ He ] | 0.999996968 | 0.000477842 | 0.000462518 | 0.800086271 | 0.967929872 | ppb |
| He | 29 | Si | 45 Sc [ He ] | 0.999954787 | 1.34E-05 | 0.013103123 | 73.94783336 | 977.9175897 | ppb |
| He | 39 | K | 45 Sc [ He ] | 0.999999156 | 0.000727716 | 0.05559655 | 25.45309505 | 76.39868532 | ppb |
| He | 44 | Ca | 45 Sc [ He ] | 0.999999953 | 4.04E-05 | 0.00149679 | 28.82795685 | 37.04326522 | ppb |
| He | 47 | Ti | 45 Sc [ He ] | 0.999999271 | 0.000335165 | 5.76E-05 | 0.200404252 | 0.171805333 | ppb |
| He | 51 | V | 72 Ge [ He ] | 0.99999632 | 0.030691418 | 0.005255276 | 0.046061109 | 0.171229507 | ppb |
| He | 52 | Cr | 72 Ge [ He ] | 0.999996781 | 0.041272935 | 0.004984924 | 0.011324639 | 0.120779482 | ppb |
| He | 55 | Mn | 72 Ge [ He ] | 0.999998 | 0.017802742 | 0.009530514 | 0.268830468 | 0.535339656 | ppb |
| He | 57 | Fe | 72 Ge [ He ] | 0.999982647 | 0.000809683 | 0.000809443 | 1.046732819 | 0.999703402 | ppb |
| He | 59 | Co | 72 Ge [ He ] | 0.999992261 | 0.072636896 | 0.000394836 | 0.003967795 | 0.005435752 | ppb |
| He | 60 | Ni | 72 Ge [ He ] | 0.999989887 | 0.020303331 | 0.000415672 | 0.028257909 | 0.020473082 | ppb |
| He | 63 | Cu | 72 Ge [ He ] | 0.999978429 | 0.057151569 | 0.017657355 | 0.069173901 | 0.30895661 | ppb |
| He | 66 | Zn | 72 Ge [ He ] | 0.999989773 | 0.007002168 | 0.003551225 | 0.162934057 | 0.507160692 | ppb |
| He | 75 | As | 72 Ge [ He ] | 0.999996631 | 0.00520527 | 0.000193147 | 0.007971008 | 0.037106079 | ppb |
| He | 78 | Se | 72 Ge [ He ] | 0.99999443 | 0.0003422 | 6.81E-05 | 0.291755838 | 0.19905557 | ppb |
| No Gas | 88 | Sr | 72 Ge [ No Gas ] | 0.99999905 | 0.030858082 | 0.000664317 | 0.007387739 | 0.021528139 | ppb |
| No Gas | 90 | Zr | 72 Ge [ No Gas ] | 0.999999371 | 0.021328046 | 0.000643306 | 0.006448443 | 0.030162439 | ppb |
| No Gas | 95 | Mo | 115 In [ No Gas ] | 0.999986783 | 0.001011981 | 1.18E-05 | 0.007087717 | 0.01164088 | ppb |
| No Gas | 107 | Ag | 115 In [ No Gas ] | 0.999999288 | 0.002751878 | 1.33E-05 | 0.004372167 | 0.004839153 | ppb |
| No Gas | 111 | Cd | 115 In [ No Gas ] | 0.999997694 | 0.000561345 | 7.76E-06 | 0.008769858 | 0.013825514 | ppb |
| No Gas | 118 | [Sn] | 115 In [ No Gas ] | 0.99999574 | 0.001632876 | 0.000226265 | 0.017575305 | 0.1385683 | ppb |
| He | 118 | [Sn] | 115 In [ He ] | 0.999996887 | 0.002305248 | 0.000296483 | 0.094546886 | 0.128612401 | ppb |
| He | 120 | Sn | 115 In [ He ] | 0.999999712 | 0.003356904 | 0.000357444 | 0.040649217 | 0.106480291 | ppb |
| No Gas | 121 | Sb | 115 In [ No Gas ] | 0.9999803 | 0.002266835 | 0.000133485 | 0.009472275 | 0.058885996 | ppb |
| No Gas | 137 | Ba | 115 In [ No Gas ] | 0.999999557 | 0.000724272 | 2.07E-05 | 0.009764407 | 0.028535297 | ppb |
| He | 156 | [Se] | 115 In [ He ] | | | | | | ppb |
| No Gas | 205 | Tl | 209 Bi [ No Gas ] | 0.999992251 | 0.005662598 | 4.00E-05 | 0.002074642 | 0.007065557 | ppb |
| No Gas | 206 | [Pb] | 209 Bi [ No Gas ] | 0.999999472 | 0.001850837 | 8.57E-05 | 0.008685663 | 0.04628516 | ppb |
| No Gas | 207 | [Pb] | 209 Bi [ No Gas ] | 0.999999972 | 0.001638022 | 7.47E-05 | 0.009744176 | 0.045611424 | ppb |
| No Gas | 208 | Pb | 209 Bi [ No Gas ] | 0.999999983 | 0.007423123 | 0.000350967 | 0.002785325 | 0.047280279 | ppb |
| No Gas | 45 | Sc | | | | | | | ppb |
| He | 45 | Sc | | | | | | | ppb |
| No Gas | 72 | Ge | | | | | | | ppb |
| He | 72 | Ge | | | | | | | ppb |
| No Gas | 103 | Rh | | | | | | | ppb |
| He | 103 | Rh | | | | | | | ppb |
| No Gas | 115 | In | | | | | | | ppb |
| He | 115 | In | | | | | | | ppb |
| No Gas | 159 | Tb | | | | | | | ppb |
| He | 159 | Tb | | | | | | | ppb |
| No Gas | 175 | Lu | | | | | | | ppb |
| He | 175 | Lu | | | | | | | ppb |
| No Gas | 209 | Bi | | | | | | | ppb |
| He | 209 | Bi | | | | | | | ppb |

Batch Folder: C:\Agilent\ICPMH\1\DATA\2180416B_MS1.b\
Analysis File: 2180416B_MS1.batch.bin
DA Date-Time: 2018-04-17 08:48:31
Calibration Title:
Calibration Method: External Calibration
VIS Interpolation Fit:

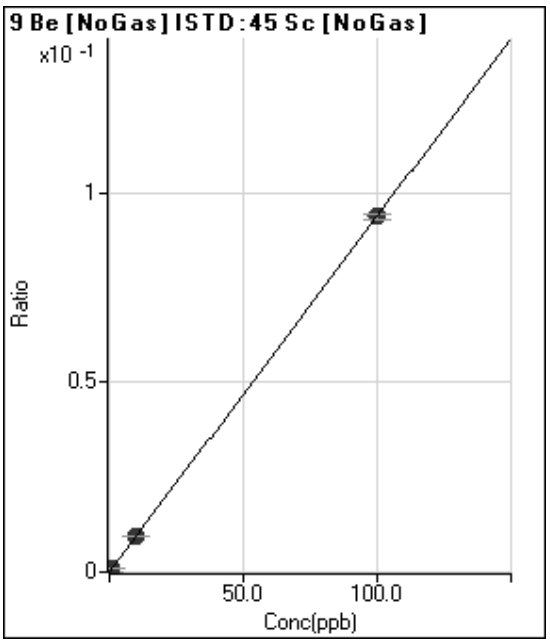
| Level | Standard Data File | Sample Name | Acq. Date-Time |
|---|---|---|---|
| 1 | 002CALB.d | 1300 | 2018-04-16 12:32:07 |
| 2 | | | |
| 3 | 003CALS.d | 1302 | 2018-04-16 12:36:28 |
| 4 | | | |
| 5 | 004CALS.d | 1304 | 2018-04-16 12:41:24 |
| 6 | 005CALS.d | 1305 | 2018-04-16 12:45:59 |
| 7 | 006CALS.d | 1306 | 2018-04-16 12:50:33 |
| 8 | 007CALS.d | 1301 | 2018-04-16 12:55:04 |




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 198623.66 | 0.0403 | P | 1.4 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.500 | 0.346 | 208058.30 | 0.0418 | P | 1.1 |
| 4 | ☐ | 2.500 | | | | | |
| 5 | ☐ | 5.000 | 5.064 | 307339.52 | 0.0624 | P | 0.4 |
| 6 | ☐ | 50.000 | 52.092 | 1325401.80 | 0.2672 | A | 2.6 |
| 7 | ☐ | 500.000 | 499.790 | 10588101.7 | 2.2172 | A | 2.5 |
| 8 | ☐ | | | 205850.39 | 0.0437 | P | 0.7 |

y = 0.0044 * x + 0.0403
R = 1.0000
DL = 0.3869
BEC = 9.252

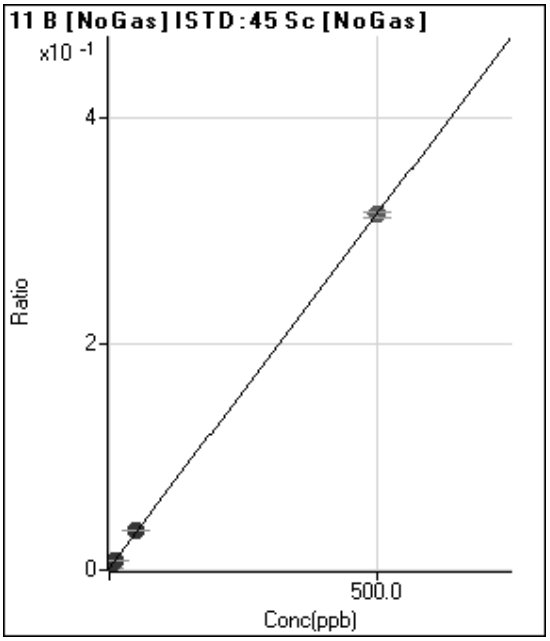
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 56.67 | 0.0000 | P | 22.4 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.108 | 560.68 | 0.0001 | P | 4.5 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 1.002 | 4682.00 | 0.0009 | P | 1.1 |
| 6 | ☐ | 10.000 | 10.095 | 46957.12 | 0.0095 | P | 2.8 |
| 7 | ☐ | 100.000 | 99.990 | 447304.27 | 0.0937 | P | 1.4 |
| 8 | ☐ | | | 354.01 | 0.0001 | P | 3.0 |

y = 9.3657E-004 * x + 1.1478E-005
R = 1.0000
DL = 0.008238
BEC = 0.01226

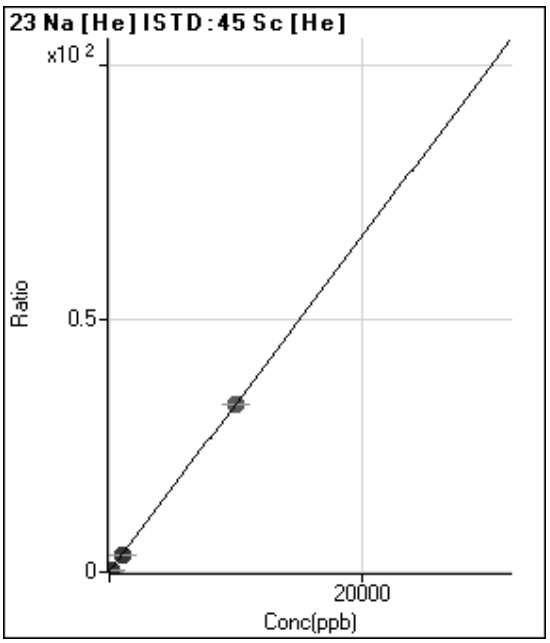
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 9516.40 | 0.0019 | P | 2.2 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 1.000 | 0.699 | 11784.52 | 0.0024 | P | 2.8 |
| 4 | ☐ | 2.500 | | | | | |
| 5 | ☐ | 10.000 | 9.267 | 38069.97 | 0.0077 | P | 1.6 |
| 6 | ☐ | 50.000 | 52.717 | 173073.10 | 0.0349 | P | 2.7 |
| 7 | ☐ | 500.000 | 499.744 | 1501330.24 | 0.3144 | A | 1.5 |
| 8 | ☐ | | | 29332.93 | 0.0062 | P | 3.3 |

y = 6.2519E-004 * x + 0.0019
R = 1.0000
DL = 0.2075
BEC = 3.088

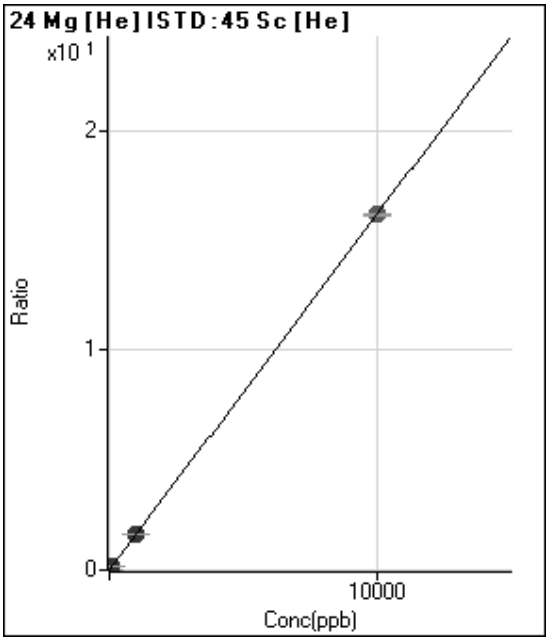
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 12031.40 | 0.0947 | P | 1.8 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 10.000 | 9.872 | 16248.44 | 0.1272 | P | 2.3 |
| 4 | ☐ | 50.000 | | | | | |
| 5 | ☐ | 100.000 | 98.653 | 53635.96 | 0.4202 | P | 1.8 |
| 6 | ☐ | 1000.000 | 1000.465 | 432091.98 | 3.3958 | P | 0.5 |
| 7 | ☐ | 10000.00 | 9999.967 | 4071778.90 | 33.090 | A | 0.9 |
| 8 | ☐ | | | 13709.45 | 0.1098 | P | 4.8 |

y = 0.0033 * x + 0.0947
R = 1.0000
DL = 1.559
BEC = 28.69

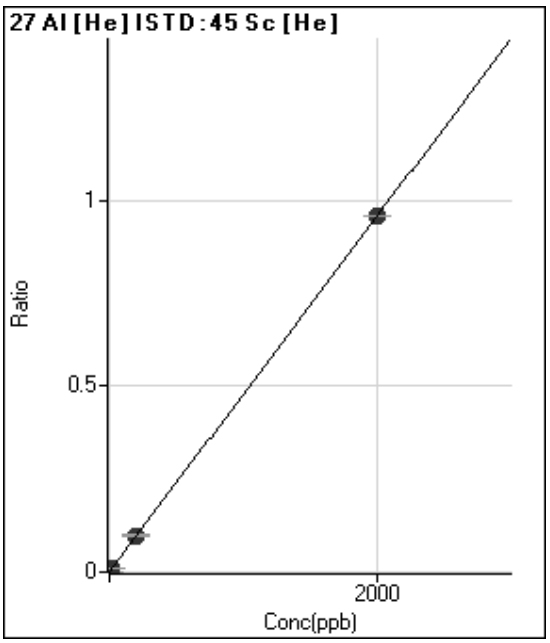
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 53.33 | 0.0004 | P | 23.0 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 10.000 | 10.180 | 2156.90 | 0.0169 | P | 9.6 |
| 4 | ☐ | 50.000 | | | | | |
| 5 | ☐ | 100.000 | 101.162 | 20950.41 | 0.1641 | P | 2.5 |
| 6 | ☐ | 1000.000 | 1021.809 | 210452.29 | 1.6539 | P | 0.7 |
| 7 | ☐ | 10000.00 | 9997.807 | 1990857.94 | 16.179 | A | 0.3 |
| 8 | ☐ | | | 870.06 | 0.0070 | P | 16.1 |

y = 0.0016 * x + 4.2062E-004
R = 1.0000
DL = 0.1794
BEC = 0.2599

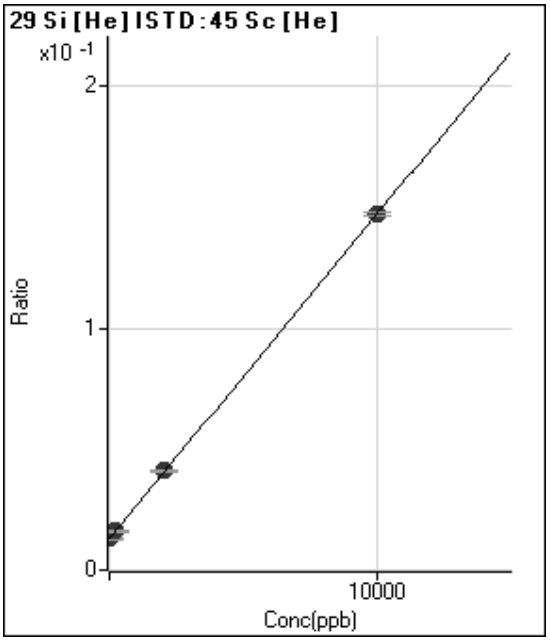
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 58.67 | 0.0005 | P | 27.6 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 2.000 | 2.068 | 185.33 | 0.0015 | P | 11.7 |
| 4 | ☐ | 10.000 | | | | | |
| 5 | ☐ | 20.000 | 19.733 | 1262.73 | 0.0099 | P | 1.3 |
| 6 | ☐ | 200.000 | 204.755 | 12508.66 | 0.0983 | P | 1.9 |
| 7 | ☐ | 2000.000 | 1999.527 | 117627.02 | 0.9559 | P | 0.0 |
| 8 | ☐ | | | 86.67 | 0.0007 | P | 11.5 |

y = 4.7784E-004 * x + 4.6252E-004
R = 1.0000
DL = 0.8001
BEC = 0.9679

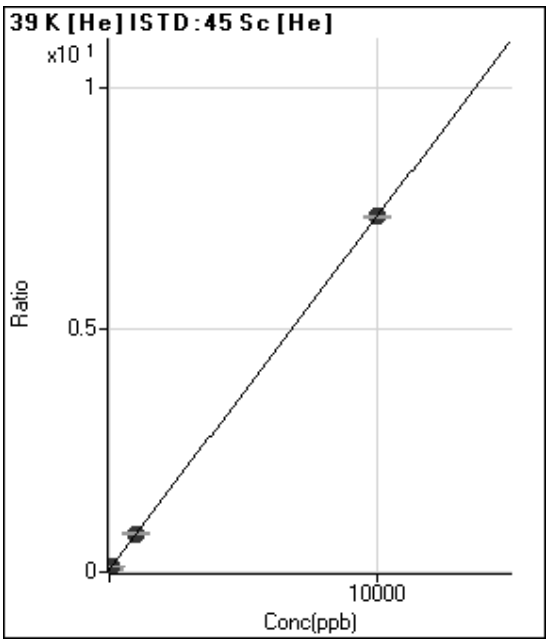
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 1665.43 | 0.0131 | P | 2.5 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 20.000 | -11.699 | 1653.43 | 0.0129 | P | 2.4 |
| 4 | ☐ | 100.000 | | | | | |
| 5 | ☐ | 200.000 | 218.009 | 2045.48 | 0.0160 | P | 2.4 |
| 6 | ☐ | 2000.000 | 2075.684 | 5206.17 | 0.0409 | P | 1.3 |
| 7 | ☐ | 10000.00 | 9984.566 | 18074.39 | 0.1469 | P | 1.2 |
| 8 | ☐ | | | 1710.10 | 0.0137 | P | 4.9 |

y = 1.3399E-005 * x + 0.0131
R = 1.0000
DL = 73.95
BEC = 977.9

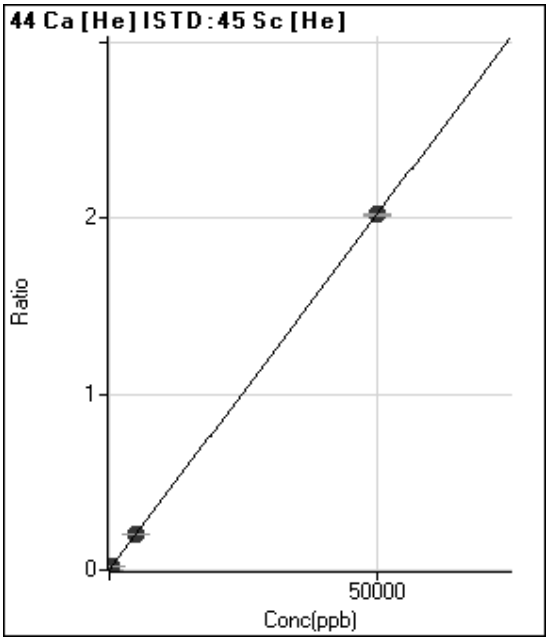
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 7071.82 | 0.0556 | P | 11.1 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 10.000 | 12.576 | 8269.13 | 0.0647 | P | 1.3 |
| 4 | ☐ | 50.000 | | | | | |
| 5 | ☐ | 100.000 | 102.577 | 16625.43 | 0.1302 | P | 3.4 |
| 6 | ☐ | 1000.000 | 1014.031 | 100968.33 | 0.7935 | P | 1.7 |
| 7 | ☐ | 10000.00 | 9998.569 | 902189.75 | 7.3317 | P | 0.8 |
| 8 | ☐ | | | 7918.86 | 0.0634 | P | 7.4 |

y = 7.2772E-004 * x + 0.0556
R = 1.0000
DL = 25.45
BEC = 76.4

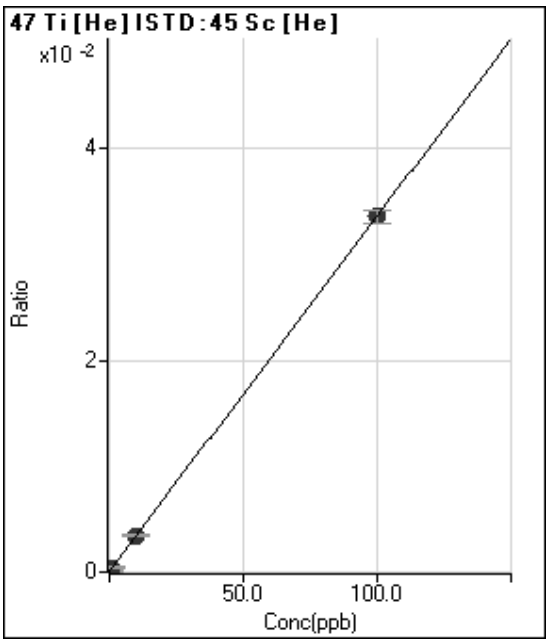
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 190.01 | 0.0015 | P | 25.9 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 50.000 | 54.385 | 471.68 | 0.0037 | P | 4.7 |
| 4 | ☐ | 250.000 | | | | | |
| 5 | ☐ | 500.000 | 505.547 | 2798.62 | 0.0219 | P | 2.8 |
| 6 | ☐ | 5000.000 | 5017.302 | 25985.70 | 0.2042 | P | 2.7 |
| 7 | ☐ | 50000.00 | 49998.21 | 248780.54 | 2.0218 | P | 0.9 |
| 8 | ☐ | | | 508.35 | 0.0041 | P | 8.8 |

y = 4.0407E-005 * x + 0.0015
R = 1.0000
DL = 28.83
BEC = 37.04

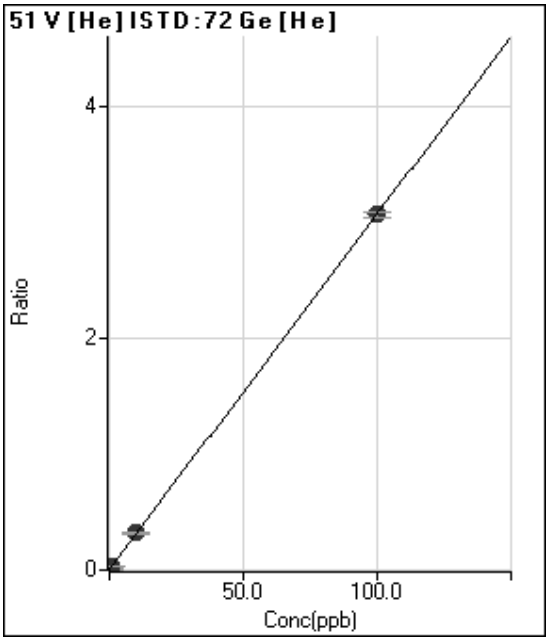
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 7.33 | 0.0001 | P | 38.9 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.085 | 11.00 | 0.0001 | P | 9.3 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 1.114 | 55.00 | 0.0004 | P | 20.1 |
| 6 | ☐ | 10.000 | 10.067 | 436.68 | 0.0034 | P | 4.6 |
| 7 | ☐ | 100.000 | 99.992 | 4130.52 | 0.0336 | P | 3.8 |
| 8 | ☐ | | | 9.00 | 0.0001 | P | 66.4 |

y = 3.3517E-004 * x + 5.7583E-005
R = 1.0000
DL = 0.2004
BEC = 0.1718

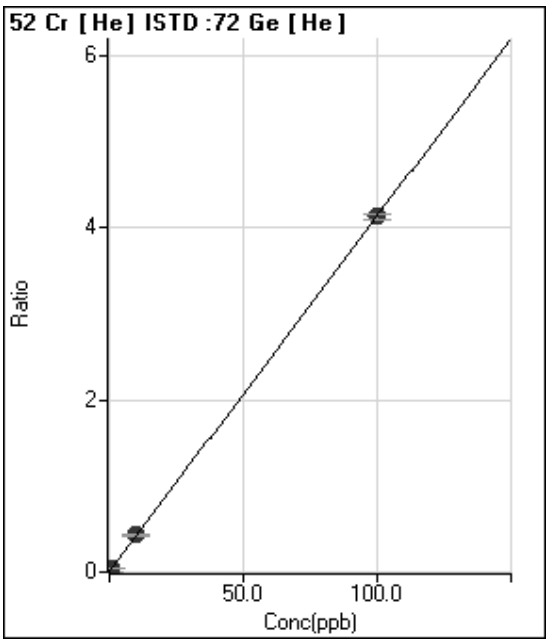
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 281.12 | 0.0053 | P | 9.0 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.115 | 472.24 | 0.0088 | P | 7.6 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 1.076 | 2046.82 | 0.0383 | P | 3.3 |
| 6 | ☐ | 10.000 | 10.284 | 16970.00 | 0.3209 | P | 2.3 |
| 7 | ☐ | 100.000 | 99.971 | 158298.81 | 3.0735 | P | 1.6 |
| 8 | ☐ | | | 221.12 | 0.0042 | P | 13.8 |

y = 0.0307 * x + 0.0053
R = 1.0000
DL = 0.04606
BEC = 0.1712

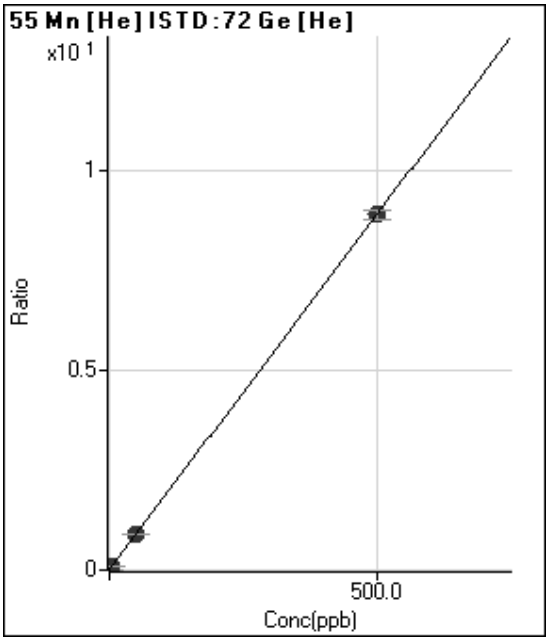
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 266.67 | 0.0050 | P | 3.1 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.110 | 512.24 | 0.0095 | P | 10.7 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 1.015 | 2504.67 | 0.0469 | P | 7.0 |
| 6 | ☐ | 10.000 | 10.255 | 22650.09 | 0.4283 | P | 1.2 |
| 7 | ☐ | 100.000 | 99.974 | 212778.60 | 4.1312 | P | 1.5 |
| 8 | ☐ | | | 404.45 | 0.0077 | P | 6.4 |

y = 0.0413 * x + 0.0050
R = 1.0000
DL = 0.01132
BEC = 0.1208

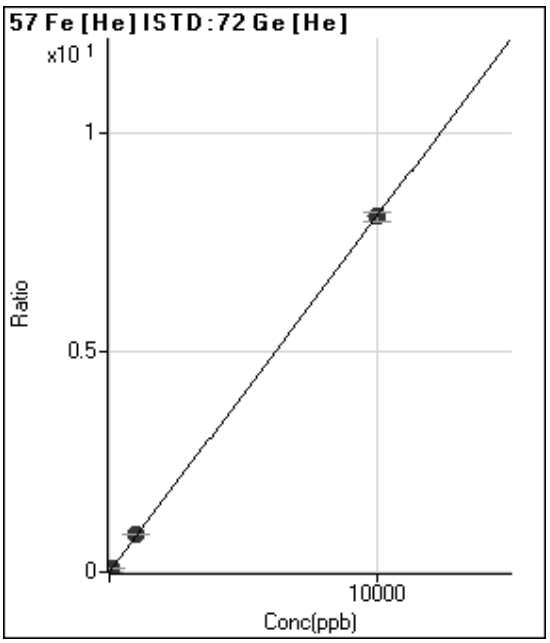
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 510.01 | 0.0095 | P | 16.7 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.500 | 0.003 | 516.68 | 0.0096 | P | 12.4 |
| 4 | ☐ | 2.500 | | | | | |
| 5 | ☐ | 5.000 | 4.553 | 4840.77 | 0.0906 | P | 7.4 |
| 6 | ☐ | 50.000 | 50.597 | 48142.04 | 0.9103 | P | 1.8 |
| 7 | ☐ | 500.000 | 499.945 | 458856.77 | 8.9099 | P | 2.3 |
| 8 | ☐ | | | 370.01 | 0.0071 | P | 5.7 |

y = 0.0178 * x + 0.0095
R = 1.0000
DL = 0.2688
BEC = 0.5353

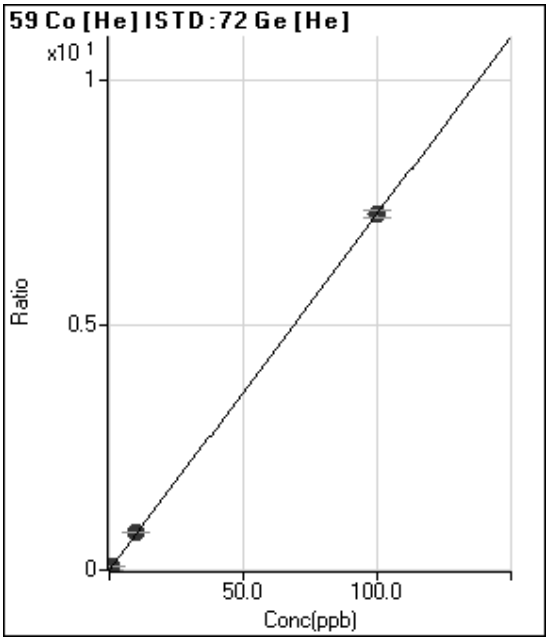
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 43.33 | 0.0008 | P | 34.9 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 10.000 | 9.932 | 476.70 | 0.0089 | P | 12.9 |
| 4 | ☐ | 50.000 | | | | | |
| 5 | ☐ | 100.000 | 108.128 | 4720.87 | 0.0884 | P | 7.4 |
| 6 | ☐ | 1000.000 | 1059.487 | 45420.58 | 0.8587 | P | 1.4 |
| 7 | ☐ | 10000.00 | 9993.970 | 416766.58 | 8.0928 | P | 2.6 |
| 8 | ☐ | | | 190.01 | 0.0036 | P | 19.6 |

y = 8.0968E-004 * x + 8.0944E-004
R = 1.0000
DL = 1.047
BEC = 0.9997

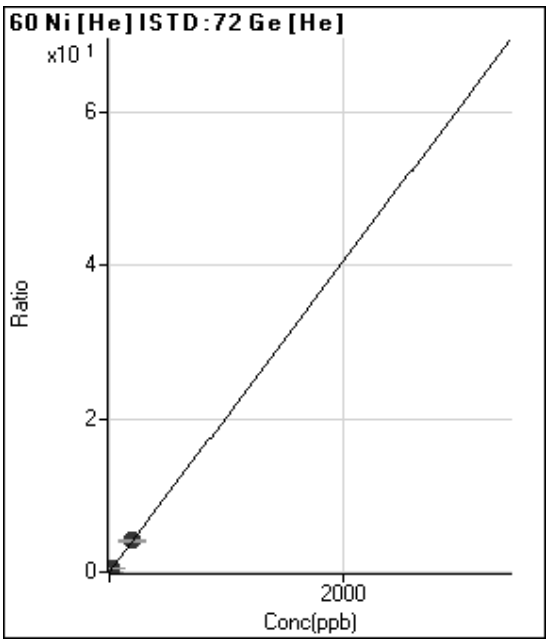
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 21.11 | 0.0004 | P | 24.3 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.109 | 446.68 | 0.0083 | P | 14.7 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 1.029 | 4017.21 | 0.0752 | P | 5.4 |
| 6 | ☐ | 10.000 | 10.395 | 39957.24 | 0.7555 | P | 1.2 |
| 7 | ☐ | 100.000 | 99.960 | 373956.68 | 7.2612 | P | 2.1 |
| 8 | ☐ | | | 181.12 | 0.0035 | P | 4.1 |

y = 0.0726 * x + 3.9484E-004
R = 1.0000
DL = 0.003968
BEC = 0.005436

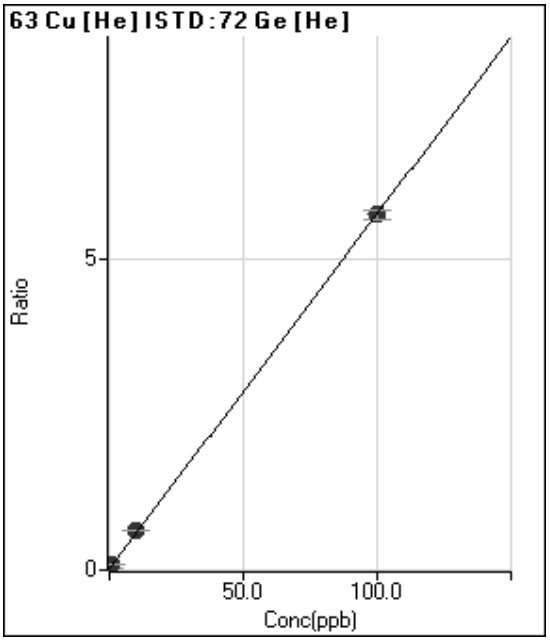
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 22.22 | 0.0004 | P | 46.0 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.200 | 0.214 | 256.67 | 0.0048 | P | 21.6 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 2.000 | 2.048 | 2244.63 | 0.0420 | P | 2.2 |
| 6 | ☐ | 20.000 | 20.897 | 22463.25 | 0.4247 | P | 2.2 |
| 7 | ☐ | 200.000 | 199.910 | 209050.72 | 4.0593 | P | 2.2 |
| 8 | ☐ | | | 91.11 | 0.0017 | P | 14.1 |

y = 0.0203 * x + 4.1567E-004
R = 1.0000
DL = 0.02826
BEC = 0.02047

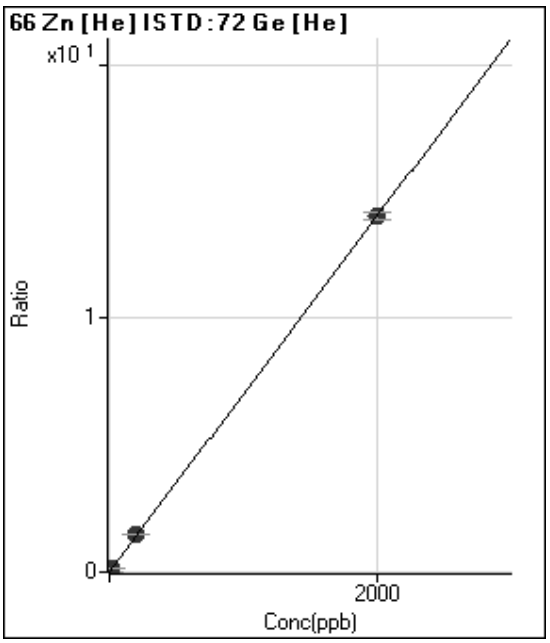
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 944.48 | 0.0177 | P | 7.5 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.069 | 1164.50 | 0.0216 | P | 2.6 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 1.039 | 4118.35 | 0.0771 | P | 1.1 |
| 6 | ☐ | 10.000 | 10.642 | 33105.60 | 0.6259 | P | 0.3 |
| 7 | ☐ | 100.000 | 99.935 | 295025.27 | 5.7291 | P | 2.8 |
| 8 | ☐ | | | 1661.22 | 0.0317 | P | 3.3 |

y = 0.0572 * x + 0.0177
R = 1.0000
DL = 0.06917
BEC = 0.309

Weight: <None>
Min Conc: <None>

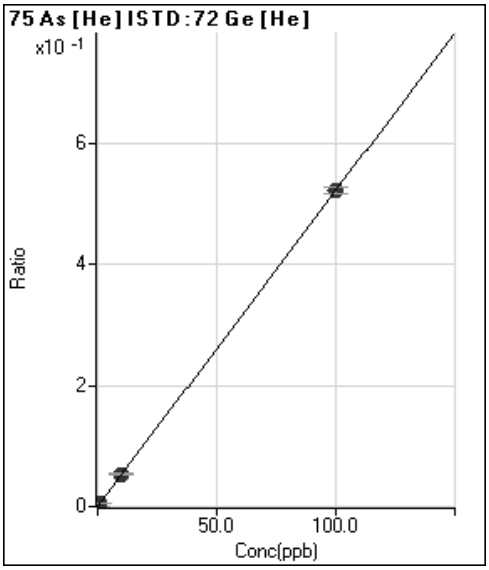



| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 190.00 | 0.0036 | P | 10.7 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 2.000 | 2.048 | 963.37 | 0.0179 | P | 13.2 |
| 4 | ☐ | 10.000 | | | | | |
| 5 | ☐ | 20.000 | 20.660 | 7922.00 | 0.1482 | P | 1.4 |
| 6 | ☐ | 200.000 | 209.038 | 77611.11 | 1.4673 | P | 0.4 |
| 7 | ☐ | 2000.000 | 1999.090 | 721104.52 | 14.001 | P | 2.0 |
| 8 | ☐ | | | 784.47 | 0.0150 | P | 7.9 |

y = 0.0070 * x + 0.0036
R = 1.0000
DL = 0.1629
BEC = 0.5072

Weight: <None>
Min Conc: <None>

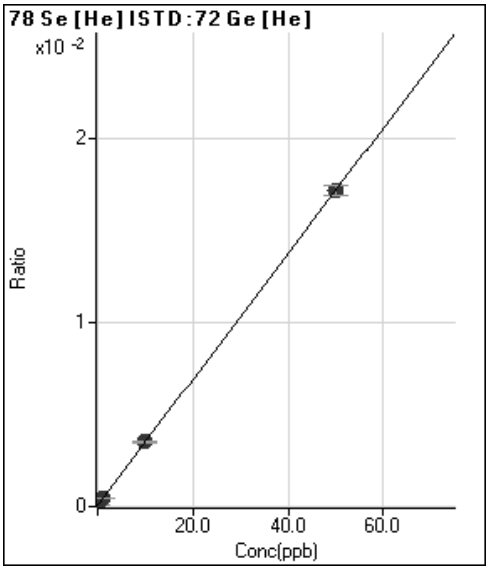
Calibration for 126SMPL.d




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 10.33 | 0.0002 | P | 7.2 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.115 | 42.50 | 0.0008 | P | 19.9 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 0.997 | 287.83 | 0.0054 | P | 3.5 |
| 6 | ☐ | 10.000 | 10.257 | 2833.58 | 0.0536 | P | 3.4 |
| 7 | ☐ | 100.000 | 99.974 | 26811.15 | 0.5206 | P | 2.0 |
| 8 | ☐ | | | 30.00 | 0.0006 | P | 13.6 |

y = 0.0052 * x + 1.9315E-004
R = 1.0000
DL = 0.007971
BEC = 0.03711

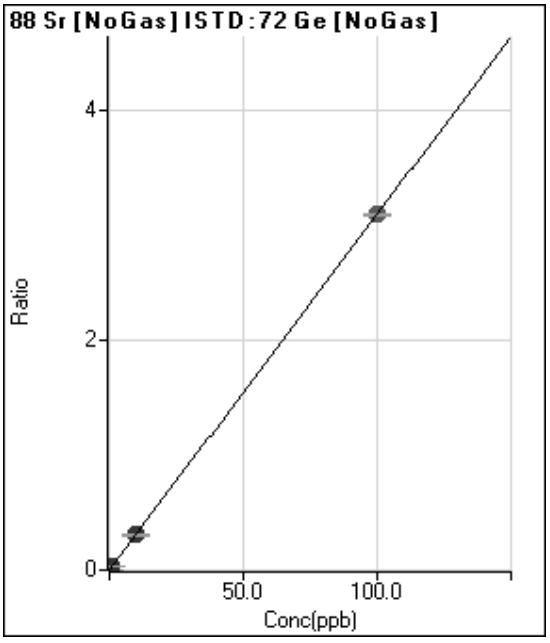
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 3.65 | 0.0001 | P | 48.9 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.061 | 4.79 | 0.0001 | P | 13.6 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 1.066 | 23.15 | 0.0004 | P | 6.8 |
| 6 | ☐ | 10.000 | 10.138 | 187.12 | 0.0035 | P | 2.3 |
| 7 | ☐ | 50.000 | 49.971 | 884.58 | 0.0172 | P | 3.3 |
| 8 | ☐ | | | 4.31 | 0.0001 | P | 8.6 |

y = 3.4220E-004 * x + 6.8117E-005
R = 1.0000
DL = 0.2918
BEC = 0.1991

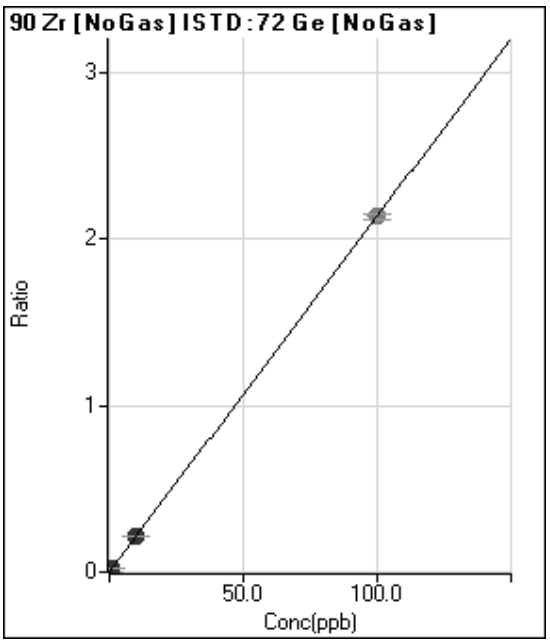
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 440.03 | 0.0007 | P | 11.4 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.096 | 2410.29 | 0.0036 | P | 5.6 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 0.987 | 20747.52 | 0.0311 | P | 1.3 |
| 6 | ☐ | 10.000 | 9.860 | 204534.60 | 0.3049 | P | 2.2 |
| 7 | ☐ | 100.000 | 100.014 | 1983979.45 | 3.0869 | A | 0.5 |
| 8 | ☐ | | | 1530.14 | 0.0024 | P | 8.4 |

y = 0.0309 * x + 6.6432E-004
R = 1.0000
DL = 0.007388
BEC = 0.02153

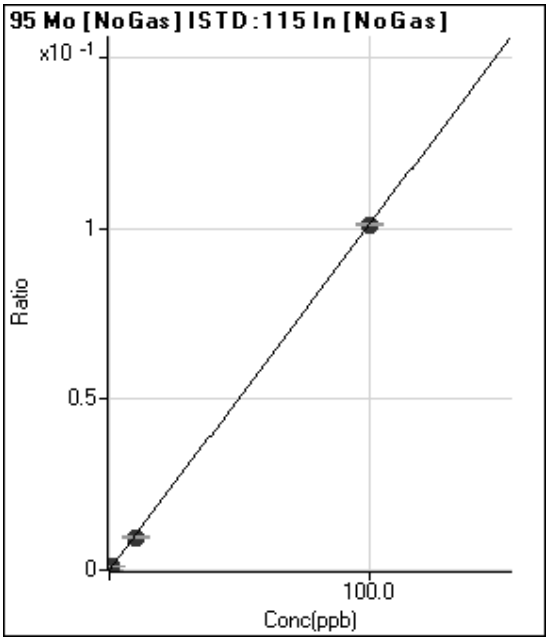
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 426.68 | 0.0006 | P | 7.1 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.089 | 1689.00 | 0.0025 | P | 4.6 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 0.882 | 12964.22 | 0.0194 | P | 2.7 |
| 6 | ☐ | 10.000 | 9.926 | 142431.82 | 0.2123 | P | 2.2 |
| 7 | ☐ | 100.000 | 100.009 | 1371357.86 | 2.1336 | M | 1.5 |
| 8 | ☐ | | | 1435.64 | 0.0022 | P | 0.7 |

y = 0.0213 * x + 6.4331E-004
R = 1.0000
DL = 0.006448
BEC = 0.03016

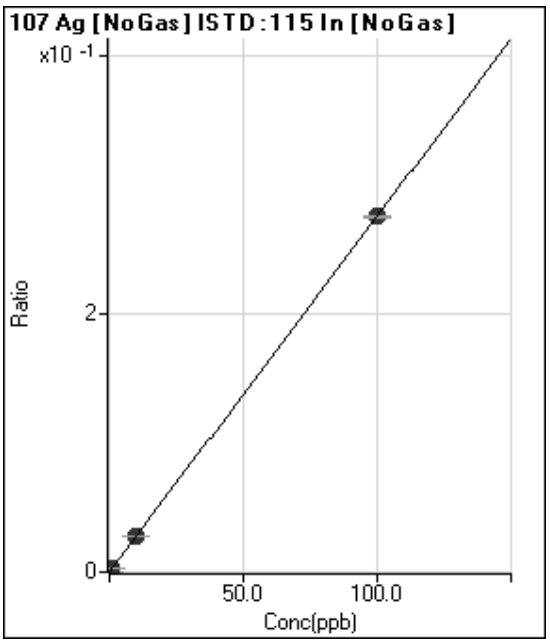
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 50.00 | 0.0000 | P | 20.3 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.108 | 512.24 | 0.0001 | P | 5.9 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 0.976 | 4251.73 | 0.0010 | P | 2.6 |
| 6 | ☐ | 10.000 | 9.492 | 41421.18 | 0.0096 | P | 1.6 |
| 7 | ☐ | 100.000 | 100.051 | 407454.91 | 0.1013 | P | 0.6 |
| 8 | ☐ | | | 537.80 | 0.0001 | P | 7.4 |

y = 0.0010 * x + 1.1780E-005
R = 1.0000
DL = 0.007088
BEC = 0.01164

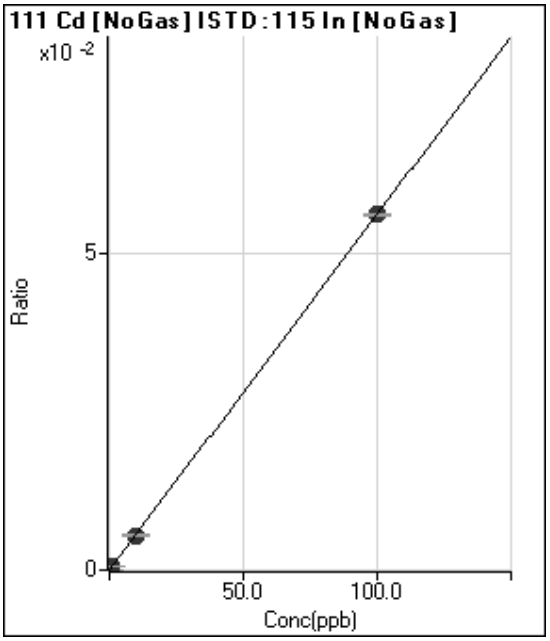
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 56.67 | 0.0000 | P | 30.1 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.097 | 1182.28 | 0.0003 | P | 1.9 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 0.976 | 11479.81 | 0.0027 | P | 2.3 |
| 6 | ☐ | 10.000 | 9.877 | 117121.72 | 0.0272 | P | 1.2 |
| 7 | ☐ | 100.000 | 100.013 | 1107495.96 | 0.2752 | P | 0.6 |
| 8 | ☐ | | | 862.26 | 0.0002 | P | 8.6 |

y = 0.0028 * x + 1.3317E-005
R = 1.0000
DL = 0.004372
BEC = 0.004839

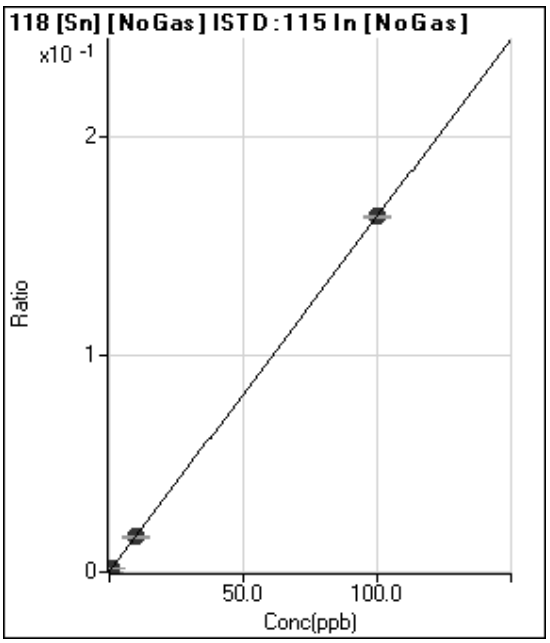
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 33.00 | 0.0000 | P | 21.1 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.087 | 238.67 | 0.0001 | P | 1.8 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 0.988 | 2390.52 | 0.0006 | P | 1.9 |
| 6 | ☐ | 10.000 | 9.782 | 23684.92 | 0.0055 | P | 1.0 |
| 7 | ☐ | 100.000 | 100.022 | 225957.95 | 0.0562 | P | 0.7 |
| 8 | ☐ | | | 164.67 | 0.0000 | P | 11.3 |

y = 5.6135E-004 * x + 7.7609E-006
R = 1.0000
DL = 0.00877
BEC = 0.01383

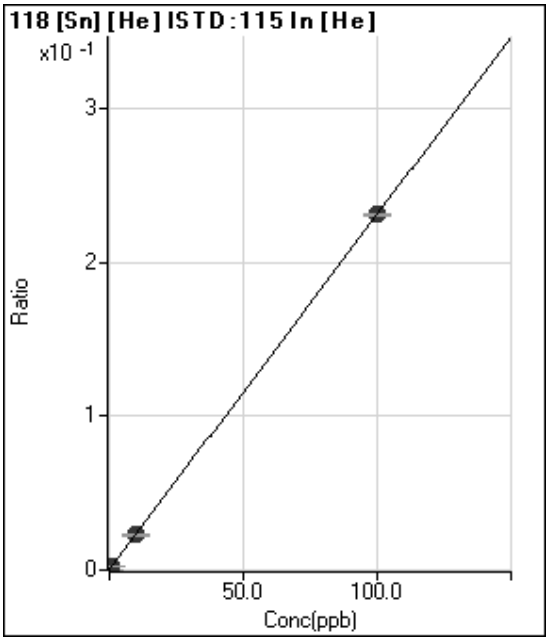
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 961.16 | 0.0002 | P | 4.2 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.063 | 1391.19 | 0.0003 | P | 5.8 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 0.944 | 7514.11 | 0.0018 | P | 3.9 |
| 6 | ☐ | 10.000 | 9.690 | 69116.02 | 0.0160 | P | 2.1 |
| 7 | ☐ | 100.000 | 100.032 | 658174.33 | 0.1636 | P | 0.3 |
| 8 | ☐ | | | 1248.95 | 0.0003 | P | 6.4 |

y = 0.0016 * x + 2.2626E-004
R = 1.0000
DL = 0.01758
BEC = 0.1386

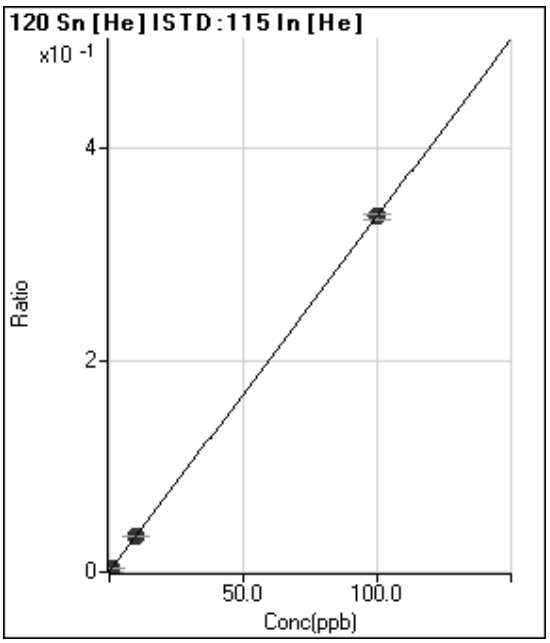
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 125.56 | 0.0003 | P | 24.5 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.033 | 158.89 | 0.0004 | P | 12.6 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 0.952 | 1060.05 | 0.0025 | P | 3.4 |
| 6 | ☐ | 10.000 | 9.728 | 9664.17 | 0.0227 | P | 1.9 |
| 7 | ☐ | 100.000 | 100.028 | 92206.53 | 0.2309 | P | 0.4 |
| 8 | ☐ | | | 140.01 | 0.0003 | P | 3.9 |

y = 0.0023 * x + 2.9648E-004
R = 1.0000
DL = 0.09455
BEC = 0.1286

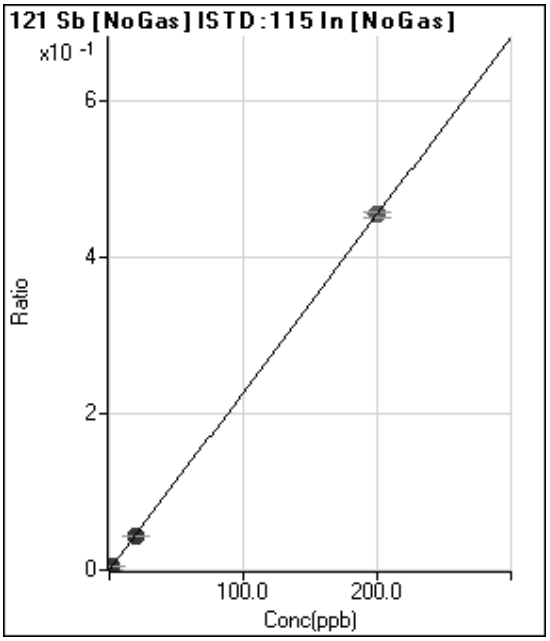
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 151.11 | 0.0004 | P | 12.7 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.096 | 288.90 | 0.0007 | P | 4.0 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 1.014 | 1601.22 | 0.0038 | P | 3.6 |
| 6 | ☐ | 10.000 | 9.930 | 14332.22 | 0.0337 | P | 3.9 |
| 7 | ☐ | 100.000 | 100.007 | 134209.26 | 0.3361 | P | 1.3 |
| 8 | ☐ | | | 237.78 | 0.0006 | P | 21.5 |

y = 0.0034 * x + 3.5744E-004
R = 1.0000
DL = 0.04065
BEC = 0.1065

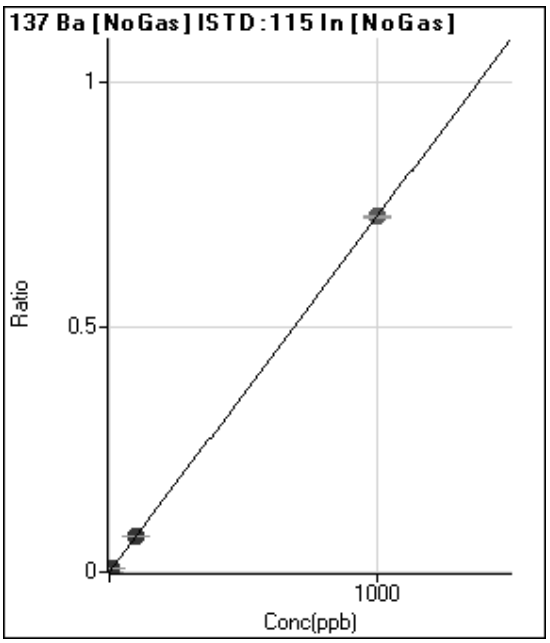
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 566.68 | 0.0001 | P | 5.4 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.200 | 0.197 | 2450.23 | 0.0006 | P | 4.0 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 2.000 | 1.916 | 19041.71 | 0.0045 | P | 0.2 |
| 6 | ☐ | 20.000 | 18.745 | 183573.07 | 0.0426 | P | 2.0 |
| 7 | ☐ | 200.000 | 200.126 | 1826145.69 | 0.4538 | A | 1.5 |
| 8 | ☐ | | | 11386.47 | 0.0027 | P | 3.7 |

y = 0.0023 * x + 1.3348E-004
R = 1.0000
DL = 0.009472
BEC = 0.05889

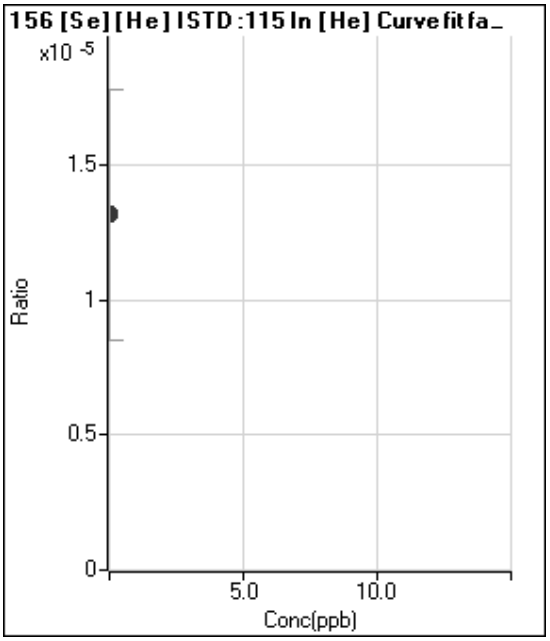
Weight: <None>
Min Conc: <None>



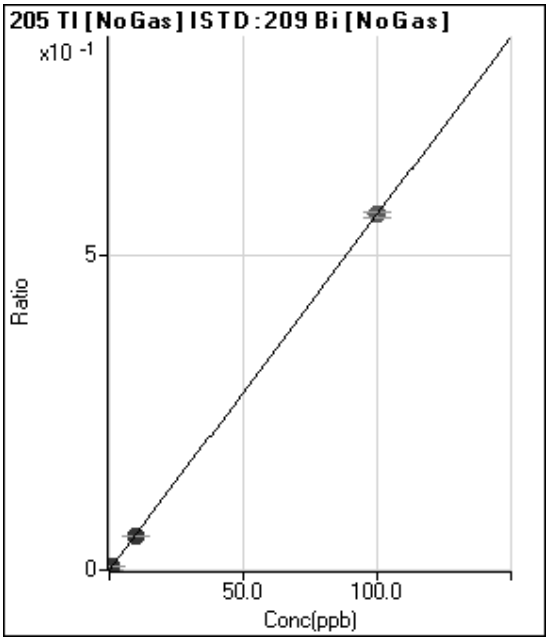

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 87.78 | 0.0000 | P | 11.4 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.097 | 383.35 | 0.0001 | P | 14.8 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 1.108 | 3499.34 | 0.0008 | P | 5.2 |
| 6 | ☐ | 10.000 | 9.581 | 29972.29 | 0.0070 | P | 3.1 |
| 7 | ☐ | 100.000 | 99.122 | 288958.43 | 0.0718 | P | 0.4 |
| 8 | ☐ | 1000.000 | 1000.092 | 3014678.00 | 0.7244 | A | 0.6 |

y = 7.2427E-004 * x + 2.0667E-005
R = 1.0000
DL = 0.009764
BEC = 0.02854

Weight: <None>
Min Conc: <None>



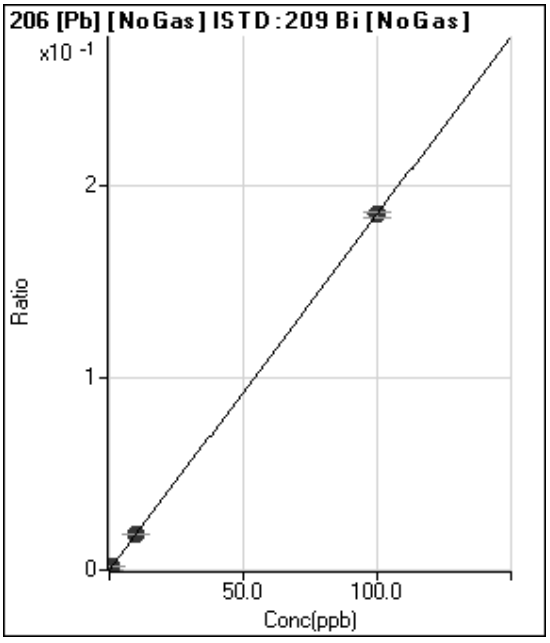

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | | 5.55 | 0.0000 | P | 70.2 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | | | 10.00 | 0.0000 | P | 33.7 |
| 4 | ☐ | | | | | | |
| 5 | ☐ | | | 4.44 | 0.0000 | P | 173. |
| 6 | ☐ | | | 10.00 | 0.0000 | P | 57.4 |
| 7 | ☐ | | | 7.78 | 0.0000 | P | 49.2 |
| 8 | ☐ | | | 6.67 | 0.0000 | P | 50.1 |




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 158.89 | 0.0000 | P | 9.8 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.095 | 2282.43 | 0.0006 | P | 5.1 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 0.944 | 21314.43 | 0.0054 | P | 0.9 |
| 6 | ☐ | 10.000 | 9.599 | 214673.49 | 0.0544 | P | 0.9 |
| 7 | ☐ | 100.000 | 100.041 | 2127770.89 | 0.5665 | A | 1.3 |
| 8 | ☐ | | | 1794.58 | 0.0005 | P | 6.3 |

y = 0.0057 * x + 4.0009E-005
R = 1.0000
DL = 0.002075
BEC = 0.007066

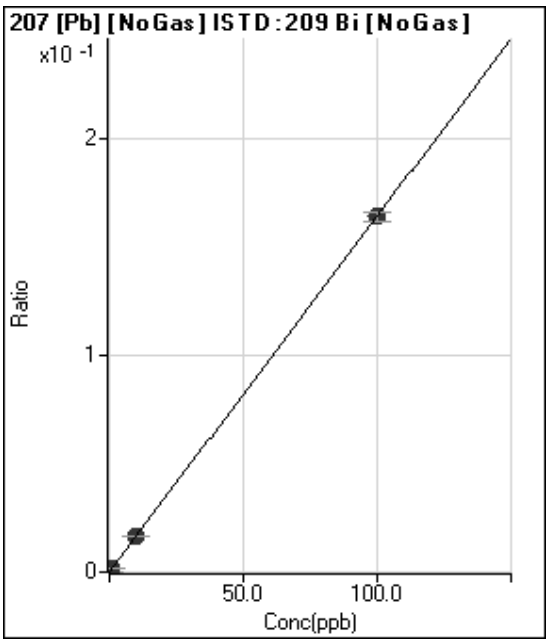
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 340.02 | 0.0001 | P | 6.3 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.107 | 1116.75 | 0.0003 | P | 12.2 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 0.957 | 7345.49 | 0.0019 | P | 1.7 |
| 6 | ☐ | 10.000 | 10.080 | 73969.23 | 0.0187 | P | 1.0 |
| 7 | ☐ | 100.000 | 99.992 | 695385.10 | 0.1852 | P | 1.9 |
| 8 | ☐ | | | 940.07 | 0.0002 | P | 11.8 |

y = 0.0019 * x + 8.5666E-005
R = 1.0000
DL = 0.008686
BEC = 0.04629

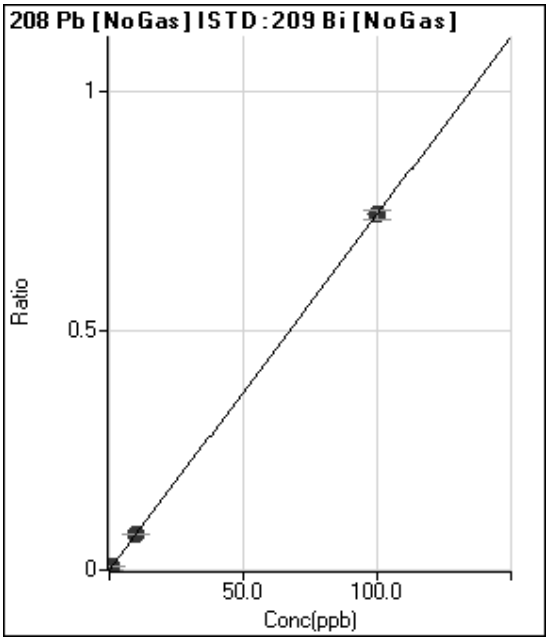
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 296.69 | 0.0001 | P | 7.1 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.113 | 1023.41 | 0.0003 | P | 5.9 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 0.989 | 6705.11 | 0.0017 | P | 2.7 |
| 6 | ☐ | 10.000 | 9.988 | 64859.98 | 0.0164 | P | 2.5 |
| 7 | ☐ | 100.000 | 100.001 | 615431.02 | 0.1639 | P | 3.0 |
| 8 | ☐ | | | 796.72 | 0.0002 | P | 4.2 |

y = 0.0016 * x + 7.4713E-005
R = 1.0000
DL = 0.009744
BEC = 0.04561

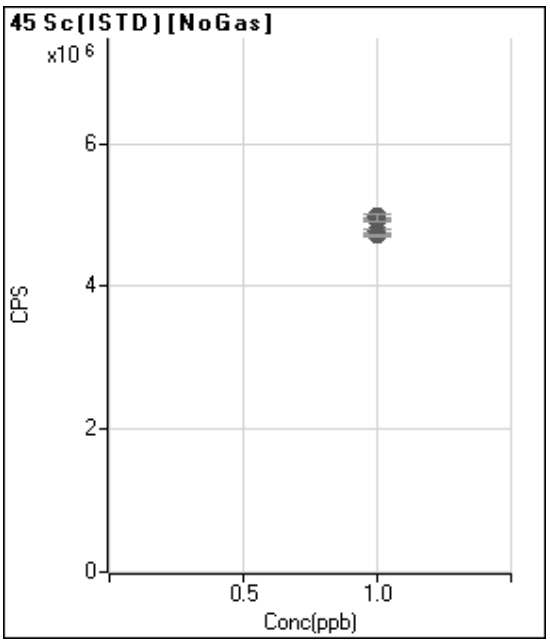
Weight: <None>
Min Conc: <None>



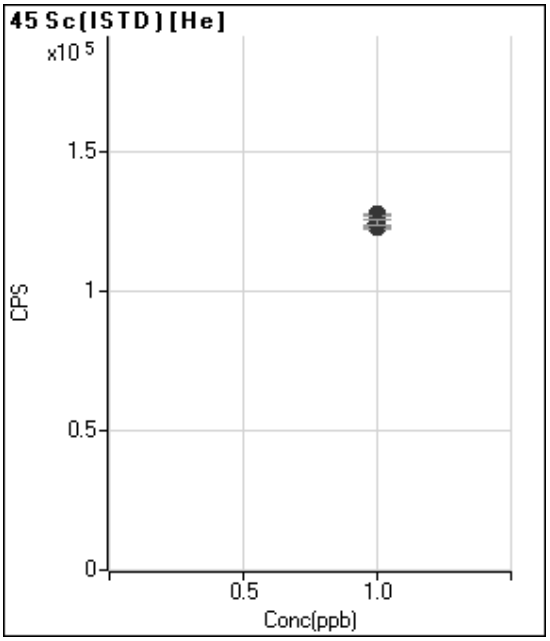

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 1393.43 | 0.0004 | P | 2.0 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.110 | 4578.81 | 0.0012 | P | 5.0 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 0.991 | 30510.50 | 0.0077 | P | 2.7 |
| 6 | ☐ | 10.000 | 9.989 | 294019.82 | 0.0745 | P | 0.4 |
| 7 | ☐ | 100.000 | 100.001 | 2789111.93 | 0.7427 | P | 2.6 |
| 8 | ☐ | | | 3470.30 | 0.0009 | P | 3.4 |

y = 0.0074 * x + 3.5097E-004
R = 1.0000
DL = 0.002785
BEC = 0.04728

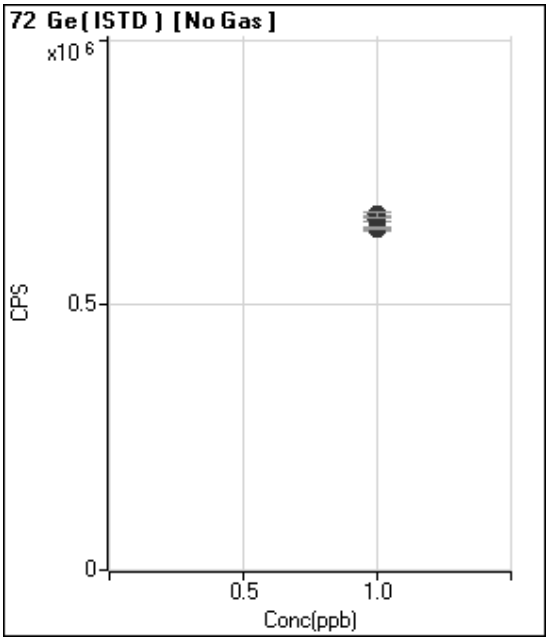
Weight: <None>
Min Conc: <None>



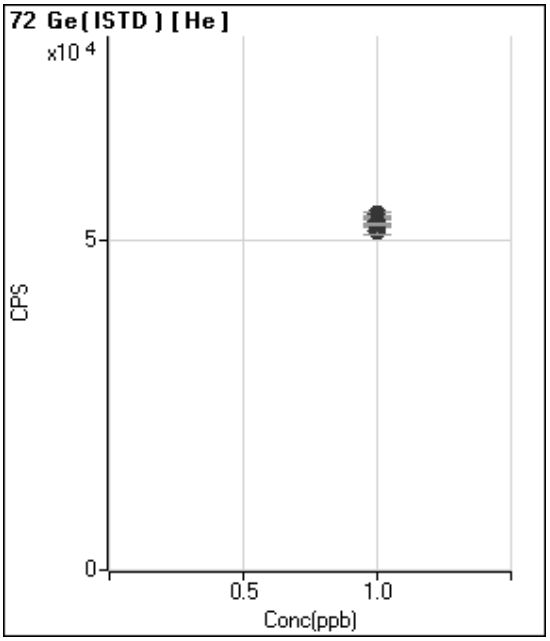

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 4929728.14 | | A | 1.4 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 4977623.28 | | A | 1.4 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 4928988.69 | | A | 0.5 |
| 6 | ☐ | 1.000 | | 4962568.41 | | A | 2.3 |
| 7 | ☐ | 1.000 | | 4776265.09 | | A | 1.2 |
| 8 | ☐ | 1.000 | | 4715293.98 | | A | 0.7 |



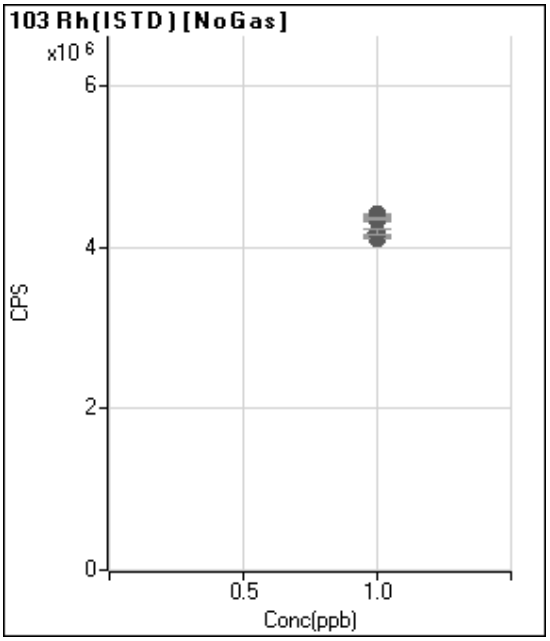

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 127114.41 | | P | 1.6 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 127705.59 | | P | 0.7 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 127650.94 | | P | 0.1 |
| 6 | ☐ | 1.000 | | 127242.87 | | P | 0.2 |
| 7 | ☐ | 1.000 | | 123050.85 | | P | 0.5 |
| 8 | ☐ | 1.000 | | 124883.39 | | P | 1.2 |



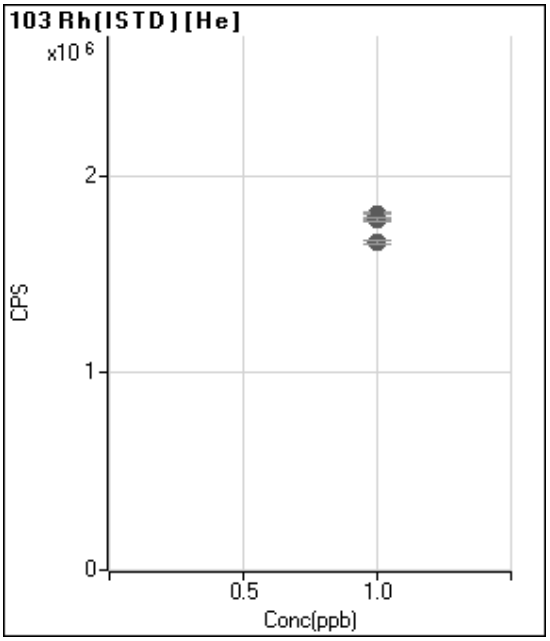

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 662907.37 | | P | 1.2 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 667062.44 | | P | 0.3 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 666618.57 | | P | 0.8 |
| 6 | ☐ | 1.000 | | 670916.69 | | P | 1.8 |
| 7 | ☐ | 1.000 | | 642716.24 | | P | 0.6 |
| 8 | ☐ | 1.000 | | 645743.81 | | P | 0.9 |



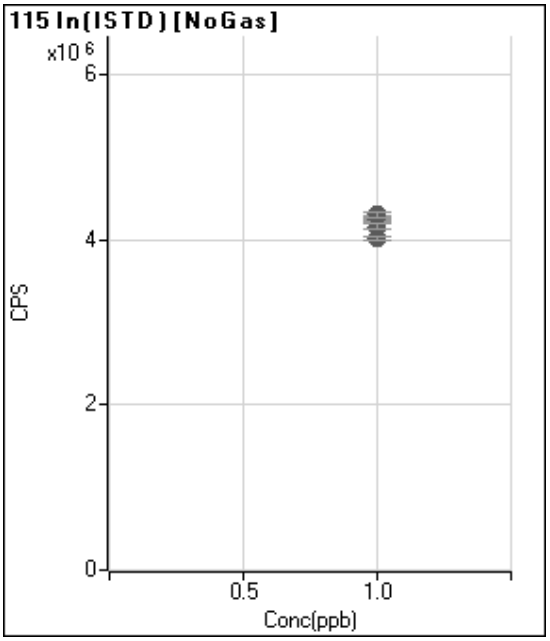

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 53494.07 | | P | 0.3 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 53865.26 | | P | 1.2 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 53451.58 | | P | 1.0 |
| 6 | ☐ | 1.000 | | 52896.37 | | P | 1.7 |
| 7 | ☐ | 1.000 | | 51516.49 | | P | 2.2 |
| 8 | ☐ | 1.000 | | 52442.75 | | P | 0.9 |



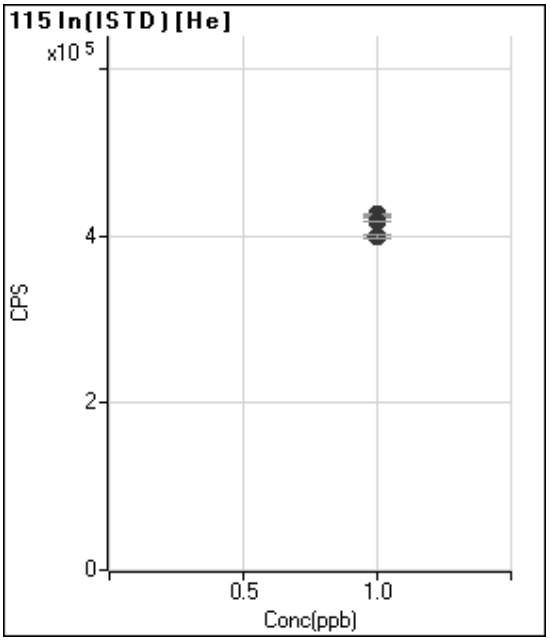

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 4339714.13 | | A | 0.5 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 4405371.35 | | A | 0.6 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 4334450.80 | | A | 0.3 |
| 6 | ☐ | 1.000 | | 4355215.66 | | A | 0.6 |
| 7 | ☐ | 1.000 | | 4114955.39 | | A | 0.4 |
| 8 | ☐ | 1.000 | | 4187144.00 | | A | 1.7 |



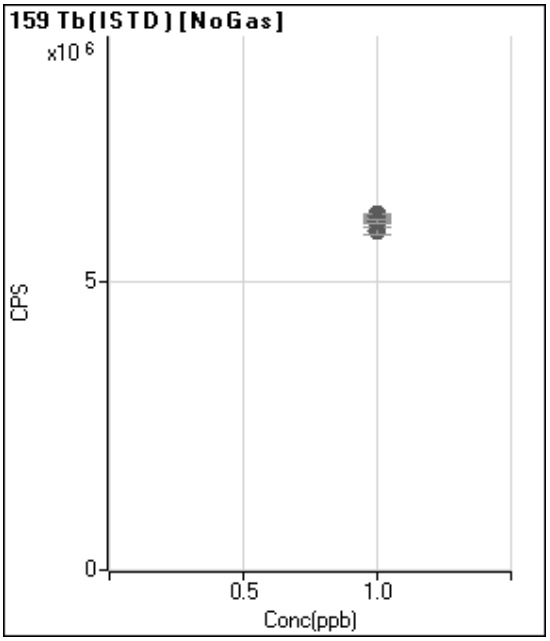

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 1802038.33 | | A | 1.9 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 1791835.76 | | A | 1.3 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 1795073.96 | | A | 1.9 |
| 6 | ☐ | 1.000 | | 1790257.78 | | A | 2.0 |
| 7 | ☐ | 1.000 | | 1659159.48 | | A | 1.4 |
| 8 | ☐ | 1.000 | | 1773227.22 | | A | 1.0 |



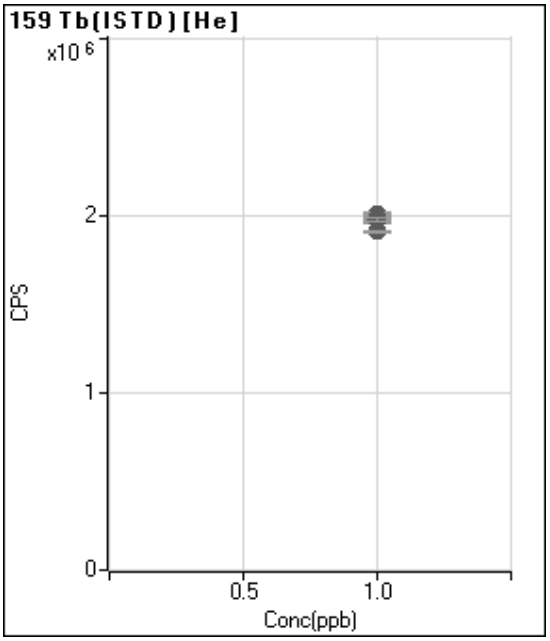

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 4246975.93 | | A | 1.1 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 4228270.77 | | A | 0.4 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 4253306.62 | | A | 1.9 |
| 6 | ☐ | 1.000 | | 4307433.89 | | A | 1.2 |
| 7 | ☐ | 1.000 | | 4023918.32 | | A | 1.1 |
| 8 | ☐ | 1.000 | | 4161588.45 | | A | 1.5 |



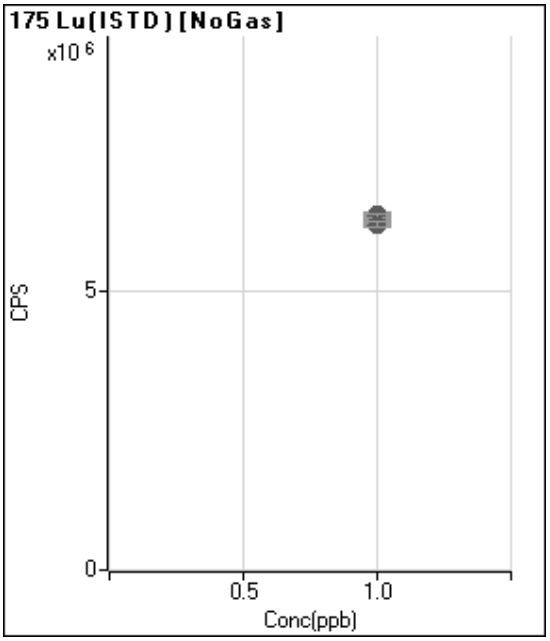

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 422983.59 | | P | 0.8 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 425814.93 | | P | 0.7 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 425458.29 | | P | 0.7 |
| 6 | ☐ | 1.000 | | 425358.82 | | P | 0.4 |
| 7 | ☐ | 1.000 | | 399367.37 | | P | 0.7 |
| 8 | ☐ | 1.000 | | 417226.64 | | P | 0.3 |



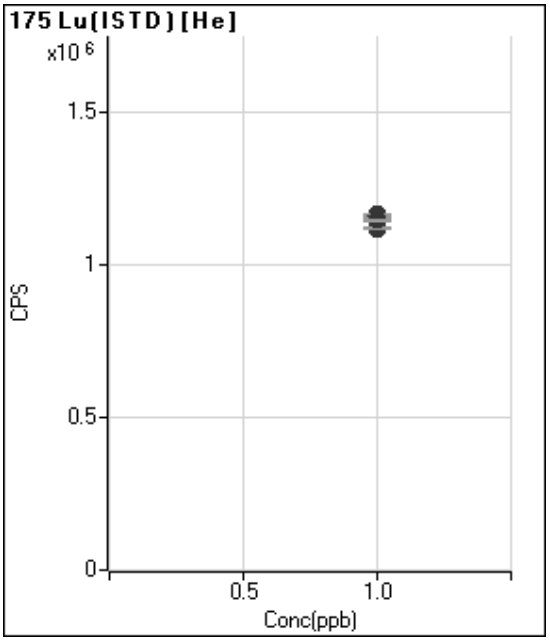

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 6085949.28 | | A | 1.7 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 6164147.20 | | A | 0.3 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 6119494.08 | | A | 1.7 |
| 6 | ☐ | 1.000 | | 6144093.03 | | A | 1.4 |
| 7 | ☐ | 1.000 | | 5879034.91 | | A | 1.8 |
| 8 | ☐ | 1.000 | | 6039309.70 | | A | 1.1 |



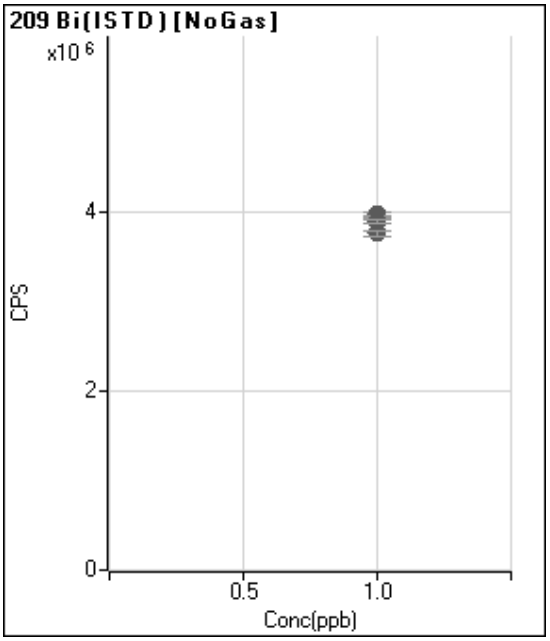

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 2010526.85 | | A | 1.1 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 1996949.35 | | A | 1.7 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 1991027.11 | | A | 2.5 |
| 6 | ☐ | 1.000 | | 1996016.74 | | A | 1.2 |
| 7 | ☐ | 1.000 | | 1912857.36 | | A | 0.9 |
| 8 | ☐ | 1.000 | | 1981385.23 | | A | 0.7 |



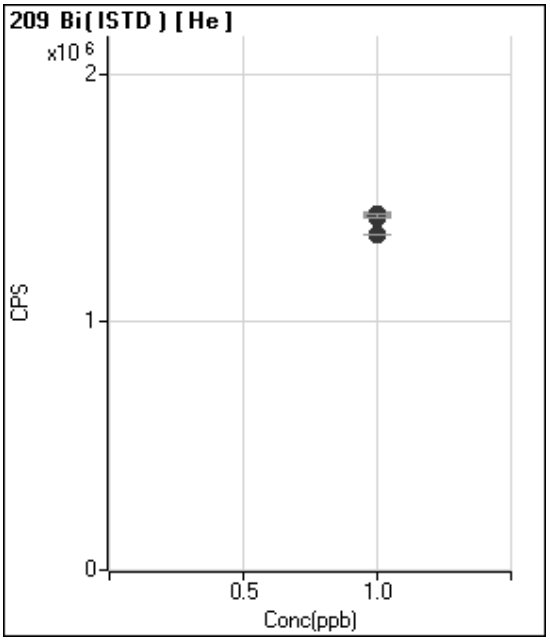

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 6373136.99 | | A | 1.5 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 6339135.95 | | A | 1.0 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 6321458.24 | | A | 1.1 |
| 6 | ☐ | 1.000 | | 6358161.78 | | A | 1.1 |
| 7 | ☐ | 1.000 | | 6185165.12 | | A | 0.7 |
| 8 | ☐ | 1.000 | | 6198538.45 | | A | 1.7 |




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 1160314.62 | | P | 0.9 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 1160053.08 | | P | 0.1 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 1164400.35 | | P | 0.9 |
| 6 | ☐ | 1.000 | | 1159930.58 | | P | 1.2 |
| 7 | ☐ | 1.000 | | 1117953.26 | | P | 0.4 |
| 8 | ☐ | 1.000 | | 1145439.41 | | P | 0.6 |




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 3969825.05 | | A | 1.1 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 3934164.21 | | A | 1.0 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 3956860.67 | | A | 0.3 |
| 6 | ☐ | 1.000 | | 3946519.84 | | A | 0.4 |
| 7 | ☐ | 1.000 | | 3756253.90 | | A | 1.4 |
| 8 | ☐ | 1.000 | | 3890735.77 | | A | 1.1 |




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 1434384.40 | | P | 1.2 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 1420130.09 | | P | 0.1 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 1431145.03 | | P | 1.1 |
| 6 | ☐ | 1.000 | | 1432303.21 | | P | 0.2 |
| 7 | ☐ | 1.000 | | 1355399.25 | | P | 0.1 |
| 8 | ☐ | 1.000 | | 1427686.44 | | P | 0.9 |

GCAL ANALYTICAL LABORATORIES, LLC

# ICP-MS

## BY METHODS EPA 200.8/6020A/6020B

Date: 4/17/18
Analyst: AWG

Instrument ID: ICPMS1
HBN: 633612, 633613
Batch: 11818, 11819
ICPMS Reference File: 2180417A_MS1

| | | | |
|---|---|---|---|
| Cal Standard | 316-47-9 | Exp. Date | 4/23/18 |
| ICV Standard | 316-47-11 | Exp. Date | 4/23/18 |
| ICSA Standard | 316-47-10 | Exp. Date | 4/23/18 |
| ICSAB Standard | 316-47-8 | Exp. Date | 4/20/18 |
| Internal Standard | 316-45-5 | Exp. Date | 5/2/18 |
| Tune | 316-46-7 | Exp. Date | 6/23/18 |
| P/A | 316-44-4 | Exp. Date | 6/23/18 |

ICPMS Acid Matrix (Calibration Blank) (2% HNO3/0.5% HCl) 317-36-17 Exp. Date 6/23/18
ICPMS Acid Matrix (5% HNO3/2% HCl) 317-36-16 Exp. Date 5/26/19

**QC Limits:**
Calibration Correlation Coefficient R ≥ 0.998 for 6020A and 200.8
Calibration Correlation Coefficient R ≥ 0.995 for 6020B

| | GCAL Limits |
|---|---|
| ICV | 90-110% |
| LLCCV (initial) | 80-120% DOD and 6020B / 70-130% for 6020A non DOD and 200.8 |
| ICSA/ICSAB | 80-120% |
| LLCCV (continuing) | 70-130% (not applicable for 6020B) |
| CCV | 90-110% |



Reviewer/Date: AWG 4/17/18
AWG 4/18/18

| Sample | | | | | | |
|---|---|---|---|---|---|---|
| Data File | Acq. Date-Time | Type | Sample Name | Total Dil. | Vial Number | Comment |
| 008CALB.d | 4/17/2018 10:37 | CalBlk | 1300 | 1 | 1107 | |
| 009CALS.d | 4/17/2018 10:42 | CalStd | 1302 | 1 | 1105 | |
| 010CALS.d | 4/17/2018 10:46 | CalStd | 1304 | 1 | 1103 | |
| 011CALS.d | 4/17/2018 10:51 | CalStd | 1305 | 1 | 1102 | |
| 012CALS.d | 4/17/2018 10:55 | CalStd | 1306 | 1 | 1101 | |
| 013CALS.d | 4/17/2018 11:00 | CalStd | 1301 | 1 | 1301 | |
| 014_ICV.d | 4/17/2018 11:04 | ICV | 1600 | 1 | 1201 | |
| 015_ICV.d | 4/17/2018 11:09 | ICV | 1600 AI | 1 | 1203 | |
| 016_ICB.d | 4/17/2018 11:13 | ICB | 1700 | 1 | 1107 | |
| 017CCV1.d | 4/17/2018 11:17 | LLCCV1 | 1803 | 1 | 1103 | |
| 018ICSA.d | 4/17/2018 11:22 | ICSA | 2000 | 1 | 1205 | |
| 019ICSB.d | 4/17/2018 11:26 | ICSB | 2100 | 1 | 1206 | |
| 020SMPL.d | 4/17/2018 11:34 | Sample | 21804107906 | 396.8254 | 2101 | |
| 021SMPL.d | 4/17/2018 11:38 | Sample | 21804107907 | 400 | 2102 | |
| 022SMPL.d | 4/17/2018 11:43 | Sample | 21804107908 | 396.8254 | 2103 | |
| 023SMPL.d | 4/17/2018 11:47 | Sample | 21804107909 | 400 | 2104 | |
| 024SMPL.d | 4/17/2018 11:52 | Sample | 21804107501 | 400 | 2105 | |
| 025SMPL.d | 4/17/2018 11:56 | Sample | 21804107601 | 396.8254 | 2106 | |
| 026SMPL.d | 4/17/2018 12:00 | Sample | 21804107701 | 400 | 2107 | |
| 027SMPL.d | 4/17/2018 12:05 | Sample | 21804107801 | 390.625 | 2108 | |
| 028SMPL.d | 4/17/2018 12:09 | Sample | 21804053520 | 100 | 2109 | |
| 029SMPL.d | 4/17/2018 12:13 | MBWATER | 1793968 | 1 | 2110 | |
| 030SMPL.d | 4/17/2018 12:18 | LCS6020 | 1793969 | 1 | 2111 | |
| 031SMPL.d | 4/17/2018 12:22 | Sample | 21804053520 D | 100 | 2112 | |
| 032_CCV.d | 4/17/2018 12:27 | CCV | 1800 | 1 | 1102 | |
| 033_CCB.d | 4/17/2018 12:31 | CCB | 1900 | 1 | 1107 | |
| 034LCCV.d | 4/17/2018 12:35 | LLCCV | 1803 | 1 | 1103 | |
| 035SMPL.d | 4/17/2018 12:40 | Sample | 21804060101 SAR | 10 | 2201 | |
| 036SMPL.d | 4/17/2018 12:44 | Sample | 21804060102 SAR | 10 | 2202 | |
| 037SMPL.d | 4/17/2018 12:49 | Sample | 21804060103 SAR | 10 | 2203 | |
| 038SMPL.d | 4/17/2018 12:53 | Sample | 21804060104 SAR | 10 | 2204 | |
| 039_CCV.d | 4/17/2018 12:57 | CCV | 1800 | 1 | 1102 | |
| 040_CCB.d | 4/17/2018 13:02 | CCB | 1900 | 1 | 1107 | |
| 041LCCV.d | 4/17/2018 13:06 | LLCCV | 1803 | 1 | 1103 | |
| 042LCCV.d | 4/17/2018 13:39 | LLCCV | 1803 | 1 | 1103 | |
| 043SMPL.d | 4/17/2018 13:43 | Sample | 21804060101 SAR | 10 | 2201 | |
| 044SMPL.d | 4/17/2018 13:48 | Sample | 21804060102 SAR | 10 | 2202 | |
| 045SMPL.d | 4/17/2018 13:52 | Sample | 21804060103 SAR | 10 | 2203 | |
| 046SMPL.d | 4/17/2018 13:57 | Sample | 21804060104 SAR | 10 | 2204 | |
| 047_CCV.d | 4/17/2018 14:01 | CCV | 1800 | 1 | 1102 | |
| 048_CCB.d | 4/17/2018 14:05 | CCB | 1900 | 1 | 1107 | |
| 049LCCV.d | 4/17/2018 14:10 | LLCCV | 1803 | 1 | 1103 | |
| 050SMPL.d | 4/17/2018 14:38 | MBWATER | 1794155 | 1 | 2205 | |
| 051SMPL.d | 4/17/2018 14:42 | LCS6020 | 1794156 | 1 | 2206 | |
| 052SMPL.d | 4/17/2018 14:47 | LCS6020 | 1794294 | 1 | 2207 | |

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|---|---|---|---|---|---|---|
| 053SMPL.d | 4/17/2018 14:51 | Sample | 21804062001 10X | 10 | 2208 | |
| 054SMPL.d | 4/17/2018 14:56 | Sample | 21804062001 | 1 | 2209 | |
| 055SMPL.d | 4/17/2018 15:00 | Sample | 21804062002 10X | 10 | 2210 | |
| 056SMPL.d | 4/17/2018 15:04 | Sample | 21804062002 | 1 | 2211 | |
| 057SMPL.d | 4/17/2018 15:09 | Sample | 21804062007 10X | 10 | 2212 | |
| 058SMPL.d | 4/17/2018 15:13 | Sample | 21804062007 | 1 | 2301 | |
| 059SMPL.d | 4/17/2018 15:17 | Sample | 21804062008 10X | 10 | 2302 | |
| 060SMPL.d | 4/17/2018 15:22 | Sample | 21804062008 | 1 | 2303 | |
| 061SMPL.d | 4/17/2018 15:26 | Sample | 21804062009 10X | 10 | 2304 | |
| 062SMPL.d | 4/17/2018 15:31 | Sample | 21804062009 | 1 | 2305 | |
| 063_CCV.d | 4/17/2018 15:35 | CCV | 1800 | 1 | 1102 | |
| 064_CCB.d | 4/17/2018 15:39 | CCB | 1900 | 1 | 1107 | |
| 065LCCV.d | 4/17/2018 15:44 | LLCCV | 1803 | 1 | 1103 | |
| 066SMPL.d | 4/17/2018 15:48 | Sample | 21804062010 10X | 10 | 2306 | |
| 067SMPL.d | 4/17/2018 15:53 | Sample | 21804062010 | 1 | 2307 | |
| 068SMPL.d | 4/17/2018 15:57 | Sample | 21804064501 | 100 | 2308 | |
| 069SMPL.d | 4/17/2018 16:01 | Sample | 21804064502 | 100 | 2309 | |
| 070SMPL.d | 4/17/2018 16:06 | Sample | 21804064503 | 100 | 2310 | |
| 071SMPL.d | 4/17/2018 16:10 | Sample | 21804064504 | 100 | 2311 | |
| 072SMPL.d | 4/17/2018 16:14 | Sample | 21804064505 | 100 | 2312 | |
| 073SMPL.d | 4/17/2018 16:19 | Sample | 21804062001 D 10X | 10 | 2401 | |
| 074SMPL.d | 4/17/2018 16:23 | Sample | 21804062001 D | 1 | 2402 | |
| 075_CCV.d | 4/17/2018 16:28 | CCV | 1800 | 1 | 1102 | |
| 076_CCB.d | 4/17/2018 16:32 | CCB | 1900 | 1 | 1107 | |
| 077LCCV.d | 4/17/2018 16:36 | LLCCV | 1803 | 1 | 1103 | |
| 078SMPL.d | 4/17/2018 16:41 | Sample | 21804062002 D 10X | 10 | 2403 | |
| 079SMPL.d | 4/17/2018 16:45 | Sample | 21804062002 D | 1 | 2404 | |
| 080SMPL.d | 4/17/2018 16:49 | Sample | 2500 | 1 | 3 | |
| 081SMPL.d | 4/17/2018 16:54 | Sample | 21804062007 D 10X | 10 | 2405 | |
| 082SMPL.d | 4/17/2018 16:58 | Sample | 21804062007 D | 1 | 2406 | |
| 083SMPL.d | 4/17/2018 17:03 | Sample | 21804062008 D 10X | 10 | 2407 | |
| 084SMPL.d | 4/17/2018 17:07 | Sample | 21804062008 D | 1 | 2408 | |
| 085SMPL.d | 4/17/2018 17:11 | Sample | 21804062009 D 10X | 10 | 2409 | |
| 086SMPL.d | 4/17/2018 17:16 | Sample | 21804062009 D | 1 | 2410 | |
| 087SMPL.d | 4/17/2018 17:20 | Sample | 21804062010 D 10X | 10 | 2411 | |
| 088SMPL.d | 4/17/2018 17:24 | Sample | 21804062010 D | 1 | 2412 | |
| 089_CCV.d | 4/17/2018 17:29 | CCV | 1800 | 1 | 1102 | |
| 090_CCB.d | 4/17/2018 17:33 | CCB | 1900 | 1 | 1107 | |
| 091LCCV.d | 4/17/2018 17:38 | LLCCV | 1803 | 1 | 1103 | |
| 092SMPL.d | 4/17/2018 17:42 | Sample | 1797495 | 1 | 2501 | |
| 093SMPL.d | 4/17/2018 17:46 | Sample | 1797496 | 1 | 2502 | |
| 094SMPL.d | 4/17/2018 17:51 | Sample | 21804062301 | 100 | 2503 | |
| 095SMPL.d | 4/17/2018 17:55 | Sample | 21804062302 | 100 | 2504 | |
| 096SMPL.d | 4/17/2018 17:59 | Sample | 21804062303 | 100 | 2505 | |
| 097SMPL.d | 4/17/2018 18:04 | Sample | 21804064901 | 100 | 2506 | |
| 098SMPL.d | 4/17/2018 18:08 | Sample | 21804090502 | 100 | 2507 | |
| 099SMPL.d | 4/17/2018 18:12 | Sample | 1797497 | 100 | 2508 | |

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|---|---|---|---|---|---|---|
| 100SMPL.d | 4/17/2018 18:17 | Sample | 21804112801 | 100 | 2509 | |
| 101SMPL.d | 4/17/2018 18:21 | Sample | 21804121101 | 100 | 2510 | |
| 102SMPL.d | 4/17/2018 18:26 | Sample | 21804121201 | 100 | 2511 | |
| 103SMPL.d | 4/17/2018 18:30 | Sample | 21804090501 | 100 | 4505 | |
| 104_CCV.d | 4/17/2018 18:34 | CCV | 1800 | 1 | 1102 | |
| 105_CCB.d | 4/17/2018 18:39 | CCB | 1900 | 1 | 1107 | |
| 106SMPL.d | 4/17/2018 18:43 | Sample | 1804 | 1 | 1104 | |
| 107LCCV.d | 4/17/2018 18:48 | LLCCV | 1803 | 1 | 1103 | |
| 108SMPL.d | 4/17/2018 18:52 | Sample | 1794874 | 1 | 3101 | |
| 109SMPL.d | 4/17/2018 18:56 | Sample | 1794875 | 1 | 3102 | |
| 110SMPL.d | 4/17/2018 19:01 | Sample | 21804064801 | 100 | 3103 | |
| 111SMPL.d | 4/17/2018 19:05 | Sample | 21804071301 | 100 | 3104 | |
| 112SMPL.d | 4/17/2018 19:09 | Sample | 21804063401 | 100 | 3105 | |
| 113SMPL.d | 4/17/2018 19:14 | Sample | 1794876 | 100 | 3106 | |
| 114SMPL.d | 4/17/2018 19:18 | Sample | 1794877 | 100 | 3107 | |
| 115SMPL.d | 4/17/2018 19:22 | Sample | 1798255 | 100 | 3108 | |
| 116SMPL.d | 4/17/2018 19:27 | Sample | 1798256 | 500 | 3109 | |
| 117SMPL.d | 4/17/2018 19:31 | Sample | 1794827 | 1 | 3110 | |
| 118SMPL.d | 4/17/2018 19:36 | Sample | 1794828 | 1 | 3111 | |
| 119SMPL.d | 4/17/2018 19:40 | Sample | 21804064203 | 1 | 3112 | |
| 120SMPL.d | 4/17/2018 19:44 | Sample | 21804092701 | 1 | 3201 | |
| 121SMPL.d | 4/17/2018 19:49 | Sample | 1797976 | 1 | 3206 | |
| 122SMPL.d | 4/17/2018 19:53 | Sample | 1797977 | 1 | 3207 | |
| 123SMPL.d | 4/17/2018 19:57 | Sample | 1798264 | 1 | 3208 | |
| 124SMPL.d | 4/17/2018 20:02 | Sample | 21804052001 | 1 | 3209 | |
| 125SMPL.d | 4/17/2018 20:06 | Sample | 21804052003 | 1 | 3210 | |
| 126SMPL.d | 4/17/2018 20:11 | Sample | 21804052005 | 1 | 3211 | |
| 127SMPL.d | 4/17/2018 20:15 | Sample | 21804052006 | 1 | 3212 | |
| 128_CCV.d | 4/17/2018 20:19 | CCV | 1800 | 1 | 1102 | |
| 129_CCB.d | 4/17/2018 20:24 | CCB | 1900 | 1 | 1107 | |
| 130SMPL.d | 4/17/2018 20:28 | Sample | 1804 | 1 | 1104 | |
| 131LCCV.d | 4/17/2018 20:33 | LLCCV | 1803 | 1 | 1103 | |
| 132SMPL.d | 4/17/2018 20:37 | Sample | 1797116 | 40 | 3202 | |
| 133SMPL.d | 4/17/2018 20:41 | Sample | 1797117 | 40 | 3203 | |
| 134SMPL.d | 4/17/2018 20:46 | Sample | 21804140501 100x | 4000 | 3204 | |
| 135SMPL.d | 4/17/2018 20:50 | Sample | 21804140501 | 400 | 3205 | |
| 136SMPL.d | 4/17/2018 20:54 | Sample | 1794673 | 1 | 3301 | |
| 137SMPL.d | 4/17/2018 20:59 | Sample | 1794674 | 1 | 3302 | |
| 138SMPL.d | 4/17/2018 21:03 | Sample | 21804071505 10X | 10 | 3303 | |
| 139SMPL.d | 4/17/2018 21:07 | Sample | 21804071505 | 1 | 3304 | |
| 140SMPL.d | 4/17/2018 21:12 | Sample | 21804071506 10X | 10 | 3305 | |
| 141SMPL.d | 4/17/2018 21:16 | Sample | 21804071506 | 1 | 3306 | |
| 142SMPL.d | 4/17/2018 21:21 | Sample | 21804071508 10X | 10 | 3307 | |
| 143SMPL.d | 4/17/2018 21:25 | Sample | 21804071509 10X | 10 | 3308 | |
| 144SMPL.d | 4/17/2018 21:29 | Sample | 21804071510 10X | 10 | 3309 | |
| 145SMPL.d | 4/17/2018 21:34 | Sample | 1798317 10X | 10 | 3310 | |
| 146SMPL.d | 4/17/2018 21:38 | Sample | 1798318 10X | 50 | 3311 | |

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|---|---|---|---|---|---|---|
| 147_CCV.d | 4/17/2018 21:43 | CCV | 1800 | 1 | 1102 | |
| 148_CCB.d | 4/17/2018 21:47 | CCB | 1900 | 1 | 1107 | |
| 149LCCV.d | 4/17/2018 21:51 | LLCCV | 1803 | 1 | 1103 | |
| 150ICSA.d | 4/17/2018 21:56 | ICSA | 2000 | 1 | 1205 | |
| 151ICSB.d | 4/17/2018 22:00 | ICSB | 2100 | 1 | 1206 | |
| 152SMPL.d | 4/17/2018 22:04 | Sample | 21804071508 | 1 | 3312 | |
| 153SMPL.d | 4/17/2018 22:09 | Sample | 21804071509 | 1 | 3401 | |
| 154SMPL.d | 4/17/2018 22:13 | Sample | 21804071510 | 1 | 3402 | |
| 155SMPL.d | 4/17/2018 22:18 | Sample | 1798317 | 1 | 3403 | |
| 156SMPL.d | 4/17/2018 22:22 | Sample | 1798318 | 5 | 3404 | |
| 157SMPL.d | 4/17/2018 22:26 | Sample | 21804071511 10X | 10 | 3405 | |
| 158SMPL.d | 4/17/2018 22:31 | Sample | 21804071511 | 1 | 3406 | |
| 159SMPL.d | 4/17/2018 22:35 | Sample | 21804071513 10X | 10 | 3407 | |
| 160SMPL.d | 4/17/2018 22:39 | Sample | 21804071513 | 1 | 3408 | |
| 161SMPL.d | 4/17/2018 22:44 | Sample | 21804071514 10X | 10 | 3409 | |
| 162SMPL.d | 4/17/2018 22:48 | Sample | 21804071514 | 1 | 3410 | |
| 163_CCV.d | 4/17/2018 22:53 | CCV | 1800 | 1 | 1102 | |
| 164_CCB.d | 4/17/2018 22:57 | CCB | 1900 | 1 | 1107 | |
| 165LCCV.d | 4/17/2018 23:01 | LLCCV | 1803 | 1 | 1103 | |
| 166SMPL.d | 4/17/2018 23:06 | Sample | 21804071515 10X | 10 | 3411 | |
| 167SMPL.d | 4/17/2018 23:10 | Sample | 21804071515 | 1 | 3412 | |
| 168SMPL.d | 4/17/2018 23:14 | Sample | 21804071516 10X | 10 | 3501 | |
| 169SMPL.d | 4/17/2018 23:19 | Sample | 21804071516 | 1 | 3502 | |
| 170SMPL.d | 4/17/2018 23:23 | Sample | 21804071517 10X | 10 | 3503 | |
| 171SMPL.d | 4/17/2018 23:28 | Sample | 21804071517 | 1 | 3504 | |
| 172SMPL.d | 4/17/2018 23:32 | Sample | 21804071518 10X | 10 | 3505 | |
| 173SMPL.d | 4/17/2018 23:36 | Sample | 21804071518 | 1 | 3506 | |
| 174SMPL.d | 4/17/2018 23:41 | Sample | 21804090224 10X | 10 | 3507 | |
| 175SMPL.d | 4/17/2018 23:45 | Sample | 21804090224 | 1 | 3508 | |
| 176_CCV.d | 4/17/2018 23:50 | CCV | 1800 | 1 | 1102 | |
| 177_CCB.d | 4/17/2018 23:54 | CCB | 1900 | 1 | 1107 | |
| 178LCCV.d | 4/17/2018 23:58 | LLCCV | 1803 | 1 | 1103 | |
| 179SMPL.d | 4/18/2018 0:03 | Sample | 21804090225 10X | 10 | 3509 | |
| 180SMPL.d | 4/18/2018 0:07 | Sample | 21804090225 | 1 | 3510 | |
| 181SMPL.d | 4/18/2018 0:12 | Sample | 21804090226 10X | 10 | 3511 | |
| 182SMPL.d | 4/18/2018 0:16 | Sample | 21804090226 | 1 | 3512 | |
| 183SMPL.d | 4/18/2018 0:20 | Sample | 21804090227 10X | 10 | 4101 | |
| 184SMPL.d | 4/18/2018 0:25 | Sample | 21804090227 | 1 | 4102 | |
| 185SMPL.d | 4/18/2018 0:29 | Sample | 21804090228 10X | 10 | 4103 | |
| 186SMPL.d | 4/18/2018 0:33 | Sample | 21804090228 | 1 | 4104 | |
| 187SMPL.d | 4/18/2018 0:38 | Sample | 1794675 | 1 | 4105 | |
| 188SMPL.d | 4/18/2018 0:42 | Sample | 1794676 | 1 | 4106 | |
| 189SMPL.d | 4/18/2018 0:47 | Sample | 21804090201 10X | 10 | 4107 | |
| 190SMPL.d | 4/18/2018 0:51 | Sample | 21804090201 | 1 | 4108 | |
| 191_CCV.d | 4/18/2018 0:55 | CCV | 1800 | 1 | 1102 | |
| 192_CCB.d | 4/18/2018 1:00 | CCB | 1900 | 1 | 1107 | |
| 193LCCV.d | 4/18/2018 1:04 | LLCCV | 1803 | 1 | 1103 | |

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|---|---|---|---|---|---|---|
| 194SMPL.d | 4/18/2018 1:08 | Sample | 21804090202 10X | 10 | 4109 | |
| 195SMPL.d | 4/18/2018 1:13 | Sample | 21804090202 | 1 | 4110 | |
| 196SMPL.d | 4/18/2018 1:17 | Sample | 21804090203 10X | 10 | 4111 | |
| 197SMPL.d | 4/18/2018 1:22 | Sample | 21804090203 | 1 | 4112 | |
| 198SMPL.d | 4/18/2018 1:26 | Sample | 21804090204 10X | 10 | 4201 | |
| 199SMPL.d | 4/18/2018 1:30 | Sample | 21804090205 10X | 10 | 4202 | |
| 200SMPL.d | 4/18/2018 1:35 | Sample | 21804090206 10X | 10 | 4203 | |
| 201SMPL.d | 4/18/2018 1:39 | Sample | 1798319 10X | 10 | 4204 | |
| 202SMPL.d | 4/18/2018 1:43 | Sample | 1798320 10X | 50 | 4205 | |
| 203SMPL.d | 4/18/2018 1:48 | Sample | 21804090204 | 1 | 4206 | |
| 204SMPL.d | 4/18/2018 1:52 | Sample | 21804090205 | 1 | 4207 | |
| 205SMPL.d | 4/18/2018 1:57 | Sample | 21804090206 | 1 | 4208 | |
| 206SMPL.d | 4/18/2018 2:01 | Sample | 1798319 | 1 | 4209 | |
| 207SMPL.d | 4/18/2018 2:05 | Sample | 1798320 | 5 | 4210 | |
| 208_CCV.d | 4/18/2018 2:10 | CCV | 1800 | 1 | 1102 | |
| 209_CCB.d | 4/18/2018 2:14 | CCB | 1900 | 1 | 1107 | |
| 210LCCV.d | 4/18/2018 2:19 | LLCCV | 1803 | 1 | 1103 | |
| 211SMPL.d | 4/18/2018 2:23 | Sample | 21804090207 10X | 10 | 4211 | |
| 212SMPL.d | 4/18/2018 2:27 | Sample | 21804090207 | 1 | 4212 | |
| 213SMPL.d | 4/18/2018 2:32 | Sample | 21804090208 10X | 10 | 4301 | |
| 214SMPL.d | 4/18/2018 2:36 | Sample | 21804090208 | 1 | 4302 | |
| 215SMPL.d | 4/18/2018 2:40 | Sample | 21804090209 10X | 10 | 4303 | |
| 216SMPL.d | 4/18/2018 2:45 | Sample | 21804090210 10X | 10 | 4304 | |
| 217SMPL.d | 4/18/2018 2:49 | Sample | 21804090211 10X | 10 | 4305 | |
| 218SMPL.d | 4/18/2018 2:54 | Sample | 1798321 10X | 10 | 4306 | |
| 219SMPL.d | 4/18/2018 2:58 | Sample | 1798322 10X | 50 | 4307 | |
| 220SMPL.d | 4/18/2018 3:02 | Sample | 21804090209 | 1 | 4308 | |
| 221SMPL.d | 4/18/2018 3:07 | Sample | 21804090210 | 1 | 4309 | |
| 222SMPL.d | 4/18/2018 3:11 | Sample | 21804090211 | 1 | 4310 | |
| 223SMPL.d | 4/18/2018 3:15 | Sample | 1798321 | 1 | 4311 | |
| 224SMPL.d | 4/18/2018 3:20 | Sample | 1798322 | 5 | 4312 | |
| 225_CCV.d | 4/18/2018 3:24 | CCV | 1800 | 1 | 1302 | |
| 226_CCB.d | 4/18/2018 3:29 | CCB | 1900 | 1 | 1307 | |
| 227LCCV.d | 4/18/2018 3:33 | LLCCV | 1803 | 1 | 1303 | |
| 228SMPL.d | 4/18/2018 3:37 | Sample | 21804090212 10X | 10 | 4401 | |
| 229SMPL.d | 4/18/2018 3:42 | Sample | 21804090212 | 1 | 4402 | |
| 230SMPL.d | 4/18/2018 3:46 | Sample | 21804090213 10X | 10 | 4403 | |
| 231SMPL.d | 4/18/2018 3:51 | Sample | 21804090213 | 1 | 4404 | |
| 232SMPL.d | 4/18/2018 3:55 | Sample | 21804090214 10X | 10 | 4405 | |
| 233SMPL.d | 4/18/2018 3:59 | Sample | 21804090214 | 1 | 4406 | |
| 234SMPL.d | 4/18/2018 4:04 | Sample | 21804090215 10X | 10 | 4407 | |
| 235SMPL.d | 4/18/2018 4:08 | Sample | 21804090215 | 1 | 4408 | |
| 236SMPL.d | 4/18/2018 4:12 | Sample | 21804090216 10X | 10 | 4409 | |
| 237SMPL.d | 4/18/2018 4:17 | Sample | 21804090216 | 1 | 4410 | |
| 238_CCV.d | 4/18/2018 4:21 | CCV | 1800 | 1 | 1302 | |
| 239_CCB.d | 4/18/2018 4:26 | CCB | 1900 | 1 | 1307 | |
| 240LCCV.d | 4/18/2018 4:30 | LLCCV | 1803 | 1 | 1303 | |

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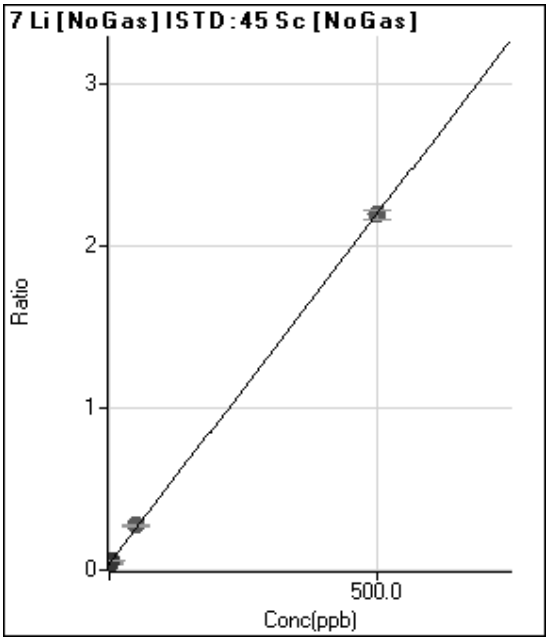
|---|---|---|---|---|---|---|
| 241SMPL.d | 4/18/2018 4:34 | Sample | 21804090218 10X | 10 | 4411 | |
| 242SMPL.d | 4/18/2018 4:39 | Sample | 21804090218 | 1 | 4412 | |
| 243SMPL.d | 4/18/2018 4:43 | Sample | 21804090219 10X | 10 | 4501 | |
| 244SMPL.d | 4/18/2018 4:48 | Sample | 21804090219 | 1 | 4502 | |
| 245SMPL.d | 4/18/2018 4:52 | Sample | 21804090220 10X | 10 | 4503 | |
| 246SMPL.d | 4/18/2018 4:56 | Sample | 21804090220 | 1 | 4504 | |
| 247_CCV.d | 4/18/2018 5:01 | CCV | 1800 | 1 | 1302 | |
| 248_CCB.d | 4/18/2018 5:05 | CCB | 1900 | 1 | 1307 | |
| 249LCCV.d | 4/18/2018 5:09 | LLCCV | 1803 | 1 | 1303 | |

| Tune Mode | Mass | Name | ISTD | R | a | b (blank) | DL | BEC | Units |
|---|---|---|---|---|---|---|---|---|---|
| No Gas | 7 | Li | 45 Sc [ No Gas ] | 0.999963688 | 0.00430786 | 0.040520059 | 0.326590688 | 9.406076783 | ppb |
| No Gas | 9 | Be | 45 Sc [ No Gas ] | 0.999999356 | 0.000953922 | 2.15E-05 | 0.007027093 | 0.022503444 | ppb |
| No Gas | 11 | B | 45 Sc [ No Gas ] | 0.999963138 | 0.000638633 | 0.000138624 | 0.108590072 | 0.217064223 | ppb |
| He | 23 | Na | 45 Sc [ He ] | 0.999998937 | 0.003536547 | 0.078923145 | 4.021013418 | 22.31644176 | ppb |
| He | 24 | Mg | 45 Sc [ He ] | 0.999999668 | 0.001762707 | 0.000459641 | 0.27880228 | 0.260758787 | ppb |
| He | 27 | Al | 45 Sc [ He ] | 0.999998495 | 0.000519961 | 0.000294209 | 0.48672542 | 0.565828897 | ppb |
| He | 29 | Si | 45 Sc [ He ] | 0.99985771 | 1.46E-05 | 0.012330805 | 177.7228837 | 844.5068319 | ppb |
| He | 39 | K | 45 Sc [ He ] | 0.99999931 | 0.000776552 | 0.065354174 | 12.53646461 | 84.15946159 | ppb |
| He | 44 | Ca | 45 Sc [ He ] | 0.999997695 | 4.34E-05 | 0.001901018 | 30.15073557 | 43.77643306 | ppb |
| He | 47 | Ti | 45 Sc [ He ] | 0.999996715 | 0.000369225 | 4.23E-05 | 0.291237833 | 0.114493449 | ppb |
| He | 51 | V | 72 Ge [ He ] | 0.999999618 | 0.031630794 | 0.001675822 | 0.077494787 | 0.052980701 | ppb |
| He | 52 | Cr | 72 Ge [ He ] | 0.999999668 | 0.042180976 | 0.004776823 | 0.054341424 | 0.113245916 | ppb |
| He | 55 | Mn | 72 Ge [ He ] | 0.999999142 | 0.017976309 | 0.000821231 | 0.026709869 | 0.045684066 | ppb |
| He | 57 | Fe | 72 Ge [ He ] | 0.99999603 | 0.000829483 | 0.000558453 | 1.132734742 | 0.673254516 | ppb |
| He | 59 | Co | 72 Ge [ He ] | 0.999992871 | 0.074479558 | 0.000681866 | 0.009512395 | 0.009155079 | ppb |
| He | 60 | Ni | 72 Ge [ He ] | 0.999995856 | 0.020870848 | 0.000631521 | 0.030132274 | 0.030258511 | ppb |
| He | 63 | Cu | 72 Ge [ He ] | 0.999992108 | 0.058664924 | 0.024317919 | 0.076437131 | 0.414522301 | ppb |
| He | 66 | Zn | 72 Ge [ He ] | 0.999988111 | 0.007032157 | 0.003304217 | 0.293832536 | 0.469872492 | ppb |
| He | 75 | As | 72 Ge [ He ] | 0.999999918 | 0.005158737 | 0.000203717 | 0.00941366 | 0.039489782 | ppb |
| He | 78 | Se | 72 Ge [ He ] | 0.999974908 | 0.000328692 | 6.83E-05 | 0.089271595 | 0.207922558 | ppb |
| No Gas | 88 | Sr | 72 Ge [ No Gas ] | 0.999998728 | 0.030849211 | 0.000564282 | 0.017228484 | 0.018291608 | ppb |
| No Gas | 90 | Zr | 72 Ge [ No Gas ] | 0.99999783 | 0.021110991 | 0.000671439 | 0.01185952 | 0.031805166 | ppb |
| No Gas | 95 | Mo | 115 In [ No Gas ] | 0.999994898 | 0.001014695 | 8.63E-06 | 0.018299196 | 0.00850852 | ppb |
| No Gas | 107 | Ag | 115 In [ No Gas ] | 0.999999973 | 0.002753393 | 6.29E-06 | 0.001991093 | 0.002283384 | ppb |
| No Gas | 111 | Cd | 115 In [ No Gas ] | 0.999999814 | 0.000552973 | 8.11E-06 | 0.012480884 | 0.014661057 | ppb |
| No Gas | 118 | [Sn] | 115 In [ No Gas ] | 0.999997753 | 0.001640153 | 0.000137983 | 0.019668087 | 0.084128037 | ppb |
| He | 118 | [Sn] | 115 In [ He ] | 0.999999209 | 0.002303998 | 0.000259435 | 0.122825635 | 0.112601949 | ppb |
| He | 120 | Sn | 115 In [ He ] | 0.999999382 | 0.003388539 | 0.000289144 | 0.048144485 | 0.085329965 | ppb |
| No Gas | 121 | Sb | 115 In [ No Gas ] | 0.999997255 | 0.002349879 | 3.08E-05 | 0.001914553 | 0.013115768 | ppb |
| No Gas | 137 | Ba | 115 In [ No Gas ] | 0.999999143 | 0.000740545 | 8.85E-06 | 0.011201239 | 0.011956121 | ppb |
| He | 156 | [Se] | 115 In [ He ] | | | | | | ppb |
| No Gas | 205 | Tl | 209 Bi [ No Gas ] | 0.999987231 | 0.005721375 | 7.09E-05 | 0.005999288 | 0.012388418 | ppb |
| No Gas | 206 | [Pb] | 209 Bi [ No Gas ] | 0.999999672 | 0.001868818 | 8.02E-05 | 0.004311801 | 0.04290059 | ppb |
| No Gas | 207 | [Pb] | 209 Bi [ No Gas ] | 0.999996714 | 0.001690347 | 7.08E-05 | 0.024673342 | 0.041867705 | ppb |
| No Gas | 208 | Pb | 209 Bi [ No Gas ] | 0.999997454 | 0.007611365 | 0.000331927 | 0.021654327 | 0.043609358 | ppb |
| No Gas | 45 | Sc | | | | | | | ppb |
| He | 45 | Sc | | | | | | | ppb |
| No Gas | 72 | Ge | | | | | | | ppb |
| He | 72 | Ge | | | | | | | ppb |
| No Gas | 103 | Rh | | | | | | | ppb |
| He | 103 | Rh | | | | | | | ppb |
| No Gas | 115 | In | | | | | | | ppb |
| He | 115 | In | | | | | | | ppb |
| No Gas | 159 | Tb | | | | | | | ppb |
| He | 159 | Tb | | | | | | | ppb |
| No Gas | 175 | Lu | | | | | | | ppb |
| He | 175 | Lu | | | | | | | ppb |
| No Gas | 209 | Bi | | | | | | | ppb |
| He | 209 | Bi | | | | | | | ppb |

Batch Folder: C:\Agilent\ICPMH\1\DATA\2180417A_MS1.b\
Analysis File: 2180417A_MS1.batch.bin
DA Date-Time: 2018-04-17 12:59:51
Calibration Title:
Calibration Method: External Calibration
VIS Interpolation Fit:

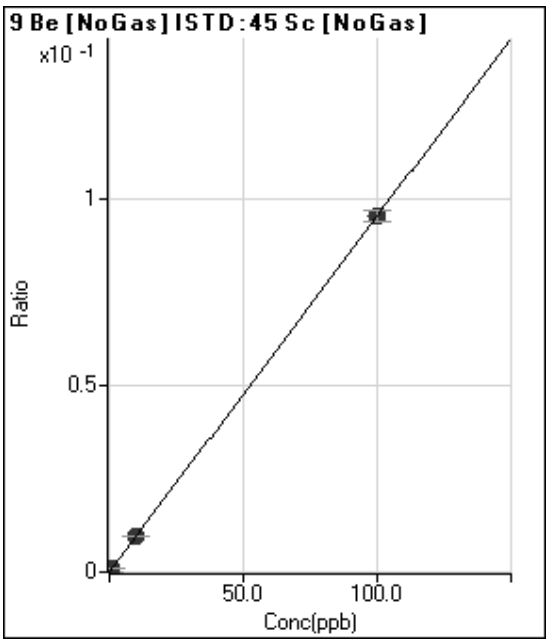
| Level | Standard Data File | Sample Name | Acq. Date-Time |
|---|---|---|---|
| 1 | 008CALB.d | 1300 | 2018-04-17 10:37:49 |
| 2 | | | |
| 3 | 009CALS.d | 1302 | 2018-04-17 10:42:29 |
| 4 | | | |
| 5 | 010CALS.d | 1304 | 2018-04-17 10:46:58 |
| 6 | 011CALS.d | 1305 | 2018-04-17 10:51:26 |
| 7 | 012CALS.d | 1306 | 2018-04-17 10:55:53 |
| 8 | 013CALS.d | 1301 | 2018-04-17 11:00:19 |




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 165824.03 | 0.0405 | P | 1.2 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.500 | 0.374 | 172761.91 | 0.0421 | P | 4.0 |
| 4 | ☐ | 2.500 | | | | | |
| 5 | ☐ | 5.000 | 5.243 | 256086.67 | 0.0631 | P | 0.7 |
| 6 | ☐ | 50.000 | 54.188 | 1120549.41 | 0.2740 | A | 0.8 |
| 7 | ☐ | 500.000 | 499.579 | 8924342.99 | 2.1926 | A | 2.4 |
| 8 | ☐ | | | 171596.97 | 0.0426 | P | 0.7 |

y = 0.0043 * x + 0.0405
R = 1.0000
DL = 0.3266
BEC = 9.406

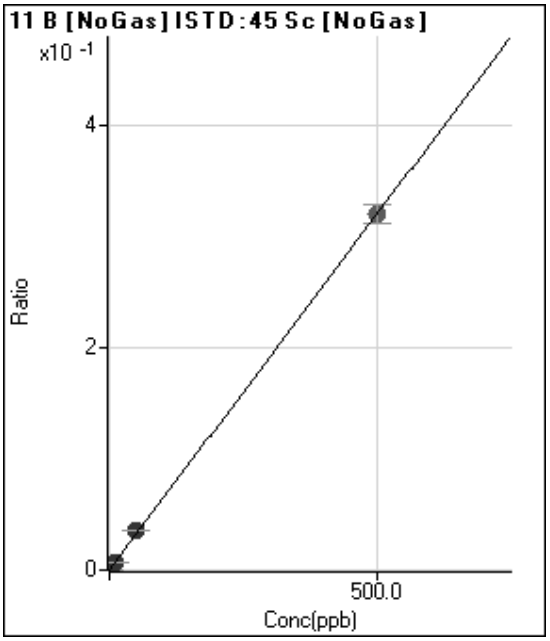
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 88.00 | 0.0000 | P | 10.4 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.104 | 496.68 | 0.0001 | P | 5.6 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 1.019 | 4029.83 | 0.0010 | P | 1.7 |
| 6 | ☐ | 10.000 | 10.117 | 39559.28 | 0.0097 | P | 2.4 |
| 7 | ☐ | 100.000 | 99.988 | 388246.16 | 0.0954 | P | 3.3 |
| 8 | ☐ | | | 301.34 | 0.0001 | P | 7.5 |

y = 9.5392E-004 * x + 2.1467E-005
R = 1.0000
DL = 0.007027
BEC = 0.0225

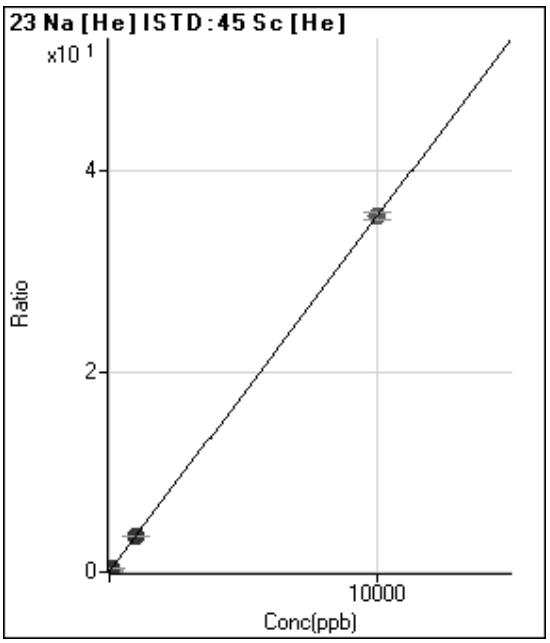
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 566.71 | 0.0001 | P | 16.7 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 1.000 | 1.085 | 3410.50 | 0.0008 | P | 2.6 |
| 4 | ☐ | 2.500 | | | | | |
| 5 | ☐ | 10.000 | 10.224 | 27059.01 | 0.0067 | P | 2.8 |
| 6 | ☐ | 50.000 | 54.273 | 142334.62 | 0.0348 | P | 0.4 |
| 7 | ☐ | 500.000 | 499.568 | 1298621.62 | 0.3192 | A | 5.4 |
| 8 | ☐ | | | 21571.05 | 0.0054 | P | 4.2 |

y = 6.3863E-004 * x + 1.3862E-004
R = 1.0000
DL = 0.1086
BEC = 0.2171

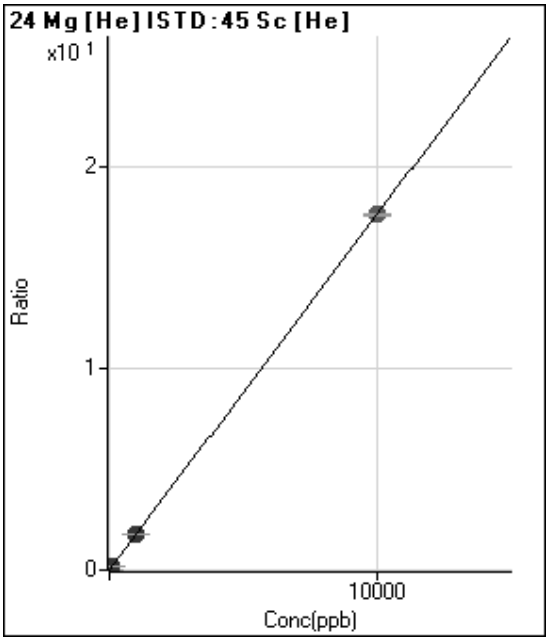
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 8609.23 | 0.0789 | P | 6.0 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 10.000 | 10.026 | 12575.25 | 0.1144 | P | 1.9 |
| 4 | ☐ | 50.000 | | | | | |
| 5 | ☐ | 100.000 | 92.034 | 47270.08 | 0.4044 | P | 9.8 |
| 6 | ☐ | 1000.000 | 985.386 | 381800.60 | 3.5638 | P | 1.9 |
| 7 | ☐ | 10000.000 | 10001.541 | 3693756.72 | 35.4498 | A | 2.1 |
| 8 | ☐ | | | 10570.45 | 0.0944 | P | 8.9 |

y = 0.0035 * x + 0.0789
R = 1.0000
DL = 4.021
BEC = 22.32

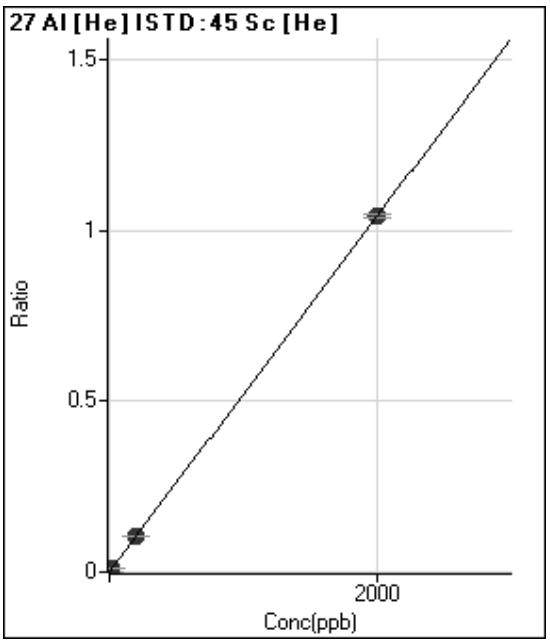
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 50.00 | 0.0005 | P | 35.6 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 10.000 | 9.622 | 1916.86 | 0.0174 | P | 7.2 |
| 4 | ☐ | 50.000 | | | | | |
| 5 | ☐ | 100.000 | 92.063 | 19048.11 | 0.1627 | P | 7.7 |
| 6 | ☐ | 1000.000 | 993.931 | 187775.85 | 1.7525 | P | 0.7 |
| 7 | ☐ | 10000.000 | 10000.687 | 1836980.60 | 17.6287 | A | 0.6 |
| 8 | ☐ | | | 596.70 | 0.0053 | P | 2.6 |

y = 0.0018 * x + 4.5964E-004
R = 1.0000
DL = 0.2788
BEC = 0.2608

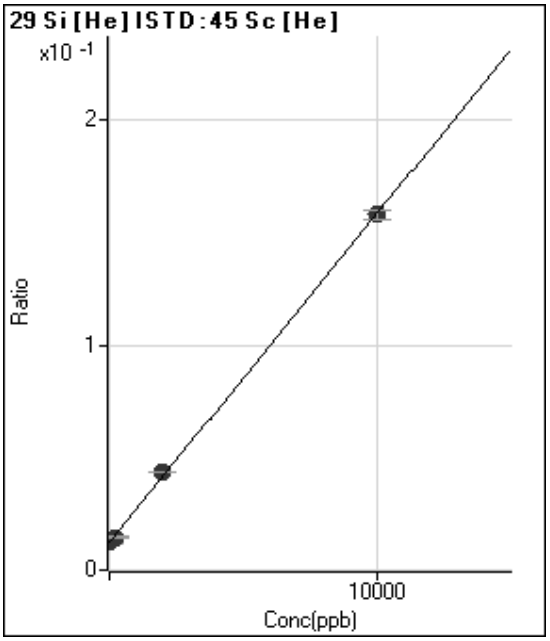
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 32.00 | 0.0003 | P | 28.7 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 2.000 | 1.948 | 144.00 | 0.0013 | P | 19.3 |
| 4 | ☐ | 10.000 | | | | | |
| 5 | ☐ | 20.000 | 18.267 | 1146.05 | 0.0098 | P | 7.8 |
| 6 | ☐ | 200.000 | 202.488 | 11311.84 | 0.1056 | P | 1.3 |
| 7 | ☐ | 2000.000 | 1999.769 | 108380.21 | 1.0401 | P | 1.1 |
| 8 | ☐ | | | 52.67 | 0.0005 | P | 4.1 |

y = 5.1996E-004 * x + 2.9421E-004
R = 1.0000
DL = 0.4867
BEC = 0.5658

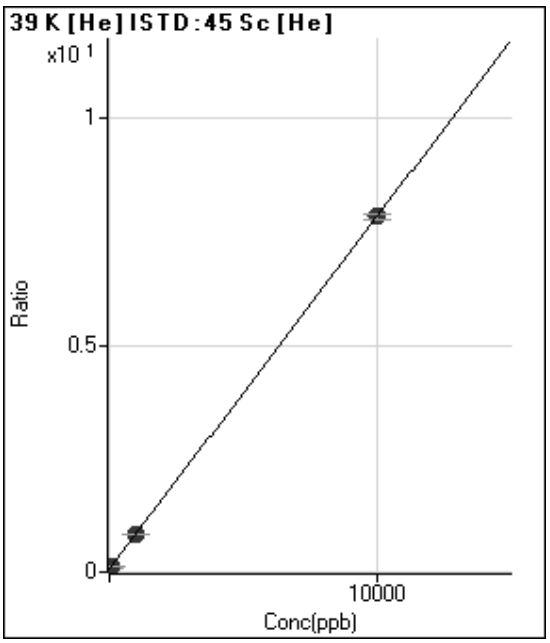
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 1343.40 | 0.0123 | P | 7.0 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 20.000 | 51.496 | 1438.08 | 0.0131 | P | 3.2 |
| 4 | ☐ | 100.000 | | | | | |
| 5 | ☐ | 200.000 | 147.994 | 1695.43 | 0.0145 | P | 8.3 |
| 6 | ☐ | 2000.000 | 2137.406 | 4665.35 | 0.0435 | P | 0.5 |
| 7 | ☐ | 10000.000 | 9973.496 | 16458.09 | 0.1580 | P | 2.4 |
| 8 | ☐ | | | 1386.74 | 0.0124 | P | 8.7 |

y = 1.4601E-005 * x + 0.0123
R = 0.9999
DL = 177.7
BEC = 844.5

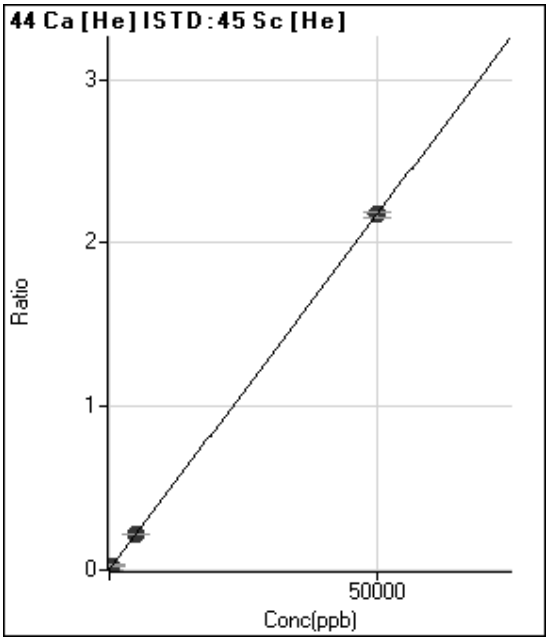
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 7121.87 | 0.0654 | P | 5.0 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 10.000 | 8.048 | 7875.53 | 0.0716 | P | 1.4 |
| 4 | ☐ | 50.000 | | | | | |
| 5 | ☐ | 100.000 | 86.742 | 15507.77 | 0.1327 | P | 10.3 |
| 6 | ☐ | 1000.000 | 993.855 | 89690.17 | 0.8371 | P | 1.4 |
| 7 | ☐ | 10000.000 | 10000.749 | 816062.54 | 7.8315 | P | 1.5 |
| 8 | ☐ | | | 7138.49 | 0.0638 | P | 9.6 |

y = 7.7655E-004 * x + 0.0654
R = 1.0000
DL = 12.54
BEC = 84.16

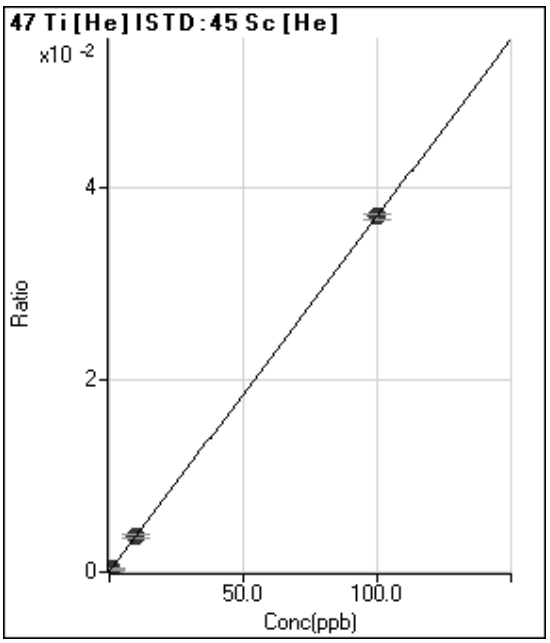
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 206.67 | 0.0019 | P | 23.0 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 50.000 | 53.000 | 461.69 | 0.0042 | P | 6.7 |
| 4 | ☐ | 250.000 | | | | | |
| 5 | ☐ | 500.000 | 598.153 | 3265.39 | 0.0279 | P | 8.7 |
| 6 | ☐ | 5000.000 | 4973.700 | 23341.70 | 0.2179 | P | 2.5 |
| 7 | ☐ | 50000.000 | 50001.645 | 226453.05 | 2.1733 | P | 1.3 |
| 8 | ☐ | | | 280.01 | 0.0025 | P | 13.3 |

y = 4.3426E-005 * x + 0.0019
R = 1.0000
DL = 30.15
BEC = 43.78

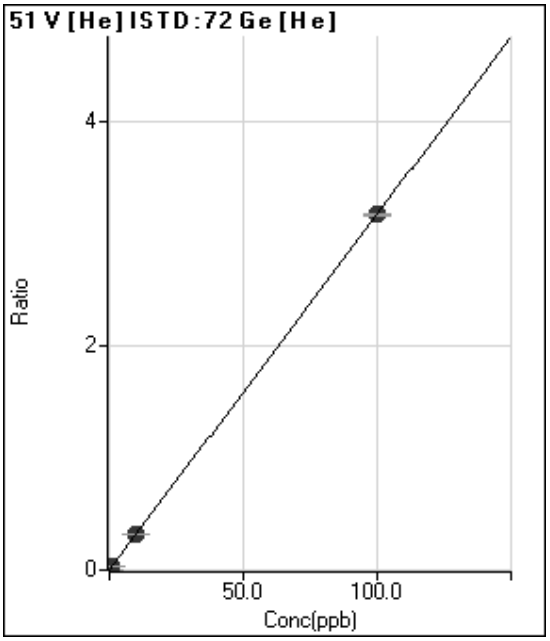
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 4.67 | 0.0000 | P | 84.8 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.108 | 9.00 | 0.0001 | P | 31.5 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 0.735 | 36.67 | 0.0003 | P | 12.7 |
| 6 | ☐ | 10.000 | 9.971 | 398.68 | 0.0037 | P | 8.8 |
| 7 | ☐ | 100.000 | 100.006 | 3851.79 | 0.0370 | P | 1.9 |
| 8 | ☐ | | | 4.33 | 0.0000 | P | 38.3 |

y = 3.6922E-004 * x + 4.2274E-005
R = 1.0000
DL = 0.2912
BEC = 0.1145

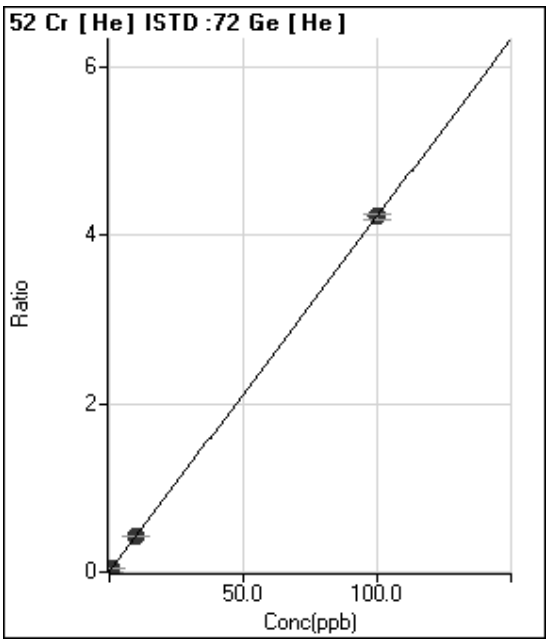
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 80.00 | 0.0017 | P | 48.8 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.106 | 240.01 | 0.0050 | P | 16.7 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 0.970 | 1522.32 | 0.0323 | P | 3.6 |
| 6 | ☐ | 10.000 | 9.913 | 14742.24 | 0.3152 | P | 0.9 |
| 7 | ☐ | 100.000 | 100.009 | 145952.10 | 3.1650 | P | 0.4 |
| 8 | ☐ | | | 108.89 | 0.0023 | P | 30.5 |

y = 0.0316 * x + 0.0017
R = 1.0000
DL = 0.07749
BEC = 0.05298

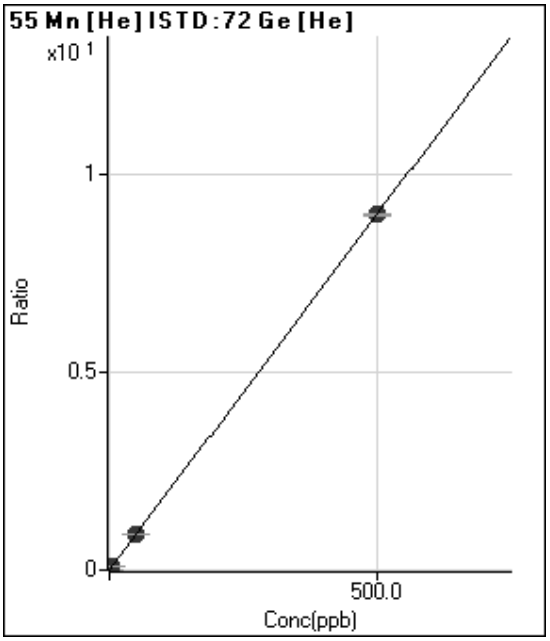
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 226.67 | 0.0048 | P | 16.0 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.078 | 385.57 | 0.0081 | P | 11.5 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 1.041 | 2290.19 | 0.0487 | P | 6.8 |
| 6 | ☐ | 10.000 | 9.944 | 19838.68 | 0.4242 | P | 1.4 |
| 7 | ☐ | 100.000 | 100.005 | 194721.96 | 4.2231 | P | 1.3 |
| 8 | ☐ | | | 268.90 | 0.0056 | P | 10.7 |

y = 0.0422 * x + 0.0048
R = 1.0000
DL = 0.05434
BEC = 0.1132

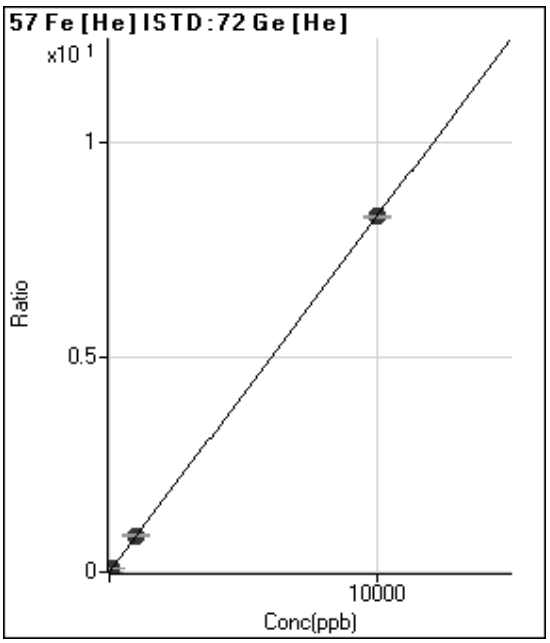
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 38.89 | 0.0008 | P | 19.5 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.500 | 0.579 | 535.58 | 0.0112 | P | 7.1 |
| 4 | ☐ | 2.500 | | | | | |
| 5 | ☐ | 5.000 | 5.432 | 4630.71 | 0.0985 | P | 4.2 |
| 6 | ☐ | 50.000 | 50.677 | 42635.99 | 0.9118 | P | 2.7 |
| 7 | ☐ | 500.000 | 499.928 | 414445.89 | 8.9877 | P | 0.2 |
| 8 | ☐ | | | 177.78 | 0.0037 | P | 25.9 |

y = 0.0180 * x + 8.2123E-004
R = 1.0000
DL = 0.02671
BEC = 0.04568

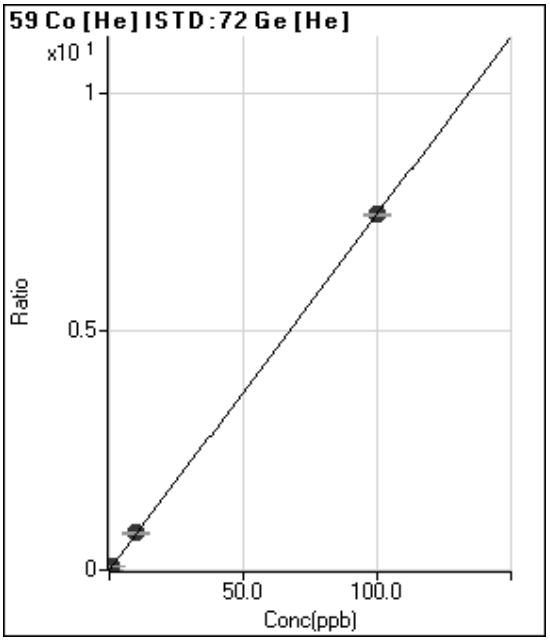
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 26.67 | 0.0006 | P | 56.1 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 10.000 | 9.442 | 400.02 | 0.0084 | P | 11.6 |
| 4 | ☐ | 50.000 | | | | | |
| 5 | ☐ | 100.000 | 111.472 | 4374.10 | 0.0930 | P | 5.4 |
| 6 | ☐ | 1000.000 | 1028.586 | 39922.91 | 0.8538 | P | 2.8 |
| 7 | ☐ | 10000.000 | 9997.027 | 382397.59 | 8.2929 | P | 0.8 |
| 8 | ☐ | | | 136.68 | 0.0029 | P | 11.6 |

y = 8.2948E-004 * x + 5.5845E-004
R = 1.0000
DL = 1.133
BEC = 0.6733

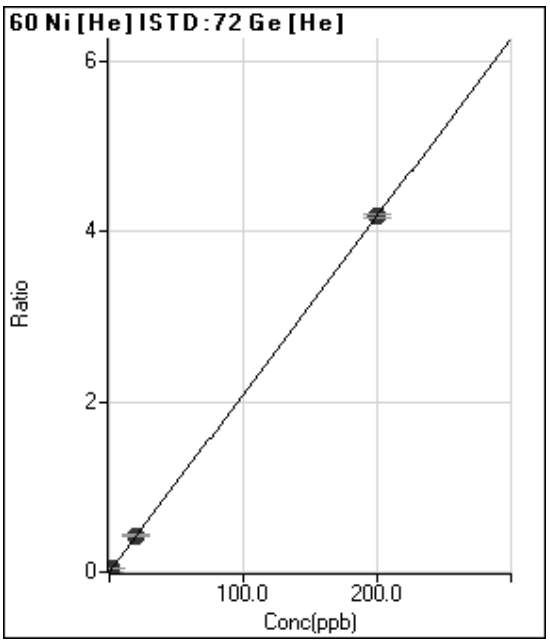
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 32.22 | 0.0007 | P | 34.6 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.109 | 420.01 | 0.0088 | P | 16.0 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 0.971 | 3432.63 | 0.0730 | P | 3.9 |
| 6 | ☐ | 10.000 | 10.362 | 36124.08 | 0.7725 | P | 1.1 |
| 7 | ☐ | 100.000 | 99.964 | 343341.03 | 7.4460 | P | 0.7 |
| 8 | ☐ | | | 106.67 | 0.0022 | P | 16.9 |

y = 0.0745 * x + 6.8187E-004
R = 1.0000
DL = 0.009512
BEC = 0.009155

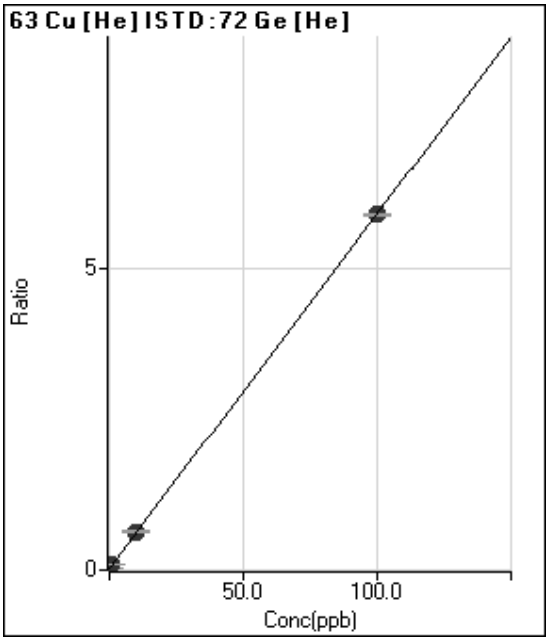
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 30.00 | 0.0006 | P | 33.2 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.200 | 0.194 | 223.34 | 0.0047 | P | 0.6 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 2.000 | 2.134 | 2124.62 | 0.0452 | P | 2.8 |
| 6 | ☐ | 20.000 | 20.587 | 20122.41 | 0.4303 | P | 1.4 |
| 7 | ☐ | 200.000 | 199.940 | 192441.98 | 4.1735 | P | 1.0 |
| 8 | ☐ | | | 93.34 | 0.0019 | P | 8.9 |

y = 0.0209 * x + 6.3152E-004
R = 1.0000
DL = 0.03013
BEC = 0.03026

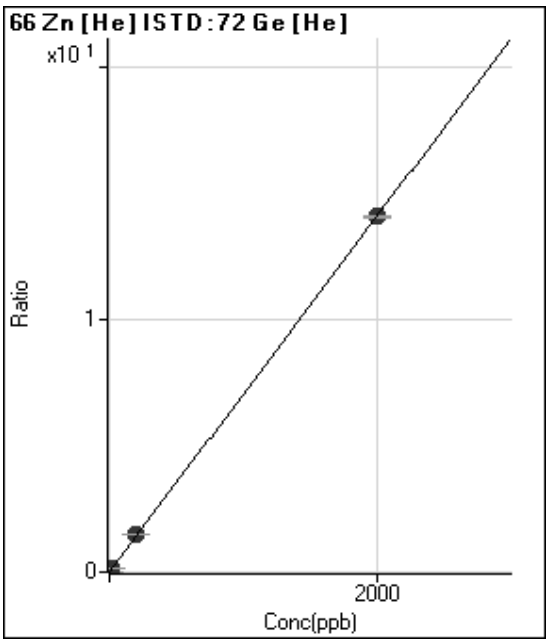
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 1153.39 | 0.0243 | P | 6.1 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.096 | 1426.75 | 0.0299 | P | 2.0 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 1.104 | 4189.48 | 0.0891 | P | 4.4 |
| 6 | ☐ | 10.000 | 10.406 | 29681.30 | 0.6348 | P | 3.1 |
| 7 | ☐ | 100.000 | 99.958 | 271517.01 | 5.8884 | P | 0.7 |
| 8 | ☐ | | | 1120.05 | 0.0234 | P | 5.1 |

y = 0.0587 * x + 0.0243
R = 1.0000
DL = 0.07644
BEC = 0.4145

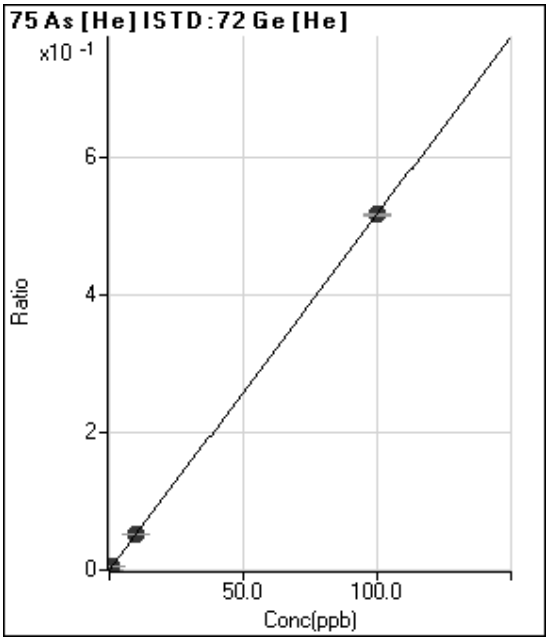
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 156.67 | 0.0033 | P | 20.8 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 2.000 | 2.192 | 892.26 | 0.0187 | P | 9.0 |
| 4 | ☐ | 10.000 | | | | | |
| 5 | ☐ | 20.000 | 21.794 | 7366.19 | 0.1566 | P | 2.2 |
| 6 | ☐ | 200.000 | 209.994 | 69216.13 | 1.4800 | P | 0.9 |
| 7 | ☐ | 2000.000 | 1998.982 | 648350.77 | 14.0605 | P | 0.4 |
| 8 | ☐ | | | 407.79 | 0.0085 | P | 8.7 |

y = 0.0070 * x + 0.0033
R = 1.0000
DL = 0.2938
BEC = 0.4699

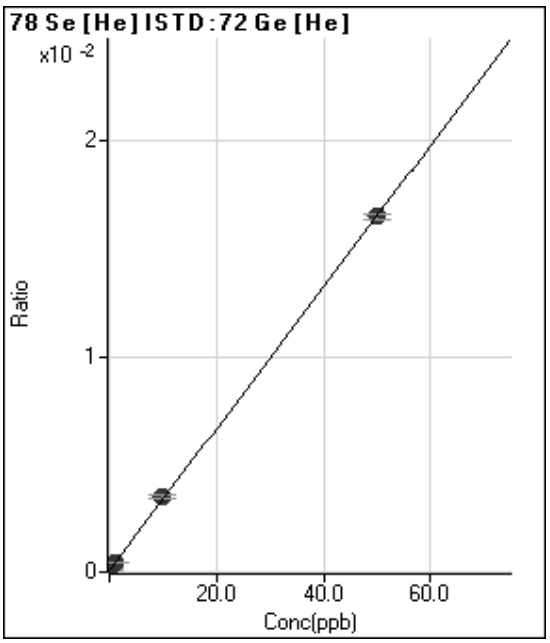
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 9.67 | 0.0002 | P | 7.9 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.103 | 35.00 | 0.0007 | P | 14.8 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 1.043 | 262.67 | 0.0056 | P | 5.1 |
| 6 | ☐ | 10.000 | 10.025 | 2428.18 | 0.0519 | P | 0.5 |
| 7 | ☐ | 100.000 | 99.997 | 23796.19 | 0.5161 | P | 0.8 |
| 8 | ☐ | | | 19.33 | 0.0004 | P | 10.8 |

y = 0.0052 * x + 2.0372E-004
R = 1.0000
DL = 0.009414
BEC = 0.03949

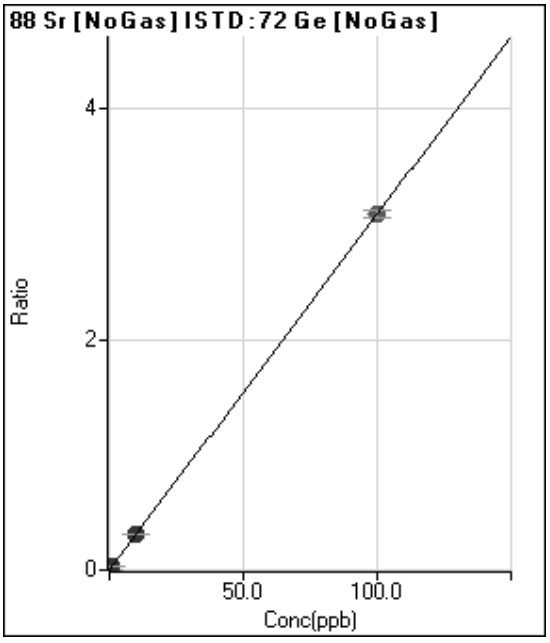
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 3.25 | 0.0001 | P | 14.3 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.253 | 7.23 | 0.0002 | P | 14.7 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 1.057 | 19.55 | 0.0004 | P | 8.3 |
| 6 | ☐ | 10.000 | 10.360 | 162.48 | 0.0035 | P | 5.9 |
| 7 | ☐ | 50.000 | 49.927 | 759.89 | 0.0165 | P | 1.2 |
| 8 | ☐ | | | 4.33 | 0.0001 | P | 32.7 |

y = 3.2869E-004 * x + 6.8342E-005
R = 1.0000
DL = 0.08927
BEC = 0.2079

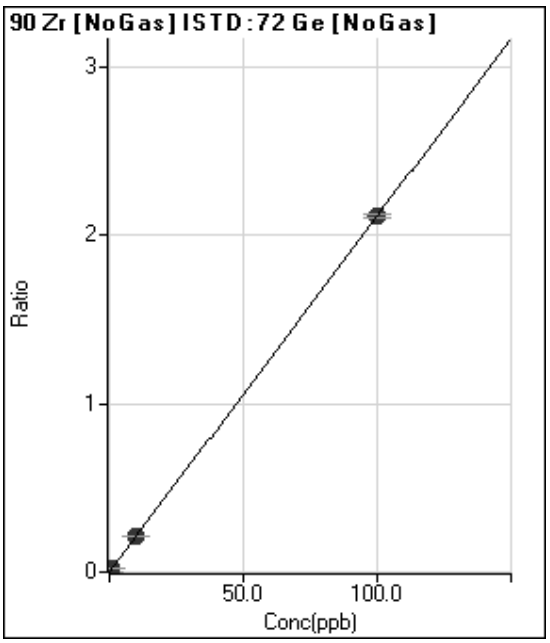
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 336.69 | 0.0006 | P | 31.4 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.092 | 2026.88 | 0.0034 | P | 6.6 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 1.026 | 19195.77 | 0.0322 | P | 1.3 |
| 6 | ☐ | 10.000 | 9.851 | 182747.41 | 0.3045 | P | 0.3 |
| 7 | ☐ | 100.000 | 100.015 | 1822518.30 | 3.0859 | A | 2.0 |
| 8 | ☐ | | | 1390.12 | 0.0023 | P | 23.3 |

y = 0.0308 * x + 5.6428E-004
R = 1.0000
DL = 0.01723
BEC = 0.01829

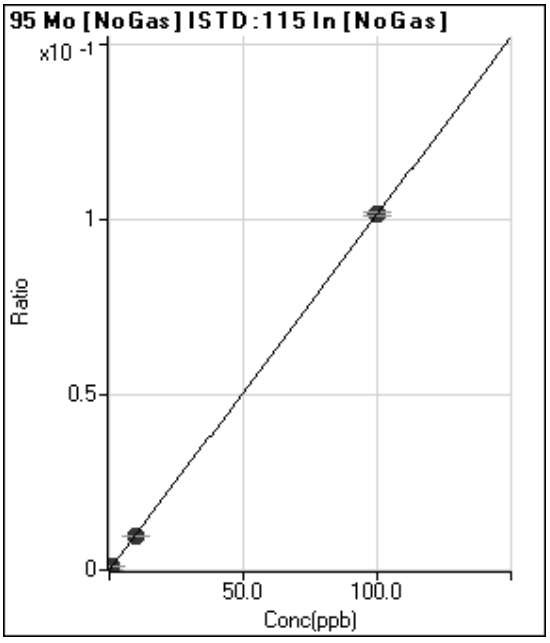
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 401.12 | 0.0007 | P | 12.4 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.098 | 1637.91 | 0.0027 | P | 8.7 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 0.940 | 12234.77 | 0.0205 | P | 1.7 |
| 6 | ☐ | 10.000 | 10.179 | 129377.59 | 0.2156 | P | 0.3 |
| 7 | ☐ | 100.000 | 99.983 | 1246918.88 | 2.1114 | P | 1.1 |
| 8 | ☐ | | | 1278.95 | 0.0021 | P | 8.4 |

y = 0.0211 * x + 6.7144E-004
R = 1.0000
DL = 0.01186
BEC = 0.03181

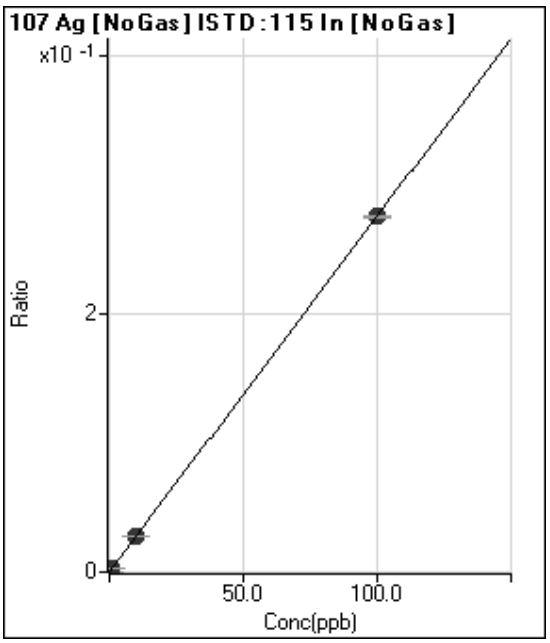
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 33.33 | 0.0000 | P | 71.7 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.096 | 404.46 | 0.0001 | P | 18.3 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 0.954 | 3757.16 | 0.0010 | P | 7.4 |
| 6 | ☐ | 10.000 | 9.674 | 37960.47 | 0.0098 | P | 2.2 |
| 7 | ☐ | 100.000 | 100.033 | 375484.35 | 0.1015 | P | 1.1 |
| 8 | ☐ | | | 456.68 | 0.0001 | P | 7.7 |

y = 0.0010 * x + 8.6336E-006
R = 1.0000
DL = 0.0183
BEC = 0.008509

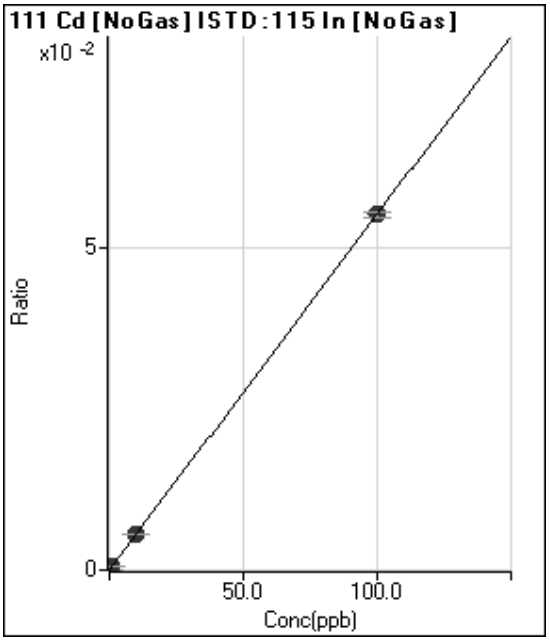
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 24.45 | 0.0000 | P | 29.1 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.097 | 1045.60 | 0.0003 | P | 5.1 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 1.014 | 10774.90 | 0.0028 | P | 1.0 |
| 6 | ☐ | 10.000 | 10.021 | 106623.62 | 0.0276 | P | 1.2 |
| 7 | ☐ | 100.000 | 99.998 | 1018477.15 | 0.2753 | P | 0.9 |
| 8 | ☐ | | | 720.03 | 0.0002 | P | 13.2 |

y = 0.0028 * x + 6.2871E-006
R = 1.0000
DL = 0.001991
BEC = 0.002283

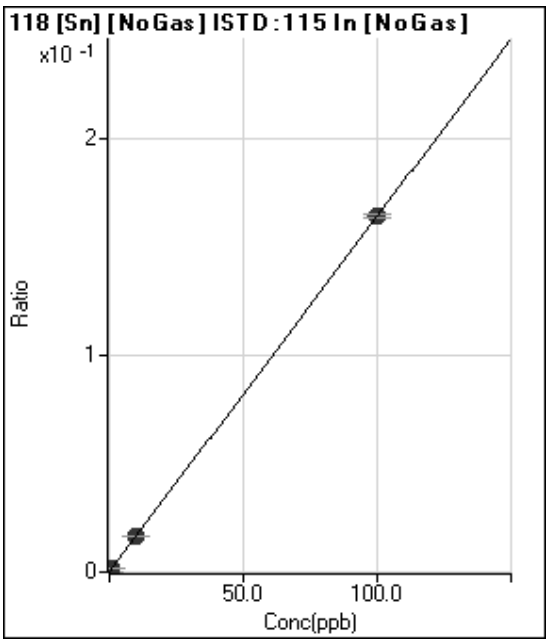
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 31.67 | 0.0000 | P | 28.4 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.097 | 237.33 | 0.0001 | P | 1.6 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 1.017 | 2196.50 | 0.0006 | P | 2.7 |
| 6 | ☐ | 10.000 | 10.061 | 21527.20 | 0.0056 | P | 0.9 |
| 7 | ☐ | 100.000 | 99.994 | 204553.62 | 0.0553 | P | 1.6 |
| 8 | ☐ | | | 171.33 | 0.0000 | P | 8.3 |

y = 5.5297E-004 * x + 8.1072E-006
R = 1.0000
DL = 0.01248
BEC = 0.01466

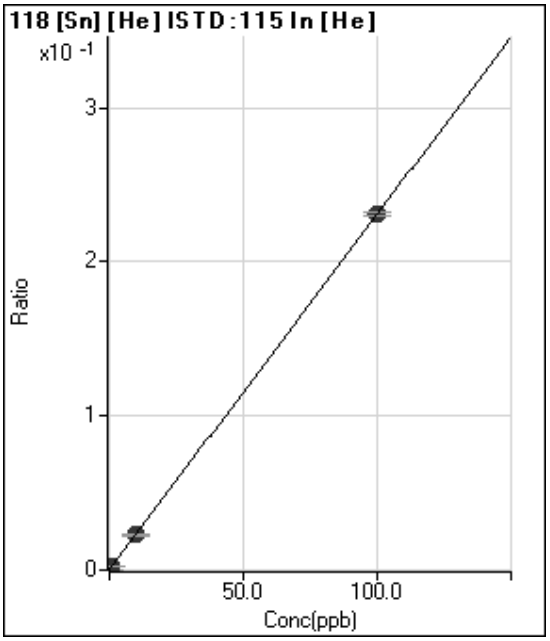
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 536.68 | 0.0001 | P | 7.8 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.113 | 1236.73 | 0.0003 | P | 1.5 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 1.000 | 6847.16 | 0.0018 | P | 2.1 |
| 6 | ☐ | 10.000 | 9.796 | 62611.18 | 0.0162 | P | 1.3 |
| 7 | ☐ | 100.000 | 100.020 | 607347.51 | 0.1642 | P | 1.2 |
| 8 | ☐ | | | 926.71 | 0.0002 | P | 5.3 |

y = 0.0016 * x + 1.3798E-004
R = 1.0000
DL = 0.01967
BEC = 0.08413

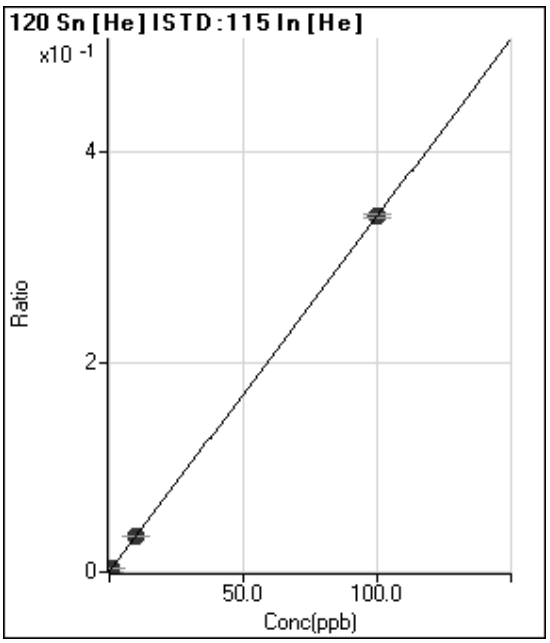
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 96.67 | 0.0003 | P | 36.4 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.075 | 163.34 | 0.0004 | P | 17.5 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 0.893 | 864.48 | 0.0023 | P | 8.9 |
| 6 | ☐ | 10.000 | 9.876 | 8537.97 | 0.0230 | P | 3.7 |
| 7 | ☐ | 100.000 | 100.014 | 82471.68 | 0.2307 | P | 1.0 |
| 8 | ☐ | | | 103.33 | 0.0003 | P | 31.3 |

y = 0.0023 * x + 2.5943E-004
R = 1.0000
DL = 0.1228
BEC = 0.1126

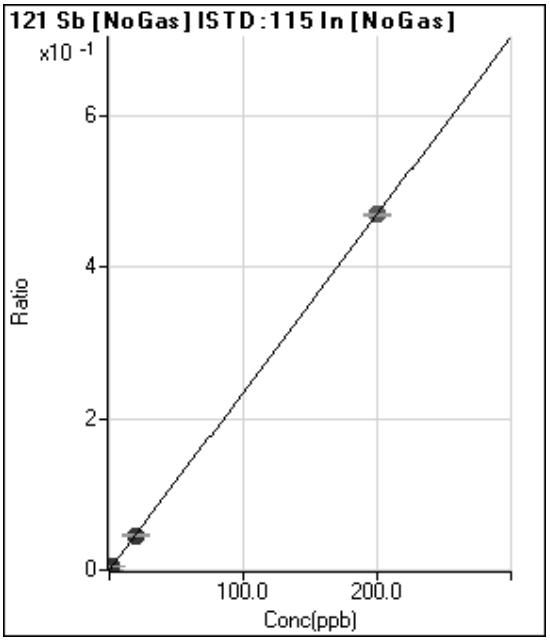
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 107.78 | 0.0003 | P | 18.8 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.096 | 232.23 | 0.0006 | P | 11.8 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 1.015 | 1390.08 | 0.0037 | P | 12.2 |
| 6 | ☐ | 10.000 | 10.111 | 12820.93 | 0.0345 | P | 2.0 |
| 7 | ☐ | 100.000 | 99.989 | 121233.15 | 0.3391 | P | 1.1 |
| 8 | ☐ | | | 181.11 | 0.0005 | P | 19.1 |

y = 0.0034 * x + 2.8914E-004
R = 1.0000
DL = 0.04814
BEC = 0.08533

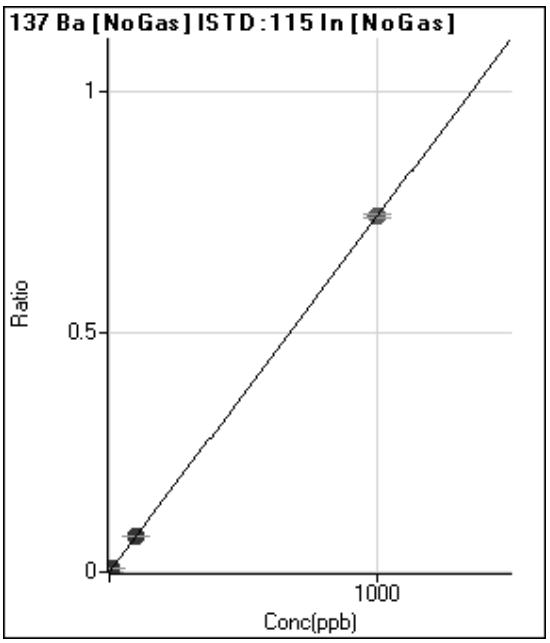
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 120.00 | 0.0000 | P | 4.9 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.200 | 0.199 | 1910.15 | 0.0005 | P | 1.6 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 2.000 | 1.997 | 18177.32 | 0.0047 | P | 3.0 |
| 6 | ☐ | 20.000 | 19.539 | 177518.12 | 0.0459 | P | 1.4 |
| 7 | ☐ | 200.000 | 200.046 | 1738939.17 | 0.4701 | A | 0.4 |
| 8 | ☐ | | | 4351.78 | 0.0011 | P | 7.7 |

y = 0.0023 * x + 3.0820E-005
R = 1.0000
DL = 0.001915
BEC = 0.01312

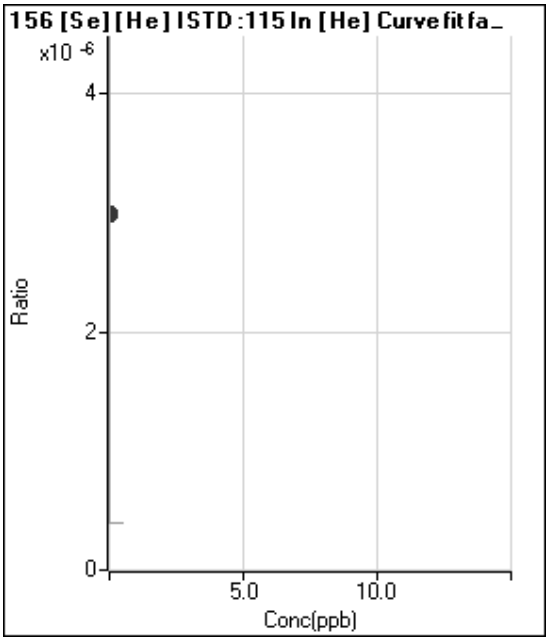
Weight: <None>
Min Conc: <None>



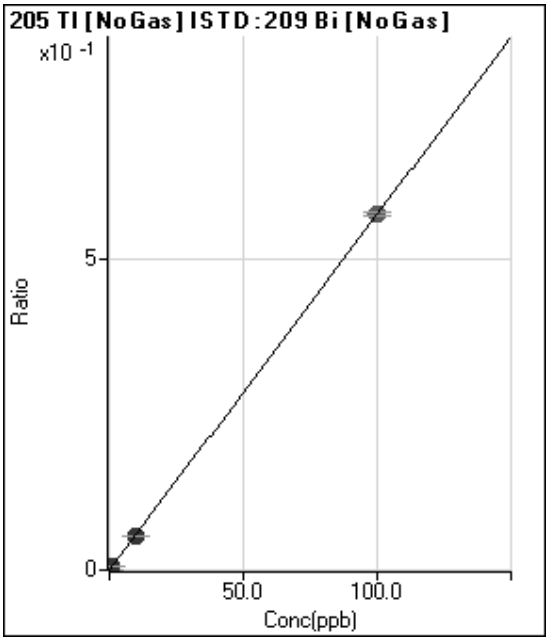

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 34.45 | 0.0000 | P | 31.2 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.105 | 332.23 | 0.0001 | P | 11.4 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 1.022 | 2948.11 | 0.0008 | P | 2.3 |
| 6 | ☐ | 10.000 | 9.758 | 27954.16 | 0.0072 | P | 0.1 |
| 7 | ☐ | 100.000 | 98.694 | 270369.98 | 0.0731 | P | 0.9 |
| 8 | ☐ | 1000.000 | 1000.133 | 2861290.86 | 0.7407 | A | 1.2 |

y = 7.4055E-004 * x + 8.8540E-006
R = 1.0000
DL = 0.0112
BEC = 0.01196

Weight: <None>
Min Conc: <None>



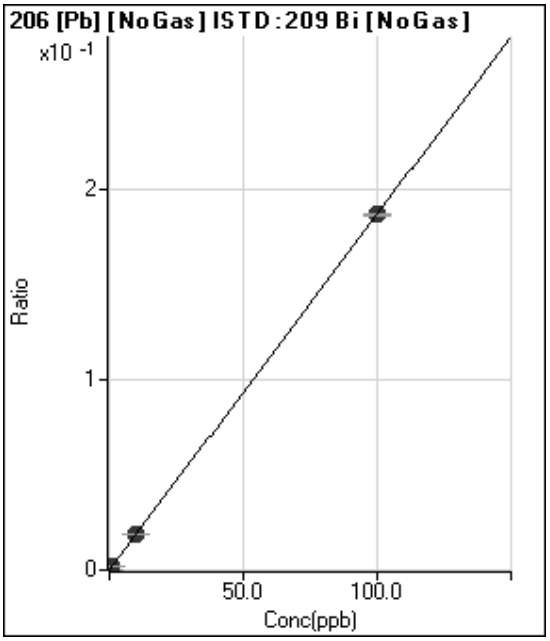

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | | 1.11 | 0.0000 | P | 173.2 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | | | 5.55 | 0.0000 | P | 125.2 |
| 4 | ☐ | | | | | | |
| 5 | ☐ | | | 7.78 | 0.0000 | P | 107.6 |
| 6 | ☐ | | | 4.44 | 0.0000 | P | 173.2 |
| 7 | ☐ | | | 13.33 | 0.0000 | P | 75.3 |
| 8 | ☐ | | | 2.22 | 0.0000 | P | 86.6 |




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 256.67 | 0.0001 | P | 16.1 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.089 | 2110.18 | 0.0006 | P | 1.0 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 0.941 | 19841.26 | 0.0055 | P | 1.1 |
| 6 | ☐ | 10.000 | 9.486 | 196439.24 | 0.0543 | P | 1.8 |
| 7 | ☐ | 100.000 | 100.052 | 1959036.94 | 0.5725 | A | 1.0 |
| 8 | ☐ | | | 1567.89 | 0.0004 | P | 11.7 |

y = 0.0057 * x + 7.0879E-005
R = 1.0000
DL = 0.005999
BEC = 0.01239

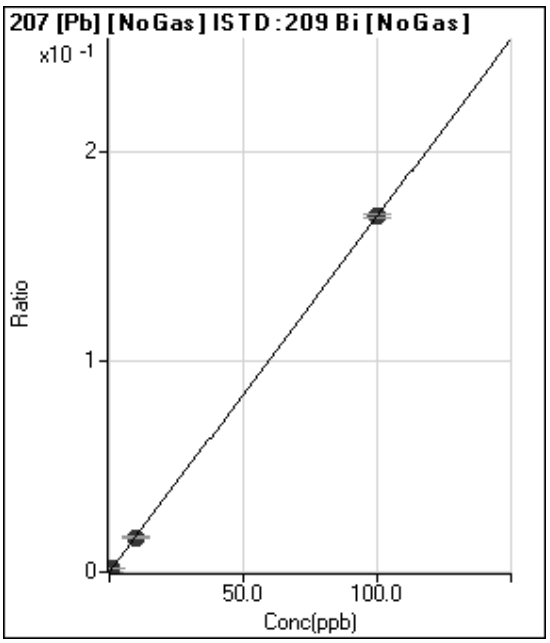
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 290.02 | 0.0001 | P | 3.4 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.114 | 1066.75 | 0.0003 | P | 8.3 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 1.017 | 7198.77 | 0.0020 | P | 3.7 |
| 6 | ☐ | 10.000 | 9.931 | 67380.86 | 0.0186 | P | 1.0 |
| 7 | ☐ | 100.000 | 100.007 | 639798.26 | 0.1870 | P | 0.4 |
| 8 | ☐ | | | 643.38 | 0.0002 | P | 10.2 |

y = 0.0019 * x + 8.0173E-005
R = 1.0000
DL = 0.004312
BEC = 0.0429

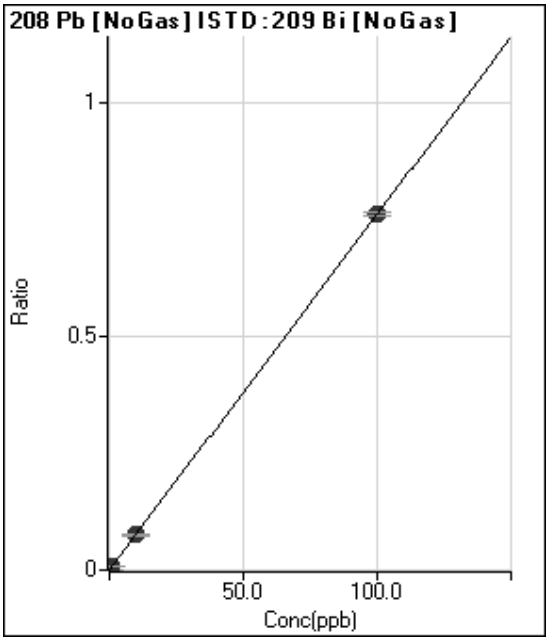
Weight: <None>
Min Conc: <None>




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 256.68 | 0.0001 | P | 19.6 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.098 | 863.40 | 0.0002 | P | 13.4 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 1.006 | 6441.70 | 0.0018 | P | 4.2 |
| 6 | ☐ | 10.000 | 9.750 | 59822.16 | 0.0166 | P | 3.7 |
| 7 | ☐ | 100.000 | 100.025 | 578788.52 | 0.1691 | P | 1.1 |
| 8 | ☐ | | | 623.38 | 0.0002 | P | 6.1 |

y = 0.0017 * x + 7.0771E-005
R = 1.0000
DL = 0.02467
BEC = 0.04187

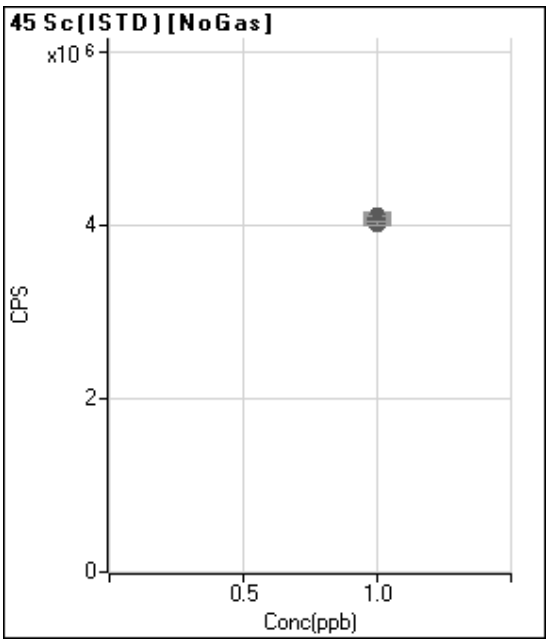
Weight: <None>
Min Conc: <None>



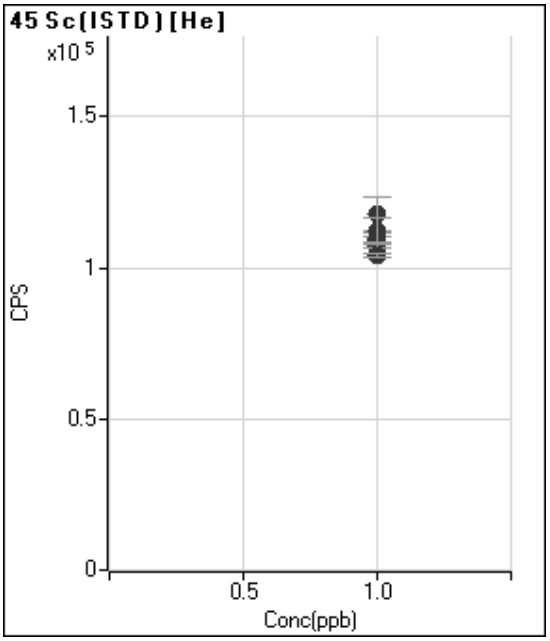

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 0.000 | 0.000 | 1203.41 | 0.0003 | P | 16.6 |
| 2 | ☐ | 0.000 | | | | | |
| 3 | ☐ | 0.100 | 0.103 | 4057.07 | 0.0011 | P | 6.3 |
| 4 | ☐ | 0.500 | | | | | |
| 5 | ☐ | 1.000 | 1.009 | 29119.21 | 0.0080 | P | 3.2 |
| 6 | ☐ | 10.000 | 9.782 | 270342.22 | 0.0748 | P | 1.6 |
| 7 | ☐ | 100.000 | 100.022 | 2606172.53 | 0.7616 | P | 1.2 |
| 8 | ☐ | | | 2653.56 | 0.0007 | P | 1.5 |

y = 0.0076 * x + 3.3193E-004
R = 1.0000
DL = 0.02165
BEC = 0.04361

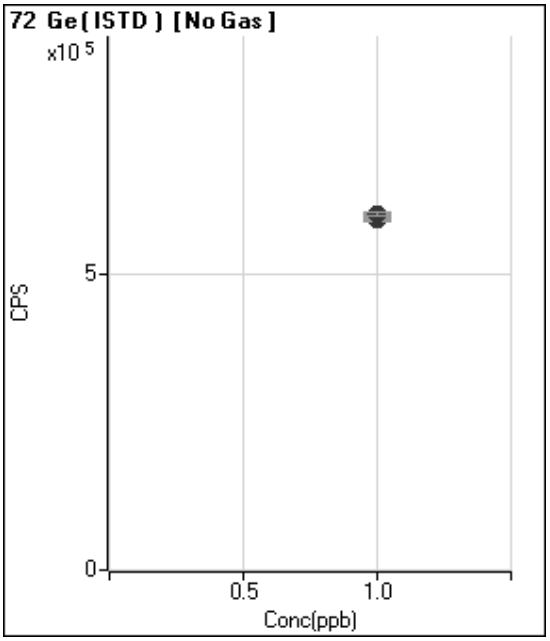
Weight: <None>
Min Conc: <None>



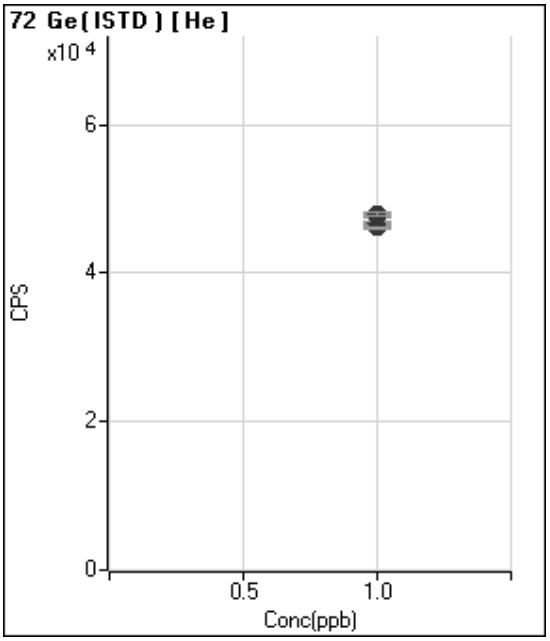

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 4093118.31 | | A | 2.3 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 4102879.70 | | A | 2.3 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 4058051.92 | | A | 1.0 |
| 6 | ☐ | 1.000 | | 4090233.73 | | A | 0.8 |
| 7 | ☐ | 1.000 | | 4071448.03 | | A | 2.1 |
| 8 | ☐ | 1.000 | | 4027469.56 | | A | 0.8 |



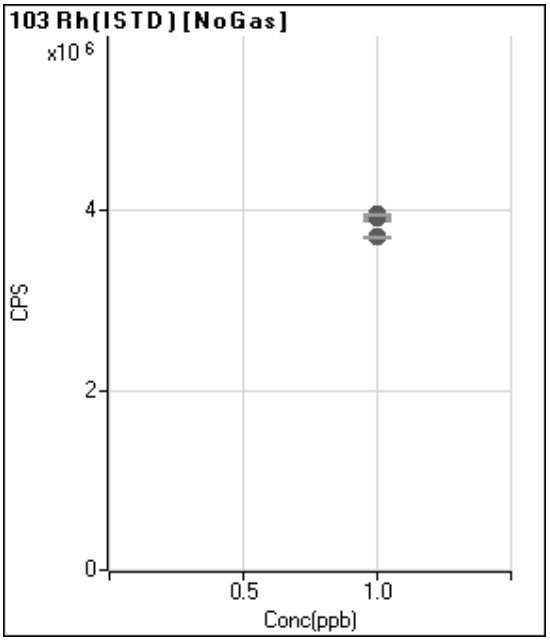

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 109033.72 | | P | 2.3 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 109978.87 | | P | 2.8 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 117605.37 | | P | 9.4 |
| 6 | ☐ | 1.000 | | 107154.00 | | P | 1.5 |
| 7 | ☐ | 1.000 | | 104207.68 | | P | 0.9 |
| 8 | ☐ | 1.000 | | 112421.47 | | P | 7.5 |



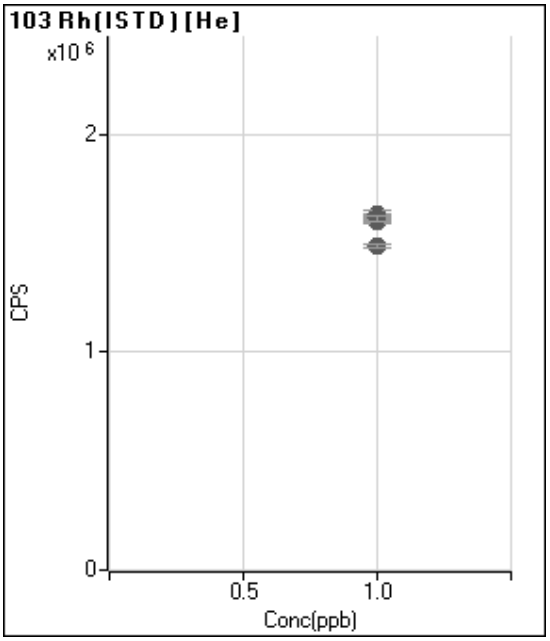

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 597606.89 | | P | 1.2 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 596432.01 | | P | 1.3 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 596047.08 | | P | 0.7 |
| 6 | ☐ | 1.000 | | 600212.91 | | P | 0.1 |
| 7 | ☐ | 1.000 | | 590538.68 | | P | 0.8 |
| 8 | ☐ | 1.000 | | 600388.02 | | P | 1.0 |



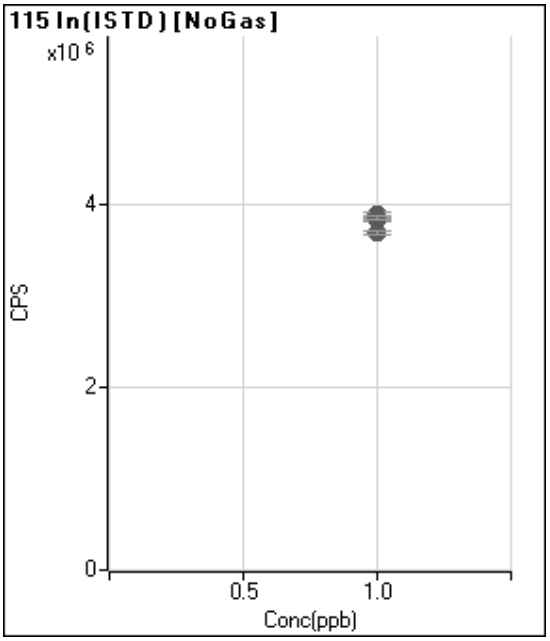

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 47456.50 | | P | 1.8 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 47679.33 | | P | 1.2 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 47040.95 | | P | 1.5 |
| 6 | ☐ | 1.000 | | 46766.69 | | P | 0.8 |
| 7 | ☐ | 1.000 | | 46112.77 | | P | 1.0 |
| 8 | ☐ | 1.000 | | 47912.32 | | P | 1.1 |



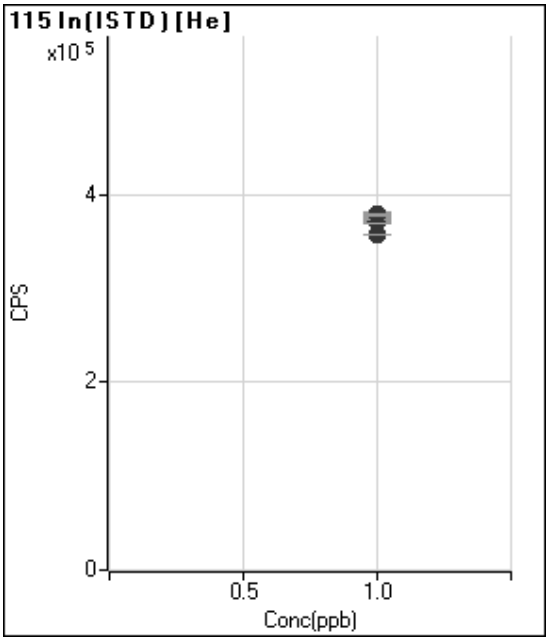

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 3958933.73 | | A | 0.9 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 3920973.04 | | A | 1.7 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 3919589.29 | | A | 1.2 |
| 6 | ☐ | 1.000 | | 3941432.34 | | A | 0.4 |
| 7 | ☐ | 1.000 | | 3709108.32 | | A | 0.9 |
| 8 | ☐ | 1.000 | | 3960150.68 | | A | 0.7 |



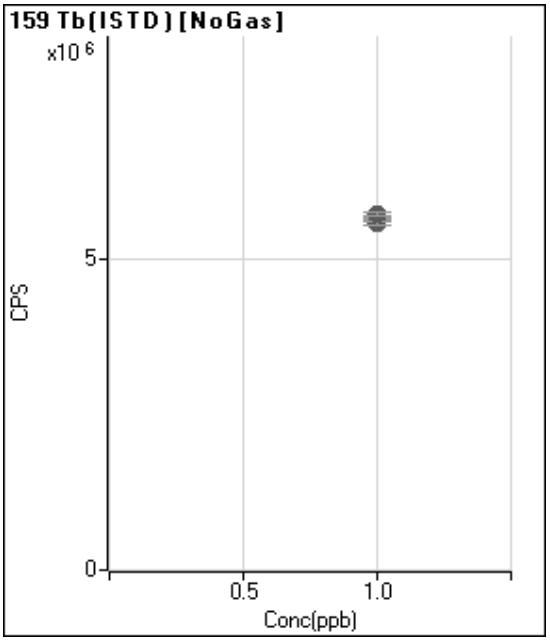

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 1626201.64 | | A | 0.8 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 1631309.73 | | A | 2.4 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 1611231.43 | | A | 1.1 |
| 6 | ☐ | 1.000 | | 1600763.58 | | A | 1.2 |
| 7 | ☐ | 1.000 | | 1488237.37 | | A | 1.3 |
| 8 | ☐ | 1.000 | | 1615008.82 | | A | 1.6 |



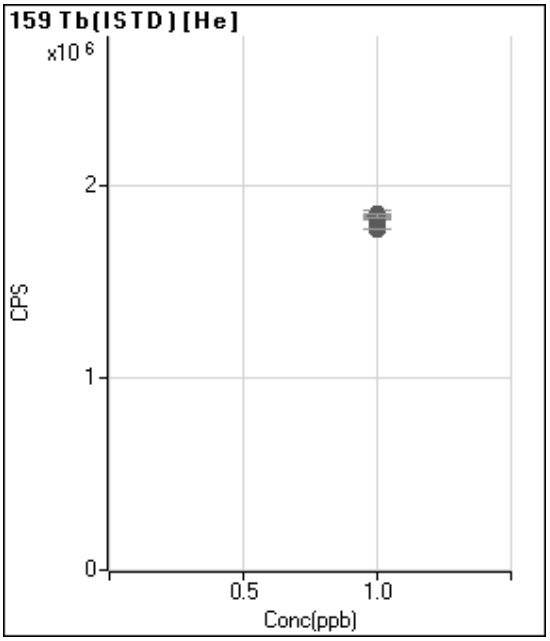

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 3893084.07 | | A | 1.8 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 3831855.45 | | A | 0.6 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 3849942.13 | | A | 1.2 |
| 6 | ☐ | 1.000 | | 3863602.22 | | A | 0.1 |
| 7 | ☐ | 1.000 | | 3698943.43 | | A | 1.0 |
| 8 | ☐ | 1.000 | | 3863296.73 | | A | 0.8 |



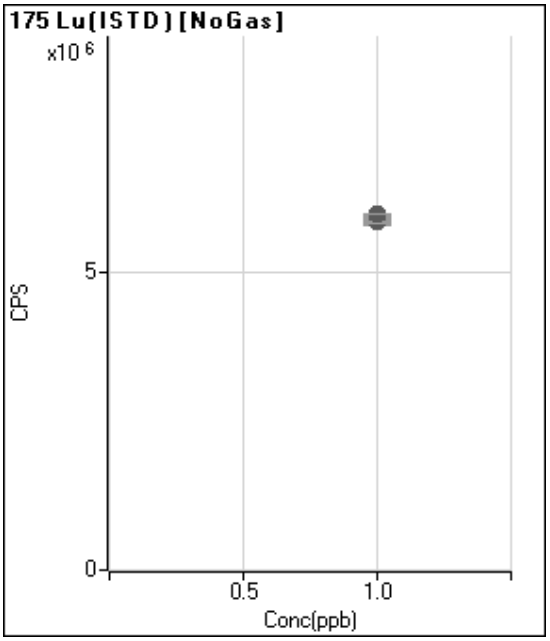

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 372695.23 | | P | 0.2 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 378473.88 | | P | 1.6 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 373082.83 | | P | 0.8 |
| 6 | ☐ | 1.000 | | 371034.40 | | P | 1.0 |
| 7 | ☐ | 1.000 | | 357507.16 | | P | 0.5 |
| 8 | ☐ | 1.000 | | 378994.43 | | P | 0.6 |



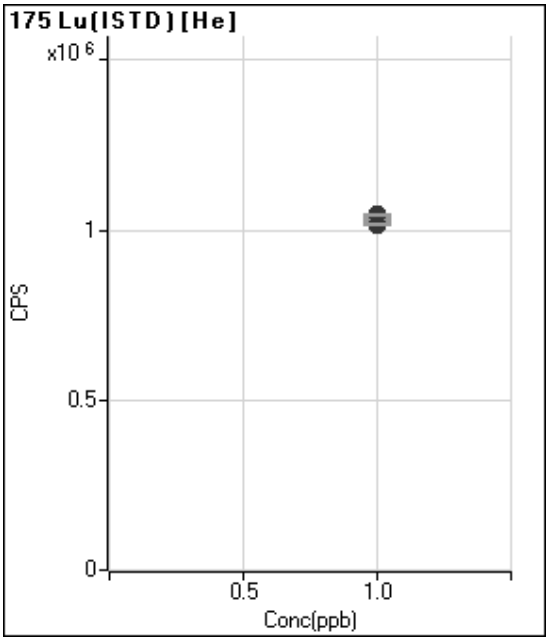

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 5654253.04 | | A | 1.7 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 5659373.25 | | A | 0.6 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 5623586.59 | | A | 0.2 |
| 6 | ☐ | 1.000 | | 5685576.79 | | A | 0.4 |
| 7 | ☐ | 1.000 | | 5574693.25 | | A | 0.9 |
| 8 | ☐ | 1.000 | | 5714447.62 | | A | 1.0 |



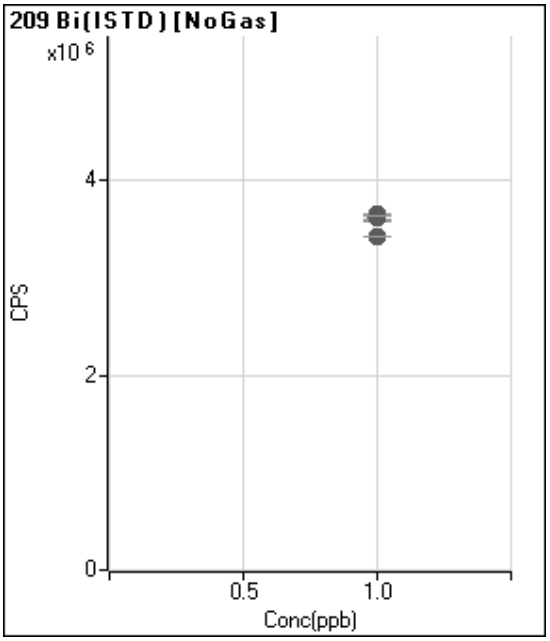

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 1820531.74 | | A | 0.1 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 1846167.99 | | A | 2.1 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 1836661.90 | | A | 0.6 |
| 6 | ☐ | 1.000 | | 1830203.05 | | A | 0.6 |
| 7 | ☐ | 1.000 | | 1774098.93 | | A | 0.2 |
| 8 | ☐ | 1.000 | | 1838769.76 | | A | 0.7 |



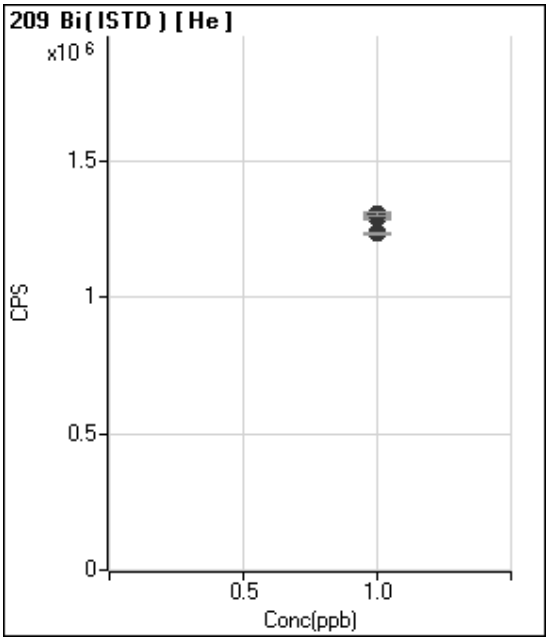

| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 5877008.04 | | A | 2.5 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 5917477.41 | | A | 0.7 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 5928402.41 | | A | 1.7 |
| 6 | ☐ | 1.000 | | 5910051.37 | | A | 0.6 |
| 7 | ☐ | 1.000 | | 5863518.24 | | A | 0.7 |
| 8 | ☐ | 1.000 | | 5987701.37 | | A | 0.1 |




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 1029247.51 | | P | 0.2 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 1036549.23 | | P | 1.2 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 1034333.84 | | P | 0.8 |
| 6 | ☐ | 1.000 | | 1028871.84 | | P | 0.9 |
| 7 | ☐ | 1.000 | | 1015687.28 | | P | 0.7 |
| 8 | ☐ | 1.000 | | 1045865.59 | | P | 0.3 |




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 3617762.55 | | A | 1.9 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 3647149.01 | | A | 0.3 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 3635677.76 | | A | 0.6 |
| 6 | ☐ | 1.000 | | 3615175.26 | | A | 1.1 |
| 7 | ☐ | 1.000 | | 3421830.05 | | A | 0.3 |
| 8 | ☐ | 1.000 | | 3634528.28 | | A | 0.5 |




| | Rjct | Conc. | Calc Conc. | CPS | Ratio | Det. | RSD |
|---|---|---|---|---|---|---|---|
| 1 | ☐ | 1.000 | | 1291085.71 | | P | 0.8 |
| 2 | ☐ | 1.000 | | | | | |
| 3 | ☐ | 1.000 | | 1298736.23 | | P | 0.5 |
| 4 | ☐ | 1.000 | | | | | |
| 5 | ☐ | 1.000 | | 1301925.37 | | P | 0.7 |
| 6 | ☐ | 1.000 | | 1291695.84 | | P | 0.5 |
| 7 | ☐ | 1.000 | | 1235499.88 | | P | 0.4 |
| 8 | ☐ | 1.000 | | 1304075.66 | | P | 1.2 |

# PrepSheets

GCAL ANALYTICAL LABORATORIES, LLC

# 3010A Metals Dissolved Prep

*632790*

| START DATE/TIME | 9:35 4-9-18 | END DATE/TIME | 9:45 | BATCH | 632790 |
|---|---|---|---|---|---|

| # | CLIENT | TYPE | CLIENT ID | GCAL ID | INITIAL VOL (mL) | FINAL VOL (mL) | FIELD FILTERED | LAB FILTERED | COMMENT | STANDARDS\ REAGENTS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | QC | MB | MB 1793968 | 1793968 | 50 | 50 | | | | GCAL - 8 - 50uL 2126470 |
| 2 | QC | LCS | LCS 1793969 | 1793969 | | | | | | |
| 3 | 4859 | SAMP | MW-11-07-21 | 21804053507 | | | | — | | Ag Spike - 50uL 316-46-8 |
| 4 | 4859 | FD | MW-11-07-21DUP | 21804053508 | | | | — | | |
| 5 | 4859 | SAMP | MW-01-09-21 | 21804053509 | | | | — | | Sb SPIKE - 50uL 316-44-6 |
| 6 | 4859 | MS | MW-01-09-21MS | 21804053510 | | | | — | | |
| 7 | 4859 | MSD | MW-01-09-21MSD | 21804053511 | | | | — | | Se SPIKE - 100uL 316-41-1 |
| 8 | 4859 | SAMP | MW-11-08-21 | 21804053512 | | | | — | | |
| 9 | 4859 | SAMP | MW-11-09-21 | 21804053520 | | | | — | | Li,B,Zr SPIKE - 50uL 316-45-8 |
| 10 | 4859 | SAMP | MW-13-11-21 | 21804062001 | | | | — | | |
| 11 | 4859 | SAMP | MW-11-02-21 | 21804062002 | | | | — | | 1:1 HNO3 726-26-12 |
| 12 | 4859 | SAMP | MW-11-06-21 | 21804062007 | | | | — | | |
| 13 | 4859 | SAMP | MW-11-10-21 | 21804062008 | | | | — | | 1:1 HCL 726 26-1 |
| 14 | 4859 | SAMP | MW-11-01-21 | 21804062009 | | | | — | | |
| 15 | 4859 | SAMP | RD5-MW-01-21 | 21804062010 | | | | — | | |
| 16 | | | | | | | | | | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |
| 19 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 21 | | | | | | | | | | |
| 22 | | | | | | | | | | |
| 23 | | | | | | | | | | |
| 24 | | | | | | | | | | |
| 25 | | | | | | | | | | Digestion Vessel Lot # 180211 |
| 26 | | | | | | | | | | |
| 27 | | | | | | | | | | Filter Lot # 121064B |
| 28 | | | | | | | | | | |

**NOTES**

Samples are undigested. Matrix-Water. 6020_D_EX

**REVIEW**

| TECHNICIAN\DATE | SUPERVISOR\DATE |
|---|---|
| 4-9-18 | AWG 4/11/18 |

# 3010A Metals Water Preparation

| START DATE/TIME | 10:50 4-7-18 | END DATE/TIME | 12:15 | BATCH | 632823 |
|---|---|---|---|---|---|

| # | CLIENT | TYPE | CLIENT ID | GCAL ID | INITIAL VOL (mL) | FINAL VOL (mL) | COMMENT | STANDARDS\ REAGENTS |
|---|---|---|---|---|---|---|---|---|
| 1 | QC | MB | MB 1794155 | 1794155 | 50 | 50 | | GCAL - 8 - 250uL 212647D |
| 2 | QC | LCSD | LCSD 1794294 | 1794294 | | | | |
| 3 | QC | LCS | LCS 1794156 | 1794156 | | | | Sb,Ag,Se SPIKE - 250uL 316-44-2 |
| 4 | 4859 | SAMP | MW-13-11-21 | 21804062001 | | | | |
| 5 | 4859 | SAMP | MW-11-02-21 | 21804062002 | | | | Li,B,Zr SPIKE - 250uL 316-41-5 |
| 6 | 4859 | SAMP | MW-11-06-21 | 21804062007 | | | | |
| 7 | 4859 | SAMP | MW-11-10-21 | 21804062008 | | | | Si SPIKE - 250uL 212516SD |
| 8 | 4859 | SAMP | MW-11-01-21 | 21804062009 | | | | |
| 9 | 4859 | SAMP | RD5-MW-01-21 | 21804062010 | | | | 1:1 HNO3 72426-00 |
| 10 | 4380 | SAMP | 08MW-02-040518 | 21804061801 | | | | |
| 11 | 4380 | FD | 08MW-02-040518-FD | 21804061802 | | | | 1:1 HCL 72424-1 |
| 12 | 4380 | SAMP | 08MW-03-040518 | 21804061804 | | | | |
| 13 | 0176 | SAMP | ECT33 Bottoms | 21804061103 | | | | |
| 14 | 4271 | SAMP | S-33A | 21804064501 | | | | |
| 15 | 4271 | SAMP | S-33B | 21804064502 | | | | |
| 16 | 4271 | SAMP | S-33M | 21804064503 | | | | |
| 17 | 4271 | SAMP | DZ-9A | 21804064504 | | | | |
| 18 | 4271 | SAMP | DZ-9M | 21804064505 | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | Digestion Vessel Lot# 180211 |
| 28 | | | | | | | | |

**NOTES**

TCLPs are reduced in volume due to sample matrix. Matrix-Water, 6020_W_EX

**EQUIPMENT\CONDITIONS**

| DIGESTION BLOCK | B2 | TEMPERATURE | 95° | |
|---|---|---|---|---|

**REVIEW**

| TECHNICIAN\DATE | JEL 4-7-18 | SUPERVISOR\DATE | AWG 4/10/18 |
|---|---|---|---|

# Form 1A

# Results

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-13-11-21 |
| Collect Date: | 04/05/18 Time: 1045 | GCAL Sample ID: | 21804062001 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8075 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1434 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-35-4 | 1,1-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | 4.75 | | 0.200 | 0.500 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | 3.67 | | 0.200 | 0.500 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | 15.7 | | 0.200 | 0.500 | 1.00 |
| 544-10-5 | 1-Chlorohexane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-93-3 | 2-Butanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 95-49-8 | 2-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 591-78-6 | 2-Hexanone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 67-64-1 | Acetone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 71-43-2 | Benzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-86-1 | Bromobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-97-5 | Bromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-27-4 | Bromodichloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-25-2 | Bromoform | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 74-83-9 | Bromomethane | 1.00 | U | 0.500 | 1.00 | 1.00 |
| 75-15-0 | Carbon disulfide | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 56-23-5 | Carbon tetrachloride | 0.500 | U | 0.250 | 0.500 | 1.00 |

FORM I VOA

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | | | |
|---|---|---|---|---|---|
| Report No: | 218040620 | | | Client Sample ID: | MW-13-11-21 |
| Collect Date: | 04/05/18 | Time: | 1045 | GCAL Sample ID: | 21804062001 |
| Matrix: | Water | % Moisture: | NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | | | Lab File ID: | 2180418/q8075 |
| Injection Vol.: | 1.0 ( µL ) | | | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 | Analyst: | JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 | Time: | 1434 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 108-90-7 | Chlorobenzene | 20.7 | | 0.200 | 0.500 | 1.00 |
| 75-00-3 | Chloroethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 67-66-3 | Chloroform | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-87-3 | Chloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethene | 152 | | 0.200 | 0.500 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 124-48-1 | Dibromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-95-3 | Dibromomethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-41-4 | Ethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 98-82-8 | Isopropylbenzene (Cumene) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 136777-61-2 | m,p-Xylene | 0.500 | U | 0.200 | 0.500 | 2.00 |
| 75-09-2 | Methylene chloride | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 91-20-3 | Naphthalene | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 104-51-8 | n-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 103-65-1 | n-Propylbenzene | 2.00 | U | 1.00 | 2.00 | 5.00 |
| 95-47-6 | o-Xylene | 0.695 | J | 0.200 | 0.500 | 1.00 |
| 135-98-8 | sec-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-42-5 | Styrene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether (MTBE) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 98-06-6 | tert-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 127-18-4 | Tetrachloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-88-3 | Toluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethene | 0.695 | J | 0.200 | 0.500 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-01-6 | Trichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-01-4 | Vinyl chloride | 41.5 | | 0.200 | 0.500 | 1.00 |

FORM I VOA

GCAL, Inc.

Data file : /var/chem/msv12.i/2180418.s.b/q8075.d
Lab Smp Id: 21804062001 Client Smp ID: 21804062001
Inj Date : 18-APR-2018 14:34
Operator : JMC2 Inst ID: msv12.i
Smp Info : 21804062001*
Misc Info : MSV~40673~*1*JMC2
Comment :
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:06 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 18:43 Cal File: q7984cD.d
Als bottle: 10
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b-.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| | Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|---|
| | 3 Vinyl Chloride + | 62 | 2.067 | 2.068 | (0.307) | 136975 | 41.5005 | 41.5 | |
| | 19 trans-1,2-Dichloroethene | 61 | 4.234 | 4.238 | (0.629) | 2681 | 0.69456 | 0.695 | |
| | 30 cis-1,2-Dichloroethene | 61 | 5.512 | 5.509 | (0.819) | 597573 | 151.890 | 152 | |
| M | 48 Total 1,2-Dichloroethene | 61 | | | | 600254 | 152.584 | 153 | |
| $ | 36 Dibromofluoromethane | 111 | 5.962 | 5.966 | (0.885) | 124251 | 49.7953 | 49.8 | 8024 |
| $ | 43 1,2-Dichloroethane-d4 | 67 | 6.476 | 6.476 | (0.962) | 73722 | 49.8965 | 49.9 | |
| * | 47 FLUOROBENZENE | 96 | 6.735 | 6.735 | (1.000) | 467217 | 50.0000 | | |
| $ | 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.879) | 447219 | 51.3694 | 51.4 | |
| * | 71 CHLOROBENZENE-d5 | 82 | 9.197 | 9.198 | (1.000) | 178828 | 50.0000 | | |
| | 72 Chlorobenzene ++ | 112 | 9.209 | 9.205 | (1.001) | 164587 | 20.6515 | 20.7 | |
| | 76 o-Xylene | 106 | 9.591 | 9.591 | (1.043) | 3373 | 0.69456 | 0.695 | (H) |
| M | 99 TOTAL XYLENE | 106 | | | | 3373 | 0.69456 | 0.695 | |
| $ | 80 Bromofluorobenzene | 174 | 9.973 | 9.970 | (1.084) | 148257 | 46.8641 | 46.9 | |
| | 96 1,3-Dichlorobenzene | 146 | 10.603 | 10.603 | (0.996) | 18138 | 3.66551 | 3.67 | |

| Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|
| * 97 1,4-DICHLOROBENZENE-D4 | 152 | 10.648 | 10.645 | (1.000) | 146251 | 50.0000 | | |
| 98 1,4-Dichlorobenzene | 146 | 10.656 | 10.656 | (1.001) | 81284 | 15.6815 | 15.7 | |
| 102 1,2-Dichlorobenzene | 146 | 10.918 | 10.914 | (1.025) | 23784 | 4.75370 | 4.75 | |

QC Flag Legend

H - Operator selected an alternate compound hit.

Data File: /var/chem/msv12.i/2180418.s.b/q8075.d

Page 1

Date : 18-APR-2018 14:34

Client ID: 21804062001

Instrument: msv12.i

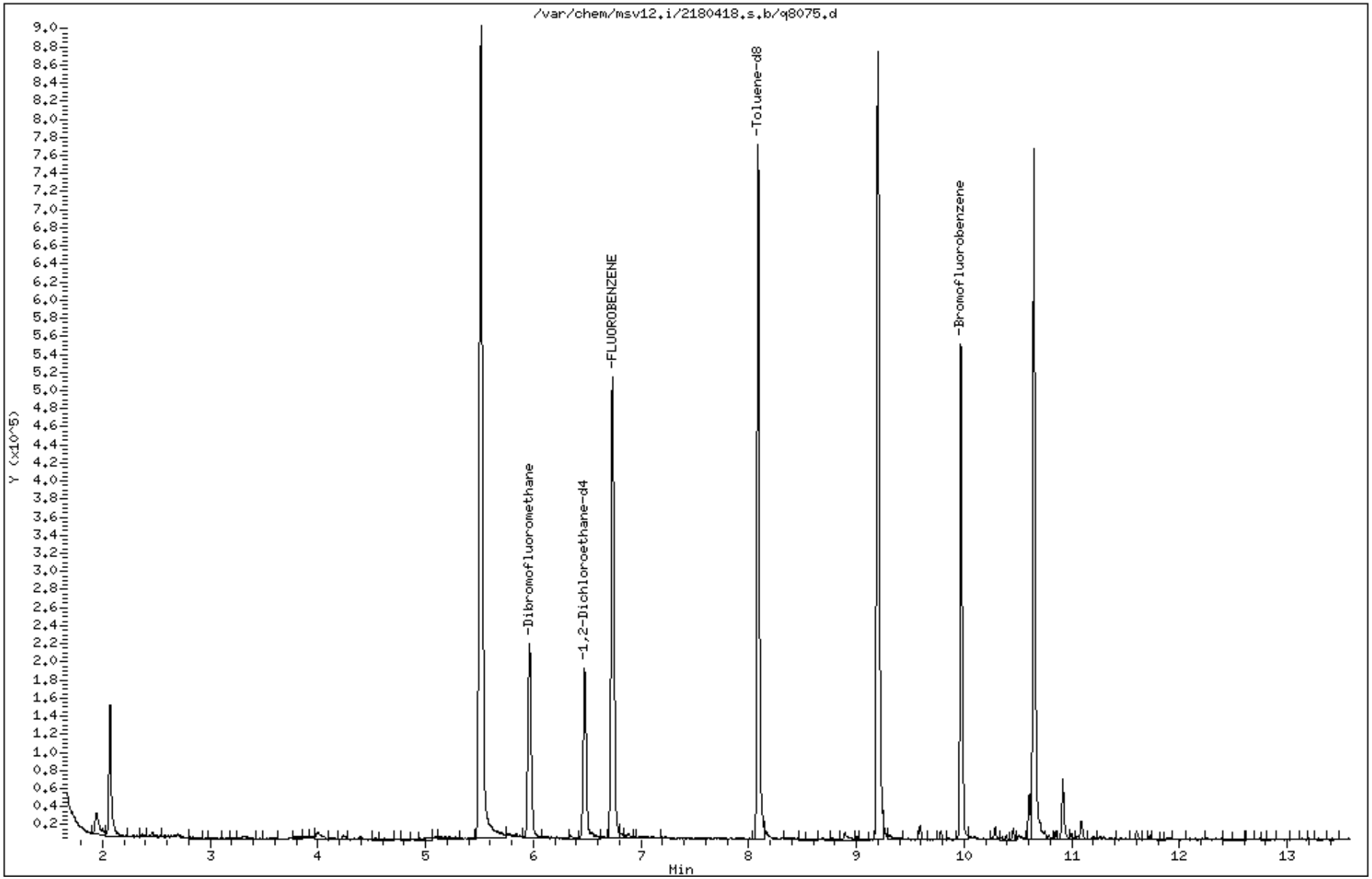
Sample Info: 21804062001*

Purge Volume: 5.0

Operator: JMC2

Column phase: RTX-VMS-30M

Column diameter: 0.25



Data File: /var/chem/msv12.i/2180418.s.b/q8075.d

Date : 18-APR-2018 14:34

Client ID: 21804062001

Instrument: msv12.i

Sample Info: 21804062001x

Purge Volume: 5.0

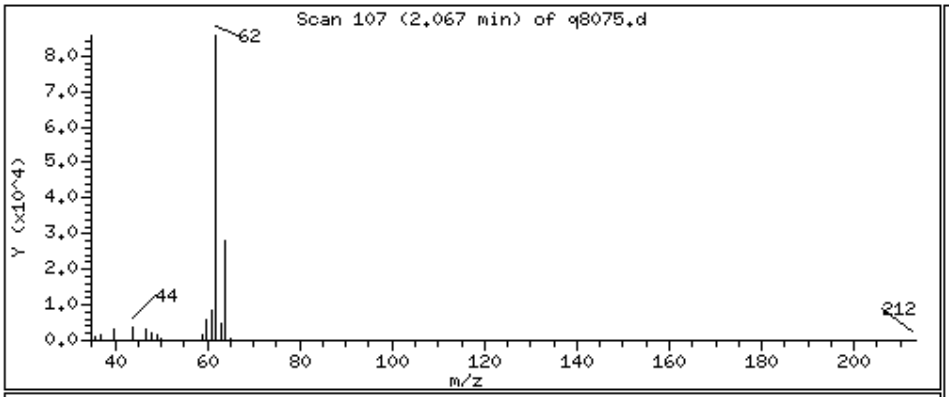
Operator: JMC2

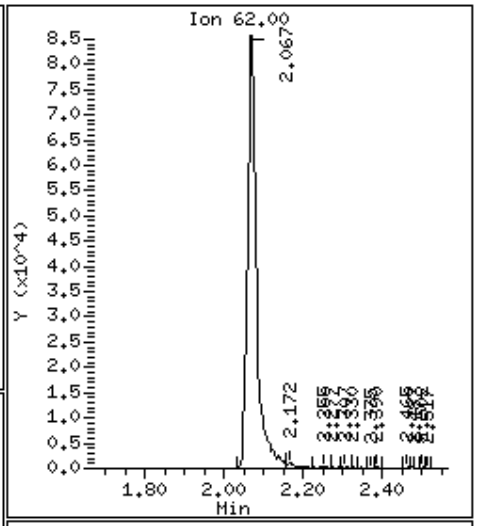
Column phase: RTX-VMS-30M

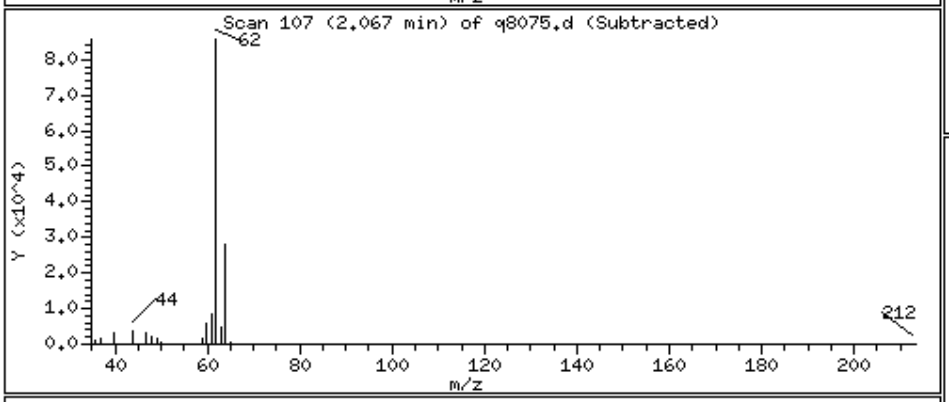
Column diameter: 0.25

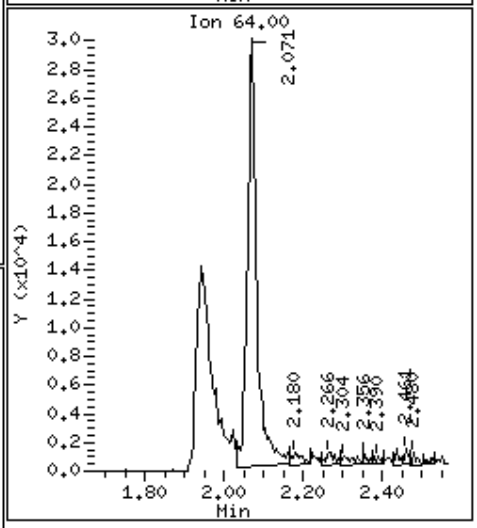
3 Vinyl Chloride +

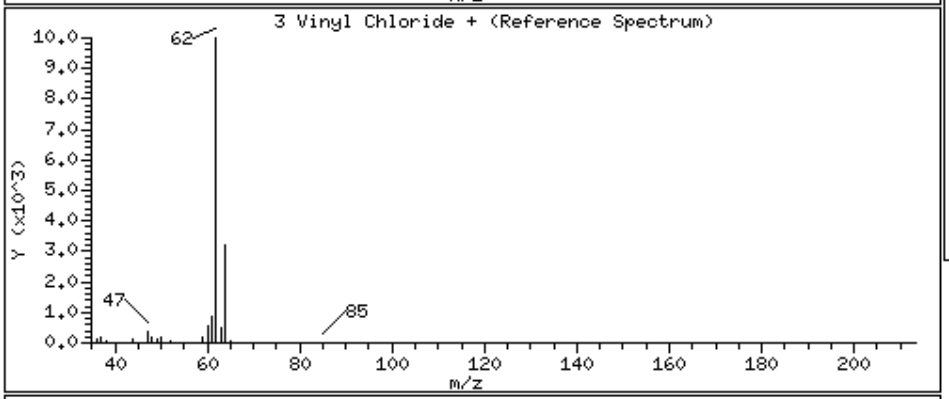
Concentration: 41.5 ug/L

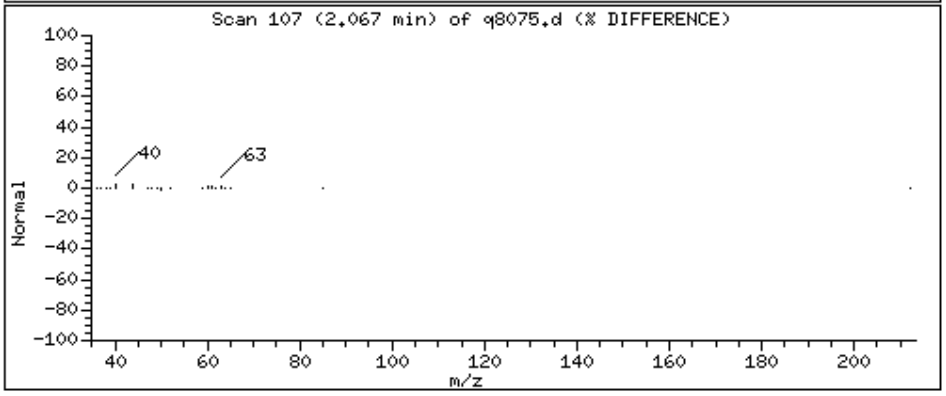


Data File: /var/chem/msv12.i/2180418.s.b/q8075.d

Date : 18-APR-2018 14:34

Client ID: 21804062001

Instrument: msv12.i

Sample Info: 21804062001x

Purge Volume: 5.0

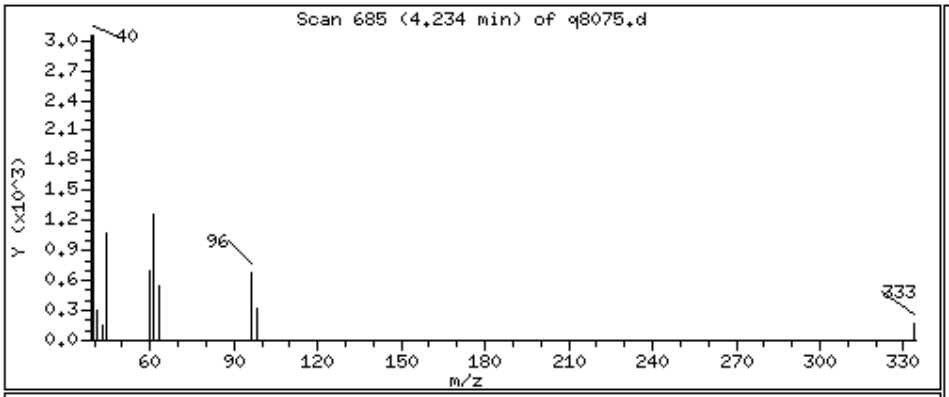
Operator: JMC2

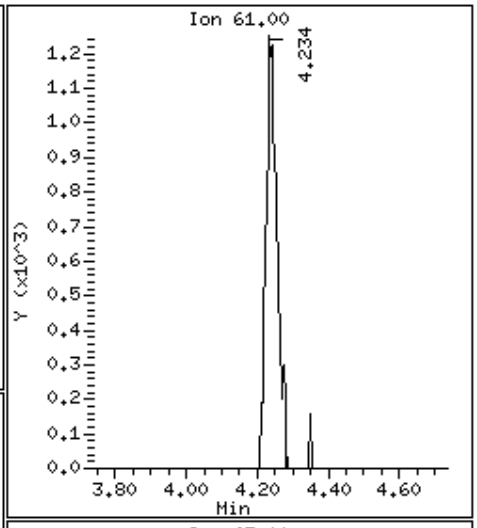
Column phase: RTX-VMS-30M

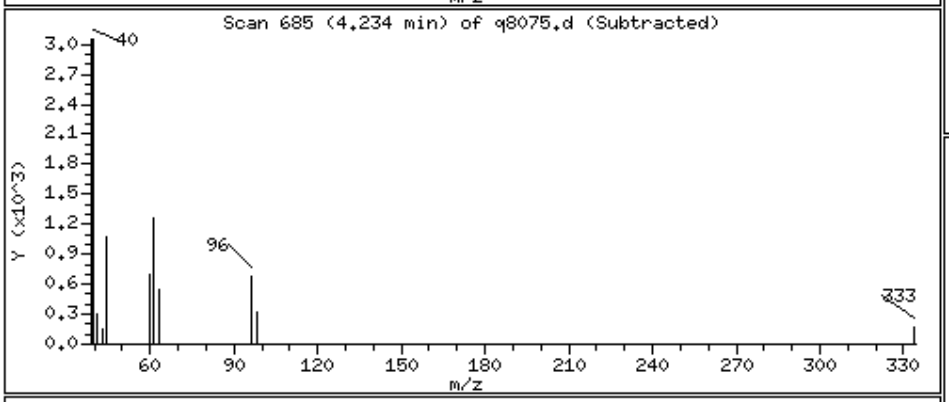
Column diameter: 0.25

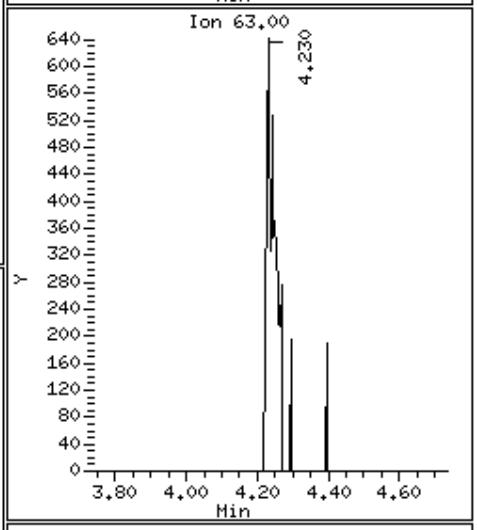
19 trans-1,2-Dichloroethene

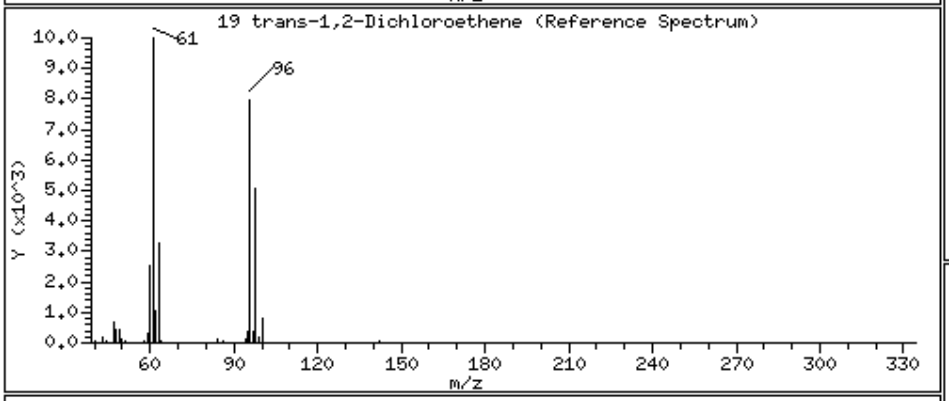
Concentration: 0.695 ug/L

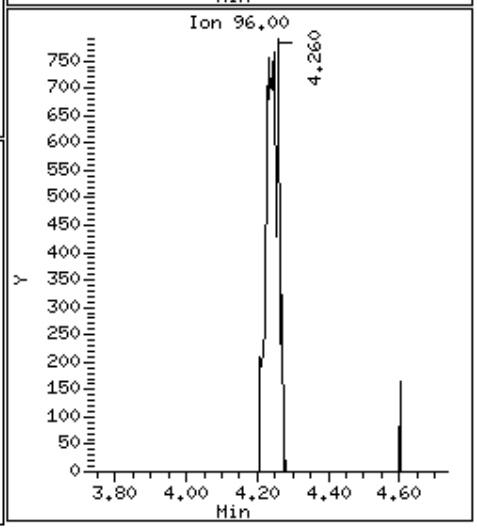


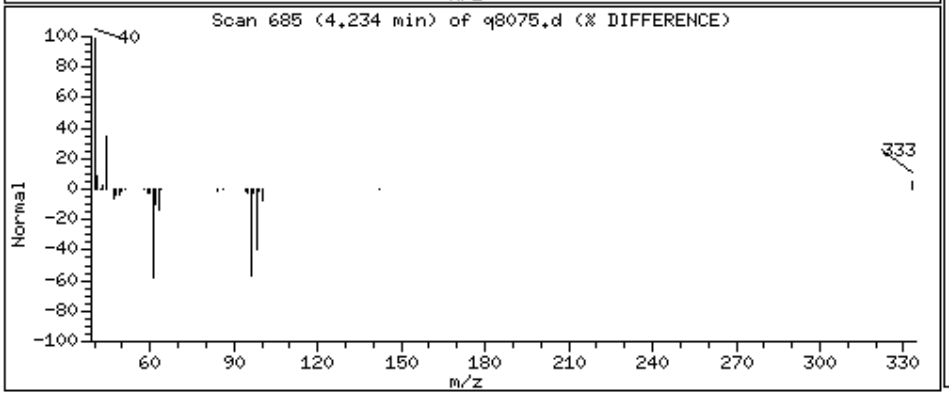



Data File: /var/chem/msv12.i/2180418.s.b/q8075.d

Date : 18-APR-2018 14:34

Client ID: 21804062001

Instrument: msv12.i

Sample Info: 21804062001x

Purge Volume: 5.0

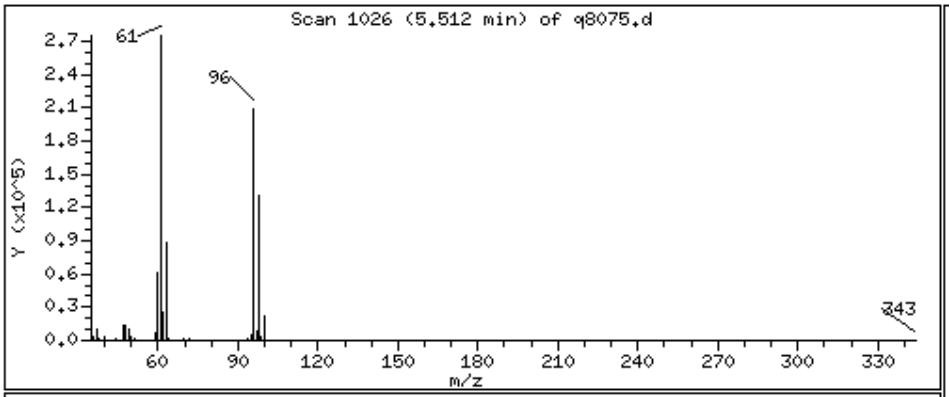
Operator: JMC2

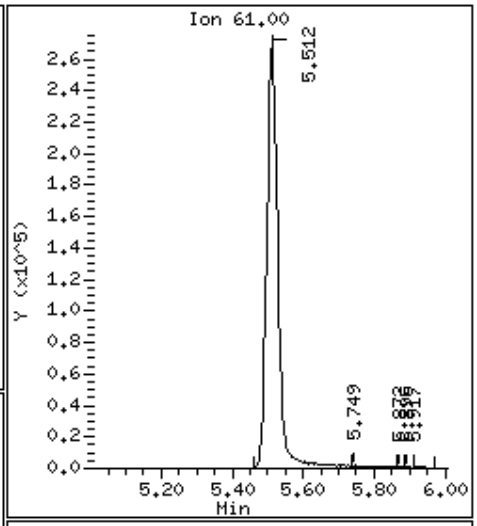
Column phase: RTX-VMS-30M

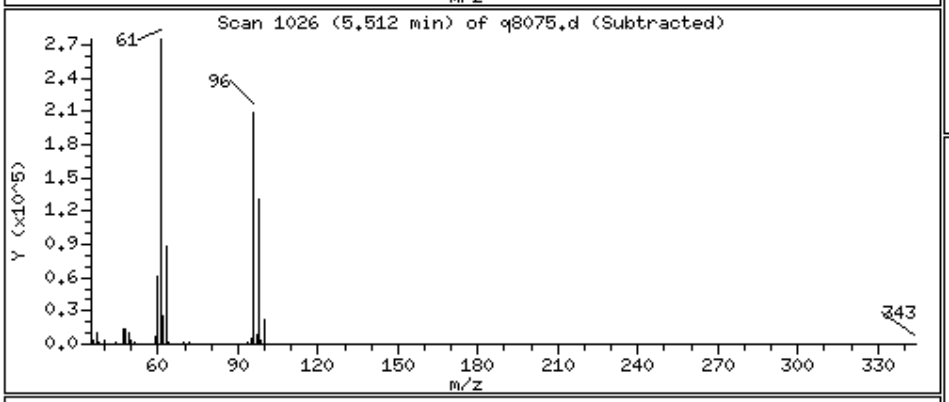
Column diameter: 0.25

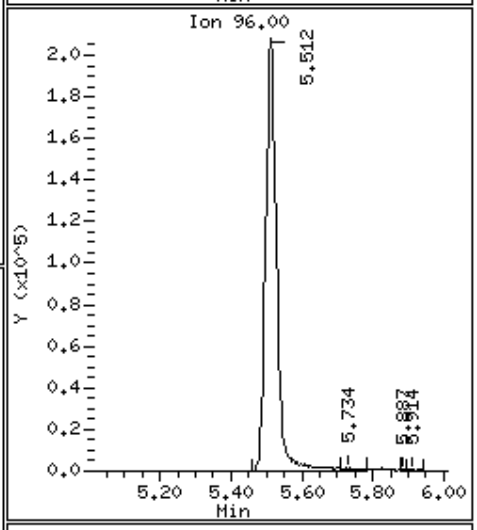
30 cis-1,2-Dichloroethene

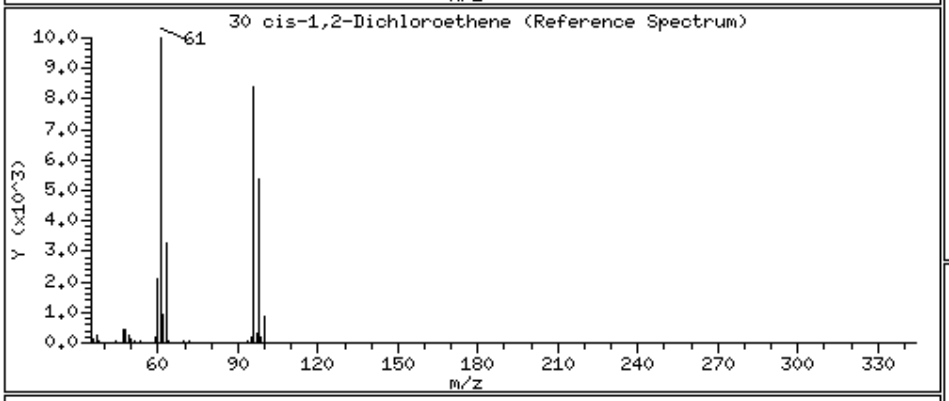
Concentration: 152 ug/L

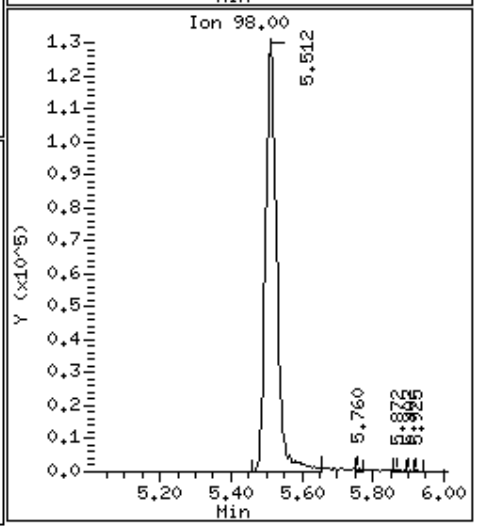


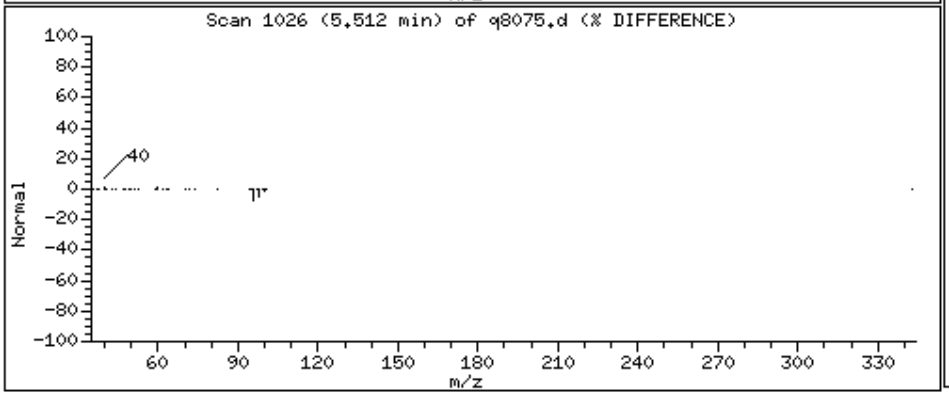



Data File: /var/chem/msv12.i/2180418.s.b/q8075.d

Date : 18-APR-2018 14:34

Client ID: 21804062001

Instrument: msv12.i

Sample Info: 21804062001x

Purge Volume: 5.0

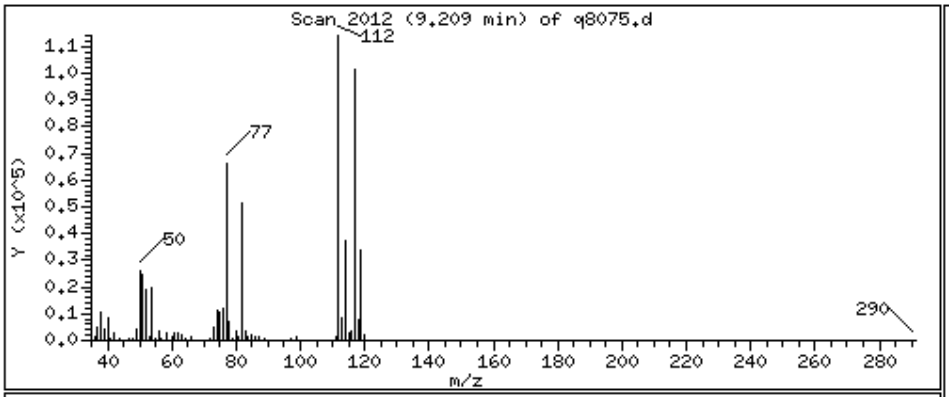
Operator: JMC2

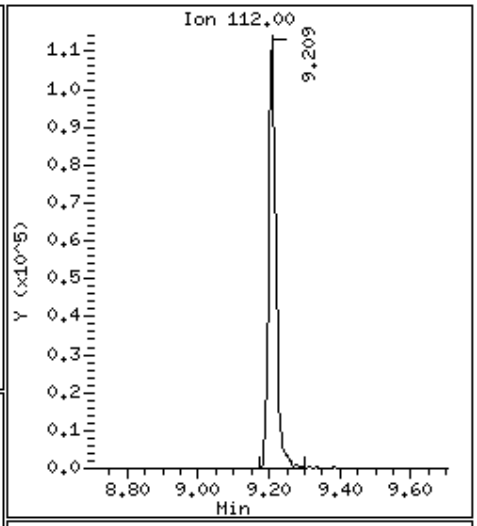
Column phase: RTX-VMS-30M

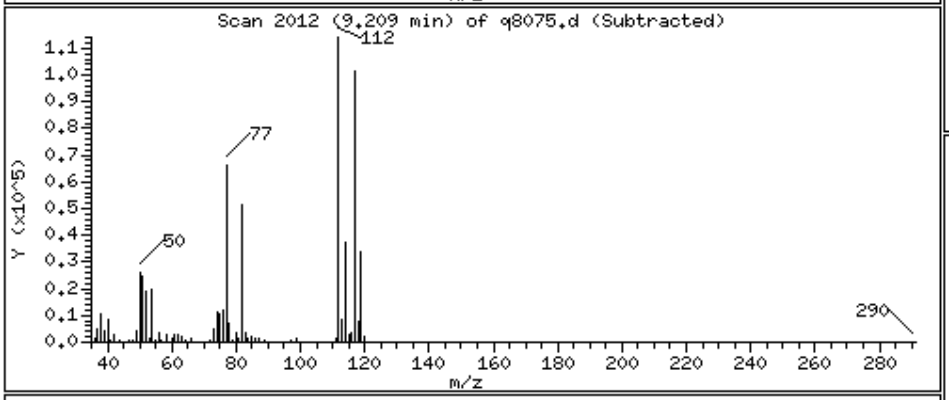
Column diameter: 0.25

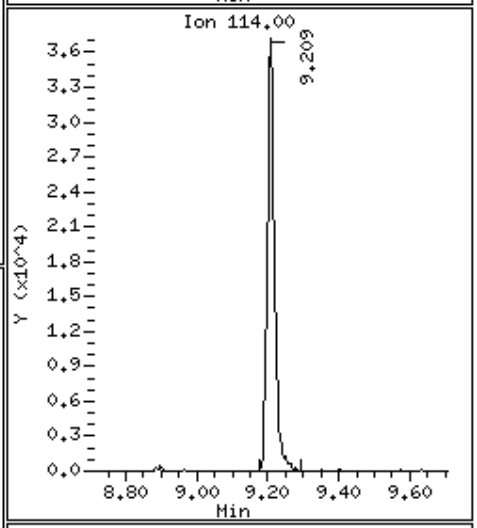
72 Chlorobenzene ++

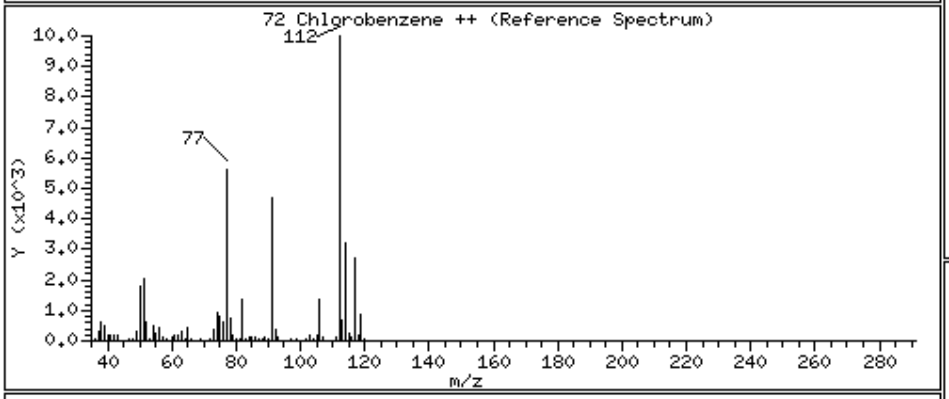
Concentration: 20.7 ug/L

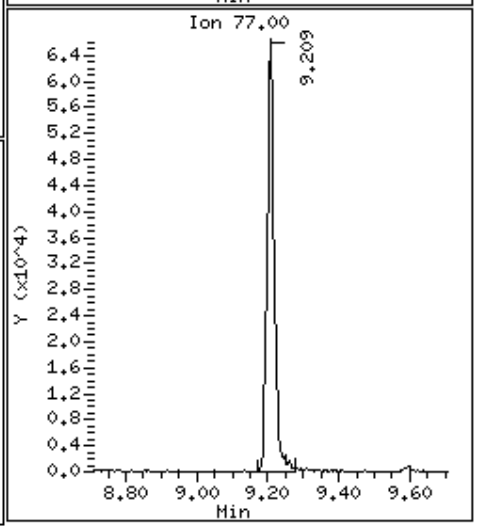


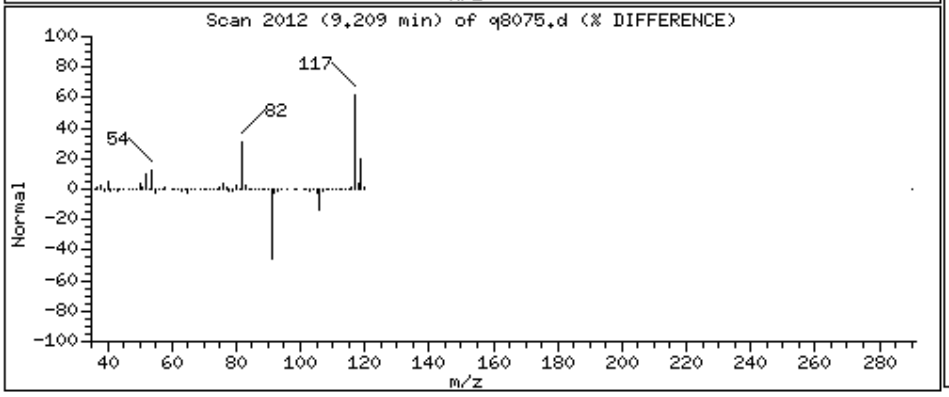



Data File: /var/chem/msv12.i/2180418.s.b/q8075.d

Date : 18-APR-2018 14:34

Client ID: 21804062001

Instrument: msv12.i

Sample Info: 21804062001x

Purge Volume: 5.0

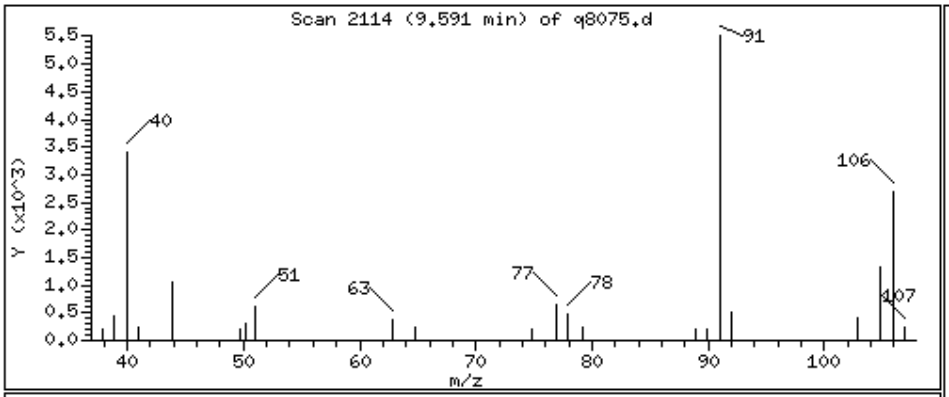
Operator: JMC2

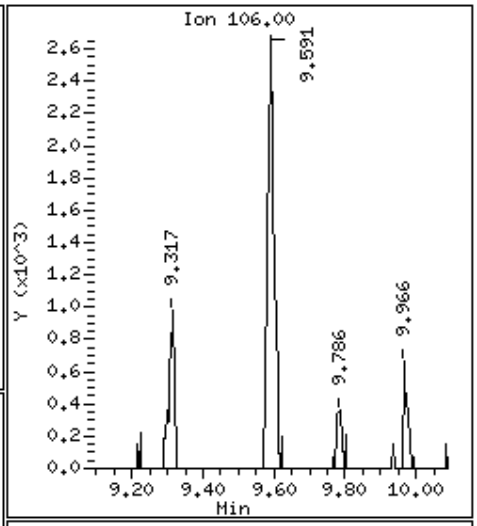
Column phase: RTX-VMS-30M

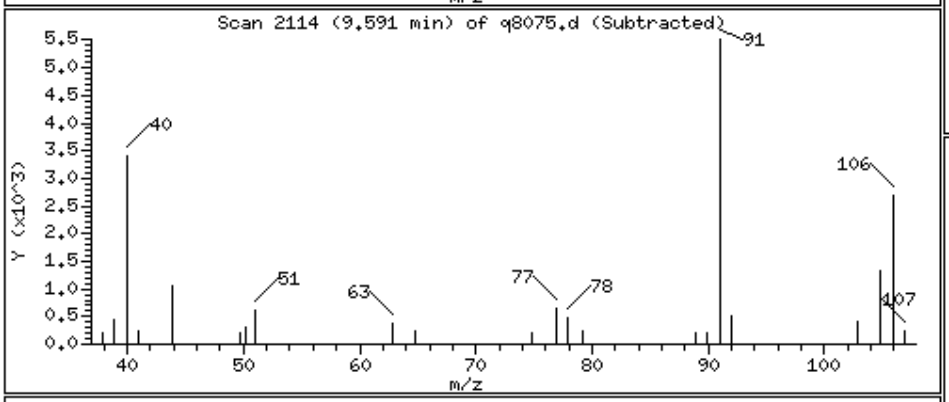
Column diameter: 0.25

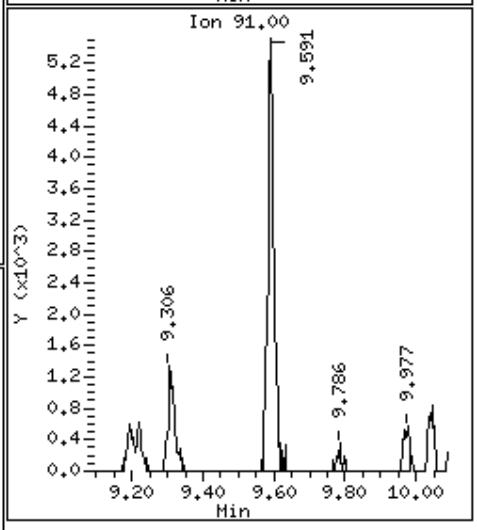
76 o-Xylene

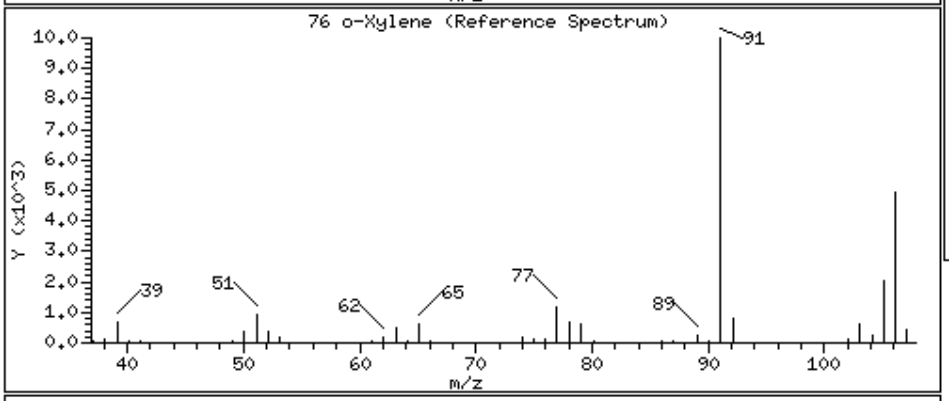
Concentration: 0.695 ug/L

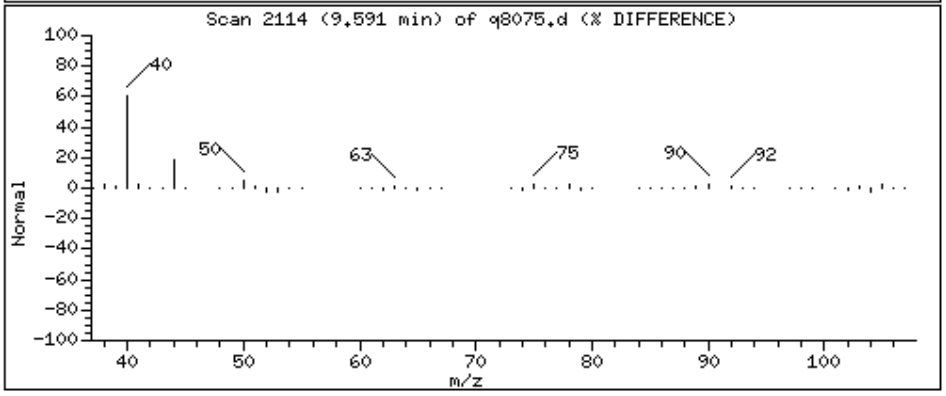


Data File: /var/chem/msv12.i/2180418.s.b/q8075.d

Date : 18-APR-2018 14:34

Client ID: 21804062001

Instrument: msv12.i

Sample Info: 21804062001x

Purge Volume: 5.0

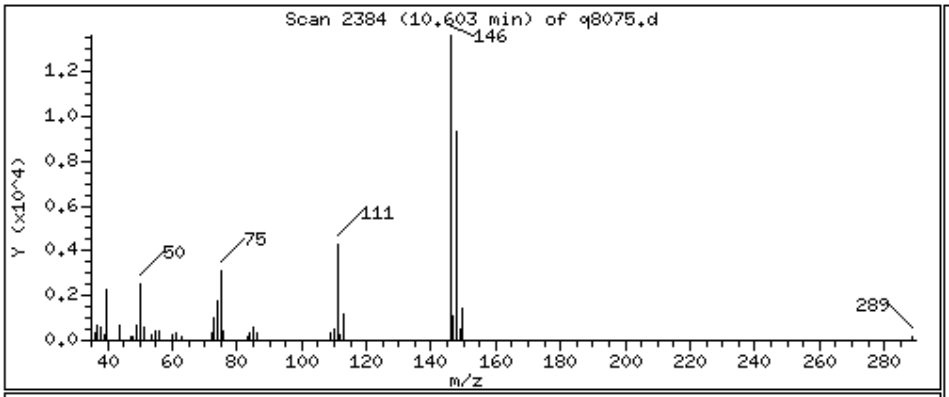
Operator: JMC2

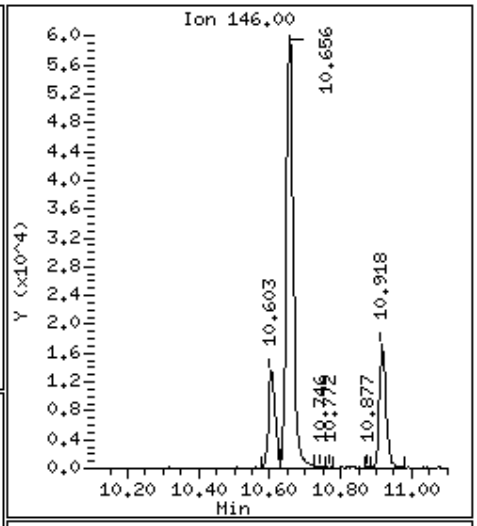
Column phase: RTX-VMS-30M

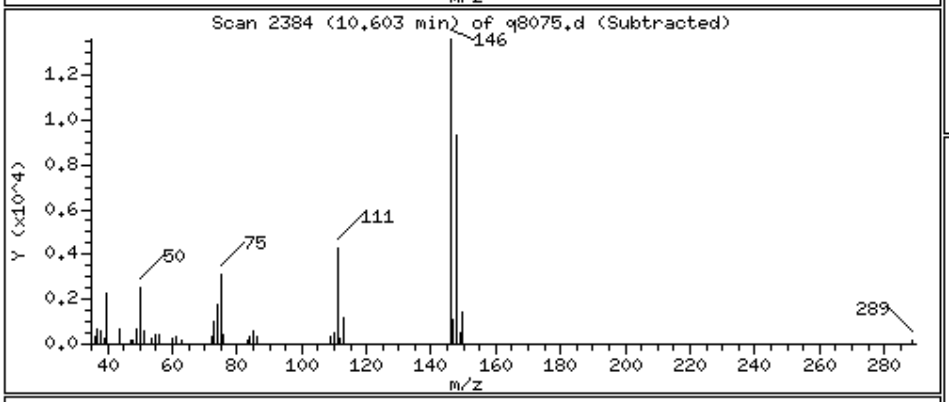
Column diameter: 0.25

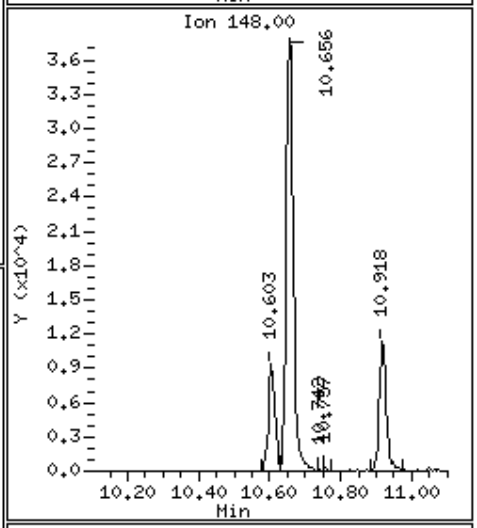
96 1,3-Dichlorobenzene

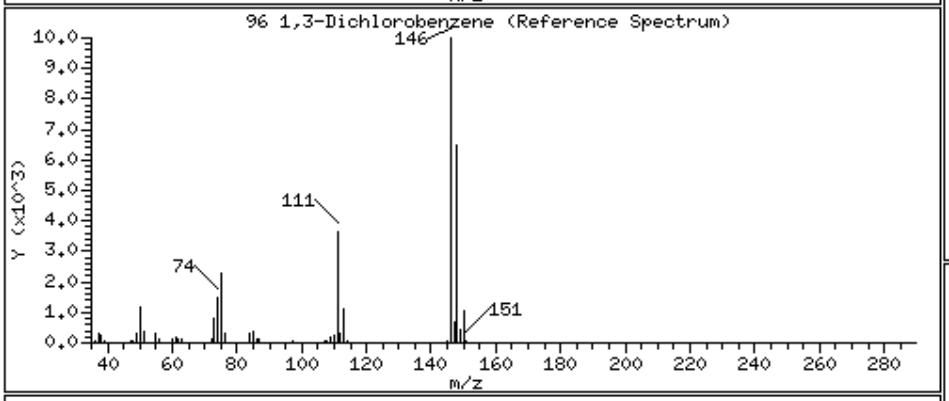
Concentration: 3.67 ug/L

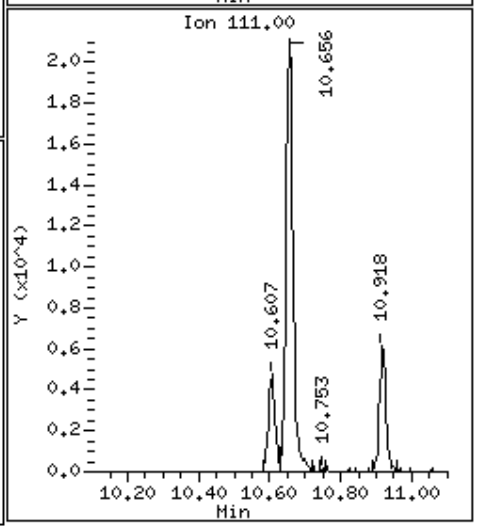


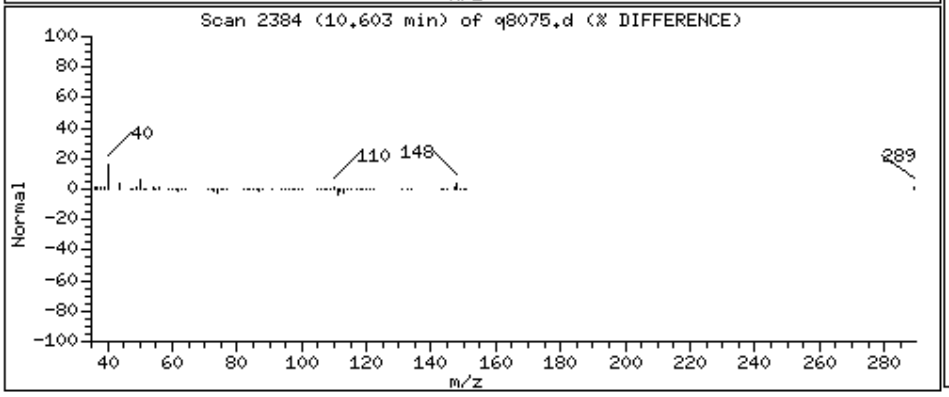



Data File: /var/chem/msv12.i/2180418.s.b/q8075.d

Date : 18-APR-2018 14:34

Client ID: 21804062001

Instrument: msv12.i

Sample Info: 21804062001x

Purge Volume: 5.0

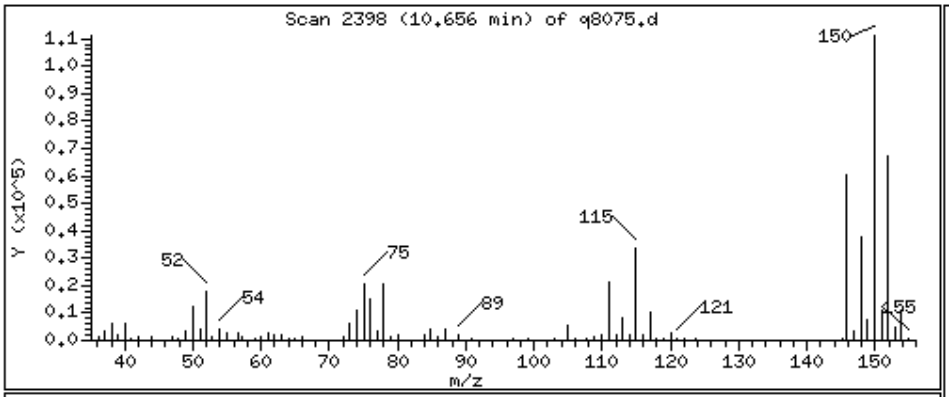
Operator: JMC2

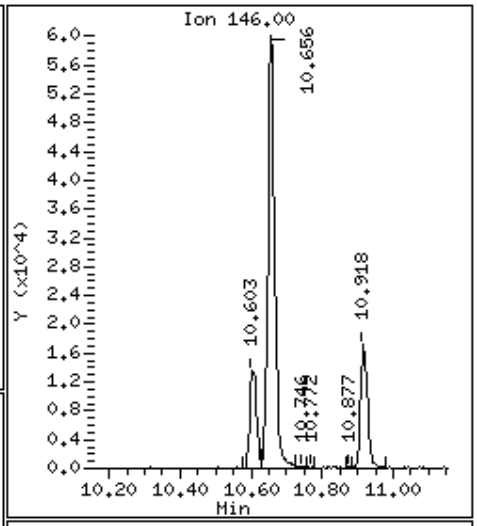
Column phase: RTX-VMS-30M

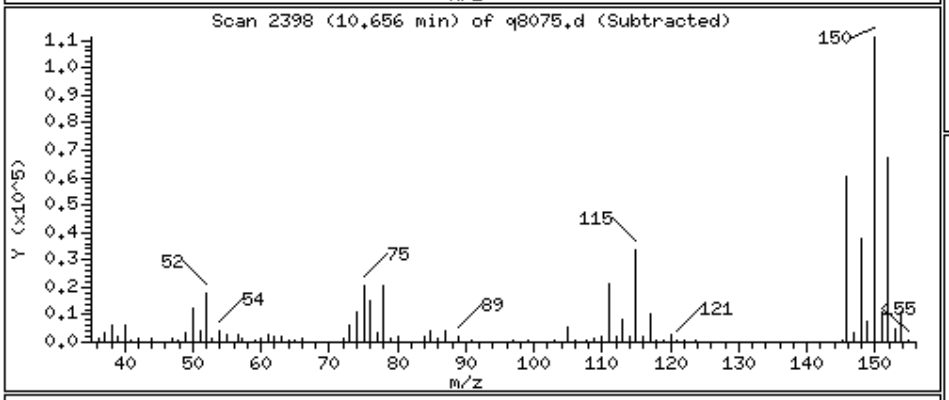
Column diameter: 0.25

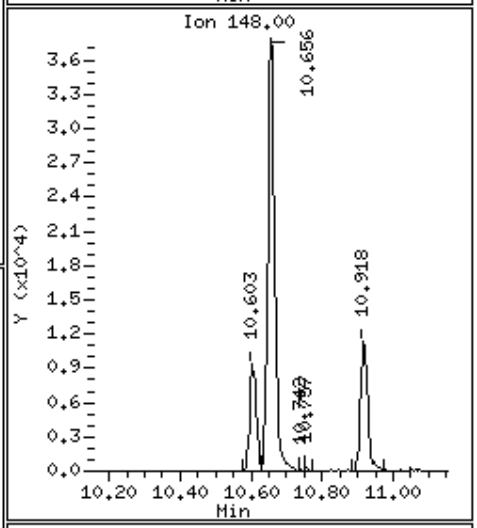
98 1,4-Dichlorobenzene

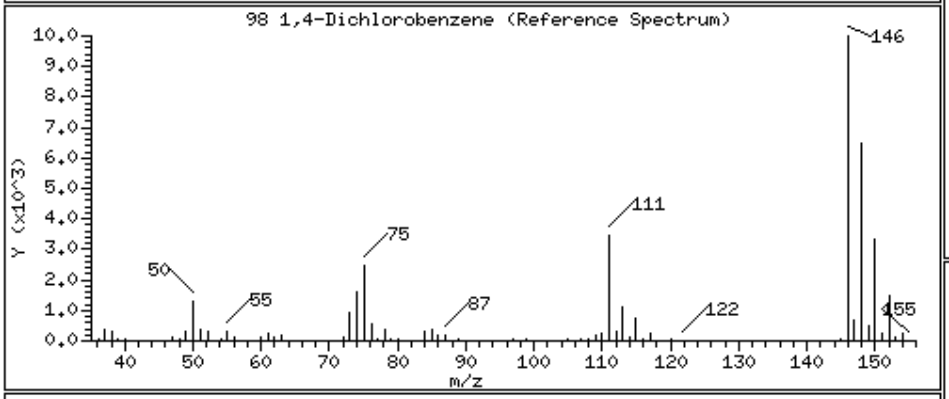
Concentration: 15.7 ug/L

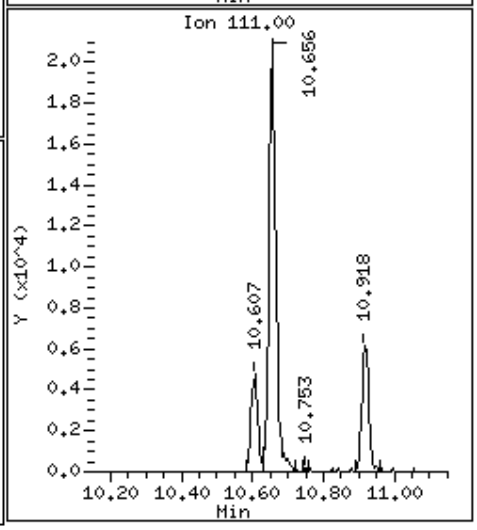


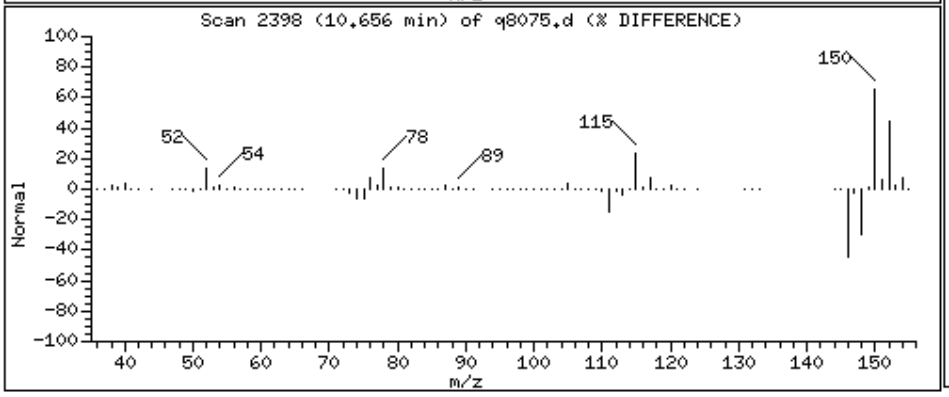



Data File: /var/chem/msv12.i/2180418.s.b/q8075.d

Date : 18-APR-2018 14:34

Client ID: 21804062001

Instrument: msv12.i

Sample Info: 21804062001x

Purge Volume: 5.0

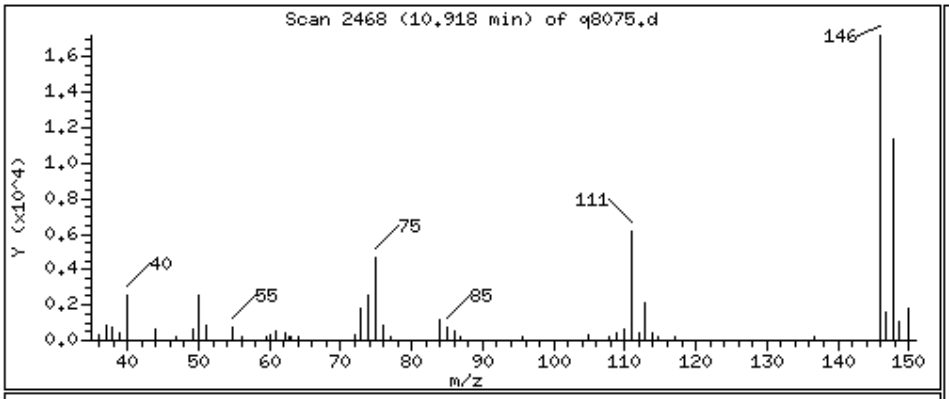
Operator: JMC2

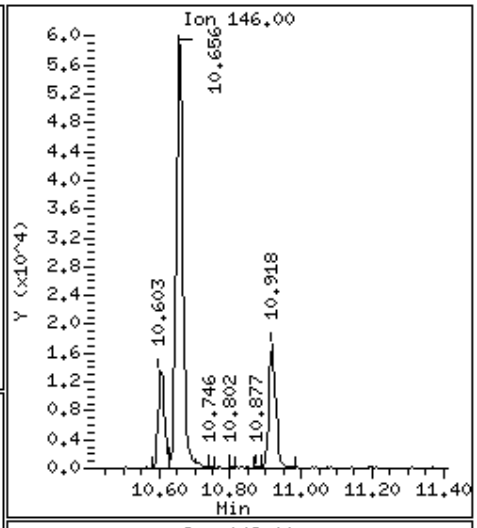
Column phase: RTX-VMS-30M

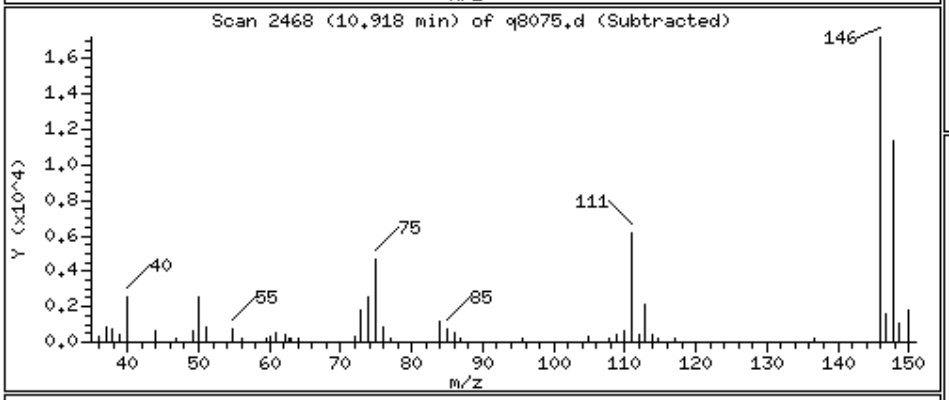
Column diameter: 0.25

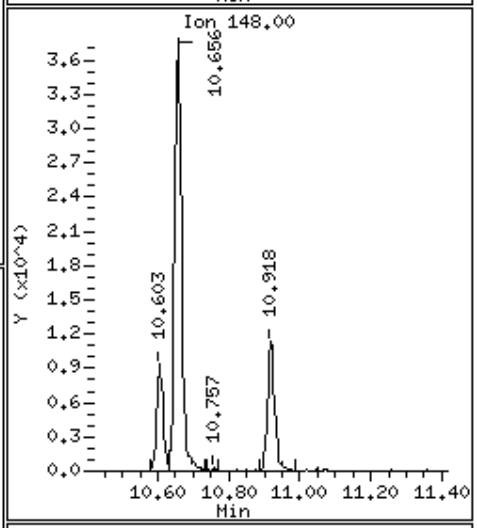
102 1,2-Dichlorobenzene

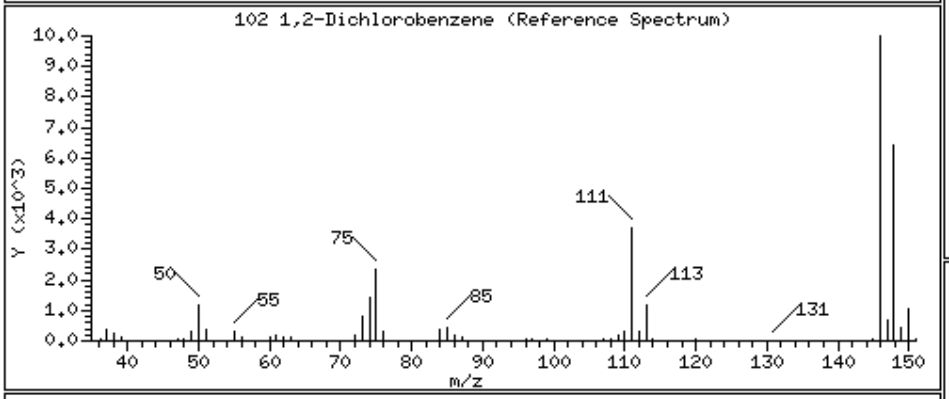
Concentration: 4.75 ug/L

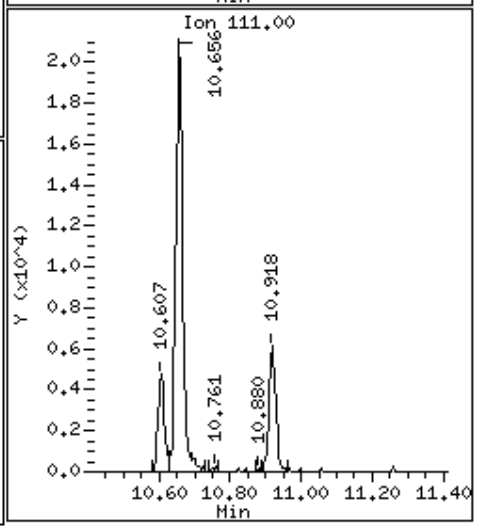


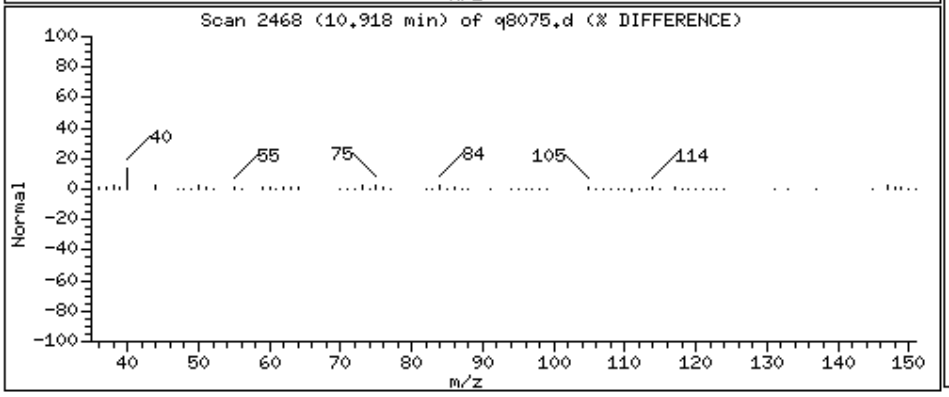



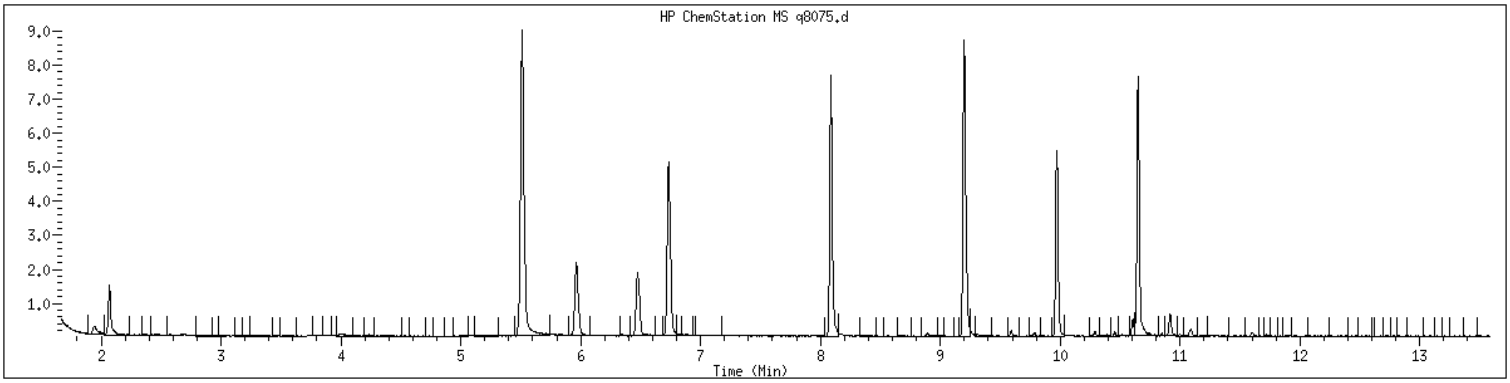



MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 21804062001 SampleType : SAMPLE
Injection Date: 04/18/2018 14:34 Instrument : msv12.i
Operator : JMC2
Sample Info : 21804062001*
Misc Info : MSV~40673~*1*JMC2
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b-




NO MANUAL INTEGRATIONS

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-02-21 |
| Collect Date: | 04/05/18 Time: 1310 | GCAL Sample ID: | 21804062002 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8074 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1411 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-35-4 | 1,1-Dichloroethene | 1.53 | | 0.200 | 0.500 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | 21.7 | | 0.200 | 0.500 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | 4.37 | | 0.200 | 0.500 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | 14.9 | | 0.200 | 0.500 | 1.00 |
| 544-10-5 | 1-Chlorohexane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-93-3 | 2-Butanone | 39.8 | | 0.200 | 0.500 | 5.00 |
| 95-49-8 | 2-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 591-78-6 | 2-Hexanone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 67-64-1 | Acetone | 10.7 | | 0.500 | 1.00 | 5.00 |
| 71-43-2 | Benzene | 0.456 | J | 0.200 | 0.500 | 1.00 |
| 108-86-1 | Bromobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-97-5 | Bromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-27-4 | Bromodichloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-25-2 | Bromoform | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 74-83-9 | Bromomethane | 1.00 | U | 0.500 | 1.00 | 1.00 |
| 75-15-0 | Carbon disulfide | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 56-23-5 | Carbon tetrachloride | 0.500 | U | 0.250 | 0.500 | 1.00 |

FORM I VOA

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-02-21 |
| Collect Date: | 04/05/18 Time: 1310 | GCAL Sample ID: | 21804062002 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8074 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1411 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 108-90-7 | Chlorobenzene | 2.68 | | 0.200 | 0.500 | 1.00 |
| 75-00-3 | Chloroethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 67-66-3 | Chloroform | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-87-3 | Chloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethene | 196 | | 0.200 | 0.500 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 124-48-1 | Dibromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-95-3 | Dibromomethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-41-4 | Ethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 98-82-8 | Isopropylbenzene (Cumene) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 136777-61-2 | m,p-Xylene | 0.500 | U | 0.200 | 0.500 | 2.00 |
| 75-09-2 | Methylene chloride | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 91-20-3 | Naphthalene | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 104-51-8 | n-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 103-65-1 | n-Propylbenzene | 2.00 | U | 1.00 | 2.00 | 5.00 |
| 95-47-6 | o-Xylene | 0.452 | J | 0.200 | 0.500 | 1.00 |
| 135-98-8 | sec-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-42-5 | Styrene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether (MTBE) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 98-06-6 | tert-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 127-18-4 | Tetrachloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-88-3 | Toluene | 8.53 | | 0.200 | 0.500 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethene | 0.439 | J | 0.200 | 0.500 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-01-6 | Trichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-01-4 | Vinyl chloride | 2.59 | | 0.200 | 0.500 | 1.00 |

FORM I VOA

GCAL, Inc.

Data file : /var/chem/msv12.i/2180418.s.b/q8074.d
Lab Smp Id: 21804062002 Client Smp ID: 21804062002
Inj Date : 18-APR-2018 14:11
Operator : JMC2 Inst ID: msv12.i
Smp Info : 21804062002*
Misc Info : MSV~40673~*1*JMC2
Comment :
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:06 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 18:43 Cal File: q7984cD.d
Als bottle: 9
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b-.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| | Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|---|
| | 3 Vinyl Chloride + | 62 | 2.071 | 2.068 | (0.308) | 8618 | 2.58925 | 2.59 | |
| | 11 1,1-Dichloroethene + | 96 | 3.297 | 3.301 | (0.490) | 3357 | 1.53232 | 1.53 | (H) |
| | 12 Acetone | 43 | 4.140 | 4.133 | (0.615) | 27591 | 10.7322 | 10.7 | |
| | 19 trans-1,2-Dichloroethene | 61 | 4.238 | 4.238 | (0.629) | 1710 | 0.43930 | 0.439 | (H) |
| | 30 cis-1,2-Dichloroethene | 61 | 5.512 | 5.509 | (0.819) | 777773 | 196.040 | 196 | |
| M | 48 Total 1,2-Dichloroethene | 61 | | | | 779483 | 196.480 | 196 | |
| $ | 36 Dibromofluoromethane | 111 | 5.966 | 5.966 | (0.886) | 124185 | 49.3529 | 49.4 | 7193 |
| | 32 2-Butanone | 43 | 6.108 | 6.109 | (0.907) | 99108 | 39.7652 | 39.8 | (H) |
| | 44 Benzene | 78 | 6.345 | 6.345 | (0.942) | 5473 | 0.45587 | 0.456 | (H) |
| $ | 43 1,2-Dichloroethane-d4 | 67 | 6.476 | 6.476 | (0.962) | 75517 | 50.6842 | 50.7 | |
| * | 47 FLUOROBENZENE | 96 | 6.735 | 6.735 | (1.000) | 471155 | 50.0000 | | |
| $ | 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.879) | 441226 | 50.7716 | 50.8 | |
| | 61 Toluene + | 91 | 8.129 | 8.125 | (0.884) | 103440 | 8.53067 | 8.53 | |
| * | 71 CHLOROBENZENE-d5 | 82 | 9.197 | 9.198 | (1.000) | 178509 | 50.0000 | | |

| | Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|---|
| | 72 Chlorobenzene ++ | 112 | 9.209 | 9.205 | (1.001) | 21287 | 2.67575 | 2.68 | |
| | 76 o-Xylene | 106 | 9.595 | 9.591 | (1.043) | 2193 | 0.45238 | 0.452 | (H) |
| M | 99 TOTAL XYLENE | 106 | | | | 2193 | 0.45238 | 0.452 | |
| $ | 80 Bromofluorobenzene | 174 | 9.973 | 9.970 | (1.084) | 148446 | 47.0077 | 47.0 | |
| | 96 1,3-Dichlorobenzene | 146 | 10.603 | 10.603 | (0.996) | 22674 | 4.36867 | 4.37 | |
| * | 97 1,4-DICHLOROBENZENE-D4 | 152 | 10.648 | 10.645 | (1.000) | 153399 | 50.0000 | | |
| | 98 1,4-Dichlorobenzene | 146 | 10.656 | 10.656 | (1.001) | 81177 | 14.9311 | 14.9 | |
| | 102 1,2-Dichlorobenzene | 146 | 10.918 | 10.914 | (1.025) | 114103 | 21.7430 | 21.7 | |

QC Flag Legend

H - Operator selected an alternate compound hit.

Data File: /var/chem/msv12.i/2180418.s.b/q8074.d



Date : 18-APR-2018 14:11

Client ID: 21804062002

Instrument: msv12.i

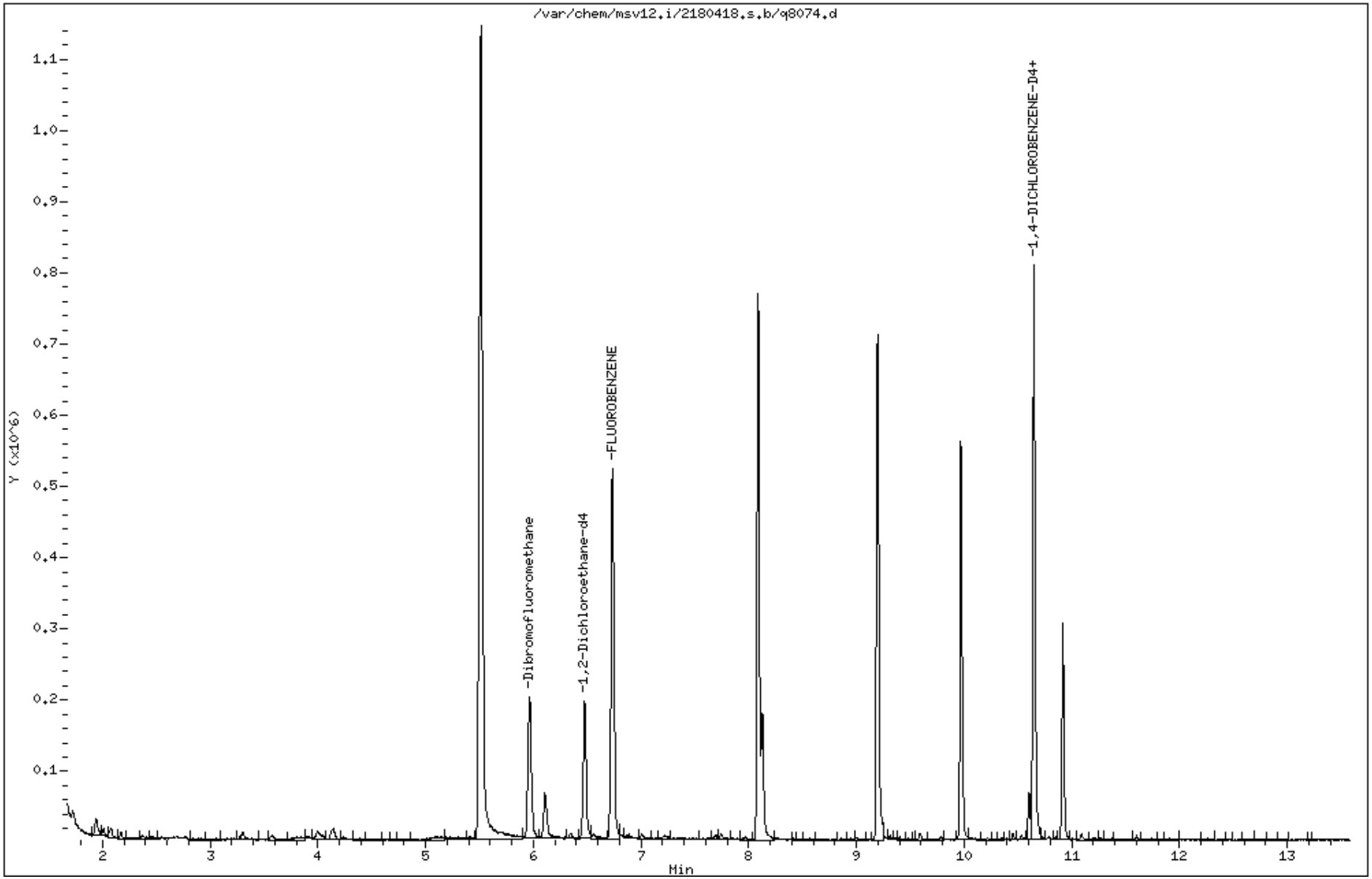
Sample Info: 21804062002*

Purge Volume: 5.0

Operator: JMC2

Column phase: RTX-VMS-30M

Column diameter: 0.25



Data File: /var/chem/msv12.i/2180418.s.b/q8074.d

Date : 18-APR-2018 14:11

Client ID: 21804062002

Instrument: msv12.i

Sample Info: 21804062002x

Purge Volume: 5.0

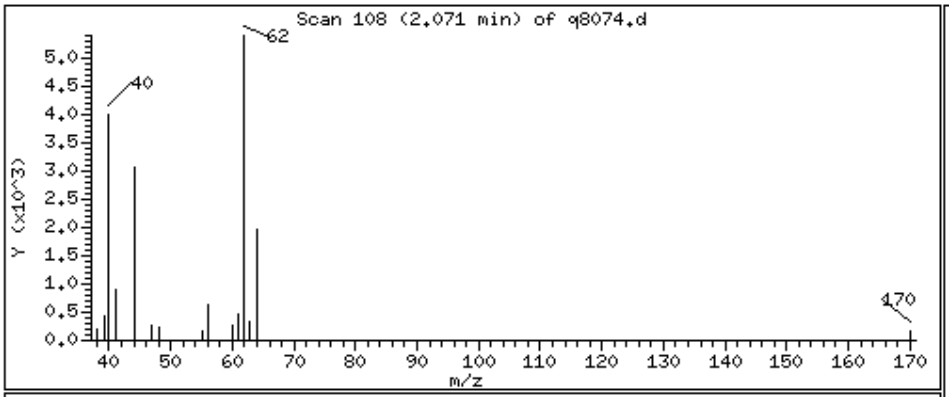
Operator: JMC2

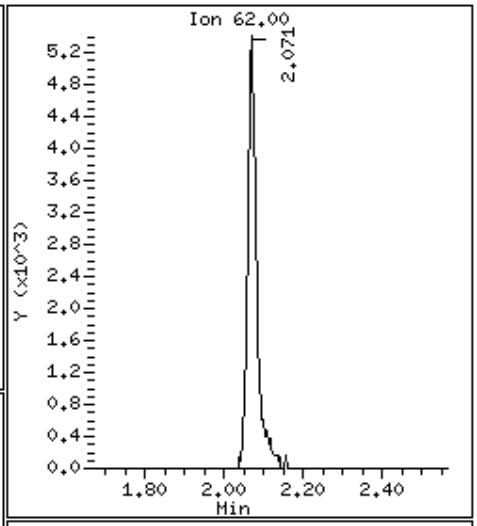
Column phase: RTX-VMS-30M

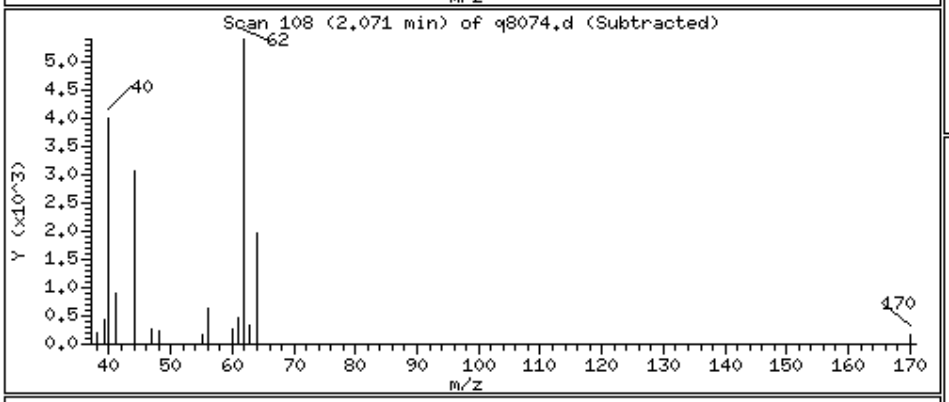
Column diameter: 0.25

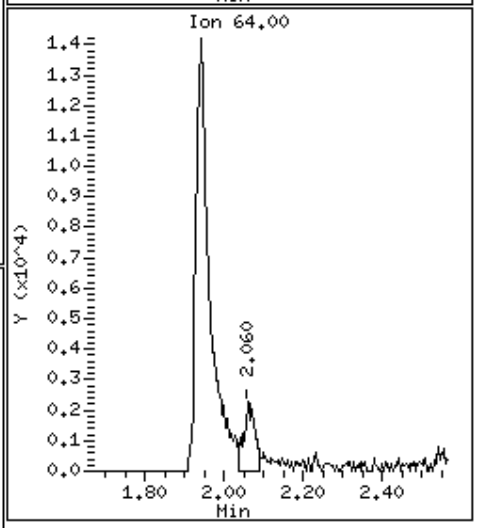
3 Vinyl Chloride +

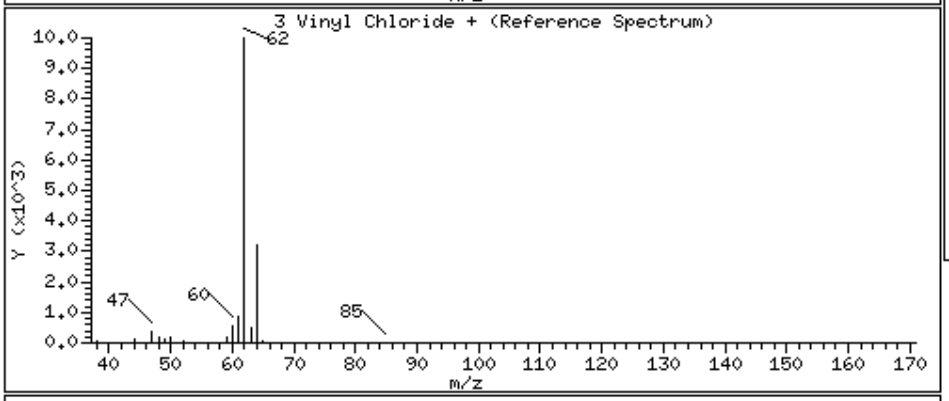
Concentration: 2.59 ug/L

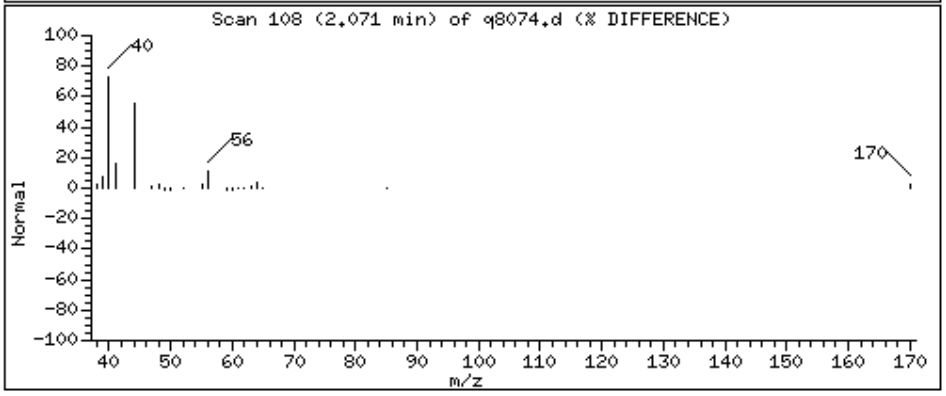


Data File: /var/chem/msv12.i/2180418.s.b/q8074.d

Date : 18-APR-2018 14:11

Client ID: 21804062002

Instrument: msv12.i

Sample Info: 21804062002x

Purge Volume: 5.0

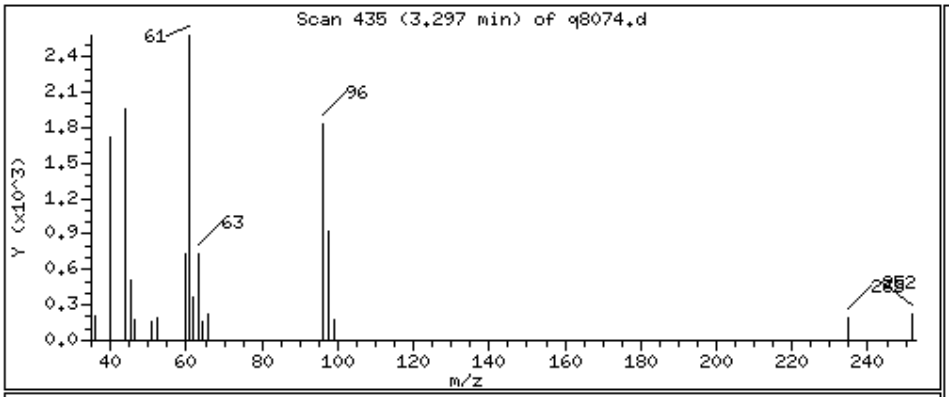
Operator: JMC2

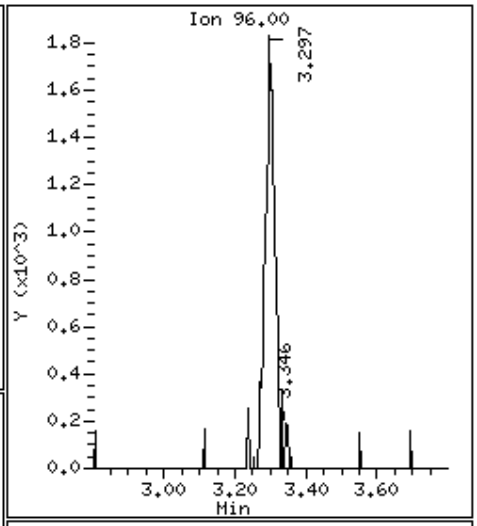
Column phase: RTX-VMS-30M

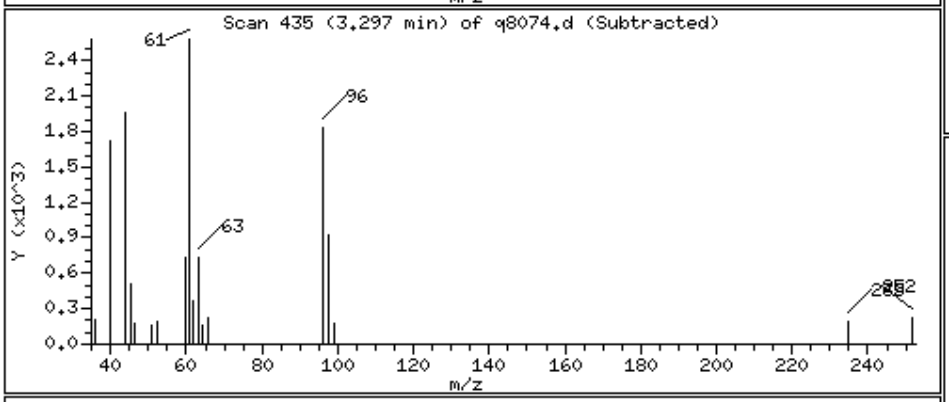
Column diameter: 0.25

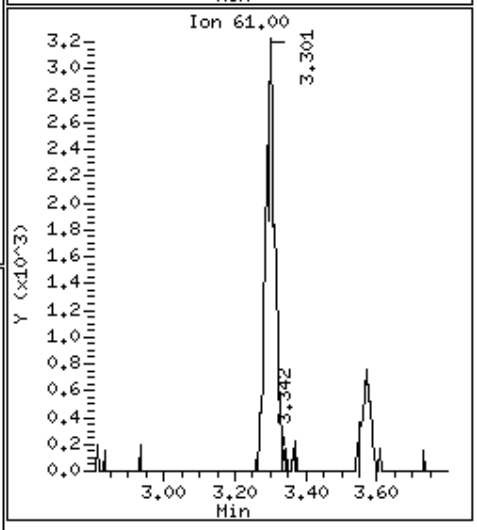
11 1,1-Dichloroethene +

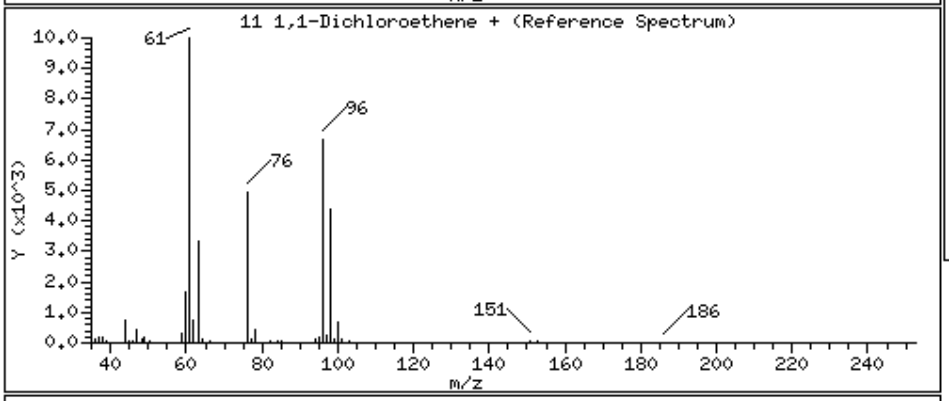
Concentration: 1.53 ug/L

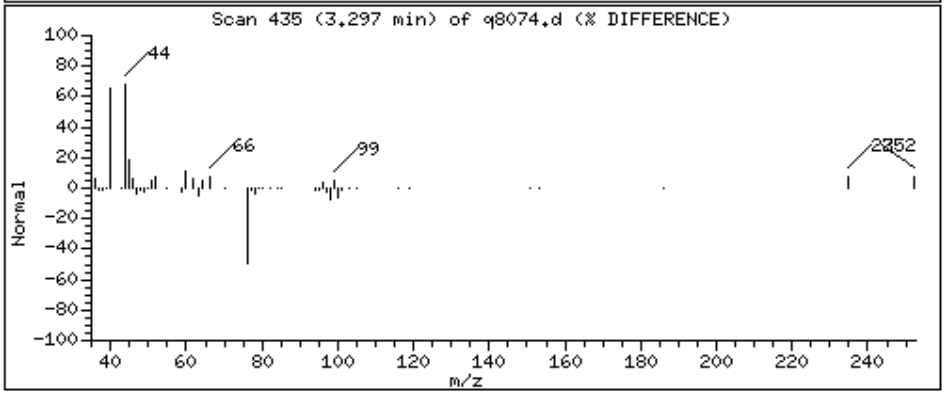


Data File: /var/chem/msv12.i/2180418.s.b/q8074.d

Date : 18-APR-2018 14:11

Client ID: 21804062002

Instrument: msv12.i

Sample Info: 21804062002x

Purge Volume: 5.0

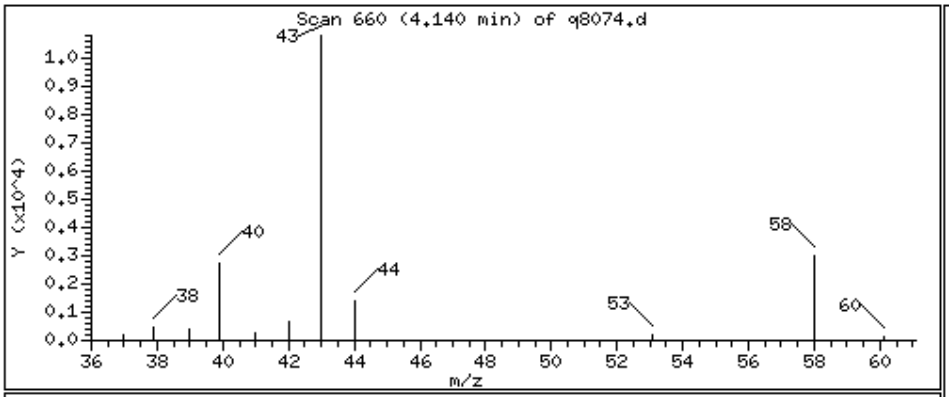
Operator: JMC2

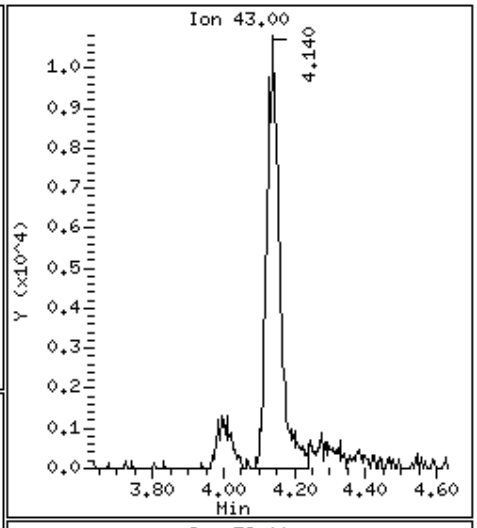
Column phase: RTX-VMS-30M

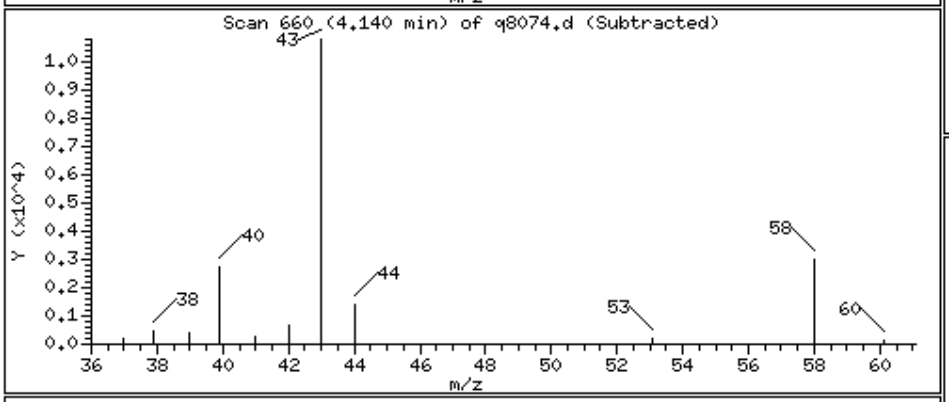
Column diameter: 0.25

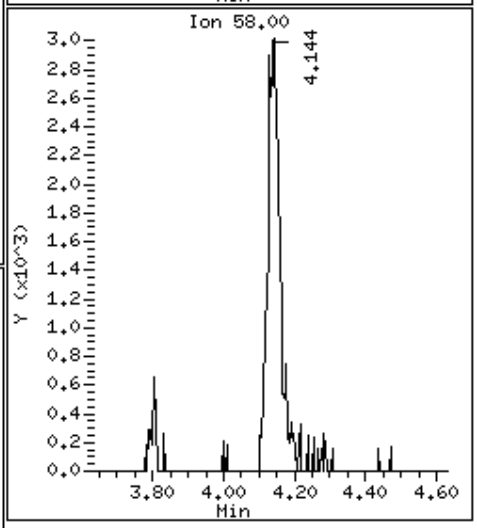
12 Acetone

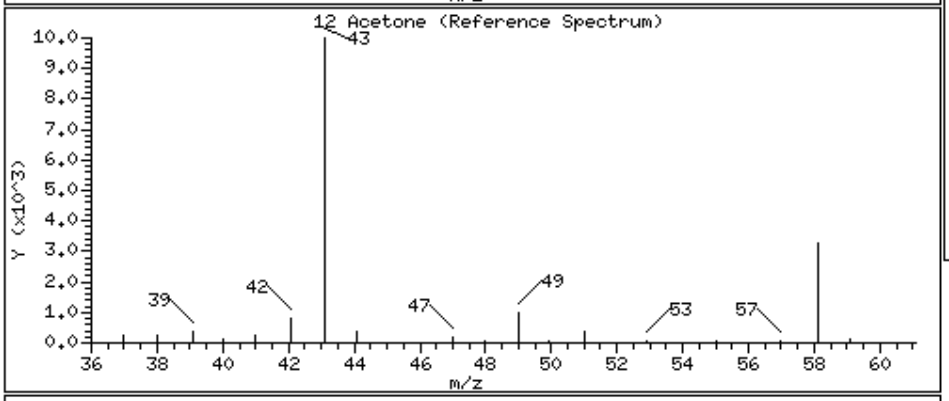
Concentration: 10.7 ug/L

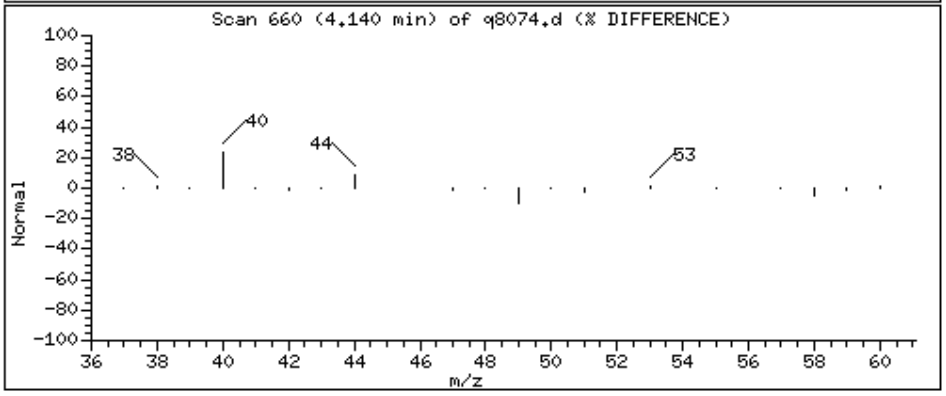


Data File: /var/chem/msv12.i/2180418.s.b/q8074.d

Date : 18-APR-2018 14:11

Client ID: 21804062002

Instrument: msv12.i

Sample Info: 21804062002x

Purge Volume: 5.0

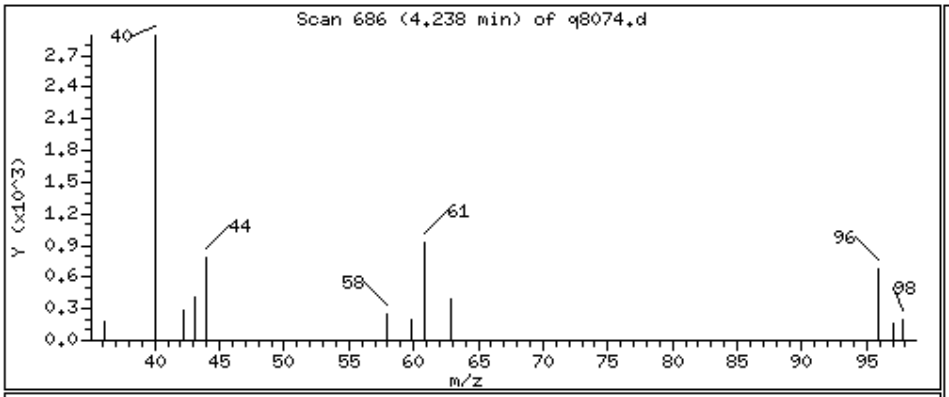
Operator: JMC2

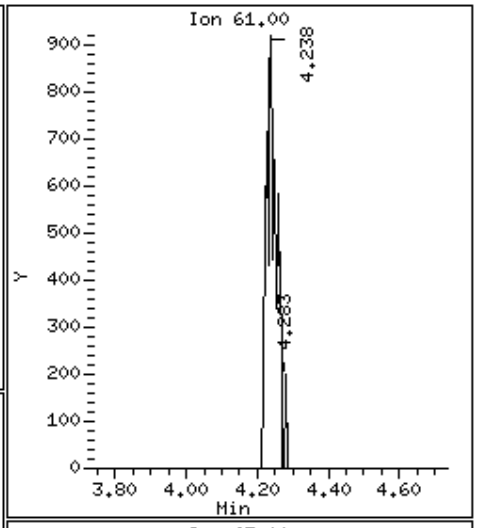
Column phase: RTX-VMS-30M

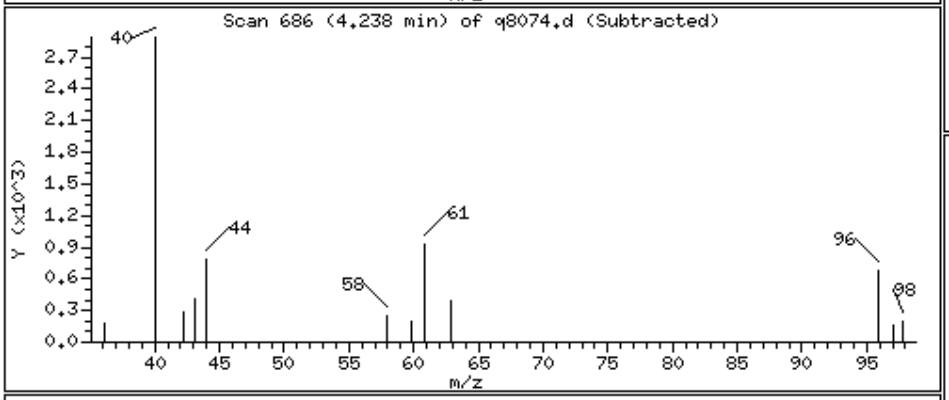
Column diameter: 0.25

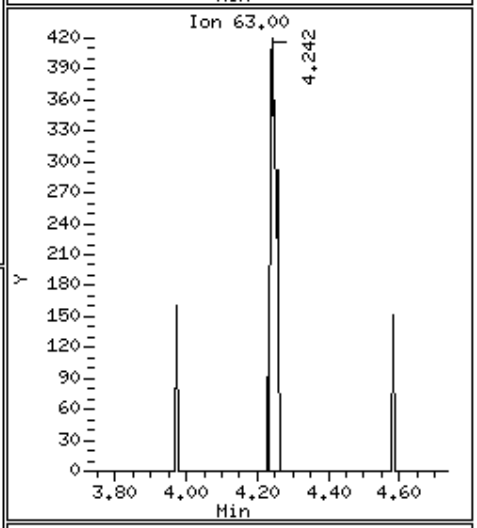
19 trans-1,2-Dichloroethene

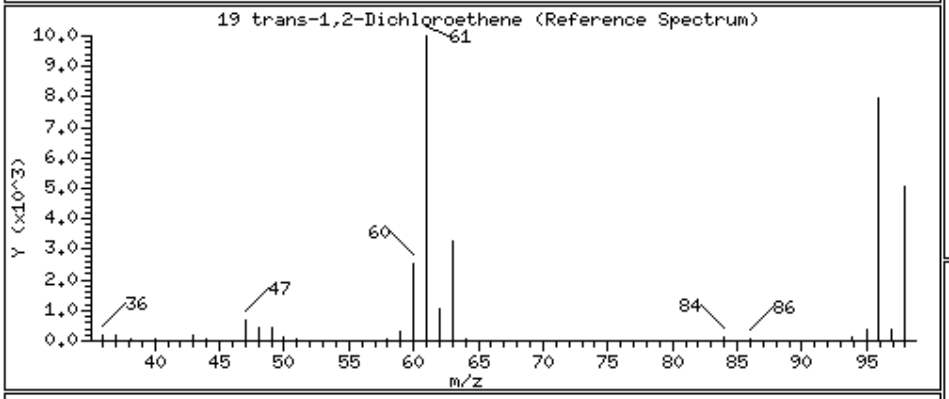
Concentration: 0.439 ug/L

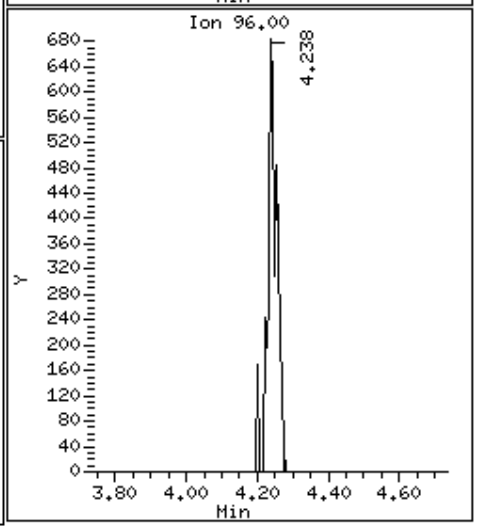


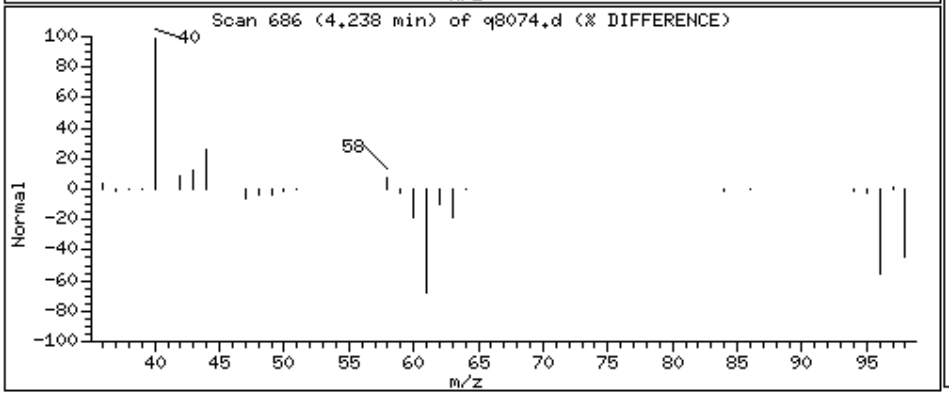



Data File: /var/chem/msv12.i/2180418.s.b/q8074.d

Date : 18-APR-2018 14:11

Client ID: 21804062002

Instrument: msv12.i

Sample Info: 21804062002x

Purge Volume: 5.0

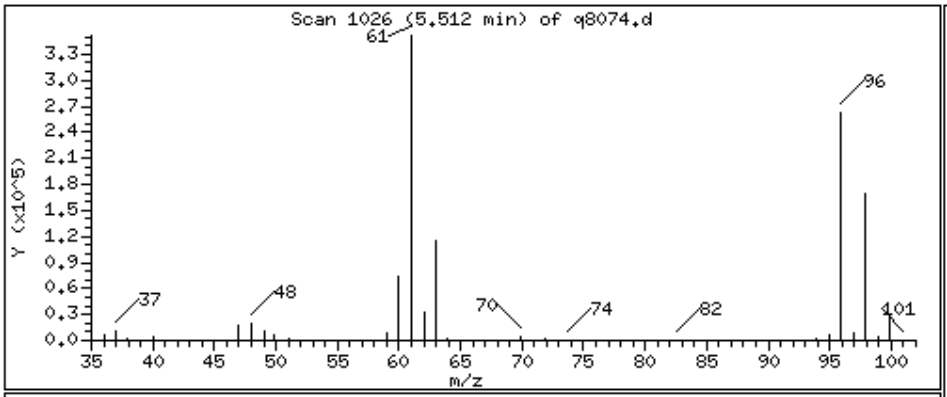
Operator: JMC2

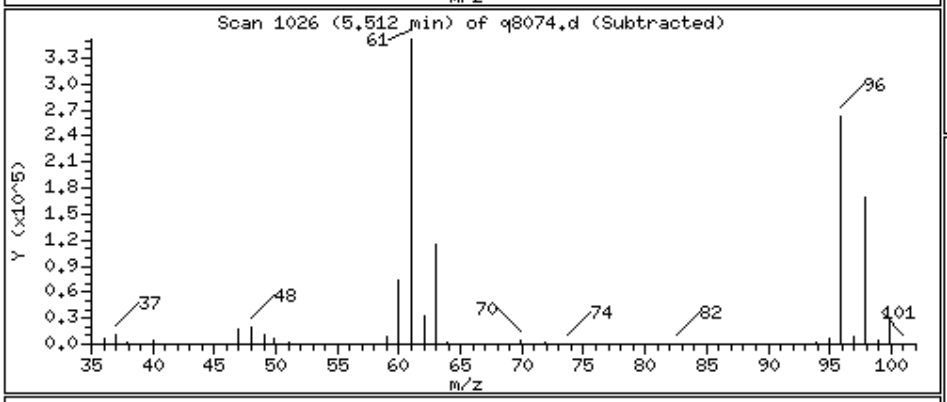
Column phase: RTX-VMS-30M

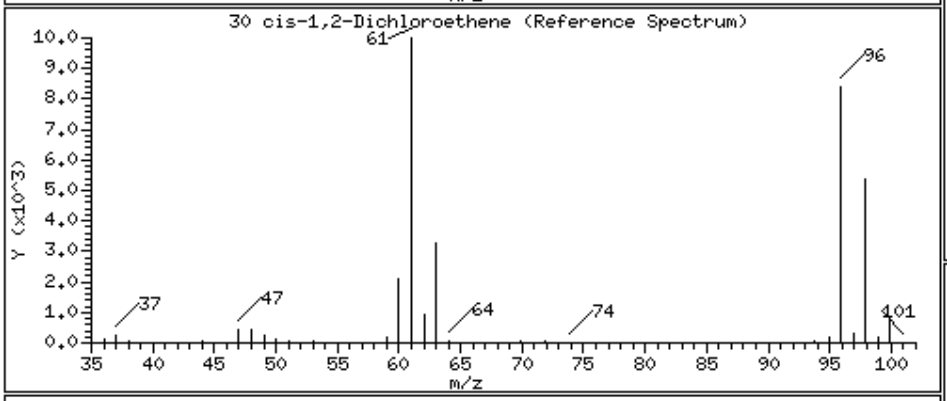
Column diameter: 0.25

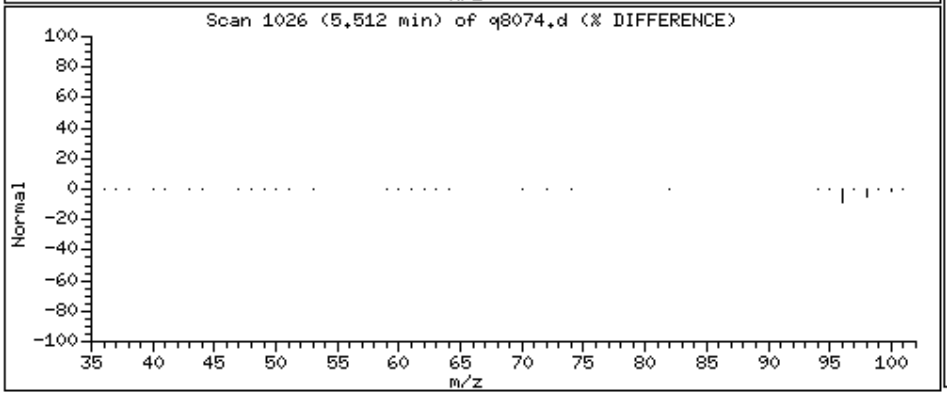
30 cis-1,2-Dichloroethene

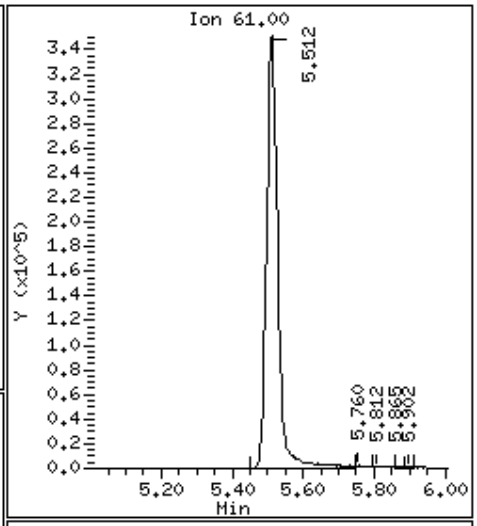
Concentration: 196 ug/L

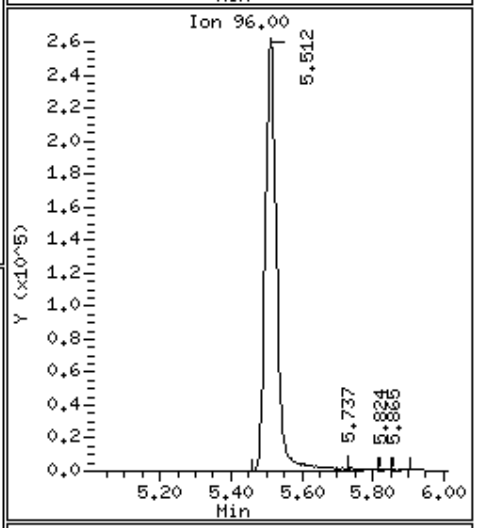


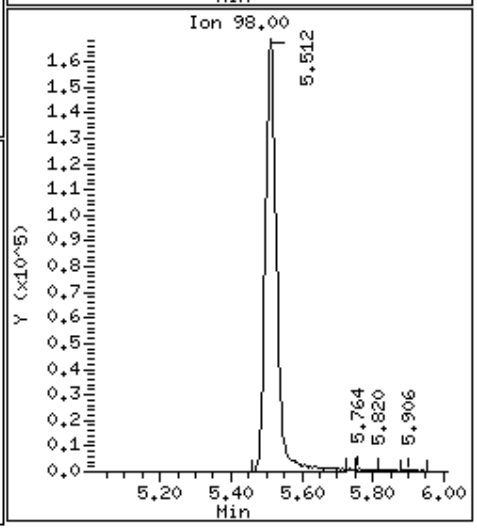



Data File: /var/chem/msv12.i/2180418.s.b/q8074.d

Date : 18-APR-2018 14:11

Client ID: 21804062002

Instrument: msv12.i

Sample Info: 21804062002x

Purge Volume: 5.0

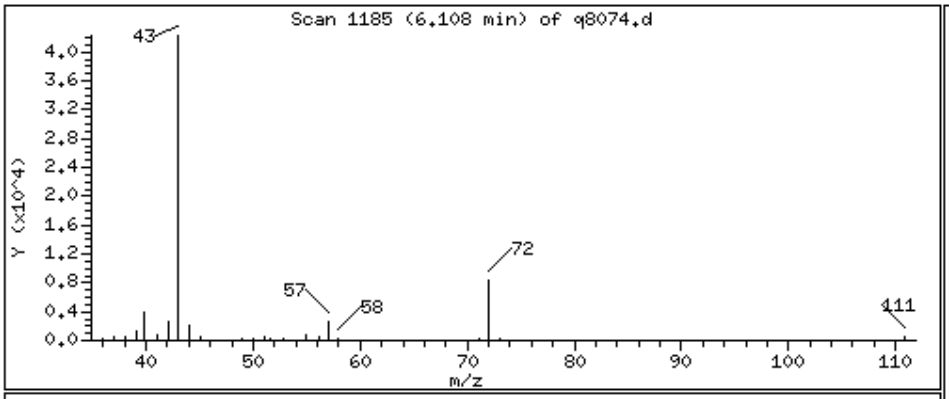
Operator: JMC2

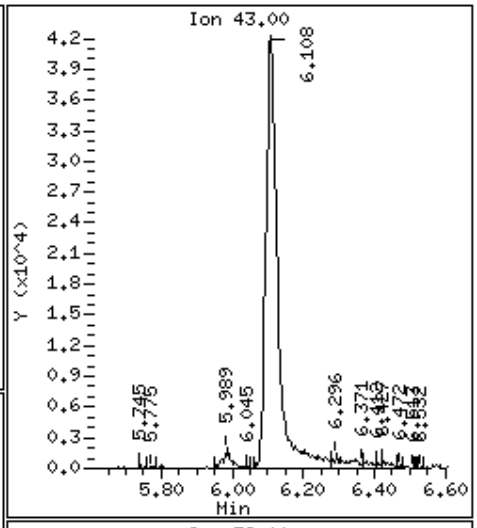
Column phase: RTX-VMS-30M

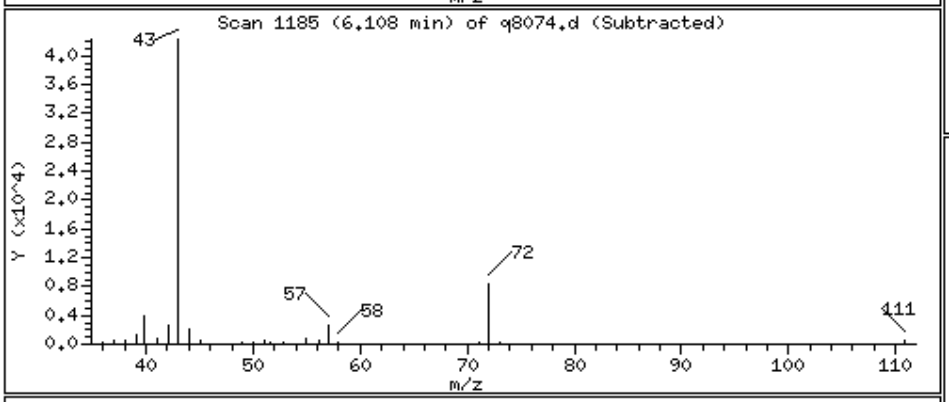
Column diameter: 0.25

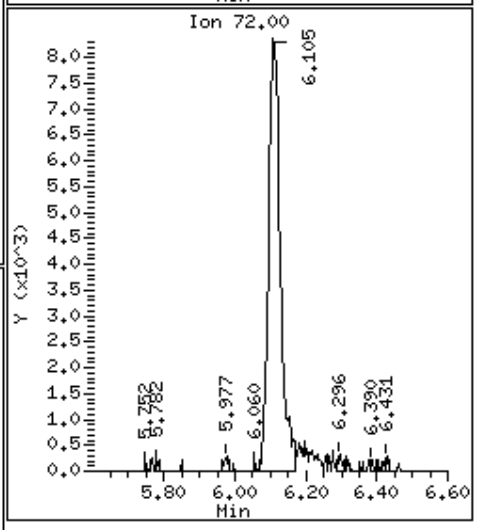
32 2-Butanone

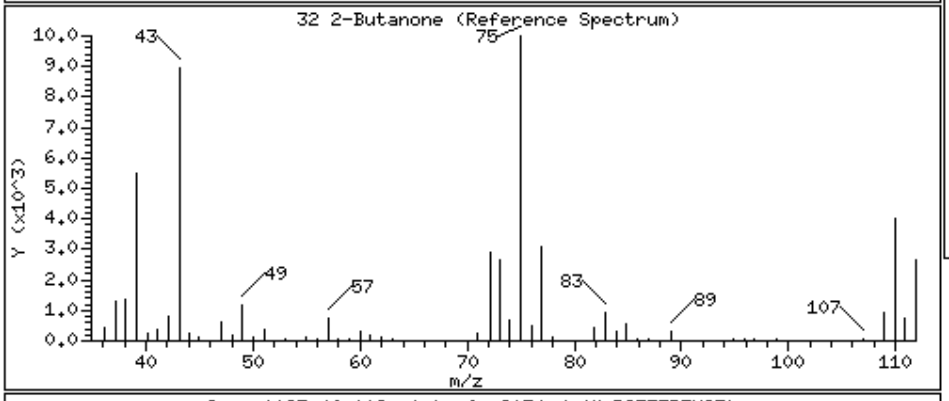
Concentration: 39.8 ug/L

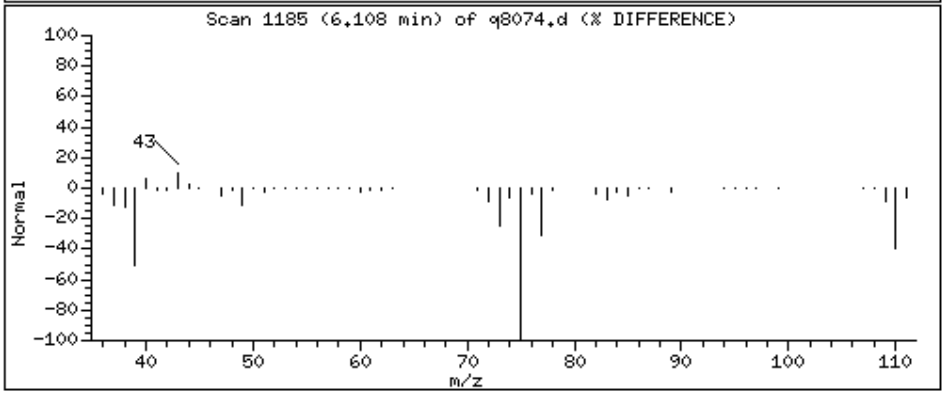


Data File: /var/chem/msv12.i/2180418.s.b/q8074.d

Date : 18-APR-2018 14:11

Client ID: 21804062002

Instrument: msv12.i

Sample Info: 21804062002x

Purge Volume: 5.0

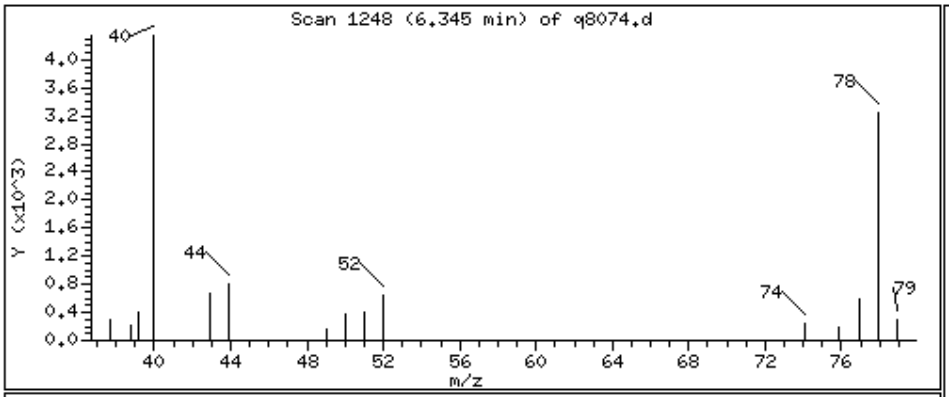
Operator: JMC2

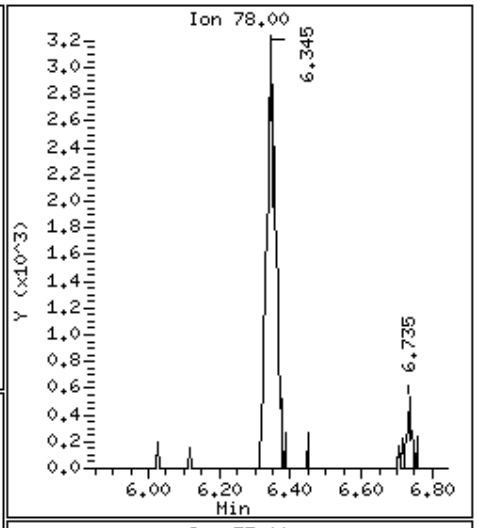
Column phase: RTX-VMS-30M

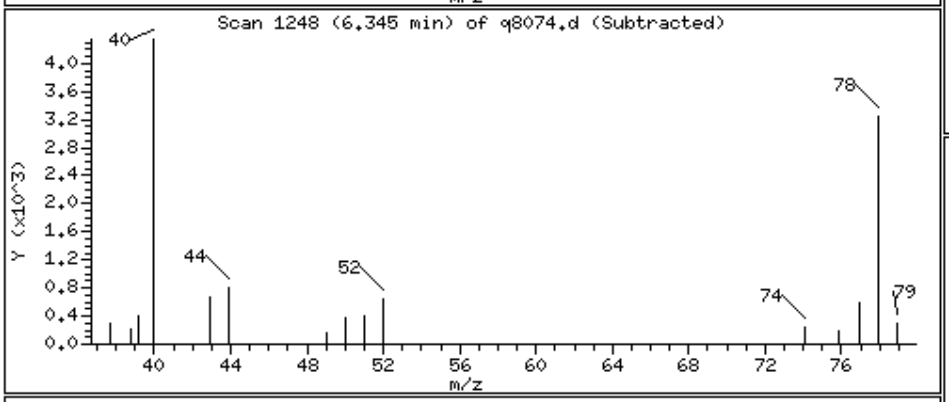
Column diameter: 0.25

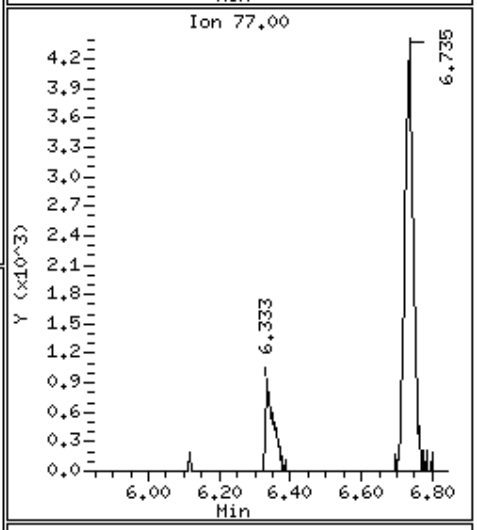
44 Benzene

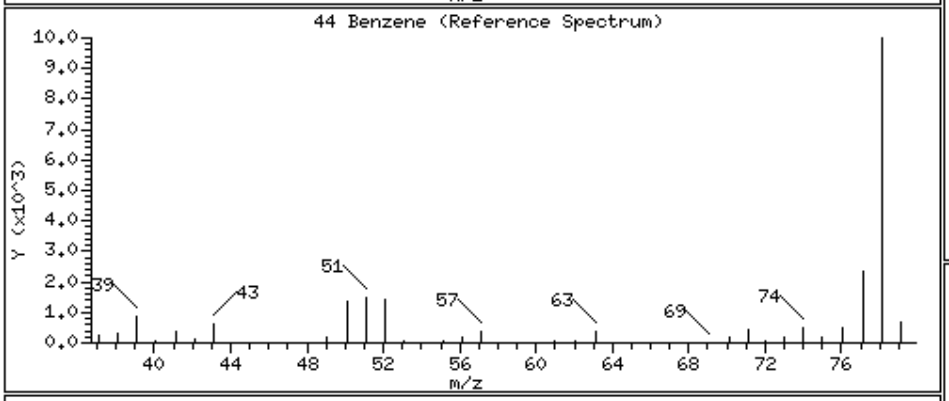
Concentration: 0.456 ug/L

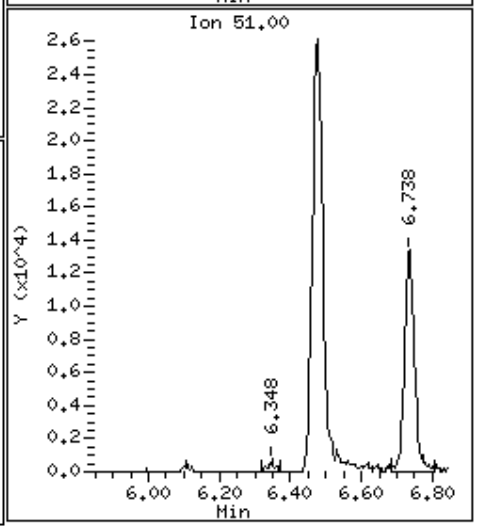


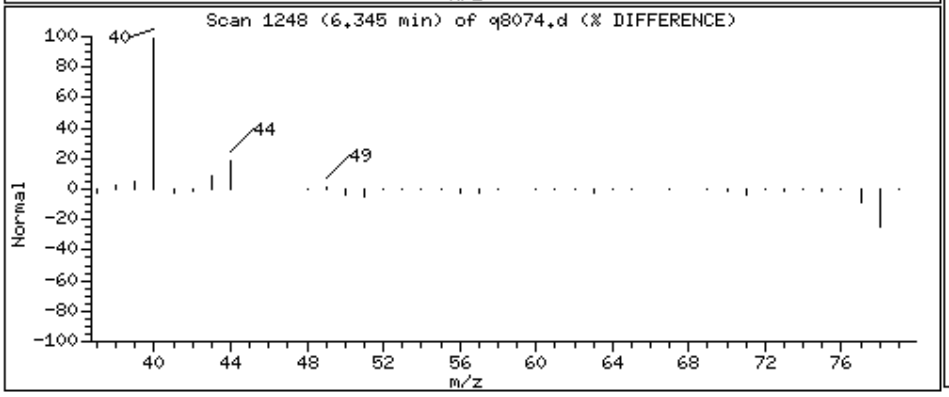



Data File: /var/chem/msv12.i/2180418.s.b/q8074.d

Date : 18-APR-2018 14:11

Client ID: 21804062002

Instrument: msv12.i

Sample Info: 21804062002x

Purge Volume: 5.0

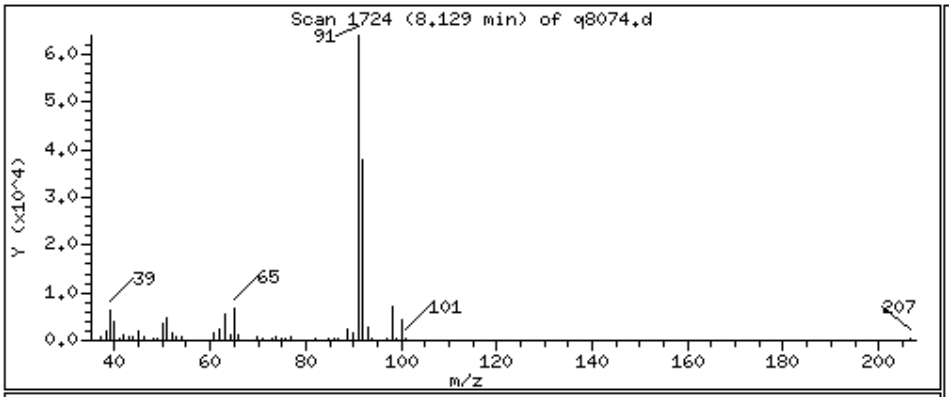
Operator: JMC2

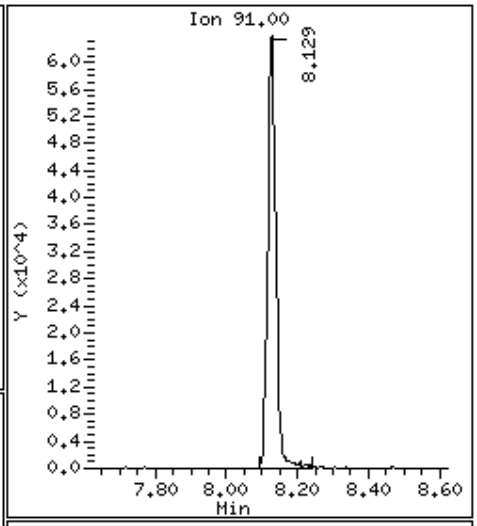
Column phase: RTX-VMS-30M

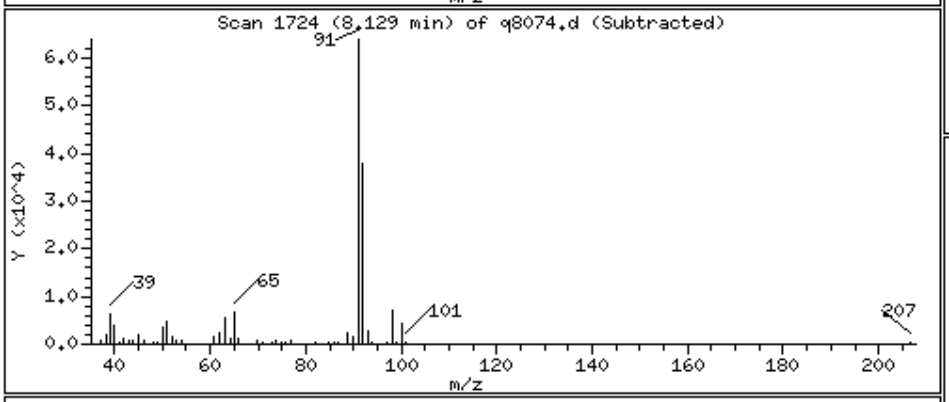
Column diameter: 0.25

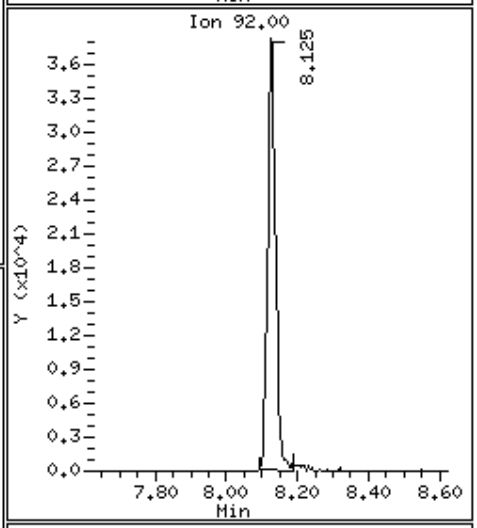
61 Toluene +

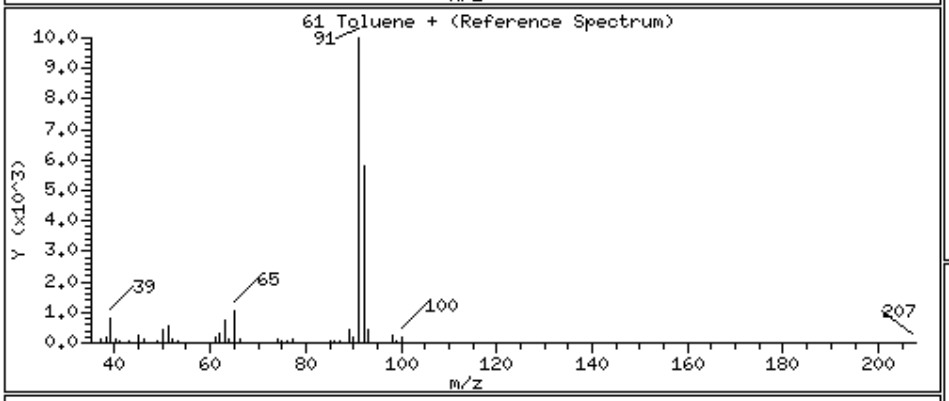
Concentration: 8.53 ug/L

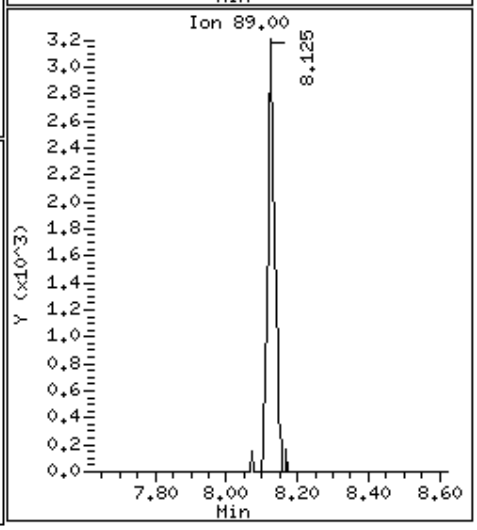


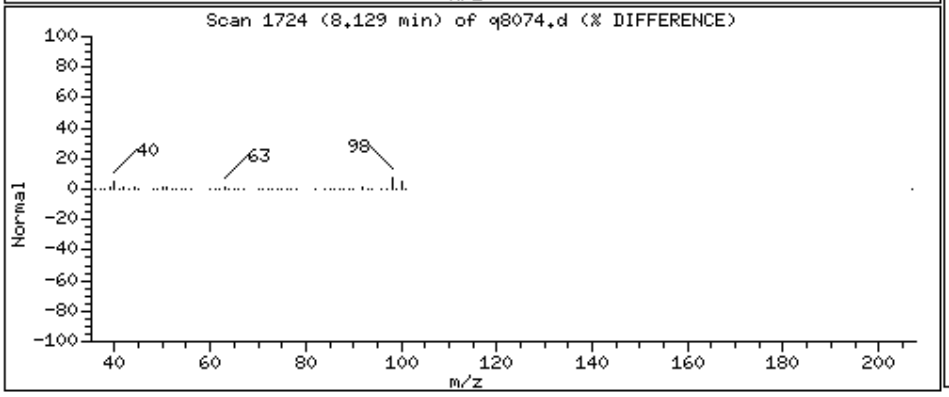



Data File: /var/chem/msv12.i/2180418.s.b/q8074.d

Date : 18-APR-2018 14:11

Client ID: 21804062002

Instrument: msv12.i

Sample Info: 21804062002x

Purge Volume: 5.0

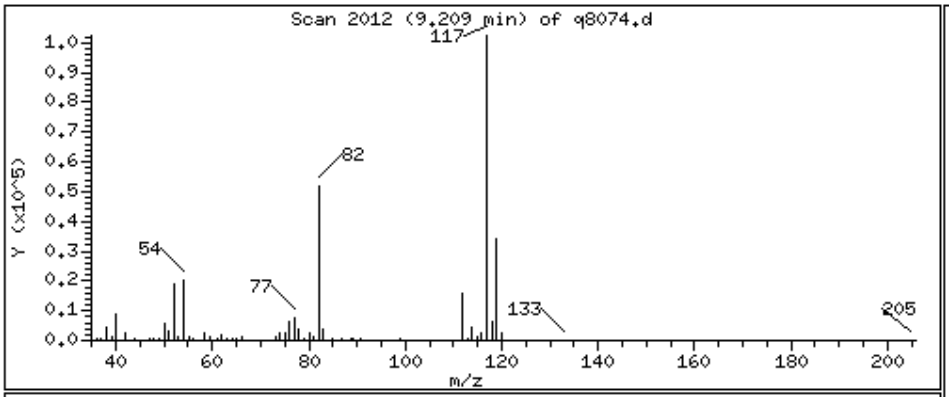
Operator: JMC2

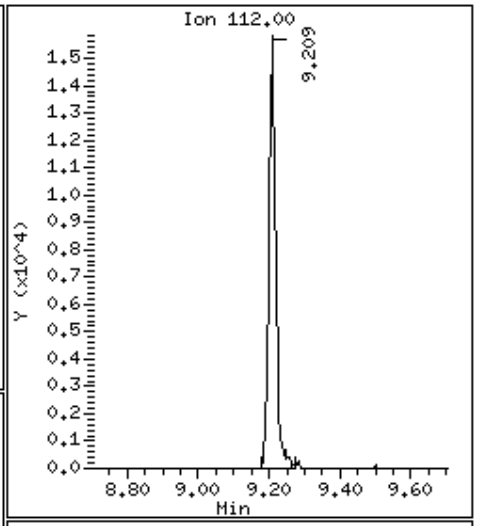
Column phase: RTX-VMS-30M

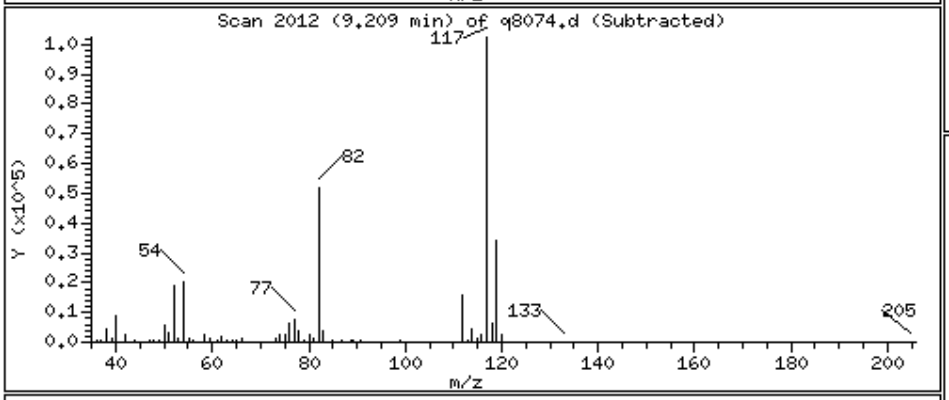
Column diameter: 0.25

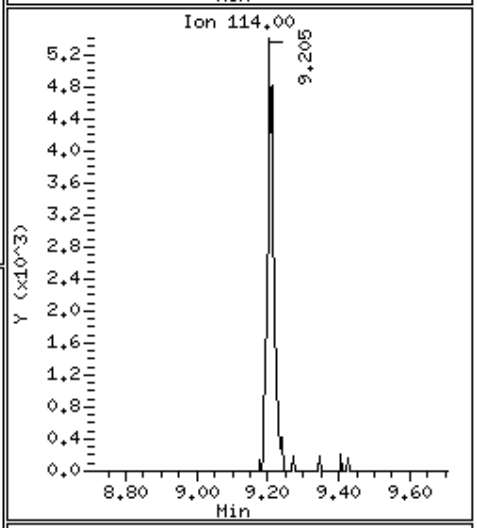
72 Chlorobenzene ++

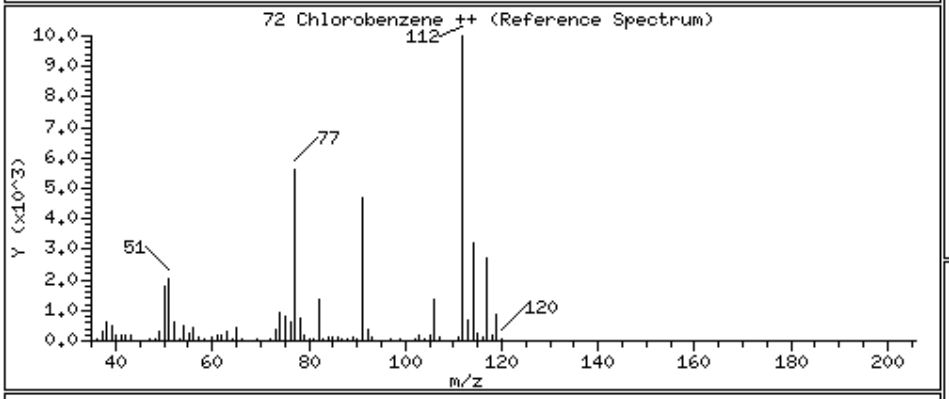
Concentration: 2.68 ug/L

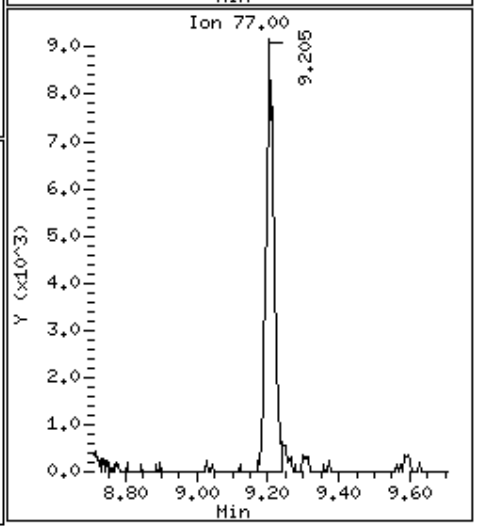


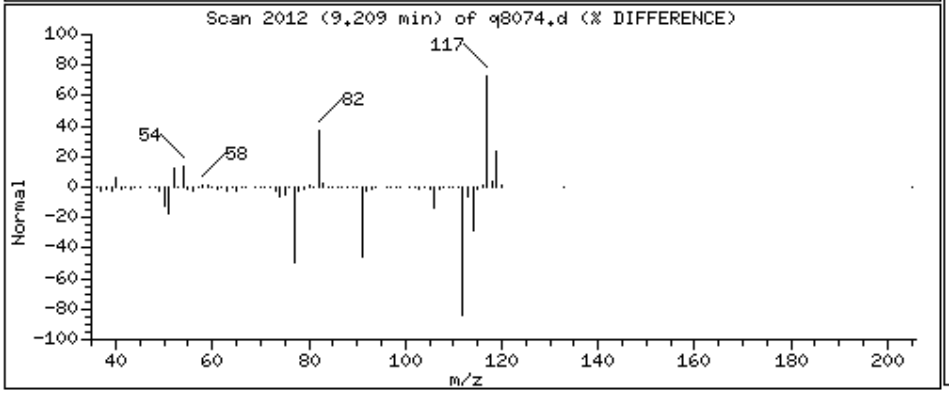



Data File: /var/chem/msv12.i/2180418.s.b/q8074.d

Date : 18-APR-2018 14:11

Client ID: 21804062002

Instrument: msv12.i

Sample Info: 21804062002x

Purge Volume: 5.0

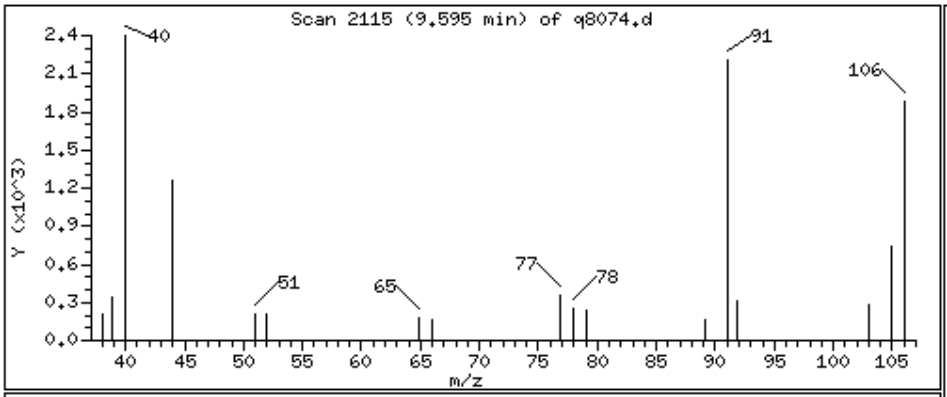
Operator: JMC2

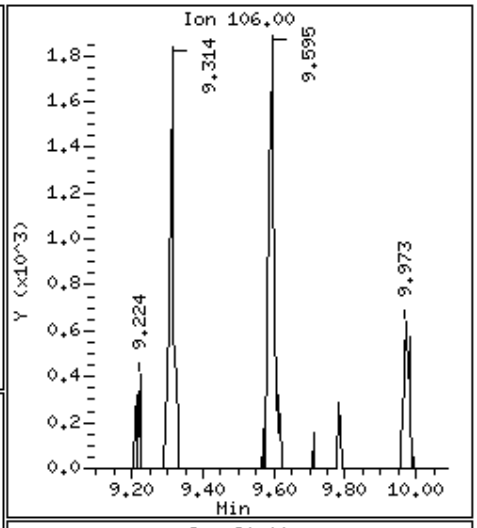
Column phase: RTX-VMS-30M

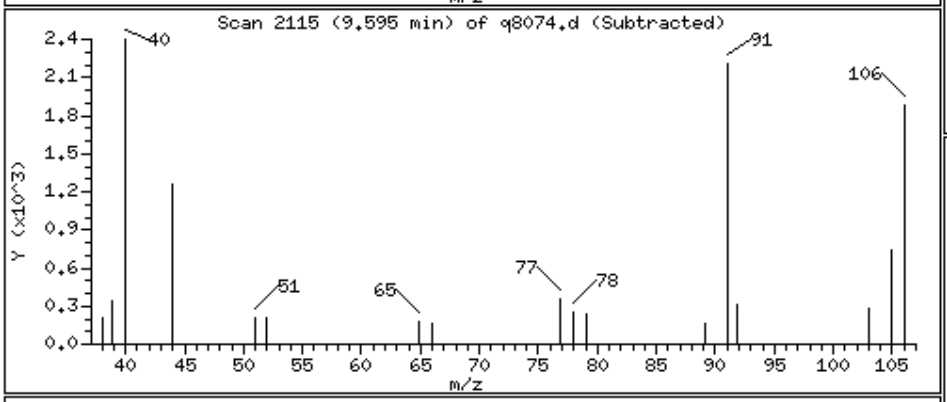
Column diameter: 0.25

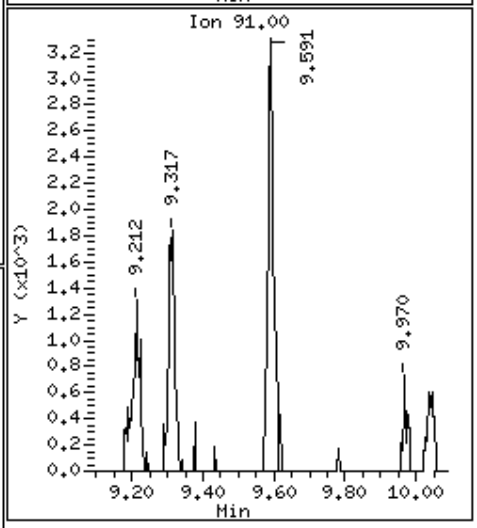
76 o-Xylene

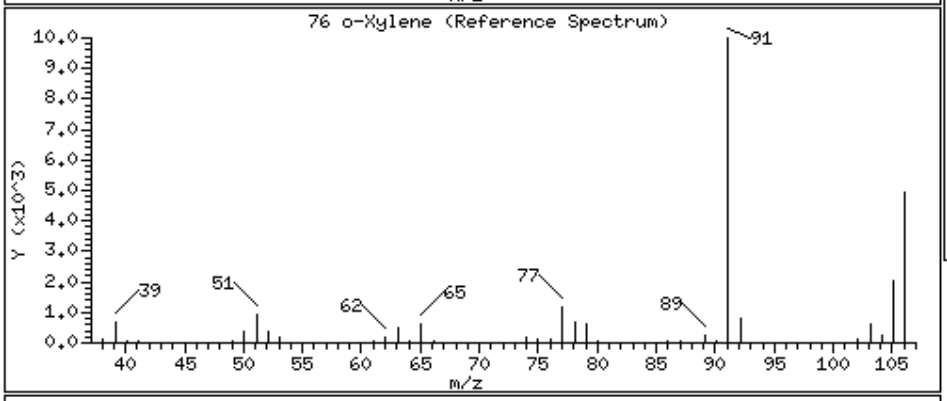
Concentration: 0.452 ug/L

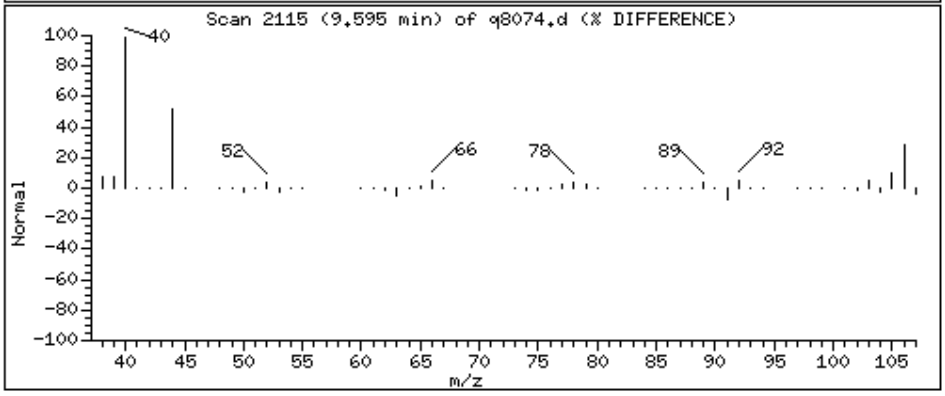


Data File: /var/chem/msv12.i/2180418.s.b/q8074.d

Date : 18-APR-2018 14:11

Client ID: 21804062002

Instrument: msv12.i

Sample Info: 21804062002x

Purge Volume: 5.0

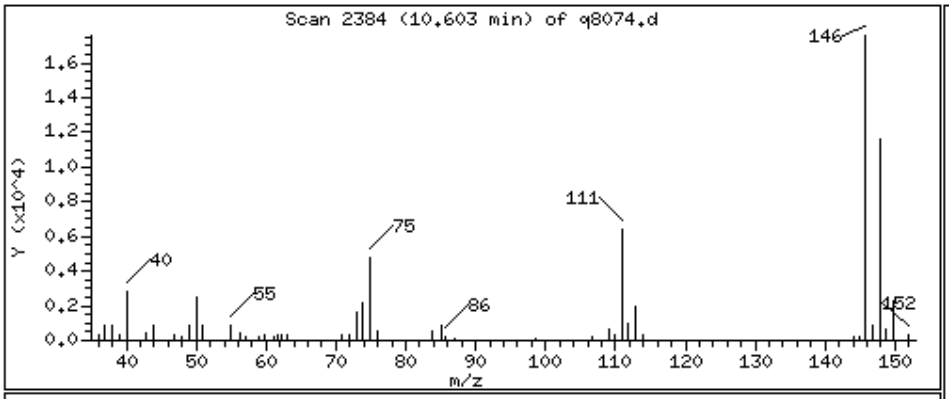
Operator: JMC2

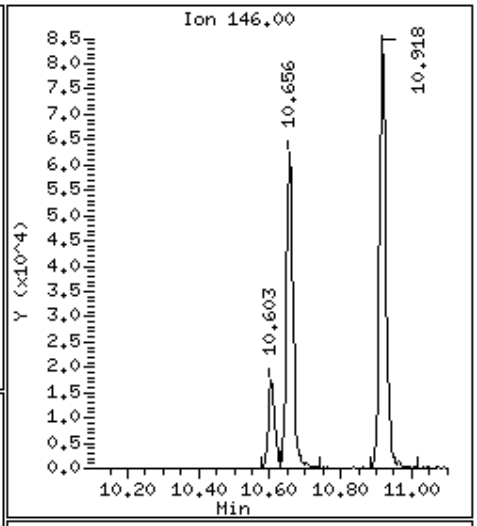
Column phase: RTX-VMS-30M

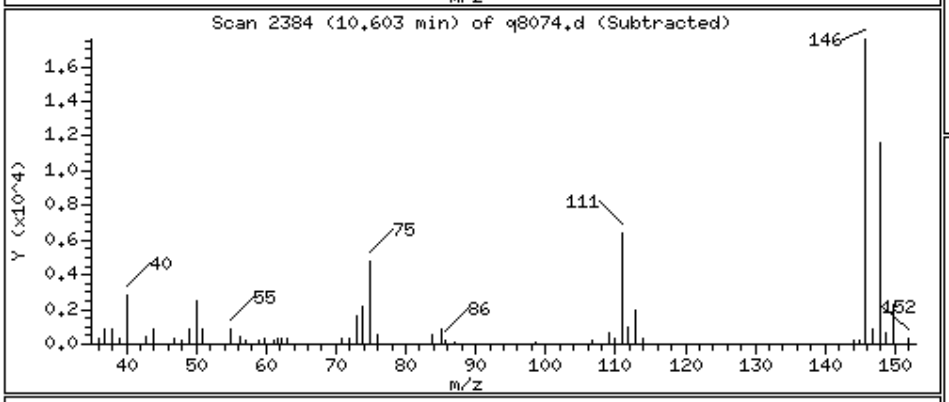
Column diameter: 0.25

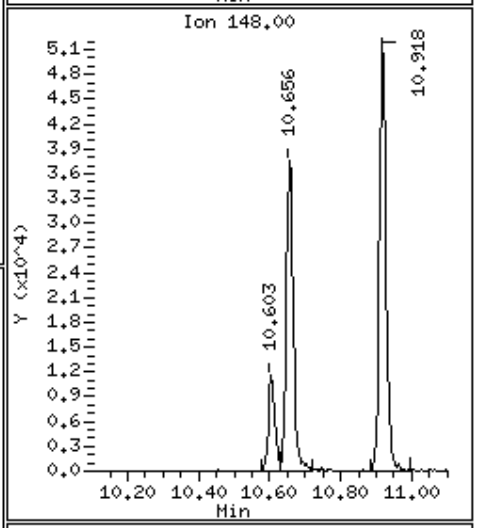
96 1,3-Dichlorobenzene

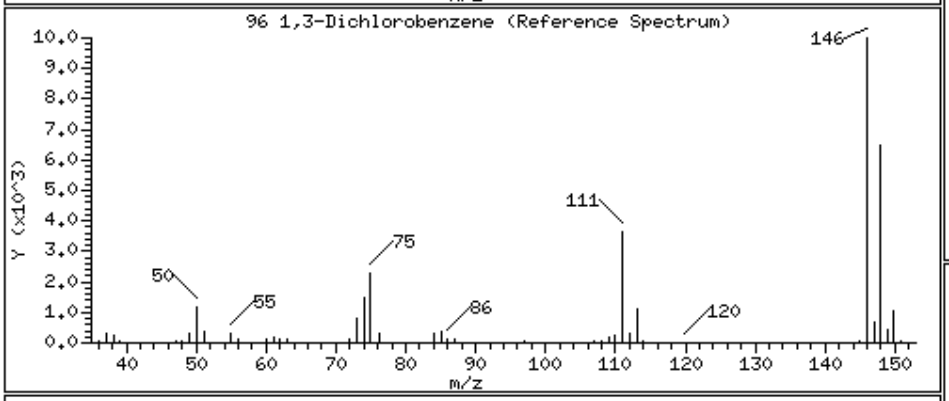
Concentration: 4.37 ug/L

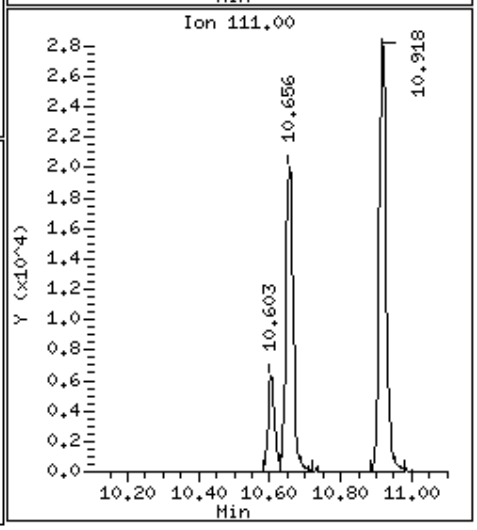


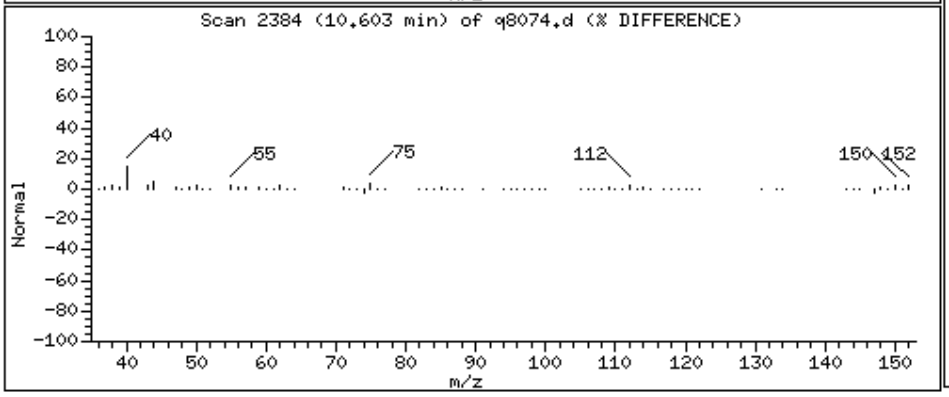



Data File: /var/chem/msv12.i/2180418.s.b/q8074.d

Date : 18-APR-2018 14:11

Client ID: 21804062002

Instrument: msv12.i

Sample Info: 21804062002x

Purge Volume: 5.0

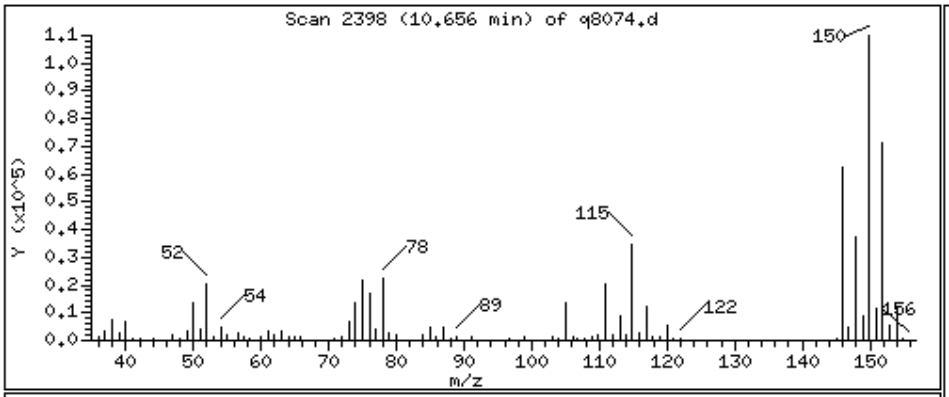
Operator: JMC2

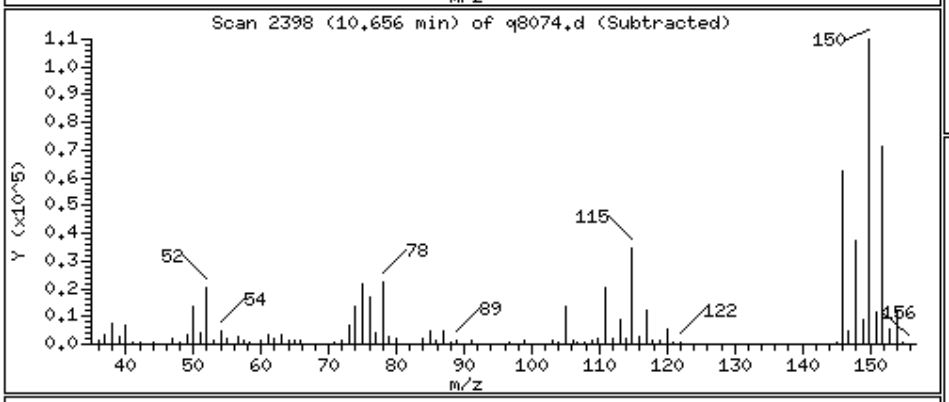
Column phase: RTX-VMS-30M

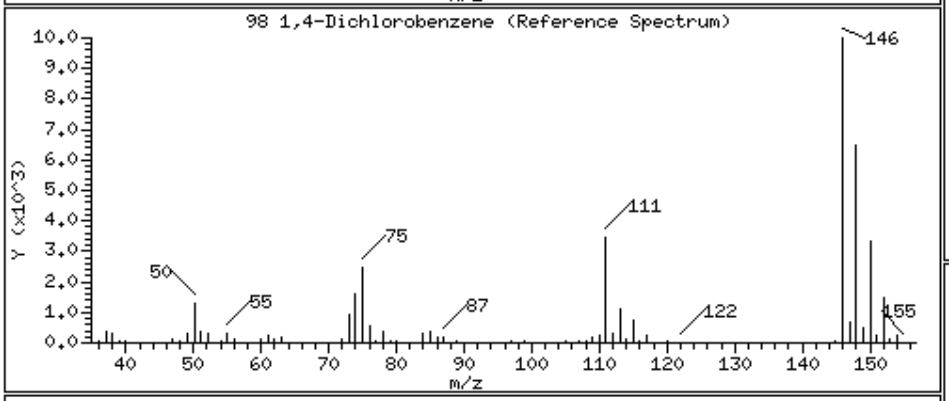
Column diameter: 0.25

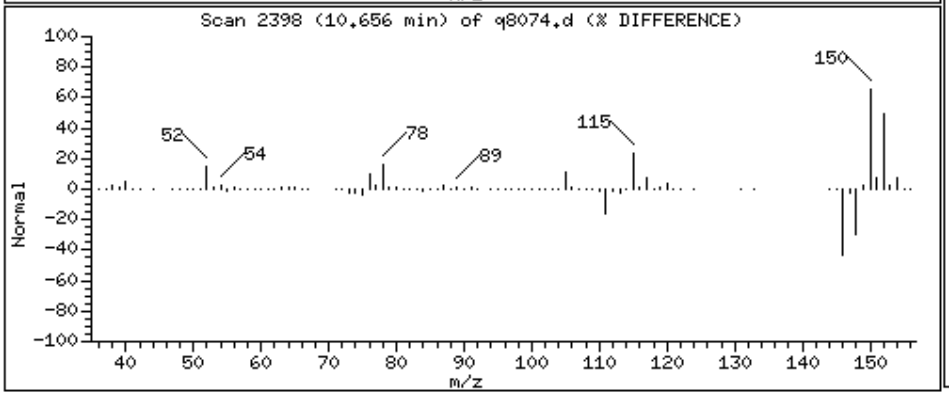
98 1,4-Dichlorobenzene

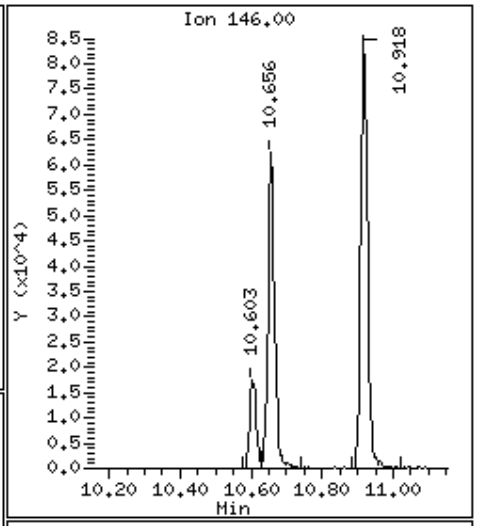
Concentration: 14.9 ug/L

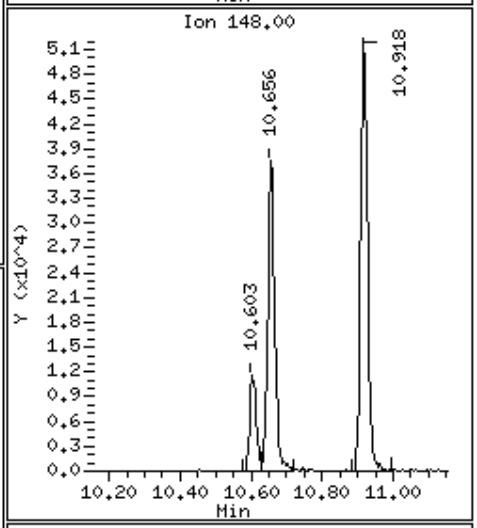


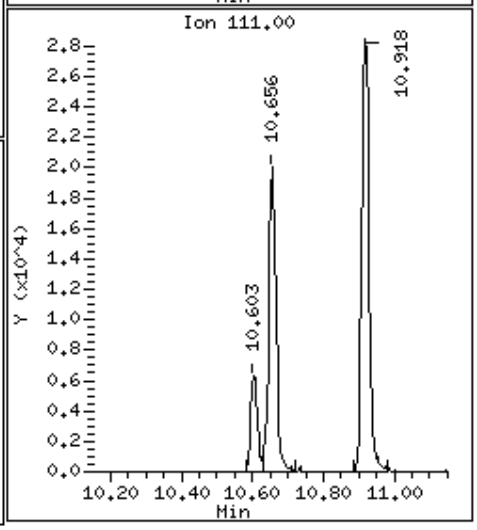



Data File: /var/chem/msv12.i/2180418.s.b/q8074.d

Date : 18-APR-2018 14:11

Client ID: 21804062002

Instrument: msv12.i

Sample Info: 21804062002x

Purge Volume: 5.0

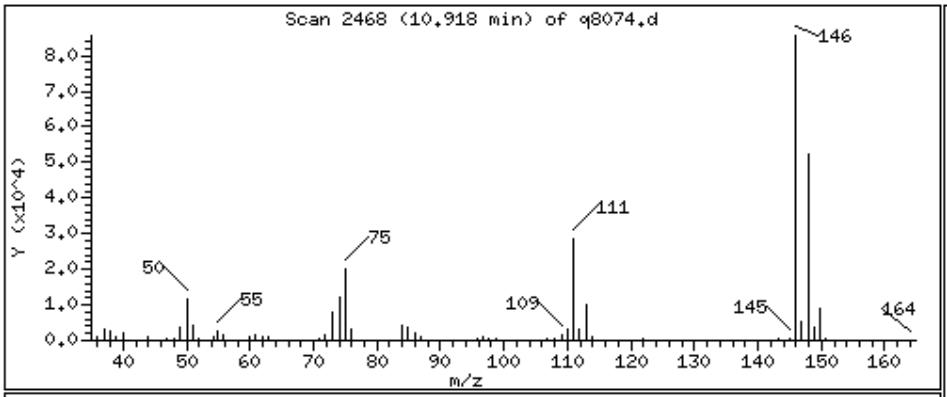
Operator: JMC2

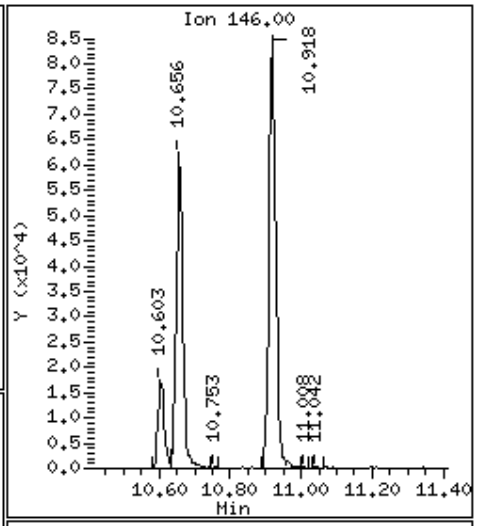
Column phase: RTX-VMS-30M

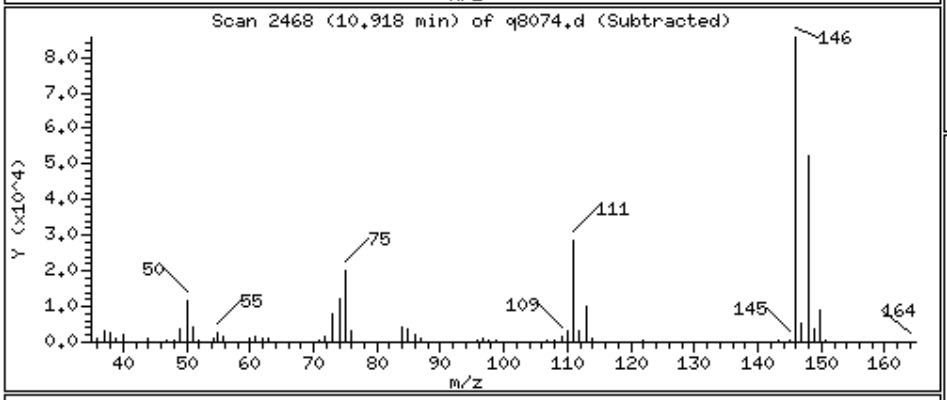
Column diameter: 0.25

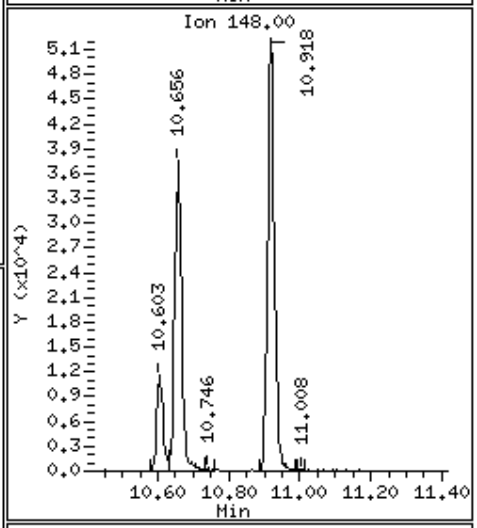
102 1,2-Dichlorobenzene

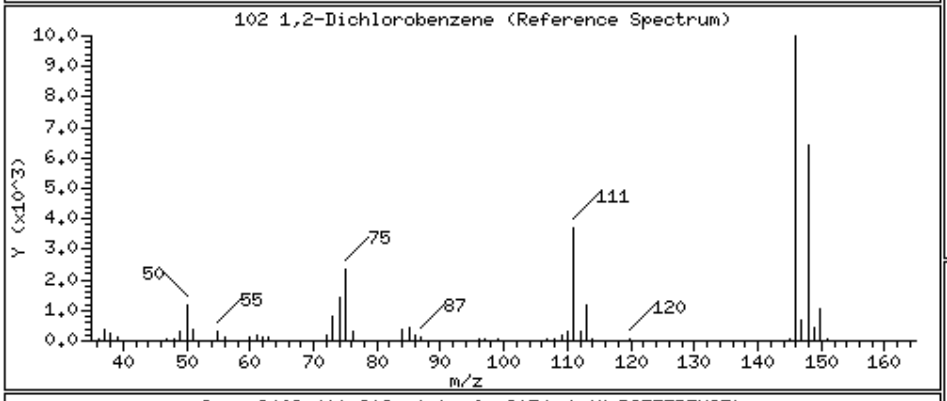
Concentration: 21.7 ug/L

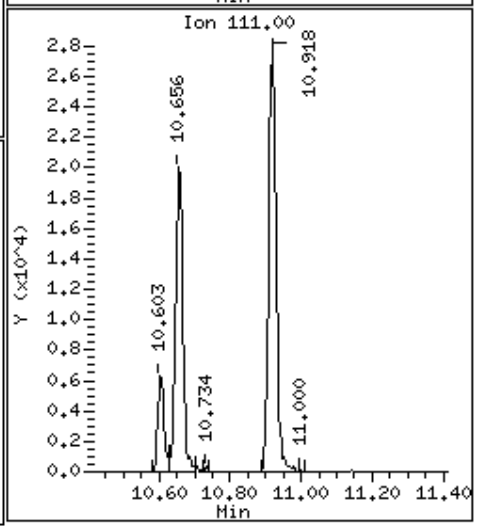


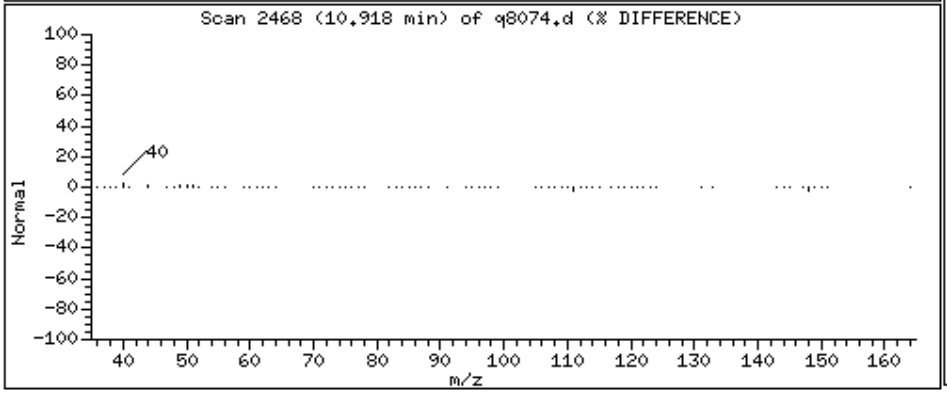



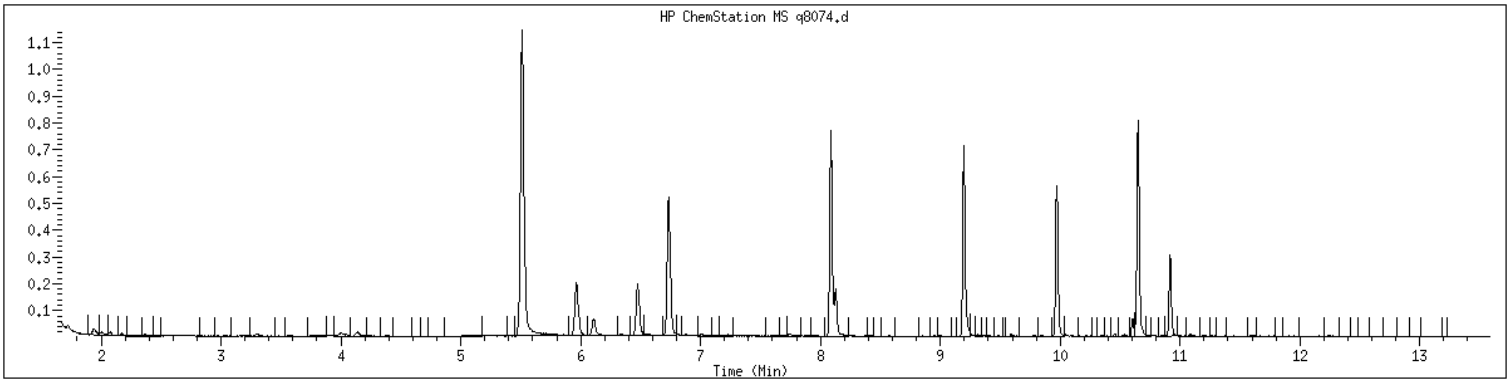



MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 21804062002 SampleType : SAMPLE
Injection Date: 04/18/2018 14:11 Instrument : msv12.i
Operator : JMC2
Sample Info : 21804062002*
Misc Info : MSV~40673~*1*JMC2
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b-




NO MANUAL INTEGRATIONS

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | S4-MW50-21 |
| Collect Date: | 04/05/18 Time: 1010 | GCAL Sample ID: | 21804062003 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8079 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1605 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-35-4 | 1,1-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 544-10-5 | 1-Chlorohexane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-93-3 | 2-Butanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 95-49-8 | 2-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 591-78-6 | 2-Hexanone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 67-64-1 | Acetone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 71-43-2 | Benzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-86-1 | Bromobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-97-5 | Bromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-27-4 | Bromodichloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-25-2 | Bromoform | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 74-83-9 | Bromomethane | 1.00 | U | 0.500 | 1.00 | 1.00 |
| 75-15-0 | Carbon disulfide | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 56-23-5 | Carbon tetrachloride | 0.500 | U | 0.250 | 0.500 | 1.00 |

FORM I VOA

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | S4-MW50-21 |
| Collect Date: | 04/05/18 Time: 1010 | GCAL Sample ID: | 21804062003 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8079 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1605 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 108-90-7 | Chlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-00-3 | Chloroethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 67-66-3 | Chloroform | 1.04 | | 0.200 | 0.500 | 1.00 |
| 74-87-3 | Chloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 124-48-1 | Dibromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-95-3 | Dibromomethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-41-4 | Ethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 98-82-8 | Isopropylbenzene (Cumene) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 136777-61-2 | m,p-Xylene | 0.500 | U | 0.200 | 0.500 | 2.00 |
| 75-09-2 | Methylene chloride | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 91-20-3 | Naphthalene | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 104-51-8 | n-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 103-65-1 | n-Propylbenzene | 2.00 | U | 1.00 | 2.00 | 5.00 |
| 95-47-6 | o-Xylene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 135-98-8 | sec-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-42-5 | Styrene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether (MTBE) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 98-06-6 | tert-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 127-18-4 | Tetrachloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-88-3 | Toluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-01-6 | Trichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-01-4 | Vinyl chloride | 0.500 | U | 0.200 | 0.500 | 1.00 |

FORM I VOA

GCAL, Inc.

Data file : /var/chem/msv12.i/2180418.s.b/q8079.d
Lab Smp Id: 21804062003 Client Smp ID: 21804062003
Inj Date : 18-APR-2018 16:05
Operator : JMC2 Inst ID: msv12.i
Smp Info : 21804062003*
Misc Info : MSV~40673~*1*JMC2
Comment :
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:06 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 18:43 Cal File: q7984cD.d
Als bottle: 14
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b-.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|
| 41 Chloroform + | 83 | 5.794 | 5.783 | (0.860) | 5504 | 1.04490 | 1.04 | |
| $ 36 Dibromofluoromethane | 111 | 5.966 | 5.966 | (0.886) | 119856 | 50.2947 | 50.3 | 6990 |
| $ 43 1,2-Dichloroethane-d4 | 67 | 6.476 | 6.476 | (0.962) | 67974 | 48.1715 | 48.2 | |
| * 47 FLUOROBENZENE | 96 | 6.735 | 6.735 | (1.000) | 446215 | 50.0000 | | |
| $ 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.879) | 423372 | 51.2805 | 51.3 | |
| * 71 CHLOROBENZENE-d5 | 82 | 9.197 | 9.198 | (1.000) | 169586 | 50.0000 | | |
| $ 80 Bromofluorobenzene | 174 | 9.973 | 9.970 | (1.084) | 135727 | 45.2414 | 45.2 | |
| * 97 1,4-DICHLOROBENZENE-D4 | 152 | 10.648 | 10.645 | (1.000) | 123440 | 50.0000 | | |

Data File: /var/chem/msv12.i/2180418.s.b/q8079.d



Date : 18-APR-2018 16:05

Client ID: 21804062003

Instrument: msv12.i

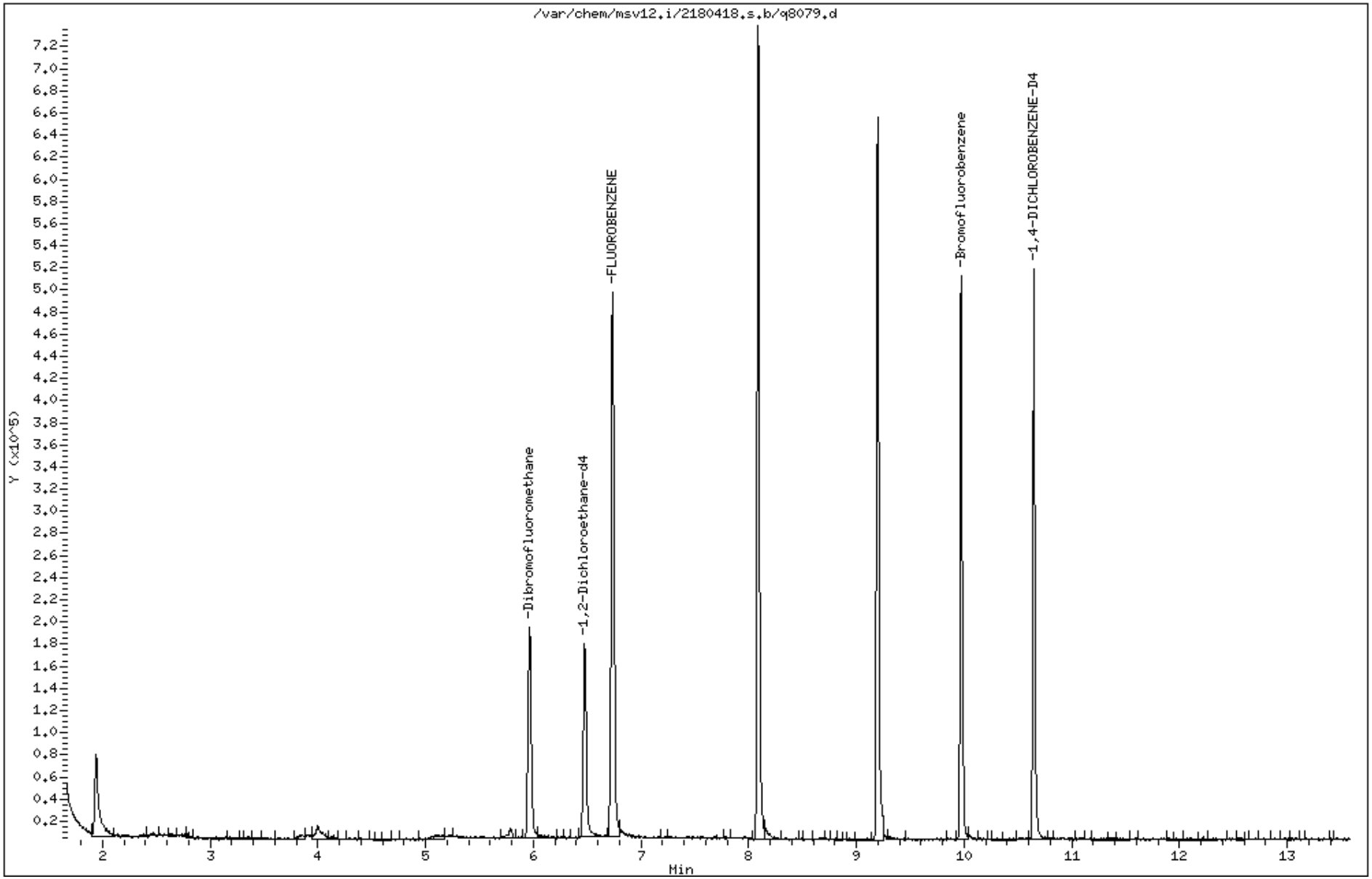
Sample Info: 21804062003*

Purge Volume: 5.0

Operator: JMC2

Column phase: RTX-VMS-30M

Column diameter: 0.25



Data File: /var/chem/msv12.i/2180418.s.b/q8079.d

Date : 18-APR-2018 16:05

Client ID: 21804062003

Instrument: msv12.i

Sample Info: 21804062003x

Purge Volume: 5.0

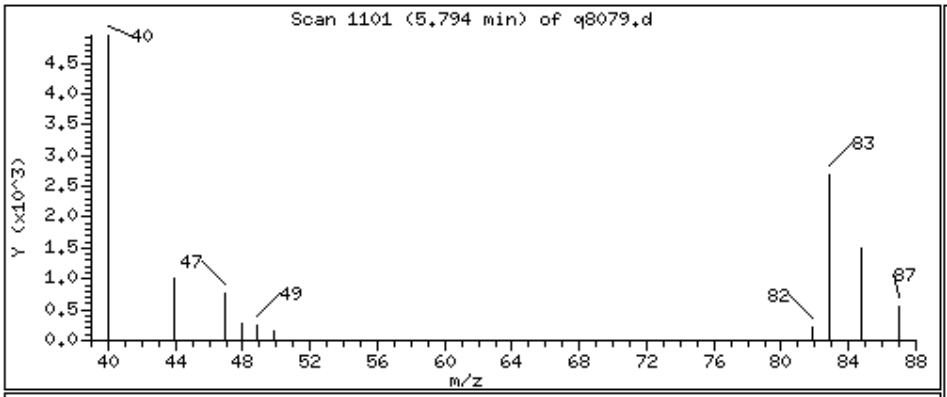
Operator: JMC2

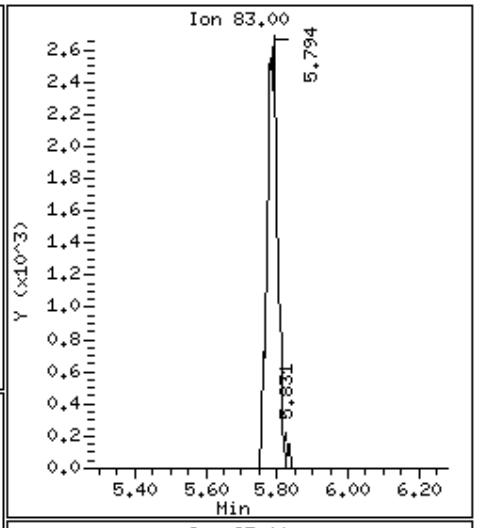
Column phase: RTX-VMS-30M

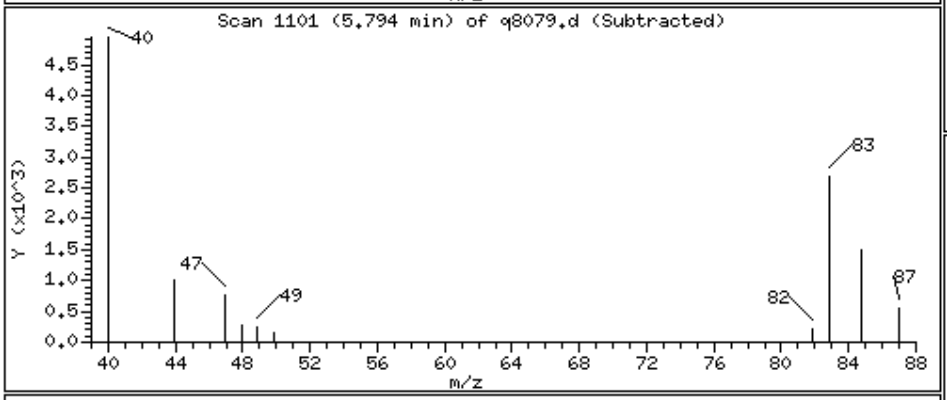
Column diameter: 0.25

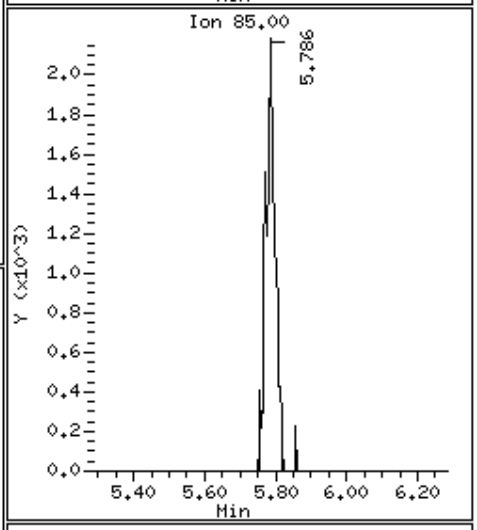
41 Chloroform +

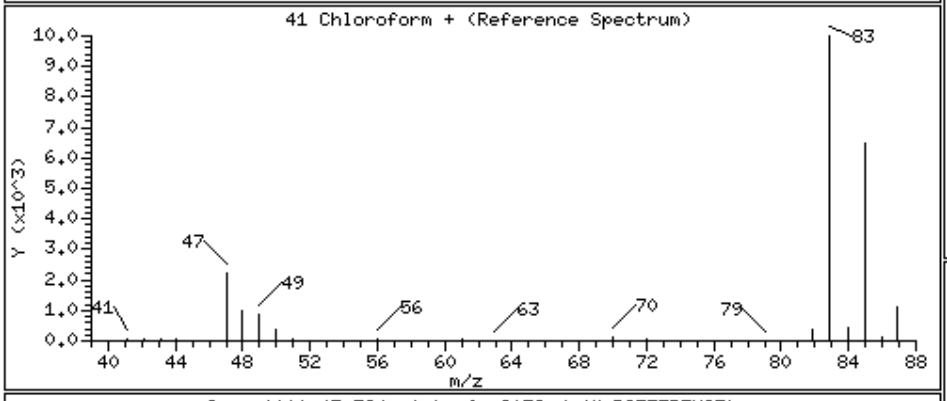
Concentration: 1.04 ug/L

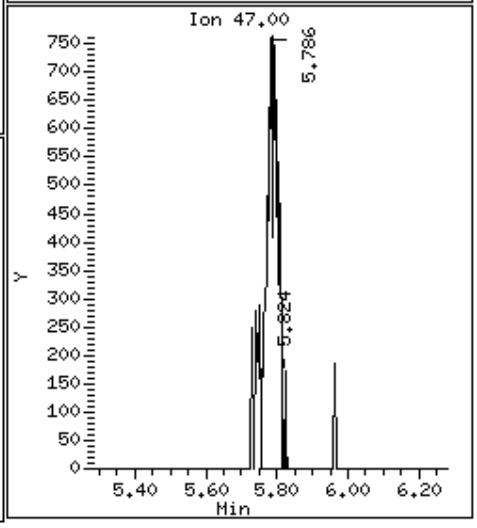


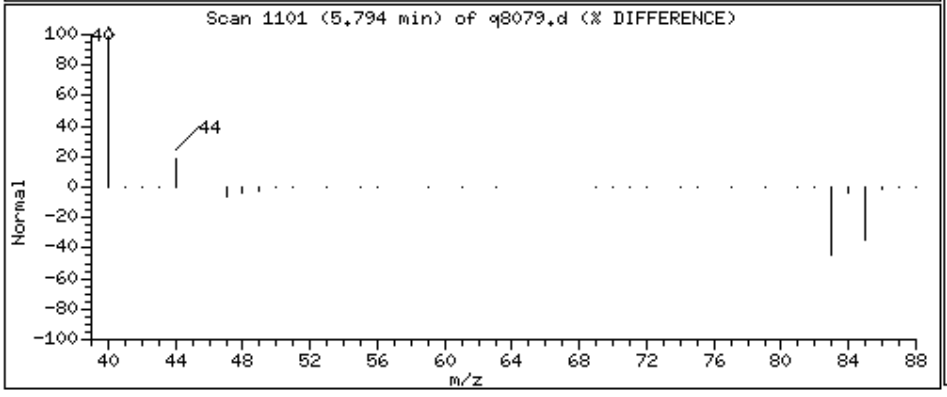



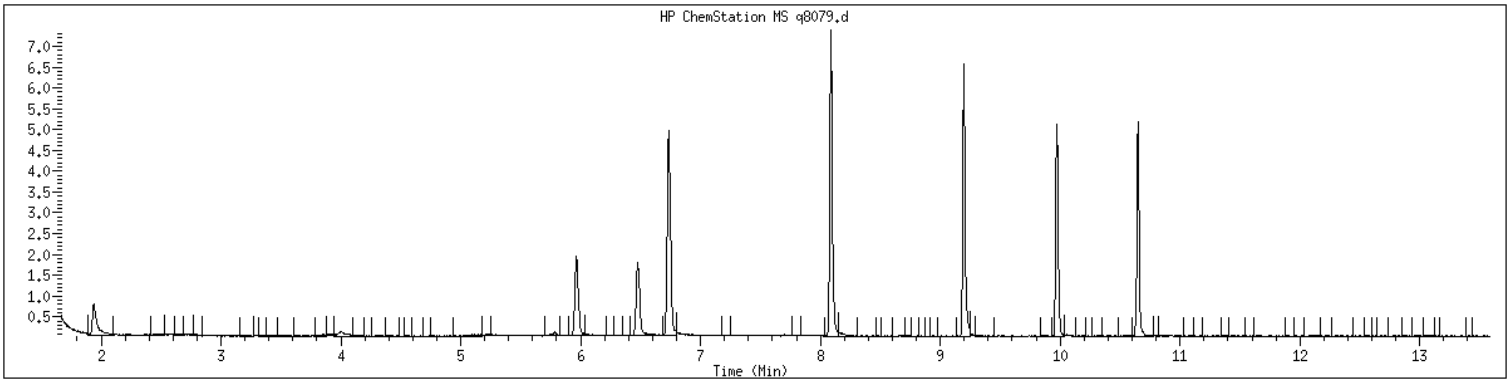



MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 21804062003 SampleType : SAMPLE
Injection Date: 04/18/2018 16:05 Instrument : msv12.i
Operator : JMC2
Sample Info : 21804062003*
Misc Info : MSV~40673~*1*JMC2
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b-




NO MANUAL INTEGRATIONS

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | S4-MW51-21 |
| Collect Date: | 04/05/18 Time: 1140 | GCAL Sample ID: | 21804062004 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8080 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1628 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-35-4 | 1,1-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 544-10-5 | 1-Chlorohexane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-93-3 | 2-Butanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 95-49-8 | 2-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 591-78-6 | 2-Hexanone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 67-64-1 | Acetone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 71-43-2 | Benzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-86-1 | Bromobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-97-5 | Bromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-27-4 | Bromodichloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-25-2 | Bromoform | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 74-83-9 | Bromomethane | 1.00 | U | 0.500 | 1.00 | 1.00 |
| 75-15-0 | Carbon disulfide | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 56-23-5 | Carbon tetrachloride | 0.500 | U | 0.250 | 0.500 | 1.00 |

FORM I VOA

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | S4-MW51-21 |
| Collect Date: | 04/05/18 Time: 1140 | GCAL Sample ID: | 21804062004 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8080 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1628 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 108-90-7 | Chlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-00-3 | Chloroethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 67-66-3 | Chloroform | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-87-3 | Chloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 124-48-1 | Dibromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-95-3 | Dibromomethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-41-4 | Ethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 98-82-8 | Isopropylbenzene (Cumene) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 136777-61-2 | m,p-Xylene | 0.500 | U | 0.200 | 0.500 | 2.00 |
| 75-09-2 | Methylene chloride | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 91-20-3 | Naphthalene | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 104-51-8 | n-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 103-65-1 | n-Propylbenzene | 2.00 | U | 1.00 | 2.00 | 5.00 |
| 95-47-6 | o-Xylene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 135-98-8 | sec-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-42-5 | Styrene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether (MTBE) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 98-06-6 | tert-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 127-18-4 | Tetrachloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-88-3 | Toluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-01-6 | Trichloroethene | 4.24 | | 0.200 | 0.500 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-01-4 | Vinyl chloride | 0.500 | U | 0.200 | 0.500 | 1.00 |

GCAL, Inc.

Data file : /var/chem/msv12.i/2180418.s.b/q8080.d
Lab Smp Id: 21804062004 Client Smp ID: 21804062004
Inj Date : 18-APR-2018 16:28
Operator : JMC2 Inst ID: msv12.i
Smp Info : 21804062004*
Misc Info : MSV~40673~*1*JMC2
Comment :
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:06 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 18:43 Cal File: q7984cD.d
Als bottle: 15
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b-.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|
| $ 36 Dibromofluoromethane | 111 | 5.966 | 5.966 | (0.886) | 119551 | 49.5007 | 49.5 | 6990 |
| $ 43 1,2-Dichloroethane-d4 | 67 | 6.476 | 6.476 | (0.962) | 71074 | 49.6997 | 49.7 | |
| * 47 FLUOROBENZENE | 96 | 6.735 | 6.735 | (1.000) | 452219 | 50.0000 | | |
| 49 Trichloroethene | 130 | 6.888 | 6.888 | (1.023) | 13461 | 4.23783 | 4.24 | (H) |
| $ 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.879) | 434244 | 52.6368 | 52.6 | |
| * 71 CHLOROBENZENE-d5 | 82 | 9.197 | 9.198 | (1.000) | 169459 | 50.0000 | | |
| $ 80 Bromofluorobenzene | 174 | 9.973 | 9.970 | (1.084) | 136728 | 45.6093 | 45.6 | |
| * 97 1,4-DICHLOROBENZENE-D4 | 152 | 10.648 | 10.645 | (1.000) | 123107 | 50.0000 | | |

QC Flag Legend

H - Operator selected an alternate compound hit.

Data File: /var/chem/msv12.i/2180418.s.b/q8080.d

Page 1

Date : 18-APR-2018 16:28

Client ID: 21804062004

Instrument: msv12.i

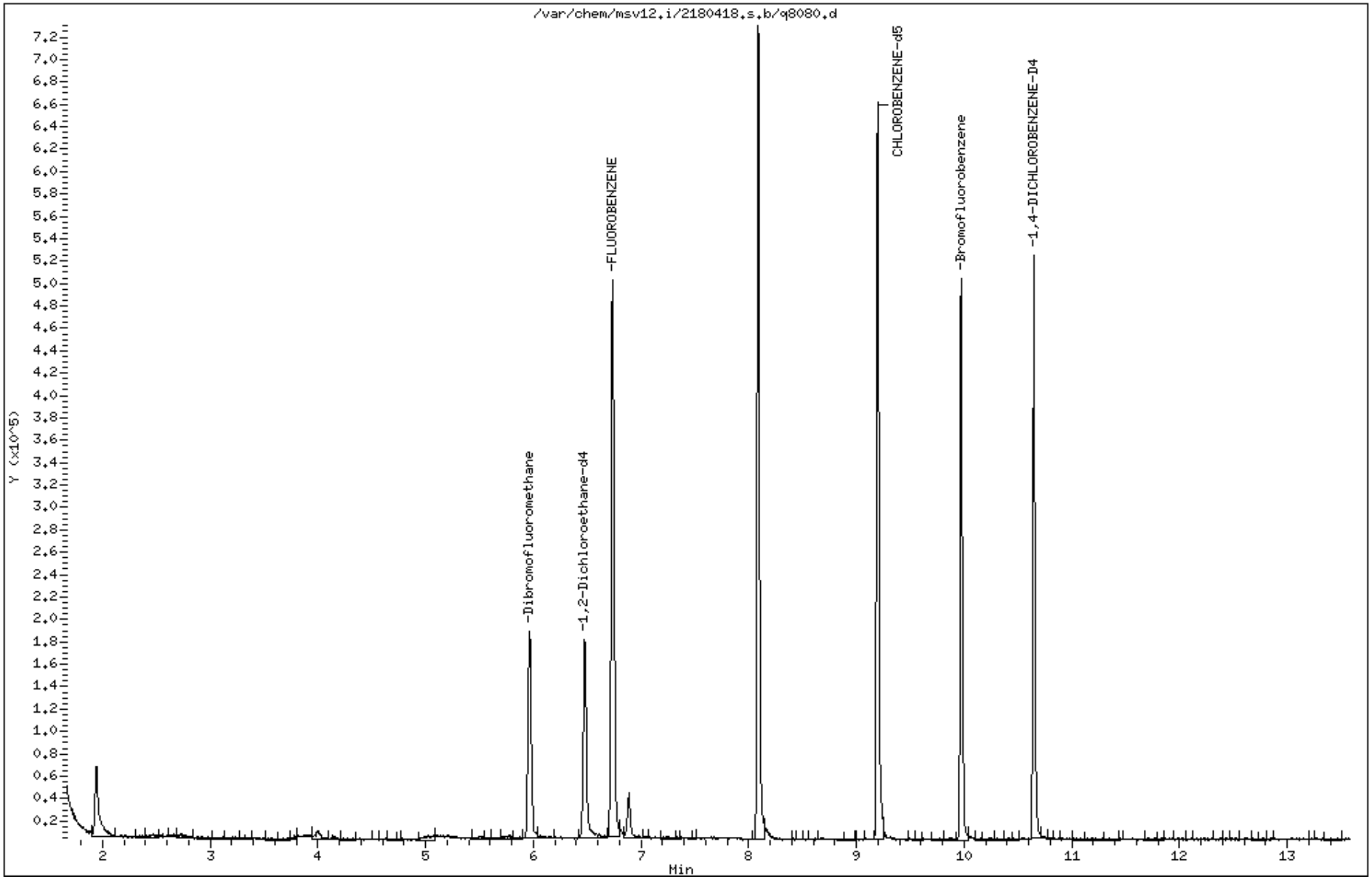
Sample Info: 21804062004*

Purge Volume: 5.0

Operator: JMC2

Column phase: RTX-VMS-30M

Column diameter: 0.25



Data File: /var/chem/msv12.i/2180418.s.b/q8080.d

Date : 18-APR-2018 16:28

Client ID: 21804062004

Instrument: msv12.i

Sample Info: 21804062004x

Purge Volume: 5.0

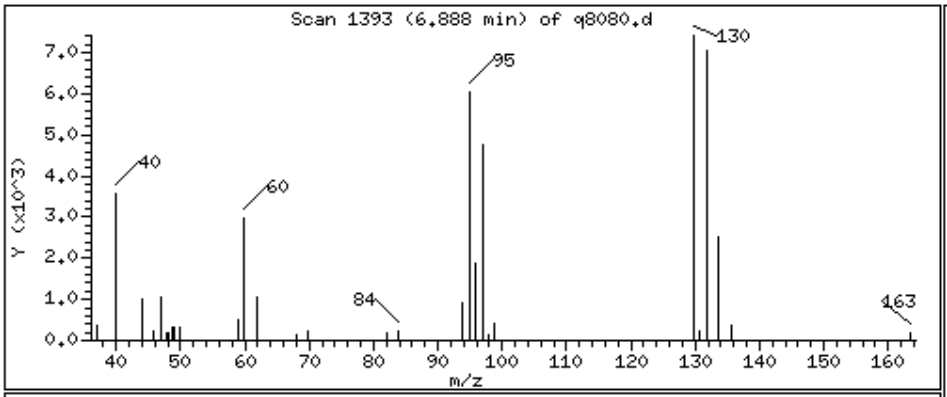
Operator: JMC2

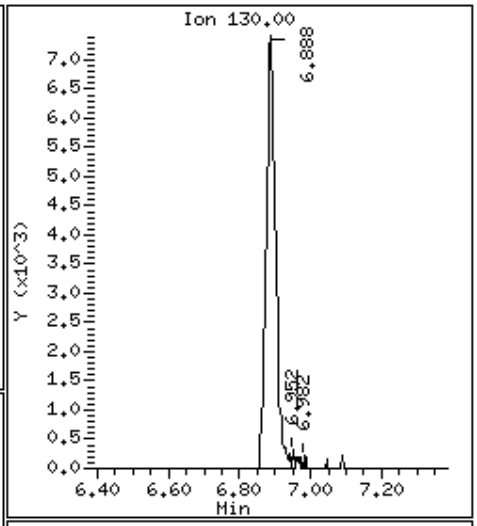
Column phase: RTX-VMS-30M

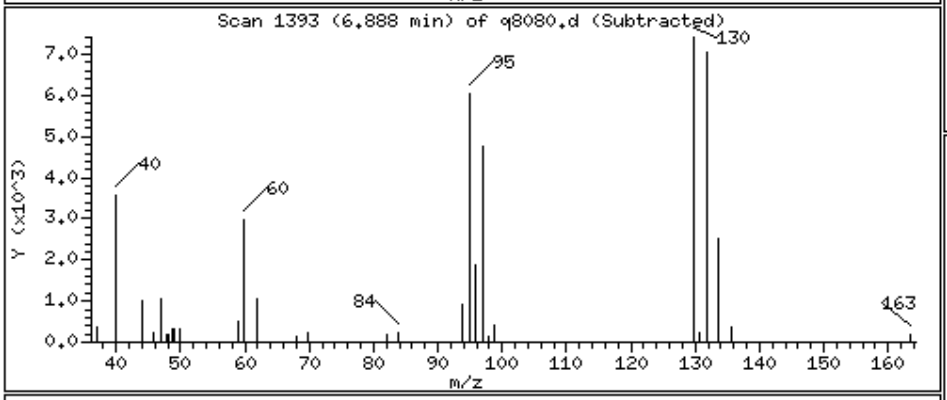
Column diameter: 0.25

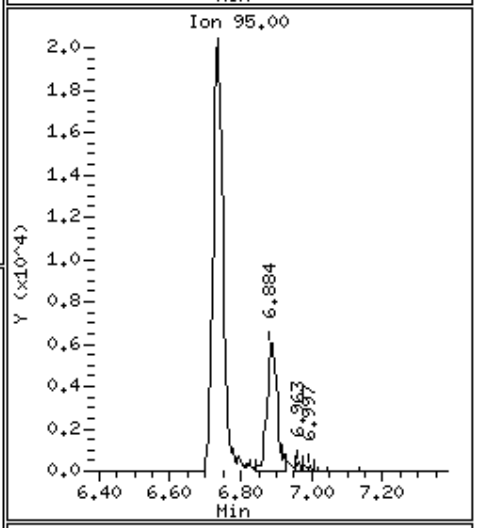
49 Trichloroethene

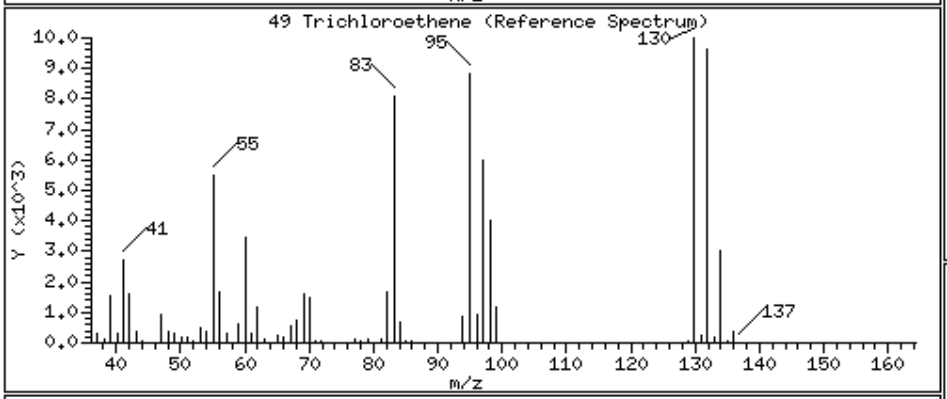
Concentration: 4.24 ug/L

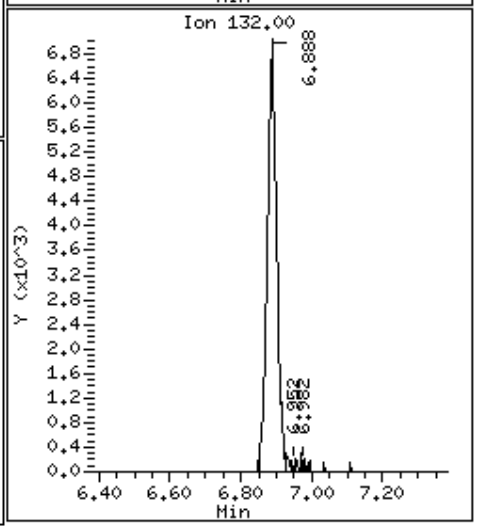


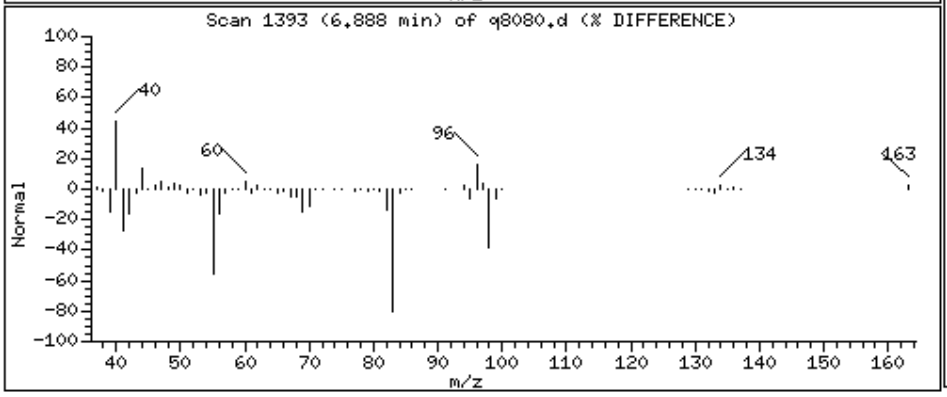



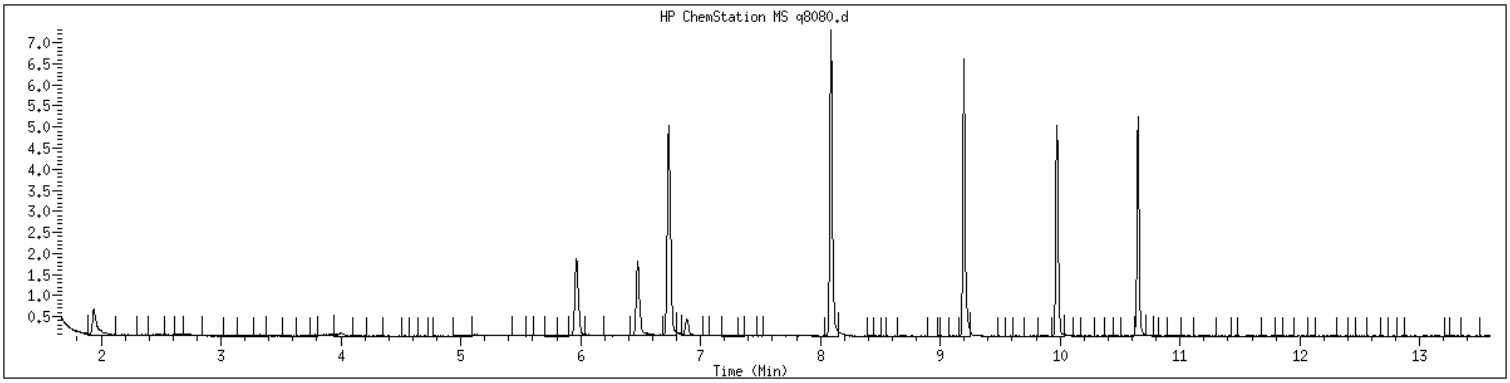



MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 21804062004 SampleType : SAMPLE
Injection Date: 04/18/2018 16:28 Instrument : msv12.i
Operator : JMC2
Sample Info : 21804062004*
Misc Info : MSV~40673~*1*JMC2
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b-




NO MANUAL INTEGRATIONS

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | S4-MW-49-21 |
| Collect Date: | 04/05/18 Time: 1013 | GCAL Sample ID: | 21804062005 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8081 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1651 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-35-4 | 1,1-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 544-10-5 | 1-Chlorohexane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-93-3 | 2-Butanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 95-49-8 | 2-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 591-78-6 | 2-Hexanone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 67-64-1 | Acetone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 71-43-2 | Benzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-86-1 | Bromobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-97-5 | Bromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-27-4 | Bromodichloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-25-2 | Bromoform | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 74-83-9 | Bromomethane | 1.00 | U | 0.500 | 1.00 | 1.00 |
| 75-15-0 | Carbon disulfide | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 56-23-5 | Carbon tetrachloride | 0.500 | U | 0.250 | 0.500 | 1.00 |

FORM I VOA

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | S4-MW-49-21 |
| Collect Date: | 04/05/18 Time: 1013 | GCAL Sample ID: | 21804062005 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8081 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1651 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 108-90-7 | Chlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-00-3 | Chloroethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 67-66-3 | Chloroform | 0.525 | J | 0.200 | 0.500 | 1.00 |
| 74-87-3 | Chloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 124-48-1 | Dibromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-95-3 | Dibromomethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-41-4 | Ethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 98-82-8 | Isopropylbenzene (Cumene) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 136777-61-2 | m,p-Xylene | 0.500 | U | 0.200 | 0.500 | 2.00 |
| 75-09-2 | Methylene chloride | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 91-20-3 | Naphthalene | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 104-51-8 | n-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 103-65-1 | n-Propylbenzene | 2.00 | U | 1.00 | 2.00 | 5.00 |
| 95-47-6 | o-Xylene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 135-98-8 | sec-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-42-5 | Styrene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether (MTBE) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 98-06-6 | tert-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 127-18-4 | Tetrachloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-88-3 | Toluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-01-6 | Trichloroethene | 1.98 | | 0.200 | 0.500 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-01-4 | Vinyl chloride | 0.500 | U | 0.200 | 0.500 | 1.00 |

FORM I VOA

GCAL, Inc.

Data file : /var/chem/msv12.i/2180418.s.b/q8081.d
Lab Smp Id: 21804062005 Client Smp ID: 21804062005
Inj Date : 18-APR-2018 16:51
Operator : JMC2 Inst ID: msv12.i
Smp Info : 21804062005*
Misc Info : MSV~40673~*1*JMC2
Comment :
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:06 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 18:43 Cal File: q7984cD.d
Als bottle: 16
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b-.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|
| 41 Chloroform + | 83 | 5.790 | 5.783 | (0.860) | 2814 | 0.52467 | 0.525 | (H) |
| $ 36 Dibromofluoromethane | 111 | 5.966 | 5.966 | (0.886) | 122770 | 50.5961 | 50.6 | 7001 |
| $ 43 1,2-Dichloroethane-d4 | 67 | 6.476 | 6.476 | (0.962) | 71575 | 49.8163 | 49.8 | |
| * 47 FLUOROBENZENE | 96 | 6.735 | 6.735 | (1.000) | 454341 | 50.0000 | | |
| 49 Trichloroethene | 130 | 6.885 | 6.888 | (1.022) | 6314 | 1.97851 | 1.98 | |
| $ 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.879) | 444507 | 52.7386 | 52.7 | |
| * 71 CHLOROBENZENE-d5 | 82 | 9.198 | 9.198 | (1.000) | 173129 | 50.0000 | | |
| $ 80 Bromofluorobenzene | 174 | 9.974 | 9.970 | (1.084) | 138731 | 45.2964 | 45.3 | |
| * 97 1,4-DICHLOROBENZENE-D4 | 152 | 10.648 | 10.645 | (1.000) | 125082 | 50.0000 | | |

QC Flag Legend

H - Operator selected an alternate compound hit.

Data File: /var/chem/msv12.i/2180418.s.b/q8081.d

Page 1

Date : 18-APR-2018 16:51

Client ID: 21804062005

Instrument: msv12.i

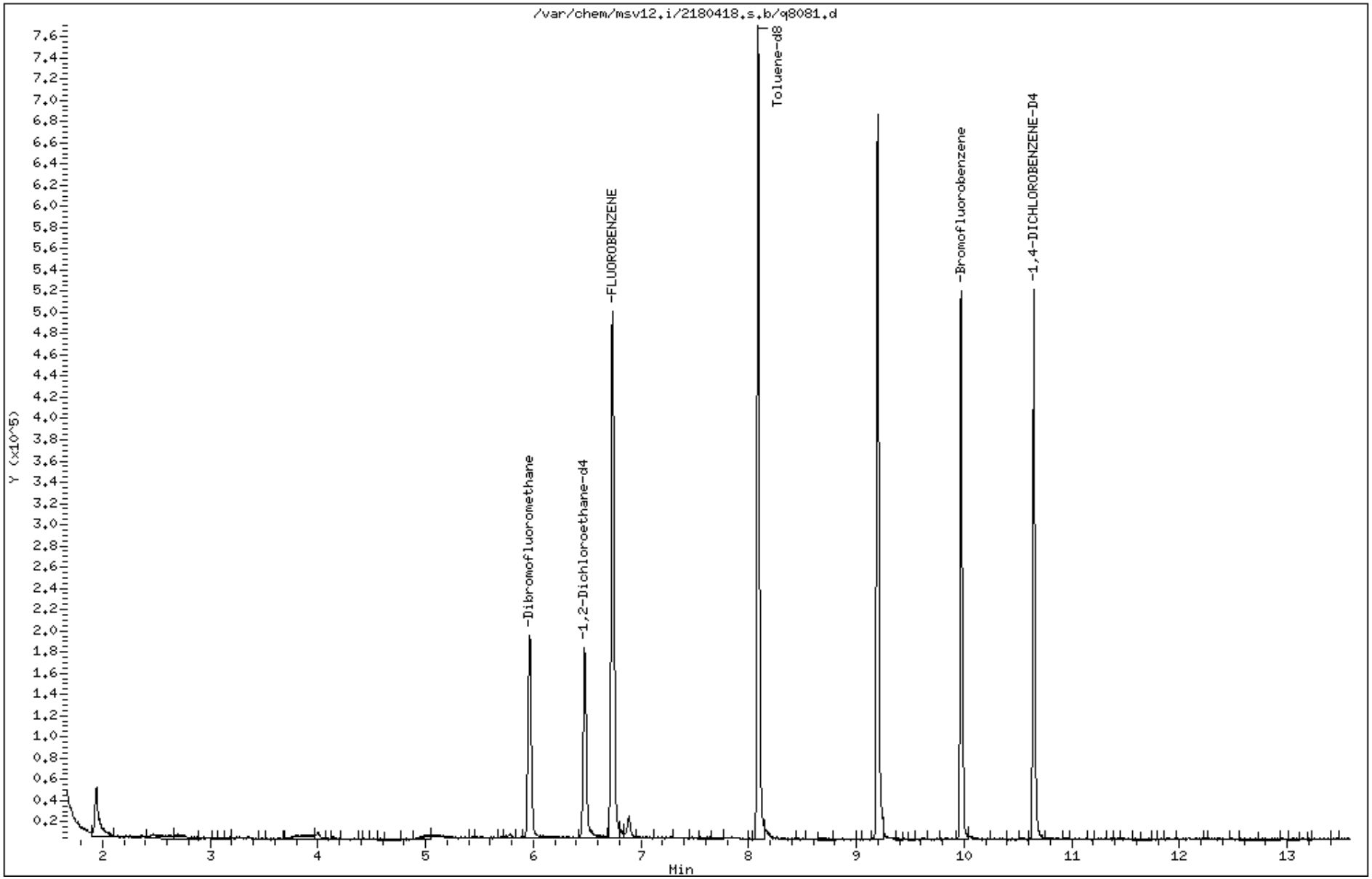
Sample Info: 21804062005*

Purge Volume: 5.0

Operator: JMC2

Column phase: RTX-VMS-30M

Column diameter: 0.25



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Date : 18-APR-2018 16:51

Client ID: 21804062005

Instrument: msv12.i

Sample Info: 21804062005x

Purge Volume: 5.0

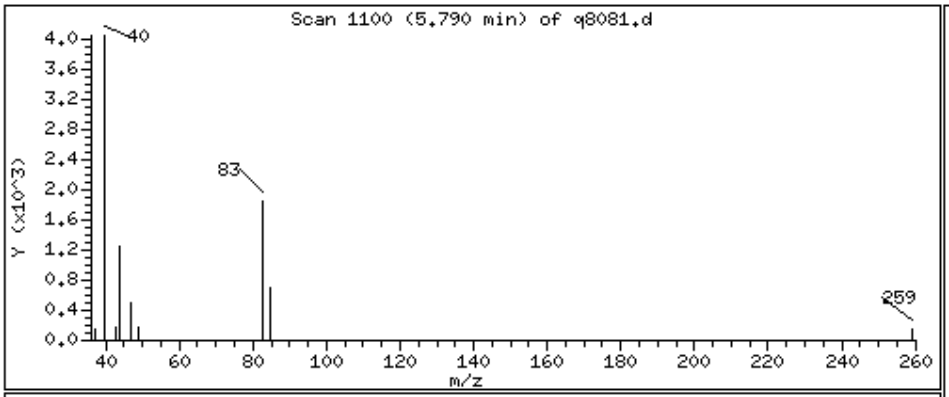
Operator: JMC2

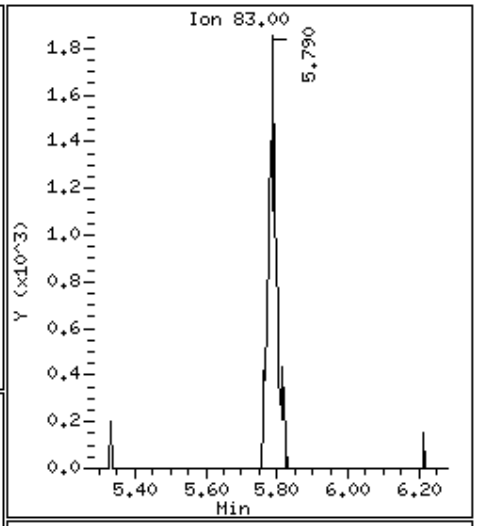
Column phase: RTX-VMS-30M

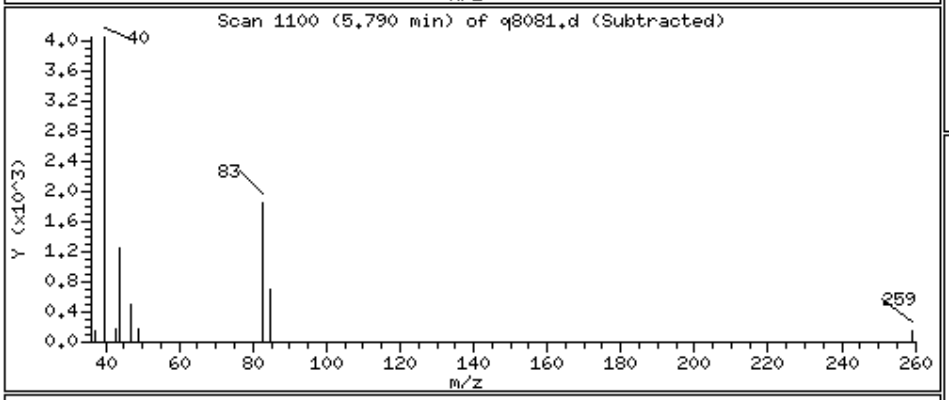
Column diameter: 0.25

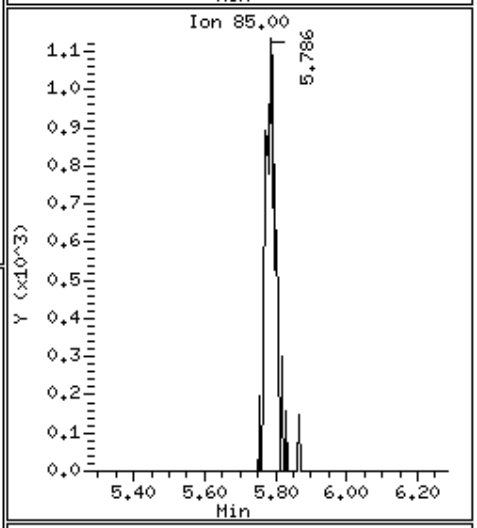
41 Chloroform +

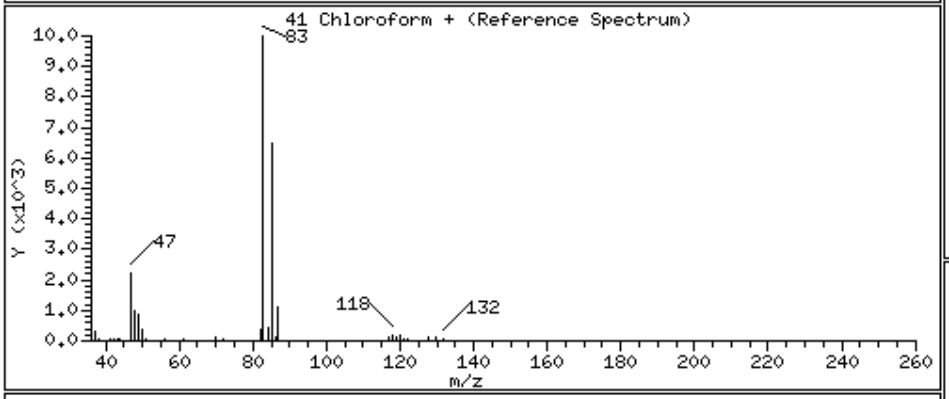
Concentration: 0.525 ug/L

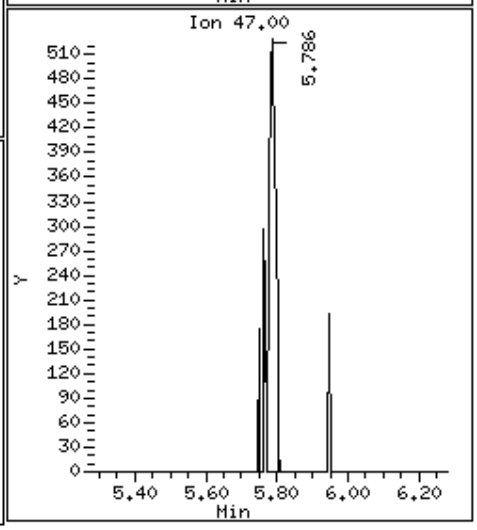


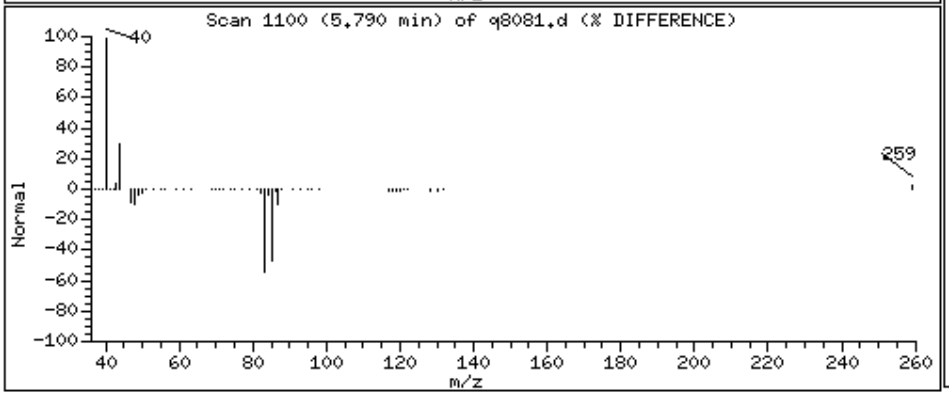



Data File: /var/chem/msv12.i/2180418.s.b/q8081.d

Date : 18-APR-2018 16:51

Client ID: 21804062005

Instrument: msv12.i

Sample Info: 21804062005x

Purge Volume: 5.0

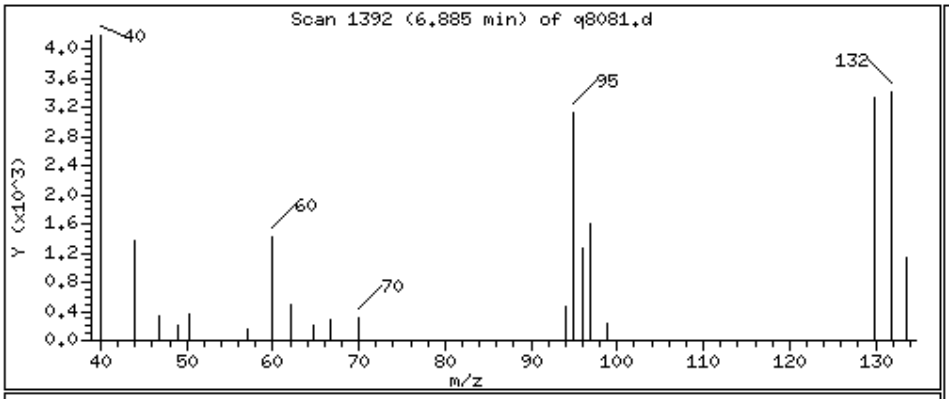
Operator: JMC2

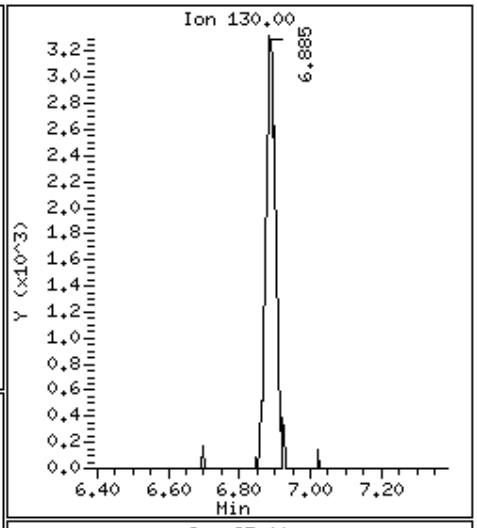
Column phase: RTX-VMS-30M

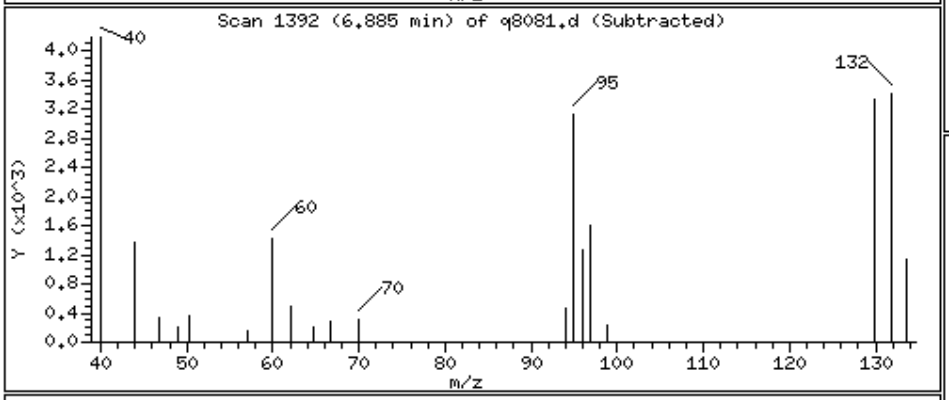
Column diameter: 0.25

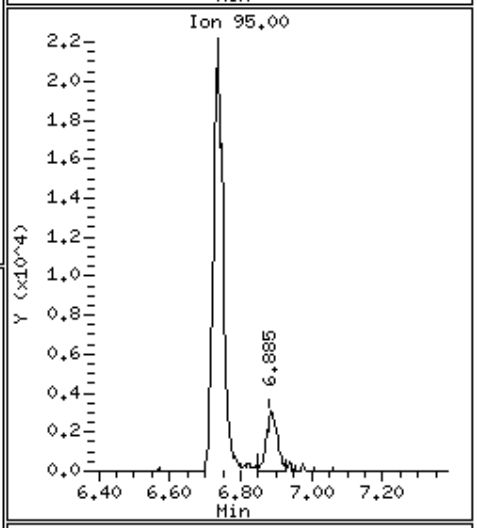
49 Trichloroethene

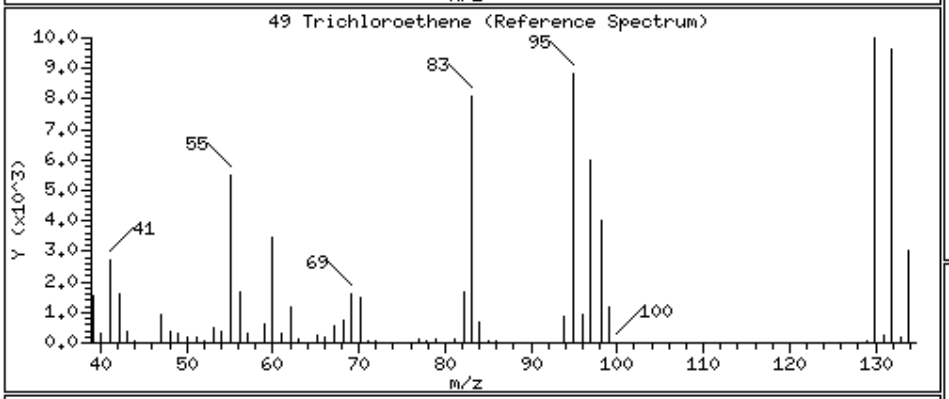
Concentration: 1.98 ug/L

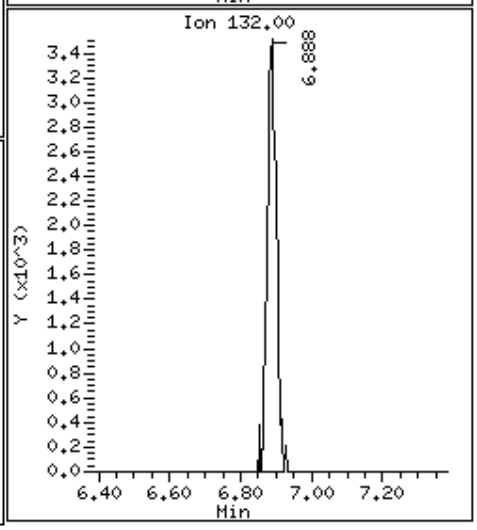


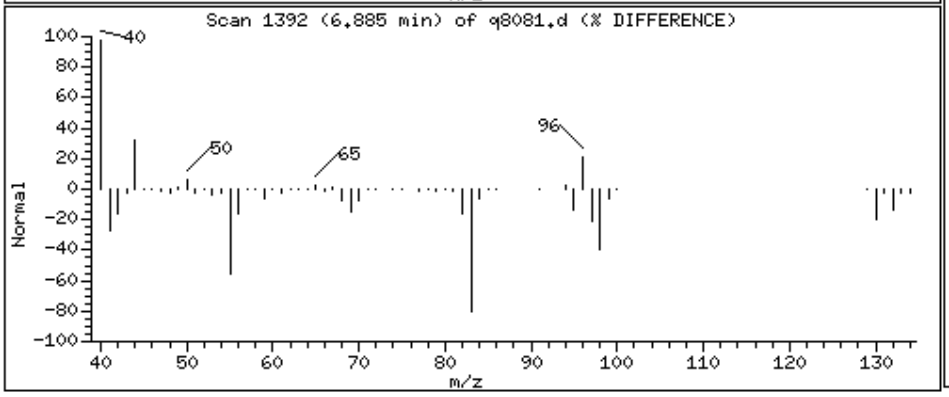



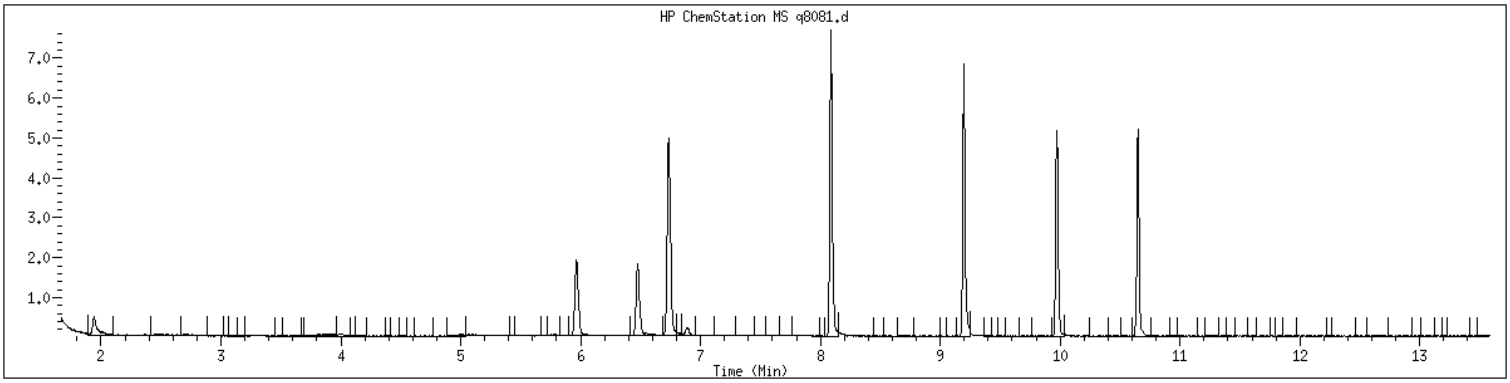



Report Date: 04/19/2018 11:06

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 21804062005 SampleType : SAMPLE
Injection Date: 04/18/2018 16:51 Instrument : msv12.i
Operator : JMC2
Sample Info : 21804062005*
Misc Info : MSV~40673~*1*JMC2
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b-




NO MANUAL INTEGRATIONS

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | S4-MW-48-21 |
| Collect Date: | 04/05/18 Time: 1140 | GCAL Sample ID: | 21804062006 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8082 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1714 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-35-4 | 1,1-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 544-10-5 | 1-Chlorohexane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-93-3 | 2-Butanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 95-49-8 | 2-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 591-78-6 | 2-Hexanone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 67-64-1 | Acetone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 71-43-2 | Benzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-86-1 | Bromobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-97-5 | Bromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-27-4 | Bromodichloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-25-2 | Bromoform | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 74-83-9 | Bromomethane | 1.00 | U | 0.500 | 1.00 | 1.00 |
| 75-15-0 | Carbon disulfide | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 56-23-5 | Carbon tetrachloride | 0.500 | U | 0.250 | 0.500 | 1.00 |

FORM I VOA

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | S4-MW-48-21 |
| Collect Date: | 04/05/18 Time: 1140 | GCAL Sample ID: | 21804062006 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8082 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1714 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 108-90-7 | Chlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-00-3 | Chloroethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 67-66-3 | Chloroform | 0.604 | J | 0.200 | 0.500 | 1.00 |
| 74-87-3 | Chloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethene | 0.416 | J | 0.200 | 0.500 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 124-48-1 | Dibromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-95-3 | Dibromomethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-41-4 | Ethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 98-82-8 | Isopropylbenzene (Cumene) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 136777-61-2 | m,p-Xylene | 0.500 | U | 0.200 | 0.500 | 2.00 |
| 75-09-2 | Methylene chloride | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 91-20-3 | Naphthalene | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 104-51-8 | n-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 103-65-1 | n-Propylbenzene | 2.00 | U | 1.00 | 2.00 | 5.00 |
| 95-47-6 | o-Xylene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 135-98-8 | sec-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-42-5 | Styrene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether (MTBE) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 98-06-6 | tert-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 127-18-4 | Tetrachloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-88-3 | Toluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-01-6 | Trichloroethene | 11.4 | | 0.200 | 0.500 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-01-4 | Vinyl chloride | 0.500 | U | 0.200 | 0.500 | 1.00 |

GCAL, Inc.

Data file : /var/chem/msv12.i/2180418.s.b/q8082.d
Lab Smp Id: 21804062006 Client Smp ID: 21804062006
Inj Date : 18-APR-2018 17:14
Operator : JMC2 Inst ID: msv12.i
Smp Info : 21804062006*
Misc Info : MSV~40673~*1*JMC2
Comment :
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:06 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 18:43 Cal File: q7984cD.d
Als bottle: 17
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b-.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| | Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|---|
| | 30 cis-1,2-Dichloroethene | 61 | 5.516 | 5.509 | (0.819) | 1548 | 0.41573 | 0.416 | (H) |
| M | 48 Total 1,2-Dichloroethene | 61 | | | | 1548 | 0.41573 | 0.416 | |
| | 41 Chloroform + | 83 | 5.790 | 5.783 | (0.859) | 3154 | 0.60421 | 0.604 | |
| $ | 36 Dibromofluoromethane | 111 | 5.966 | 5.966 | (0.885) | 118828 | 50.3162 | 50.3 | 6998 |
| $ | 43 1,2-Dichloroethane-d4 | 67 | 6.480 | 6.476 | (0.962) | 68521 | 49.0002 | 49.0 | |
| * | 47 FLUOROBENZENE | 96 | 6.738 | 6.735 | (1.000) | 442199 | 50.0000 | | |
| | 49 Trichloroethene | 130 | 6.888 | 6.888 | (1.022) | 35562 | 11.4494 | 11.4 | |
| $ | 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.879) | 428452 | 51.6861 | 51.7 | |
| * | 71 CHLOROBENZENE-d5 | 82 | 9.197 | 9.198 | (1.000) | 170274 | 50.0000 | | |
| $ | 80 Bromofluorobenzene | 174 | 9.973 | 9.970 | (1.084) | 135050 | 44.8339 | 44.8 | |
| * | 97 1,4-DICHLOROBENZENE-D4 | 152 | 10.648 | 10.645 | (1.000) | 122410 | 50.0000 | | |

QC Flag Legend

H - Operator selected an alternate compound hit.

Data File: /var/chem/msv12.i/2180418.s.b/q8082.d



Date : 18-APR-2018 17:14

Client ID: 21804062006

Instrument: msv12.i

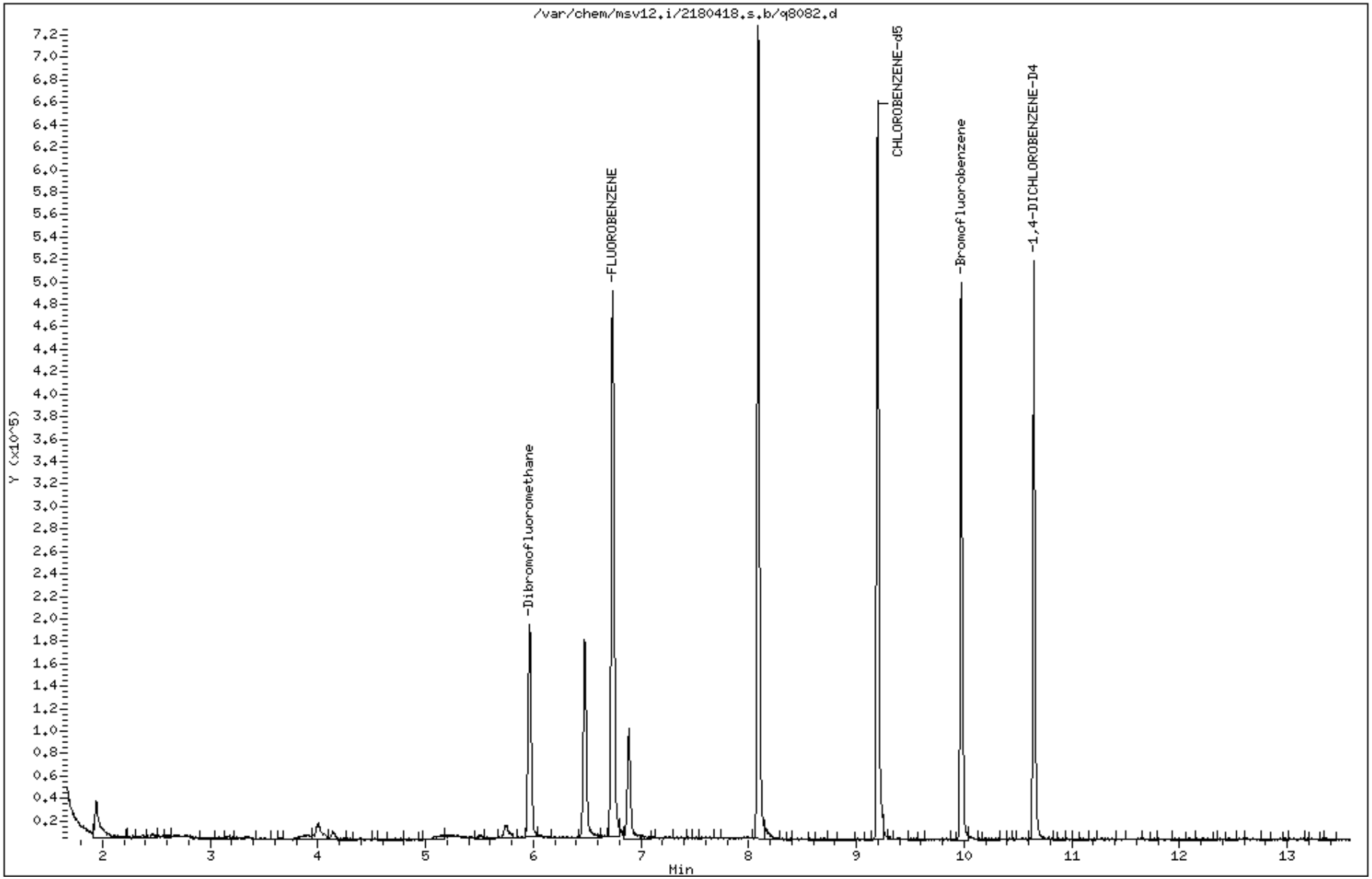
Sample Info: 21804062006*

Purge Volume: 5.0

Operator: JMC2

Column phase: RTX-VMS-30M

Column diameter: 0.25



Data File: /var/chem/msv12.i/2180418.s.b/q8082.d

Date : 18-APR-2018 17:14

Client ID: 21804062006

Instrument: msv12.i

Sample Info: 21804062006x

Purge Volume: 5.0

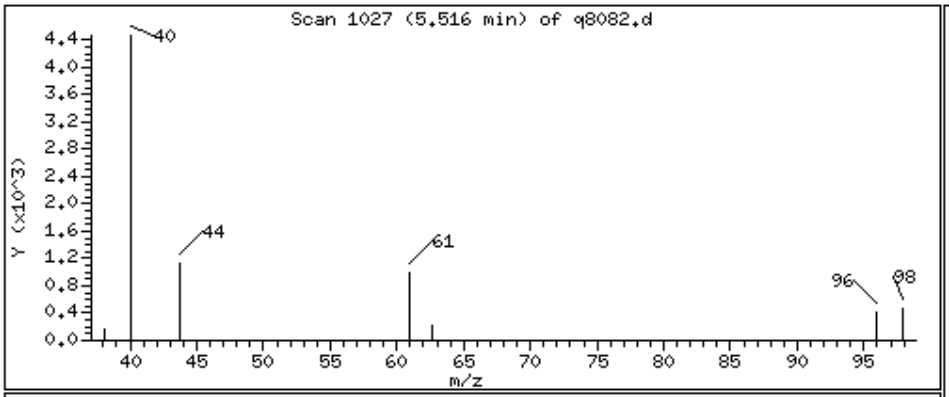
Operator: JMC2

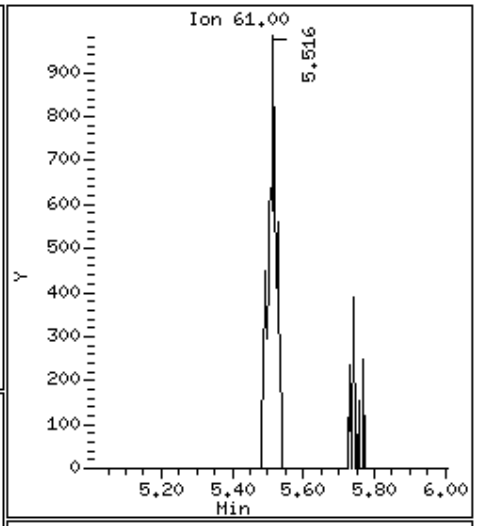
Column phase: RTX-VMS-30M

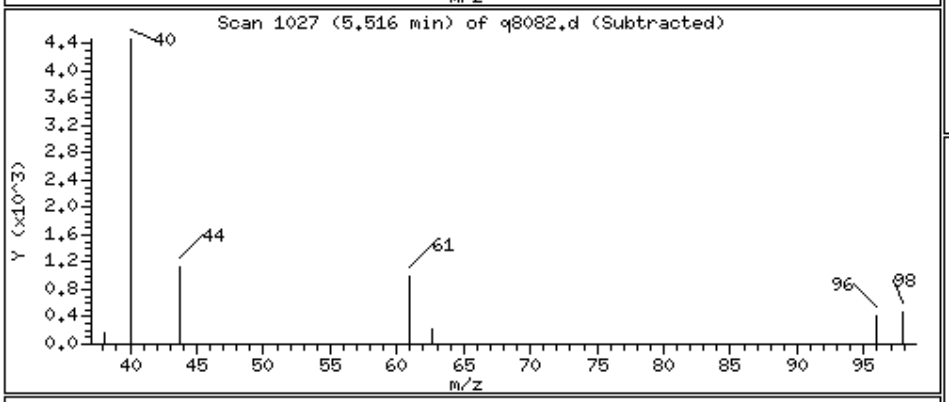
Column diameter: 0.25

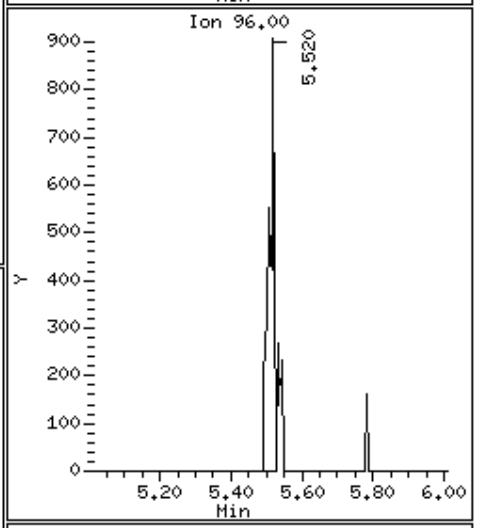
30 cis-1,2-Dichloroethene

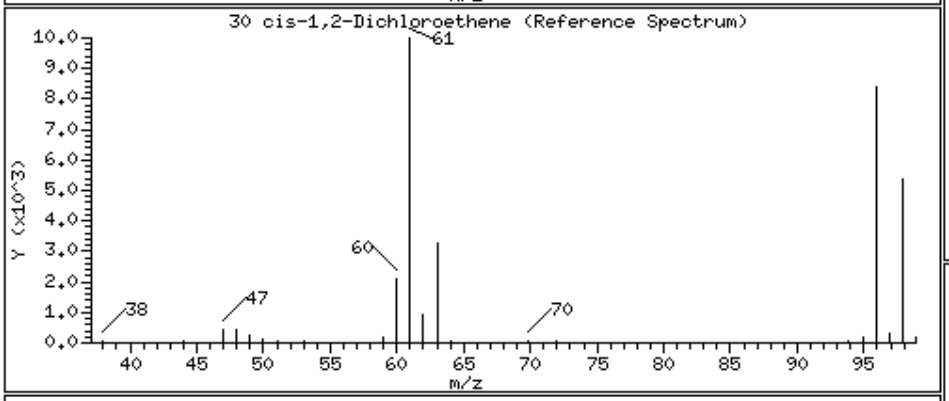
Concentration: 0.416 ug/L

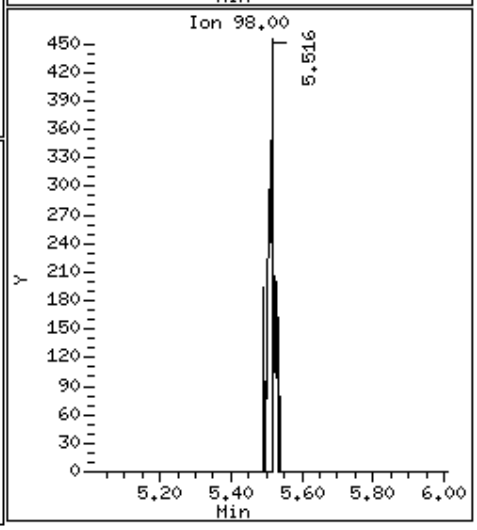


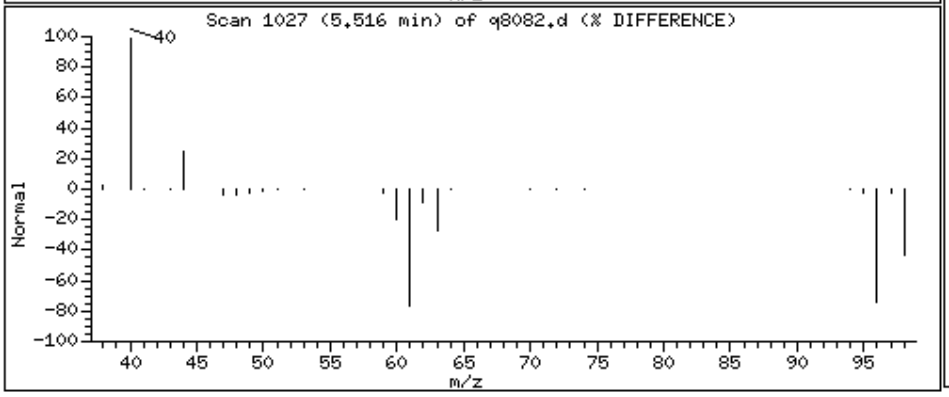



Data File: /var/chem/msv12.i/2180418.s.b/q8082.d

Date : 18-APR-2018 17:14

Client ID: 21804062006

Instrument: msv12.i

Sample Info: 21804062006x

Purge Volume: 5.0

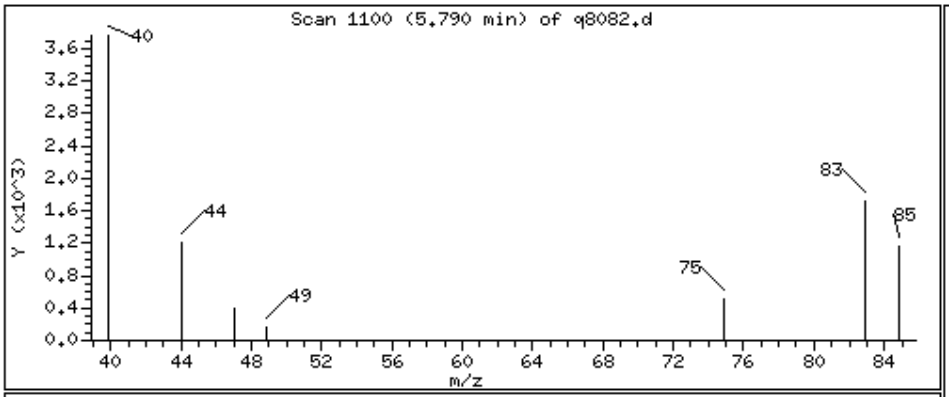
Operator: JMC2

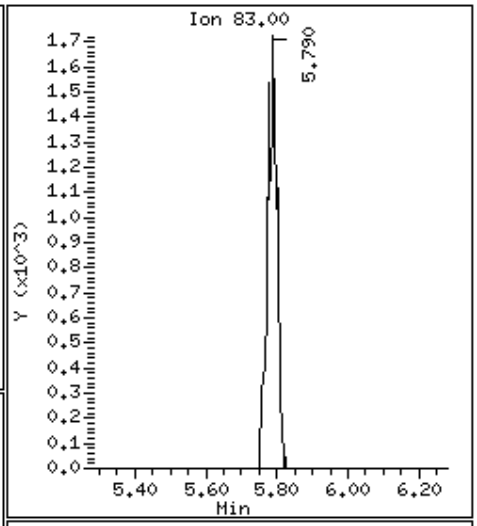
Column phase: RTX-VMS-30M

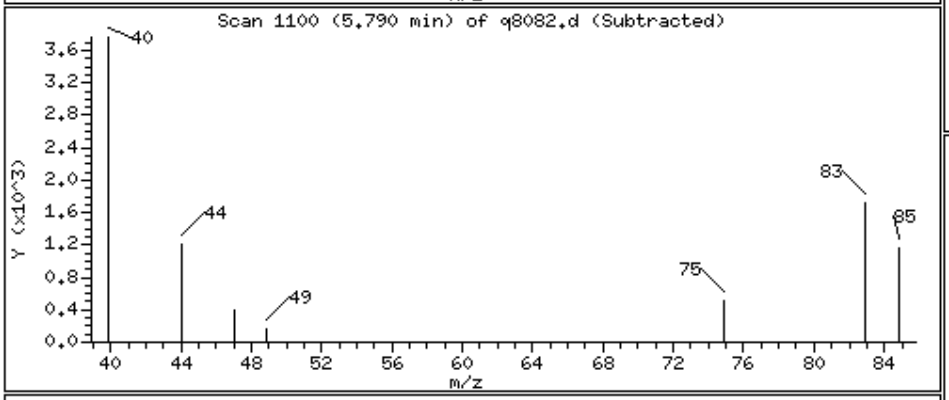
Column diameter: 0.25

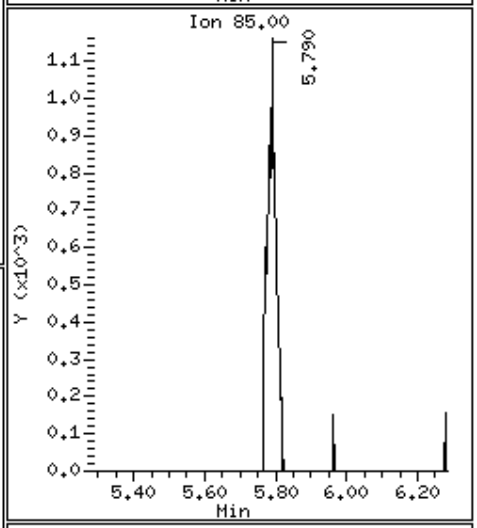
41 Chloroform +

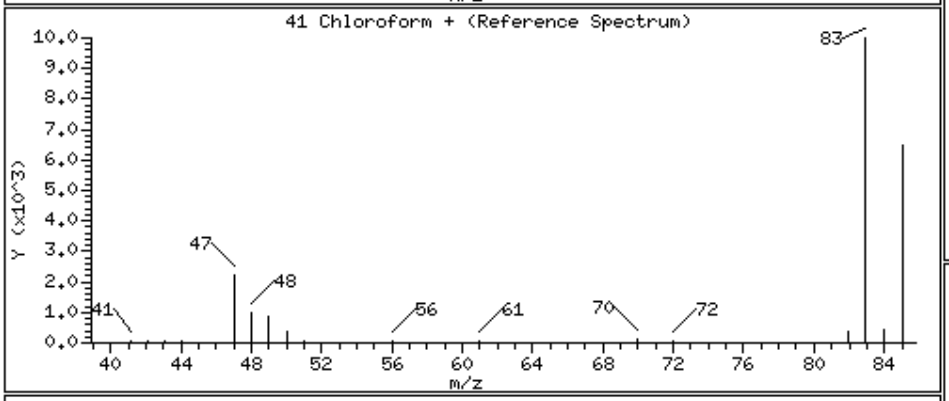
Concentration: 0.604 ug/L

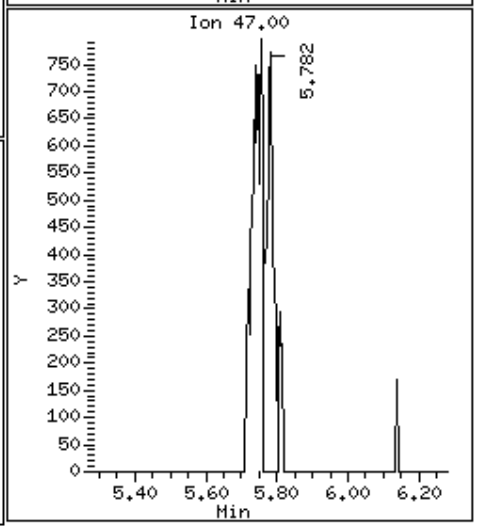


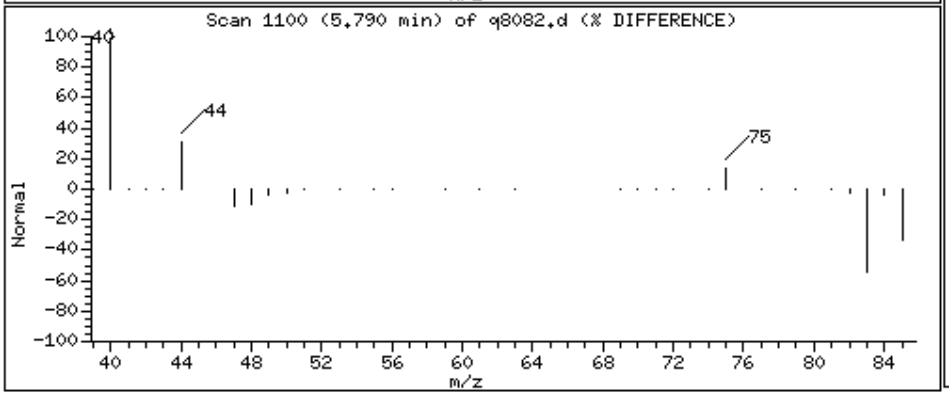



Data File: /var/chem/msv12.i/2180418.s.b/q8082.d

Date : 18-APR-2018 17:14

Client ID: 21804062006

Instrument: msv12.i

Sample Info: 21804062006x

Purge Volume: 5.0

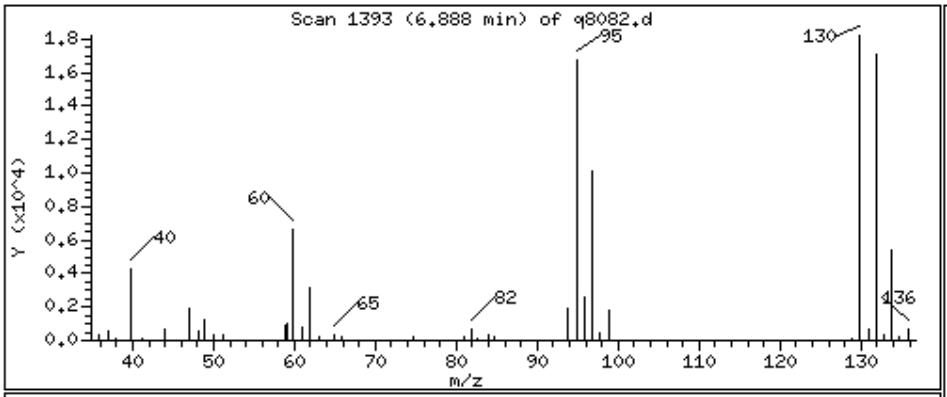
Operator: JMC2

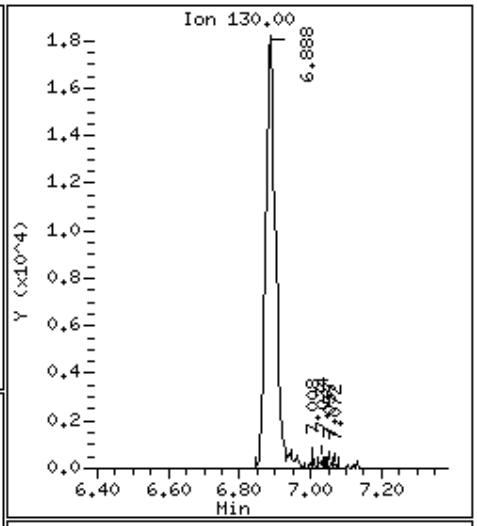
Column phase: RTX-VMS-30M

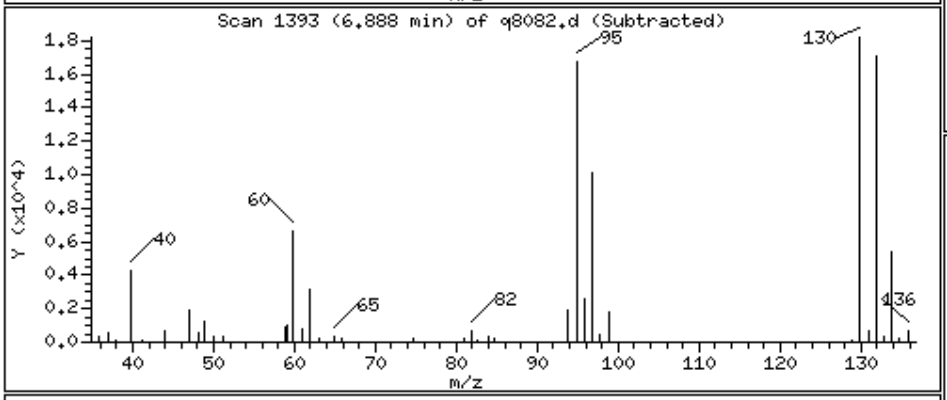
Column diameter: 0.25

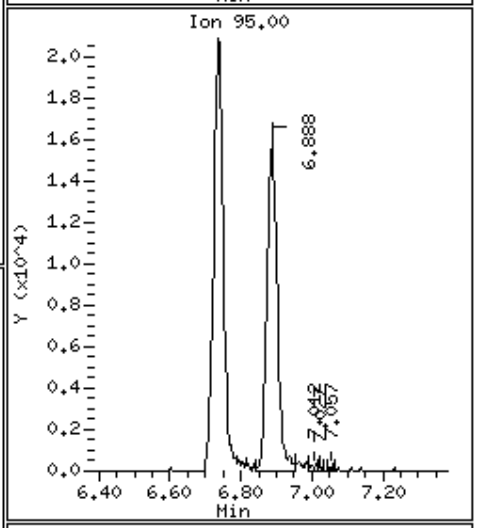
49 Trichloroethene

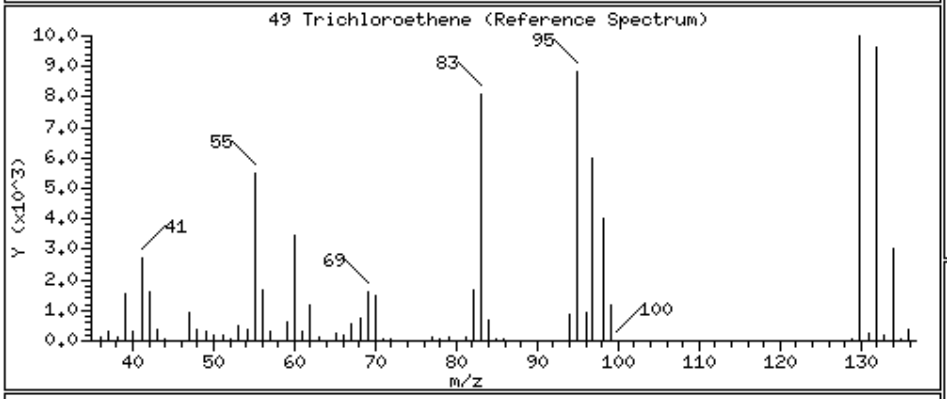
Concentration: 11.4 ug/L

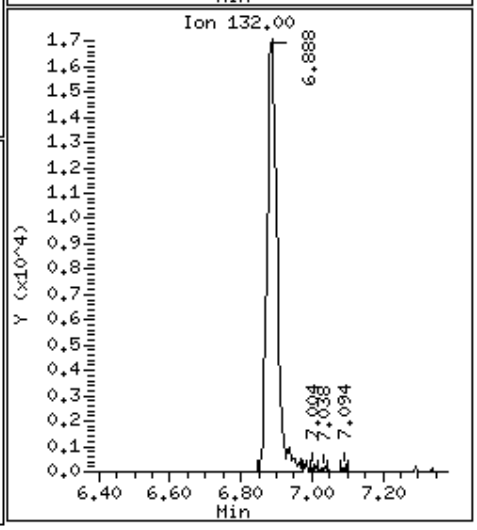


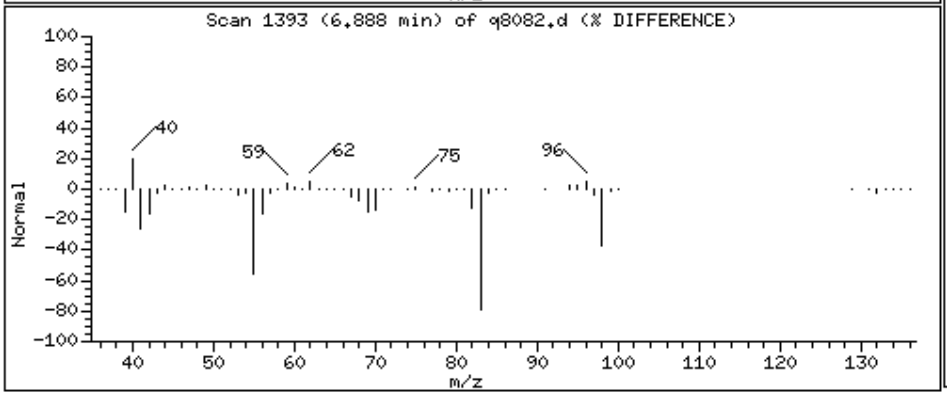



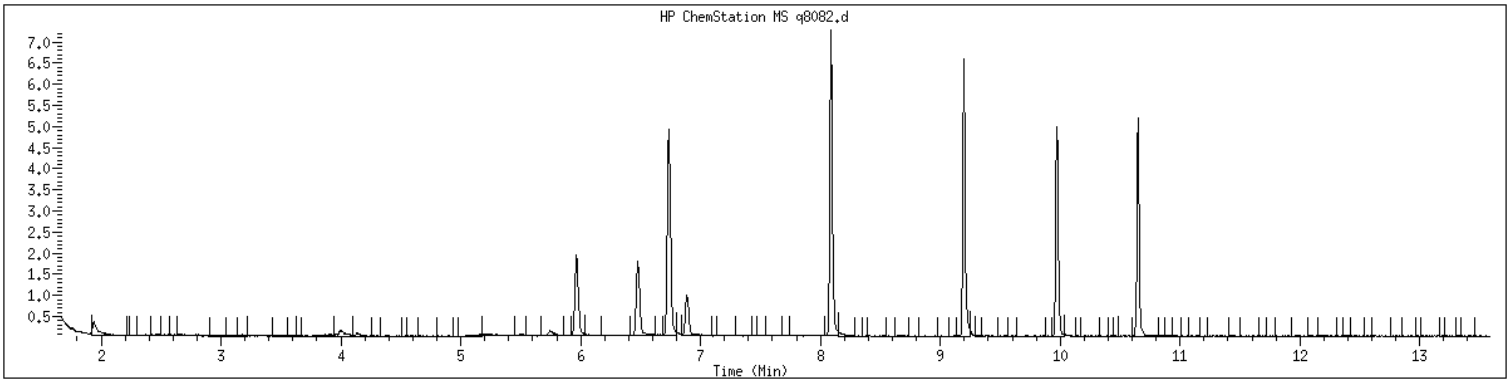



MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 21804062006 SampleType : SAMPLE
Injection Date: 04/18/2018 17:14 Instrument : msv12.i
Operator : JMC2
Sample Info : 21804062006*
Misc Info : MSV~40673~*1*JMC2
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b-




NO MANUAL INTEGRATIONS

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-06-21 |
| Collect Date: | 04/05/18 Time: 1450 | GCAL Sample ID: | 21804062007 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8077 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1519 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-35-4 | 1,1-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | 3.02 | | 0.200 | 0.500 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | 0.863 | J | 0.200 | 0.500 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | 1.88 | | 0.200 | 0.500 | 1.00 |
| 544-10-5 | 1-Chlorohexane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-93-3 | 2-Butanone | 2.70 | J | 0.200 | 0.500 | 5.00 |
| 95-49-8 | 2-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 591-78-6 | 2-Hexanone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 67-64-1 | Acetone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 71-43-2 | Benzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-86-1 | Bromobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-97-5 | Bromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-27-4 | Bromodichloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-25-2 | Bromoform | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 74-83-9 | Bromomethane | 1.00 | U | 0.500 | 1.00 | 1.00 |
| 75-15-0 | Carbon disulfide | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 56-23-5 | Carbon tetrachloride | 0.500 | U | 0.250 | 0.500 | 1.00 |

FORM I VOA

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-06-21 |
| Collect Date: | 04/05/18 Time: 1450 | GCAL Sample ID: | 21804062007 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8077 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1519 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 108-90-7 | Chlorobenzene | 0.411 | J | 0.200 | 0.500 | 1.00 |
| 75-00-3 | Chloroethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 67-66-3 | Chloroform | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-87-3 | Chloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethene | 30.7 | | 0.200 | 0.500 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 124-48-1 | Dibromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-95-3 | Dibromomethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-41-4 | Ethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 98-82-8 | Isopropylbenzene (Cumene) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 136777-61-2 | m,p-Xylene | 0.500 | U | 0.200 | 0.500 | 2.00 |
| 75-09-2 | Methylene chloride | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 91-20-3 | Naphthalene | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 104-51-8 | n-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 103-65-1 | n-Propylbenzene | 2.00 | U | 1.00 | 2.00 | 5.00 |
| 95-47-6 | o-Xylene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 135-98-8 | sec-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-42-5 | Styrene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether (MTBE) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 98-06-6 | tert-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 127-18-4 | Tetrachloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-88-3 | Toluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-01-6 | Trichloroethene | 16.6 | | 0.200 | 0.500 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-01-4 | Vinyl chloride | 72.4 | | 0.200 | 0.500 | 1.00 |

FORM I VOA

GCAL, Inc.

Data file : /var/chem/msv12.i/2180418.s.b/q8077.d
Lab Smp Id: 21804062007 Client Smp ID: 21804062007
Inj Date : 18-APR-2018 15:19
Operator : JMC2 Inst ID: msv12.i
Smp Info : 21804062007*
Misc Info : MSV~40673~*1*JMC2
Comment :
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:06 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 18:43 Cal File: q7984cD.d
Als bottle: 12
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b-.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| | Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|---|
| | 3 Vinyl Chloride + | 62 | 2.071 | 2.068 | (0.307) | 231327 | 72.3584 | 72.4 | |
| | 30 cis-1,2-Dichloroethene | 61 | 5.512 | 5.509 | (0.818) | 116914 | 30.6799 | 30.7 | |
| M | 48 Total 1,2-Dichloroethene | 61 | | | | 116914 | 30.6799 | 30.7 | |
| $ | 36 Dibromofluoromethane | 111 | 5.966 | 5.966 | (0.885) | 123197 | 50.9728 | 51.0 | 6990 |
| | 32 2-Butanone | 43 | 6.120 | 6.109 | (0.908) | 6463 | 2.69975 | 2.70 | |
| $ | 43 1,2-Dichloroethane-d4 | 67 | 6.476 | 6.476 | (0.961) | 73102 | 51.0802 | 51.1 | |
| * | 47 FLUOROBENZENE | 96 | 6.738 | 6.735 | (1.000) | 452552 | 50.0000 | | |
| | 49 Trichloroethene | 130 | 6.888 | 6.888 | (1.022) | 52712 | 16.5827 | 16.6 | |
| $ | 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.879) | 439250 | 51.3927 | 51.4 | |
| * | 71 CHLOROBENZENE-d5 | 82 | 9.197 | 9.198 | (1.000) | 175562 | 50.0000 | | |
| | 72 Chlorobenzene ++ | 112 | 9.209 | 9.205 | (1.001) | 3217 | 0.41116 | 0.411 | (H) |
| $ | 80 Bromofluorobenzene | 174 | 9.973 | 9.970 | (1.084) | 139549 | 44.9321 | 44.9 | |
| | 96 1,3-Dichlorobenzene | 146 | 10.607 | 10.603 | (0.996) | 3867 | 0.86257 | 0.863 | (H) |
| * | 97 1,4-DICHLOROBENZENE-D4 | 152 | 10.648 | 10.645 | (1.000) | 132503 | 50.0000 | | |

| Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | CONCENTRATIONS FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|
| 98 1,4-Dichlorobenzene | 146 | 10.656 | 10.656 | (1.001) | 8824 | 1.87898 | 1.88 | |
| 102 1,2-Dichlorobenzene | 146 | 10.918 | 10.914 | (1.025) | 13704 | 3.02320 | 3.02 | |

QC Flag Legend

H - Operator selected an alternate compound hit.

Data File: /var/chem/msv12.i/2180418.s.b/q8077.d



Date : 18-APR-2018 15:19

Client ID: 21804062007

Instrument: msv12.i

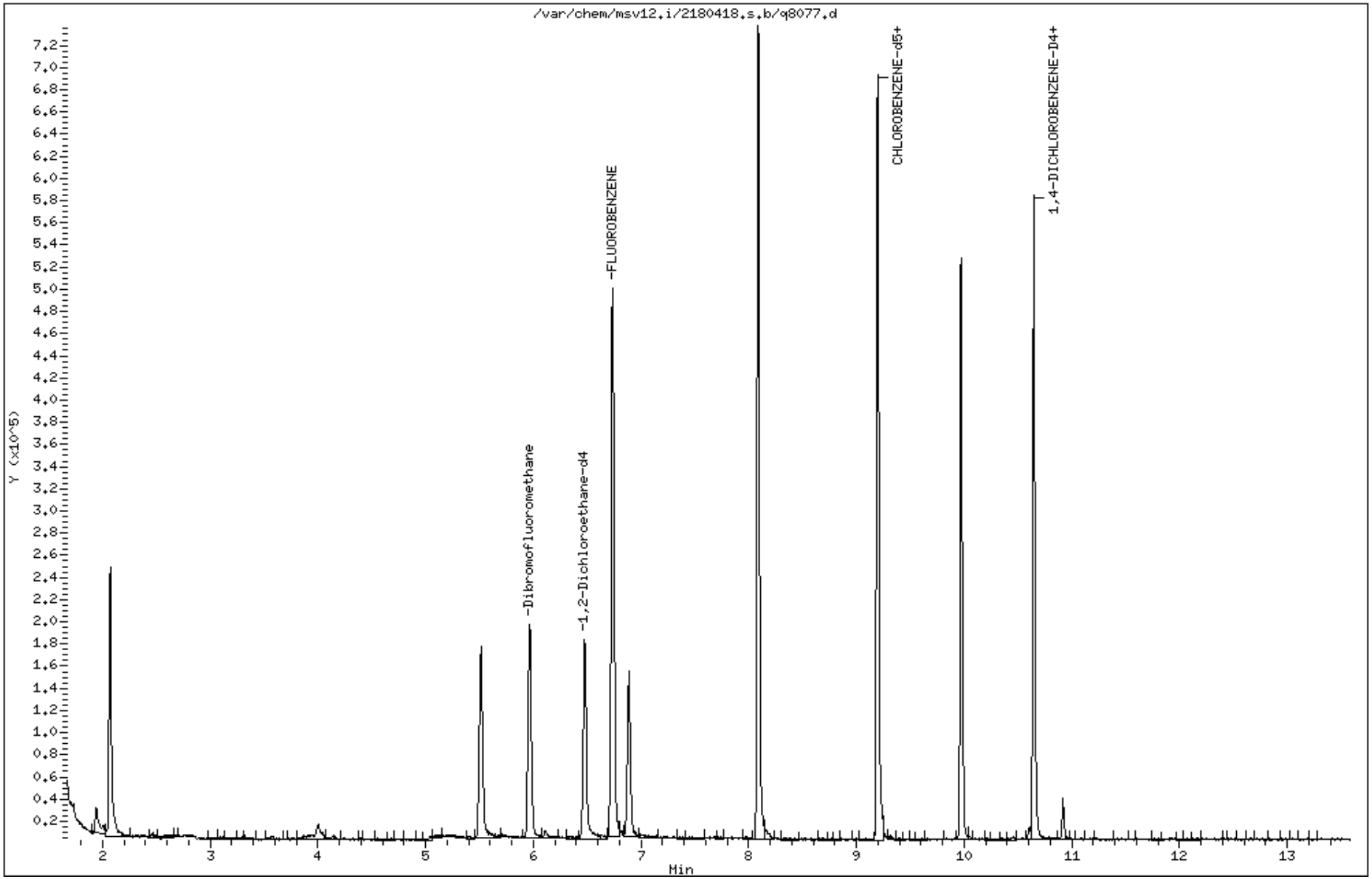
Sample Info: 21804062007*

Purge Volume: 5.0

Operator: JMC2

Column phase: RTX-VMS-30M

Column diameter: 0.25



Data File: /var/chem/msv12.i/2180418.s.b/q8077.d

Date : 18-APR-2018 15:19

Client ID: 21804062007

Instrument: msv12.i

Sample Info: 21804062007*

Purge Volume: 5.0

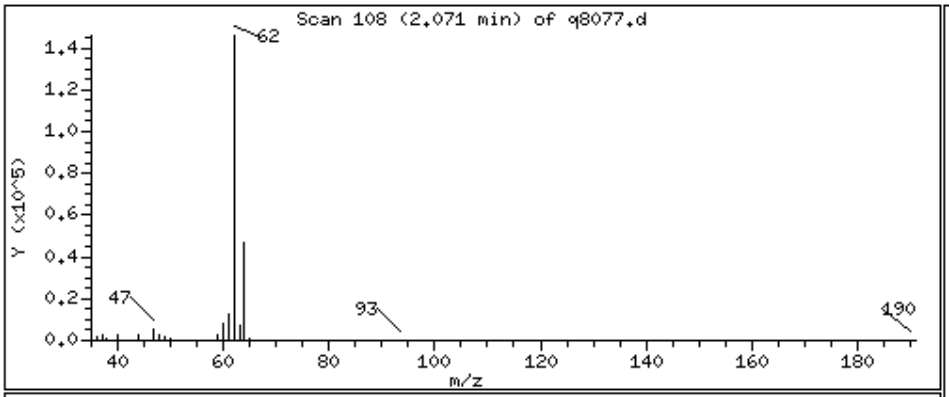
Operator: JMC2

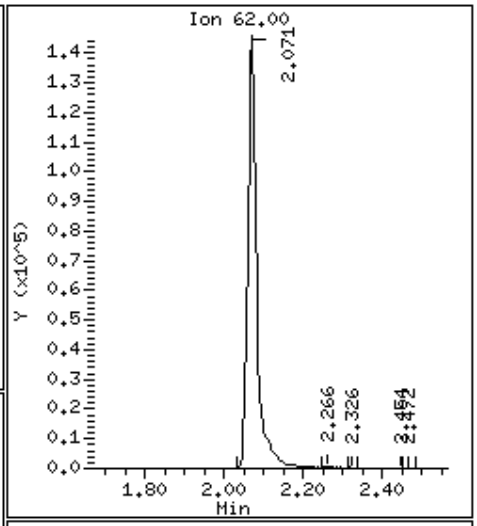
Column phase: RTX-VMS-30M

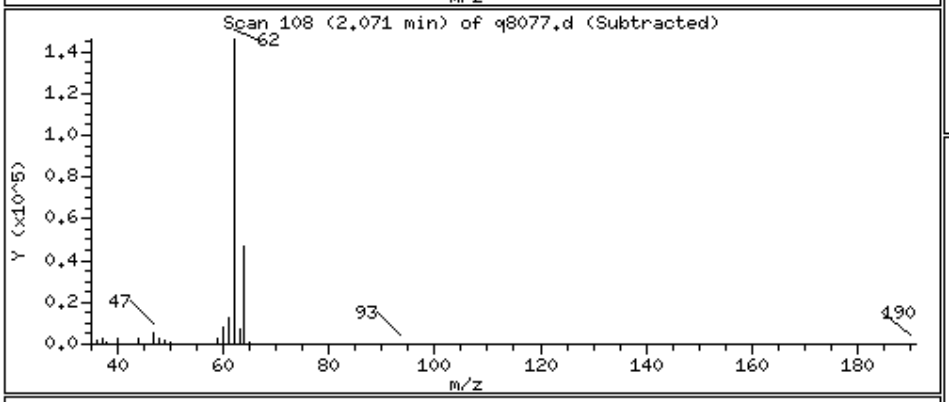
Column diameter: 0.25

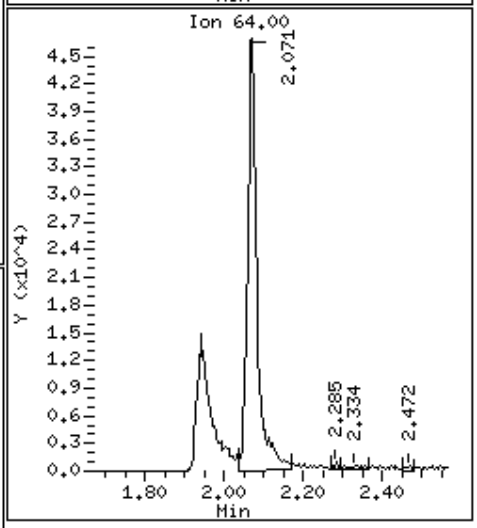
3 Vinyl Chloride +

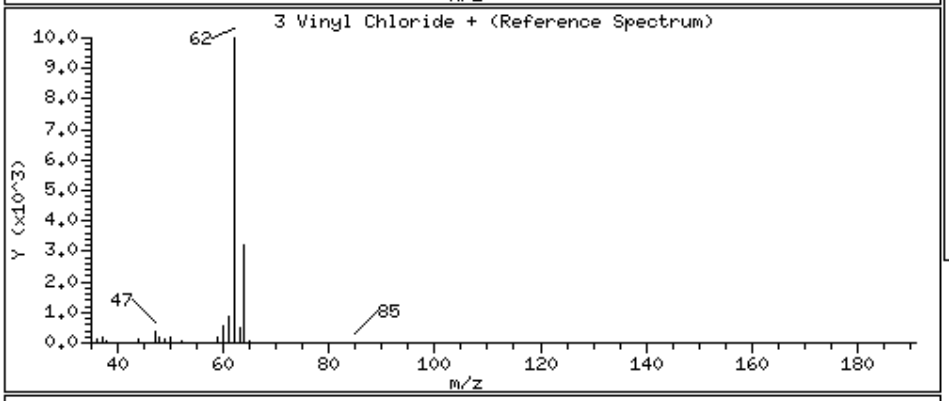
Concentration: 72.4 ug/L

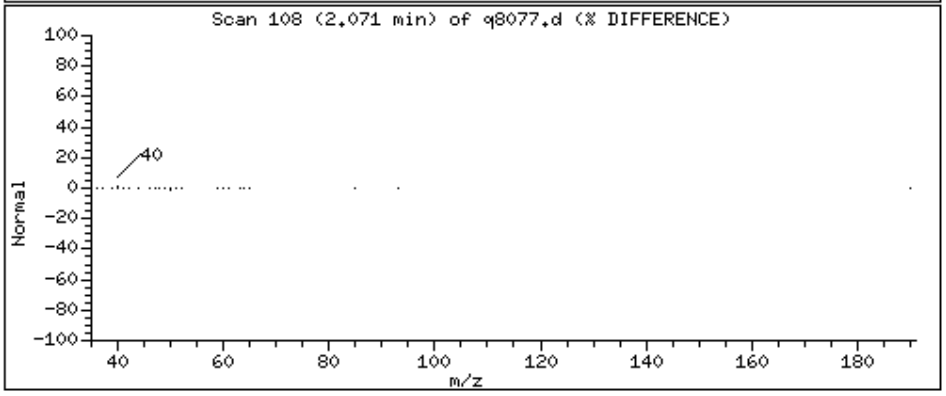


Data File: /var/chem/msv12.i/2180418.s.b/q8077.d

Date : 18-APR-2018 15:19

Client ID: 21804062007

Instrument: msv12.i

Sample Info: 21804062007*

Purge Volume: 5.0

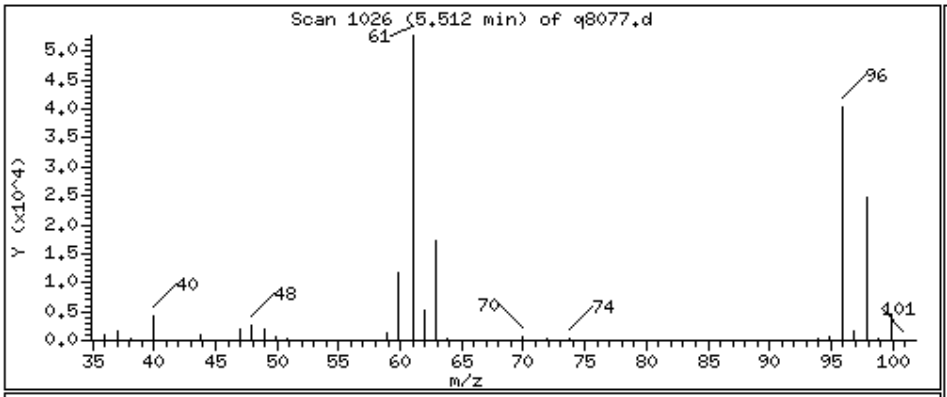
Operator: JMC2

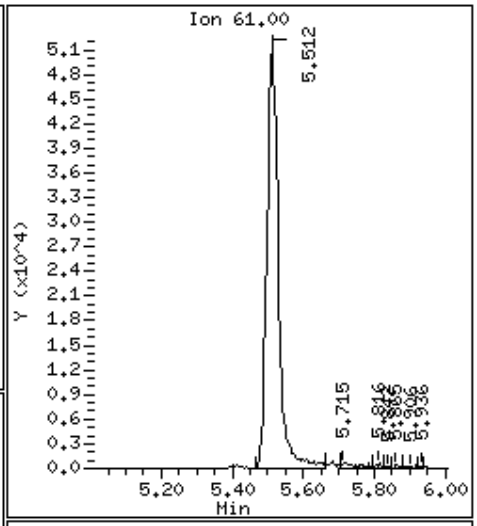
Column phase: RTX-VMS-30M

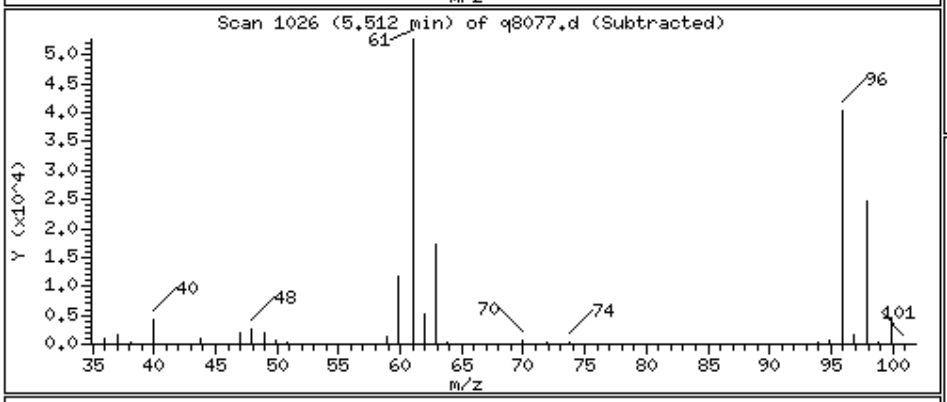
Column diameter: 0.25

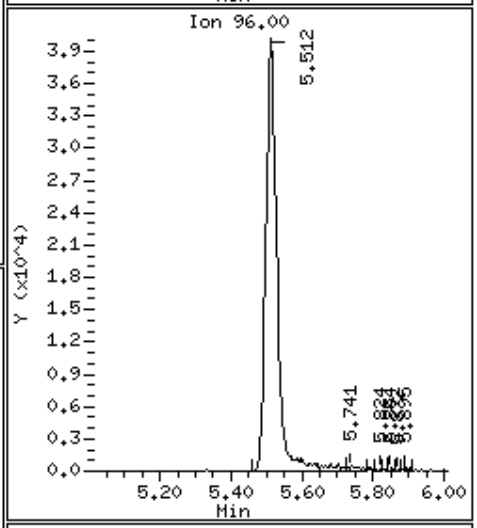
30 cis-1,2-Dichloroethene

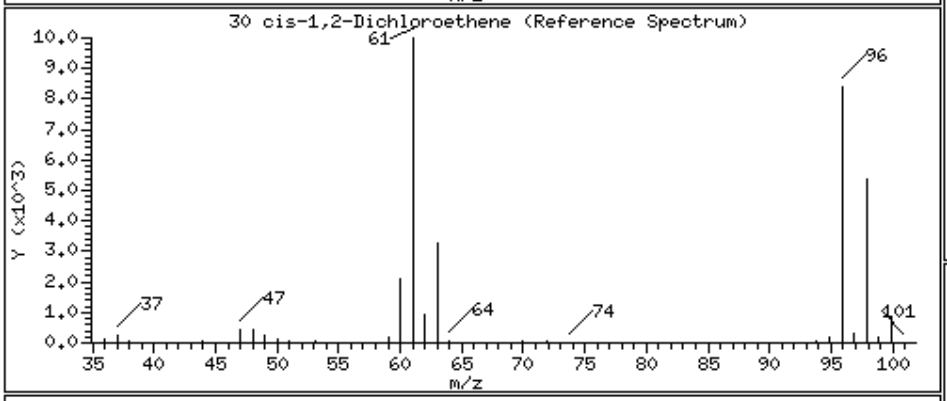
Concentration: 30.7 ug/L

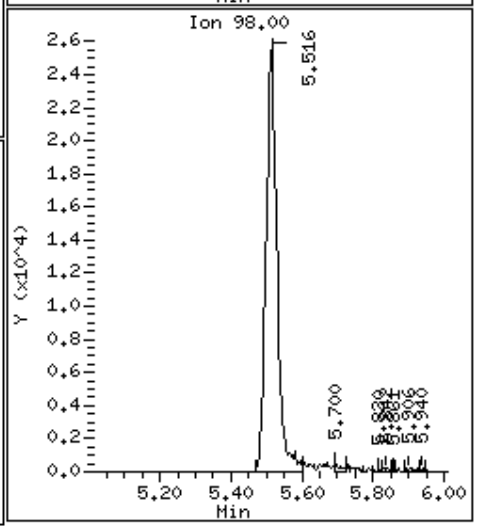


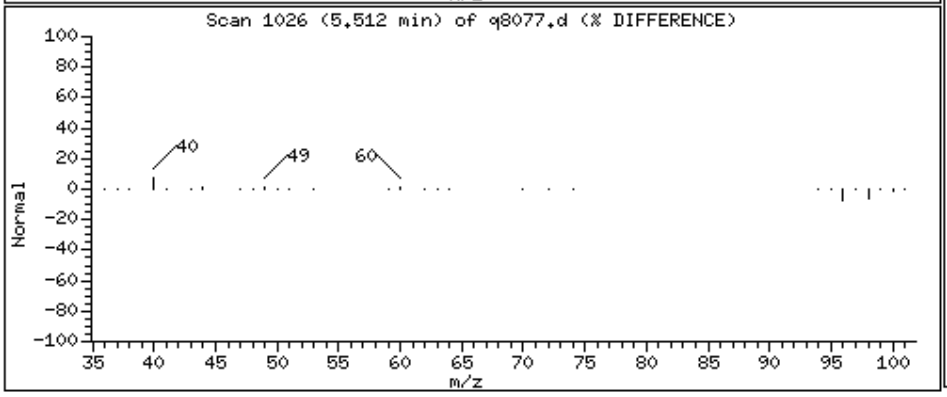



Data File: /var/chem/msv12.i/2180418.s.b/q8077.d

Date : 18-APR-2018 15:19

Client ID: 21804062007

Instrument: msv12.i

Sample Info: 21804062007*

Purge Volume: 5.0

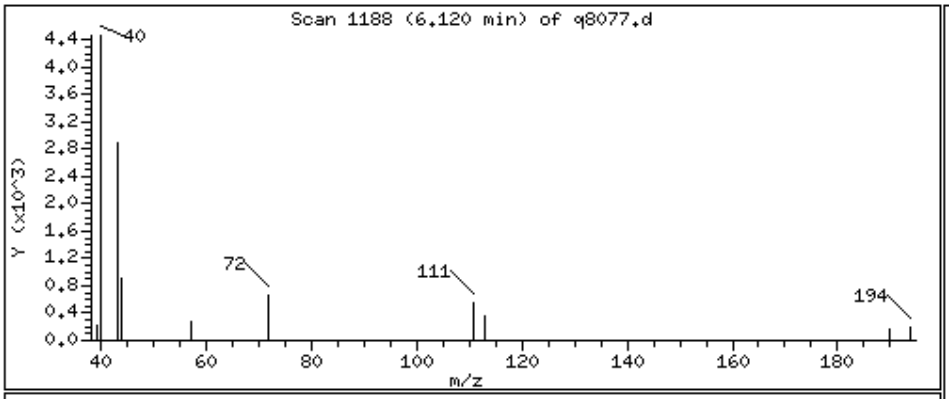
Operator: JMC2

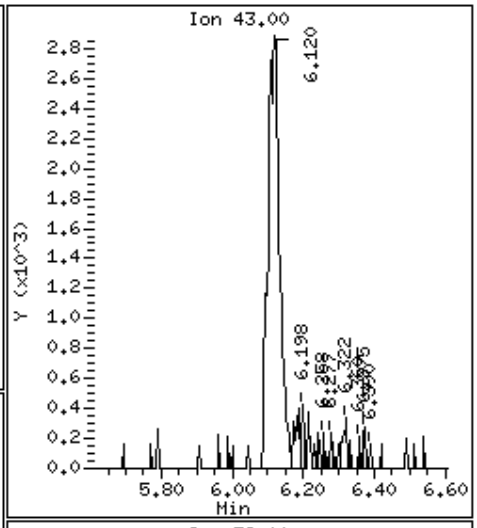
Column phase: RTX-VMS-30M

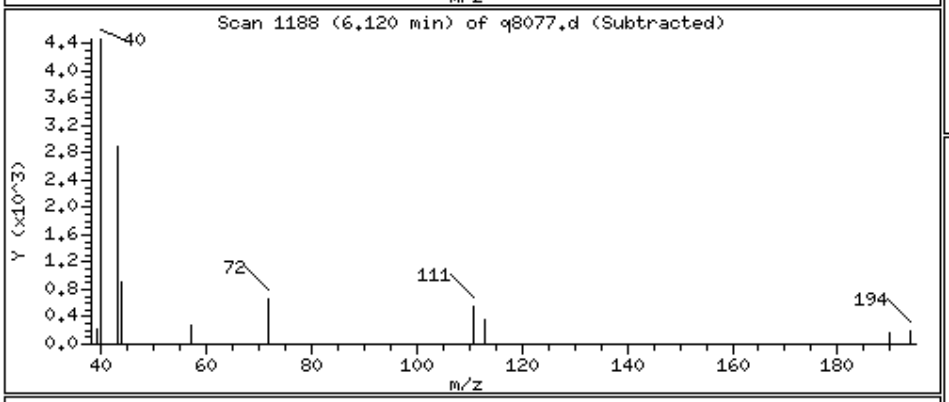
Column diameter: 0.25

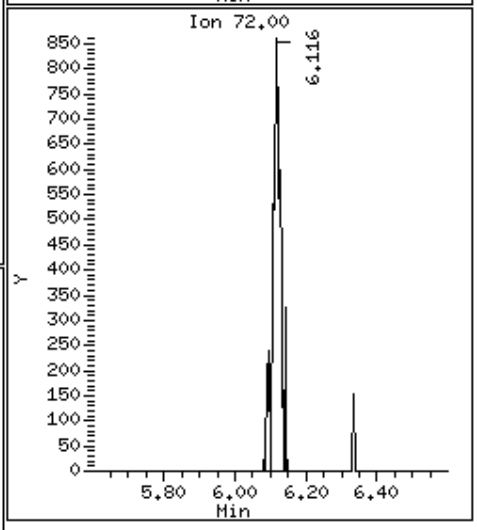
32 2-Butanone

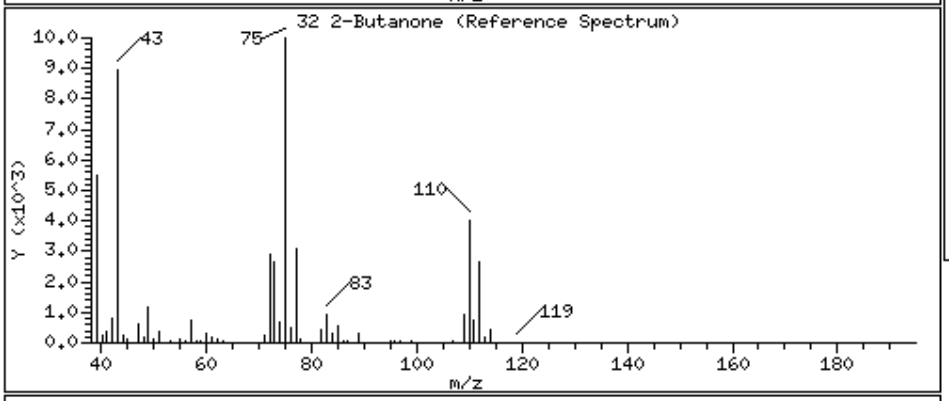
Concentration: 2.70 ug/L

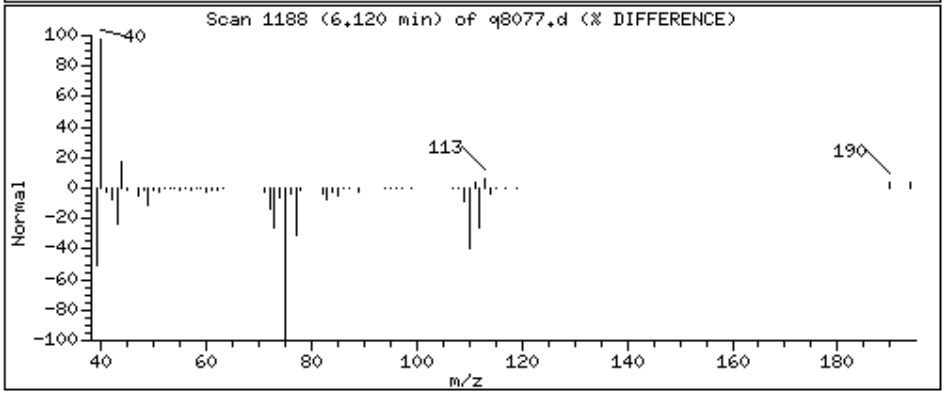


Data File: /var/chem/msv12.i/2180418.s.b/q8077.d

Date : 18-APR-2018 15:19

Client ID: 21804062007

Instrument: msv12.i

Sample Info: 21804062007*

Purge Volume: 5.0

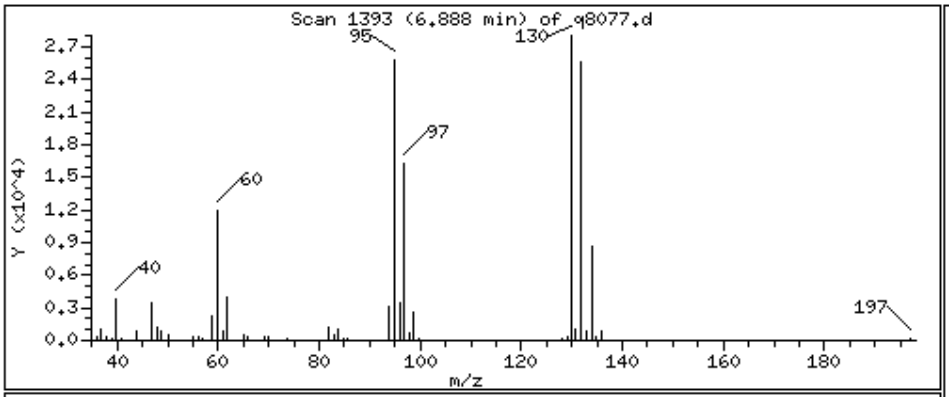
Operator: JMC2

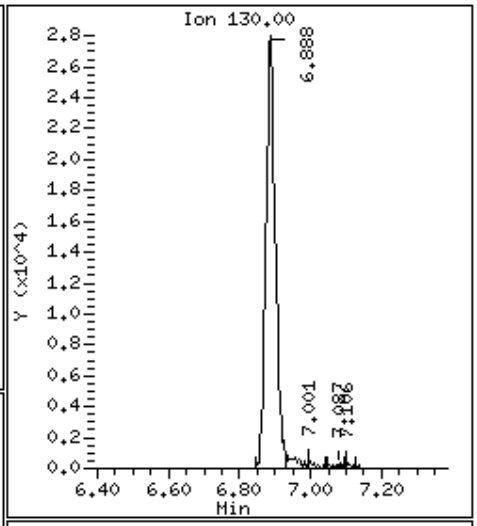
Column phase: RTX-VMS-30M

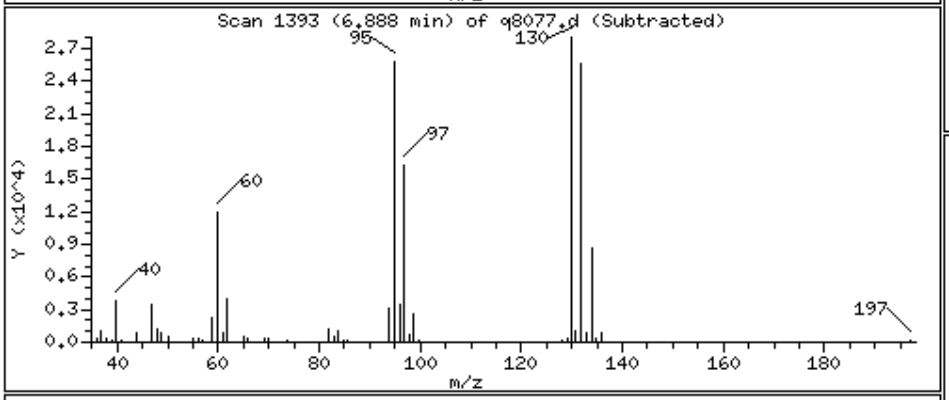
Column diameter: 0.25

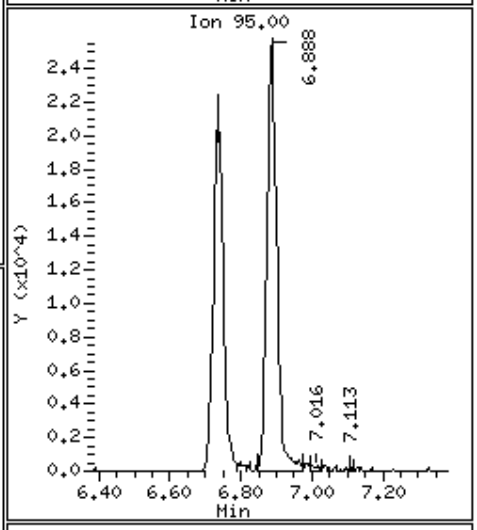
49 Trichloroethene

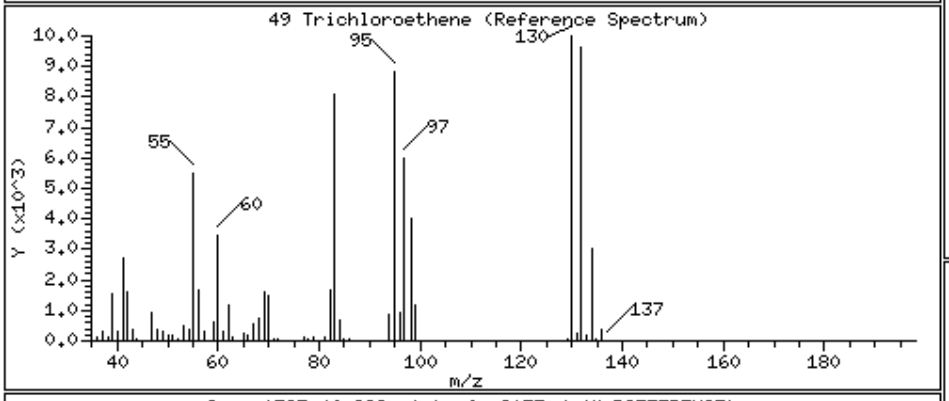
Concentration: 16.6 ug/L

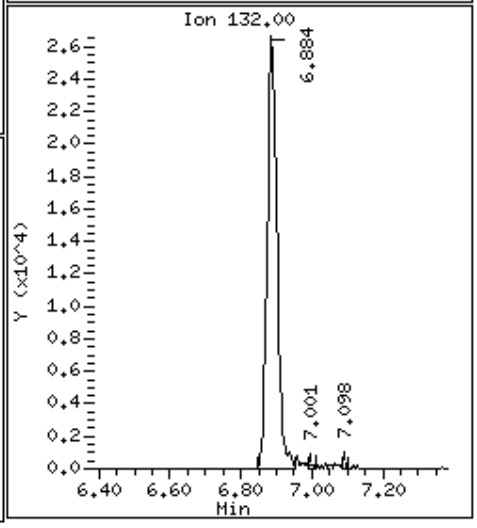


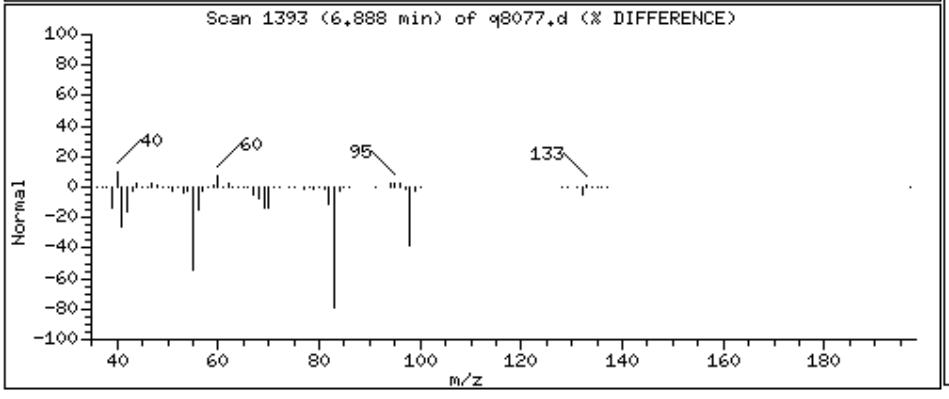



Data File: /var/chem/msv12.i/2180418.s.b/q8077.d

Date : 18-APR-2018 15:19

Client ID: 21804062007

Instrument: msv12.i

Sample Info: 21804062007*

Purge Volume: 5.0

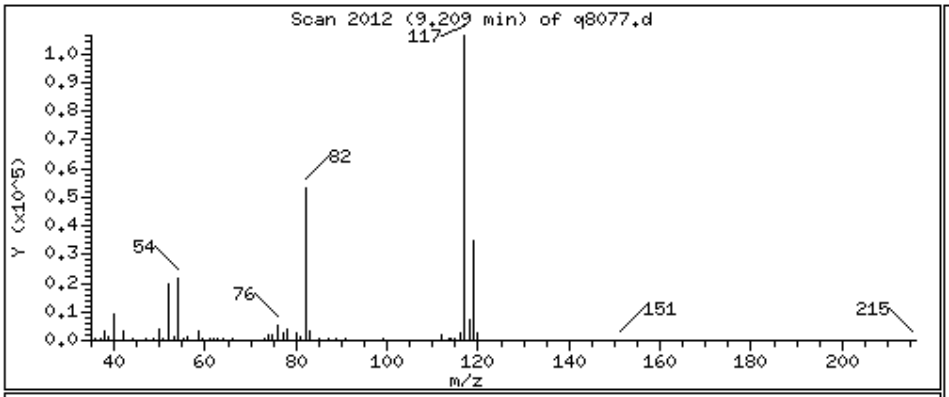
Operator: JMC2

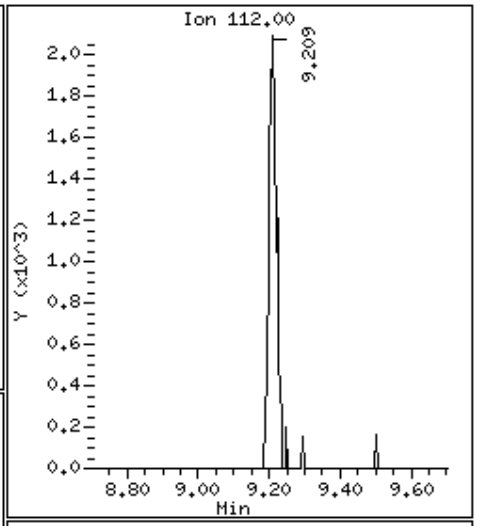
Column phase: RTX-VMS-30M

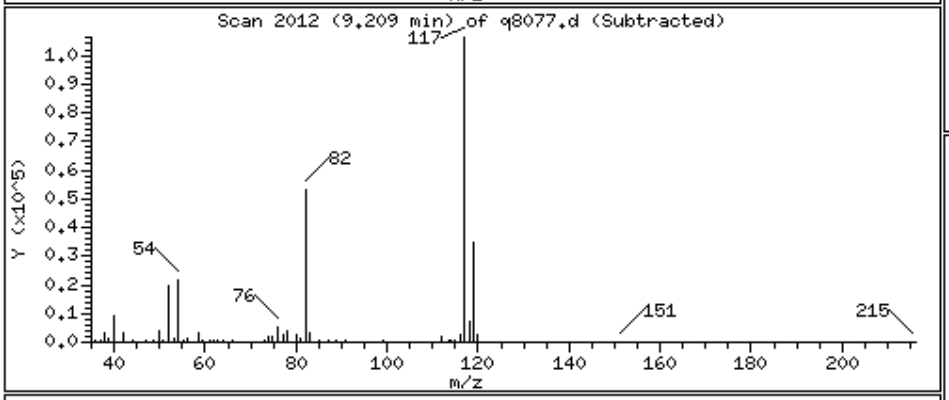
Column diameter: 0.25

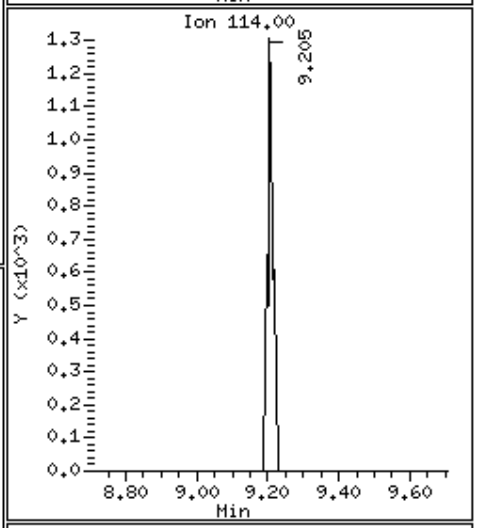
72 Chlorobenzene ++

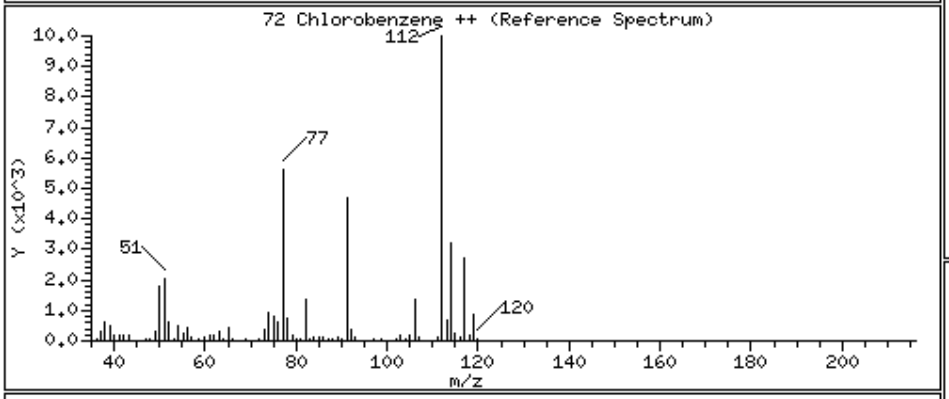
Concentration: 0.411 ug/L

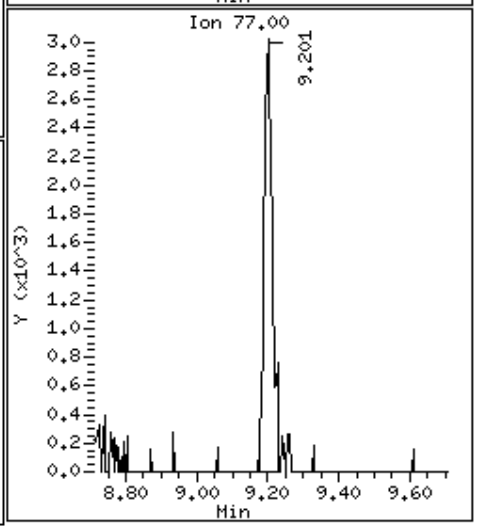


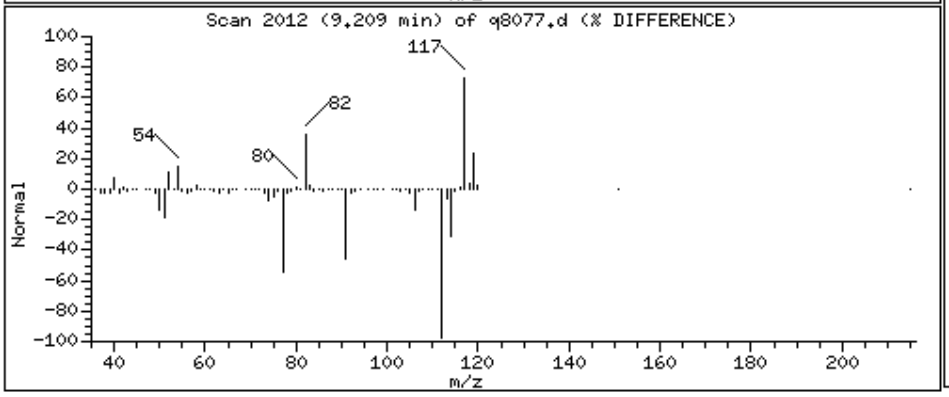



Data File: /var/chem/msv12.i/2180418.s.b/q8077.d

Date : 18-APR-2018 15:19

Client ID: 21804062007

Instrument: msv12.i

Sample Info: 21804062007*

Purge Volume: 5.0

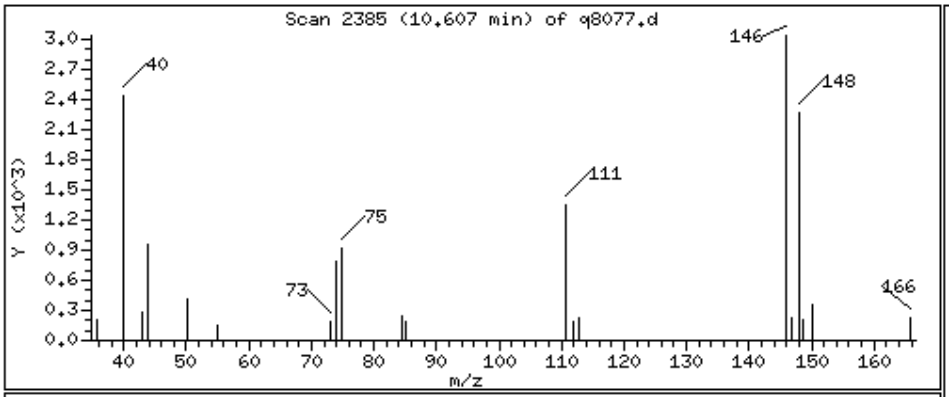
Operator: JMC2

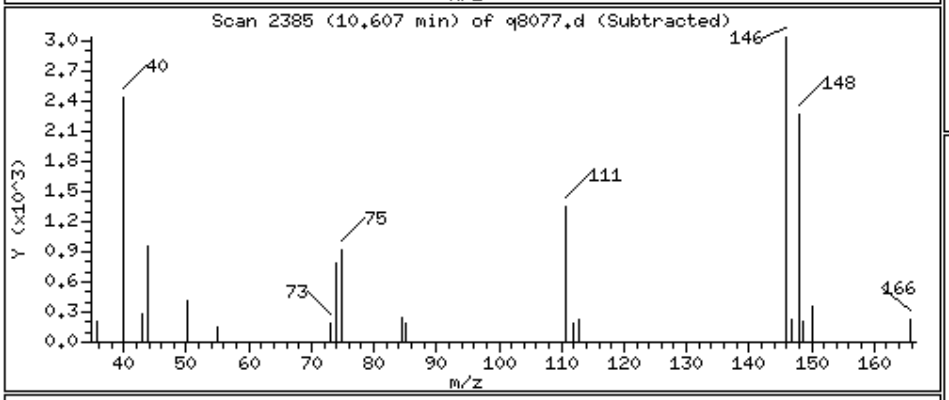
Column phase: RTX-VMS-30M

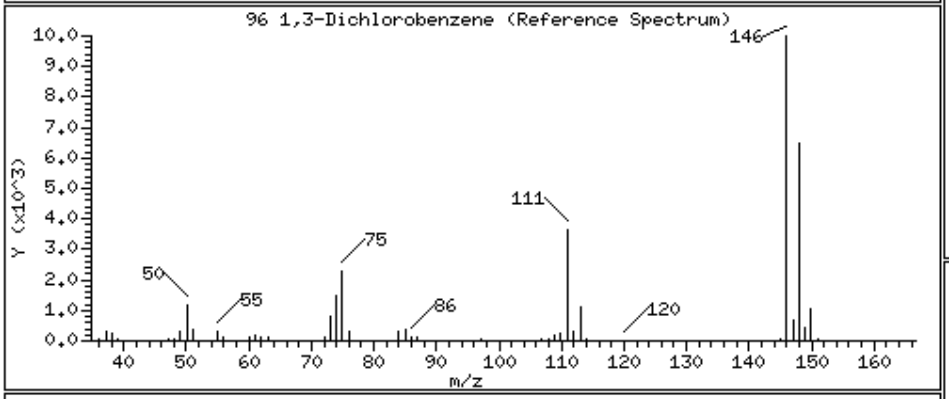
Column diameter: 0.25

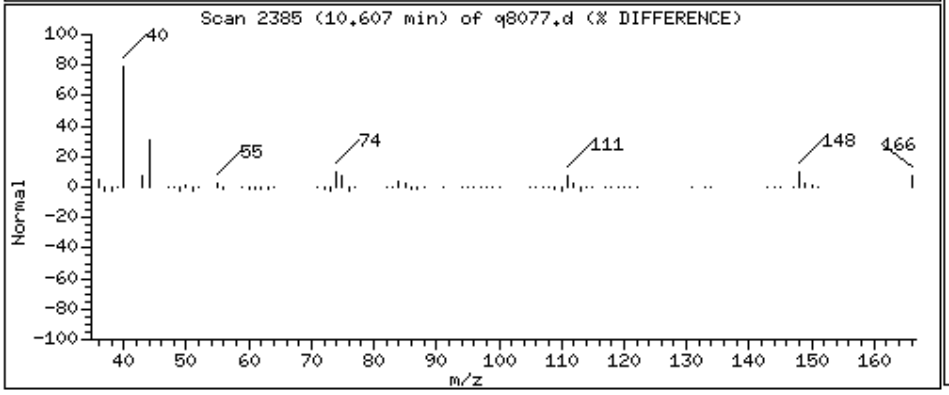
96 1,3-Dichlorobenzene

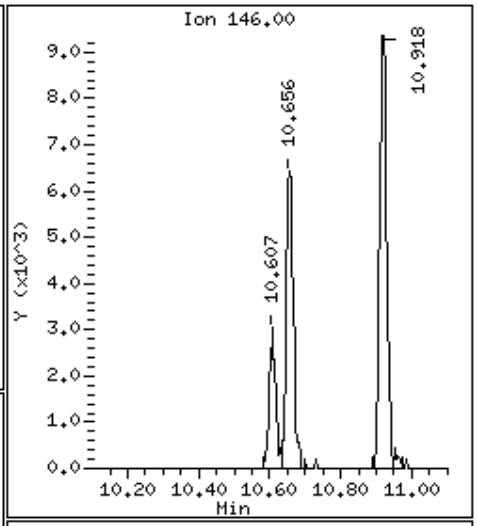
Concentration: 0.863 ug/L

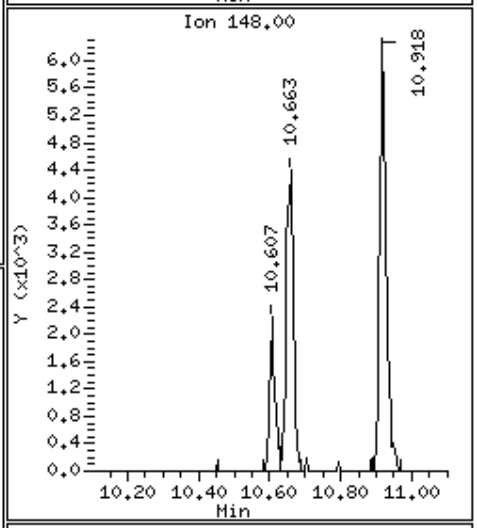


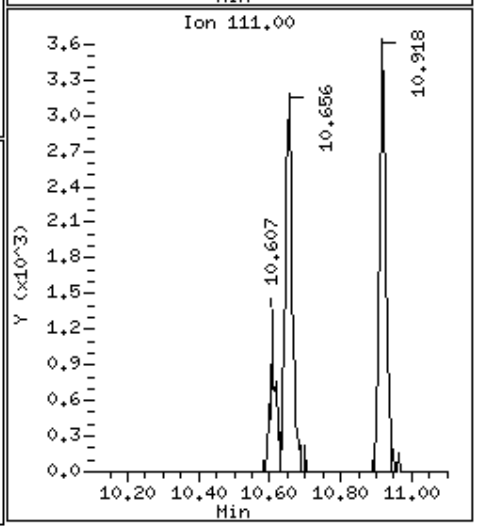



Data File: /var/chem/msv12.i/2180418.s.b/q8077.d

Date : 18-APR-2018 15:19

Client ID: 21804062007

Instrument: msv12.i

Sample Info: 21804062007*

Purge Volume: 5.0

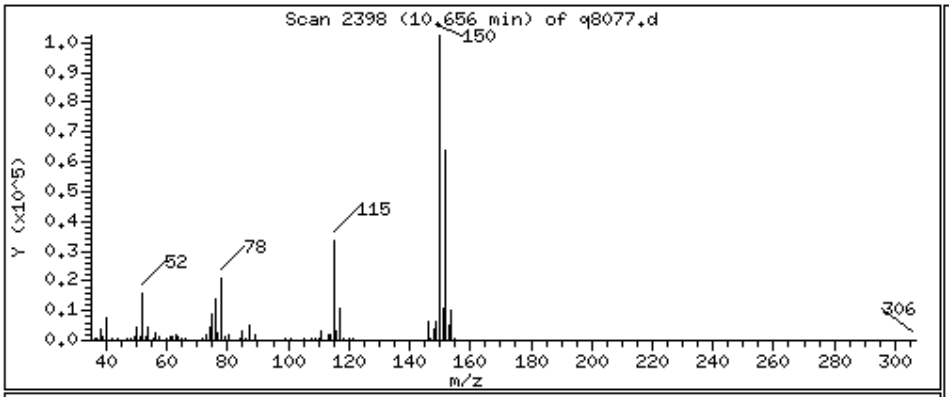
Operator: JMC2

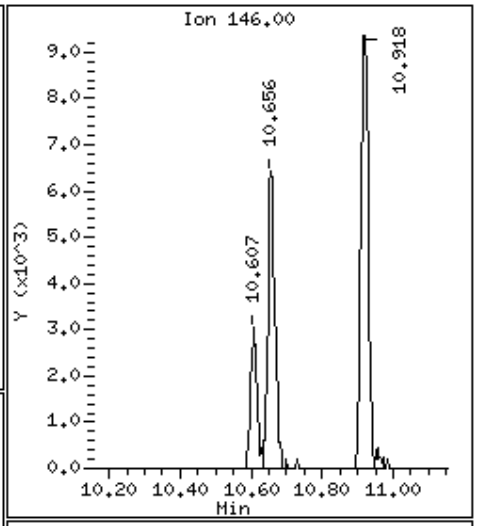
Column phase: RTX-VMS-30M

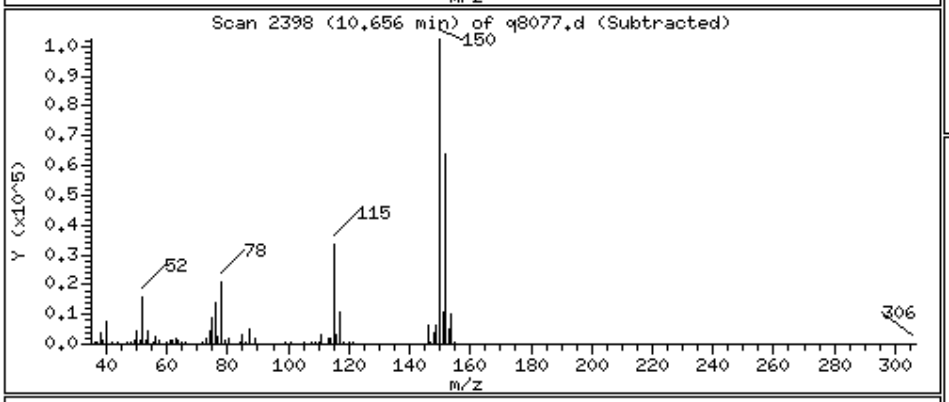
Column diameter: 0.25

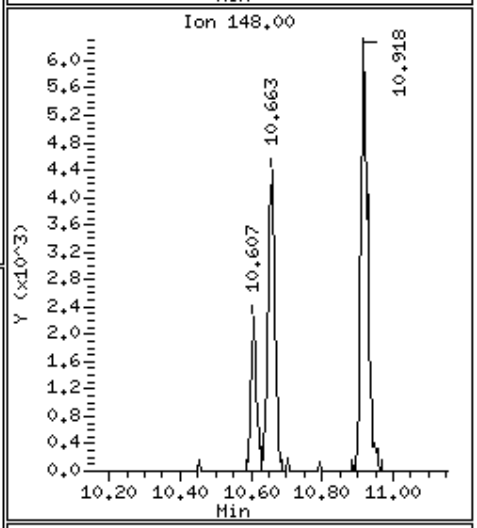
98 1,4-Dichlorobenzene

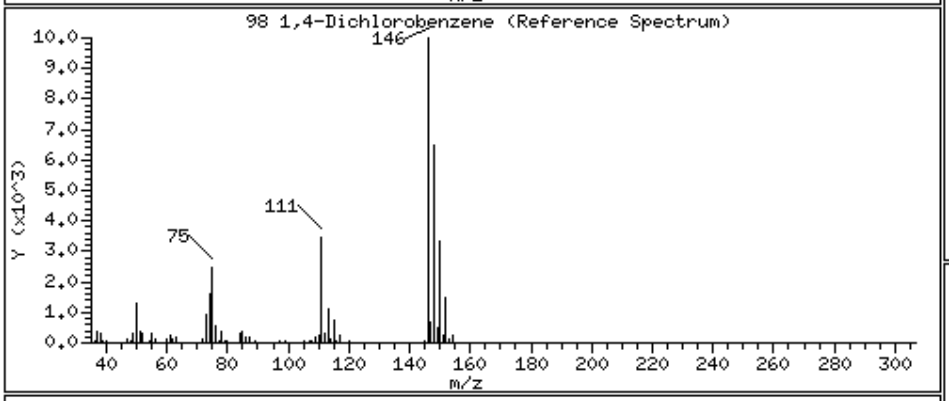
Concentration: 1.88 ug/L

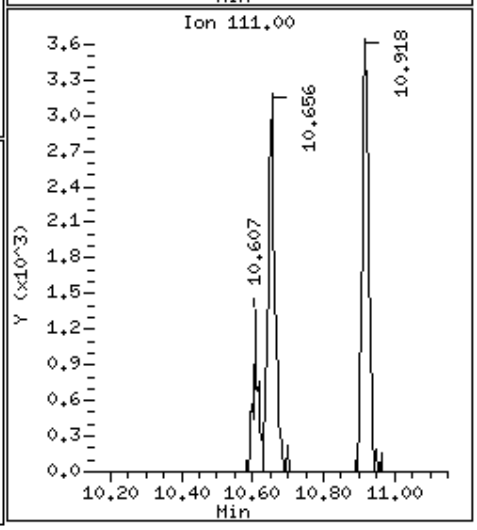


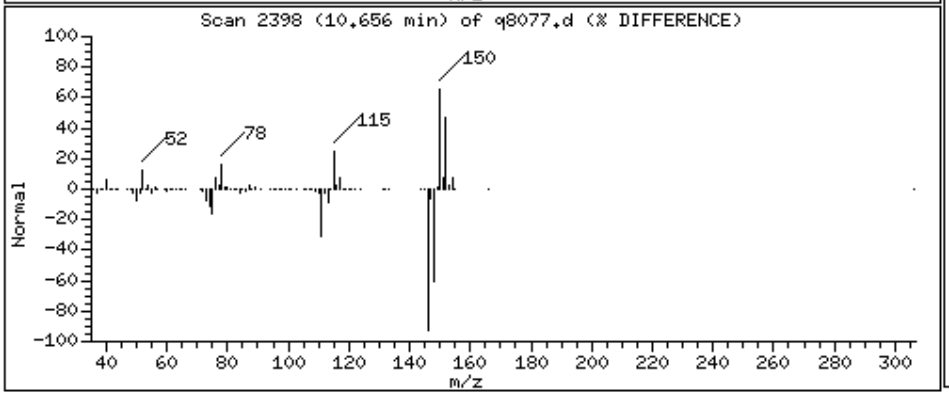



Data File: /var/chem/msv12.i/2180418.s.b/q8077.d

Date : 18-APR-2018 15:19

Client ID: 21804062007

Instrument: msv12.i

Sample Info: 21804062007*

Purge Volume: 5.0

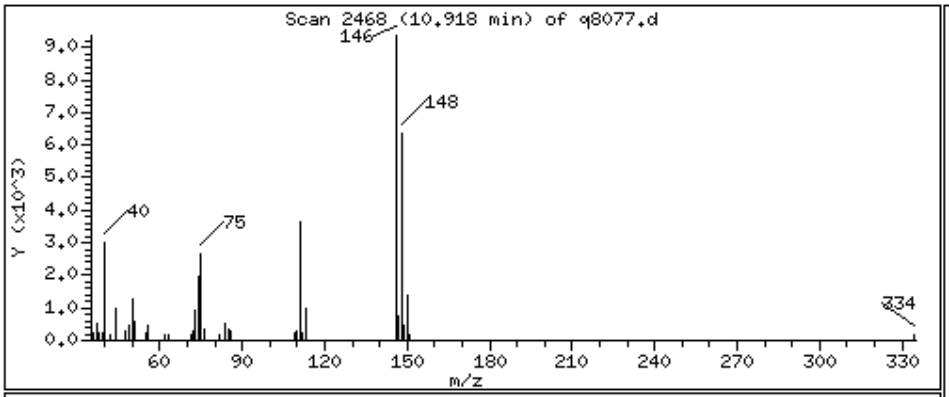
Operator: JMC2

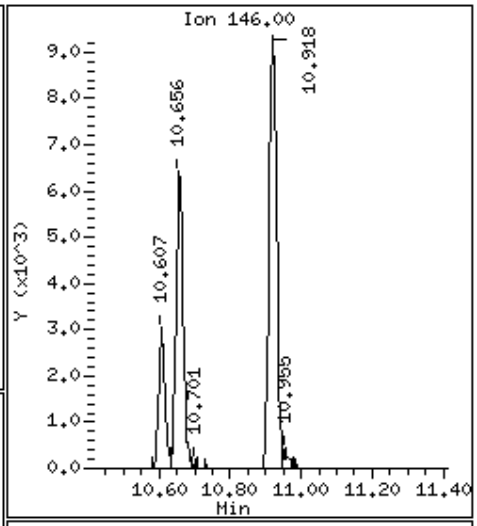
Column phase: RTX-VMS-30M

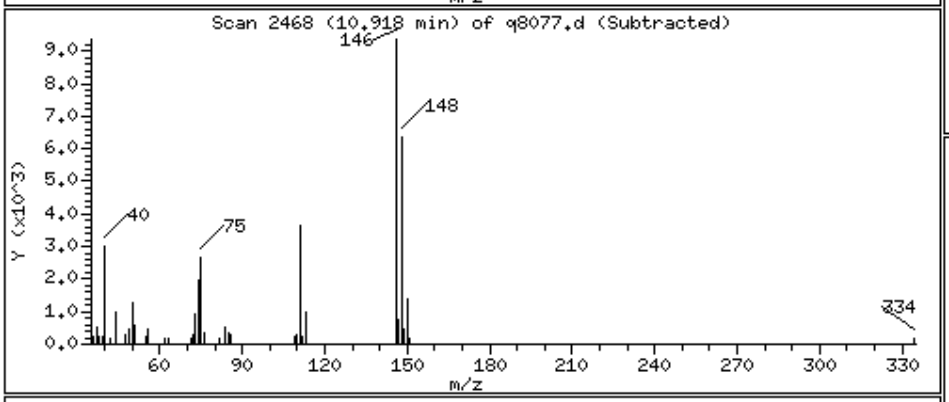
Column diameter: 0.25

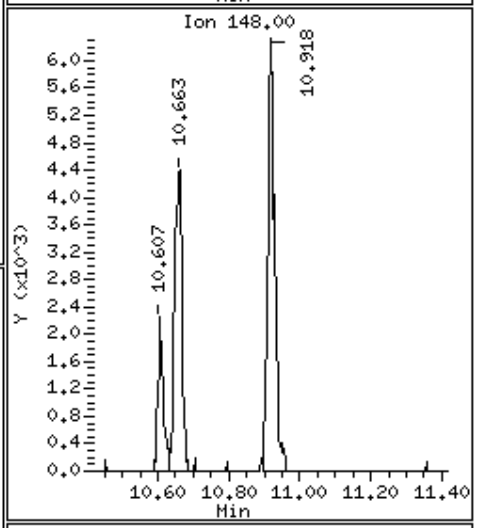
102 1,2-Dichlorobenzene

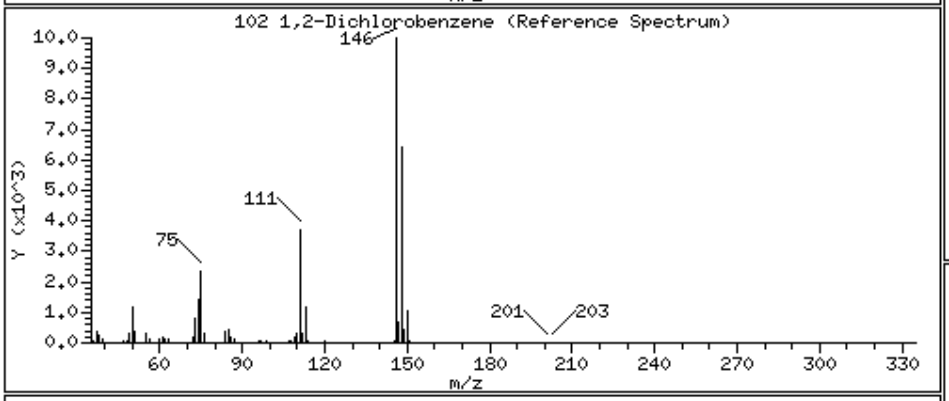
Concentration: 3.02 ug/L

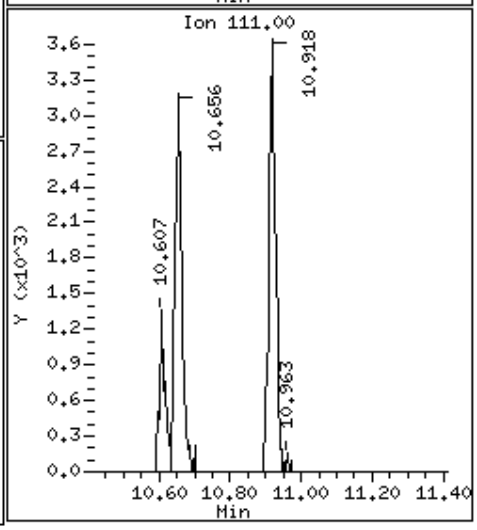


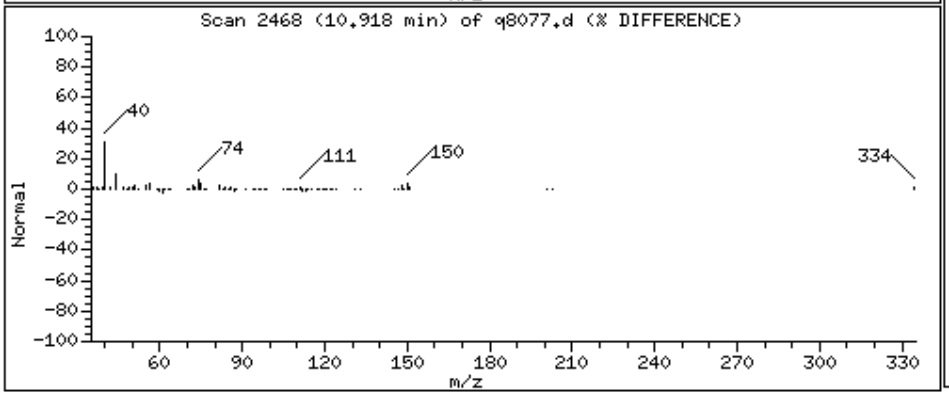



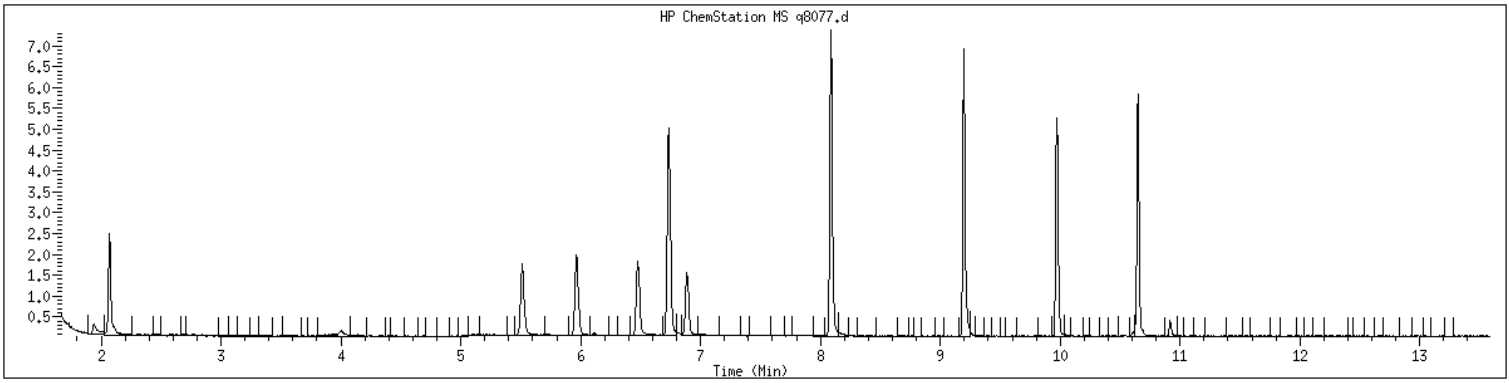



MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 21804062007 SampleType : SAMPLE
Injection Date: 04/18/2018 15:19 Instrument : msv12.i
Operator : JMC2
Sample Info : 21804062007*
Misc Info : MSV~40673~*1*JMC2
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b-




NO MANUAL INTEGRATIONS

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-10-21 |
| Collect Date: | 04/05/18 Time: 1715 | GCAL Sample ID: | 21804062008 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8078 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1542 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-35-4 | 1,1-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | 1.38 | | 0.200 | 0.500 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | 0.554 | J | 0.200 | 0.500 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | 1.10 | | 0.200 | 0.500 | 1.00 |
| 544-10-5 | 1-Chlorohexane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-93-3 | 2-Butanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 95-49-8 | 2-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 591-78-6 | 2-Hexanone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 67-64-1 | Acetone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 71-43-2 | Benzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-86-1 | Bromobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-97-5 | Bromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-27-4 | Bromodichloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-25-2 | Bromoform | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 74-83-9 | Bromomethane | 1.00 | U | 0.500 | 1.00 | 1.00 |
| 75-15-0 | Carbon disulfide | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 56-23-5 | Carbon tetrachloride | 0.500 | U | 0.250 | 0.500 | 1.00 |

FORM I VOA

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-10-21 |
| Collect Date: | 04/05/18 Time: 1715 | GCAL Sample ID: | 21804062008 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8078 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1542 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 108-90-7 | Chlorobenzene | 0.456 | J | 0.200 | 0.500 | 1.00 |
| 75-00-3 | Chloroethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 67-66-3 | Chloroform | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-87-3 | Chloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethene | 27.1 | | 0.200 | 0.500 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 124-48-1 | Dibromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-95-3 | Dibromomethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-41-4 | Ethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 98-82-8 | Isopropylbenzene (Cumene) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 136777-61-2 | m,p-Xylene | 0.500 | U | 0.200 | 0.500 | 2.00 |
| 75-09-2 | Methylene chloride | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 91-20-3 | Naphthalene | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 104-51-8 | n-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 103-65-1 | n-Propylbenzene | 2.00 | U | 1.00 | 2.00 | 5.00 |
| 95-47-6 | o-Xylene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 135-98-8 | sec-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-42-5 | Styrene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether (MTBE) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 98-06-6 | tert-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 127-18-4 | Tetrachloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-88-3 | Toluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-01-6 | Trichloroethene | 14.1 | | 0.200 | 0.500 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-01-4 | Vinyl chloride | 10.3 | | 0.200 | 0.500 | 1.00 |

FORM I VOA

GCAL, Inc.

Data file : /var/chem/msv12.i/2180418.s.b/q8078.d
Lab Smp Id: 21804062008 Client Smp ID: 21804062008
Inj Date : 18-APR-2018 15:42
Operator : JMC2 Inst ID: msv12.i
Smp Info : 21804062008*
Misc Info : MSV~40673~*1*JMC2
Comment :
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:06 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 18:43 Cal File: q7984cD.d
Als bottle: 13
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b-.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| | Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|---|
| | 3 Vinyl Chloride + | 62 | 2.071 | 2.068 | (0.308) | 33349 | 10.3263 | 10.3 | |
| | 30 cis-1,2-Dichloroethene | 61 | 5.513 | 5.509 | (0.819) | 104289 | 27.0911 | 27.1 | |
| M | 48 Total 1,2-Dichloroethene | 61 | | | | 104289 | 27.0911 | 27.1 | |
| $ | 36 Dibromofluoromethane | 111 | 5.962 | 5.966 | (0.885) | 122124 | 50.0195 | 50.0 | 7070 |
| $ | 43 1,2-Dichloroethane-d4 | 67 | 6.476 | 6.476 | (0.962) | 71614 | 49.5361 | 49.5 | |
| * | 47 FLUOROBENZENE | 96 | 6.735 | 6.735 | (1.000) | 457160 | 50.0000 | | |
| | 49 Trichloroethene | 130 | 6.888 | 6.888 | (1.023) | 45273 | 14.0989 | 14.1 | |
| $ | 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.879) | 438735 | 52.5700 | 52.6 | |
| * | 71 CHLOROBENZENE-d5 | 82 | 9.198 | 9.198 | (1.000) | 171429 | 50.0000 | | |
| | 72 Chlorobenzene ++ | 112 | 9.205 | 9.205 | (1.001) | 3483 | 0.45589 | 0.456 | |
| $ | 80 Bromofluorobenzene | 174 | 9.973 | 9.970 | (1.084) | 142125 | 46.8648 | 46.9 | |
| | 96 1,3-Dichlorobenzene | 146 | 10.607 | 10.603 | (0.996) | 2482 | 0.55408 | 0.554 | |
| * | 97 1,4-DICHLOROBENZENE-D4 | 152 | 10.648 | 10.645 | (1.000) | 132396 | 50.0000 | | |
| | 98 1,4-Dichlorobenzene | 146 | 10.656 | 10.656 | (1.001) | 5152 | 1.09795 | 1.10 | |

| Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | CONCENTRATIONS FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|
| 102 1,2-Dichlorobenzene | 146 | 10.918 | 10.914 | (1.025) | 6235 | 1.37660 | 1.38 | |

Data File: /var/chem/msv12.i/2180418.s.b/q8078.d



Date : 18-APR-2018 15:42

Client ID: 21804062008

Instrument: msv12.i

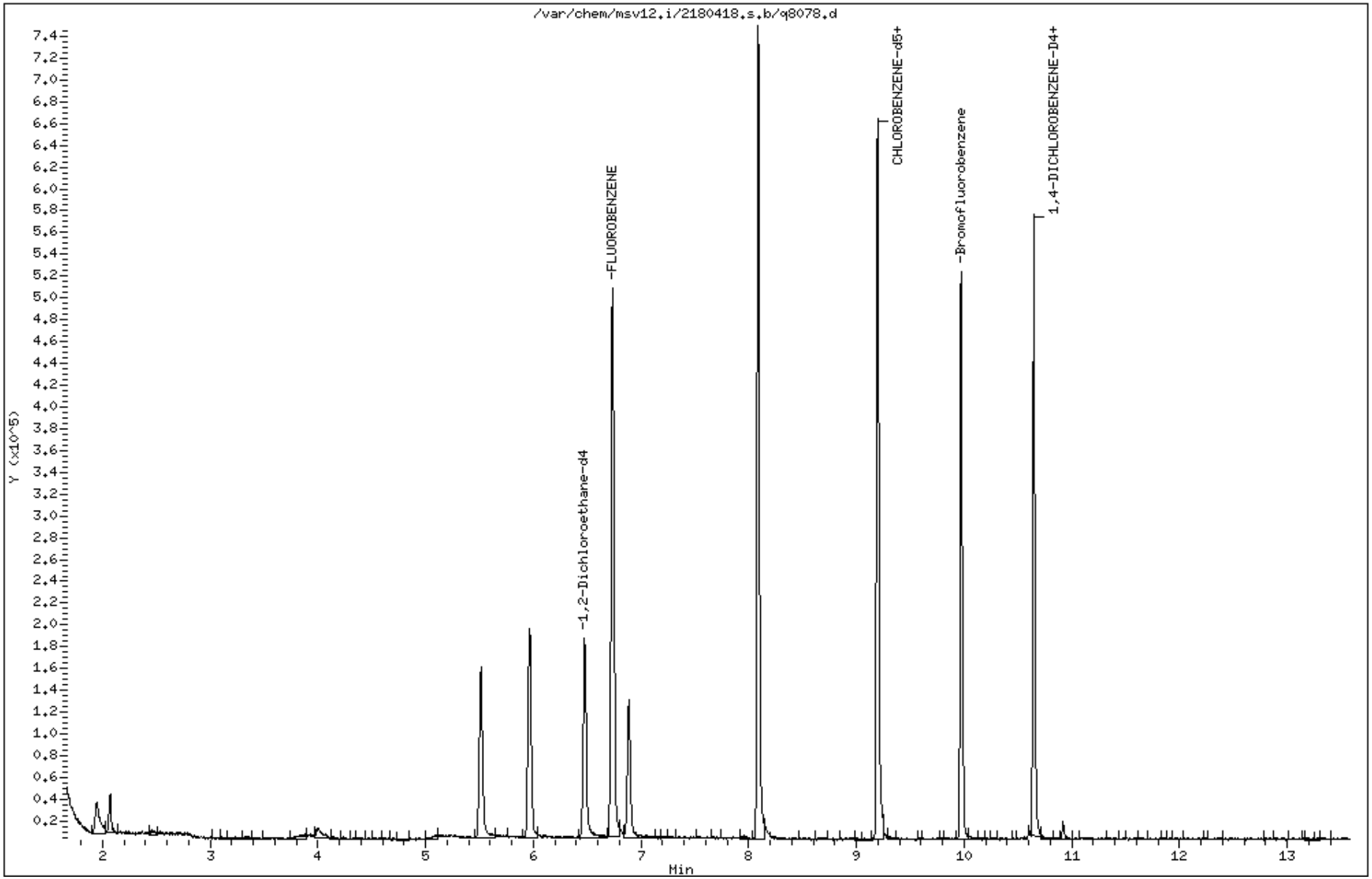
Sample Info: 21804062008*

Purge Volume: 5.0

Operator: JMC2

Column phase: RTX-VMS-30M

Column diameter: 0.25



Data File: /var/chem/msv12.i/2180418.s.b/q8078.d

Date : 18-APR-2018 15:42

Client ID: 21804062008

Instrument: msv12.i

Sample Info: 21804062008x

Purge Volume: 5.0

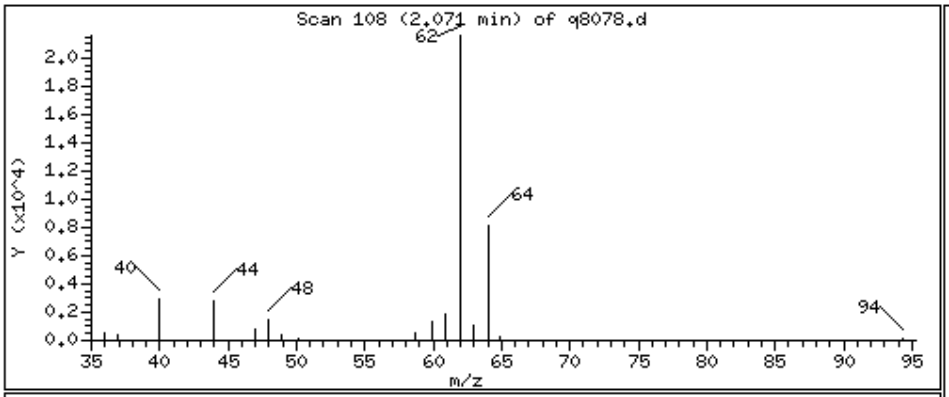
Operator: JMC2

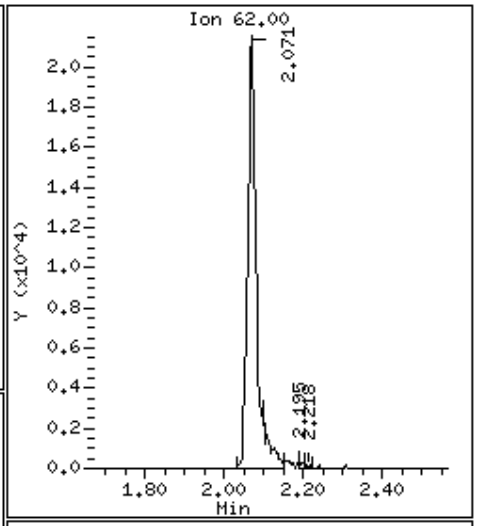
Column phase: RTX-VMS-30M

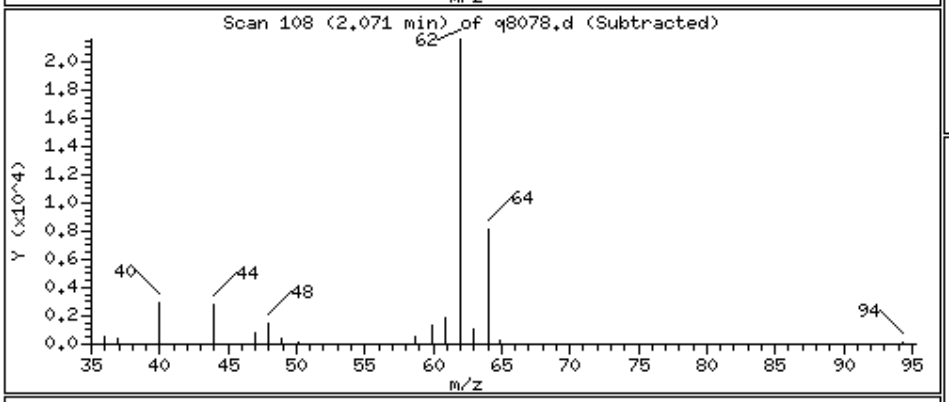
Column diameter: 0.25

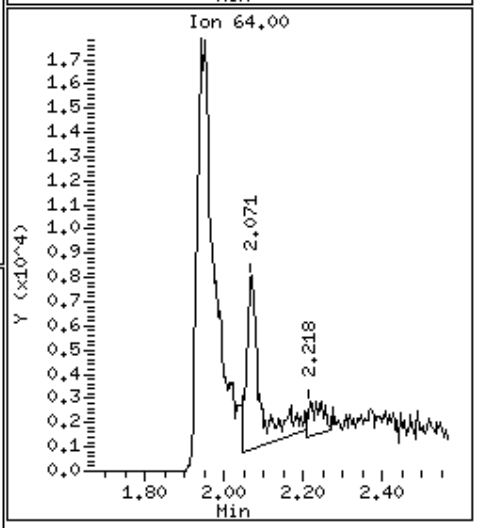
3 Vinyl Chloride +

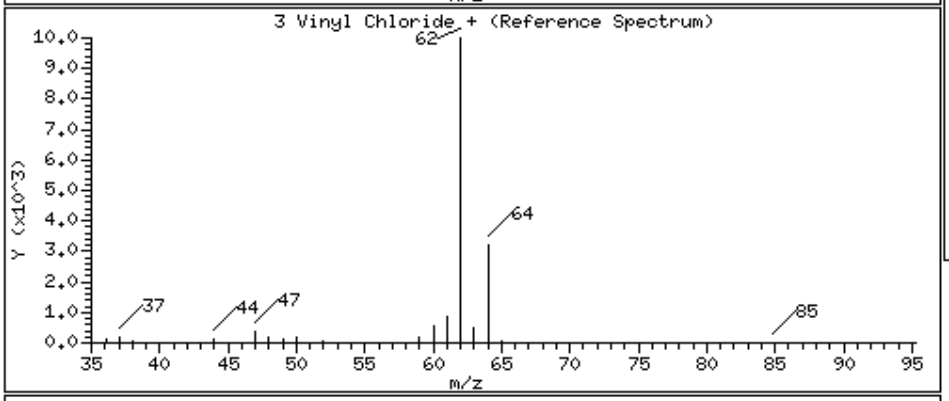
Concentration: 10.3 ug/L

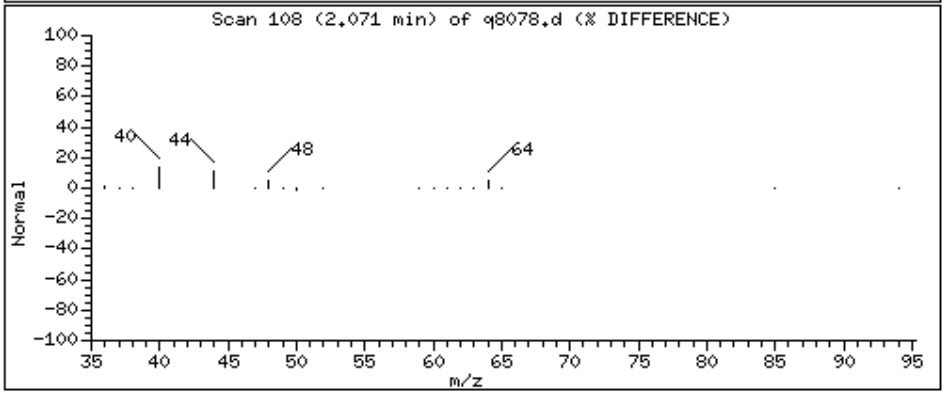


Data File: /var/chem/msv12.i/2180418.s.b/q8078.d

Date : 18-APR-2018 15:42

Client ID: 21804062008

Instrument: msv12.i

Sample Info: 21804062008x

Purge Volume: 5.0

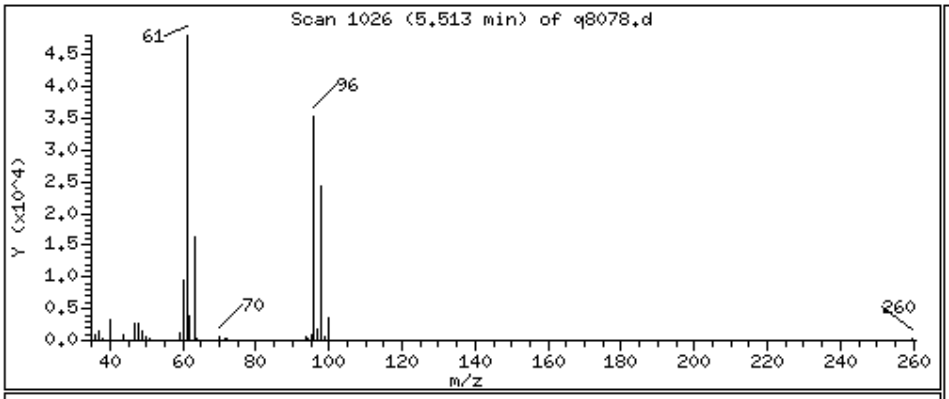
Operator: JMC2

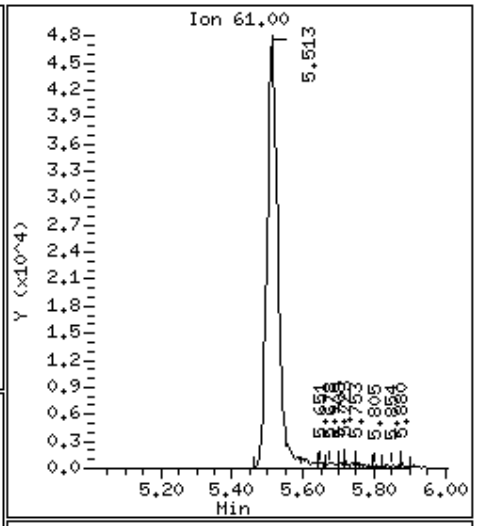
Column phase: RTX-VMS-30M

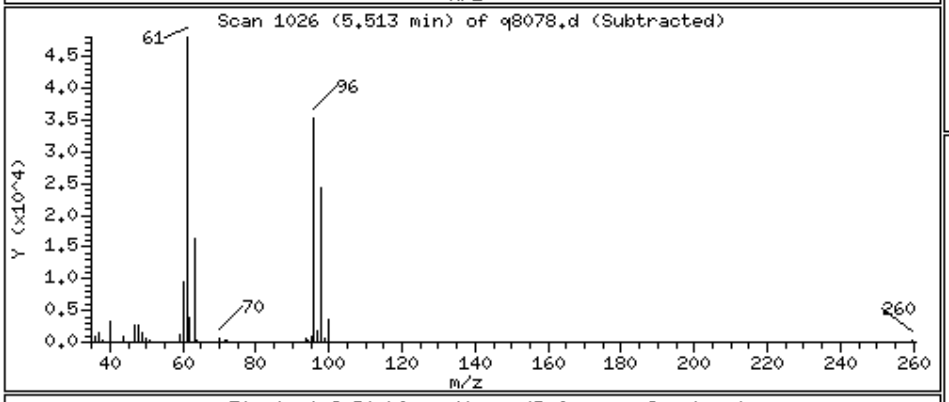
Column diameter: 0.25

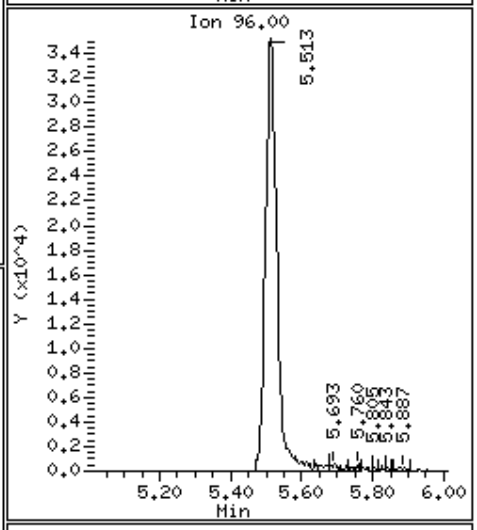
30 cis-1,2-Dichloroethene

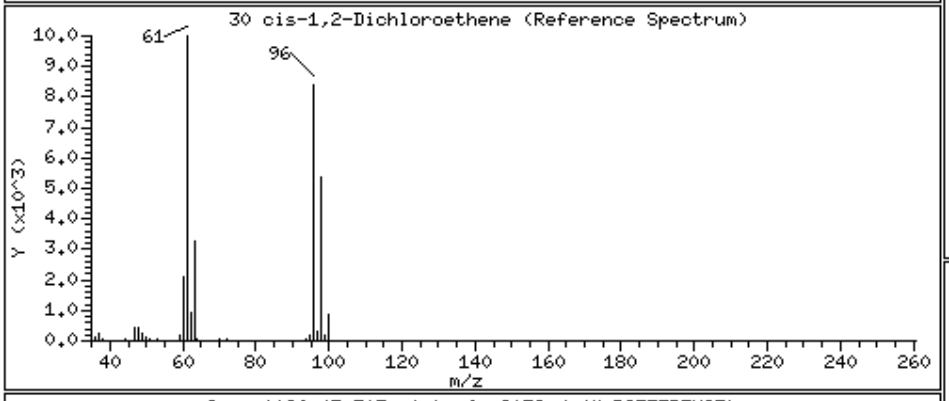
Concentration: 27.1 ug/L

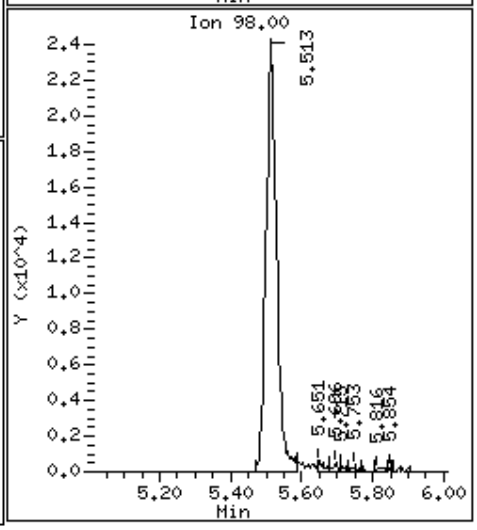


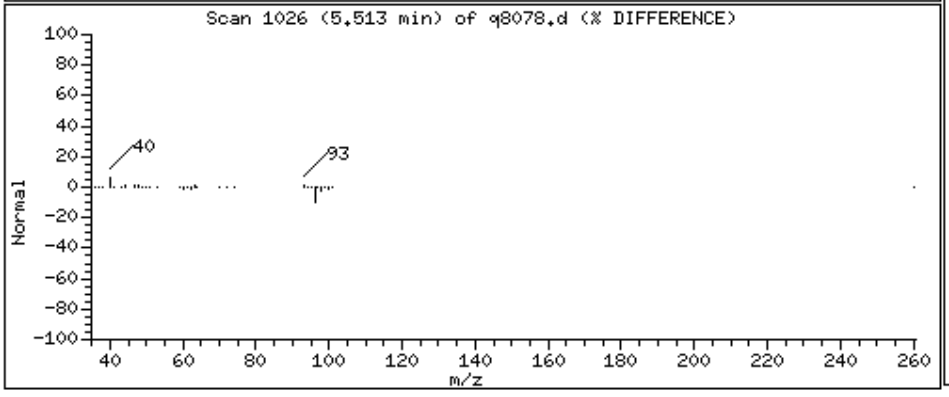



Data File: /var/chem/msv12.i/2180418.s.b/q8078.d

Date : 18-APR-2018 15:42

Client ID: 21804062008

Instrument: msv12.i

Sample Info: 21804062008x

Purge Volume: 5.0

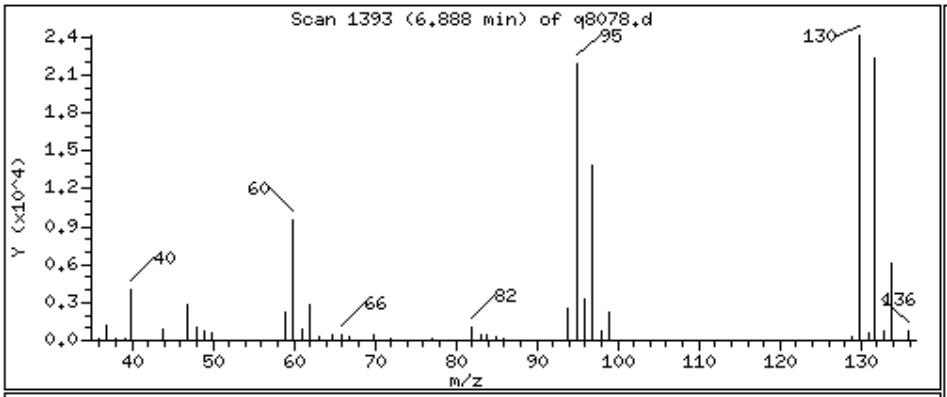
Operator: JMC2

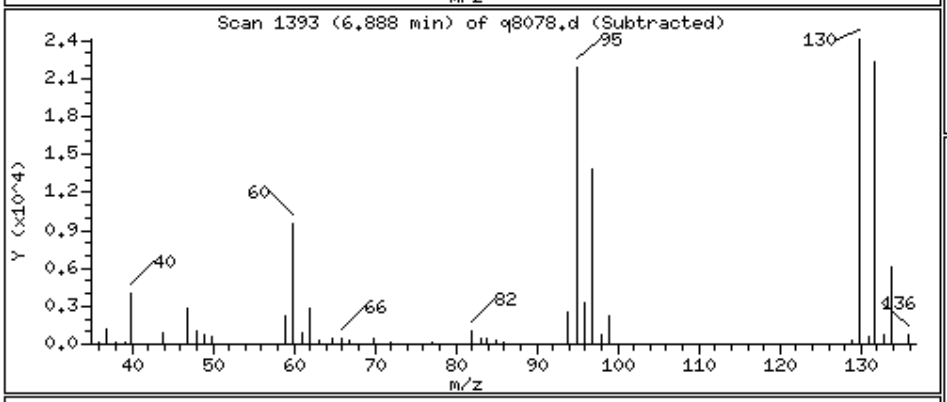
Column phase: RTX-VMS-30M

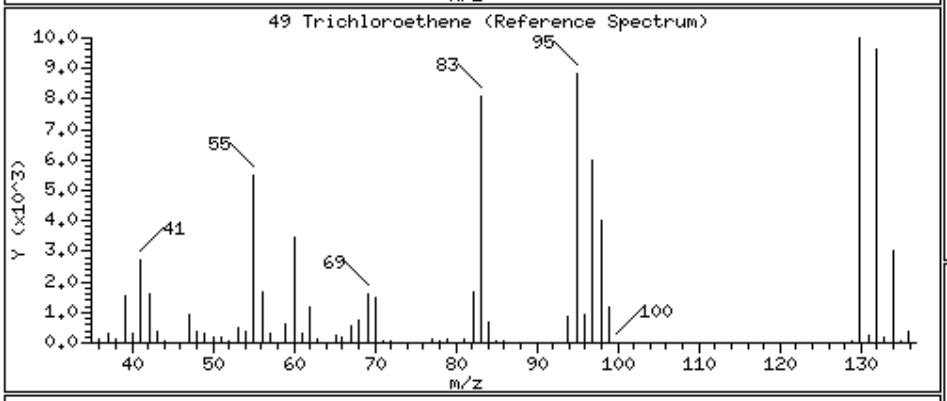
Column diameter: 0.25

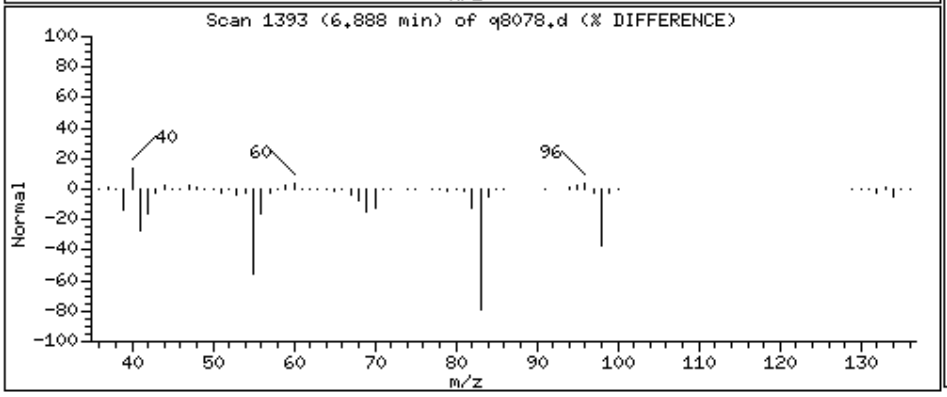
49 Trichloroethene

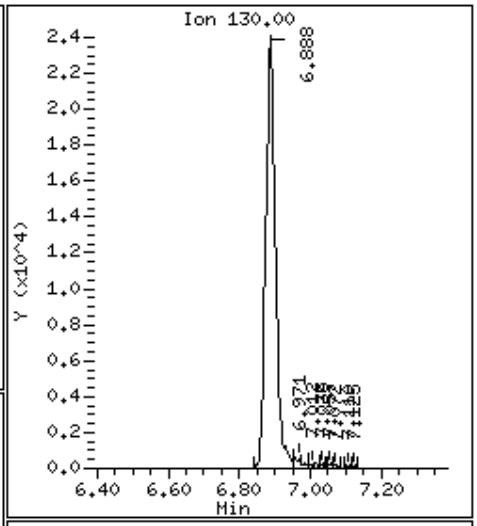
Concentration: 14.1 ug/L

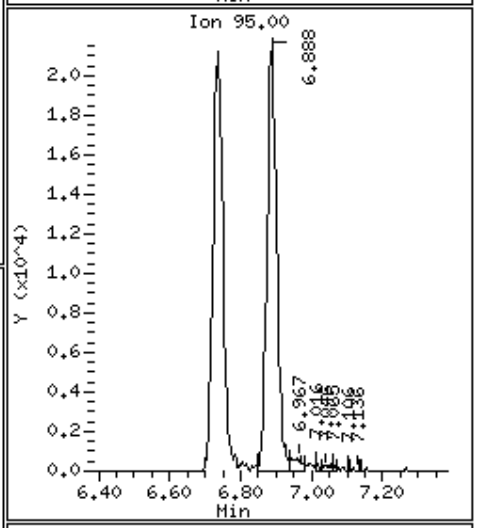


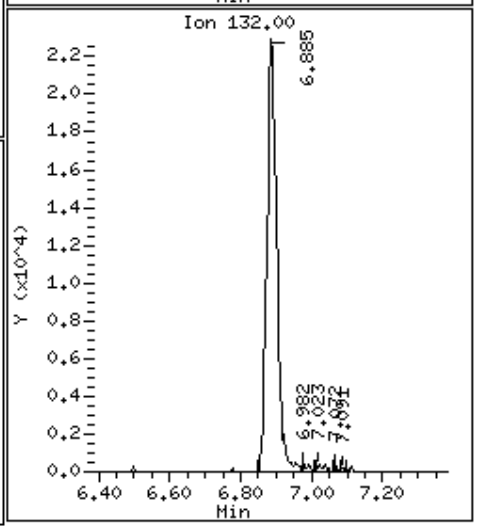



Data File: /var/chem/msv12.i/2180418.s.b/q8078.d

Date : 18-APR-2018 15:42

Client ID: 21804062008

Instrument: msv12.i

Sample Info: 21804062008x

Purge Volume: 5.0

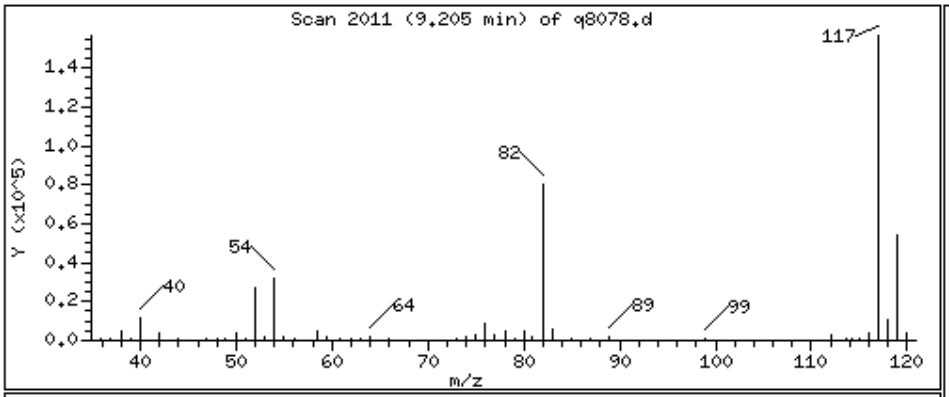
Operator: JMC2

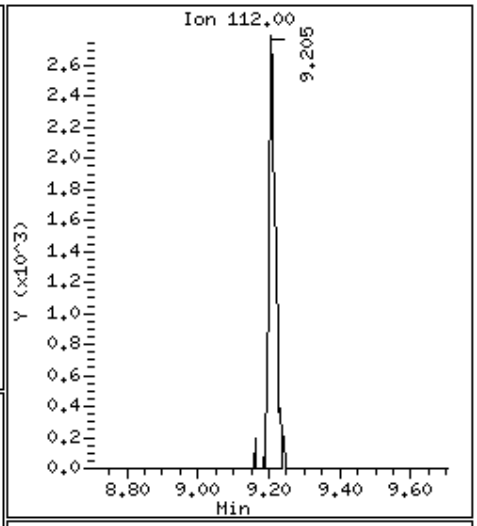
Column phase: RTX-VMS-30M

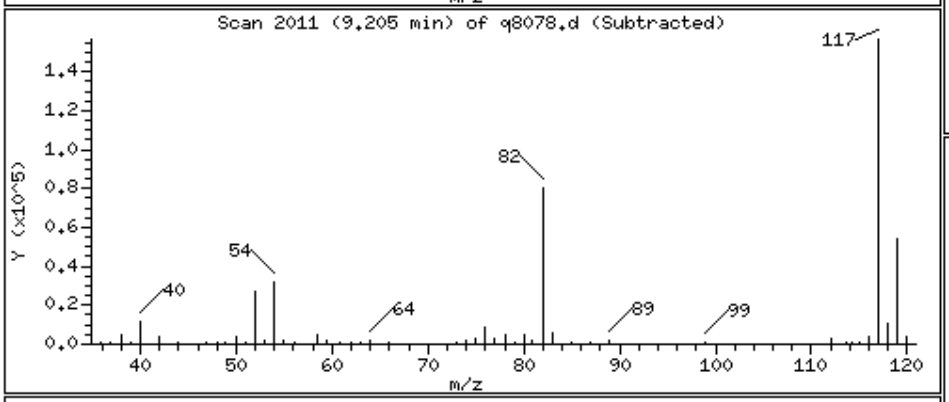
Column diameter: 0.25

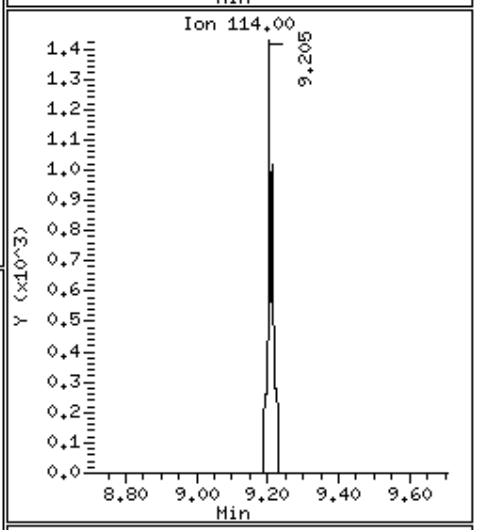
72 Chlorobenzene ++

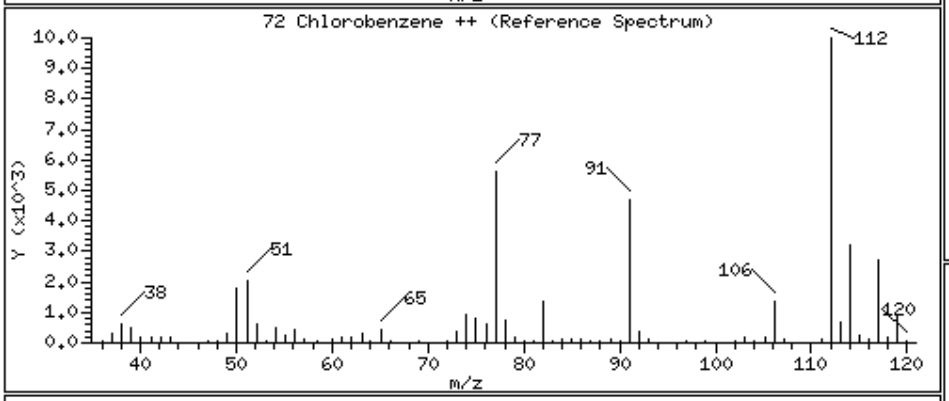
Concentration: 0.456 ug/L

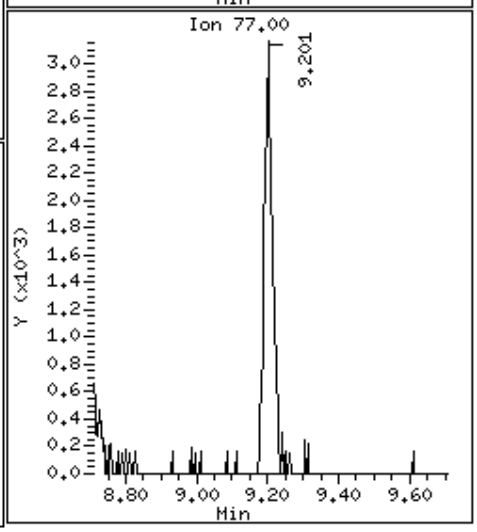


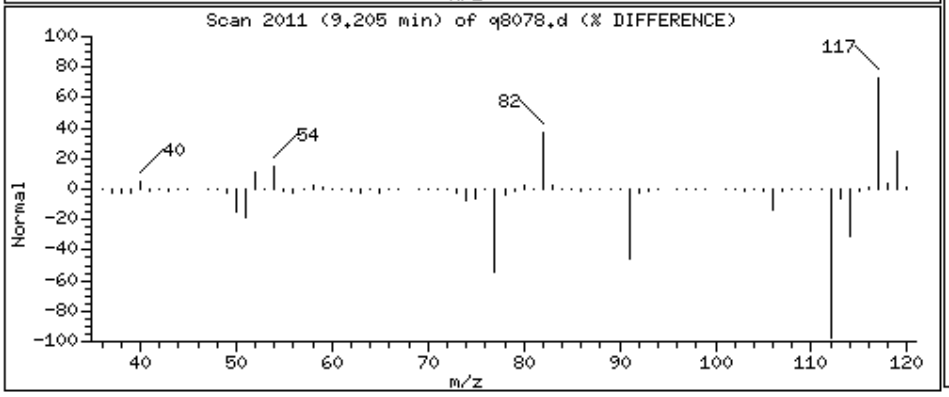



Data File: /var/chem/msv12.i/2180418.s.b/q8078.d

Date : 18-APR-2018 15:42

Client ID: 21804062008

Instrument: msv12.i

Sample Info: 21804062008x

Purge Volume: 5.0

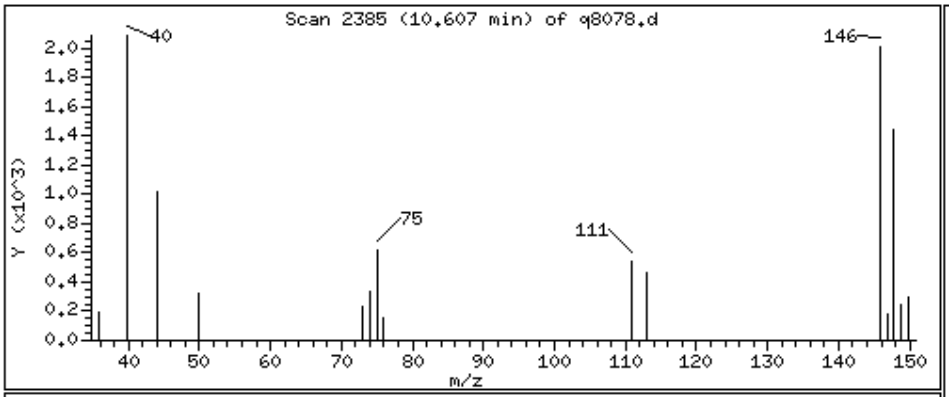
Operator: JMC2

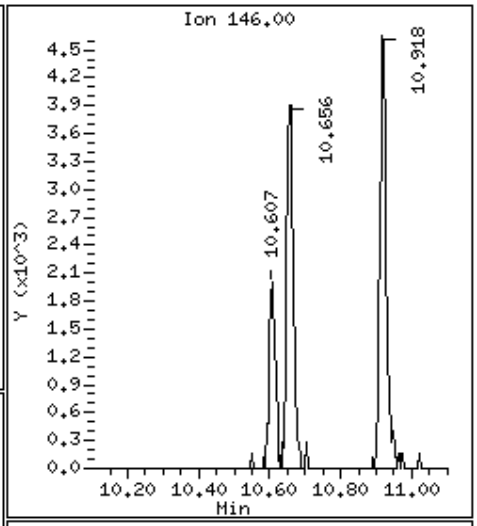
Column phase: RTX-VMS-30M

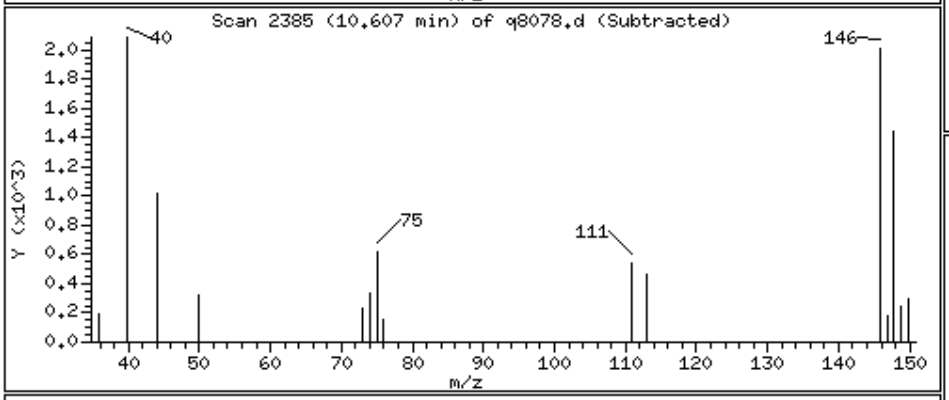
Column diameter: 0.25

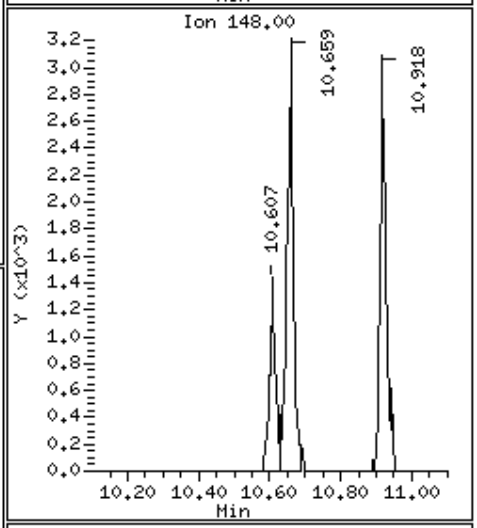
96 1,3-Dichlorobenzene

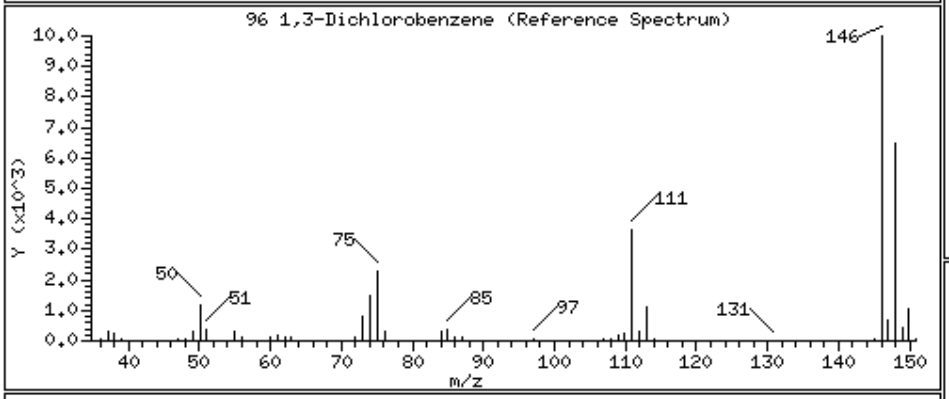
Concentration: 0.554 ug/L

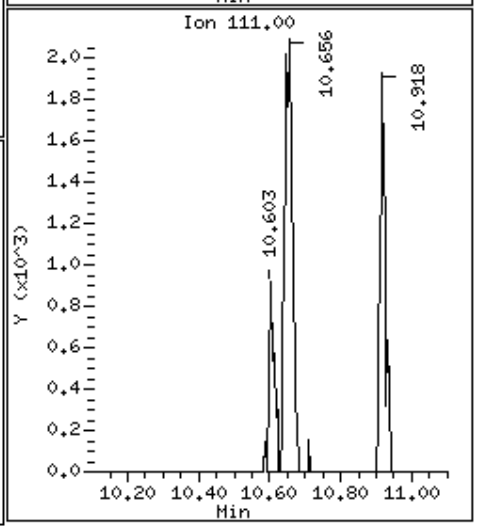


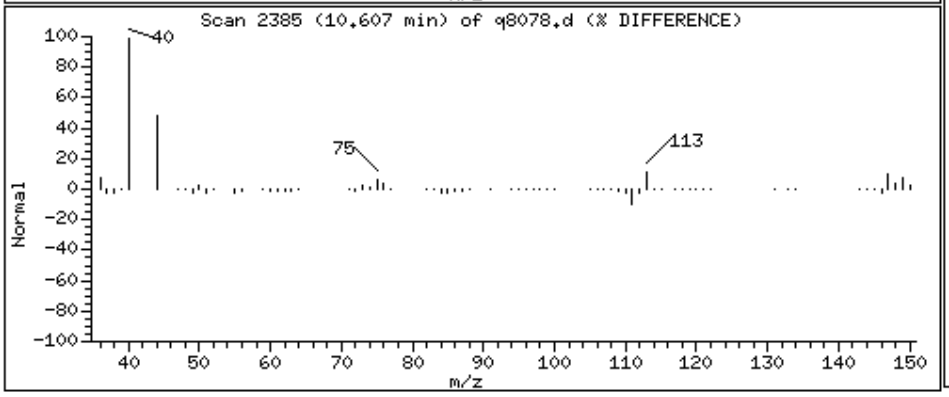



Data File: /var/chem/msv12.i/2180418.s.b/q8078.d

Date : 18-APR-2018 15:42

Client ID: 21804062008

Instrument: msv12.i

Sample Info: 21804062008x

Purge Volume: 5.0

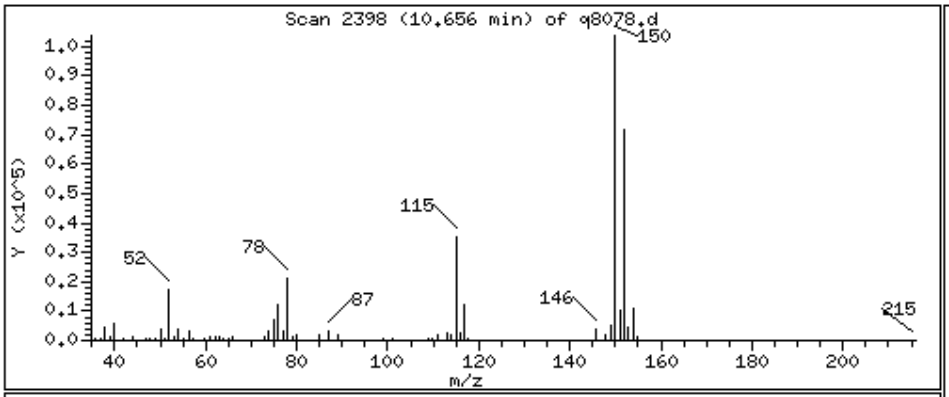
Operator: JMC2

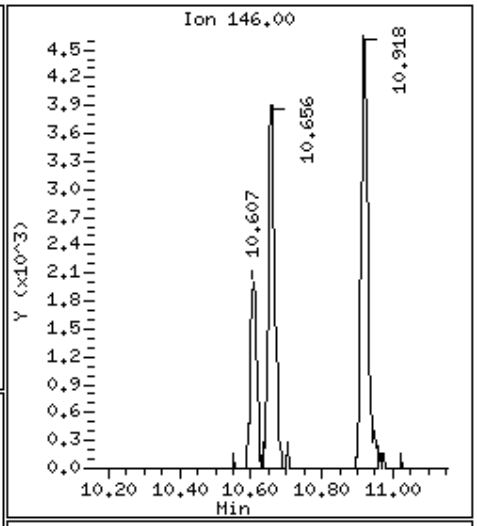
Column phase: RTX-VMS-30M

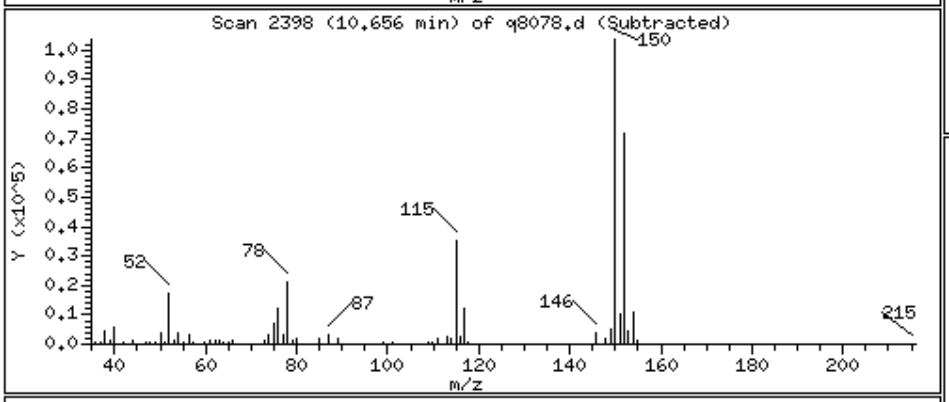
Column diameter: 0.25

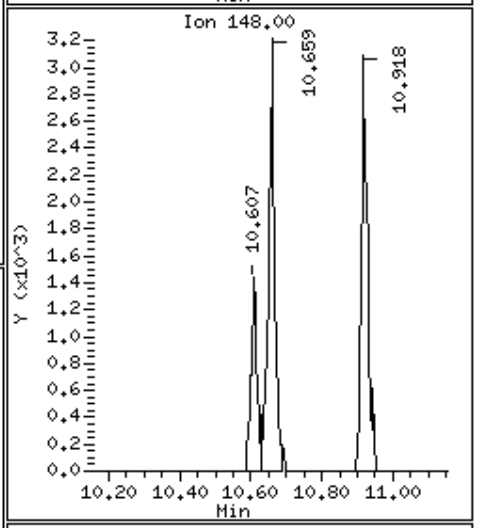
98 1,4-Dichlorobenzene

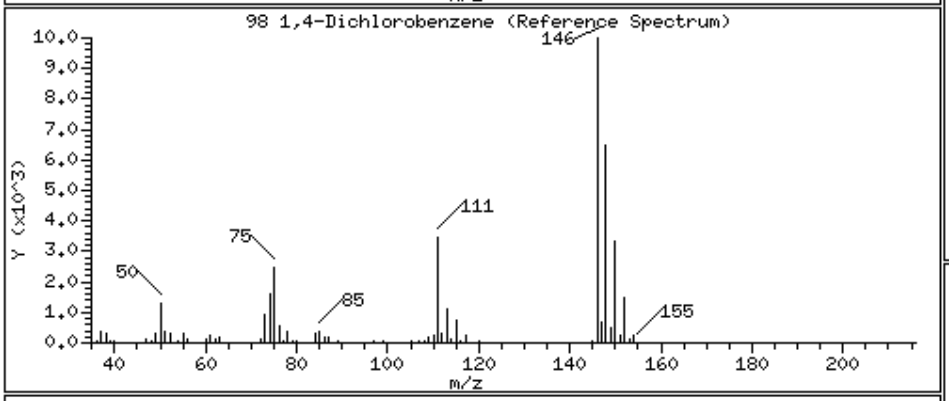
Concentration: 1.10 ug/L

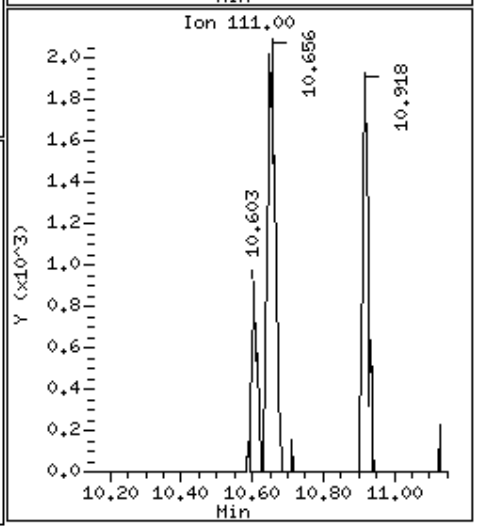


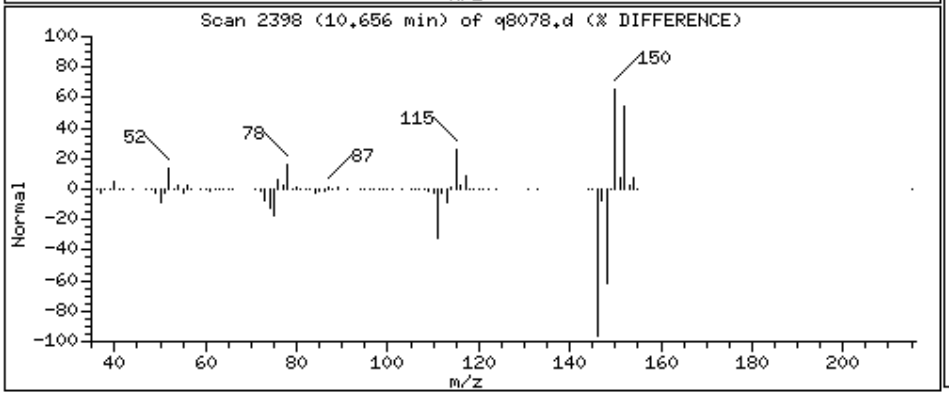



Data File: /var/chem/msv12.i/2180418.s.b/q8078.d

Date : 18-APR-2018 15:42

Client ID: 21804062008

Instrument: msv12.i

Sample Info: 21804062008x

Purge Volume: 5.0

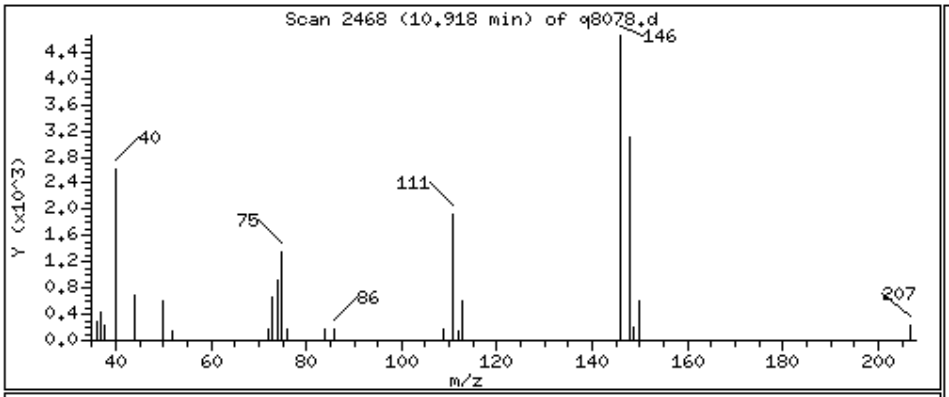
Operator: JMC2

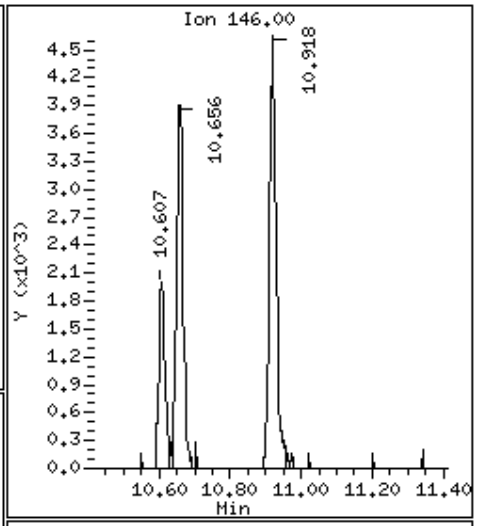
Column phase: RTX-VMS-30M

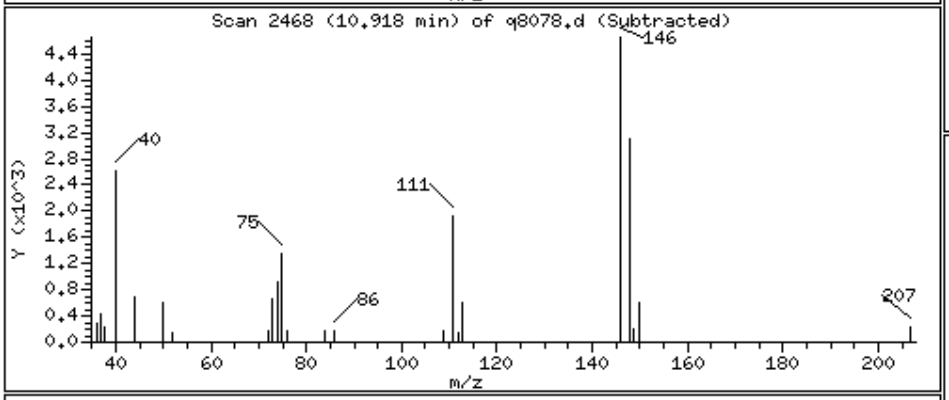
Column diameter: 0.25

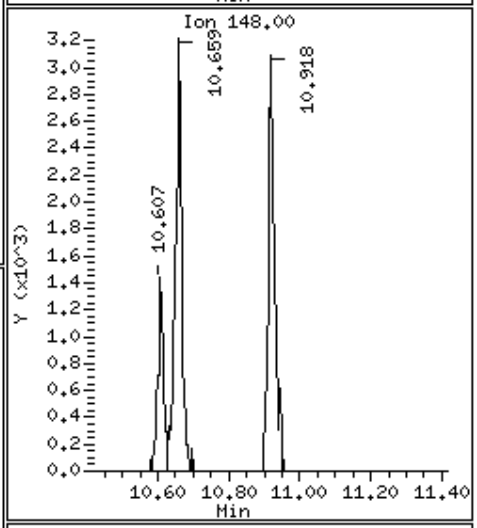
102 1,2-Dichlorobenzene

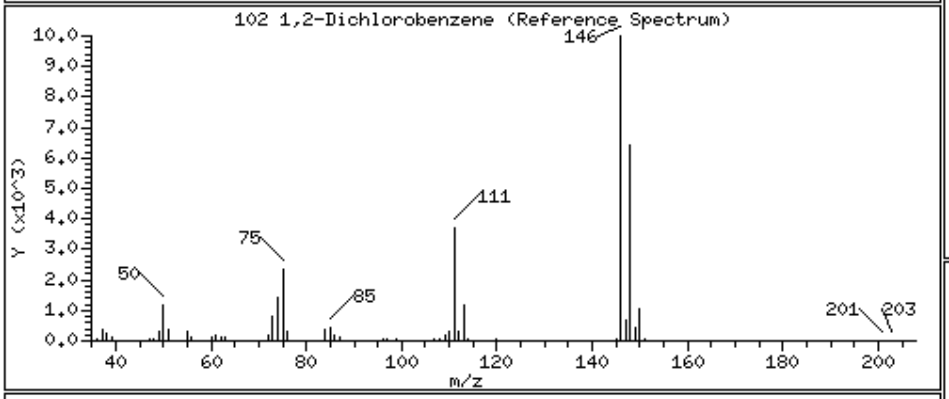
Concentration: 1.38 ug/L

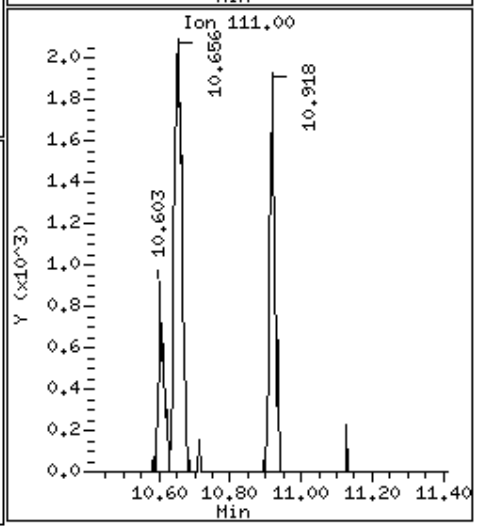


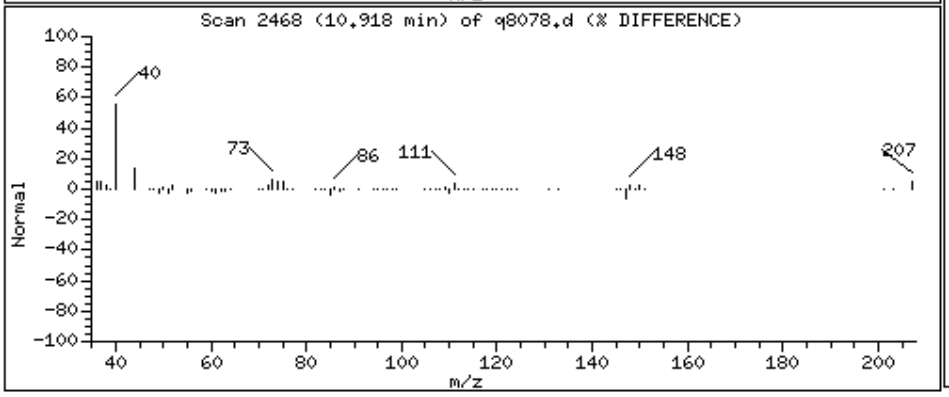



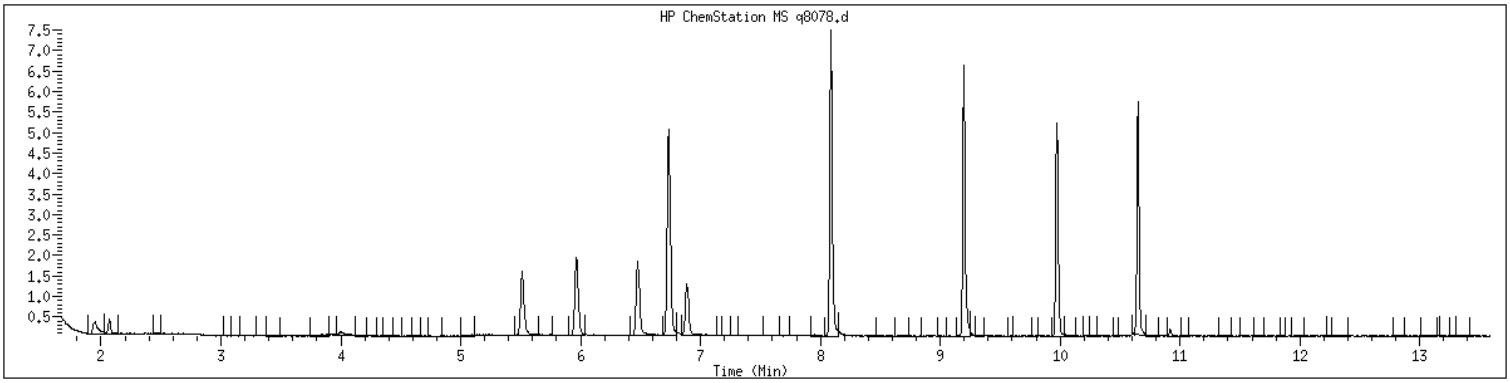



MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 21804062008 SampleType : SAMPLE
Injection Date: 04/18/2018 15:42 Instrument : msv12.i
Operator : JMC2
Sample Info : 21804062008*
Misc Info : MSV~40673~*1*JMC2
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b-




NO MANUAL INTEGRATIONS

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-01-21 |
| Collect Date: | 04/05/18 Time: 1450 | GCAL Sample ID: | 21804062009 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8076 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1456 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-35-4 | 1,1-Dichloroethene | 0.463 | J | 0.200 | 0.500 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | 1.35 | | 0.200 | 0.500 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | 1.01 | | 0.200 | 0.500 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | 2.26 | | 0.200 | 0.500 | 1.00 |
| 544-10-5 | 1-Chlorohexane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-93-3 | 2-Butanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 95-49-8 | 2-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 591-78-6 | 2-Hexanone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 67-64-1 | Acetone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 71-43-2 | Benzene | 0.891 | J | 0.200 | 0.500 | 1.00 |
| 108-86-1 | Bromobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-97-5 | Bromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-27-4 | Bromodichloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-25-2 | Bromoform | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 74-83-9 | Bromomethane | 1.00 | U | 0.500 | 1.00 | 1.00 |
| 75-15-0 | Carbon disulfide | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 56-23-5 | Carbon tetrachloride | 0.500 | U | 0.250 | 0.500 | 1.00 |

FORM I VOA

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-01-21 |
| Collect Date: | 04/05/18 Time: 1450 | GCAL Sample ID: | 21804062009 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8076 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1456 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 108-90-7 | Chlorobenzene | 0.512 | J | 0.200 | 0.500 | 1.00 |
| 75-00-3 | Chloroethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 67-66-3 | Chloroform | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-87-3 | Chloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethene | 136 | | 0.200 | 0.500 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 124-48-1 | Dibromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-95-3 | Dibromomethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-41-4 | Ethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 98-82-8 | Isopropylbenzene (Cumene) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 136777-61-2 | m,p-Xylene | 0.500 | U | 0.200 | 0.500 | 2.00 |
| 75-09-2 | Methylene chloride | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 91-20-3 | Naphthalene | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 104-51-8 | n-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 103-65-1 | n-Propylbenzene | 2.00 | U | 1.00 | 2.00 | 5.00 |
| 95-47-6 | o-Xylene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 135-98-8 | sec-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-42-5 | Styrene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether (MTBE) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 98-06-6 | tert-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 127-18-4 | Tetrachloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-88-3 | Toluene | 2.46 | | 0.200 | 0.500 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-01-6 | Trichloroethene | 30.3 | | 0.200 | 0.500 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-01-4 | Vinyl chloride | 1.87 | | 0.200 | 0.500 | 1.00 |

FORM I VOA

GCAL, Inc.

Data file : /var/chem/msv12.i/2180418.s.b/q8076.d
Lab Smp Id: 21804062009 Client Smp ID: 21804062009
Inj Date : 18-APR-2018 14:56
Operator : JMC2 Inst ID: msv12.i
Smp Info : 21804062009*
Misc Info : MSV~40673~*1*JMC2
Comment :
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:06 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 18:43 Cal File: q7984cD.d
Als bottle: 11
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b-.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| | Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|---|
| | 3 Vinyl Chloride + | 62 | 2.068 | 2.068 | (0.307) | 6099 | 1.86942 | 1.87 | |
| | 11 1,1-Dichloroethene + | 96 | 3.293 | 3.301 | (0.489) | 995 | 0.46334 | 0.463 | (H) |
| | 30 cis-1,2-Dichloroethene | 61 | 5.513 | 5.509 | (0.818) | 527794 | 135.718 | 136 | |
| M | 48 Total 1,2-Dichloroethene | 61 | | | | 527794 | 135.718 | 136 | |
| $ | 36 Dibromofluoromethane | 111 | 5.966 | 5.966 | (0.885) | 124480 | 50.4689 | 50.5 | 7009 |
| | 44 Benzene | 78 | 6.345 | 6.345 | (0.942) | 10486 | 0.89107 | 0.891 | (H) |
| $ | 43 1,2-Dichloroethane-d4 | 67 | 6.476 | 6.476 | (0.961) | 74222 | 50.8208 | 50.8 | |
| * | 47 FLUOROBENZENE | 96 | 6.738 | 6.735 | (1.000) | 461831 | 50.0000 | | |
| | 49 Trichloroethene | 130 | 6.888 | 6.888 | (1.022) | 98323 | 30.3101 | 30.3 | |
| $ | 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.879) | 448459 | 52.4484 | 52.4 | |
| | 61 Toluene + | 91 | 8.129 | 8.125 | (0.884) | 29312 | 2.45691 | 2.46 | |
| * | 71 CHLOROBENZENE-d5 | 82 | 9.197 | 9.198 | (1.000) | 175635 | 50.0000 | | |
| | 72 Chlorobenzene ++ | 112 | 9.212 | 9.205 | (1.002) | 4006 | 0.51179 | 0.512 | |
| $ | 80 Bromofluorobenzene | 174 | 9.973 | 9.970 | (1.084) | 143574 | 46.2088 | 46.2 | |

| | Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|---|
| 96 | 1,3-Dichlorobenzene | 146 | 10.607 | 10.603 | (0.996) | 4635 | 1.00565 | 1.01 | |
| * 97 | 1,4-DICHLOROBENZENE-D4 | 152 | 10.648 | 10.645 | (1.000) | 136222 | 50.0000 | | |
| 98 | 1,4-Dichlorobenzene | 146 | 10.652 | 10.656 | (1.000) | 10899 | 2.25747 | 2.26 | |
| 102 | 1,2-Dichlorobenzene | 146 | 10.918 | 10.914 | (1.025) | 6292 | 1.35017 | 1.35 | |

QC Flag Legend

H - Operator selected an alternate compound hit.

Data File: /var/chem/msv12.i/2180418.s.b/q8076.d



Date : 18-APR-2018 14:56

Client ID: 21804062009

Instrument: msv12.i

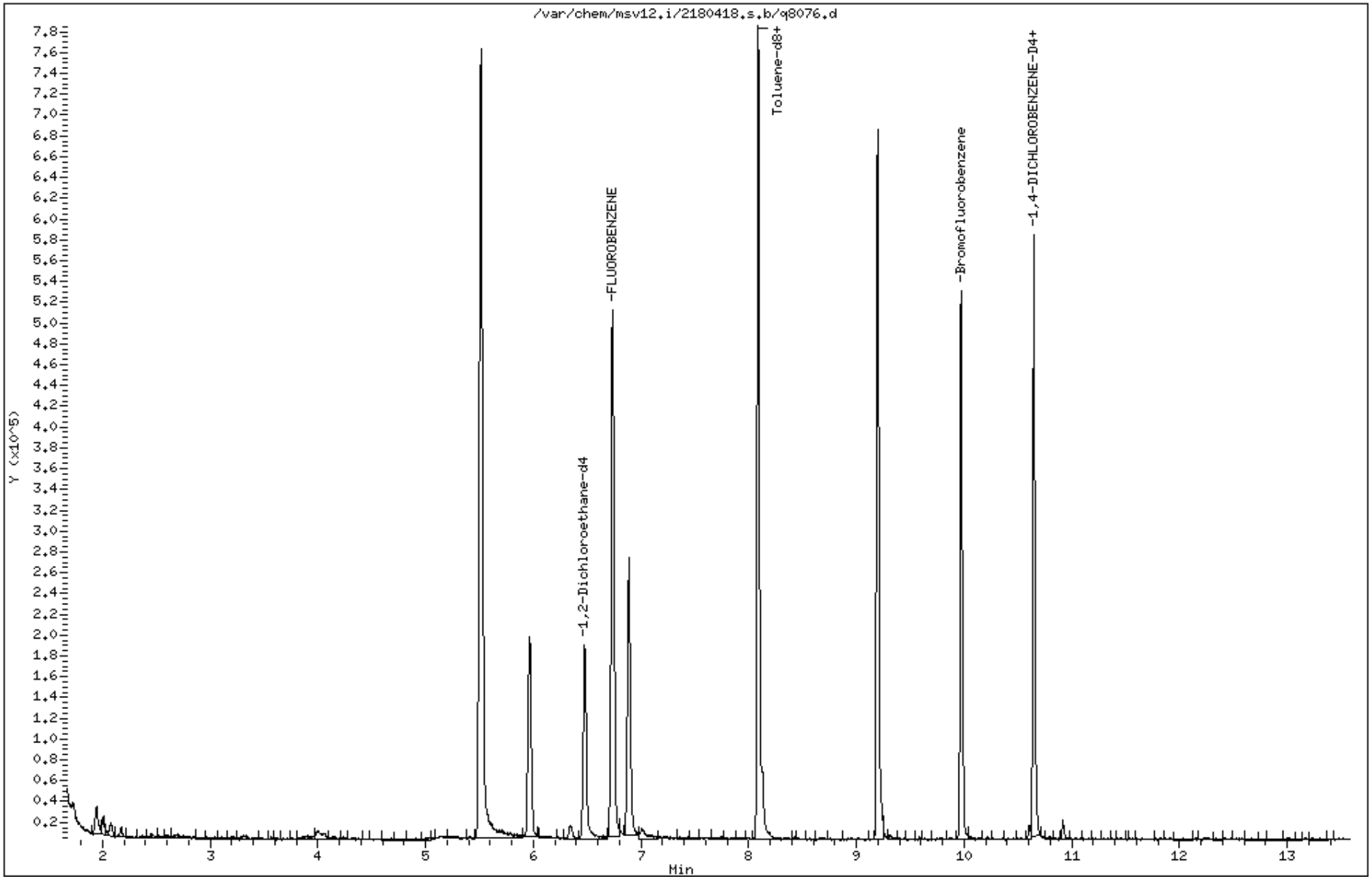
Sample Info: 21804062009*

Purge Volume: 5.0

Operator: JMC2

Column phase: RTX-VMS-30M

Column diameter: 0.25



Data File: /var/chem/msv12.i/2180418.s.b/q8076.d

Date : 18-APR-2018 14:56

Client ID: 21804062009

Instrument: msv12.i

Sample Info: 21804062009x

Purge Volume: 5.0

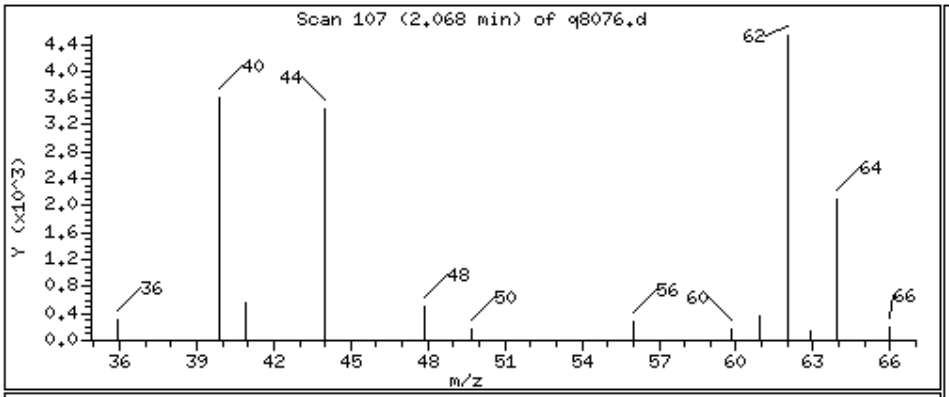
Operator: JMC2

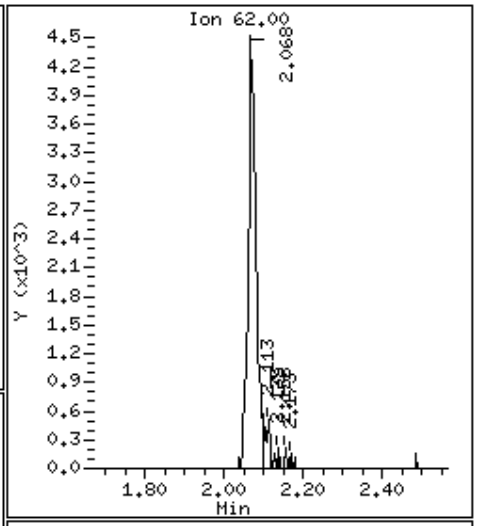
Column phase: RTX-VMS-30M

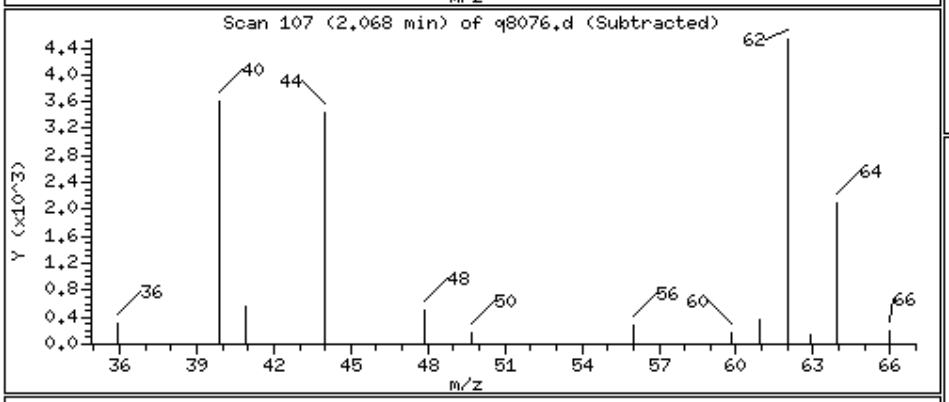
Column diameter: 0.25

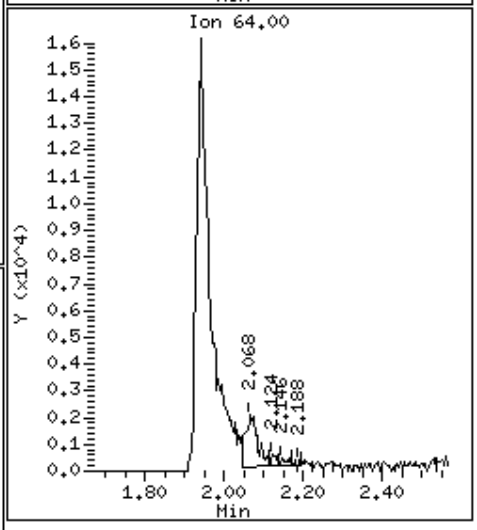
3 Vinyl Chloride +

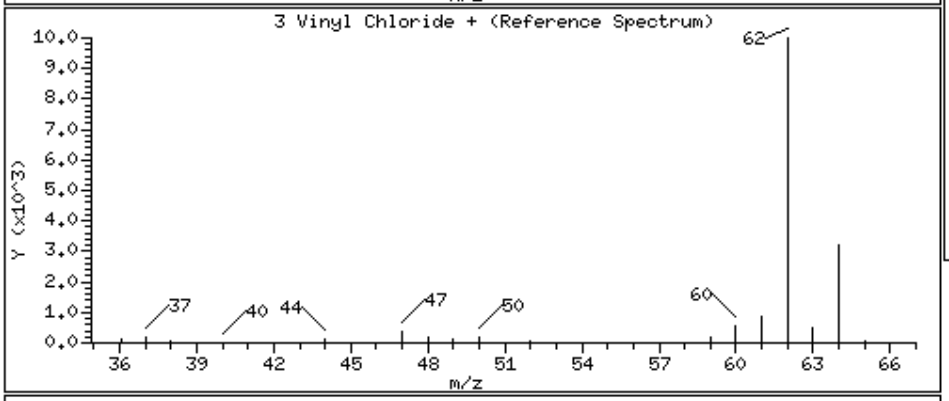
Concentration: 1.87 ug/L

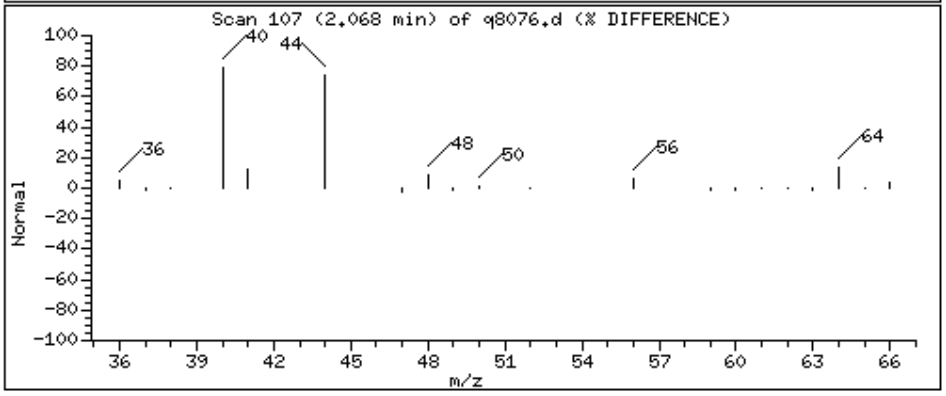


Data File: /var/chem/msv12.i/2180418.s.b/q8076.d

Date : 18-APR-2018 14:56

Client ID: 21804062009

Instrument: msv12.i

Sample Info: 21804062009x

Purge Volume: 5.0

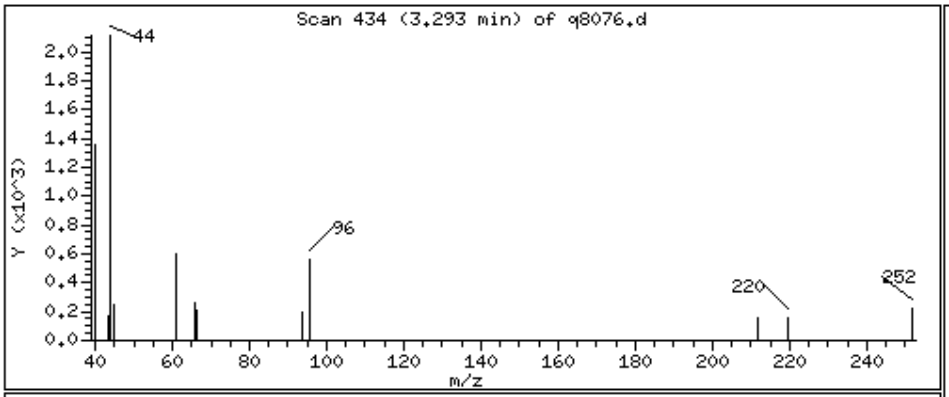
Operator: JMC2

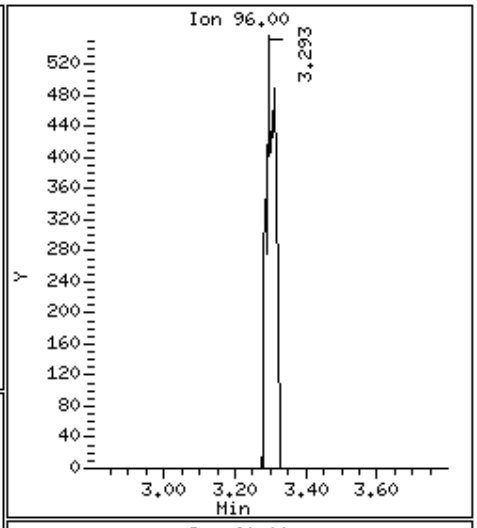
Column phase: RTX-VMS-30M

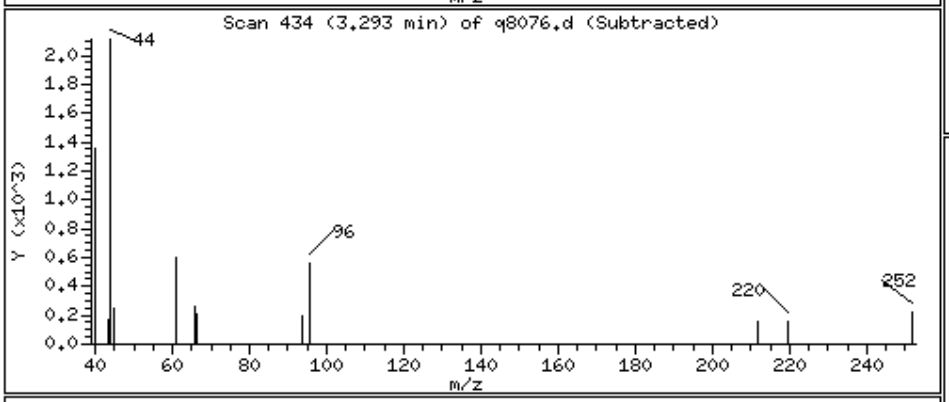
Column diameter: 0.25

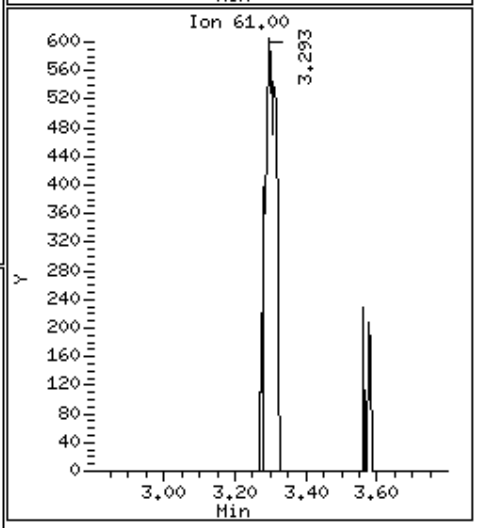
11 1,1-Dichloroethene +

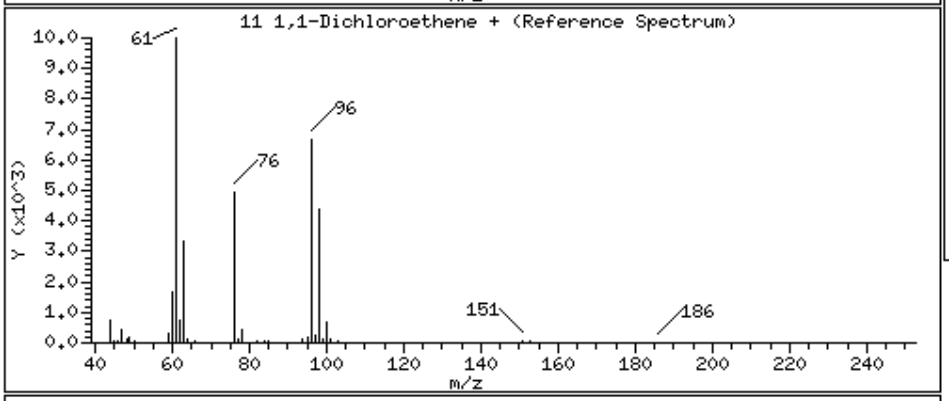
Concentration: 0.463 ug/L

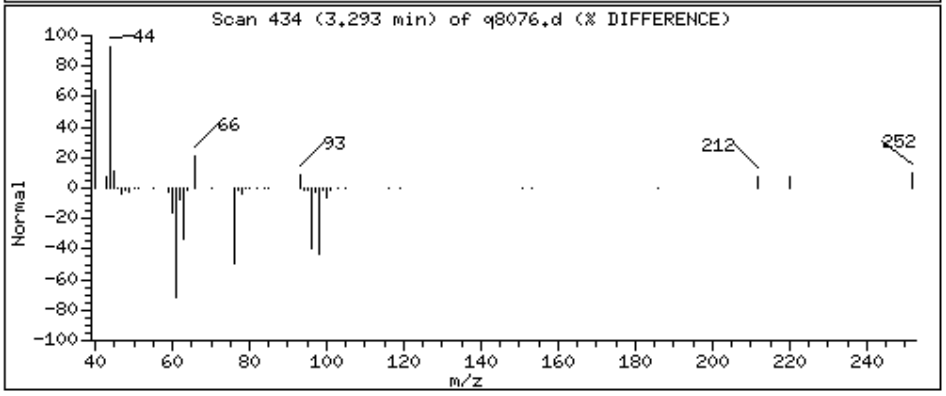


Data File: /var/chem/msv12.i/2180418.s.b/q8076.d

Date : 18-APR-2018 14:56

Client ID: 21804062009

Instrument: msv12.i

Sample Info: 21804062009x

Purge Volume: 5.0

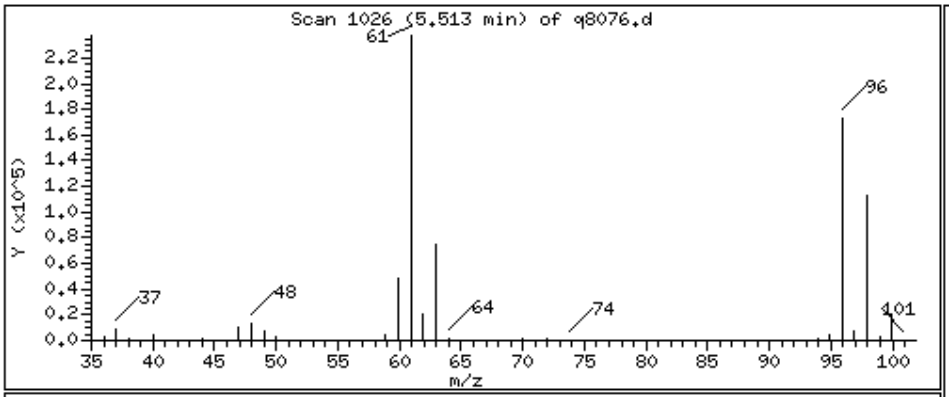
Operator: JMC2

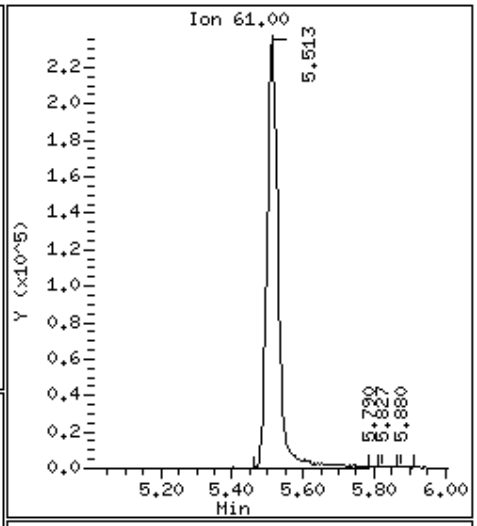
Column phase: RTX-VMS-30M

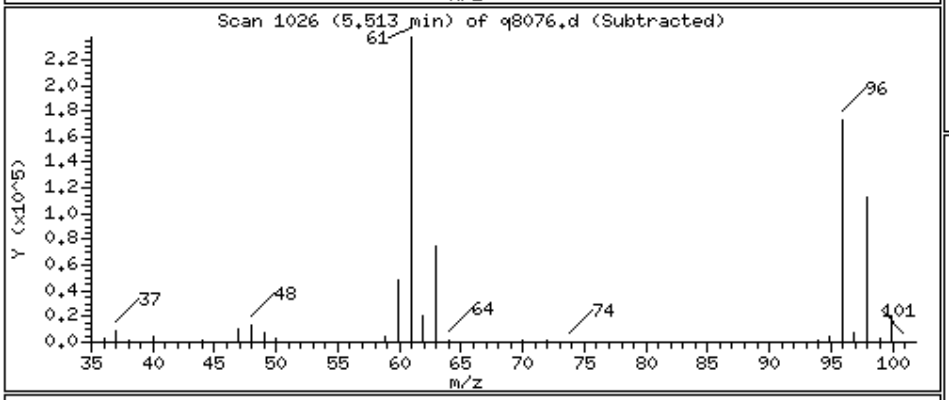
Column diameter: 0.25

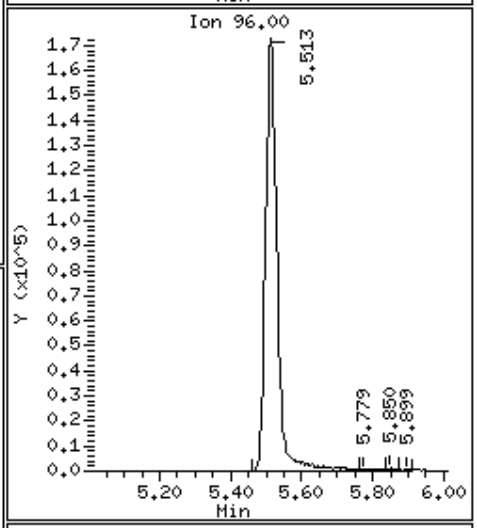
30 cis-1,2-Dichloroethene

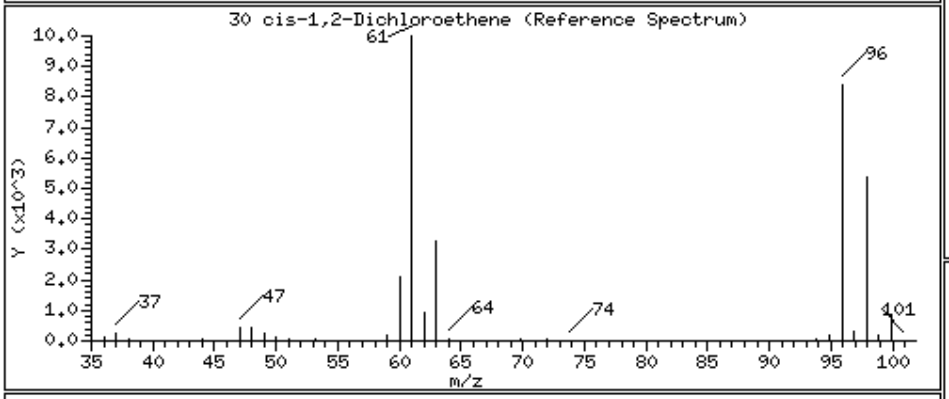
Concentration: 136 ug/L

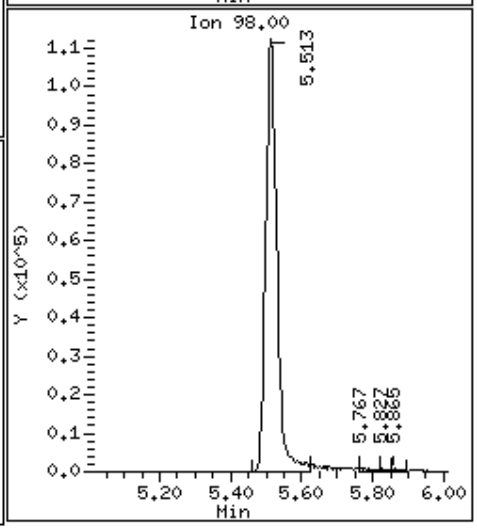


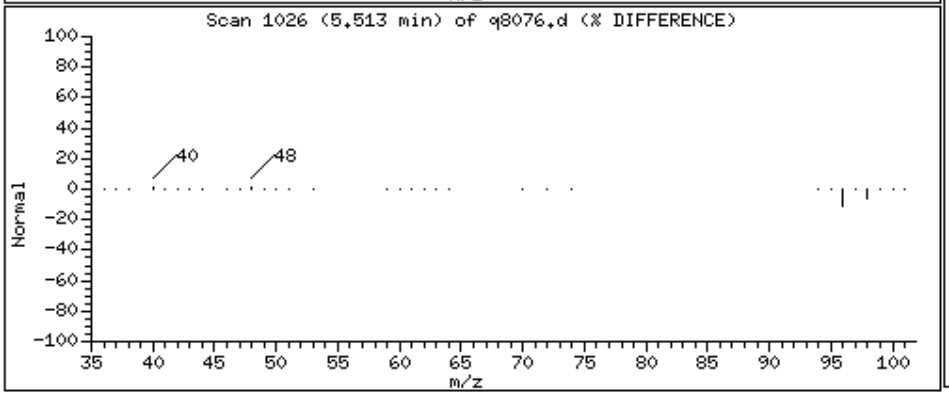



Data File: /var/chem/msv12.i/2180418.s.b/q8076.d

Date : 18-APR-2018 14:56

Client ID: 21804062009

Instrument: msv12.i

Sample Info: 21804062009x

Purge Volume: 5.0

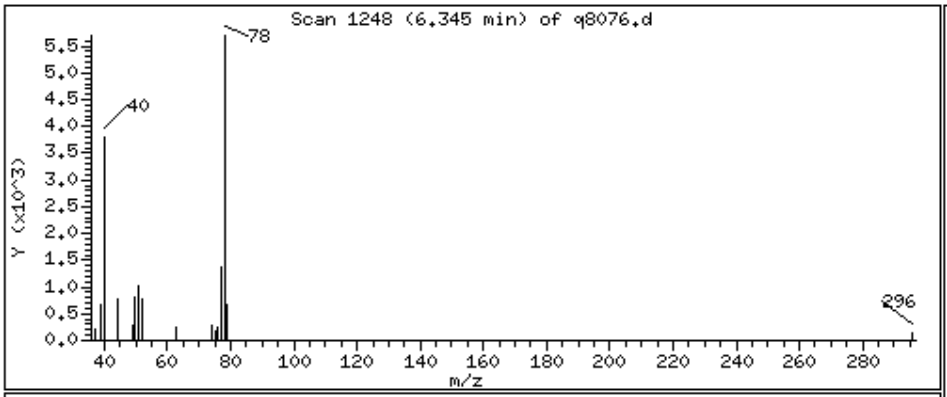
Operator: JMC2

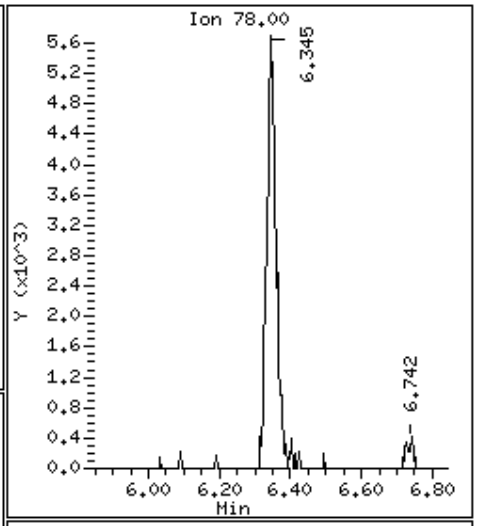
Column phase: RTX-VMS-30M

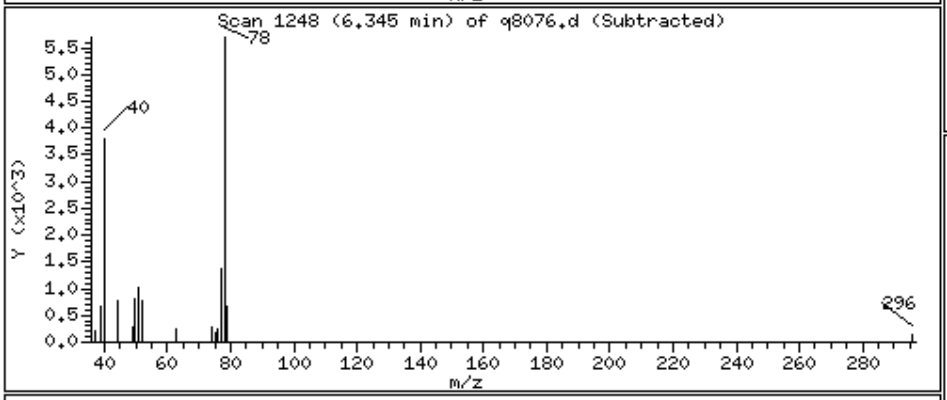
Column diameter: 0.25

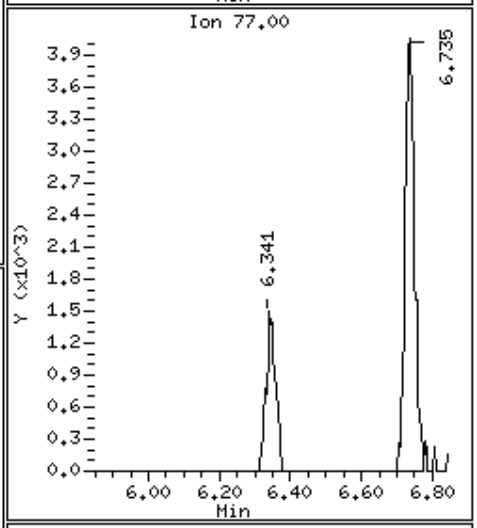
44 Benzene

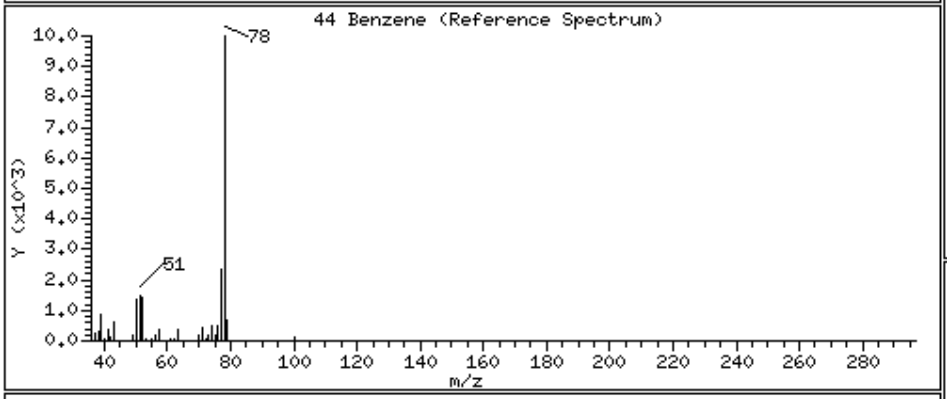
Concentration: 0.891 ug/L

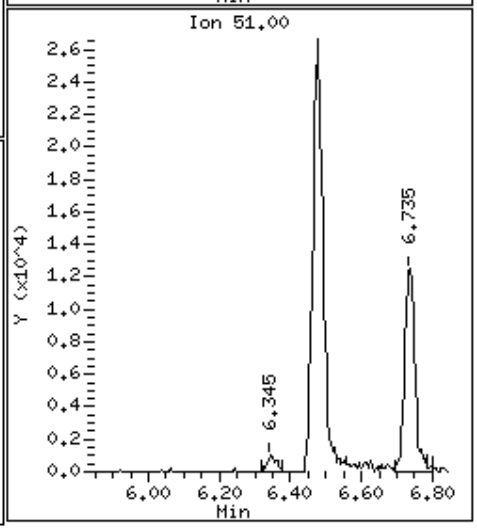


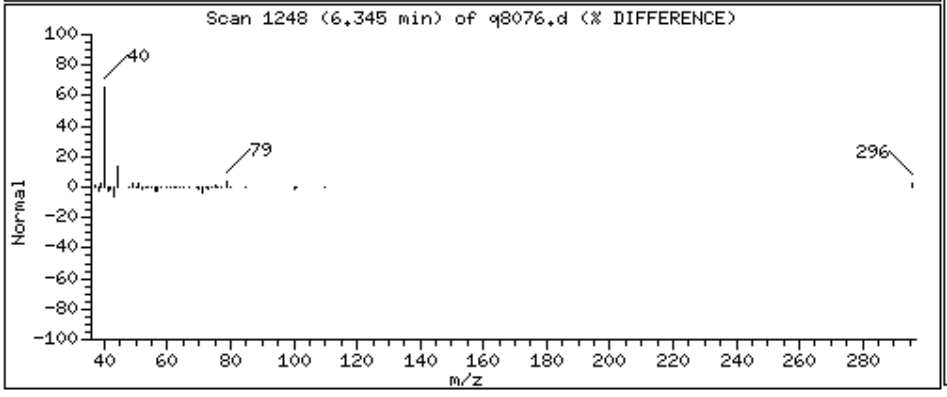



Data File: /var/chem/msv12.i/2180418.s.b/q8076.d

Date : 18-APR-2018 14:56

Client ID: 21804062009

Instrument: msv12.i

Sample Info: 21804062009x

Purge Volume: 5.0

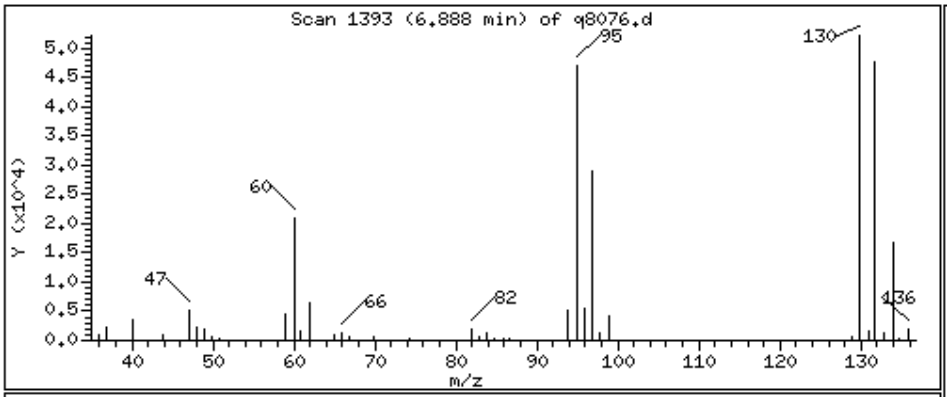
Operator: JMC2

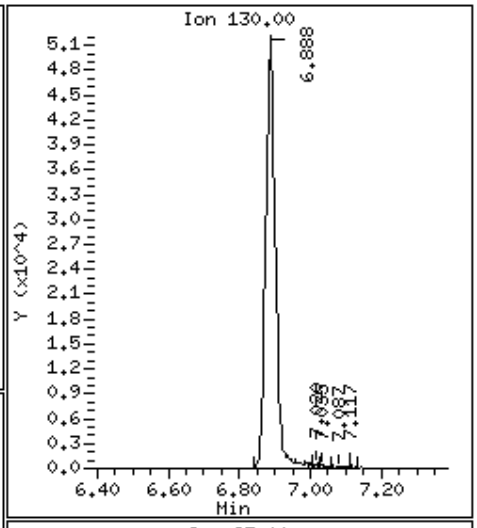
Column phase: RTX-VMS-30M

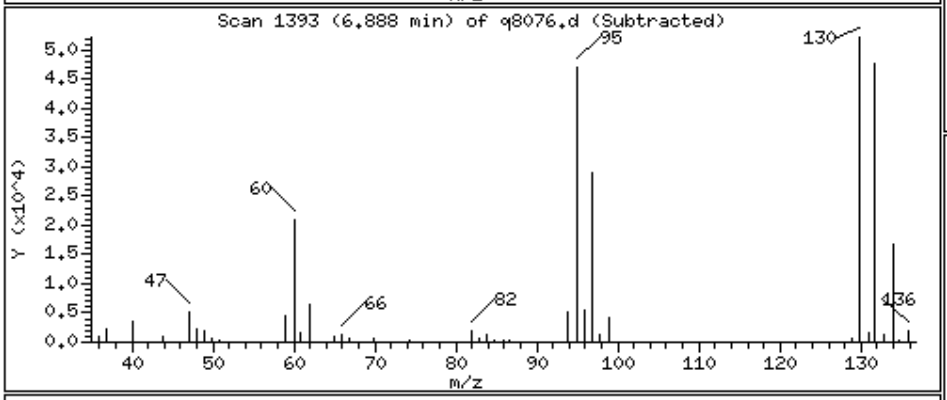
Column diameter: 0.25

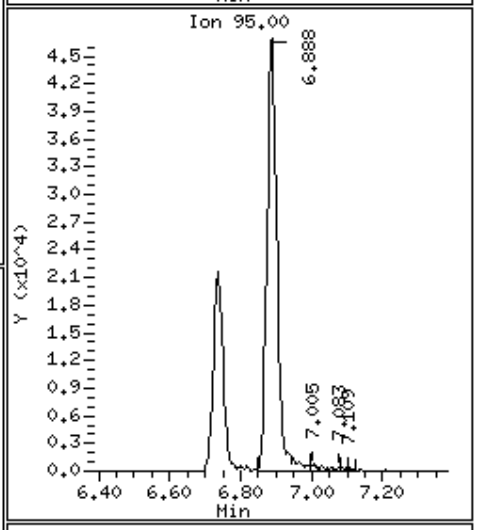
49 Trichloroethene

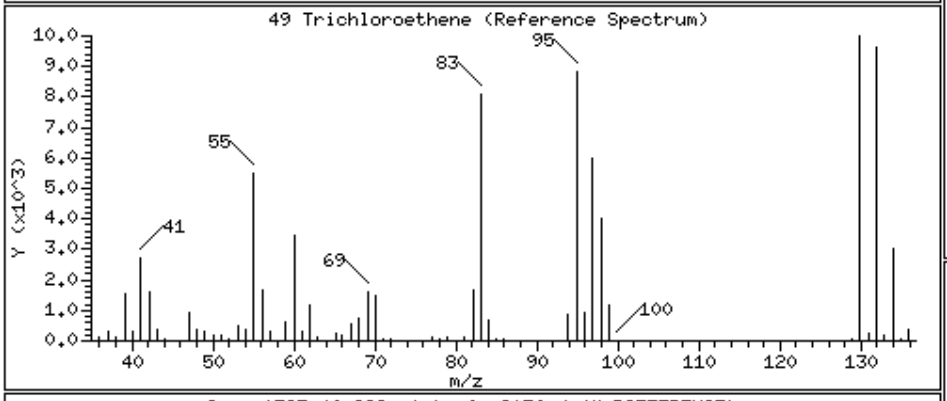
Concentration: 30.3 ug/L

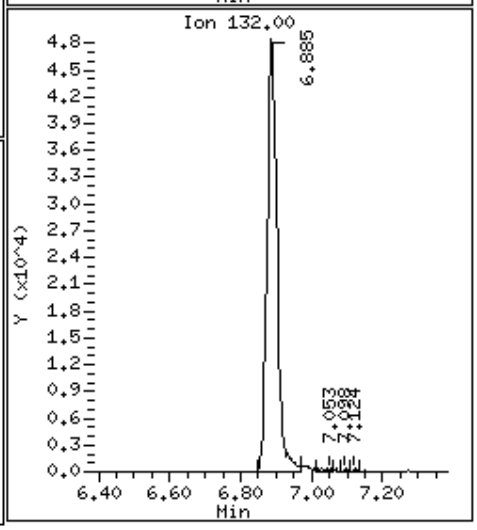


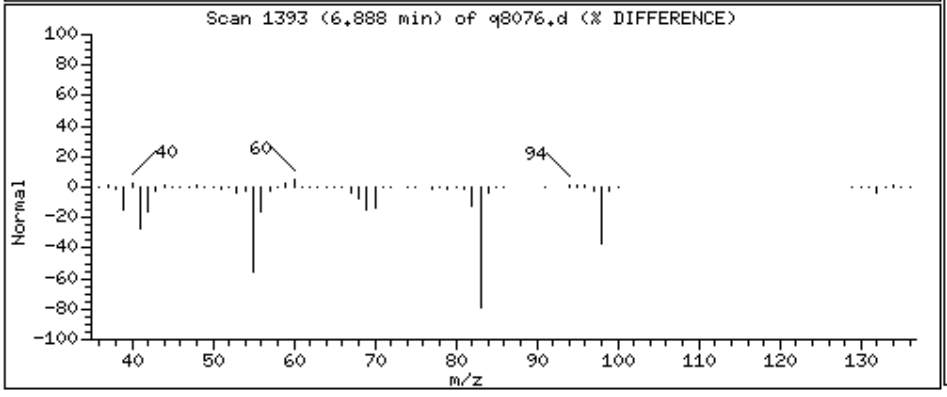



Data File: /var/chem/msv12.i/2180418.s.b/q8076.d

Date : 18-APR-2018 14:56

Client ID: 21804062009

Instrument: msv12.i

Sample Info: 21804062009x

Purge Volume: 5.0

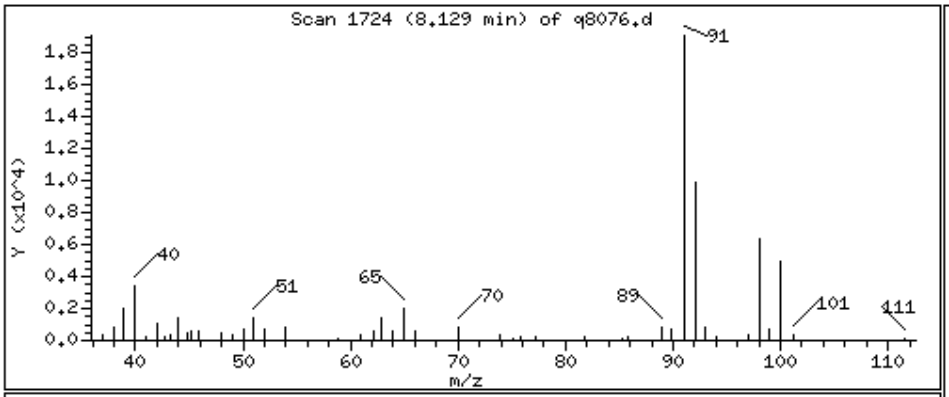
Operator: JMC2

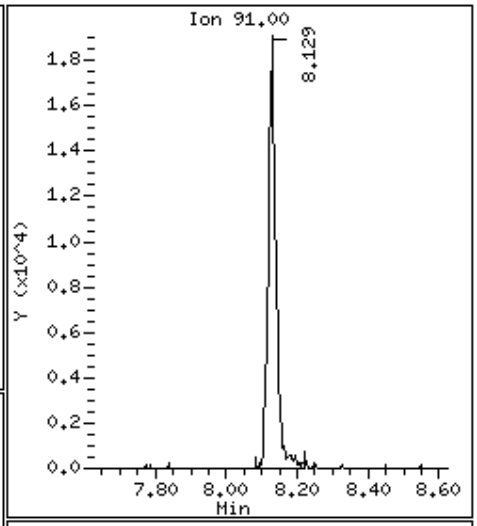
Column phase: RTX-VMS-30M

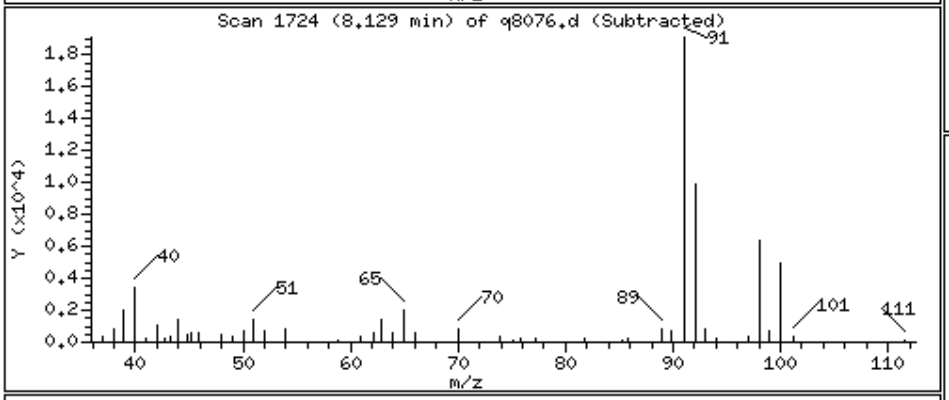
Column diameter: 0.25

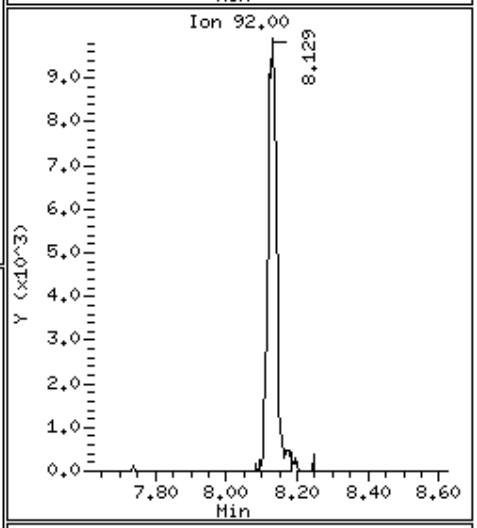
61 Toluene +

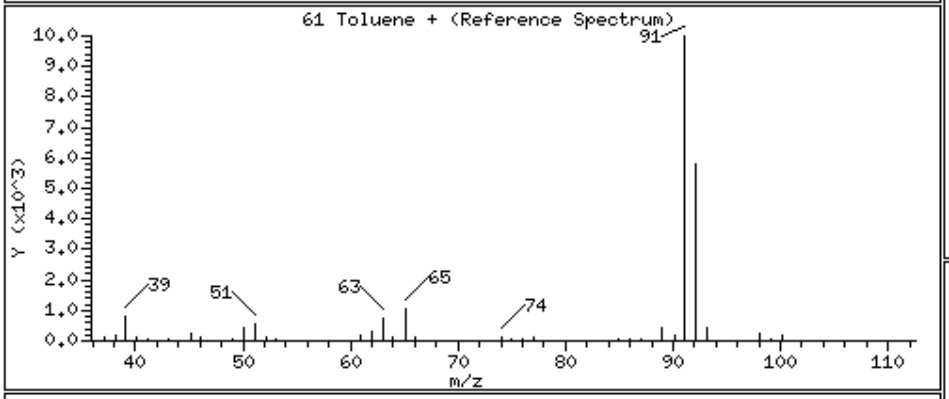
Concentration: 2.46 ug/L

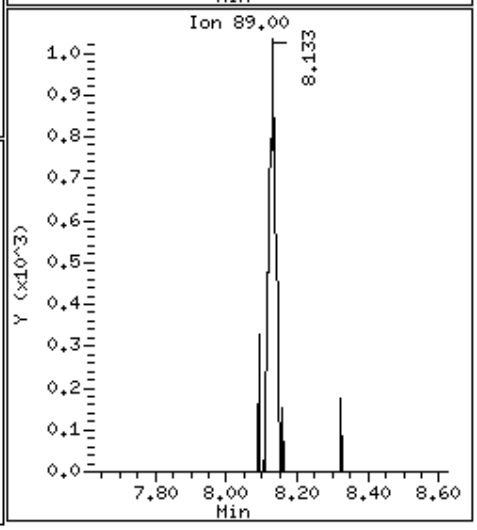


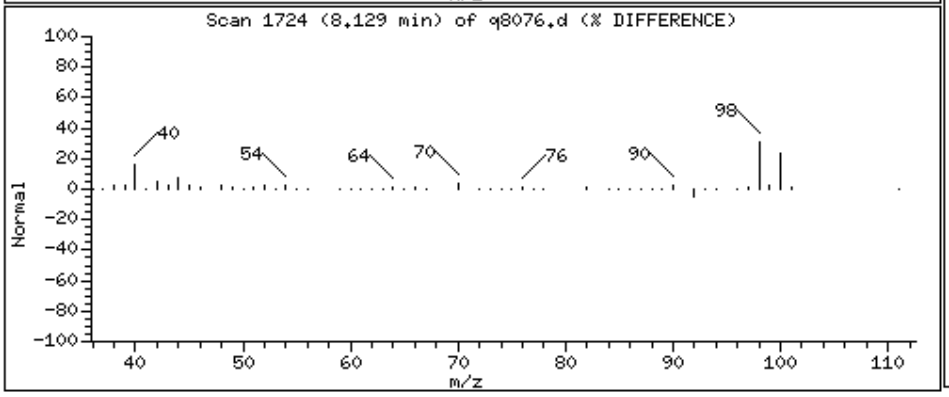



Data File: /var/chem/msv12.i/2180418.s.b/q8076.d

Date : 18-APR-2018 14:56

Client ID: 21804062009

Instrument: msv12.i

Sample Info: 21804062009x

Purge Volume: 5.0

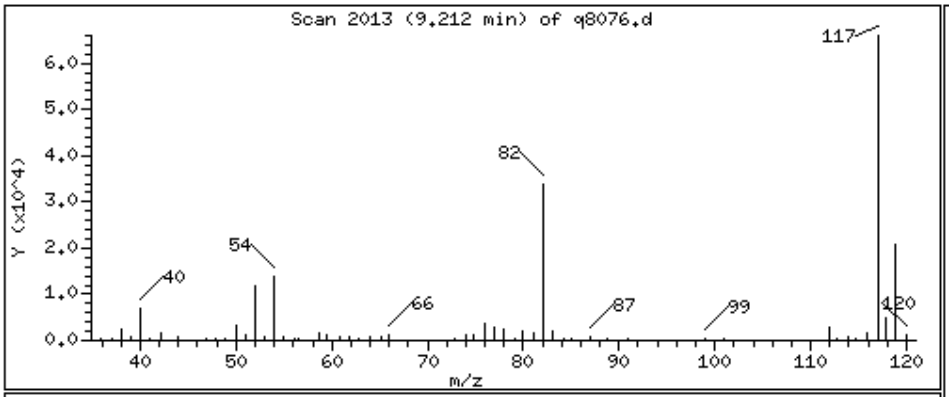
Operator: JMC2

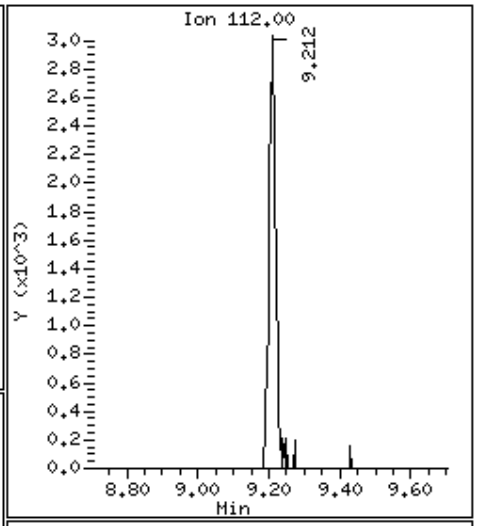
Column phase: RTX-VMS-30M

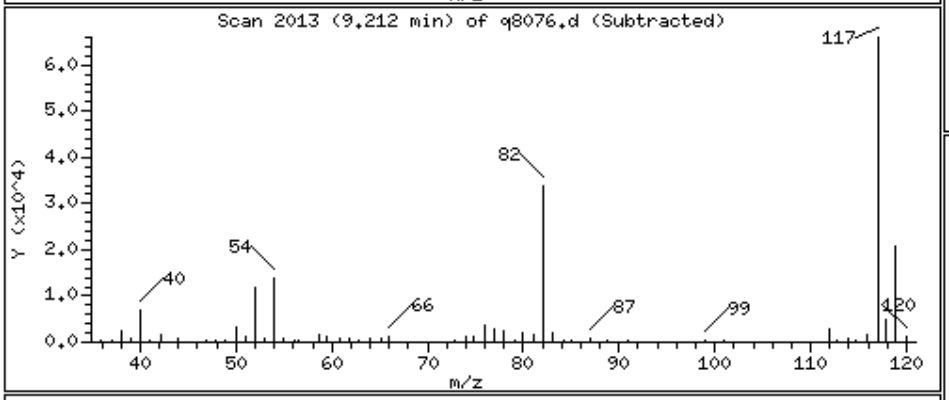
Column diameter: 0.25

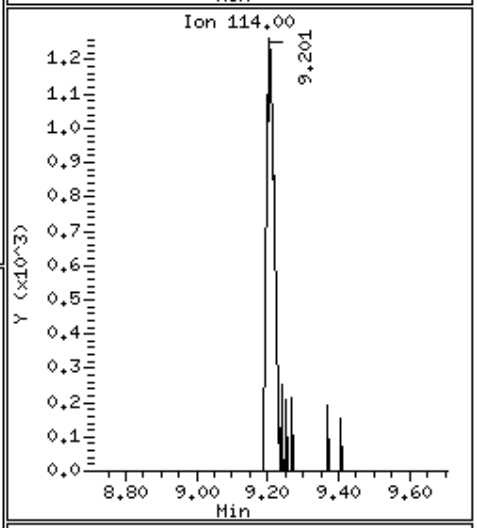
72 Chlorobenzene ++

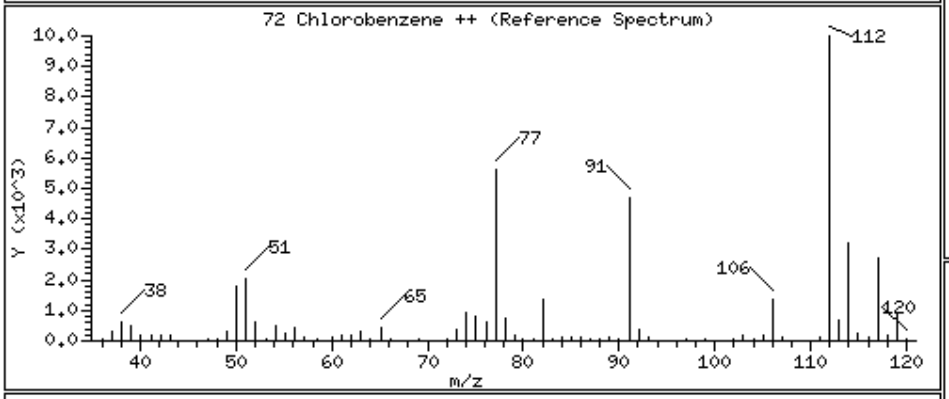
Concentration: 0.512 ug/L

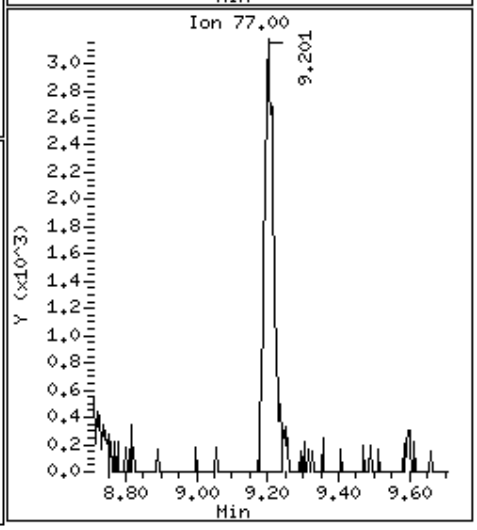


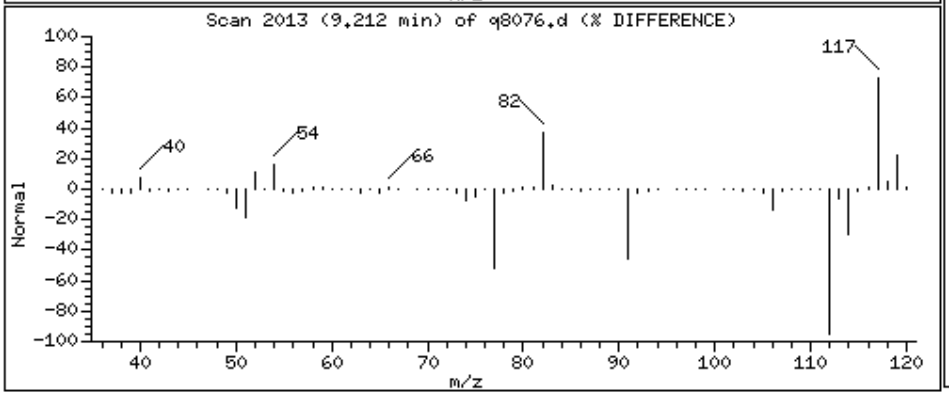



Data File: /var/chem/msv12.i/2180418.s.b/q8076.d

Date : 18-APR-2018 14:56

Client ID: 21804062009

Instrument: msv12.i

Sample Info: 21804062009x

Purge Volume: 5.0

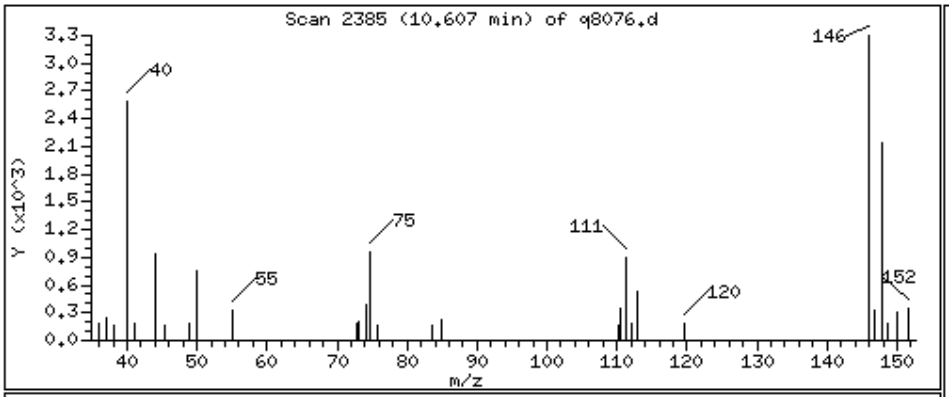
Operator: JMC2

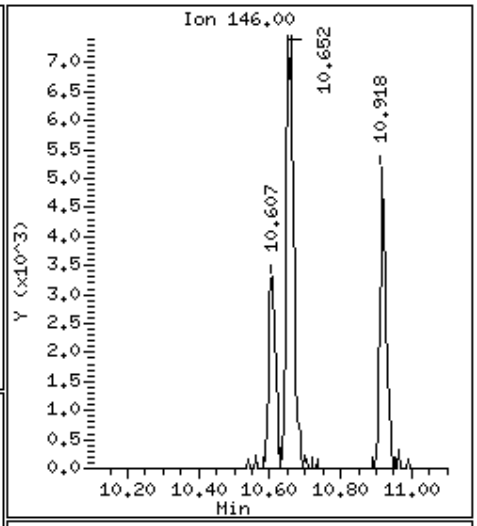
Column phase: RTX-VMS-30M

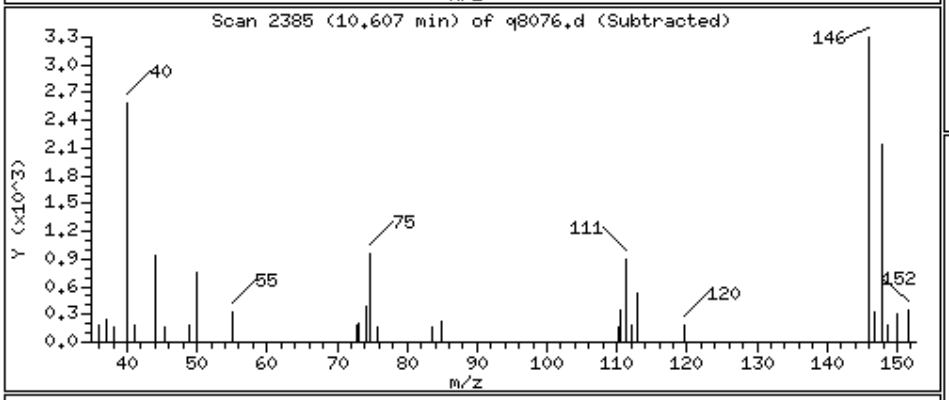
Column diameter: 0.25

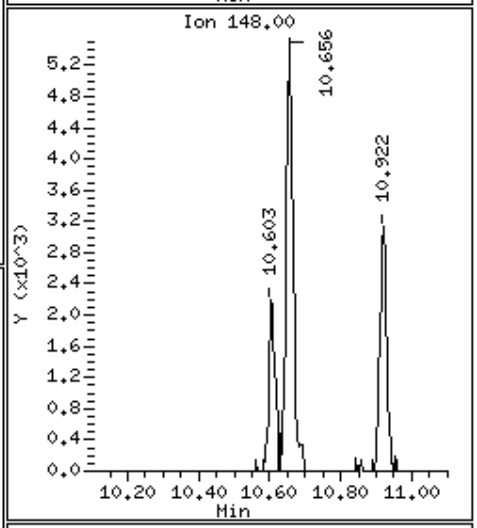
96 1,3-Dichlorobenzene

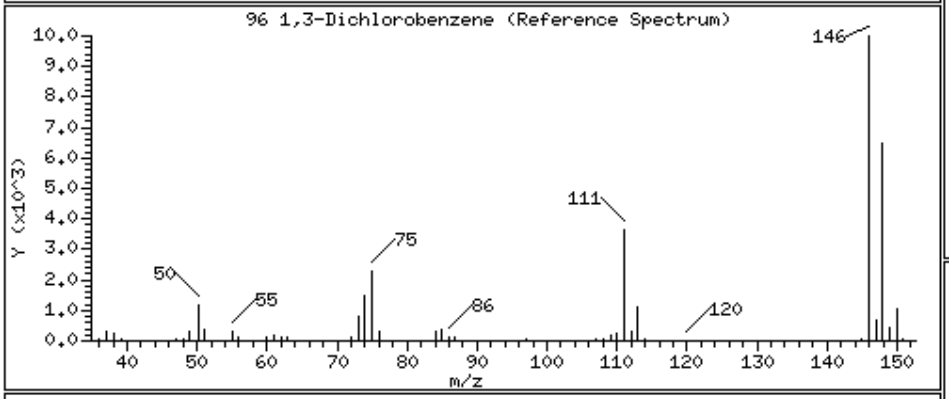
Concentration: 1.01 ug/L

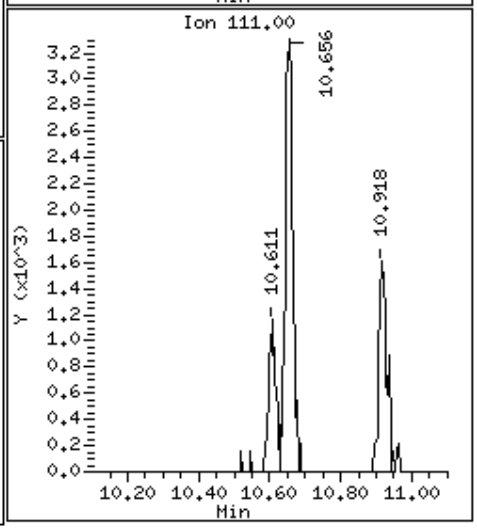


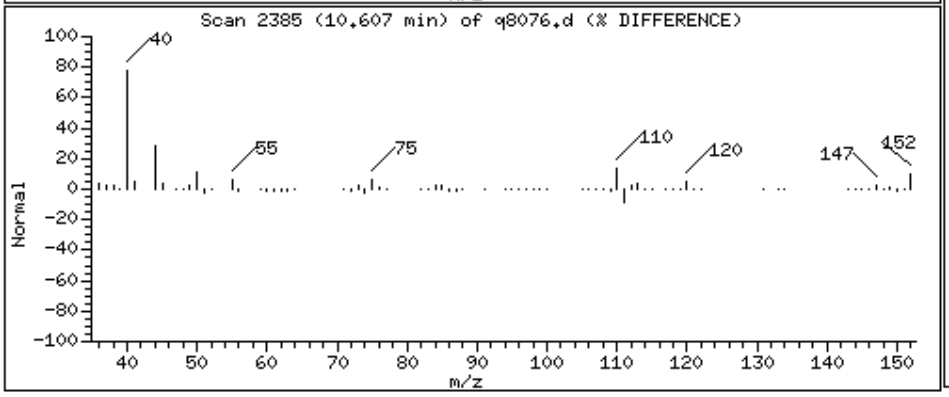



Data File: /var/chem/msv12.i/2180418.s.b/q8076.d

Date : 18-APR-2018 14:56

Client ID: 21804062009

Instrument: msv12.i

Sample Info: 21804062009x

Purge Volume: 5.0

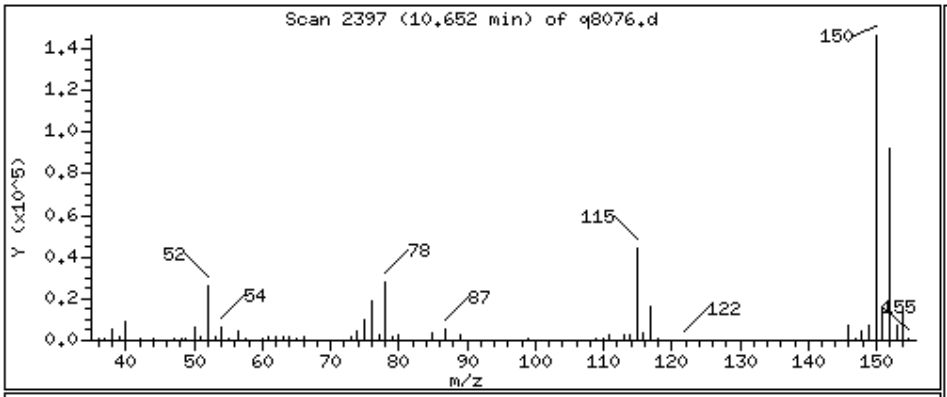
Operator: JMC2

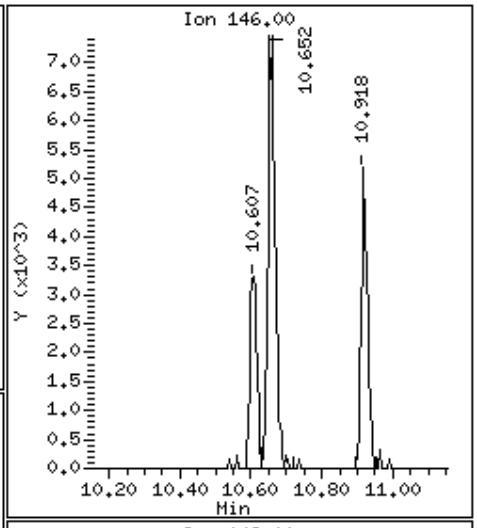
Column phase: RTX-VMS-30M

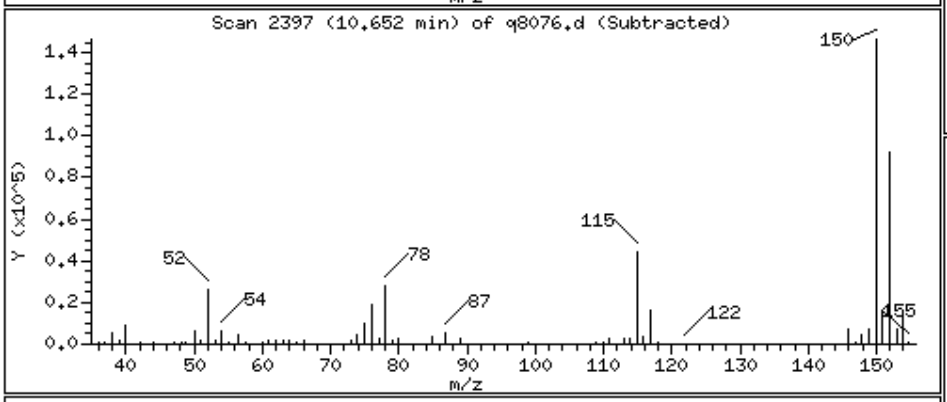
Column diameter: 0.25

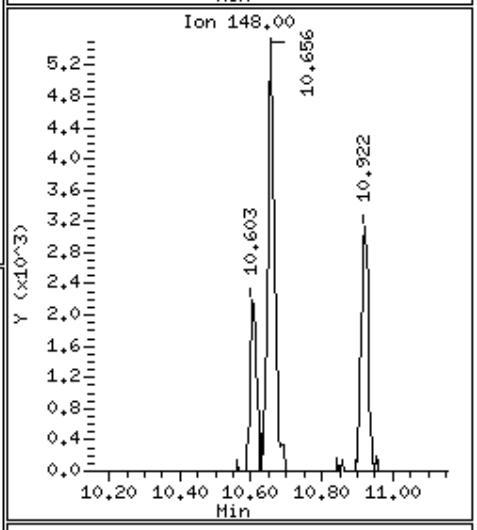
98 1,4-Dichlorobenzene

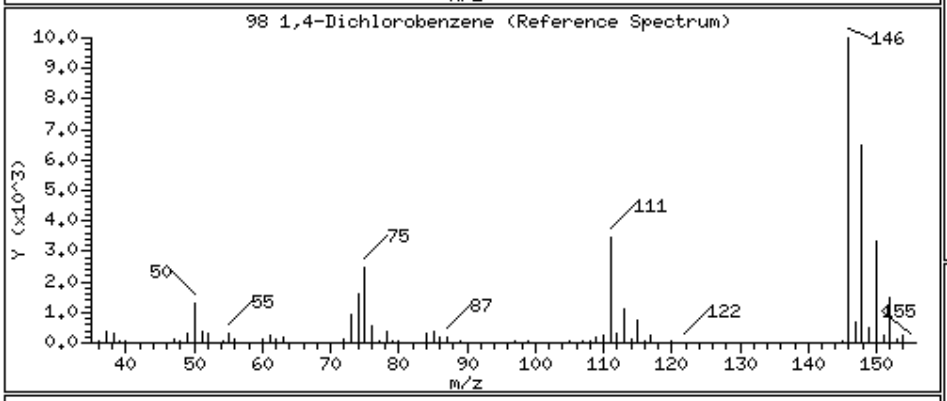
Concentration: 2.26 ug/L

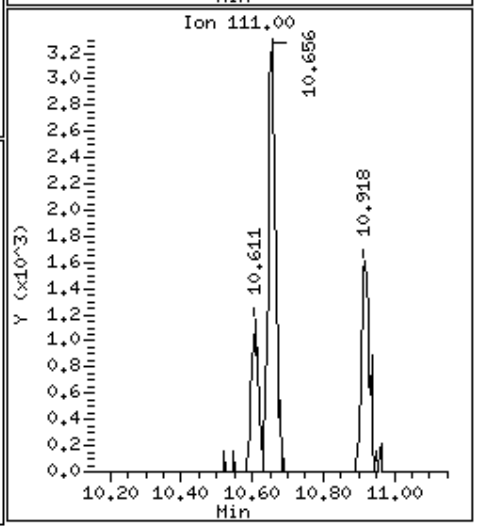


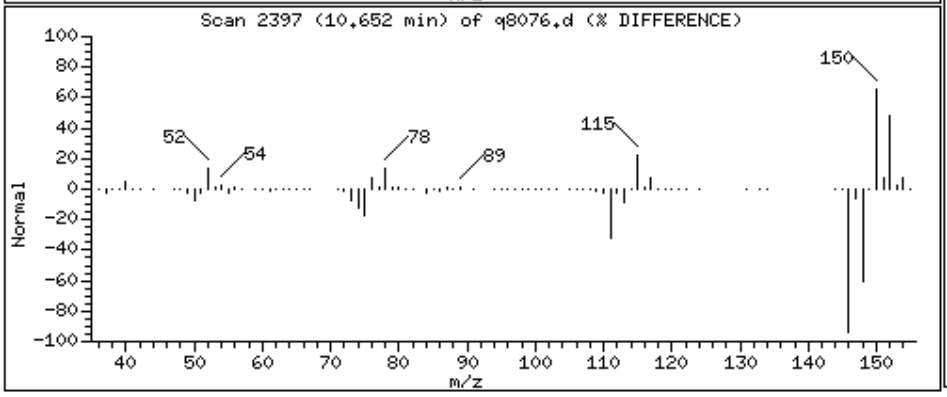



Data File: /var/chem/msv12.i/2180418.s.b/q8076.d

Date : 18-APR-2018 14:56

Client ID: 21804062009

Instrument: msv12.i

Sample Info: 21804062009x

Purge Volume: 5.0

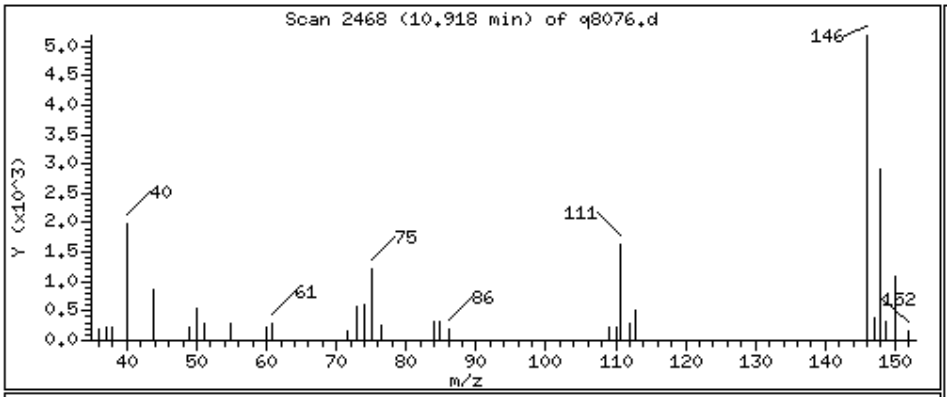
Operator: JMC2

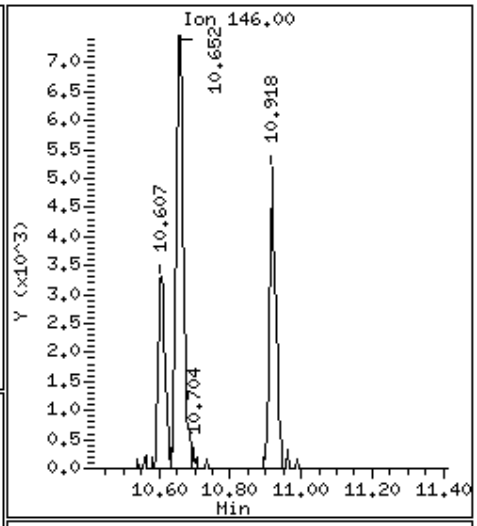
Column phase: RTX-VMS-30M

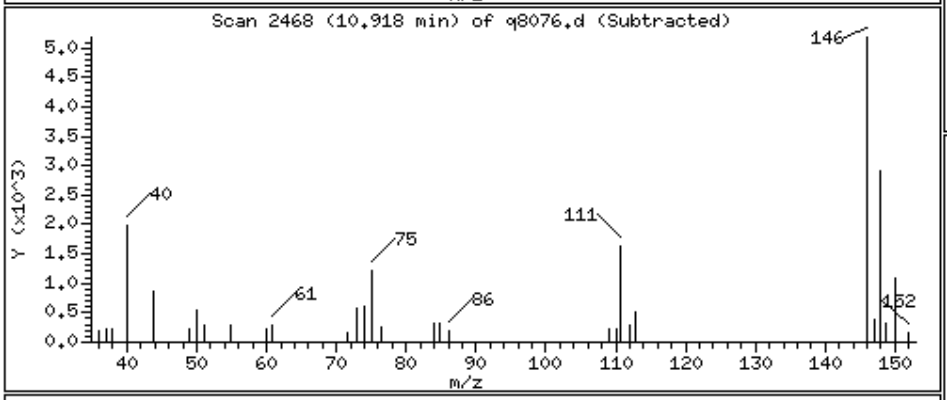
Column diameter: 0.25

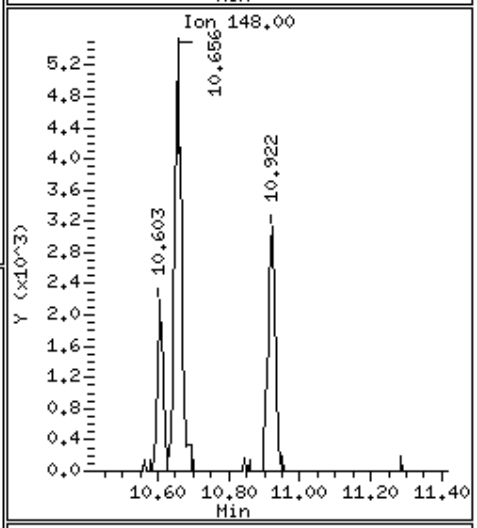
102 1,2-Dichlorobenzene

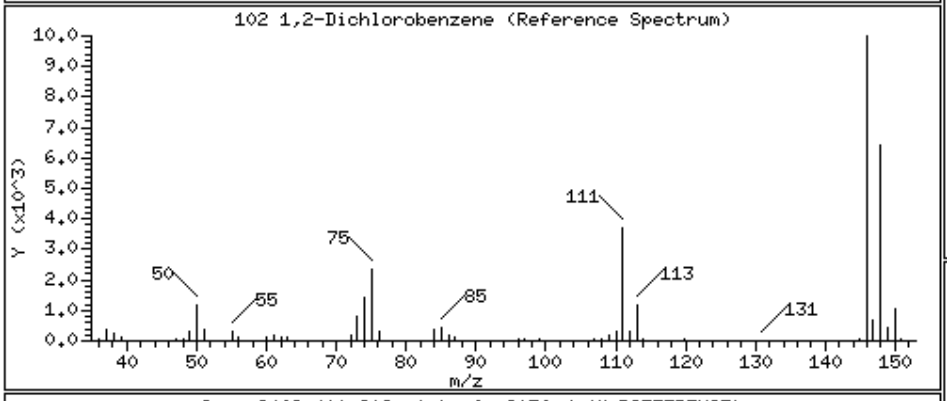
Concentration: 1.35 ug/L

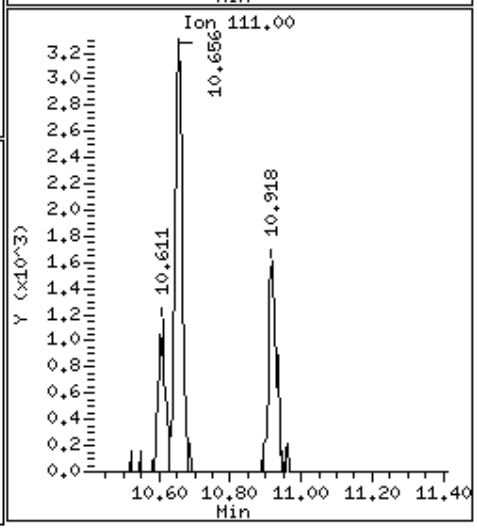


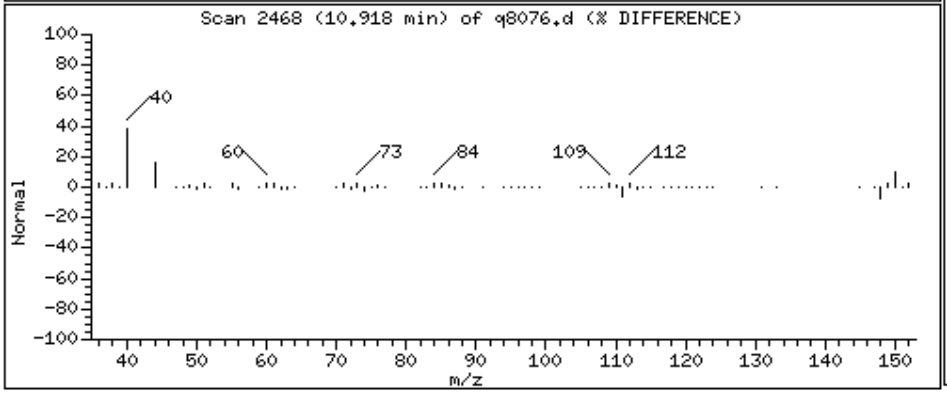



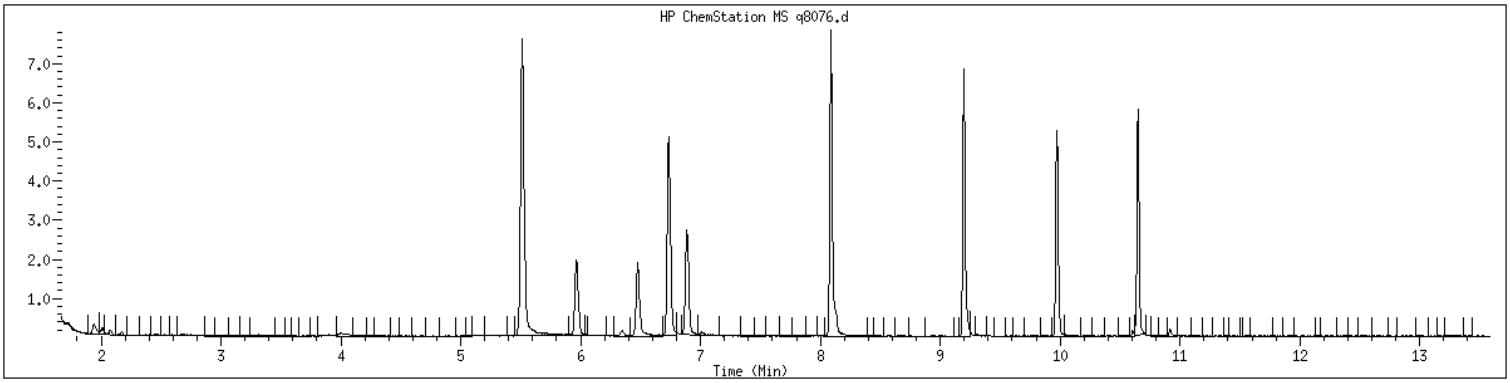



MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 21804062009 SampleType : SAMPLE
Injection Date: 04/18/2018 14:56 Instrument : msv12.i
Operator : JMC2
Sample Info : 21804062009*
Misc Info : MSV~40673~*1*JMC2
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b-




NO MANUAL INTEGRATIONS

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | RD5-MW-01-21 |
| Collect Date: | 04/05/18 Time: 1635 | GCAL Sample ID: | 21804062010 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8083 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1737 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-35-4 | 1,1-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 544-10-5 | 1-Chlorohexane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-93-3 | 2-Butanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 95-49-8 | 2-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 591-78-6 | 2-Hexanone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 67-64-1 | Acetone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 71-43-2 | Benzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-86-1 | Bromobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-97-5 | Bromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-27-4 | Bromodichloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-25-2 | Bromoform | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 74-83-9 | Bromomethane | 1.00 | U | 0.500 | 1.00 | 1.00 |
| 75-15-0 | Carbon disulfide | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 56-23-5 | Carbon tetrachloride | 0.500 | U | 0.250 | 0.500 | 1.00 |

FORM I VOA

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | RD5-MW-01-21 |
| Collect Date: | 04/05/18 Time: 1635 | GCAL Sample ID: | 21804062010 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8083 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1737 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 108-90-7 | Chlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-00-3 | Chloroethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 67-66-3 | Chloroform | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-87-3 | Chloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 124-48-1 | Dibromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-95-3 | Dibromomethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-41-4 | Ethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 98-82-8 | Isopropylbenzene (Cumene) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 136777-61-2 | m,p-Xylene | 0.500 | U | 0.200 | 0.500 | 2.00 |
| 75-09-2 | Methylene chloride | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 91-20-3 | Naphthalene | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 104-51-8 | n-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 103-65-1 | n-Propylbenzene | 2.00 | U | 1.00 | 2.00 | 5.00 |
| 95-47-6 | o-Xylene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 135-98-8 | sec-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-42-5 | Styrene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether (MTBE) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 98-06-6 | tert-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 127-18-4 | Tetrachloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-88-3 | Toluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-01-6 | Trichloroethene | 2.97 | | 0.200 | 0.500 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-01-4 | Vinyl chloride | 0.500 | U | 0.200 | 0.500 | 1.00 |

FORM I VOA

GCAL, Inc.

Data file : /var/chem/msv12.i/2180418.s.b/q8083.d
Lab Smp Id: 21804062010 Client Smp ID: 21804062010
Inj Date : 18-APR-2018 17:37
Operator : JMC2 Inst ID: msv12.i
Smp Info : 21804062010*
Misc Info : MSV~40673~*1*JMC2
Comment :
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:06 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 18:43 Cal File: q7984cD.d
Als bottle: 18
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b-.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|
| $ 36 Dibromofluoromethane | 111 | 5.966 | 5.966 | (0.886) | 120316 | 50.5848 | 50.6 | 7001 |
| $ 43 1,2-Dichloroethane-d4 | 67 | 6.480 | 6.476 | (0.962) | 69730 | 49.5110 | 49.5 | |
| * 47 FLUOROBENZENE | 96 | 6.734 | 6.735 | (1.000) | 445359 | 50.0000 | | |
| 49 Trichloroethene | 130 | 6.884 | 6.888 | (1.022) | 9282 | 2.96720 | 2.97 | |
| $ 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.879) | 432572 | 52.7861 | 52.8 | |
| * 71 CHLOROBENZENE-d5 | 82 | 9.197 | 9.198 | (1.000) | 168329 | 50.0000 | | |
| $ 80 Bromofluorobenzene | 174 | 9.973 | 9.970 | (1.084) | 135412 | 45.4735 | 45.5 | |
| * 97 1,4-DICHLOROBENZENE-D4 | 152 | 10.648 | 10.645 | (1.000) | 120412 | 50.0000 | | |

Data File: /var/chem/msv12.i/2180418.s.b/q8083.d



Date : 18-APR-2018 17:37

Client ID: 21804062010

Instrument: msv12.i

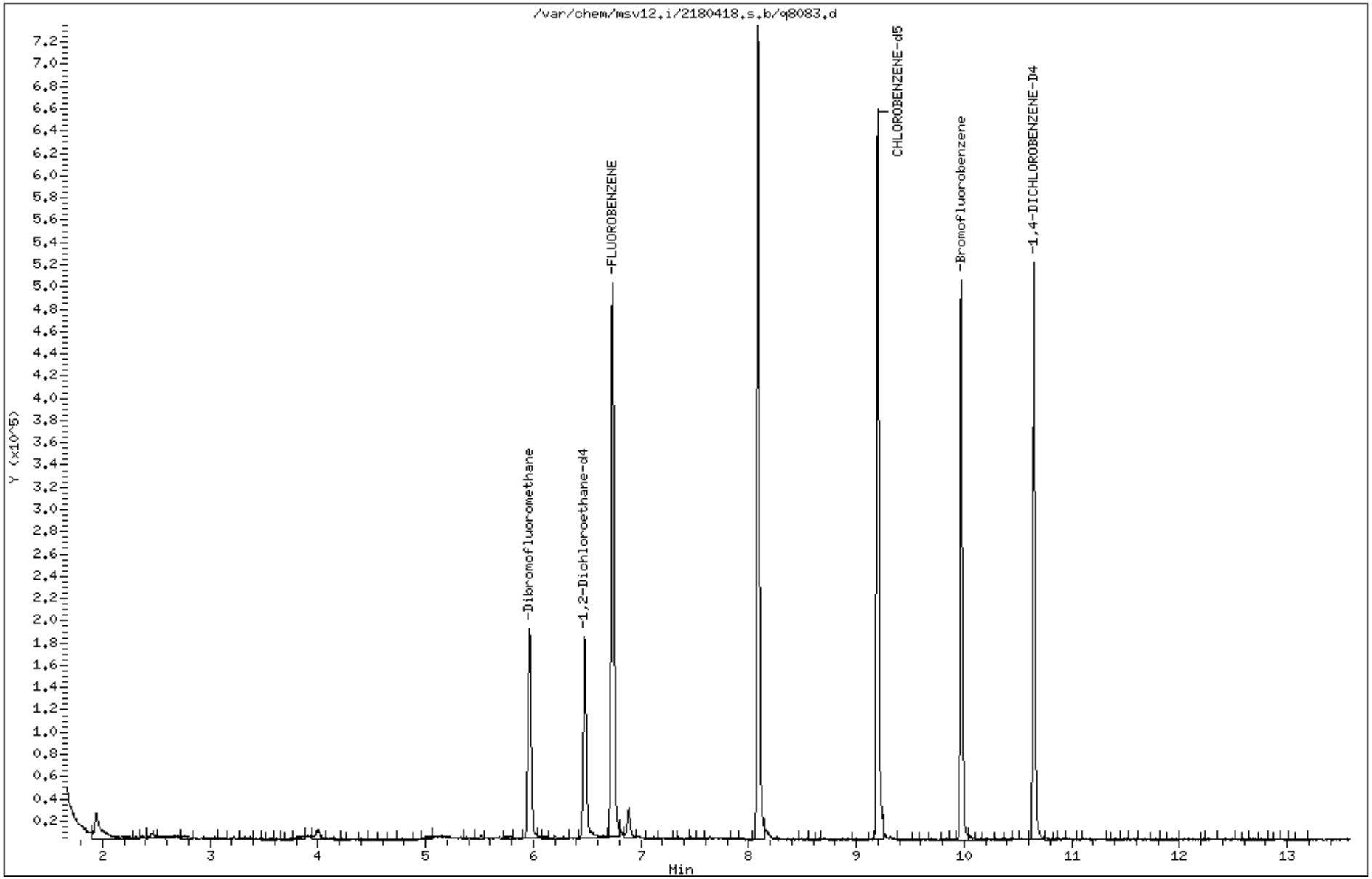
Sample Info: 21804062010x

Purge Volume: 5.0

Operator: JMC2

Column phase: RTX-VMS-30M

Column diameter: 0.25



Data File: /var/chem/msv12.i/2180418.s.b/q8083.d

Date : 18-APR-2018 17:37

Client ID: 21804062010

Instrument: msv12.i

Sample Info: 21804062010x

Purge Volume: 5.0

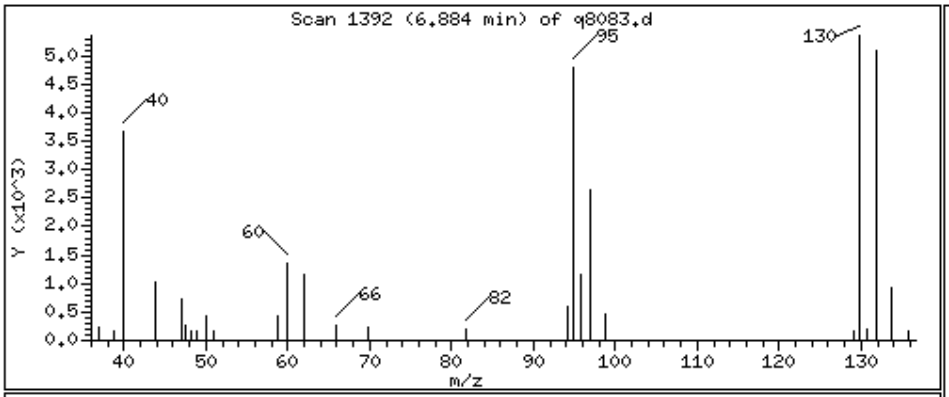
Operator: JMC2

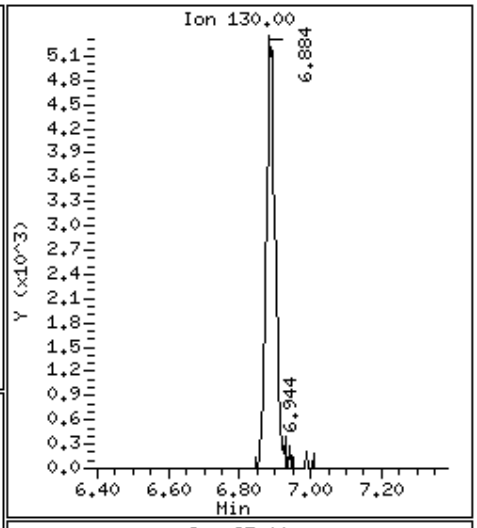
Column phase: RTX-VMS-30M

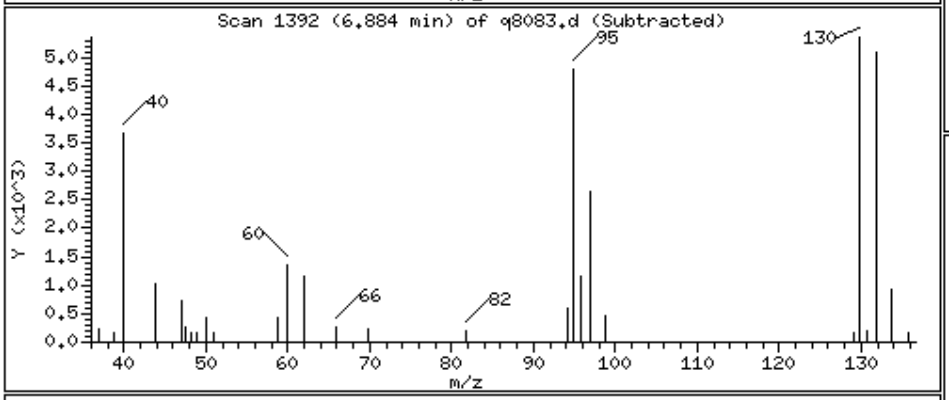
Column diameter: 0.25

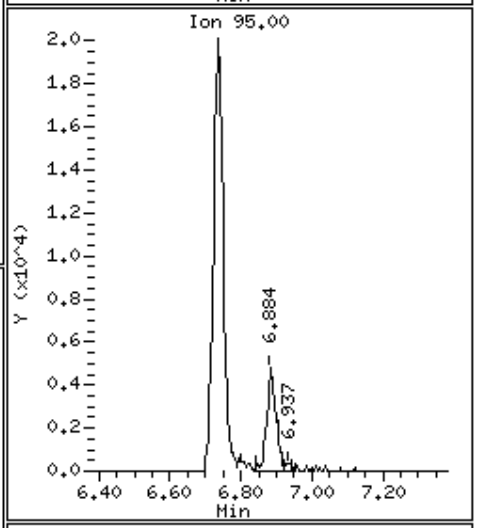
49 Trichloroethene

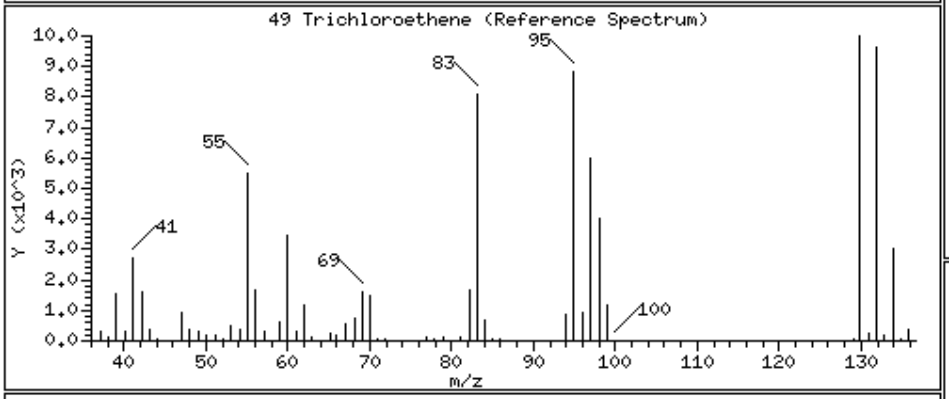
Concentration: 2.97 ug/L

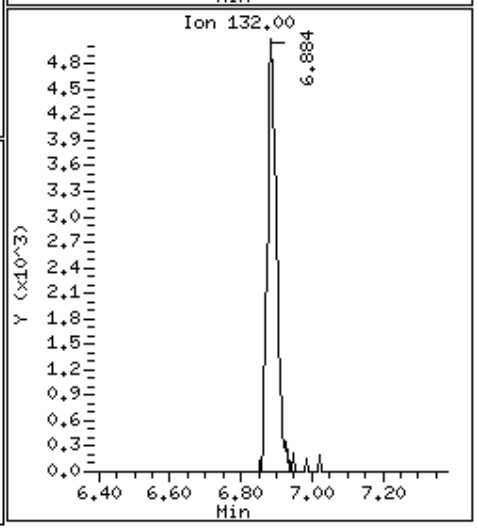


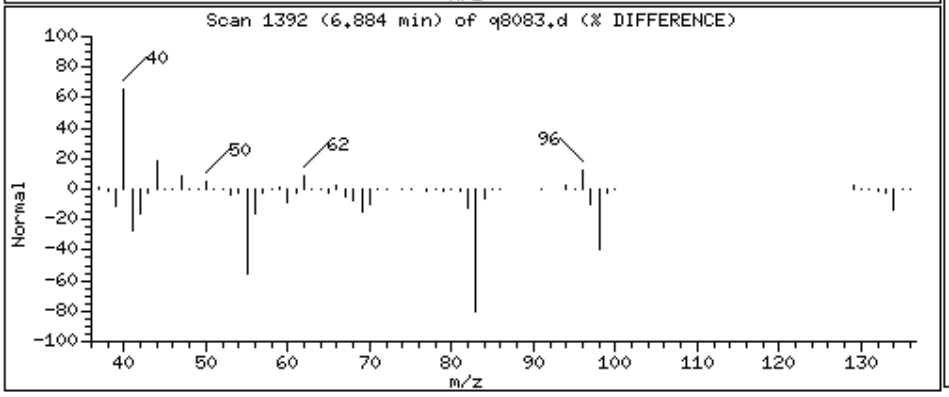



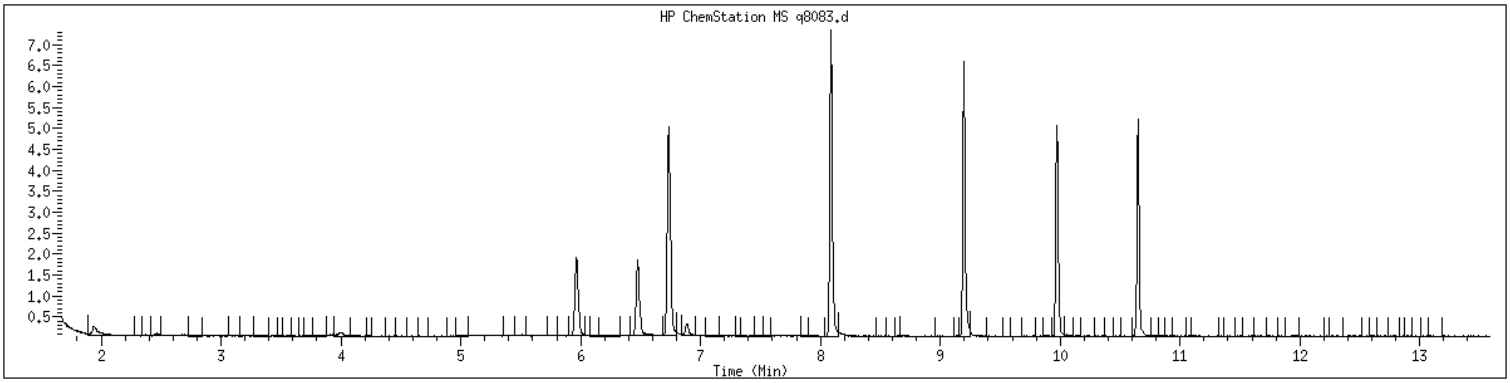



Report Date: 04/19/2018 11:29

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 21804062010 SampleType : SAMPLE
Injection Date: 04/18/2018 17:37 Instrument : msv12.i
Operator : JMC2
Sample Info : 21804062010*
Misc Info : MSV~40673~*1*JMC2
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b-




NO MANUAL INTEGRATIONS

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-01-07-21 |
| Collect Date: | 04/05/18 Time: 1345 | GCAL Sample ID: | 21804062011 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8084 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1820 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-35-4 | 1,1-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 544-10-5 | 1-Chlorohexane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-93-3 | 2-Butanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 95-49-8 | 2-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 591-78-6 | 2-Hexanone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 67-64-1 | Acetone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 71-43-2 | Benzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-86-1 | Bromobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-97-5 | Bromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-27-4 | Bromodichloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-25-2 | Bromoform | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 74-83-9 | Bromomethane | 1.00 | U | 0.500 | 1.00 | 1.00 |
| 75-15-0 | Carbon disulfide | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 56-23-5 | Carbon tetrachloride | 0.500 | U | 0.250 | 0.500 | 1.00 |

FORM I VOA

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-01-07-21 |
| Collect Date: | 04/05/18 Time: 1345 | GCAL Sample ID: | 21804062011 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8084 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1820 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 108-90-7 | Chlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-00-3 | Chloroethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 67-66-3 | Chloroform | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-87-3 | Chloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethene | 2.43 | | 0.200 | 0.500 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 124-48-1 | Dibromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-95-3 | Dibromomethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-41-4 | Ethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 98-82-8 | Isopropylbenzene (Cumene) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 136777-61-2 | m,p-Xylene | 0.500 | U | 0.200 | 0.500 | 2.00 |
| 75-09-2 | Methylene chloride | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 91-20-3 | Naphthalene | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 104-51-8 | n-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 103-65-1 | n-Propylbenzene | 2.00 | U | 1.00 | 2.00 | 5.00 |
| 95-47-6 | o-Xylene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 135-98-8 | sec-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-42-5 | Styrene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether (MTBE) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 98-06-6 | tert-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 127-18-4 | Tetrachloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-88-3 | Toluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-01-6 | Trichloroethene | 26.1 | | 0.200 | 0.500 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-01-4 | Vinyl chloride | 0.500 | U | 0.200 | 0.500 | 1.00 |

FORM I VOA

GCAL, Inc.

Data file : /var/chem/msv12.i/2180418.s.b/q8084.d
Lab Smp Id: 21804062011 Client Smp ID: 21804062011
Inj Date : 18-APR-2018 18:20
Operator : JMC2 Inst ID: msv12.i
Smp Info : 21804062011*
Misc Info : MSV~40673~*1*JMC2
Comment :
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:06 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 18:43 Cal File: q7984cD.d
Als bottle: 19
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b-.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| | Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|---|
| | 30 cis-1,2-Dichloroethene | 61 | 5.513 | 5.509 | (0.819) | 9624 | 2.43027 | 2.43 | |
| M | 48 Total 1,2-Dichloroethene | 61 | | | | 9624 | 2.43027 | 2.43 | |
| $ | 36 Dibromofluoromethane | 111 | 5.962 | 5.966 | (0.885) | 126588 | 50.4013 | 50.4 | 6990 |
| $ | 43 1,2-Dichloroethane-d4 | 67 | 6.476 | 6.476 | (0.962) | 72223 | 48.5635 | 48.6 | |
| * | 47 FLUOROBENZENE | 96 | 6.735 | 6.735 | (1.000) | 470281 | 50.0000 | | |
| | 49 Trichloroethene | 130 | 6.885 | 6.888 | (1.022) | 86339 | 26.1375 | 26.1 | |
| $ | 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.879) | 440148 | 52.9212 | 52.9 | |
| * | 71 CHLOROBENZENE-d5 | 82 | 9.198 | 9.198 | (1.000) | 170840 | 50.0000 | | |
| $ | 80 Bromofluorobenzene | 174 | 9.973 | 9.970 | (1.084) | 134355 | 44.4554 | 44.5 | |
| * | 97 1,4-DICHLOROBENZENE-D4 | 152 | 10.648 | 10.645 | (1.000) | 113582 | 50.0000 | | |

Data File: /var/chem/msv12.i/2180418.s.b/q8084.d



Date : 18-APR-2018 18:20

Client ID: 21804062011

Instrument: msv12.i

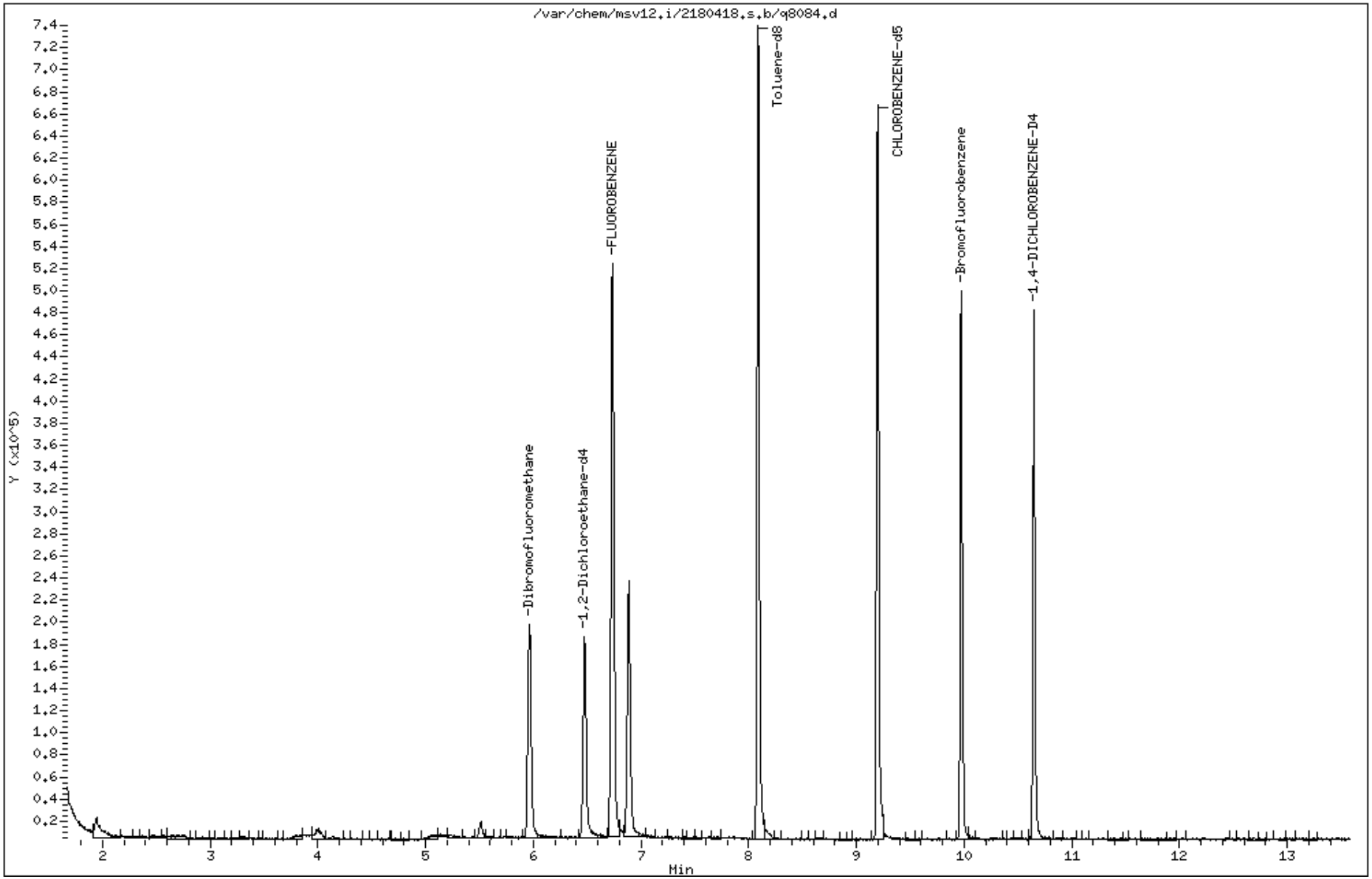
Sample Info: 21804062011*

Purge Volume: 5.0

Operator: JMC2

Column phase: RTX-VMS-30M

Column diameter: 0.25



Data File: /var/chem/msv12.i/2180418.s.b/q8084.d

Date : 18-APR-2018 18:20

Client ID: 21804062011

Instrument: msv12.i

Sample Info: 21804062011*

Purge Volume: 5.0

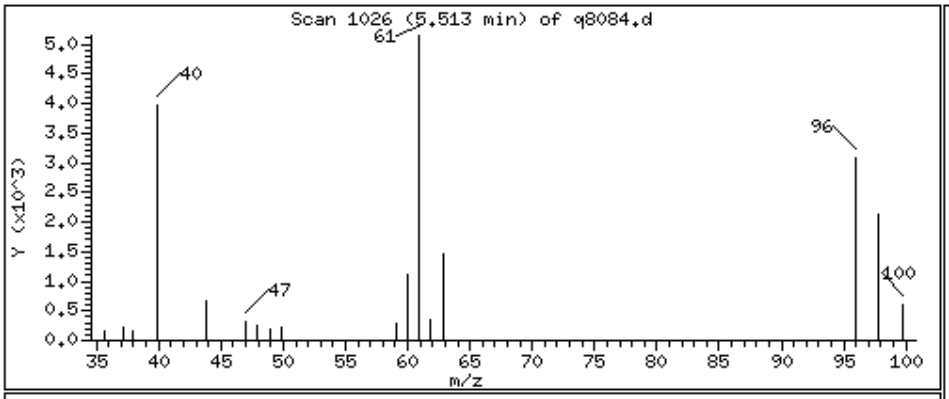
Operator: JMC2

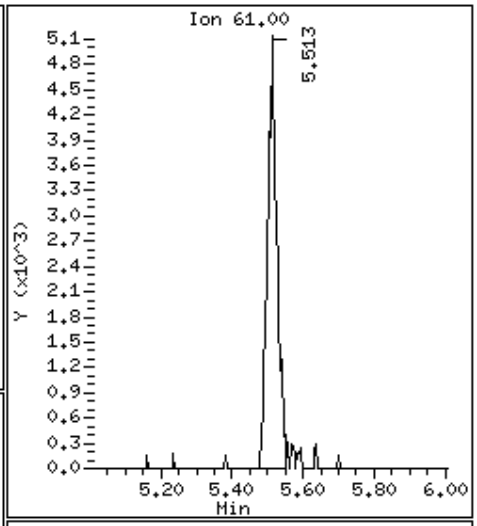
Column phase: RTX-VMS-30M

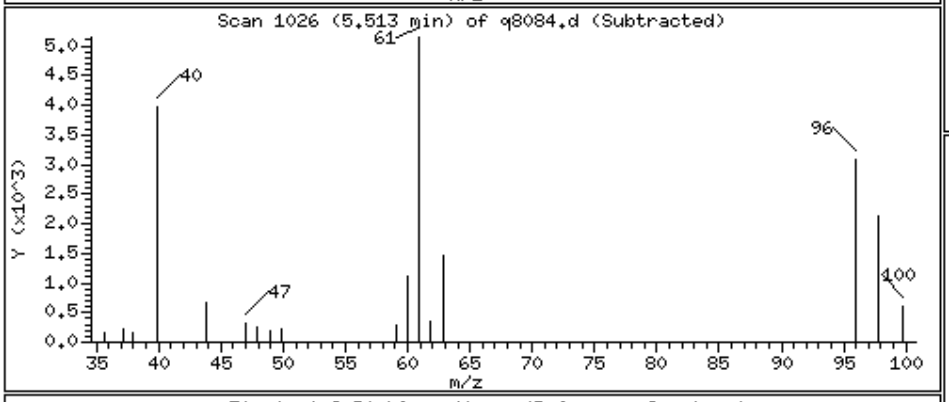
Column diameter: 0.25

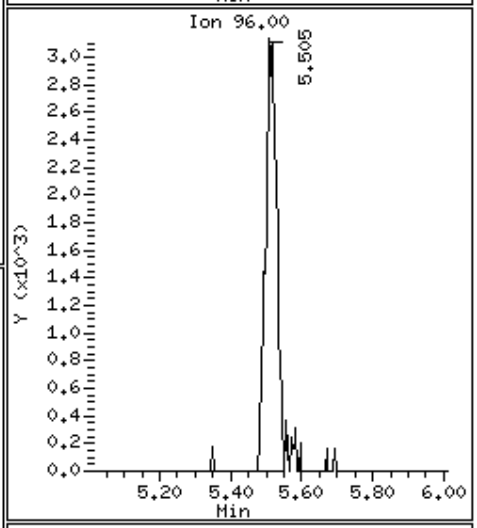
30 cis-1,2-Dichloroethene

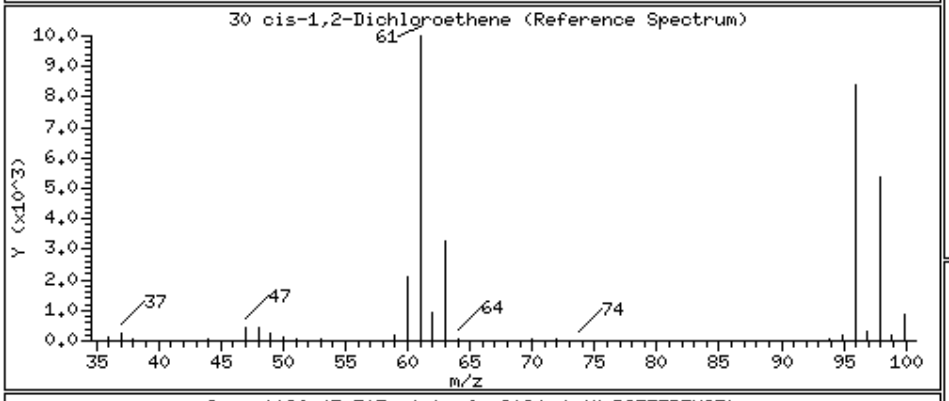
Concentration: 2.43 ug/L

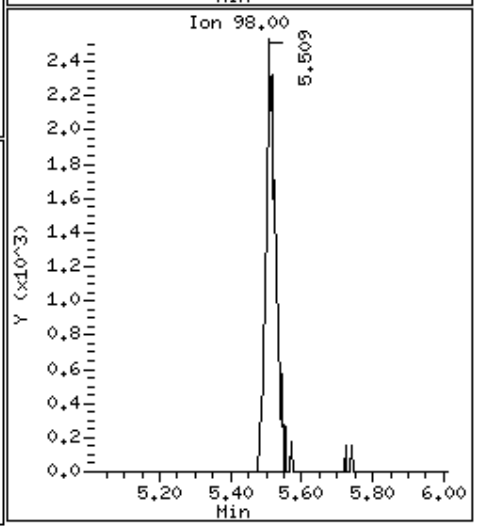


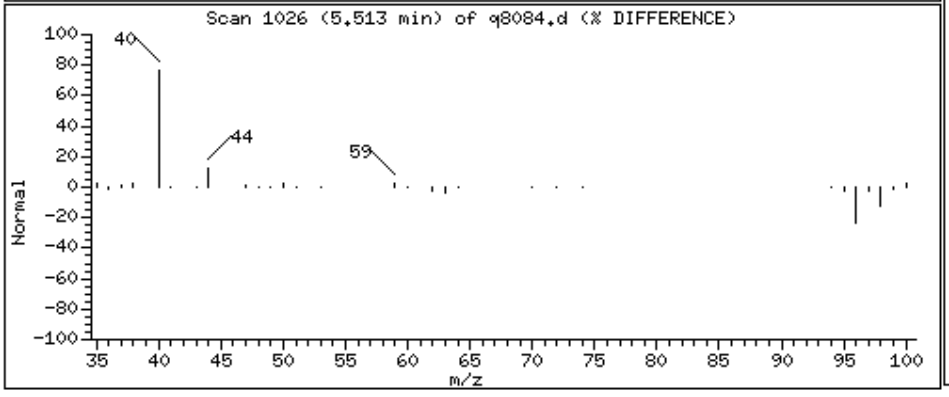



Data File: /var/chem/msv12.i/2180418.s.b/q8084.d

Date : 18-APR-2018 18:20

Client ID: 21804062011

Instrument: msv12.i

Sample Info: 21804062011x

Purge Volume: 5.0

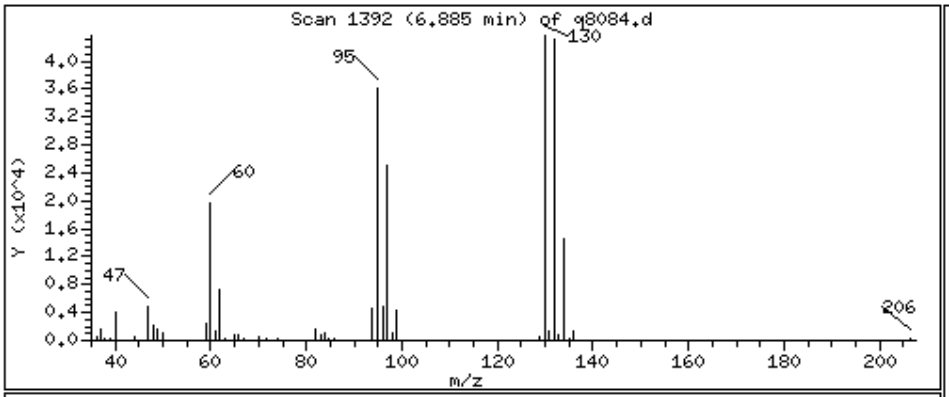
Operator: JMC2

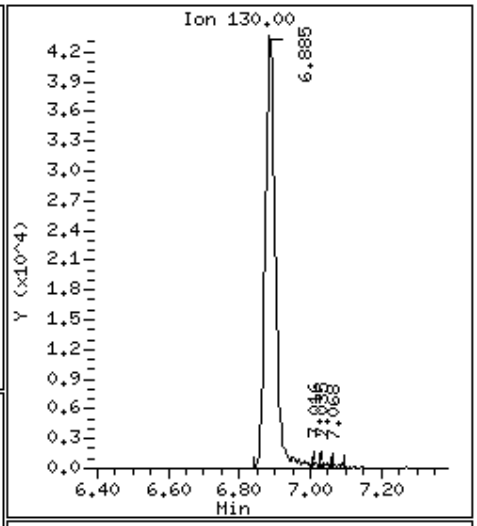
Column phase: RTX-VMS-30M

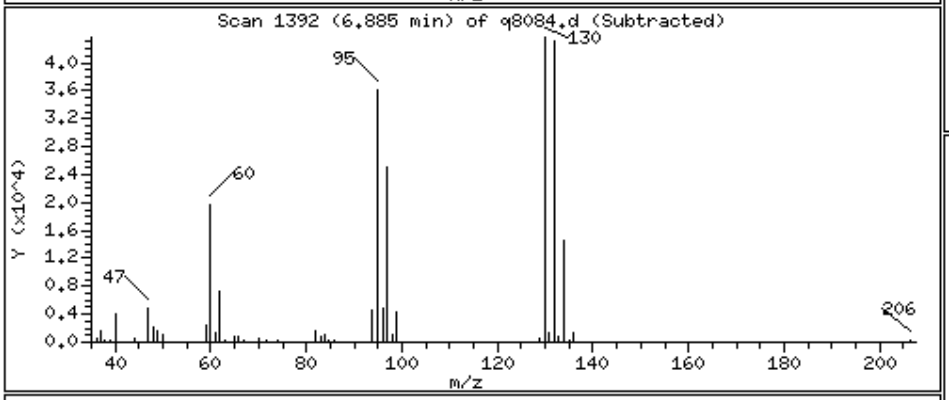
Column diameter: 0.25

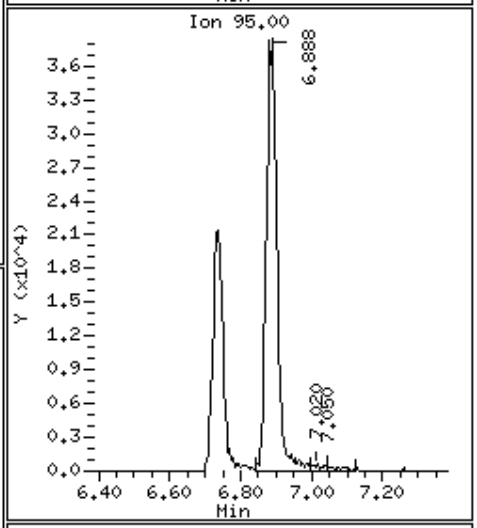
49 Trichloroethene

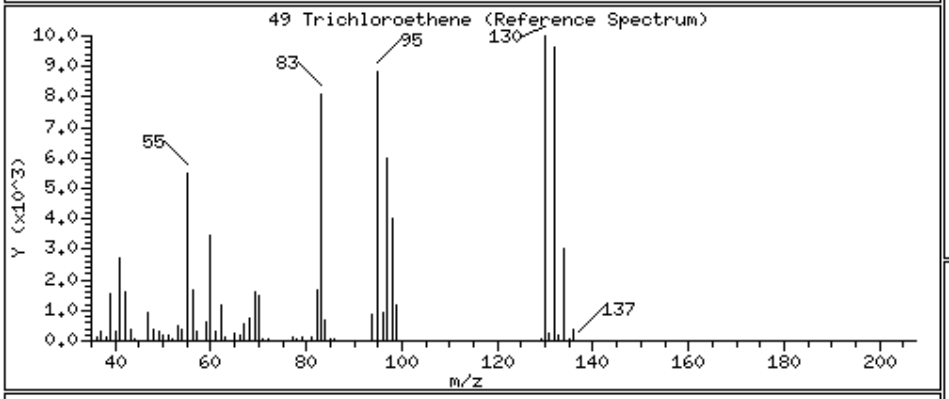
Concentration: 26.1 ug/L

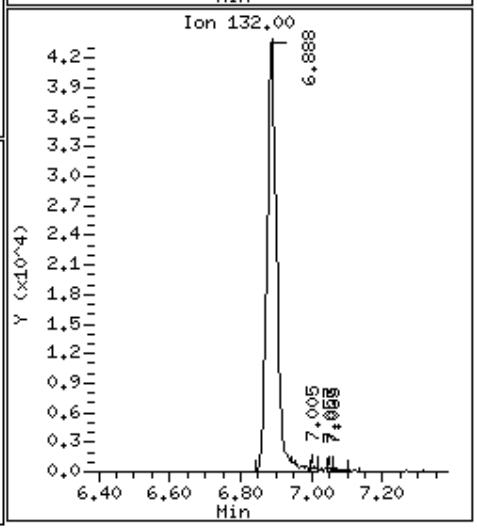


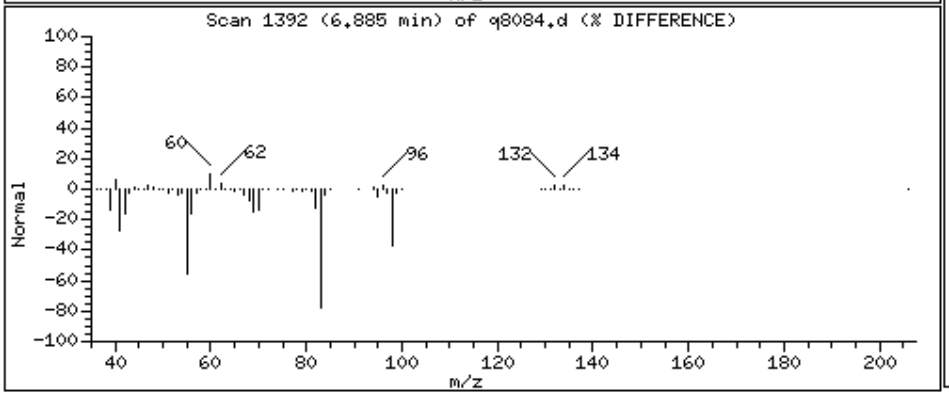



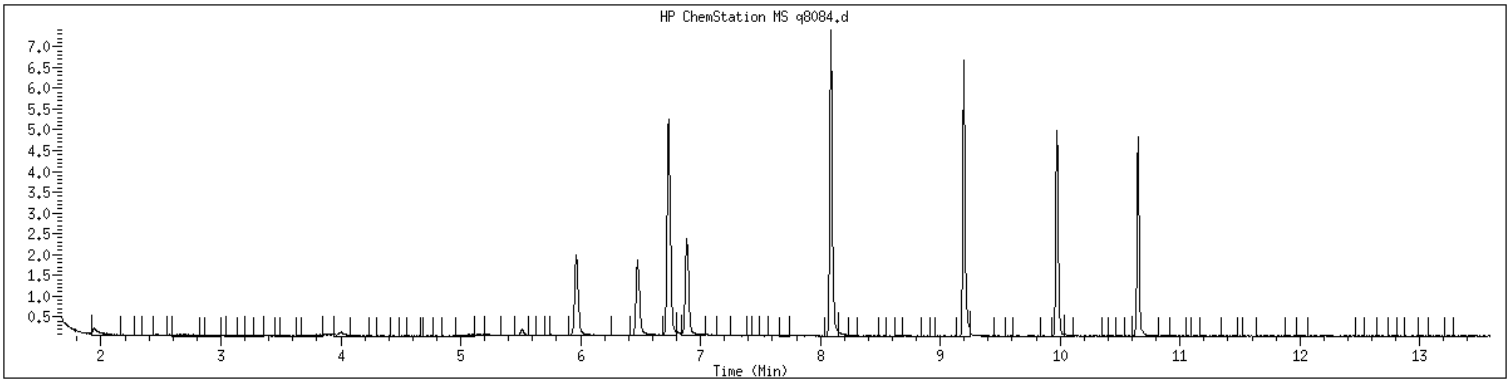



Report Date: 04/19/2018 11:30

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 21804062011 SampleType : SAMPLE
Injection Date: 04/18/2018 18:20 Instrument : msv12.i
Operator : JMC2
Sample Info : 21804062011*
Misc Info : MSV~40673~*1*JMC2
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b-




NO MANUAL INTEGRATIONS

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | S4-MW-46-21 |
| Collect Date: | 04/05/18 Time: 1310 | GCAL Sample ID: | 21804062012 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8085 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1843 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-35-4 | 1,1-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 544-10-5 | 1-Chlorohexane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-93-3 | 2-Butanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 95-49-8 | 2-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 591-78-6 | 2-Hexanone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 67-64-1 | Acetone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 71-43-2 | Benzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-86-1 | Bromobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-97-5 | Bromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-27-4 | Bromodichloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-25-2 | Bromoform | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 74-83-9 | Bromomethane | 1.00 | U | 0.500 | 1.00 | 1.00 |
| 75-15-0 | Carbon disulfide | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 56-23-5 | Carbon tetrachloride | 0.500 | U | 0.250 | 0.500 | 1.00 |

FORM I VOA

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | S4-MW-46-21 |
| Collect Date: | 04/05/18 Time: 1310 | GCAL Sample ID: | 21804062012 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8085 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1843 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 108-90-7 | Chlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-00-3 | Chloroethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 67-66-3 | Chloroform | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-87-3 | Chloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethene | 0.885 | J | 0.200 | 0.500 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 124-48-1 | Dibromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-95-3 | Dibromomethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-41-4 | Ethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 98-82-8 | Isopropylbenzene (Cumene) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 136777-61-2 | m,p-Xylene | 0.500 | U | 0.200 | 0.500 | 2.00 |
| 75-09-2 | Methylene chloride | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 91-20-3 | Naphthalene | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 104-51-8 | n-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 103-65-1 | n-Propylbenzene | 2.00 | U | 1.00 | 2.00 | 5.00 |
| 95-47-6 | o-Xylene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 135-98-8 | sec-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-42-5 | Styrene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether (MTBE) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 98-06-6 | tert-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 127-18-4 | Tetrachloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-88-3 | Toluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-01-6 | Trichloroethene | 4.54 | | 0.200 | 0.500 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-01-4 | Vinyl chloride | 0.500 | U | 0.200 | 0.500 | 1.00 |

FORM I VOA

GCAL, Inc.

Data file : /var/chem/msv12.i/2180418.s.b/q8085.d
Lab Smp Id: 21804062012 Client Smp ID: 21804062012
Inj Date : 18-APR-2018 18:43
Operator : JMC2 Inst ID: msv12.i
Smp Info : 21804062012*
Misc Info : MSV~40673~*1*JMC2
Comment :
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:06 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 18:43 Cal File: q7984cD.d
Als bottle: 20
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b-.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| | Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|---|
| | 30 cis-1,2-Dichloroethene | 61 | 5.512 | 5.509 | (0.818) | 3350 | 0.88473 | 0.885 | (H) |
| M | 48 Total 1,2-Dichloroethene | 61 | | | | 3350 | 0.88473 | 0.885 | |
| $ | 36 Dibromofluoromethane | 111 | 5.966 | 5.966 | (0.885) | 123590 | 51.4637 | 51.5 | 6990 |
| $ | 43 1,2-Dichloroethane-d4 | 67 | 6.480 | 6.476 | (0.962) | 69787 | 49.0769 | 49.1 | |
| * | 47 FLUOROBENZENE | 96 | 6.738 | 6.735 | (1.000) | 449665 | 50.0000 | | |
| | 49 Trichloroethene | 130 | 6.892 | 6.888 | (1.023) | 14344 | 4.54147 | 4.54 | |
| $ | 60 Toluene-d8 | 98 | 8.091 | 8.088 | (0.880) | 433832 | 51.3520 | 51.4 | |
| * | 71 CHLOROBENZENE-d5 | 82 | 9.197 | 9.198 | (1.000) | 173534 | 50.0000 | | |
| $ | 80 Bromofluorobenzene | 174 | 9.973 | 9.970 | (1.084) | 139010 | 45.2816 | 45.3 | |
| * | 97 1,4-DICHLOROBENZENE-D4 | 152 | 10.648 | 10.645 | (1.000) | 121102 | 50.0000 | | |

QC Flag Legend

H - Operator selected an alternate compound hit.

Data File: /var/chem/msv12.i/2180418.s.b/q8085.d

Page 1

Date : 18-APR-2018 18:43

Client ID: 21804062012

Instrument: msv12.i

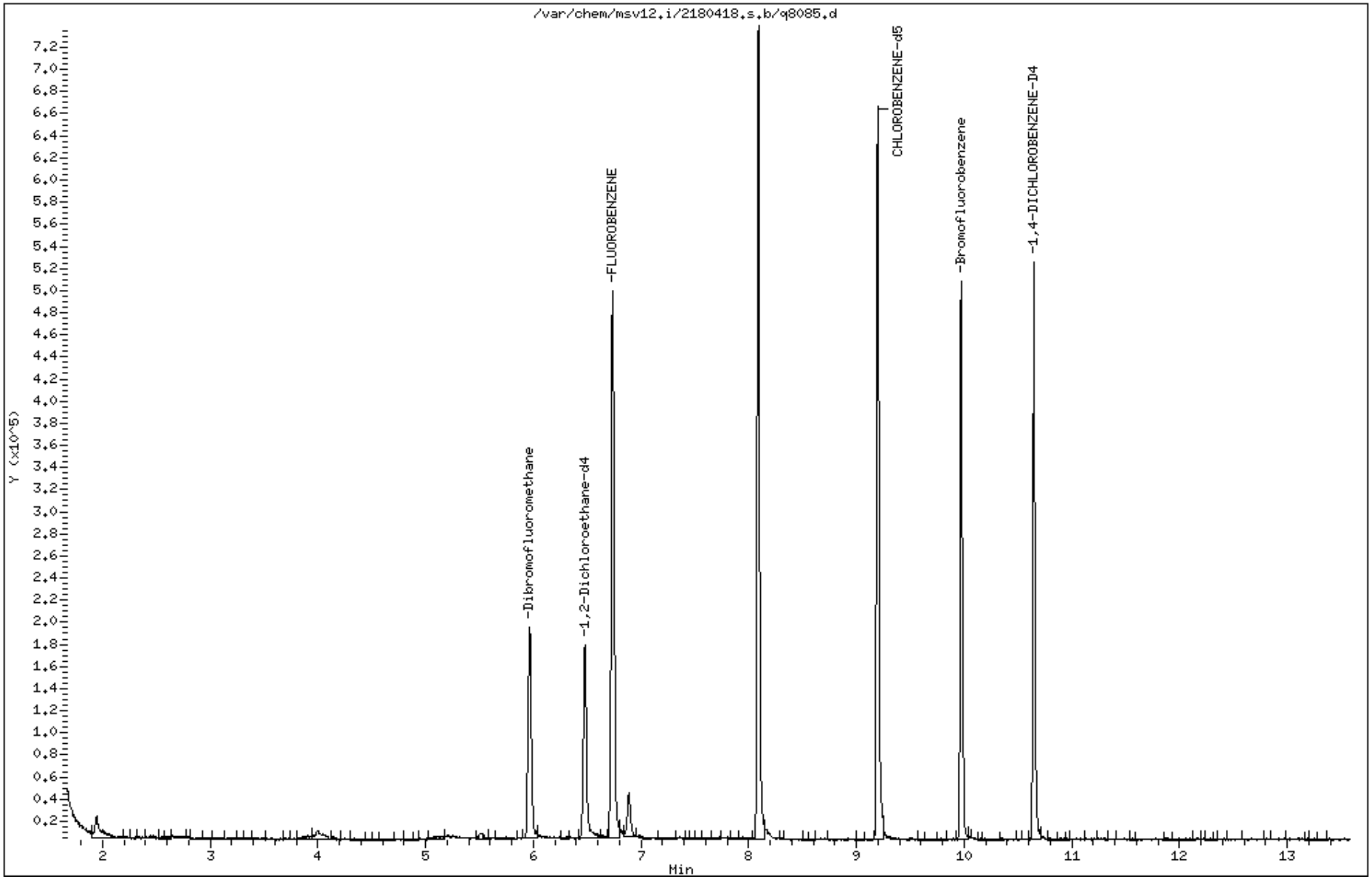
Sample Info: 21804062012*

Purge Volume: 5.0

Operator: JMC2

Column phase: RTX-VMS-30M

Column diameter: 0.25



Data File: /var/chem/msv12.i/2180418.s.b/q8085.d

Date : 18-APR-2018 18:43

Client ID: 21804062012

Instrument: msv12.i

Sample Info: 21804062012x

Purge Volume: 5.0

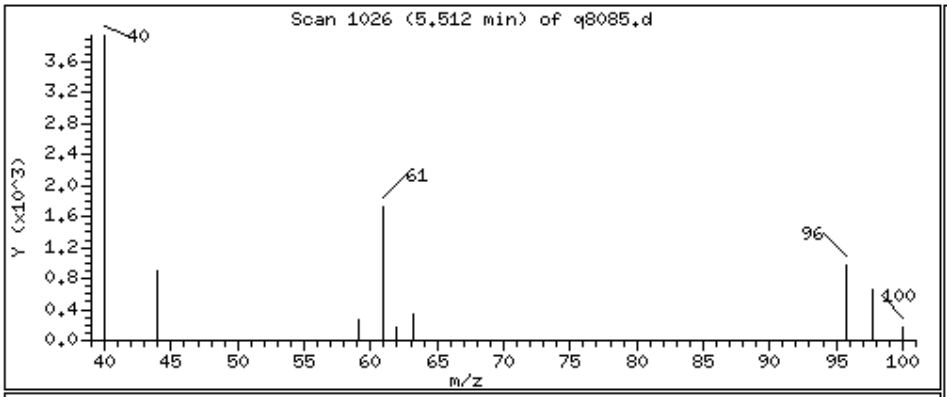
Operator: JMC2

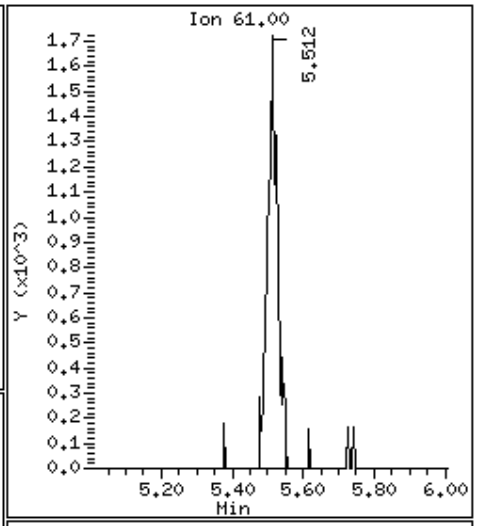
Column phase: RTX-VMS-30M

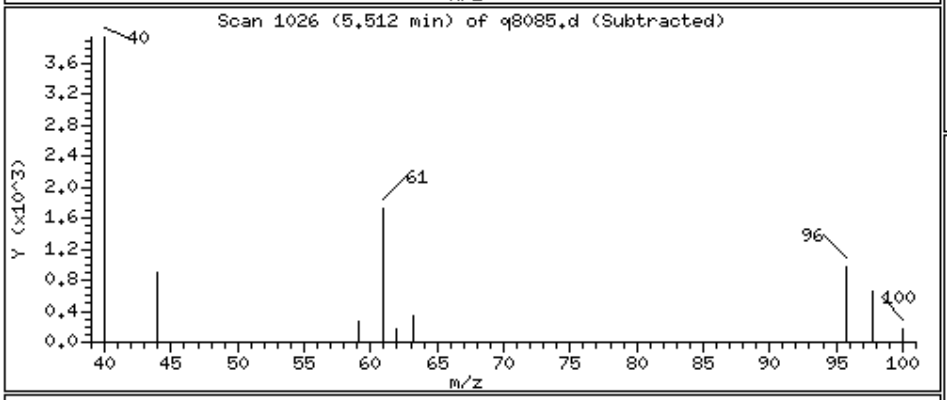
Column diameter: 0.25

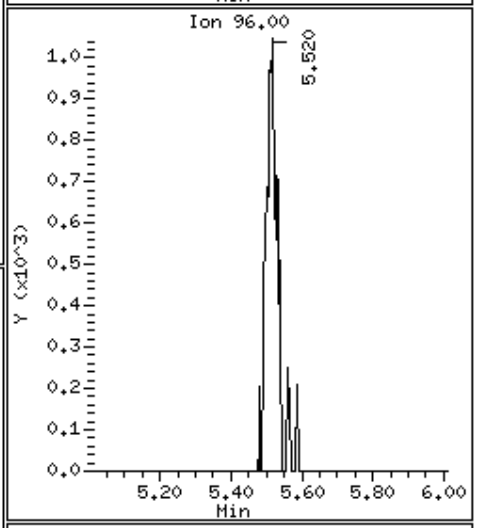
30 cis-1,2-Dichloroethene

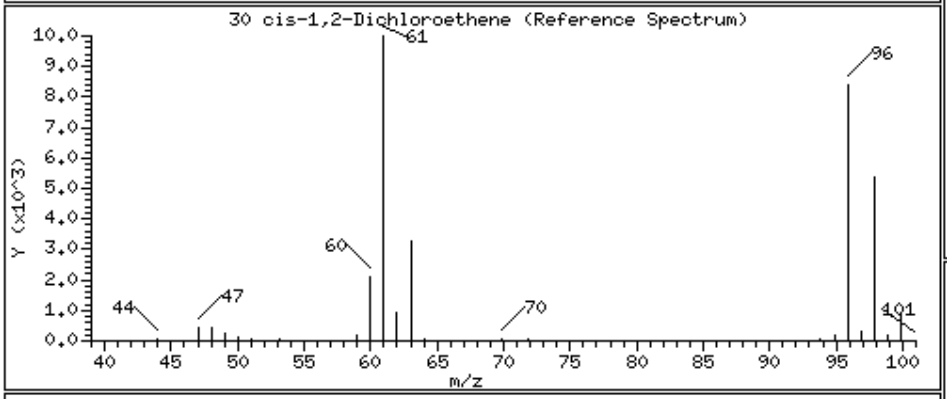
Concentration: 0.885 ug/L

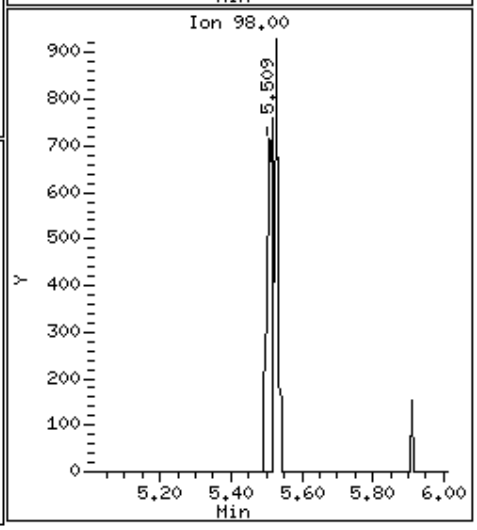


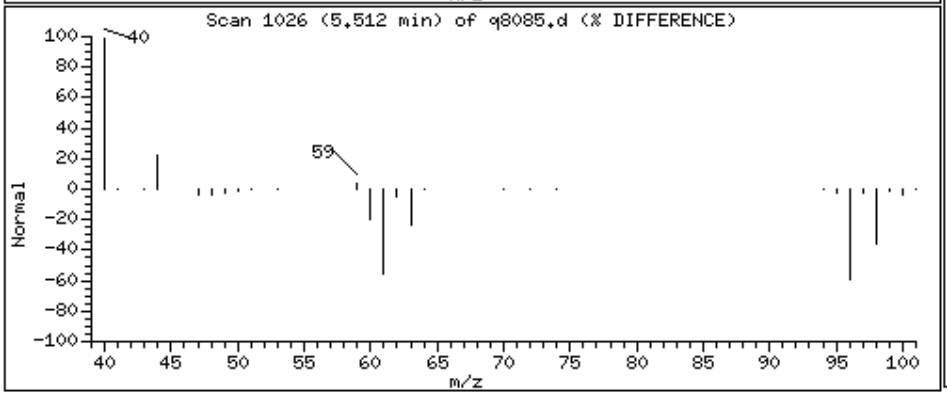



Data File: /var/chem/msv12.i/2180418.s.b/q8085.d

Date : 18-APR-2018 18:43

Client ID: 21804062012

Instrument: msv12.i

Sample Info: 21804062012x

Purge Volume: 5.0

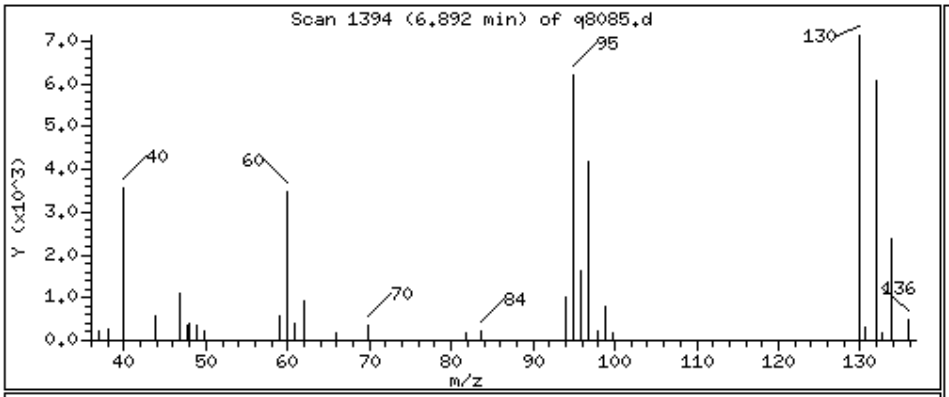
Operator: JMC2

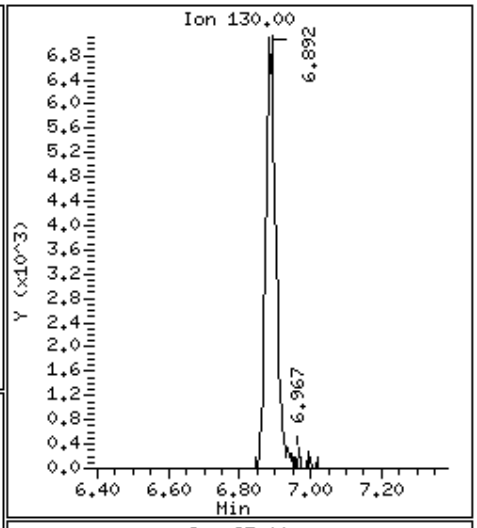
Column phase: RTX-VMS-30M

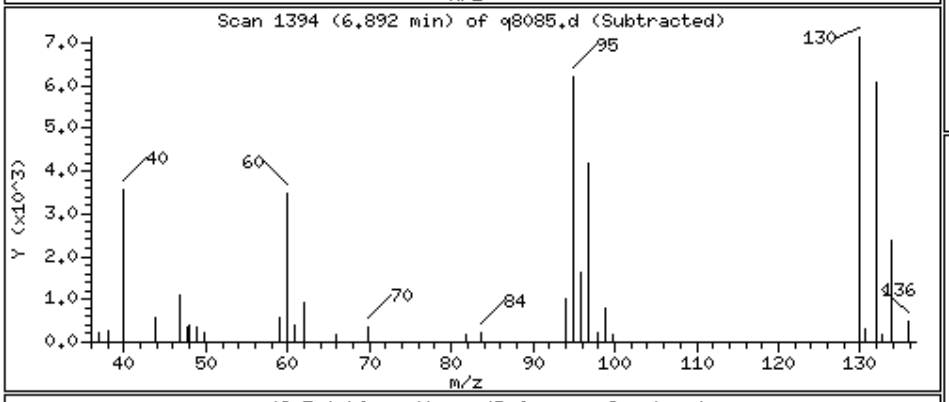
Column diameter: 0.25

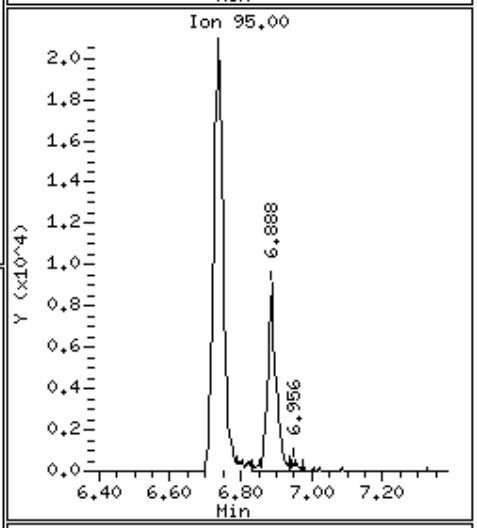
49 Trichloroethene

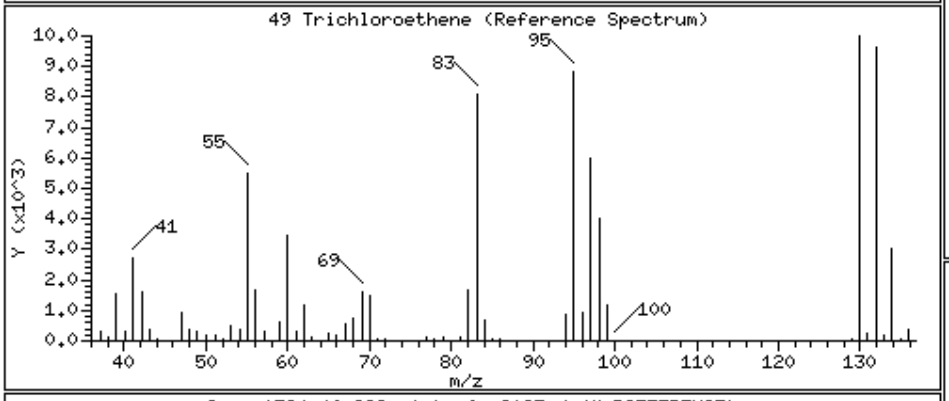
Concentration: 4.54 ug/L

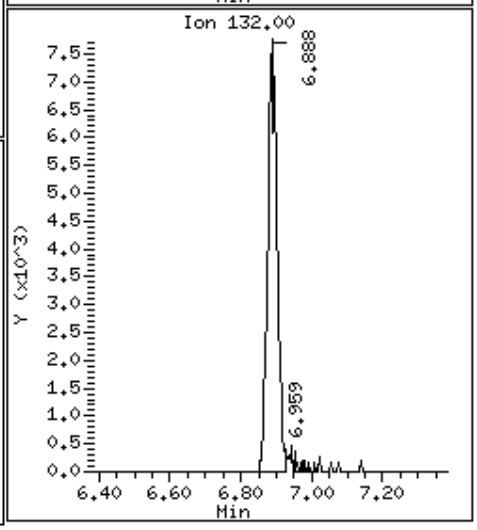


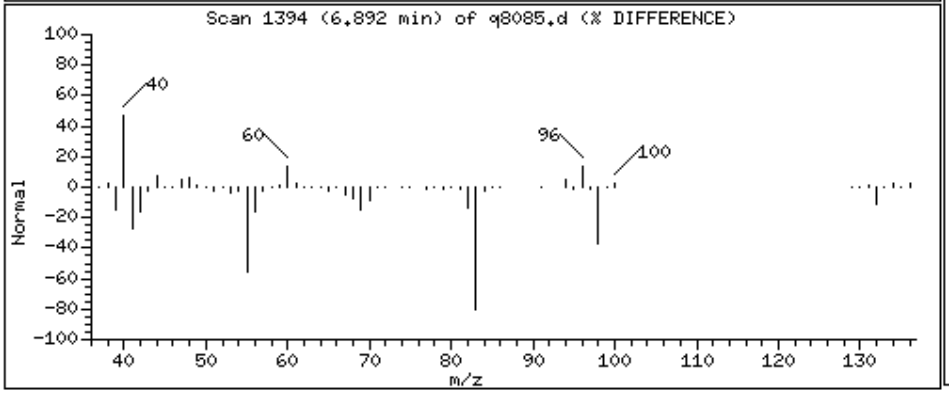



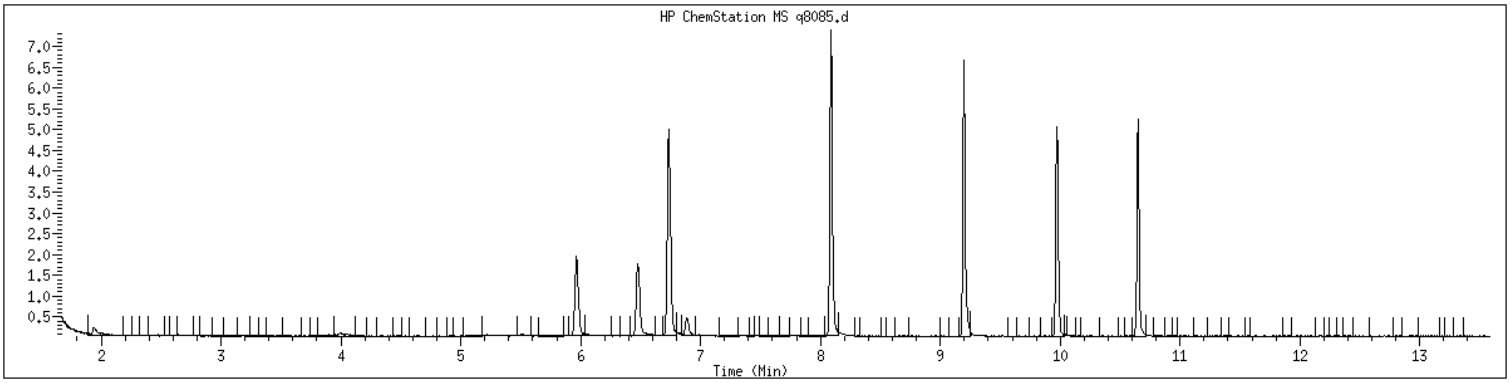



MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 21804062012 SampleType : SAMPLE
Injection Date: 04/18/2018 18:43 Instrument : msv12.i
Operator : JMC2
Sample Info : 21804062012*
Misc Info : MSV~40673~*1*JMC2
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b-




NO MANUAL INTEGRATIONS

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | S4-MW-47-21 |
| Collect Date: | 04/05/18 Time: 1440 | GCAL Sample ID: | 21804062013 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8086 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1906 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-35-4 | 1,1-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 544-10-5 | 1-Chlorohexane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-93-3 | 2-Butanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 95-49-8 | 2-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 591-78-6 | 2-Hexanone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 67-64-1 | Acetone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 71-43-2 | Benzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-86-1 | Bromobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-97-5 | Bromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-27-4 | Bromodichloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-25-2 | Bromoform | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 74-83-9 | Bromomethane | 1.00 | U | 0.500 | 1.00 | 1.00 |
| 75-15-0 | Carbon disulfide | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 56-23-5 | Carbon tetrachloride | 0.500 | U | 0.250 | 0.500 | 1.00 |

FORM I VOA

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | S4-MW-47-21 |
| Collect Date: | 04/05/18 Time: 1440 | GCAL Sample ID: | 21804062013 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8086 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1906 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 108-90-7 | Chlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-00-3 | Chloroethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 67-66-3 | Chloroform | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-87-3 | Chloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethene | 1.07 | | 0.200 | 0.500 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 124-48-1 | Dibromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-95-3 | Dibromomethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-41-4 | Ethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 98-82-8 | Isopropylbenzene (Cumene) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 136777-61-2 | m,p-Xylene | 0.500 | U | 0.200 | 0.500 | 2.00 |
| 75-09-2 | Methylene chloride | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 91-20-3 | Naphthalene | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 104-51-8 | n-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 103-65-1 | n-Propylbenzene | 2.00 | U | 1.00 | 2.00 | 5.00 |
| 95-47-6 | o-Xylene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 135-98-8 | sec-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-42-5 | Styrene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether (MTBE) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 98-06-6 | tert-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 127-18-4 | Tetrachloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-88-3 | Toluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-01-6 | Trichloroethene | 6.12 | | 0.200 | 0.500 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-01-4 | Vinyl chloride | 0.500 | U | 0.200 | 0.500 | 1.00 |

FORM I VOA

GCAL, Inc.

Data file : /var/chem/msv12.i/2180418.s.b/q8086.d
Lab Smp Id: 21804062013 Client Smp ID: 21804062013
Inj Date : 18-APR-2018 19:06
Operator : JMC2 Inst ID: msv12.i
Smp Info : 21804062013*
Misc Info : MSV~40673~*1*JMC2
Comment :
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:06 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 18:43 Cal File: q7984cD.d
Als bottle: 21
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b-.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| | Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|---|
| | 30 cis-1,2-Dichloroethene | 61 | 5.520 | 5.509 | (0.819) | 4142 | 1.06666 | 1.07 | |
| M | 48 Total 1,2-Dichloroethene | 61 | | | | 4142 | 1.06666 | 1.07 | |
| $ | 36 Dibromofluoromethane | 111 | 5.966 | 5.966 | (0.885) | 121443 | 49.3105 | 49.3 | 6990 |
| $ | 43 1,2-Dichloroethane-d4 | 67 | 6.480 | 6.476 | (0.962) | 70097 | 48.0674 | 48.1 | |
| * | 47 FLUOROBENZENE | 96 | 6.738 | 6.735 | (1.000) | 461148 | 50.0000 | | |
| | 49 Trichloroethene | 130 | 6.884 | 6.888 | (1.022) | 19830 | 6.12206 | 6.12 | (H) |
| $ | 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.879) | 438192 | 52.6078 | 52.6 | |
| * | 71 CHLOROBENZENE-d5 | 82 | 9.197 | 9.198 | (1.000) | 171094 | 50.0000 | | |
| $ | 80 Bromofluorobenzene | 174 | 9.973 | 9.970 | (1.084) | 136741 | 45.1777 | 45.2 | |
| * | 97 1,4-DICHLOROBENZENE-D4 | 152 | 10.648 | 10.645 | (1.000) | 120451 | 50.0000 | | |

QC Flag Legend

H - Operator selected an alternate compound hit.

Data File: /var/chem/msv12.i/2180418.s.b/q8086.d



Date : 18-APR-2018 19:06

Client ID: 21804062013

Instrument: msv12.i

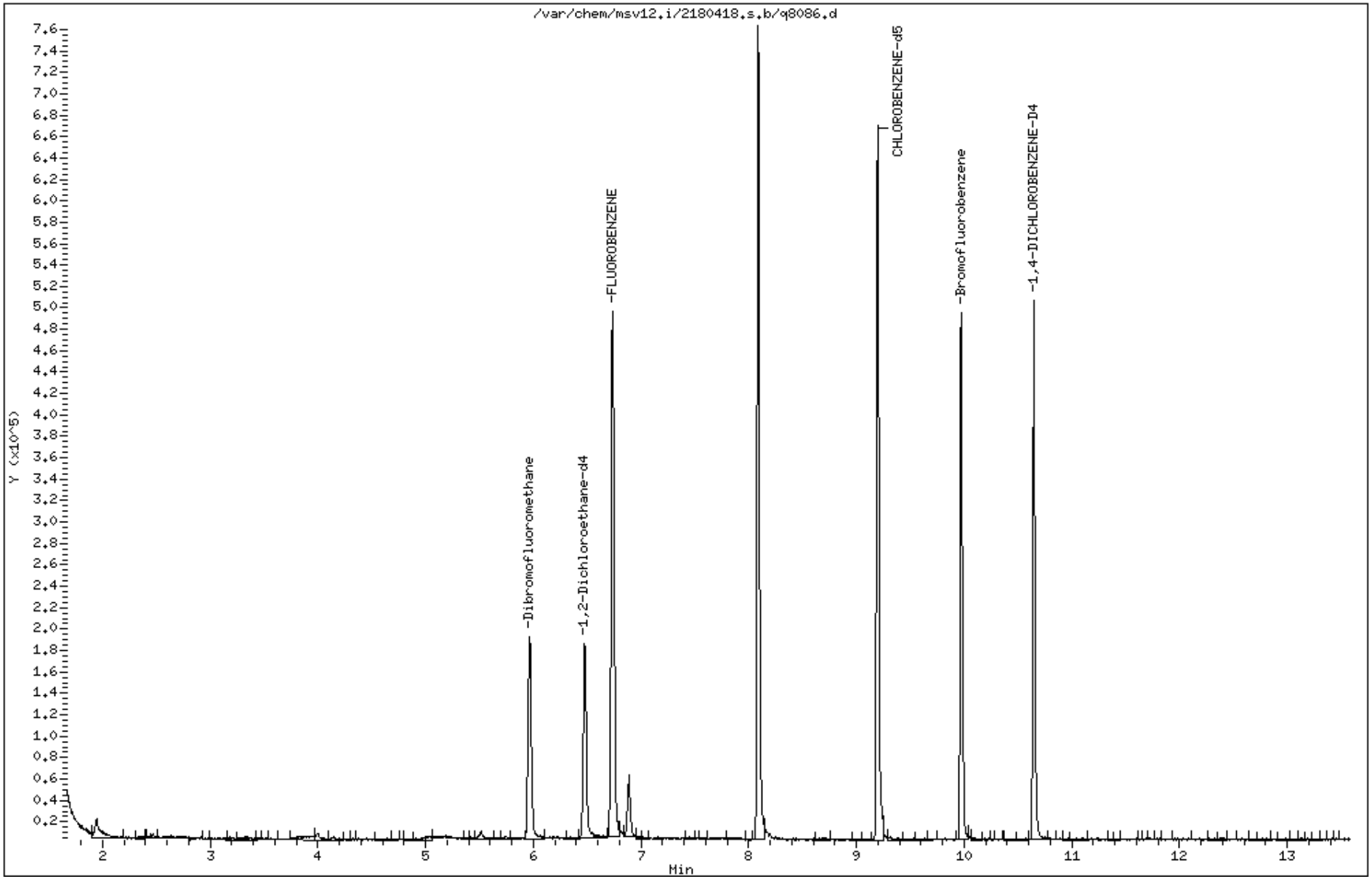
Sample Info: 21804062013*

Purge Volume: 5.0

Operator: JMC2

Column phase: RTX-VMS-30M

Column diameter: 0.25



Data File: /var/chem/msv12.i/2180418.s.b/q8086.d

Date : 18-APR-2018 19:06

Client ID: 21804062013

Instrument: msv12.i

Sample Info: 21804062013x

Purge Volume: 5.0

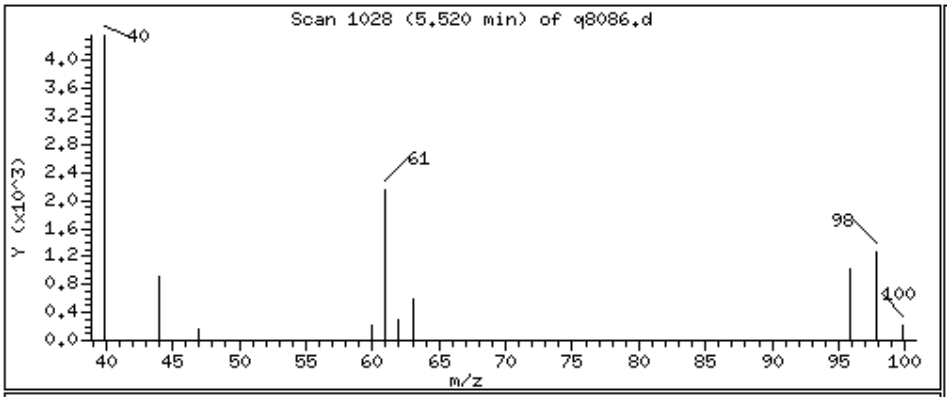
Operator: JMC2

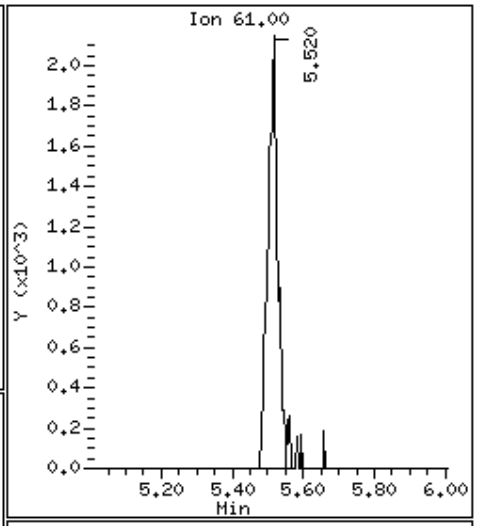
Column phase: RTX-VMS-30M

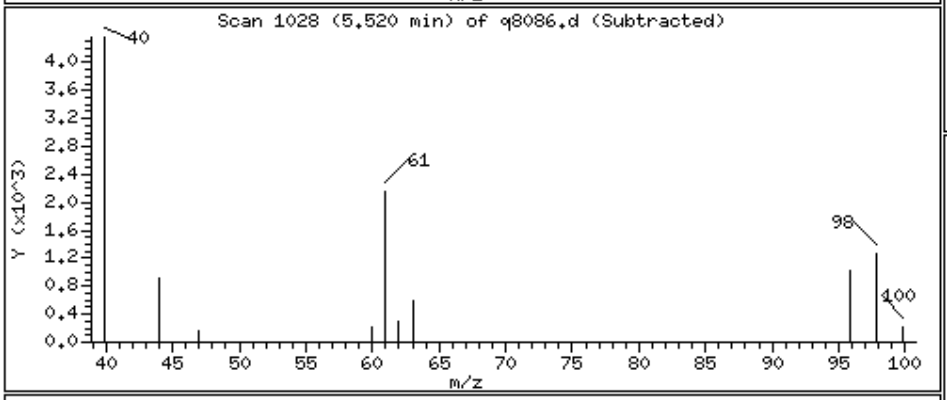
Column diameter: 0.25

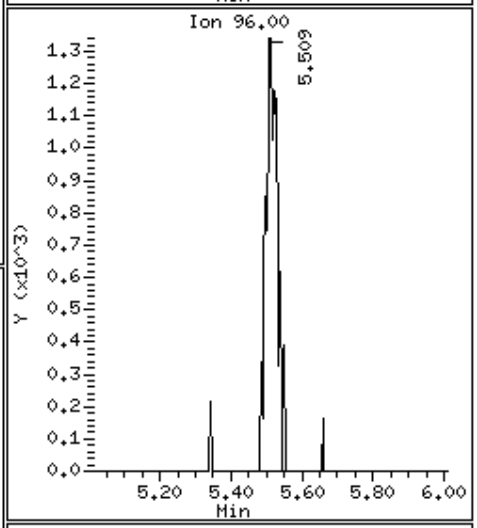
30 cis-1,2-Dichloroethene

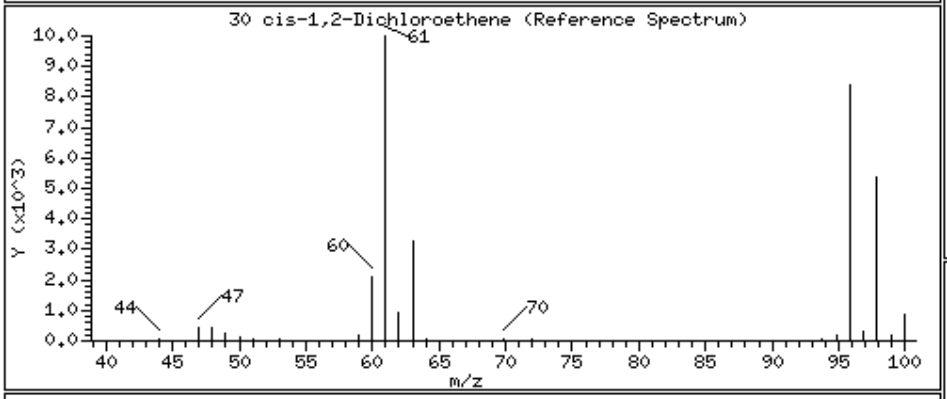
Concentration: 1.07 ug/L

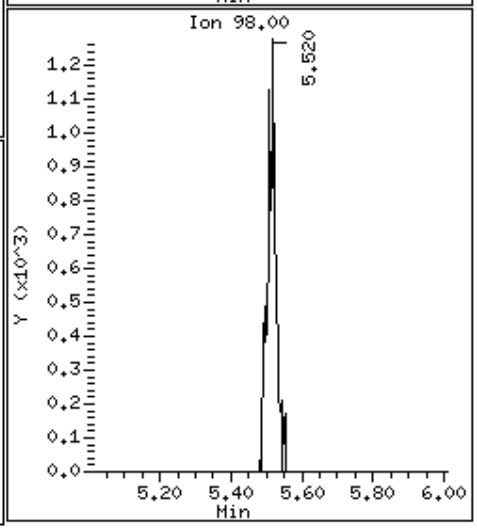


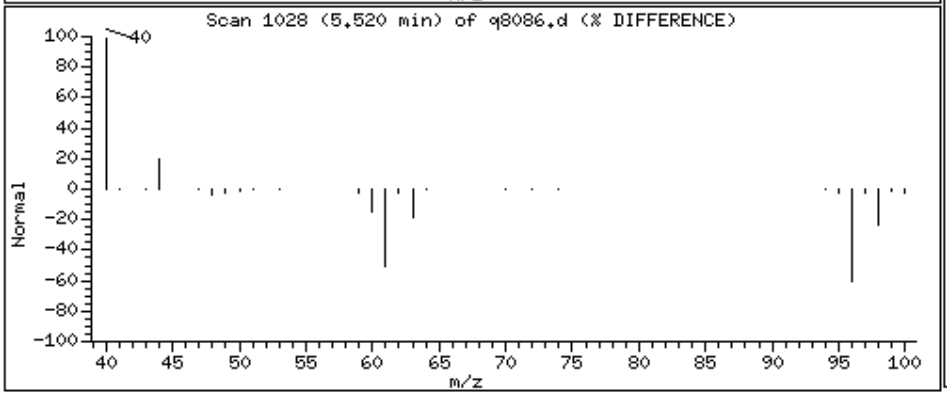



Data File: /var/chem/msv12.i/2180418.s.b/q8086.d

Date : 18-APR-2018 19:06

Client ID: 21804062013

Instrument: msv12.i

Sample Info: 21804062013x

Purge Volume: 5.0

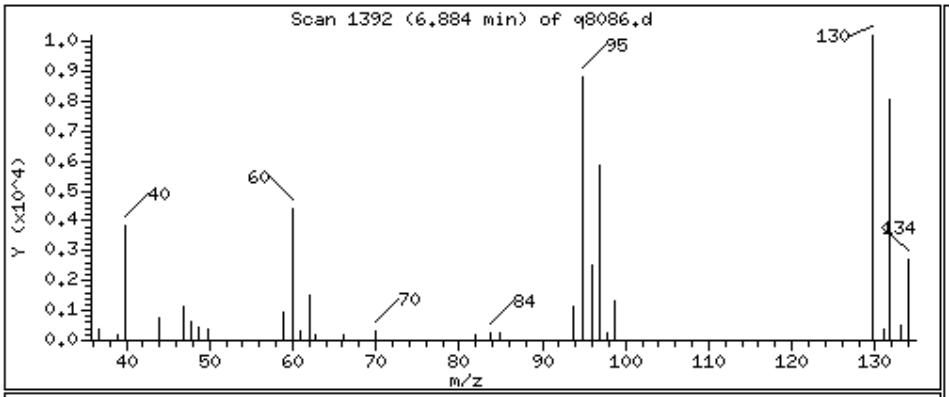
Operator: JMC2

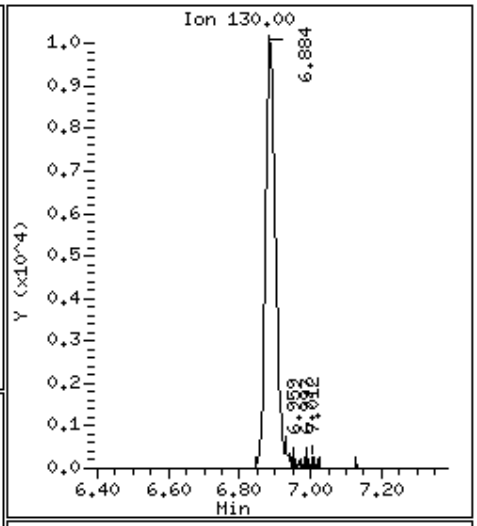
Column phase: RTX-VMS-30M

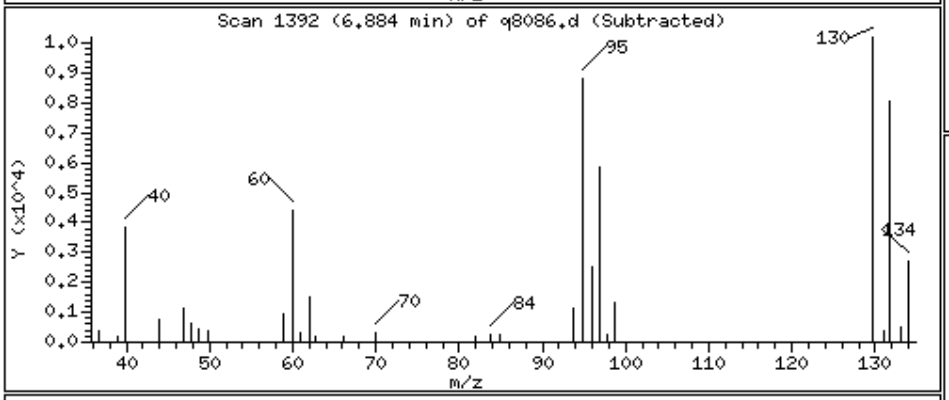
Column diameter: 0.25

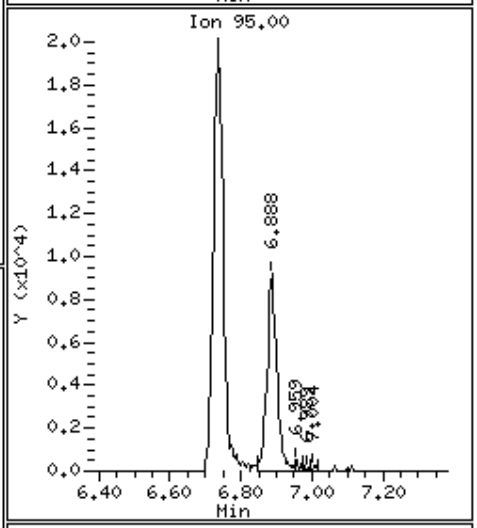
49 Trichloroethene

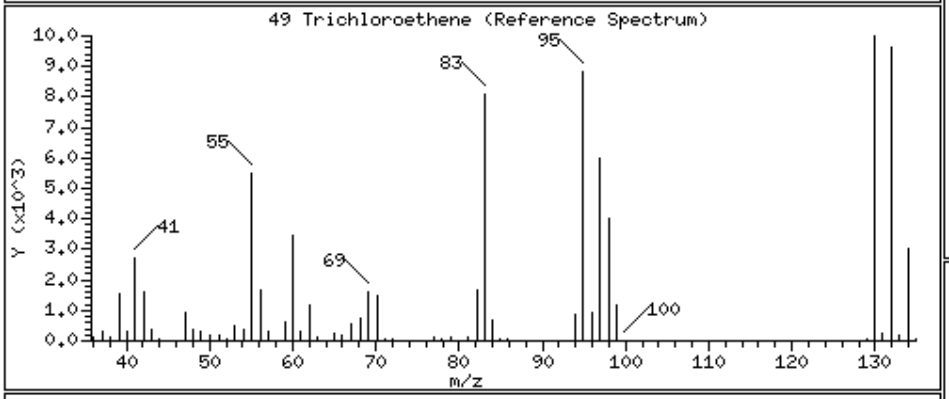
Concentration: 6.12 ug/L

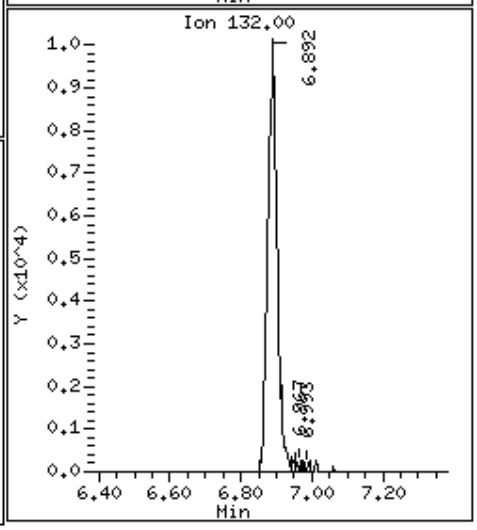


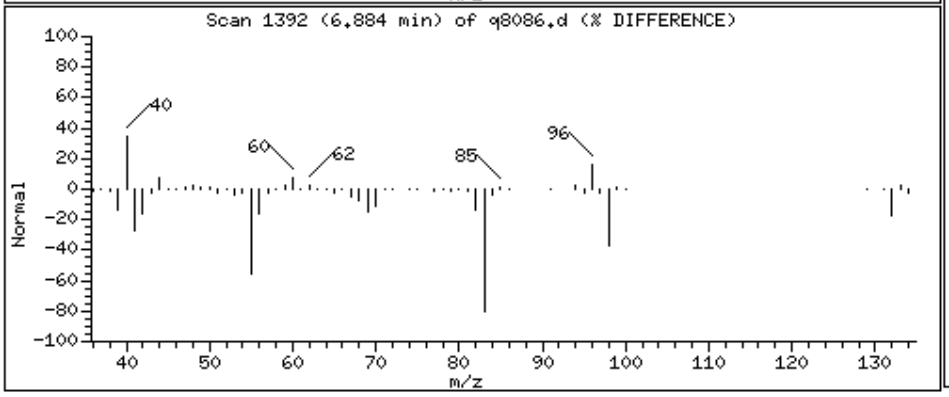



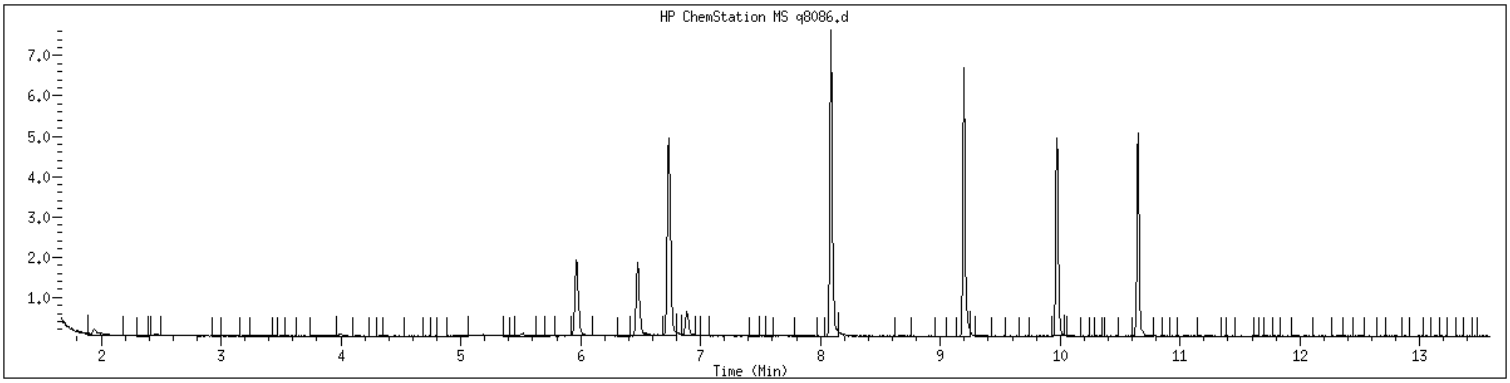



MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 21804062013 SampleType : SAMPLE
Injection Date: 04/18/2018 19:06 Instrument : msv12.i
Operator : JMC2
Sample Info : 21804062013*
Misc Info : MSV~40673~*1*JMC2
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b-




NO MANUAL INTEGRATIONS

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | Trip Blank |
| Collect Date: | 04/05/18 Time: 0001 | GCAL Sample ID: | 21804062014 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8070 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1239 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-35-4 | 1,1-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 544-10-5 | 1-Chlorohexane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-93-3 | 2-Butanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 95-49-8 | 2-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 591-78-6 | 2-Hexanone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 67-64-1 | Acetone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 71-43-2 | Benzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-86-1 | Bromobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-97-5 | Bromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-27-4 | Bromodichloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-25-2 | Bromoform | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 74-83-9 | Bromomethane | 1.00 | U | 0.500 | 1.00 | 1.00 |
| 75-15-0 | Carbon disulfide | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 56-23-5 | Carbon tetrachloride | 0.500 | U | 0.250 | 0.500 | 1.00 |

FORM I VOA

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | Trip Blank |
| Collect Date: | 04/05/18 Time: 0001 | GCAL Sample ID: | 21804062014 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8070 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1239 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 108-90-7 | Chlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-00-3 | Chloroethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 67-66-3 | Chloroform | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-87-3 | Chloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 124-48-1 | Dibromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-95-3 | Dibromomethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-41-4 | Ethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 98-82-8 | Isopropylbenzene (Cumene) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 136777-61-2 | m,p-Xylene | 0.500 | U | 0.200 | 0.500 | 2.00 |
| 75-09-2 | Methylene chloride | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 91-20-3 | Naphthalene | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 104-51-8 | n-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 103-65-1 | n-Propylbenzene | 2.00 | U | 1.00 | 2.00 | 5.00 |
| 95-47-6 | o-Xylene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 135-98-8 | sec-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-42-5 | Styrene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether (MTBE) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 98-06-6 | tert-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 127-18-4 | Tetrachloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-88-3 | Toluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-01-6 | Trichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-01-4 | Vinyl chloride | 0.500 | U | 0.200 | 0.500 | 1.00 |

FORM I VOA

GCAL, Inc.

Data file : /var/chem/msv12.i/2180418.s.b/q8070.d
Lab Smp Id: 21804062014 Client Smp ID: 21804062014
Inj Date : 18-APR-2018 12:39
Operator : JMC2 Inst ID: msv12.i
Smp Info : 21804062014*
Misc Info : MSV~40673~*1*JMC2
Comment :
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:06 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 18:43 Cal File: q7984cD.d
Als bottle: 5
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b-.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|
| $ 36 Dibromofluoromethane | 111 | 5.962 | 5.966 | (0.885) | 126719 | 50.0627 | 50.1 | 6999 |
| $ 43 1,2-Dichloroethane-d4 | 67 | 6.476 | 6.476 | (0.961) | 71504 | 47.7076 | 47.7 | |
| * 47 FLUOROBENZENE | 96 | 6.738 | 6.735 | (1.000) | 473952 | 50.0000 | | |
| $ 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.879) | 463622 | 52.5399 | 52.5 | |
| * 71 CHLOROBENZENE-d5 | 82 | 9.197 | 9.198 | (1.000) | 181257 | 50.0000 | | |
| $ 80 Bromofluorobenzene | 174 | 9.973 | 9.970 | (1.084) | 147462 | 45.9881 | 46.0 | |
| * 97 1,4-DICHLOROBENZENE-D4 | 152 | 10.648 | 10.645 | (1.000) | 133040 | 50.0000 | | |

Data File: /var/chem/msv12.i/2180418.s.b/q8070.d

Page 1

Date : 18-APR-2018 12:39

Client ID: 21804062014

Instrument: msv12.i

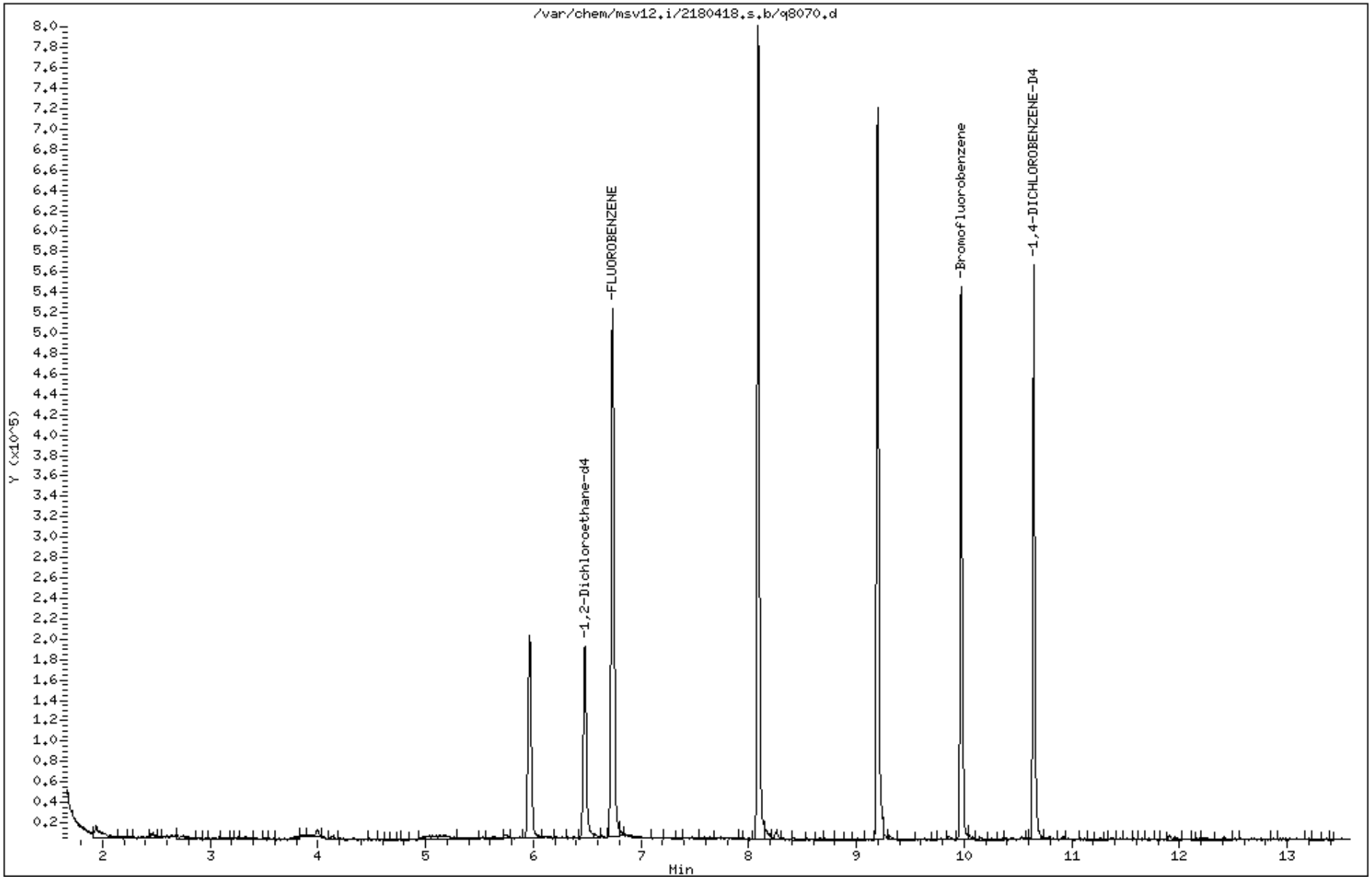
Sample Info: 21804062014*

Purge Volume: 5.0

Operator: JMC2

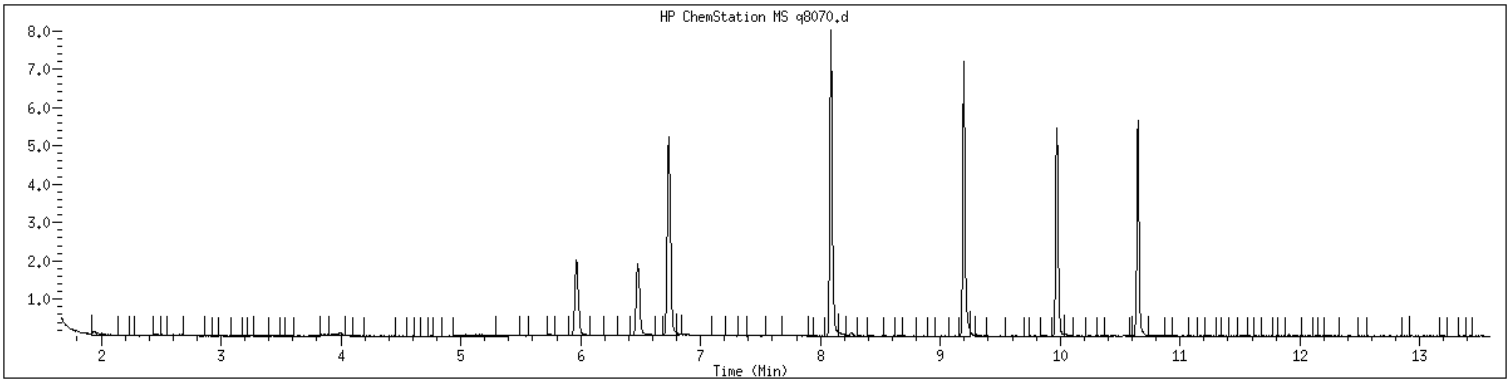
Column phase: RTX-VMS-30M

Column diameter: 0.25



MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 21804062014 SampleType : SAMPLE
Injection Date: 04/18/2018 12:39 Instrument : msv12.i
Operator : JMC2
Sample Info : 21804062014*
Misc Info : MSV~40673~*1*JMC2
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b-




NO MANUAL INTEGRATIONS

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | S4-MW28-21 |
| Collect Date: | 04/05/18 Time: 1130 | GCAL Sample ID: | 21804062015 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8087 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1928 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-35-4 | 1,1-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 544-10-5 | 1-Chlorohexane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-93-3 | 2-Butanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 95-49-8 | 2-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 591-78-6 | 2-Hexanone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 67-64-1 | Acetone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 71-43-2 | Benzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-86-1 | Bromobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-97-5 | Bromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-27-4 | Bromodichloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-25-2 | Bromoform | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 74-83-9 | Bromomethane | 1.00 | U | 0.500 | 1.00 | 1.00 |
| 75-15-0 | Carbon disulfide | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 56-23-5 | Carbon tetrachloride | 0.500 | U | 0.250 | 0.500 | 1.00 |

FORM I VOA

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | S4-MW28-21 |
| Collect Date: | 04/05/18 Time: 1130 | GCAL Sample ID: | 21804062015 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8087 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1928 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 108-90-7 | Chlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-00-3 | Chloroethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 67-66-3 | Chloroform | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-87-3 | Chloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 124-48-1 | Dibromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-95-3 | Dibromomethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-41-4 | Ethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 98-82-8 | Isopropylbenzene (Cumene) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 136777-61-2 | m,p-Xylene | 0.500 | U | 0.200 | 0.500 | 2.00 |
| 75-09-2 | Methylene chloride | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 91-20-3 | Naphthalene | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 104-51-8 | n-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 103-65-1 | n-Propylbenzene | 2.00 | U | 1.00 | 2.00 | 5.00 |
| 95-47-6 | o-Xylene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 135-98-8 | sec-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-42-5 | Styrene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether (MTBE) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 98-06-6 | tert-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 127-18-4 | Tetrachloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-88-3 | Toluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-01-6 | Trichloroethene | 0.737 | J | 0.200 | 0.500 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-01-4 | Vinyl chloride | 0.500 | U | 0.200 | 0.500 | 1.00 |

FORM I VOA

GCAL, Inc.

Data file : /var/chem/msv12.i/2180418.s.b/q8087.d
Lab Smp Id: 21804062015 Client Smp ID: 21804062015
Inj Date : 18-APR-2018 19:28
Operator : JMC2 Inst ID: msv12.i
Smp Info : 21804062015*
Misc Info : MSV~40673~*1*JMC2
Comment :
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:06 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 18:43 Cal File: q7984cD.d
Als bottle: 22
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b-.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|
| $ 36 Dibromofluoromethane | 111 | 5.962 | 5.966 | (0.885) | 124654 | 50.0378 | 50.0 | 6990 |
| $ 43 1,2-Dichloroethane-d4 | 67 | 6.476 | 6.476 | (0.961) | 74650 | 50.6065 | 50.6 | |
| * 47 FLUOROBENZENE | 96 | 6.738 | 6.735 | (1.000) | 466461 | 50.0000 | | |
| 49 Trichloroethene | 130 | 6.892 | 6.888 | (1.023) | 2416 | 0.73739 | 0.737 | |
| $ 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.879) | 446719 | 51.1521 | 51.2 | |
| * 71 CHLOROBENZENE-d5 | 82 | 9.198 | 9.198 | (1.000) | 179387 | 50.0000 | | |
| $ 80 Bromofluorobenzene | 174 | 9.973 | 9.970 | (1.084) | 144370 | 45.4932 | 45.5 | |
| * 97 1,4-DICHLOROBENZENE-D4 | 152 | 10.648 | 10.645 | (1.000) | 125676 | 50.0000 | | |

Data File: /var/chem/msv12.i/2180418.s.b/q8087.d



Date : 18-APR-2018 19:28

Client ID: 21804062015

Instrument: msv12.i

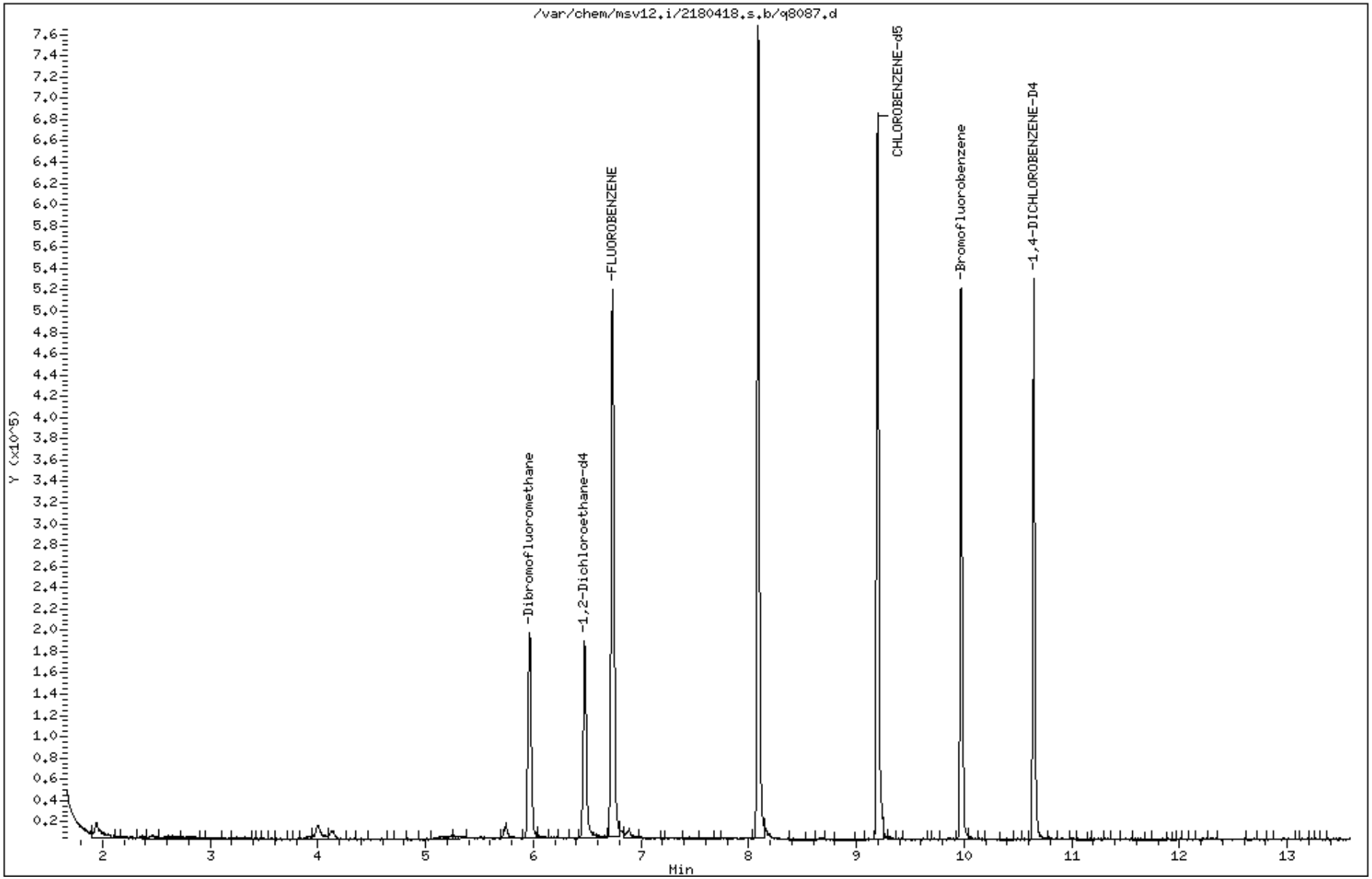
Sample Info: 21804062015*

Purge Volume: 5.0

Operator: JMC2

Column phase: RTX-VMS-30M

Column diameter: 0.25



Data File: /var/chem/msv12.i/2180418.s.b/q8087.d

Date : 18-APR-2018 19:28

Client ID: 21804062015

Instrument: msv12.i

Sample Info: 21804062015x

Purge Volume: 5.0

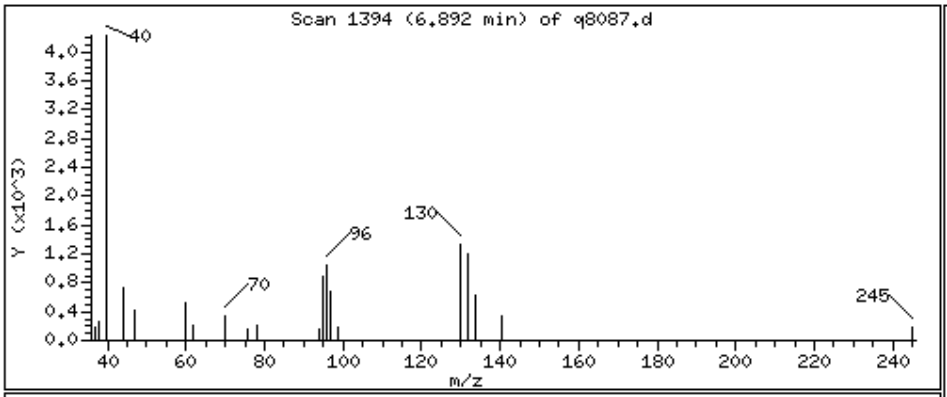
Operator: JMC2

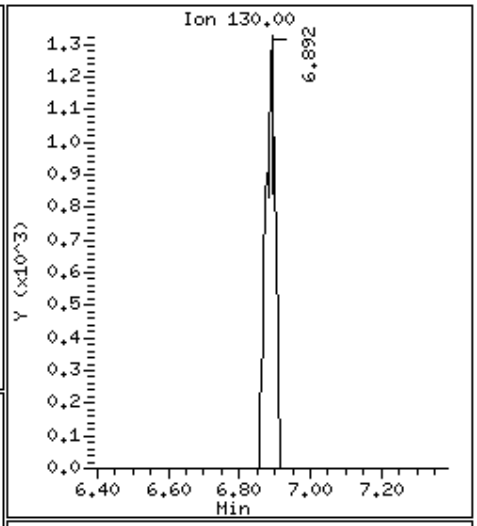
Column phase: RTX-VMS-30M

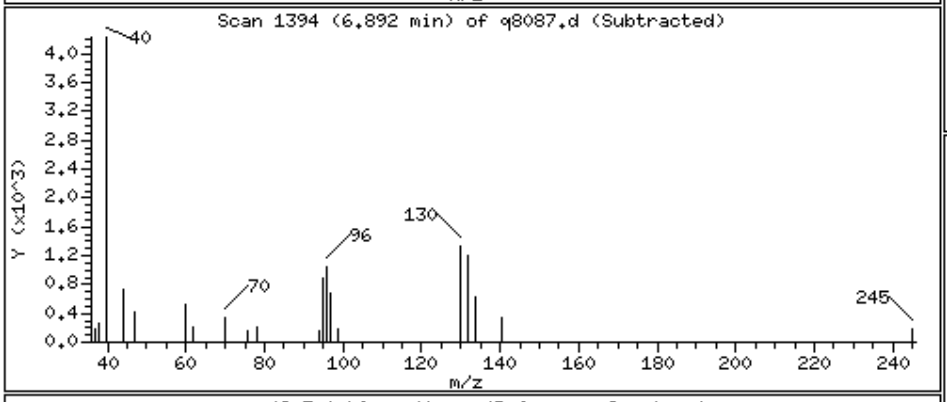
Column diameter: 0.25

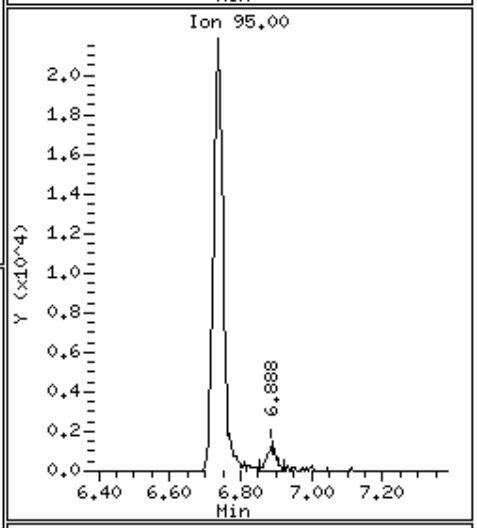
49 Trichloroethene

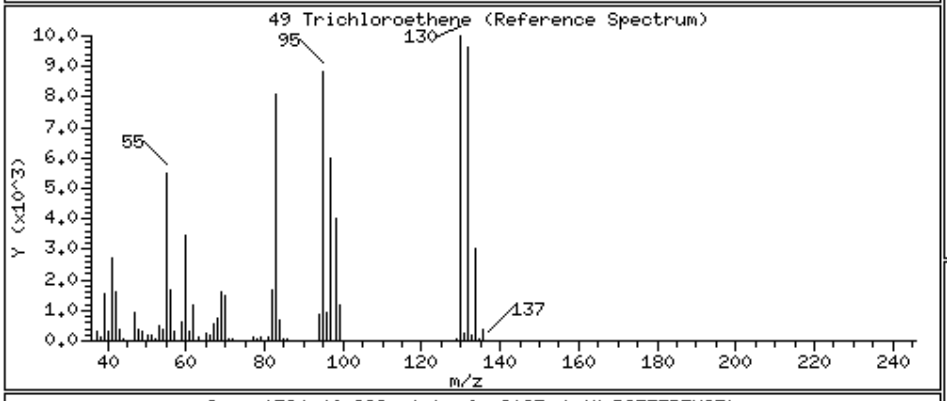
Concentration: 0.737 ug/L

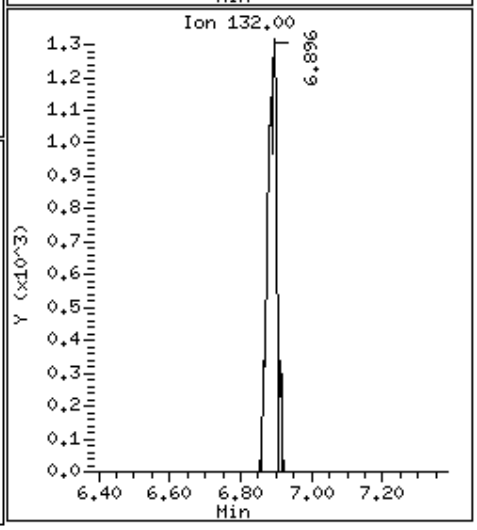


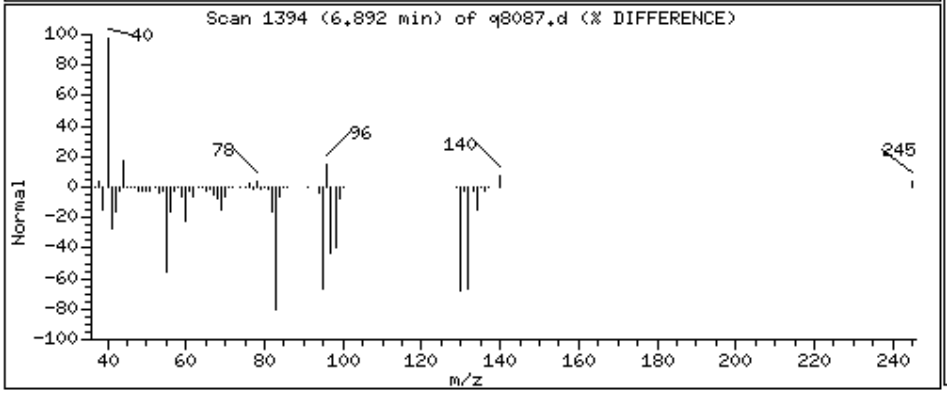



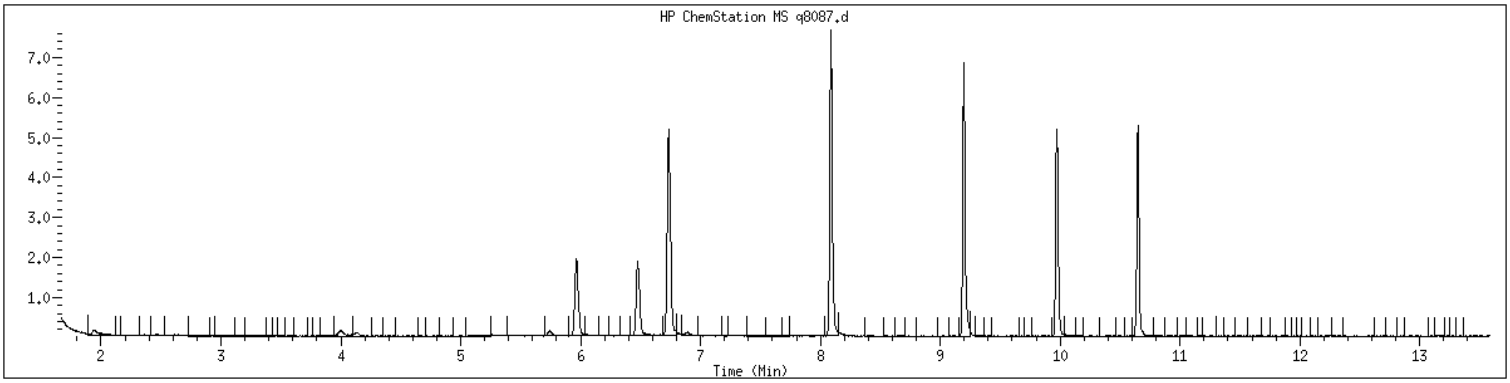



Report Date: 04/19/2018 11:06

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 21804062015 SampleType : SAMPLE
Injection Date: 04/18/2018 19:28 Instrument : msv12.i
Operator : JMC2
Sample Info : 21804062015*
Misc Info : MSV~40673~*1*JMC2
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b-




NO MANUAL INTEGRATIONS

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | S4-MW37-21 |
| Collect Date: | 04/05/18 Time: 1015 | GCAL Sample ID: | 21804062016 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8088 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1951 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | 5.11 | | 0.200 | 0.500 | 1.00 |
| 75-35-4 | 1,1-Dichloroethene | 1.61 | | 0.200 | 0.500 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 544-10-5 | 1-Chlorohexane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-93-3 | 2-Butanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 95-49-8 | 2-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 591-78-6 | 2-Hexanone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 67-64-1 | Acetone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 71-43-2 | Benzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-86-1 | Bromobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-97-5 | Bromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-27-4 | Bromodichloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-25-2 | Bromoform | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 74-83-9 | Bromomethane | 1.00 | U | 0.500 | 1.00 | 1.00 |
| 75-15-0 | Carbon disulfide | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 56-23-5 | Carbon tetrachloride | 0.500 | U | 0.250 | 0.500 | 1.00 |

FORM I VOA

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | S4-MW37-21 |
| Collect Date: | 04/05/18 Time: 1015 | GCAL Sample ID: | 21804062016 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8088 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1951 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 108-90-7 | Chlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-00-3 | Chloroethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 67-66-3 | Chloroform | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-87-3 | Chloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 124-48-1 | Dibromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-95-3 | Dibromomethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-41-4 | Ethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 98-82-8 | Isopropylbenzene (Cumene) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 136777-61-2 | m,p-Xylene | 0.500 | U | 0.200 | 0.500 | 2.00 |
| 75-09-2 | Methylene chloride | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 91-20-3 | Naphthalene | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 104-51-8 | n-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 103-65-1 | n-Propylbenzene | 2.00 | U | 1.00 | 2.00 | 5.00 |
| 95-47-6 | o-Xylene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 135-98-8 | sec-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-42-5 | Styrene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether (MTBE) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 98-06-6 | tert-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 127-18-4 | Tetrachloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-88-3 | Toluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-01-6 | Trichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-01-4 | Vinyl chloride | 0.500 | U | 0.200 | 0.500 | 1.00 |

GCAL, Inc.

Data file : /var/chem/msv12.i/2180418.s.b/q8088.d
Lab Smp Id: 21804062016 Client Smp ID: 21804062016
Inj Date : 18-APR-2018 19:51
Operator : JMC2 Inst ID: msv12.i
Smp Info : 21804062016*
Misc Info : MSV~40673~*1*JMC2
Comment :
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:06 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 18:43 Cal File: q7984cD.d
Als bottle: 23
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b-.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| | Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|---|
| | 11 1,1-Dichloroethene + | 96 | 3.297 | 3.301 | (0.490) | 3415 | 1.60893 | 1.61 | |
| | 24 1,1-Dichloroethane ++ | 63 | 4.946 | 4.939 | (0.734) | 28241 | 5.10720 | 5.11 | |
| $ | 36 Dibromofluoromethane | 111 | 5.966 | 5.966 | (0.886) | 122299 | 50.1663 | 50.2 | 6990 |
| $ | 43 1,2-Dichloroethane-d4 | 67 | 6.476 | 6.476 | (0.962) | 69855 | 48.3918 | 48.4 | |
| * | 47 FLUOROBENZENE | 96 | 6.734 | 6.735 | (1.000) | 456476 | 50.0000 | | |
| $ | 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.879) | 430884 | 52.0578 | 52.1 | |
| * | 71 CHLOROBENZENE-d5 | 82 | 9.197 | 9.198 | (1.000) | 170018 | 50.0000 | | |
| $ | 80 Bromofluorobenzene | 174 | 9.973 | 9.970 | (1.084) | 135621 | 45.0913 | 45.1 | |
| * | 97 1,4-DICHLOROBENZENE-D4 | 152 | 10.648 | 10.645 | (1.000) | 120230 | 50.0000 | | |

Data File: /var/chem/msv12.i/2180418.s.b/q8088.d



Date : 18-APR-2018 19:51

Client ID: 21804062016

Instrument: msv12.i

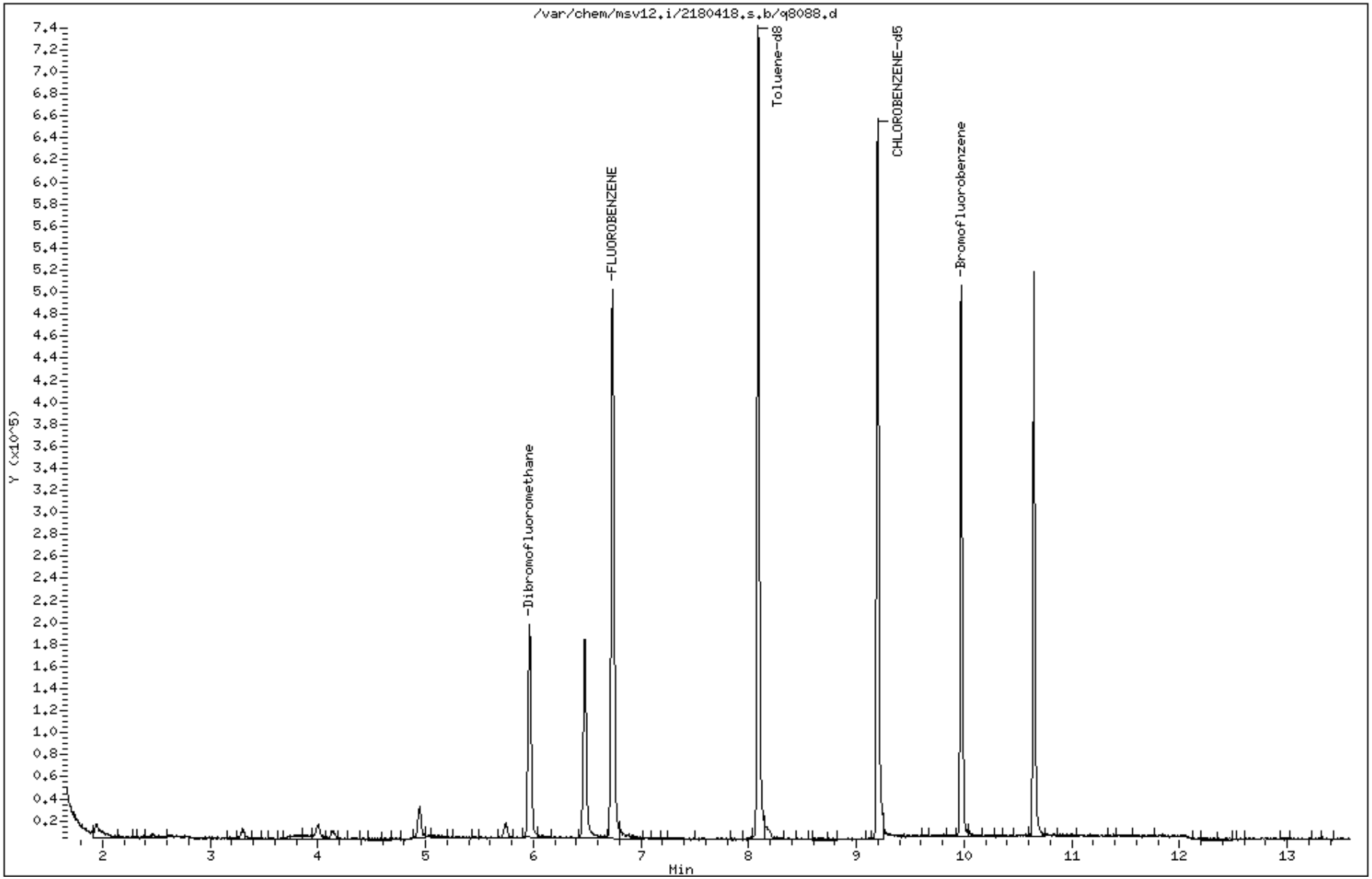
Sample Info: 21804062016*

Purge Volume: 5.0

Operator: JMC2

Column phase: RTX-VMS-30M

Column diameter: 0.25



Data File: /var/chem/msv12.i/2180418.s.b/q8088.d

Date : 18-APR-2018 19:51

Client ID: 21804062016

Instrument: msv12.i

Sample Info: 21804062016x

Purge Volume: 5.0

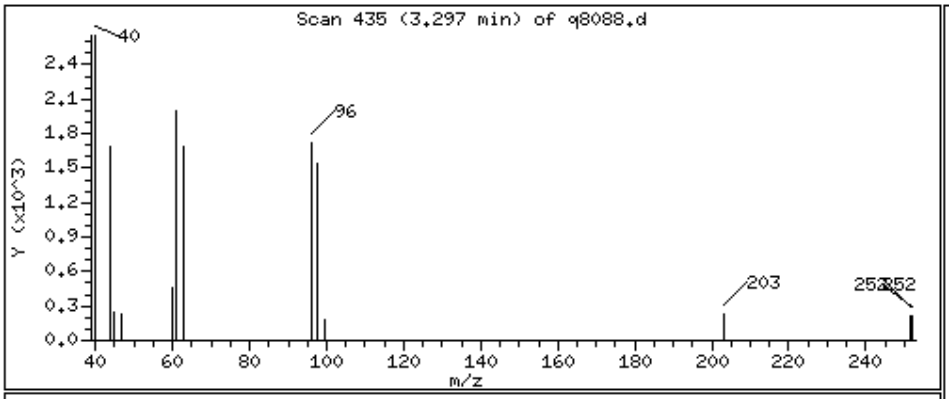
Operator: JMC2

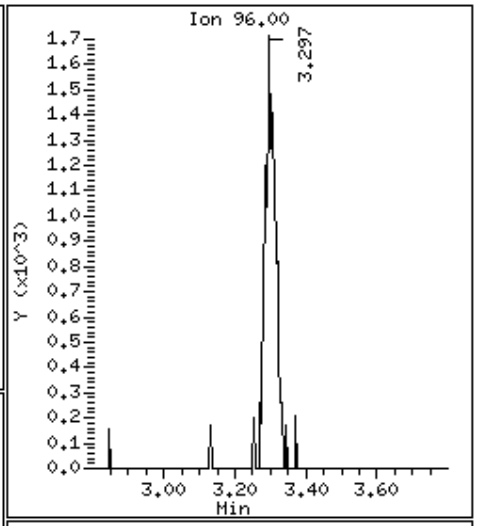
Column phase: RTX-VMS-30M

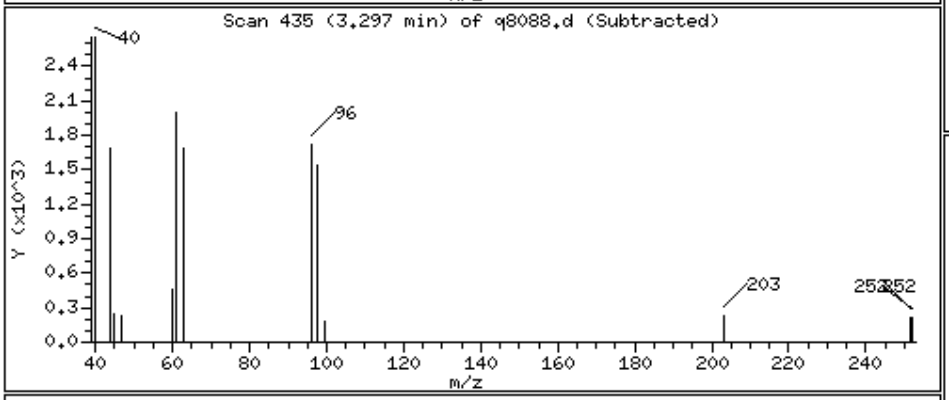
Column diameter: 0.25

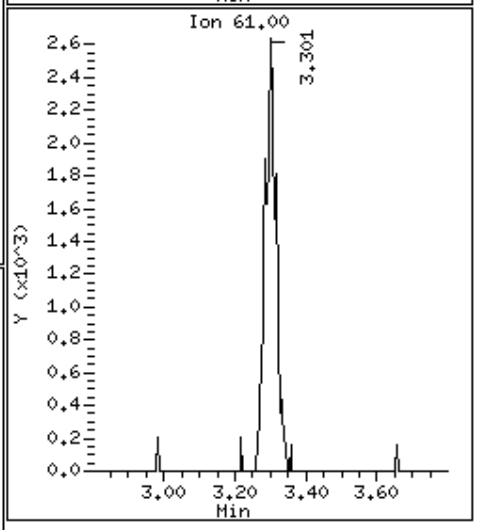
11 1,1-Dichloroethene +

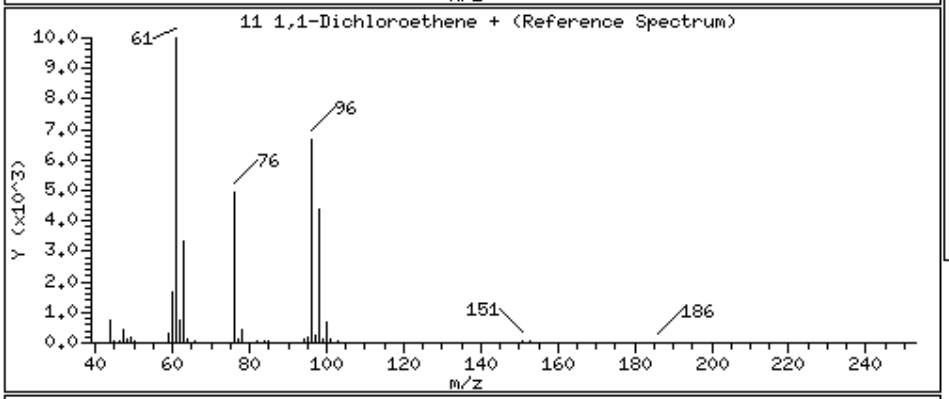
Concentration: 1.61 ug/L

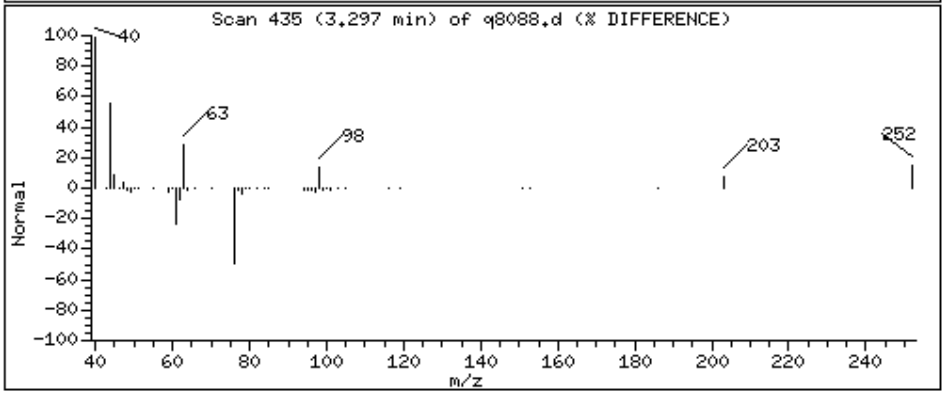


Data File: /var/chem/msv12.i/2180418.s.b/q8088.d

Date : 18-APR-2018 19:51

Client ID: 21804062016

Instrument: msv12.i

Sample Info: 21804062016x

Purge Volume: 5.0

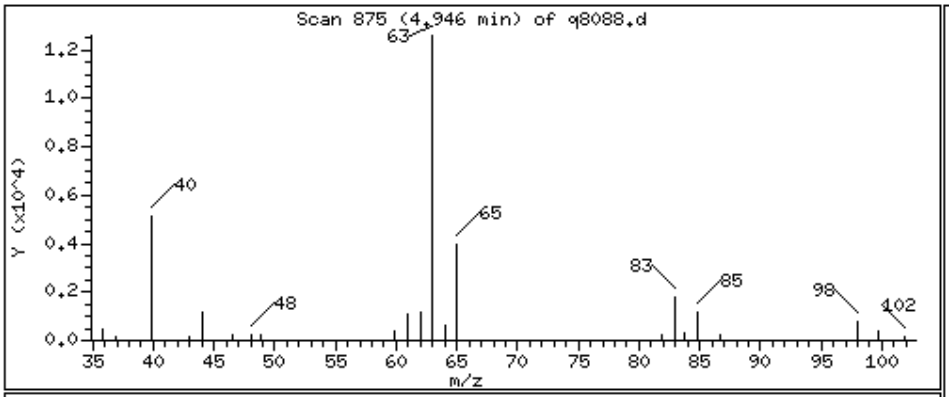
Operator: JMC2

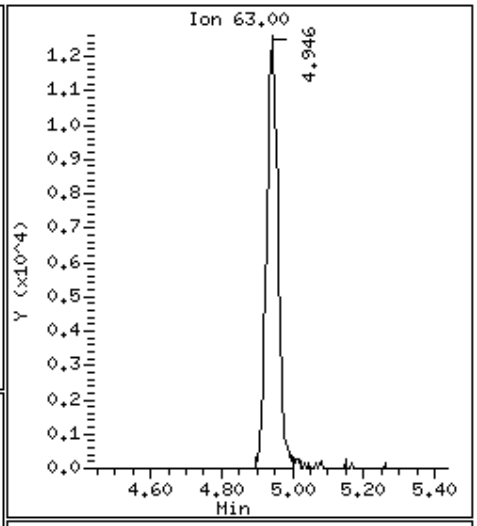
Column phase: RTX-VMS-30M

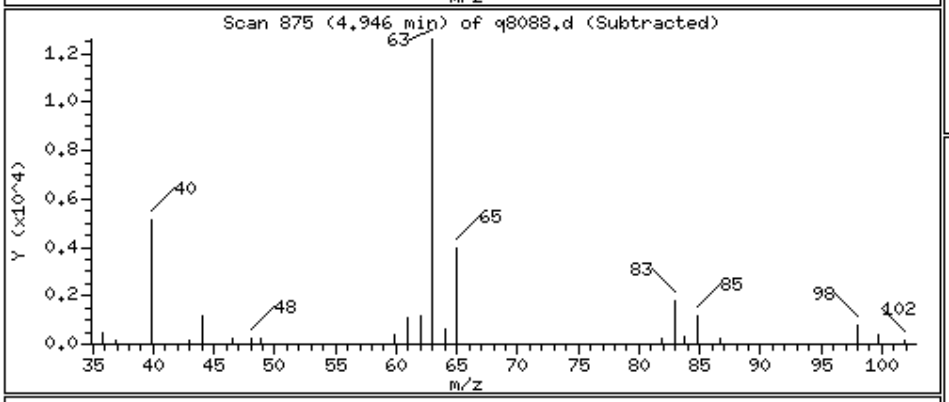
Column diameter: 0.25

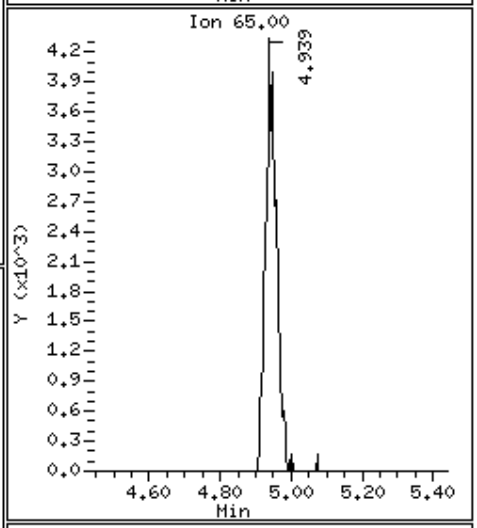
24 1,1-Dichloroethane ++

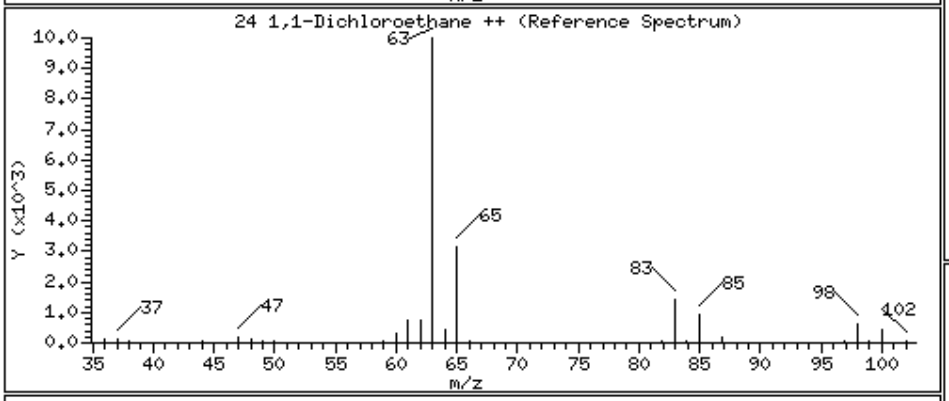
Concentration: 5.11 ug/L

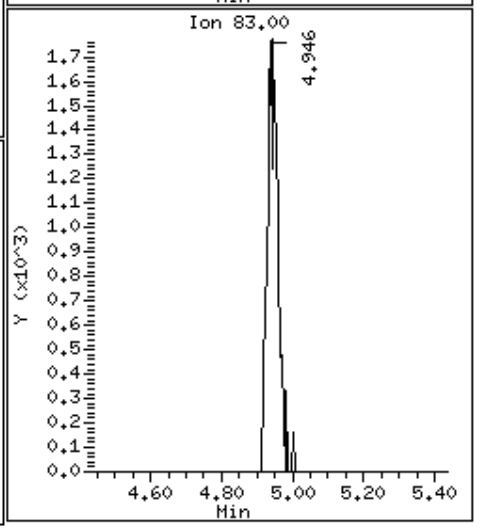


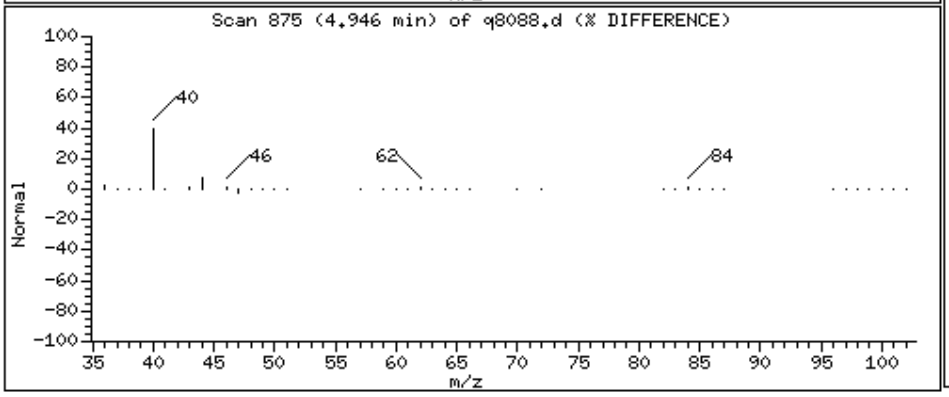



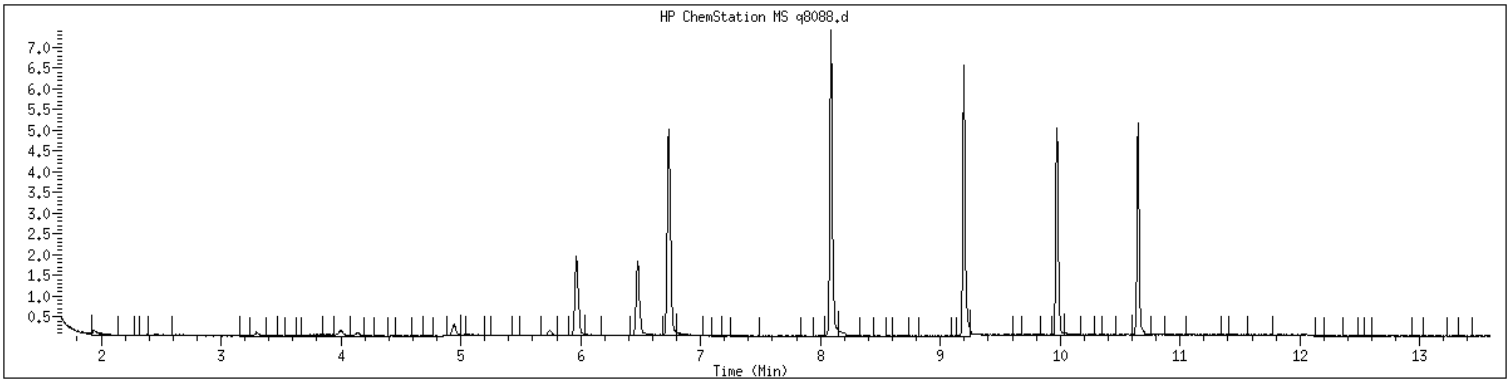



Report Date: 04/19/2018 11:06

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 21804062016 SampleType : SAMPLE
Injection Date: 04/18/2018 19:51 Instrument : msv12.i
Operator : JMC2
Sample Info : 21804062016*
Misc Info : MSV~40673~*1*JMC2
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b-




NO MANUAL INTEGRATIONS

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-01-06-21 |
| Collect Date: | 04/05/18 Time: 1540 | GCAL Sample ID: | 21804062017 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8071 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1302 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-35-4 | 1,1-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 544-10-5 | 1-Chlorohexane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-93-3 | 2-Butanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 95-49-8 | 2-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 591-78-6 | 2-Hexanone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 67-64-1 | Acetone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 71-43-2 | Benzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-86-1 | Bromobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-97-5 | Bromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-27-4 | Bromodichloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-25-2 | Bromoform | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 74-83-9 | Bromomethane | 1.00 | U | 0.500 | 1.00 | 1.00 |
| 75-15-0 | Carbon disulfide | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 56-23-5 | Carbon tetrachloride | 0.500 | U | 0.250 | 0.500 | 1.00 |

FORM I VOA

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-01-06-21 |
| Collect Date: | 04/05/18 Time: 1540 | GCAL Sample ID: | 21804062017 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8071 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1302 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 108-90-7 | Chlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-00-3 | Chloroethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 67-66-3 | Chloroform | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-87-3 | Chloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 124-48-1 | Dibromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-95-3 | Dibromomethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-41-4 | Ethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 98-82-8 | Isopropylbenzene (Cumene) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 136777-61-2 | m,p-Xylene | 0.500 | U | 0.200 | 0.500 | 2.00 |
| 75-09-2 | Methylene chloride | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 91-20-3 | Naphthalene | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 104-51-8 | n-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 103-65-1 | n-Propylbenzene | 2.00 | U | 1.00 | 2.00 | 5.00 |
| 95-47-6 | o-Xylene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 135-98-8 | sec-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-42-5 | Styrene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether (MTBE) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 98-06-6 | tert-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 127-18-4 | Tetrachloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-88-3 | Toluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-01-6 | Trichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-01-4 | Vinyl chloride | 0.500 | U | 0.200 | 0.500 | 1.00 |

FORM I VOA

GCAL, Inc.

Data file : /var/chem/msv12.i/2180418.s.b/q8071.d
Lab Smp Id: 21804062017 Client Smp ID: 21804062017
Inj Date : 18-APR-2018 13:02
Operator : JMC2 Inst ID: msv12.i
Smp Info : 21804062017*
Misc Info : MSV~40673~*1*JMC2
Comment :
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:06 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 18:43 Cal File: q7984cD.d
Als bottle: 6
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b-.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|
| $ 36 Dibromofluoromethane | 111 | 5.966 | 5.966 | (0.885) | 124533 | 49.6636 | 49.7 | 6990 |
| $ 43 1,2-Dichloroethane-d4 | 67 | 6.476 | 6.476 | (0.961) | 76131 | 51.2744 | 51.3 | |
| * 47 FLUOROBENZENE | 96 | 6.738 | 6.735 | (1.000) | 469519 | 50.0000 | | |
| $ 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.879) | 451453 | 52.7418 | 52.7 | |
| * 71 CHLOROBENZENE-d5 | 82 | 9.198 | 9.198 | (1.000) | 175824 | 50.0000 | | |
| $ 80 Bromofluorobenzene | 174 | 9.974 | 9.970 | (1.084) | 144310 | 46.3958 | 46.4 | |
| * 97 1,4-DICHLOROBENZENE-D4 | 152 | 10.648 | 10.645 | (1.000) | 133805 | 50.0000 | | |

Data File: /var/chem/msv12.i/2180418.s.b/q8071.d



Date : 18-APR-2018 13:02

Client ID: 21804062017

Instrument: msv12.i

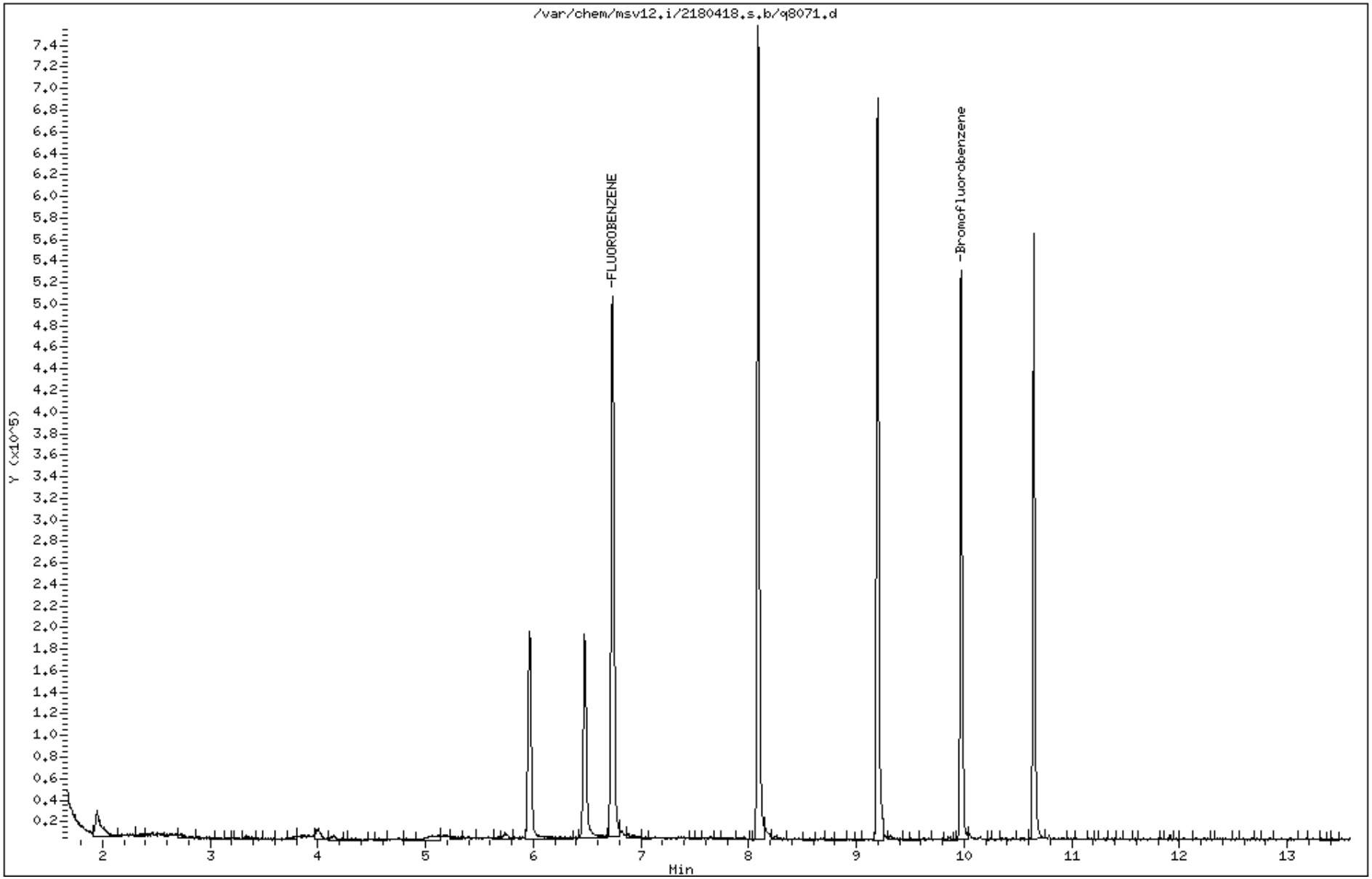
Sample Info: 21804062017*

Purge Volume: 5.0

Operator: JMC2

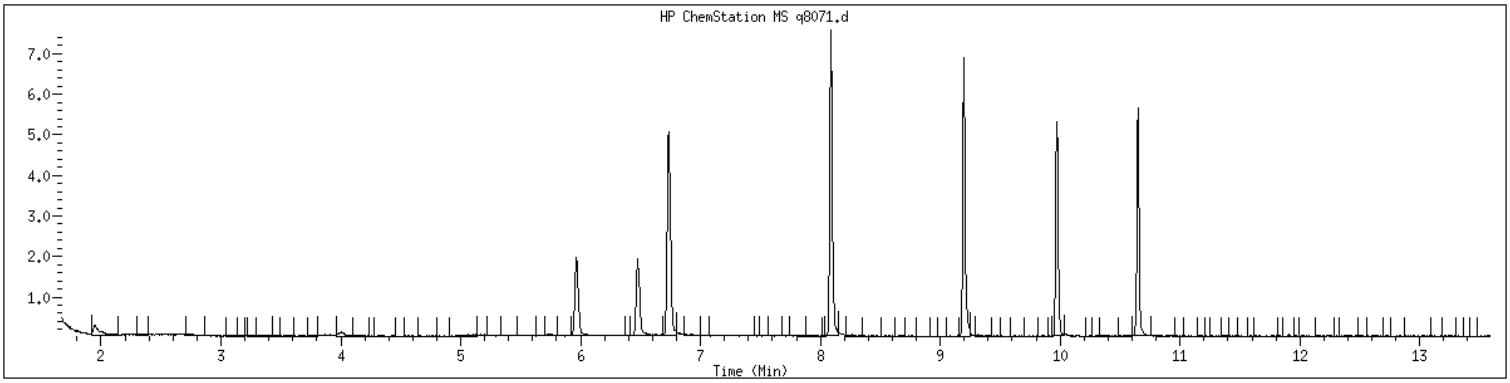
Column phase: RTX-VMS-30M

Column diameter: 0.25



MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 21804062017 SampleType : SAMPLE
Injection Date: 04/18/2018 13:02 Instrument : msv12.i
Operator : JMC2
Sample Info : 21804062017*
Misc Info : MSV~40673~*1*JMC2
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b-




NO MANUAL INTEGRATIONS

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | TW-6-21 |
| Collect Date: | 04/05/18 Time: 0900 | GCAL Sample ID: | 21804062018 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8072 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1325 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-35-4 | 1,1-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 544-10-5 | 1-Chlorohexane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-93-3 | 2-Butanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 95-49-8 | 2-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 591-78-6 | 2-Hexanone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 67-64-1 | Acetone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 71-43-2 | Benzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-86-1 | Bromobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-97-5 | Bromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-27-4 | Bromodichloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-25-2 | Bromoform | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 74-83-9 | Bromomethane | 1.00 | U | 0.500 | 1.00 | 1.00 |
| 75-15-0 | Carbon disulfide | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 56-23-5 | Carbon tetrachloride | 0.500 | U | 0.250 | 0.500 | 1.00 |

FORM I VOA

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | TW-6-21 |
| Collect Date: | 04/05/18 Time: 0900 | GCAL Sample ID: | 21804062018 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8072 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1325 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 108-90-7 | Chlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-00-3 | Chloroethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 67-66-3 | Chloroform | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-87-3 | Chloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethene | 0.682 | J | 0.200 | 0.500 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 124-48-1 | Dibromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-95-3 | Dibromomethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-41-4 | Ethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 98-82-8 | Isopropylbenzene (Cumene) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 136777-61-2 | m,p-Xylene | 0.500 | U | 0.200 | 0.500 | 2.00 |
| 75-09-2 | Methylene chloride | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 91-20-3 | Naphthalene | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 104-51-8 | n-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 103-65-1 | n-Propylbenzene | 2.00 | U | 1.00 | 2.00 | 5.00 |
| 95-47-6 | o-Xylene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 135-98-8 | sec-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-42-5 | Styrene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether (MTBE) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 98-06-6 | tert-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 127-18-4 | Tetrachloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-88-3 | Toluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-01-6 | Trichloroethene | 15.8 | | 0.200 | 0.500 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-01-4 | Vinyl chloride | 0.500 | U | 0.200 | 0.500 | 1.00 |

FORM I VOA

GCAL, Inc.

Data file : /var/chem/msv12.i/2180418.s.b/q8072.d
Lab Smp Id: 21804062018 Client Smp ID: 21804062018
Inj Date : 18-APR-2018 13:25
Operator : JMC2 Inst ID: msv12.i
Smp Info : 21804062018*
Misc Info : MSV~40673~*1*JMC2
Comment :
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:06 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 18:43 Cal File: q7984cD.d
Als bottle: 7
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b-.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| | Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|---|
| | 30 cis-1,2-Dichloroethene | 61 | 5.505 | 5.509 | (0.817) | 2638 | 0.68229 | 0.682 | |
| M | 48 Total 1,2-Dichloroethene | 61 | | | | 2638 | 0.68229 | 0.682 | |
| $ | 36 Dibromofluoromethane | 111 | 5.962 | 5.966 | (0.885) | 124223 | 50.6581 | 50.7 | 6990 |
| $ | 43 1,2-Dichloroethane-d4 | 67 | 6.476 | 6.476 | (0.962) | 73421 | 50.5652 | 50.6 | |
| * | 47 FLUOROBENZENE | 96 | 6.734 | 6.735 | (1.000) | 459156 | 50.0000 | | |
| | 49 Trichloroethene | 130 | 6.888 | 6.888 | (1.023) | 50892 | 15.7799 | 15.8 | |
| $ | 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.879) | 446191 | 52.4726 | 52.5 | |
| * | 71 CHLOROBENZENE-d5 | 82 | 9.197 | 9.198 | (1.000) | 174666 | 50.0000 | | |
| $ | 80 Bromofluorobenzene | 174 | 9.973 | 9.970 | (1.084) | 143919 | 46.5768 | 46.6 | |
| * | 97 1,4-DICHLOROBENZENE-D4 | 152 | 10.648 | 10.645 | (1.000) | 129231 | 50.0000 | | |

Data File: /var/chem/msv12.i/2180418.s.b/q8072.d

Page 1

Date : 18-APR-2018 13:25

Client ID: 21804062018

Instrument: msv12.i

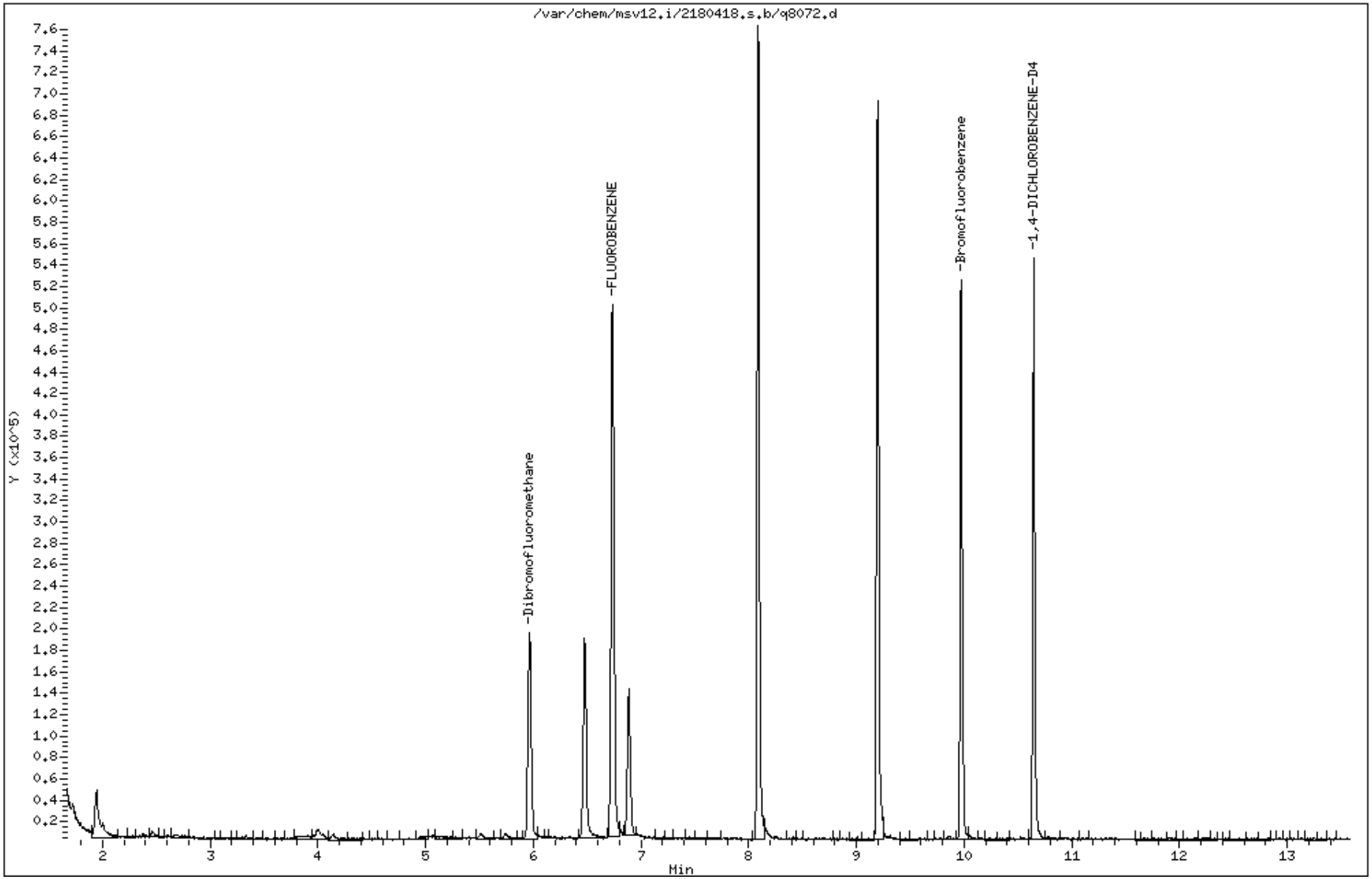
Sample Info: 21804062018*

Purge Volume: 5.0

Operator: JMC2

Column phase: RTX-VMS-30M

Column diameter: 0.25



Data File: /var/chem/msv12.i/2180418.s.b/q8072.d

Date : 18-APR-2018 13:25

Client ID: 21804062018

Instrument: msv12.i

Sample Info: 21804062018x

Purge Volume: 5.0

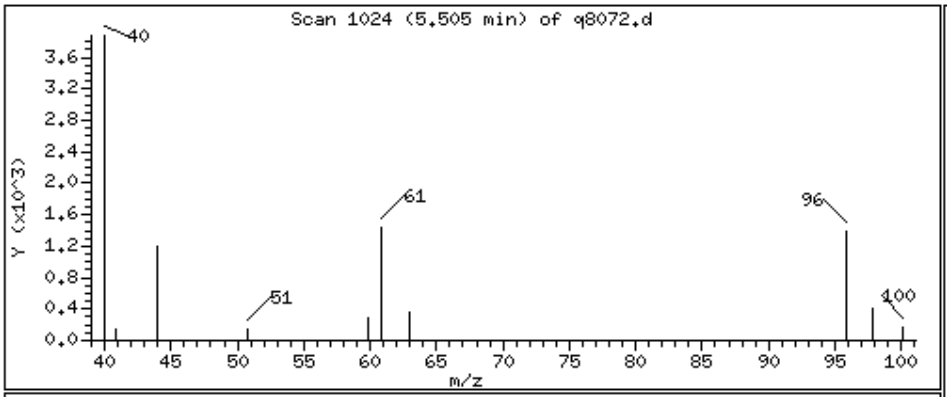
Operator: JMC2

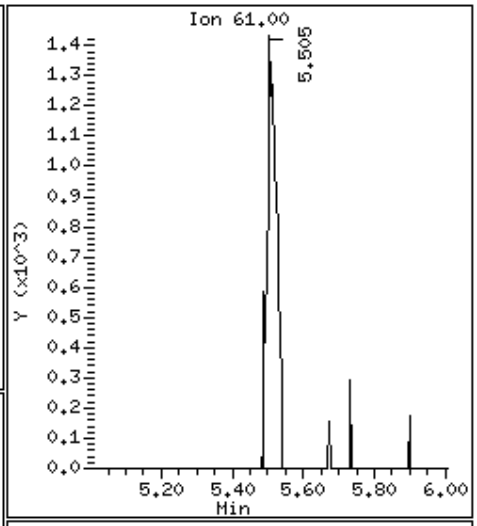
Column phase: RTX-VMS-30M

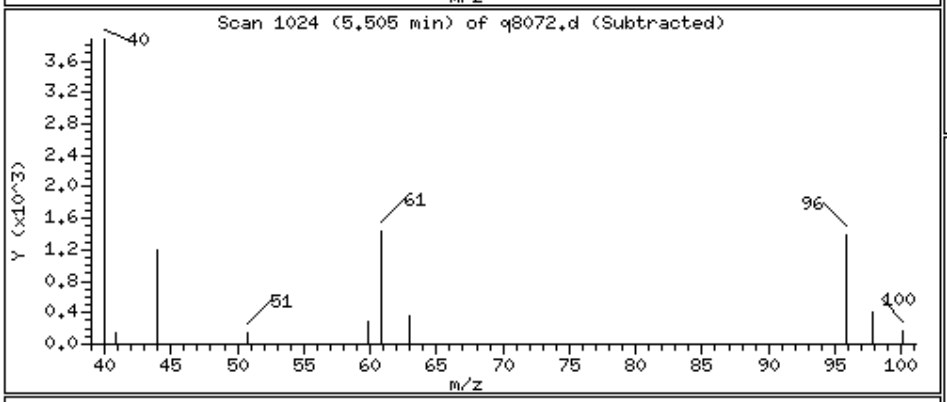
Column diameter: 0.25

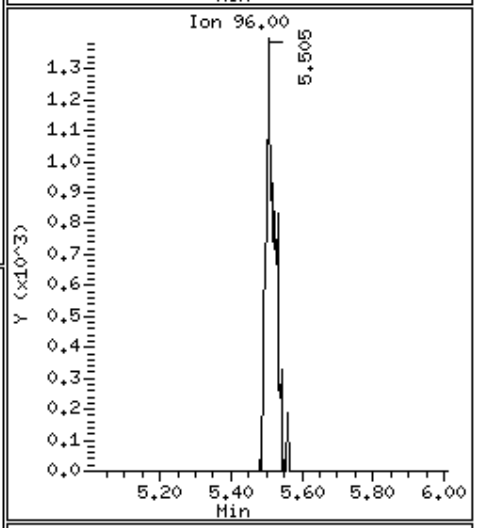
30 cis-1,2-Dichloroethene

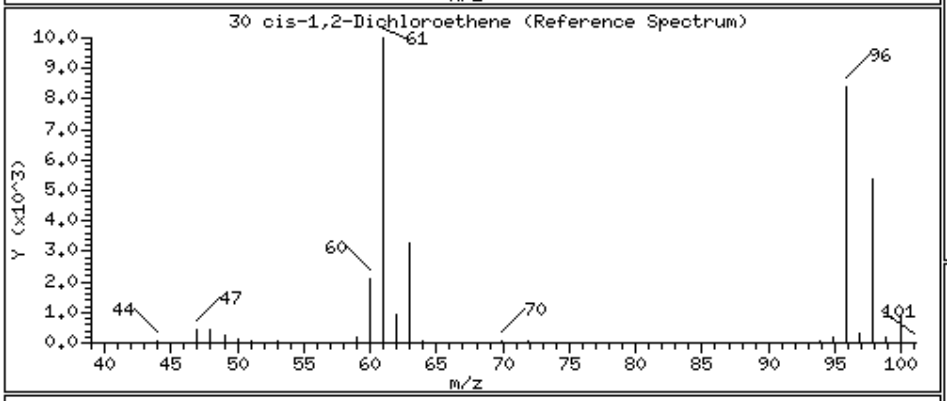
Concentration: 0.682 ug/L

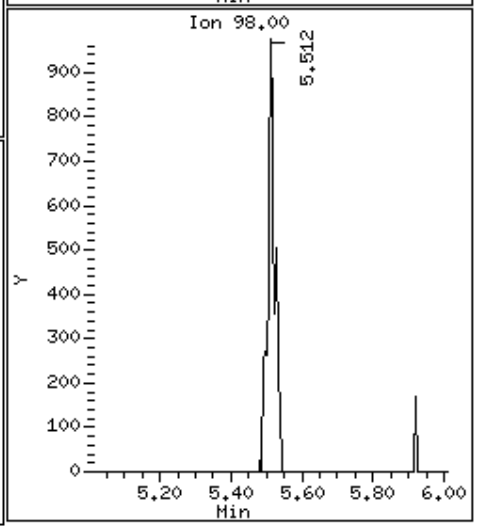


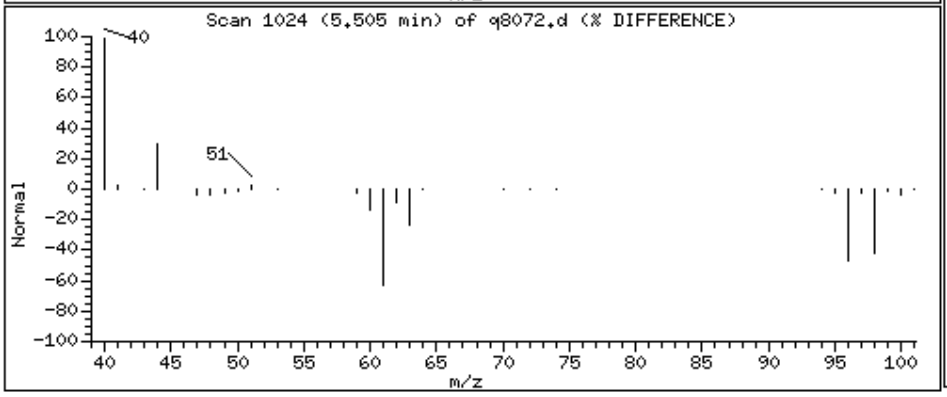



Data File: /var/chem/msv12.i/2180418.s.b/q8072.d

Date : 18-APR-2018 13:25

Client ID: 21804062018

Instrument: msv12.i

Sample Info: 21804062018x

Purge Volume: 5.0

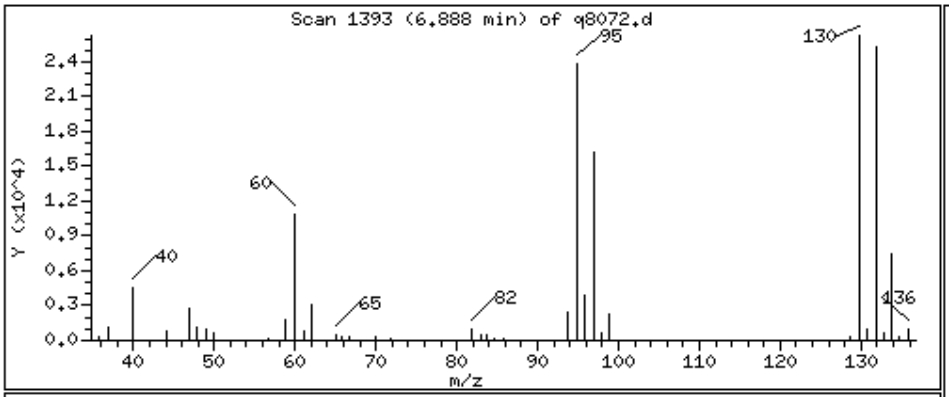
Operator: JMC2

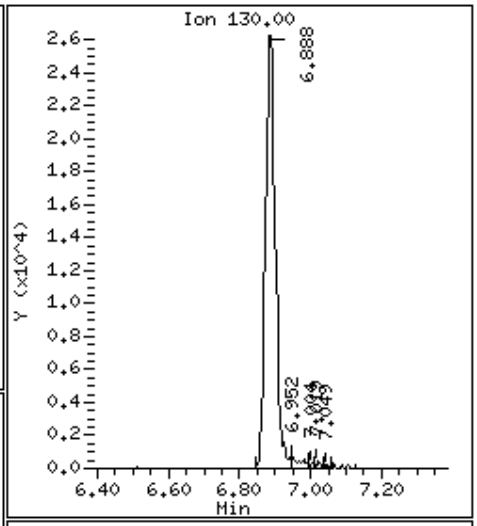
Column phase: RTX-VMS-30M

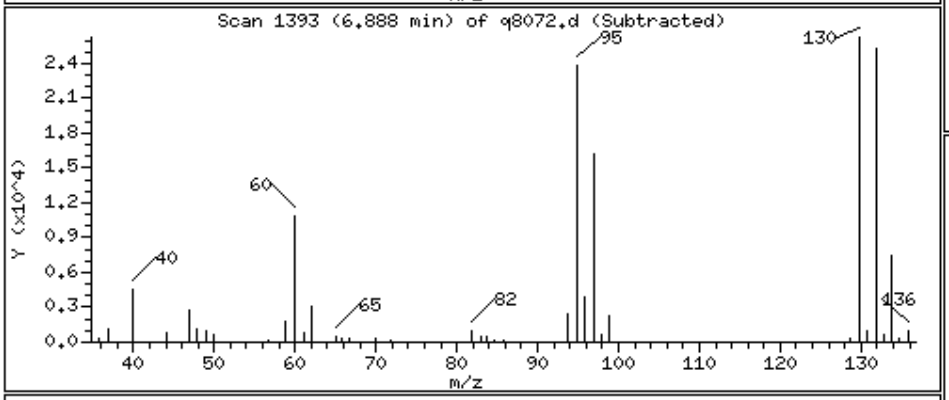
Column diameter: 0.25

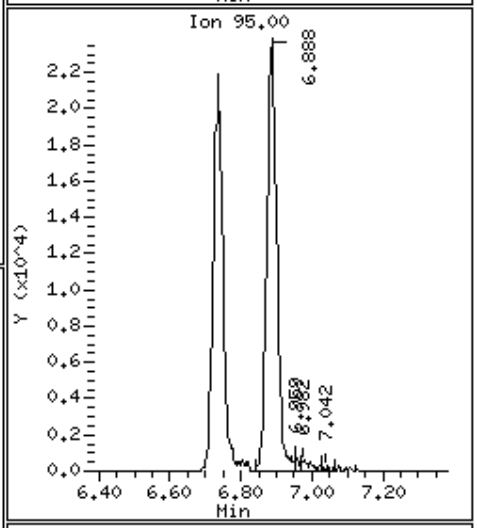
49 Trichloroethene

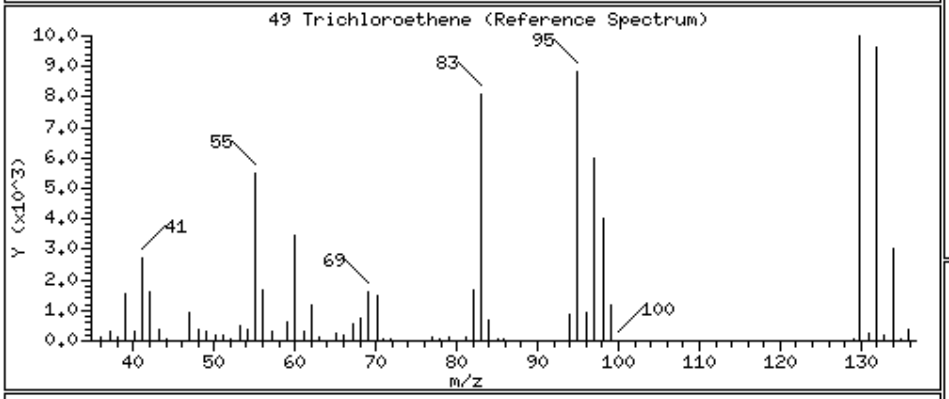
Concentration: 15.8 ug/L

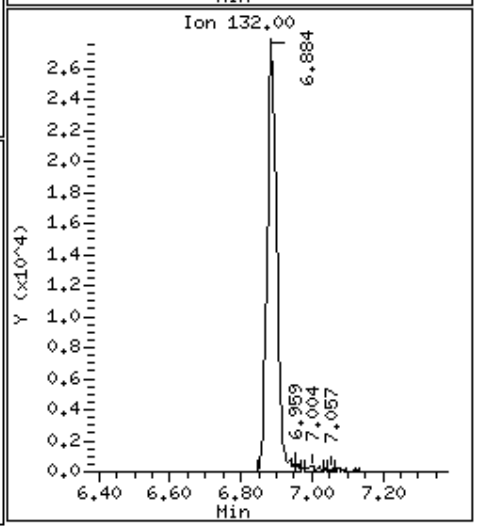


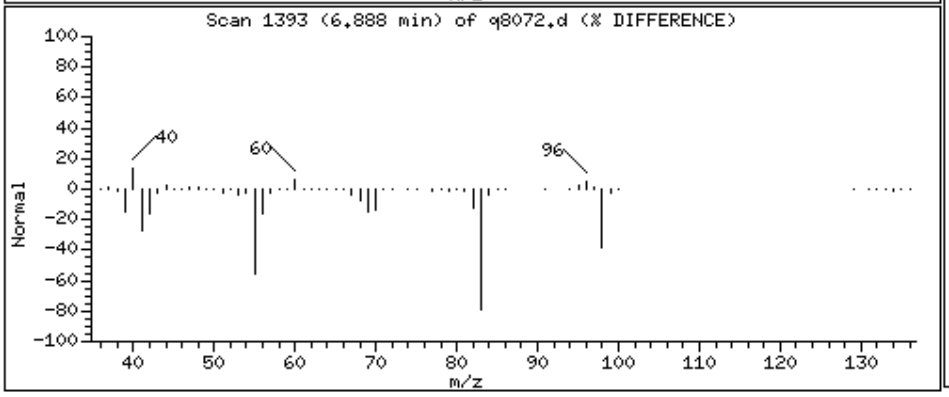



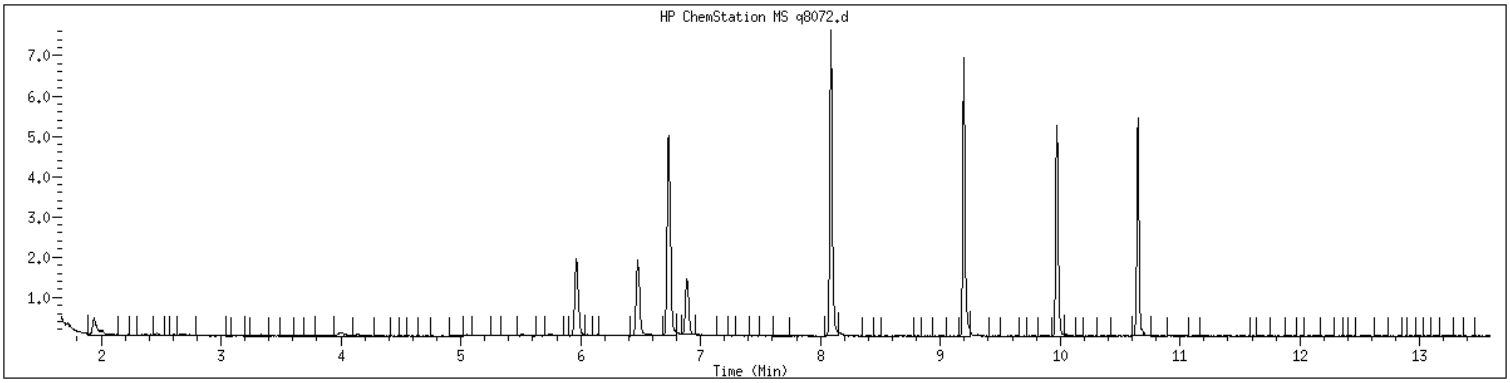



Report Date: 04/19/2018 11:06

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 21804062018 SampleType : SAMPLE
Injection Date: 04/18/2018 13:25 Instrument : msv12.i
Operator : JMC2
Sample Info : 21804062018*
Misc Info : MSV~40673~*1*JMC2
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b-




NO MANUAL INTEGRATIONS

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | TW-7-21 |
| Collect Date: | 04/05/18 Time: 1000 | GCAL Sample ID: | 21804062019 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8073 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1348 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-35-4 | 1,1-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 544-10-5 | 1-Chlorohexane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-93-3 | 2-Butanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 95-49-8 | 2-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 591-78-6 | 2-Hexanone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 67-64-1 | Acetone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 71-43-2 | Benzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-86-1 | Bromobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-97-5 | Bromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-27-4 | Bromodichloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-25-2 | Bromoform | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 74-83-9 | Bromomethane | 1.00 | U | 0.500 | 1.00 | 1.00 |
| 75-15-0 | Carbon disulfide | 1.27 | | 0.200 | 0.500 | 1.00 |
| 56-23-5 | Carbon tetrachloride | 0.500 | U | 0.250 | 0.500 | 1.00 |

FORM I VOA

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | TW-7-21 |
| Collect Date: | 04/05/18 Time: 1000 | GCAL Sample ID: | 21804062019 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8073 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1348 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 108-90-7 | Chlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-00-3 | Chloroethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 67-66-3 | Chloroform | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-87-3 | Chloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 124-48-1 | Dibromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-95-3 | Dibromomethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-41-4 | Ethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 98-82-8 | Isopropylbenzene (Cumene) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 136777-61-2 | m,p-Xylene | 0.500 | U | 0.200 | 0.500 | 2.00 |
| 75-09-2 | Methylene chloride | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 91-20-3 | Naphthalene | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 104-51-8 | n-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 103-65-1 | n-Propylbenzene | 2.00 | U | 1.00 | 2.00 | 5.00 |
| 95-47-6 | o-Xylene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 135-98-8 | sec-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-42-5 | Styrene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether (MTBE) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 98-06-6 | tert-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 127-18-4 | Tetrachloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-88-3 | Toluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-01-6 | Trichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-01-4 | Vinyl chloride | 0.500 | U | 0.200 | 0.500 | 1.00 |

FORM I VOA

GCAL, Inc.

Data file : /var/chem/msv12.i/2180418.s.b/q8073.d
Lab Smp Id: 21804062019 Client Smp ID: 21804062019
Inj Date : 18-APR-2018 13:48
Operator : JMC2 Inst ID: msv12.i
Smp Info : 21804062019*
Misc Info : MSV~40673~*1*JMC2
Comment :
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:06 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 18:43 Cal File: q7984cD.d
Als bottle: 8
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b-.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|
| 14 Carbon Disulfide | 76 | 3.331 | 3.331 | (0.495) | 11357 | 1.26808 | 1.27 | |
| $ 36 Dibromofluoromethane | 111 | 5.962 | 5.966 | (0.885) | 118584 | 48.9896 | 49.0 | 6990 |
| $ 43 1,2-Dichloroethane-d4 | 67 | 6.480 | 6.476 | (0.962) | 69064 | 48.1853 | 48.2 | |
| * 47 FLUOROBENZENE | 96 | 6.735 | 6.735 | (1.000) | 453241 | 50.0000 | | |
| $ 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.879) | 426378 | 51.2182 | 51.2 | |
| * 71 CHLOROBENZENE-d5 | 82 | 9.197 | 9.198 | (1.000) | 170998 | 50.0000 | | |
| $ 80 Bromofluorobenzene | 174 | 9.973 | 9.970 | (1.084) | 136379 | 45.0834 | 45.1 | |
| * 97 1,4-DICHLOROBENZENE-D4 | 152 | 10.648 | 10.645 | (1.000) | 123372 | 50.0000 | | |

Data File: /var/chem/msv12.i/2180418.s.b/q8073.d



Date : 18-APR-2018 13:48

Client ID: 21804062019

Instrument: msv12.i

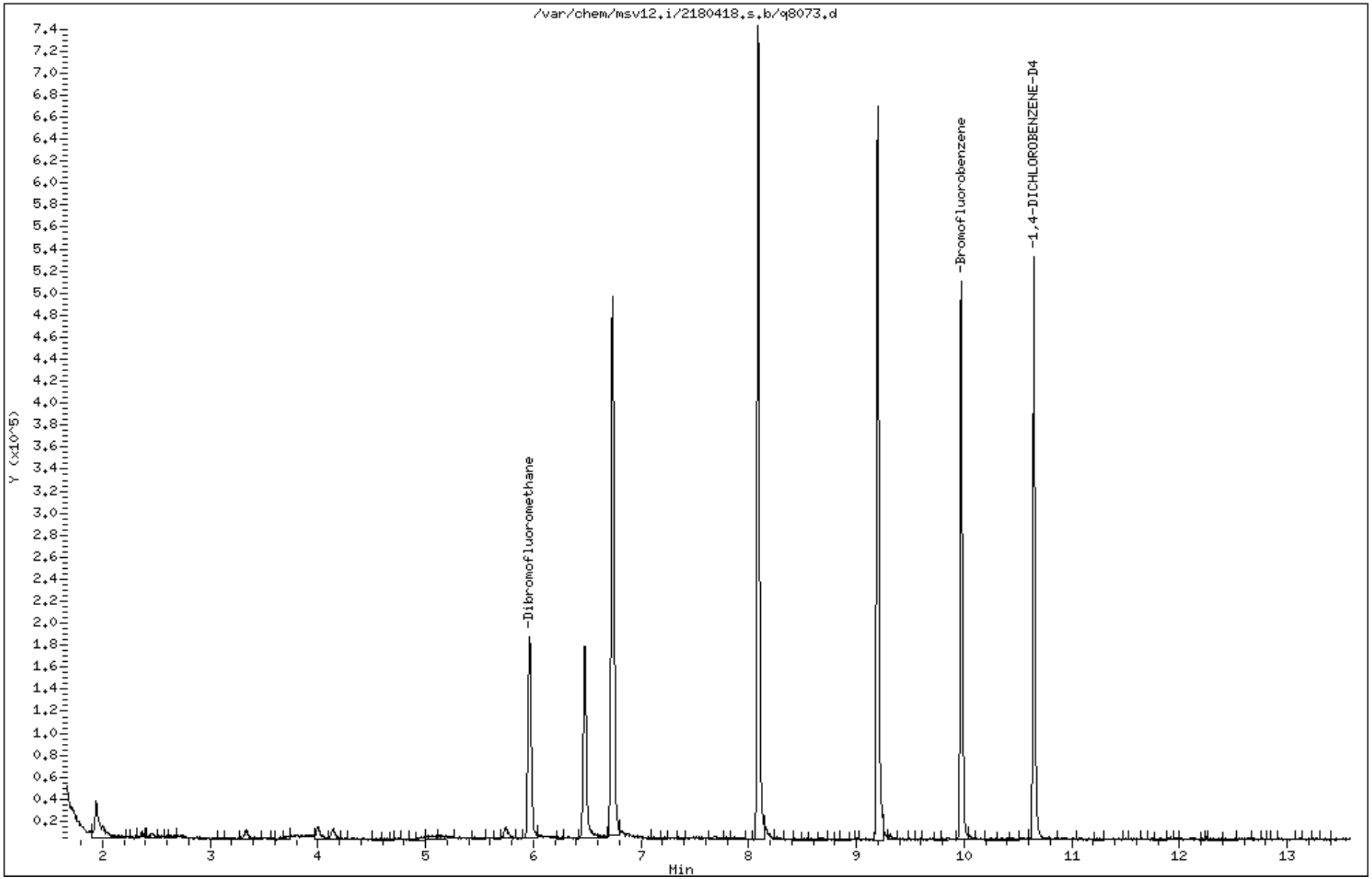
Sample Info: 21804062019*

Purge Volume: 5.0

Operator: JMC2

Column phase: RTX-VMS-30M

Column diameter: 0.25



Data File: /var/chem/msv12.i/2180418.s.b/q8073.d

Date : 18-APR-2018 13:48

Client ID: 21804062019

Instrument: msv12.i

Sample Info: 21804062019x

Purge Volume: 5.0

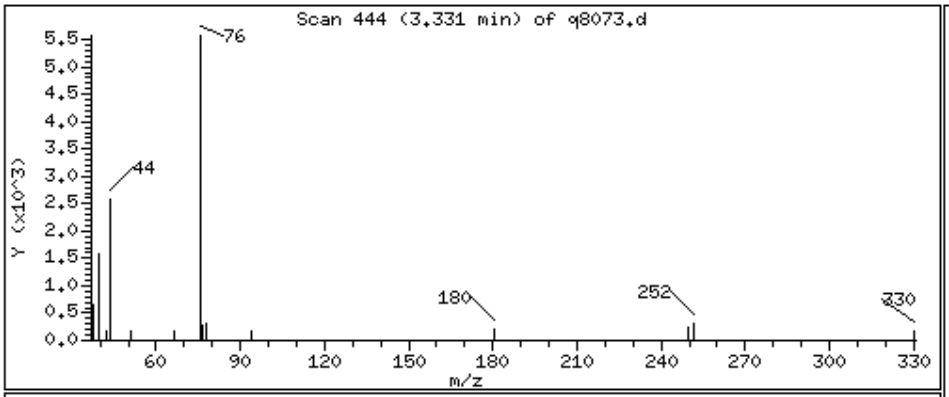
Operator: JMC2

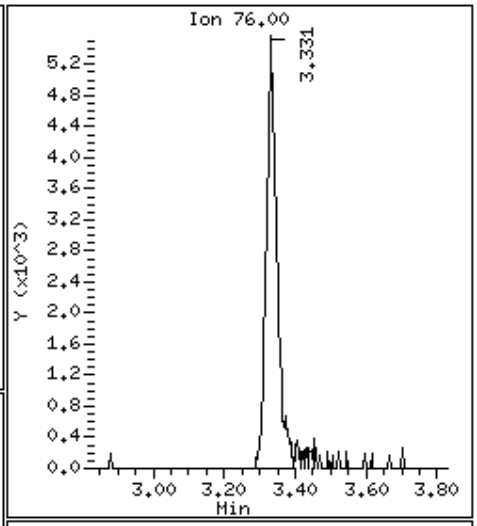
Column phase: RTX-VMS-30M

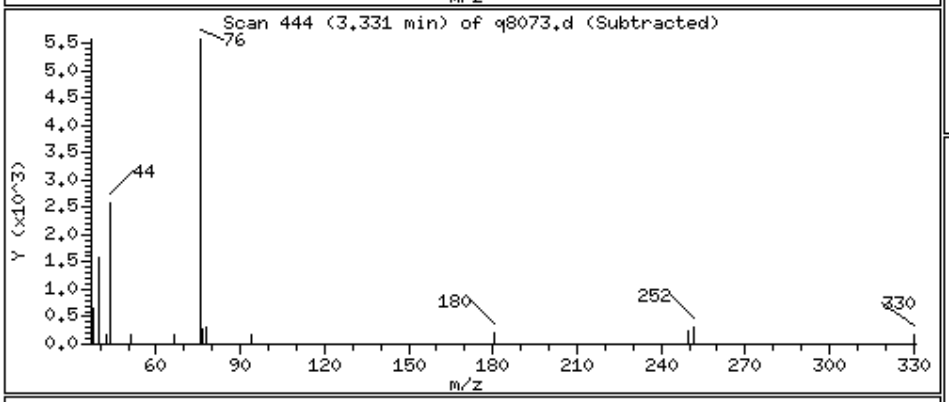
Column diameter: 0.25

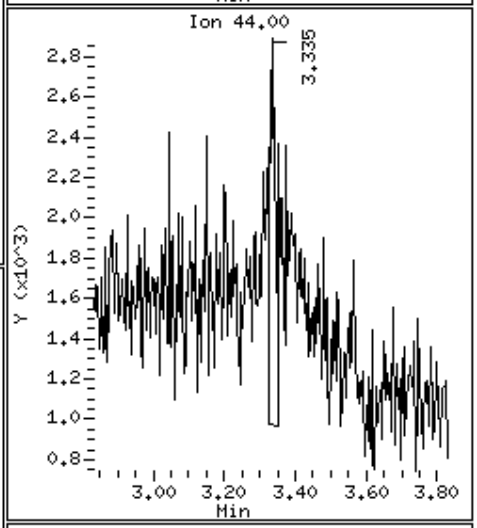
14 Carbon Disulfide

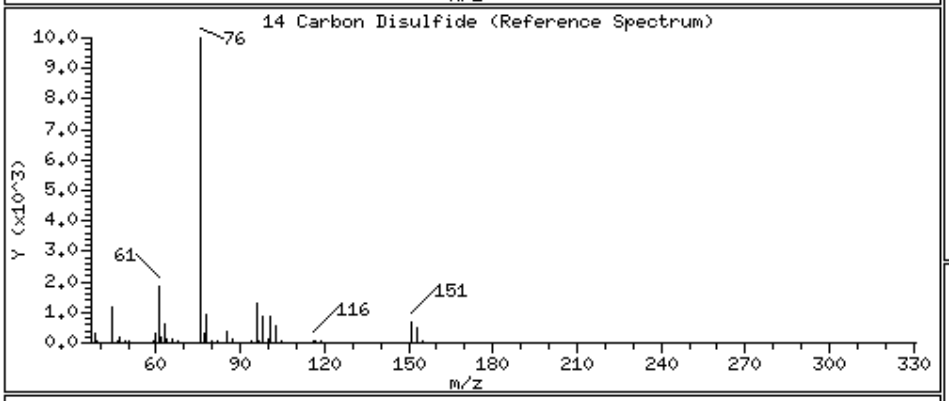
Concentration: 1.27 ug/L

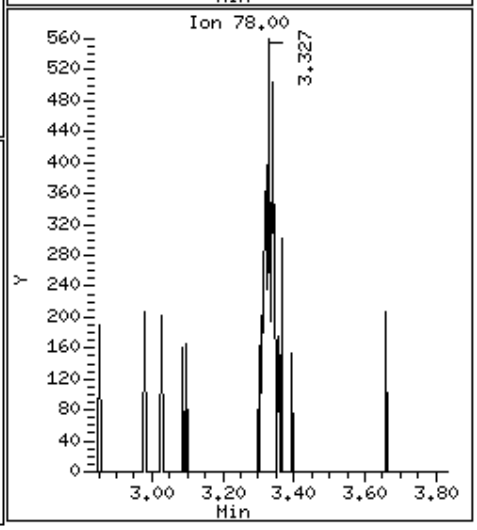


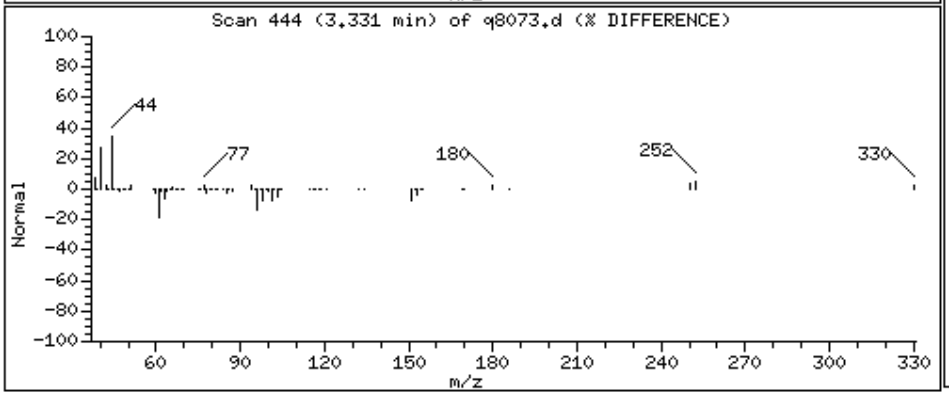



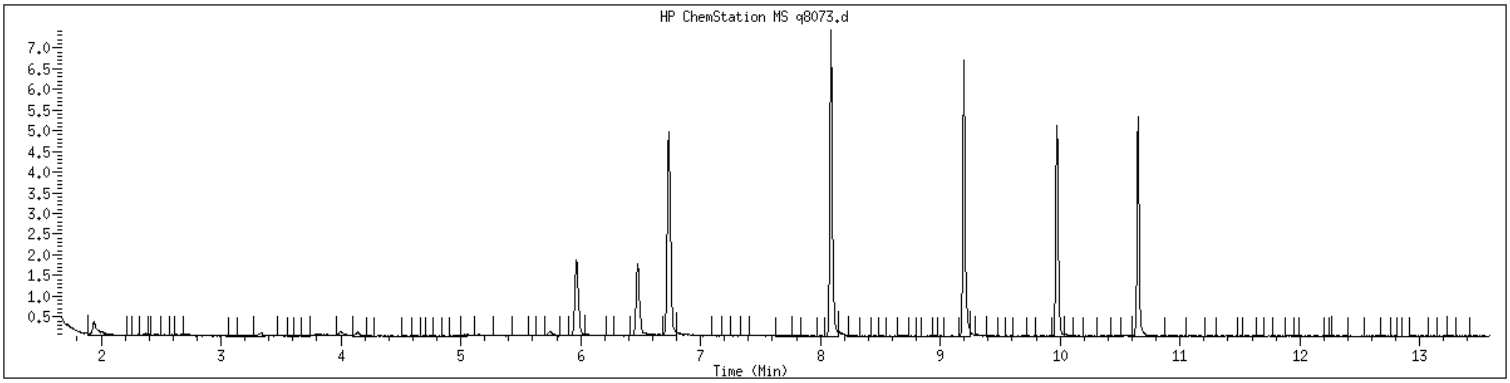



Report Date: 04/19/2018 11:14

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 21804062019 SampleType : SAMPLE
Injection Date: 04/18/2018 13:48 Instrument : msv12.i
Operator : JMC2
Sample Info : 21804062019*
Misc Info : MSV~40673~*1*JMC2
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b-




NO MANUAL INTEGRATIONS

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MB1797923 |
| Collect Date: | NA Time: NA | GCAL Sample ID: | 1797923 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8069 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1216 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-35-4 | 1,1-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 544-10-5 | 1-Chlorohexane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 78-93-3 | 2-Butanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 95-49-8 | 2-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 591-78-6 | 2-Hexanone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 67-64-1 | Acetone | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 71-43-2 | Benzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-86-1 | Bromobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-97-5 | Bromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-27-4 | Bromodichloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-25-2 | Bromoform | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 74-83-9 | Bromomethane | 1.00 | U | 0.500 | 1.00 | 1.00 |
| 75-15-0 | Carbon disulfide | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 56-23-5 | Carbon tetrachloride | 0.500 | U | 0.250 | 0.500 | 1.00 |

FORM I VOA

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | | | |
|---|---|---|---|---|---|
| Report No: | 218040620 | | | Client Sample ID: | MB1797923 |
| Collect Date: | NA | Time: | NA | GCAL Sample ID: | 1797923 |
| Matrix: | Water | % Moisture: | NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | | | Lab File ID: | 2180418/q8069 |
| Injection Vol.: | 1.0 | ( µL ) | | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 | Analyst: | JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 | Time: | 1216 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 108-90-7 | Chlorobenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-00-3 | Chloroethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 67-66-3 | Chloroform | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-87-3 | Chloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 124-48-1 | Dibromochloromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 74-95-3 | Dibromomethane | 0.500 | U | 0.250 | 0.500 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-41-4 | Ethylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | 1.00 | U | 0.500 | 1.00 | 5.00 |
| 98-82-8 | Isopropylbenzene (Cumene) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 136777-61-2 | m,p-Xylene | 0.500 | U | 0.200 | 0.500 | 2.00 |
| 75-09-2 | Methylene chloride | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 91-20-3 | Naphthalene | 0.500 | U | 0.200 | 0.500 | 5.00 |
| 104-51-8 | n-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 103-65-1 | n-Propylbenzene | 2.00 | U | 1.00 | 2.00 | 5.00 |
| 95-47-6 | o-Xylene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 135-98-8 | sec-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 100-42-5 | Styrene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether (MTBE) | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 98-06-6 | tert-Butylbenzene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 127-18-4 | Tetrachloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 108-88-3 | Toluene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 79-01-6 | Trichloroethene | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | 0.500 | U | 0.200 | 0.500 | 1.00 |
| 75-01-4 | Vinyl chloride | 0.500 | U | 0.200 | 0.500 | 1.00 |

FORM I VOA

GCAL, Inc.

Data file : /var/chem/msv12.i/2180418.s.b/q8069.d
Lab Smp Id: 1797923 Client Smp ID: MB
Inj Date : 18-APR-2018 12:16
Operator : JMC2 Inst ID: msv12.i
Smp Info : 1797923*MB
Misc Info : MSV~40673~*1*JMC2
Comment :
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:06 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 18:43 Cal File: q7984cD.d
Als bottle: 4 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|
| $ 36 Dibromofluoromethane | 111 | 5.966 | 5.966 | (0.885) | 127311 | 49.7989 | 49.8 | 7010 |
| $ 43 1,2-Dichloroethane-d4 | 67 | 6.476 | 6.476 | (0.961) | 72709 | 48.0315 | 48.0 | |
| * 47 FLUOROBENZENE | 96 | 6.738 | 6.735 | (1.000) | 478689 | 50.0000 | | |
| $ 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.879) | 459632 | 52.6196 | 52.6 | |
| * 71 CHLOROBENZENE-d5 | 82 | 9.197 | 9.198 | (1.000) | 179425 | 50.0000 | | |
| $ 80 Bromofluorobenzene | 174 | 9.973 | 9.970 | (1.084) | 145774 | 45.9259 | 45.9 | |
| * 97 1,4-DICHLOROBENZENE-D4 | 152 | 10.648 | 10.645 | (1.000) | 134484 | 50.0000 | | |

Data File: /var/chem/msv12.i/2180418.s.b/q8069.d



Date : 18-APR-2018 12:16

Client ID: MB

Instrument: msv12.i

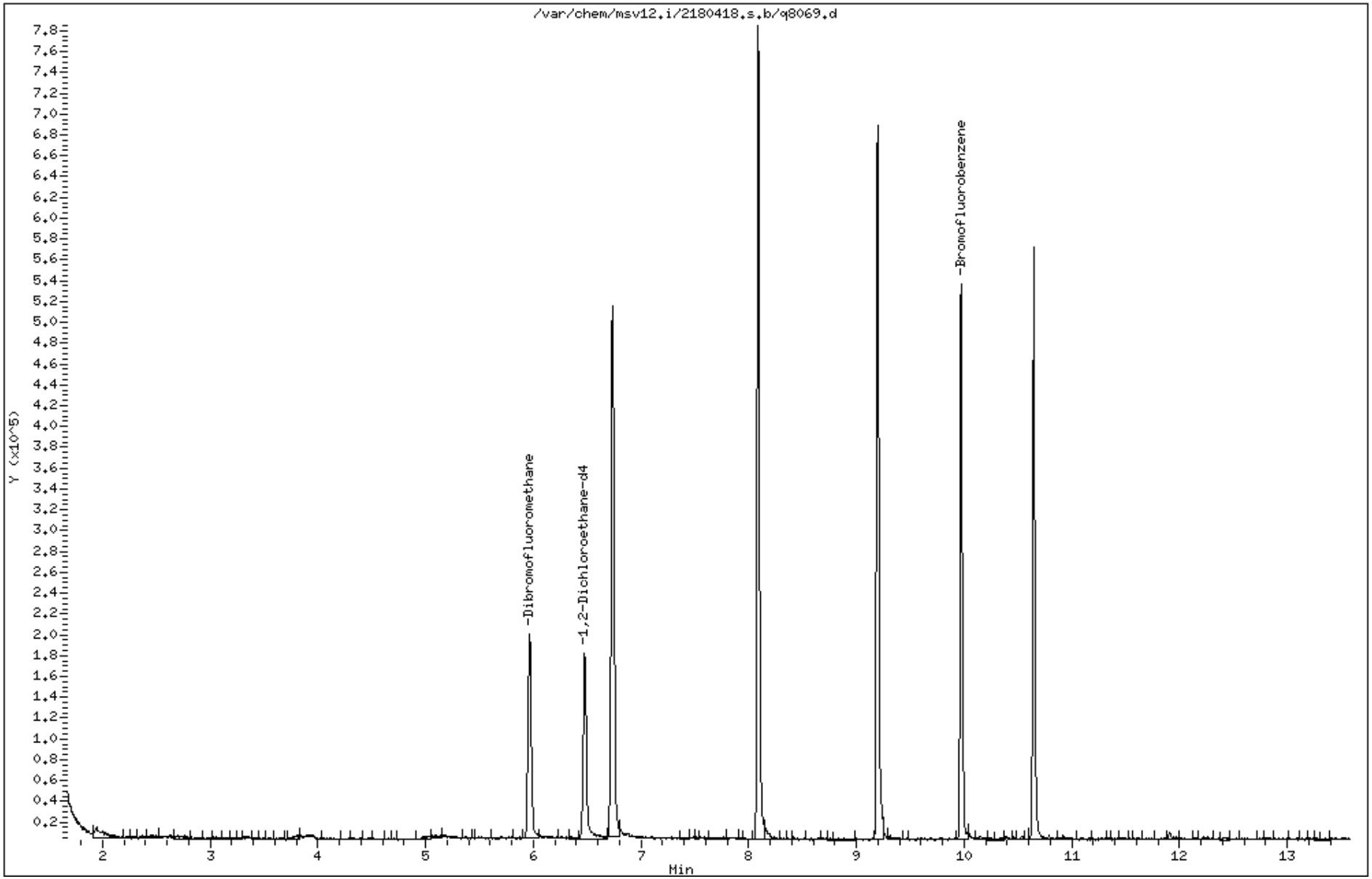
Sample Info: 1797923*MB

Purge Volume: 5.0

Operator: JMC2

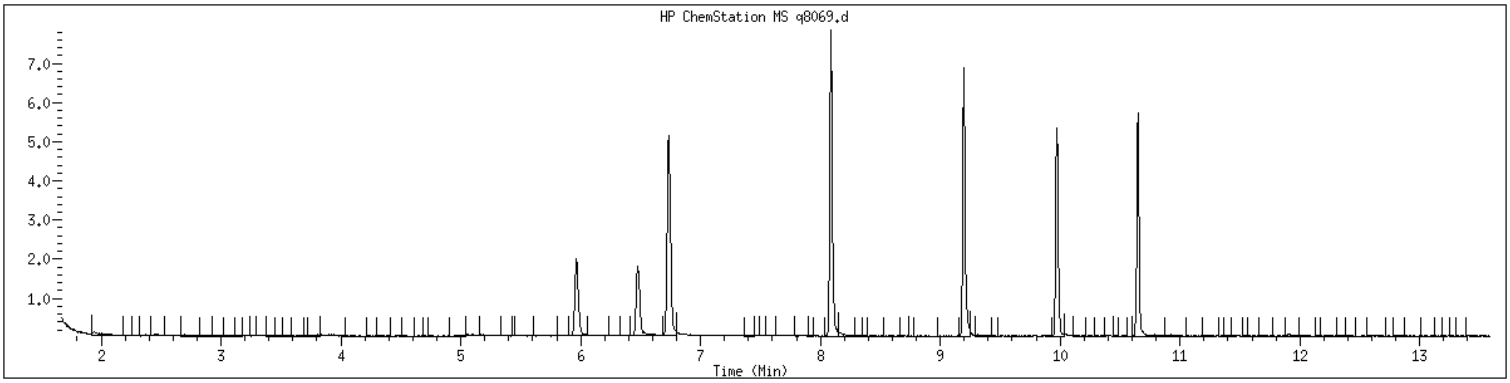
Column phase: RTX-VMS-30M

Column diameter: 0.25



MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 1797923 SampleType : BLANK
Injection Date: 04/18/2018 12:16 Instrument : msv12.i
Operator : JMC2
Sample Info : 1797923*MB
Misc Info : MSV~40673~*1*JMC2
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b




NO MANUAL INTEGRATIONS

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | LCS1797924 |
| Collect Date: | NA Time: NA | GCAL Sample ID: | 1797924 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8065L |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1045 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 51.2 | | 0.200 | 0.500 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | 49.6 | | 0.200 | 0.500 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 54.9 | | 0.200 | 0.500 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | 50.5 | | 0.200 | 0.500 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | 49.4 | | 0.200 | 0.500 | 1.00 |
| 75-35-4 | 1,1-Dichloroethene | 48.0 | | 0.200 | 0.500 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | 49.9 | | 0.200 | 0.500 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | 51.2 | | 0.200 | 0.500 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | 47.9 | | 0.200 | 0.500 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | 48.9 | | 0.200 | 0.500 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 51.5 | | 0.200 | 0.500 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 51.6 | | 0.200 | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | 54.0 | | 0.200 | 0.500 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | 51.1 | | 0.200 | 0.500 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | 50.3 | | 0.200 | 0.500 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | 50.4 | | 0.200 | 0.500 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 50.0 | | 0.200 | 0.500 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | 50.6 | | 0.200 | 0.500 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | 53.2 | | 0.200 | 0.500 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | 50.1 | | 0.200 | 0.500 | 1.00 |
| 544-10-5 | 1-Chlorohexane | 59.2 | | 0.200 | 0.500 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | 50.8 | | 0.200 | 0.500 | 1.00 |
| 78-93-3 | 2-Butanone | 52.9 | | 0.200 | 0.500 | 5.00 |
| 95-49-8 | 2-Chlorotoluene | 48.0 | | 0.200 | 0.500 | 1.00 |
| 591-78-6 | 2-Hexanone | 56.3 | | 0.500 | 1.00 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | 50.6 | | 0.200 | 0.500 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | 52.3 | | 0.200 | 0.500 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | 55.4 | | 0.200 | 0.500 | 5.00 |
| 67-64-1 | Acetone | 48.7 | | 0.500 | 1.00 | 5.00 |
| 71-43-2 | Benzene | 51.2 | | 0.200 | 0.500 | 1.00 |
| 108-86-1 | Bromobenzene | 47.9 | | 0.200 | 0.500 | 1.00 |
| 74-97-5 | Bromochloromethane | 51.5 | | 0.200 | 0.500 | 1.00 |
| 75-27-4 | Bromodichloromethane | 51.2 | | 0.200 | 0.500 | 1.00 |
| 75-25-2 | Bromoform | 52.3 | | 0.250 | 0.500 | 1.00 |
| 74-83-9 | Bromomethane | 53.7 | | 0.500 | 1.00 | 1.00 |
| 75-15-0 | Carbon disulfide | 45.0 | | 0.200 | 0.500 | 1.00 |
| 56-23-5 | Carbon tetrachloride | 48.1 | | 0.250 | 0.500 | 1.00 |

FORM I VOA

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | LCS1797924 |
| Collect Date: | NA Time: NA | GCAL Sample ID: | 1797924 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8065L |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1045 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 108-90-7 | Chlorobenzene | 51.7 | | 0.200 | 0.500 | 1.00 |
| 75-00-3 | Chloroethane | 47.8 | | 0.250 | 0.500 | 1.00 |
| 67-66-3 | Chloroform | 50.4 | | 0.200 | 0.500 | 1.00 |
| 74-87-3 | Chloromethane | 49.6 | | 0.200 | 0.500 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethene | 51.9 | | 0.200 | 0.500 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropene | 56.0 | | 0.200 | 0.500 | 1.00 |
| 124-48-1 | Dibromochloromethane | 53.0 | | 0.200 | 0.500 | 1.00 |
| 74-95-3 | Dibromomethane | 52.5 | | 0.250 | 0.500 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | 42.1 | | 0.200 | 0.500 | 1.00 |
| 100-41-4 | Ethylbenzene | 52.6 | | 0.200 | 0.500 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | 52.0 | | 0.500 | 1.00 | 5.00 |
| 98-82-8 | Isopropylbenzene (Cumene) | 55.1 | | 0.200 | 0.500 | 1.00 |
| 136777-61-2 | m,p-Xylene | 106 | | 0.200 | 0.500 | 2.00 |
| 75-09-2 | Methylene chloride | 48.7 | | 0.200 | 0.500 | 5.00 |
| 91-20-3 | Naphthalene | 46.4 | | 0.200 | 0.500 | 5.00 |
| 104-51-8 | n-Butylbenzene | 54.3 | | 0.200 | 0.500 | 1.00 |
| 103-65-1 | n-Propylbenzene | 48.4 | | 1.00 | 2.00 | 5.00 |
| 95-47-6 | o-Xylene | 54.2 | | 0.200 | 0.500 | 1.00 |
| 135-98-8 | sec-Butylbenzene | 49.2 | | 0.200 | 0.500 | 1.00 |
| 100-42-5 | Styrene | 56.1 | | 0.200 | 0.500 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether (MTBE) | 51.8 | | 0.200 | 0.500 | 1.00 |
| 98-06-6 | tert-Butylbenzene | 48.1 | | 0.200 | 0.500 | 1.00 |
| 127-18-4 | Tetrachloroethene | 49.5 | | 0.200 | 0.500 | 1.00 |
| 108-88-3 | Toluene | 51.8 | | 0.200 | 0.500 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethene | 51.9 | | 0.200 | 0.500 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropene | 55.1 | | 0.200 | 0.500 | 1.00 |
| 79-01-6 | Trichloroethene | 51.5 | | 0.200 | 0.500 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | 45.0 | | 0.200 | 0.500 | 1.00 |
| 75-01-4 | Vinyl chloride | 48.1 | | 0.200 | 0.500 | 1.00 |

FORM I VOA

GCAL, Inc.

Data file : /var/chem/msv12.i/2180418.s.b/q8065L.d
Lab Smp Id: 1797924 Client Smp ID: LCS
Inj Date : 18-APR-2018 10:45
Operator : JMC2 Inst ID: msv12.i
Smp Info : 1797924*LCS
Misc Info : MSV~40673~*1*JMC2
Comment :
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:06 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 18:43 Cal File: q7984cD.d
Als bottle: 2 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|
| 1 Dichlorodifluoromethane | 85 | 1.768 | 1.768 | (0.262) | 153494 | 42.0623 | 42.1 | |
| 2 Chloromethane ++ | 50 | 1.981 | 1.981 | (0.294) | 188527 | 49.5578 | 49.6 | |
| 3 Vinyl Chloride + | 62 | 2.068 | 2.068 | (0.307) | 171366 | 48.1395 | 48.1 | |
| 5 Bromomethane | 94 | 2.409 | 2.409 | (0.358) | 69376 | 53.6975 | 53.7 | |
| 6 Chloroethane | 64 | 2.547 | 2.547 | (0.378) | 82489 | 47.7854 | 47.8 | |
| 7 Trichlorofluoromethane | 101 | 2.701 | 2.701 | (0.401) | 202307 | 45.0354 | 45.0 | |
| 11 1,1-Dichloroethene + | 96 | 3.301 | 3.301 | (0.490) | 112571 | 48.0436 | 48.0 | |
| 14 Carbon Disulfide | 76 | 3.331 | 3.331 | (0.495) | 362274 | 44.9932 | 45.0 | |
| 10 1,1,2Trichlotrifluoroethane | 101 | 3.353 | 3.353 | (0.498) | 102155 | 39.0918 | 39.1 | |
| 13 Methyl Iodide | 142 | 3.477 | 3.477 | (0.516) | 132488 | 49.9167 | 49.9 | |
| 9 Acrolein | 56 | 3.762 | 3.762 | (0.559) | 53576 | 253.723 | 254 | |
| 17 Methylene Chloride | 49 | 4.047 | 4.047 | (0.601) | 225259 | 48.7429 | 48.7 | |
| 12 Acetone | 43 | 4.133 | 4.133 | (0.614) | 133819 | 48.6685 | 48.7 | |
| 19 trans-1,2-Dichloroethene | 61 | 4.238 | 4.238 | (0.629) | 216001 | 51.8839 | 51.9 | |

| | Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|---|
| | 20 Methyl Acetate | 43 | 4.287 | 4.287 | (0.637) | 144929 | 49.2989 | 49.3 | 8728 |
| | 23 Hexane | 57 | 4.332 | 4.332 | (0.643) | 157059 | 43.1449 | 43.1 | 9421 |
| | 21 MTBE | 73 | 4.384 | 4.384 | (0.651) | 516108 | 51.7546 | 51.8 | 9508 |
| | 24 1,1-Dichloroethane ++ | 63 | 4.939 | 4.939 | (0.733) | 301406 | 49.3762 | 49.4 | |
| | 22 Acrylonitrile | 53 | 5.018 | 5.018 | (0.745) | 314137 | 277.389 | 277 | |
| | 25 Vinyl Acetate | 43 | 5.235 | 5.235 | (0.777) | 87753 | 48.2320 | 48.2 | |
| | 30 cis-1,2-Dichloroethene | 61 | 5.509 | 5.509 | (0.818) | 220393 | 51.9397 | 51.9 | |
| M | 48 Total 1,2-Dichloroethene | 61 | | | | 436394 | 103.824 | 104 | |
| | 31 2,2-Dichloropropane | 77 | 5.618 | 5.618 | (0.834) | 237431 | 50.7700 | 50.8 | |
| | 38 Cyclohexane | 56 | 5.704 | 5.704 | (0.847) | 218470 | 46.2377 | 46.2 | 8517 |
| | 34 Bromochloromethane | 128 | 5.711 | 5.711 | (0.848) | 86413 | 51.5308 | 51.5 | |
| | 41 Chloroform + | 83 | 5.783 | 5.783 | (0.859) | 299992 | 50.4308 | 50.4 | |
| | 39 Carbon Tetrachloride | 117 | 5.914 | 5.914 | (0.878) | 221398 | 48.1001 | 48.1 | |
| $ | 36 Dibromofluoromethane | 111 | 5.966 | 5.966 | (0.886) | 133725 | 49.6895 | 49.7 | 7038 |
| | 37 1,1,1-Trichloroethane | 97 | 5.989 | 5.989 | (0.889) | 260503 | 49.6312 | 49.6 | |
| | 42 1,1-Dichloropropene | 75 | 6.105 | 6.105 | (0.906) | 202882 | 49.9001 | 49.9 | |
| | 32 2-Butanone | 43 | 6.109 | 6.109 | (0.907) | 140906 | 52.8607 | 52.9 | |
| | 44 Benzene | 78 | 6.345 | 6.345 | (0.942) | 657083 | 51.1740 | 51.2 | |
| $ | 43 1,2-Dichloroethane-d4 | 67 | 6.476 | 6.476 | (0.962) | 78228 | 49.0907 | 49.1 | |
| | 46 1,2-Dichloroethane | 62 | 6.540 | 6.540 | (0.971) | 238411 | 50.2895 | 50.3 | |
| * | 47 FLUOROBENZENE | 96 | 6.735 | 6.735 | (1.000) | 503912 | 50.0000 | | |
| | 50 Methyl Cyclohexane | 83 | 6.873 | 6.873 | (1.021) | 195480 | 46.2605 | 46.3 | 8895 |
| | 49 Trichloroethene | 130 | 6.888 | 6.888 | (1.023) | 182366 | 51.5234 | 51.5 | |
| | 52 Dibromomethane | 93 | 7.271 | 7.271 | (1.080) | 102123 | 52.5025 | 52.5 | |
| | 51 1,2-Dichloropropane + | 63 | 7.364 | 7.364 | (1.093) | 172973 | 50.4486 | 50.4 | |
| | 54 Bromodichloromethane | 83 | 7.413 | 7.413 | (1.101) | 242108 | 51.2157 | 51.2 | |
| | 57 1-Bromo-2-chloroethane | 63 | 7.822 | 7.822 | (1.161) | 245310 | 50.2170 | 50.2 | 9781 |
| | 56 2-Chloroethyl vinyl ether | 63 | 7.893 | 7.893 | (1.172) | 24330 | 48.5254 | 48.5 | (M2) |
| | 58 cis-1,3-Dichloropropene | 75 | 7.942 | 7.942 | (1.179) | 264633 | 56.0085 | 56.0 | |
| $ | 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.879) | 492099 | 50.4256 | 50.4 | |
| | 61 Toluene + | 91 | 8.125 | 8.125 | (0.883) | 705048 | 51.7788 | 51.8 | |
| | 66 Tetrachloroethene | 164 | 8.414 | 8.414 | (0.915) | 153328 | 49.5322 | 49.5 | |
| | 59 4-methyl-2-pentanone | 43 | 8.414 | 8.414 | (0.915) | 240292 | 55.3961 | 55.4 | |
| | 62 trans-1,3-Dichloropropene | 75 | 8.437 | 8.437 | (1.253) | 229072 | 55.1468 | 55.1 | |
| M | 145 1-3 Dichloropropene total | 100 | | | | 493705 | 111.155 | 111 | 0 |
| | 65 1,1,2-Trichloroethane | 97 | 8.553 | 8.553 | (0.930) | 163529 | 50.4516 | 50.5 | |
| | 69 Dibromochloromethane | 129 | 8.680 | 8.680 | (0.944) | 211719 | 52.9832 | 53.0 | |
| | 67 1,3-Dichloropropane | 76 | 8.751 | 8.751 | (0.951) | 270987 | 53.1992 | 53.2 | |
| | 70 1,2-Dibromoethane(EDB) | 107 | 8.853 | 8.853 | (0.963) | 159024 | 53.9996 | 54.0 | |
| | 68 2-Hexanone | 43 | 8.995 | 8.995 | (0.978) | 188375 | 56.3254 | 56.3 | |
| | 140 1-Chlorohexane | 91 | 9.179 | 9.179 | (0.998) | 200782 | 59.2274 | 59.2 | 9178 |
| * | 71 CHLOROBENZENE-d5 | 82 | 9.198 | 9.198 | (1.000) | 200457 | 50.0000 | | |
| | 72 Chlorobenzene ++ | 112 | 9.205 | 9.205 | (1.001) | 462271 | 51.7448 | 51.7 | |
| | 73 Ethylbenzene + | 106 | 9.216 | 9.216 | (1.002) | 242005 | 52.6350 | 52.6 | |
| | 74 1,1,1,2-Tetrachloroethane | 133 | 9.246 | 9.246 | (1.005) | 185569 | 51.1732 | 51.2 | |
| | 75 p,m-Xylene | 106 | 9.310 | 9.310 | (1.012) | 595618 | 106.495 | 106 | |
| | 76 o-Xylene | 106 | 9.591 | 9.591 | (1.043) | 295041 | 54.1988 | 54.2 | |

| | | | QUANT SIG | | | | | CONCENTRATIONS ON-COLUMN | CONCENTRATIONS FINAL | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Compounds | MASS | RT | EXP RT | REL RT | RESPONSE | ( ppb) | ( ug/L) | SIMILARITY |
| M | 99 | TOTAL XYLENE | 106 | | | | 890659 | 160.694 | 161 | |
| | 77 | Styrene | 104 | 9.625 | 9.625 | (1.046) | 484936 | 56.1124 | 56.1 | |
| | 78 | Bromoform ++ | 173 | 9.651 | 9.651 | (1.049) | 169917 | 52.2603 | 52.3 | |
| | 79 | Isopropylbenzene | 105 | 9.782 | 9.782 | (1.064) | 722901 | 55.0725 | 55.1 | |
| $ | 80 | Bromofluorobenzene | 174 | 9.970 | 9.970 | (1.084) | 184368 | 51.9906 | 52.0 | |
| | 84 | Bromobenzene | 77 | 10.041 | 10.041 | (0.943) | 319289 | 47.9406 | 47.9 | |
| | 86 | n-Propylbenzene | 91 | 10.037 | 10.037 | (0.943) | 791104 | 48.4051 | 48.4 | |
| | 81 | 1,1,2,2-Tetrachloroethane++ | 83 | 10.082 | 10.082 | (0.947) | 242648 | 54.8778 | 54.9 | |
| | 87 | 2-Chlorotoluene | 91 | 10.146 | 10.146 | (0.953) | 558600 | 48.0204 | 48.0 | |
| | 88 | 1,3,5-Trimethylbenzene | 105 | 10.150 | 10.150 | (0.954) | 583544 | 49.9883 | 50.0 | |
| | 85 | 1,2,3-Trichloropropane | 75 | 10.176 | 10.176 | (0.956) | 257321 | 47.9445 | 47.9 | |
| | 83 | trans-1,4-Dichloro-2-Butene | 53 | 10.191 | 10.191 | (0.957) | 47869 | 52.6323 | 52.6 | |
| | 90 | 4-Chlorotoluene | 91 | 10.247 | 10.247 | (0.963) | 512503 | 50.5802 | 50.6 | |
| | 91 | tert-butylbenzene | 91 | 10.348 | 10.348 | (0.972) | 304479 | 48.0739 | 48.1 | |
| | 93 | 1,2,4-Trimethylbenzene | 105 | 10.390 | 10.390 | (0.976) | 585674 | 51.4986 | 51.5 | |
| | 94 | sec-Butylbenzene | 105 | 10.457 | 10.457 | (0.982) | 666254 | 49.1953 | 49.2 | |
| | 92 | p-Isopropyltoluene | 119 | 10.532 | 10.532 | (0.989) | 591142 | 52.3485 | 52.3 | |
| | 96 | 1,3-Dichlorobenzene | 146 | 10.603 | 10.603 | (0.996) | 357416 | 50.6115 | 50.6 | |
| * | 97 | 1,4-DICHLOROBENZENE-D4 | 152 | 10.645 | 10.645 | (1.000) | 208722 | 50.0000 | | |
| | 98 | 1,4-Dichlorobenzene | 146 | 10.656 | 10.656 | (1.001) | 370310 | 50.0586 | 50.1 | |
| | 100 | n-Butylbenzene | 91 | 10.787 | 10.787 | (1.013) | 439485 | 54.2596 | 54.3 | |
| | 102 | 1,2-Dichlorobenzene | 146 | 10.914 | 10.914 | (1.025) | 365158 | 51.1397 | 51.1 | |
| | 106 | 1,2-Dibromo-3-Chloropropane | 157 | 11.447 | 11.447 | (1.075) | 56850 | 51.5630 | 51.6 | |
| | 109 | Hexachlorobutadiene | 225 | 11.908 | 11.908 | (1.119) | 108197 | 52.0340 | 52.0 | |
| | 108 | 1,2,4-Trichlorobenzene | 180 | 11.957 | 11.957 | (1.123) | 161570 | 48.9187 | 48.9 | |
| | 110 | Naphthalene | 128 | 12.249 | 12.249 | (1.151) | 313732 | 46.4203 | 46.4 | |
| | 111 | 1,2,3-Trichlorobenzene | 180 | 12.418 | 12.418 | (1.167) | 164586 | 51.2237 | 51.2 | |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/msv12.i/2180418.s.b/q8065L.d



Date : 18-APR-2018 10:45

Client ID: LCS

Instrument: msv12.i

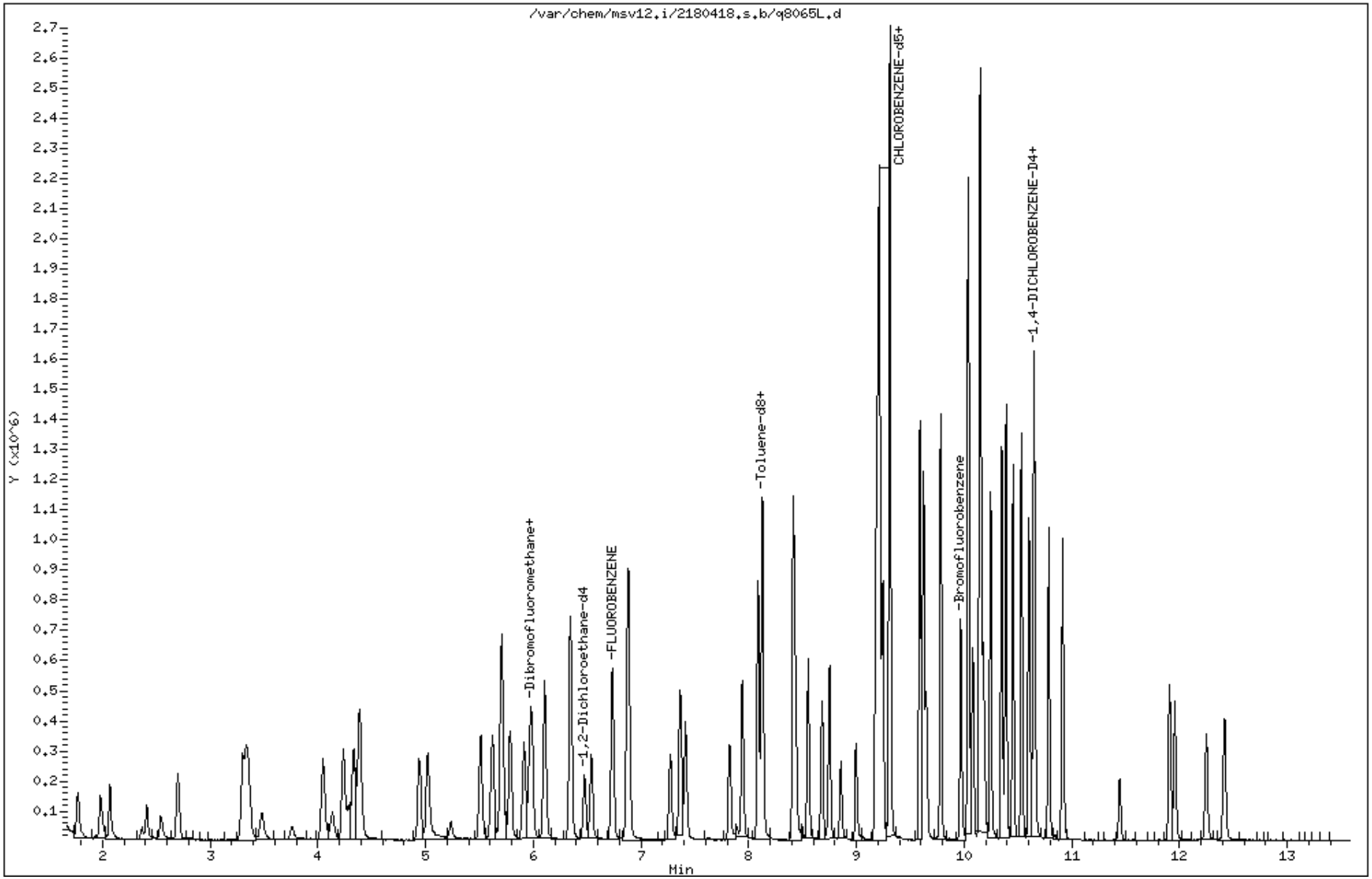
Sample Info: 1797924*LCS

Purge Volume: 5.0

Operator: JMC2

Column phase: RTX-VMS-30M

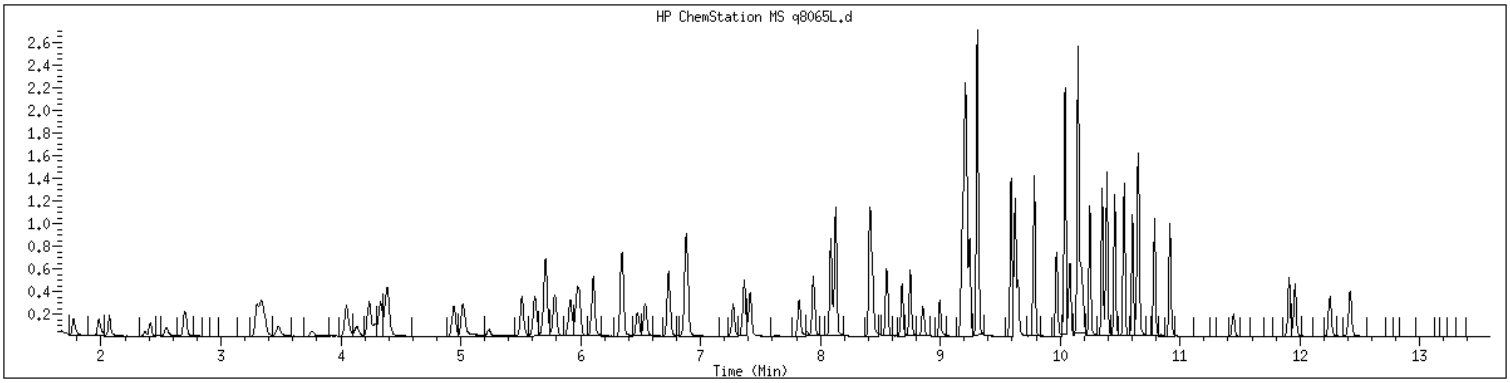
Column diameter: 0.25



Report Date: 04/19/2018 11:06

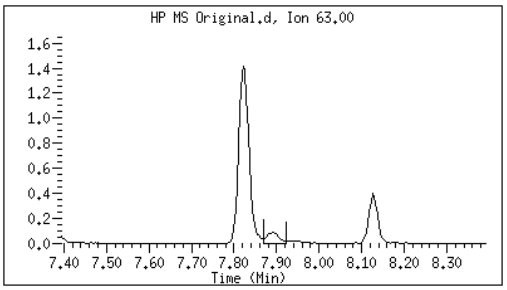
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 1797924 SampleType : LCS
Injection Date: 04/18/2018 10:45 Instrument : msv12.i
Operator : JMC2
Sample Info : 1797924*LCS
Misc Info : MSV~40673~*1*JMC2
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b



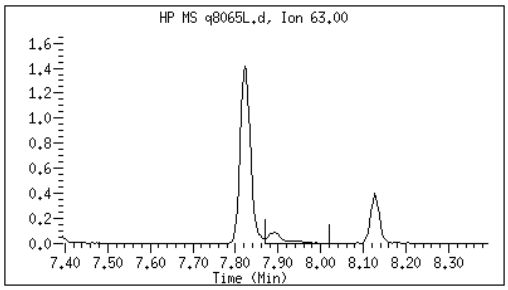

Original Final

56 2-Chloroethyl vinyl ether CAS#: 110-75-8 Reason: M2




Electronic Signature Applied

User: jmc
Date: 04/18/2018 11:01




M2 - Target system integrated incorrectly

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | LCSD1797925 |
| Collect Date: | NA Time: NA | GCAL Sample ID: | 1797925 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8066 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1108 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 49.9 | | 0.200 | 0.500 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | 46.9 | | 0.200 | 0.500 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 54.3 | | 0.200 | 0.500 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | 50.0 | | 0.200 | 0.500 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | 47.6 | | 0.200 | 0.500 | 1.00 |
| 75-35-4 | 1,1-Dichloroethene | 45.9 | | 0.200 | 0.500 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | 48.1 | | 0.200 | 0.500 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | 50.1 | | 0.200 | 0.500 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | 47.8 | | 0.200 | 0.500 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | 47.4 | | 0.200 | 0.500 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 50.3 | | 0.200 | 0.500 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 50.7 | | 0.200 | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | 53.7 | | 0.200 | 0.500 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | 50.0 | | 0.200 | 0.500 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | 48.5 | | 0.200 | 0.500 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | 49.1 | | 0.200 | 0.500 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 48.3 | | 0.200 | 0.500 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | 49.1 | | 0.200 | 0.500 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | 51.9 | | 0.200 | 0.500 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | 49.0 | | 0.200 | 0.500 | 1.00 |
| 544-10-5 | 1-Chlorohexane | 58.0 | | 0.200 | 0.500 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | 49.6 | | 0.200 | 0.500 | 1.00 |
| 78-93-3 | 2-Butanone | 51.9 | | 0.200 | 0.500 | 5.00 |
| 95-49-8 | 2-Chlorotoluene | 46.7 | | 0.200 | 0.500 | 1.00 |
| 591-78-6 | 2-Hexanone | 55.8 | | 0.500 | 1.00 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | 49.1 | | 0.200 | 0.500 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | 49.7 | | 0.200 | 0.500 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | 54.7 | | 0.200 | 0.500 | 5.00 |
| 67-64-1 | Acetone | 48.7 | | 0.500 | 1.00 | 5.00 |
| 71-43-2 | Benzene | 49.8 | | 0.200 | 0.500 | 1.00 |
| 108-86-1 | Bromobenzene | 46.9 | | 0.200 | 0.500 | 1.00 |
| 74-97-5 | Bromochloromethane | 51.0 | | 0.200 | 0.500 | 1.00 |
| 75-27-4 | Bromodichloromethane | 50.6 | | 0.200 | 0.500 | 1.00 |
| 75-25-2 | Bromoform | 51.9 | | 0.250 | 0.500 | 1.00 |
| 74-83-9 | Bromomethane | 53.4 | | 0.500 | 1.00 | 1.00 |
| 75-15-0 | Carbon disulfide | 44.2 | | 0.200 | 0.500 | 1.00 |
| 56-23-5 | Carbon tetrachloride | 45.5 | | 0.250 | 0.500 | 1.00 |

FORM I VOA

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | LCSD1797925 |
| Collect Date: | NA Time: NA | GCAL Sample ID: | 1797925 |
| Matrix: | Water % Moisture: NA | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8066 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1108 | Analytical Method: | EPA 8260C |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 108-90-7 | Chlorobenzene | 50.4 | | 0.200 | 0.500 | 1.00 |
| 75-00-3 | Chloroethane | 45.9 | | 0.250 | 0.500 | 1.00 |
| 67-66-3 | Chloroform | 48.9 | | 0.200 | 0.500 | 1.00 |
| 74-87-3 | Chloromethane | 49.1 | | 0.200 | 0.500 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethene | 49.8 | | 0.200 | 0.500 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropene | 53.7 | | 0.200 | 0.500 | 1.00 |
| 124-48-1 | Dibromochloromethane | 52.7 | | 0.200 | 0.500 | 1.00 |
| 74-95-3 | Dibromomethane | 51.2 | | 0.250 | 0.500 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | 39.4 | | 0.200 | 0.500 | 1.00 |
| 100-41-4 | Ethylbenzene | 51.0 | | 0.200 | 0.500 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | 51.1 | | 0.500 | 1.00 | 5.00 |
| 98-82-8 | Isopropylbenzene (Cumene) | 53.3 | | 0.200 | 0.500 | 1.00 |
| 136777-61-2 | m,p-Xylene | 103 | | 0.200 | 0.500 | 2.00 |
| 75-09-2 | Methylene chloride | 47.4 | | 0.200 | 0.500 | 5.00 |
| 91-20-3 | Naphthalene | 46.2 | | 0.200 | 0.500 | 5.00 |
| 104-51-8 | n-Butylbenzene | 51.6 | | 0.200 | 0.500 | 1.00 |
| 103-65-1 | n-Propylbenzene | 46.8 | | 1.00 | 2.00 | 5.00 |
| 95-47-6 | o-Xylene | 52.9 | | 0.200 | 0.500 | 1.00 |
| 135-98-8 | sec-Butylbenzene | 47.6 | | 0.200 | 0.500 | 1.00 |
| 100-42-5 | Styrene | 55.3 | | 0.200 | 0.500 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether (MTBE) | 51.0 | | 0.200 | 0.500 | 1.00 |
| 98-06-6 | tert-Butylbenzene | 46.4 | | 0.200 | 0.500 | 1.00 |
| 127-18-4 | Tetrachloroethene | 47.8 | | 0.200 | 0.500 | 1.00 |
| 108-88-3 | Toluene | 50.5 | | 0.200 | 0.500 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethene | 49.3 | | 0.200 | 0.500 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropene | 53.7 | | 0.200 | 0.500 | 1.00 |
| 79-01-6 | Trichloroethene | 49.3 | | 0.200 | 0.500 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | 42.9 | | 0.200 | 0.500 | 1.00 |
| 75-01-4 | Vinyl chloride | 44.6 | | 0.200 | 0.500 | 1.00 |

GCAL, Inc.

Data file : /var/chem/msv12.i/2180418.s.b/q8066.d
Lab Smp Id: 1797925 Client Smp ID: LCSD
Inj Date : 18-APR-2018 11:08
Operator : JMC2 Inst ID: msv12.i
Smp Info : 1797925*LCSD
Misc Info : MSV~40673~*1*JMC2
Comment :
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:06 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 18:43 Cal File: q7984cD.d
Als bottle: 2 QC Sample: LCSD
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|
| 1 Dichlorodifluoromethane | 85 | 1.768 | 1.768 | (0.262) | 144622 | 39.4482 | 39.4 | |
| 2 Chloromethane ++ | 50 | 1.981 | 1.981 | (0.294) | 187661 | 49.1026 | 49.1 | |
| 3 Vinyl Chloride + | 62 | 2.068 | 2.068 | (0.307) | 159424 | 44.5782 | 44.6 | |
| 5 Bromomethane | 94 | 2.412 | 2.409 | (0.358) | 69293 | 53.3859 | 53.4 | |
| 6 Chloroethane | 64 | 2.544 | 2.547 | (0.378) | 79520 | 45.8530 | 45.9 | |
| 7 Trichlorofluoromethane | 101 | 2.697 | 2.701 | (0.401) | 193438 | 42.8624 | 42.9 | |
| 11 1,1-Dichloroethene + | 96 | 3.301 | 3.301 | (0.490) | 108115 | 45.9290 | 45.9 | |
| 14 Carbon Disulfide | 76 | 3.331 | 3.331 | (0.495) | 357627 | 44.2058 | 44.2 | |
| 10 1,1,2Trichlotrifluoroethane | 101 | 3.353 | 3.353 | (0.498) | 101340 | 38.6010 | 38.6 | |
| 13 Methyl Iodide | 142 | 3.481 | 3.477 | (0.517) | 133726 | 50.1321 | 50.1 | |
| 9 Acrolein | 56 | 3.758 | 3.762 | (0.558) | 52635 | 248.117 | 248 | |
| 17 Methylene Chloride | 49 | 4.047 | 4.047 | (0.601) | 220061 | 47.3985 | 47.4 | |
| 12 Acetone | 43 | 4.129 | 4.133 | (0.613) | 134514 | 48.6956 | 48.7 | |
| 19 trans-1,2-Dichloroethene | 61 | 4.234 | 4.238 | (0.629) | 206395 | 49.3479 | 49.3 | |

| | Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|---|
| | 20 Methyl Acetate | 43 | 4.283 | 4.287 | (0.636) | 158309 | 53.6018 | 53.6 | 8784 |
| | 23 Hexane | 57 | 4.328 | 4.332 | (0.643) | 149841 | 40.9722 | 41.0 | 9357 |
| | 21 MTBE | 73 | 4.384 | 4.384 | (0.651) | 510717 | 50.9778 | 51.0 | 9414 |
| | 24 1,1-Dichloroethane ++ | 63 | 4.943 | 4.939 | (0.734) | 291803 | 47.5826 | 47.6 | |
| | 22 Acrylonitrile | 53 | 5.018 | 5.018 | (0.745) | 296758 | 260.834 | 261 | |
| | 25 Vinyl Acetate | 43 | 5.231 | 5.235 | (0.777) | 82082 | 44.9069 | 44.9 | |
| | 30 cis-1,2-Dichloroethene | 61 | 5.509 | 5.509 | (0.818) | 212307 | 49.8033 | 49.8 | |
| M | 48 Total 1,2-Dichloroethene | 61 | | | | 418702 | 99.1512 | 99.2 | |
| | 31 2,2-Dichloropropane | 77 | 5.618 | 5.618 | (0.834) | 233015 | 49.5959 | 49.6 | |
| | 38 Cyclohexane | 56 | 5.700 | 5.704 | (0.846) | 211896 | 44.6395 | 44.6 | 8772 |
| | 34 Bromochloromethane | 128 | 5.711 | 5.711 | (0.848) | 85998 | 51.0468 | 51.0 | |
| | 41 Chloroform + | 83 | 5.786 | 5.783 | (0.859) | 292234 | 48.9000 | 48.9 | |
| | 39 Carbon Tetrachloride | 117 | 5.917 | 5.914 | (0.879) | 210487 | 45.5187 | 45.5 | |
| $ | 36 Dibromofluoromethane | 111 | 5.962 | 5.966 | (0.885) | 133386 | 49.3350 | 49.3 | 7005 |
| | 37 1,1,1-Trichloroethane | 97 | 5.985 | 5.989 | (0.889) | 247495 | 46.9354 | 46.9 | |
| | 42 1,1-Dichloropropene | 75 | 6.105 | 6.105 | (0.906) | 196301 | 48.0588 | 48.1 | |
| | 32 2-Butanone | 43 | 6.109 | 6.109 | (0.907) | 139094 | 51.9403 | 51.9 | |
| | 44 Benzene | 78 | 6.345 | 6.345 | (0.942) | 642226 | 49.7862 | 49.8 | |
| $ | 43 1,2-Dichloroethane-d4 | 67 | 6.476 | 6.476 | (0.962) | 82071 | 51.2648 | 51.3 | |
| | 46 1,2-Dichloroethane | 62 | 6.536 | 6.540 | (0.970) | 230759 | 48.4509 | 48.5 | |
| * | 47 FLUOROBENZENE | 96 | 6.735 | 6.735 | (1.000) | 506247 | 50.0000 | | |
| | 50 Methyl Cyclohexane | 83 | 6.873 | 6.873 | (1.021) | 184485 | 43.4572 | 43.5 | 8835 |
| | 49 Trichloroethene | 130 | 6.885 | 6.888 | (1.022) | 175460 | 49.3436 | 49.3 | |
| | 52 Dibromomethane | 93 | 7.271 | 7.271 | (1.080) | 99994 | 51.1709 | 51.2 | |
| | 51 1,2-Dichloropropane + | 63 | 7.364 | 7.364 | (1.093) | 169164 | 49.1101 | 49.1 | |
| | 54 Bromodichloromethane | 83 | 7.413 | 7.413 | (1.101) | 240319 | 50.6028 | 50.6 | |
| | 57 1-Bromo-2-chloroethane | 63 | 7.822 | 7.822 | (1.161) | 241723 | 49.2545 | 49.3 | 9724 |
| | 56 2-Chloroethyl vinyl ether | 63 | 7.893 | 7.893 | (1.172) | 26612 | 52.8325 | 52.8 | (M2) |
| | 58 cis-1,3-Dichloropropene | 75 | 7.942 | 7.942 | (1.179) | 254735 | 53.6650 | 53.7 | |
| $ | 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.880) | 499692 | 51.3716 | 51.4 | |
| | 61 Toluene + | 91 | 8.125 | 8.125 | (0.884) | 684885 | 50.4629 | 50.5 | |
| | 66 Tetrachloroethene | 164 | 8.418 | 8.414 | (0.916) | 147359 | 47.7600 | 47.8 | |
| | 59 4-methyl-2-pentanone | 43 | 8.414 | 8.414 | (0.915) | 236650 | 54.7354 | 54.7 | |
| | 62 trans-1,3-Dichloropropene | 75 | 8.437 | 8.437 | (1.253) | 224102 | 53.7015 | 53.7 | |
| M | 145 1-3 Dichloropropene total | 100 | | | | 478837 | 107.366 | 107 | 0 |
| | 65 1,1,2-Trichloroethane | 97 | 8.553 | 8.553 | (0.930) | 161486 | 49.9847 | 50.0 | |
| | 69 Dibromochloromethane | 129 | 8.680 | 8.680 | (0.944) | 209885 | 52.6965 | 52.7 | |
| | 67 1,3-Dichloropropane | 76 | 8.751 | 8.751 | (0.952) | 263252 | 51.8501 | 51.9 | |
| | 70 1,2-Dibromoethane(EDB) | 107 | 8.856 | 8.853 | (0.963) | 157763 | 53.7471 | 53.7 | |
| | 68 2-Hexanone | 43 | 8.995 | 8.995 | (0.978) | 186160 | 55.8456 | 55.8 | |
| | 140 1-Chlorohexane | 91 | 9.179 | 9.179 | (0.998) | 196113 | 58.0398 | 58.0 | 9248 |
| * | 71 CHLOROBENZENE-d5 | 82 | 9.194 | 9.198 | (1.000) | 199802 | 50.0000 | | |
| | 72 Chlorobenzene ++ | 112 | 9.209 | 9.205 | (1.002) | 448354 | 50.3515 | 50.4 | |
| | 73 Ethylbenzene + | 106 | 9.216 | 9.216 | (1.002) | 233565 | 50.9659 | 51.0 | |
| | 74 1,1,1,2-Tetrachloroethane | 133 | 9.246 | 9.246 | (1.006) | 180346 | 49.8959 | 49.9 | |
| | 75 p,m-Xylene | 106 | 9.310 | 9.310 | (1.013) | 574780 | 103.106 | 103 | |
| | 76 o-Xylene | 106 | 9.591 | 9.591 | (1.043) | 287163 | 52.9245 | 52.9 | |

| | | | QUANT SIG | | | | | CONCENTRATIONS ON-COLUMN | CONCENTRATIONS FINAL | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Compounds | MASS | RT | EXP RT | REL RT | RESPONSE | ( ppb) | ( ug/L) | SIMILARITY |
| M | 99 | TOTAL XYLENE | 106 | | | | 861943 | 156.031 | 156 | |
| | 77 | Styrene | 104 | 9.625 | 9.625 | (1.047) | 476415 | 55.3072 | 55.3 | |
| | 78 | Bromoform ++ | 173 | 9.651 | 9.651 | (1.050) | 168261 | 51.9207 | 51.9 | |
| | 79 | Isopropylbenzene | 105 | 9.782 | 9.782 | (1.064) | 696953 | 53.2698 | 53.3 | |
| $ | 80 | Bromofluorobenzene | 174 | 9.970 | 9.970 | (1.084) | 187082 | 52.9288 | 52.9 | |
| | 84 | Bromobenzene | 77 | 10.041 | 10.041 | (0.943) | 309681 | 46.9458 | 46.9 | |
| | 86 | n-Propylbenzene | 91 | 10.041 | 10.037 | (0.943) | 756854 | 46.7555 | 46.8 | |
| | 81 | 1,1,2,2-Tetrachloroethane++ | 83 | 10.082 | 10.082 | (0.947) | 237986 | 54.3324 | 54.3 | |
| | 87 | 2-Chlorotoluene | 91 | 10.146 | 10.146 | (0.953) | 537598 | 46.6600 | 46.7 | |
| | 88 | 1,3,5-Trimethylbenzene | 105 | 10.150 | 10.150 | (0.954) | 558856 | 48.3345 | 48.3 | |
| | 85 | 1,2,3-Trichloropropane | 75 | 10.176 | 10.176 | (0.956) | 254121 | 47.8042 | 47.8 | |
| | 83 | trans-1,4-Dichloro-2-Butene | 53 | 10.191 | 10.191 | (0.957) | 46339 | 51.4408 | 51.4 | |
| | 90 | 4-Chlorotoluene | 91 | 10.247 | 10.247 | (0.963) | 492518 | 49.0759 | 49.1 | |
| | 91 | tert-butylbenzene | 91 | 10.352 | 10.348 | (0.973) | 291139 | 46.4104 | 46.4 | |
| | 93 | 1,2,4-Trimethylbenzene | 105 | 10.390 | 10.390 | (0.976) | 566126 | 50.2592 | 50.3 | |
| | 94 | sec-Butylbenzene | 105 | 10.457 | 10.457 | (0.982) | 638258 | 47.5820 | 47.6 | |
| | 92 | p-Isopropyltoluene | 119 | 10.532 | 10.532 | (0.989) | 556384 | 49.7450 | 49.7 | |
| | 96 | 1,3-Dichlorobenzene | 146 | 10.603 | 10.603 | (0.996) | 343209 | 49.0678 | 49.1 | |
| * | 97 | 1,4-DICHLOROBENZENE-D4 | 152 | 10.644 | 10.645 | (1.000) | 206731 | 50.0000 | | |
| | 98 | 1,4-Dichlorobenzene | 146 | 10.656 | 10.656 | (1.001) | 358841 | 48.9754 | 49.0 | |
| | 100 | n-Butylbenzene | 91 | 10.787 | 10.787 | (1.013) | 413801 | 51.5806 | 51.6 | |
| | 102 | 1,2-Dichlorobenzene | 146 | 10.918 | 10.914 | (1.026) | 353342 | 49.9615 | 50.0 | |
| | 106 | 1,2-Dibromo-3-Chloropropane | 157 | 11.443 | 11.447 | (1.075) | 55371 | 50.7052 | 50.7 | |
| | 109 | Hexachlorobutadiene | 225 | 11.908 | 11.908 | (1.119) | 105198 | 51.0790 | 51.1 | |
| | 108 | 1,2,4-Trichlorobenzene | 180 | 11.960 | 11.957 | (1.124) | 154586 | 47.4187 | 47.4 | |
| | 110 | Naphthalene | 128 | 12.249 | 12.249 | (1.151) | 309231 | 46.2317 | 46.2 | |
| | 111 | 1,2,3-Trichlorobenzene | 180 | 12.421 | 12.418 | (1.167) | 159276 | 50.1392 | 50.1 | |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/msv12.i/2180418.s.b/q8066.d



Date : 18-APR-2018 11:08

Client ID: LCSD

Instrument: msv12.i

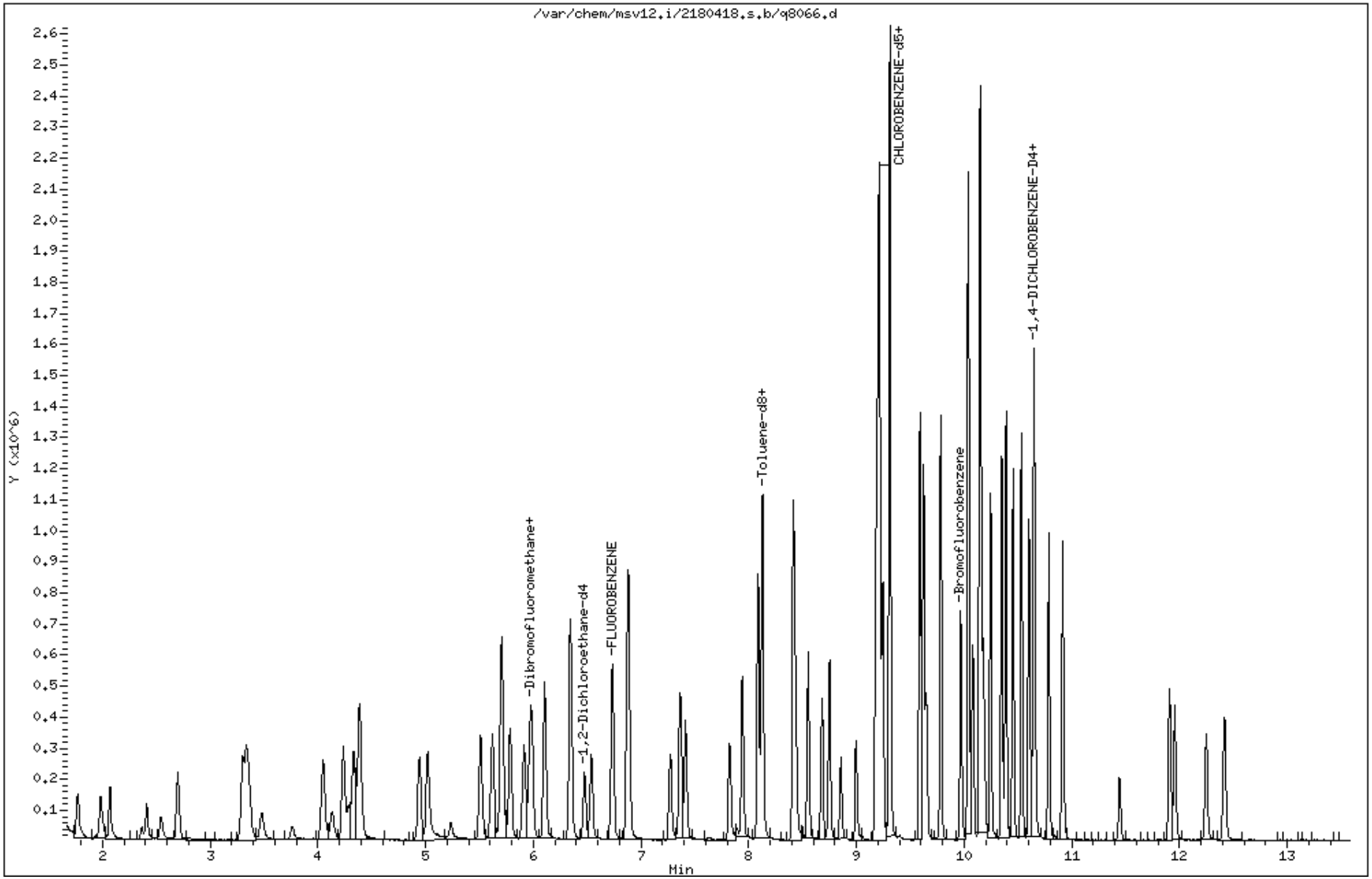
Sample Info: 1797925xLCSD

Purge Volume: 5.0

Operator: JMC2

Column phase: RTX-VMS-30M

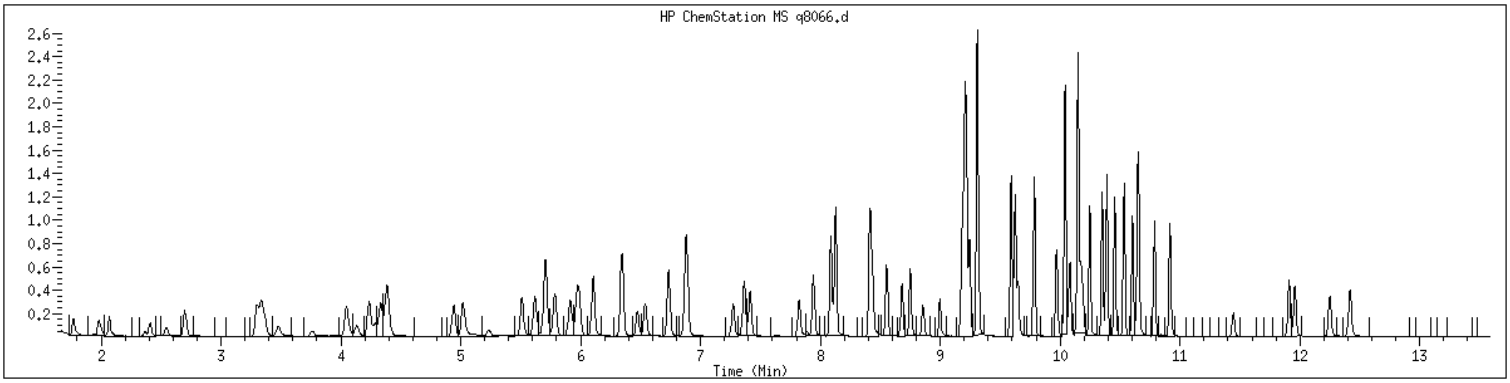
Column diameter: 0.25



Report Date: 04/19/2018 11:36

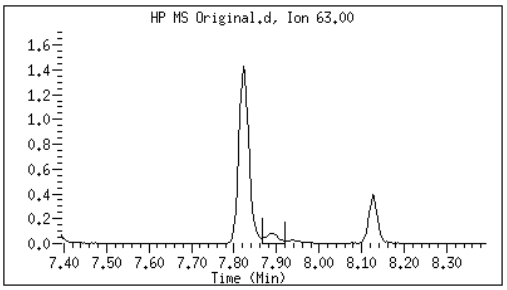
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 1797925 SampleType : LCSD
Injection Date: 04/18/2018 11:08 Instrument : msv12.i
Operator : JMC2
Sample Info : 1797925*LCSD
Misc Info : MSV~40673~*1*JMC2
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b



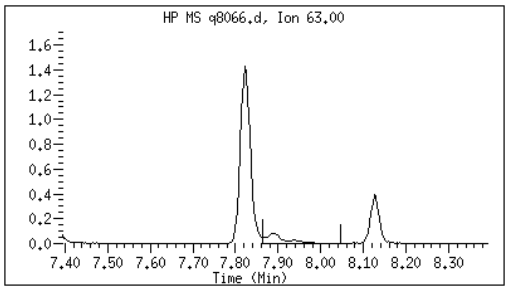

Original Final

56 2-Chloroethyl vinyl ether CAS#: 110-75-8 Reason: M2




Electronic Signature Applied

User: jck2
Date: 04/19/2018 11:36




M2 - Target system integrated incorrectly

# Form 2A

# Surrogates

# Water

2A

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Report No: 218040620 Analytical Method: EPA 8260C

| | Client Sample ID | GCALSample ID | SMC1 | # | SMC2 | # | SMC3 | # | SMC4 | # | TOT OUT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 . | MW-13-11-21 | 21804062001 | 100 | | 94 | | 100 | | 103 | | 0 |
| 2 . | RD5-MW-01-21 | 21804062010 | 99 | | 91 | | 101 | | 106 | | 0 |
| 3 . | MW-01-07-21 | 21804062011 | 97 | | 89 | | 101 | | 106 | | 0 |
| 4 . | S4-MW-46-21 | 21804062012 | 98 | | 91 | | 103 | | 103 | | 0 |
| 5 . | S4-MW-47-21 | 21804062013 | 96 | | 90 | | 99 | | 105 | | 0 |
| 6 . | Trip Blank | 21804062014 | 95 | | 92 | | 100 | | 105 | | 0 |
| 7 . | S4-MW28-21 | 21804062015 | 101 | | 91 | | 100 | | 102 | | 0 |
| 8 . | S4-MW37-21 | 21804062016 | 97 | | 90 | | 100 | | 104 | | 0 |
| 9 . | MW-01-06-21 | 21804062017 | 103 | | 93 | | 99 | | 105 | | 0 |
| 10 . | TW-6-21 | 21804062018 | 101 | | 93 | | 101 | | 105 | | 0 |
| 11 . | TW-7-21 | 21804062019 | 96 | | 90 | | 98 | | 102 | | 0 |
| 12 . | MW-11-02-21 | 21804062002 | 101 | | 94 | | 99 | | 102 | | 0 |
| 13 . | MB1797923 | 1797923 | 96 | | 92 | | 100 | | 105 | | 0 |
| 14 . | LCS1797924 | 1797924 | 98 | | 104 | | 99 | | 101 | | 0 |
| 15 . | LCSD1797925 | 1797925 | 103 | | 106 | | 99 | | 103 | | 0 |
| 16 . | S4-MW50-21 | 21804062003 | 96 | | 90 | | 101 | | 103 | | 0 |
| 17 . | S4-MW51-21 | 21804062004 | 99 | | 91 | | 99 | | 105 | | 0 |
| 18 . | S4-MW-49-21 | 21804062005 | 100 | | 91 | | 101 | | 105 | | 0 |
| 19 . | S4-MW-48-21 | 21804062006 | 98 | | 90 | | 101 | | 103 | | 0 |
| 20 . | MW-11-06-21 | 21804062007 | 102 | | 90 | | 102 | | 103 | | 0 |
| 21 . | MW-11-10-21 | 21804062008 | 99 | | 94 | | 100 | | 105 | | 0 |
| 22 . | MW-11-01-21 | 21804062009 | 102 | | 92 | | 101 | | 105 | | 0 |

| | | QC LIMITS | |
|---|---|---|---|
| SMC 1 | 1,2-Dichloroethane-d4 | 81 - 118 | # Column to be used to flag recovery values |
| SMC 2 | 4-Bromofluorobenzene | 85 - 114 | * Values outside of QC limits |
| SMC 3 | Dibromofluoromethane | 80 - 119 | |
| SMC 4 | Toluene-d8 | 89 - 112 | |

FORM II VOA-1

# Form 3A

# Spikes

# Water

3A

WATER VOLATILE LCS/LCSD RECOVERY

Report No: 218040620

Analytical Method: EPA 8260C Analytical Batch: 633552

***GCAL QC ID: 1797924***

| *ANALYTE* | *UNITS* | *SPIKE ADDED* | *SAMPLE RESULT* | *LCS RESULT* | *LCS % REC* | # | *QC LIMITS* |
|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ug/L | 50 | 0 | 51.2 | 102 | | 78 - 124 |
| 1,1,1-Trichloroethane | ug/L | 50 | 0 | 49.6 | 99 | | 74 - 131 |
| 1,1,2,2-Tetrachloroethane | ug/L | 50 | 0 | 54.9 | 110 | | 71 - 121 |
| 1,1,2-Trichloroethane | ug/L | 50 | 0 | 50.5 | 101 | | 80 - 119 |
| 1,1-Dichloroethane | ug/L | 50 | 0 | 49.4 | 99 | | 77 - 125 |
| 1,1-Dichloroethene | ug/L | 50 | 0 | 48 | 96 | | 71 - 131 |
| 1,1-Dichloropropene | ug/L | 50 | 0 | 49.9 | 100 | | 79 - 125 |
| 1,2,3-Trichlorobenzene | ug/L | 50 | 0 | 51.2 | 102 | | 69 - 129 |
| 1,2,3-Trichloropropane | ug/L | 50 | 0 | 47.9 | 96 | | 73 - 122 |
| 1,2,4-Trichlorobenzene | ug/L | 50 | 0 | 48.9 | 98 | | 69 - 130 |
| 1,2,4-Trimethylbenzene | ug/L | 50 | 0 | 51.5 | 103 | | 76 - 124 |
| 1,2-Dibromo-3-chloropropane | ug/L | 50 | 0 | 51.6 | 103 | | 62 - 128 |
| 1,2-Dibromoethane | ug/L | 50 | 0 | 54 | 108 | | 77 - 121 |
| 1,2-Dichlorobenzene | ug/L | 50 | 0 | 51.1 | 102 | | 80 - 119 |
| 1,2-Dichloroethane | ug/L | 50 | 0 | 50.3 | 101 | | 73 - 128 |
| 1,2-Dichloropropane | ug/L | 50 | 0 | 50.4 | 101 | | 78 - 122 |
| 1,3,5-Trimethylbenzene | ug/L | 50 | 0 | 50 | 100 | | 75 - 124 |
| 1,3-Dichlorobenzene | ug/L | 50 | 0 | 50.6 | 101 | | 80 - 119 |
| 1,3-Dichloropropane | ug/L | 50 | 0 | 53.2 | 106 | | 80 - 119 |
| 1,4-Dichlorobenzene | ug/L | 50 | 0 | 50.1 | 100 | | 79 - 118 |
| 1-Chlorohexane | ug/L | 50 | 0 | 59.2 | 118 | | 76 - 124 |
| 2,2-Dichloropropane | ug/L | 50 | 0 | 50.8 | 102 | | 60 - 139 |
| 2-Butanone | ug/L | 50 | 0 | 52.9 | 106 | | 56 - 143 |
| 2-Chlorotoluene | ug/L | 50 | 0 | 48 | 96 | | 79 - 122 |
| 2-Hexanone | ug/L | 50 | 0 | 56.3 | 113 | | 57 - 139 |
| 4-Chlorotoluene | ug/L | 50 | 0 | 50.6 | 101 | | 78 - 122 |
| 4-Isopropyltoluene | ug/L | 50 | 0 | 52.3 | 105 | | 77 - 127 |
| 4-Methyl-2-pentanone | ug/L | 50 | 0 | 55.4 | 111 | | 67 - 130 |
| Acetone | ug/L | 50 | 0 | 48.7 | 97 | | 39 - 160 |
| Benzene | ug/L | 50 | 0 | 51.2 | 102 | | 79 - 120 |
| Bromobenzene | ug/L | 50 | 0 | 47.9 | 96 | | 80 - 120 |
| Bromochloromethane | ug/L | 50 | 0 | 51.5 | 103 | | 78 - 123 |
| Bromodichloromethane | ug/L | 50 | 0 | 51.2 | 102 | | 79 - 125 |
| Bromoform | ug/L | 50 | 0 | 52.3 | 105 | | 66 - 130 |
| Bromomethane | ug/L | 50 | 0 | 53.7 | 107 | | 53 - 141 |
| Carbon disulfide | ug/L | 50 | 0 | 45 | 90 | | 64 - 133 |
| Carbon tetrachloride | ug/L | 50 | 0 | 48.1 | 96 | | 72 - 136 |
| Chlorobenzene | ug/L | 50 | 0 | 51.7 | 103 | | 82 - 118 |
| Chloroethane | ug/L | 50 | 0 | 47.8 | 96 | | 60 - 138 |

RPD : 0 out of 66 outside limits

Spike Recovery: 0 out of 132 outside limits

# Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III VOA-1

3A

WATER VOLATILE LCS/LCSD RECOVERY

Report No: 218040620

Analytical Method: EPA 8260C Analytical Batch: 633552

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Chloroform | ug/L | 50 | 0 | 50.4 | 101 | | 79 - 124 |
| Chloromethane | ug/L | 50 | 0 | 49.6 | 99 | | 50 - 139 |
| Dibromochloromethane | ug/L | 50 | 0 | 53 | 106 | | 74 - 126 |
| Dibromomethane | ug/L | 50 | 0 | 52.5 | 105 | | 79 - 123 |
| Dichlorodifluoromethane | ug/L | 50 | 0 | 42.1 | 84 | | 32 - 152 |
| Ethylbenzene | ug/L | 50 | 0 | 52.6 | 105 | | 79 - 121 |
| Hexachlorobutadiene | ug/L | 50 | 0 | 52 | 104 | | 66 - 134 |
| Isopropylbenzene (Cumene) | ug/L | 50 | 0 | 55.1 | 110 | | 72 - 131 |
| Methylene chloride | ug/L | 50 | 0 | 48.7 | 97 | | 74 - 124 |
| Naphthalene | ug/L | 50 | 0 | 46.4 | 93 | | 61 - 128 |
| Styrene | ug/L | 50 | 0 | 56.1 | 112 | | 78 - 123 |
| Tetrachloroethene | ug/L | 50 | 0 | 49.5 | 99 | | 74 - 129 |
| Toluene | ug/L | 50 | 0 | 51.8 | 104 | | 80 - 121 |
| Trichloroethene | ug/L | 50 | 0 | 51.5 | 103 | | 79 - 123 |
| Trichlorofluoromethane | ug/L | 50 | 0 | 45 | 90 | | 65 - 141 |
| Vinyl chloride | ug/L | 50 | 0 | 48.1 | 96 | | 58 - 137 |
| cis-1,2-Dichloroethene | ug/L | 50 | 0 | 51.9 | 104 | | 78 - 123 |
| cis-1,3-Dichloropropene | ug/L | 50 | 0 | 56 | 112 | | 75 - 124 |
| m,p-Xylene | ug/L | 100 | 0 | 106 | 106 | | 80 - 121 |
| n-Butylbenzene | ug/L | 50 | 0 | 54.3 | 109 | | 75 - 128 |
| n-Propylbenzene | ug/L | 50 | 0 | 48.4 | 97 | | 76 - 126 |
| o-Xylene | ug/L | 50 | 0 | 54.2 | 108 | | 78 - 122 |
| sec-Butylbenzene | ug/L | 50 | 0 | 49.2 | 98 | | 77 - 126 |
| tert-Butyl methyl ether (MTBE) | ug/L | 50 | 0 | 51.8 | 104 | | 71 - 124 |
| tert-Butylbenzene | ug/L | 50 | 0 | 48.1 | 96 | | 78 - 124 |
| trans-1,2-Dichloroethene | ug/L | 50 | 0 | 51.9 | 104 | | 75 - 124 |
| trans-1,3-Dichloropropene | ug/L | 50 | 0 | 55.1 | 110 | | 73 - 127 |

RPD : 0 out of 66 outside limits

Spike Recovery: 0 out of 132 outside limits

# Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III VOA-1

3A

WATER VOLATILE LCS/LCSD RECOVERY

Report No: 218040620

Analytical Method: EPA 8260C

Analytical Batch: 633552

***GCAL QC ID: 1797925***

| *ANALYTE* | *UNITS* | *SPIKE ADDED* | *LCSD RESULT* | *LCSD % REC* | # | *% RPD* | # | *QC LIMITS REC* | *QC LIMITS RPD* |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ug/L | 50 | 49.9 | 100 | | 3 | | 78 - 124 | 0 - 20 |
| 1,1,1-Trichloroethane | ug/L | 50 | 46.9 | 94 | | 6 | | 74 - 131 | 0 - 20 |
| 1,1,2,2-Tetrachloroethane | ug/L | 50 | 54.3 | 109 | | 1 | | 71 - 121 | 0 - 20 |
| 1,1,2-Trichloroethane | ug/L | 50 | 50 | 100 | | 1 | | 80 - 119 | 0 - 20 |
| 1,1-Dichloroethane | ug/L | 50 | 47.6 | 95 | | 4 | | 77 - 125 | 0 - 20 |
| 1,1-Dichloroethene | ug/L | 50 | 45.9 | 92 | | 4 | | 71 - 131 | 0 - 20 |
| 1,1-Dichloropropene | ug/L | 50 | 48.1 | 96 | | 4 | | 79 - 125 | 0 - 20 |
| 1,2,3-Trichlorobenzene | ug/L | 50 | 50.1 | 100 | | 2 | | 69 - 129 | 0 - 20 |
| 1,2,3-Trichloropropane | ug/L | 50 | 47.8 | 96 | | .2 | | 73 - 122 | 0 - 20 |
| 1,2,4-Trichlorobenzene | ug/L | 50 | 47.4 | 95 | | 3 | | 69 - 130 | 0 - 20 |
| 1,2,4-Trimethylbenzene | ug/L | 50 | 50.3 | 101 | | 2 | | 76 - 124 | 0 - 20 |
| 1,2-Dibromo-3-chloropropane | ug/L | 50 | 50.7 | 101 | | 2 | | 62 - 128 | 0 - 20 |
| 1,2-Dibromoethane | ug/L | 50 | 53.7 | 107 | | .6 | | 77 - 121 | 0 - 20 |
| 1,2-Dichlorobenzene | ug/L | 50 | 50 | 100 | | 2 | | 80 - 119 | 0 - 20 |
| 1,2-Dichloroethane | ug/L | 50 | 48.5 | 97 | | 4 | | 73 - 128 | 0 - 20 |
| 1,2-Dichloropropane | ug/L | 50 | 49.1 | 98 | | 3 | | 78 - 122 | 0 - 20 |
| 1,3,5-Trimethylbenzene | ug/L | 50 | 48.3 | 97 | | 3 | | 75 - 124 | 0 - 20 |
| 1,3-Dichlorobenzene | ug/L | 50 | 49.1 | 98 | | 3 | | 80 - 119 | 0 - 20 |
| 1,3-Dichloropropane | ug/L | 50 | 51.9 | 104 | | 2 | | 80 - 119 | 0 - 20 |
| 1,4-Dichlorobenzene | ug/L | 50 | 49 | 98 | | 2 | | 79 - 118 | 0 - 20 |
| 1-Chlorohexane | ug/L | 50 | 58 | 116 | | 2 | | 76 - 124 | 0 - 20 |
| 2,2-Dichloropropane | ug/L | 50 | 49.6 | 99 | | 2 | | 60 - 139 | 0 - 20 |
| 2-Butanone | ug/L | 50 | 51.9 | 104 | | 2 | | 56 - 143 | 0 - 20 |
| 2-Chlorotoluene | ug/L | 50 | 46.7 | 93 | | 3 | | 79 - 122 | 0 - 20 |
| 2-Hexanone | ug/L | 50 | 55.8 | 112 | | .9 | | 57 - 139 | 0 - 20 |
| 4-Chlorotoluene | ug/L | 50 | 49.1 | 98 | | 3 | | 78 - 122 | 0 - 20 |
| 4-Isopropyltoluene | ug/L | 50 | 49.7 | 99 | | 5 | | 77 - 127 | 0 - 20 |
| 4-Methyl-2-pentanone | ug/L | 50 | 54.7 | 109 | | 1 | | 67 - 130 | 0 - 20 |
| Acetone | ug/L | 50 | 48.7 | 97 | | 0 | | 39 - 160 | 0 - 20 |
| Benzene | ug/L | 50 | 49.8 | 100 | | 3 | | 79 - 120 | 0 - 20 |
| Bromobenzene | ug/L | 50 | 46.9 | 94 | | 2 | | 80 - 120 | 0 - 20 |
| Bromochloromethane | ug/L | 50 | 51 | 102 | | 1 | | 78 - 123 | 0 - 20 |
| Bromodichloromethane | ug/L | 50 | 50.6 | 101 | | 1 | | 79 - 125 | 0 - 20 |
| Bromoform | ug/L | 50 | 51.9 | 104 | | .8 | | 66 - 130 | 0 - 20 |
| Bromomethane | ug/L | 50 | 53.4 | 107 | | .6 | | 53 - 141 | 0 - 20 |
| Carbon disulfide | ug/L | 50 | 44.2 | 88 | | 2 | | 64 - 133 | 0 - 20 |
| Carbon tetrachloride | ug/L | 50 | 45.5 | 91 | | 6 | | 72 - 136 | 0 - 20 |
| Chlorobenzene | ug/L | 50 | 50.4 | 101 | | 3 | | 82 - 118 | 0 - 20 |

RPD : 0 out of 66 outside limits

Spike Recovery: 0 out of 132 outside limits

# Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III VOA-1

3A

WATER VOLATILE LCS/LCSD RECOVERY

Report No: 218040620

Analytical Method: EPA 8260C Analytical Batch: 633552

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Chloroethane | ug/L | 50 | 45.9 | 92 | | 4 | | 60 - 138 | 0 - 20 |
| Chloroform | ug/L | 50 | 48.9 | 98 | | 3 | | 79 - 124 | 0 - 20 |
| Chloromethane | ug/L | 50 | 49.1 | 98 | | 1 | | 50 - 139 | 0 - 20 |
| Dibromochloromethane | ug/L | 50 | 52.7 | 105 | | .6 | | 74 - 126 | 0 - 20 |
| Dibromomethane | ug/L | 50 | 51.2 | 102 | | 3 | | 79 - 123 | 0 - 20 |
| Dichlorodifluoromethane | ug/L | 50 | 39.4 | 79 | | 7 | | 32 - 152 | 0 - 20 |
| Ethylbenzene | ug/L | 50 | 51 | 102 | | 3 | | 79 - 121 | 0 - 20 |
| Hexachlorobutadiene | ug/L | 50 | 51.1 | 102 | | 2 | | 66 - 134 | 0 - 20 |
| Isopropylbenzene (Cumene) | ug/L | 50 | 53.3 | 107 | | 3 | | 72 - 131 | 0 - 20 |
| Methylene chloride | ug/L | 50 | 47.4 | 95 | | 3 | | 74 - 124 | 0 - 20 |
| Naphthalene | ug/L | 50 | 46.2 | 92 | | .4 | | 61 - 128 | 0 - 20 |
| Styrene | ug/L | 50 | 55.3 | 111 | | 1 | | 78 - 123 | 0 - 20 |
| Tetrachloroethene | ug/L | 50 | 47.8 | 96 | | 3 | | 74 - 129 | 0 - 20 |
| Toluene | ug/L | 50 | 50.5 | 101 | | 3 | | 80 - 121 | 0 - 20 |
| Trichloroethene | ug/L | 50 | 49.3 | 99 | | 4 | | 79 - 123 | 0 - 20 |
| Trichlorofluoromethane | ug/L | 50 | 42.9 | 86 | | 5 | | 65 - 141 | 0 - 20 |
| Vinyl chloride | ug/L | 50 | 44.6 | 89 | | 8 | | 58 - 137 | 0 - 20 |
| cis-1,2-Dichloroethene | ug/L | 50 | 49.8 | 100 | | 4 | | 78 - 123 | 0 - 20 |
| cis-1,3-Dichloropropene | ug/L | 50 | 53.7 | 107 | | 4 | | 75 - 124 | 0 - 20 |
| m,p-Xylene | ug/L | 100 | 103 | 103 | | 3 | | 80 - 121 | 0 - 20 |
| n-Butylbenzene | ug/L | 50 | 51.6 | 103 | | 5 | | 75 - 128 | 0 - 20 |
| n-Propylbenzene | ug/L | 50 | 46.8 | 94 | | 3 | | 76 - 126 | 0 - 20 |
| o-Xylene | ug/L | 50 | 52.9 | 106 | | 2 | | 78 - 122 | 0 - 20 |
| sec-Butylbenzene | ug/L | 50 | 47.6 | 95 | | 3 | | 77 - 126 | 0 - 20 |
| tert-Butyl methyl ether (MTBE) | ug/L | 50 | 51 | 102 | | 2 | | 71 - 124 | 0 - 20 |
| tert-Butylbenzene | ug/L | 50 | 46.4 | 93 | | 4 | | 78 - 124 | 0 - 20 |
| trans-1,2-Dichloroethene | ug/L | 50 | 49.3 | 99 | | 5 | | 75 - 124 | 0 - 20 |
| trans-1,3-Dichloropropene | ug/L | 50 | 53.7 | 107 | | 3 | | 73 - 127 | 0 - 20 |

RPD : 0 out of 66 outside limits

Spike Recovery: 0 out of 132 outside limits

# Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III VOA-1

# Form 4A

# Method Blanks

4A

VOLATILE METHOD BLANK SUMMARY

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Method Blank ID: | 1797923 |
| Matrix: | Water | Instrument ID: | MSV12 |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/q8069 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | RTX-VMS-30 ID .25 (mm) |
| Dilution Factor: | 1 Analyst: JMC2 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1216 | Analytical Method: | EPA 8260C |

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD

| | CLIENT SAMPLE ID | GCAL SAMPLE ID | LAB FILE ID | DATE ANALYZED | TIME ANALYZED |
|---|---|---|---|---|---|
| 1 . | LCS1797924 | 1797924 | 2180418/q8065L | 04/18/18 | 1045 |
| 2 . | LCSD1797925 | 1797925 | 2180418/q8066 | 04/18/18 | 1108 |
| 3 . | Trip Blank | 21804062014 | 2180418/q8070 | 04/18/18 | 1239 |
| 4 . | MW-01-06-21 | 21804062017 | 2180418/q8071 | 04/18/18 | 1302 |
| 5 . | TW-6-21 | 21804062018 | 2180418/q8072 | 04/18/18 | 1325 |
| 6 . | TW-7-21 | 21804062019 | 2180418/q8073 | 04/18/18 | 1348 |
| 7 . | MW-11-02-21 | 21804062002 | 2180418/q8074 | 04/18/18 | 1411 |
| 8 . | MW-13-11-21 | 21804062001 | 2180418/q8075 | 04/18/18 | 1434 |
| 9 . | MW-11-01-21 | 21804062009 | 2180418/q8076 | 04/18/18 | 1456 |
| 10 . | MW-11-06-21 | 21804062007 | 2180418/q8077 | 04/18/18 | 1519 |
| 11 . | MW-11-10-21 | 21804062008 | 2180418/q8078 | 04/18/18 | 1542 |
| 12 . | S4-MW50-21 | 21804062003 | 2180418/q8079 | 04/18/18 | 1605 |
| 13 . | S4-MW51-21 | 21804062004 | 2180418/q8080 | 04/18/18 | 1628 |
| 14 . | S4-MW-49-21 | 21804062005 | 2180418/q8081 | 04/18/18 | 1651 |
| 15 . | S4-MW-48-21 | 21804062006 | 2180418/q8082 | 04/18/18 | 1714 |
| 16 . | RD5-MW-01-21 | 21804062010 | 2180418/q8083 | 04/18/18 | 1737 |
| 17 . | MW-01-07-21 | 21804062011 | 2180418/q8084 | 04/18/18 | 1820 |
| 18 . | S4-MW-46-21 | 21804062012 | 2180418/q8085 | 04/18/18 | 1843 |
| 19 . | S4-MW-47-21 | 21804062013 | 2180418/q8086 | 04/18/18 | 1906 |
| 20 . | S4-MW28-21 | 21804062015 | 2180418/q8087 | 04/18/18 | 1928 |
| 21 . | S4-MW37-21 | 21804062016 | 2180418/q8088 | 04/18/18 | 1951 |

FORM IV VOA

# Form 5A

# Tunes

5A

VOLATILE ORGANICS INSTRUMENT PERFORMANCE CHECK

BROMOFLUOROBENZENE ( BFB )

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Tune ID: | 1000 |
| GC Column: | RTX-VMS-30 ID .25 (mm) | Instrument ID: | MSV12 |
| Injection Vol.: | 1.0 ( µL ) | Lab File ID: | 2180416p/q7974bfbcD |
| Analyst: | JCK | Analytical Batch: | 633658 |
| Analysis Date: | 04/16/18 Time: 1439 | Analytical Method: | EPA 8260C |

| *m / e* | *ION ABUNDANCE CRITERIA* | *% Relative Abundance* | | | |
|---|---|---|---|---|---|
| 50 | 15.0 - 40.0% of mass 95 | 19.1 | ( | ) | |
| 75 | 30.0 - 60.0% of mass 95 | 48.35 | ( | ) | |
| 95 | Base Peak, 100% relative abundance | 100 | ( | ) | |
| 96 | 5.0 -9.0% of mass 95 | 6.03 | ( | ) | |
| 173 | Less than 2.0% of mass 174 | .61 | ( .57 | ) | 1 |
| 174 | 50.0 - 120.0% of mass 95 | 107.6 | ( | ) | |
| 175 | 5.0 - 9.0% of mass 174 | 8.51 | ( 7.91 | ) | 1 |
| 176 | 95.0 - 101.0% of mass 174 | 103.3 | ( 96.06 | ) | 1 |
| 177 | 5.0 - 9.0% of mass 176 | 6.63 | ( 6.42 | ) | 2 |

1- Value is % mass 174 2- Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

| | *CLIENT SAMPLE ID* | *GCAL SAMPLE ID* | *LAB FILE ID* | *DATE ANALYZED* | *TIME ANALYZED* |
|---|---|---|---|---|---|
| 1 . | V12STD001 | 1203 | 180416p/q7977cl | 04/16/18 | 1603 |
| 2 . | V12STD005 | 1204 | 180416p/q7979cl | 04/16/18 | 1648 |
| 3 . | V12STD010 | 1205 | 180416p/q7980cl | 04/16/18 | 1711 |
| 4 . | V12STD020 | 1206 | 180416p/q7981cl | 04/16/18 | 1734 |
| 5 . | V12STD050 | 1207 | 180416p/q7982cl | 04/16/18 | 1757 |
| 6 . | V12STD100 | 1208 | 180416p/q7983cl | 04/16/18 | 1820 |
| 7 . | V12STD200 | 1209 | 180416p/q7984cl | 04/16/18 | 1843 |
| 8 . | ICV050 | 1600 | 180416p/q7986cl | 04/16/18 | 1929 |

FORM V VOA

Data File: /var/chem/msv12.i/2180416p.s.b/q7974bfbcD.d



Date : 16-APR-2018 14:39

Client ID: V12BFB

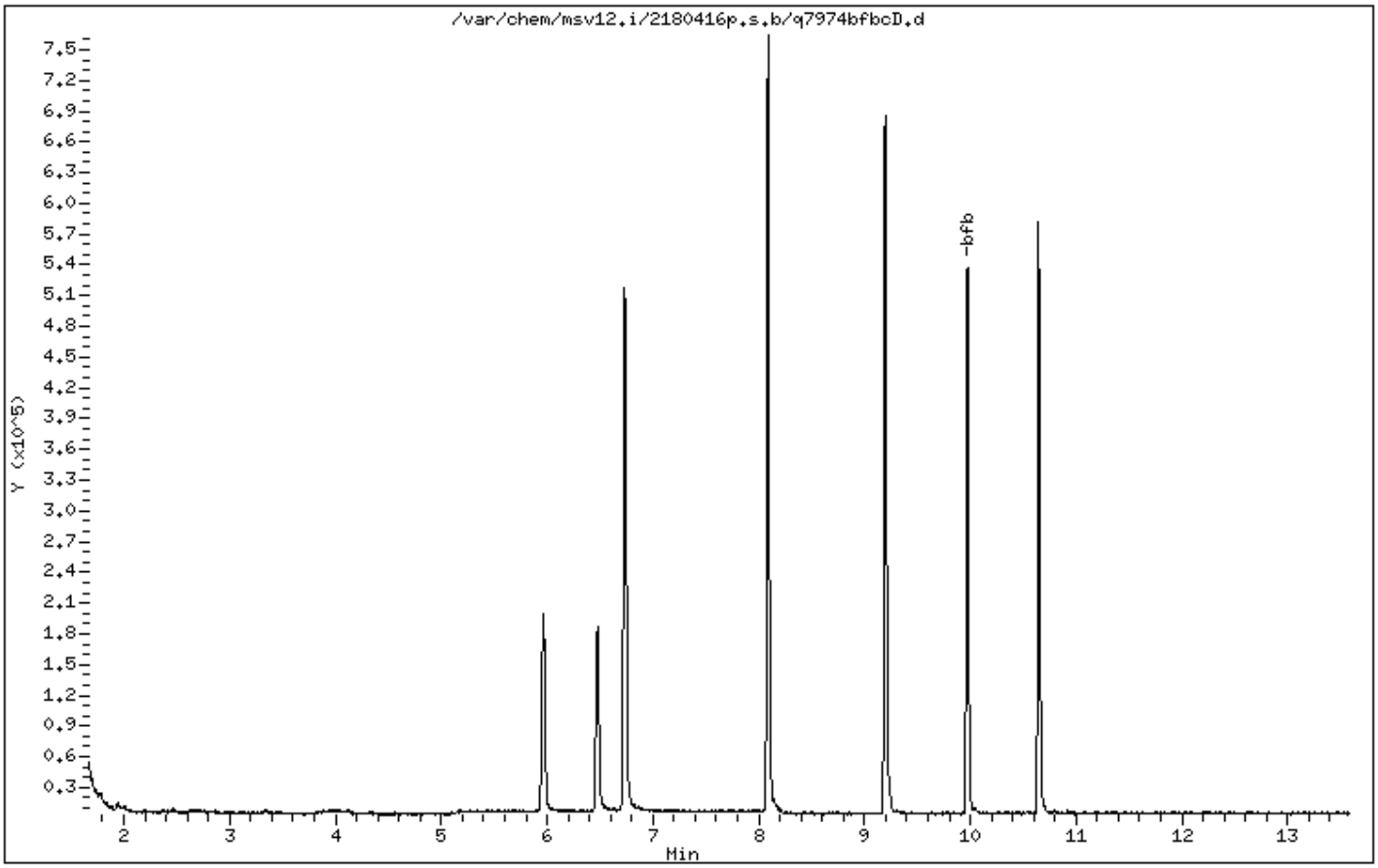
Instrument: msv12.i

Sample Info: 1000*V12BFB

Operator: JCK

Column phase: RTX-VMS-30M

Column diameter: 0.25



Data File: /var/chem/msv12.i/2180416p.s.b/q7974bfbcD.d



Date : 16-APR-2018 14:39

Client ID: V12BFB

Instrument: msv12.i

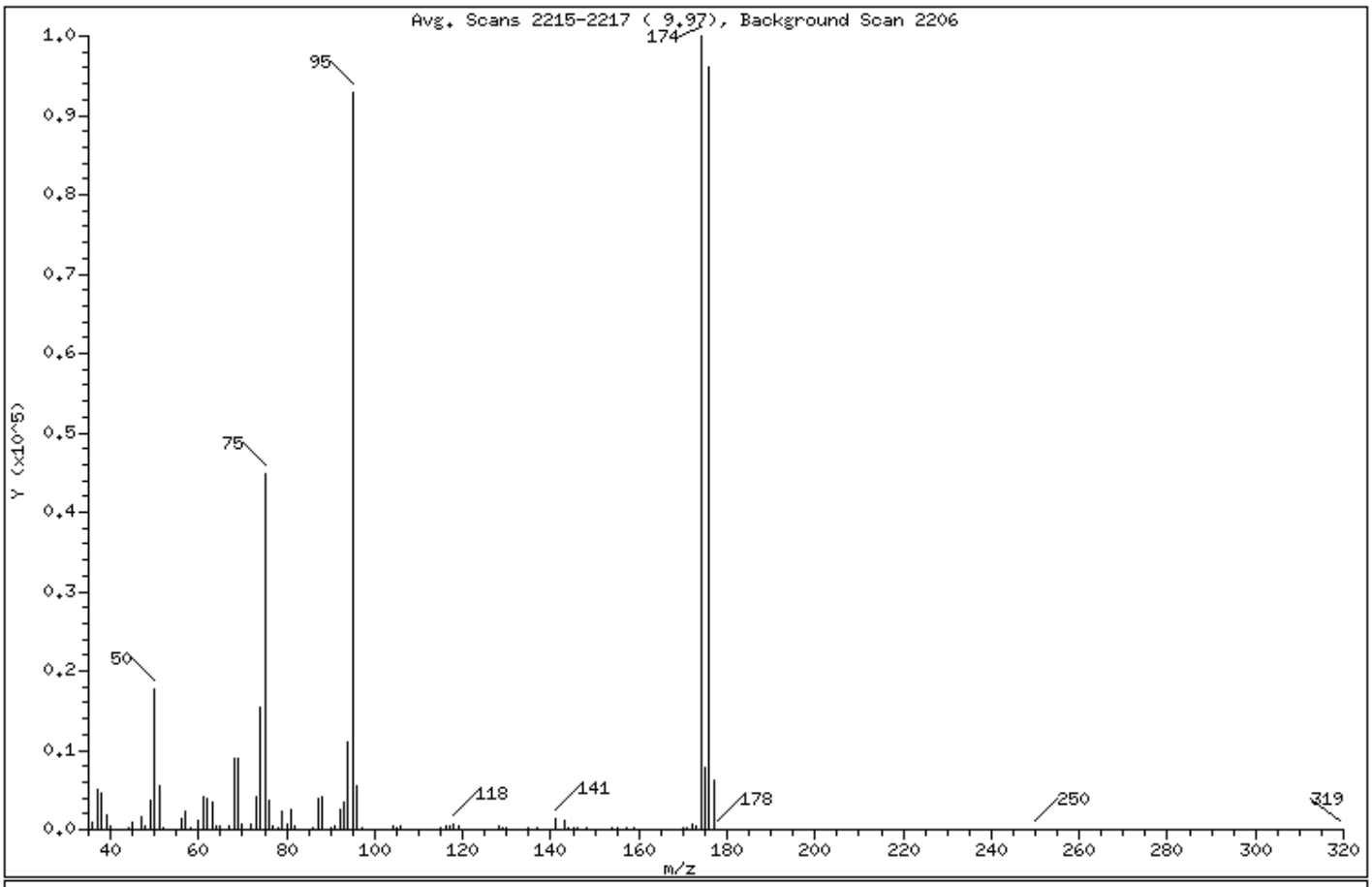
Sample Info: 1000*V12BFB

Operator: JCK

Column phase: RTX-VMS-30M

Column diameter: 0.25

1 bfb




| m/e | ION ABUNDANCE CRITERIA | % RELATIVE ABUNDANCE |
|---|---|---|
| 95 | Base Peak, 100% relative abundance | 100.00 |
| 50 | 15.00 - 40.00% of mass 95 | 19.10 |
| 75 | 30.00 - 60.00% of mass 95 | 48.35 |
| 96 | 5.00 - 9.00% of mass 95 | 6.03 |
| 173 | Less than 2.00% of mass 174 | 0.61 ( 0.57) |
| 174 | 50.00 - 120.00% of mass 95 | 107.62 |
| 175 | 5.00 - 9.00% of mass 174 | 8.51 ( 7.91) |
| 176 | 95.00 - 101.00% of mass 174 | 103.38 ( 96.06) |
| 177 | 5.00 - 9.00% of mass 176 | 6.64 ( 6.42) |

Date : 16-APR-2018 14:39

Client ID: V12BFB Instrument: msv12.i

Sample Info: 1000*V12BFB

Operator: JCK

Column phase: RTX-VMS-30M Column diameter: 0.25

Data File: q7974bfbcD.d
Spectrum: Avg. Scans 2215-2217 ( 9.97), Background Scan 2206
Location of Maximum: 174.00
Number of points: 92

| m/z | Y | m/z | Y | m/z | Y | m/z | Y |
|---|---|---|---|---|---|---|---|
| 36.00 | 936 | 67.00 | 367 | 95.00 | 92920 | 148.00 | 178 |
| 37.00 | 5162 | 68.00 | 8892 | 96.00 | 5603 | 150.00 | 101 |
| 38.00 | 4622 | 69.00 | 8908 | 97.00 | 172 | 154.00 | 124 |
| 39.00 | 1865 | 70.00 | 754 | 104.00 | 548 | 155.00 | 173 |
| 40.00 | 373 | 72.00 | 597 | 105.00 | 159 | 157.00 | 279 |
| 43.00 | 52 | 73.00 | 4034 | 106.00 | 411 | 158.00 | 53 |
| 44.00 | 119 | 74.00 | 15411 | 107.00 | 70 | 159.00 | 176 |
| 45.00 | 903 | 75.00 | 44928 | 115.00 | 122 | 161.00 | 72 |
| 47.00 | 1530 | 76.00 | 3657 | 116.00 | 361 | 169.00 | 68 |
| 48.00 | 540 | 77.00 | 443 | 117.00 | 561 | 170.00 | 189 |
| 49.00 | 3654 | 78.00 | 331 | 118.00 | 596 | 171.00 | 179 |
| 50.00 | 17744 | 79.00 | 2189 | 119.00 | 497 | 172.00 | 801 |
| 51.00 | 5417 | 80.00 | 735 | 128.00 | 513 | 173.00 | 568 |
| 52.00 | 224 | 81.00 | 2447 | 129.00 | 143 | 174.00 | 100008 |
| 55.00 | 70 | 82.00 | 497 | 130.00 | 310 | 175.00 | 7911 |
| 56.00 | 1279 | 83.00 | 72 | 131.00 | 60 | 176.00 | 96064 |
| 57.00 | 2297 | 86.00 | 261 | 135.00 | 178 | 177.00 | 6166 |
| 58.00 | 187 | 87.00 | 3907 | 137.00 | 148 | 178.00 | 53 |
| 60.00 | 1052 | 88.00 | 4030 | 141.00 | 1315 | 250.00 | 52 |
| 61.00 | 4202 | 90.00 | 135 | 142.00 | 57 | 319.00 | 50 |
| 62.00 | 3994 | 91.00 | 385 | 143.00 | 1126 | | |
| 63.00 | 3385 | 92.00 | 2575 | 144.00 | 118 | | |
| 64.00 | 356 | 93.00 | 3451 | 145.00 | 187 | | |
| 65.00 | 399 | 94.00 | 11004 | 146.00 | 127 | | |

5A

VOLATILE ORGANICS INSTRUMENT PERFORMANCE CHECK

BROMOFLUOROBENZENE ( BFB )

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Tune ID: | 1000 |
| GC Column: | RTX-VMS-30 ID .25 (mm) | Instrument ID: | MSV12 |
| Injection Vol.: | 1.0 ( µL ) | Lab File ID: | 2180418/q8061bfb |
| Analyst: | JCK | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 0841 | Analytical Method: | EPA 8260C |

| *m / e* | *ION ABUNDANCE CRITERIA* | *% Relative Abundance* | | | |
|---|---|---|---|---|---|
| 50 | 15.0 - 40.0% of mass 95 | 19.68 | ( | ) | |
| 75 | 30.0 - 60.0% of mass 95 | 50.65 | ( | ) | |
| 95 | Base Peak, 100% relative abundance | 100 | ( | ) | |
| 96 | 5.0 -9.0% of mass 95 | 6.48 | ( | ) | |
| 173 | Less than 2.0% of mass 174 | 1.53 | ( 1.42 | ) | 1 |
| 174 | 50.0 - 120.0% of mass 95 | 108.3 | ( | ) | |
| 175 | 5.0 - 9.0% of mass 174 | 8.28 | ( 7.64 | ) | 1 |
| 176 | 95.0 - 101.0% of mass 174 | 102.9 | ( 95.03 | ) | 1 |
| 177 | 5.0 - 9.0% of mass 176 | 7.05 | ( 6.85 | ) | 2 |

1- Value is % mass 174

2- Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

| | *CLIENT SAMPLE ID* | *GCAL SAMPLE ID* | *LAB FILE ID* | *DATE ANALYZED* | *TIME ANALYZED* |
|---|---|---|---|---|---|
| 1 . | V12STD050 | 1400 | 2180418/q8065 | 04/18/18 | 1045 |
| 2 . | LCS1797924 | 1797924 | 2180418/q8065L | 04/18/18 | 1045 |
| 3 . | LCSD1797925 | 1797925 | 2180418/q8066 | 04/18/18 | 1108 |
| 4 . | MB1797923 | 1797923 | 2180418/q8069 | 04/18/18 | 1216 |
| 5 . | Trip Blank | 21804062014 | 2180418/q8070 | 04/18/18 | 1239 |
| 6 . | MW-01-06-21 | 21804062017 | 2180418/q8071 | 04/18/18 | 1302 |
| 7 . | TW-6-21 | 21804062018 | 2180418/q8072 | 04/18/18 | 1325 |
| 8 . | TW-7-21 | 21804062019 | 2180418/q8073 | 04/18/18 | 1348 |
| 9 . | MW-11-02-21 | 21804062002 | 2180418/q8074 | 04/18/18 | 1411 |
| 10 . | MW-13-11-21 | 21804062001 | 2180418/q8075 | 04/18/18 | 1434 |
| 11 . | MW-11-01-21 | 21804062009 | 2180418/q8076 | 04/18/18 | 1456 |
| 12 . | MW-11-06-21 | 21804062007 | 2180418/q8077 | 04/18/18 | 1519 |
| 13 . | MW-11-10-21 | 21804062008 | 2180418/q8078 | 04/18/18 | 1542 |
| 14 . | S4-MW50-21 | 21804062003 | 2180418/q8079 | 04/18/18 | 1605 |
| 15 . | S4-MW51-21 | 21804062004 | 2180418/q8080 | 04/18/18 | 1628 |
| 16 . | S4-MW-49-21 | 21804062005 | 2180418/q8081 | 04/18/18 | 1651 |
| 17 . | S4-MW-48-21 | 21804062006 | 2180418/q8082 | 04/18/18 | 1714 |
| 18 . | RD5-MW-01-21 | 21804062010 | 2180418/q8083 | 04/18/18 | 1737 |

FORM V VOA

5A

VOLATILE ORGANICS INSTRUMENT PERFORMANCE CHECK

BROMOFLUOROBENZENE ( BFB )

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Tune ID: | 1000 |
| GC Column: | RTX-VMS-30 ID .25 (mm) | Instrument ID: | MSV12 |
| Injection Vol.: | 1.0 ( µL ) | Lab File ID: | 2180418/q8061bfb |
| Analyst: | JCK | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 0841 | Analytical Method: | EPA 8260C |

| | | | | | |
|---|---|---|---|---|---|
| 19 . | MW-01-07-21 | 21804062011 | 2180418/q8084 | 04/18/18 | 1820 |
| 20 . | S4-MW-46-21 | 21804062012 | 2180418/q8085 | 04/18/18 | 1843 |
| 21 . | S4-MW-47-21 | 21804062013 | 2180418/q8086 | 04/18/18 | 1906 |
| 22 . | S4-MW28-21 | 21804062015 | 2180418/q8087 | 04/18/18 | 1928 |
| 23 . | S4-MW37-21 | 21804062016 | 2180418/q8088 | 04/18/18 | 1951 |
| 24 . | V12STD050 | 1440 | 2180418/q8089 | 04/18/18 | 2021 |

FORM V VOA

Data File: /var/chem/msv12.i/2180418.s.b/q8061bfb.d



Date : 18-APR-2018 08:41

Client ID: V12BFB

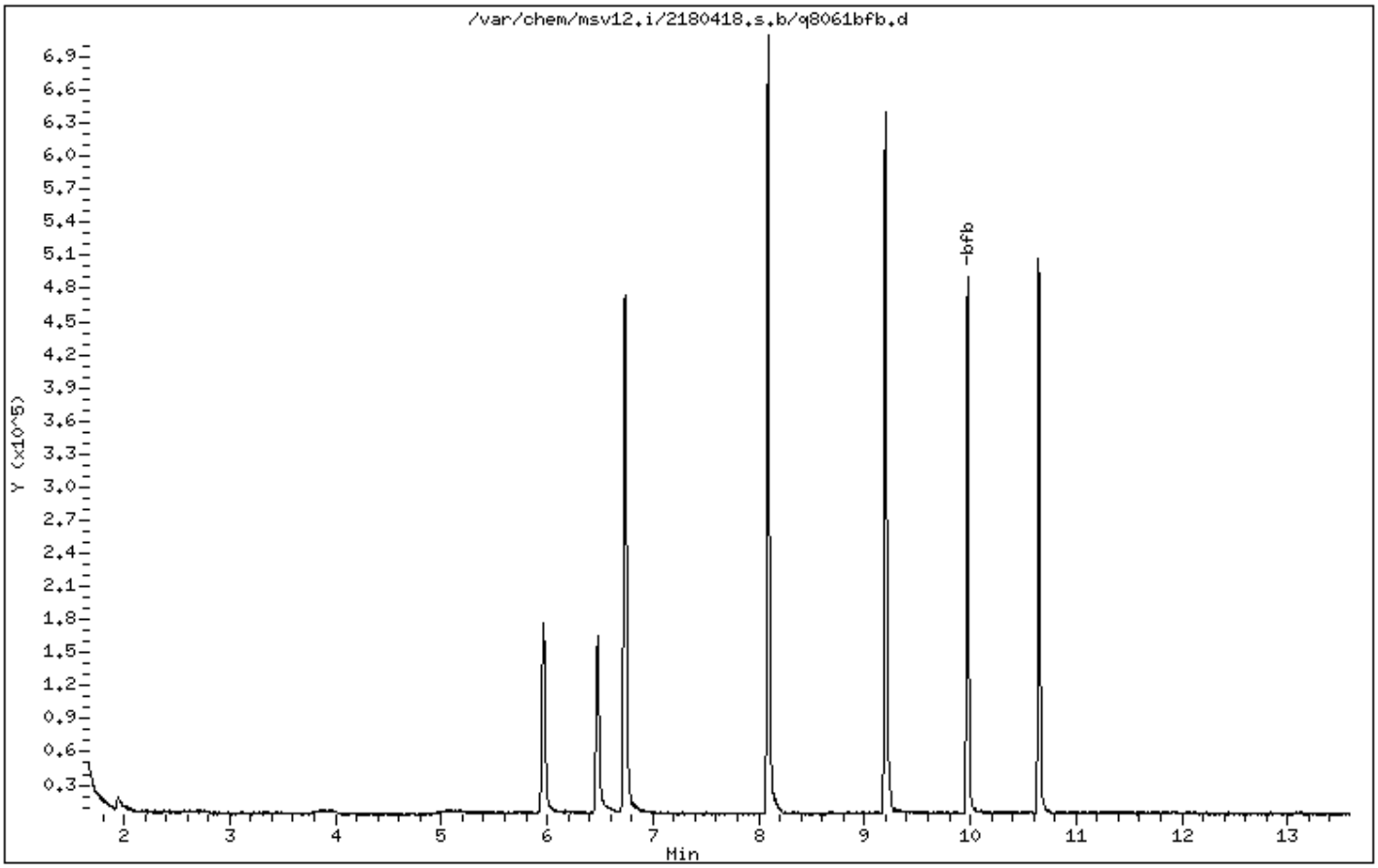
Instrument: msv12.i

Sample Info: 1000*V12BFB

Operator: JCK

Column phase: RTX-VMS-30M

Column diameter: 0.25



Data File: /var/chem/msv12.i/2180418.s.b/q8061bfb.d

Date : 18-APR-2018 08:41

Client ID: V12BFB

Instrument: msv12.i

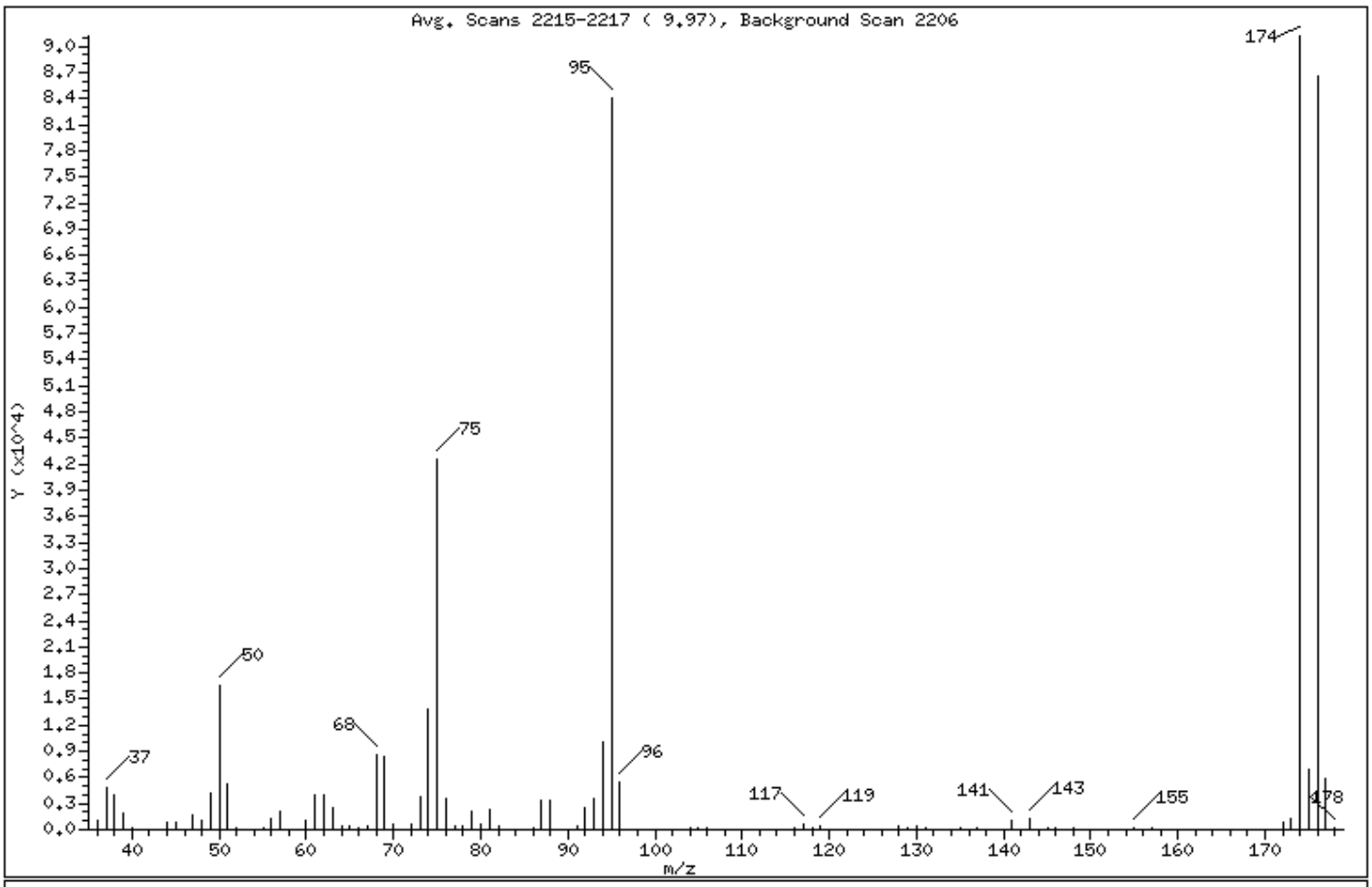
Sample Info: 1000*V12BFB

Operator: JCK

Column phase: RTX-VMS-30M

Column diameter: 0.25

1 bfb




| m/e | ION ABUNDANCE CRITERIA | % RELATIVE ABUNDANCE |
|---|---|---|
| 95 | Base Peak, 100% relative abundance | 100.00 |
| 50 | 15.00 - 40.00% of mass 95 | 19.68 |
| 75 | 30.00 - 60.00% of mass 95 | 50.65 |
| 96 | 5.00 - 9.00% of mass 95 | 6.48 |
| 173 | Less than 2.00% of mass 174 | 1.54 ( 1.42) |
| 174 | 50.00 - 120.00% of mass 95 | 108.38 |
| 175 | 5.00 - 9.00% of mass 174 | 8.28 ( 7.64) |
| 176 | 95.00 - 101.00% of mass 174 | 103.00 ( 95.03) |
| 177 | 5.00 - 9.00% of mass 176 | 7.05 ( 6.85) |

Date : 18-APR-2018 08:41

Client ID: V12BFB Instrument: msv12.i

Sample Info: 1000*V12BFB

Operator: JCK

Column phase: RTX-VMS-30M Column diameter: 0.25

Data File: q8061bfb.d
Spectrum: Avg. Scans 2215-2217 ( 9.97), Background Scan 2206
Location of Maximum: 174.00
Number of points: 88

| m/z | Y | m/z | Y | m/z | Y | m/z | Y |
|---|---|---|---|---|---|---|---|
| 36.00 | 963 | 66.00 | 123 | 94.00 | 9986 | 143.00 | 1245 |
| 37.00 | 4857 | 67.00 | 319 | 95.00 | 84128 | 145.00 | 236 |
| 38.00 | 4029 | 68.00 | 8503 | 96.00 | 5453 | 146.00 | 207 |
| 39.00 | 1967 | 69.00 | 8476 | 97.00 | 57 | 148.00 | 294 |
| 40.00 | 292 | 70.00 | 695 | 103.00 | 53 | 150.00 | 93 |
| 44.00 | 854 | 72.00 | 603 | 104.00 | 288 | 154.00 | 67 |
| 45.00 | 774 | 73.00 | 3873 | 105.00 | 108 | 155.00 | 172 |
| 47.00 | 1776 | 74.00 | 13757 | 106.00 | 300 | 157.00 | 118 |
| 48.00 | 956 | 75.00 | 42616 | 116.00 | 289 | 159.00 | 50 |
| 49.00 | 4166 | 76.00 | 3511 | 117.00 | 534 | 160.00 | 60 |
| 50.00 | 16552 | 77.00 | 512 | 118.00 | 285 | 167.00 | 50 |
| 51.00 | 5302 | 78.00 | 469 | 119.00 | 498 | 170.00 | 82 |
| 52.00 | 193 | 79.00 | 2076 | 126.00 | 63 | 172.00 | 780 |
| 53.00 | 51 | 80.00 | 695 | 127.00 | 62 | 173.00 | 1296 |
| 55.00 | 312 | 81.00 | 2340 | 128.00 | 323 | 174.00 | 91184 |
| 56.00 | 1282 | 82.00 | 435 | 129.00 | 195 | 175.00 | 6965 |
| 57.00 | 2157 | 86.00 | 134 | 130.00 | 334 | 176.00 | 86656 |
| 60.00 | 948 | 87.00 | 3362 | 131.00 | 180 | 177.00 | 5934 |
| 61.00 | 3925 | 88.00 | 3404 | 135.00 | 155 | 178.00 | 245 |
| 62.00 | 4006 | 90.00 | 54 | 137.00 | 183 | | |
| 63.00 | 2537 | 91.00 | 333 | 140.00 | 50 | | |
| 64.00 | 390 | 92.00 | 2464 | 141.00 | 991 | | |
| 65.00 | 357 | 93.00 | 3634 | 142.00 | 62 | | |

# Form 6A

# Calibrations

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | **GCALID - FileID - Conc** | 1203 ~ 2180416p/q7977cD ~ 1 | | |
| Report No: | 218040620 | | Instrument ID: | MSV12 | 1204 ~ 2180416p/q7979cD ~ 5 | 1205 ~ 2180416p/q7980cD ~ 10 | | |
| GC Column: | RTX-VMS-30 | ID .25 (mm) | Analyst: | JCK | 1206 ~ 2180416p/q7981cD ~ 20 | 1207 ~ 2180416p/q7982cD ~ 50 | | |
| Calib. Date 1: | 04/16/18 | Time 1: 1603 | Analytical Batch: | 633658 | 1208 ~ 2180416p/q7983cD ~ 100 | 1209 ~ 2180416p/q7984cD ~ 200 | | |
| Calib. Date 2: | 04/16/18 | Time 2: 1843 | Analytical Method: | EPA 8260C | | | | |

| *ANALYTE* | *1201* | *1202* | *1203* | *1204* | *1205* | *1206* | *1207* | *1208* | *1209* | *$\overline{RF}$ / b / A* | *m / B* | *C* | *FIT* | *TYPE* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | | | 0.959 | 0.917 | 0.882 | 0.871 | 0.902 | 0.912 | 0.888 | 0.905 | | | 3.205 | A |
| 1,1,1-Trichloroethane | | | 0.551 | 0.528 | 0.507 | 0.507 | 0.521 | 0.522 | 0.508 | 0.521 | | | 3.025 | A |
| 1,1,2,2-Tetrachloroethane (RS | | | 4200 | 22698 | 42895 | 86520 | 221085 | 474263 | 923726 | 1.041 | -0.019 | | 0.995 | W |
| 1,1,2,2-Tetrachloroethane | | | 1.550 | 1.477 | 1.272 | 1.193 | 1.099 | 1.092 | 0.987 | | | | | |
| 1,1,2-Trichloroethane | | | 0.871 | 0.806 | 0.795 | 0.775 | 0.809 | 0.820 | 0.783 | 0.808 | | | 3.916 | A |
| 1,1-Dichloroethane | | | 0.677 | 0.632 | 0.586 | 0.576 | 0.597 | 0.595 | 0.577 | 0.606 | | | 6.032 | A |
| 1,1-Dichloroethene | | | 0.250 | 0.224 | 0.227 | 0.225 | 0.237 | 0.235 | 0.230 | 0.232 | | | 3.824 | A |
| 1,1-Dichloropropene | | | 0.388 | 0.390 | 0.395 | 0.390 | 0.420 | 0.427 | 0.413 | 0.403 | | | 4.025 | A |
| 1,2,3-Trichlorobenzene (RSP) | | | 415 | 4942 | 14487 | 42108 | 146640 | 352689 | 765351 | 0.834 | 0.079 | | 0.999 | L |
| 1,2,3-Trichlorobenzene | | | 0.153 | 0.322 | 0.429 | 0.581 | 0.729 | 0.812 | 0.818 | | | | | |
| 1,2,3-Trichloropropane | | | 1.415 | 1.470 | 1.301 | 1.203 | 1.225 | 1.227 | 1.160 | 1.286 | | | 9.020 | A |
| 1,2,4-Trichlorobenzene (RSP) | | | 701 | 5054 | 13857 | 39702 | 145115 | 366377 | 803867 | 0.878 | 0.096 | | 0.998 | L |
| 1,2,4-Trichlorobenzene | | | 0.259 | 0.329 | 0.411 | 0.548 | 0.721 | 0.844 | 0.859 | | | | | |
| 1,2,4-Trimethylbenzene | | | 2.797 | 2.788 | 2.856 | 2.735 | 2.746 | 2.722 | 2.426 | 2.724 | | | 5.102 | A |
| 1,2-Dibromo-3-chloropropane | | | 0.237 | 0.301 | 0.251 | 0.258 | 0.269 | 0.272 | 0.261 | 0.264 | | | 7.679 | A |
| 1,2-Dibromoethane | | | 0.605 | 0.715 | 0.717 | 0.715 | 0.781 | 0.808 | 0.801 | 0.735 | | | 9.592 | A |
| 1,2-Dichlorobenzene | | | 1.712 | 1.798 | 1.752 | 1.698 | 1.711 | 1.718 | 1.585 | 1.710 | | | 3.791 | A |
| 1,2-Dichloroethane | | | 0.491 | 0.492 | 0.464 | 0.447 | 0.462 | 0.474 | 0.462 | 0.470 | | | 3.455 | A |
| 1,2-Dichloroethane-d4 | | | 0.155 | 0.156 | 0.157 | 0.159 | 0.158 | 0.160 | 0.163 | 0.158 | | | 1.841 | A |
| 1,2-Dichloroethene (total) | | | 0.403 | 0.415 | 0.409 | 0.399 | 0.424 | 0.438 | 0.431 | 0.417 | | | 3.455 | A |
| 1,2-Dichloropropane | | | 0.374 | 0.348 | 0.327 | 0.321 | 0.339 | 0.340 | 0.333 | 0.340 | | | 5.121 | A |
| 1,3,5-Trimethylbenzene | | | 3.049 | 3.031 | 2.878 | 2.815 | 2.754 | 2.672 | 2.377 | 2.796 | | | 8.244 | A |
| 1,3-Dichlorobenzene | | | 1.820 | 1.737 | 1.647 | 1.639 | 1.695 | 1.702 | 1.600 | 1.692 | | | 4.300 | A |
| 1,3-Dichloropropane | | | 1.202 | 1.285 | 1.285 | 1.200 | 1.294 | 1.340 | 1.289 | 1.271 | | | 4.047 | A |
| 1,3-Dichloropropylene | | | 0.370 | 0.406 | 0.391 | 0.428 | 0.481 | 0.503 | 0.505 | 0.440 | | | 12.57 | A |

FIT = %RSD For Average Curve And Calibration Coefficent For Linear And Quadratic

Curve Types: A - Averged, L - Linear Regression, W - Weighted Linear, Q - Quadratic

For curve types L and Q, the RRF and RSP (Response) are shown on separate lines to allow for evaluation against minimum RRF

$\overline{RF}$ = Mean Response Factor For Average Curve

m,b = Slope and Intercept For Linear Curve

A,B,C = Coefficents For Quadratic Curve

FORM V I VOA

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | **GCALID - FileID - Conc** | 1203 ~ 2180416p/q7977cD ~ 1 | |
| Report No: | 218040620 | | Instrument ID: | MSV12 | | 1204 ~ 2180416p/q7979cD ~ 5 | 1205 ~ 2180416p/q7980cD ~ 10 | |
| GC Column: | RTX-VMS-30 | ID .25 (mm) | Analyst: | JCK | | 1206 ~ 2180416p/q7981cD ~ 20 | 1207 ~ 2180416p/q7982cD ~ 50 | |
| Calib. Date 1: | 04/16/18 | Time 1: 1603 | Analytical Batch: | 633658 | | 1208 ~ 2180416p/q7983cD ~ 100 | 1209 ~ 2180416p/q7984cD ~ 200 | |
| Calib. Date 2: | 04/16/18 | Time 2: 1843 | Analytical Method: | EPA 8260C | | | | |

| *ANALYTE* | *1201* | *1202* | *1203* | *1204* | *1205* | *1206* | *1207* | *1208* | *1209* | *$\overline{RF}$ / b / A* | *m / B* | *C* | *FIT* | *TYPE* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,4-Dichlorobenzene | | | 2.130 | 1.776 | 1.677 | 1.717 | 1.725 | 1.746 | 1.634 | 1.772 | | | 9.271 | A |
| 1-Bromo-2-Chloroethane | | | 0.485 | 0.490 | 0.506 | 0.448 | 0.478 | 0.499 | 0.487 | 0.485 | | | 3.892 | A |
| 1-Chlorohexane | | | 0.634 | 0.743 | 0.819 | 0.861 | 0.952 | 0.974 | 0.935 | 0.846 | | | 14.65 | A |
| 2,2-Dichloropropane | | | 0.473 | 0.470 | 0.445 | 0.443 | 0.466 | 0.491 | 0.460 | 0.464 | | | 3.583 | A |
| 2-Butanone | | | 0.246 | 0.258 | 0.254 | 0.255 | 0.274 | 0.285 | 0.280 | 0.264 | | | 5.659 | A |
| 2-Chloroethylvinyl ether | | | 0.046 | 0.064 | 0.042 | 0.045 | 0.049 | 0.053 | 0.049 | 0.050 | | | 14.50 | A |
| 2-Chlorotoluene | | | 3.354 | 3.062 | 2.861 | 2.710 | 2.652 | 2.557 | 2.311 | 2.787 | | | 12.31 | A |
| 2-Hexanone | | | 0.722 | 0.779 | 0.747 | 0.792 | 0.893 | 0.955 | 0.951 | 0.834 | | | 11.65 | A |
| 4-Bromofluorobenzene | | | 0.816 | 0.837 | 0.847 | 0.873 | 0.916 | 0.942 | 0.962 | 0.885 | | | 6.326 | A |
| 4-Chlorotoluene | | | 2.618 | 2.549 | 2.494 | 2.365 | 2.419 | 2.377 | 2.169 | 2.427 | | | 6.025 | A |
| 4-Isopropyltoluene | | | 2.670 | 2.725 | 2.703 | 2.767 | 2.818 | 2.797 | 2.457 | 2.705 | | | 4.486 | A |
| 4-Methyl-2-pentanone | | | 0.972 | 1.113 | 1.028 | 1.016 | 1.120 | 1.190 | 1.134 | 1.082 | | | 7.167 | A |
| Acetone | | | 0.315 | 0.287 | 0.259 | 0.254 | 0.265 | 0.268 | 0.263 | 0.273 | | | 7.792 | A |
| Acrolein | | | 0.016 | 0.022 | 0.019 | 0.019 | 0.022 | 0.023 | 0.024 | 0.021 | | | 12.83 | A |
| Acrylonitrile | | | 0.092 | 0.102 | 0.112 | 0.111 | 0.118 | 0.119 | 0.133 | 0.112 | | | 11.74 | A |
| Benzene | | | 1.272 | 1.263 | 1.269 | 1.255 | 1.291 | 1.316 | 1.253 | 1.274 | | | 1.748 | A |
| Bromobenzene | | | 1.897 | 1.742 | 1.643 | 1.547 | 1.508 | 1.465 | 1.365 | 1.595 | | | 11.28 | A |
| Bromochloromethane | | | 0.139 | 0.169 | 0.172 | 0.173 | 0.176 | 0.171 | 0.165 | 0.166 | | | 7.565 | A |
| Bromodichloromethane | | | 0.457 | 0.480 | 0.471 | 0.447 | 0.475 | 0.484 | 0.470 | 0.469 | | | 2.709 | A |
| Bromoform | | | 0.788 | 0.793 | 0.774 | 0.765 | 0.833 | 0.868 | 0.856 | 0.811 | | | 5.050 | A |
| Bromomethane | | | 0.141 | 0.109 | 0.118 | 0.116 | 0.124 | 0.140 | 0.150 | 0.128 | | | 11.83 | A |
| Carbon disulfide (RSP) | | | 10347 | 38219 | 69653 | 147845 | 399786 | 776718 | 1628946 | 0.793 | -0.006 | | 0.999 | W |
| Carbon disulfide | | | 1.129 | 0.835 | 0.748 | 0.780 | 0.825 | 0.777 | 0.802 | | | | | |
| Carbon tetrachloride | | | 0.465 | 0.473 | 0.451 | 0.437 | 0.456 | 0.462 | 0.452 | 0.457 | | | 2.495 | A |
| Chlorobenzene | | | 2.450 | 2.258 | 2.192 | 2.099 | 2.211 | 2.215 | 2.174 | 2.228 | | | 4.894 | A |

FIT = %RSD For Average Curve And Calibration Coefficent For Linear And Quadratic

Curve Types: A - Averged, L - Linear Regression, W - Weighted Linear, Q - Quadratic

For curve types L and Q, the RRF and RSP (Response) are shown on separate lines to allow for evaluation against minimum RRF

$\overline{RF}$ = Mean Response Factor For Average Curve

m,b = Slope and Intercept For Linear Curve

A,B,C = Coefficents For Quadratic Curve

FORM V I VOA

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | **GCALID - FileID - Conc** | 1203 ~ 2180416p/q7977cD ~ 1 | |
| Report No: | 218040620 | | Instrument ID: | MSV12 | | 1204 ~ 2180416p/q7979cD ~ 5 | 1205 ~ 2180416p/q7980cD ~ 10 | |
| GC Column: | RTX-VMS-30 | ID .25 (mm) | Analyst: | JCK | | 1206 ~ 2180416p/q7981cD ~ 20 | 1207 ~ 2180416p/q7982cD ~ 50 | |
| Calib. Date 1: | 04/16/18 | Time 1: 1603 | Analytical Batch: | 633658 | | 1208 ~ 2180416p/q7983cD ~ 100 | 1209 ~ 2180416p/q7984cD ~ 200 | |
| Calib. Date 2: | 04/16/18 | Time 2: 1843 | Analytical Method: | EPA 8260C | | | | |

| ***ANALYTE*** | ***1201*** | ***1202*** | ***1203*** | ***1204*** | ***1205*** | ***1206*** | ***1207*** | ***1208*** | ***1209*** | ***$\overline{RF}$ / b / A*** | ***m / B*** | ***C*** | ***FIT*** | ***TYPE*** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloroethane | | | 0.219 | 0.169 | 0.176 | 0.169 | 0.170 | 0.165 | 0.132 | 0.171 | | | 14.80 | A |
| Chloroform | | | 0.637 | 0.596 | 0.585 | 0.563 | 0.584 | 0.595 | 0.571 | 0.590 | | | 4.068 | A |
| Chloromethane | | | 0.434 | 0.376 | 0.367 | 0.346 | 0.370 | 0.367 | 0.382 | 0.377 | | | 7.225 | A |
| Cyclohexane | | | 0.423 | 0.465 | 0.456 | 0.467 | 0.498 | 0.496 | 0.477 | 0.469 | | | 5.462 | A |
| Dibromochloromethane | | | 0.932 | 1.019 | 0.990 | 0.935 | 1.030 | 1.042 | 1.029 | 0.997 | | | 4.635 | A |
| Dibromofluoromethane | | | 0.266 | 0.268 | 0.269 | 0.265 | 0.265 | 0.268 | 0.268 | 0.267 | | | 0.683 | A |
| Dibromomethane | | | 0.184 | 0.196 | 0.195 | 0.174 | 0.197 | 0.203 | 0.201 | 0.193 | | | 5.407 | A |
| Dichlorodifluoromethane | | | 0.366 | 0.374 | 0.368 | 0.355 | 0.370 | 0.355 | 0.346 | 0.362 | | | 2.805 | A |
| Ethylbenzene | | | 1.105 | 1.203 | 1.112 | 1.116 | 1.156 | 1.185 | 1.151 | 1.147 | | | 3.325 | A |
| Hexachlorobutadiene | | | 0.404 | 0.553 | 0.510 | 0.510 | 0.510 | 0.527 | 0.472 | 0.498 | | | 9.626 | A |
| Isopropylbenzene (Cumene) | | | 2.851 | 3.175 | 3.172 | 3.275 | 3.522 | 3.620 | 3.304 | 3.274 | | | 7.699 | A |
| Methyl Acetate | | | 0.251 | 0.291 | 0.276 | 0.268 | 0.306 | 0.323 | 0.326 | 0.292 | | | 9.748 | A |
| Methyl iodide (RSP) | | | 1542 | 8185 | 18470 | 40590 | 127300 | 283800 | 654600 | 3.790 | 0.041 | -0.559 | 0.999 | Q |
| Methyl iodide | | | 0.168 | 0.179 | 0.198 | 0.214 | 0.263 | 0.284 | 0.322 | | | | | |
| Methylcyclohexane | | | 0.432 | 0.400 | 0.392 | 0.419 | 0.427 | 0.442 | 0.422 | 0.419 | | | 4.229 | A |
| Methylene chloride | | | 0.548 | 0.460 | 0.456 | 0.433 | 0.443 | 0.438 | 0.432 | 0.459 | | | 8.958 | A |
| Naphthalene (RSP) | | | 1466 | 7644 | 18263 | 56719 | 278392 | 754441 | 1765177 | 1.934 | 0.151 | | 0.995 | L |
| Naphthalene | | | 0.541 | 0.497 | 0.541 | 0.782 | 1.383 | 1.737 | 1.886 | | | | | |
| Styrene | | | 1.737 | 2.002 | 2.061 | 2.088 | 2.385 | 2.438 | 2.378 | 2.156 | | | 11.88 | A |
| Tetrachloroethene | | | 0.895 | 0.777 | 0.733 | 0.716 | 0.755 | 0.779 | 0.751 | 0.772 | | | 7.582 | A |
| Toluene | | | 3.454 | 3.486 | 3.401 | 3.320 | 3.442 | 3.425 | 3.248 | 3.396 | | | 2.469 | A |
| Toluene-d8 | | | 2.525 | 2.452 | 2.394 | 2.401 | 2.372 | 2.435 | 2.460 | 2.434 | | | 2.109 | A |
| Trichloroethene | | | 0.321 | 0.367 | 0.359 | 0.342 | 0.355 | 0.361 | 0.353 | 0.351 | | | 4.360 | A |
| Trichlorofluoromethane | | | 0.479 | 0.458 | 0.431 | 0.431 | 0.449 | 0.445 | 0.426 | 0.446 | | | 4.190 | A |
| Trichlorotrifluoroethane | | | 0.285 | 0.260 | 0.244 | 0.252 | 0.270 | 0.250 | 0.254 | 0.259 | | | 5.378 | A |

FIT = %RSD For Average Curve And Calibration Coefficent For Linear And Quadratic

$\overline{RF}$ = Mean Response Factor For Average Curve

Curve Types: A - Averged, L - Linear Regression, W - Weighted Linear, Q - Quadratic

m,b = Slope and Intercept For Linear Curve

For curve types L and Q, the RRF and RSP (Response) are shown on separate lines to allow for evaluation against minimum RRF

A,B,C = Coefficents For Quadratic Curve

FORM V I VOA

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | **GCALID - FileID - Conc** | 1203 ~ 2180416p/q7977cD ~ 1 | |
| Report No: | 218040620 | | Instrument ID: | MSV12 | | 1204 ~ 2180416p/q7979cD ~ 5 | 1205 ~ 2180416p/q7980cD ~ 10 | |
| GC Column: | RTX-VMS-30 | ID .25 (mm) | Analyst: | JCK | | 1206 ~ 2180416p/q7981cD ~ 20 | 1207 ~ 2180416p/q7982cD ~ 50 | |
| Calib. Date 1: | 04/16/18 | Time 1: 1603 | Analytical Batch: | 633658 | | 1208 ~ 2180416p/q7983cD ~ 100 | 1209 ~ 2180416p/q7984cD ~ 200 | |
| Calib. Date 2: | 04/16/18 | Time 2: 1843 | Analytical Method: | EPA 8260C | | | | |

| ***ANALYTE*** | ***1201*** | ***1202*** | ***1203*** | ***1204*** | ***1205*** | ***1206*** | ***1207*** | ***1208*** | ***1209*** | ***$\overline{RF}$ / b / A*** | ***m / B*** | ***C*** | ***FIT*** | ***TYPE*** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vinyl acetate | | | 0.159 | 0.153 | 0.157 | 0.185 | 0.191 | 0.203 | 0.215 | 0.181 | | | 13.71 | A |
| Vinyl chloride | | | 0.355 | 0.356 | 0.359 | 0.338 | 0.358 | 0.357 | 0.349 | 0.353 | | | 2.122 | A |
| Xylene (total) | | | 1.287 | 1.379 | 1.350 | 1.356 | 1.447 | 1.464 | 1.396 | 1.383 | | | 4.379 | A |
| cis-1,2-Dichloroethene | | | 0.420 | 0.410 | 0.412 | 0.408 | 0.426 | 0.439 | 0.432 | 0.421 | | | 2.808 | A |
| cis-1,3-Dichloropropene | | | 0.373 | 0.446 | 0.423 | 0.457 | 0.517 | 0.534 | 0.532 | 0.469 | | | 13.06 | A |
| m,p-Xylene | | | 1.315 | 1.418 | 1.364 | 1.366 | 1.452 | 1.464 | 1.386 | 1.395 | | | 3.802 | A |
| n-Butylbenzene | | | 1.780 | 1.750 | 1.838 | 1.964 | 2.084 | 2.179 | 1.986 | 1.940 | | | 8.219 | A |
| n-Hexane | | | 0.388 | 0.352 | 0.319 | 0.366 | 0.361 | 0.379 | 0.364 | 0.361 | | | 6.185 | A |
| n-Propylbenzene | | | 4.725 | 4.309 | 3.951 | 3.878 | 3.795 | 3.646 | 3.102 | 3.915 | | | 13.02 | A |
| o-Xylene | | | 1.230 | 1.301 | 1.321 | 1.336 | 1.439 | 1.462 | 1.416 | 1.358 | | | 6.183 | A |
| sec-Butylbenzene | | | 3.434 | 3.439 | 3.352 | 3.322 | 3.245 | 3.171 | 2.746 | 3.244 | | | 7.392 | A |
| tert-Butyl methyl ether (MTBE) | | | 0.978 | 1.007 | 0.971 | 0.960 | 0.992 | 1.028 | 0.989 | 0.989 | | | 2.319 | A |
| tert-Butylbenzene | | | 1.690 | 1.628 | 1.567 | 1.543 | 1.464 | 1.430 | 1.299 | 1.517 | | | 8.639 | A |
| trans-1,2-Dichloroethene | | | 0.387 | 0.420 | 0.406 | 0.390 | 0.423 | 0.436 | 0.430 | 0.413 | | | 4.650 | A |
| trans-1,3-Dichloropropene | | | 0.366 | 0.366 | 0.360 | 0.400 | 0.444 | 0.473 | 0.477 | 0.412 | | | 12.52 | A |
| trans-1,4-Dichloro-2-butene | | | 0.188 | 0.215 | 0.201 | 0.198 | 0.224 | 0.248 | 0.252 | 0.218 | | | 11.43 | A |

FIT = %RSD For Average Curve And Calibration Coefficent For Linear And Quadratic

Curve Types: A - Averged, L - Linear Regression, W - Weighted Linear, Q - Quadratic

For curve types L and Q, the RRF and RSP (Response) are shown on separate lines to allow for evaluation against minimum RRF

$\overline{RF}$ = Mean Response Factor For Average Curve

m,b = Slope and Intercept For Linear Curve

A,B,C = Coefficents For Quadratic Curve

FORM V I VOA

GCAL, Inc.

Data file : /var/chem/msv12.i/2180416p.s.b/q7977cD.d
Lab Smp Id: 1203 Client Smp ID: V12STD001
Inj Date : 16-APR-2018 16:03
Operator : JCK Inst ID: msv12.i
Smp Info : 1203*V12STD001
Misc Info : MSV~40682~*1*JCK
Comment :
Method : /var/chem/msv12.i/2180416p.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:07 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 16:03 Cal File: q7977cD.d
Als bottle: 2 Calibration Sample, Level: 3
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | AMOUNTS CAL-AMT ( ppb) | AMOUNTS ON-COL ( ppb) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|
| 1 Dichlorodifluoromethane | 85 | 1.771 | 1.771 | (0.263) | 3358 | 1.00000 | 1.01 | |
| 2 Chloromethane ++ | 50 | 1.989 | 1.989 | (0.295) | 3976 | 1.00000 | 1.15 | |
| 3 Vinyl Chloride + | 62 | 2.068 | 2.068 | (0.307) | 3251 | 1.00000 | 1.00 | |
| 5 Bromomethane | 94 | 2.401 | 2.401 | (0.357) | 1291 | 1.00000 | 1.10 | |
| 6 Chloroethane | 64 | 2.551 | 2.551 | (0.379) | 2003 | 1.00000 | 1.28 | |
| 7 Trichlorofluoromethane | 101 | 2.705 | 2.705 | (0.402) | 4394 | 1.00000 | 1.08 | |
| 11 1,1-Dichloroethene + | 96 | 3.305 | 3.305 | (0.491) | 2288 | 1.00000 | 1.07 | |
| 14 Carbon Disulfide | 76 | 3.338 | 3.338 | (0.496) | 10347 | 1.00000 | 1.11 | |
| 10 1,1,2Trichlotrifluoroethane | 101 | 3.353 | 3.353 | (0.498) | 2610 | 1.00000 | 1.10 | (M2) |
| 13 Methyl Iodide | 142 | 3.488 | 3.488 | (0.518) | 1542 | 1.00000 | 2.67 | (M2) |
| 9 Acrolein | 56 | 3.762 | 3.762 | (0.559) | 751 | 5.00000 | 3.91 | |
| 17 Methylene Chloride | 49 | 4.043 | 4.043 | (0.600) | 5027 | 1.00000 | 1.20 | |
| 12 Acetone | 43 | 4.141 | 4.141 | (0.615) | 2888 | 1.00000 | 1.15 | (M2) |
| 19 trans-1,2-Dichloroethene | 61 | 4.242 | 4.242 | (0.630) | 3547 | 1.00000 | 0.937 | |

| | Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | AMOUNTS CAL-AMT ( ppb) | ON-COL ( ppb) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|---|
| | 20 Methyl Acetate | 43 | 4.294 | 4.294 | (0.638) | 2298 | 1.00000 | 0.859 | 5217(M2) |
| | 23 Hexane | 57 | 4.332 | 4.332 | (0.643) | 3557 | 1.00000 | 1.07 | 5982 |
| | 21 MTBE | 73 | 4.384 | 4.384 | (0.651) | 8969 | 1.00000 | 0.989 | 6167 |
| | 24 1,1-Dichloroethane ++ | 63 | 4.939 | 4.939 | (0.733) | 6205 | 1.00000 | 1.12 | |
| | 22 Acrylonitrile | 53 | 5.025 | 5.025 | (0.746) | 4209 | 5.00000 | 4.09 | |
| | 25 Vinyl Acetate | 43 | 5.246 | 5.246 | (0.779) | 1454 | 1.00000 | 0.879 | (M1) |
| | 30 cis-1,2-Dichloroethene | 61 | 5.516 | 5.516 | (0.819) | 3848 | 1.00000 | 0.997 | |
| M | 48 Total 1,2-Dichloroethene | 61 | | | | 7395 | 2.00000 | 1.93 | |
| | 31 2,2-Dichloropropane | 77 | 5.625 | 5.625 | (0.835) | 4339 | 1.00000 | 1.02 | |
| | 38 Cyclohexane | 56 | 5.715 | 5.715 | (0.849) | 3877 | 1.00000 | 0.902 | 6565(M2) |
| | 34 Bromochloromethane | 128 | 5.715 | 5.715 | (0.849) | 1273 | 1.00000 | 0.835 | (M2) |
| | 41 Chloroform + | 83 | 5.779 | 5.779 | (0.858) | 5843 | 1.00000 | 1.08 | |
| | 39 Carbon Tetrachloride | 117 | 5.914 | 5.914 | (0.878) | 4267 | 1.00000 | 1.02 | |
| $ | 36 Dibromofluoromethane | 111 | 5.966 | 5.966 | (0.886) | 121965 | 50.0000 | 49.8 | 7004 |
| | 37 1,1,1-Trichloroethane | 97 | 5.981 | 5.981 | (0.888) | 5053 | 1.00000 | 1.06 | |
| | 42 1,1-Dichloropropene | 75 | 6.101 | 6.101 | (0.906) | 3558 | 1.00000 | 0.962 | |
| | 32 2-Butanone | 43 | 6.120 | 6.120 | (0.909) | 2258 | 1.00000 | 0.931 | |
| | 44 Benzene | 78 | 6.345 | 6.345 | (0.942) | 11663 | 1.00000 | 0.999 | |
| $ | 43 1,2-Dichloroethane-d4 | 67 | 6.476 | 6.476 | (0.962) | 70845 | 50.0000 | 48.9 | |
| | 46 1,2-Dichloroethane | 62 | 6.543 | 6.543 | (0.972) | 4499 | 1.00000 | 1.04 | |
| * | 47 FLUOROBENZENE | 96 | 6.735 | 6.735 | (1.000) | 458339 | 50.0000 | | |
| | 50 Methyl Cyclohexane | 83 | 6.877 | 6.877 | (1.021) | 3962 | 1.00000 | 1.03 | 8516 |
| | 49 Trichloroethene | 130 | 6.888 | 6.888 | (1.023) | 2945 | 1.00000 | 0.915 | |
| | 52 Dibromomethane | 93 | 7.271 | 7.271 | (1.080) | 1689 | 1.00000 | 0.955 | |
| | 51 1,2-Dichloropropane + | 63 | 7.368 | 7.368 | (1.094) | 3430 | 1.00000 | 1.10 | |
| | 54 Bromodichloromethane | 83 | 7.413 | 7.413 | (1.101) | 4191 | 1.00000 | 0.975 | |
| | 57 1-Bromo-2-chloroethane | 63 | 7.829 | 7.829 | (1.163) | 4447 | 1.00000 | 1.00 | 7249 |
| | 56 2-Chloroethyl vinyl ether | 63 | 7.867 | 7.867 | (1.168) | 419 | 1.00000 | 0.919 | (M1) |
| | 58 cis-1,3-Dichloropropene | 75 | 7.942 | 7.942 | (1.179) | 3423 | 1.00000 | 0.796 | |
| $ | 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.879) | 440081 | 50.0000 | 51.9 | |
| | 61 Toluene + | 91 | 8.129 | 8.129 | (0.884) | 12038 | 1.00000 | 1.02 | |
| | 66 Tetrachloroethene | 164 | 8.414 | 8.414 | (0.915) | 3119 | 1.00000 | 1.16 | |
| | 59 4-methyl-2-pentanone | 43 | 8.414 | 8.414 | (0.915) | 3388 | 1.00000 | 0.898 | |
| | 62 trans-1,3-Dichloropropene | 75 | 8.436 | 8.436 | (1.253) | 3357 | 1.00000 | 0.889 | |
| M | 145 1-3 Dichloropropene total | 100 | | | | 6780 | 2.00000 | 1.69 | 0 |
| | 65 1,1,2-Trichloroethane | 97 | 8.560 | 8.560 | (0.931) | 3036 | 1.00000 | 1.08 | |
| | 69 Dibromochloromethane | 129 | 8.684 | 8.684 | (0.944) | 3249 | 1.00000 | 0.935 | |
| | 67 1,3-Dichloropropane | 76 | 8.751 | 8.751 | (0.951) | 4188 | 1.00000 | 0.946 | |
| | 70 1,2-Dibromoethane(EDB) | 107 | 8.860 | 8.860 | (0.963) | 2109 | 1.00000 | 0.824 | |
| | 68 2-Hexanone | 43 | 9.006 | 9.006 | (0.979) | 2517 | 1.00000 | 0.866 | |
| | 140 1-Chlorohexane | 91 | 9.179 | 9.179 | (0.998) | 2210 | 1.00000 | 0.750 | 3658 |
| * | 71 CHLOROBENZENE-d5 | 82 | 9.197 | 9.197 | (1.000) | 174279 | 50.0000 | | |
| | 72 Chlorobenzene ++ | 112 | 9.209 | 9.209 | (1.001) | 8538 | 1.00000 | 1.10 | |
| | 73 Ethylbenzene + | 106 | 9.216 | 9.216 | (1.002) | 3850 | 1.00000 | 0.963 | |
| | 74 1,1,1,2-Tetrachloroethane | 133 | 9.242 | 9.242 | (1.005) | 3341 | 1.00000 | 1.06 | |
| | 75 p,m-Xylene | 106 | 9.310 | 9.310 | (1.012) | 9166 | 2.00000 | 1.89 | |
| | 76 o-Xylene | 106 | 9.587 | 9.587 | (1.042) | 4287 | 1.00000 | 0.906 | |

| | | | QUANT SIG | | | | | AMOUNTS | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Compounds | MASS | RT | EXP RT | REL RT | RESPONSE | CAL-AMT ( ppb) | ON-COL ( ppb) | SIMILARITY |
| M | 99 | TOTAL XYLENE | 106 | | | | 13453 | 3.00000 | 2.79 | |
| | 77 | Styrene | 104 | 9.625 | 9.625 | (1.046) | 6056 | 1.00000 | 0.806 | |
| | 78 | Bromoform ++ | 173 | 9.651 | 9.651 | (1.049) | 2748 | 1.00000 | 0.972 | |
| | 79 | Isopropylbenzene | 105 | 9.782 | 9.782 | (1.064) | 9936 | 1.00000 | 0.871 | |
| $ | 80 | Bromofluorobenzene | 174 | 9.973 | 9.973 | (1.084) | 142163 | 50.0000 | 46.1 | |
| | 84 | Bromobenzene | 77 | 10.045 | 10.045 | (0.943) | 5140 | 1.00000 | 1.19 | |
| | 86 | n-Propylbenzene | 91 | 10.041 | 10.041 | (0.943) | 12801 | 1.00000 | 1.21 | |
| | 81 | 1,1,2,2-Tetrachloroethane++ | 83 | 10.082 | 10.082 | (0.947) | 4200 | 1.00000 | 0.530 | |
| | 87 | 2-Chlorotoluene | 91 | 10.146 | 10.146 | (0.953) | 9087 | 1.00000 | 1.20 | |
| | 88 | 1,3,5-Trimethylbenzene | 105 | 10.157 | 10.157 | (0.954) | 8261 | 1.00000 | 1.09 | |
| | 85 | 1,2,3-Trichloropropane | 75 | 10.172 | 10.172 | (0.955) | 3833 | 1.00000 | 1.10 | |
| | 83 | trans-1,4-Dichloro-2-Butene | 53 | 10.198 | 10.198 | (0.958) | 508 | 1.00000 | 0.861 | (M3) |
| | 90 | 4-Chlorotoluene | 91 | 10.251 | 10.251 | (0.963) | 7092 | 1.00000 | 1.08 | |
| | 91 | tert-butylbenzene | 91 | 10.348 | 10.348 | (0.972) | 4579 | 1.00000 | 1.11 | |
| | 93 | 1,2,4-Trimethylbenzene | 105 | 10.389 | 10.389 | (0.976) | 7577 | 1.00000 | 1.03 | |
| | 94 | sec-Butylbenzene | 105 | 10.457 | 10.457 | (0.982) | 9304 | 1.00000 | 1.06 | |
| | 92 | p-Isopropyltoluene | 119 | 10.532 | 10.532 | (0.989) | 7233 | 1.00000 | 0.987 | |
| | 96 | 1,3-Dichlorobenzene | 146 | 10.607 | 10.607 | (0.996) | 4932 | 1.00000 | 1.08 | |
| * | 97 | 1,4-DICHLOROBENZENE-D4 | 152 | 10.648 | 10.648 | (1.000) | 135470 | 50.0000 | | |
| | 98 | 1,4-Dichlorobenzene | 146 | 10.656 | 10.656 | (1.001) | 5770 | 1.00000 | 1.20 | |
| | 100 | n-Butylbenzene | 91 | 10.787 | 10.787 | (1.013) | 4824 | 1.00000 | 0.918 | |
| | 102 | 1,2-Dichlorobenzene | 146 | 10.918 | 10.918 | (1.025) | 4639 | 1.00000 | 1.00 | |
| | 106 | 1,2-Dibromo-3-Chloropropane | 157 | 11.447 | 11.447 | (1.075) | 641 | 1.00000 | 0.896 | (M2) |
| | 109 | Hexachlorobutadiene | 225 | 11.911 | 11.911 | (1.119) | 1095 | 1.00000 | 0.811 | |
| | 108 | 1,2,4-Trichlorobenzene | 180 | 11.953 | 11.953 | (1.123) | 701 | 1.00000 | 5.11 | (M1) |
| | 110 | Naphthalene | 128 | 12.260 | 12.260 | (1.151) | 1466 | 1.00000 | 7.85 | |
| | 111 | 1,2,3-Trichlorobenzene | 180 | 12.414 | 12.414 | (1.166) | 415 | 1.00000 | 4.14 | (M1) |

QC Flag Legend

M1- Compound response manually integrated because
Target system did not integrate.
M2- Compound response manually integrated because
Target system integrated incorrectly.
M3- Compound response manually integrated because
Target system integrated incorrect peak.

Data File: /var/chem/msv12.i/2180416p.s.b/q7977cD.d



Date : 16-APR-2018 16:03

Client ID: V12STD001

Instrument: msv12.i

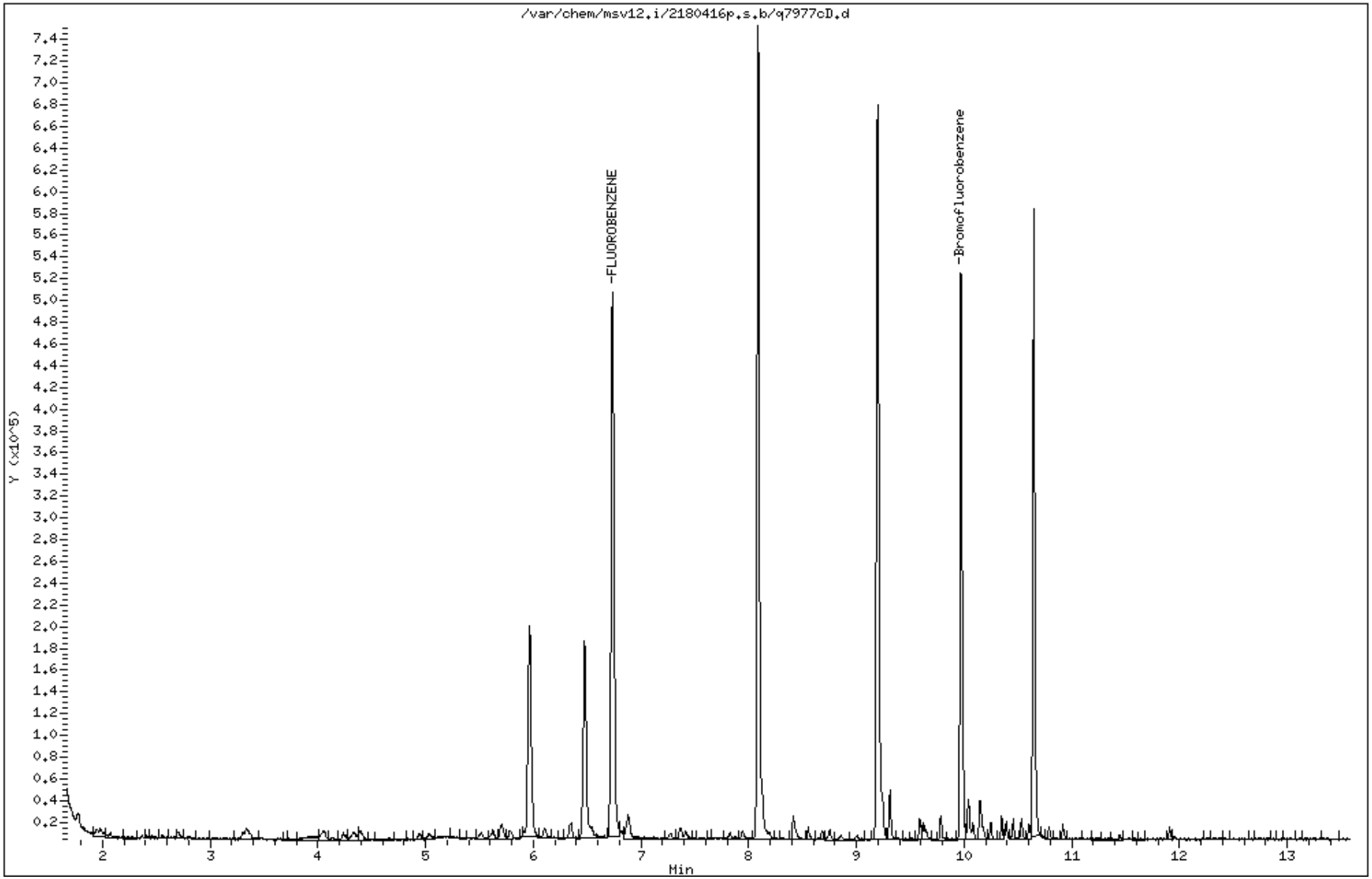
Sample Info: 1203*V12STD001

Purge Volume: 5.0

Operator: JCK

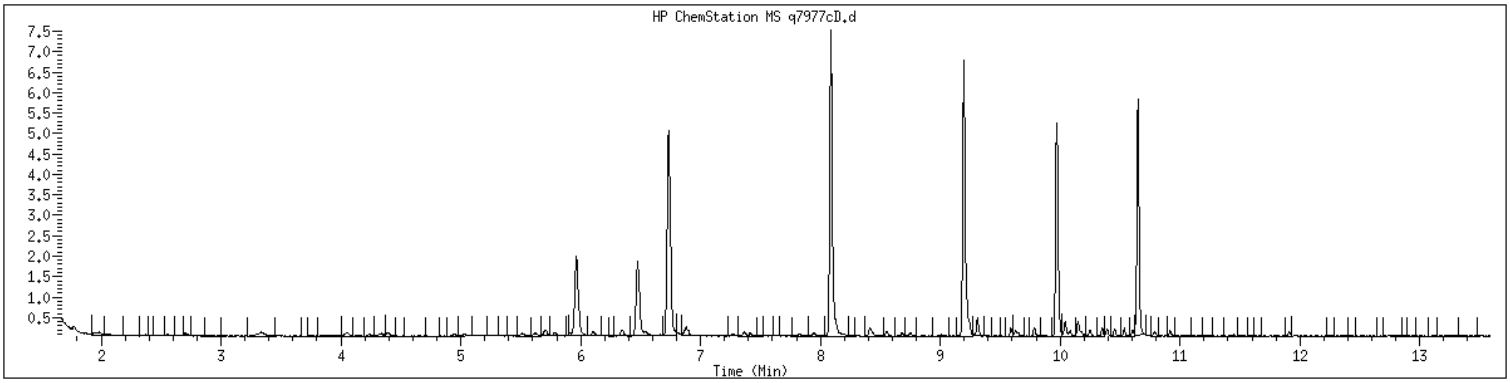
Column phase: RTX-VMS-30M

Column diameter: 0.25



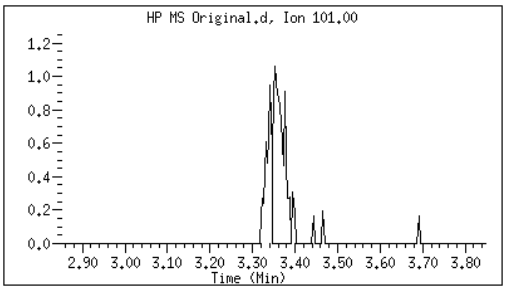
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 1203 SampleType : CALIB_3
Injection Date: 04/16/2018 16:03 Instrument : msv12.i
Operator : JCK
Sample Info : 1203*V12STD001
Misc Info : MSV~40682~*1*JCK
Method : /var/chem/msv12.i/2180416p.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b




Original Final

10 1,1,2Trichlotrifluoroethane CAS#: 76-13-1 Reason: M2

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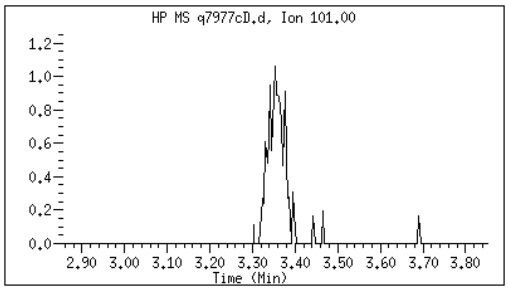
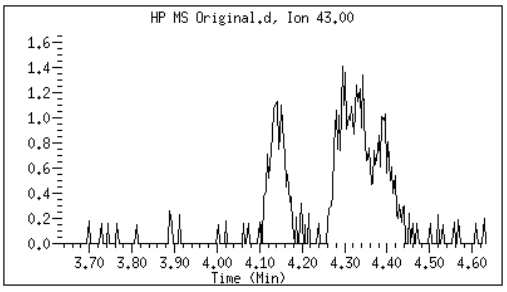
User: jck2
Date: 04/16/2018 16:57




12 Acetone CAS#: 67-64-1 Reason: M2

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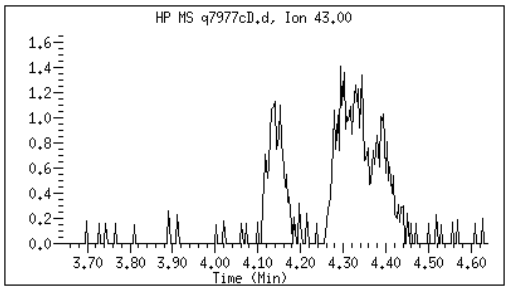
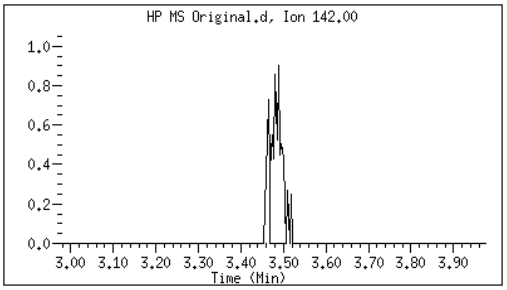


Original Final

13 Methyl Iodide CAS#: 74-88-4 Reason: M2

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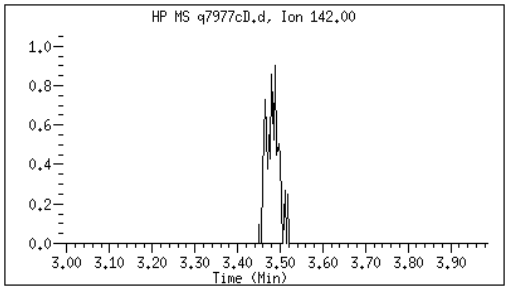
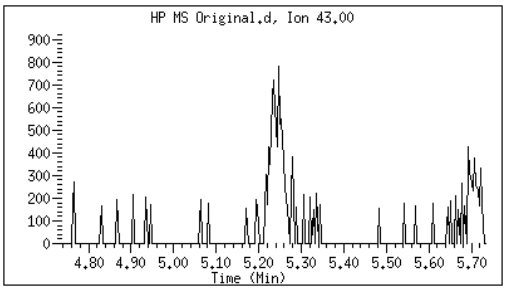



25 Vinyl Acetate CAS#: 108-05-4 Reason: M1

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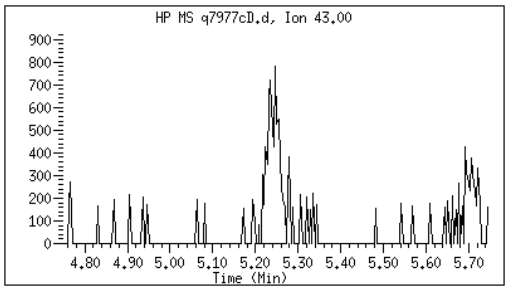
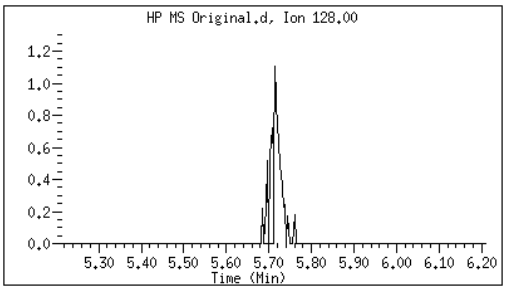



34 Bromochloromethane CAS#: 74-97-5 Reason: M2

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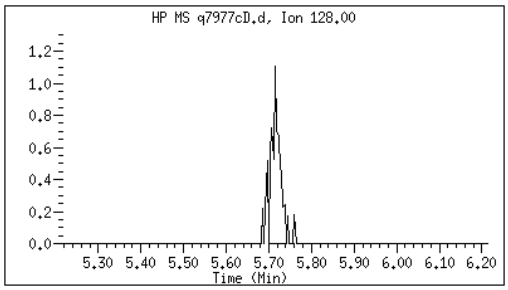
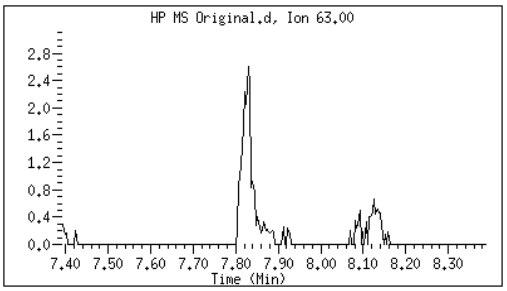
Date: 04/16/2018 16:58




56 2-Chloroethyl vinyl ether CAS#: 110-75-8 Reason: M1

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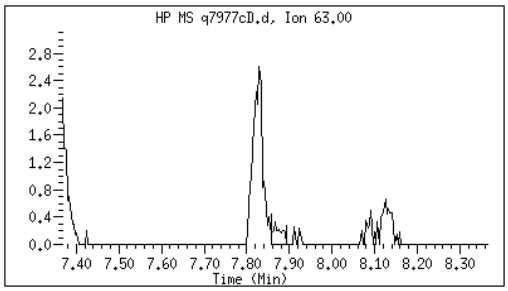
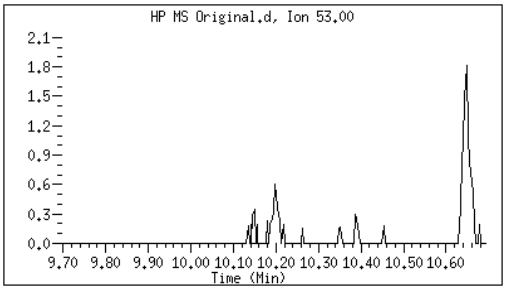
User: jck2
Date: 04/16/2018 16:59



Original Final

83 trans-1,4-Dichloro-2-Butene CAS#: 110-57-6 Reason: M3

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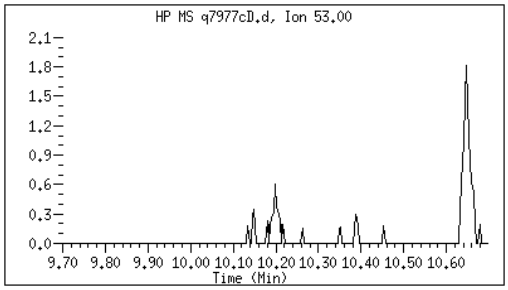
Date: 04/16/2018 16:59

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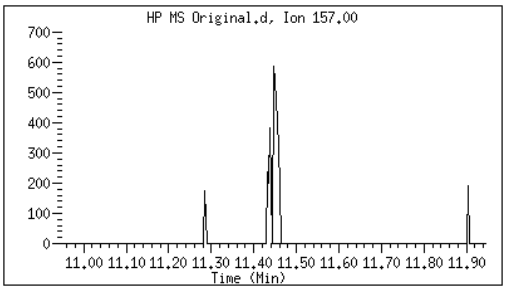
106 1,2-Dibromo-3-Chloropropane CAS#: 96-12-8 Reason: M2

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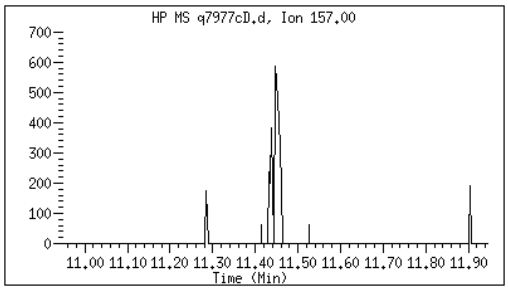


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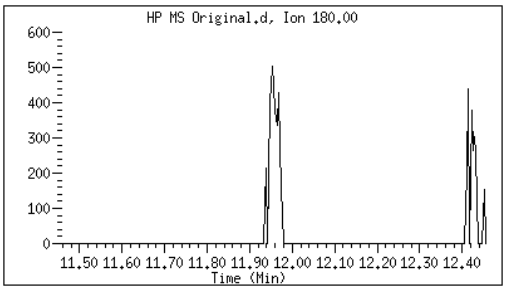
108 1,2,4-Trichlorobenzene CAS#: 120-82-1 Reason: M1

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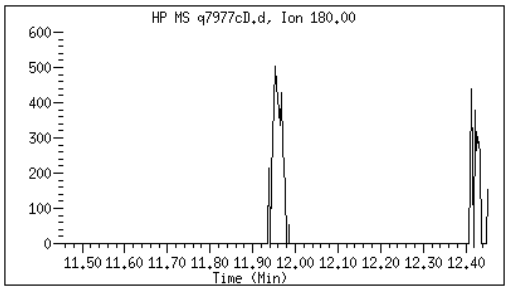


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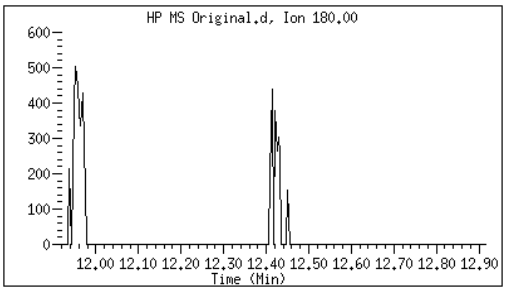
111 1,2,3-Trichlorobenzene CAS#: 87-61-6 Reason: M1

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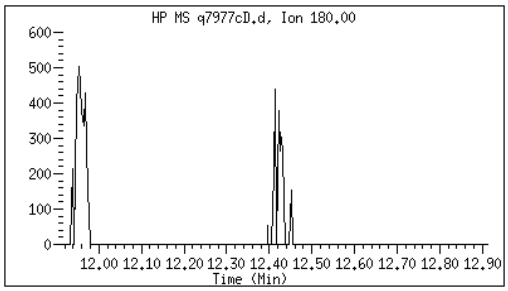


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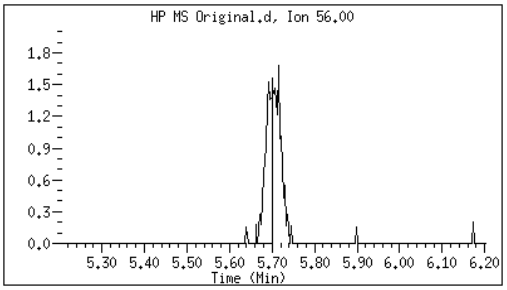
Original Final

38 Cyclohexane CAS#: 110-82-7 Reason: M2

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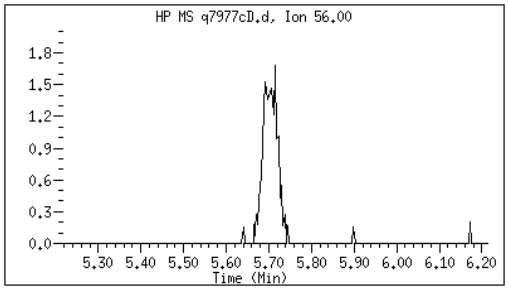


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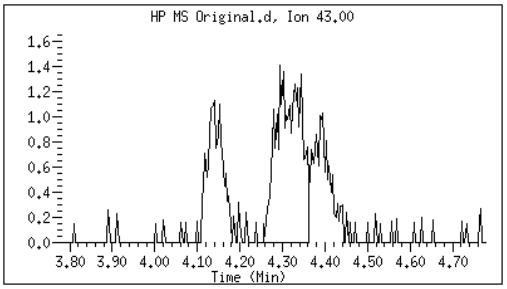
20 Methyl Acetate CAS#: 79-20-9 Reason: M2

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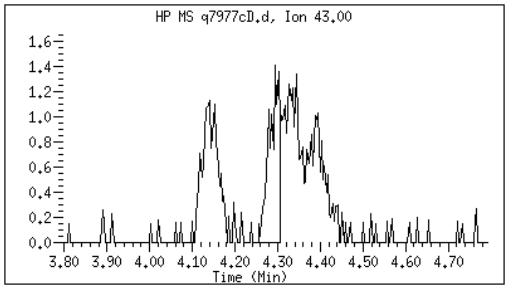


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M1 - Target system did not integrate
M2 - Target system integrated incorrectly
M3 - Target system integrated incorrect peak

GCAL, Inc.

Data file : /var/chem/msv12.i/2180416p.s.b/q7979cD.d
Lab Smp Id: 1204 Client Smp ID: V12STD005
Inj Date : 16-APR-2018 16:48
Operator : JCK Inst ID: msv12.i
Smp Info : 1204*V12STD005
Misc Info : MSV~40682~*1*JCK
Comment :
Method : /var/chem/msv12.i/2180416p.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:07 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 16:48 Cal File: q7979cD.d
Als bottle: 4 Calibration Sample, Level: 4
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | AMOUNTS CAL-AMT ( ppb) | AMOUNTS ON-COL ( ppb) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|
| 1 Dichlorodifluoromethane | 85 | 1.775 | 1.775 | (0.264) | 17136 | 5.00000 | 5.17 | |
| 2 Chloromethane ++ | 50 | 1.981 | 1.981 | (0.294) | 17221 | 5.00000 | 4.98 | |
| 3 Vinyl Chloride + | 62 | 2.071 | 2.071 | (0.308) | 16316 | 5.00000 | 5.05 | |
| 5 Bromomethane | 94 | 2.409 | 2.409 | (0.358) | 4993 | 5.00000 | 4.25 | |
| 6 Chloroethane | 64 | 2.551 | 2.551 | (0.379) | 7736 | 5.00000 | 4.93 | |
| 7 Trichlorofluoromethane | 101 | 2.697 | 2.697 | (0.401) | 20972 | 5.00000 | 5.14 | |
| 11 1,1-Dichloroethene + | 96 | 3.293 | 3.293 | (0.489) | 10275 | 5.00000 | 4.83 | |
| 14 Carbon Disulfide | 76 | 3.331 | 3.331 | (0.495) | 38219 | 5.00000 | 4.95 | |
| 10 1,1,2Trichlotrifluoroethane | 101 | 3.353 | 3.353 | (0.498) | 11909 | 5.00000 | 5.02 | |
| 13 Methyl Iodide | 142 | 3.473 | 3.473 | (0.516) | 8185 | 5.00000 | 5.41 | |
| 9 Acrolein | 56 | 3.758 | 3.758 | (0.558) | 5053 | 25.0000 | 26.3 | |
| 17 Methylene Chloride | 49 | 4.047 | 4.047 | (0.601) | 21042 | 5.00000 | 5.01 | |
| 12 Acetone | 43 | 4.137 | 4.137 | (0.614) | 13115 | 5.00000 | 5.25 | |
| 19 trans-1,2-Dichloroethene | 61 | 4.238 | 4.238 | (0.629) | 19225 | 5.00000 | 5.08 | |

| | Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | AMOUNTS CAL-AMT ( ppb) | ON-COL ( ppb) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|---|
| | 20 Methyl Acetate | 43 | 4.287 | 4.287 | (0.637) | 13335 | 5.00000 | 4.99 | 8355 |
| | 23 Hexane | 57 | 4.328 | 4.328 | (0.643) | 16090 | 5.00000 | 4.87 | 8562 |
| | 21 MTBE | 73 | 4.384 | 4.384 | (0.651) | 46110 | 5.00000 | 5.09 | 8613 |
| | 24 1,1-Dichloroethane ++ | 63 | 4.943 | 4.943 | (0.734) | 28917 | 5.00000 | 5.21 | |
| | 22 Acrylonitrile | 53 | 5.025 | 5.025 | (0.746) | 23380 | 25.0000 | 22.7 | |
| | 25 Vinyl Acetate | 43 | 5.239 | 5.239 | (0.778) | 7005 | 5.00000 | 4.24 | |
| | 30 cis-1,2-Dichloroethene | 61 | 5.509 | 5.509 | (0.818) | 18772 | 5.00000 | 4.87 | |
| M | 48 Total 1,2-Dichloroethene | 61 | | | | 37997 | 10.0000 | 9.95 | |
| | 31 2,2-Dichloropropane | 77 | 5.621 | 5.621 | (0.835) | 21517 | 5.00000 | 5.06 | |
| | 38 Cyclohexane | 56 | 5.704 | 5.704 | (0.847) | 21306 | 5.00000 | 4.96 | 8287 |
| | 34 Bromochloromethane | 128 | 5.711 | 5.711 | (0.848) | 7747 | 5.00000 | 5.09 | |
| | 41 Chloroform + | 83 | 5.790 | 5.790 | (0.860) | 27292 | 5.00000 | 5.05 | |
| | 39 Carbon Tetrachloride | 117 | 5.917 | 5.917 | (0.879) | 21632 | 5.00000 | 5.17 | |
| $ | 36 Dibromofluoromethane | 111 | 5.962 | 5.962 | (0.885) | 122751 | 50.0000 | 50.2 | 6990 |
| | 37 1,1,1-Trichloroethane | 97 | 5.981 | 5.981 | (0.888) | 24159 | 5.00000 | 5.07 | |
| | 42 1,1-Dichloropropene | 75 | 6.109 | 6.109 | (0.907) | 17869 | 5.00000 | 4.84 | |
| | 32 2-Butanone | 43 | 6.116 | 6.116 | (0.908) | 11801 | 5.00000 | 4.87 | |
| | 44 Benzene | 78 | 6.348 | 6.348 | (0.943) | 57818 | 5.00000 | 4.96 | |
| $ | 43 1,2-Dichloroethane-d4 | 67 | 6.472 | 6.472 | (0.961) | 71183 | 50.0000 | 49.2 | |
| | 46 1,2-Dichloroethane | 62 | 6.536 | 6.536 | (0.970) | 22513 | 5.00000 | 5.23 | |
| * | 47 FLUOROBENZENE | 96 | 6.735 | 6.735 | (1.000) | 457756 | 50.0000 | | |
| | 50 Methyl Cyclohexane | 83 | 6.877 | 6.877 | (1.021) | 18317 | 5.00000 | 4.77 | 8503 |
| | 49 Trichloroethene | 130 | 6.888 | 6.888 | (1.023) | 16820 | 5.00000 | 5.23 | |
| | 52 Dibromomethane | 93 | 7.271 | 7.271 | (1.080) | 8990 | 5.00000 | 5.09 | |
| | 51 1,2-Dichloropropane + | 63 | 7.364 | 7.364 | (1.093) | 15925 | 5.00000 | 5.11 | |
| | 54 Bromodichloromethane | 83 | 7.413 | 7.413 | (1.101) | 21964 | 5.00000 | 5.11 | |
| | 57 1-Bromo-2-chloroethane | 63 | 7.825 | 7.825 | (1.162) | 22435 | 5.00000 | 5.06 | 9517 |
| | 56 2-Chloroethyl vinyl ether | 63 | 7.889 | 7.889 | (1.171) | 2930 | 5.00000 | 6.43 | (M3) |
| | 58 cis-1,3-Dichloropropene | 75 | 7.942 | 7.942 | (1.179) | 20396 | 5.00000 | 4.75 | |
| $ | 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.879) | 444640 | 50.0000 | 50.4 | |
| | 61 Toluene + | 91 | 8.125 | 8.125 | (0.883) | 63218 | 5.00000 | 5.13 | |
| | 66 Tetrachloroethene | 164 | 8.414 | 8.414 | (0.915) | 14085 | 5.00000 | 5.03 | |
| | 59 4-methyl-2-pentanone | 43 | 8.414 | 8.414 | (0.915) | 20194 | 5.00000 | 5.15 | |
| | 62 trans-1,3-Dichloropropene | 75 | 8.440 | 8.440 | (1.253) | 16740 | 5.00000 | 4.44 | |
| M | 145 1-3 Dichloropropene total | 100 | | | | 37136 | 10.0000 | 9.19 | 0 |
| | 65 1,1,2-Trichloroethane | 97 | 8.553 | 8.553 | (0.930) | 14626 | 5.00000 | 4.99 | |
| | 69 Dibromochloromethane | 129 | 8.680 | 8.680 | (0.944) | 18478 | 5.00000 | 5.11 | |
| | 67 1,3-Dichloropropane | 76 | 8.751 | 8.751 | (0.951) | 23300 | 5.00000 | 5.06 | |
| | 70 1,2-Dibromoethane(EDB) | 107 | 8.856 | 8.856 | (0.963) | 12971 | 5.00000 | 4.87 | |
| | 68 2-Hexanone | 43 | 8.999 | 8.999 | (0.978) | 14129 | 5.00000 | 4.67 | |
| | 140 1-Chlorohexane | 91 | 9.182 | 9.182 | (0.998) | 13479 | 5.00000 | 4.39 | 4757 |
| * | 71 CHLOROBENZENE-d5 | 82 | 9.197 | 9.197 | (1.000) | 181360 | 50.0000 | | |
| | 72 Chlorobenzene ++ | 112 | 9.205 | 9.205 | (1.001) | 40946 | 5.00000 | 5.07 | |
| | 73 Ethylbenzene + | 106 | 9.216 | 9.216 | (1.002) | 21826 | 5.00000 | 5.25 | |
| | 74 1,1,1,2-Tetrachloroethane | 133 | 9.246 | 9.246 | (1.005) | 16636 | 5.00000 | 5.07 | |
| | 75 p,m-Xylene | 106 | 9.314 | 9.314 | (1.013) | 51443 | 10.0000 | 10.2 | |
| | 76 o-Xylene | 106 | 9.591 | 9.591 | (1.043) | 23596 | 5.00000 | 4.79 | |

| | | | QUANT SIG | | | | | AMOUNTS | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Compounds | MASS | RT | EXP RT | REL RT | RESPONSE | CAL-AMT ( ppb) | ON-COL ( ppb) | SIMILARITY |
| M | 99 | TOTAL XYLENE | 106 | | | | 75039 | 15.0000 | 15.0 | |
| | 77 | Styrene | 104 | 9.625 | 9.625 | (1.046) | 36314 | 5.00000 | 4.64 | |
| | 78 | Bromoform ++ | 173 | 9.651 | 9.651 | (1.049) | 14389 | 5.00000 | 4.89 | |
| | 79 | Isopropylbenzene | 105 | 9.786 | 9.786 | (1.064) | 57578 | 5.00000 | 4.85 | |
| $ | 80 | Bromofluorobenzene | 174 | 9.973 | 9.973 | (1.084) | 151788 | 50.0000 | 47.3 | |
| | 84 | Bromobenzene | 77 | 10.041 | 10.041 | (0.943) | 26772 | 5.00000 | 5.46 | |
| | 86 | n-Propylbenzene | 91 | 10.041 | 10.041 | (0.943) | 66230 | 5.00000 | 5.50 | |
| | 81 | 1,1,2,2-Tetrachloroethane++ | 83 | 10.082 | 10.082 | (0.947) | 22698 | 5.00000 | 6.13 | |
| | 87 | 2-Chlorotoluene | 91 | 10.146 | 10.146 | (0.953) | 47059 | 5.00000 | 5.49 | |
| | 88 | 1,3,5-Trimethylbenzene | 105 | 10.150 | 10.150 | (0.953) | 46579 | 5.00000 | 5.42 | |
| | 85 | 1,2,3-Trichloropropane | 75 | 10.172 | 10.172 | (0.955) | 22592 | 5.00000 | 5.72 | |
| | 83 | trans-1,4-Dichloro-2-Butene | 53 | 10.195 | 10.195 | (0.957) | 3298 | 5.00000 | 4.92 | |
| | 90 | 4-Chlorotoluene | 91 | 10.247 | 10.247 | (0.962) | 39171 | 5.00000 | 5.25 | |
| | 91 | tert-butylbenzene | 91 | 10.352 | 10.352 | (0.972) | 25016 | 5.00000 | 5.36 | |
| | 93 | 1,2,4-Trimethylbenzene | 105 | 10.390 | 10.390 | (0.976) | 42856 | 5.00000 | 5.12 | |
| | 94 | sec-Butylbenzene | 105 | 10.457 | 10.457 | (0.982) | 52862 | 5.00000 | 5.30 | |
| | 92 | p-Isopropyltoluene | 119 | 10.536 | 10.536 | (0.989) | 41876 | 5.00000 | 5.04 | |
| | 96 | 1,3-Dichlorobenzene | 146 | 10.607 | 10.607 | (0.996) | 26700 | 5.00000 | 5.13 | |
| * | 97 | 1,4-DICHLOROBENZENE-D4 | 152 | 10.648 | 10.648 | (1.000) | 153694 | 50.0000 | | |
| | 98 | 1,4-Dichlorobenzene | 146 | 10.656 | 10.656 | (1.001) | 27303 | 5.00000 | 5.01 | |
| | 100 | n-Butylbenzene | 91 | 10.787 | 10.787 | (1.013) | 26897 | 5.00000 | 4.51 | |
| | 102 | 1,2-Dichlorobenzene | 146 | 10.918 | 10.918 | (1.025) | 27627 | 5.00000 | 5.25 | |
| | 106 | 1,2-Dibromo-3-Chloropropane | 157 | 11.450 | 11.450 | (1.075) | 4633 | 5.00000 | 5.71 | |
| | 109 | Hexachlorobutadiene | 225 | 11.908 | 11.908 | (1.118) | 8496 | 5.00000 | 5.55 | |
| | 108 | 1,2,4-Trichlorobenzene | 180 | 11.960 | 11.960 | (1.123) | 5054 | 5.00000 | 6.69 | |
| | 110 | Naphthalene | 128 | 12.249 | 12.249 | (1.150) | 7644 | 5.00000 | 8.85 | |
| | 111 | 1,2,3-Trichlorobenzene | 180 | 12.421 | 12.421 | (1.167) | 4942 | 5.00000 | 5.88 | |

QC Flag Legend

M3- Compound response manually integrated because
Target system integrated incorrect peak.

Data File: /var/chem/msv12.i/2180416p.s.b/q7979cD.d



Date : 16-APR-2018 16:48

Client ID: V12STD005

Instrument: msv12.i

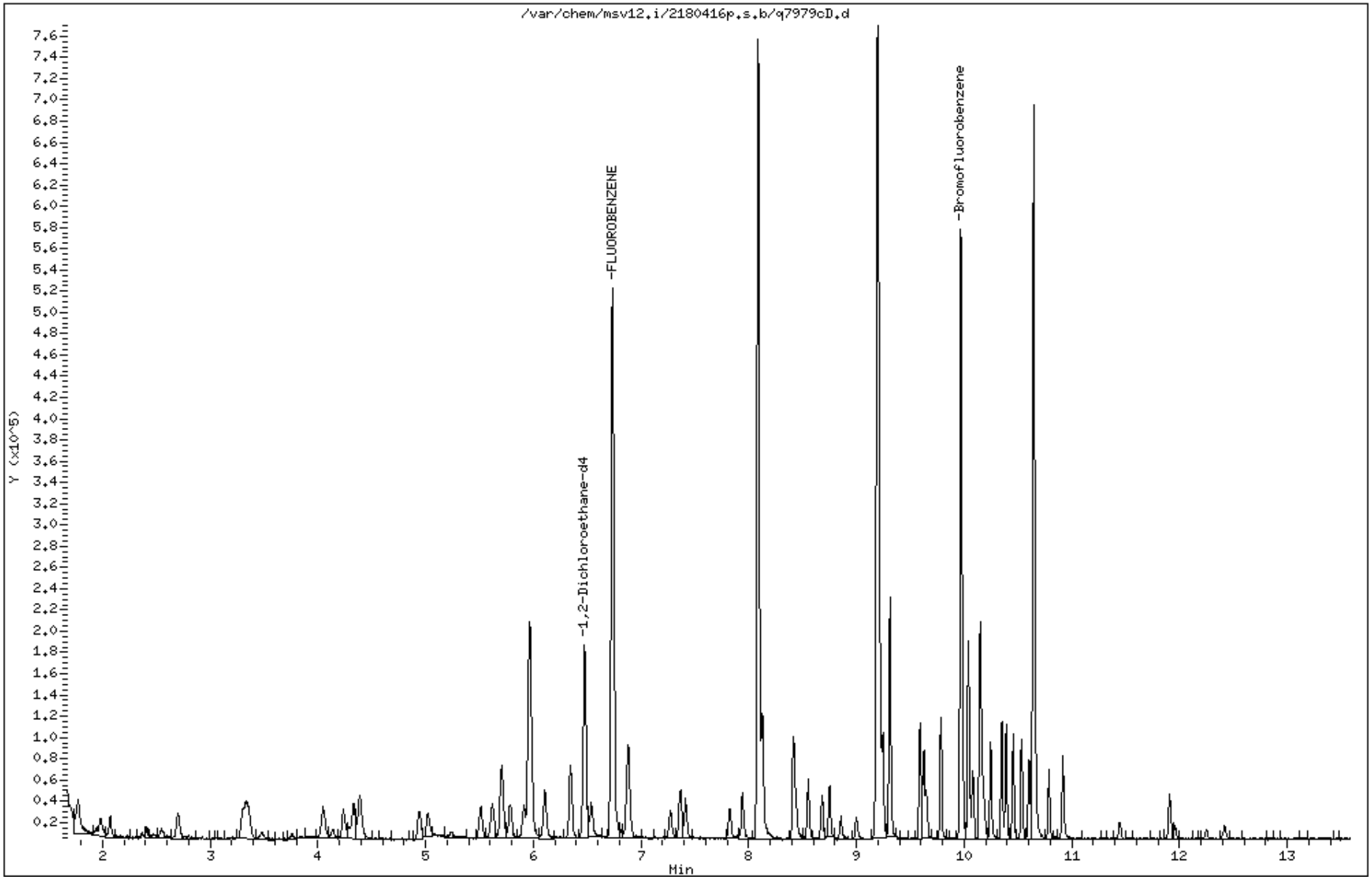
Sample Info: 1204*V12STD005

Purge Volume: 5.0

Operator: JCK

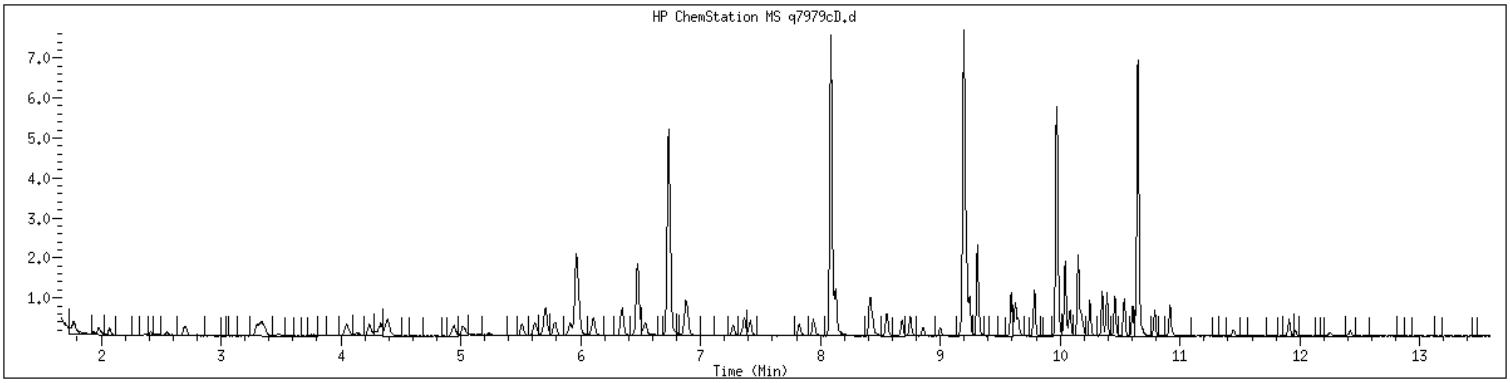
Column phase: RTX-VMS-30M

Column diameter: 0.25



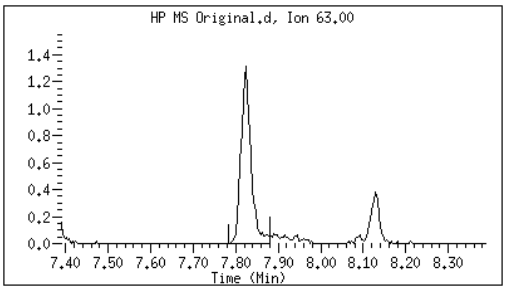
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 1204 SampleType : CALIB_4
Injection Date: 04/16/2018 16:48 Instrument : msv12.i
Operator : JCK
Sample Info : 1204*V12STD005
Misc Info : MSV~40682~*1*JCK
Method : /var/chem/msv12.i/2180416p.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b



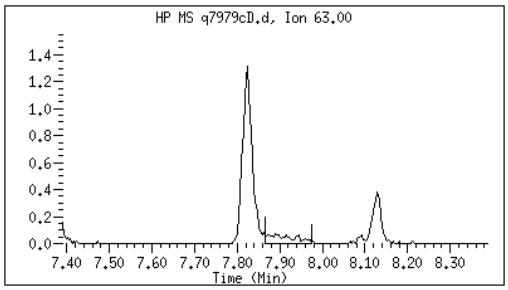

Original Final

56 2-Chloroethyl vinyl ether CAS#: 110-75-8 Reason: M3




Electronic Signature Applied

User: jck2
Date: 04/16/2018 17:06




M3 - Target system integrated incorrect peak

GCAL, Inc.

Data file : /var/chem/msv12.i/2180416p.s.b/q7980cD.d
Lab Smp Id: 1205 Client Smp ID: V12STD010
Inj Date : 16-APR-2018 17:11
Operator : JCK Inst ID: msv12.i
Smp Info : 1205*V12STD010
Misc Info : MSV~40682~*1*JCK
Comment :
Method : /var/chem/msv12.i/2180416p.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:07 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 17:11 Cal File: q7980cD.d
Als bottle: 5 Calibration Sample, Level: 5
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | AMOUNTS CAL-AMT ( ppb) | AMOUNTS ON-COL ( ppb) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|
| 1 Dichlorodifluoromethane | 85 | 1.771 | 1.771 | (0.263) | 34282 | 10.0000 | 10.2 | |
| 2 Chloromethane ++ | 50 | 1.981 | 1.981 | (0.294) | 34218 | 10.0000 | 9.73 | |
| 3 Vinyl Chloride + | 62 | 2.067 | 2.067 | (0.307) | 33425 | 10.0000 | 10.2 | |
| 5 Bromomethane | 94 | 2.412 | 2.412 | (0.358) | 11015 | 10.0000 | 9.23 | |
| 6 Chloroethane | 64 | 2.547 | 2.547 | (0.378) | 16387 | 10.0000 | 10.3 | |
| 7 Trichlorofluoromethane | 101 | 2.705 | 2.705 | (0.402) | 40158 | 10.0000 | 9.68 | |
| 11 1,1-Dichloroethene + | 96 | 3.301 | 3.301 | (0.490) | 21184 | 10.0000 | 9.78 | |
| 14 Carbon Disulfide | 76 | 3.331 | 3.331 | (0.495) | 69653 | 10.0000 | 9.12 | |
| 10 1,1,2Trichlotrifluoroethane | 101 | 3.349 | 3.349 | (0.497) | 22758 | 10.0000 | 9.43 | |
| 13 Methyl Iodide | 142 | 3.481 | 3.481 | (0.517) | 18472 | 10.0000 | 9.51 | |
| 9 Acrolein | 56 | 3.762 | 3.762 | (0.559) | 9063 | 50.0000 | 46.5 | |
| 17 Methylene Chloride | 49 | 4.047 | 4.047 | (0.601) | 42483 | 10.0000 | 9.95 | |
| 12 Acetone | 43 | 4.137 | 4.137 | (0.614) | 24134 | 10.0000 | 9.50 | |
| 19 trans-1,2-Dichloroethene | 61 | 4.238 | 4.238 | (0.629) | 37800 | 10.0000 | 9.83 | |

| | Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | AMOUNTS CAL-AMT ( ppb) | ON-COL ( ppb) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|---|
| | 20 Methyl Acetate | 43 | 4.287 | 4.287 | (0.636) | 25736 | 10.0000 | 9.47 | 8269(M2) |
| | 23 Hexane | 57 | 4.332 | 4.332 | (0.643) | 29663 | 10.0000 | 8.82 | 8880 |
| | 21 MTBE | 73 | 4.392 | 4.392 | (0.652) | 90392 | 10.0000 | 9.81 | 8944 |
| | 24 1,1-Dichloroethane ++ | 63 | 4.939 | 4.939 | (0.733) | 54543 | 10.0000 | 9.67 | |
| | 22 Acrylonitrile | 53 | 5.025 | 5.025 | (0.746) | 52015 | 50.0000 | 49.7 | |
| | 25 Vinyl Acetate | 43 | 5.235 | 5.235 | (0.777) | 14590 | 10.0000 | 8.68 | |
| | 30 cis-1,2-Dichloroethene | 61 | 5.509 | 5.509 | (0.818) | 38368 | 10.0000 | 9.79 | |
| M | 48 Total 1,2-Dichloroethene | 61 | | | | 76168 | 20.0000 | 19.6 | |
| | 31 2,2-Dichloropropane | 77 | 5.614 | 5.614 | (0.834) | 41441 | 10.0000 | 9.59 | |
| | 38 Cyclohexane | 56 | 5.704 | 5.704 | (0.847) | 42441 | 10.0000 | 9.72 | 8546 |
| | 34 Bromochloromethane | 128 | 5.715 | 5.715 | (0.849) | 16016 | 10.0000 | 10.3 | |
| | 41 Chloroform + | 83 | 5.786 | 5.786 | (0.859) | 54494 | 10.0000 | 9.91 | |
| | 39 Carbon Tetrachloride | 117 | 5.910 | 5.910 | (0.878) | 42042 | 10.0000 | 9.89 | |
| $ | 36 Dibromofluoromethane | 111 | 5.962 | 5.962 | (0.885) | 125322 | 50.0000 | 50.4 | 7029 |
| | 37 1,1,1-Trichloroethane | 97 | 5.985 | 5.985 | (0.889) | 47249 | 10.0000 | 9.74 | |
| | 42 1,1-Dichloropropene | 75 | 6.108 | 6.108 | (0.907) | 36808 | 10.0000 | 9.80 | |
| | 32 2-Butanone | 43 | 6.108 | 6.108 | (0.907) | 23609 | 10.0000 | 9.59 | |
| | 44 Benzene | 78 | 6.345 | 6.345 | (0.942) | 118202 | 10.0000 | 9.96 | |
| $ | 43 1,2-Dichloroethane-d4 | 67 | 6.476 | 6.476 | (0.962) | 73217 | 50.0000 | 49.7 | |
| | 46 1,2-Dichloroethane | 62 | 6.536 | 6.536 | (0.970) | 43248 | 10.0000 | 9.87 | |
| * | 47 FLUOROBENZENE | 96 | 6.734 | 6.734 | (1.000) | 465599 | 50.0000 | | |
| | 50 Methyl Cyclohexane | 83 | 6.873 | 6.873 | (1.021) | 36480 | 10.0000 | 9.34 | 9192 |
| | 49 Trichloroethene | 130 | 6.888 | 6.888 | (1.023) | 33421 | 10.0000 | 10.2 | |
| | 52 Dibromomethane | 93 | 7.274 | 7.274 | (1.080) | 18169 | 10.0000 | 10.1 | |
| | 51 1,2-Dichloropropane + | 63 | 7.364 | 7.364 | (1.093) | 30472 | 10.0000 | 9.62 | |
| | 54 Bromodichloromethane | 83 | 7.417 | 7.417 | (1.101) | 43870 | 10.0000 | 10.0 | |
| | 57 1-Bromo-2-chloroethane | 63 | 7.822 | 7.822 | (1.161) | 47106 | 10.0000 | 10.4 | 9565 |
| | 56 2-Chloroethyl vinyl ether | 63 | 7.889 | 7.889 | (1.171) | 3936 | 10.0000 | 8.50 | (M2) |
| | 58 cis-1,3-Dichloropropene | 75 | 7.942 | 7.942 | (1.179) | 39362 | 10.0000 | 9.02 | |
| $ | 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.879) | 451491 | 50.0000 | 49.2 | |
| | 61 Toluene + | 91 | 8.129 | 8.129 | (0.884) | 128244 | 10.0000 | 10.0 | |
| | 66 Tetrachloroethene | 164 | 8.418 | 8.418 | (0.915) | 27637 | 10.0000 | 9.49 | |
| | 59 4-methyl-2-pentanone | 43 | 8.418 | 8.418 | (0.915) | 38779 | 10.0000 | 9.50 | |
| | 62 trans-1,3-Dichloropropene | 75 | 8.436 | 8.436 | (1.253) | 33538 | 10.0000 | 8.74 | |
| M | 145 1-3 Dichloropropene total | 100 | | | | 72900 | 20.0000 | 17.8 | 0 |
| | 65 1,1,2-Trichloroethane | 97 | 8.553 | 8.553 | (0.930) | 29987 | 10.0000 | 9.83 | |
| | 69 Dibromochloromethane | 129 | 8.680 | 8.680 | (0.944) | 37335 | 10.0000 | 9.93 | |
| | 67 1,3-Dichloropropane | 76 | 8.751 | 8.751 | (0.951) | 48454 | 10.0000 | 10.1 | |
| | 70 1,2-Dibromoethane(EDB) | 107 | 8.856 | 8.856 | (0.963) | 27049 | 10.0000 | 9.76 | |
| | 68 2-Hexanone | 43 | 8.999 | 8.999 | (0.978) | 28190 | 10.0000 | 8.96 | |
| | 140 1-Chlorohexane | 91 | 9.182 | 9.182 | (0.998) | 30886 | 10.0000 | 9.69 | 6167(M2) |
| * | 71 CHLOROBENZENE-d5 | 82 | 9.197 | 9.197 | (1.000) | 188566 | 50.0000 | | |
| | 72 Chlorobenzene ++ | 112 | 9.209 | 9.209 | (1.001) | 82671 | 10.0000 | 9.84 | |
| | 73 Ethylbenzene + | 106 | 9.216 | 9.216 | (1.002) | 41932 | 10.0000 | 9.70 | |
| | 74 1,1,1,2-Tetrachloroethane | 133 | 9.246 | 9.246 | (1.005) | 33246 | 10.0000 | 9.75 | |
| | 75 p,m-Xylene | 106 | 9.310 | 9.310 | (1.012) | 102885 | 20.0000 | 19.6 | |
| | 76 o-Xylene | 106 | 9.591 | 9.591 | (1.043) | 49811 | 10.0000 | 9.73 | |

| | | | QUANT SIG | | | | | AMOUNTS | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Compounds | MASS | RT | EXP RT | REL RT | RESPONSE | CAL-AMT ( ppb) | ON-COL ( ppb) | SIMILARITY |
| M | 99 | TOTAL XYLENE | 106 | | | | 152696 | 30.0000 | 29.3 | |
| | 77 | Styrene | 104 | 9.625 | 9.625 | (1.046) | 77710 | 10.0000 | 9.56 | |
| | 78 | Bromoform ++ | 173 | 9.651 | 9.651 | (1.049) | 29180 | 10.0000 | 9.54 | |
| | 79 | Isopropylbenzene | 105 | 9.786 | 9.786 | (1.064) | 119645 | 10.0000 | 9.69 | |
| $ | 80 | Bromofluorobenzene | 174 | 9.973 | 9.973 | (1.084) | 159664 | 50.0000 | 47.9 | |
| | 84 | Bromobenzene | 77 | 10.044 | 10.044 | (0.944) | 55431 | 10.0000 | 10.3 | |
| | 86 | n-Propylbenzene | 91 | 10.041 | 10.041 | (0.943) | 133259 | 10.0000 | 10.1 | |
| | 81 | 1,1,2,2-Tetrachloroethane++ | 83 | 10.082 | 10.082 | (0.947) | 42895 | 10.0000 | 11.3 | |
| | 87 | 2-Chlorotoluene | 91 | 10.149 | 10.149 | (0.954) | 96497 | 10.0000 | 10.3 | |
| | 88 | 1,3,5-Trimethylbenzene | 105 | 10.149 | 10.149 | (0.954) | 97062 | 10.0000 | 10.3 | |
| | 85 | 1,2,3-Trichloropropane | 75 | 10.176 | 10.176 | (0.956) | 43879 | 10.0000 | 10.1 | |
| | 83 | trans-1,4-Dichloro-2-Butene | 53 | 10.194 | 10.194 | (0.958) | 6783 | 10.0000 | 9.23 | |
| | 90 | 4-Chlorotoluene | 91 | 10.247 | 10.247 | (0.963) | 84124 | 10.0000 | 10.3 | |
| | 91 | tert-butylbenzene | 91 | 10.352 | 10.352 | (0.973) | 52850 | 10.0000 | 10.3 | |
| | 93 | 1,2,4-Trimethylbenzene | 105 | 10.389 | 10.389 | (0.976) | 96338 | 10.0000 | 10.5 | |
| | 94 | sec-Butylbenzene | 105 | 10.457 | 10.457 | (0.982) | 113079 | 10.0000 | 10.3 | |
| | 92 | p-Isopropyltoluene | 119 | 10.536 | 10.536 | (0.990) | 91173 | 10.0000 | 9.99 | |
| | 96 | 1,3-Dichlorobenzene | 146 | 10.603 | 10.603 | (0.996) | 55570 | 10.0000 | 9.74 | |
| * | 97 | 1,4-DICHLOROBENZENE-D4 | 152 | 10.644 | 10.644 | (1.000) | 168654 | 50.0000 | | |
| | 98 | 1,4-Dichlorobenzene | 146 | 10.656 | 10.656 | (1.001) | 56579 | 10.0000 | 9.47 | |
| | 100 | n-Butylbenzene | 91 | 10.787 | 10.787 | (1.013) | 62009 | 10.0000 | 9.47 | |
| | 102 | 1,2-Dichlorobenzene | 146 | 10.918 | 10.918 | (1.026) | 59102 | 10.0000 | 10.2 | |
| | 106 | 1,2-Dibromo-3-Chloropropane | 157 | 11.450 | 11.450 | (1.076) | 8460 | 10.0000 | 9.50 | |
| | 109 | Hexachlorobutadiene | 225 | 11.908 | 11.908 | (1.119) | 17219 | 10.0000 | 10.2 | |
| | 108 | 1,2,4-Trichlorobenzene | 180 | 11.968 | 11.968 | (1.124) | 13857 | 10.0000 | 9.50 | |
| | 110 | Naphthalene | 128 | 12.252 | 12.252 | (1.151) | 18263 | 10.0000 | 10.4 | |
| | 111 | 1,2,3-Trichlorobenzene | 180 | 12.417 | 12.417 | (1.167) | 14487 | 10.0000 | 9.10 | |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/msv12.i/2180416p.s.b/q7980cD.d



Date : 16-APR-2018 17:11

Client ID: V12STD010

Instrument: msv12.i

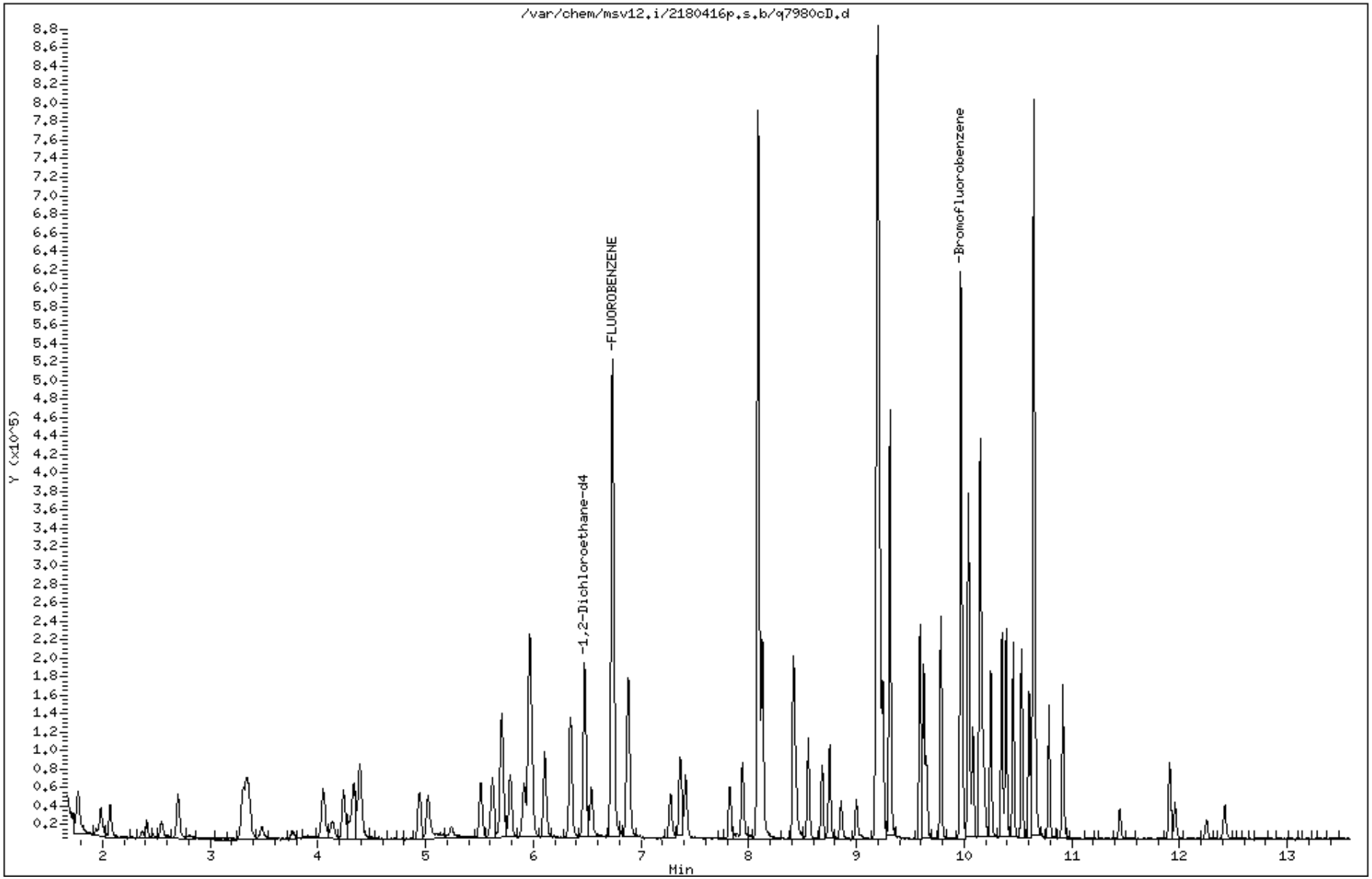
Sample Info: 1205*V12STD010

Purge Volume: 5.0

Operator: JCK

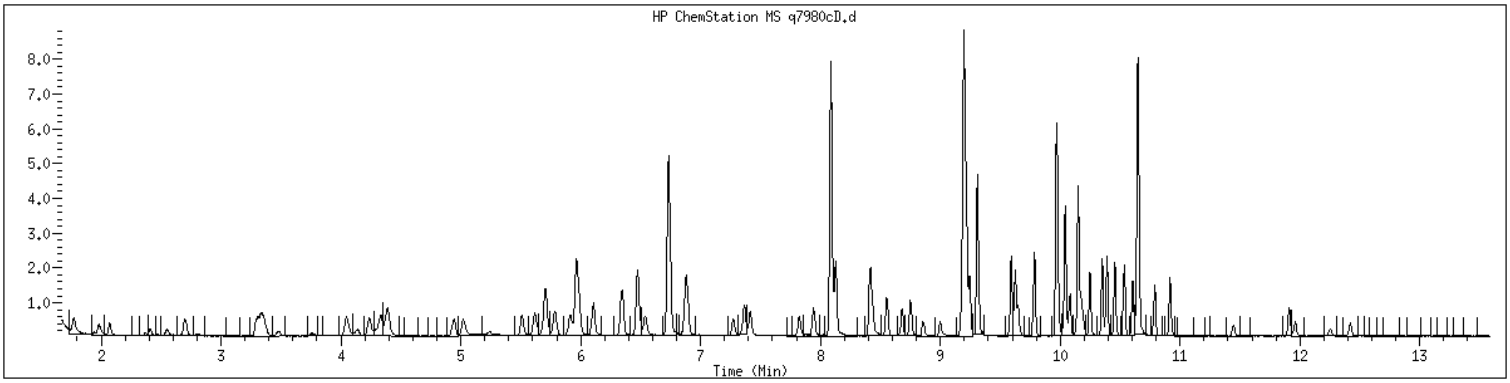
Column phase: RTX-VMS-30M

Column diameter: 0.25



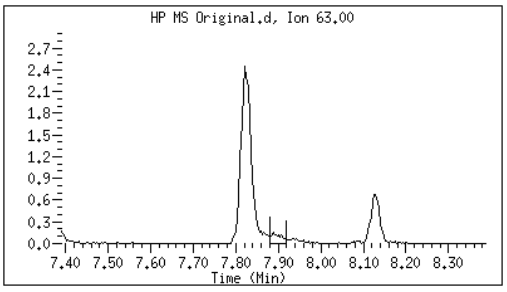
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 1205 SampleType : CALIB_5
Injection Date: 04/16/2018 17:11 Instrument : msv12.i
Operator : JCK
Sample Info : 1205*V12STD010
Misc Info : MSV~40682~*1*JCK
Method : /var/chem/msv12.i/2180416p.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b



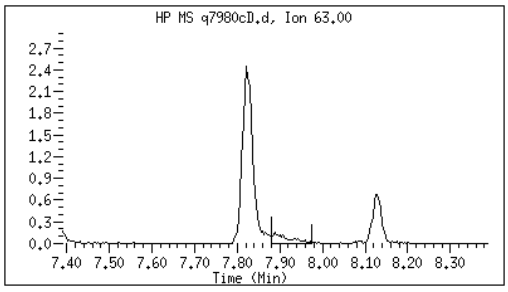

Original Final

56 2-Chloroethyl vinyl ether CAS#: 110-75-8 Reason: M2

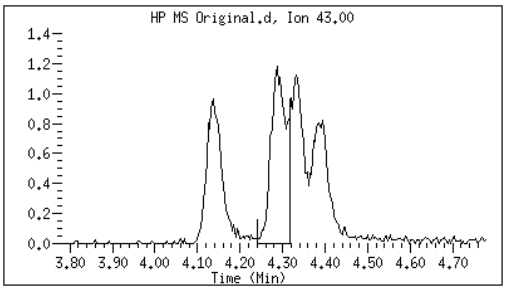



Electronic Signature Applied

User: jck2
Date: 04/16/2018 17:33

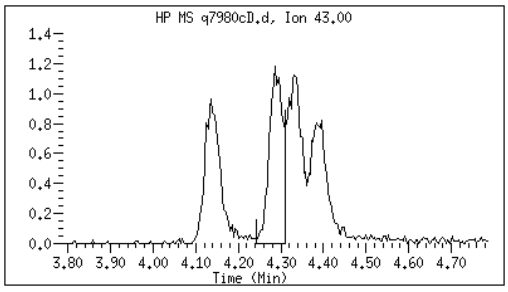



20 Methyl Acetate CAS#: 79-20-9 Reason: M2



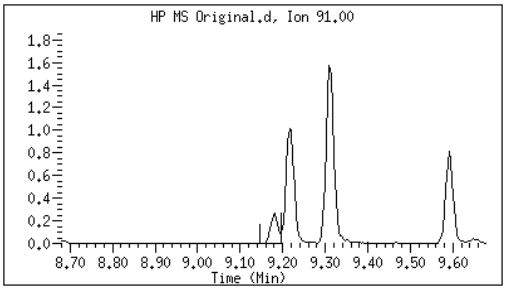

Electronic Signature Applied

User: jck2
Date: 04/16/2018 19:12



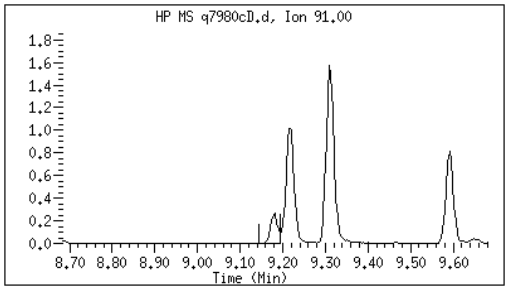
Original Final

140 1-Chlorohexane CAS#: 544-10-5 Reason: M2




Electronic Signature Applied

User: jck2
Date: 04/16/2018 19:15

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M2 - Target system integrated incorrectly

GCAL, Inc.

Data file : /var/chem/msv12.i/2180416p.s.b/q7981cD.d
Lab Smp Id: 1206 Client Smp ID: V12STD020
Inj Date : 16-APR-2018 17:34
Operator : JCK Inst ID: msv12.i
Smp Info : 1206*V12STD020
Misc Info : MSV~40682~*1*JCK
Comment :
Method : /var/chem/msv12.i/2180416p.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:07 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 17:34 Cal File: q7981cD.d
Als bottle: 6 Calibration Sample, Level: 6
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | AMOUNTS CAL-AMT ( ppb) | AMOUNTS ON-COL ( ppb) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|
| 1 Dichlorodifluoromethane | 85 | 1.771 | 1.771 | (0.263) | 67358 | 20.0000 | 19.6 | |
| 2 Chloromethane ++ | 50 | 1.981 | 1.981 | (0.294) | 65549 | 20.0000 | 18.3 | |
| 3 Vinyl Chloride + | 62 | 2.071 | 2.071 | (0.308) | 64084 | 20.0000 | 19.1 | |
| 5 Bromomethane | 94 | 2.409 | 2.409 | (0.358) | 22007 | 20.0000 | 18.1 | |
| 6 Chloroethane | 64 | 2.543 | 2.543 | (0.378) | 32047 | 20.0000 | 19.7 | |
| 7 Trichlorofluoromethane | 101 | 2.701 | 2.701 | (0.401) | 81718 | 20.0000 | 19.3 | |
| 11 1,1-Dichloroethene + | 96 | 3.301 | 3.301 | (0.490) | 42568 | 20.0000 | 19.3 | |
| 14 Carbon Disulfide | 76 | 3.331 | 3.331 | (0.495) | 147845 | 20.0000 | 19.3 | |
| 10 1,1,2Trichlotrifluoroethane | 101 | 3.353 | 3.353 | (0.498) | 47744 | 20.0000 | 19.4 | |
| 13 Methyl Iodide | 142 | 3.484 | 3.484 | (0.517) | 40587 | 20.0000 | 18.1 | |
| 9 Acrolein | 56 | 3.762 | 3.762 | (0.559) | 18363 | 100.000 | 92.5 | |
| 17 Methylene Chloride | 49 | 4.050 | 4.050 | (0.601) | 82036 | 20.0000 | 18.9 | |
| 12 Acetone | 43 | 4.133 | 4.133 | (0.614) | 48108 | 20.0000 | 18.6 | |
| 19 trans-1,2-Dichloroethene | 61 | 4.238 | 4.238 | (0.629) | 73953 | 20.0000 | 18.9 | |

| | Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | AMOUNTS CAL-AMT ( ppb) | ON-COL ( ppb) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|---|
| | 20 Methyl Acetate | 43 | 4.287 | 4.287 | (0.636) | 50863 | 20.0000 | 18.4 | 8901 |
| | 23 Hexane | 57 | 4.335 | 4.335 | (0.644) | 69431 | 20.0000 | 20.3 | 9186 |
| | 21 MTBE | 73 | 4.384 | 4.384 | (0.651) | 181999 | 20.0000 | 19.4 | 9273 |
| | 24 1,1-Dichloroethane ++ | 63 | 4.946 | 4.946 | (0.734) | 109276 | 20.0000 | 19.0 | |
| | 22 Acrylonitrile | 53 | 5.021 | 5.021 | (0.746) | 104836 | 100.000 | 98.4 | |
| | 25 Vinyl Acetate | 43 | 5.235 | 5.235 | (0.777) | 35141 | 20.0000 | 20.5 | |
| | 30 cis-1,2-Dichloroethene | 61 | 5.509 | 5.509 | (0.818) | 77367 | 20.0000 | 19.4 | |
| M | 48 Total 1,2-Dichloroethene | 61 | | | | 151320 | 40.0000 | 38.3 | |
| | 31 2,2-Dichloropropane | 77 | 5.625 | 5.625 | (0.835) | 83973 | 20.0000 | 19.1 | |
| | 38 Cyclohexane | 56 | 5.704 | 5.704 | (0.847) | 88555 | 20.0000 | 19.9 | 8755 |
| | 34 Bromochloromethane | 128 | 5.711 | 5.711 | (0.848) | 32836 | 20.0000 | 20.8 | |
| | 41 Chloroform + | 83 | 5.786 | 5.786 | (0.859) | 106678 | 20.0000 | 19.1 | |
| | 39 Carbon Tetrachloride | 117 | 5.913 | 5.913 | (0.878) | 82899 | 20.0000 | 19.2 | |
| $ | 36 Dibromofluoromethane | 111 | 5.962 | 5.962 | (0.885) | 125440 | 50.0000 | 49.6 | 7023 |
| | 37 1,1,1-Trichloroethane | 97 | 5.985 | 5.985 | (0.889) | 96189 | 20.0000 | 19.5 | |
| | 42 1,1-Dichloropropene | 75 | 6.108 | 6.108 | (0.907) | 73950 | 20.0000 | 19.3 | |
| | 32 2-Butanone | 43 | 6.108 | 6.108 | (0.907) | 48287 | 20.0000 | 19.3 | |
| | 44 Benzene | 78 | 6.345 | 6.345 | (0.942) | 237837 | 20.0000 | 19.7 | |
| $ | 43 1,2-Dichloroethane-d4 | 67 | 6.476 | 6.476 | (0.962) | 75372 | 50.0000 | 50.3 | |
| | 46 1,2-Dichloroethane | 62 | 6.540 | 6.540 | (0.971) | 84805 | 20.0000 | 19.0 | |
| * | 47 FLUOROBENZENE | 96 | 6.734 | 6.734 | (1.000) | 473910 | 50.0000 | | |
| | 50 Methyl Cyclohexane | 83 | 6.877 | 6.877 | (1.021) | 79468 | 20.0000 | 20.0 | 8585 |
| | 49 Trichloroethene | 130 | 6.888 | 6.888 | (1.023) | 64852 | 20.0000 | 19.5 | |
| | 52 Dibromomethane | 93 | 7.274 | 7.274 | (1.080) | 32946 | 20.0000 | 18.0 | |
| | 51 1,2-Dichloropropane + | 63 | 7.368 | 7.368 | (1.094) | 60789 | 20.0000 | 18.9 | |
| | 54 Bromodichloromethane | 83 | 7.413 | 7.413 | (1.101) | 84816 | 20.0000 | 19.1 | |
| | 57 1-Bromo-2-chloroethane | 63 | 7.822 | 7.822 | (1.161) | 84830 | 20.0000 | 18.5 | 9640 |
| | 56 2-Chloroethyl vinyl ether | 63 | 7.893 | 7.893 | (1.172) | 8536 | 20.0000 | 18.1 | (M2) |
| | 58 cis-1,3-Dichloropropene | 75 | 7.941 | 7.941 | (1.179) | 86565 | 20.0000 | 19.5 | |
| $ | 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.879) | 465494 | 50.0000 | 49.3 | |
| | 61 Toluene + | 91 | 8.129 | 8.129 | (0.884) | 257414 | 20.0000 | 19.5 | |
| | 66 Tetrachloroethene | 164 | 8.414 | 8.414 | (0.915) | 55513 | 20.0000 | 18.5 | |
| | 59 4-methyl-2-pentanone | 43 | 8.414 | 8.414 | (0.915) | 78784 | 20.0000 | 18.8 | |
| | 62 trans-1,3-Dichloropropene | 75 | 8.436 | 8.436 | (1.253) | 75756 | 20.0000 | 19.4 | |
| M | 145 1-3 Dichloropropene total | 100 | | | | 162321 | 40.0000 | 38.9 | 0 |
| | 65 1,1,2-Trichloroethane | 97 | 8.553 | 8.553 | (0.930) | 60079 | 20.0000 | 19.2 | |
| | 69 Dibromochloromethane | 129 | 8.680 | 8.680 | (0.944) | 72459 | 20.0000 | 18.8 | |
| | 67 1,3-Dichloropropane | 76 | 8.751 | 8.751 | (0.951) | 93038 | 20.0000 | 18.9 | |
| | 70 1,2-Dibromoethane(EDB) | 107 | 8.856 | 8.856 | (0.963) | 55404 | 20.0000 | 19.5 | |
| | 68 2-Hexanone | 43 | 8.999 | 8.999 | (0.978) | 61370 | 20.0000 | 19.0 | |
| | 140 1-Chlorohexane | 91 | 9.182 | 9.182 | (0.998) | 66781 | 20.0000 | 20.4 | 7741(M2) |
| * | 71 CHLOROBENZENE-d5 | 82 | 9.197 | 9.197 | (1.000) | 193841 | 50.0000 | | |
| | 72 Chlorobenzene ++ | 112 | 9.209 | 9.209 | (1.001) | 162711 | 20.0000 | 18.8 | |
| | 73 Ethylbenzene + | 106 | 9.216 | 9.216 | (1.002) | 86527 | 20.0000 | 19.5 | |
| | 74 1,1,1,2-Tetrachloroethane | 133 | 9.246 | 9.246 | (1.005) | 67553 | 20.0000 | 19.3 | |
| | 75 p,m-Xylene | 106 | 9.310 | 9.310 | (1.012) | 211818 | 40.0000 | 39.2 | |
| | 76 o-Xylene | 106 | 9.591 | 9.591 | (1.043) | 103565 | 20.0000 | 19.7 | |

| | | | QUANT SIG | | | | | AMOUNTS | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Compounds | MASS | RT | EXP RT | REL RT | RESPONSE | CAL-AMT ( ppb) | ON-COL ( ppb) | SIMILARITY |
| M | 99 | TOTAL XYLENE | 106 | | | | 315383 | 60.0000 | 58.8 | |
| | 77 | Styrene | 104 | 9.625 | 9.625 | (1.046) | 161862 | 20.0000 | 19.4 | |
| | 78 | Bromoform ++ | 173 | 9.651 | 9.651 | (1.049) | 59301 | 20.0000 | 18.9 | |
| | 79 | Isopropylbenzene | 105 | 9.786 | 9.786 | (1.064) | 253934 | 20.0000 | 20.0 | |
| $ | 80 | Bromofluorobenzene | 174 | 9.970 | 9.970 | (1.084) | 169198 | 50.0000 | 49.3 | |
| | 84 | Bromobenzene | 77 | 10.041 | 10.041 | (0.943) | 112157 | 20.0000 | 19.4 | |
| | 86 | n-Propylbenzene | 91 | 10.041 | 10.041 | (0.943) | 281187 | 20.0000 | 19.8 | |
| | 81 | 1,1,2,2-Tetrachloroethane++ | 83 | 10.082 | 10.082 | (0.947) | 86520 | 20.0000 | 22.0 | |
| | 87 | 2-Chlorotoluene | 91 | 10.146 | 10.146 | (0.953) | 196491 | 20.0000 | 19.5 | |
| | 88 | 1,3,5-Trimethylbenzene | 105 | 10.149 | 10.149 | (0.953) | 204106 | 20.0000 | 20.1 | |
| | 85 | 1,2,3-Trichloropropane | 75 | 10.176 | 10.176 | (0.956) | 87190 | 20.0000 | 18.7 | |
| | 83 | trans-1,4-Dichloro-2-Butene | 53 | 10.194 | 10.194 | (0.957) | 14349 | 20.0000 | 18.2 | |
| | 90 | 4-Chlorotoluene | 91 | 10.247 | 10.247 | (0.962) | 171439 | 20.0000 | 19.5 | |
| | 91 | tert-butylbenzene | 91 | 10.352 | 10.352 | (0.972) | 111843 | 20.0000 | 20.3 | |
| | 93 | 1,2,4-Trimethylbenzene | 105 | 10.389 | 10.389 | (0.976) | 198259 | 20.0000 | 20.1 | |
| | 94 | sec-Butylbenzene | 105 | 10.457 | 10.457 | (0.982) | 240862 | 20.0000 | 20.5 | |
| | 92 | p-Isopropyltoluene | 119 | 10.536 | 10.536 | (0.989) | 200602 | 20.0000 | 20.5 | |
| | 96 | 1,3-Dichlorobenzene | 146 | 10.603 | 10.603 | (0.996) | 118860 | 20.0000 | 19.4 | |
| * | 97 | 1,4-DICHLOROBENZENE-D4 | 152 | 10.648 | 10.648 | (1.000) | 181250 | 50.0000 | | |
| | 98 | 1,4-Dichlorobenzene | 146 | 10.656 | 10.656 | (1.001) | 124476 | 20.0000 | 19.4 | |
| | 100 | n-Butylbenzene | 91 | 10.787 | 10.787 | (1.013) | 142391 | 20.0000 | 20.2 | |
| | 102 | 1,2-Dichlorobenzene | 146 | 10.918 | 10.918 | (1.025) | 123094 | 20.0000 | 19.9 | |
| | 106 | 1,2-Dibromo-3-Chloropropane | 157 | 11.446 | 11.446 | (1.075) | 18678 | 20.0000 | 19.5 | |
| | 109 | Hexachlorobutadiene | 225 | 11.908 | 11.908 | (1.118) | 36987 | 20.0000 | 20.5 | |
| | 108 | 1,2,4-Trichlorobenzene | 180 | 11.956 | 11.956 | (1.123) | 39702 | 20.0000 | 17.3 | |
| | 110 | Naphthalene | 128 | 12.252 | 12.252 | (1.151) | 56719 | 20.0000 | 15.7 | |
| | 111 | 1,2,3-Trichlorobenzene | 180 | 12.417 | 12.417 | (1.166) | 42108 | 20.0000 | 17.9 | |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/msv12.i/2180416p.s.b/q7981cD.d



Date : 16-APR-2018 17:34

Client ID: V12STD020

Instrument: msv12.i

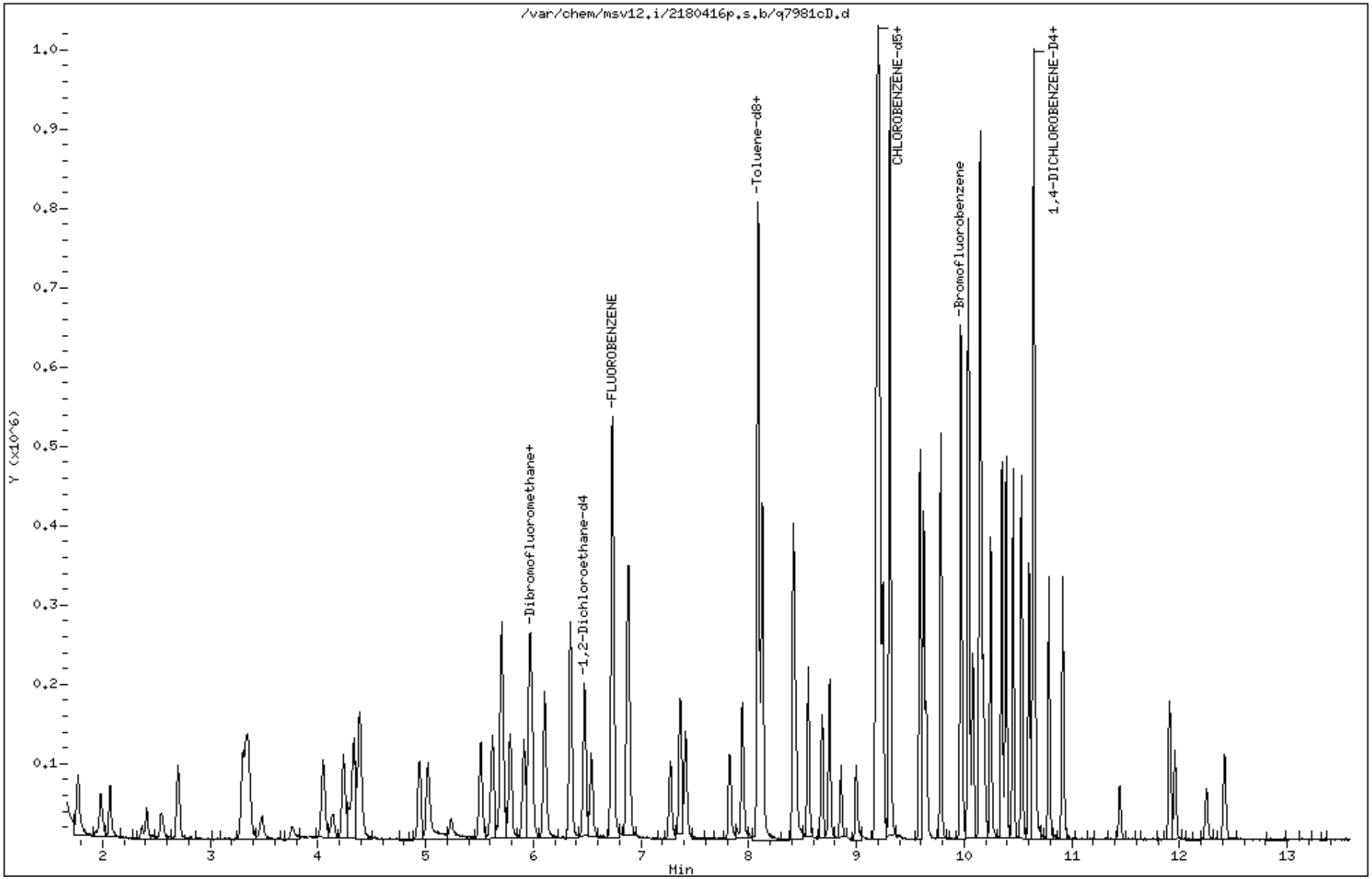
Sample Info: 1206*V12STD020

Purge Volume: 5.0

Operator: JCK

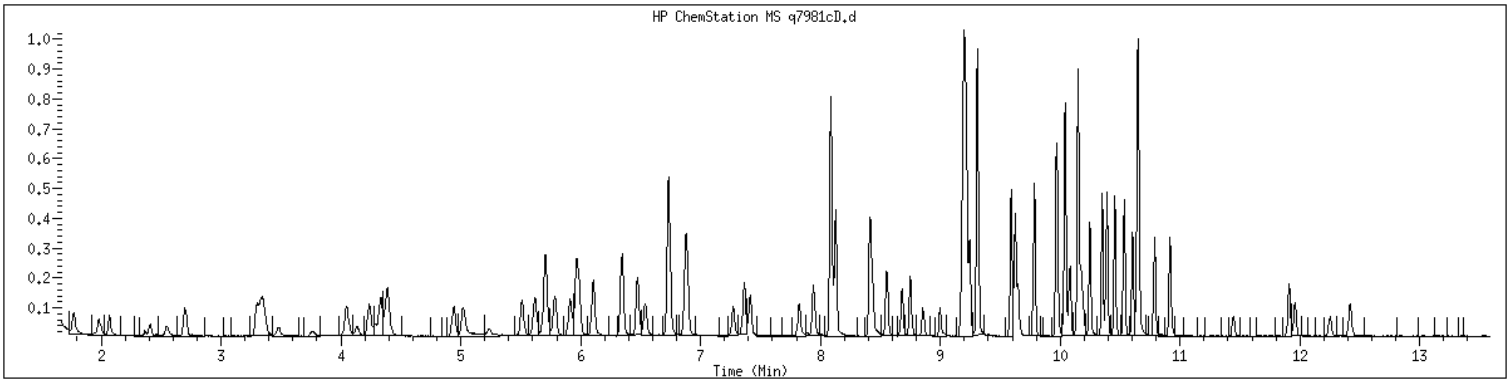
Column phase: RTX-VMS-30M

Column diameter: 0.25



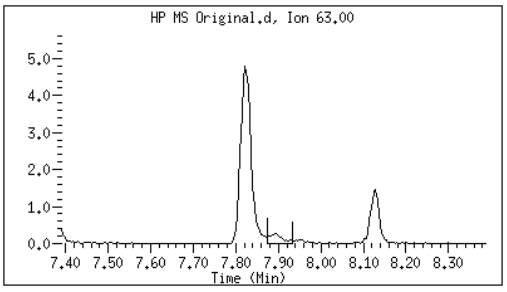
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 1206 SampleType : CALIB_6
Injection Date: 04/16/2018 17:34 Instrument : msv12.i
Operator : JCK
Sample Info : 1206*V12STD020
Misc Info : MSV~40682~*1*JCK
Method : /var/chem/msv12.i/2180416p.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b



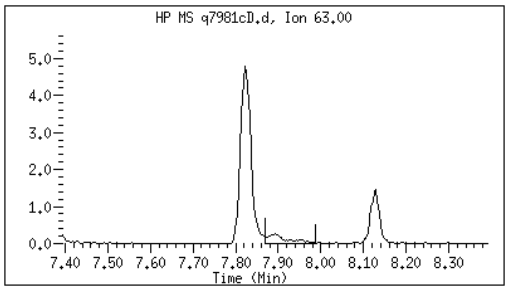

Original Final

56 2-Chloroethyl vinyl ether CAS#: 110-75-8 Reason: M2

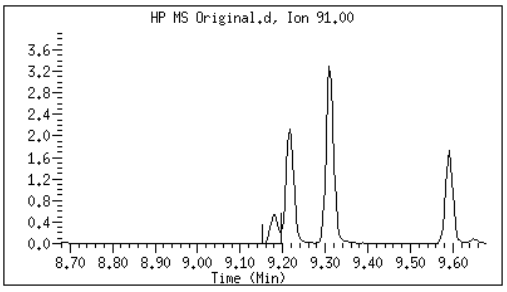



Electronic Signature Applied

User: jck2
Date: 04/16/2018 18:49

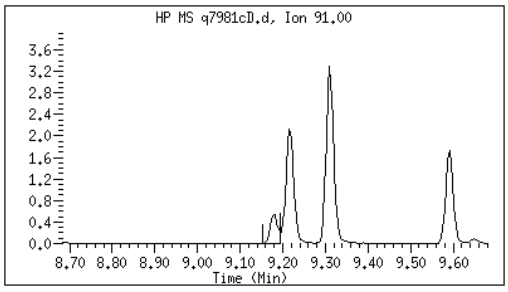



140 1-Chlorohexane CAS#: 544-10-5 Reason: M2




Electronic Signature Applied

User: jck2
Date: 04/16/2018 19:15



M2 - Target system integrated incorrectly

GCAL, Inc.

Data file : /var/chem/msv12.i/2180416p.s.b/q7982cD.d
Lab Smp Id: 1207 Client Smp ID: V12STD050
Inj Date : 16-APR-2018 17:57
Operator : JCK Inst ID: msv12.i
Smp Info : 1207*V12STD050
Misc Info : MSV~40682~*1*JCK
Comment :
Method : /var/chem/msv12.i/2180416p.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:07 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 17:57 Cal File: q7982cD.d
Als bottle: 7 Calibration Sample, Level: 7
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | AMOUNTS CAL-AMT ( ppb) | AMOUNTS ON-COL ( ppb) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|
| 1 Dichlorodifluoromethane | 85 | 1.771 | 1.771 | (0.263) | 179153 | 50.0000 | 51.0 | |
| 2 Chloromethane ++ | 50 | 1.981 | 1.981 | (0.294) | 179255 | 50.0000 | 49.0 | |
| 3 Vinyl Chloride + | 62 | 2.067 | 2.067 | (0.307) | 173760 | 50.0000 | 50.7 | |
| 5 Bromomethane | 94 | 2.409 | 2.409 | (0.358) | 60013 | 50.0000 | 48.3 | |
| 6 Chloroethane | 64 | 2.540 | 2.540 | (0.377) | 82193 | 50.0000 | 49.5 | |
| 7 Trichlorofluoromethane | 101 | 2.697 | 2.697 | (0.401) | 217753 | 50.0000 | 50.4 | |
| 11 1,1-Dichloroethene + | 96 | 3.297 | 3.297 | (0.490) | 114774 | 50.0000 | 50.9 | |
| 14 Carbon Disulfide | 76 | 3.331 | 3.331 | (0.495) | 399786 | 50.0000 | 51.7 | |
| 10 1,1,2Trichlotrifluoroethane | 101 | 3.349 | 3.349 | (0.497) | 131003 | 50.0000 | 52.1 | |
| 13 Methyl Iodide | 142 | 3.477 | 3.477 | (0.516) | 127274 | 50.0000 | 49.9 | |
| 9 Acrolein | 56 | 3.758 | 3.758 | (0.558) | 54259 | 250.000 | 267 | |
| 17 Methylene Chloride | 49 | 4.047 | 4.047 | (0.601) | 214728 | 50.0000 | 48.3 | |
| 12 Acetone | 43 | 4.133 | 4.133 | (0.614) | 128360 | 50.0000 | 48.5 | |
| 19 trans-1,2-Dichloroethene | 61 | 4.234 | 4.234 | (0.629) | 204870 | 50.0000 | 51.2 | |

| | Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | AMOUNTS CAL-AMT ( ppb) | ON-COL ( ppb) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|---|
| | 20 Methyl Acetate | 43 | 4.279 | 4.279 | (0.635) | 148156 | 50.0000 | 52.4 | 8946 |
| | 23 Hexane | 57 | 4.332 | 4.332 | (0.643) | 174866 | 50.0000 | 49.9 | 9378 |
| | 21 MTBE | 73 | 4.384 | 4.384 | (0.651) | 481049 | 50.0000 | 50.1 | 9412 |
| | 24 1,1-Dichloroethane ++ | 63 | 4.943 | 4.943 | (0.734) | 289527 | 50.0000 | 49.3 | |
| | 22 Acrylonitrile | 53 | 5.018 | 5.018 | (0.745) | 285974 | 250.000 | 263 | |
| | 25 Vinyl Acetate | 43 | 5.235 | 5.235 | (0.777) | 92702 | 50.0000 | 53.0 | |
| | 30 cis-1,2-Dichloroethene | 61 | 5.509 | 5.509 | (0.818) | 206652 | 50.0000 | 50.6 | |
| M | 48 Total 1,2-Dichloroethene | 61 | | | | 411522 | 100.000 | 102 | |
| | 31 2,2-Dichloropropane | 77 | 5.621 | 5.621 | (0.835) | 225667 | 50.0000 | 50.2 | |
| | 38 Cyclohexane | 56 | 5.704 | 5.704 | (0.847) | 241358 | 50.0000 | 53.1 | 8722 |
| | 34 Bromochloromethane | 128 | 5.711 | 5.711 | (0.848) | 85126 | 50.0000 | 52.8 | |
| | 41 Chloroform + | 83 | 5.786 | 5.786 | (0.859) | 283062 | 50.0000 | 49.5 | |
| | 39 Carbon Tetrachloride | 117 | 5.914 | 5.914 | (0.878) | 221126 | 50.0000 | 49.9 | |
| $ | 36 Dibromofluoromethane | 111 | 5.966 | 5.966 | (0.886) | 128332 | 50.0000 | 49.6 | 7006 |
| | 37 1,1,1-Trichloroethane | 97 | 5.985 | 5.985 | (0.889) | 252517 | 50.0000 | 50.0 | |
| | 42 1,1-Dichloropropene | 75 | 6.105 | 6.105 | (0.906) | 203601 | 50.0000 | 52.1 | |
| | 32 2-Butanone | 43 | 6.105 | 6.105 | (0.906) | 132844 | 50.0000 | 51.8 | |
| | 44 Benzene | 78 | 6.341 | 6.341 | (0.942) | 625623 | 50.0000 | 50.7 | |
| $ | 43 1,2-Dichloroethane-d4 | 67 | 6.472 | 6.472 | (0.961) | 76368 | 50.0000 | 49.8 | |
| | 46 1,2-Dichloroethane | 62 | 6.536 | 6.536 | (0.970) | 224001 | 50.0000 | 49.1 | |
| * | 47 FLUOROBENZENE | 96 | 6.734 | 6.734 | (1.000) | 484732 | 50.0000 | | |
| | 50 Methyl Cyclohexane | 83 | 6.877 | 6.877 | (1.021) | 207088 | 50.0000 | 50.9 | 8510 |
| | 49 Trichloroethene | 130 | 6.884 | 6.884 | (1.022) | 172073 | 50.0000 | 50.5 | |
| | 52 Dibromomethane | 93 | 7.271 | 7.271 | (1.080) | 95306 | 50.0000 | 50.9 | |
| | 51 1,2-Dichloropropane + | 63 | 7.364 | 7.364 | (1.093) | 164494 | 50.0000 | 49.9 | |
| | 54 Bromodichloromethane | 83 | 7.413 | 7.413 | (1.101) | 230042 | 50.0000 | 50.6 | |
| | 57 1-Bromo-2-chloroethane | 63 | 7.822 | 7.822 | (1.161) | 231494 | 50.0000 | 49.3 | 9719 |
| | 56 2-Chloroethyl vinyl ether | 63 | 7.889 | 7.889 | (1.171) | 23581 | 50.0000 | 48.9 | |
| | 58 cis-1,3-Dichloropropene | 75 | 7.942 | 7.942 | (1.179) | 250798 | 50.0000 | 55.2 | |
| $ | 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.880) | 464249 | 50.0000 | 48.7 | |
| | 61 Toluene + | 91 | 8.129 | 8.129 | (0.884) | 673705 | 50.0000 | 50.7 | |
| | 66 Tetrachloroethene | 164 | 8.414 | 8.414 | (0.915) | 147818 | 50.0000 | 48.9 | |
| | 59 4-methyl-2-pentanone | 43 | 8.414 | 8.414 | (0.915) | 219233 | 50.0000 | 51.8 | |
| | 62 trans-1,3-Dichloropropene | 75 | 8.436 | 8.436 | (1.253) | 215218 | 50.0000 | 53.9 | |
| M | 145 1-3 Dichloropropene total | 100 | | | | 466016 | 100.000 | 109 | 0 |
| | 65 1,1,2-Trichloroethane | 97 | 8.553 | 8.553 | (0.930) | 158289 | 50.0000 | 50.0 | |
| | 69 Dibromochloromethane | 129 | 8.680 | 8.680 | (0.944) | 201680 | 50.0000 | 51.7 | |
| | 67 1,3-Dichloropropane | 76 | 8.751 | 8.751 | (0.952) | 253289 | 50.0000 | 50.9 | |
| | 70 1,2-Dibromoethane(EDB) | 107 | 8.856 | 8.856 | (0.963) | 152830 | 50.0000 | 53.1 | |
| | 68 2-Hexanone | 43 | 8.999 | 8.999 | (0.979) | 174783 | 50.0000 | 53.5 | |
| | 140 1-Chlorohexane | 91 | 9.179 | 9.179 | (0.998) | 186357 | 50.0000 | 56.3 | 9180(M2) |
| * | 71 CHLOROBENZENE-d5 | 82 | 9.194 | 9.194 | (1.000) | 195747 | 50.0000 | | |
| | 72 Chlorobenzene ++ | 112 | 9.209 | 9.209 | (1.002) | 432864 | 50.0000 | 49.6 | |
| | 73 Ethylbenzene + | 106 | 9.216 | 9.216 | (1.002) | 226327 | 50.0000 | 50.4 | |
| | 74 1,1,1,2-Tetrachloroethane | 133 | 9.246 | 9.246 | (1.006) | 176632 | 50.0000 | 49.9 | |
| | 75 p,m-Xylene | 106 | 9.310 | 9.310 | (1.013) | 568293 | 100.000 | 104 | |
| | 76 o-Xylene | 106 | 9.591 | 9.591 | (1.043) | 281669 | 50.0000 | 53.0 | |

| | | | QUANT SIG | | | | | AMOUNTS | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Compounds | MASS | RT | EXP RT | REL RT | RESPONSE | CAL-AMT ( ppb) | ON-COL ( ppb) | SIMILARITY |
| M | 99 | TOTAL XYLENE | 106 | | | | 849962 | 150.000 | 157 | |
| | 77 | Styrene | 104 | 9.625 | 9.625 | (1.047) | 466860 | 50.0000 | 55.3 | |
| | 78 | Bromoform ++ | 173 | 9.651 | 9.651 | (1.050) | 163014 | 50.0000 | 51.3 | |
| | 79 | Isopropylbenzene | 105 | 9.782 | 9.782 | (1.064) | 689442 | 50.0000 | 53.8 | |
| $ | 80 | Bromofluorobenzene | 174 | 9.970 | 9.970 | (1.084) | 179289 | 50.0000 | 51.8 | |
| | 84 | Bromobenzene | 77 | 10.041 | 10.041 | (0.943) | 303556 | 50.0000 | 47.3 | |
| | 86 | n-Propylbenzene | 91 | 10.041 | 10.041 | (0.943) | 763704 | 50.0000 | 48.5 | |
| | 81 | 1,1,2,2-Tetrachloroethane++ | 83 | 10.082 | 10.082 | (0.947) | 221085 | 50.0000 | 51.8 | |
| | 87 | 2-Chlorotoluene | 91 | 10.146 | 10.146 | (0.953) | 533602 | 50.0000 | 47.6 | |
| | 88 | 1,3,5-Trimethylbenzene | 105 | 10.149 | 10.149 | (0.954) | 554140 | 50.0000 | 49.2 | |
| | 85 | 1,2,3-Trichloropropane | 75 | 10.176 | 10.176 | (0.956) | 246492 | 50.0000 | 47.6 | |
| | 83 | trans-1,4-Dichloro-2-Butene | 53 | 10.194 | 10.194 | (0.958) | 45071 | 50.0000 | 51.4 | |
| | 90 | 4-Chlorotoluene | 91 | 10.247 | 10.247 | (0.963) | 486852 | 50.0000 | 49.8 | |
| | 91 | tert-butylbenzene | 91 | 10.352 | 10.352 | (0.973) | 294583 | 50.0000 | 48.2 | |
| | 93 | 1,2,4-Trimethylbenzene | 105 | 10.389 | 10.389 | (0.976) | 552578 | 50.0000 | 50.4 | |
| | 94 | sec-Butylbenzene | 105 | 10.457 | 10.457 | (0.982) | 652993 | 50.0000 | 50.0 | |
| | 92 | p-Isopropyltoluene | 119 | 10.532 | 10.532 | (0.989) | 567040 | 50.0000 | 52.1 | |
| | 96 | 1,3-Dichlorobenzene | 146 | 10.603 | 10.603 | (0.996) | 341043 | 50.0000 | 50.1 | |
| * | 97 | 1,4-DICHLOROBENZENE-D4 | 152 | 10.644 | 10.644 | (1.000) | 201236 | 50.0000 | | |
| | 98 | 1,4-Dichlorobenzene | 146 | 10.656 | 10.656 | (1.001) | 347062 | 50.0000 | 48.7 | |
| | 100 | n-Butylbenzene | 91 | 10.787 | 10.787 | (1.013) | 419361 | 50.0000 | 53.7 | |
| | 102 | 1,2-Dichlorobenzene | 146 | 10.918 | 10.918 | (1.026) | 344225 | 50.0000 | 50.0 | |
| | 106 | 1,2-Dibromo-3-Chloropropane | 157 | 11.447 | 11.447 | (1.075) | 54078 | 50.0000 | 50.9 | |
| | 109 | Hexachlorobutadiene | 225 | 11.911 | 11.911 | (1.119) | 102653 | 50.0000 | 51.2 | |
| | 108 | 1,2,4-Trichlorobenzene | 180 | 11.956 | 11.956 | (1.123) | 145115 | 50.0000 | 45.9 | |
| | 110 | Naphthalene | 128 | 12.249 | 12.249 | (1.151) | 278392 | 50.0000 | 43.3 | |
| | 111 | 1,2,3-Trichlorobenzene | 180 | 12.417 | 12.417 | (1.167) | 146640 | 50.0000 | 47.6 | |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/msv12.i/2180416p.s.b/q7982cD.d

Page 1

Date : 16-APR-2018 17:57

Client ID: V12STD050

Instrument: msv12.i

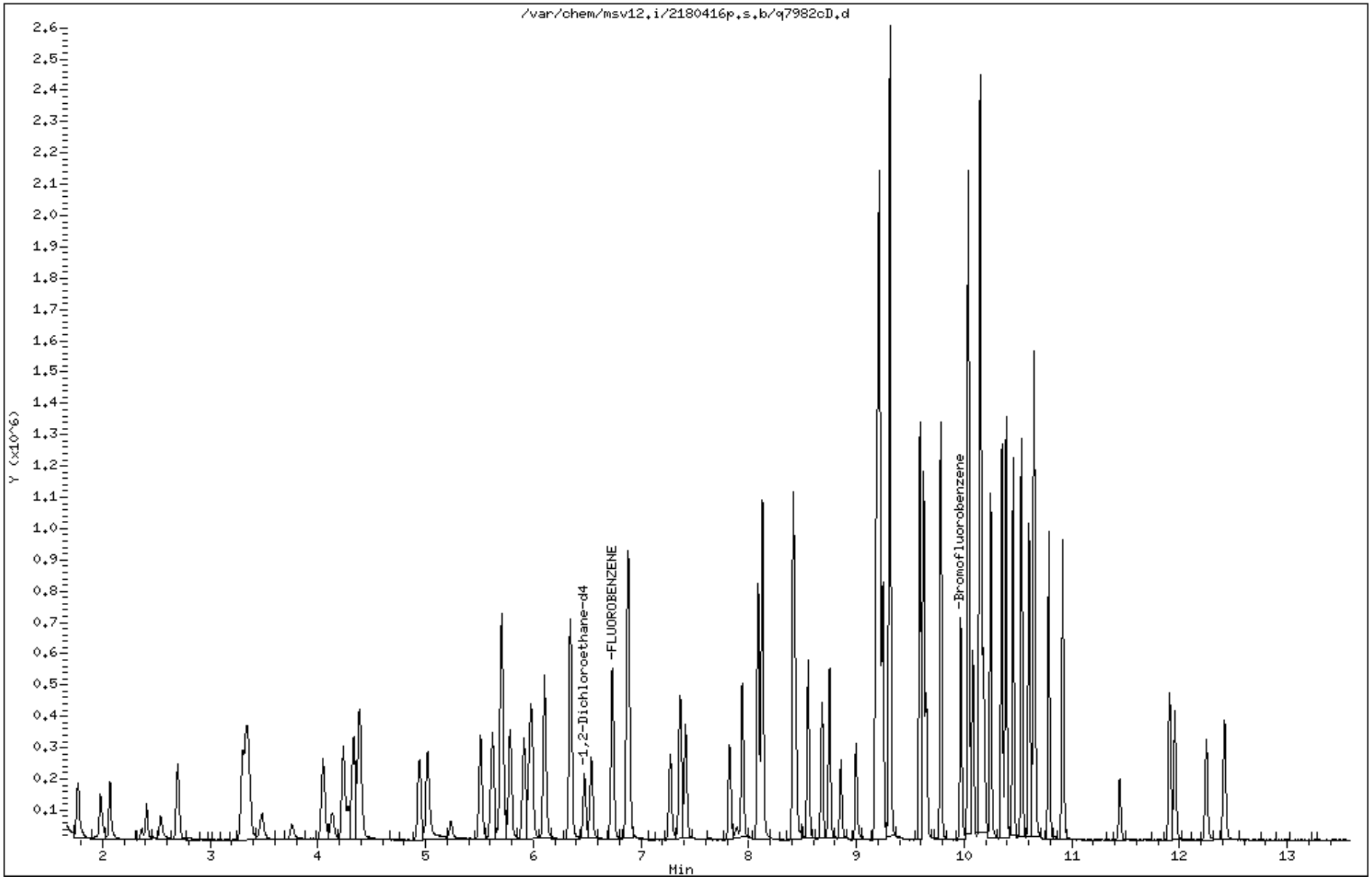
Sample Info: 1207*V12STD050

Purge Volume: 5.0

Operator: JCK

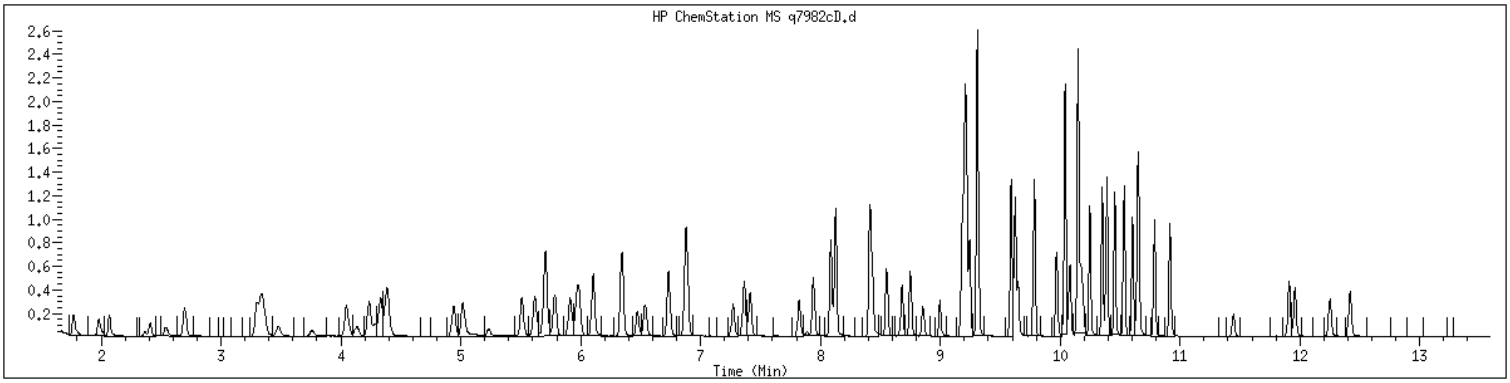
Column phase: RTX-VMS-30M

Column diameter: 0.25



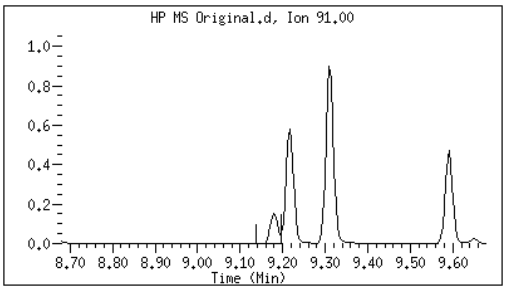
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 1207 SampleType : CALIB_7
Injection Date: 04/16/2018 17:57 Instrument : msv12.i
Operator : JCK
Sample Info : 1207*V12STD050
Misc Info : MSV~40682~*1*JCK
Method : /var/chem/msv12.i/2180416p.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b



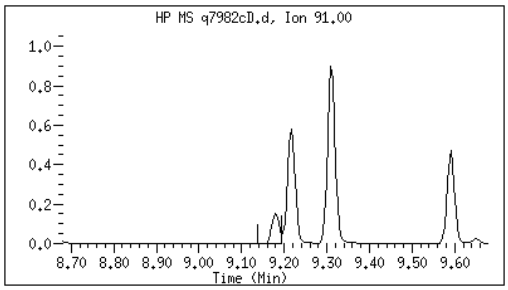

Original Final

140 1-Chlorohexane CAS#: 544-10-5 Reason: M2




Electronic Signature Applied

User: jck2
Date: 04/16/2018 19:15




M2 - Target system integrated incorrectly

GCAL, Inc.

Data file : /var/chem/msv12.i/2180416p.s.b/q7983cD.d
Lab Smp Id: 1208 Client Smp ID: V12STD100
Inj Date : 16-APR-2018 18:20
Operator : JCK Inst ID: msv12.i
Smp Info : 1208*V12STD100
Misc Info : MSV~40682~*1*JCK
Comment :
Method : /var/chem/msv12.i/2180416p.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:07 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 18:20 Cal File: q7983cD.d
Als bottle: 8 Calibration Sample, Level: 8
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | AMOUNTS CAL-AMT ( ppb) | AMOUNTS ON-COL ( ppb) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|
| 1 Dichlorodifluoromethane | 85 | 1.768 | 1.768 | (0.262) | 354777 | 100.000 | 98.0 | |
| 2 Chloromethane ++ | 50 | 1.981 | 1.981 | (0.294) | 366859 | 100.000 | 97.2 | |
| 3 Vinyl Chloride + | 62 | 2.067 | 2.067 | (0.307) | 356971 | 100.000 | 101 | |
| 5 Bromomethane | 94 | 2.409 | 2.409 | (0.358) | 139485 | 100.000 | 109 | |
| 6 Chloroethane | 64 | 2.532 | 2.532 | (0.376) | 164918 | 100.000 | 96.3 | |
| 7 Trichlorofluoromethane | 101 | 2.693 | 2.693 | (0.400) | 444434 | 100.000 | 99.8 | |
| 11 1,1-Dichloroethene + | 96 | 3.297 | 3.297 | (0.490) | 234510 | 100.000 | 101 | |
| 14 Carbon Disulfide | 76 | 3.327 | 3.327 | (0.494) | 776718 | 100.000 | 97.6 | |
| 10 1,1,2Trichlotrifluoroethane | 101 | 3.357 | 3.357 | (0.498) | 249424 | 100.000 | 96.2 | |
| 13 Methyl Iodide | 142 | 3.477 | 3.477 | (0.516) | 283777 | 100.000 | 101 | |
| 9 Acrolein | 56 | 3.758 | 3.758 | (0.558) | 112841 | 500.000 | 539 | |
| 17 Methylene Chloride | 49 | 4.047 | 4.047 | (0.601) | 437865 | 100.000 | 95.5 | |
| 12 Acetone | 43 | 4.129 | 4.129 | (0.613) | 267683 | 100.000 | 98.2 | |
| 19 trans-1,2-Dichloroethene | 61 | 4.234 | 4.234 | (0.629) | 436021 | 100.000 | 106 | |

| | Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | AMOUNTS CAL-AMT ( ppb) | ON-COL ( ppb) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|---|
| | 20 Methyl Acetate | 43 | 4.279 | 4.279 | (0.635) | 323056 | 100.000 | 111 | 8683 |
| | 23 Hexane | 57 | 4.332 | 4.332 | (0.643) | 379143 | 100.000 | 105 | 9395 |
| | 21 MTBE | 73 | 4.384 | 4.384 | (0.651) | 1027709 | 100.000 | 104 | 9524 |
| | 24 1,1-Dichloroethane ++ | 63 | 4.939 | 4.939 | (0.733) | 594320 | 100.000 | 98.2 | |
| | 22 Acrylonitrile | 53 | 5.014 | 5.014 | (0.745) | 594363 | 500.000 | 529 | |
| | 25 Vinyl Acetate | 43 | 5.231 | 5.231 | (0.777) | 203236 | 100.000 | 113 | |
| | 30 cis-1,2-Dichloroethene | 61 | 5.505 | 5.505 | (0.817) | 438937 | 100.000 | 104 | |
| M | 48 Total 1,2-Dichloroethene | 61 | | | | 874958 | 200.000 | 210 | |
| | 31 2,2-Dichloropropane | 77 | 5.617 | 5.617 | (0.834) | 490585 | 100.000 | 106 | |
| | 38 Cyclohexane | 56 | 5.704 | 5.704 | (0.847) | 495793 | 100.000 | 106 | 8734 |
| | 34 Bromochloromethane | 128 | 5.711 | 5.711 | (0.848) | 170793 | 100.000 | 103 | |
| | 41 Chloroform + | 83 | 5.782 | 5.782 | (0.859) | 594568 | 100.000 | 101 | |
| | 39 Carbon Tetrachloride | 117 | 5.910 | 5.910 | (0.878) | 461603 | 100.000 | 101 | |
| $ | 36 Dibromofluoromethane | 111 | 5.962 | 5.962 | (0.885) | 134065 | 50.0000 | 50.2 | 7056 |
| | 37 1,1,1-Trichloroethane | 97 | 5.985 | 5.985 | (0.889) | 522228 | 100.000 | 100 | |
| | 42 1,1-Dichloropropene | 75 | 6.105 | 6.105 | (0.906) | 427188 | 100.000 | 106 | |
| | 32 2-Butanone | 43 | 6.105 | 6.105 | (0.906) | 285022 | 100.000 | 108 | |
| | 44 Benzene | 78 | 6.345 | 6.345 | (0.942) | 1314993 | 100.000 | 103 | |
| $ | 43 1,2-Dichloroethane-d4 | 67 | 6.472 | 6.472 | (0.961) | 79734 | 50.0000 | 50.4 | |
| | 46 1,2-Dichloroethane | 62 | 6.540 | 6.540 | (0.971) | 473671 | 100.000 | 101 | |
| * | 47 FLUOROBENZENE | 96 | 6.734 | 6.734 | (1.000) | 499777 | 50.0000 | | |
| | 50 Methyl Cyclohexane | 83 | 6.877 | 6.877 | (1.021) | 441967 | 100.000 | 105 | 8387 |
| | 49 Trichloroethene | 130 | 6.884 | 6.884 | (1.022) | 360385 | 100.000 | 103 | |
| | 52 Dibromomethane | 93 | 7.271 | 7.271 | (1.080) | 203307 | 100.000 | 105 | |
| | 51 1,2-Dichloropropane + | 63 | 7.364 | 7.364 | (1.093) | 339370 | 100.000 | 99.8 | |
| | 54 Bromodichloromethane | 83 | 7.413 | 7.413 | (1.101) | 483320 | 100.000 | 103 | |
| | 57 1-Bromo-2-chloroethane | 63 | 7.822 | 7.822 | (1.161) | 499208 | 100.000 | 103 | 9720 |
| | 56 2-Chloroethyl vinyl ether | 63 | 7.889 | 7.889 | (1.171) | 53346 | 100.000 | 107 | |
| | 58 cis-1,3-Dichloropropene | 75 | 7.942 | 7.942 | (1.179) | 533517 | 100.000 | 114 | |
| $ | 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.880) | 489072 | 50.0000 | 50.0 | |
| | 61 Toluene + | 91 | 8.125 | 8.125 | (0.884) | 1376185 | 100.000 | 101 | |
| | 66 Tetrachloroethene | 164 | 8.414 | 8.414 | (0.915) | 312856 | 100.000 | 101 | |
| | 59 4-methyl-2-pentanone | 43 | 8.414 | 8.414 | (0.915) | 477959 | 100.000 | 110 | |
| | 62 trans-1,3-Dichloropropene | 75 | 8.436 | 8.436 | (1.253) | 472453 | 100.000 | 115 | |
| M | 145 1-3 Dichloropropene total | 100 | | | | 1005970 | 200.000 | 229 | 0 |
| | 65 1,1,2-Trichloroethane | 97 | 8.553 | 8.553 | (0.930) | 329551 | 100.000 | 101 | |
| | 69 Dibromochloromethane | 129 | 8.680 | 8.680 | (0.944) | 418551 | 100.000 | 105 | |
| | 67 1,3-Dichloropropane | 76 | 8.751 | 8.751 | (0.952) | 538357 | 100.000 | 105 | |
| | 70 1,2-Dibromoethane(EDB) | 107 | 8.856 | 8.856 | (0.963) | 324629 | 100.000 | 110 | |
| | 68 2-Hexanone | 43 | 8.995 | 8.995 | (0.978) | 383600 | 100.000 | 114 | |
| | 140 1-Chlorohexane | 91 | 9.179 | 9.179 | (0.998) | 391408 | 100.000 | 115 | 8889(M2) |
| * | 71 CHLOROBENZENE-d5 | 82 | 9.194 | 9.194 | (1.000) | 200874 | 50.0000 | | |
| | 72 Chlorobenzene ++ | 112 | 9.205 | 9.205 | (1.001) | 889926 | 100.000 | 99.4 | |
| | 73 Ethylbenzene + | 106 | 9.216 | 9.216 | (1.002) | 476055 | 100.000 | 103 | |
| | 74 1,1,1,2-Tetrachloroethane | 133 | 9.246 | 9.246 | (1.006) | 366524 | 100.000 | 101 | |
| | 75 p,m-Xylene | 106 | 9.310 | 9.310 | (1.013) | 1176717 | 200.000 | 210 | |
| | 76 o-Xylene | 106 | 9.591 | 9.591 | (1.043) | 587372 | 100.000 | 108 | |

| | | | QUANT SIG | | | | | AMOUNTS | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Compounds | MASS | RT | EXP RT | REL RT | RESPONSE | CAL-AMT ( ppb) | ON-COL ( ppb) | SIMILARITY |
| M | 99 | TOTAL XYLENE | 106 | | | | 1764089 | 300.000 | 318 | |
| | 77 | Styrene | 104 | 9.625 | 9.625 | (1.047) | 979478 | 100.000 | 113 | |
| | 78 | Bromoform ++ | 173 | 9.651 | 9.651 | (1.050) | 348572 | 100.000 | 107 | |
| | 79 | Isopropylbenzene | 105 | 9.786 | 9.786 | (1.064) | 1454126 | 100.000 | 111 | |
| $ | 80 | Bromofluorobenzene | 174 | 9.970 | 9.970 | (1.084) | 189164 | 50.0000 | 53.2 | |
| | 84 | Bromobenzene | 77 | 10.041 | 10.041 | (0.943) | 636161 | 100.000 | 91.8 | |
| | 86 | n-Propylbenzene | 91 | 10.041 | 10.041 | (0.943) | 1583017 | 100.000 | 93.1 | |
| | 81 | 1,1,2,2-Tetrachloroethane++ | 83 | 10.082 | 10.082 | (0.947) | 474263 | 100.000 | 104 | |
| | 87 | 2-Chlorotoluene | 91 | 10.146 | 10.146 | (0.953) | 1110300 | 100.000 | 91.8 | |
| | 88 | 1,3,5-Trimethylbenzene | 105 | 10.149 | 10.149 | (0.954) | 1160355 | 100.000 | 95.6 | |
| | 85 | 1,2,3-Trichloropropane | 75 | 10.176 | 10.176 | (0.956) | 532854 | 100.000 | 95.4 | |
| | 83 | trans-1,4-Dichloro-2-Butene | 53 | 10.191 | 10.191 | (0.957) | 107814 | 100.000 | 114 | |
| | 90 | 4-Chlorotoluene | 91 | 10.247 | 10.247 | (0.963) | 1032309 | 100.000 | 97.9 | |
| | 91 | tert-butylbenzene | 91 | 10.348 | 10.348 | (0.972) | 621101 | 100.000 | 94.3 | |
| | 93 | 1,2,4-Trimethylbenzene | 105 | 10.389 | 10.389 | (0.976) | 1182131 | 100.000 | 99.9 | |
| | 94 | sec-Butylbenzene | 105 | 10.457 | 10.457 | (0.982) | 1376758 | 100.000 | 97.7 | |
| | 92 | p-Isopropyltoluene | 119 | 10.532 | 10.532 | (0.989) | 1214709 | 100.000 | 103 | |
| | 96 | 1,3-Dichlorobenzene | 146 | 10.603 | 10.603 | (0.996) | 739220 | 100.000 | 101 | |
| * | 97 | 1,4-DICHLOROBENZENE-D4 | 152 | 10.644 | 10.644 | (1.000) | 217116 | 50.0000 | | |
| | 98 | 1,4-Dichlorobenzene | 146 | 10.656 | 10.656 | (1.001) | 758210 | 100.000 | 98.5 | |
| | 100 | n-Butylbenzene | 91 | 10.787 | 10.787 | (1.013) | 946393 | 100.000 | 112 | |
| | 102 | 1,2-Dichlorobenzene | 146 | 10.914 | 10.914 | (1.025) | 746037 | 100.000 | 100 | |
| | 106 | 1,2-Dibromo-3-Chloropropane | 157 | 11.447 | 11.447 | (1.075) | 118270 | 100.000 | 103 | |
| | 109 | Hexachlorobutadiene | 225 | 11.908 | 11.908 | (1.119) | 228934 | 100.000 | 106 | |
| | 108 | 1,2,4-Trichlorobenzene | 180 | 11.960 | 11.960 | (1.124) | 366377 | 100.000 | 101 | |
| | 110 | Naphthalene | 128 | 12.249 | 12.249 | (1.151) | 754441 | 100.000 | 97.4 | |
| | 111 | 1,2,3-Trichlorobenzene | 180 | 12.417 | 12.417 | (1.167) | 352689 | 100.000 | 101 | |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/msv12.i/2180416p.s.b/q7983cD.d



Date : 16-APR-2018 18:20

Client ID: V12STD100

Instrument: msv12.i

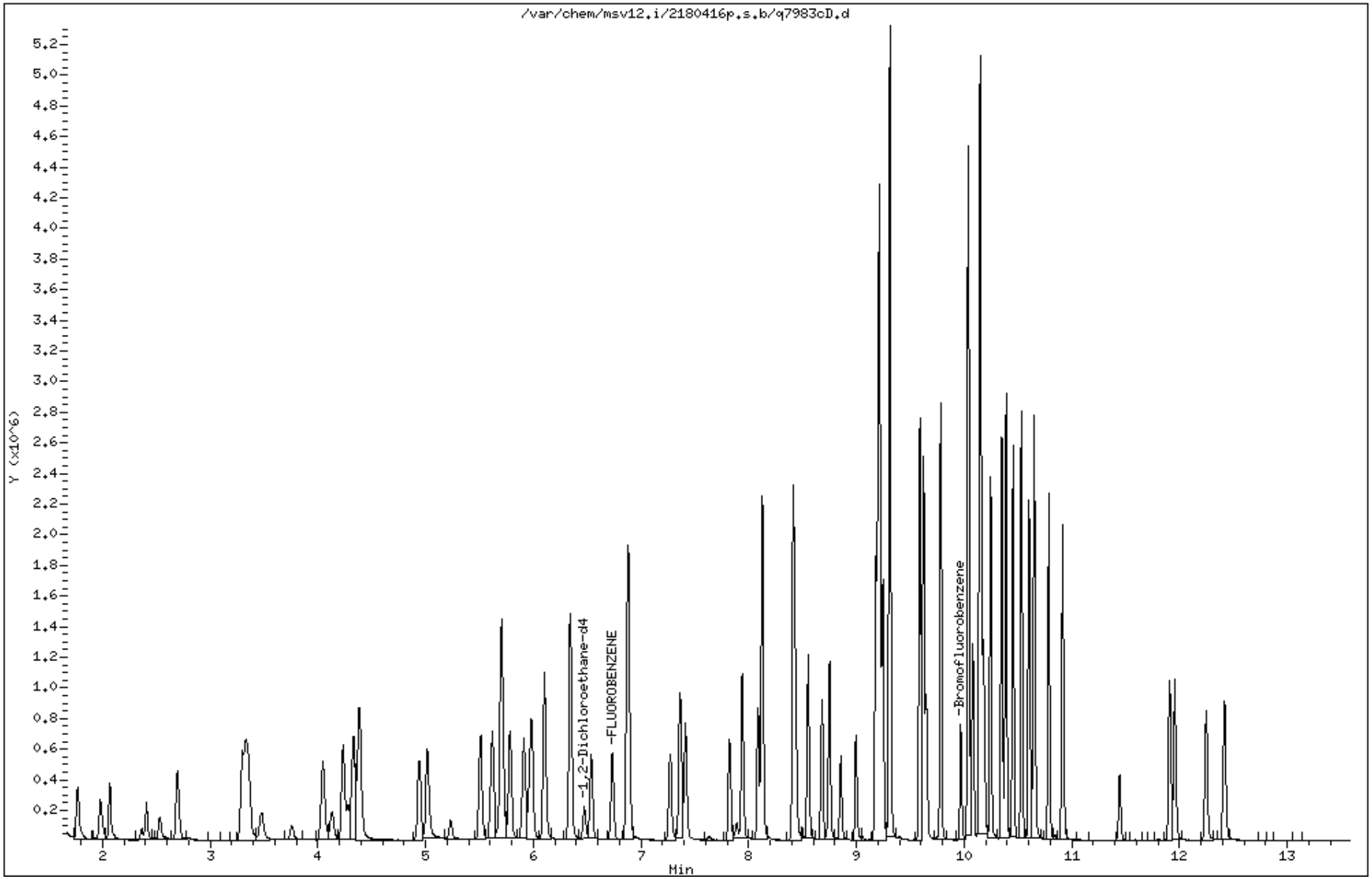
Sample Info: 1208*V12STD100

Purge Volume: 5.0

Operator: JCK

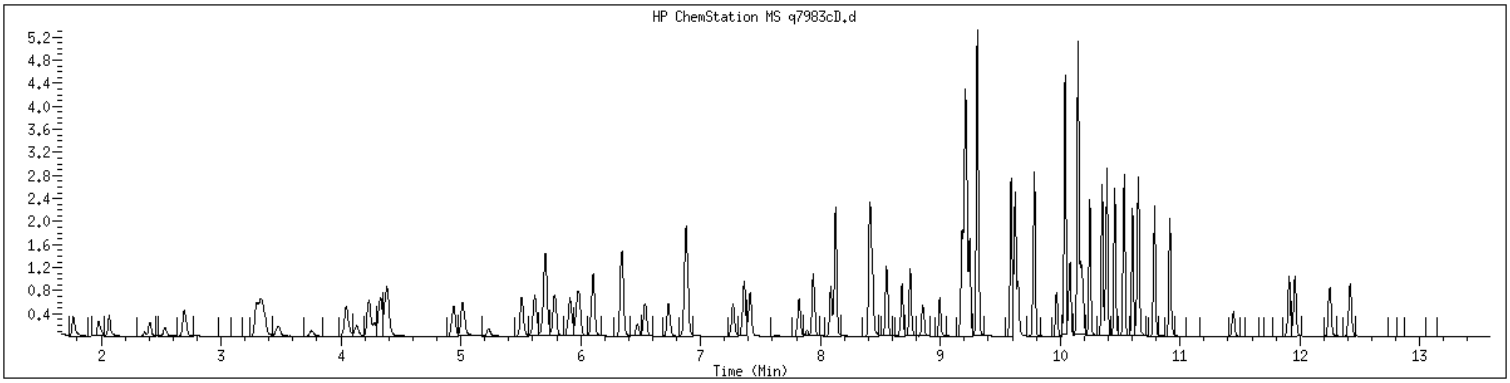
Column phase: RTX-VMS-30M

Column diameter: 0.25



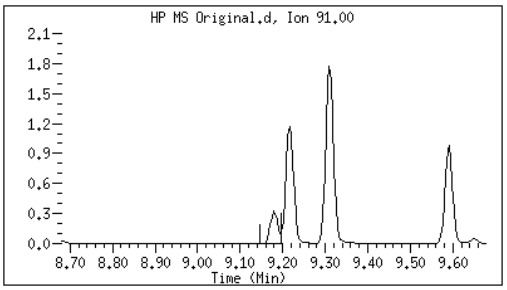
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 1208 SampleType : CALIB_8
Injection Date: 04/16/2018 18:20 Instrument : msv12.i
Operator : JCK
Sample Info : 1208*V12STD100
Misc Info : MSV~40682~*1*JCK
Method : /var/chem/msv12.i/2180416p.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b



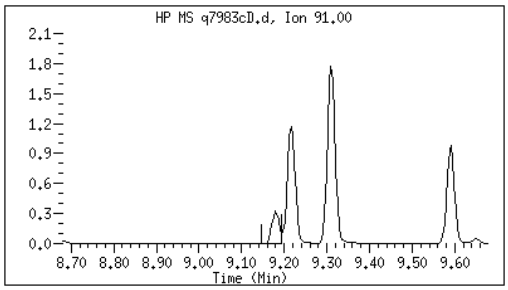

Original Final

140 1-Chlorohexane CAS#: 544-10-5 Reason: M2




Electronic Signature Applied

User: jck2
Date: 04/16/2018 19:15




M2 - Target system integrated incorrectly

GCAL, Inc.

Data file : /var/chem/msv12.i/2180416p.s.b/q7984cD.d
Lab Smp Id: 1209 Client Smp ID: V12STD200
Inj Date : 16-APR-2018 18:43
Operator : JCK Inst ID: msv12.i
Smp Info : 1209*V12STD200
Misc Info : MSV~40682~*1*JCK
Comment :
Method : /var/chem/msv12.i/2180416p.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:07 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 18:43 Cal File: q7984cD.d
Als bottle: 9 Calibration Sample, Level: 9
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | AMOUNTS CAL-AMT ( ppb) | AMOUNTS ON-COL ( ppb) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|
| 1 Dichlorodifluoromethane | 85 | 1.771 | 1.771 | (0.263) | 702301 | 200.000 | 191 | |
| 2 Chloromethane ++ | 50 | 1.981 | 1.981 | (0.294) | 775989 | 200.000 | 203 | (A) |
| 3 Vinyl Chloride + | 62 | 2.067 | 2.067 | (0.307) | 708144 | 200.000 | 198 | |
| 5 Bromomethane | 94 | 2.405 | 2.405 | (0.357) | 303950 | 200.000 | 234 | (A) |
| 6 Chloroethane | 64 | 2.517 | 2.517 | (0.374) | 267761 | 200.000 | 154 | |
| 7 Trichlorofluoromethane | 101 | 2.690 | 2.690 | (0.400) | 865723 | 200.000 | 191 | |
| 11 1,1-Dichloroethene + | 96 | 3.293 | 3.293 | (0.489) | 466800 | 200.000 | 198 | |
| 14 Carbon Disulfide | 76 | 3.327 | 3.327 | (0.494) | 1628946 | 200.000 | 202 | (A) |
| 10 1,1,2Trichlotrifluoroethane | 101 | 3.350 | 3.350 | (0.498) | 515880 | 200.000 | 196 | |
| 13 Methyl Iodide | 142 | 3.477 | 3.477 | (0.517) | 654585 | 200.000 | 200 | |
| 9 Acrolein | 56 | 3.751 | 3.751 | (0.557) | 247646 | 1000.00 | 1160 | (A) |
| 17 Methylene Chloride | 49 | 4.043 | 4.043 | (0.601) | 876512 | 200.000 | 188 | |
| 12 Acetone | 43 | 4.129 | 4.129 | (0.613) | 533239 | 200.000 | 193 | |
| 19 trans-1,2-Dichloroethene | 61 | 4.234 | 4.234 | (0.629) | 872455 | 200.000 | 208 | (A) |

| | Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | AMOUNTS CAL-AMT ( ppb) | ON-COL ( ppb) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|---|
| | 20 Methyl Acetate | 43 | 4.275 | 4.275 | (0.635) | 662536 | 200.000 | 224 | 8745(A) |
| | 23 Hexane | 57 | 4.332 | 4.332 | (0.644) | 738979 | 200.000 | 202 | 9399(A) |
| | 21 MTBE | 73 | 4.380 | 4.380 | (0.651) | 2008337 | 200.000 | 200 | 9584 |
| | 24 1,1-Dichloroethane ++ | 63 | 4.943 | 4.943 | (0.734) | 1171671 | 200.000 | 191 | |
| | 22 Acrylonitrile | 53 | 5.014 | 5.014 | (0.745) | 1353655 | 1000.00 | 1190 | (AM1) |
| | 25 Vinyl Acetate | 43 | 5.231 | 5.231 | (0.777) | 437322 | 200.000 | 239 | (A) |
| | 30 cis-1,2-Dichloroethene | 61 | 5.509 | 5.509 | (0.818) | 876484 | 200.000 | 205 | (A) |
| M | 48 Total 1,2-Dichloroethene | 61 | | | | 1748939 | 400.000 | 413 | |
| | 31 2,2-Dichloropropane | 77 | 5.617 | 5.617 | (0.835) | 934781 | 200.000 | 198 | |
| | 38 Cyclohexane | 56 | 5.704 | 5.704 | (0.847) | 967434 | 200.000 | 203 | 8797(A) |
| | 34 Bromochloromethane | 128 | 5.711 | 5.711 | (0.849) | 334821 | 200.000 | 198 | |
| | 41 Chloroform + | 83 | 5.782 | 5.782 | (0.859) | 1159848 | 200.000 | 194 | |
| | 39 Carbon Tetrachloride | 117 | 5.914 | 5.914 | (0.879) | 917921 | 200.000 | 198 | |
| $ | 36 Dibromofluoromethane | 111 | 5.962 | 5.962 | (0.886) | 136075 | 50.0000 | 50.2 | 7099 |
| | 37 1,1,1-Trichloroethane | 97 | 5.985 | 5.985 | (0.889) | 1032113 | 200.000 | 195 | |
| | 42 1,1-Dichloropropene | 75 | 6.105 | 6.105 | (0.907) | 837736 | 200.000 | 205 | (A) |
| | 32 2-Butanone | 43 | 6.101 | 6.101 | (0.906) | 568131 | 200.000 | 212 | (A) |
| | 44 Benzene | 78 | 6.345 | 6.345 | (0.943) | 2543186 | 200.000 | 197 | |
| $ | 43 1,2-Dichloroethane-d4 | 67 | 6.472 | 6.472 | (0.962) | 82912 | 50.0000 | 51.7 | |
| | 46 1,2-Dichloroethane | 62 | 6.536 | 6.536 | (0.971) | 938684 | 200.000 | 197 | |
| * | 47 FLUOROBENZENE | 96 | 6.731 | 6.731 | (1.000) | 507534 | 50.0000 | | |
| | 50 Methyl Cyclohexane | 83 | 6.877 | 6.877 | (1.022) | 857254 | 200.000 | 201 | 8352(A) |
| | 49 Trichloroethene | 130 | 6.884 | 6.884 | (1.023) | 716928 | 200.000 | 201 | (A) |
| | 52 Dibromomethane | 93 | 7.271 | 7.271 | (1.080) | 408936 | 200.000 | 209 | (A) |
| | 51 1,2-Dichloropropane + | 63 | 7.364 | 7.364 | (1.094) | 675227 | 200.000 | 196 | |
| | 54 Bromodichloromethane | 83 | 7.413 | 7.413 | (1.101) | 953560 | 200.000 | 200 | (A) |
| | 57 1-Bromo-2-chloroethane | 63 | 7.822 | 7.822 | (1.162) | 989400 | 200.000 | 201 | 9713(A) |
| | 56 2-Chloroethyl vinyl ether | 63 | 7.889 | 7.889 | (1.172) | 99913 | 200.000 | 198 | |
| | 58 cis-1,3-Dichloropropene | 75 | 7.942 | 7.942 | (1.180) | 1080534 | 200.000 | 227 | (A) |
| $ | 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.879) | 502798 | 50.0000 | 50.5 | |
| | 61 Toluene + | 91 | 8.125 | 8.125 | (0.883) | 2654911 | 200.000 | 191 | |
| | 66 Tetrachloroethene | 164 | 8.414 | 8.414 | (0.915) | 613697 | 200.000 | 194 | |
| | 59 4-methyl-2-pentanone | 43 | 8.410 | 8.410 | (0.914) | 927191 | 200.000 | 210 | (A) |
| | 62 trans-1,3-Dichloropropene | 75 | 8.436 | 8.436 | (1.253) | 967900 | 200.000 | 231 | (A) |
| M | 145 1-3 Dichloropropene total | 100 | | | | 2048434 | 400.000 | 458 | 0 |
| | 65 1,1,2-Trichloroethane | 97 | 8.553 | 8.553 | (0.930) | 640072 | 200.000 | 194 | |
| | 69 Dibromochloromethane | 129 | 8.680 | 8.680 | (0.944) | 841535 | 200.000 | 207 | (A) |
| | 67 1,3-Dichloropropane | 76 | 8.751 | 8.751 | (0.951) | 1053668 | 200.000 | 203 | (A) |
| | 70 1,2-Dibromoethane(EDB) | 107 | 8.856 | 8.856 | (0.963) | 654820 | 200.000 | 218 | (A) |
| | 68 2-Hexanone | 43 | 8.995 | 8.995 | (0.978) | 777841 | 200.000 | 228 | (A) |
| | 140 1-Chlorohexane | 91 | 9.179 | 9.179 | (0.998) | 764534 | 200.000 | 221 | 8677(AM2) |
| * | 71 CHLOROBENZENE-d5 | 82 | 9.197 | 9.197 | (1.000) | 204378 | 50.0000 | | |
| | 72 Chlorobenzene ++ | 112 | 9.205 | 9.205 | (1.001) | 1777233 | 200.000 | 195 | |
| | 73 Ethylbenzene + | 106 | 9.216 | 9.216 | (1.002) | 940776 | 200.000 | 201 | (A) |
| | 74 1,1,1,2-Tetrachloroethane | 133 | 9.246 | 9.246 | (1.005) | 726172 | 200.000 | 196 | |
| | 75 p,m-Xylene | 106 | 9.310 | 9.310 | (1.012) | 2266310 | 400.000 | 397 | |
| | 76 o-Xylene | 106 | 9.591 | 9.591 | (1.043) | 1157826 | 200.000 | 209 | (A) |

| | | | QUANT SIG | | | | | AMOUNTS | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Compounds | MASS | RT | EXP RT | REL RT | RESPONSE | CAL-AMT ( ppb) | ON-COL ( ppb) | SIMILARITY |
| M | 99 | TOTAL XYLENE | 106 | | | | 3424136 | 600.000 | 606 | |
| | 77 | Styrene | 104 | 9.625 | 9.625 | (1.046) | 1944434 | 200.000 | 221 | (A) |
| | 78 | Bromoform ++ | 173 | 9.651 | 9.651 | (1.049) | 699914 | 200.000 | 211 | (A) |
| | 79 | Isopropylbenzene | 105 | 9.782 | 9.782 | (1.064) | 2701232 | 200.000 | 202 | (A) |
| $ | 80 | Bromofluorobenzene | 174 | 9.970 | 9.970 | (1.084) | 196567 | 50.0000 | 54.4 | |
| | 84 | Bromobenzene | 77 | 10.041 | 10.041 | (0.943) | 1277872 | 200.000 | 171 | |
| | 86 | n-Propylbenzene | 91 | 10.041 | 10.041 | (0.943) | 2903496 | 200.000 | 158 | |
| | 81 | 1,1,2,2-Tetrachloroethane++ | 83 | 10.082 | 10.082 | (0.947) | 923726 | 200.000 | 189 | |
| | 87 | 2-Chlorotoluene | 91 | 10.146 | 10.146 | (0.953) | 2162994 | 200.000 | 166 | |
| | 88 | 1,3,5-Trimethylbenzene | 105 | 10.150 | 10.150 | (0.954) | 2224592 | 200.000 | 170 | |
| | 85 | 1,2,3-Trichloropropane | 75 | 10.176 | 10.176 | (0.956) | 1085476 | 200.000 | 180 | |
| | 83 | trans-1,4-Dichloro-2-Butene | 53 | 10.191 | 10.191 | (0.957) | 235643 | 200.000 | 231 | (A) |
| | 90 | 4-Chlorotoluene | 91 | 10.247 | 10.247 | (0.963) | 2030471 | 200.000 | 179 | |
| | 91 | tert-butylbenzene | 91 | 10.348 | 10.348 | (0.972) | 1215982 | 200.000 | 171 | |
| | 93 | 1,2,4-Trimethylbenzene | 105 | 10.389 | 10.389 | (0.976) | 2271094 | 200.000 | 178 | |
| | 94 | sec-Butylbenzene | 105 | 10.457 | 10.457 | (0.982) | 2570542 | 200.000 | 169 | |
| | 92 | p-Isopropyltoluene | 119 | 10.532 | 10.532 | (0.989) | 2299362 | 200.000 | 182 | |
| | 96 | 1,3-Dichlorobenzene | 146 | 10.603 | 10.603 | (0.996) | 1497928 | 200.000 | 189 | |
| * | 97 | 1,4-DICHLOROBENZENE-D4 | 152 | 10.644 | 10.644 | (1.000) | 233989 | 50.0000 | | |
| | 98 | 1,4-Dichlorobenzene | 146 | 10.656 | 10.656 | (1.001) | 1528976 | 200.000 | 184 | |
| | 100 | n-Butylbenzene | 91 | 10.787 | 10.787 | (1.013) | 1858674 | 200.000 | 205 | (A) |
| | 102 | 1,2-Dichlorobenzene | 146 | 10.914 | 10.914 | (1.025) | 1483659 | 200.000 | 185 | |
| | 106 | 1,2-Dibromo-3-Chloropropane | 157 | 11.443 | 11.443 | (1.075) | 244518 | 200.000 | 198 | |
| | 109 | Hexachlorobutadiene | 225 | 11.908 | 11.908 | (1.119) | 441673 | 200.000 | 189 | |
| | 108 | 1,2,4-Trichlorobenzene | 180 | 11.956 | 11.956 | (1.123) | 803867 | 200.000 | 201 | (A) |
| | 110 | Naphthalene | 128 | 12.249 | 12.249 | (1.151) | 1765177 | 200.000 | 203 | (A) |
| | 111 | 1,2,3-Trichlorobenzene | 180 | 12.417 | 12.417 | (1.167) | 765351 | 200.000 | 200 | (A) |

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.
M1- Compound response manually integrated because Target system did not integrate.
M2- Compound response manually integrated because Target system integrated incorrectly.

Data File: /var/chem/msv12.i/2180416p.s.b/q7984cD.d



Date : 16-APR-2018 18:43

Client ID: V12STD200

Instrument: msv12.i

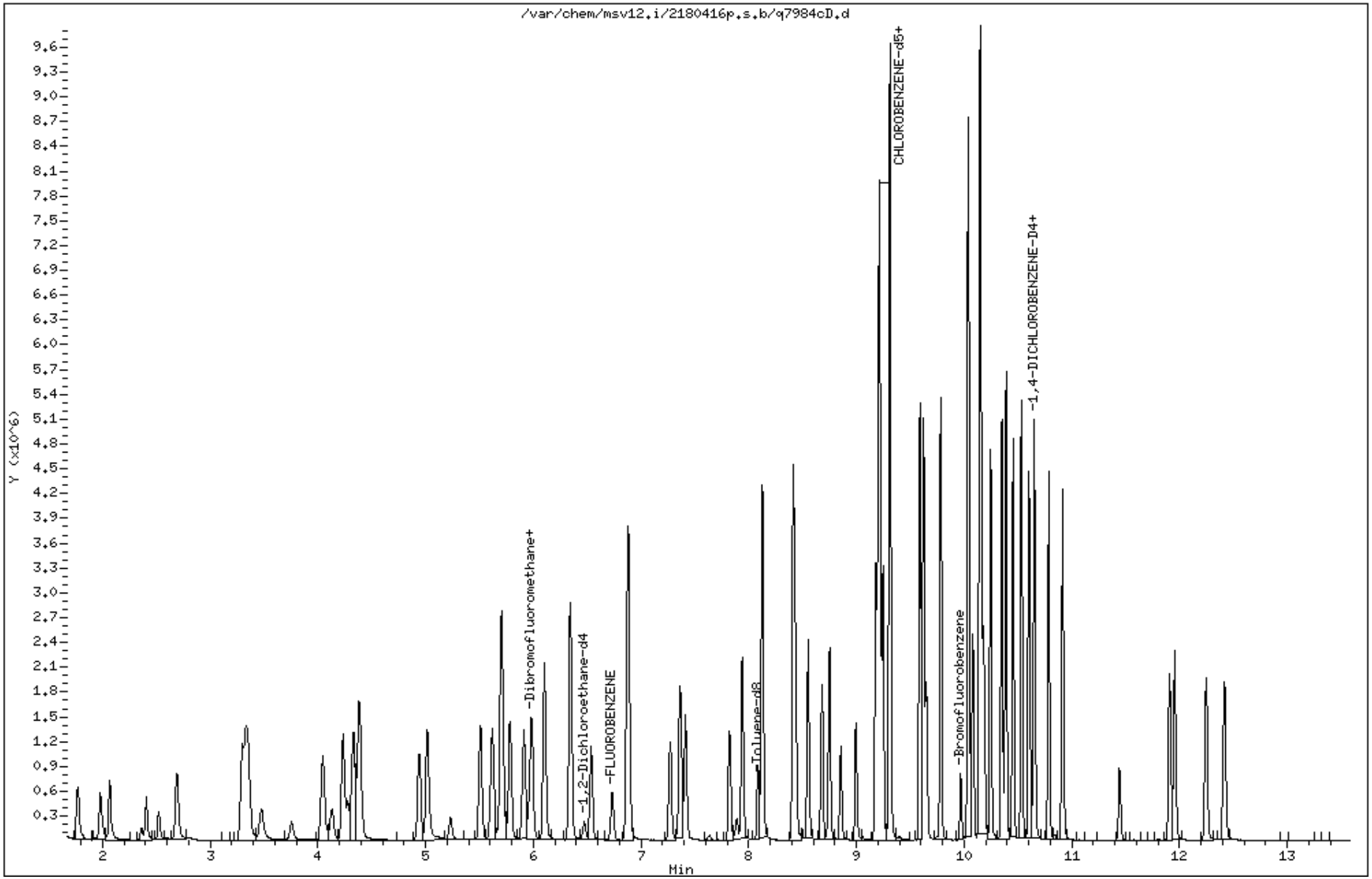
Sample Info: 1209*V12STD200

Purge Volume: 5.0

Operator: JCK

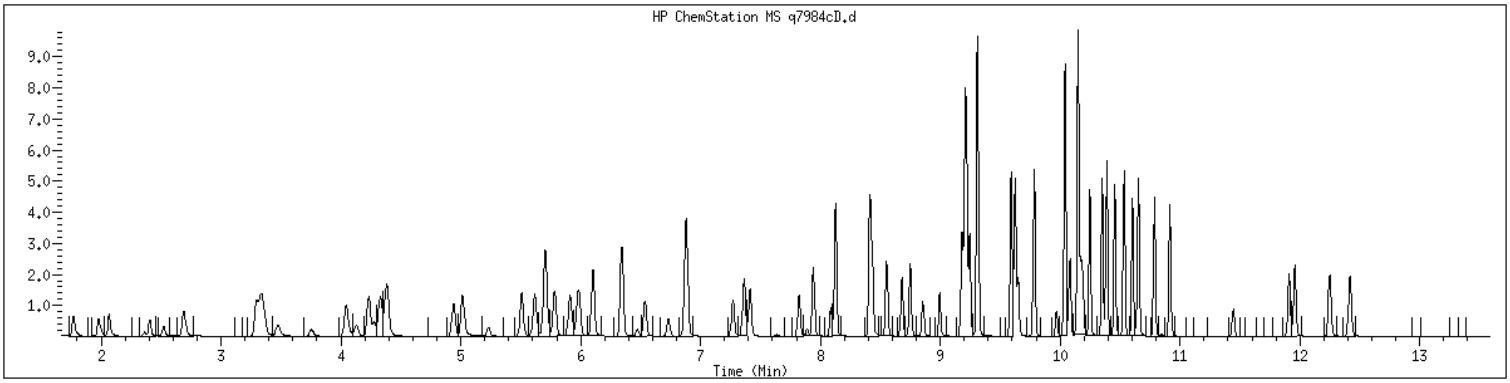
Column phase: RTX-VMS-30M

Column diameter: 0.25



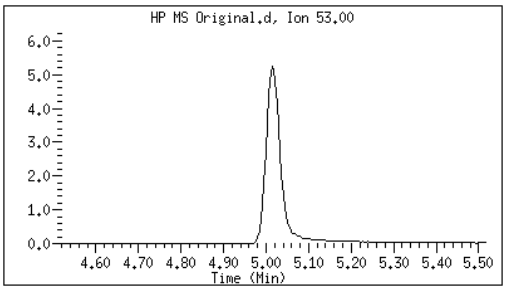
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 1209 SampleType : CALIB_9
Injection Date: 04/16/2018 18:43 Instrument : msv12.i
Operator : JCK
Sample Info : 1209*V12STD200
Misc Info : MSV~40682~*1*JCK
Method : /var/chem/msv12.i/2180416p.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b



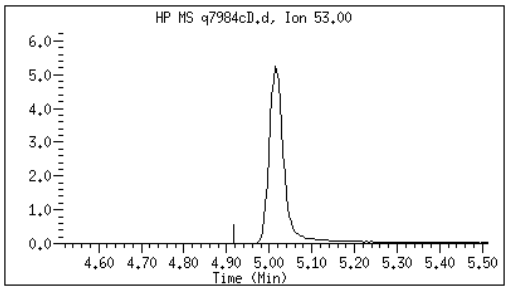

Original Final

22 Acrylonitrile CAS#: 107-13-1 Reason: M1

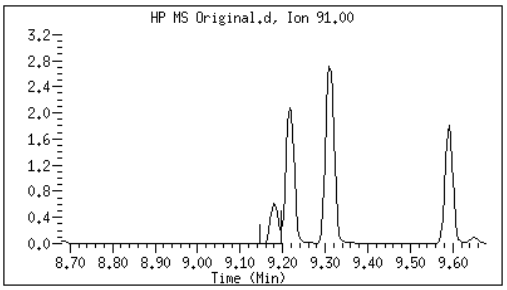



Electronic Signature Applied

User: jck2
Date: 04/16/2018 19:06

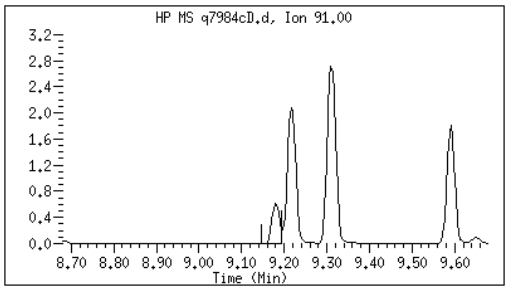



140 1-Chlorohexane CAS#: 544-10-5 Reason: M2




Electronic Signature Applied

User: jck2
Date: 04/16/2018 19:15



M1 - Target system did not integrate
M2 - Target system integrated incorrectly

# Form 6I

# ICAL Verifications

6I

ORGANICS INITIAL CALIBRATION VERIFICATION

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Instrument ID: | MSV12 |
| Analysis Date: | 04/16/18 1929 | Lab File ID: | 2180416p/q7986cD |
| Analytical Method: | EPA 8260C | Analytical Batch: | 633658 |

| *ANALYTE* | *UNITS* | *TRUE* | *FOUND* | *% REC* | *LCL* | *UCL* | *Q* |
|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ug/L | 50.0 | 50.4 | 101 | 80 | 120 | |
| 1,1,1-Trichloroethane | ug/L | 50.0 | 50.4 | 101 | 80 | 120 | |
| 1,1,2,2-Tetrachloroethane | ug/L | 50.0 | 54.4 | 109 | 80 | 120 | |
| 1,1,2-Trichloroethane | ug/L | 50.0 | 50.6 | 101 | 80 | 120 | |
| 1,1-Dichloroethane | ug/L | 50.0 | 50.5 | 101 | 80 | 120 | |
| 1,1-Dichloroethene | ug/L | 50.0 | 52.1 | 104 | 80 | 120 | |
| 1,1-Dichloropropene | ug/L | 50.0 | 53.2 | 106 | 80 | 120 | |
| 1,2,3-Trichlorobenzene | ug/L | 50.0 | 49.4 | 99 | 80 | 120 | |
| 1,2,3-Trichloropropane | ug/L | 50.0 | 48.3 | 97 | 80 | 120 | |
| 1,2,4-Trichlorobenzene | ug/L | 50.0 | 47.5 | 95 | 80 | 120 | |
| 1,2,4-Trimethylbenzene | ug/L | 50.0 | 50.6 | 101 | 80 | 120 | |
| 1,2-Dibromo-3-chloropropane | ug/L | 50.0 | 51.3 | 103 | 80 | 120 | |
| 1,2-Dibromoethane | ug/L | 50.0 | 53.7 | 107 | 80 | 120 | |
| 1,2-Dichlorobenzene | ug/L | 50.0 | 50.3 | 101 | 80 | 120 | |
| 1,2-Dichloroethane | ug/L | 50.0 | 50.4 | 101 | 80 | 120 | |
| 1,2-Dichloropropane | ug/L | 50.0 | 50.3 | 101 | 80 | 120 | |
| 1,3,5-Trimethylbenzene | ug/L | 50.0 | 49.0 | 98 | 80 | 120 | |
| 1,3-Dichlorobenzene | ug/L | 50.0 | 50.5 | 101 | 80 | 120 | |
| 1,3-Dichloropropane | ug/L | 50.0 | 52.6 | 105 | 80 | 120 | |
| 1,4-Dichlorobenzene | ug/L | 50.0 | 48.9 | 98 | 80 | 120 | |
| 1-Chlorohexane | ug/L | 50.0 | 57.5 | 115 | 80 | 120 | |
| 2,2-Dichloropropane | ug/L | 50.0 | 50.7 | 101 | 80 | 120 | |
| 2-Butanone | ug/L | 50.0 | 53.9 | 108 | 80 | 120 | |
| 2-Chlorotoluene | ug/L | 50.0 | 47.4 | 95 | 80 | 120 | |
| 2-Hexanone | ug/L | 50.0 | 55.8 | 112 | 80 | 120 | |
| 4-Chlorotoluene | ug/L | 50.0 | 49.7 | 99 | 80 | 120 | |
| 4-Isopropyltoluene | ug/L | 50.0 | 50.8 | 102 | 80 | 120 | |
| 4-Methyl-2-pentanone | ug/L | 50.0 | 55.7 | 111 | 80 | 120 | |
| Acetone | ug/L | 50.0 | 50.3 | 101 | 80 | 120 | |
| Benzene | ug/L | 50.0 | 52.2 | 104 | 80 | 120 | |
| Bromobenzene | ug/L | 50.0 | 47.6 | 95 | 80 | 120 | |
| Bromochloromethane | ug/L | 50.0 | 53.8 | 108 | 80 | 120 | |
| Bromodichloromethane | ug/L | 50.0 | 52.2 | 104 | 80 | 120 | |
| Bromoform | ug/L | 50.0 | 53.3 | 107 | 80 | 120 | |

FORM 6I - ORG

6I

ORGANICS INITIAL CALIBRATION VERIFICATION

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Instrument ID: | MSV12 |
| Analysis Date: | 04/16/18 1929 | Lab File ID: | 2180416p/q7986cD |
| Analytical Method: | EPA 8260C | Analytical Batch: | 633658 |

| *ANALYTE* | *UNITS* | *TRUE* | *FOUND* | *% REC* | *LCL* | *UCL* | *Q* |
|---|---|---|---|---|---|---|---|
| Bromomethane | ug/L | 50.0 | 54.8 | 110 | 80 | 120 | |
| Carbon disulfide | ug/L | 50.0 | 55.5 | 111 | 80 | 120 | |
| Carbon tetrachloride | ug/L | 50.0 | 50.9 | 102 | 80 | 120 | |
| Chlorobenzene | ug/L | 50.0 | 50.7 | 101 | 80 | 120 | |
| Chloroethane | ug/L | 50.0 | 49.9 | 100 | 80 | 120 | |
| Chloroform | ug/L | 50.0 | 50.5 | 101 | 80 | 120 | |
| Chloromethane | ug/L | 50.0 | 48.3 | 97 | 80 | 120 | |
| cis-1,2-Dichloroethene | ug/L | 50.0 | 52.2 | 104 | 80 | 120 | |
| cis-1,3-Dichloropropene | ug/L | 50.0 | 55.7 | 111 | 80 | 120 | |
| Dibromochloromethane | ug/L | 50.0 | 52.3 | 105 | 80 | 120 | |
| Dibromomethane | ug/L | 50.0 | 52.1 | 104 | 80 | 120 | |
| Dichlorodifluoromethane | ug/L | 50.0 | 50.3 | 101 | 80 | 120 | |
| Ethylbenzene | ug/L | 50.0 | 51.8 | 104 | 80 | 120 | |
| Hexachlorobutadiene | ug/L | 50.0 | 52.3 | 105 | 80 | 120 | |
| Isopropylbenzene (Cumene) | ug/L | 50.0 | 55.1 | 110 | 80 | 120 | |
| m,p-Xylene | ug/L | 100 | 107 | 107 | 80 | 120 | |
| Methylene chloride | ug/L | 50.0 | 49.4 | 99 | 80 | 120 | |
| Naphthalene | ug/L | 50.0 | 45.9 | 92 | 80 | 120 | |
| n-Butylbenzene | ug/L | 50.0 | 53.3 | 107 | 80 | 120 | |
| n-Propylbenzene | ug/L | 50.0 | 48.3 | 97 | 80 | 120 | |
| o-Xylene | ug/L | 50.0 | 54.4 | 109 | 80 | 120 | |
| sec-Butylbenzene | ug/L | 50.0 | 49.2 | 98 | 80 | 120 | |
| Styrene | ug/L | 50.0 | 56.1 | 112 | 80 | 120 | |
| tert-Butyl methyl ether (MTBE) | ug/L | 50.0 | 51.5 | 103 | 80 | 120 | |
| tert-Butylbenzene | ug/L | 50.0 | 47.8 | 96 | 80 | 120 | |
| Tetrachloroethene | ug/L | 50.0 | 50.9 | 102 | 80 | 120 | |
| Toluene | ug/L | 50.0 | 51.4 | 103 | 80 | 120 | |
| trans-1,2-Dichloroethene | ug/L | 50.0 | 52.6 | 105 | 80 | 120 | |
| trans-1,3-Dichloropropene | ug/L | 50.0 | 55.4 | 111 | 80 | 120 | |
| Trichloroethene | ug/L | 50.0 | 52.3 | 105 | 80 | 120 | |
| Trichlorofluoromethane | ug/L | 50.0 | 50.5 | 101 | 80 | 120 | |
| Vinyl chloride | ug/L | 50.0 | 51.3 | 103 | 80 | 120 | |

GCAL, Inc.

Data file : /var/chem/msv12.i/2180416p.s.b/q7986cD.d
Lab Smp Id: 1600 Client Smp ID: ICV050
Inj Date : 16-APR-2018 19:29
Operator : JCK Inst ID: msv12.i
Smp Info : 1600*ICV050
Misc Info : MSV~40682~*1*JCK
Comment :
Method : /var/chem/msv12.i/2180416p.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:07 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 18:43 Cal File: q7984cD.d
Als bottle: 11 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|
| 1 Dichlorodifluoromethane | 85 | 1.771 | 1.771 | (0.263) | 178498 | 50.3322 | 50.3 | |
| 2 Chloromethane ++ | 50 | 1.978 | 1.981 | (0.294) | 178536 | 48.2921 | 48.3 | |
| 3 Vinyl Chloride + | 62 | 2.068 | 2.067 | (0.307) | 177375 | 51.2720 | 51.3 | |
| 5 Bromomethane | 94 | 2.412 | 2.405 | (0.358) | 68865 | 54.8472 | 54.8 | |
| 6 Chloroethane | 64 | 2.544 | 2.517 | (0.378) | 83670 | 49.8746 | 49.9 | (H) |
| 7 Trichlorofluoromethane | 101 | 2.697 | 2.690 | (0.401) | 220338 | 50.4712 | 50.5 | |
| 11 1,1-Dichloroethene + | 96 | 3.301 | 3.293 | (0.490) | 118734 | 52.1429 | 52.1 | |
| 14 Carbon Disulfide | 76 | 3.331 | 3.327 | (0.495) | 433378 | 55.4563 | 55.5 | |
| 10 1,1,2Trichlotrifluoroethane | 101 | 3.353 | 3.350 | (0.498) | 133259 | 52.4727 | 52.5 | |
| 13 Methyl Iodide | 142 | 3.481 | 3.477 | (0.517) | 125404 | 48.7194 | 48.7 | |
| 9 Acrolein | 56 | 3.754 | 3.751 | (0.557) | 57443 | 279.922 | 280 | |
| 17 Methylene Chloride | 49 | 4.043 | 4.043 | (0.600) | 221964 | 49.4223 | 49.4 | |
| 12 Acetone | 43 | 4.133 | 4.129 | (0.614) | 134339 | 50.2740 | 50.3 | |
| 19 trans-1,2-Dichloroethene | 61 | 4.238 | 4.234 | (0.629) | 212854 | 52.6102 | 52.6 | |

| | Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppb) | CONCENTRATIONS FINAL ( ug/L) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|---|
| | 20 Methyl Acetate | 43 | 4.279 | 4.275 | (0.635) | 147885 | 51.7627 | 51.8 | 8706 |
| | 23 Hexane | 57 | 4.332 | 4.332 | (0.643) | 172641 | 48.8002 | 48.8 | 9269 |
| | 21 MTBE | 73 | 4.384 | 4.380 | (0.651) | 498669 | 51.4555 | 51.5 | 9439 |
| | 24 1,1-Dichloroethane ++ | 63 | 4.943 | 4.943 | (0.734) | 299295 | 50.4518 | 50.5 | |
| | 22 Acrylonitrile | 53 | 5.018 | 5.014 | (0.745) | 295258 | 268.277 | 268 | |
| | 25 Vinyl Acetate | 43 | 5.235 | 5.231 | (0.777) | 95723 | 54.1378 | 54.1 | |
| | 30 cis-1,2-Dichloroethene | 61 | 5.509 | 5.509 | (0.818) | 215239 | 52.1956 | 52.2 | |
| M | 48 Total 1,2-Dichloroethene | 61 | | | | 428093 | 104.806 | 105 | |
| | 31 2,2-Dichloropropane | 77 | 5.618 | 5.617 | (0.834) | 230211 | 50.6532 | 50.7 | |
| | 38 Cyclohexane | 56 | 5.704 | 5.704 | (0.847) | 244138 | 53.1681 | 53.2 | 8698 |
| | 34 Bromochloromethane | 128 | 5.711 | 5.711 | (0.848) | 87707 | 53.8187 | 53.8 | |
| | 41 Chloroform + | 83 | 5.786 | 5.782 | (0.859) | 292089 | 50.5257 | 50.5 | |
| | 39 Carbon Tetrachloride | 117 | 5.914 | 5.914 | (0.878) | 227758 | 50.9164 | 50.9 | |
| $ | 36 Dibromofluoromethane | 111 | 5.962 | 5.962 | (0.885) | 130541 | 49.9126 | 49.9 | 7045 |
| | 37 1,1,1-Trichloroethane | 97 | 5.985 | 5.985 | (0.889) | 257110 | 50.4048 | 50.4 | |
| | 42 1,1-Dichloropropene | 75 | 6.105 | 6.105 | (0.906) | 210281 | 53.2193 | 53.2 | |
| | 32 2-Butanone | 43 | 6.105 | 6.101 | (0.906) | 139550 | 53.8697 | 53.9 | |
| | 44 Benzene | 78 | 6.345 | 6.345 | (0.942) | 651464 | 52.2072 | 52.2 | |
| $ | 43 1,2-Dichloroethane-d4 | 67 | 6.472 | 6.472 | (0.961) | 78521 | 50.7031 | 50.7 | |
| | 46 1,2-Dichloroethane | 62 | 6.540 | 6.536 | (0.971) | 232336 | 50.4288 | 50.4 | |
| * | 47 FLUOROBENZENE | 96 | 6.735 | 6.731 | (1.000) | 489715 | 50.0000 | | |
| | 50 Methyl Cyclohexane | 83 | 6.877 | 6.877 | (1.021) | 213844 | 52.0735 | 52.1 | 8393 |
| | 49 Trichloroethene | 130 | 6.885 | 6.884 | (1.022) | 179966 | 52.3193 | 52.3 | |
| | 52 Dibromomethane | 93 | 7.271 | 7.271 | (1.080) | 98506 | 52.1111 | 52.1 | |
| | 51 1,2-Dichloropropane + | 63 | 7.361 | 7.364 | (1.093) | 167482 | 50.2632 | 50.3 | |
| | 54 Bromodichloromethane | 83 | 7.413 | 7.413 | (1.101) | 239956 | 52.2320 | 52.2 | |
| | 57 1-Bromo-2-chloroethane | 63 | 7.822 | 7.822 | (1.161) | 241419 | 50.8532 | 50.9 | 9720 |
| | 56 2-Chloroethyl vinyl ether | 63 | 7.889 | 7.889 | (1.171) | 23064 | 47.3339 | 47.3 | (M2) |
| | 58 cis-1,3-Dichloropropene | 75 | 7.942 | 7.942 | (1.179) | 255771 | 55.7023 | 55.7 | |
| $ | 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.880) | 484214 | 50.1470 | 50.1 | |
| | 61 Toluene + | 91 | 8.125 | 8.125 | (0.884) | 692816 | 51.4233 | 51.4 | |
| | 66 Tetrachloroethene | 164 | 8.414 | 8.414 | (0.915) | 155871 | 50.8909 | 50.9 | |
| | 59 4-methyl-2-pentanone | 43 | 8.414 | 8.410 | (0.915) | 239008 | 55.6880 | 55.7 | |
| | 62 trans-1,3-Dichloropropene | 75 | 8.433 | 8.436 | (1.252) | 223480 | 55.3603 | 55.4 | |
| M | 145 1-3 Dichloropropene total | 100 | | | | 479251 | 111.063 | 111 | 0 |
| | 65 1,1,2-Trichloroethane | 97 | 8.553 | 8.553 | (0.930) | 162133 | 50.5546 | 50.6 | |
| | 69 Dibromochloromethane | 129 | 8.680 | 8.680 | (0.944) | 206722 | 52.2846 | 52.3 | |
| | 67 1,3-Dichloropropane | 76 | 8.751 | 8.751 | (0.952) | 265086 | 52.5959 | 52.6 | |
| | 70 1,2-Dibromoethane(EDB) | 107 | 8.856 | 8.856 | (0.963) | 156397 | 53.6742 | 53.7 | |
| | 68 2-Hexanone | 43 | 8.995 | 8.995 | (0.978) | 184498 | 55.7547 | 55.8 | |
| | 140 1-Chlorohexane | 91 | 9.179 | 9.179 | (0.998) | 192737 | 57.4608 | 57.5 | 9231(M2) |
| * | 71 CHLOROBENZENE-d5 | 82 | 9.194 | 9.197 | (1.000) | 198341 | 50.0000 | | |
| | 72 Chlorobenzene ++ | 112 | 9.209 | 9.205 | (1.002) | 448008 | 50.6833 | 50.7 | |
| | 73 Ethylbenzene + | 106 | 9.216 | 9.216 | (1.002) | 235501 | 51.7669 | 51.8 | |
| | 74 1,1,1,2-Tetrachloroethane | 133 | 9.242 | 9.246 | (1.005) | 180783 | 50.3853 | 50.4 | |
| | 75 p,m-Xylene | 106 | 9.310 | 9.310 | (1.013) | 592873 | 107.135 | 107 | |
| | 76 o-Xylene | 106 | 9.591 | 9.591 | (1.043) | 293193 | 54.4339 | 54.4 | |

| | | | QUANT SIG | | | | | CONCENTRATIONS ON-COLUMN | FINAL | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Compounds | MASS | RT | EXP RT | REL RT | RESPONSE | ( ppb) | ( ug/L) | SIMILARITY |
| M | 99 | TOTAL XYLENE | 106 | | | | 886066 | 161.569 | 162 | |
| | 77 | Styrene | 104 | 9.625 | 9.625 | (1.047) | 479948 | 56.1277 | 56.1 | |
| | 78 | Bromoform ++ | 173 | 9.651 | 9.651 | (1.050) | 171403 | 53.2798 | 53.3 | |
| | 79 | Isopropylbenzene | 105 | 9.782 | 9.782 | (1.064) | 715372 | 55.0804 | 55.1 | |
| $ | 80 | Bromofluorobenzene | 174 | 9.970 | 9.970 | (1.084) | 182714 | 52.0738 | 52.1 | |
| | 84 | Bromobenzene | 77 | 10.041 | 10.041 | (0.943) | 318426 | 47.6253 | 47.6 | |
| | 86 | n-Propylbenzene | 91 | 10.041 | 10.041 | (0.943) | 792170 | 48.2821 | 48.3 | |
| | 81 | 1,1,2,2-Tetrachloroethane++ | 83 | 10.078 | 10.082 | (0.947) | 241721 | 54.4484 | 54.4 | |
| | 87 | 2-Chlorotoluene | 91 | 10.146 | 10.146 | (0.953) | 553061 | 47.3595 | 47.4 | |
| | 88 | 1,3,5-Trimethylbenzene | 105 | 10.150 | 10.150 | (0.954) | 573987 | 48.9786 | 49.0 | |
| | 85 | 1,2,3-Trichloropropane | 75 | 10.176 | 10.176 | (0.956) | 260325 | 48.3157 | 48.3 | |
| | 83 | trans-1,4-Dichloro-2-Butene | 53 | 10.191 | 10.191 | (0.957) | 47360 | 51.8704 | 51.9 | |
| | 90 | 4-Chlorotoluene | 91 | 10.247 | 10.247 | (0.963) | 505246 | 49.6702 | 49.7 | |
| | 91 | tert-butylbenzene | 91 | 10.348 | 10.348 | (0.972) | 303894 | 47.7951 | 47.8 | |
| | 93 | 1,2,4-Trimethylbenzene | 105 | 10.390 | 10.389 | (0.976) | 578084 | 50.6338 | 50.6 | |
| | 94 | sec-Butylbenzene | 105 | 10.453 | 10.457 | (0.982) | 668583 | 49.1755 | 49.2 | |
| | 92 | p-Isopropyltoluene | 119 | 10.532 | 10.532 | (0.989) | 576391 | 50.8439 | 50.8 | |
| | 96 | 1,3-Dichlorobenzene | 146 | 10.603 | 10.603 | (0.996) | 358030 | 50.5015 | 50.5 | |
| * | 97 | 1,4-DICHLOROBENZENE-D4 | 152 | 10.644 | 10.644 | (1.000) | 209536 | 50.0000 | | |
| | 98 | 1,4-Dichlorobenzene | 146 | 10.656 | 10.656 | (1.001) | 362930 | 48.8704 | 48.9 | |
| | 100 | n-Butylbenzene | 91 | 10.787 | 10.787 | (1.013) | 433581 | 53.3227 | 53.3 | |
| | 102 | 1,2-Dichlorobenzene | 146 | 10.914 | 10.914 | (1.025) | 360699 | 50.3190 | 50.3 | |
| | 106 | 1,2-Dibromo-3-Chloropropane | 157 | 11.447 | 11.443 | (1.075) | 56828 | 51.3428 | 51.3 | |
| | 109 | Hexachlorobutadiene | 225 | 11.908 | 11.908 | (1.119) | 109156 | 52.2913 | 52.3 | |
| | 108 | 1,2,4-Trichlorobenzene | 180 | 11.960 | 11.956 | (1.124) | 156954 | 47.4923 | 47.5 | |
| | 110 | Naphthalene | 128 | 12.249 | 12.249 | (1.151) | 310404 | 45.8588 | 45.9 | |
| | 111 | 1,2,3-Trichlorobenzene | 180 | 12.418 | 12.417 | (1.167) | 158984 | 49.4374 | 49.4 | |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.
H - Operator selected an alternate compound hit.

Data File: /var/chem/msv12.i/2180416p.s.b/q7986cD.d

Page 1

Date : 16-APR-2018 19:29

Client ID: ICV050

Instrument: msv12.i

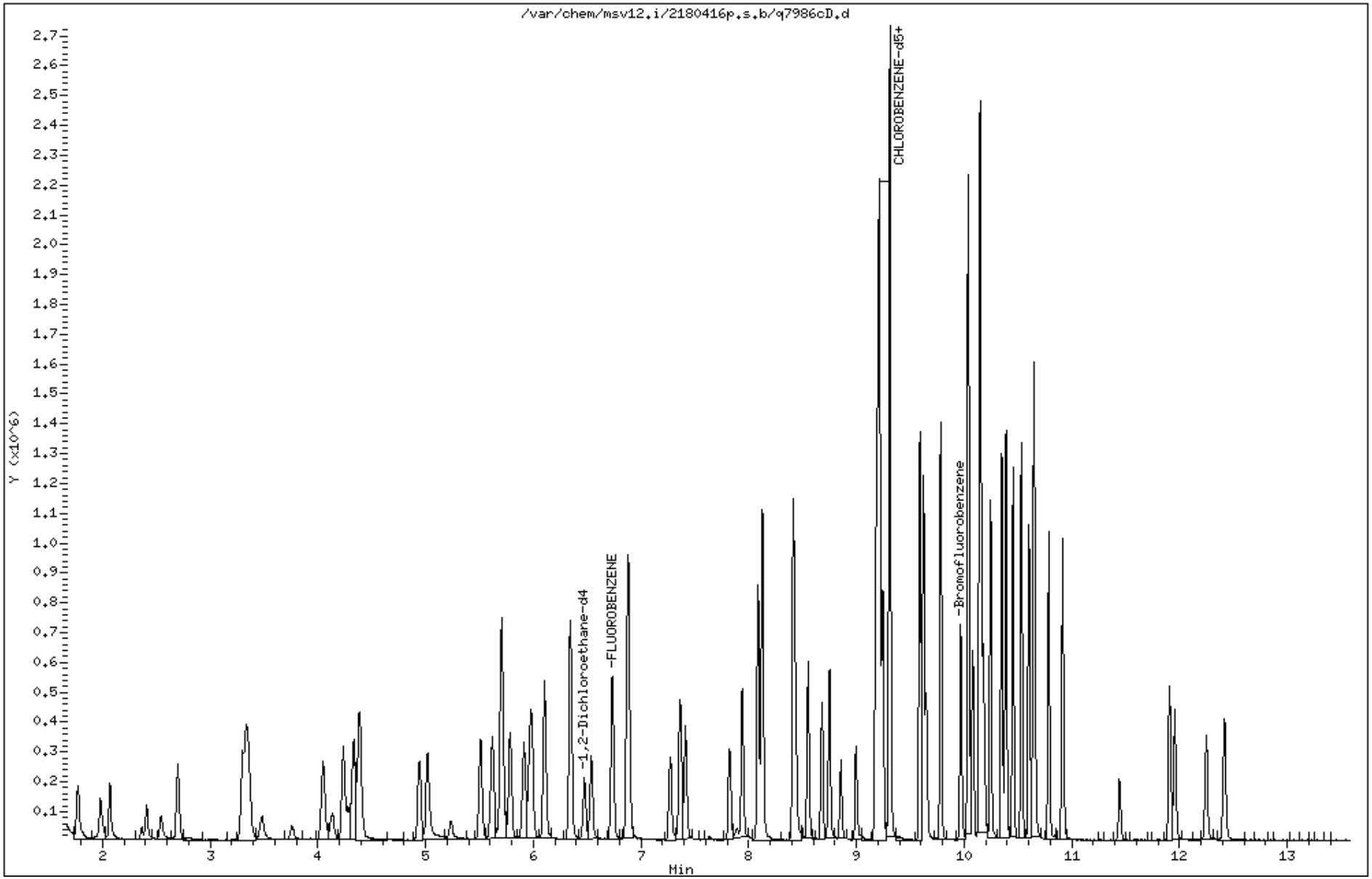
Sample Info: 1600*ICV050

Purge Volume: 5.0

Operator: JCK

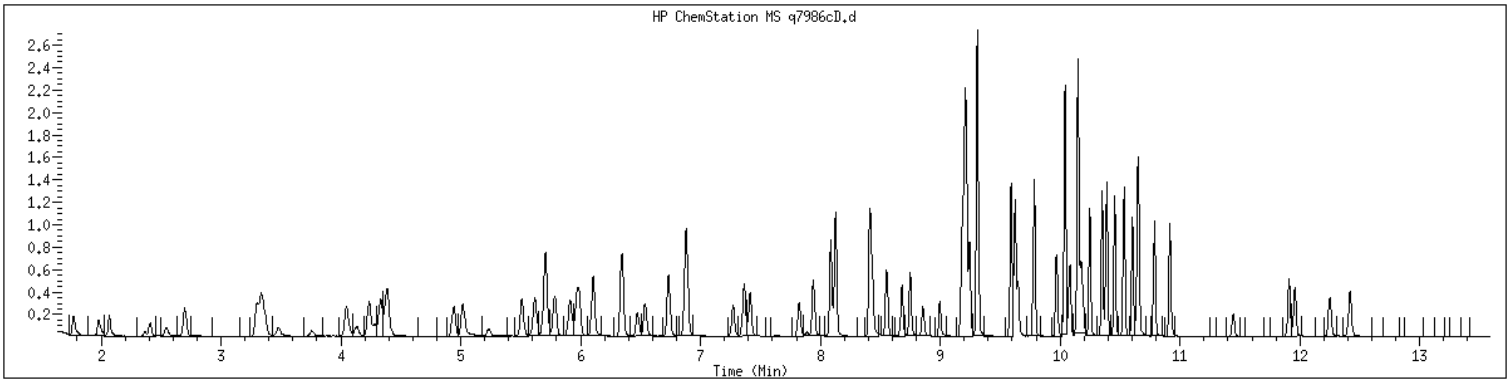
Column phase: RTX-VMS-30M

Column diameter: 0.25



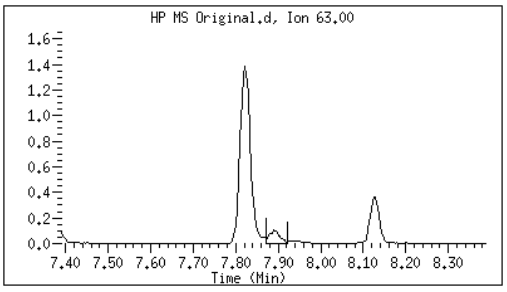
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 1600 SampleType : LCS
Injection Date: 04/16/2018 19:29 Instrument : msv12.i
Operator : JCK
Sample Info : 1600*ICV050
Misc Info : MSV~40682~*1*JCK
Method : /var/chem/msv12.i/2180416p.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b



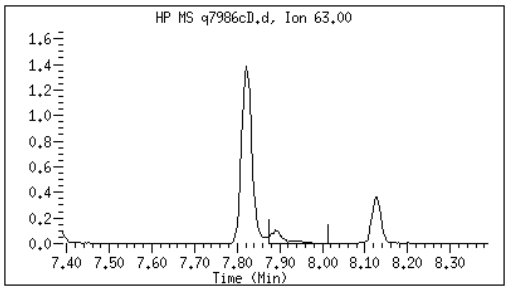

Original Final

56 2-Chloroethyl vinyl ether CAS#: 110-75-8 Reason: M2

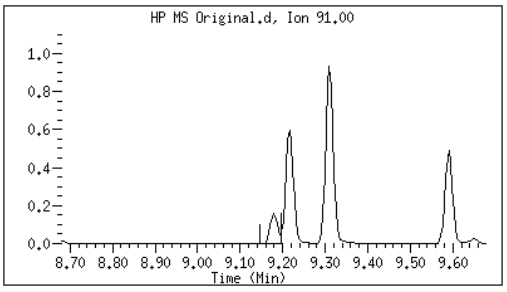



Electronic Signature Applied

User: jck2
Date: 04/16/2018 19:49

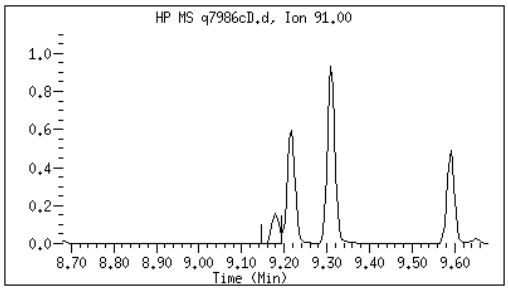



140 1-Chlorohexane CAS#: 544-10-5 Reason: M2




Electronic Signature Applied

User: jck2
Date: 04/16/2018 19:49



M2 - Target system integrated incorrectly

# Form 7A

# CCAL Verifications

7A
VOLATILE CONTINUING CALIBRATION CHECK

| | | | |
|---|---|---|---|
| Report No: | 218040620 | CCAL ID: | 1400 |
| GC Column: | RTX-VMS-30 ID .25 (mm) | Instrument ID: | MSV12 |
| Injection Vol.: | 1.0 ( µL ) | Lab File ID: | 2180418/q8065 |
| Init. Calib. Date 1: | 04/16/18 Time 1: 1603 | Analyst: | JMC2 |
| Init. Calib. Date 2: | 04/16/18 Time 2: 1843 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1045 | Analytical Method: | EPA 8260C |

| *ANALYTE* | *$\overline{RRF}$* | *RRF CCV* | *Min RRF* | *%D/%Drift* | *Max %D/ %Drift* | *TYPE* | *Q* |
|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 0.905 | 0.926 | .1 | 2.35 | 20 | A | |
| 1,1,1-Trichloroethane | 0.521 | 0.517 | .1 | -.74 | 20 | A | |
| 1,1,2,2-Tetrachloroethane | 1.041 | 1.163 | .3 | 9.8 | 20 | W | |
| 1,1,2-Trichloroethane | 0.808 | 0.816 | .1 | .9 | 20 | A | |
| 1,1-Dichloroethane | 0.606 | 0.598 | .2 | -1.25 | 20 | A | |
| 1,1-Dichloroethene | 0.232 | 0.223 | .1 | -3.91 | 20 | A | |
| 1,1-Dichloropropene | 0.403 | 0.403 | .1 | -.2 | 20 | A | |
| 1,2,3-Trichlorobenzene | 0.834 | 0.789 | .1 | 2.4 | 20 | L | |
| 1,2,3-Trichloropropane | 1.286 | 1.233 | .1 | -4.11 | 20 | A | |
| 1,2,4-Trichlorobenzene | 0.878 | 0.774 | .2 | -2.2 | 20 | L | |
| 1,2,4-Trimethylbenzene | 2.724 | 2.806 | .1 | 3 | 20 | A | |
| 1,2-Dibromo-3-chloropropane | 0.264 | 0.272 | .05 | 3.13 | 20 | A | |
| 1,2-Dibromoethane | 0.735 | 0.793 | .1 | 8 | 20 | A | |
| 1,2-Dichlorobenzene | 1.710 | 1.749 | .4 | 2.28 | 20 | A | |
| 1,2-Dichloroethane | 0.470 | 0.473 | .1 | .58 | 20 | A | |
| 1,2-Dichloroethane-d4 | 0.158 | 0.155 | .1 | -1.82 | 20 | A | |
| 1,2-Dichloropropane | 0.340 | 0.343 | .1 | .9 | 20 | A | |
| 1,3,5-Trimethylbenzene | 2.796 | 2.796 | .1 | -.02 | 20 | A | |
| 1,3-Dichlorobenzene | 1.692 | 1.712 | .6 | 1.22 | 20 | A | |
| 1,3-Dichloropropane | 1.271 | 1.352 | .1 | 6.4 | 20 | A | |
| 1,4-Dichlorobenzene | 1.772 | 1.774 | .5 | .12 | 20 | A | |
| 1-Chlorohexane | 0.846 | 1.002 | .001 | 18.4 | 20 | A | |
| 2,2-Dichloropropane | 0.464 | 0.471 | .1 | 1.54 | 20 | A | |
| 2-Butanone | 0.264 | 0.280 | .1 | 5.72 | 20 | A | |
| 2-Chlorotoluene | 2.787 | 2.676 | .1 | -3.96 | 20 | A | |
| 2-Hexanone | 0.834 | 0.940 | .1 | 12.6 | 20 | A | |
| 4-Bromofluorobenzene | 0.885 | 0.920 | .1 | 3.98 | 20 | A | |
| 4-Chlorotoluene | 2.427 | 2.455 | .1 | 1.16 | 20 | A | |
| 4-Isopropyltoluene | 2.705 | 2.832 | .1 | 4.7 | 20 | A | |
| 4-Methyl-2-pentanone | 1.082 | 1.199 | .1 | 10.8 | 20 | A | |
| Acetone | 0.273 | 0.266 | .1 | -2.66 | 20 | A | |
| Benzene | 1.274 | 1.304 | .5 | 2.35 | 20 | A | |
| Bromobenzene | 1.595 | 1.530 | .1 | -4.12 | 20 | A | |
| Bromochloromethane | 0.166 | 0.171 | .1 | 3.06 | 20 | A | |
| Bromodichloromethane | 0.469 | 0.480 | .2 | 2.43 | 20 | A | |
| Bromoform | 0.811 | 0.848 | .1 | 4.52 | 20 | A | |
| Bromomethane | 0.128 | 0.138 | .1 | 7.39 | 20 | A | |
| Carbon disulfide | 0.793 | 0.719 | .1 | -10 | 20 | W | |
| Carbon tetrachloride | 0.457 | 0.439 | .1 | -3.8 | 20 | A | |

FORM V II VOA

7A

VOLATILE CONTINUING CALIBRATION CHECK

| | | | |
|---|---|---|---|
| Report No: | 218040620 | CCAL ID: | 1400 |
| GC Column: | RTX-VMS-30 ID .25 (mm) | Instrument ID: | MSV12 |
| Injection Vol.: | 1.0 ( µL ) | Lab File ID: | 2180418/q8065 |
| Init. Calib. Date 1: | 04/16/18 Time 1: 1603 | Analyst: | JMC2 |
| Init. Calib. Date 2: | 04/16/18 Time 2: 1843 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 1045 | Analytical Method: | EPA 8260C |

| *ANALYTE* | *$\overline{RRF}$* | *RRF CCV* | *Min RRF* | *%D/%Drift* | *Max %D/ %Drift* | *TYPE* | *Q* |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | 2.228 | 2.306 | .5 | 3.49 | 20 | A | |
| Chloroethane | 0.171 | 0.164 | .1 | -4.43 | 20 | A | |
| Chloroform | 0.590 | 0.595 | .2 | .86 | 20 | A | |
| Chloromethane | 0.377 | 0.374 | .1 | -.88 | 20 | A | |
| Dibromochloromethane | 0.997 | 1.056 | .1 | 5.97 | 20 | A | |
| Dibromofluoromethane | 0.267 | 0.265 | .1 | -.62 | 20 | A | |
| Dibromomethane | 0.193 | 0.203 | .1 | 5.01 | 20 | A | |
| Dichlorodifluoromethane | 0.362 | 0.305 | .1 | -15.8 | 20 | A | |
| Ethylbenzene | 1.147 | 1.207 | .1 | 5.27 | 20 | A | |
| Hexachlorobutadiene | 0.498 | 0.518 | .1 | 4.07 | 20 | A | |
| Isopropylbenzene (Cumene) | 3.274 | 3.606 | .1 | 10.2 | 20 | A | |
| Methylene chloride | 0.459 | 0.447 | .1 | -2.51 | 20 | A | |
| Naphthalene | 1.934 | 1.503 | .1 | -7.2 | 20 | L | |
| Styrene | 2.156 | 2.419 | .3 | 12.2 | 20 | A | |
| Tetrachloroethene | 0.772 | 0.765 | .2 | -.94 | 20 | A | |
| Toluene | 3.396 | 3.517 | .4 | 3.56 | 20 | A | |
| Toluene-d8 | 2.434 | 2.455 | .1 | .85 | 20 | A | |
| Trichloroethene | 0.351 | 0.362 | .2 | 3.05 | 20 | A | |
| Trichlorofluoromethane | 0.446 | 0.401 | .1 | -9.93 | 20 | A | |
| Vinyl chloride | 0.353 | 0.340 | .1 | -3.72 | 20 | A | |
| cis-1,2-Dichloroethene | 0.421 | 0.437 | .1 | 3.88 | 20 | A | |
| cis-1,3-Dichloropropene | 0.469 | 0.525 | .2 | 12 | 20 | A | |
| m,p-Xylene | 1.395 | 1.486 | .1 | 6.5 | 20 | A | |
| n-Butylbenzene | 1.940 | 2.106 | .1 | 8.52 | 20 | A | |
| n-Propylbenzene | 3.915 | 3.790 | .1 | -3.19 | 20 | A | |
| o-Xylene | 1.358 | 1.472 | .3 | 8.4 | 20 | A | |
| sec-Butylbenzene | 3.244 | 3.192 | .1 | -1.61 | 20 | A | |
| tert-Butyl methyl ether (MTBE) | 0.989 | 1.024 | .1 | 3.51 | 20 | A | |
| tert-Butylbenzene | 1.517 | 1.459 | .1 | -3.85 | 20 | A | |
| trans-1,2-Dichloroethene | 0.413 | 0.429 | .1 | 3.77 | 20 | A | |
| trans-1,3-Dichloropropene | 0.412 | 0.455 | .1 | 10.3 | 20 | A | |

FORM V II VOA

GCAL, Inc.

Data file : /var/chem/msv12.i/2180418.s.b/q8065.d
Lab Smp Id: 1400 Client Smp ID: V12STD050
Inj Date : 18-APR-2018 10:45
Operator : JMC2 Inst ID: msv12.i
Smp Info : 1400*V12STD050
Misc Info : MSV~40673~*1*JMC2
Comment :
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Meth Date : 19-Apr-2018 11:06 jck2 Quant Type: ISTD
Cal Date : 16-APR-2018 18:43 Cal File: q7984cD.d
Als bottle: 2 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | AMOUNTS CAL-AMT ( ppb) | AMOUNTS ON-COL ( ppb) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|
| 1 Dichlorodifluoromethane | 85 | 1.768 | 1.768 | (0.262) | 153494 | 50.0000 | 42.1 | |
| 2 Chloromethane ++ | 50 | 1.981 | 1.981 | (0.294) | 188527 | 50.0000 | 49.6 | |
| 3 Vinyl Chloride + | 62 | 2.068 | 2.068 | (0.307) | 171366 | 50.0000 | 48.1 | |
| 5 Bromomethane | 94 | 2.409 | 2.409 | (0.358) | 69376 | 50.0000 | 53.7 | |
| 6 Chloroethane | 64 | 2.547 | 2.547 | (0.378) | 82489 | 50.0000 | 47.8 | |
| 7 Trichlorofluoromethane | 101 | 2.701 | 2.701 | (0.401) | 202307 | 50.0000 | 45.0 | |
| 11 1,1-Dichloroethene + | 96 | 3.301 | 3.301 | (0.490) | 112571 | 50.0000 | 48.0 | |
| 14 Carbon Disulfide | 76 | 3.331 | 3.331 | (0.495) | 362274 | 50.0000 | 45.0 | |
| 10 1,1,2Trichlotrifluoroethane | 101 | 3.353 | 3.353 | (0.498) | 102155 | 50.0000 | 39.1 | |
| 13 Methyl Iodide | 142 | 3.477 | 3.477 | (0.516) | 132488 | 50.0000 | 49.9 | |
| 9 Acrolein | 56 | 3.762 | 3.762 | (0.559) | 53576 | 250.000 | 254 | |
| 17 Methylene Chloride | 49 | 4.047 | 4.047 | (0.601) | 225259 | 50.0000 | 48.7 | |
| 12 Acetone | 43 | 4.133 | 4.133 | (0.614) | 133819 | 50.0000 | 48.7 | |
| 19 trans-1,2-Dichloroethene | 61 | 4.238 | 4.238 | (0.629) | 216001 | 50.0000 | 51.9 | |

| | Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | AMOUNTS CAL-AMT ( ppb) | ON-COL ( ppb) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|---|
| | 20 Methyl Acetate | 43 | 4.287 | 4.287 | (0.637) | 144929 | 50.0000 | 49.3 | 8728 |
| | 23 Hexane | 57 | 4.332 | 4.332 | (0.643) | 157059 | 50.0000 | 43.1 | 9421 |
| | 21 MTBE | 73 | 4.384 | 4.384 | (0.651) | 516108 | 50.0000 | 51.8 | 9508 |
| | 24 1,1-Dichloroethane ++ | 63 | 4.939 | 4.939 | (0.733) | 301406 | 50.0000 | 49.4 | |
| | 22 Acrylonitrile | 53 | 5.018 | 5.018 | (0.745) | 314137 | 250.000 | 277 | |
| | 25 Vinyl Acetate | 43 | 5.235 | 5.235 | (0.777) | 87753 | 50.0000 | 48.2 | |
| | 30 cis-1,2-Dichloroethene | 61 | 5.509 | 5.509 | (0.818) | 220393 | 50.0000 | 51.9 | |
| M | 48 Total 1,2-Dichloroethene | 61 | | | | 436394 | 100.000 | 104 | |
| | 31 2,2-Dichloropropane | 77 | 5.618 | 5.618 | (0.834) | 237431 | 50.0000 | 50.8 | |
| | 38 Cyclohexane | 56 | 5.704 | 5.704 | (0.847) | 218470 | 50.0000 | 46.2 | 8517 |
| | 34 Bromochloromethane | 128 | 5.711 | 5.711 | (0.848) | 86413 | 50.0000 | 51.5 | |
| | 41 Chloroform + | 83 | 5.783 | 5.783 | (0.859) | 299992 | 50.0000 | 50.4 | |
| | 39 Carbon Tetrachloride | 117 | 5.914 | 5.914 | (0.878) | 221398 | 50.0000 | 48.1 | |
| $ | 36 Dibromofluoromethane | 111 | 5.966 | 5.966 | (0.886) | 133725 | 50.0000 | 49.7 | 7038 |
| | 37 1,1,1-Trichloroethane | 97 | 5.989 | 5.989 | (0.889) | 260503 | 50.0000 | 49.6 | |
| | 42 1,1-Dichloropropene | 75 | 6.105 | 6.105 | (0.906) | 202882 | 50.0000 | 49.9 | |
| | 32 2-Butanone | 43 | 6.109 | 6.109 | (0.907) | 140906 | 50.0000 | 52.9 | |
| | 44 Benzene | 78 | 6.345 | 6.345 | (0.942) | 657083 | 50.0000 | 51.2 | |
| $ | 43 1,2-Dichloroethane-d4 | 67 | 6.476 | 6.476 | (0.962) | 78228 | 50.0000 | 49.1 | |
| | 46 1,2-Dichloroethane | 62 | 6.540 | 6.540 | (0.971) | 238411 | 50.0000 | 50.3 | |
| * | 47 FLUOROBENZENE | 96 | 6.735 | 6.735 | (1.000) | 503912 | 50.0000 | | |
| | 50 Methyl Cyclohexane | 83 | 6.873 | 6.873 | (1.021) | 195480 | 50.0000 | 46.3 | 8895 |
| | 49 Trichloroethene | 130 | 6.888 | 6.888 | (1.023) | 182366 | 50.0000 | 51.5 | |
| | 52 Dibromomethane | 93 | 7.271 | 7.271 | (1.080) | 102123 | 50.0000 | 52.5 | |
| | 51 1,2-Dichloropropane + | 63 | 7.364 | 7.364 | (1.093) | 172973 | 50.0000 | 50.4 | |
| | 54 Bromodichloromethane | 83 | 7.413 | 7.413 | (1.101) | 242108 | 50.0000 | 51.2 | |
| | 57 1-Bromo-2-chloroethane | 63 | 7.822 | 7.822 | (1.161) | 245310 | 50.0000 | 50.2 | 9781 |
| | 56 2-Chloroethyl vinyl ether | 63 | 7.893 | 7.893 | (1.172) | 24330 | 50.0000 | 48.5 | (M2) |
| | 58 cis-1,3-Dichloropropene | 75 | 7.942 | 7.942 | (1.179) | 264633 | 50.0000 | 56.0 | |
| $ | 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.879) | 492099 | 50.0000 | 50.4 | |
| | 61 Toluene + | 91 | 8.125 | 8.125 | (0.883) | 705048 | 50.0000 | 51.8 | |
| | 66 Tetrachloroethene | 164 | 8.414 | 8.414 | (0.915) | 153328 | 50.0000 | 49.5 | |
| | 59 4-methyl-2-pentanone | 43 | 8.414 | 8.414 | (0.915) | 240292 | 50.0000 | 55.4 | |
| | 62 trans-1,3-Dichloropropene | 75 | 8.437 | 8.437 | (1.253) | 229072 | 50.0000 | 55.1 | |
| M | 145 1-3 Dichloropropene total | 100 | | | | 493705 | 100.000 | 111 | 0 |
| | 65 1,1,2-Trichloroethane | 97 | 8.553 | 8.553 | (0.930) | 163529 | 50.0000 | 50.5 | |
| | 69 Dibromochloromethane | 129 | 8.680 | 8.680 | (0.944) | 211719 | 50.0000 | 53.0 | |
| | 67 1,3-Dichloropropane | 76 | 8.751 | 8.751 | (0.951) | 270987 | 50.0000 | 53.2 | |
| | 70 1,2-Dibromoethane(EDB) | 107 | 8.853 | 8.853 | (0.963) | 159024 | 50.0000 | 54.0 | |
| | 68 2-Hexanone | 43 | 8.995 | 8.995 | (0.978) | 188375 | 50.0000 | 56.3 | |
| | 140 1-Chlorohexane | 91 | 9.179 | 9.179 | (0.998) | 200782 | 50.0000 | 59.2 | 9178 |
| * | 71 CHLOROBENZENE-d5 | 82 | 9.198 | 9.198 | (1.000) | 200457 | 50.0000 | | |
| | 72 Chlorobenzene ++ | 112 | 9.205 | 9.205 | (1.001) | 462271 | 50.0000 | 51.7 | |
| | 73 Ethylbenzene + | 106 | 9.216 | 9.216 | (1.002) | 242005 | 50.0000 | 52.6 | |
| | 74 1,1,1,2-Tetrachloroethane | 133 | 9.246 | 9.246 | (1.005) | 185569 | 50.0000 | 51.2 | |
| | 75 p,m-Xylene | 106 | 9.310 | 9.310 | (1.012) | 595618 | 100.000 | 106 | |
| | 76 o-Xylene | 106 | 9.591 | 9.591 | (1.043) | 295041 | 50.0000 | 54.2 | |

| | | | QUANT SIG | | | | | AMOUNTS | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Compounds | MASS | RT | EXP RT | REL RT | RESPONSE | CAL-AMT ( ppb) | ON-COL ( ppb) | SIMILARITY |
| M | 99 | TOTAL XYLENE | 106 | | | | 890659 | 150.000 | 161 | |
| | 77 | Styrene | 104 | 9.625 | 9.625 | (1.046) | 484936 | 50.0000 | 56.1 | |
| | 78 | Bromoform ++ | 173 | 9.651 | 9.651 | (1.049) | 169917 | 50.0000 | 52.3 | |
| | 79 | Isopropylbenzene | 105 | 9.782 | 9.782 | (1.064) | 722901 | 50.0000 | 55.1 | |
| $ | 80 | Bromofluorobenzene | 174 | 9.970 | 9.970 | (1.084) | 184368 | 50.0000 | 52.0 | |
| | 84 | Bromobenzene | 77 | 10.041 | 10.041 | (0.943) | 319289 | 50.0000 | 47.9 | |
| | 86 | n-Propylbenzene | 91 | 10.037 | 10.037 | (0.943) | 791104 | 50.0000 | 48.4 | |
| | 81 | 1,1,2,2-Tetrachloroethane++ | 83 | 10.082 | 10.082 | (0.947) | 242648 | 50.0000 | 54.9 | |
| | 87 | 2-Chlorotoluene | 91 | 10.146 | 10.146 | (0.953) | 558600 | 50.0000 | 48.0 | |
| | 88 | 1,3,5-Trimethylbenzene | 105 | 10.150 | 10.150 | (0.954) | 583544 | 50.0000 | 50.0 | |
| | 85 | 1,2,3-Trichloropropane | 75 | 10.176 | 10.176 | (0.956) | 257321 | 50.0000 | 47.9 | |
| | 83 | trans-1,4-Dichloro-2-Butene | 53 | 10.191 | 10.191 | (0.957) | 47869 | 50.0000 | 52.6 | |
| | 90 | 4-Chlorotoluene | 91 | 10.247 | 10.247 | (0.963) | 512503 | 50.0000 | 50.6 | |
| | 91 | tert-butylbenzene | 91 | 10.348 | 10.348 | (0.972) | 304479 | 50.0000 | 48.1 | |
| | 93 | 1,2,4-Trimethylbenzene | 105 | 10.390 | 10.390 | (0.976) | 585674 | 50.0000 | 51.5 | |
| | 94 | sec-Butylbenzene | 105 | 10.457 | 10.457 | (0.982) | 666254 | 50.0000 | 49.2 | |
| | 92 | p-Isopropyltoluene | 119 | 10.532 | 10.532 | (0.989) | 591142 | 50.0000 | 52.3 | |
| | 96 | 1,3-Dichlorobenzene | 146 | 10.603 | 10.603 | (0.996) | 357416 | 50.0000 | 50.6 | |
| * | 97 | 1,4-DICHLOROBENZENE-D4 | 152 | 10.645 | 10.645 | (1.000) | 208722 | 50.0000 | | |
| | 98 | 1,4-Dichlorobenzene | 146 | 10.656 | 10.656 | (1.001) | 370310 | 50.0000 | 50.1 | |
| | 100 | n-Butylbenzene | 91 | 10.787 | 10.787 | (1.013) | 439485 | 50.0000 | 54.3 | |
| | 102 | 1,2-Dichlorobenzene | 146 | 10.914 | 10.914 | (1.025) | 365158 | 50.0000 | 51.1 | |
| | 106 | 1,2-Dibromo-3-Chloropropane | 157 | 11.447 | 11.447 | (1.075) | 56850 | 50.0000 | 51.6 | |
| | 109 | Hexachlorobutadiene | 225 | 11.908 | 11.908 | (1.119) | 108197 | 50.0000 | 52.0 | |
| | 108 | 1,2,4-Trichlorobenzene | 180 | 11.957 | 11.957 | (1.123) | 161570 | 50.0000 | 48.9 | |
| | 110 | Naphthalene | 128 | 12.249 | 12.249 | (1.151) | 313732 | 50.0000 | 46.4 | |
| | 111 | 1,2,3-Trichlorobenzene | 180 | 12.418 | 12.418 | (1.167) | 164586 | 50.0000 | 51.2 | |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/msv12.i/2180418.s.b/q8065.d



Date : 18-APR-2018 10:45

Client ID: V12STD050

Instrument: msv12.i

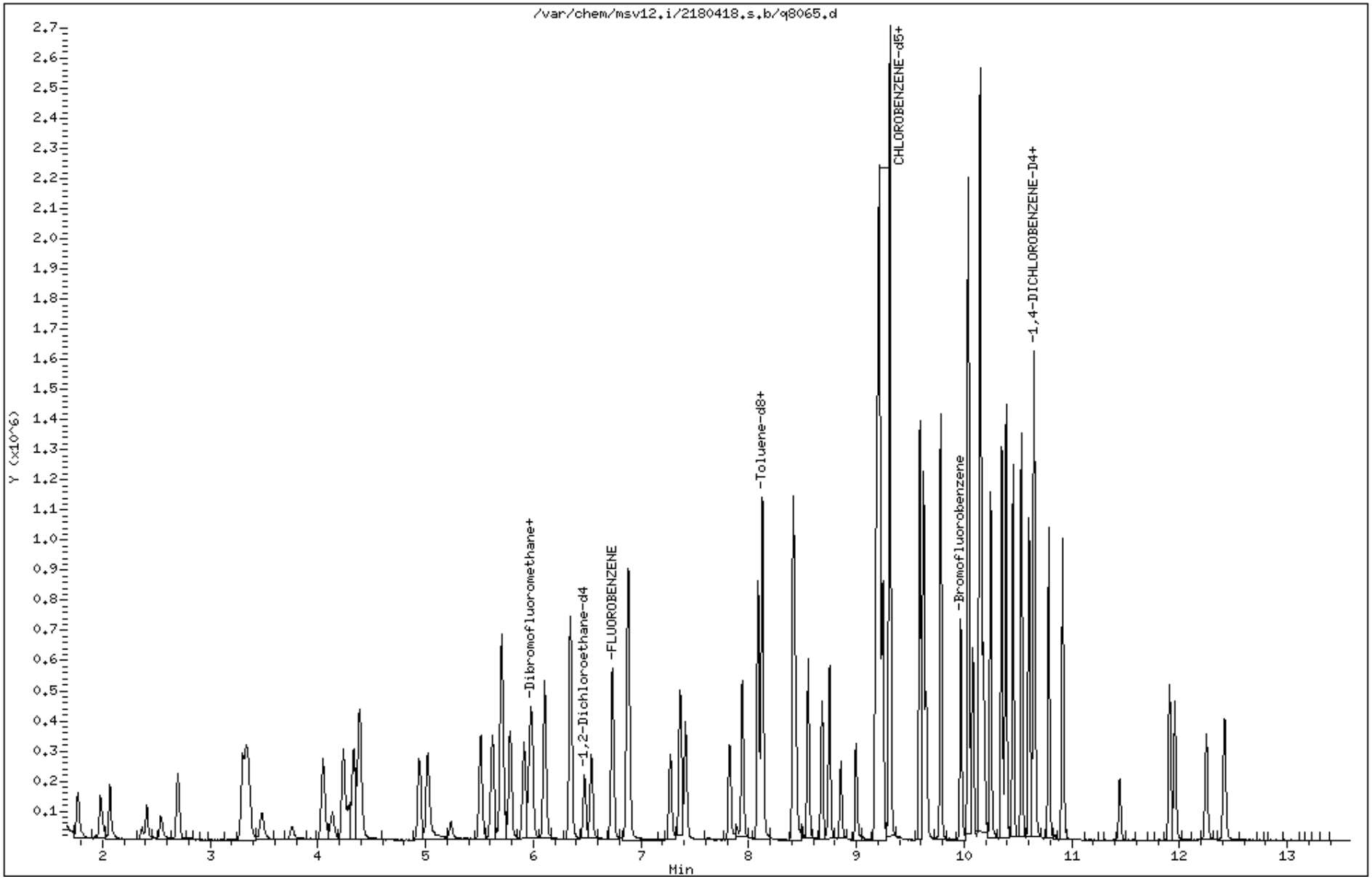
Sample Info: 1400*V12STD050

Purge Volume: 5.0

Operator: JMC2

Column phase: RTX-VMS-30M

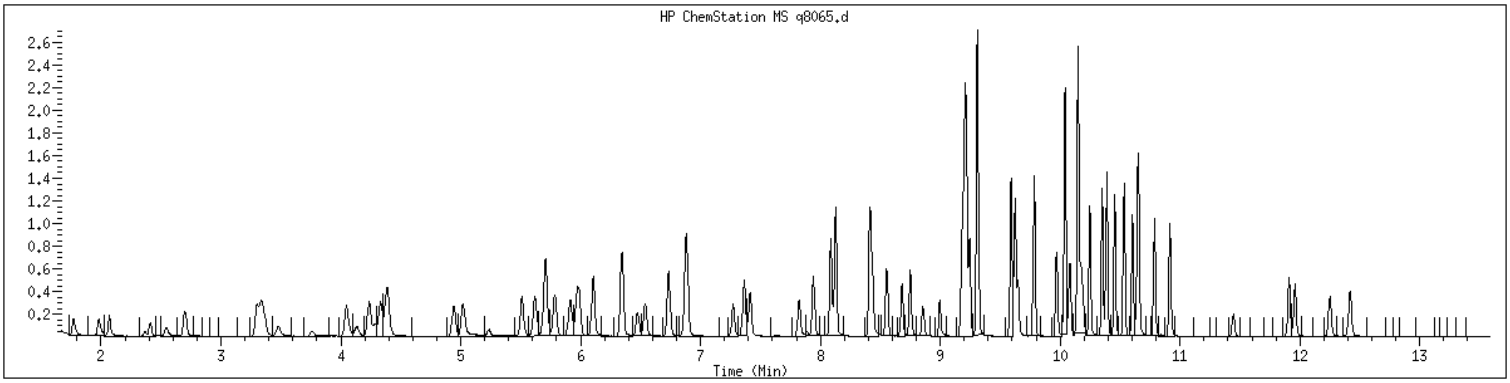
Column diameter: 0.25



Report Date: 04/19/2018 11:06

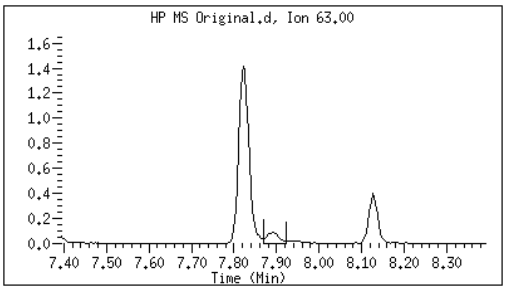
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 1400 SampleType : CCALIB_7
Injection Date: 04/18/2018 10:45 Instrument : msv12.i
Operator : JMC2
Sample Info : 1400*V12STD050
Misc Info : MSV~40673~*1*JMC2
Method : /var/chem/msv12.i/2180418.s.b/8260cdodw12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b



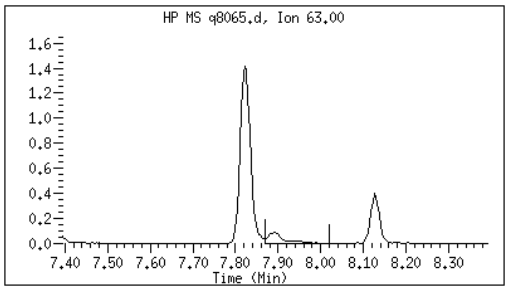

Original Final

56 2-Chloroethyl vinyl ether CAS#: 110-75-8 Reason: M2




Electronic Signature Applied

User: jmc
Date: 04/18/2018 11:01




M2 - Target system integrated incorrectly

7A

VOLATILE CLOSING CALIBRATION CHECK

| | | | |
|---|---|---|---|
| Report No: | 218040620 | CCAL ID: | 1440 |
| GC Column: | RTX-VMS-30 ID .25 (mm) | Instrument ID: | MSV12 |
| Injection Vol.: | 1.0 ( µL ) | Lab File ID: | 2180418/q8089 |
| Init. Calib. Date 1: | 04/16/18 Time 1: 1603 | Analyst: | JMC2 |
| Init. Calib. Date 2: | 04/16/18 Time 2: 1843 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 2021 | Analytical Method: | EPA 8260C |

| *ANALYTE* | *$\overline{RRF}$* | *RRF CCV* | *Min RRF* | *%D/%Drift* | *Max %D/ %Drift* | *TYPE* | *Q* |
|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 0.905 | 0.878 | .1 | -2.89 | 50 | A | |
| 1,1,1-Trichloroethane | 0.521 | 0.495 | .1 | -5.02 | 50 | A | |
| 1,1,2,2-Tetrachloroethane | 1.041 | 1.159 | .3 | 9.4 | 50 | W | |
| 1,1,2-Trichloroethane | 0.808 | 0.781 | .1 | -3.35 | 50 | A | |
| 1,1-Dichloroethane | 0.606 | 0.588 | .2 | -3 | 50 | A | |
| 1,1-Dichloroethene | 0.232 | 0.231 | .1 | -.83 | 50 | A | |
| 1,1-Dichloropropene | 0.403 | 0.391 | .1 | -3.17 | 50 | A | |
| 1,2,3-Trichlorobenzene | 0.834 | 0.678 | .1 | -10.8 | 50 | L | |
| 1,2,3-Trichloropropane | 1.286 | 1.236 | .1 | -3.9 | 50 | A | |
| 1,2,4-Trichlorobenzene | 0.878 | 0.684 | .2 | -12.4 | 50 | L | |
| 1,2,4-Trimethylbenzene | 2.724 | 2.776 | .1 | 1.88 | 50 | A | |
| 1,2-Dibromo-3-chloropropane | 0.264 | 0.263 | .05 | -.41 | 50 | A | |
| 1,2-Dibromoethane | 0.735 | 0.746 | .1 | 1.61 | 50 | A | |
| 1,2-Dichlorobenzene | 1.710 | 1.731 | .4 | 1.18 | 50 | A | |
| 1,2-Dichloroethane | 0.470 | 0.458 | .1 | -2.71 | 50 | A | |
| 1,2-Dichloroethane-d4 | 0.158 | 0.160 | .1 | 1.27 | 50 | A | |
| 1,2-Dichloropropane | 0.340 | 0.338 | .1 | -.6 | 50 | A | |
| 1,3,5-Trimethylbenzene | 2.796 | 2.786 | .1 | -.38 | 50 | A | |
| 1,3-Dichlorobenzene | 1.692 | 1.713 | .6 | 1.24 | 50 | A | |
| 1,3-Dichloropropane | 1.271 | 1.266 | .1 | -.37 | 50 | A | |
| 1,4-Dichlorobenzene | 1.772 | 1.726 | .5 | -2.61 | 50 | A | |
| 1-Chlorohexane | 0.846 | 0.939 | .001 | 11 | 50 | A | |
| 2,2-Dichloropropane | 0.464 | 0.455 | .1 | -2.02 | 50 | A | |
| 2-Butanone | 0.264 | 0.259 | .1 | -2.09 | 50 | A | |
| 2-Chlorotoluene | 2.787 | 2.698 | .1 | -3.18 | 50 | A | |
| 2-Hexanone | 0.834 | 0.850 | .1 | 1.84 | 50 | A | |
| 4-Bromofluorobenzene | 0.885 | 0.885 | .1 | .02 | 50 | A | |
| 4-Chlorotoluene | 2.427 | 2.451 | .1 | 1 | 50 | A | |
| 4-Isopropyltoluene | 2.705 | 2.797 | .1 | 3.4 | 50 | A | |
| 4-Methyl-2-pentanone | 1.082 | 1.118 | .1 | 3.33 | 50 | A | |
| Acetone | 0.273 | 0.244 | .1 | -10.3 | 50 | A | |
| Benzene | 1.274 | 1.277 | .5 | .22 | 50 | A | |
| Bromobenzene | 1.595 | 1.511 | .1 | -5.3 | 50 | A | |
| Bromochloromethane | 0.166 | 0.170 | .1 | 2.18 | 50 | A | |
| Bromodichloromethane | 0.469 | 0.467 | .2 | -.54 | 50 | A | |
| Bromoform | 0.811 | 0.798 | .1 | -1.57 | 50 | A | |
| Bromomethane | 0.128 | 0.114 | .1 | -10.9 | 50 | A | |
| Carbon disulfide | 0.793 | 0.824 | .1 | 3.2 | 50 | W | |
| Carbon tetrachloride | 0.457 | 0.430 | .1 | -5.79 | 50 | A | |

FORM V II VOA

7A

VOLATILE CLOSING CALIBRATION CHECK

| | | | |
|---|---|---|---|
| Report No: | 218040620 | CCAL ID: | 1440 |
| GC Column: | RTX-VMS-30 ID .25 (mm) | Instrument ID: | MSV12 |
| Injection Vol.: | 1.0 ( µL ) | Lab File ID: | 2180418/q8089 |
| Init. Calib. Date 1: | 04/16/18 Time 1: 1603 | Analyst: | JMC2 |
| Init. Calib. Date 2: | 04/16/18 Time 2: 1843 | Analytical Batch: | 633552 |
| Analysis Date: | 04/18/18 Time: 2021 | Analytical Method: | EPA 8260C |

| *ANALYTE* | *$\overline{RRF}$* | *RRF CCV* | *Min RRF* | *%D/%Drift* | *Max %D/ %Drift* | *TYPE* | *Q* |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | 2.228 | 2.136 | .5 | -4.16 | 50 | A | |
| Chloroethane | 0.171 | 0.151 | .1 | -11.8 | 50 | A | |
| Chloroform | 0.590 | 0.586 | .2 | -.64 | 50 | A | |
| Chloromethane | 0.377 | 0.335 | .1 | -11.2 | 50 | A | |
| Dibromochloromethane | 0.997 | 1.008 | .1 | 1.1 | 50 | A | |
| Dibromofluoromethane | 0.267 | 0.266 | .1 | -.43 | 50 | A | |
| Dibromomethane | 0.193 | 0.198 | .1 | 2.53 | 50 | A | |
| Dichlorodifluoromethane | 0.362 | 0.291 | .1 | -19.7 | 50 | A | |
| Ethylbenzene | 1.147 | 1.122 | .1 | -2.12 | 50 | A | |
| Hexachlorobutadiene | 0.498 | 0.492 | .1 | -1.18 | 50 | A | |
| Isopropylbenzene (Cumene) | 3.274 | 3.379 | .1 | 3.21 | 50 | A | |
| Methylene chloride | 0.459 | 0.434 | .1 | -5.27 | 50 | A | |
| Naphthalene | 1.934 | 1.150 | .1 | -25.4 | 50 | L | |
| Styrene | 2.156 | 2.223 | .3 | 3.14 | 50 | A | |
| Tetrachloroethene | 0.772 | 0.739 | .2 | -4.27 | 50 | A | |
| Toluene | 3.396 | 3.305 | .4 | -2.68 | 50 | A | |
| Toluene-d8 | 2.434 | 2.368 | .1 | -2.71 | 50 | A | |
| Trichloroethene | 0.351 | 0.345 | .2 | -1.71 | 50 | A | |
| Trichlorofluoromethane | 0.446 | 0.377 | .1 | -15.3 | 50 | A | |
| Vinyl chloride | 0.353 | 0.310 | .1 | -12.1 | 50 | A | |
| cis-1,2-Dichloroethene | 0.421 | 0.417 | .1 | -.94 | 50 | A | |
| cis-1,3-Dichloropropene | 0.469 | 0.514 | .2 | 9.61 | 50 | A | |
| m,p-Xylene | 1.395 | 1.384 | .1 | -.77 | 50 | A | |
| n-Butylbenzene | 1.940 | 2.030 | .1 | 4.63 | 50 | A | |
| n-Propylbenzene | 3.915 | 3.780 | .1 | -3.44 | 50 | A | |
| o-Xylene | 1.358 | 1.374 | .3 | 1.23 | 50 | A | |
| sec-Butylbenzene | 3.244 | 3.170 | .1 | -2.28 | 50 | A | |
| tert-Butyl methyl ether (MTBE) | 0.989 | 0.989 | .1 | -.04 | 50 | A | |
| tert-Butylbenzene | 1.517 | 1.452 | .1 | -4.3 | 50 | A | |
| trans-1,2-Dichloroethene | 0.413 | 0.413 | .1 | -.12 | 50 | A | |
| trans-1,3-Dichloropropene | 0.412 | 0.444 | .1 | 7.61 | 50 | A | |

FORM V II VOA

GCAL, Inc.

Data file : /var/chem/msv12.i/2180418.s.b/q8089.d
Lab Smp Id: 1440 Client Smp ID: V12STD050
Inj Date : 18-APR-2018 20:21
Operator : JMC2 Inst ID: msv12.i
Smp Info : 1440*V12STD050
Misc Info : MSV~40673~*1*JMC2
Comment :
Method : /var/chem/msv12.i/2180418.s.b/8260cdod5w12.m
Meth Date : 18-Apr-2018 20:39 jmc Quant Type: ISTD
Cal Date : 16-APR-2018 18:43 Cal File: q7984cD.d
Als bottle: 24 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8260b.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.00000 | Dilution Factor |
| Uf | 5.00000 | ng unit correction factor |
| Vo | 5.00000 | Sample Volume purged (mL) |
| DF | 1.00000 | |

Cpnd Variable Local Compound Variable

| Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | AMOUNTS CAL-AMT ( ppb) | AMOUNTS ON-COL ( ppb) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|
| 1 Dichlorodifluoromethane | 85 | 1.768 | 1.768 | (0.262) | 144368 | 50.0000 | 40.1 | |
| 2 Chloromethane ++ | 50 | 1.985 | 1.985 | (0.295) | 166450 | 50.0000 | 44.4 | |
| 3 Vinyl Chloride + | 62 | 2.068 | 2.068 | (0.307) | 154119 | 50.0000 | 43.9 | |
| 5 Bromomethane | 94 | 2.405 | 2.405 | (0.357) | 56731 | 50.0000 | 44.5 | |
| 6 Chloroethane | 64 | 2.536 | 2.536 | (0.377) | 75013 | 50.0000 | 44.1 | |
| 7 Trichlorofluoromethane | 101 | 2.697 | 2.697 | (0.401) | 187421 | 50.0000 | 42.3 | |
| 11 1,1-Dichloroethene + | 96 | 3.297 | 3.297 | (0.490) | 114518 | 50.0000 | 49.6 | |
| 14 Carbon Disulfide | 76 | 3.327 | 3.327 | (0.494) | 409086 | 50.0000 | 51.6 | |
| 10 1,1,2Trichlotrifluoroethane | 101 | 3.350 | 3.350 | (0.497) | 121377 | 50.0000 | 47.1 | |
| 13 Methyl Iodide | 142 | 3.481 | 3.481 | (0.517) | 108718 | 50.0000 | 42.2 | |
| 9 Acrolein | 56 | 3.758 | 3.758 | (0.558) | 53963 | 250.000 | 259 | |
| 17 Methylene Chloride | 49 | 4.047 | 4.047 | (0.601) | 215756 | 50.0000 | 47.4 | |
| 12 Acetone | 43 | 4.133 | 4.133 | (0.614) | 121446 | 50.0000 | 44.8 | |
| 19 trans-1,2-Dichloroethene | 61 | 4.234 | 4.234 | (0.629) | 204930 | 50.0000 | 49.9 | |

| | Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | AMOUNTS CAL-AMT ( ppb) | ON-COL ( ppb) | SIMILARITY |
|---|---|---|---|---|---|---|---|---|---|
| | 20 Methyl Acetate | 43 | 4.279 | 4.279 | (0.635) | 157722 | 50.0000 | 54.4 | 8940 |
| | 23 Hexane | 57 | 4.328 | 4.328 | (0.643) | 162204 | 50.0000 | 45.2 | 9352 |
| | 21 MTBE | 73 | 4.384 | 4.384 | (0.651) | 491266 | 50.0000 | 50.0 | 9316 |
| | 24 1,1-Dichloroethane ++ | 63 | 4.943 | 4.943 | (0.734) | 291834 | 50.0000 | 48.5 | |
| | 22 Acrylonitrile | 53 | 5.018 | 5.018 | (0.745) | 299065 | 250.000 | 268 | |
| | 25 Vinyl Acetate | 43 | 5.231 | 5.231 | (0.777) | 89466 | 50.0000 | 49.9 | |
| | 30 cis-1,2-Dichloroethene | 61 | 5.509 | 5.509 | (0.818) | 207160 | 50.0000 | 49.5 | |
| M | 48 Total 1,2-Dichloroethene | 61 | | | | 412090 | 100.000 | 99.5 | |
| | 31 2,2-Dichloropropane | 77 | 5.621 | 5.621 | (0.835) | 225825 | 50.0000 | 49.0 | |
| | 38 Cyclohexane | 56 | 5.704 | 5.704 | (0.847) | 214110 | 50.0000 | 46.0 | 8385 |
| | 34 Bromochloromethane | 128 | 5.707 | 5.707 | (0.847) | 84445 | 50.0000 | 51.1 | |
| | 41 Chloroform + | 83 | 5.782 | 5.782 | (0.859) | 291300 | 50.0000 | 49.7 | |
| | 39 Carbon Tetrachloride | 117 | 5.910 | 5.910 | (0.878) | 213709 | 50.0000 | 47.1 | |
| $ | 36 Dibromofluoromethane | 111 | 5.966 | 5.966 | (0.886) | 132064 | 50.0000 | 49.8 | 7047 |
| | 37 1,1,1-Trichloroethane | 97 | 5.985 | 5.985 | (0.889) | 245687 | 50.0000 | 47.5 | |
| | 42 1,1-Dichloropropene | 75 | 6.101 | 6.101 | (0.906) | 194022 | 50.0000 | 48.4 | |
| | 32 2-Butanone | 43 | 6.105 | 6.105 | (0.906) | 128625 | 50.0000 | 49.0 | |
| | 44 Benzene | 78 | 6.341 | 6.341 | (0.942) | 634250 | 50.0000 | 50.1 | |
| $ | 43 1,2-Dichloroethane-d4 | 67 | 6.472 | 6.472 | (0.961) | 79532 | 50.0000 | 50.6 | |
| | 46 1,2-Dichloroethane | 62 | 6.540 | 6.540 | (0.971) | 227326 | 50.0000 | 48.6 | |
| * | 47 FLUOROBENZENE | 96 | 6.735 | 6.735 | (1.000) | 496705 | 50.0000 | | |
| | 50 Methyl Cyclohexane | 83 | 6.873 | 6.873 | (1.021) | 193935 | 50.0000 | 46.6 | 8784 |
| | 49 Trichloroethene | 130 | 6.885 | 6.885 | (1.022) | 171457 | 50.0000 | 49.1 | |
| | 52 Dibromomethane | 93 | 7.274 | 7.274 | (1.080) | 98292 | 50.0000 | 51.3 | |
| | 51 1,2-Dichloropropane + | 63 | 7.364 | 7.364 | (1.093) | 167965 | 50.0000 | 49.7 | |
| | 54 Bromodichloromethane | 83 | 7.409 | 7.409 | (1.100) | 231721 | 50.0000 | 49.7 | |
| | 57 1-Bromo-2-chloroethane | 63 | 7.822 | 7.822 | (1.161) | 233881 | 50.0000 | 48.6 | 9710 |
| | 56 2-Chloroethyl vinyl ether | 63 | 7.889 | 7.889 | (1.171) | 21624 | 50.0000 | 43.8 | |
| | 58 cis-1,3-Dichloropropene | 75 | 7.942 | 7.942 | (1.179) | 255234 | 50.0000 | 54.8 | |
| $ | 60 Toluene-d8 | 98 | 8.088 | 8.088 | (0.880) | 482959 | 50.0000 | 48.6 | |
| | 61 Toluene + | 91 | 8.125 | 8.125 | (0.884) | 674083 | 50.0000 | 48.7 | |
| | 66 Tetrachloroethene | 164 | 8.414 | 8.414 | (0.915) | 150742 | 50.0000 | 47.9 | |
| | 59 4-methyl-2-pentanone | 43 | 8.410 | 8.410 | (0.915) | 227984 | 50.0000 | 51.7 | |
| | 62 trans-1,3-Dichloropropene | 75 | 8.436 | 8.436 | (1.253) | 220312 | 50.0000 | 53.8 | |
| M | 145 1-3 Dichloropropene total | 100 | | | | 475546 | 100.000 | 109 | 0 |
| | 65 1,1,2-Trichloroethane | 97 | 8.553 | 8.553 | (0.930) | 159344 | 50.0000 | 48.3 | |
| | 69 Dibromochloromethane | 129 | 8.680 | 8.680 | (0.944) | 205497 | 50.0000 | 50.6 | |
| | 67 1,3-Dichloropropane | 76 | 8.751 | 8.751 | (0.952) | 258147 | 50.0000 | 49.8 | |
| | 70 1,2-Dibromoethane(EDB) | 107 | 8.856 | 8.856 | (0.963) | 152215 | 50.0000 | 50.8 | |
| | 68 2-Hexanone | 43 | 8.995 | 8.995 | (0.978) | 173241 | 50.0000 | 50.9 | |
| | 140 1-Chlorohexane | 91 | 9.179 | 9.179 | (0.998) | 191447 | 50.0000 | 55.5 | 9273 |
| * | 71 CHLOROBENZENE-d5 | 82 | 9.194 | 9.194 | (1.000) | 203931 | 50.0000 | | |
| | 72 Chlorobenzene ++ | 112 | 9.209 | 9.209 | (1.002) | 435531 | 50.0000 | 47.9 | |
| | 73 Ethylbenzene + | 106 | 9.216 | 9.216 | (1.002) | 228909 | 50.0000 | 48.9 | |
| | 74 1,1,1,2-Tetrachloroethane | 133 | 9.246 | 9.246 | (1.006) | 179118 | 50.0000 | 48.6 | |
| | 75 p,m-Xylene | 106 | 9.310 | 9.310 | (1.013) | 564619 | 100.000 | 99.2 | |
| | 76 o-Xylene | 106 | 9.591 | 9.591 | (1.043) | 280295 | 50.0000 | 50.6 | |

| | | | QUANT SIG | | | | | AMOUNTS | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Compounds | MASS | RT | EXP RT | REL RT | RESPONSE | CAL-AMT ( ppb) | ON-COL ( ppb) | SIMILARITY |
| M | 99 | TOTAL XYLENE | 106 | | | | 844914 | 150.000 | 150 | |
| | 77 | Styrene | 104 | 9.621 | 9.621 | (1.046) | 453405 | 50.0000 | 51.6 | |
| | 78 | Bromoform ++ | 173 | 9.651 | 9.651 | (1.050) | 162786 | 50.0000 | 49.2 | |
| | 79 | Isopropylbenzene | 105 | 9.782 | 9.782 | (1.064) | 689156 | 50.0000 | 51.6 | |
| $ | 80 | Bromofluorobenzene | 174 | 9.970 | 9.970 | (1.084) | 180409 | 50.0000 | 50.0 | |
| | 84 | Bromobenzene | 77 | 10.041 | 10.041 | (0.943) | 303915 | 50.0000 | 47.4 | |
| | 86 | n-Propylbenzene | 91 | 10.041 | 10.041 | (0.943) | 760358 | 50.0000 | 48.3 | |
| | 81 | 1,1,2,2-Tetrachloroethane++ | 83 | 10.082 | 10.082 | (0.947) | 233136 | 50.0000 | 54.7 | |
| | 87 | 2-Chlorotoluene | 91 | 10.146 | 10.146 | (0.953) | 542690 | 50.0000 | 48.4 | |
| | 88 | 1,3,5-Trimethylbenzene | 105 | 10.150 | 10.150 | (0.954) | 560367 | 50.0000 | 49.8 | |
| | 85 | 1,2,3-Trichloropropane | 75 | 10.176 | 10.176 | (0.956) | 248518 | 50.0000 | 48.0 | |
| | 83 | trans-1,4-Dichloro-2-Butene | 53 | 10.191 | 10.191 | (0.957) | 44721 | 50.0000 | 51.0 | |
| | 90 | 4-Chlorotoluene | 91 | 10.247 | 10.247 | (0.963) | 493080 | 50.0000 | 50.5 | |
| | 91 | tert-butylbenzene | 91 | 10.348 | 10.348 | (0.972) | 292055 | 50.0000 | 47.9 | |
| | 93 | 1,2,4-Trimethylbenzene | 105 | 10.389 | 10.389 | (0.976) | 558295 | 50.0000 | 50.9 | |
| | 94 | sec-Butylbenzene | 105 | 10.457 | 10.457 | (0.982) | 637695 | 50.0000 | 48.9 | |
| | 92 | p-Isopropyltoluene | 119 | 10.532 | 10.532 | (0.989) | 562621 | 50.0000 | 51.7 | |
| | 96 | 1,3-Dichlorobenzene | 146 | 10.603 | 10.603 | (0.996) | 344495 | 50.0000 | 50.6 | |
| * | 97 | 1,4-DICHLOROBENZENE-D4 | 152 | 10.644 | 10.644 | (1.000) | 201140 | 50.0000 | | |
| | 98 | 1,4-Dichlorobenzene | 146 | 10.656 | 10.656 | (1.001) | 347126 | 50.0000 | 48.7 | |
| | 100 | n-Butylbenzene | 91 | 10.787 | 10.787 | (1.013) | 408324 | 50.0000 | 52.3 | |
| | 102 | 1,2-Dichlorobenzene | 146 | 10.918 | 10.918 | (1.026) | 348111 | 50.0000 | 50.6 | |
| | 106 | 1,2-Dibromo-3-Chloropropane | 157 | 11.447 | 11.447 | (1.075) | 52905 | 50.0000 | 49.8 | |
| | 109 | Hexachlorobutadiene | 225 | 11.911 | 11.911 | (1.119) | 99012 | 50.0000 | 49.4 | |
| | 108 | 1,2,4-Trichlorobenzene | 180 | 11.956 | 11.956 | (1.123) | 137657 | 50.0000 | 43.8 | |
| | 110 | Naphthalene | 128 | 12.249 | 12.249 | (1.151) | 231364 | 50.0000 | 37.3 | |
| | 111 | 1,2,3-Trichlorobenzene | 180 | 12.418 | 12.418 | (1.167) | 136290 | 50.0000 | 44.6 | |

Data File: /var/chem/msv12.i/2180418.s.b/q8089.d



Date : 18-APR-2018 20:21

Client ID: V12STD050

Instrument: msv12.i

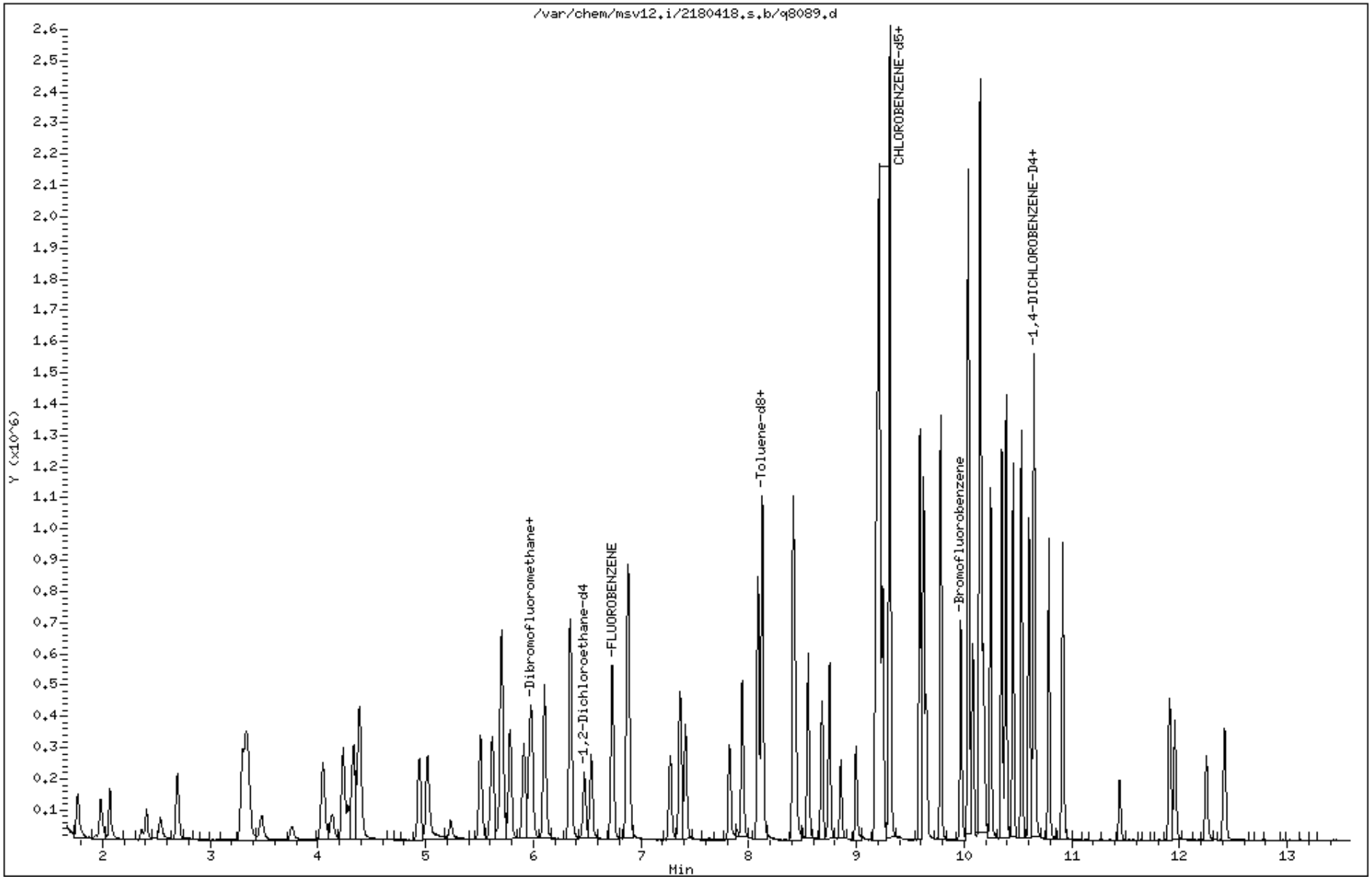
Sample Info: 1440*V12STD050

Purge Volume: 5.0

Operator: JMC2

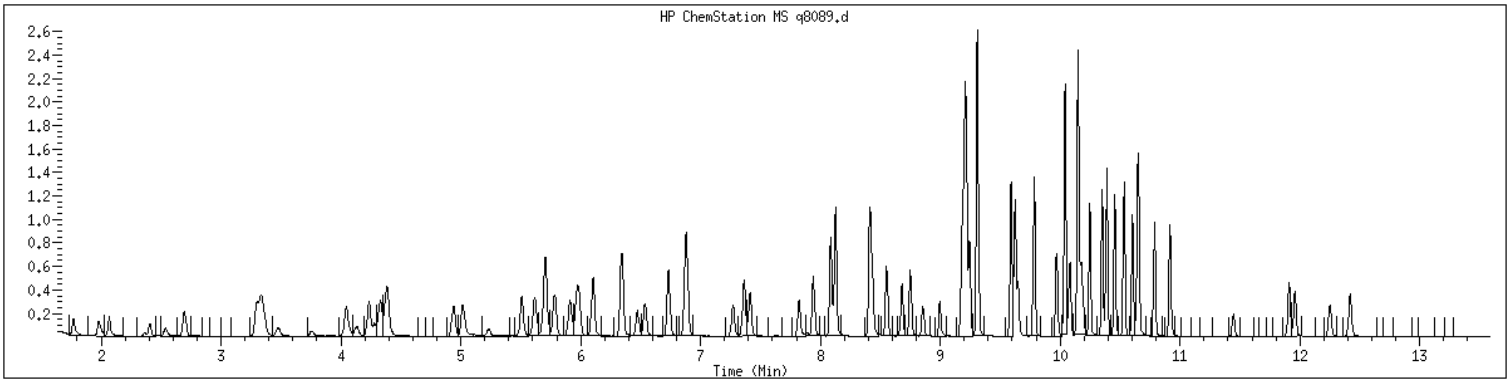
Column phase: RTX-VMS-30M

Column diameter: 0.25



MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 1440 SampleType : CCALIB_7
Injection Date: 04/18/2018 20:21 Instrument : msv12.i
Operator : JMC2
Sample Info : 1440*V12STD050
Misc Info : MSV~40673~*1*JMC2
Method : /var/chem/msv12.i/2180418.s.b/8260cdod5w12.m
Dilution : 1.00
Matrix : WATER
Integrator : HP RTE Compound Sublist: 8260b




NO MANUAL INTEGRATIONS

# Form 8A

# Internal Standards

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Standard ID: | 1207 |
| GC Column: | RTX-VMS-30 ID .25 (mm) | Instrument ID: | MSV12 |
| Injection Vol.: | 1.0 ( µL ) | Lab File ID: | 2180416p/q7982cD |
| Analyst: | JCK | Analytical Batch: | 633658 |
| Analysis Date: | 04/16/18 Time: 1757 | Analytical Method: | EPA 8260C |

| | IS 1 | | IS 2 | | IS 3 | |
|---|---|---|---|---|---|---|
| | Area | RT | Area | RT | Area | RT |
| STANDARD | 195747 | 9.19 | 201236 | 10.64 | 484732 | 6.73 |

| CLIENT SAMPLE ID | GCAL SAMP ID | | # | | # | | # | | # | | # | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LCS1797924 | 1797924 | 200457 | | 9.2 | | 208722 | | 10.64 | | 503912 | | 6.74 | |
| MW-11-01-21 | 21804062009 | 175635 | | 9.2 | | 136222 | | 10.65 | | 461831 | | 6.74 | |
| MW-11-06-21 | 21804062007 | 175562 | | 9.2 | | 132503 | | 10.65 | | 452552 | | 6.74 | |
| MW-11-10-21 | 21804062008 | 171429 | | 9.2 | | 132396 | | 10.65 | | 457160 | | 6.74 | |
| S4-MW50-21 | 21804062003 | 169586 | | 9.2 | | 123440 | | 10.65 | | 446215 | | 6.74 | |
| S4-MW51-21 | 21804062004 | 169459 | | 9.2 | | 123107 | | 10.65 | | 452219 | | 6.74 | |
| S4-MW-49-21 | 21804062005 | 173129 | | 9.2 | | 125082 | | 10.65 | | 454341 | | 6.74 | |
| S4-MW-48-21 | 21804062006 | 170274 | | 9.2 | | 122410 | | 10.65 | | 442199 | | 6.74 | |
| RD5-MW-01-21 | 21804062010 | 168329 | | 9.2 | | 120412 | | 10.65 | | 445359 | | 6.73 | |
| MW-01-07-21 | 21804062011 | 170840 | | 9.2 | | 113582 | | 10.65 | | 470281 | | 6.74 | |
| S4-MW-46-21 | 21804062012 | 173534 | | 9.2 | | 121102 | | 10.65 | | 449665 | | 6.74 | |
| LCSD1797925 | 1797925 | 199802 | | 9.19 | | 206731 | | 10.64 | | 506247 | | 6.74 | |
| S4-MW-47-21 | 21804062013 | 171094 | | 9.2 | | 120451 | | 10.65 | | 461148 | | 6.74 | |
| S4-MW28-21 | 21804062015 | 179387 | | 9.2 | | 125676 | | 10.65 | | 466461 | | 6.74 | |
| S4-MW37-21 | 21804062016 | 170018 | | 9.2 | | 120230 | | 10.65 | | 456476 | | 6.73 | |
| MB1797923 | 1797923 | 179425 | | 9.2 | | 134484 | | 10.65 | | 478689 | | 6.74 | |
| Trip Blank | 21804062014 | 181257 | | 9.2 | | 133040 | | 10.65 | | 473952 | | 6.74 | |
| MW-01-06-21 | 21804062017 | 175824 | | 9.2 | | 133805 | | 10.65 | | 469519 | | 6.74 | |
| TW-6-21 | 21804062018 | 174666 | | 9.2 | | 129231 | | 10.65 | | 459156 | | 6.73 | |
| TW-7-21 | 21804062019 | 170998 | | 9.2 | | 123372 | | 10.65 | | 453241 | | 6.74 | |
| MW-11-02-21 | 21804062002 | 178509 | | 9.2 | | 153399 | | 10.65 | | 471155 | | 6.74 | |
| MW-13-11-21 | 21804062001 | 178828 | | 9.2 | | 146251 | | 10.65 | | 467217 | | 6.74 | |

IS 1 ID : Chlorobenzene-d5
IS 2 ID : 1,4-Dichlorobenzene-d4
IS 3 ID : Fluorobenzene

# Column used to flag values outside QC limits with an asterisk
* Value outside of QC limits

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -70% of internal standard area

RT UPPER LIMIT = +0.17 minutes of internal standard RT
RT LOWER LIMIT = -0.17 minutes of internal standard RT

FORM V III VOA

# RunLogs

LABORATORY CHRONICLE:  MSV DEPARTMENT

Date: 16-APR-2018
Instrument: msv12.i
Analyst(s): JCK

| | Standard | Conc | ID | EXP |
|---|---|---|---|---|
| | 8260 IS/SS | 50 | 126-88-9 | 08/26/18 |
| 1000 (BFB) | BFB IS/SS | 50 | 126-88-9 | 08/26/18 |
| 1201-1209 (ICAL) | 8260 | 250 | 126-91-1 | 04/27/18 |
| | Ac/Ac/VA | MC | 126-90-10 | 04/30/18 |
| | CVE | 250 | 126-90-1 | 09/20/18 |
| 1600 (ICV) | 8260 | 250 | 126-88-2 | 08/07/18 |
| | Ac/Ac/VA | MC | 126-90-11 | 04/30/18 |
| | CVE | 250 | 126-84-6 | 05/09/18 |

| Sample ID | Comments | DataFile | Wgt/Vol | Injection Time | Dil | Anal | ALS |
|---|---|---|---|---|---|---|---|
| 1000 | | q7974bfb.d | 0.00 ml | 16-APR-2018 14:39 | 1.0 | JCK | 2 |
| 1000 | | q7974bfbs.d | 0.00 ml | 16-APR-2018 14:39 | 1.0 | JCK | 2 |
| 1201 | | q7975.d | 5.00 ml | 16-APR-2018 15:14 | 1.0 | JCK | 1 |
| 1202 | | q7976.d | 5.00 ml | 16-APR-2018 15:40 | 1.0 | JCK | 1 |
| 0.4PPB | | q7976LOD.d | 5.00 ml | 16-APR-2018 15:40 | 1.0 | JCK | 1 |
| 1203 | | q7977.d | 5.00 ml | 16-APR-2018 16:03 | 1.0 | JCK | 2 |
| 1PPB | | q7977LOD.d | 5.00 ml | 16-APR-2018 16:03 | 1.0 | JCK | 2 |
| 1PPB | | q7977LOQ.d | 5.00 ml | 16-APR-2018 16:03 | 1.0 | JCK | 2 |
| 2PPB | | q7978LOD.d | 5.00 ml | 16-APR-2018 16:26 | 1.0 | JCK | 3 |
| 2PPB | | q7978LOQ.d | 5.00 ml | 16-APR-2018 16:26 | 1.0 | JCK | 3 |
| 1204 | | q7979.d | 5.00 ml | 16-APR-2018 16:48 | 1.0 | JCK | 4 |
| 5PPB | | q7979LOQ.d | 5.00 ml | 16-APR-2018 16:48 | 1.0 | JCK | 4 |
| 1205 | | q7980.d | 5.00 ml | 16-APR-2018 17:11 | 1.0 | JCK | 5 |
| 1206 | | q7981.d | 5.00 ml | 16-APR-2018 17:34 | 1.0 | JCK | 6 |
| 1400 | | q7982ccv.d | 5.00 ml | 16-APR-2018 17:57 | 1.0 | JCK | 7 |
| 1207 | | q7982.d | 5.00 ml | 16-APR-2018 17:57 | 1.0 | JCK | 7 |
| 1208 | | q7983.d | 5.00 ml | 16-APR-2018 18:20 | 1.0 | JCK | 8 |
| 1209 | | q7984.d | 5.00 ml | 16-APR-2018 18:43 | 1.0 | JCK | 9 |
| BLANK | | q7985.d | 5.00 ml | 16-APR-2018 19:06 | 1.0 | JCK | 10 |
| 1600 | | q7986.d | 5.00 ml | 16-APR-2018 19:29 | 1.0 | JCK | 11 |
| 1797878 | | q7987.d | 5.00 ml | 16-APR-2018 19:52 | 1.0 | JCK | 12 |
| 1797881 | | q7987s.d | 5.00 g | 16-APR-2018 19:52 | 50.0 | JCK | 12 |
| 1797879 | | q7988.d | 5.00 ml | 16-APR-2018 20:15 | 1.0 | JCK | 12 |
| 1797882 | | q7988s.d | 5.00 g | 16-APR-2018 20:15 | 50.0 | JCK | 12 |
| MB | | q7989.d | 5.00 ml | 16-APR-2018 20:38 | 1.0 | JCK | 13 |
| MB | | q7990.d | 5.00 ml | 16-APR-2018 21:00 | 1.0 | JCK | 13 |
| 1797880 | | q7991s.d | 5.00 g | 16-APR-2018 21:23 | 50.0 | JCK | 14 |
| 1797877 | | q7992.d | 5.00 ml | 16-APR-2018 21:46 | 1.0 | JCK | 14 |
| 21804107501 | | q7993.d | 5.00 ml | 16-APR-2018 22:09 | 40.0 | JCK | 15 |
| 21804115501 | | q7994.d | 5.00 ml | 16-APR-2018 22:32 | 40.0 | JCK | 16 |
| 21804115502 | | q7995.d | 5.00 ml | 16-APR-2018 22:55 | 100.0 | JCK | 17 |
| 21804115501 | | q7996s.d | 5.34 g | 16-APR-2018 23:17 | 500.0 | JCK | 18 |
| 21804115502 | | q7997s.d | 5.48 g | 16-APR-2018 23:40 | 2000.0 | JCK | 19 |
| BLANK | | q7998.d | 5.00 ml | 17-APR-2018 00:03 | 1.0 | JCK | 20 |
| 1797886 | | q7999ms.d | 5.00 ml | 17-APR-2018 00:26 | 40.0 | JCK | 21 |
| 1797887 | | q8000msd.d | 5.00 ml | 17-APR-2018 00:49 | 40.0 | JCK | 21 |

REVISED 1-28-15  Supervisor Review:  JCK  TUNE TIME: 02:39

LABORATORY CHRONICLE:  MSV DEPARTMENT

Date: 18-APR-2018
Instrument: msv12.i
Analyst(s): HRO

| | Standard | Conc | ID | EXP |
|---|---|---|---|---|
| | 8260 IS/SS | 50 | 126-88-9 | 08/26/18 |
| 1000 (BFB) | BFB IS/SS | 50 | 126-88-9 | 08/26/18 |
| 1400 (CCV) | 8260 | 250 | 126-91-1 | 04/27/18 |
| | Ac/Ac/VA | MC | 126-90-10 | 04/30/18 |
| | CVE | 250 | 126-90-1 | 09/20/18 |

| Sample ID | Comments | DataFile | Wgt/Vol | Injection Time | Dil | Anal | ALS |
|---|---|---|---|---|---|---|---|
| 1000 | RR | q8060.d | 5.00 ml | 18-APR-2018 07:57 | 1.0 | HRO | 2 |
| 1000 | | q8061bfb.d | 0.00 ml | 18-APR-2018 08:41 | 1.0 | JCK | 11 |
| CONDITION PURG | | q8062.d | 5.00 ml | 18-APR-2018 09:14 | 1.0 | JMC2 | 11 |
| CONDITION PURG | | q8063.d | 5.00 ml | 18-APR-2018 09:59 | 1.0 | JMC2 | 1 |
| CONDITION PURG | | q8064.d | 5.00 ml | 18-APR-2018 10:22 | 1.0 | JMC2 | 1 |
| 1400 | | q8065.d | 5.00 ml | 18-APR-2018 10:45 | 1.0 | JMC2 | 2 |
| 1797924 | | q8065L.d | 5.00 ml | 18-APR-2018 10:45 | 1.0 | JMC2 | 2 |
| 1797925 | | q8066.d | 5.00 ml | 18-APR-2018 11:08 | 1.0 | JMC2 | 2 |
| BLANK | | q8067.d | 5.00 ml | 18-APR-2018 11:30 | 1.0 | JMC2 | 3 |
| BLANK | | q8068.d | 5.00 ml | 18-APR-2018 11:53 | 1.0 | JMC2 | 3 |
| 1797923 | pH | q8069.d | 5.00 ml | 18-APR-2018 12:16 | 1.0 | JMC2 | 4 |
| 21804062014 | 1 | q8070.d | 5.00 ml | 18-APR-2018 12:39 | 1.0 | JMC2 | 5 |
| 21804062017 | 1 | q8071.d | 5.00 ml | 18-APR-2018 13:02 | 1.0 | JMC2 | 6 |
| 21804062018 | 1 | q8072.d | 5.00 ml | 18-APR-2018 13:25 | 1.0 | JMC2 | 7 |
| 21804062019 | 1 | q8073.d | 5.00 ml | 18-APR-2018 13:48 | 1.0 | JMC2 | 8 |
| 21804062002 | 1 | q8074.d | 5.00 ml | 18-APR-2018 14:11 | 1.0 | JMC2 | 9 |
| 21804062001 | 1 | q8075.d | 5.00 ml | 18-APR-2018 14:34 | 1.0 | JMC2 | 10 |
| 21804062009 | 1 | q8076.d | 5.00 ml | 18-APR-2018 14:56 | 1.0 | JMC2 | 11 |
| 21804062007 | 1 | q8077.d | 5.00 ml | 18-APR-2018 15:19 | 1.0 | JMC2 | 12 |
| 21804062008 | 1 | q8078.d | 5.00 ml | 18-APR-2018 15:42 | 1.0 | JMC2 | 13 |
| 21804062003 | 1 | q8079.d | 5.00 ml | 18-APR-2018 16:05 | 1.0 | JMC2 | 14 |
| 21804062004 | 1 | q8080.d | 5.00 ml | 18-APR-2018 16:28 | 1.0 | JMC2 | 15 |
| 21804062005 | 1 | q8081.d | 5.00 ml | 18-APR-2018 16:51 | 1.0 | JMC2 | 16 |
| 21804062006 | 1 | q8082.d | 5.00 ml | 18-APR-2018 17:14 | 1.0 | JMC2 | 17 |
| 21804062010 | 1 | q8083.d | 5.00 ml | 18-APR-2018 17:37 | 1.0 | JMC2 | 18 |
| 21804062011 | 1 | q8084.d | 5.00 ml | 18-APR-2018 18:20 | 1.0 | JMC2 | 19 |
| 21804062012 | 1 | q8085.d | 5.00 ml | 18-APR-2018 18:43 | 1.0 | JMC2 | 20 |
| 21804062013 | 1 | q8086.d | 5.00 ml | 18-APR-2018 19:06 | 1.0 | JMC2 | 21 |
| 21804062015 | 1 | q8087.d | 5.00 ml | 18-APR-2018 19:28 | 1.0 | JMC2 | 22 |
| 21804062016 | 1 | q8088.d | 5.00 ml | 18-APR-2018 19:51 | 1.0 | JMC2 | 23 |
| 1440 | | q8089.d | 5.00 ml | 18-APR-2018 20:21 | 1.0 | JMC2 | 24 |

REVISED 1-28-15  Supervisor Review: JCK  TUNE TIME: 20:41

# Form 1D

# Results

1D

ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-13-11-21 |
| Collect Date: | 04/05/18 Time: 1045 | GCAL Sample ID: | 21804062001 |
| Matrix: | Water % Moisture: NA | Instrument ID: | GCV8B |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/v8009 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | ID (mm) |
| Prep Final Vol.: | 5000 ( µL ) | Dilution Factor: | 300 Analyst: BMR |
| Prep Date: | | Analysis Date: | 04/18/18 Time: 1127 |
| Prep Batch: | | Analytical Batch: | 633677 |
| Prep Method: | | Analytical Method: | RSK-175 |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 124-38-9 | Carbon Dioxide | 366000 | | 38100 | 116000 | 270000 |

FORM I ORG-1

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2180418.b/v8009.d
Lab Smp Id: 21804062001 Client Smp ID: 21804062001
Inj Date : 18-APR-2018 11:27
Operator : BMR Inst ID: gcv8b.i
Smp Info : 21804062001
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2180418.b/CO2h.m
Meth Date : 18-Apr-2018 13:24 bmr Quant Type: ESTD
Cal Date : 30-JUN-2017 10:14 Cal File: v8003.d
Als bottle: 1
Dil Factor: 300.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | CONCENTRATIONS | |
|---|---|---|---|---|---|---|
| | | | | | ON-COLUMN | FINAL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| 1 Carbon Dioxide | 1.034 | 1.035 | -0.001 | 5489212 | 1221.61 | 366000(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8b.i/2180418.b/v8009.d



Date : 18-APR-2018 11:27

Client ID: 21804062001

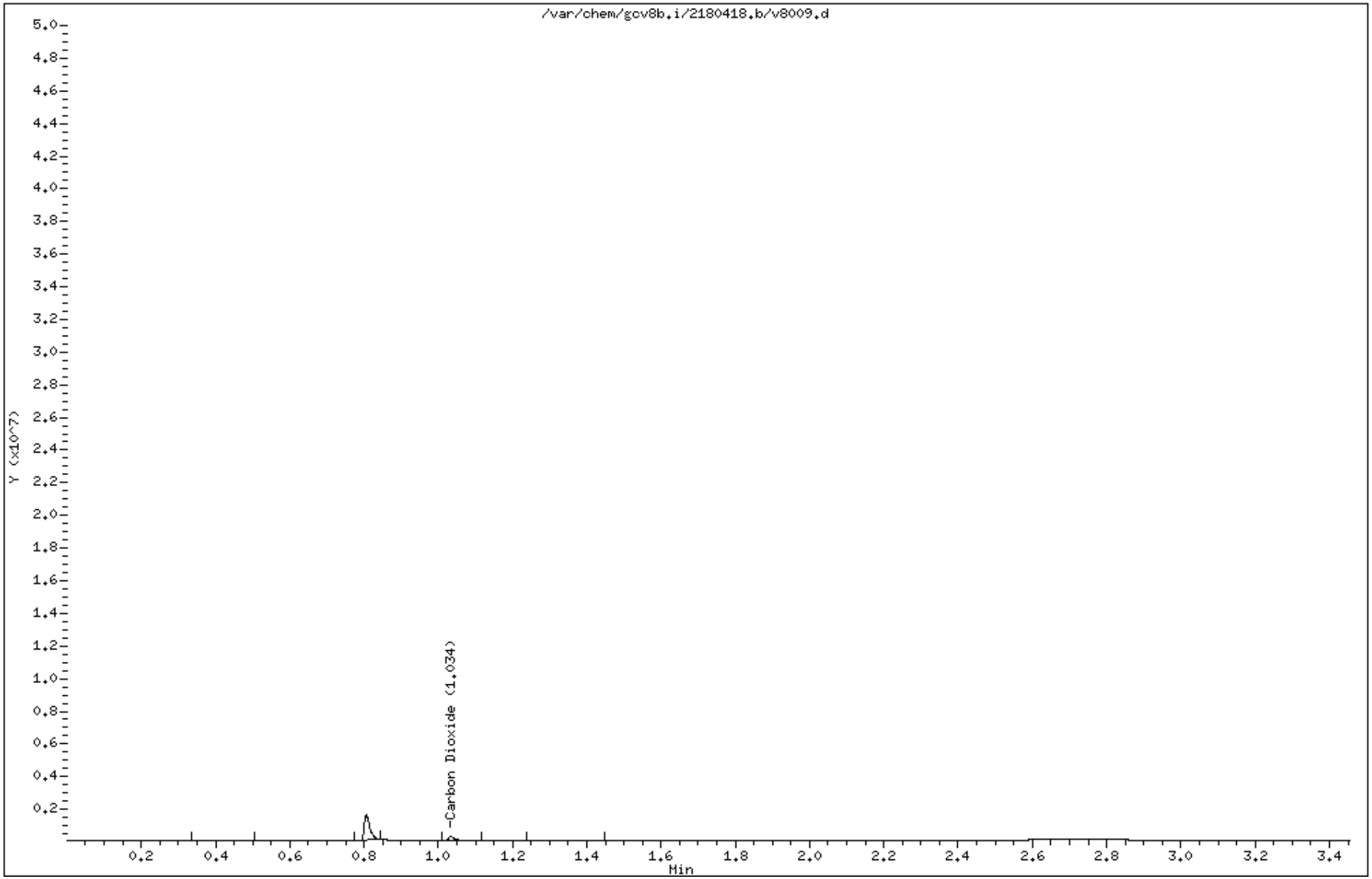
Instrument: gcv8b.i

Sample Info: 21804062001

Operator: BMR

Column phase: GS-Q-30

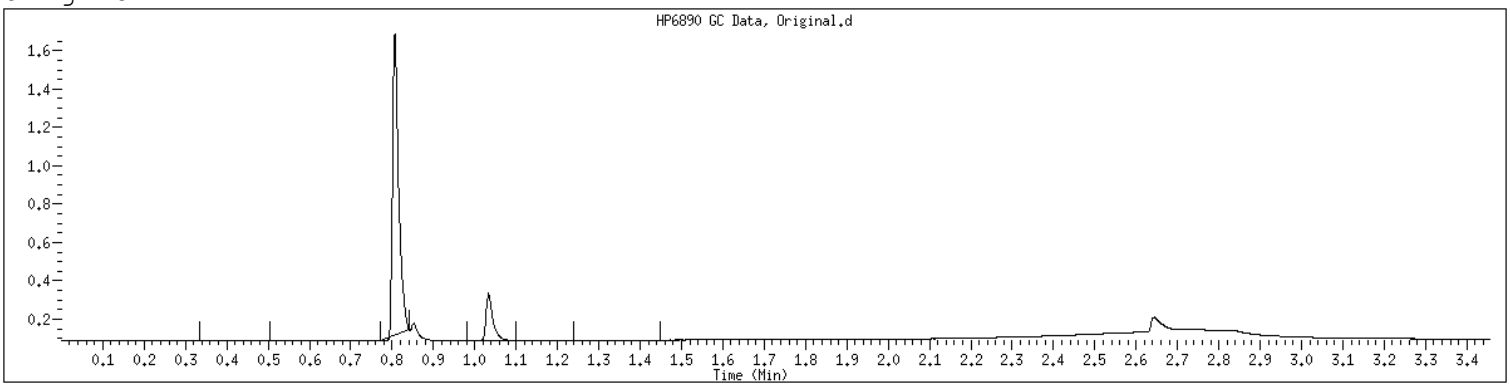
Column diameter: 0.53



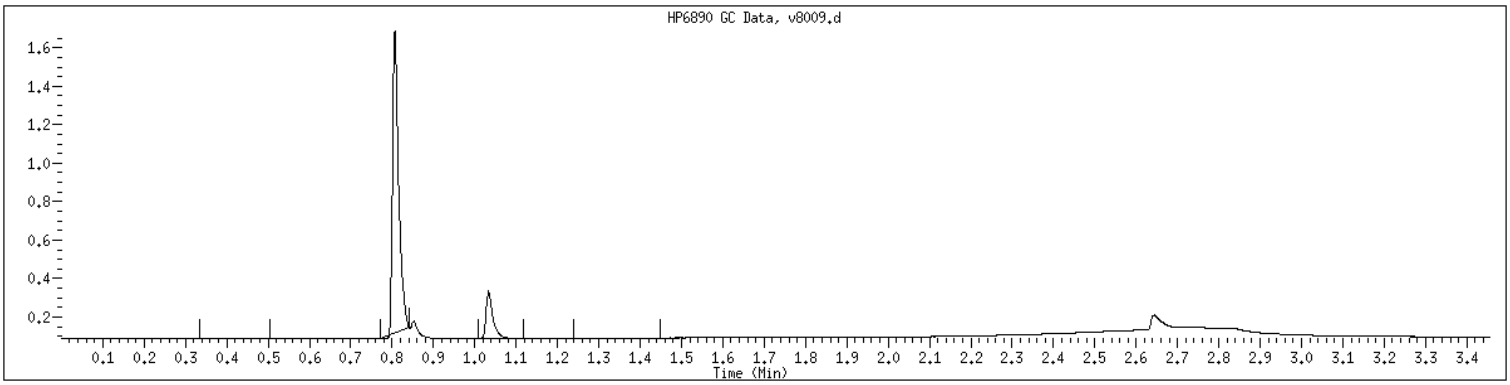
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 21804062001 | SampleType | : SAMPLE |
| Injection Date | : 04/18/2018 11:27 | Instrument | : gcv8b.i |
| Operator | : BMR | | |
| Sample Info | : 21804062001 | | |
| Misc Info | : 2125155 | | |
| Method | : /var/chem/gcv8b.i/2180418.b/CO2h.m | | |
| Dilution | : 300 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : co2 |

Original




Final



1D

ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-13-11-21 |
| Collect Date: | 04/05/18 Time: 1045 | GCAL Sample ID: | 21804062001 |
| Matrix: | Water % Moisture: NA | Instrument ID: | GCV8A |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/v8008 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | GS-Q 30 ID .53 (mm) |
| Prep Final Vol.: | 5000 ( µL ) | Dilution Factor: | 1 Analyst: BMR |
| Prep Date: | | Analysis Date: | 04/18/18 Time: 1123 |
| Prep Batch: | | Analytical Batch: | 633675 |
| Prep Method: | | Analytical Method: | RSK-175 |

*CONCENTRATION UNITS: ug/L*

| *CAS* | *ANALYTE* | *RESULT* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| 74-84-0 | Ethane | 0.286 | J | 0.110 | 0.220 | 1.00 |
| 74-85-1 | Ethene | 2.26 | | 0.150 | 0.290 | 1.00 |

FORM I ORG-1

GCAL, Inc.

Data file : /var/chem/gcv8a.i/2180418.b/v8008.d
Lab Smp Id: 21804062001 Client Smp ID: 21804062001
Inj Date : 18-APR-2018 11:23
Operator : BMR Inst ID: gcv8a.i
Smp Info : 21804062001
Misc Info : 2126160/2125841/2126599
Comment :
Method : /var/chem/gcv8a.i/2180418.b/RSK.m
Meth Date : 18-Apr-2018 11:03 bmr Quant Type: ESTD
Cal Date : 18-JUL-2017 11:21 Cal File: v8006.d
Als bottle: 1
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: me&e.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | CONCENTRATIONS | |
|---|---|---|---|---|---|---|
| | | | | | ON-COLUMN | FINAL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| ========== | == | ====== | ====== | ======== | ======= | ======= |
| 1 METHANE | 0.786 | 0.795 | -0.009 | 7834842262 | 4863.16 | 4860(AM2) |
| 2 ETHYLENE | 1.190 | 1.196 | -0.006 | 2528595 | 2.25907 | 2.26(M2) |
| 4 ETHANE | 1.375 | 1.380 | -0.005 | 405140 | 0.28602 | 0.286(M2) |
| $ 5 PROPENE | 2.476 | 2.477 | -0.001 | 19465116 | 27.7316 | 27.7(M2) |

QC Flag Legend

A - Target compound detected but, quantitated amount
exceeded maximum amount.
M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8a.i/2180418.b/v8008.d



Date : 18-APR-2018 11:23

Client ID: 21804062001

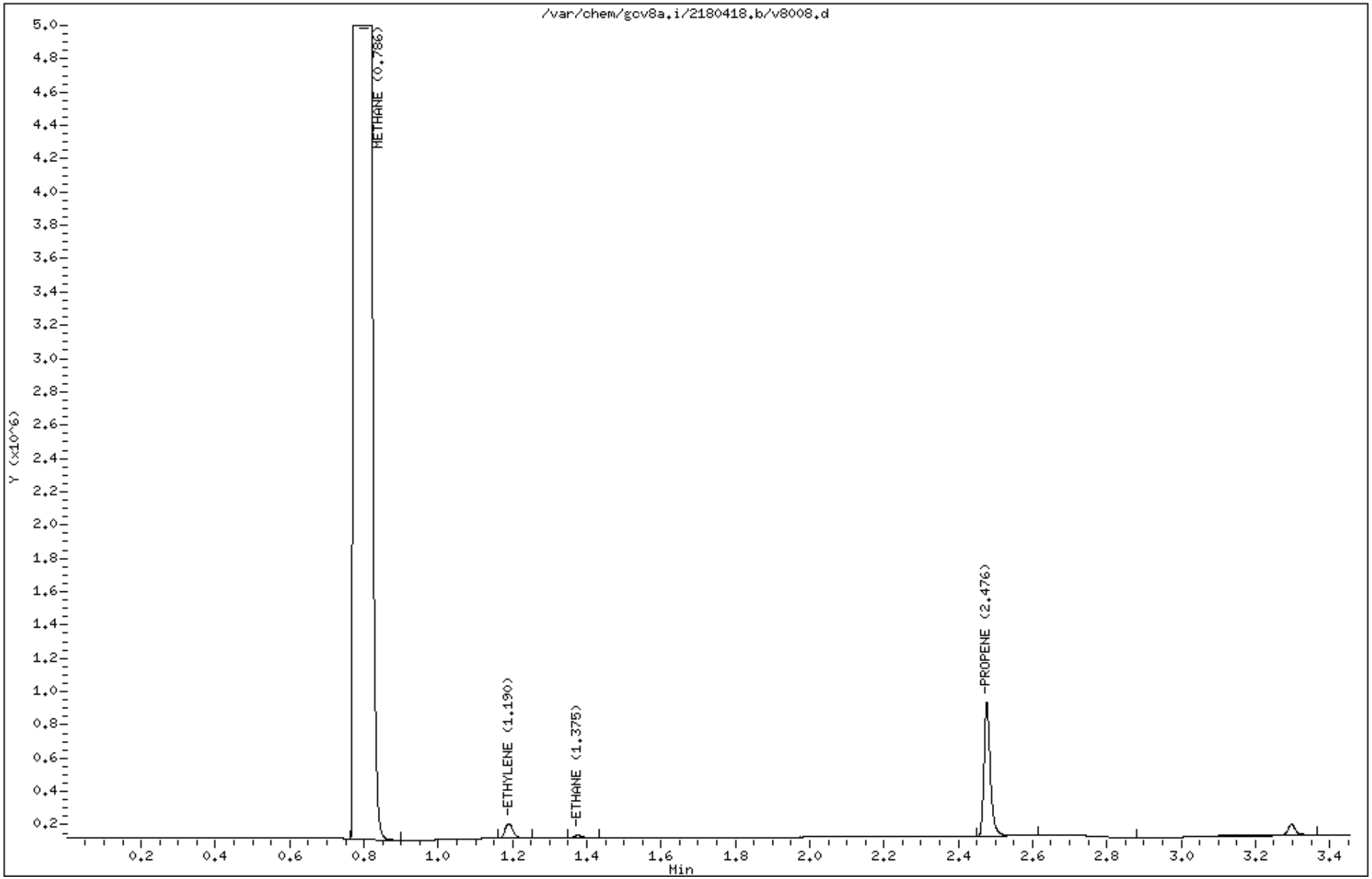
Instrument: gcv8a.i

Sample Info: 21804062001

Operator: BMR

Column phase: GS-Q-30M

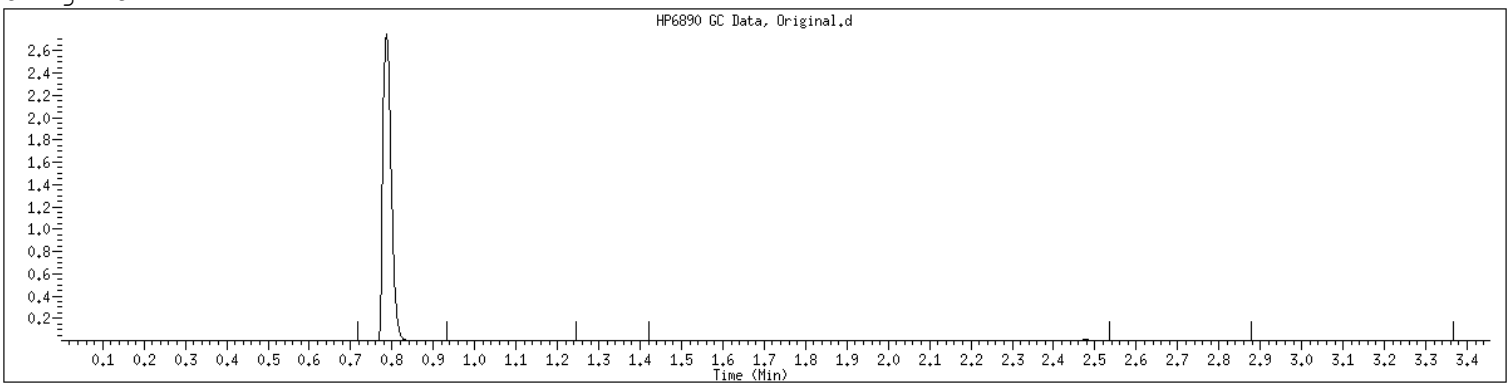
Column diameter: 0.53



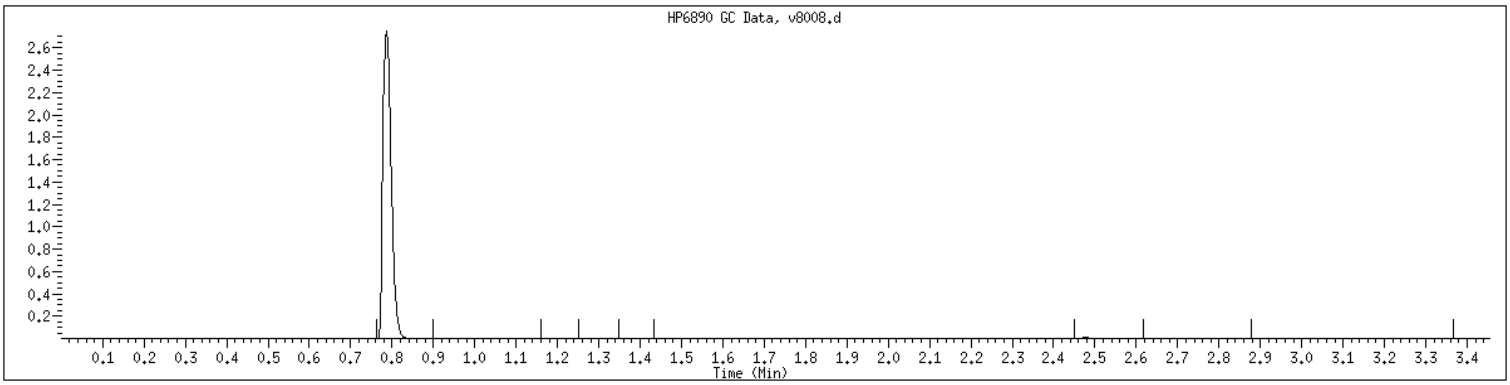
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 21804062001 SampleType : SAMPLE
Injection Date: 04/18/2018 11:23 Instrument : gcv8a.i
Operator : BMR
Sample Info : 21804062001
Misc Info : 2126160/2125841/2126599
Method : /var/chem/gcv8a.i/2180418.b/RSK.m
Dilution : 1.00
Matrix : WATER
Integrator : HP Genie Compound Sublist: me&e

Original




Final



1D

ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-13-11-21DL |
| Collect Date: | 04/05/18 Time: 1045 | GCAL Sample ID: | 21804062001DL |
| Matrix: | Water % Moisture: NA | Instrument ID: | GCV8A |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/v8009 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | GS-Q 30 ID .53 (mm) |
| Prep Final Vol.: | 5000 ( µL ) | Dilution Factor: | 300 Analyst: BMR |
| Prep Date: | | Analysis Date: | 04/18/18 Time: 1127 |
| Prep Batch: | | Analytical Batch: | 633675 |
| Prep Method: | | Analytical Method: | RSK-175 |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 74-82-8 | Methane | 10700 | | 131 | 327 | 600 |

FORM I ORG-1

GCAL, Inc.

Data file : /var/chem/gcv8a.i/2180418.b/v8009.d
Lab Smp Id: 21804062001 Client Smp ID: 21804062001
Inj Date : 18-APR-2018 11:27
Operator : BMR Inst ID: gcv8a.i
Smp Info : 21804062001
Misc Info : 2126160/2125841/2126599
Comment :
Method : /var/chem/gcv8a.i/2180418.b/RSK.m
Meth Date : 18-Apr-2018 11:34 bmr Quant Type: ESTD
Cal Date : 18-JUL-2017 11:21 Cal File: v8006.d
Als bottle: 1
Dil Factor: 300.00000
Integrator: HP Genie Compound Sublist: me&e.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| Compounds | RT | EXP RT | DLT RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ug/L) | CONCENTRATIONS FINAL ( ug/L) |
|---|---|---|---|---|---|---|
| 1 METHANE | 0.791 | 0.795 | -0.004 | 57554579 | 35.7247 | 10700(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8a.i/2180418.b/v8009.d



Date : 18-APR-2018 11:27

Client ID: 21804062001

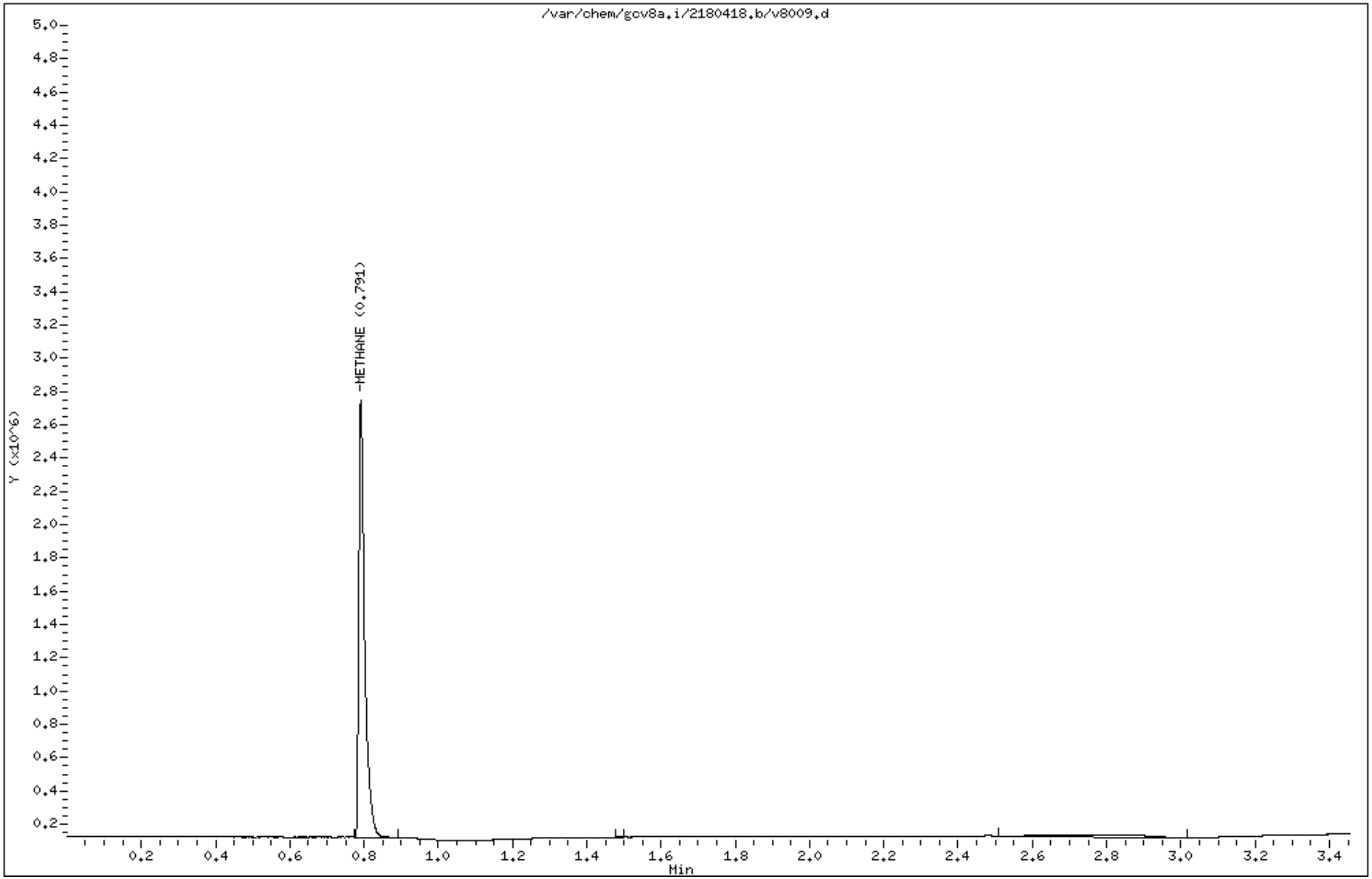
Instrument: gcv8a.i

Sample Info: 21804062001

Operator: BMR

Column phase: GS-Q-30M

Column diameter: 0.53

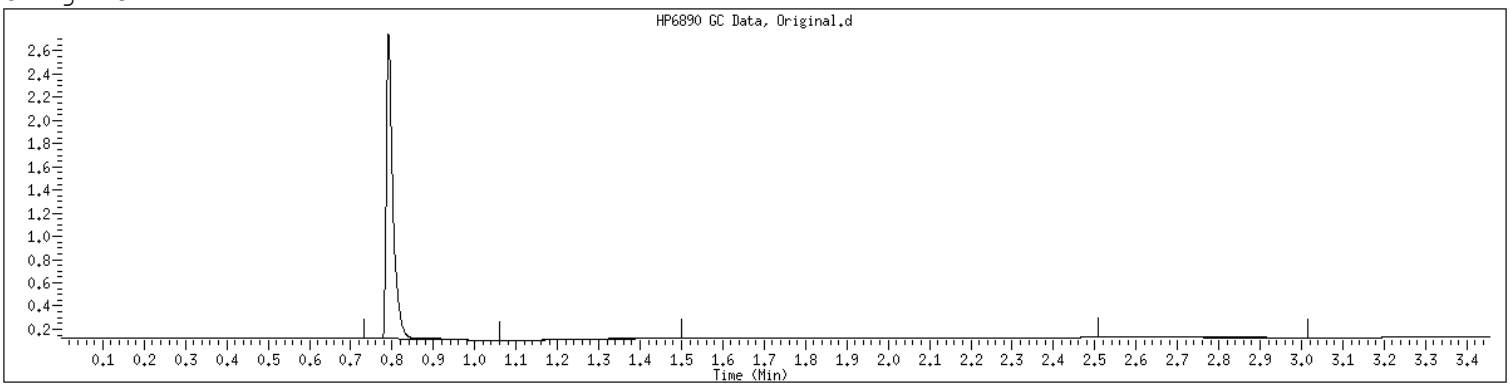


Report Date: 04/18/2018 11:36

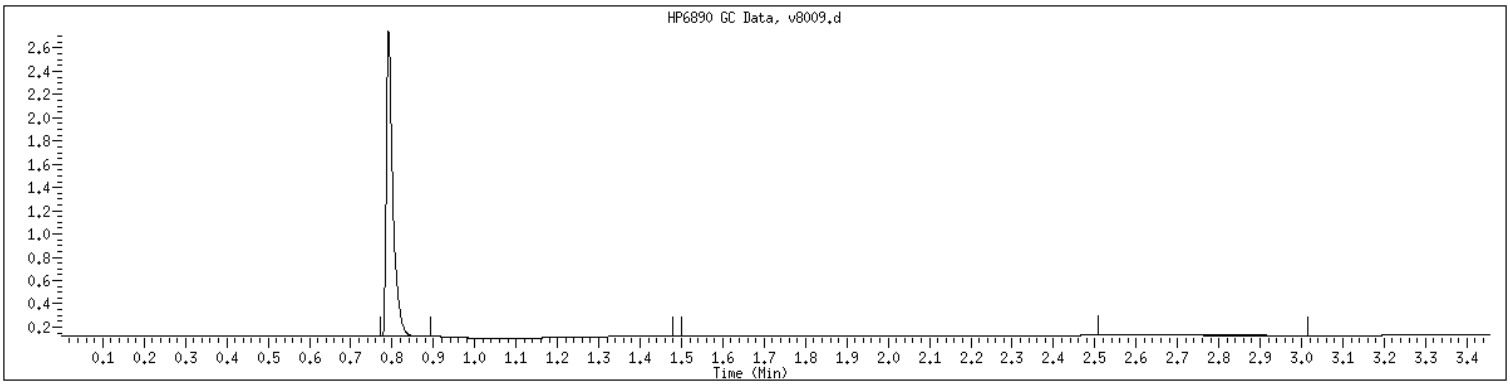
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 21804062001 SampleType : SAMPLE
Injection Date: 04/18/2018 11:27 Instrument : gcv8a.i
Operator : BMR
Sample Info : 21804062001
Misc Info : 2126160/2125841/2126599
Method : /var/chem/gcv8a.i/2180418.b/RSK.m
Dilution : 300
Matrix : WATER
Integrator : HP Genie Compound Sublist: me&e

Original




Final



1D

ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-02-21 |
| Collect Date: | 04/05/18 Time: 1310 | GCAL Sample ID: | 21804062002 |
| Matrix: | Water % Moisture: NA | Instrument ID: | GCV8B |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/v8012 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | ID (mm) |
| Prep Final Vol.: | 5000 ( µL ) | Dilution Factor: | 100 Analyst: BMR |
| Prep Date: | | Analysis Date: | 04/18/18 Time: 1149 |
| Prep Batch: | | Analytical Batch: | 633677 |
| Prep Method: | | Analytical Method: | RSK-175 |

*CONCENTRATION UNITS: ug/L*

| *CAS* | *ANALYTE* | *RESULT* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| 124-38-9 | Carbon Dioxide | 304000 | | 12700 | 38600 | 90000 |

FORM I ORG-1

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2180418.b/v8012.d
Lab Smp Id: 21804062002 Client Smp ID: 21804062002
Inj Date : 18-APR-2018 11:49
Operator : BMR Inst ID: gcv8b.i
Smp Info : 21804062002
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2180418.b/CO2h.m
Meth Date : 18-Apr-2018 13:24 bmr Quant Type: ESTD
Cal Date : 30-JUN-2017 10:14 Cal File: v8003.d
Als bottle: 1
Dil Factor: 100.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | CONCENTRATIONS | |
|---|---|---|---|---|---|---|
| | | | | | ON-COLUMN | FINAL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| 1 Carbon Dioxide | 1.030 | 1.035 | -0.005 | 13658424 | 3039.64 | 304000(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8b.i/2180418.b/v8012.d



Date : 18-APR-2018 11:49

Client ID: 21804062002

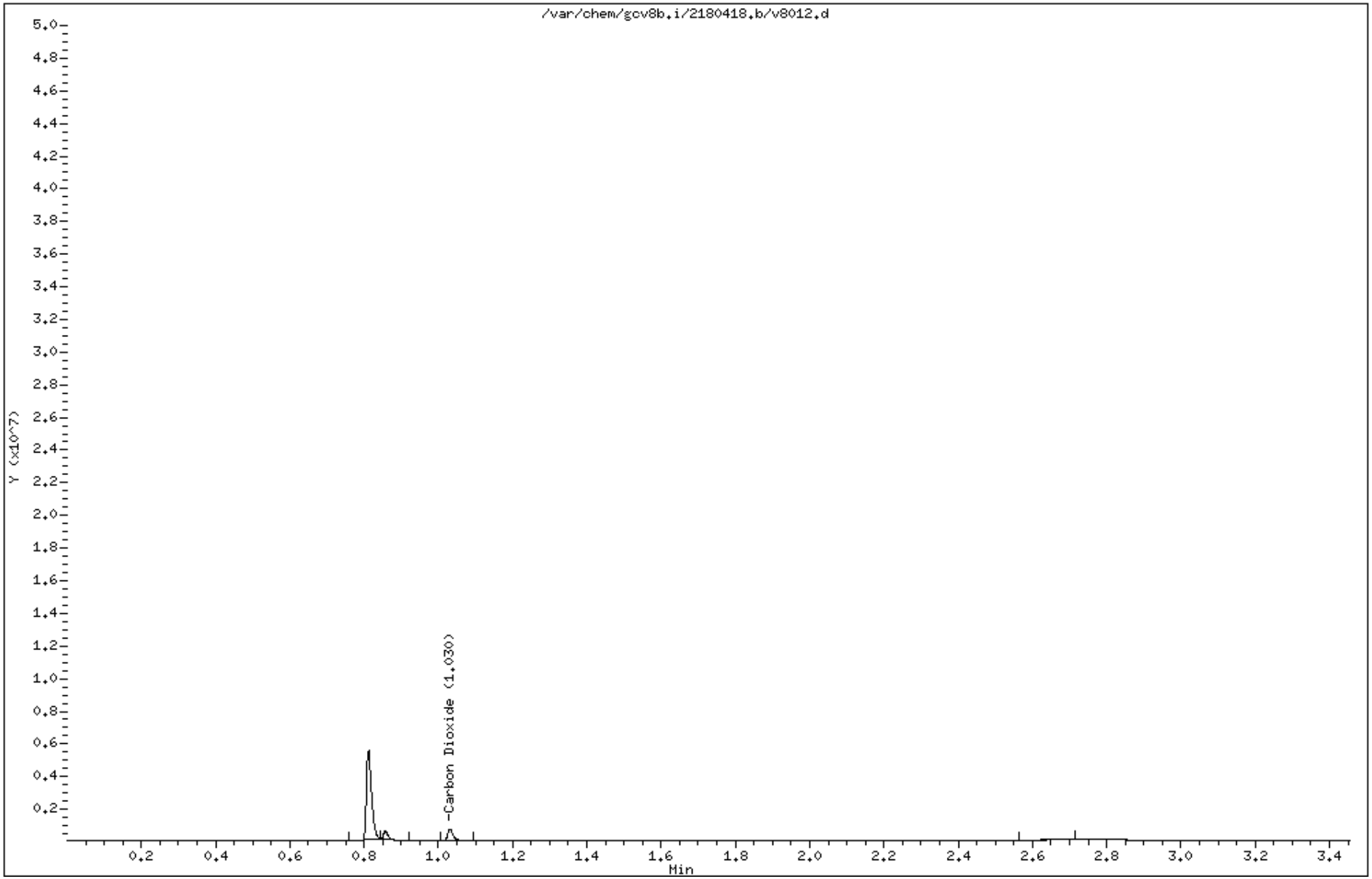
Instrument: gcv8b.i

Sample Info: 21804062002

Operator: BMR

Column phase: GS-Q-30

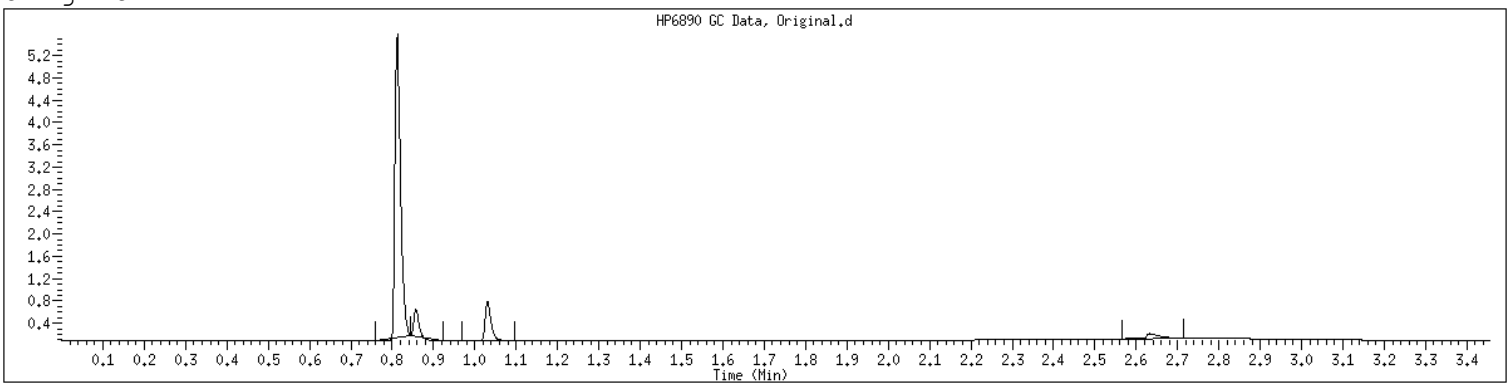
Column diameter: 0.53



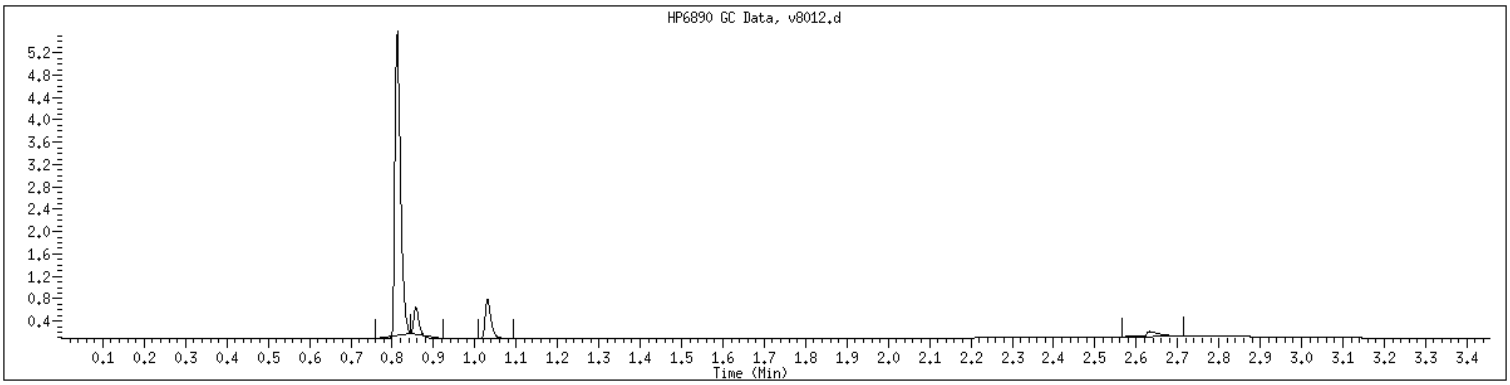
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 21804062002 | SampleType | : SAMPLE |
| Injection Date | : 04/18/2018 11:49 | Instrument | : gcv8b.i |
| Operator | : BMR | | |
| Sample Info | : 21804062002 | | |
| Misc Info | : 2125155 | | |
| Method | : /var/chem/gcv8b.i/2180418.b/CO2h.m | | |
| Dilution | : 100 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : co2 |

Original




Final



1D

ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-02-21 |
| Collect Date: | 04/05/18 Time: 1310 | GCAL Sample ID: | 21804062002 |
| Matrix: | Water % Moisture: NA | Instrument ID: | GCV8A |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/v8010 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | GS-Q 30 ID .53 (mm) |
| Prep Final Vol.: | 5000 ( µL ) | Dilution Factor: | 1 Analyst: BMR |
| Prep Date: | | Analysis Date: | 04/18/18 Time: 1137 |
| Prep Batch: | | Analytical Batch: | 633675 |
| Prep Method: | | Analytical Method: | RSK-175 |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 74-84-0 | Ethane | 8.98 | | 0.110 | 0.220 | 1.00 |
| 74-85-1 | Ethene | 3.01 | | 0.150 | 0.290 | 1.00 |

FORM I ORG-1

GCAL, Inc.

Data file : /var/chem/gcv8a.i/2180418.b/v8010.d
Lab Smp Id: 21804062002 Client Smp ID: 21804062002
Inj Date : 18-APR-2018 11:37
Operator : BMR Inst ID: gcv8a.i
Smp Info : 21804062002
Misc Info : 2126160/2125841/2126599
Comment :
Method : /var/chem/gcv8a.i/2180418.b/RSK.m
Meth Date : 18-Apr-2018 11:34 bmr Quant Type: ESTD
Cal Date : 18-JUL-2017 11:21 Cal File: v8006.d
Als bottle: 1
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: me&e.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | | CONCENTRATIONS | |
|---|---|---|---|---|---|---|---|
| | | | | | | ON-COLUMN | FINAL |
| | Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| | 1 METHANE | 0.784 | 0.795 | -0.011 | 13673962244 | 8487.56 | 8490(AM2) |
| | 2 ETHYLENE | 1.190 | 1.196 | -0.006 | 3368266 | 3.00925 | 3.01(M2) |
| | 4 ETHANE | 1.376 | 1.380 | -0.004 | 12722315 | 8.98172 | 8.98(M2) |
| $ | 5 PROPENE | 2.476 | 2.477 | -0.001 | 22810153 | 32.4973 | 32.5(M2) |

QC Flag Legend

A - Target compound detected but, quantitated amount
exceeded maximum amount.
M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8a.i/2180418.b/v8010.d

Page 1

Date : 18-APR-2018 11:37

Client ID: 21804062002

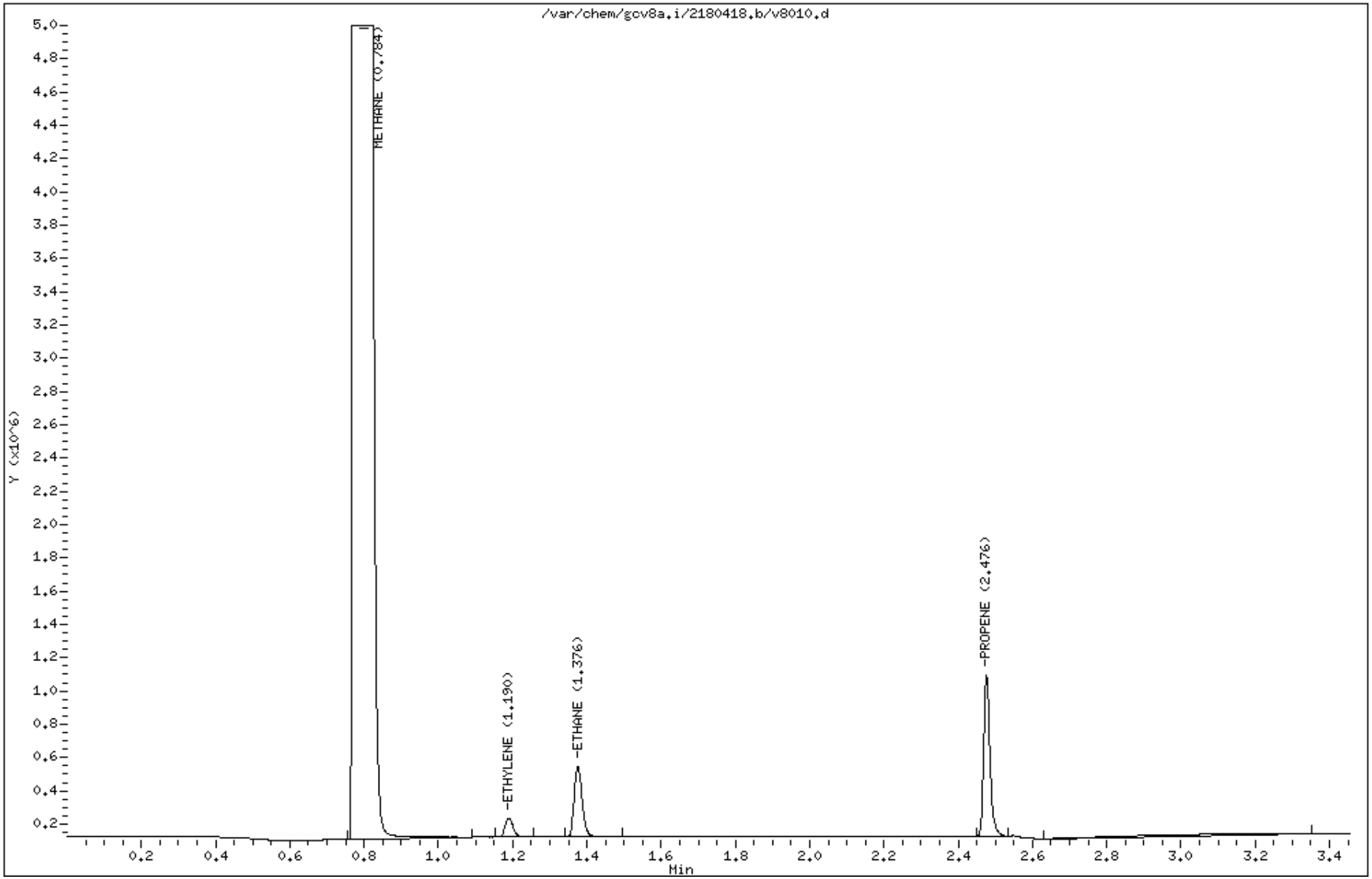
Instrument: gcv8a.i

Sample Info: 21804062002

Operator: BMR

Column phase: GS-Q-30M

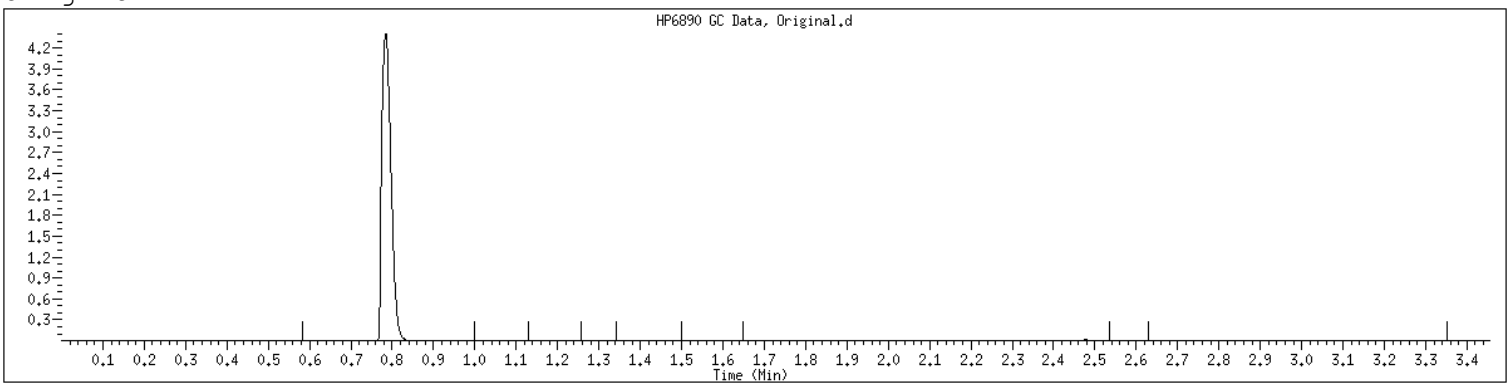
Column diameter: 0.53



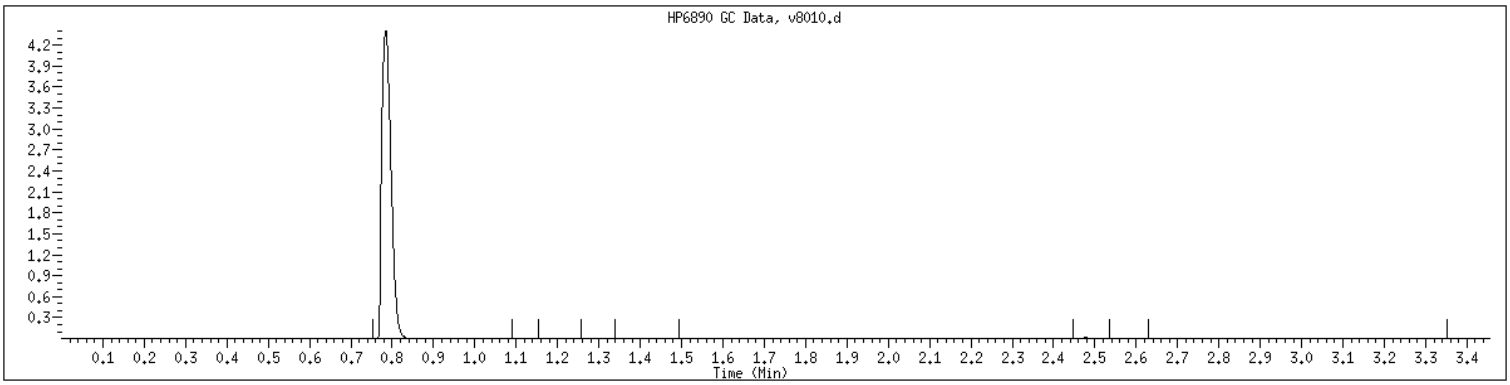
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 21804062002 SampleType : SAMPLE
Injection Date: 04/18/2018 11:37 Instrument : gcv8a.i
Operator : BMR
Sample Info : 21804062002
Misc Info : 2126160/2125841/2126599
Method : /var/chem/gcv8a.i/2180418.b/RSK.m
Dilution : 1.00
Matrix : WATER
Integrator : HP Genie Compound Sublist: me&e

Original




Final



1D

ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-02-21DL |
| Collect Date: | 04/05/18 Time: 1310 | GCAL Sample ID: | 21804062002DL |
| Matrix: | Water % Moisture: NA | Instrument ID: | GCV8A |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/v8011 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | GS-Q 30 ID .53 (mm) |
| Prep Final Vol.: | 5000 ( µL ) | Dilution Factor: | 300 Analyst: BMR |
| Prep Date: | | Analysis Date: | 04/18/18 Time: 1143 |
| Prep Batch: | | Analytical Batch: | 633675 |
| Prep Method: | | Analytical Method: | RSK-175 |

*CONCENTRATION UNITS: ug/L*

| *CAS* | *ANALYTE* | *RESULT* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| 74-82-8 | Methane | 15200 | | 131 | 327 | 600 |

FORM I ORG-1

GCAL, Inc.

Data file : /var/chem/gcv8a.i/2180418.b/v8011.d
Lab Smp Id: 21804062002 Client Smp ID: 21804062002
Inj Date : 18-APR-2018 11:43
Operator : BMR Inst ID: gcv8a.i
Smp Info : 21804062002
Misc Info : 2126160/2125841/2126599
Comment :
Method : /var/chem/gcv8a.i/2180418.b/RSK.m
Meth Date : 18-Apr-2018 11:34 bmr Quant Type: ESTD
Cal Date : 18-JUL-2017 11:21 Cal File: v8006.d
Als bottle: 1
Dil Factor: 300.00000
Integrator: HP Genie Compound Sublist: me&e.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | CONCENTRATIONS | |
|---|---|---|---|---|---|---|
| | | | | | ON-COLUMN | FINAL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| 1 METHANE | 0.797 | 0.795 | 0.002 | 81531805 | 50.6076 | 15200(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8a.i/2180418.b/v8011.d



Date : 18-APR-2018 11:43

Client ID: 21804062002

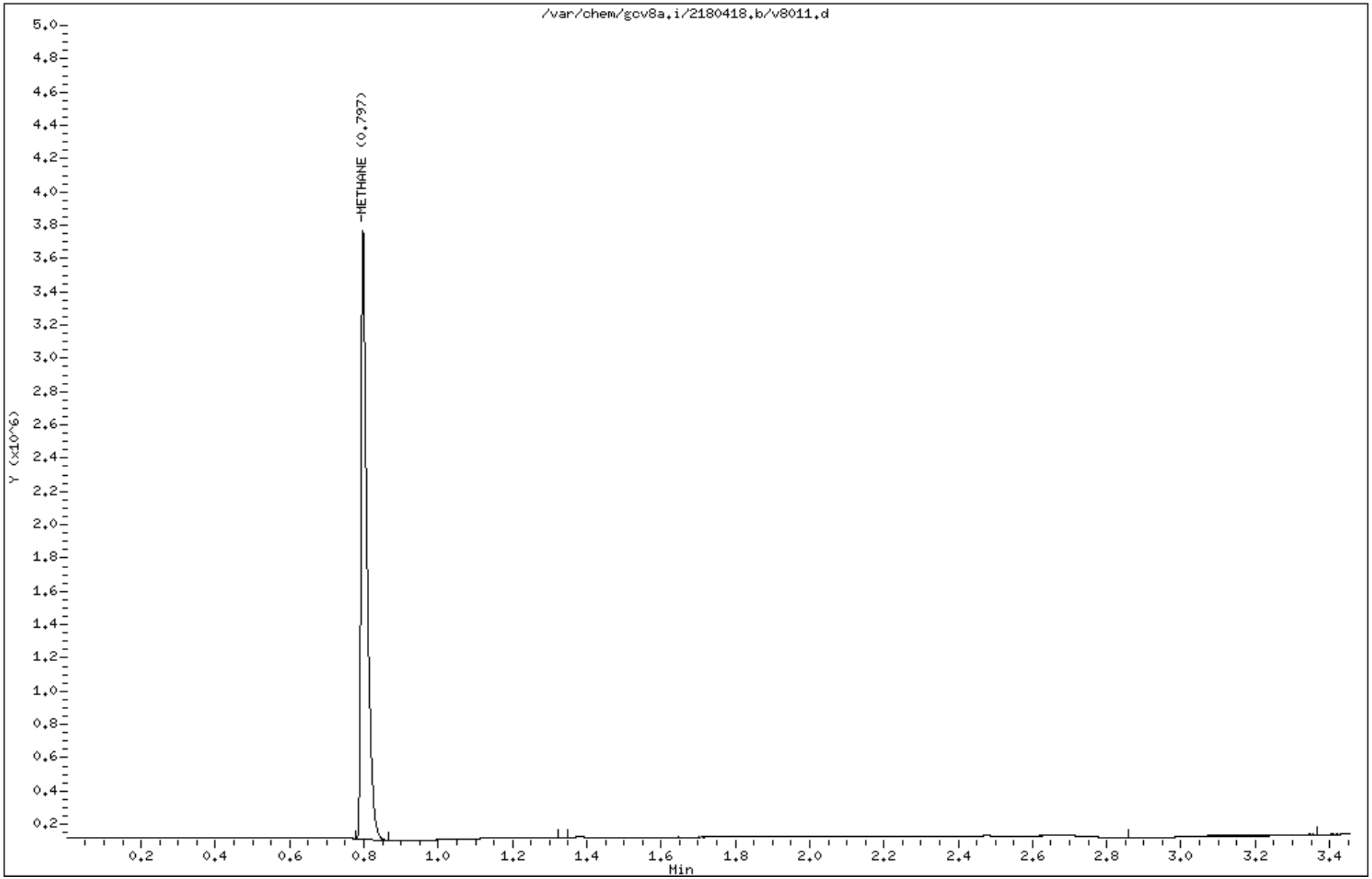
Instrument: gcv8a.i

Sample Info: 21804062002

Operator: BMR

Column phase: GS-Q-30M

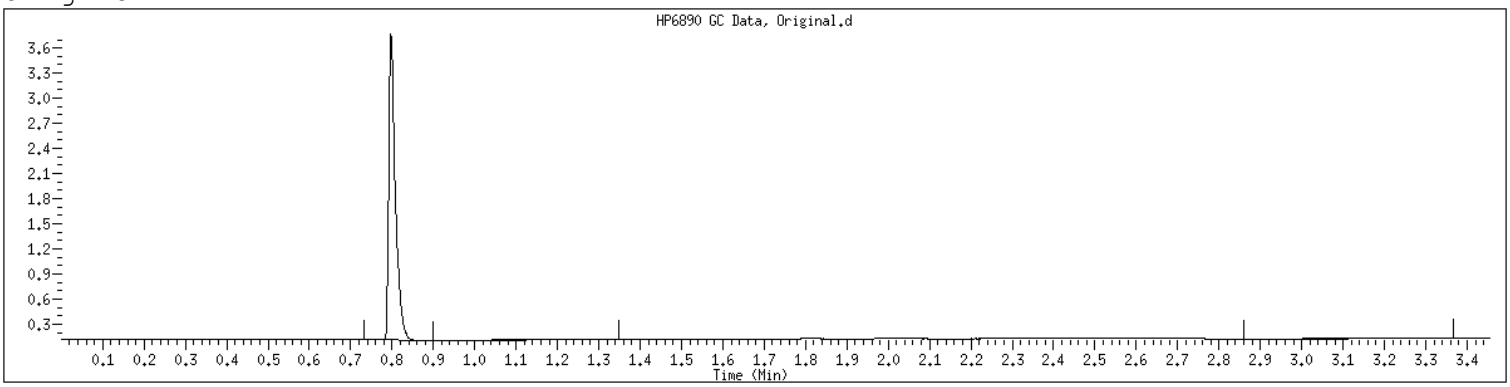
Column diameter: 0.53



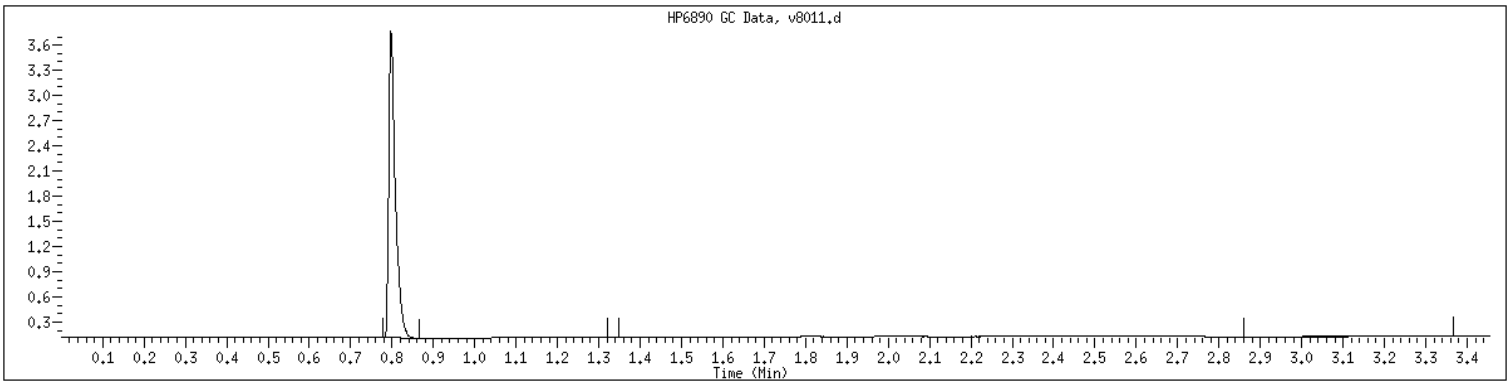
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 21804062002 SampleType : SAMPLE
Injection Date: 04/18/2018 11:43 Instrument : gcv8a.i
Operator : BMR
Sample Info : 21804062002
Misc Info : 2126160/2125841/2126599
Method : /var/chem/gcv8a.i/2180418.b/RSK.m
Dilution : 300
Matrix : WATER
Integrator : HP Genie Compound Sublist: me&e

Original




Final



1D

ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-06-21 |
| Collect Date: | 04/05/18 Time: 1450 | GCAL Sample ID: | 21804062007 |
| Matrix: | Water % Moisture: NA | Instrument ID: | GCV8B |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/v8015 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | ID (mm) |
| Prep Final Vol.: | 5000 ( µL ) | Dilution Factor: | 100 Analyst: BMR |
| Prep Date: | | Analysis Date: | 04/18/18 Time: 1206 |
| Prep Batch: | | Analytical Batch: | 633677 |
| Prep Method: | | Analytical Method: | RSK-175 |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 124-38-9 | Carbon Dioxide | 264000 | | 12700 | 38600 | 90000 |

FORM I ORG-1

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2180418.b/v8015.d
Lab Smp Id: 21804062007 Client Smp ID: 21804062007
Inj Date : 18-APR-2018 12:06
Operator : BMR Inst ID: gcv8b.i
Smp Info : 21804062007
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2180418.b/CO2h.m
Meth Date : 18-Apr-2018 13:24 bmr Quant Type: ESTD
Cal Date : 30-JUN-2017 10:14 Cal File: v8003.d
Als bottle: 1
Dil Factor: 100.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | CONCENTRATIONS | |
|---|---|---|---|---|---|---|
| | | | | | ON-COLUMN | FINAL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| 1 Carbon Dioxide | 1.030 | 1.035 | -0.005 | 11863886 | 2640.27 | 264000(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8b.i/2180418.b/v8015.d



Date : 18-APR-2018 12:06

Client ID: 21804062007

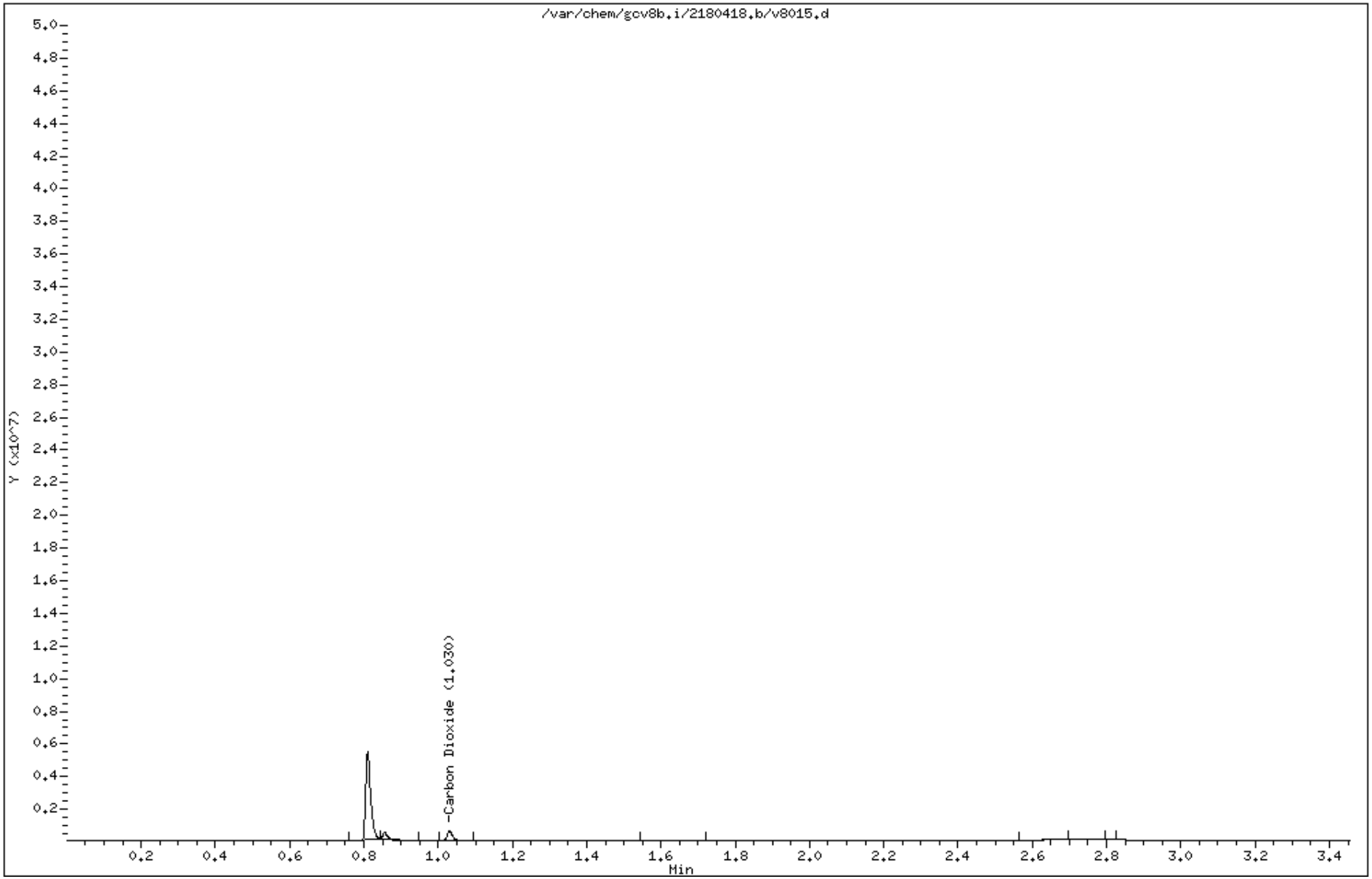
Instrument: gcv8b.i

Sample Info: 21804062007

Operator: BMR

Column phase: GS-Q-30

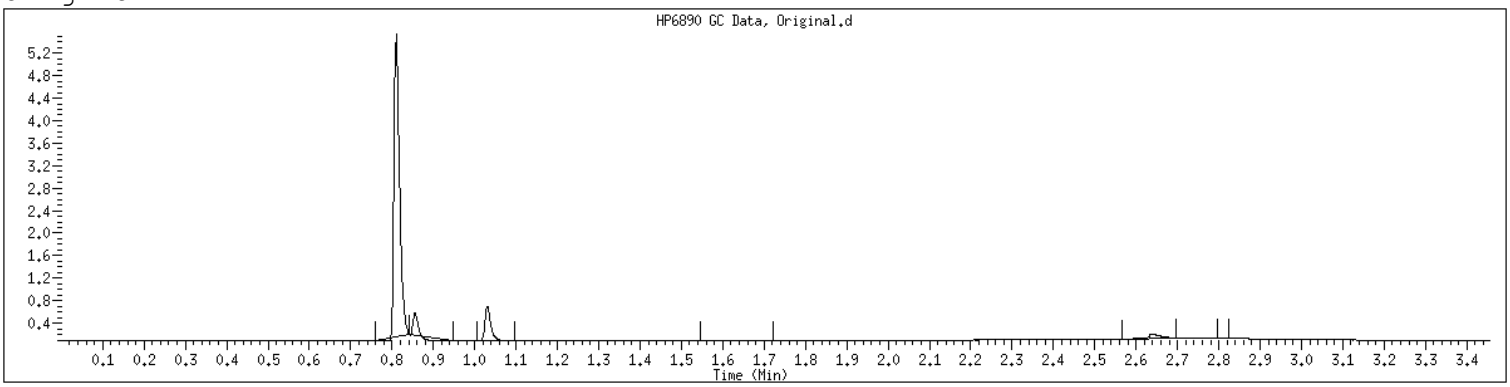
Column diameter: 0.53



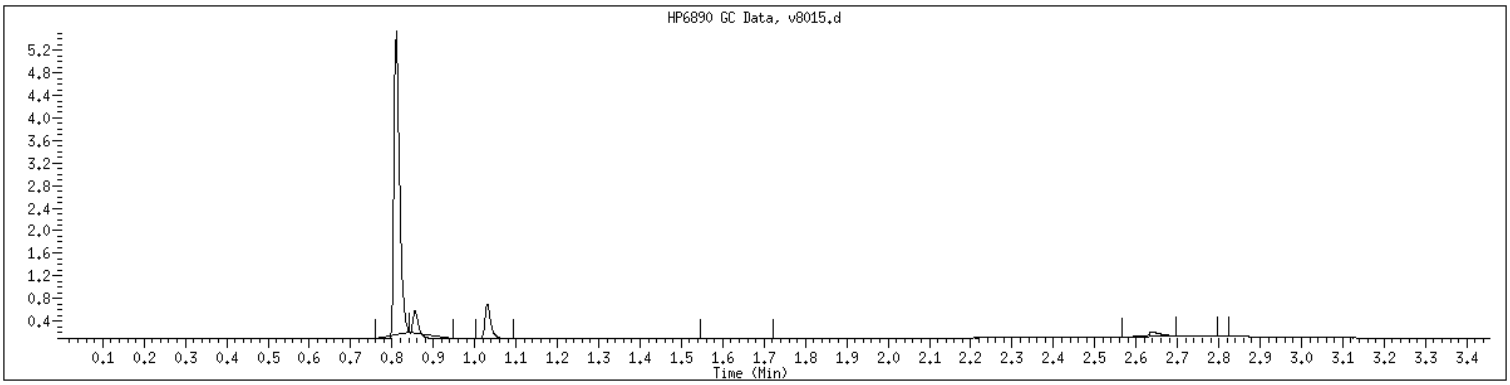
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 21804062007 | SampleType | : SAMPLE |
| Injection Date | : 04/18/2018 12:06 | Instrument | : gcv8b.i |
| Operator | : BMR | | |
| Sample Info | : 21804062007 | | |
| Misc Info | : 2125155 | | |
| Method | : /var/chem/gcv8b.i/2180418.b/CO2h.m | | |
| Dilution | : 100 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : co2 |

Original




Final



1D

ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-06-21 |
| Collect Date: | 04/05/18 Time: 1450 | GCAL Sample ID: | 21804062007 |
| Matrix: | Water % Moisture: NA | Instrument ID: | GCV8A |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/v8013 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | GS-Q 30 ID .53 (mm) |
| Prep Final Vol.: | 5000 ( µL ) | Dilution Factor: | 1 Analyst: BMR |
| Prep Date: | | Analysis Date: | 04/18/18 Time: 1154 |
| Prep Batch: | | Analytical Batch: | 633675 |
| Prep Method: | | Analytical Method: | RSK-175 |

*CONCENTRATION UNITS: ug/L*

| *CAS* | *ANALYTE* | *RESULT* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| 74-84-0 | Ethane | 3.21 | | 0.110 | 0.220 | 1.00 |
| 74-85-1 | Ethene | 4.10 | | 0.150 | 0.290 | 1.00 |

FORM I ORG-1

GCAL, Inc.

Data file : /var/chem/gcv8a.i/2180418.b/v8013.d
Lab Smp Id: 21804062007 Client Smp ID: 21804062007
Inj Date : 18-APR-2018 11:54
Operator : BMR Inst ID: gcv8a.i
Smp Info : 21804062007
Misc Info : 2126160/2125841/2126599
Comment :
Method : /var/chem/gcv8a.i/2180418.b/RSK.m
Meth Date : 18-Apr-2018 11:34 bmr Quant Type: ESTD
Cal Date : 18-JUL-2017 11:21 Cal File: v8006.d
Als bottle: 1
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: me&e.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | | CONCENTRATIONS | |
|---|---|---|---|---|---|---|---|
| | | | | | | ON-COLUMN | FINAL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | | ( ug/L) | ( ug/L) |
| ========== | == | ====== | ====== | ======== | | ======= | ======= |
| 1 METHANE | 0.784 | 0.795 | -0.011 | 12124301800 | | 7525.67 | 7530(AM2) |
| 2 ETHYLENE | 1.177 | 1.196 | -0.019 | 4592916 | | 4.10336 | 4.10(M2) |
| 4 ETHANE | 1.360 | 1.380 | -0.020 | 4546732 | | 3.20991 | 3.21(M2) |
| $ 5 PROPENE | 2.464 | 2.477 | -0.013 | 23059024 | | 32.8518 | 32.9(M2) |

QC Flag Legend

A - Target compound detected but, quantitated amount
exceeded maximum amount.
M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8a.i/2180418.b/v8013.d

Page 1

Date : 18-APR-2018 11:54

Client ID: 21804062007

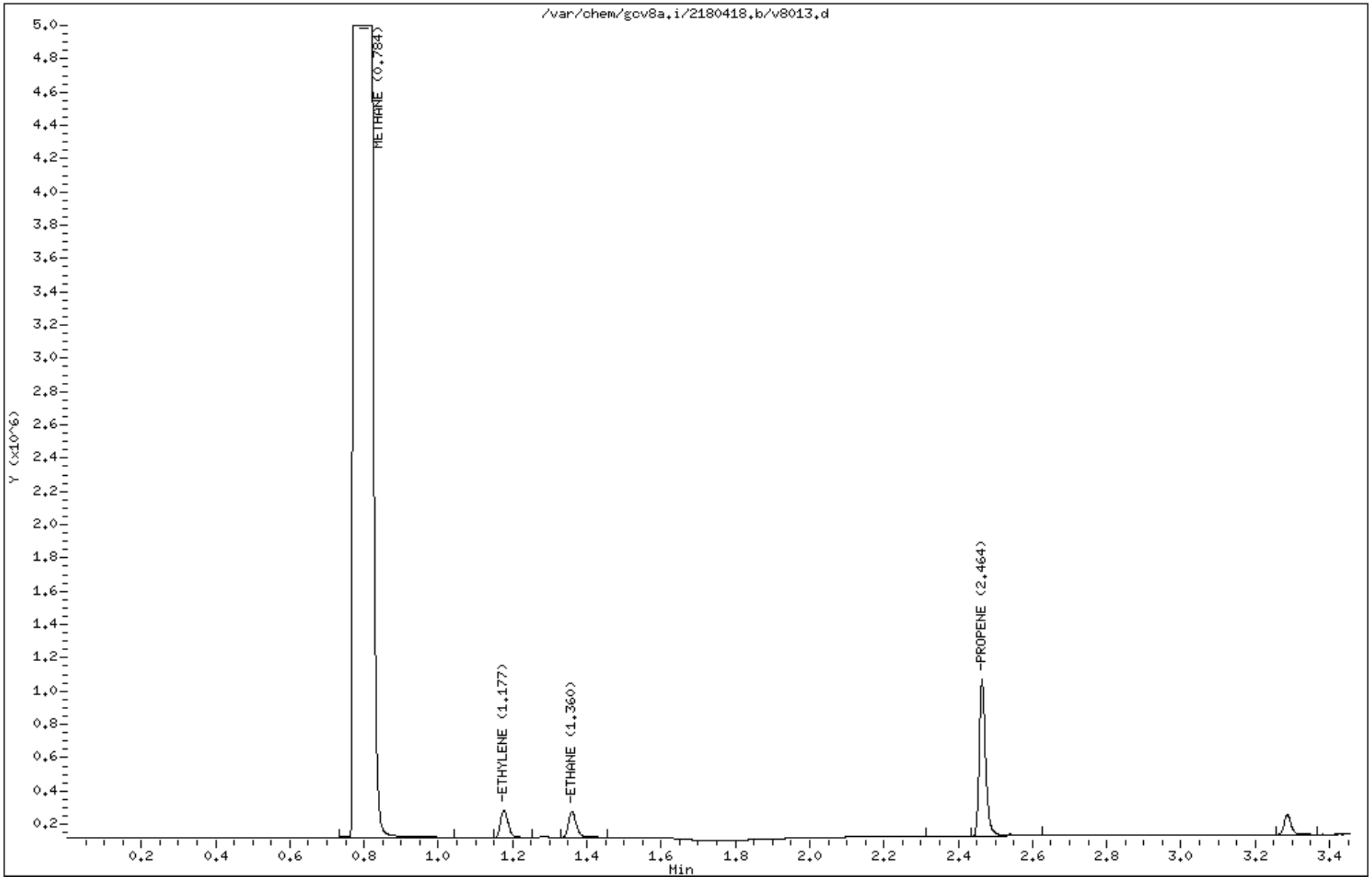
Instrument: gcv8a.i

Sample Info: 21804062007

Operator: BMR

Column phase: GS-Q-30M

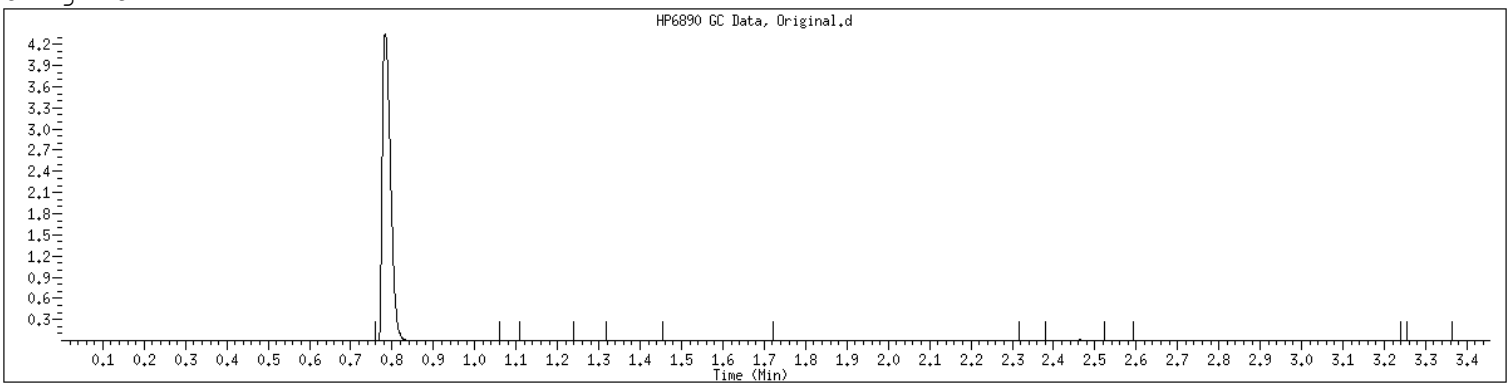
Column diameter: 0.53



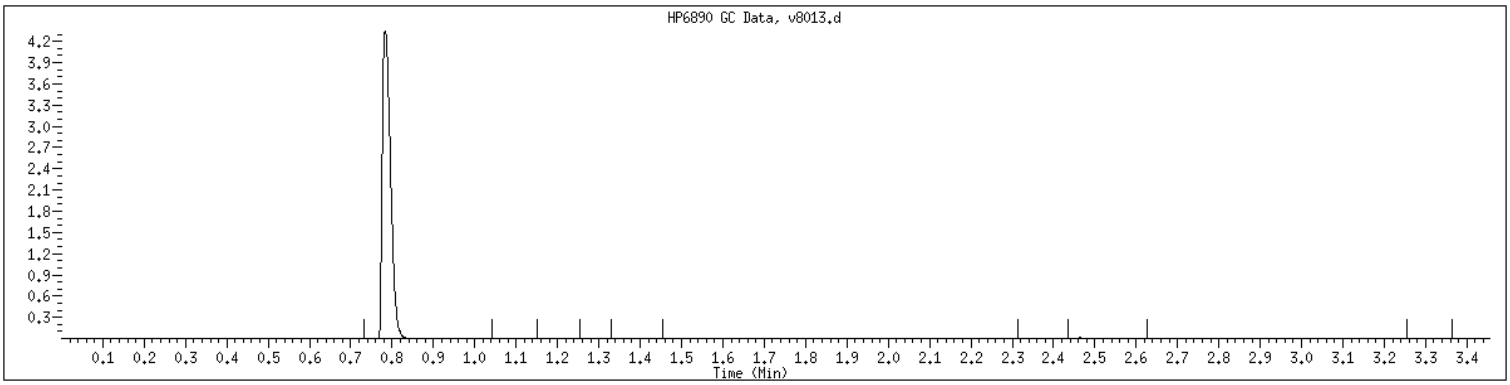
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 21804062007 | SampleType | : SAMPLE |
| Injection Date | : 04/18/2018 11:54 | Instrument | : gcv8a.i |
| Operator | : BMR | | |
| Sample Info | : 21804062007 | | |
| Misc Info | : 2126160/2125841/2126599 | | |
| Method | : /var/chem/gcv8a.i/2180418.b/RSK.m | | |
| Dilution | : 1.00 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : me&e |

Original




Final



1D

ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-06-21DL |
| Collect Date: | 04/05/18 Time: 1450 | GCAL Sample ID: | 21804062007DL |
| Matrix: | Water % Moisture: NA | Instrument ID: | GCV8A |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/v8014 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | GS-Q 30 ID .53 (mm) |
| Prep Final Vol.: | 5000 ( µL ) | Dilution Factor: | 600 Analyst: BMR |
| Prep Date: | | Analysis Date: | 04/18/18 Time: 1200 |
| Prep Batch: | | Analytical Batch: | 633675 |
| Prep Method: | | Analytical Method: | RSK-175 |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 74-82-8 | Methane | 8500 | | 261 | 654 | 1200 |

FORM I ORG-1

GCAL, Inc.

Data file : /var/chem/gcv8a.i/2180418.b/v8014.d
Lab Smp Id: 21804062007 Client Smp ID: 21804062007
Inj Date : 18-APR-2018 12:00
Operator : BMR Inst ID: gcv8a.i
Smp Info : 21804062007
Misc Info : 2126160/2125841/2126599
Comment :
Method : /var/chem/gcv8a.i/2180418.b/RSK.m
Meth Date : 18-Apr-2018 11:34 bmr Quant Type: ESTD
Cal Date : 18-JUL-2017 11:21 Cal File: v8006.d
Als bottle: 1
Dil Factor: 600.00000
Integrator: HP Genie Compound Sublist: me&e.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| Compounds | RT | EXP RT | DLT RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ug/L) | CONCENTRATIONS FINAL ( ug/L) |
|---|---|---|---|---|---|---|
| 1 METHANE | 0.802 | 0.795 | 0.007 | 22818036 | 14.1634 | 8500(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8a.i/2180418.b/v8014.d

Page 1

Date : 18-APR-2018 12:00

Client ID: 21804062007

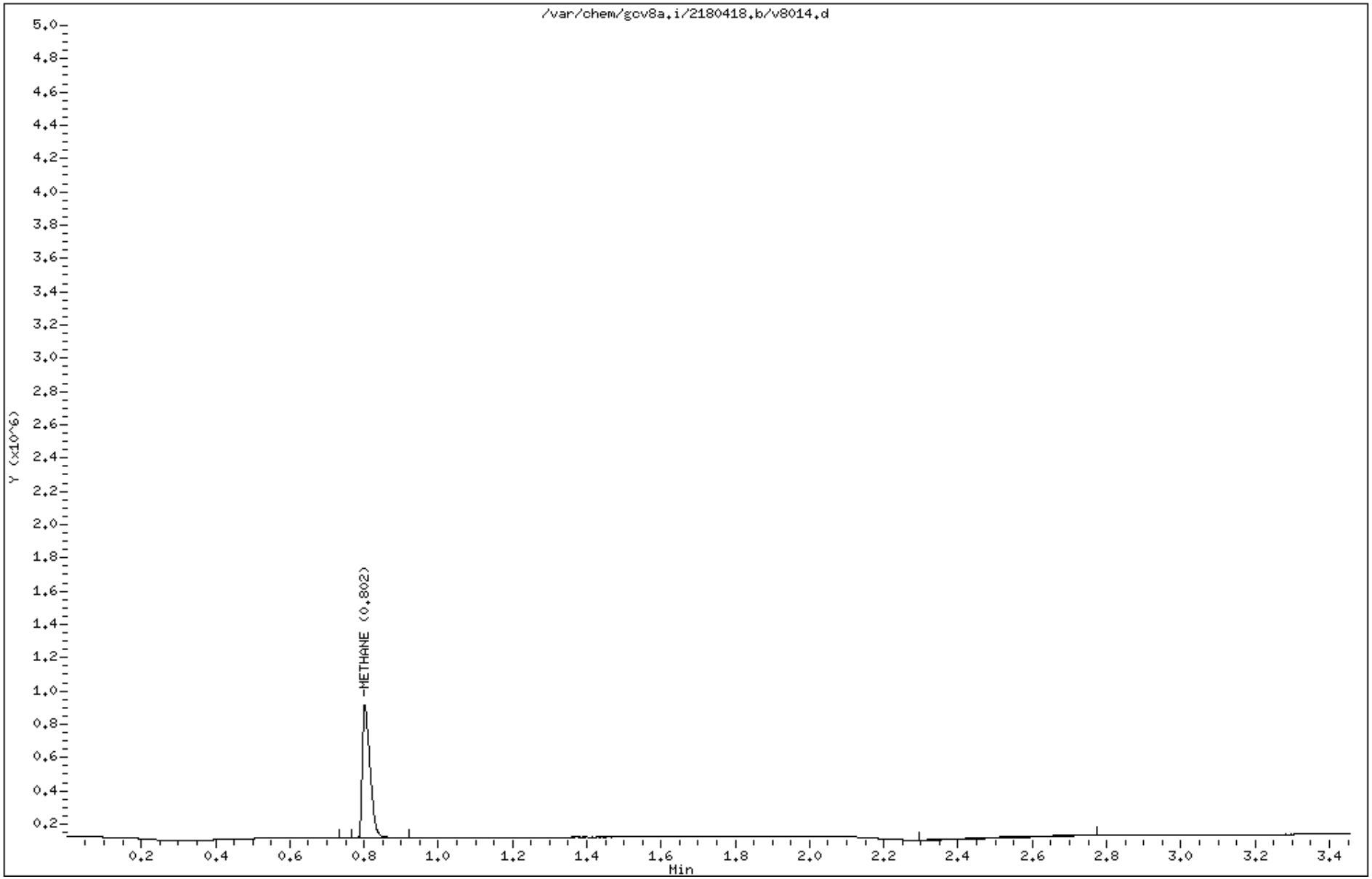
Instrument: gcv8a.i

Sample Info: 21804062007

Operator: BMR

Column phase: GS-Q-30M

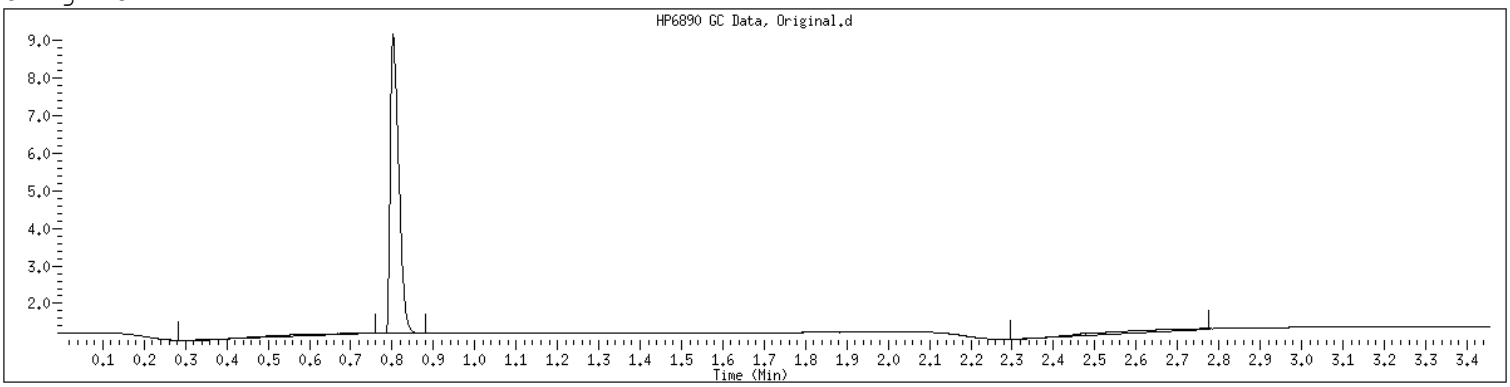
Column diameter: 0.53



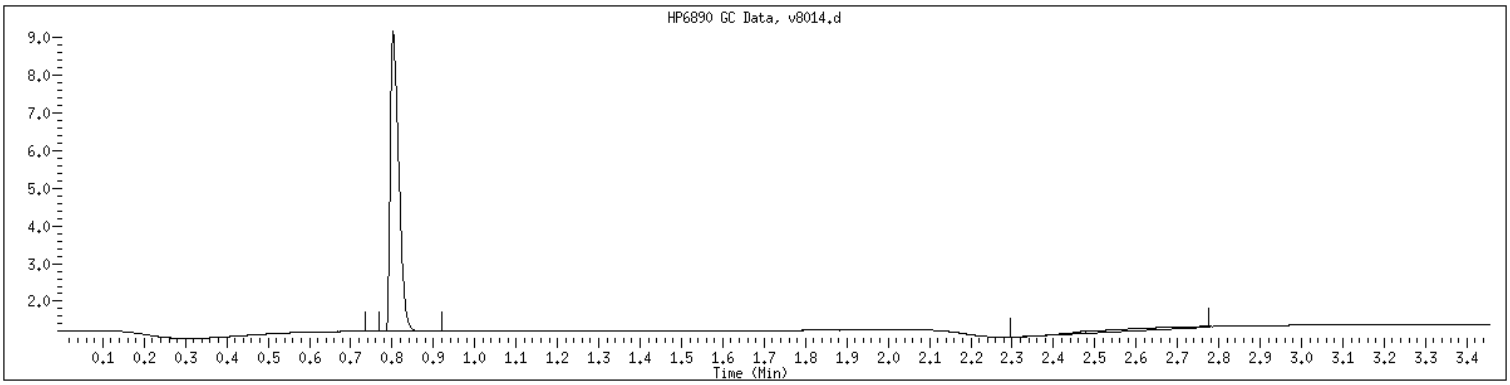
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 21804062007 | SampleType | : SAMPLE |
| Injection Date | : 04/18/2018 12:00 | Instrument | : gcv8a.i |
| Operator | : BMR | | |
| Sample Info | : 21804062007 | | |
| Misc Info | : 2126160/2125841/2126599 | | |
| Method | : /var/chem/gcv8a.i/2180418.b/RSK.m | | |
| Dilution | : 600 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : me&e |

Original




Final



1D

ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-10-21 |
| Collect Date: | 04/05/18 Time: 1715 | GCAL Sample ID: | 21804062008 |
| Matrix: | Water % Moisture: NA | Instrument ID: | GCV8B |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/v8018 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | ID (mm) |
| Prep Final Vol.: | 5000 ( µL ) | Dilution Factor: | 100 Analyst: BMR |
| Prep Date: | | Analysis Date: | 04/18/18 Time: 1228 |
| Prep Batch: | | Analytical Batch: | 633677 |
| Prep Method: | | Analytical Method: | RSK-175 |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 124-38-9 | Carbon Dioxide | 350000 | | 12700 | 38600 | 90000 |

FORM I ORG-1

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2180418.b/v8018.d
Lab Smp Id: 21804062008 Client Smp ID: 21804062008
Inj Date : 18-APR-2018 12:28
Operator : BMR Inst ID: gcv8b.i
Smp Info : 21804062008
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2180418.b/CO2h.m
Meth Date : 18-Apr-2018 13:24 bmr Quant Type: ESTD
Cal Date : 30-JUN-2017 10:14 Cal File: v8003.d
Als bottle: 1
Dil Factor: 100.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | CONCENTRATIONS | |
|---|---|---|---|---|---|---|
| | | | | | ON-COLUMN | FINAL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| 1 Carbon Dioxide | 1.036 | 1.035 | 0.001 | 15717821 | 3497.95 | 350000(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8b.i/2180418.b/v8018.d



Date : 18-APR-2018 12:28

Client ID: 21804062008

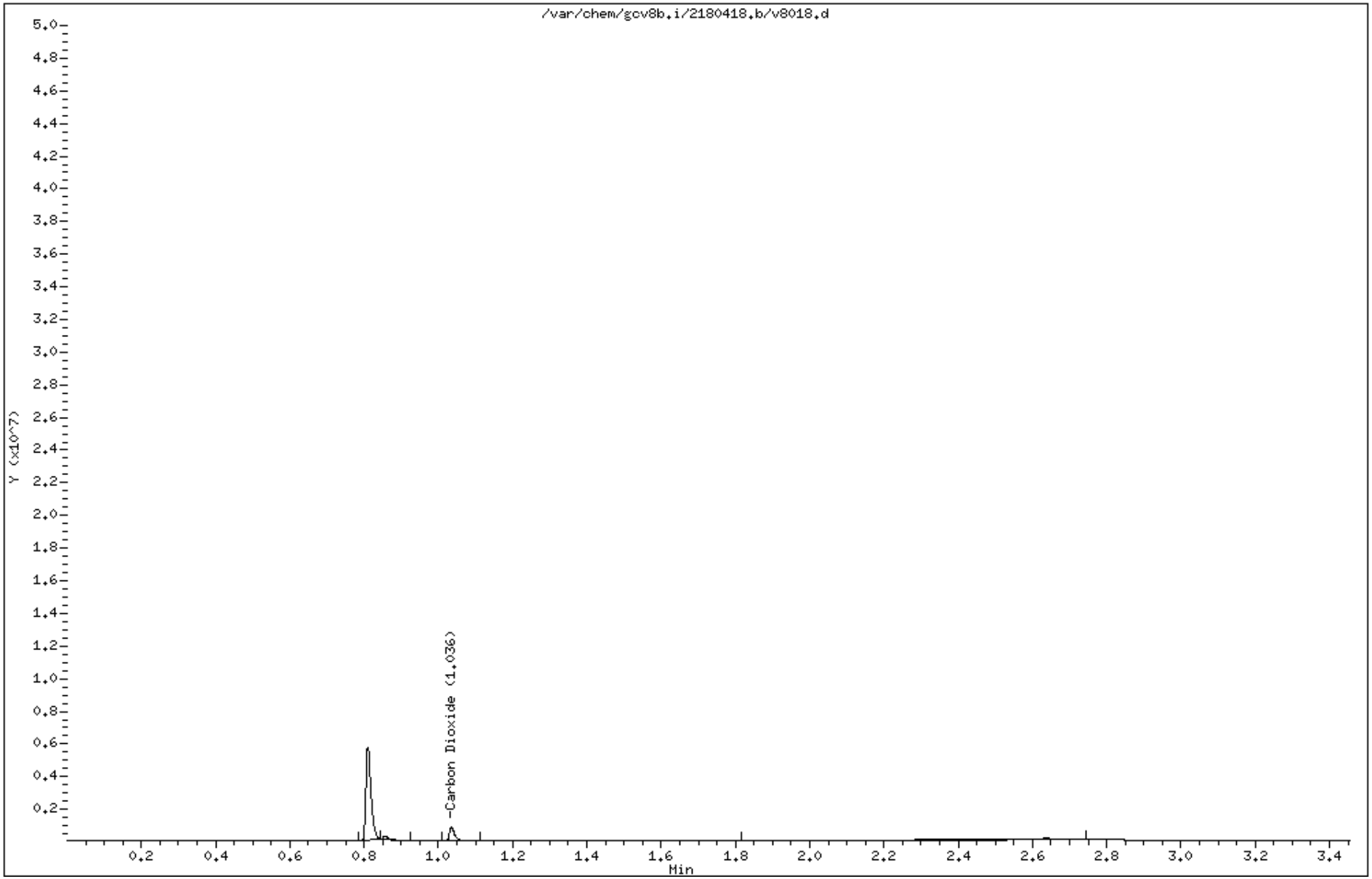
Instrument: gcv8b.i

Sample Info: 21804062008

Operator: BMR

Column phase: GS-Q-30

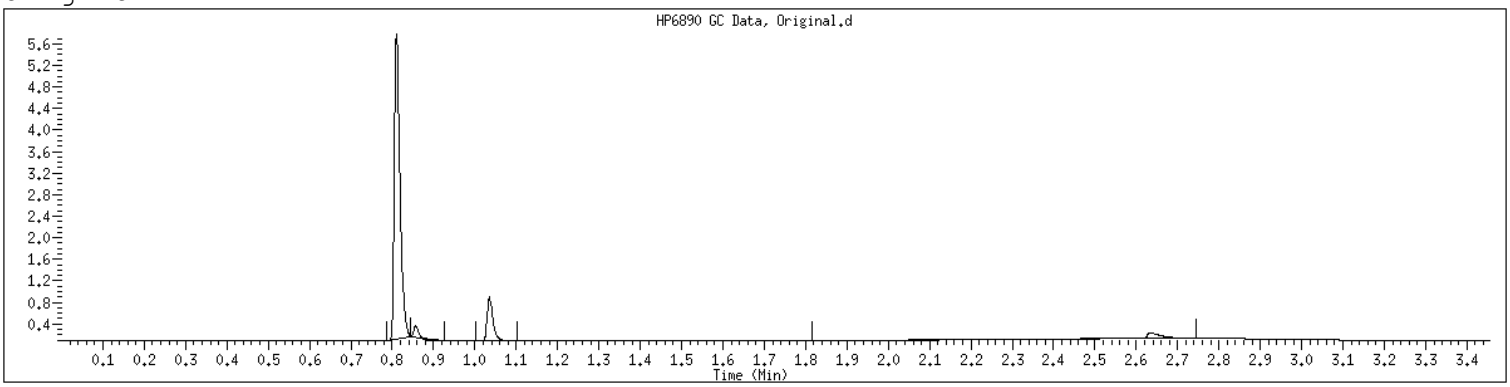
Column diameter: 0.53



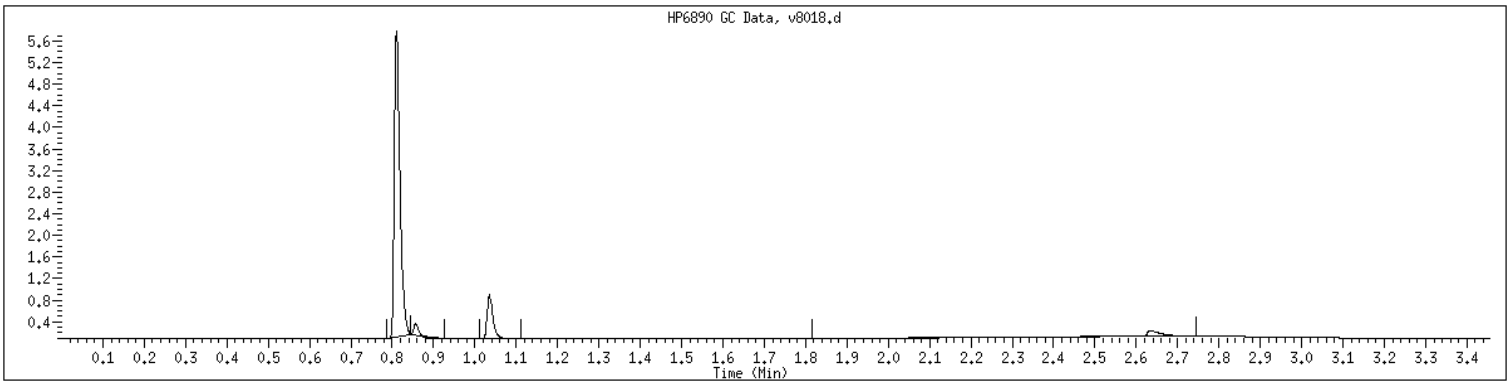
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 21804062008 | SampleType | : SAMPLE |
| Injection Date | : 04/18/2018 12:28 | Instrument | : gcv8b.i |
| Operator | : BMR | | |
| Sample Info | : 21804062008 | | |
| Misc Info | : 2125155 | | |
| Method | : /var/chem/gcv8b.i/2180418.b/CO2h.m | | |
| Dilution | : 100 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : co2 |

Original




Final



1D

ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-10-21 |
| Collect Date: | 04/05/18 Time: 1715 | GCAL Sample ID: | 21804062008 |
| Matrix: | Water % Moisture: NA | Instrument ID: | GCV8A |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/v8016 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | GS-Q 30 ID .53 (mm) |
| Prep Final Vol.: | 5000 ( µL ) | Dilution Factor: | 1 Analyst: BMR |
| Prep Date: | | Analysis Date: | 04/18/18 Time: 1216 |
| Prep Batch: | | Analytical Batch: | 633675 |
| Prep Method: | | Analytical Method: | RSK-175 |

*CONCENTRATION UNITS: ug/L*

| *CAS* | *ANALYTE* | *RESULT* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| 74-84-0 | Ethane | 0.342 | J | 0.110 | 0.220 | 1.00 |
| 74-85-1 | Ethene | 0.497 | J | 0.150 | 0.290 | 1.00 |

FORM I ORG-1

GCAL, Inc.

Data file : /var/chem/gcv8a.i/2180418.b/v8016.d
Lab Smp Id: 21804062008 Client Smp ID: 21804062008
Inj Date : 18-APR-2018 12:16
Operator : BMR Inst ID: gcv8a.i
Smp Info : 21804062008
Misc Info : 2126160/2125841/2126599
Comment :
Method : /var/chem/gcv8a.i/2180418.b/RSK.m
Meth Date : 18-Apr-2018 11:34 bmr Quant Type: ESTD
Cal Date : 18-JUL-2017 11:21 Cal File: v8006.d
Als bottle: 1
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: me&e.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | | CONCENTRATIONS | |
|---|---|---|---|---|---|---|---|
| | | | | | | ON-COLUMN | FINAL |
| | Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| | 1 METHANE | 0.785 | 0.795 | -0.010 | 6472962554 | 4017.83 | 4020(AM2) |
| | 2 ETHYLENE | 1.188 | 1.196 | -0.008 | 556145 | 0.49687 | 0.497(M2) |
| | 4 ETHANE | 1.373 | 1.380 | -0.007 | 483909 | 0.34163 | 0.342(M2) |
| $ | 5 PROPENE | 2.476 | 2.477 | -0.001 | 23343680 | 33.2574 | 33.3(M2) |

QC Flag Legend

A - Target compound detected but, quantitated amount
exceeded maximum amount.
M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8a.i/2180418.b/v8016.d



Date : 18-APR-2018 12:16

Client ID: 21804062008

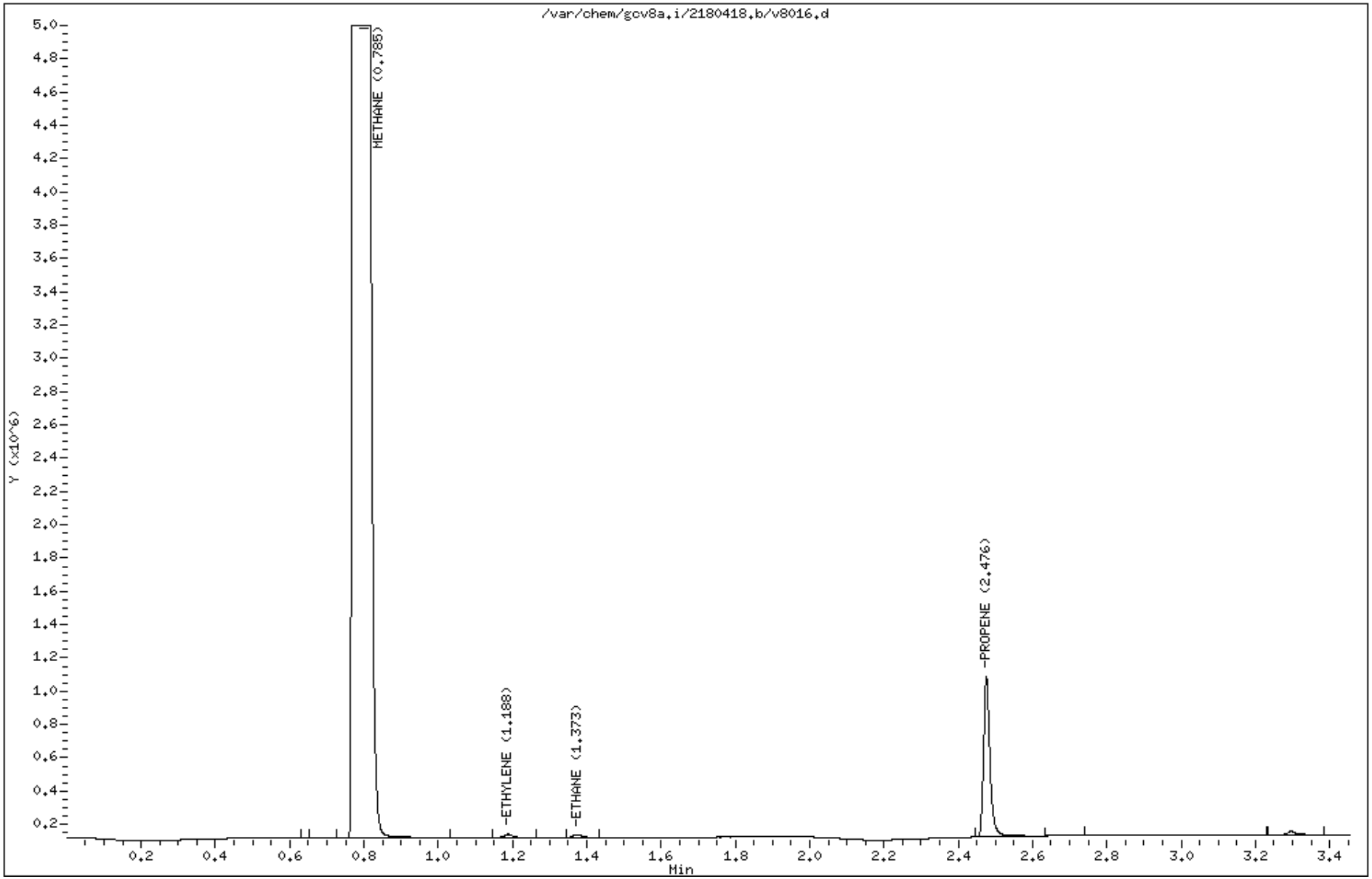
Instrument: gcv8a.i

Sample Info: 21804062008

Operator: BMR

Column phase: GS-Q-30M

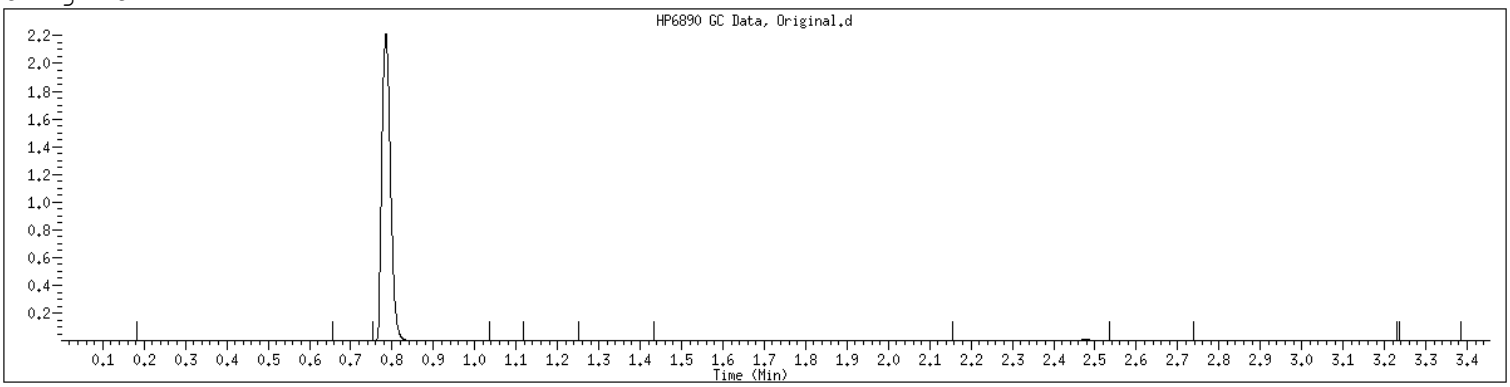
Column diameter: 0.53



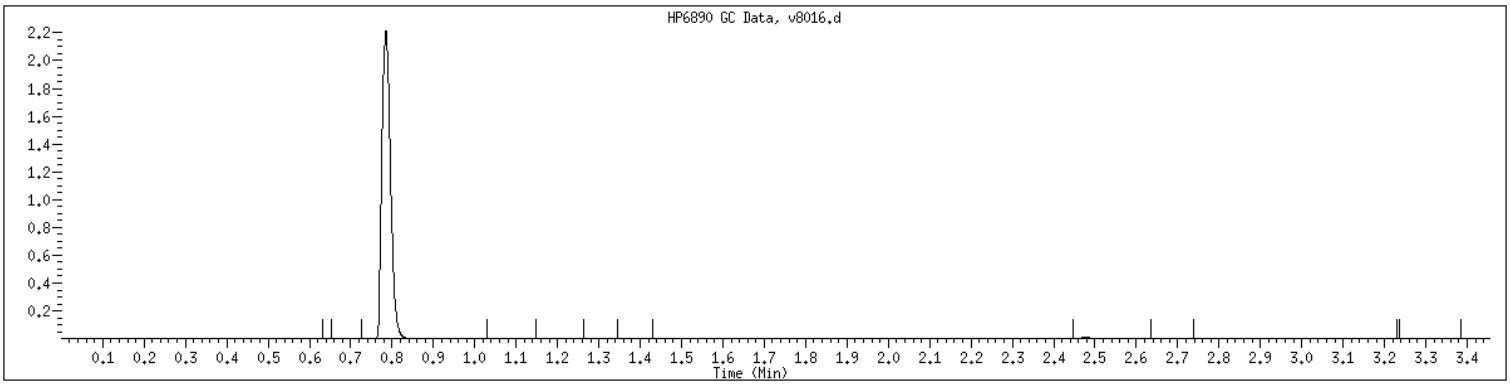
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 21804062008 SampleType : SAMPLE
Injection Date: 04/18/2018 12:16 Instrument : gcv8a.i
Operator : BMR
Sample Info : 21804062008
Misc Info : 2126160/2125841/2126599
Method : /var/chem/gcv8a.i/2180418.b/RSK.m
Dilution : 1.00
Matrix : WATER
Integrator : HP Genie Compound Sublist: me&e

Original




Final



1D

ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-10-21DL |
| Collect Date: | 04/05/18 Time: 1715 | GCAL Sample ID: | 21804062008DL |
| Matrix: | Water % Moisture: NA | Instrument ID: | GCV8A |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/v8017 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | GS-Q 30 ID .53 (mm) |
| Prep Final Vol.: | 5000 ( µL ) | Dilution Factor: | 300 Analyst: BMR |
| Prep Date: | | Analysis Date: | 04/18/18 Time: 1222 |
| Prep Batch: | | Analytical Batch: | 633675 |
| Prep Method: | | Analytical Method: | RSK-175 |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 74-82-8 | Methane | 7090 | | 131 | 327 | 600 |

FORM I ORG-1

GCAL, Inc.

Data file : /var/chem/gcv8a.i/2180418.b/v8017.d
Lab Smp Id: 21804062008 Client Smp ID: 21804062008
Inj Date : 18-APR-2018 12:22
Operator : BMR Inst ID: gcv8a.i
Smp Info : 21804062008
Misc Info : 2126160/2125841/2126599
Comment :
Method : /var/chem/gcv8a.i/2180418.b/RSK.m
Meth Date : 18-Apr-2018 11:34 bmr Quant Type: ESTD
Cal Date : 18-JUL-2017 11:21 Cal File: v8006.d
Als bottle: 1
Dil Factor: 300.00000
Integrator: HP Genie Compound Sublist: me&e.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | CONCENTRATIONS | |
|---|---|---|---|---|---|---|
| | | | | | ON-COLUMN | FINAL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| 1 METHANE | 0.797 | 0.795 | 0.002 | 38060936 | 23.6248 | 7090(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8a.i/2180418.b/v8017.d



Date : 18-APR-2018 12:22

Client ID: 21804062008

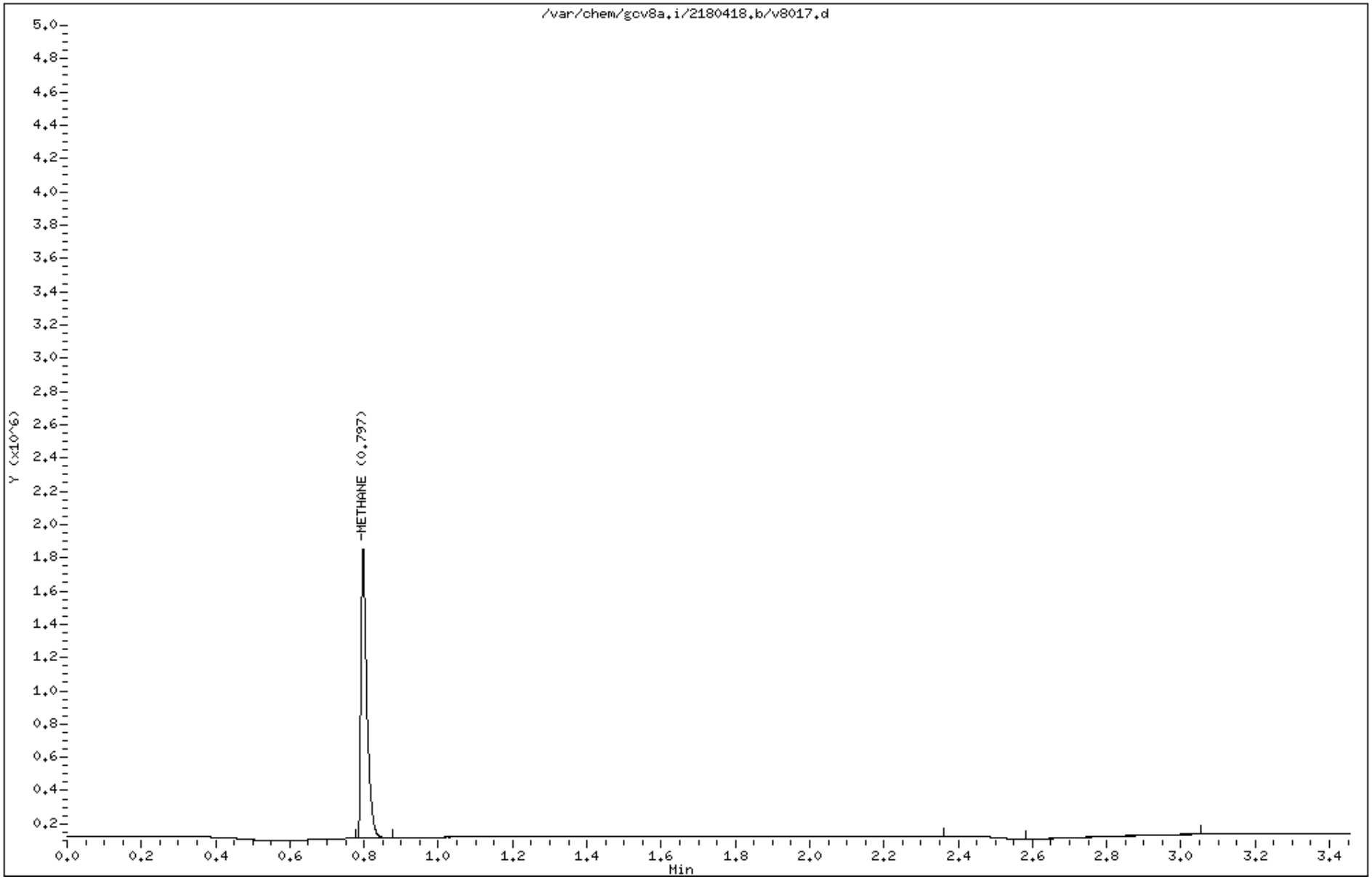
Instrument: gcv8a.i

Sample Info: 21804062008

Operator: BMR

Column phase: GS-Q-30M

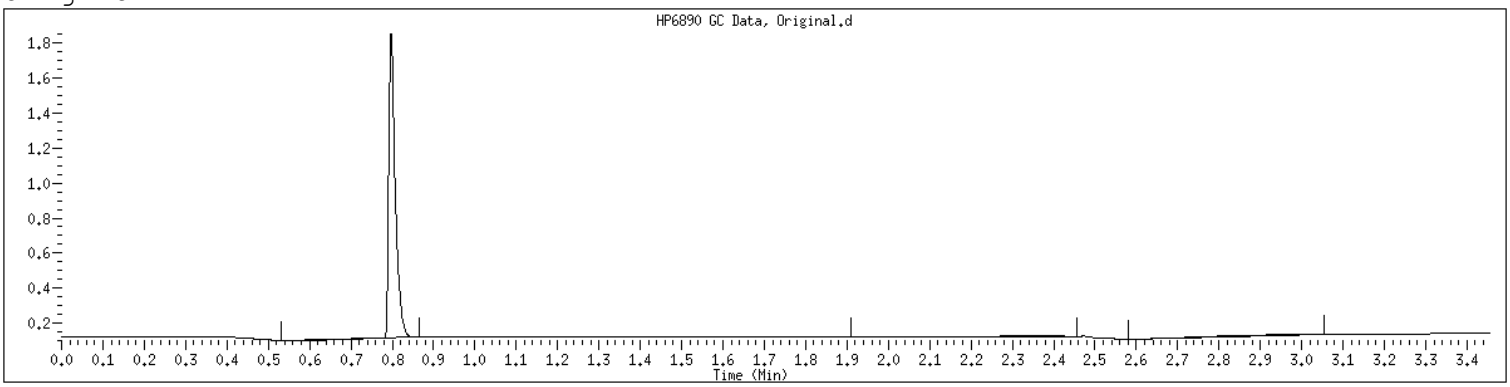
Column diameter: 0.53



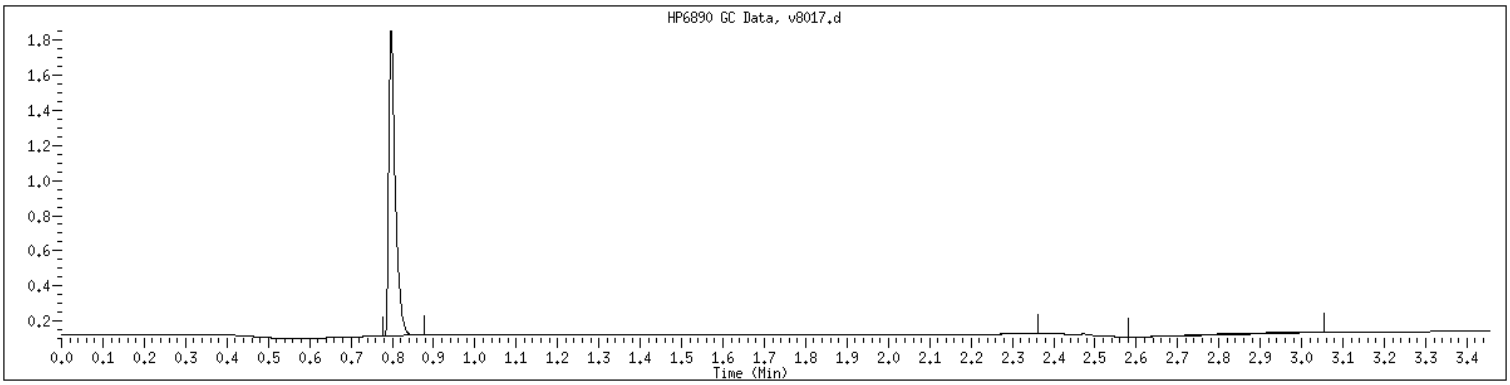
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 21804062008 | SampleType | : SAMPLE |
| Injection Date | : 04/18/2018 12:22 | Instrument | : gcv8a.i |
| Operator | : BMR | | |
| Sample Info | : 21804062008 | | |
| Misc Info | : 2126160/2125841/2126599 | | |
| Method | : /var/chem/gcv8a.i/2180418.b/RSK.m | | |
| Dilution | : 300 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : me&e |

Original




Final



1D

ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-01-21 |
| Collect Date: | 04/05/18 Time: 1450 | GCAL Sample ID: | 21804062009 |
| Matrix: | Water % Moisture: NA | Instrument ID: | GCV8B |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/v8021 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | ID (mm) |
| Prep Final Vol.: | 5000 ( µL ) | Dilution Factor: | 20 Analyst: BMR |
| Prep Date: | | Analysis Date: | 04/18/18 Time: 1246 |
| Prep Batch: | | Analytical Batch: | 633677 |
| Prep Method: | | Analytical Method: | RSK-175 |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 124-38-9 | Carbon Dioxide | 143000 | | 2540 | 7720 | 18000 |

FORM I ORG-1

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2180418.b/v8021.d
Lab Smp Id: 21804062009 Client Smp ID: 21804062009
Inj Date : 18-APR-2018 12:46
Operator : BMR Inst ID: gcv8b.i
Smp Info : 21804062009
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2180418.b/CO2h.m
Meth Date : 18-Apr-2018 13:24 bmr Quant Type: ESTD
Cal Date : 30-JUN-2017 10:14 Cal File: v8003.d
Als bottle: 1
Dil Factor: 20.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | CONCENTRATIONS | |
|---|---|---|---|---|---|---|
| | | | | | ON-COLUMN | FINAL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| 1 Carbon Dioxide | 1.020 | 1.035 | -0.015 | 32022849 | 7126.59 | 142000 |

Data File: /var/chem/gcv8b.i/2180418.b/v8021.d



Date : 18-APR-2018 12:46

Client ID: 21804062009

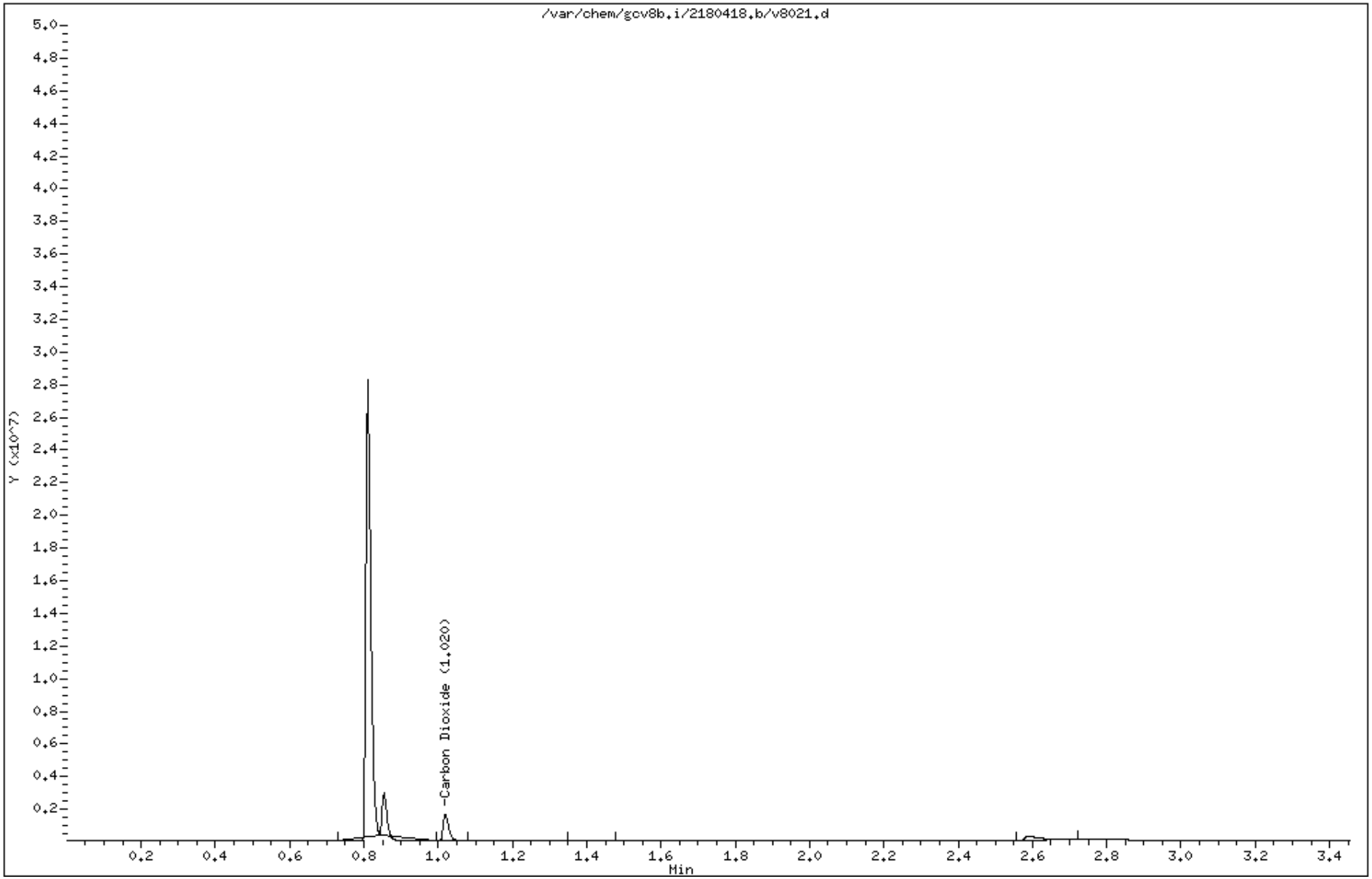
Instrument: gcv8b.i

Sample Info: 21804062009

Operator: BMR

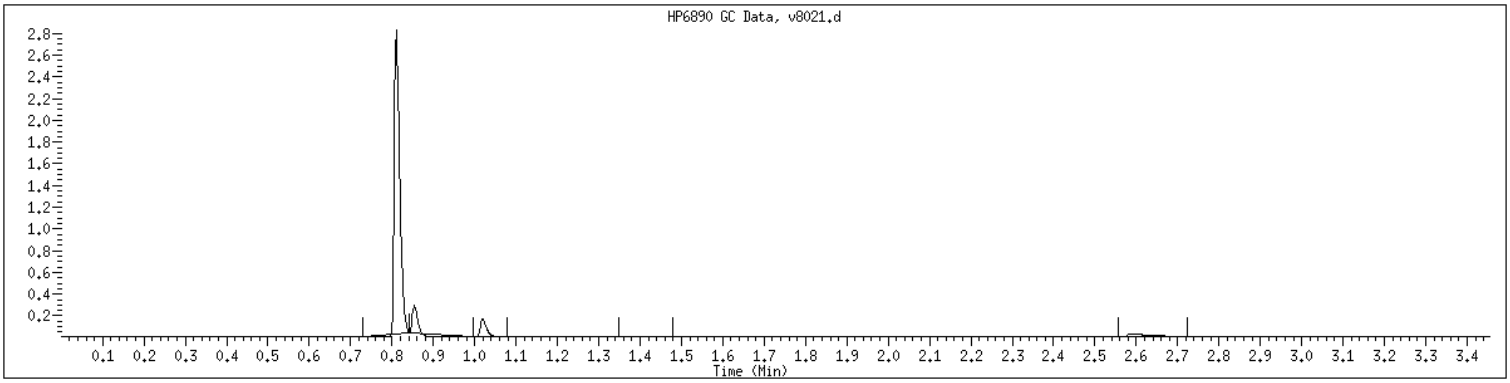
Column phase: GS-Q-30

Column diameter: 0.53



MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 21804062009 | SampleType | : SAMPLE |
| Injection Date | : 04/18/2018 12:46 | Instrument | : gcv8b.i |
| Operator | : BMR | | |
| Sample Info | : 21804062009 | | |
| Misc Info | : 2125155 | | |
| Method | : /var/chem/gcv8b.i/2180418.b/CO2h.m | | |
| Dilution | : 20.0 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : co2 |




NO MANUAL INTEGRATIONS

1D

ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-01-21 |
| Collect Date: | 04/05/18 Time: 1450 | GCAL Sample ID: | 21804062009 |
| Matrix: | Water % Moisture: NA | Instrument ID: | GCV8A |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/v8019 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | GS-Q 30 ID .53 (mm) |
| Prep Final Vol.: | 5000 ( µL ) | Dilution Factor: | 1 Analyst: BMR |
| Prep Date: | | Analysis Date: | 04/18/18 Time: 1235 |
| Prep Batch: | | Analytical Batch: | 633675 |
| Prep Method: | | Analytical Method: | RSK-175 |

*CONCENTRATION UNITS: ug/L*

| *CAS* | *ANALYTE* | *RESULT* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| 74-85-1 | Ethene | 2.98 | | 0.150 | 0.290 | 1.00 |

FORM I ORG-1

GCAL, Inc.

Data file : /var/chem/gcv8a.i/2180418.b/v8019.d
Lab Smp Id: 21804062009 Client Smp ID: 21804062009
Inj Date : 18-APR-2018 12:35
Operator : BMR Inst ID: gcv8a.i
Smp Info : 21804062009
Misc Info : 2126160/2125841/2126599
Comment :
Method : /var/chem/gcv8a.i/2180418.b/RSK.m
Meth Date : 18-Apr-2018 11:34 bmr Quant Type: ESTD
Cal Date : 18-JUL-2017 11:21 Cal File: v8006.d
Als bottle: 1
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: me&e.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | Compounds | RT | EXP RT | DLT RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ug/L) | FINAL ( ug/L) |
|---|---|---|---|---|---|---|---|
| 1 | METHANE | 0.784 | 0.795 | -0.011 | 14183167606 | 8803.63 | 8800(AM2) |
| 2 | ETHYLENE | 1.190 | 1.196 | -0.006 | 3337268 | 2.98155 | 2.98(M2) |
| 4 | ETHANE | 1.375 | 1.380 | -0.005 | 21018691 | 14.8388 | 14.8(A) |
| $ 5 | PROPENE | 2.475 | 2.477 | -0.002 | 24895726 | 35.4685 | 35.5(M2) |

QC Flag Legend

A - Target compound detected but, quantitated amount
exceeded maximum amount.
M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8a.i/2180418.b/v8019.d

Page 1

Date : 18-APR-2018 12:35

Client ID: 21804062009

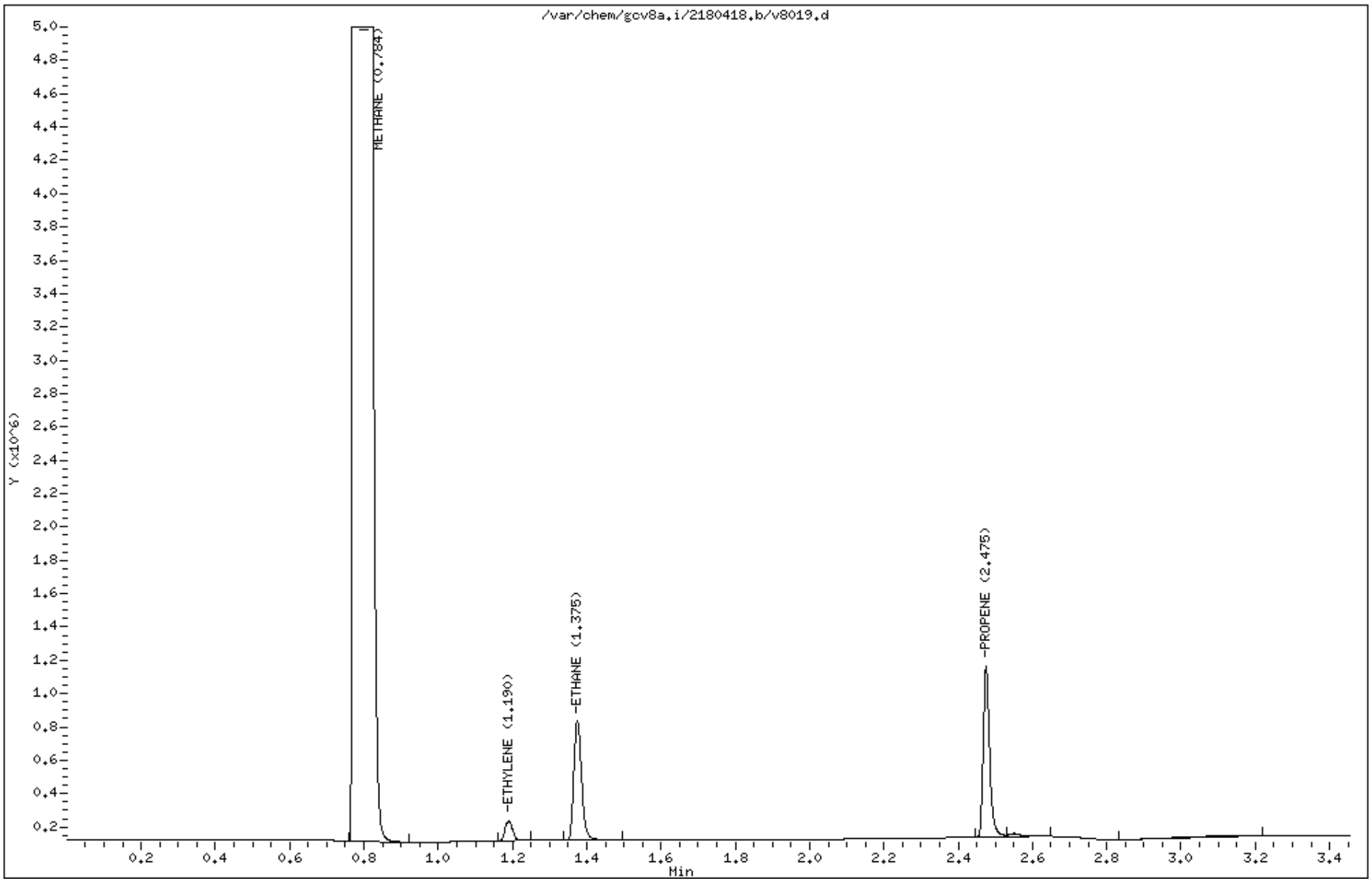
Instrument: gcv8a.i

Sample Info: 21804062009

Operator: BMR

Column phase: GS-Q-30M

Column diameter: 0.53

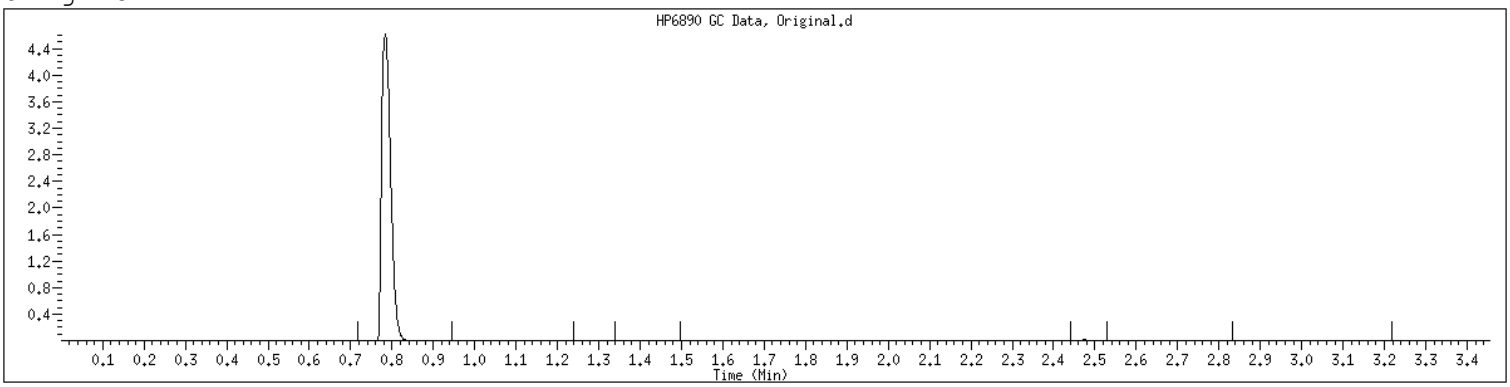


Report Date: 04/18/2018 12:42

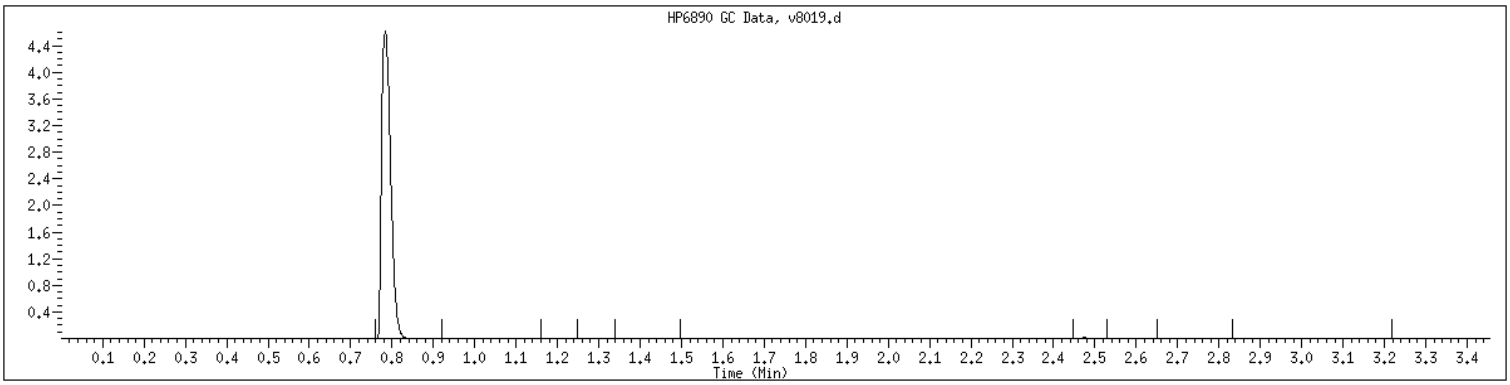
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 21804062009 | SampleType | : SAMPLE |
| Injection Date | : 04/18/2018 12:35 | Instrument | : gcv8a.i |
| Operator | : BMR | | |
| Sample Info | : 21804062009 | | |
| Misc Info | : 2126160/2125841/2126599 | | |
| Method | : /var/chem/gcv8a.i/2180418.b/RSK.m | | |
| Dilution | : 1.00 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : me&e |

Original




Final



1D

ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MW-11-01-21DL |
| Collect Date: | 04/05/18 Time: 1450 | GCAL Sample ID: | 21804062009DL |
| Matrix: | Water % Moisture: NA | Instrument ID: | GCV8A |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/v8020 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | GS-Q 30 ID .53 (mm) |
| Prep Final Vol.: | 5000 ( µL ) | Dilution Factor: | 600 Analyst: BMR |
| Prep Date: | | Analysis Date: | 04/18/18 Time: 1241 |
| Prep Batch: | | Analytical Batch: | 633675 |
| Prep Method: | | Analytical Method: | RSK-175 |

*CONCENTRATION UNITS: ug/L*

| *CAS* | *ANALYTE* | *RESULT* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| 74-84-0 | Ethane | 132 | U | 66.0 | 132 | 600 |
| 74-82-8 | Methane | 13800 | | 261 | 654 | 1200 |

FORM I ORG-1

GCAL, Inc.

Data file : /var/chem/gcv8a.i/2180418.b/v8020.d
Lab Smp Id: 21804062009 Client Smp ID: 21804062009
Inj Date : 18-APR-2018 12:41
Operator : BMR Inst ID: gcv8a.i
Smp Info : 21804062009
Misc Info : 2126160/2125841/2126599
Comment :
Method : /var/chem/gcv8a.i/2180418.b/RSK.m
Meth Date : 18-Apr-2018 11:34 bmr Quant Type: ESTD
Cal Date : 18-JUL-2017 11:21 Cal File: v8006.d
Als bottle: 1
Dil Factor: 600.00000
Integrator: HP Genie Compound Sublist: me&e.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| Compounds | RT | EXP RT | DLT RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ug/L) | FINAL ( ug/L) |
|---|---|---|---|---|---|---|
| 1 METHANE | 0.799 | 0.795 | 0.004 | 37103839 | 23.0307 | 13800(M2) |
| 4 ETHANE | 1.397 | 1.380 | 0.017 | 43516 | 0.03072 | 18.4(M1) |

QC Flag Legend

M1- Compound response manually integrated because
Target system did not integrate.
M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8a.i/2180418.b/v8020.d

Page 1

Date : 18-APR-2018 12:41

Client ID: 21804062009

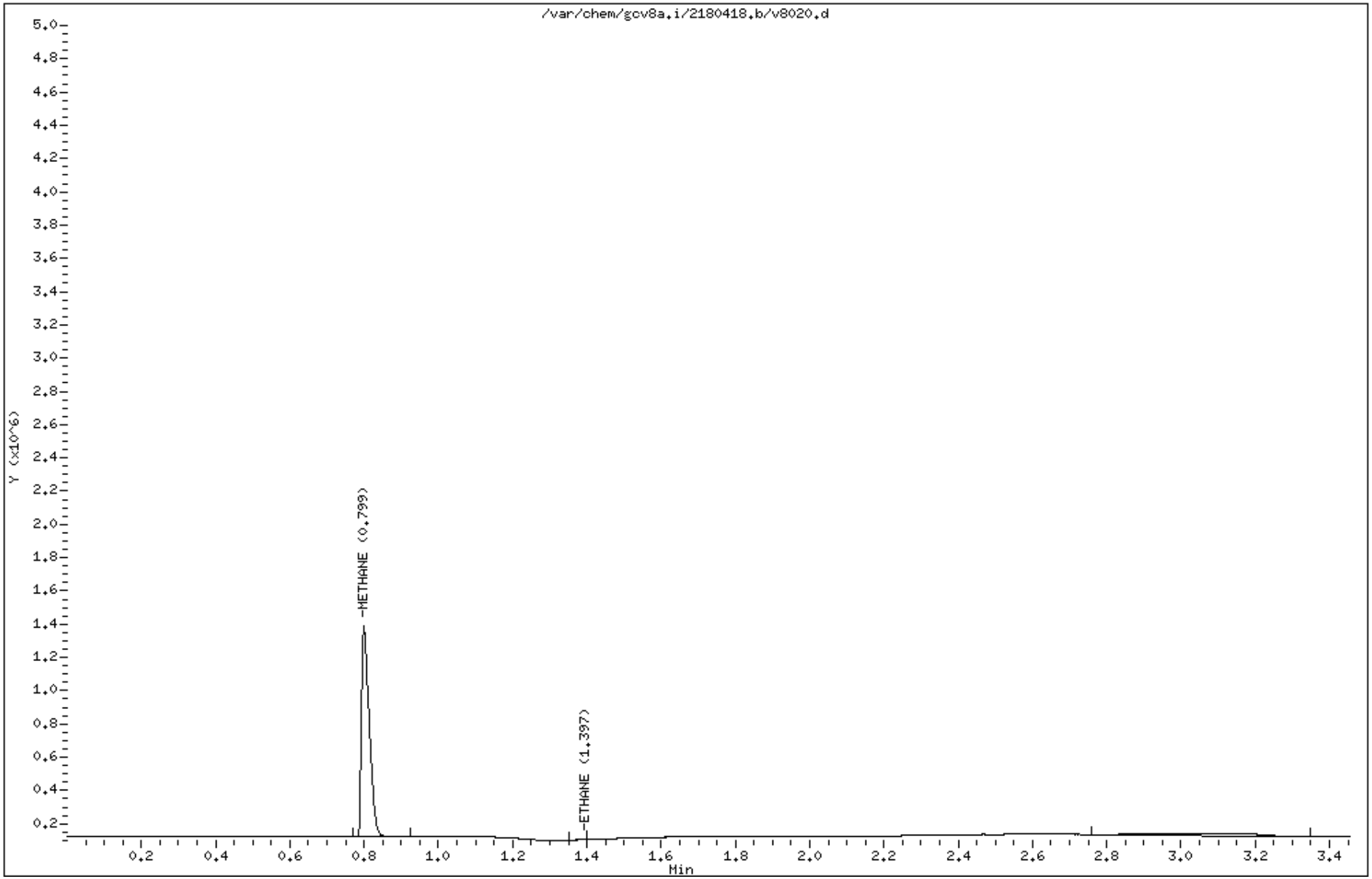
Instrument: gcv8a.i

Sample Info: 21804062009

Operator: BMR

Column phase: GS-Q-30M

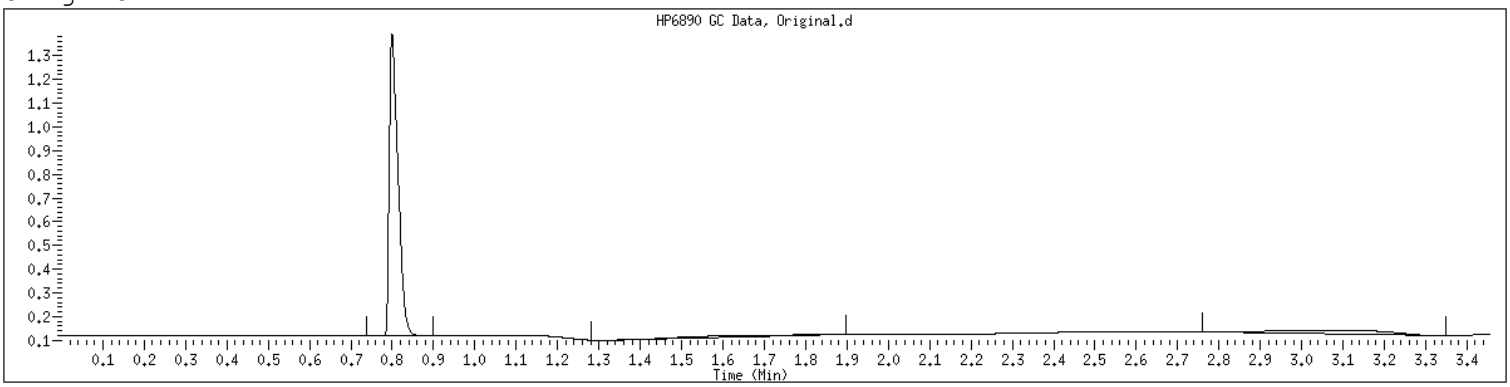
Column diameter: 0.53



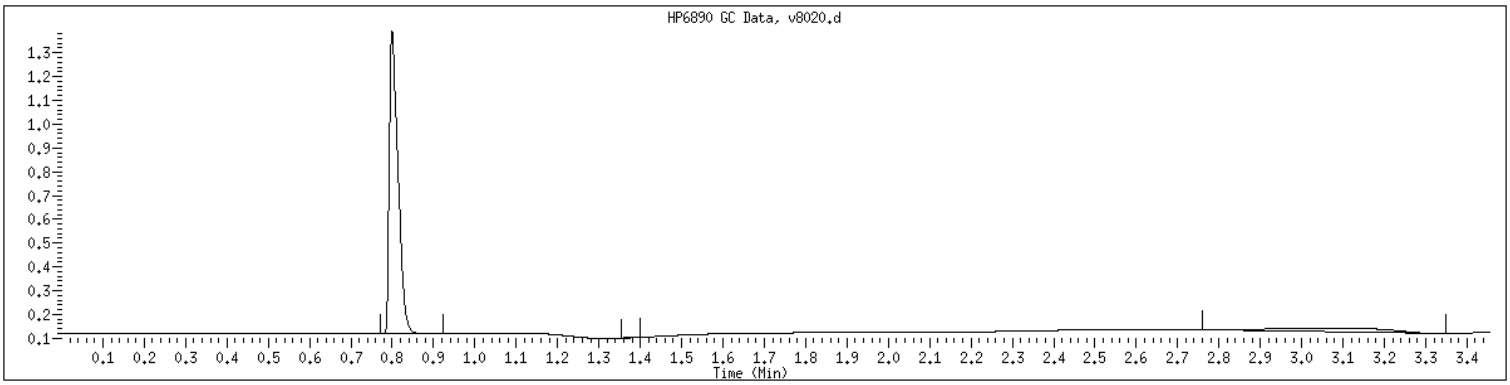
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 21804062009 | SampleType | : SAMPLE |
| Injection Date | : 04/18/2018 12:41 | Instrument | : gcv8a.i |
| Operator | : BMR | | |
| Sample Info | : 21804062009 | | |
| Misc Info | : 2126160/2125841/2126599 | | |
| Method | : /var/chem/gcv8a.i/2180418.b/RSK.m | | |
| Dilution | : 600 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : me&e |

Original




Final



1D

ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | RD5-MW-01-21 |
| Collect Date: | 04/05/18 Time: 1635 | GCAL Sample ID: | 21804062010 |
| Matrix: | Water % Moisture: NA | Instrument ID: | GCV8B |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/v8024 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | ID (mm) |
| Prep Final Vol.: | 5000 ( µL ) | Dilution Factor: | 50 Analyst: BMR |
| Prep Date: | | Analysis Date: | 04/18/18 Time: 1309 |
| Prep Batch: | | Analytical Batch: | 633677 |
| Prep Method: | | Analytical Method: | RSK-175 |

*CONCENTRATION UNITS: ug/L*

| *CAS* | *ANALYTE* | *RESULT* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| 124-38-9 | Carbon Dioxide | 174000 | | 6350 | 19300 | 45000 |

FORM I ORG-1

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2180418.b/v8024.d
Lab Smp Id: 21804062010 Client Smp ID: 21804062010
Inj Date : 18-APR-2018 13:09
Operator : BMR Inst ID: gcv8b.i
Smp Info : 21804062010
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2180418.b/CO2h.m
Meth Date : 18-Apr-2018 13:24 bmr Quant Type: ESTD
Cal Date : 30-JUN-2017 10:14 Cal File: v8003.d
Als bottle: 1
Dil Factor: 50.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | CONCENTRATIONS | |
|---|---|---|---|---|---|---|
| | | | | | ON-COLUMN | FINAL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| 1 Carbon Dioxide | 1.028 | 1.035 | -0.007 | 15644035 | 3481.53 | 174000(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8b.i/2180418.b/v8024.d



Date : 18-APR-2018 13:09

Client ID: 21804062010

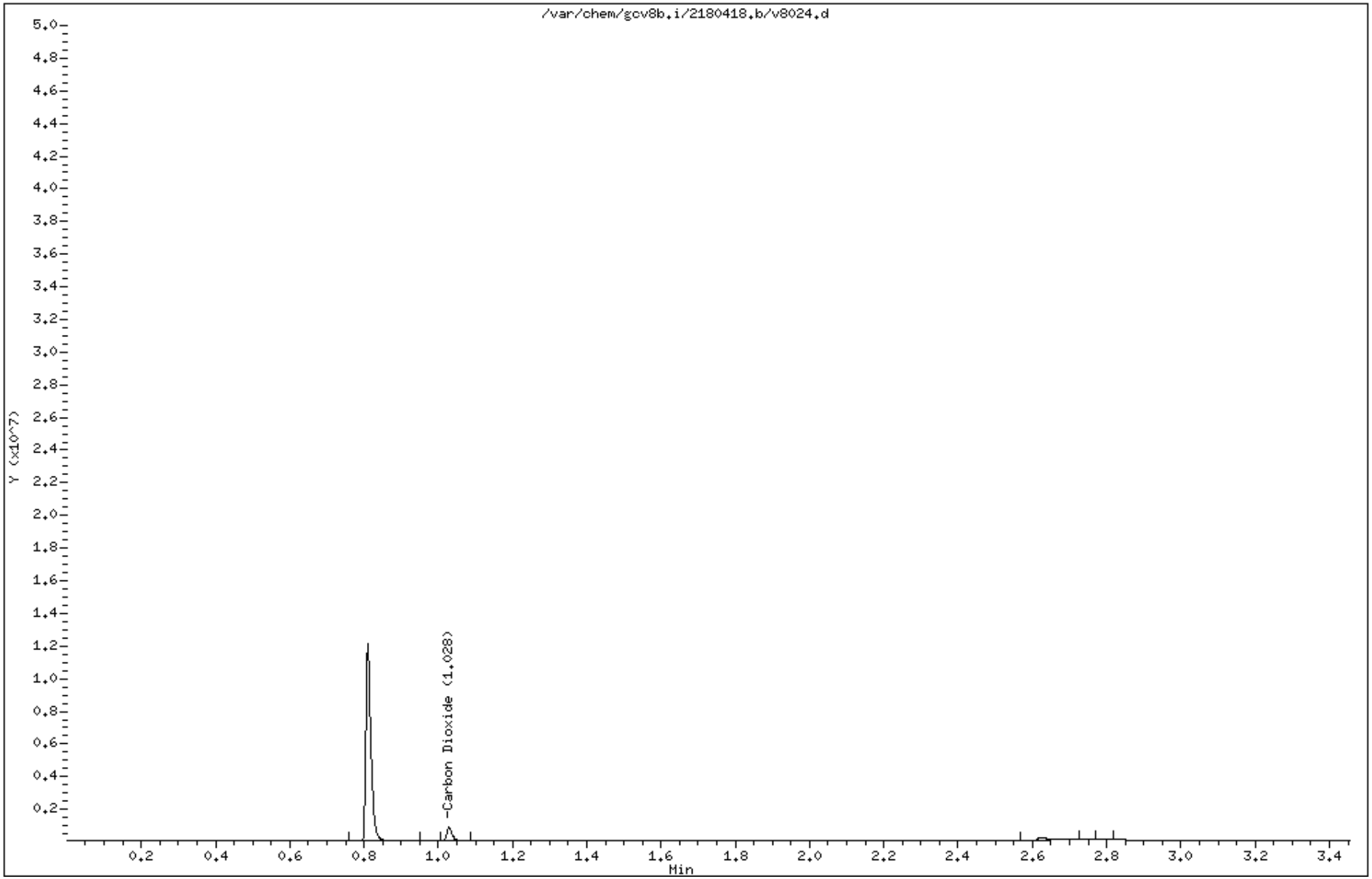
Instrument: gcv8b.i

Sample Info: 21804062010

Operator: BMR

Column phase: GS-Q-30

Column diameter: 0.53

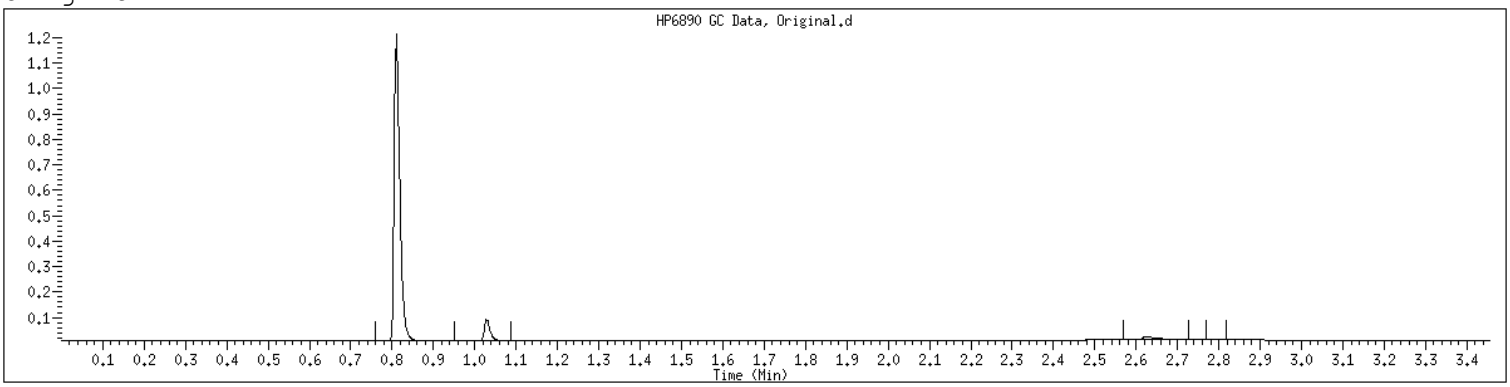


Report Date: 04/18/2018 13:24

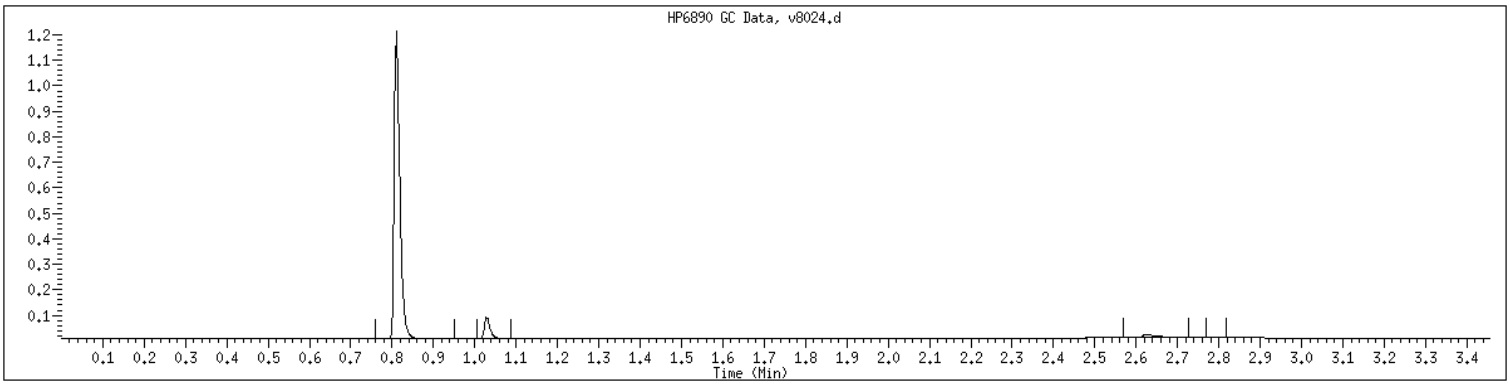
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 21804062010 | SampleType | : SAMPLE |
| Injection Date | : 04/18/2018 13:09 | Instrument | : gcv8b.i |
| Operator | : BMR | | |
| Sample Info | : 21804062010 | | |
| Misc Info | : 2125155 | | |
| Method | : /var/chem/gcv8b.i/2180418.b/CO2h.m | | |
| Dilution | : 50.0 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : co2 |

Original




Final



1D

ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | RD5-MW-01-21 |
| Collect Date: | 04/05/18 Time: 1635 | GCAL Sample ID: | 21804062010 |
| Matrix: | Water % Moisture: NA | Instrument ID: | GCV8A |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/v8023 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | GS-Q 30 ID .53 (mm) |
| Prep Final Vol.: | 5000 ( µL ) | Dilution Factor: | 1 Analyst: BMR |
| Prep Date: | | Analysis Date: | 04/18/18 Time: 1302 |
| Prep Batch: | | Analytical Batch: | 633675 |
| Prep Method: | | Analytical Method: | RSK-175 |

*CONCENTRATION UNITS: ug/L*

| *CAS* | *ANALYTE* | *RESULT* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| 74-84-0 | Ethane | 0.220 | U | 0.110 | 0.220 | 1.00 |
| 74-85-1 | Ethene | 0.290 | U | 0.150 | 0.290 | 1.00 |
| 74-82-8 | Methane | 2.76 | | 0.435 | 1.09 | 2.00 |

FORM I ORG-1

GCAL, Inc.

Data file : /var/chem/gcv8a.i/2180418.b/v8023.d
Lab Smp Id: 21804062010 Client Smp ID: 21804062010
Inj Date : 18-APR-2018 13:02
Operator : BMR Inst ID: gcv8a.i
Smp Info : 21804062010
Misc Info : 2126160/2125841/2126599
Comment :
Method : /var/chem/gcv8a.i/2180418.b/RSK.m
Meth Date : 18-Apr-2018 13:01 bmr Quant Type: ESTD
Cal Date : 18-JUL-2017 11:21 Cal File: v8006.d
Als bottle: 1
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: me&e.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | CONCENTRATIONS | |
|---|---|---|---|---|---|---|
| | | | | | ON-COLUMN | FINAL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| ========== | == | ====== | ====== | ======== | ======= | ======= |
| 1 METHANE | 0.786 | 0.794 | -0.008 | 4440381 | 2.75619 | 2.76(M2) |
| $ 5 PROPENE | 2.475 | 2.477 | -0.002 | 23180089 | 33.0243 | 33.0(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8a.i/2180418.b/v8023.d

Page 1

Date : 18-APR-2018 13:02

Client ID: 21804062010

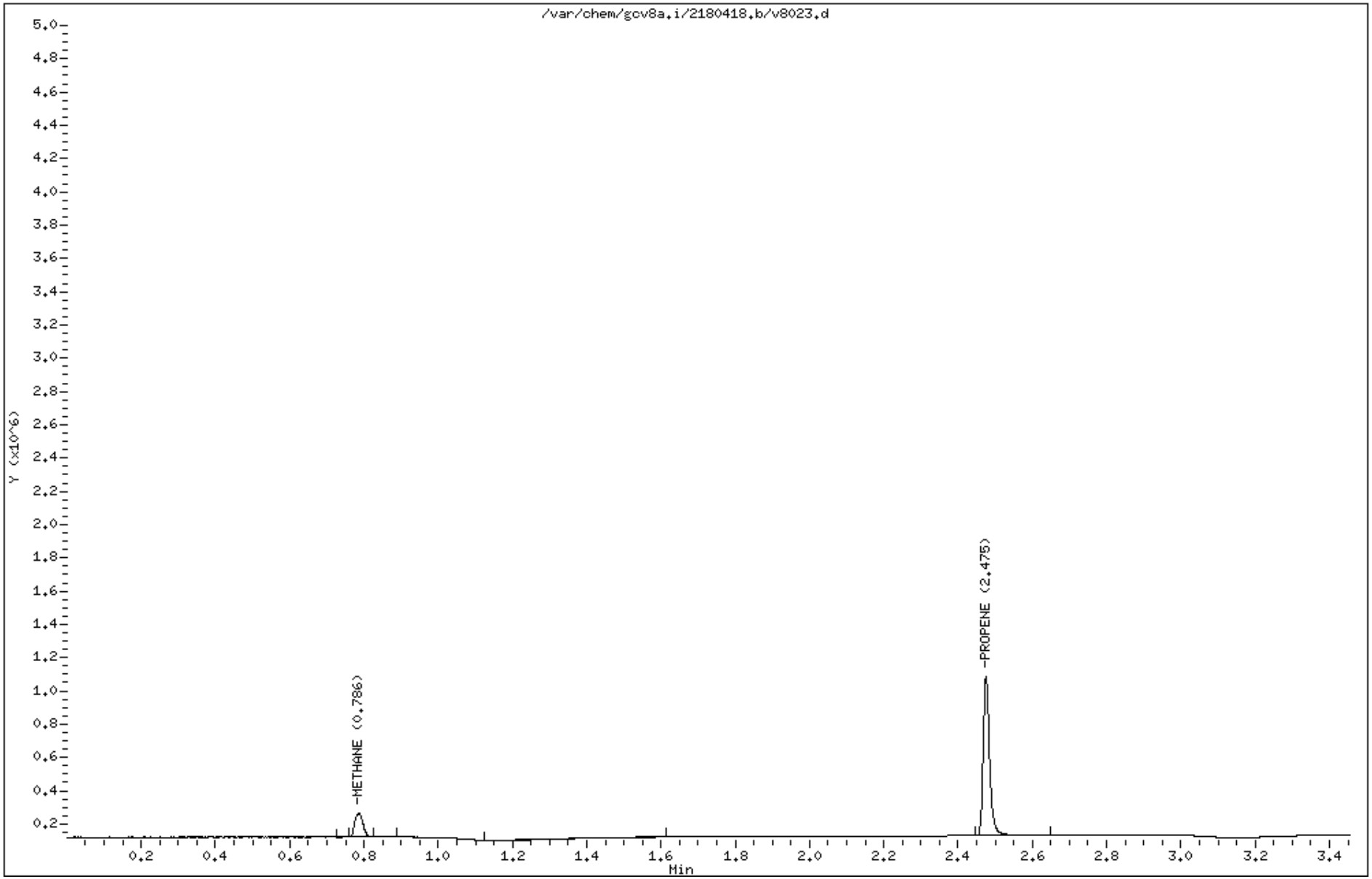
Instrument: gcv8a.i

Sample Info: 21804062010

Operator: BMR

Column phase: GS-Q-30M

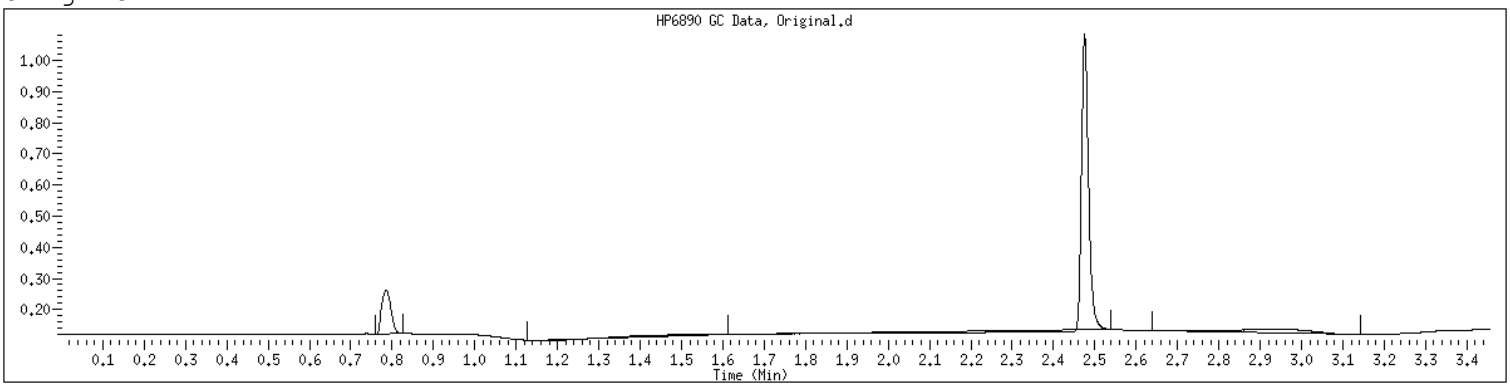
Column diameter: 0.53



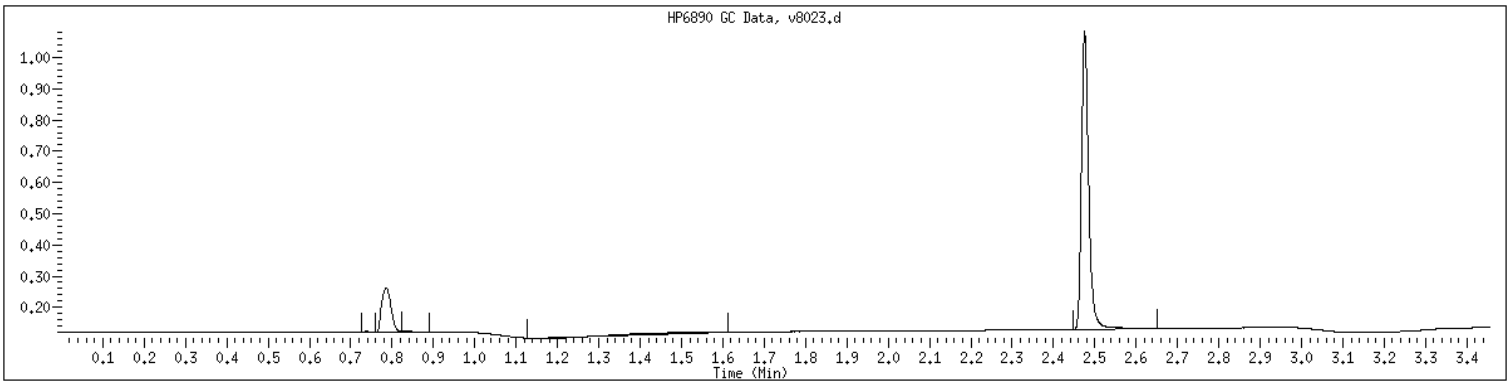
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 21804062010 SampleType : SAMPLE
Injection Date: 04/18/2018 13:02 Instrument : gcv8a.i
Operator : BMR
Sample Info : 21804062010
Misc Info : 2126160/2125841/2126599
Method : /var/chem/gcv8a.i/2180418.b/RSK.m
Dilution : 1.00
Matrix : WATER
Integrator : HP Genie Compound Sublist: me&e

Original




Final



1D

ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MB1798418 |
| Collect Date: | NA Time: NA | GCAL Sample ID: | 1798418 |
| Matrix: | Water % Moisture: NA | Instrument ID: | GCV8A |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/v8005 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | GS-Q 30 ID .53 (mm) |
| Prep Final Vol.: | 5000 ( µL ) | Dilution Factor: | 1 Analyst: BMR |
| Prep Date: | | Analysis Date: | 04/18/18 Time: 1059 |
| Prep Batch: | | Analytical Batch: | 633675 |
| Prep Method: | | Analytical Method: | RSK-175 |

*CONCENTRATION UNITS: ug/L*

| *CAS* | *ANALYTE* | *RESULT* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| 74-84-0 | Ethane | 0.220 | U | 0.110 | 0.220 | 1.00 |
| 74-85-1 | Ethene | 0.290 | U | 0.150 | 0.290 | 1.00 |
| 74-82-8 | Methane | 1.09 | U | 0.435 | 1.09 | 2.00 |

FORM I ORG-1

GCAL, Inc.

Data file : /var/chem/gcv8a.i/2180418.b/v8005.d
Lab Smp Id: 1798418 Client Smp ID: 1798418
Inj Date : 18-APR-2018 10:59
Operator : BMR Inst ID: gcv8a.i
Smp Info : 1798418
Misc Info : 2126160/2125841/2126599
Comment :
Method : /var/chem/gcv8a.i/2180418.b/RSK.m
Meth Date : 18-Apr-2018 11:03 bmr Quant Type: ESTD
Cal Date : 18-JUL-2017 11:21 Cal File: v8006.d
Als bottle: 1
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: me&e.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | CONCENTRATIONS | |
|---|---|---|---|---|---|---|
| | | | | | ON-COLUMN | FINAL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| $ 5 PROPENE | 2.479 | 2.477 | 0.002 | 25409988 | 36.2012 | 36.2(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8a.i/2180418.b/v8005.d

Page 1

Date : 18-APR-2018 10:59

Client ID: 1798418

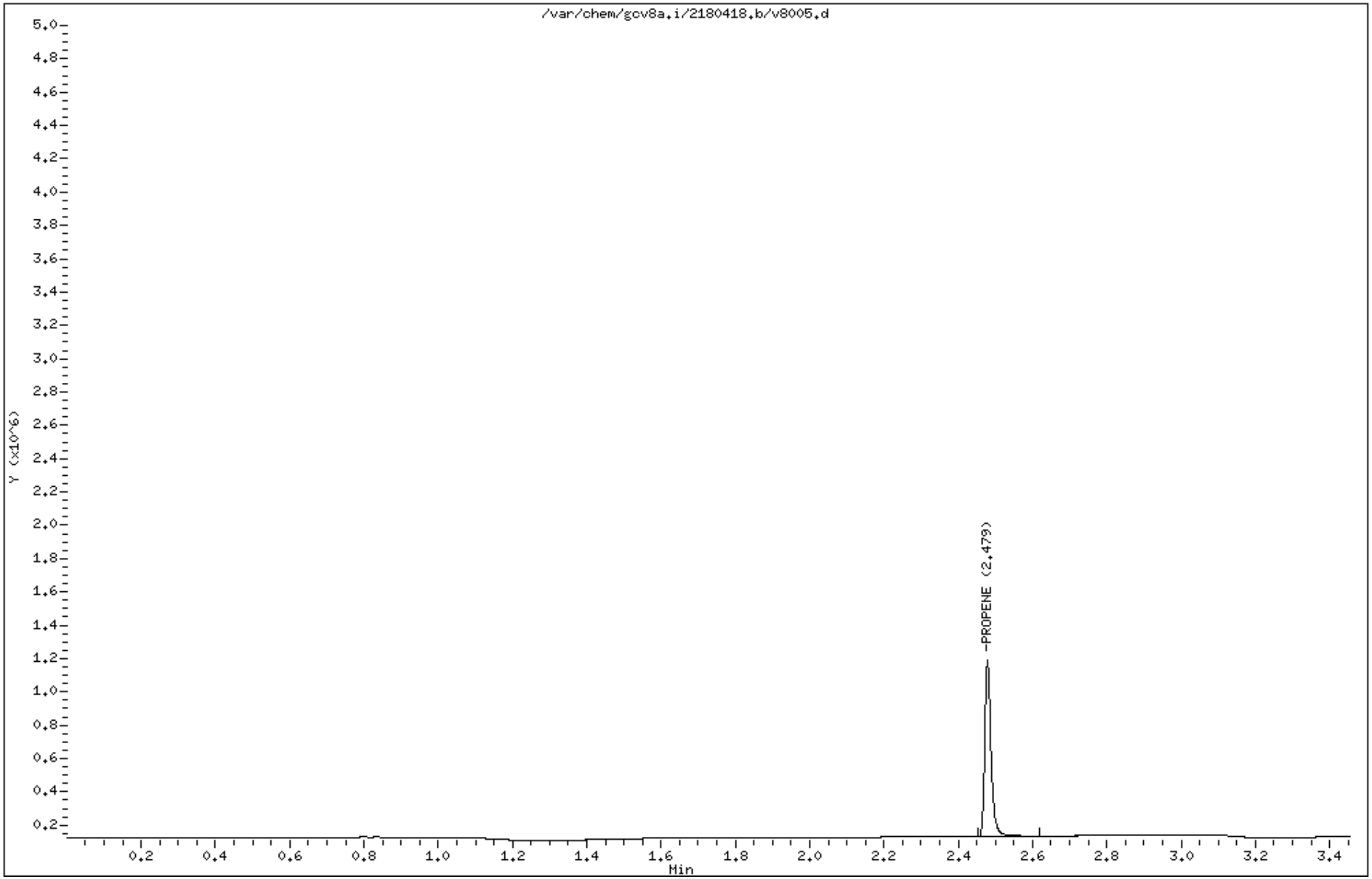
Instrument: gcv8a.i

Sample Info: 1798418

Operator: BMR

Column phase: GS-Q-30M

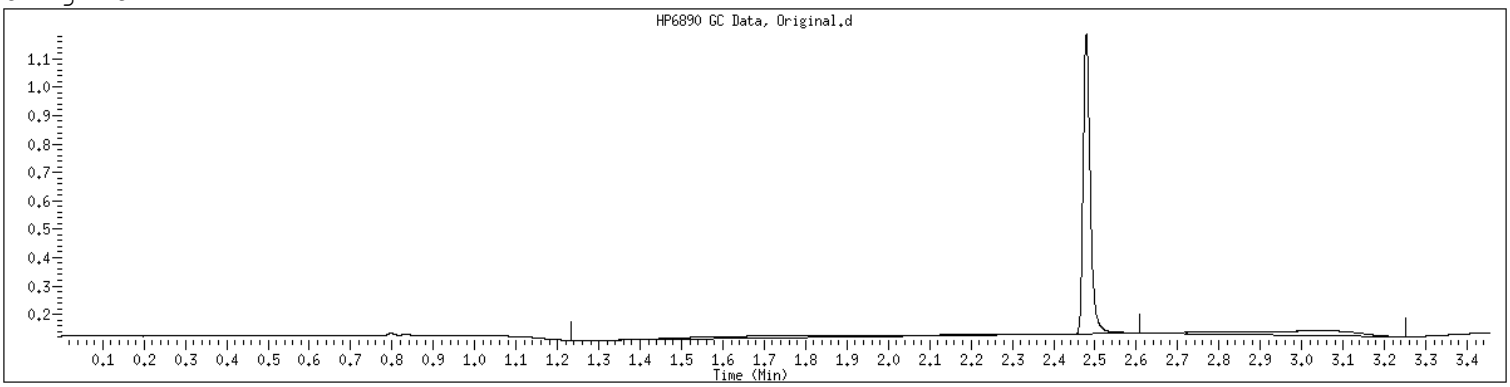
Column diameter: 0.53



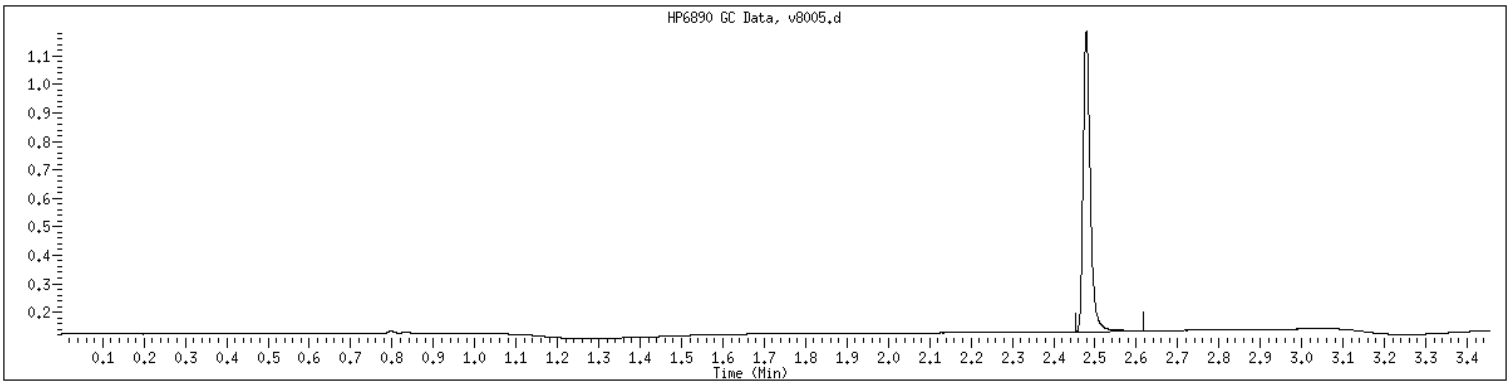
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 1798418 | SampleType | : SAMPLE |
| Injection Date | : 04/18/2018 10:59 | Instrument | : gcv8a.i |
| Operator | : BMR | | |
| Sample Info | : 1798418 | | |
| Misc Info | : 2126160/2125841/2126599 | | |
| Method | : /var/chem/gcv8a.i/2180418.b/RSK.m | | |
| Dilution | : 1.00 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : me&e |

Original




Final



1D

ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | LCS1798419 |
| Collect Date: | NA Time: NA | GCAL Sample ID: | 1798419 |
| Matrix: | Water % Moisture: NA | Instrument ID: | GCV8A |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/v8006 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | GS-Q 30 ID .53 (mm) |
| Prep Final Vol.: | 5000 ( µL ) | Dilution Factor: | 1 Analyst: BMR |
| Prep Date: | | Analysis Date: | 04/18/18 Time: 1104 |
| Prep Batch: | | Analytical Batch: | 633675 |
| Prep Method: | | Analytical Method: | RSK-175 |

*CONCENTRATION UNITS: ug/L*

| CAS | ANALYTE | RESULT | Q | DL | LOD | LOQ |
|---|---|---|---|---|---|---|
| 74-84-0 | Ethane | 2.91 | | 0.110 | 0.220 | 1.00 |
| 74-85-1 | Ethene | 2.78 | | 0.150 | 0.290 | 1.00 |
| 74-82-8 | Methane | 14.5 | | 0.435 | 1.09 | 2.00 |

FORM I ORG-1

GCAL, Inc.

Data file : /var/chem/gcv8a.i/2180418.b/v8006.d
Lab Smp Id: 1798419 Client Smp ID: 1798419
Inj Date : 18-APR-2018 11:04
Operator : BMR Inst ID: gcv8a.i
Smp Info : 1798419
Misc Info : 2126160/2125841/2126599
Comment :
Method : /var/chem/gcv8a.i/2180418.b/RSK.m
Meth Date : 18-Apr-2018 11:03 bmr Quant Type: ESTD
Cal Date : 18-JUL-2017 11:21 Cal File: v8006.d
Als bottle: 1 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: me&e.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | CONCENTRATIONS | |
|---|---|---|---|---|---|---|
| | | | | | ON-COLUMN | FINAL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| ========== | == | ====== | ====== | ======== | ======= | ======= |
| 1 METHANE | 0.790 | 0.795 | -0.005 | 23363457 | 14.5019 | 14.5(M2) |
| 2 ETHYLENE | 1.174 | 1.196 | -0.022 | 3107195 | 2.77600 | 2.78(M2) |
| 4 ETHANE | 1.354 | 1.380 | -0.026 | 4117764 | 2.90707 | 2.91(M2) |
| $ 5 PROPENE | 2.459 | 2.477 | -0.018 | 19817967 | 28.2343 | 28.2(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8a.i/2180418.b/v8006.d

Page 1

Date : 18-APR-2018 11:04

Client ID: 1798419

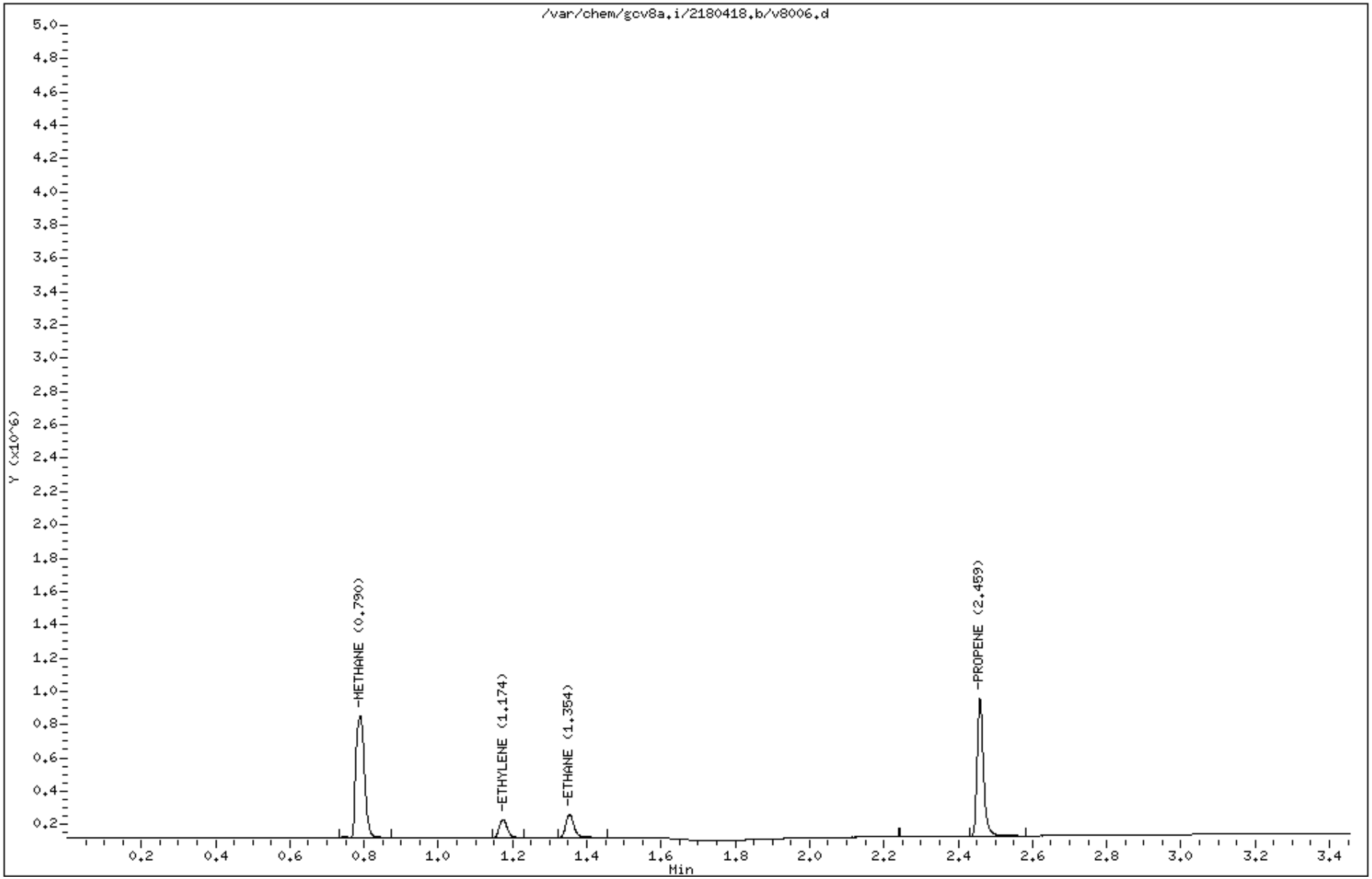
Instrument: gcv8a.i

Sample Info: 1798419

Operator: BMR

Column phase: GS-Q-30M

Column diameter: 0.53

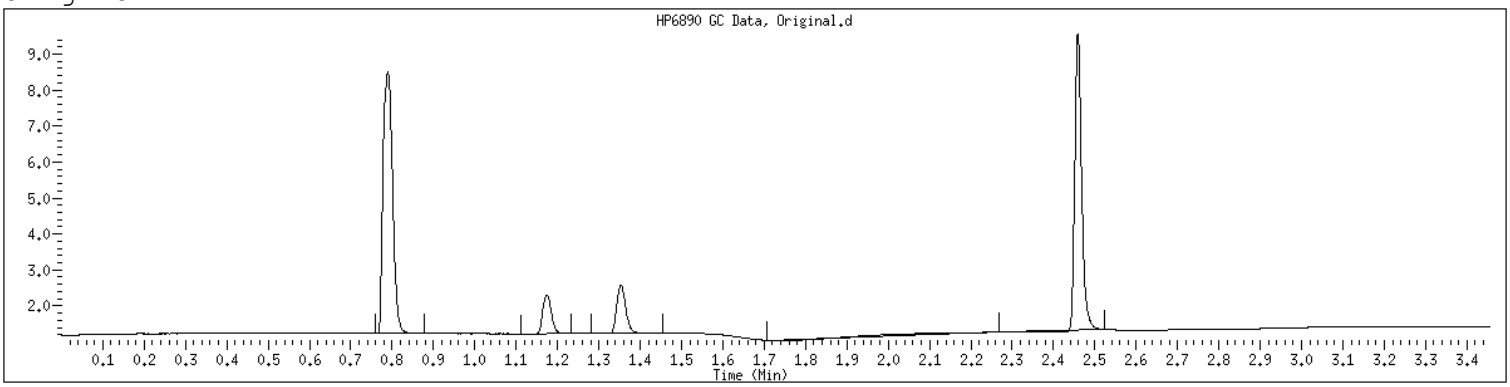


Report Date: 04/18/2018 11:09

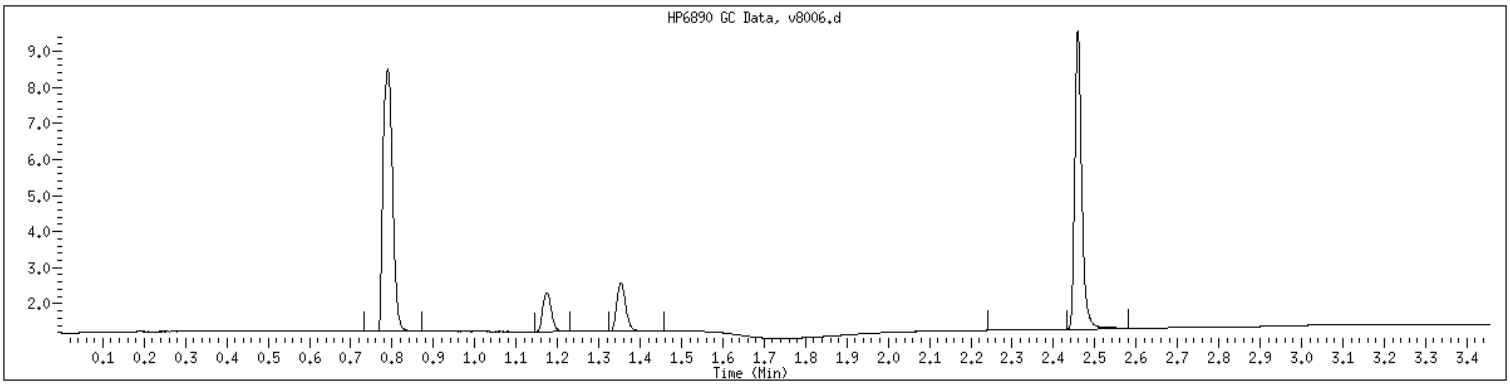
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 1798419 | SampleType | : LCS |
| Injection Date | : 04/18/2018 11:04 | Instrument | : gcv8a.i |
| Operator | : BMR | | |
| Sample Info | : 1798419 | | |
| Misc Info | : 2126160/2125841/2126599 | | |
| Method | : /var/chem/gcv8a.i/2180418.b/RSK.m | | |
| Dilution | : 1.00 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : me&e |

Original




Final



1D

ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | LCSD1798420 |
| Collect Date: | NA Time: NA | GCAL Sample ID: | 1798420 |
| Matrix: | Water % Moisture: NA | Instrument ID: | GCV8A |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/v8007 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | GS-Q 30 ID .53 (mm) |
| Prep Final Vol.: | 5000 ( µL ) | Dilution Factor: | 1 Analyst: BMR |
| Prep Date: | | Analysis Date: | 04/18/18 Time: 1110 |
| Prep Batch: | | Analytical Batch: | 633675 |
| Prep Method: | | Analytical Method: | RSK-175 |

*CONCENTRATION UNITS: ug/L*

| *CAS* | *ANALYTE* | *RESULT* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| 74-84-0 | Ethane | 2.91 | | 0.110 | 0.220 | 1.00 |
| 74-85-1 | Ethene | 2.76 | | 0.150 | 0.290 | 1.00 |
| 74-82-8 | Methane | 14.5 | | 0.435 | 1.09 | 2.00 |

FORM I ORG-1

GCAL, Inc.

Data file : /var/chem/gcv8a.i/2180418.b/v8007.d
Lab Smp Id: 1798420 Client Smp ID: 1798420
Inj Date : 18-APR-2018 11:10
Operator : BMR Inst ID: gcv8a.i
Smp Info : 1798420
Misc Info : 2126160/2125841/2126599
Comment :
Method : /var/chem/gcv8a.i/2180418.b/RSK.m
Meth Date : 18-Apr-2018 11:03 bmr Quant Type: ESTD
Cal Date : 18-JUL-2017 11:21 Cal File: v8006.d
Als bottle: 1 QC Sample: LCSD
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: me&e.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | CONCENTRATIONS | |
|---|---|---|---|---|---|---|
| | | | | | ON-COLUMN | FINAL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| ========== | == | ====== | ====== | ======== | ======= | ======= |
| 1 METHANE | 0.792 | 0.795 | -0.003 | 23290619 | 14.4567 | 14.5(M2) |
| 2 ETHYLENE | 1.177 | 1.196 | -0.019 | 3094116 | 2.76432 | 2.76(M2) |
| 4 ETHANE | 1.355 | 1.380 | -0.025 | 4128808 | 2.91486 | 2.91(M2) |
| $ 5 PROPENE | 2.458 | 2.477 | -0.019 | 19852683 | 28.2838 | 28.3(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8a.i/2180418.b/v8007.d



Date : 18-APR-2018 11:10

Client ID: 1798420

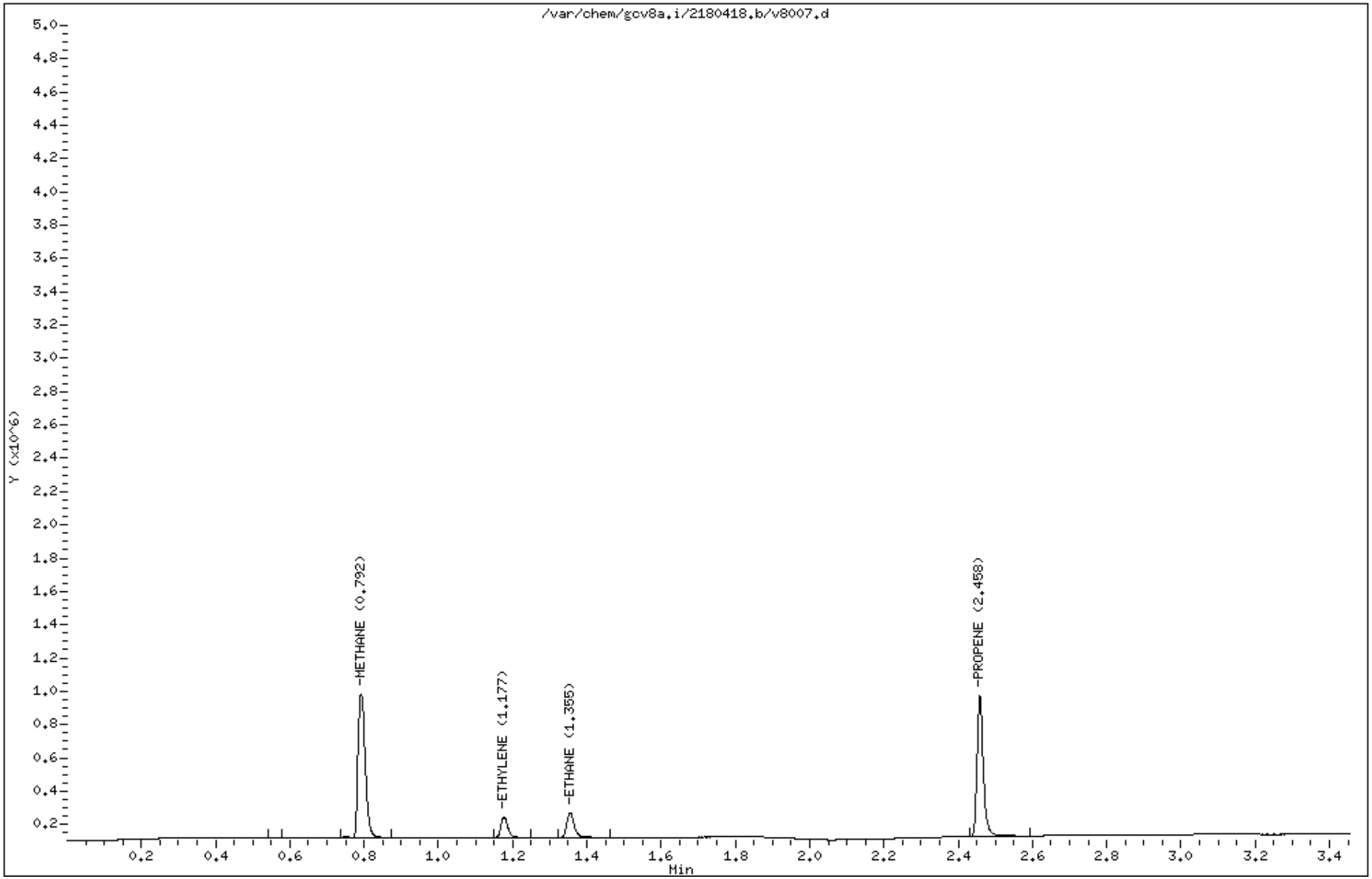
Instrument: gcv8a.i

Sample Info: 1798420

Operator: BMR

Column phase: GS-Q-30M

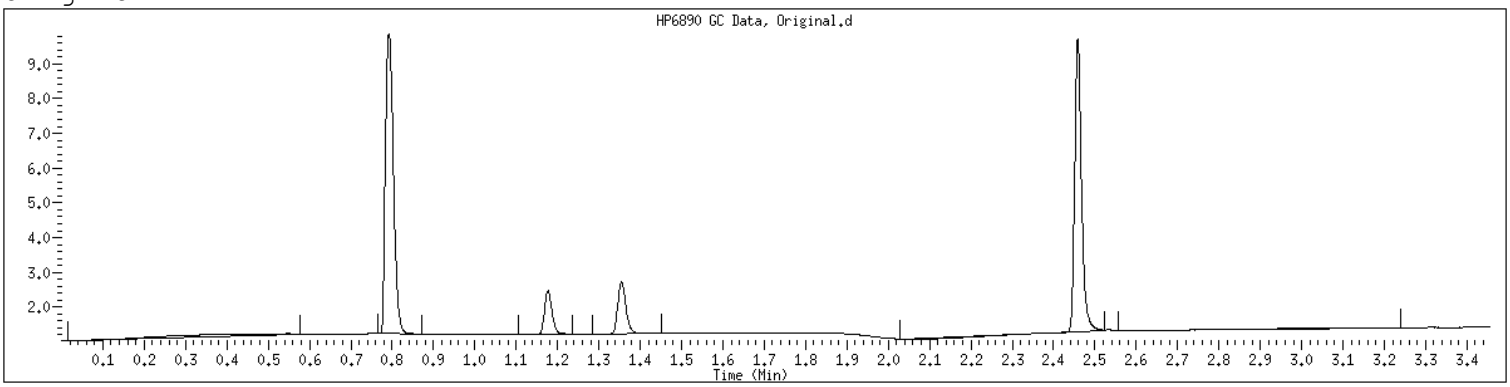
Column diameter: 0.53



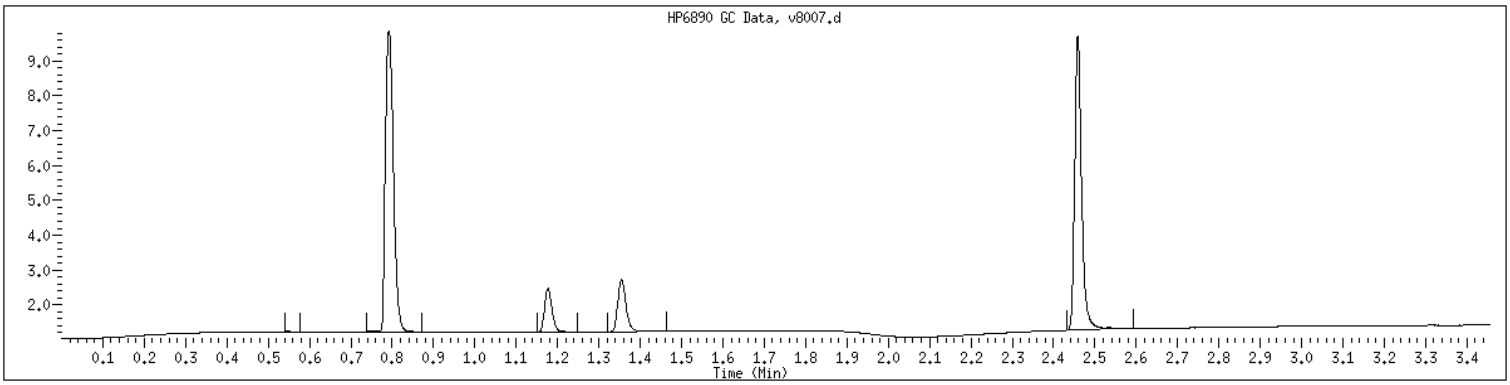
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 1798420 SampleType : LCSD
Injection Date: 04/18/2018 11:10 Instrument : gcv8a.i
Operator : BMR
Sample Info : 1798420
Misc Info : 2126160/2125841/2126599
Method : /var/chem/gcv8a.i/2180418.b/RSK.m
Dilution : 1.00
Matrix : WATER
Integrator : HP Genie Compound Sublist: me&e

Original




Final



1D

ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | MB1798426 |
| Collect Date: | NA Time: NA | GCAL Sample ID: | 1798426 |
| Matrix: | Water % Moisture: NA | Instrument ID: | GCV8B |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/v8002 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | ID (mm) |
| Prep Final Vol.: | 5000 ( µL ) | Dilution Factor: | 1 Analyst: BMR |
| Prep Date: | | Analysis Date: | 04/18/18 Time: 1033 |
| Prep Batch: | | Analytical Batch: | 633677 |
| Prep Method: | | Analytical Method: | RSK-175 |

*CONCENTRATION UNITS: ug/L*

| *CAS* | *ANALYTE* | *RESULT* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| 124-38-9 | Carbon Dioxide | 386 | U | 127 | 386 | 900 |

FORM I ORG-1

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2180418.b/v8002.d
Lab Smp Id: 1798426 Client Smp ID: 1798426
Inj Date : 18-APR-2018 10:33
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1798426
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2180418.b/CO2h.m
Meth Date : 18-Apr-2018 13:24 bmr Quant Type: ESTD
Cal Date : 30-JUN-2017 10:14 Cal File: v8003.d
Als bottle: 1 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| Compounds | RT | EXP RT DLT RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ug/L) | CONCENTRATIONS FINAL ( ug/L) |
|---|---|---|---|---|---|

Data File: /var/chem/gcv8b.i/2180418.b/v8002.d



Date : 18-APR-2018 10:33

Client ID: 1798426

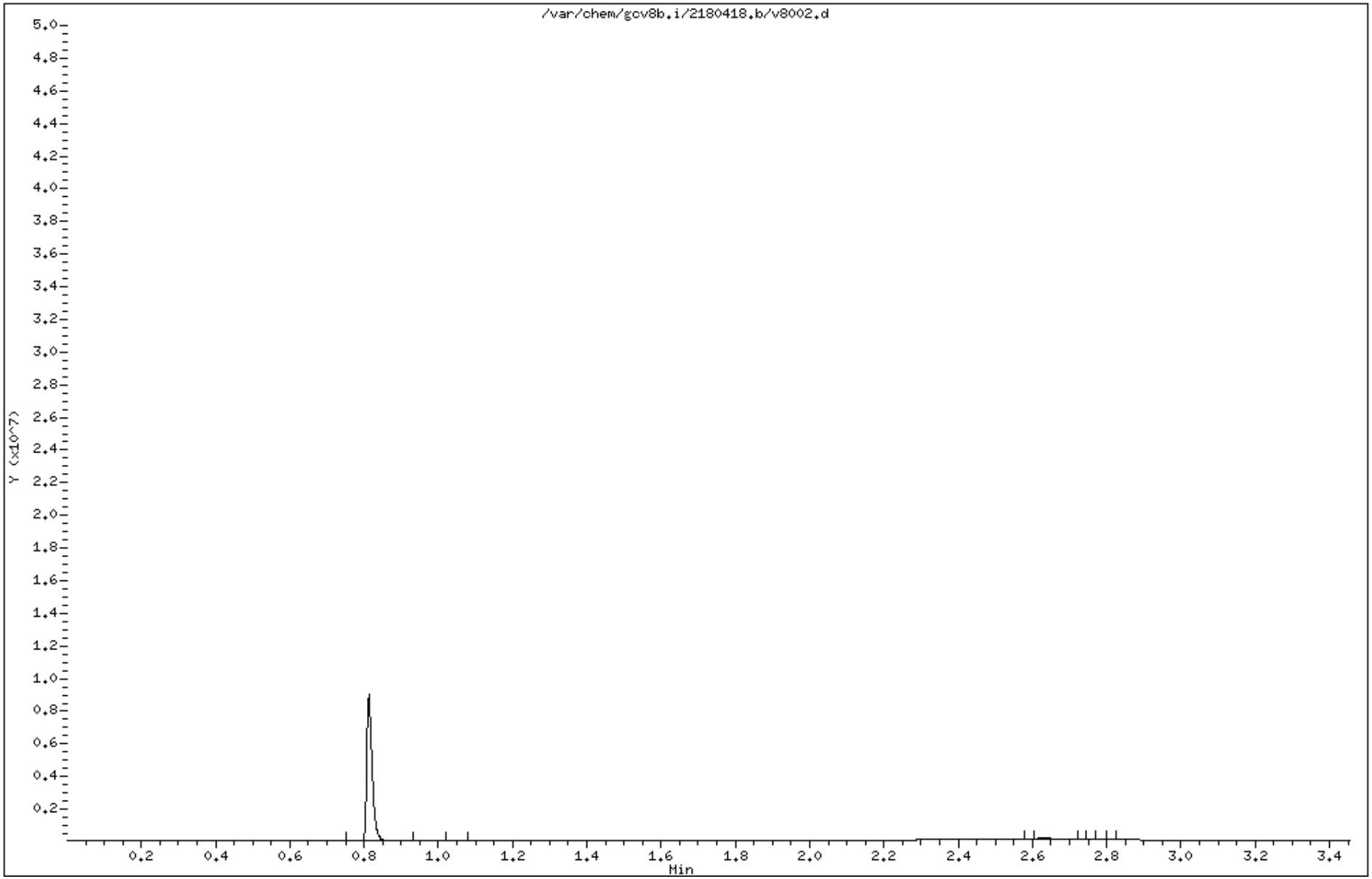
Instrument: gcv8b.i

Sample Info: 1798426

Operator: BMR

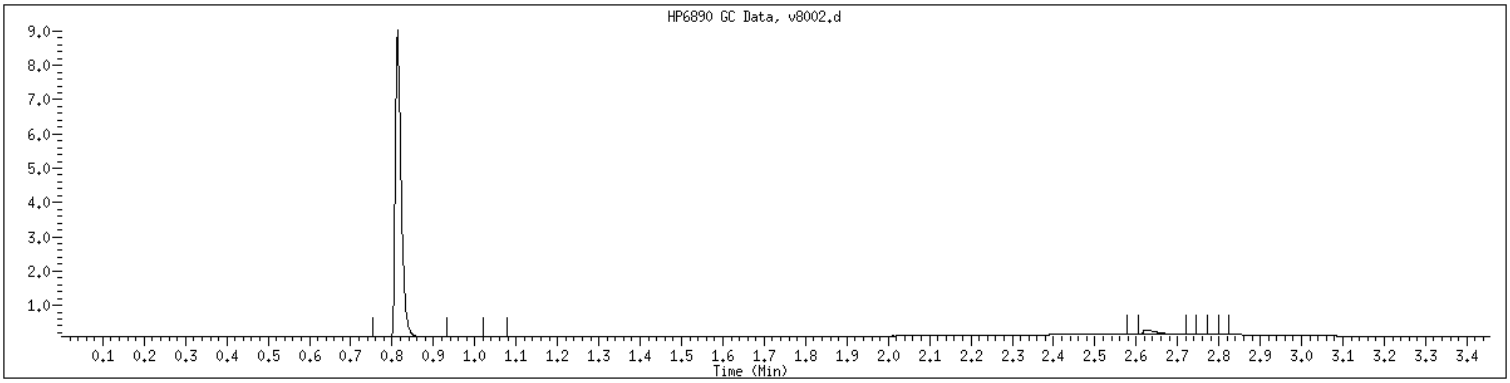
Column phase: GS-Q-30

Column diameter: 0.53



MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 1798426 SampleType : BLANK
Injection Date: 04/18/2018 10:33 Instrument : gcv8b.i
Operator : BMR
Sample Info : 1798426
Misc Info : 2125155
Method : /var/chem/gcv8b.i/2180418.b/CO2h.m
Dilution : 1.0
Matrix : WATER
Integrator : HP Genie Compound Sublist: co2




NO MANUAL INTEGRATIONS

1D

ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | LCS1798427 |
| Collect Date: | NA Time: NA | GCAL Sample ID: | 1798427 |
| Matrix: | Water % Moisture: NA | Instrument ID: | GCV8B |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/v8003 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | ID (mm) |
| Prep Final Vol.: | 5000 ( µL ) | Dilution Factor: | 1 Analyst: BMR |
| Prep Date: | | Analysis Date: | 04/18/18 Time: 1039 |
| Prep Batch: | | Analytical Batch: | 633677 |
| Prep Method: | | Analytical Method: | RSK-175 |

*CONCENTRATION UNITS: ug/L*

| *CAS* | *ANALYTE* | *RESULT* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| 124-38-9 | Carbon Dioxide | 8420 | | 127 | 386 | 900 |

FORM I ORG-1

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2180418.b/v8003.d
Lab Smp Id: 1798427 Client Smp ID: 1798427
Inj Date : 18-APR-2018 10:39
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1798427
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2180418.b/CO2h.m
Meth Date : 18-Apr-2018 13:24 bmr Quant Type: ESTD
Cal Date : 30-JUN-2017 10:14 Cal File: v8003.d
Als bottle: 1 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | CONCENTRATIONS | |
|---|---|---|---|---|---|---|
| | | | | | ON-COLUMN | FINAL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| 1 Carbon Dioxide | 1.032 | 1.035 | -0.003 | 37838462 | 8420.84 | 8420(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8b.i/2180418.b/v8003.d



Date : 18-APR-2018 10:39

Client ID: 1798427

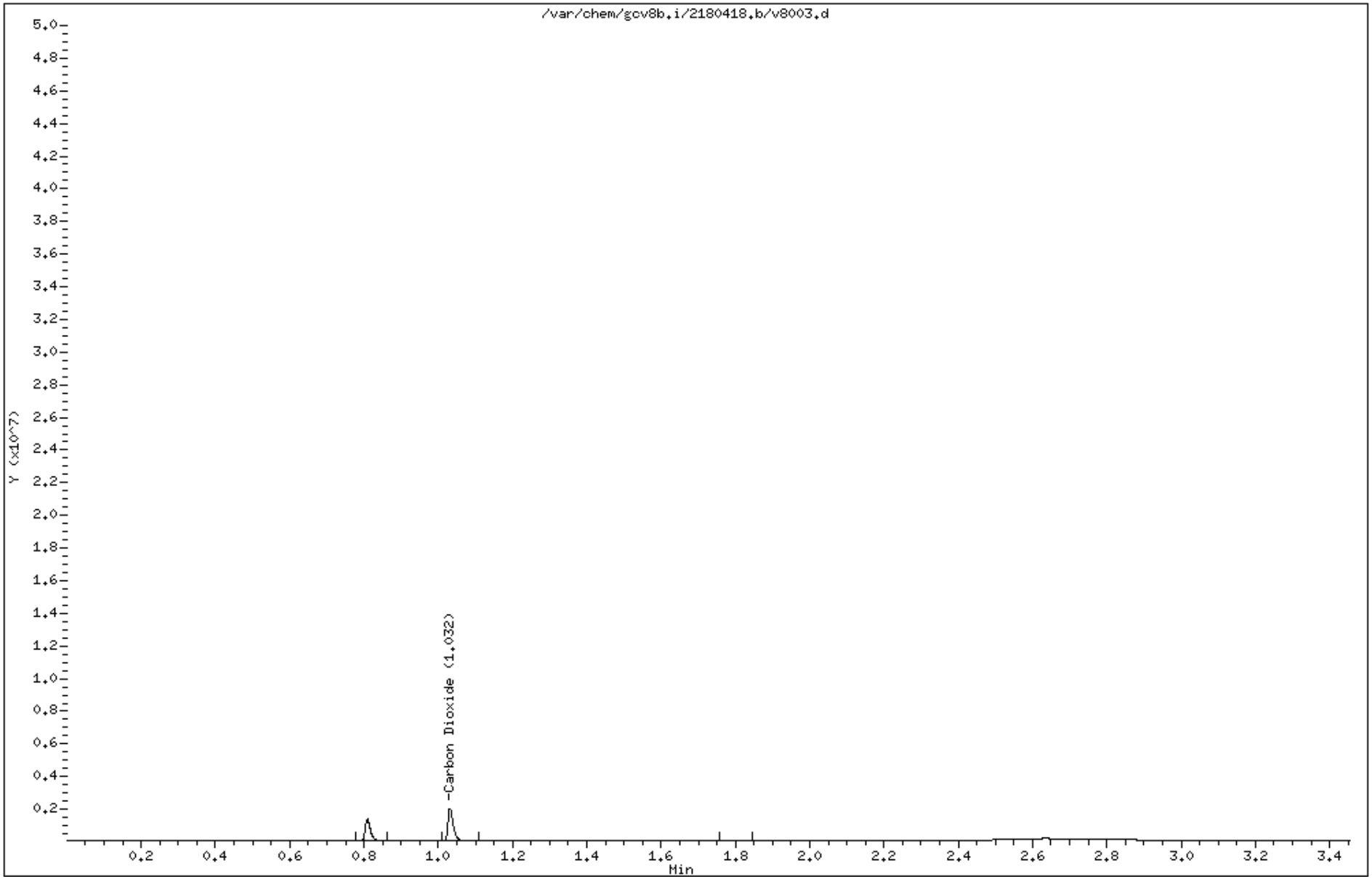
Instrument: gcv8b.i

Sample Info: 1798427

Operator: BMR

Column phase: GS-Q-30

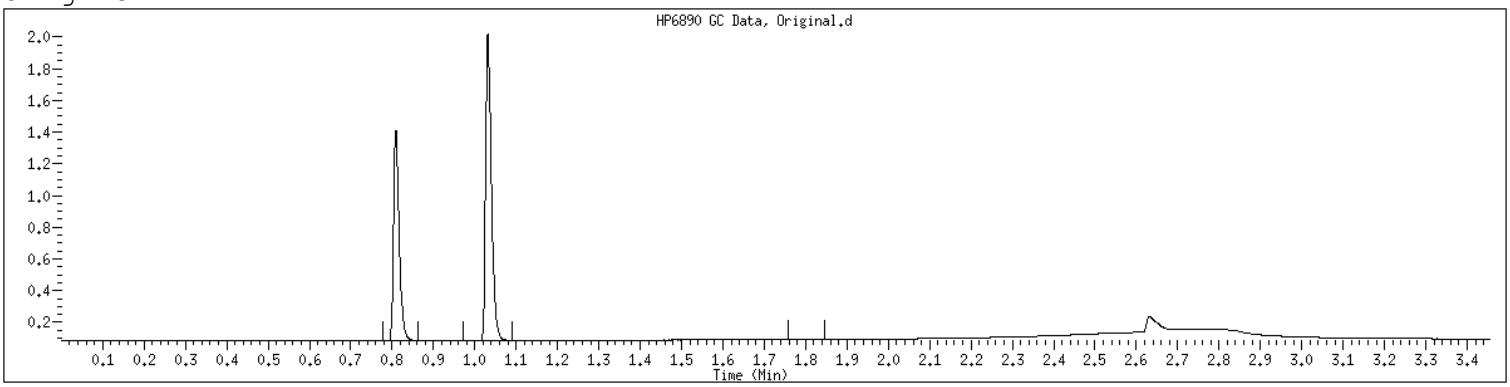
Column diameter: 0.53



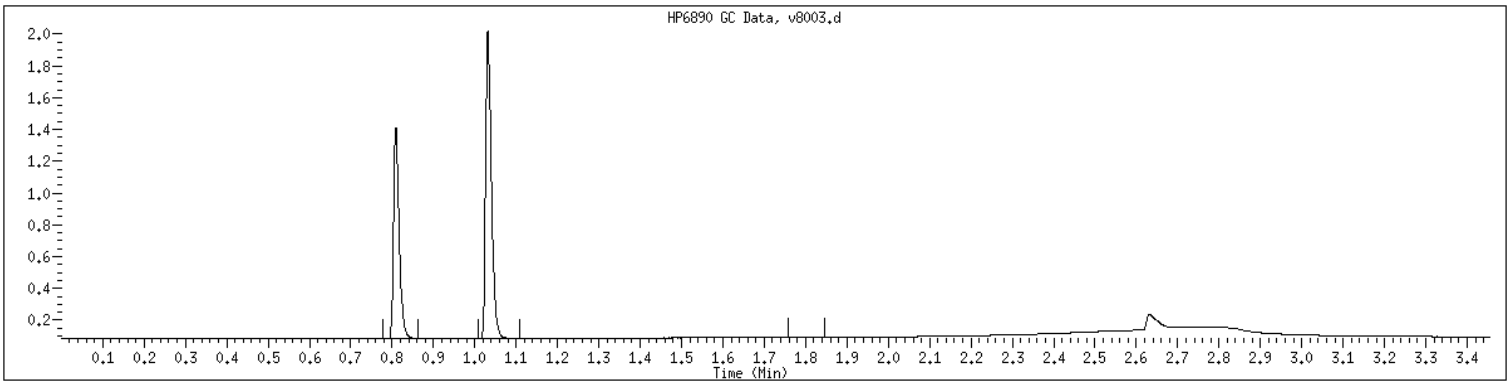
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 1798427 | SampleType | : LCS |
| Injection Date | : 04/18/2018 10:39 | Instrument | : gcv8b.i |
| Operator | : BMR | | |
| Sample Info | : 1798427 | | |
| Misc Info | : 2125155 | | |
| Method | : /var/chem/gcv8b.i/2180418.b/CO2h.m | | |
| Dilution | : 1.0 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : co2 |

Original




Final



1D

ORGANICS ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Client Sample ID: | LCSD1798428 |
| Collect Date: | NA Time: NA | GCAL Sample ID: | 1798428 |
| Matrix: | Water % Moisture: NA | Instrument ID: | GCV8B |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/v8004 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | ID (mm) |
| Prep Final Vol.: | 5000 ( µL ) | Dilution Factor: | 1 Analyst: BMR |
| Prep Date: | | Analysis Date: | 04/18/18 Time: 1045 |
| Prep Batch: | | Analytical Batch: | 633677 |
| Prep Method: | | Analytical Method: | RSK-175 |

*CONCENTRATION UNITS: ug/L*

| *CAS* | *ANALYTE* | *RESULT* | *Q* | *DL* | *LOD* | *LOQ* |
|---|---|---|---|---|---|---|
| 124-38-9 | Carbon Dioxide | 7450 | | 127 | 386 | 900 |

FORM I ORG-1

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2180418.b/v8004.d
Lab Smp Id: 1798428 Client Smp ID: 1798428
Inj Date : 18-APR-2018 10:45
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1798428
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2180418.b/CO2h.m
Meth Date : 18-Apr-2018 13:24 bmr Quant Type: ESTD
Cal Date : 30-JUN-2017 10:14 Cal File: v8003.d
Als bottle: 1 QC Sample: LCSD
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | CONCENTRATIONS | |
|---|---|---|---|---|---|---|
| | | | | | ON-COLUMN | FINAL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| 1 Carbon Dioxide | 1.033 | 1.035 | -0.002 | 33470542 | 7448.77 | 7450(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8b.i/2180418.b/v8004.d



Date : 18-APR-2018 10:45

Client ID: 1798428

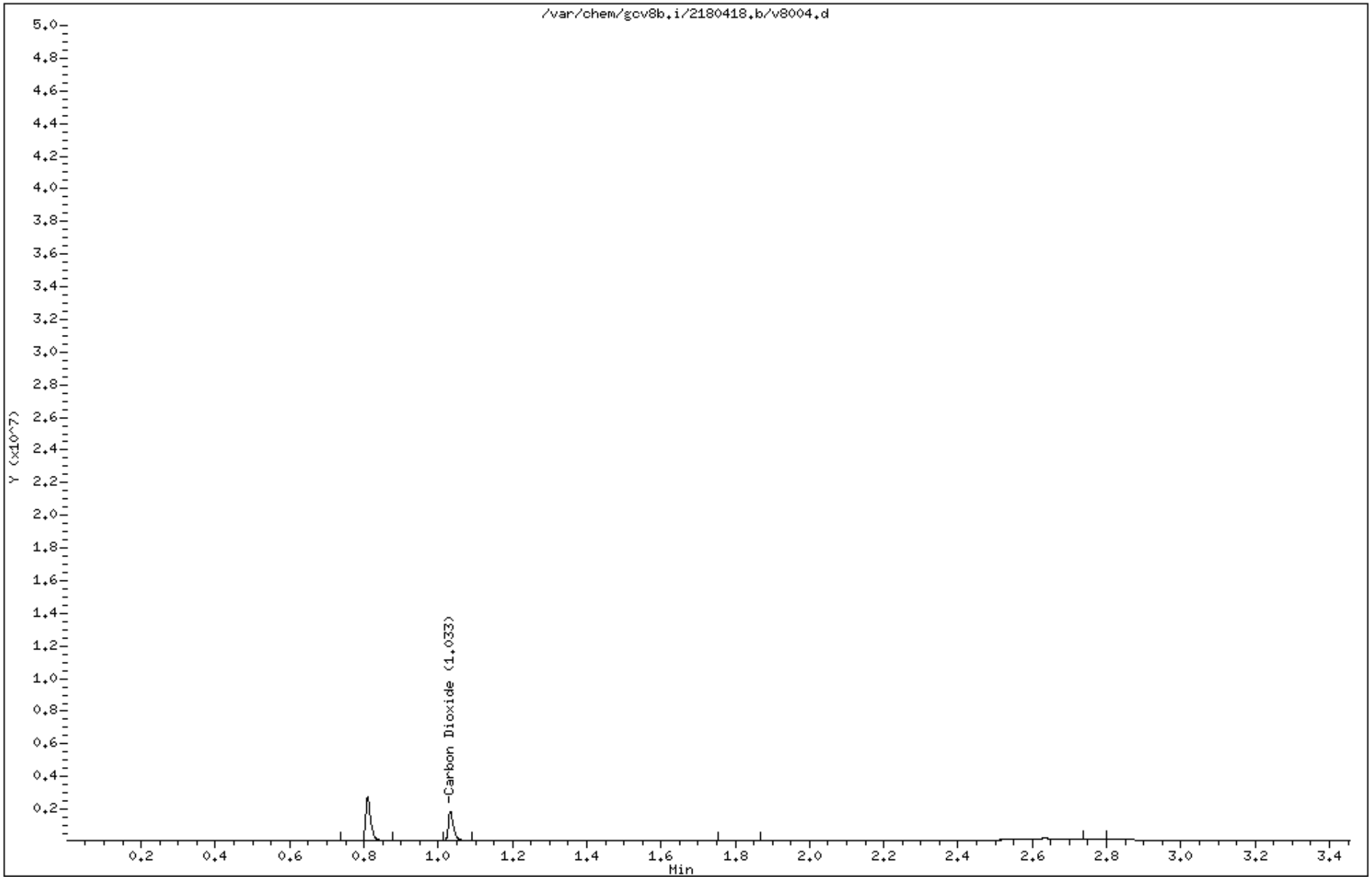
Instrument: gcv8b.i

Sample Info: 1798428

Operator: BMR

Column phase: GS-Q-30

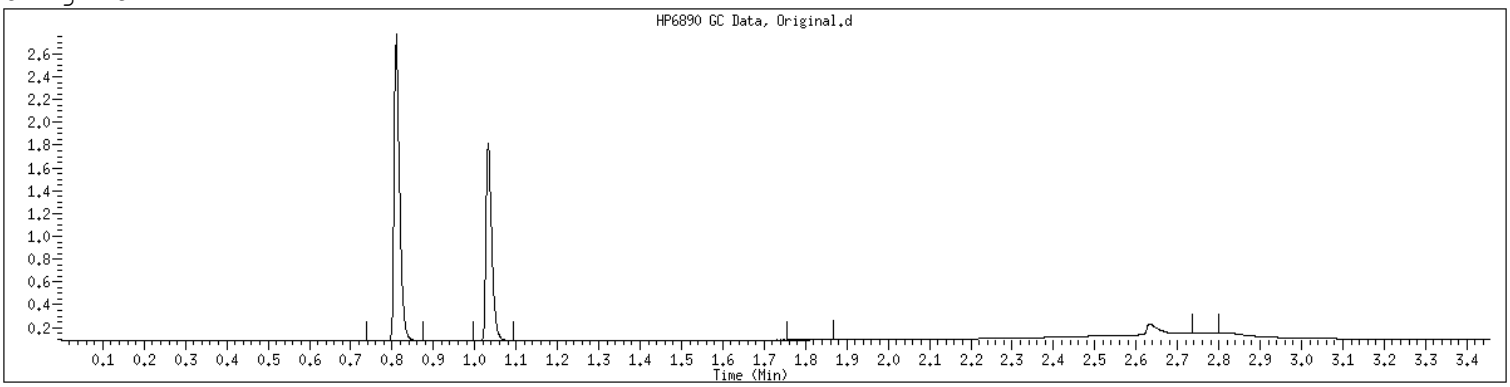
Column diameter: 0.53



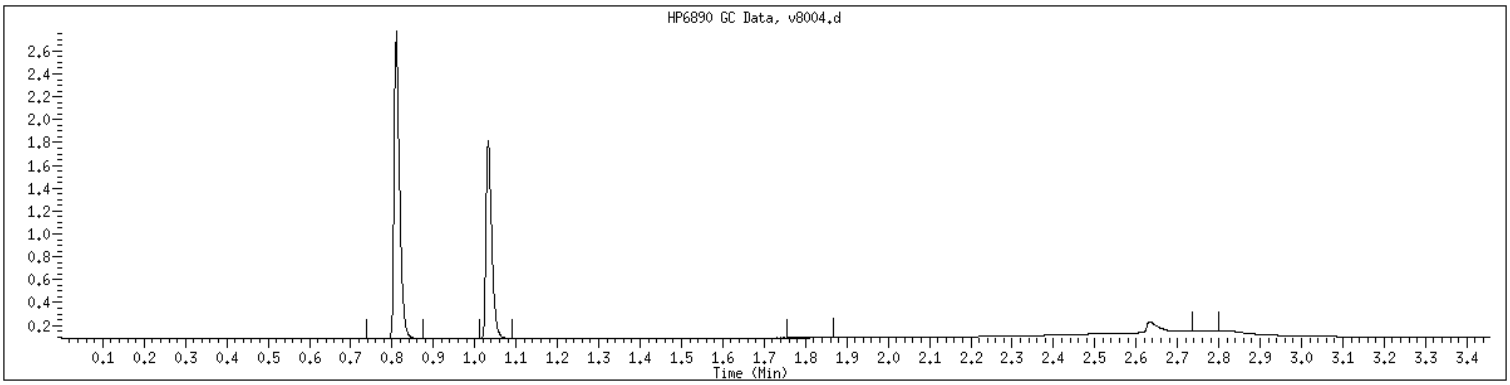
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 1798428 | SampleType | : LCSD |
| Injection Date | : 04/18/2018 10:45 | Instrument | : gcv8b.i |
| Operator | : BMR | | |
| Sample Info | : 1798428 | | |
| Misc Info | : 2125155 | | |
| Method | : /var/chem/gcv8b.i/2180418.b/CO2h.m | | |
| Dilution | : 1.0 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : co2 |

Original




Final



# Form 2E

# Surrogates

2E

ORGANIC SURROGATE RECOVERY

Report No: 218040620 Analytical Method: RSK-175

| *Client Sample ID* | *GCALSampleID* | SMC1 | Lo | Hi | # | SMC2 | Lo | Hi | # | SMC3 | Lo | Hi | # | SMC4 | Lo | Hi | # | *TOT OUT* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-13-11-21 | 21804062001 | 68 | 40 | 143 | | | | | | | | | | | | | | 0 |
| MW-13-11-21DL | 21804062001 | 0 | 40 | 143 | D | | | | | | | | | | | | | 0 |
| MW-11-02-21 | 21804062002 | 80 | 40 | 143 | | | | | | | | | | | | | | 0 |
| MW-11-02-21DL | 21804062002 | 0 | 40 | 143 | D | | | | | | | | | | | | | 0 |
| MW-11-06-21 | 21804062007 | 81 | 40 | 143 | | | | | | | | | | | | | | 0 |
| MW-11-06-21DL | 21804062007 | 0 | 40 | 143 | D | | | | | | | | | | | | | 0 |
| MW-11-10-21 | 21804062008 | 82 | 40 | 143 | | | | | | | | | | | | | | 0 |
| MW-11-10-21DL | 21804062008 | 0 | 40 | 143 | D | | | | | | | | | | | | | 0 |
| MW-11-01-21 | 21804062009 | 88 | 40 | 143 | | | | | | | | | | | | | | 0 |
| MW-11-01-21DL | 21804062009 | 0 | 40 | 143 | D | | | | | | | | | | | | | 0 |
| RD5-MW-01-21 | 21804062010 | 81 | 40 | 143 | | | | | | | | | | | | | | 0 |
| MB1798418 | 1798418 | 89 | 40 | 143 | | | | | | | | | | | | | | 0 |
| LCS1798419 | 1798419 | 70 | 40 | 143 | | | | | | | | | | | | | | 0 |
| LCSD1798420 | 1798420 | 70 | 40 | 143 | | | | | | | | | | | | | | 0 |
| | | | | | | | | | | | | | | | | | | 0 |
| | | | | | | | | | | | | | | | | | | 0 |

SMC 1 : Propene

SMC 2 :

SMC 3 :

SMC 4 :

# Column to be used to flag recovery limits

* Value outside of QC limits

D Surrogate diluted out

FORM II ORG-II

# Form 3E

# Spikes

3E

WATER ORGANICS LCS/LCSD RECOVERY

| | | | |
|---|---|---|---|
| Report No: | 218040620 | | |
| Prep Method: | NA | Prep Batch: | NA |
| Analytical Method: | RSK-175 | Analytical Batch: | 633675 |

***GCAL QC ID: 1798419***

| *ANALYTE* | *UNITS* | *SPIKE ADDED* | *SAMPLE RESULT* | *LCS RESULT* | *LCS % REC* | *#* | *QC LIMITS* |
|---|---|---|---|---|---|---|---|
| Ethane | ug/L | 3.28 | 0 | 2.91 | 89 | | 74 - 131 |
| Ethene | ug/L | 3.06 | 0 | 2.78 | 91 | | 72 - 133 |
| Methane | ug/L | 17.5 | 0 | 14.5 | 83 | | 73 - 125 |

***GCAL QC ID: 1798420***

| *ANALYTE* | *UNITS* | *SPIKE ADDED* | *LCSD RESULT* | *LCSD % REC* | *#* | *% RPD* | *#* | *QC LIMITS REC* | *QC LIMITS RPD* |
|---|---|---|---|---|---|---|---|---|---|
| Ethane | ug/L | 3.28 | 2.91 | 89 | | 0 | | 74 - 131 | 0 - 30 |
| Ethene | ug/L | 3.06 | 2.76 | 90 | | .7 | | 72 - 133 | 0 - 30 |
| Methane | ug/L | 17.5 | 14.5 | 83 | | 0 | | 73 - 125 | 0 - 30 |

RPD : 0 out of 3 outside limits

Spike Recovery: 0 out of 6 outside limits

# Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III ORG-1

3E

WATER ORGANICS LCS/LCSD RECOVERY

| | | | |
|---|---|---|---|
| Report No: | 218040620 | | |
| Prep Method: | NA | Prep Batch: | NA |
| Analytical Method: | RSK-175 | Analytical Batch: | 633677 |

***GCAL QC ID: 1798427***

| *ANALYTE* | *UNITS* | *SPIKE ADDED* | *SAMPLE RESULT* | *LCS RESULT* | *LCS % REC* | *#* | *QC LIMITS* |
|---|---|---|---|---|---|---|---|
| Carbon Dioxide | ug/L | 8700 | 0 | 8420 | 97 | | 80 - 122 |

***GCAL QC ID: 1798428***

| *ANALYTE* | *UNITS* | *SPIKE ADDED* | *LCSD RESULT* | *LCSD % REC* | *#* | *% RPD* | *#* | *QC LIMITS REC* | *QC LIMITS RPD* |
|---|---|---|---|---|---|---|---|---|---|
| Carbon Dioxide | ug/L | 8700 | 7450 | 86 | | 12 | | 80 - 122 | 0 - 30 |

RPD : 0 out of 1 outside limits

Spike Recovery: 0 out of 2 outside limits

# Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III ORG-1

# Form 4C

# Method Blanks

4C

ORGANIC METHOD BLANK SUMMARY

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Method Blank ID: | 1798426 |
| Matrix: | Water | Instrument ID: | GCV8B |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/v8002 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | ID (mm) |
| Prep Final Vol.: | ( µL ) | Dilution Factor: | 1 Analyst: BMR |
| Prep Date: | | Analysis Date: | 04/18/18 Time: 1033 |
| Prep Batch: | | Analytical Batch: | 633677 |
| Prep Method: | | Analytical Method: | RSK-175 |

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD

| | CLIENT SAMPLE ID | GCAL SAMPLE ID | DATE ANALYZED | TIME ANALYZED | INSTRUMENT ID |
|---|---|---|---|---|---|
| 1. | LCS1798427 | 1798427 | 04/18/18 | 1039 | GCV8B |
| 2. | LCSD1798428 | 1798428 | 04/18/18 | 1045 | GCV8B |
| 3. | MW-13-11-21 | 21804062001 | 04/18/18 | 1127 | GCV8B |
| 4. | MW-11-02-21 | 21804062002 | 04/18/18 | 1149 | GCV8B |
| 5. | MW-11-06-21 | 21804062007 | 04/18/18 | 1206 | GCV8B |
| 6. | MW-11-10-21 | 21804062008 | 04/18/18 | 1228 | GCV8B |
| 7. | MW-11-01-21 | 21804062009 | 04/18/18 | 1246 | GCV8B |
| 8. | RD5-MW-01-21 | 21804062010 | 04/18/18 | 1309 | GCV8B |

4C

ORGANIC METHOD BLANK SUMMARY

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Method Blank ID: | 1798418 |
| Matrix: | Water | Instrument ID: | GCV8A |
| Sample Amt: | 5 mL | Lab File ID: | 2180418/v8005 |
| Injection Vol.: | 1.0 ( µL ) | GC Column: | GS-Q 30 ID .53 (mm) |
| Prep Final Vol.: | ( µL ) | Dilution Factor: | 1 Analyst: BMR |
| Prep Date: | | Analysis Date: | 04/18/18 Time: 1059 |
| Prep Batch: | | Analytical Batch: | 633675 |
| Prep Method: | | Analytical Method: | RSK-175 |

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD

| | CLIENT SAMPLE ID | GCAL SAMPLE ID | DATE ANALYZED | TIME ANALYZED | INSTRUMENT ID |
|---|---|---|---|---|---|
| 1. | LCS1798419 | 1798419 | 04/18/18 | 1104 | GCV8A |
| 2. | LCSD1798420 | 1798420 | 04/18/18 | 1110 | GCV8A |
| 3. | MW-13-11-21 | 21804062001 | 04/18/18 | 1123 | GCV8A |
| 4. | MW-13-11-21DL | 21804062001DL | 04/18/18 | 1127 | GCV8A |
| 5. | MW-11-02-21 | 21804062002 | 04/18/18 | 1137 | GCV8A |
| 6. | MW-11-02-21DL | 21804062002DL | 04/18/18 | 1143 | GCV8A |
| 7. | MW-11-06-21 | 21804062007 | 04/18/18 | 1154 | GCV8A |
| 8. | MW-11-06-21DL | 21804062007DL | 04/18/18 | 1200 | GCV8A |
| 9. | MW-11-10-21 | 21804062008 | 04/18/18 | 1216 | GCV8A |
| 10. | MW-11-10-21DL | 21804062008DL | 04/18/18 | 1222 | GCV8A |
| 11. | MW-11-01-21 | 21804062009 | 04/18/18 | 1235 | GCV8A |
| 12. | MW-11-01-21DL | 21804062009DL | 04/18/18 | 1241 | GCV8A |
| 13. | RD5-MW-01-21 | 21804062010 | 04/18/18 | 1302 | GCV8A |

# Form 6E

# Calibrations

6E

ORGANICS INITIAL CALIBRATION DATA

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | **GCALID - FileID - Conc** | 1201 ~ 2170718/v8001 ~ mix | |
| Report No: | 218040620 | Instrument ID: | GCV8A | 1202 ~ 2170718/v8002 ~ mix | 1203 ~ 2170718/v8003 ~ mix | |
| GC Column: | GS-Q 30 ID .53 (mm) | Analyst: | BMR | 1204 ~ 2170718/v8004 ~ mix | 1205 ~ 2170718/v8005 ~ mix | |
| Calib. Date 1: | 07/18/17 Time 1: 1034 | Analytical Batch: | 614388 | | | |
| Calib. Date 2: | 07/18/17 Time 2: 1116 | Analytical Method: | RSK-175 | | | |

| *ANALYTE* | *1201* | *1202* | *1203* | *1204* | *1205* | *1206* | *1207* | *1208* | *1209* | $\overline{RF}$ / *b* / *A* | *m* / *B* | *C* | *FIT* | *TYPE* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ethane | 1450000 | 1574000 | 1536000 | 1368000 | 1154000 | | | | | 1416000 | | | 11.78 | A |
| Ethene | 1238000 | 1193000 | 1193000 | 1096000 | 876600 | | | | | 1119000 | | | 12.97 | A |
| Methane | 2005000 | 1655000 | 1637000 | 1506000 | 1252000 | | | | | 1611000 | | | 16.93 | A |
| Propene | 746900 | 742600 | 760400 | 688900 | 570700 | | | | | 701900 | | | 11.14 | A |

FIT = %RSD For Average Curve And Calibration Coefficent For Linear And Quadratic

Curve Types: A - Averged, L - Linear Regression, W - Weighted Linear, Q - Quadratic

For curve types L and Q, the RRF and RSP (Response) are shown on separate lines to allow for evaluation against minimum RRF

$\overline{RF}$ = Mean Response Factor For Average Curve

m,b = Slope and Intercept For Linear Curve

A,B,C = Coefficents For Quadratic Curve

FORM V I SVOA

GCAL, Inc.

Data file : /var/chem/gcv8a.i/2170718.b/v8001.d
Lab Smp Id: 1201 Client Smp ID: 1201
Inj Date : 18-JUL-2017 10:34
Operator : BMR Inst ID: gcv8a.i
Smp Info : 1201
Misc Info : 2124730/2124041/2122172
Comment :
Method : /var/chem/gcv8a.i/2170718.b/RSK.m
Meth Date : 19-Jul-2017 09:57 bmr Quant Type: ESTD
Cal Date : 18-JUL-2017 10:34 Cal File: v8001.d
Als bottle: 1 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: meae.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | AMOUNTS | |
|---|---|---|---|---|---|---|
| | | | | | CAL-AMT | ON-COL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| 1 METHANE | 0.796 | 0.796 | 0.000 | 2105369 | 1.05000 | 1.31(M1) |
| 2 ETHYLENE | 1.196 | 1.196 | 0.000 | 346688 | 0.28000 | 0.310(M2) |
| 3 Acetylene | 1.304 | 1.304 | 0.000 | 3971934 | 12.2000 | 12.3(M2) |
| 4 ETHANE | 1.381 | 1.381 | 0.000 | 304463 | 0.21000 | 0.215(M2) |
| $ 5 PROPENE | 2.481 | 2.481 | 0.000 | 4705564 | 6.30000 | 6.70(M2) |

QC Flag Legend

M1- Compound response manually integrated because
Target system did not integrate.
M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8a.i/2170718.b/v8001.d



Date : 18-JUL-2017 10:34

Client ID: 1201

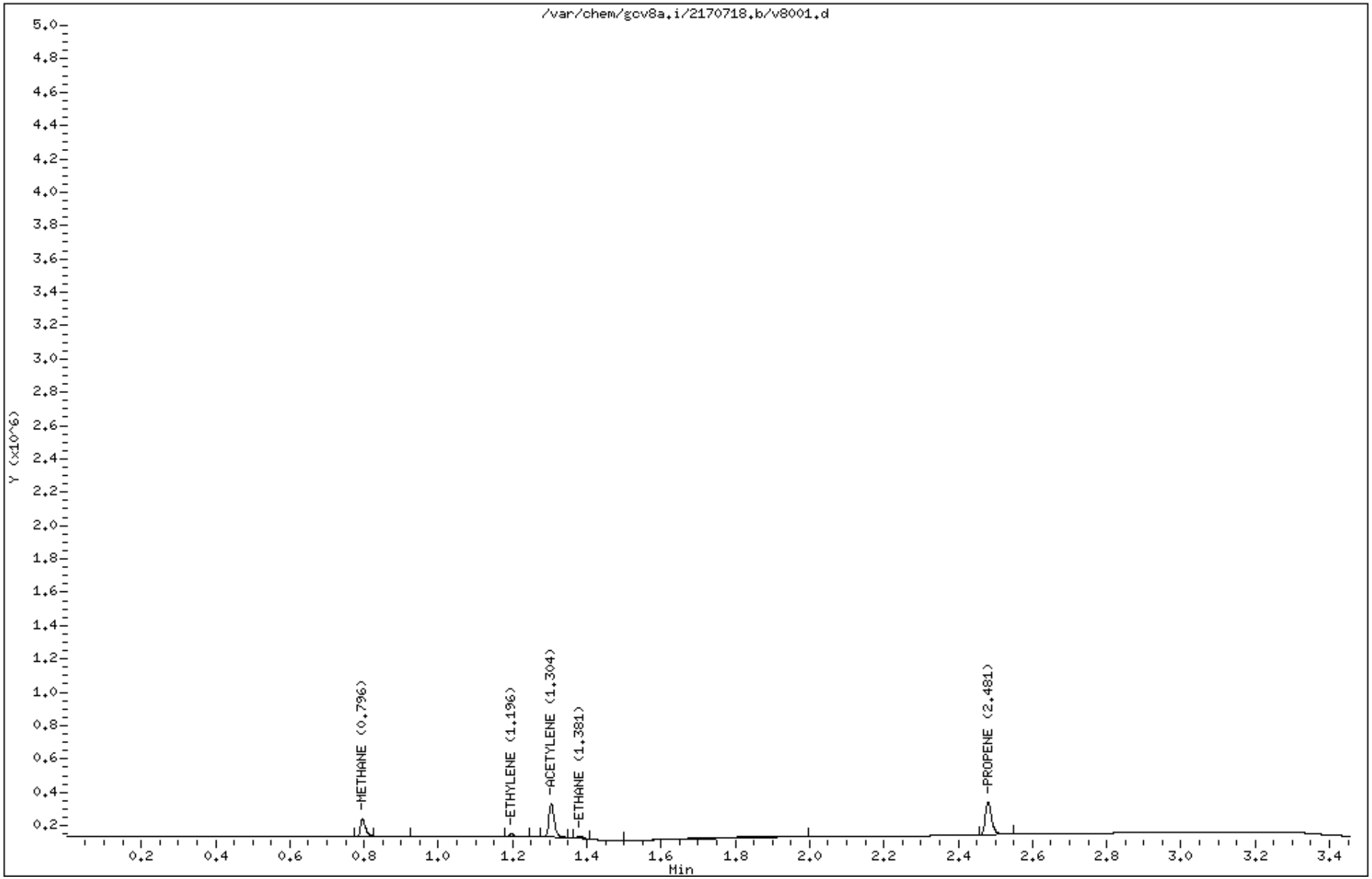
Instrument: gcv8a.i

Sample Info: 1201

Operator: BMR

Column phase: GS-Q-30M

Column diameter: 0.53

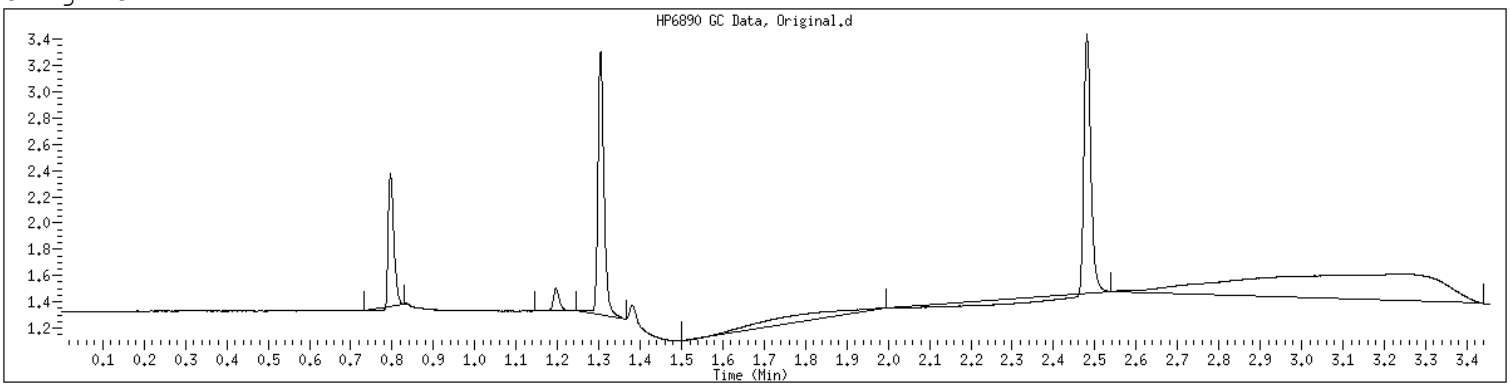


Report Date: 07/19/2017 09:57

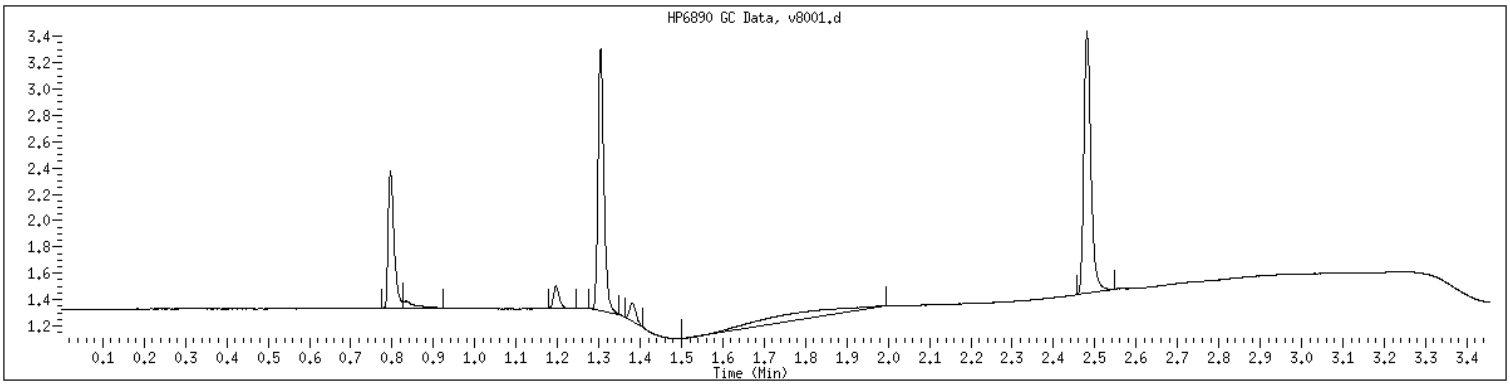
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 1201 | SampleType | : CALIB_1 |
| Injection Date | : 07/18/2017 10:34 | Instrument | : gcv8a.i |
| Operator | : BMR | | |
| Sample Info | : 1201 | | |
| Misc Info | : 2124730/2124041/2122172 | | |
| Method | : /var/chem/gcv8a.i/2170718.b/RSK.m | | |
| Dilution | : 1.00 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : meae |

Original




Final



GCAL, Inc.

Data file : /var/chem/gcv8a.i/2170718.b/v8002.d
Lab Smp Id: 1202 Client Smp ID: 1202
Inj Date : 18-JUL-2017 10:47
Operator : BMR Inst ID: gcv8a.i
Smp Info : 1202
Misc Info : 2124730/2124041/2122172
Comment :
Method : /var/chem/gcv8a.i/2170718.b/RSK.m
Meth Date : 19-Jul-2017 09:57 bmr Quant Type: ESTD
Cal Date : 18-JUL-2017 10:47 Cal File: v8002.d
Als bottle: 1 Calibration Sample, Level: 2
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: meae.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | AMOUNTS | |
|---|---|---|---|---|---|---|
| | | | | | CAL-AMT | ON-COL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| 1 METHANE | 0.790 | 0.790 | 0.000 | 8723172 | 5.27000 | 5.41(M2) |
| 2 ETHYLENE | 1.194 | 1.194 | 0.000 | 1693831 | 1.42000 | 1.51(M2) |
| 3 Acetylene | 1.302 | 1.302 | 0.000 | 20722831 | 61.1000 | 64.4(M2) |
| 4 ETHANE | 1.379 | 1.379 | 0.000 | 1668786 | 1.06000 | 1.18(M2) |
| $ 5 PROPENE | 2.483 | 2.483 | 0.000 | 23393170 | 31.5000 | 33.3(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8a.i/2170718.b/v8002.d



Date : 18-JUL-2017 10:47

Client ID: 1202

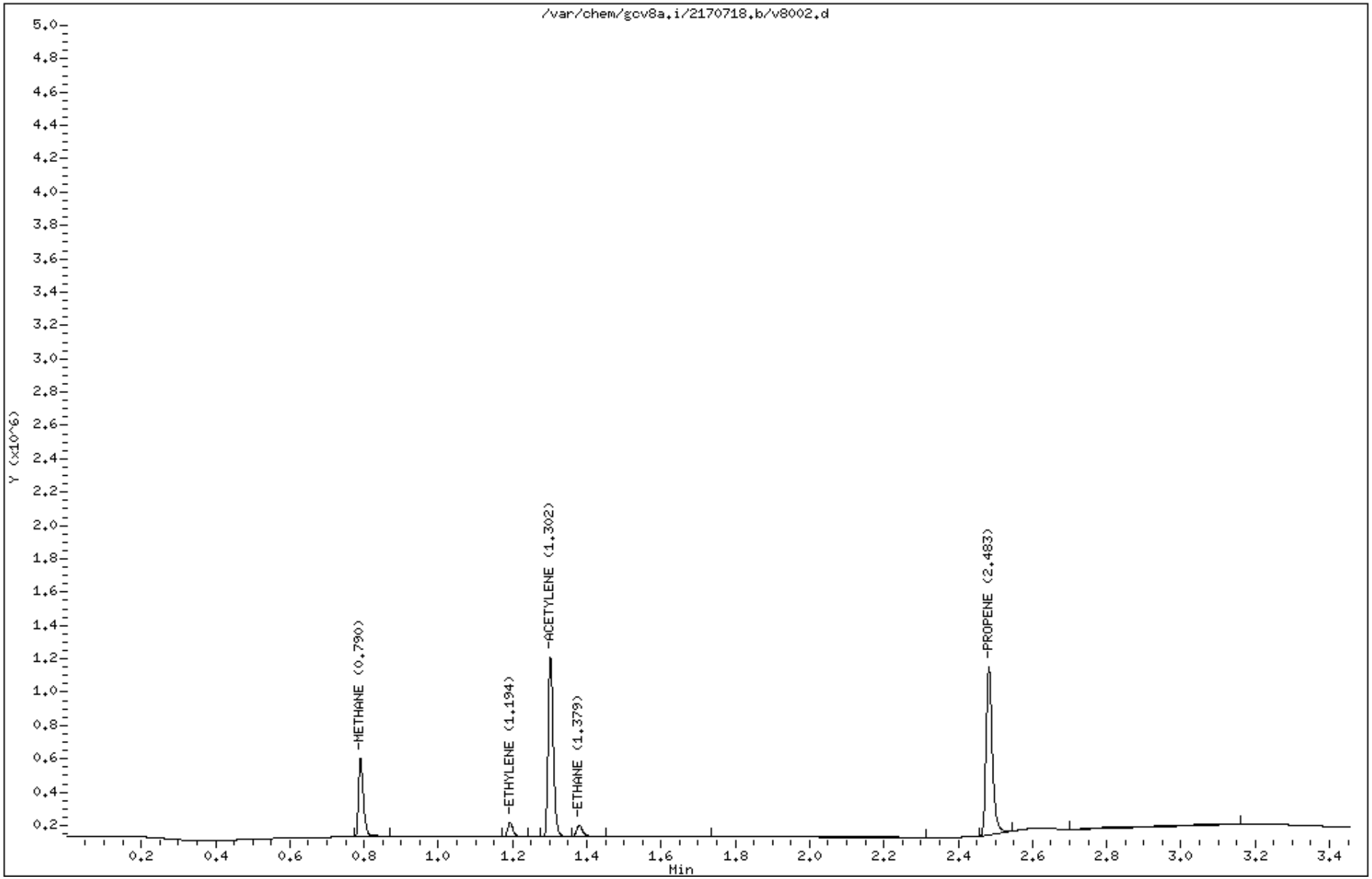
Instrument: gcv8a.i

Sample Info: 1202

Operator: BMR

Column phase: GS-Q-30M

Column diameter: 0.53

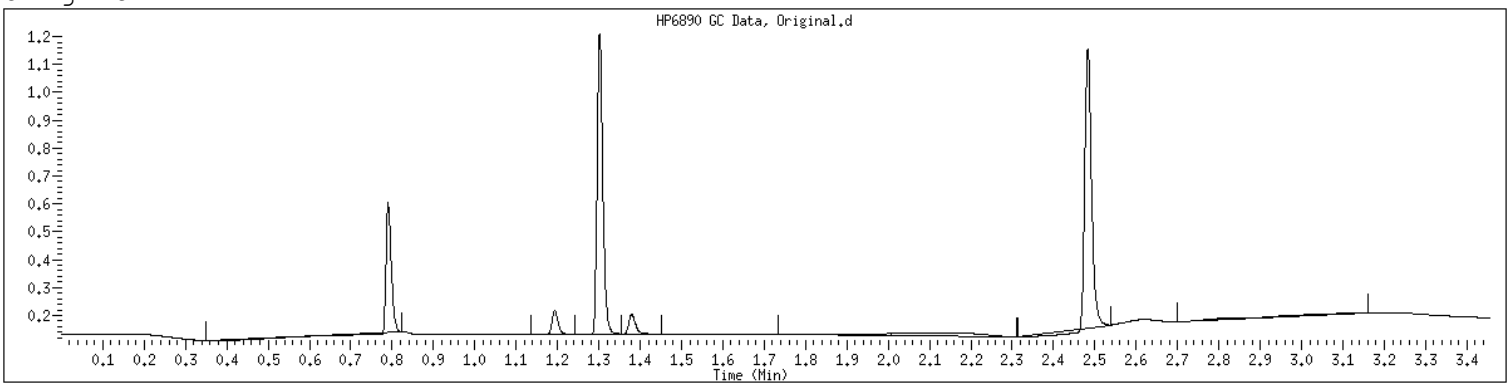


Report Date: 07/19/2017 09:57

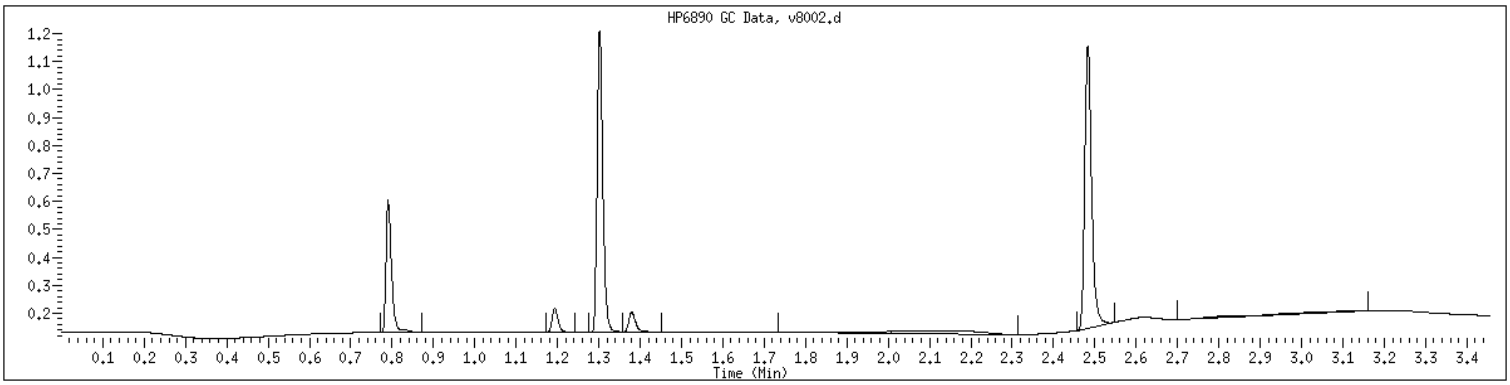
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 1202 | SampleType | : CALIB_2 |
| Injection Date | : 07/18/2017 10:47 | Instrument | : gcv8a.i |
| Operator | : BMR | | |
| Sample Info | : 1202 | | |
| Misc Info | : 2124730/2124041/2122172 | | |
| Method | : /var/chem/gcv8a.i/2170718.b/RSK.m | | |
| Dilution | : 1.00 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : meae |

Original




Final



GCAL, Inc.

Data file : /var/chem/gcv8a.i/2170718.b/v8003.d
Lab Smp Id: 1203 Client Smp ID: 1203
Inj Date : 18-JUL-2017 10:56
Operator : BMR Inst ID: gcv8a.i
Smp Info : 1203
Misc Info : 2124730/2124041/2122172
Comment :
Method : /var/chem/gcv8a.i/2170718.b/RSK.m
Meth Date : 19-Jul-2017 09:57 bmr Quant Type: ESTD
Cal Date : 18-JUL-2017 10:56 Cal File: v8003.d
Als bottle: 1 Calibration Sample, Level: 3
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: meae.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | AMOUNTS | |
|---|---|---|---|---|---|---|
| | | | | | CAL-AMT | ON-COL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| 1 METHANE | 0.790 | 0.790 | 0.000 | 17186292 | 10.5000 | 10.7(M2) |
| 2 ETHYLENE | 1.193 | 1.193 | 0.000 | 3375681 | 2.83000 | 3.02(M2) |
| 3 Acetylene | 1.302 | 1.302 | 0.000 | 41495265 | 122.000 | 129(M2) |
| 4 ETHANE | 1.379 | 1.379 | 0.000 | 3256747 | 2.12000 | 2.30(M2) |
| $ 5 PROPENE | 2.483 | 2.483 | 0.000 | 47906988 | 63.0000 | 68.3(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8a.i/2170718.b/v8003.d



Date : 18-JUL-2017 10:56

Client ID: 1203

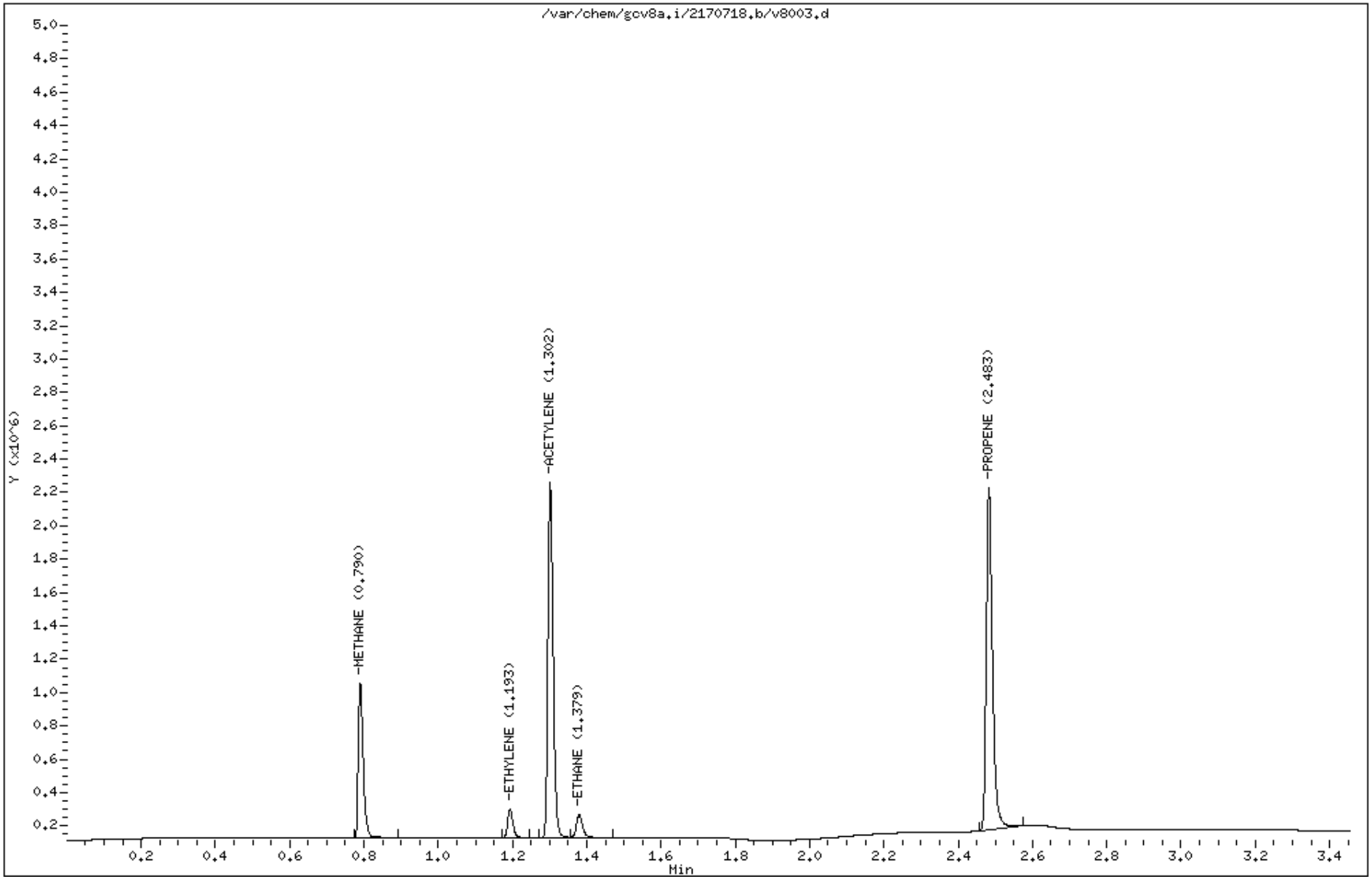
Instrument: gcv8a.i

Sample Info: 1203

Operator: BMR

Column phase: GS-Q-30M

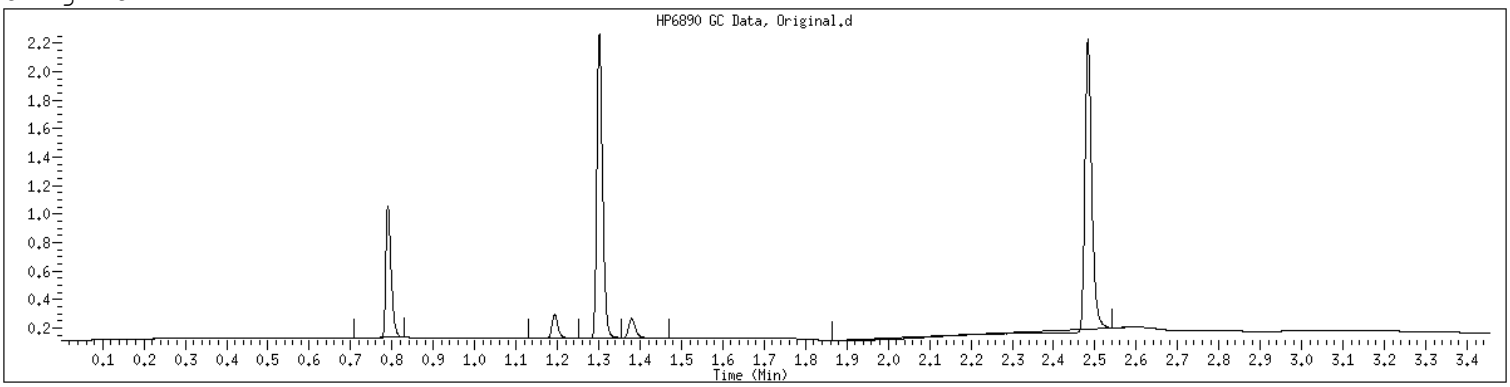
Column diameter: 0.53



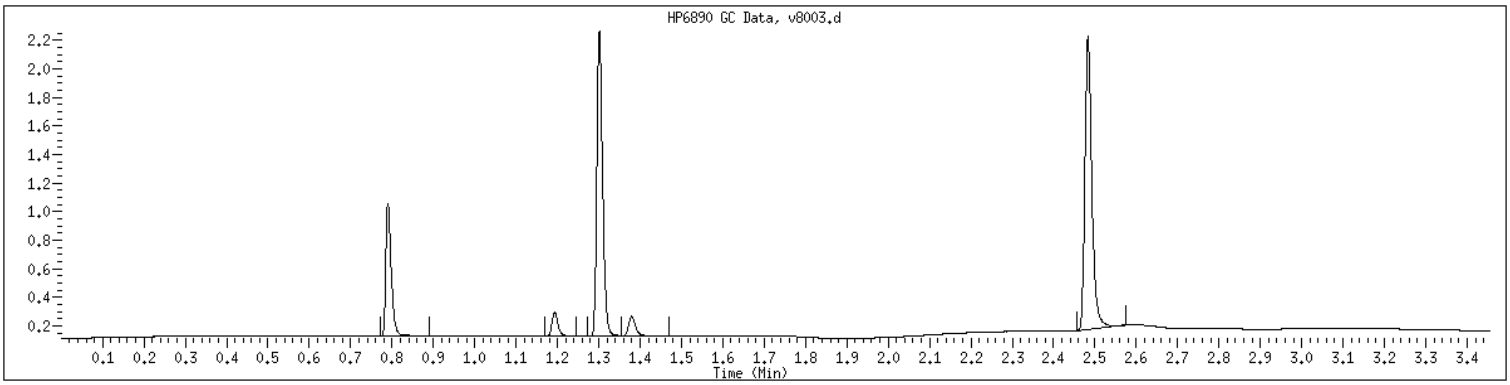
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 1203 SampleType : CALIB_3
Injection Date: 07/18/2017 10:56 Instrument : gcv8a.i
Operator : BMR
Sample Info : 1203
Misc Info : 2124730/2124041/2122172
Method : /var/chem/gcv8a.i/2170718.b/RSK.m
Dilution : 1.00
Matrix : WATER
Integrator : HP Genie Compound Sublist: meae

Original




Final



GCAL, Inc.

Data file : /var/chem/gcv8a.i/2170718.b/v8004.d
Lab Smp Id: 1204 Client Smp ID: 1204
Inj Date : 18-JUL-2017 11:07
Operator : BMR Inst ID: gcv8a.i
Smp Info : 1204
Misc Info : 2124730/2124041/2122172
Comment :
Method : /var/chem/gcv8a.i/2170718.b/RSK.m
Meth Date : 19-Jul-2017 09:57 bmr Quant Type: ESTD
Cal Date : 18-JUL-2017 11:07 Cal File: v8004.d
Als bottle: 1 Calibration Sample, Level: 4
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: meae.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | AMOUNTS | |
|---|---|---|---|---|---|---|
| | | | | | CAL-AMT | ON-COL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| 1 METHANE | 0.786 | 0.786 | 0.000 | 31777808 | 21.1000 | 19.7(M2) |
| 2 ETHYLENE | 1.190 | 1.190 | 0.000 | 6203715 | 5.66000 | 5.54(M2) |
| 3 Acetylene | 1.298 | 1.298 | 0.000 | 72466659 | 244.000 | 225(M2) |
| 4 ETHANE | 1.376 | 1.376 | 0.000 | 5812618 | 4.25000 | 4.10(M2) |
| $ 5 PROPENE | 2.481 | 2.481 | 0.000 | 86795497 | 126.000 | 124(AM2) |

QC Flag Legend

A - Target compound detected but, quantitated amount
exceeded maximum amount.
M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8a.i/2170718.b/v8004.d

Page 1

Date : 18-JUL-2017 11:07

Client ID: 1204

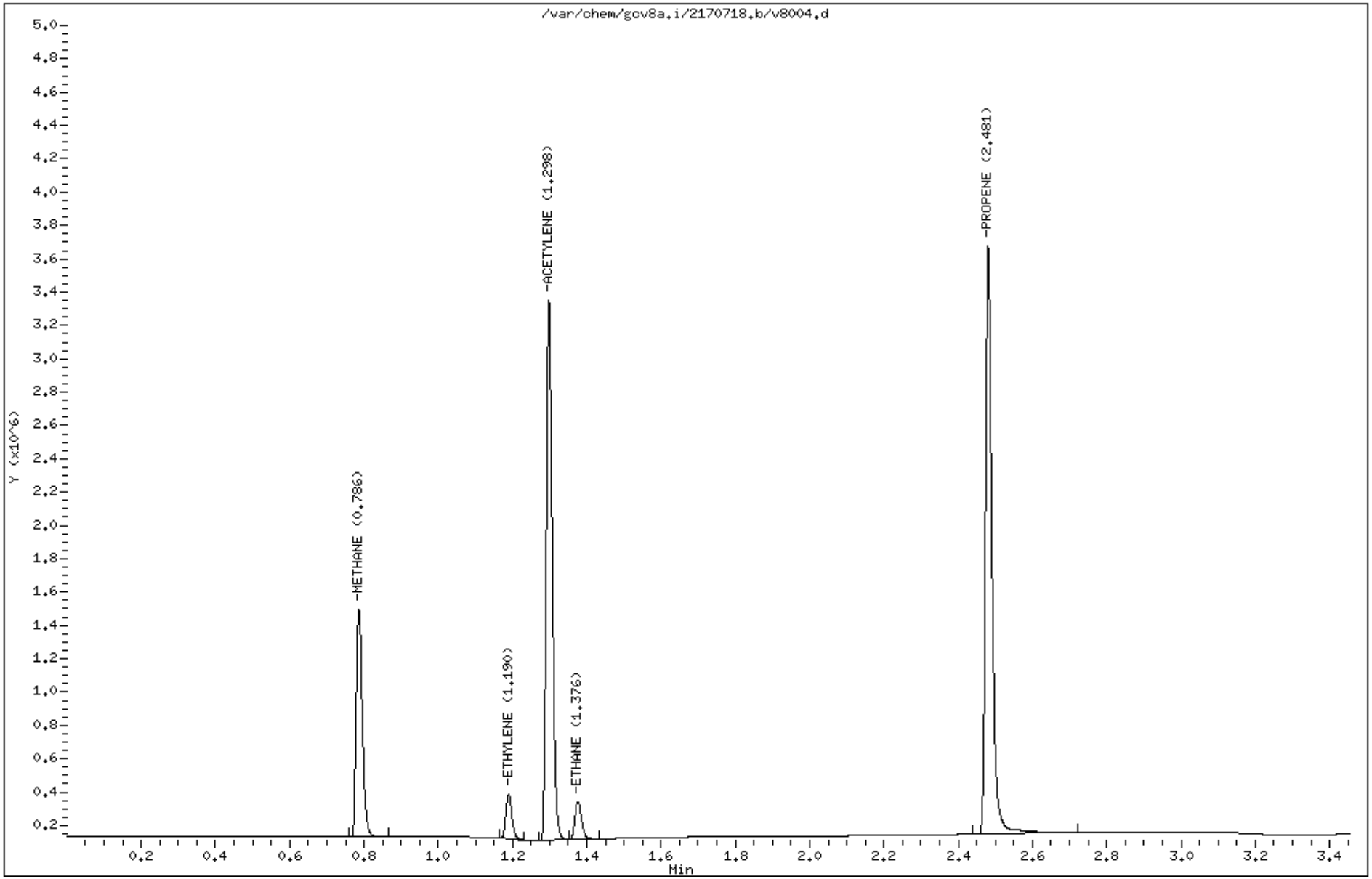
Instrument: gcv8a.i

Sample Info: 1204

Operator: BMR

Column phase: GS-Q-30M

Column diameter: 0.53

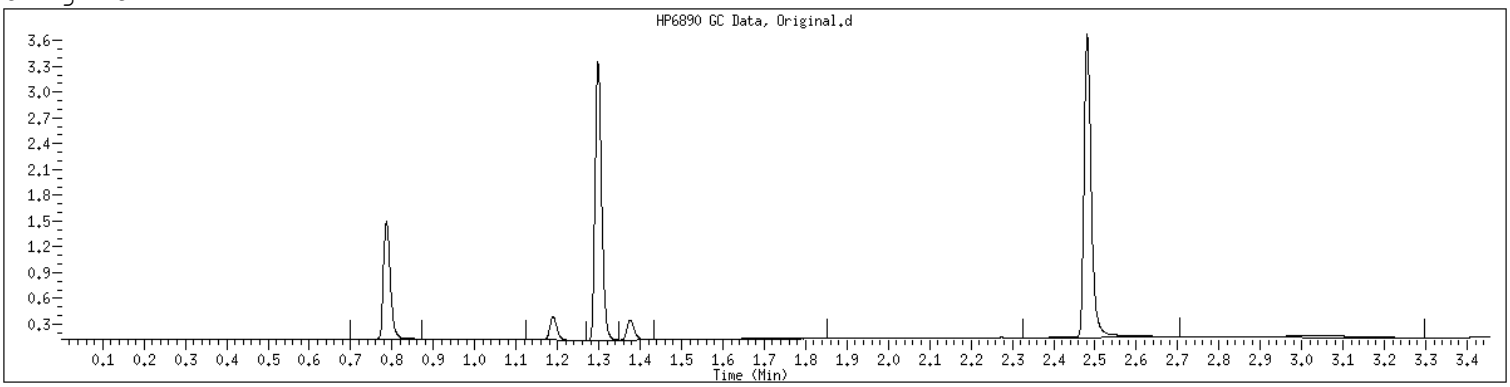


Report Date: 07/19/2017 09:57

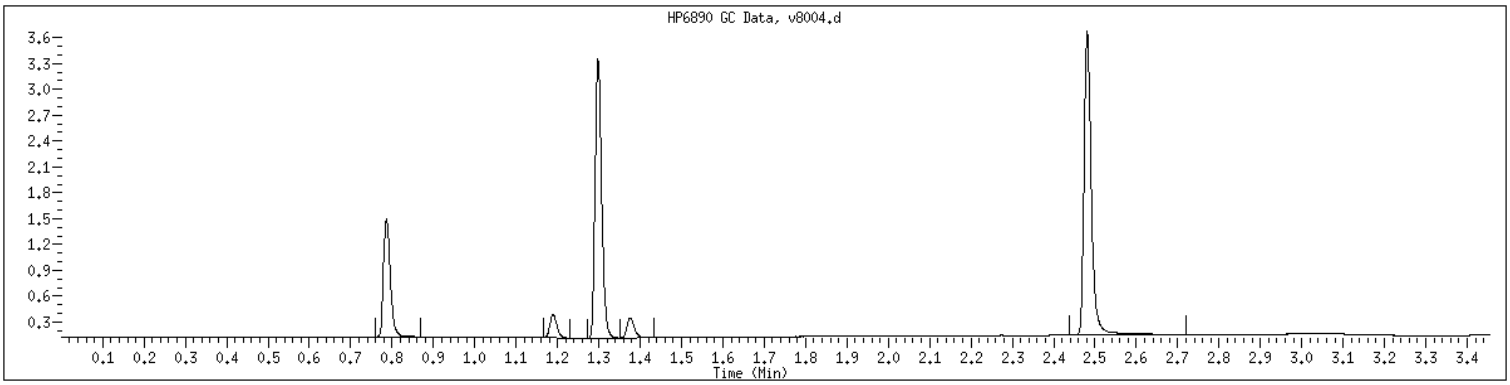
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 1204 | SampleType | : CALIB_4 |
| Injection Date | : 07/18/2017 11:07 | Instrument | : gcv8a.i |
| Operator | : BMR | | |
| Sample Info | : 1204 | | |
| Misc Info | : 2124730/2124041/2122172 | | |
| Method | : /var/chem/gcv8a.i/2170718.b/RSK.m | | |
| Dilution | : 1.00 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : meae |

Original




Final



GCAL, Inc.

Data file : /var/chem/gcv8a.i/2170718.b/v8005.d
Lab Smp Id: 1205 Client Smp ID: 1205
Inj Date : 18-JUL-2017 11:16
Operator : BMR Inst ID: gcv8a.i
Smp Info : 1205
Misc Info : 2124730/2124041/2122172
Comment :
Method : /var/chem/gcv8a.i/2170718.b/RSK.m
Meth Date : 19-Jul-2017 09:57 bmr Quant Type: ESTD
Cal Date : 18-JUL-2017 11:21 Cal File: v8006.d
Als bottle: 1 Calibration Sample, Level: 5
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: me&e.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | | AMOUNTS | |
|---|---|---|---|---|---|---|---|
| | | | | | | CAL-AMT | ON-COL |
| | Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| | 1 METHANE | 0.781 | 0.781 | 0.000 | 65984979 | 52.7000 | 41.0(M2) |
| | 2 ETHYLENE | 1.187 | 1.187 | 0.000 | 12448241 | 14.2000 | 11.1(M2) |
| | 4 ETHANE | 1.374 | 1.374 | 0.000 | 12235708 | 10.6000 | 8.64(M2) |
| $ | 5 PROPENE | 2.480 | 2.480 | 0.000 | 179774914 | 315.000 | 256(AM2) |

QC Flag Legend

A - Target compound detected but, quantitated amount
exceeded maximum amount.
M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8a.i/2170718.b/v8005.d



Date : 18-JUL-2017 11:16

Client ID: 1205

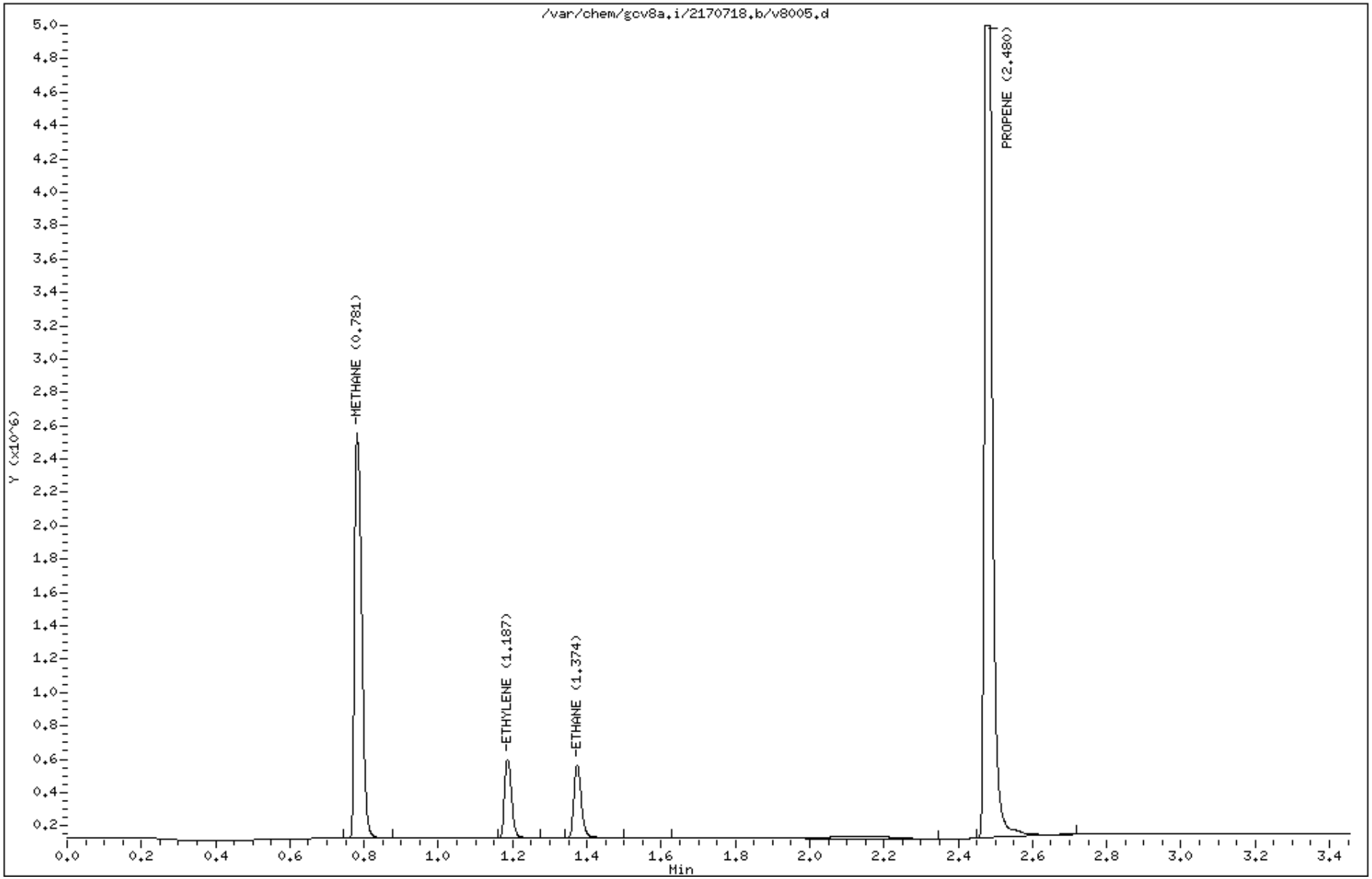
Instrument: gcv8a.i

Sample Info: 1205

Operator: BMR

Column phase: GS-Q-30M

Column diameter: 0.53

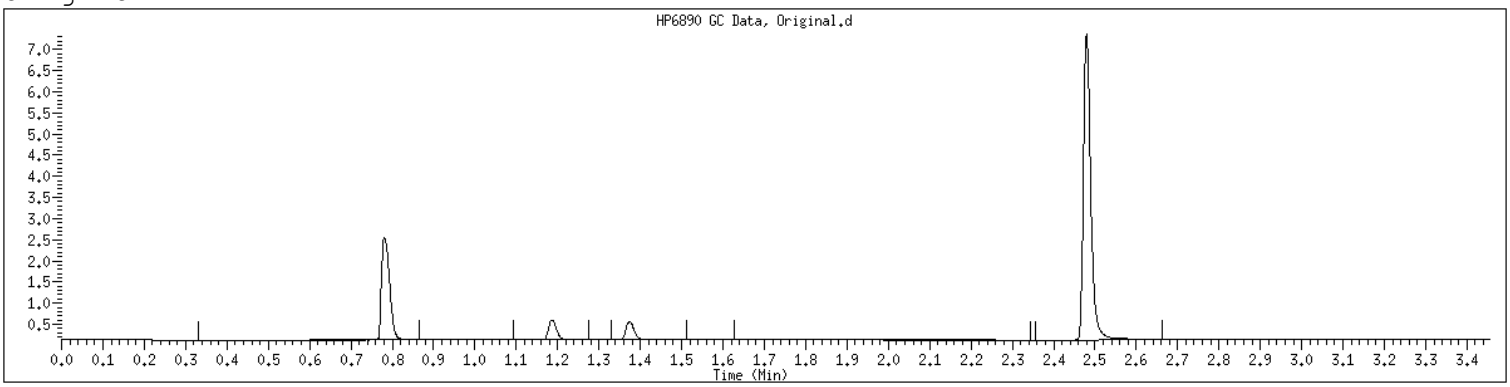


Report Date: 07/19/2017 09:57

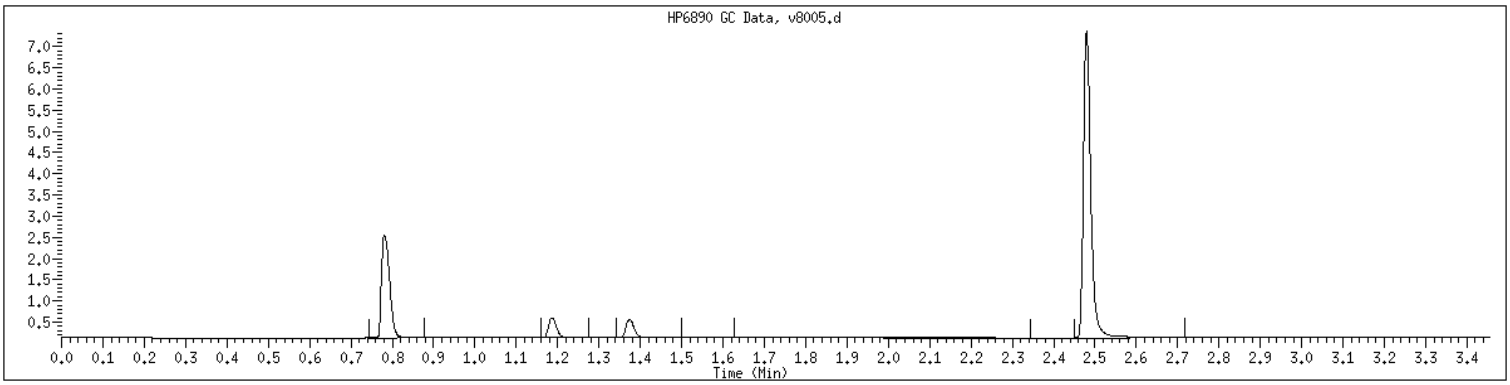
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 1205 | SampleType | : CALIB_5 |
| Injection Date | : 07/18/2017 11:16 | Instrument | : gcv8a.i |
| Operator | : BMR | | |
| Sample Info | : 1205 | | |
| Misc Info | : 2124730/2124041/2122172 | | |
| Method | : /var/chem/gcv8a.i/2170718.b/RSK.m | | |
| Dilution | : 1.00 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : me&e |

Original




Final



6E

ORGANICS INITIAL CALIBRATION DATA

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | **GCALID - FileID - Conc** | 1201 ~ 2170630/v8001 ~ mix | |
| Report No: | 218040620 | Instrument ID: | GCV8B | 1202 ~ 2170630/v8002 ~ mix | 1203 ~ 2170630/v8003 ~ mix | |
| GC Column: | ID (mm) | Analyst: | BMR | 1204 ~ 2170630/v8004 ~ mix | 1205 ~ 2170630/v8005 ~ mix | |
| Calib. Date 1: | 06/30/17 Time 1: 0958 | Analytical Batch: | 613262 | | | |
| Calib. Date 2: | 06/30/17 Time 2: 1025 | Analytical Method: | RSK-175 | | | |

| *ANALYTE* | *1201* | *1202* | *1203* | *1204* | *1205* | *1206* | *1207* | *1208* | *1209* | *$\overline{RF}$ / b / A* | *m / B* | *C* | *FIT* | *TYPE* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Dioxide | 5055 | 4261 | 4487 | 4301 | 4363 | | | | | 4493 | | | 7.243 | A |

FIT = %RSD For Average Curve And Calibration Coefficent For Linear And Quadratic

Curve Types: A - Averged, L - Linear Regression, W - Weighted Linear, Q - Quadratic

For curve types L and Q, the RRF and RSP (Response) are shown on separate lines to allow for evaluation against minimum RRF

$\overline{RF}$ = Mean Response Factor For Average Curve

m,b = Slope and Intercept For Linear Curve

A,B,C = Coefficents For Quadratic Curve

FORM V I SVOA

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2170630.b/v8001.d
Lab Smp Id: 1201 Client Smp ID: 1201-CO2
Inj Date : 30-JUN-2017 09:58
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1201-CO2
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2170630.b/CO2h.m
Meth Date : 30-Jun-2017 12:30 bmr Quant Type: ESTD
Cal Date : 30-JUN-2017 09:58 Cal File: v8001.d
Als bottle: 1 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | AMOUNTS | |
|---|---|---|---|---|---|---|
| | | | | | CAL-AMT | ON-COL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| 1 Carbon Dioxide | 1.034 | 1.034 | 0.000 | 4367668 | 864.000 | 972(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8b.i/2170630.b/v8001.d



Date : 30-JUN-2017 09:58

Client ID: 1201-CO2

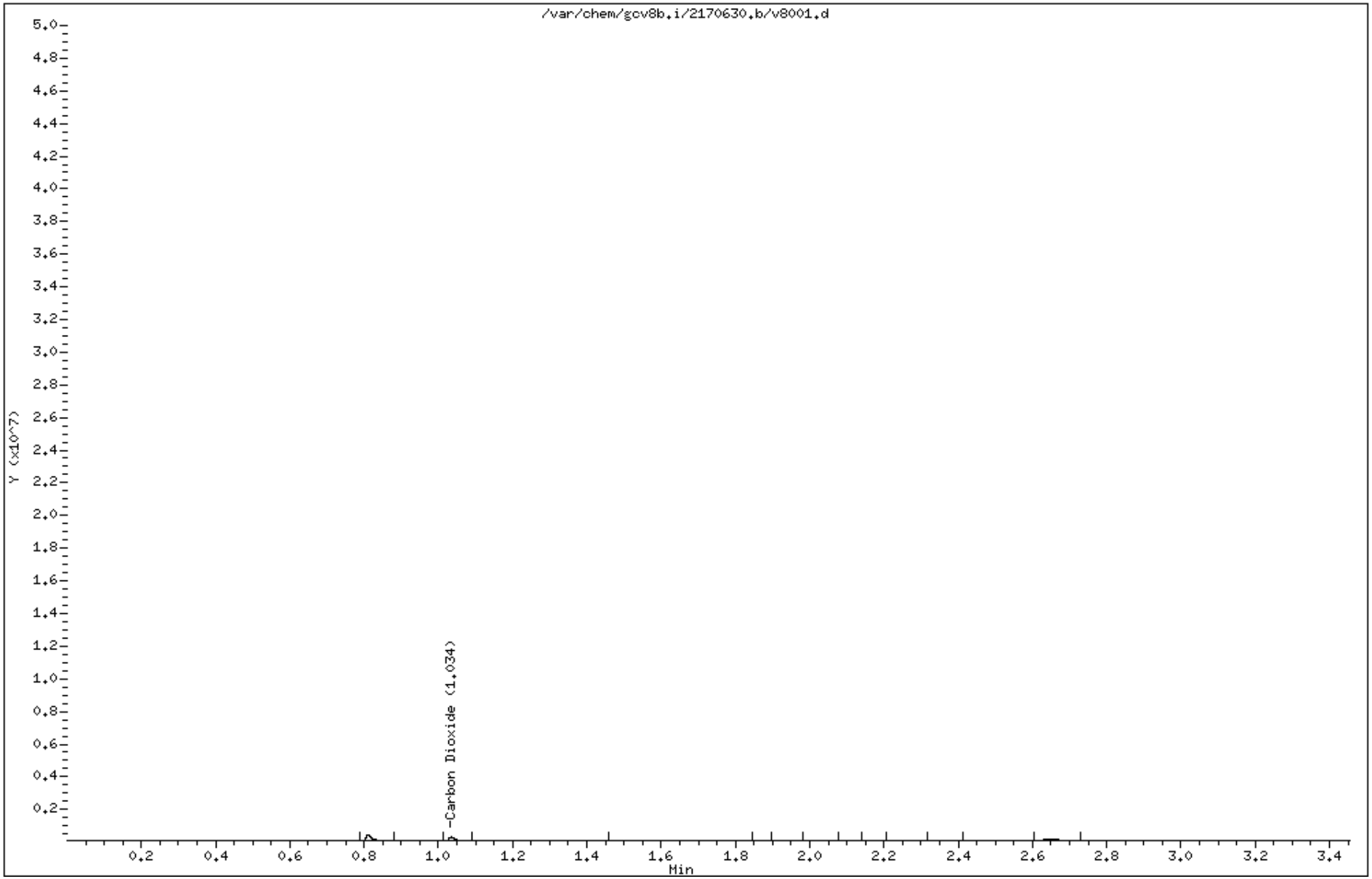
Instrument: gcv8b.i

Sample Info: 1201-CO2

Operator: BMR

Column phase: GS-Q-30

Column diameter: 0.53

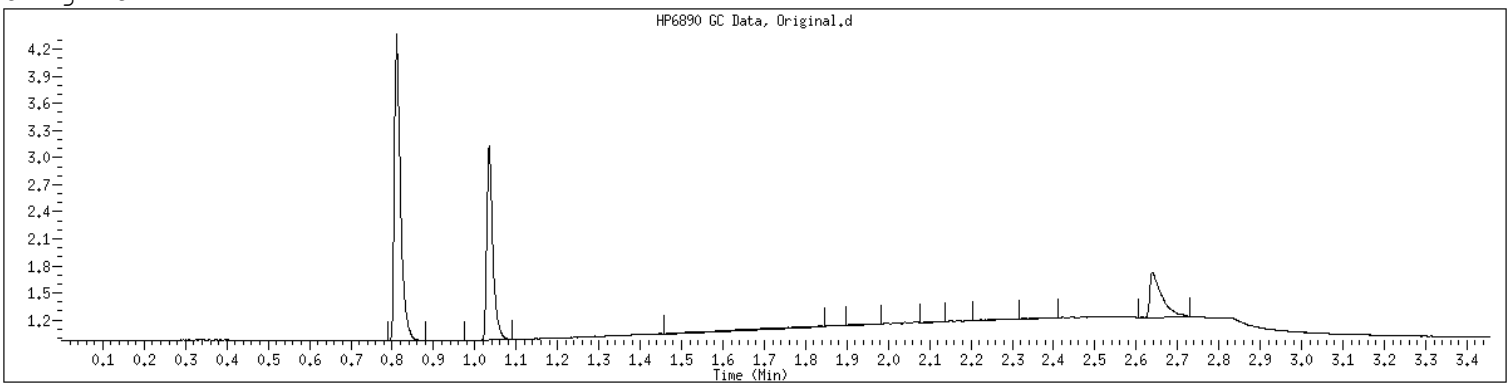


Report Date: 06/30/2017 12:30

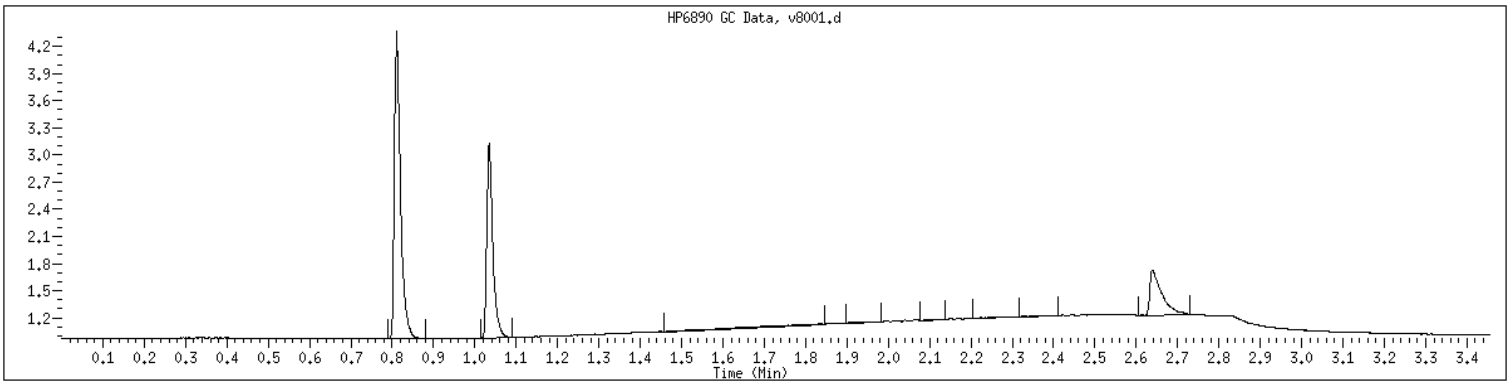
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 1201 | SampleType | : CALIB_1 |
| Injection Date | : 06/30/2017 09:58 | Instrument | : gcv8b.i |
| Operator | : BMR | | |
| Sample Info | : 1201-CO2 | | |
| Misc Info | : 2125155 | | |
| Method | : /var/chem/gcv8b.i/2170630.b/CO2h.m | | |
| Dilution | : 1.0 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : co2 |

Original




Final



GCAL, Inc.

Data file : /var/chem/gcv8b.i/2170630.b/v8002.d
Lab Smp Id: 1202 Client Smp ID: 1202-CO2
Inj Date : 30-JUN-2017 10:08
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1202-CO2
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2170630.b/CO2h.m
Meth Date : 30-Jun-2017 12:30 bmr Quant Type: ESTD
Cal Date : 30-JUN-2017 10:08 Cal File: v8002.d
Als bottle: 1 Calibration Sample, Level: 2
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | AMOUNTS | |
|---|---|---|---|---|---|---|
| | | | | | CAL-AMT | ON-COL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| 1 Carbon Dioxide | 1.032 | 1.032 | 0.000 | 7370692 | 1730.00 | 1640(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8b.i/2170630.b/v8002.d



Date : 30-JUN-2017 10:08

Client ID: 1202-CO2

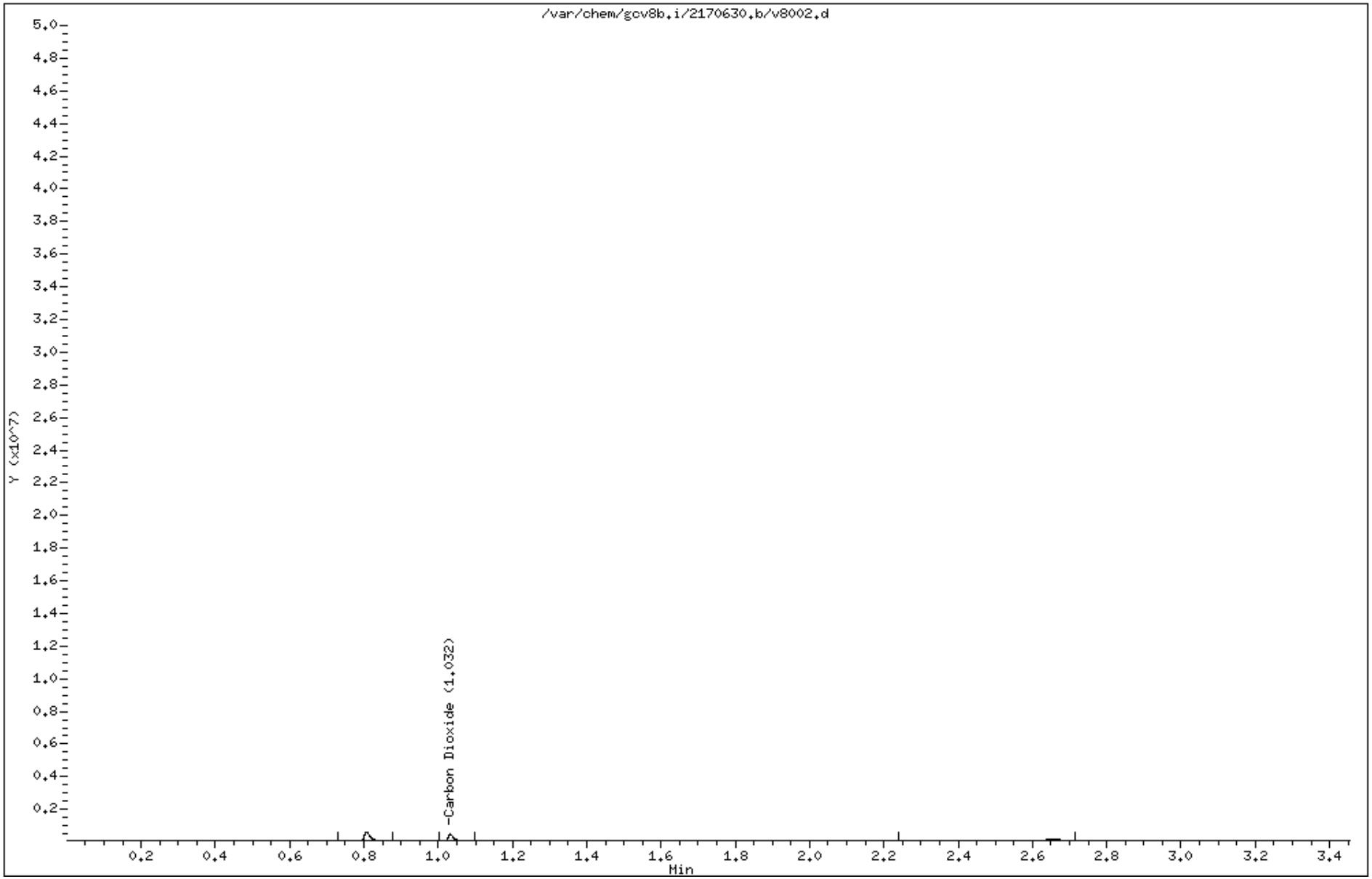
Instrument: gcv8b.i

Sample Info: 1202-CO2

Operator: BMR

Column phase: GS-Q-30

Column diameter: 0.53

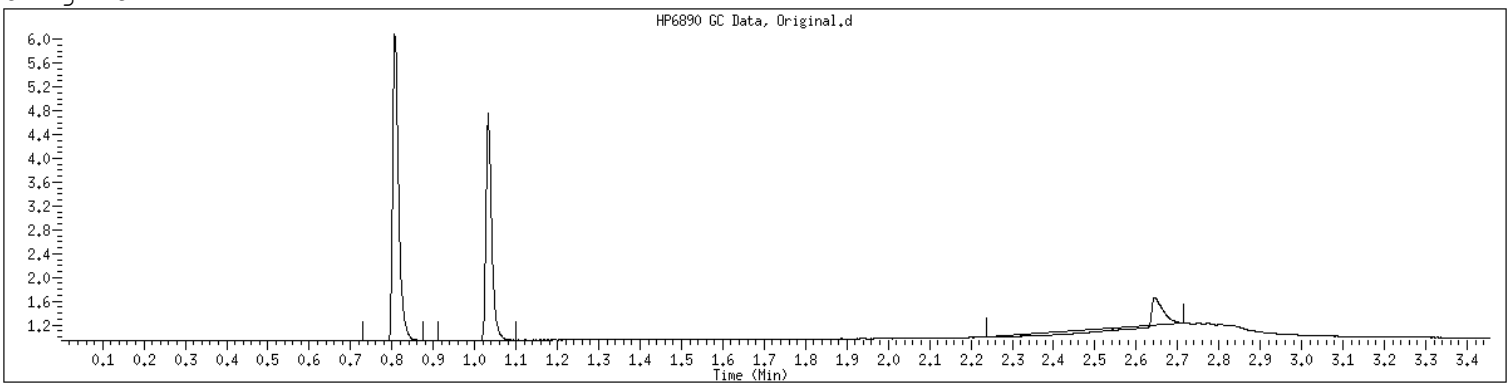


Report Date: 06/30/2017 12:30

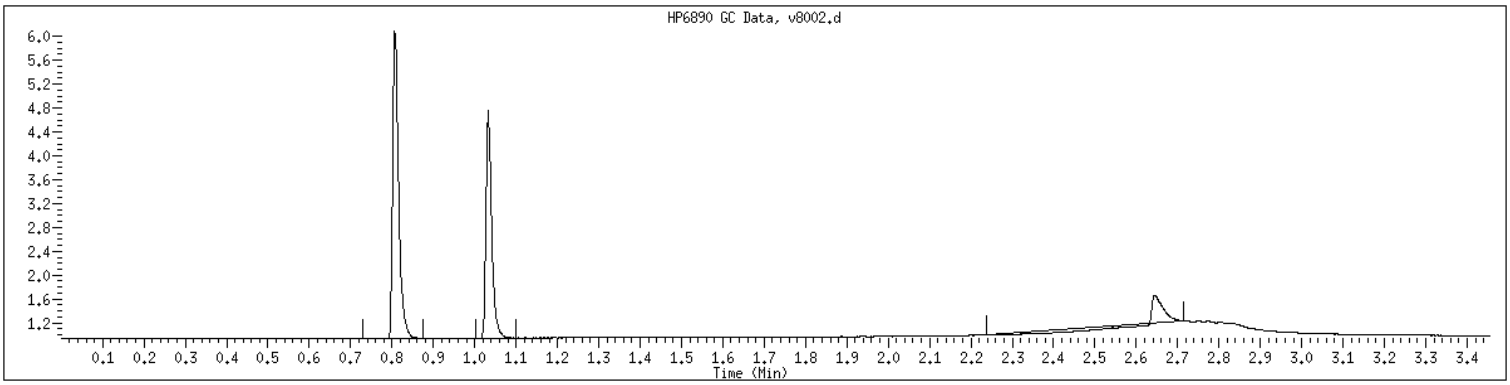
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 1202 | SampleType | : CALIB_2 |
| Injection Date | : 06/30/2017 10:08 | Instrument | : gcv8b.i |
| Operator | : BMR | | |
| Sample Info | : 1202-CO2 | | |
| Misc Info | : 2125155 | | |
| Method | : /var/chem/gcv8b.i/2170630.b/CO2h.m | | |
| Dilution | : 1.0 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : co2 |

Original




Final



GCAL, Inc.

Data file : /var/chem/gcv8b.i/2170630.b/v8003.d
Lab Smp Id: 1203 Client Smp ID: 1203-CO203
Inj Date : 30-JUN-2017 10:14
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1203-CO203
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2170630.b/CO2h.m
Meth Date : 30-Jun-2017 12:33 bmr Quant Type: ESTD
Cal Date : 30-JUN-2017 10:14 Cal File: v8003.d
Als bottle: 1 Calibration Sample, Level: 3
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | AMOUNTS | |
|---|---|---|---|---|---|---|
| | | | | | CAL-AMT | ON-COL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| 1 Carbon Dioxide | 1.030 | 1.030 | 0.000 | 38770727 | 8640.00 | 8630(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8b.i/2170630.b/v8003.d



Date : 30-JUN-2017 10:14

Client ID: 1203-CO203

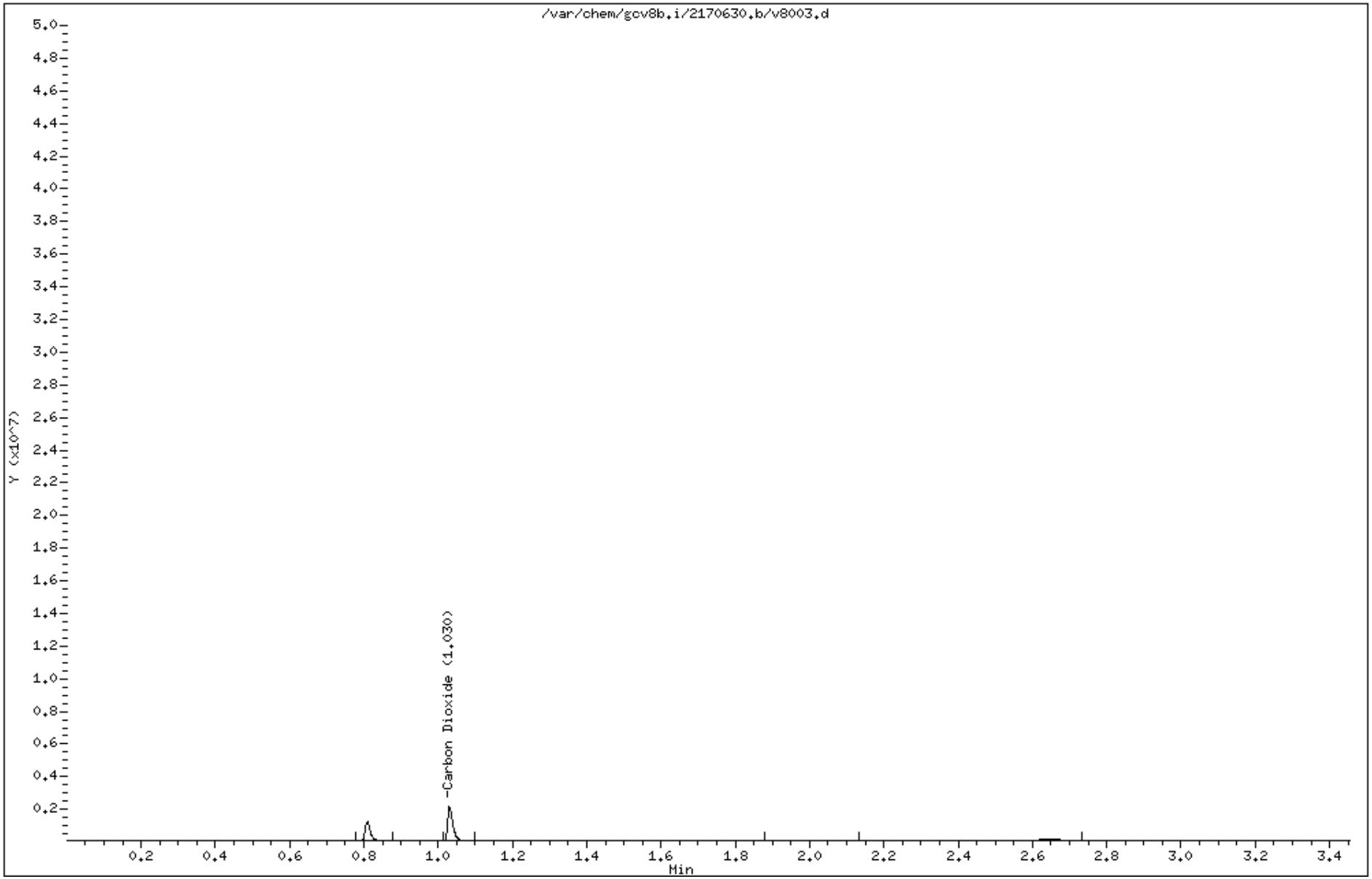
Instrument: gcv8b.i

Sample Info: 1203-CO203

Operator: BMR

Column phase: GS-Q-30

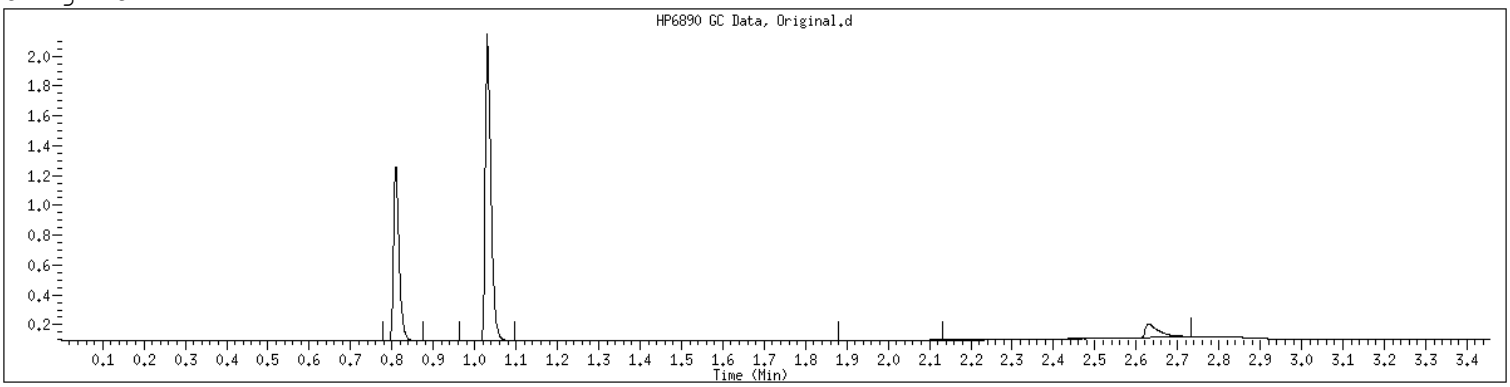
Column diameter: 0.53



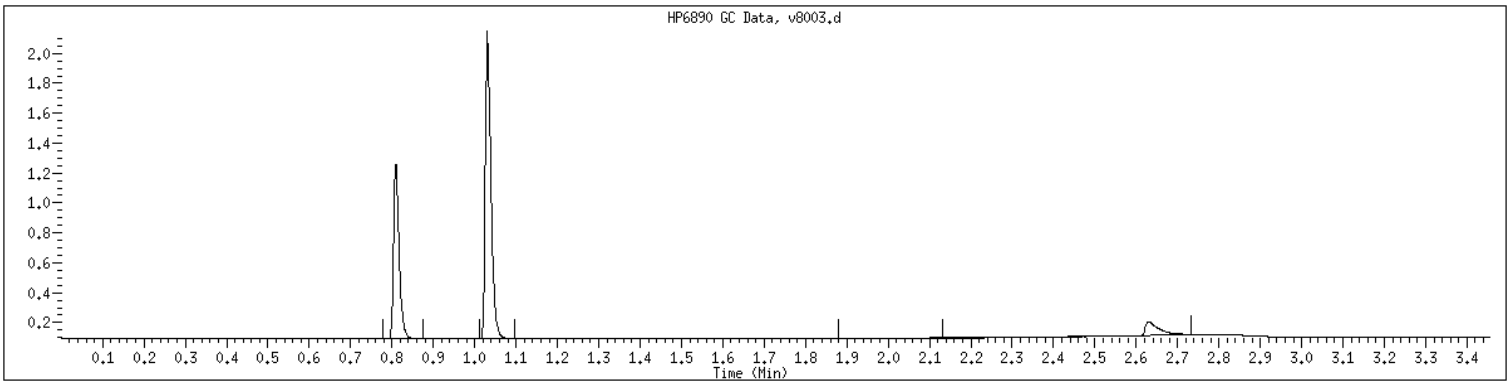
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 1203 | SampleType | : CALIB_3 |
| Injection Date | : 06/30/2017 10:14 | Instrument | : gcv8b.i |
| Operator | : BMR | | |
| Sample Info | : 1203-CO203 | | |
| Misc Info | : 2125155 | | |
| Method | : /var/chem/gcv8b.i/2170630.b/CO2h.m | | |
| Dilution | : 1.0 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : co2 |

Original




Final



GCAL, Inc.

Data file : /var/chem/gcv8b.i/2170630.b/v8004.d
Lab Smp Id: 1204 Client Smp ID: 1204-CO2
Inj Date : 30-JUN-2017 10:19
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1204-CO2
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2170630.b/CO2h.m
Meth Date : 30-Jun-2017 12:30 bmr Quant Type: ESTD
Cal Date : 30-JUN-2017 10:19 Cal File: v8004.d
Als bottle: 1 Calibration Sample, Level: 4
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | AMOUNTS | |
|---|---|---|---|---|---|---|
| | | | | | CAL-AMT | ON-COL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| 1 Carbon Dioxide | 1.026 | 1.026 | 0.000 | 59359020 | 13800.0 | 13200(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8b.i/2170630.b/v8004.d



Date : 30-JUN-2017 10:19

Client ID: 1204-CO2

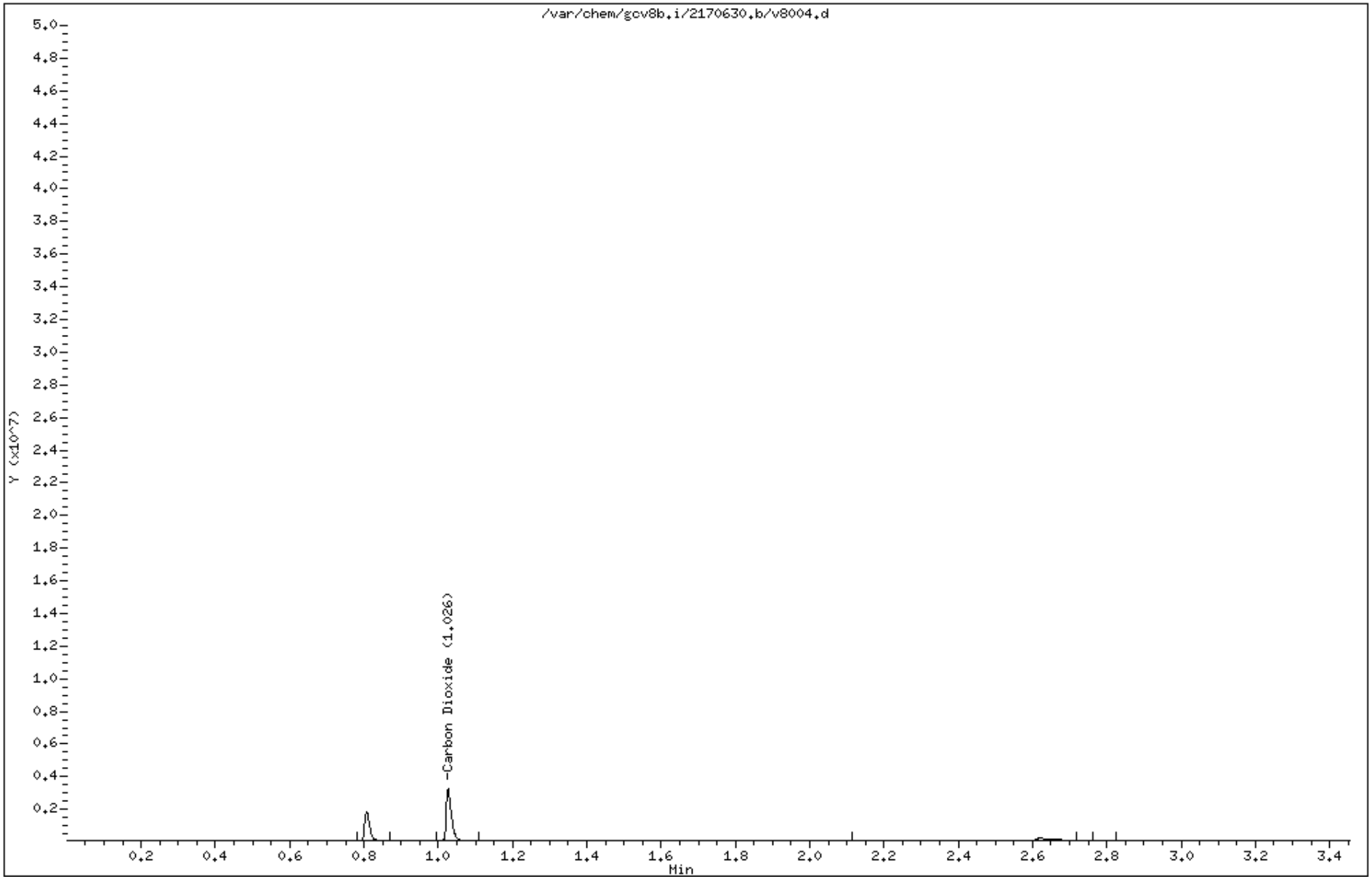
Instrument: gcv8b.i

Sample Info: 1204-CO2

Operator: BMR

Column phase: GS-Q-30

Column diameter: 0.53

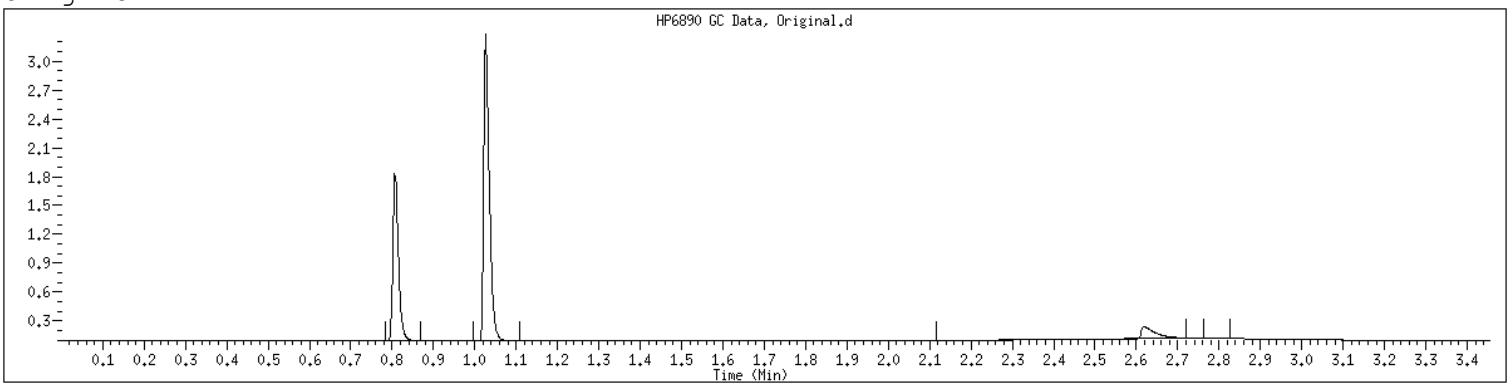


Report Date: 06/30/2017 12:30

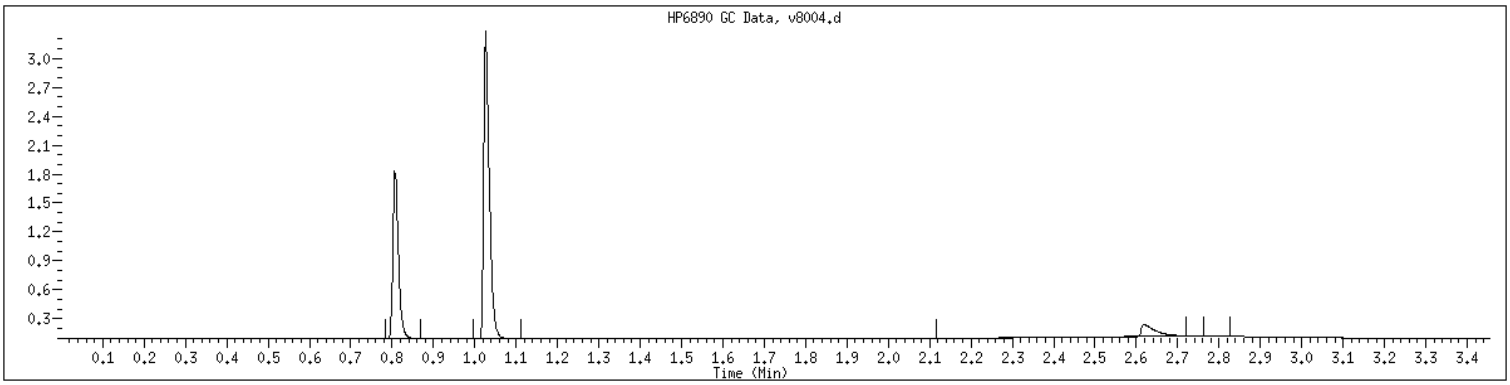
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 1204 | SampleType | : CALIB_4 |
| Injection Date | : 06/30/2017 10:19 | Instrument | : gcv8b.i |
| Operator | : BMR | | |
| Sample Info | : 1204-CO2 | | |
| Misc Info | : 2125155 | | |
| Method | : /var/chem/gcv8b.i/2170630.b/CO2h.m | | |
| Dilution | : 1.0 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : co2 |

Original




Final



GCAL, Inc.

Data file : /var/chem/gcv8b.i/2170630.b/v8005.d
Lab Smp Id: 1205 Client Smp ID: 1205-CO2
Inj Date : 30-JUN-2017 10:25
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1205-CO2
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2170630.b/CO2h.m
Meth Date : 30-Jun-2017 12:30 bmr Quant Type: ESTD
Cal Date : 30-JUN-2017 10:25 Cal File: v8005.d
Als bottle: 1 Calibration Sample, Level: 5
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | AMOUNTS | |
|---|---|---|---|---|---|---|
| | | | | | CAL-AMT | ON-COL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| 1 Carbon Dioxide | 1.026 | 1.026 | 0.000 | 75475483 | 17300.0 | 16800(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8b.i/2170630.b/v8005.d



Date : 30-JUN-2017 10:25

Client ID: 1205-CO2

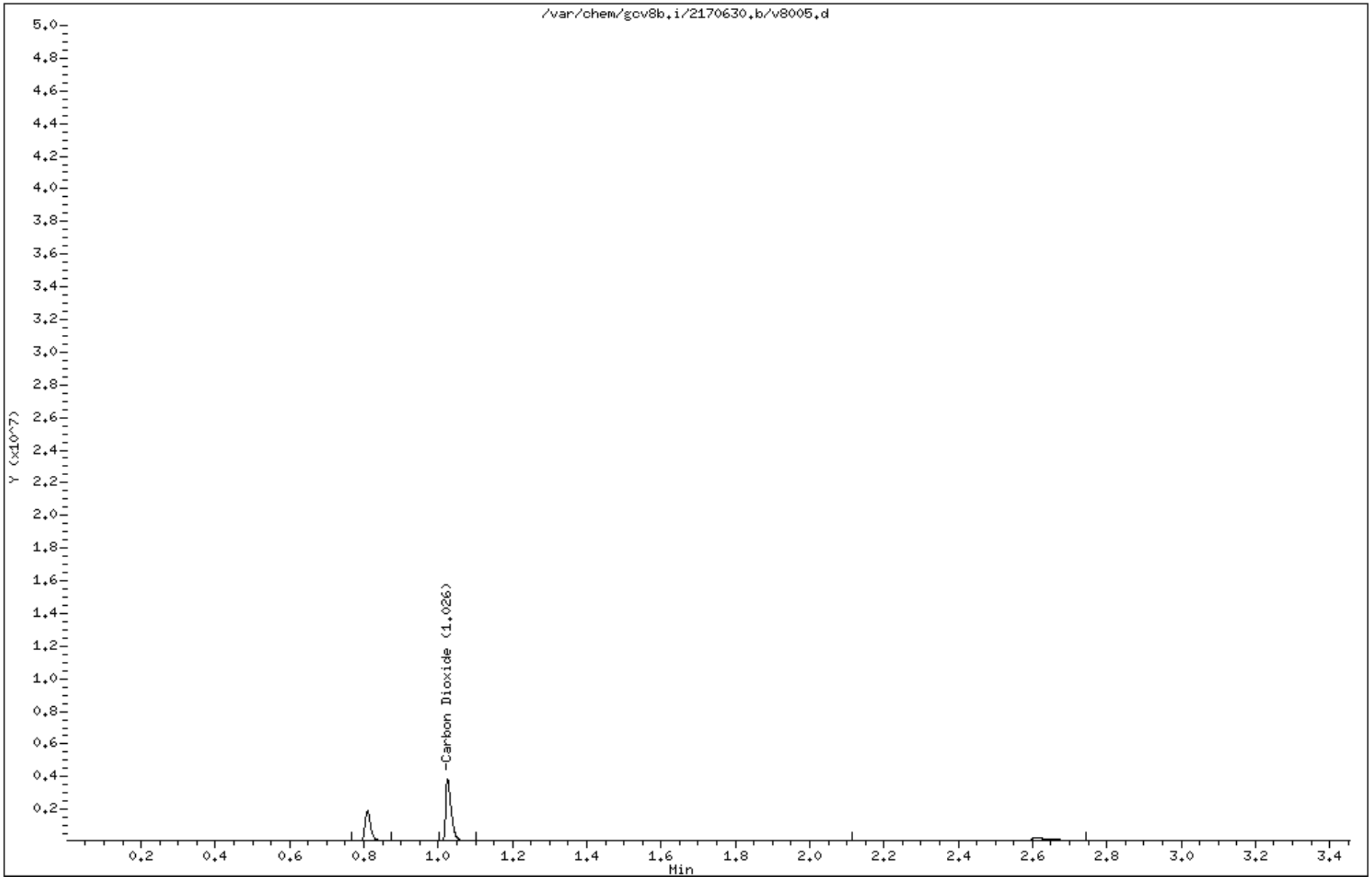
Instrument: gcv8b.i

Sample Info: 1205-CO2

Operator: BMR

Column phase: GS-Q-30

Column diameter: 0.53

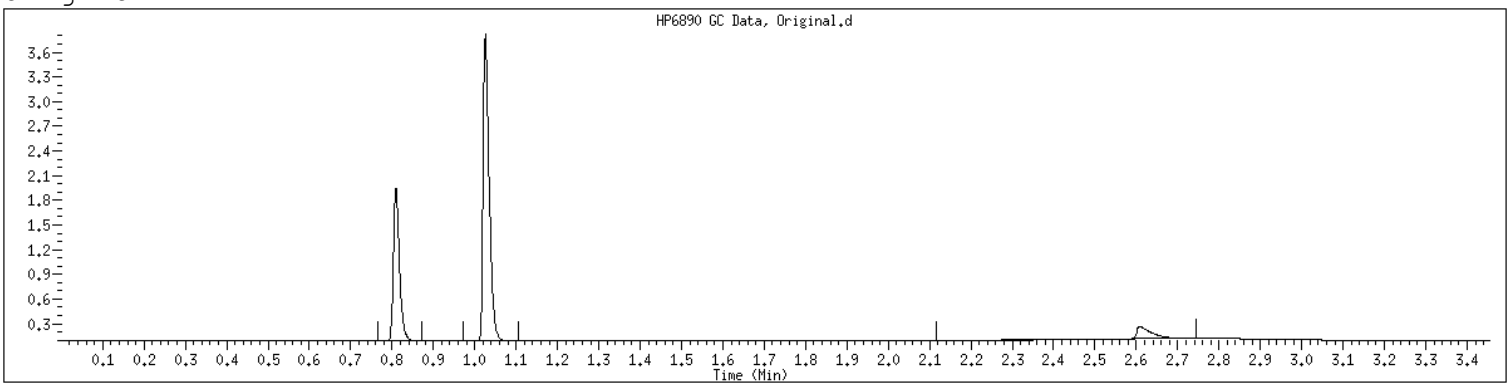


Report Date: 06/30/2017 12:30

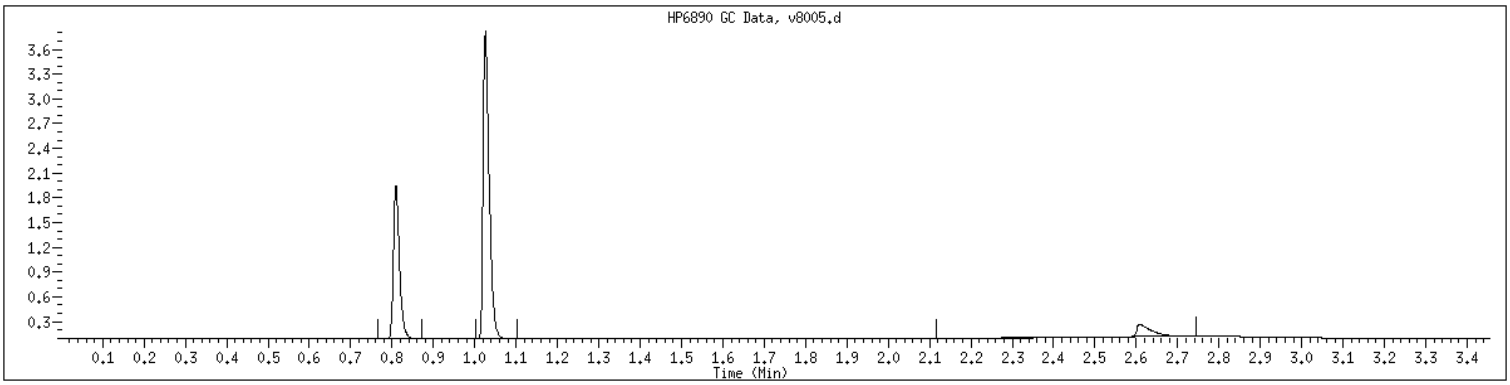
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 1205 | SampleType | : CALIB_5 |
| Injection Date | : 06/30/2017 10:25 | Instrument | : gcv8b.i |
| Operator | : BMR | | |
| Sample Info | : 1205-CO2 | | |
| Misc Info | : 2125155 | | |
| Method | : /var/chem/gcv8b.i/2170630.b/CO2h.m | | |
| Dilution | : 1.0 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : co2 |

Original




Final



# Form 6I

# ICAL Verifications

6I

ORGANICS INITIAL CALIBRATION VERIFICATION

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Instrument ID: | GCV8A |
| Analysis Date: | 07/18/17 1146 | Lab File ID: | 2170718/v8008 |
| Analytical Method: | RSK-175 | Analytical Batch: | 614388 |

| *ANALYTE* | *UNITS* | *TRUE* | *FOUND* | *% REC* | *LCL* | *UCL* | *Q* |
|---|---|---|---|---|---|---|---|
| Ethane | ug/L | 3.28 | 3.53 | 108 | 80 | 120 | |
| Ethene | ug/L | 3.06 | 3.37 | 110 | 80 | 120 | |
| Methane | ug/L | 17.5 | 17.7 | 101 | 80 | 120 | |

GCAL, Inc.

Data file : /var/chem/gcv8a.i/2170718.b/v8008.d
Lab Smp Id: 1600 Client Smp ID: 1600
Inj Date : 18-JUL-2017 11:46
Operator : BMR Inst ID: gcv8a.i
Smp Info : 1600
Misc Info : 2124730/2124041/2122172
Comment :
Method : /var/chem/gcv8a.i/2170718.b/RSK.m
Meth Date : 19-Jul-2017 09:57 bmr Quant Type: ESTD
Cal Date : 18-JUL-2017 11:21 Cal File: v8006.d
Als bottle: 1 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: meae.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | CONCENTRATIONS | |
|---|---|---|---|---|---|---|
| | | | | | ON-COLUMN | FINAL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| 1 METHANE | 0.783 | 0.781 | 0.002 | 28554385 | 17.7240 | 17.7(M2) |
| 2 ETHYLENE | 1.188 | 1.187 | 0.001 | 3773755 | 3.37151 | 3.37(M2) |
| 3 Acetylene | 1.297 | 1.288 | 0.009 | 7964449 | 24.7343 | 24.7(M2) |
| 4 ETHANE | 1.376 | 1.374 | 0.002 | 4998024 | 3.52851 | 3.53(M2) |
| $ 5 PROPENE | 2.482 | 2.480 | 0.002 | 25155482 | 35.8386 | 35.8(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8a.i/2170718.b/v8008.d



Date : 18-JUL-2017 11:46

Client ID: 1600

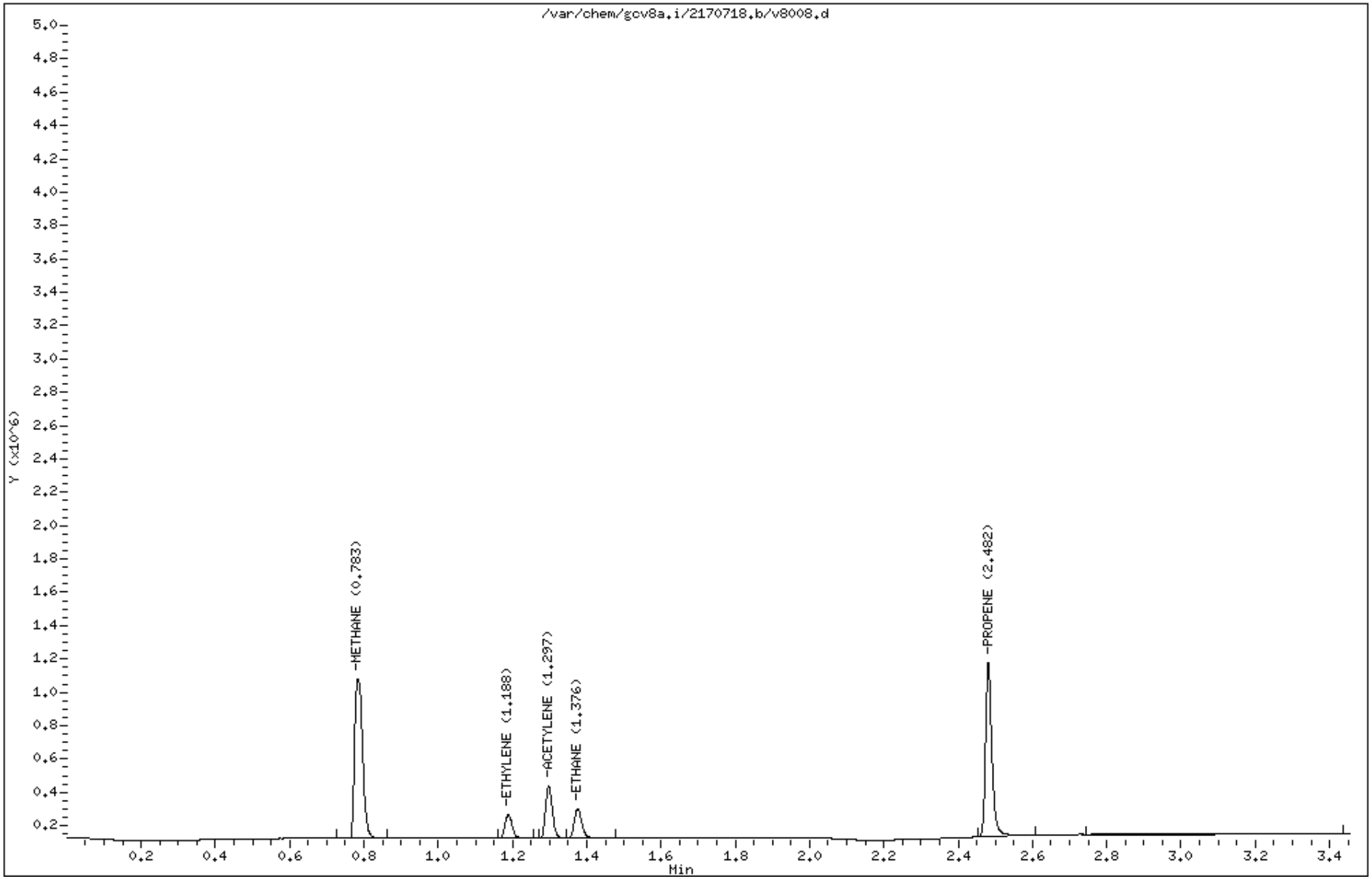
Instrument: gcv8a.i

Sample Info: 1600

Operator: BMR

Column phase: GS-Q-30M

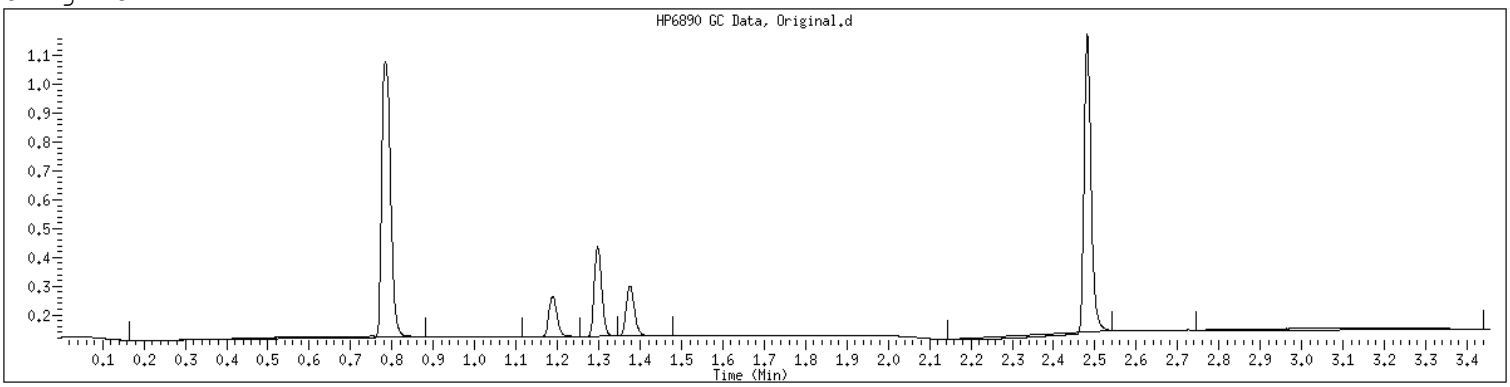
Column diameter: 0.53



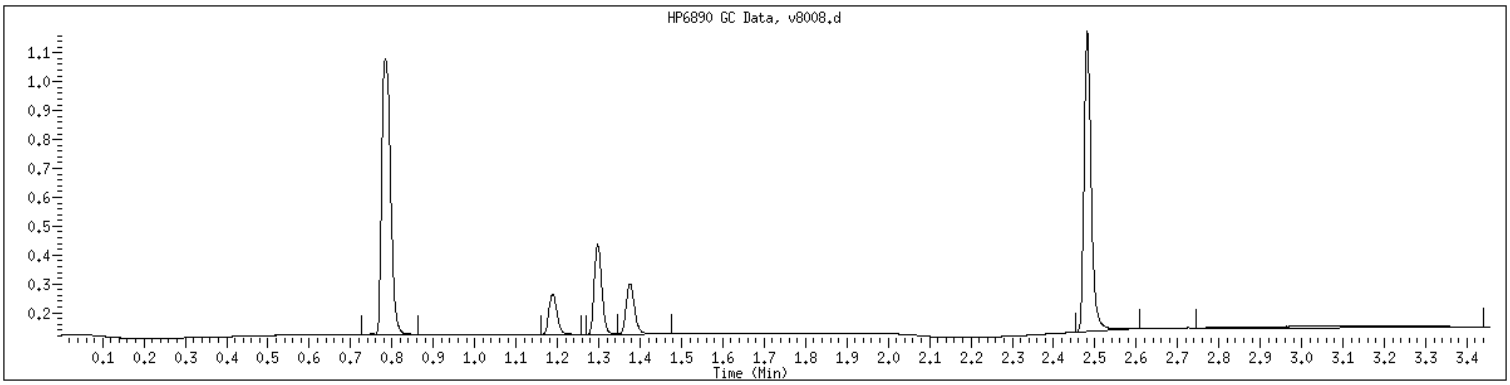
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 1600 | SampleType | : LCS |
| Injection Date | : 07/18/2017 11:46 | Instrument | : gcv8a.i |
| Operator | : BMR | | |
| Sample Info | : 1600 | | |
| Misc Info | : 2124730/2124041/2122172 | | |
| Method | : /var/chem/gcv8a.i/2170718.b/RSK.m | | |
| Dilution | : 1.00 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : meae |

Original




Final



6I

ORGANICS INITIAL CALIBRATION VERIFICATION

| | | | |
|---|---|---|---|
| Report No: | 218040620 | Instrument ID: | GCV8B |
| Analysis Date: | 06/30/17 1031 | Lab File ID: | 2170630/v8006 |
| Analytical Method: | RSK-175 | Analytical Batch: | 613262 |

| *ANALYTE* | *UNITS* | *TRUE* | *FOUND* | *% REC* | *LCL* | *UCL* | *Q* |
|---|---|---|---|---|---|---|---|
| Carbon Dioxide | ug/L | 8700 | 8790 | 101 | 80 | 120 | |

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2170630.b/v8006.d
Lab Smp Id: 1600 Client Smp ID: 1600
Inj Date : 30-JUN-2017 10:31
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1600
Misc Info : 2125156
Comment :
Method : /var/chem/gcv8b.i/2170630.b/CO2h.m
Meth Date : 30-Jun-2017 12:22 bmr Quant Type: ESTD
Cal Date : 30-JUN-2017 10:25 Cal File: v8005.d
Als bottle: 1 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | CONCENTRATIONS | |
|---|---|---|---|---|---|---|
| | | | | | ON-COLUMN | FINAL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| 1 Carbon Dioxide | 1.025 | 1.026 | -0.001 | 39481084 | 8785.54 | 8780(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8b.i/2170630.b/v8006.d



Date : 30-JUN-2017 10:31

Client ID: 1600

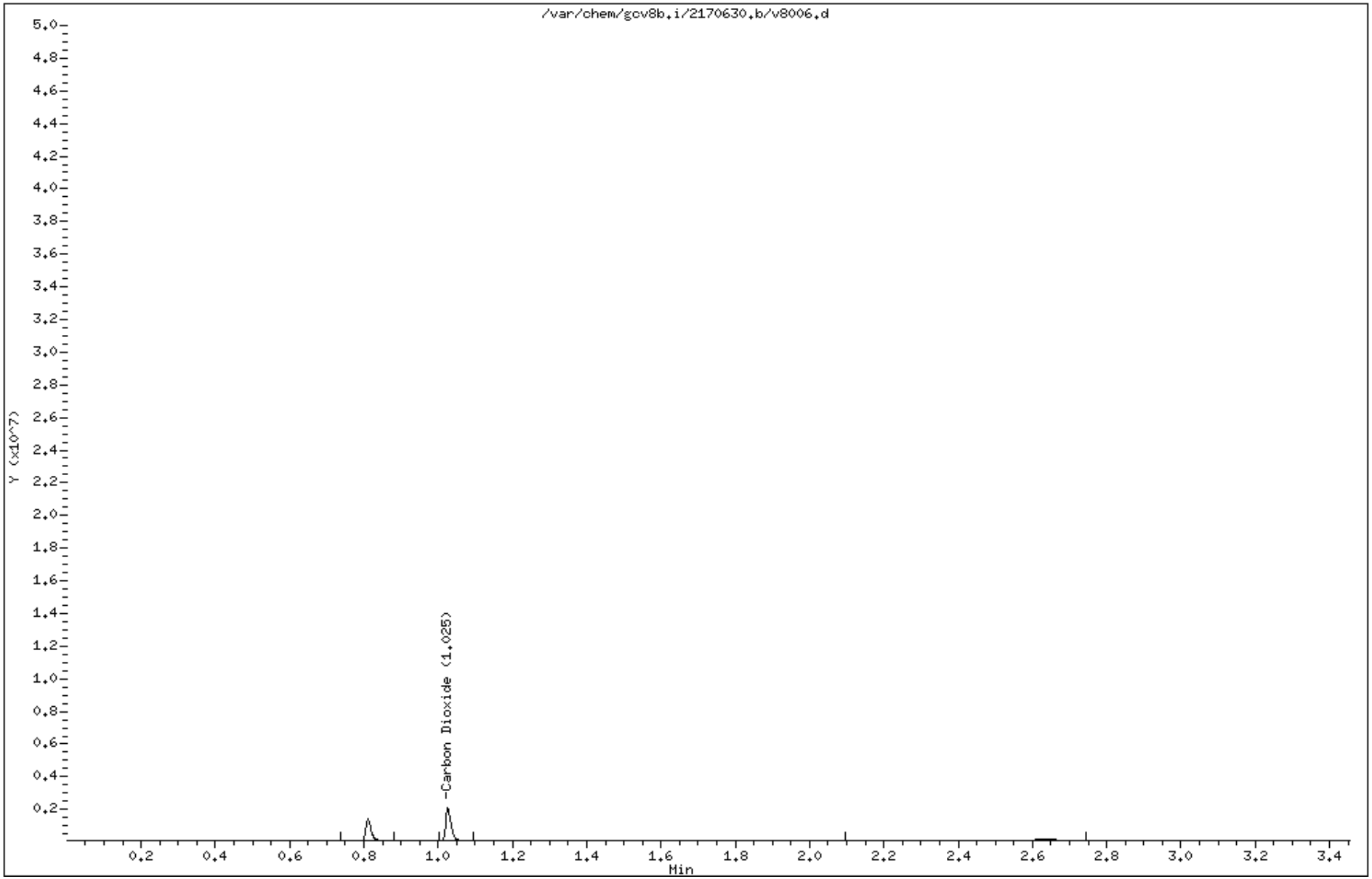
Instrument: gcv8b.i

Sample Info: 1600

Operator: BMR

Column phase: GS-Q-30

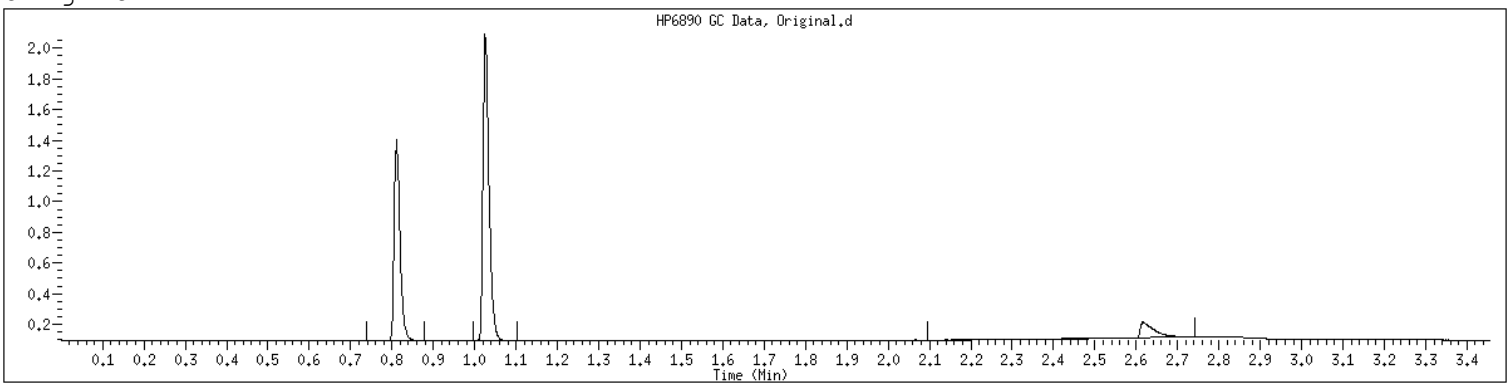
Column diameter: 0.53



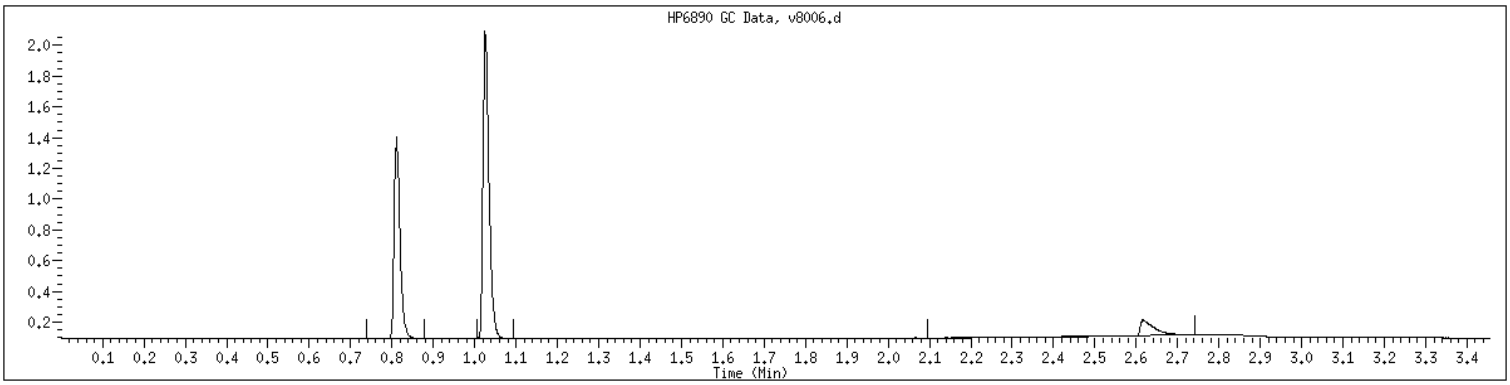
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 1600 | SampleType | : LCS |
| Injection Date | : 06/30/2017 10:31 | Instrument | : gcv8b.i |
| Operator | : BMR | | |
| Sample Info | : 1600 | | |
| Misc Info | : 2125156 | | |
| Method | : /var/chem/gcv8b.i/2170630.b/CO2h.m | | |
| Dilution | : 1.0 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : co2 |

Original




Final



# Form 7E

# CCAL Verifications

7E

ORGANICS CONTINUING CALIBRATION CHECK

| | | | |
|---|---|---|---|
| Report No: | 218040620 | CCAL ID: | 1400 |
| GC Column: | GS-Q 30 ID .53 (mm) | Instrument ID: | GCV8A |
| Injection Vol.: | 1.0 ( µL ) | Lab File ID: | 2180418/v8001 |
| Init. Calib. Date 1: | 07/18/17 Time 1: 1034 | Analyst: | BMR |
| Init. Calib. Date 2: | 07/18/17 Time 2: 1116 | Analytical Batch: | 633675 |
| Analysis Date: | 04/18/18 Time: 1024 | Analytical Method: | RSK-175 |

| *ANALYTE* | *$\overline{RRF}$* | *RRF CCV* | *%D/%Drift* | *Max %D/ % Drift* | *TYPE* | *Q* |
|---|---|---|---|---|---|---|
| Ethane | 1416000 | 1492000 | -5.31 | 20 | A | |
| Ethene | 1119000 | 1114000 | .51 | 20 | A | |
| Methane | 1611000 | 1607000 | .22 | 20 | A | |
| Propene | 701900 | 824400 | -17.4 | 30 | A | |

FORM V II SV

GCAL, Inc.

Data file : /var/chem/gcv8a.i/2180418.b/v8001.d
Lab Smp Id: 1400 Client Smp ID: MEE03
Inj Date : 18-APR-2018 10:24
Operator : BMR Inst ID: gcv8a.i
Smp Info : 1400*MEE03
Misc Info : 2126160/2125841/2126599
Comment :
Method : /var/chem/gcv8a.i/2180418.b/RSK.m
Meth Date : 18-Apr-2018 15:52 jar Quant Type: ESTD
Cal Date : 18-JUL-2017 11:21 Cal File: v8006.d
Als bottle: 1 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: me&e.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | | AMOUNTS | |
|---|---|---|---|---|---|---|---|
| | | | | | | CAL-AMT | ON-COL |
| | Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| | 1 METHANE | 0.795 | 0.795 | 0.000 | 16878639 | 10.5000 | 10.5(M2) |
| | 2 ETHYLENE | 1.196 | 1.196 | 0.000 | 3151513 | 2.83000 | 2.82(M2) |
| | 4 ETHANE | 1.380 | 1.380 | 0.000 | 3162508 | 2.12000 | 2.23(M2) |
| $ | 5 PROPENE | 2.477 | 2.477 | 0.000 | 51936896 | 63.0000 | 74.0(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8a.i/2180418.b/v8001.d

Page 1

Date : 18-APR-2018 10:24

Client ID: MEE03

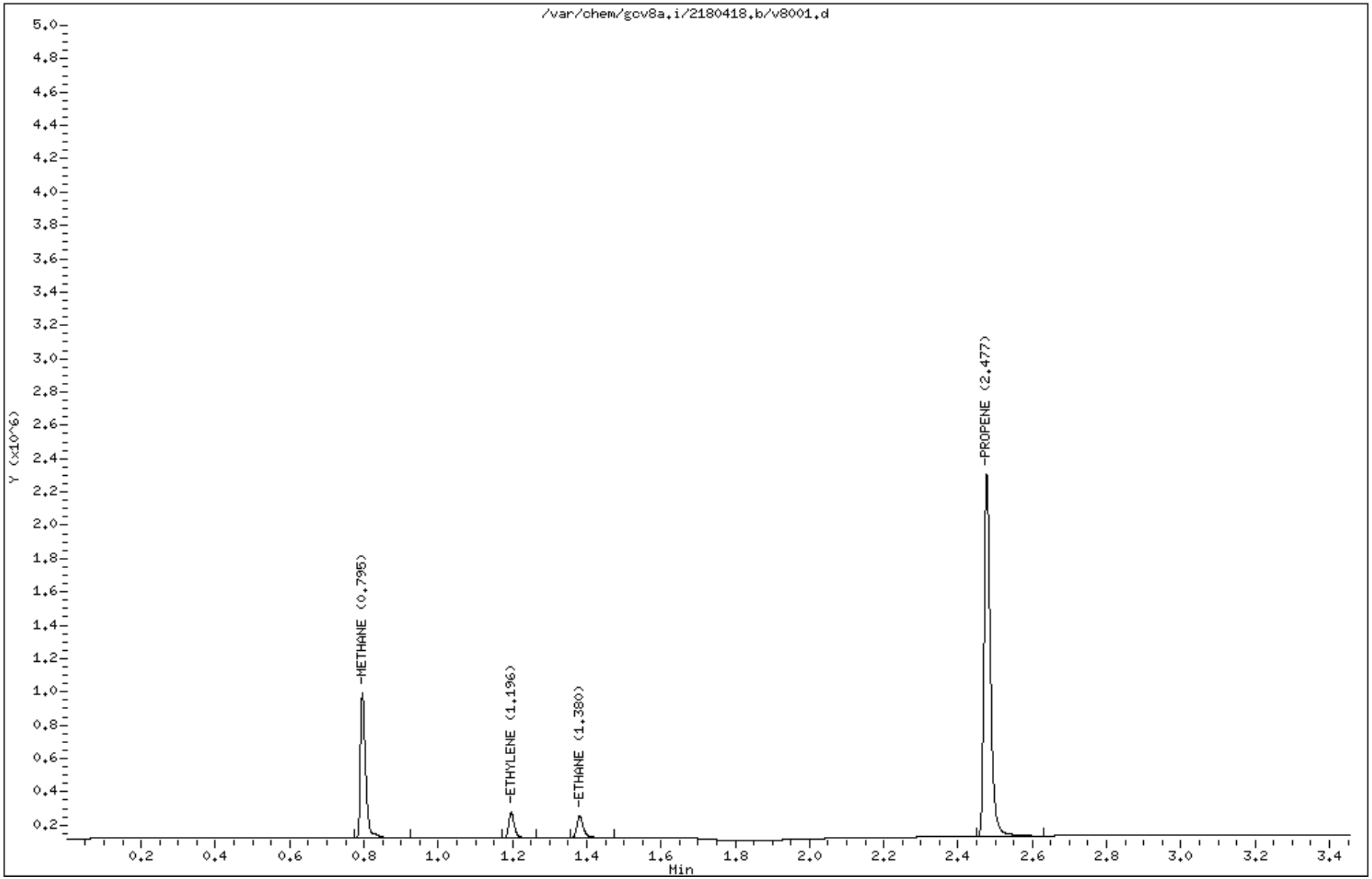
Instrument: gcv8a.i

Sample Info: 1400*MEE03

Operator: BMR

Column phase: GS-Q-30M

Column diameter: 0.53

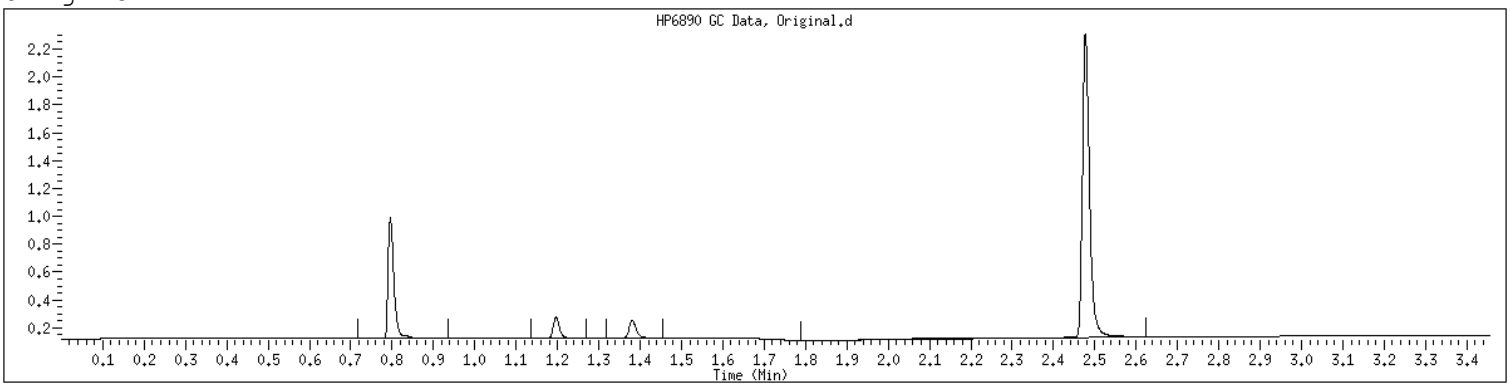


Report Date: 04/18/2018 15:52

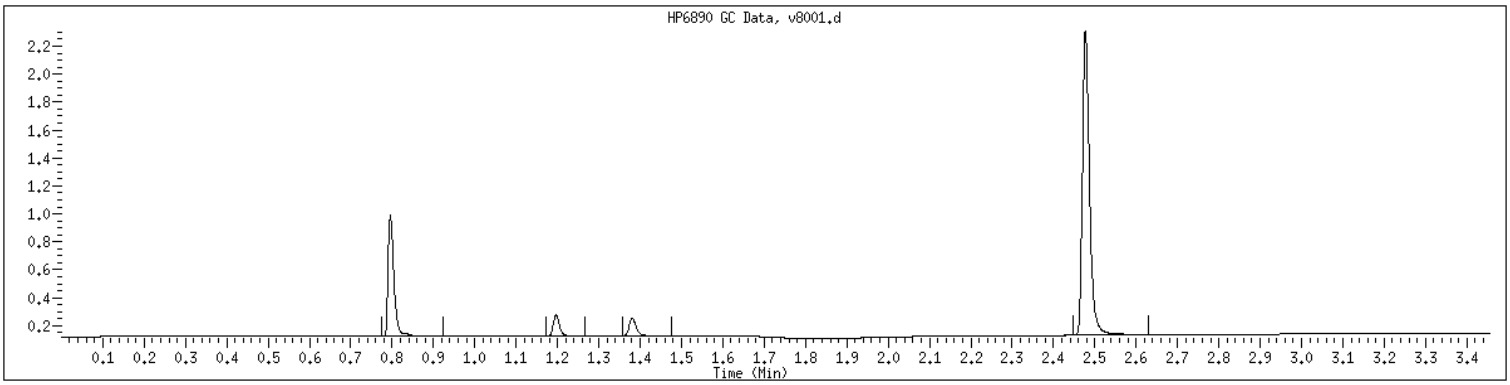
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 1400 SampleType : CCALIB_3
Injection Date: 04/18/2018 10:24 Instrument : gcv8a.i
Operator : BMR
Sample Info : 1400*MEE03
Misc Info : 2126160/2125841/2126599
Method : /var/chem/gcv8a.i/2180418.b/RSK.m
Dilution : 1.00
Matrix : WATER
Integrator : HP Genie Compound Sublist: me&e

Original




Final



7E

ORGANICS CONTINUING CALIBRATION CHECK

| | | | |
|---|---|---|---|
| Report No: | 218040620 | CCAL ID: | 1400 |
| GC Column: | GS-Q 30 ID .53 (mm) | Instrument ID: | GCV8A |
| Injection Vol.: | 1.0 ( µL ) | Lab File ID: | 2180418/v8022 |
| Init. Calib. Date 1: | 07/18/17 Time 1: 1034 | Analyst: | BMR |
| Init. Calib. Date 2: | 07/18/17 Time 2: 1116 | Analytical Batch: | 633675 |
| Analysis Date: | 04/18/18 Time: 1253 | Analytical Method: | RSK-175 |

| *ANALYTE* | *$\overline{RRF}$* | *RRF CCV* | *%D/%Drift* | *Max %D/ % Drift* | *TYPE* | *Q* |
|---|---|---|---|---|---|---|
| Ethane | 1416000 | 1557000 | -9.92 | 20 | A | |
| Ethene | 1119000 | 1177000 | -5.19 | 20 | A | |
| Methane | 1611000 | 1659000 | -3 | 20 | A | |
| Propene | 701900 | 761000 | -8.42 | 30 | A | |

FORM V II SV

GCAL, Inc.

Data file : /var/chem/gcv8a.i/2180418.b/v8022.d
Lab Smp Id: 1400 Client Smp ID: MEE03
Inj Date : 18-APR-2018 12:53
Operator : BMR Inst ID: gcv8a.i
Smp Info : 1400*MEE03
Misc Info : 2126160/2125841/2126599
Comment :
Method : /var/chem/gcv8a.i/2180418.b/RSK.m
Meth Date : 18-Apr-2018 13:01 bmr Quant Type: ESTD
Cal Date : 18-JUL-2017 11:21 Cal File: v8006.d
Als bottle: 1 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: me&e.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | AMOUNTS | |
|---|---|---|---|---|---|---|
| | | | | | CAL-AMT | ON-COL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| ========== | == | ====== | ====== | ======== | ======= | ======= |
| 1 METHANE | 0.794 | 0.794 | 0.000 | 17423592 | 10.5000 | 10.8(M2) |
| 2 ETHYLENE | 1.195 | 1.195 | 0.000 | 3332020 | 2.83000 | 2.98(M2) |
| 4 ETHANE | 1.380 | 1.380 | 0.000 | 3300807 | 2.12000 | 2.33(M2) |
| $ 5 PROPENE | 2.477 | 2.477 | 0.000 | 47944480 | 63.0000 | 68.3(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8a.i/2180418.b/v8022.d

Page 1

Date : 18-APR-2018 12:53

Client ID: MEE03

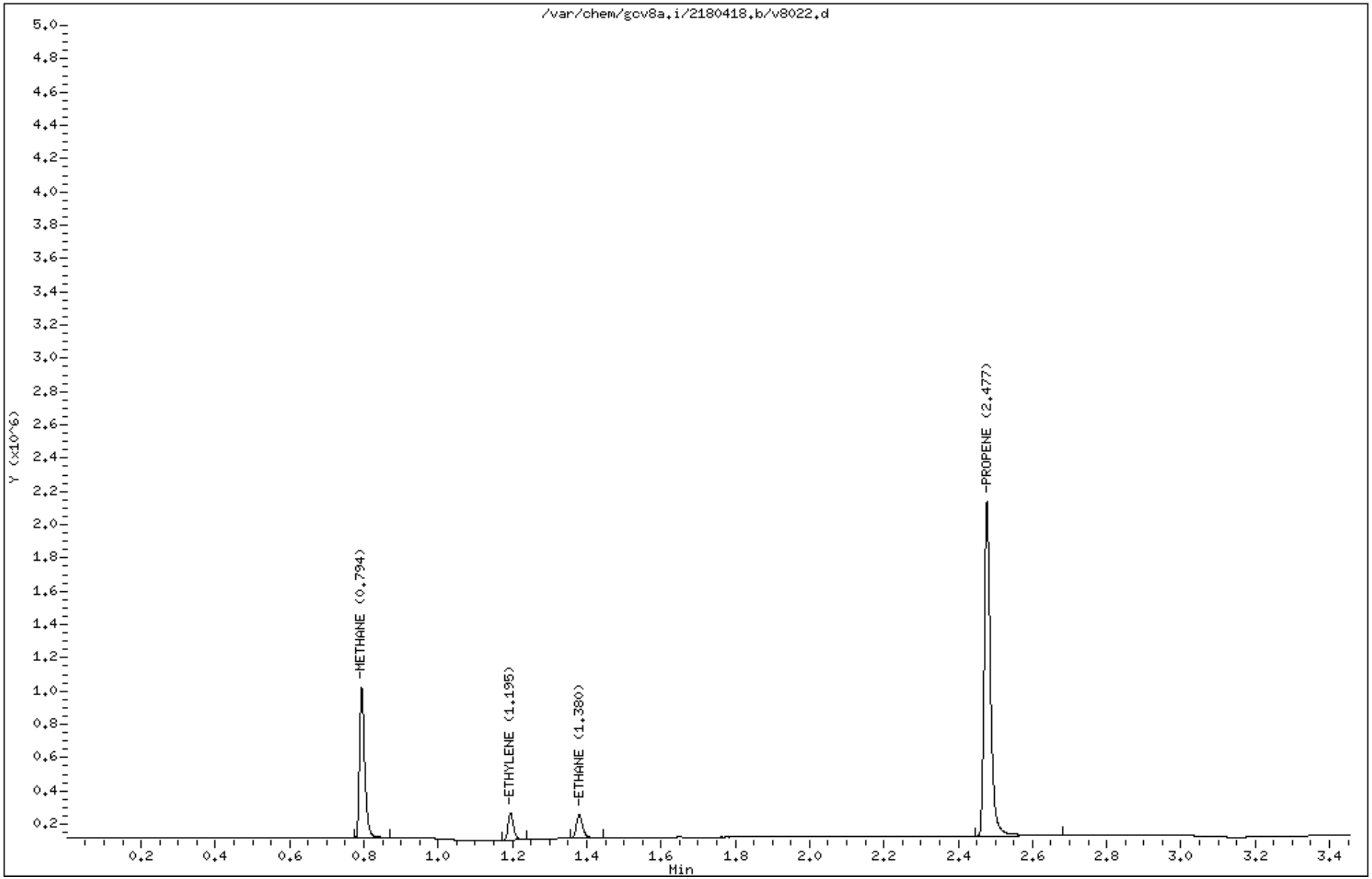
Instrument: gcv8a.i

Sample Info: 1400*MEE03

Operator: BMR

Column phase: GS-Q-30M

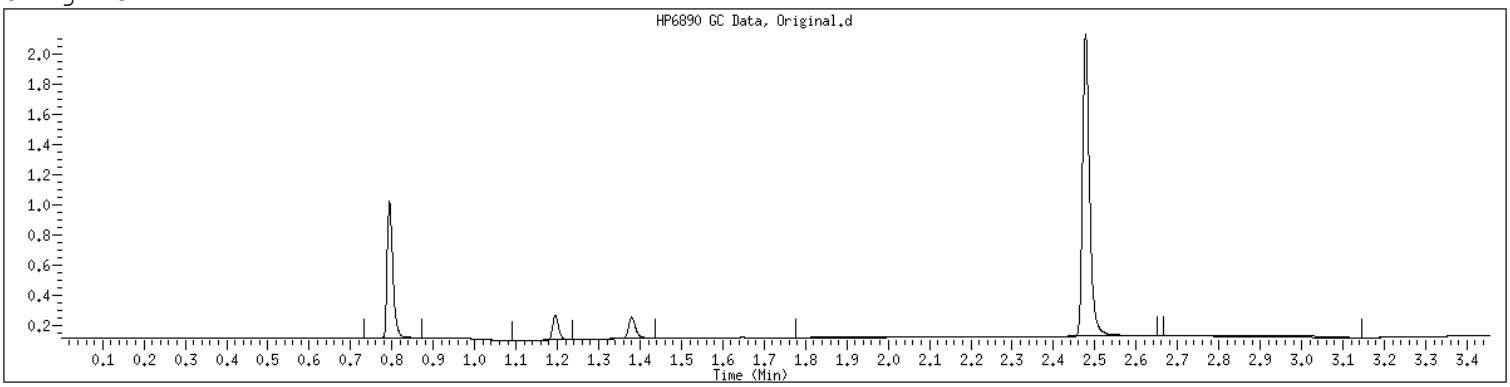
Column diameter: 0.53



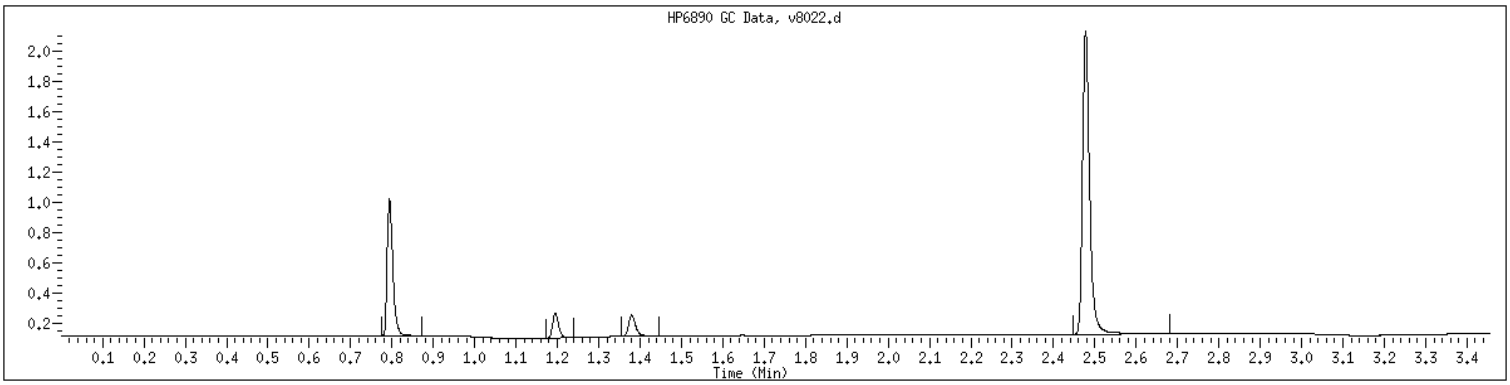
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 1400 | SampleType | : CCALIB_3 |
| Injection Date | : 04/18/2018 12:53 | Instrument | : gcv8a.i |
| Operator | : BMR | | |
| Sample Info | : 1400*MEE03 | | |
| Misc Info | : 2126160/2125841/2126599 | | |
| Method | : /var/chem/gcv8a.i/2180418.b/RSK.m | | |
| Dilution | : 1.00 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : me&e |

Original




Final



7E

ORGANICS CONTINUING CALIBRATION CHECK

| | | | | | |
|---|---|---|---|---|---|
| Report No: | 218040620 | | | CCAL ID: | 1400 |
| GC Column: | | ID | (mm) | Instrument ID: | GCV8B |
| Injection Vol.: | 1.0 | | ( µL ) | Lab File ID: | 2180418/v8001 |
| Init. Calib. Date 1: | 06/30/17 | Time 1: | 0958 | Analyst: | BMR |
| Init. Calib. Date 2: | 06/30/17 | Time 2: | 1025 | Analytical Batch: | 633677 |
| Analysis Date: | 04/18/18 | Time: | 1024 | Analytical Method: | RSK-175 |

| *ANALYTE* | *$\overline{RRF}$* | *RRF CCV* | *%D/%Drift* | *Max %D/ % Drift* | *TYPE* | *Q* |
|---|---|---|---|---|---|---|
| Carbon Dioxide | 4493 | 4925 | -9.61 | 20 | A | |

FORM V II SV

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2180418.b/v8001.d
Lab Smp Id: 1400 Client Smp ID: CO203
Inj Date : 18-APR-2018 10:24
Operator : bmR Inst ID: gcv8b.i
Smp Info : 1400*CO203
Misc Info : 2126160/2125841/2126599
Comment :
Method : /var/chem/gcv8b.i/2180418.b/CO2h.m
Meth Date : 18-Apr-2018 13:24 bmr Quant Type: ESTD
Cal Date : 30-JUN-2017 10:14 Cal File: v8003.d
Als bottle: 1 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: all.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | AMOUNTS | |
|---|---|---|---|---|---|---|
| | | | | | CAL-AMT | ON-COL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| 1 Carbon Dioxide | 1.035 | 1.035 | 0.000 | 42554917 | 8640.00 | 9470(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8b.i/2180418.b/v8001.d



Date : 18-APR-2018 10:24

Client ID: CO203

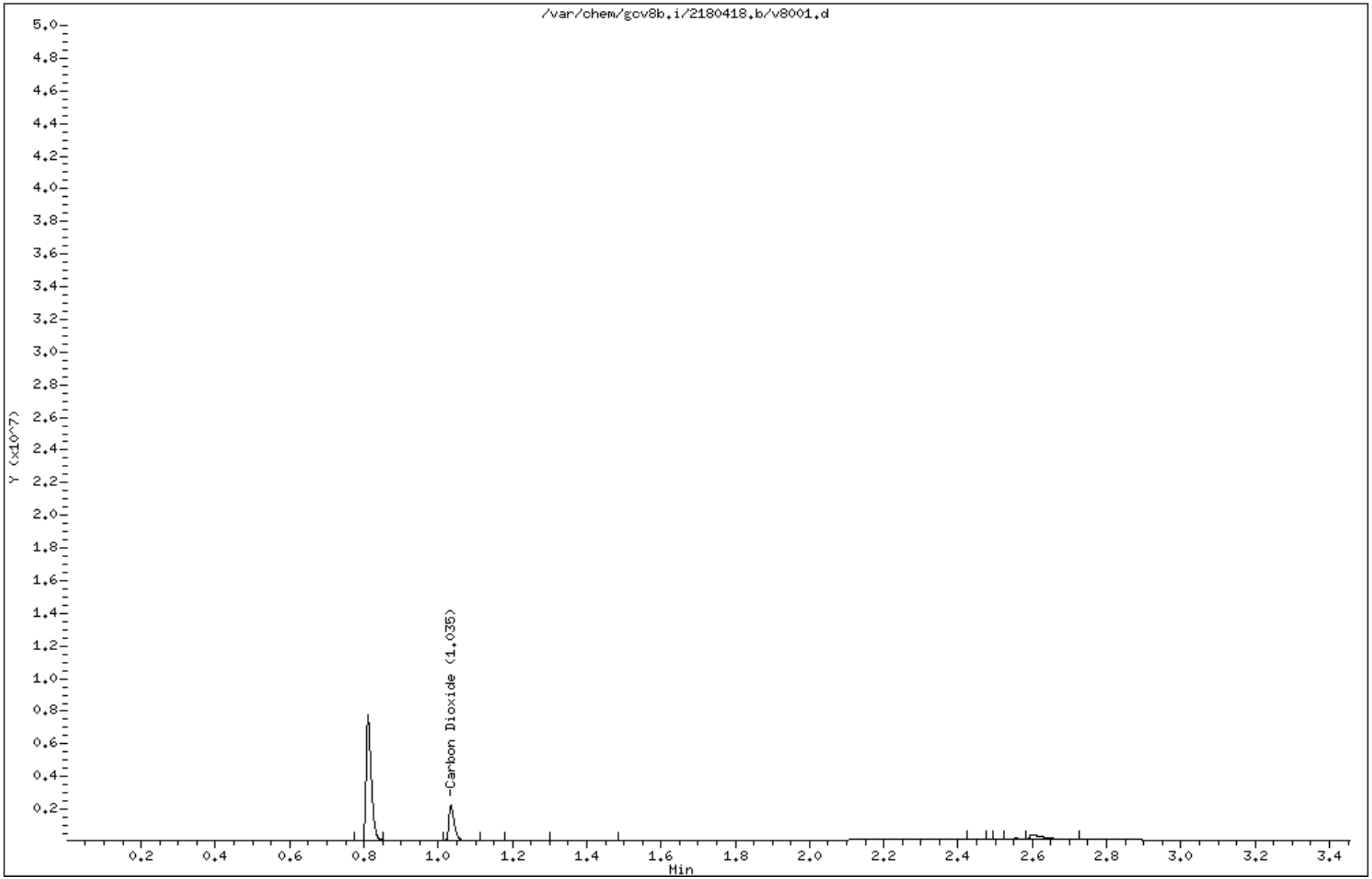
Instrument: gcv8b.i

Sample Info: 1400*CO203

Operator: bmR

Column phase: GS-Q-30

Column diameter: 0.53

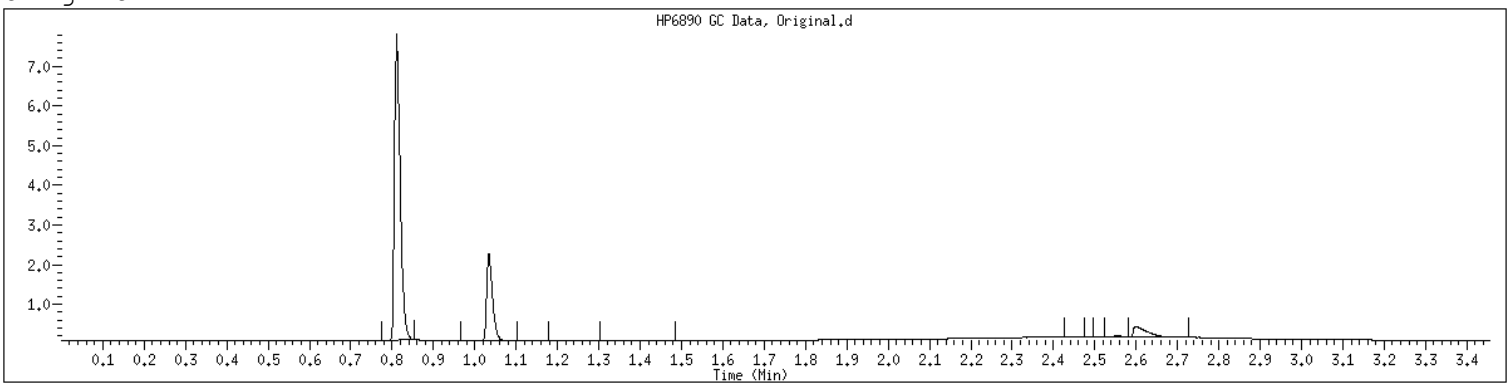


Report Date: 04/18/2018 13:24

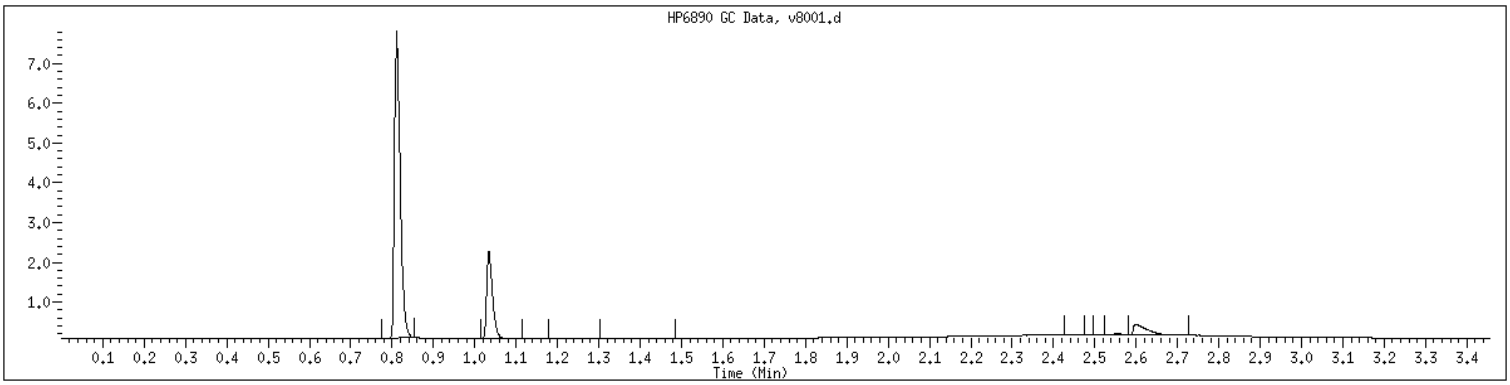
MANUAL INTEGRATION GRAPHIC REPORT

| | | | |
|---|---|---|---|
| Lab ID | : 1400 | SampleType | : CCALIB_3 |
| Injection Date | : 04/18/2018 10:24 | Instrument | : gcv8b.i |
| Operator | : bmR | | |
| Sample Info | : 1400*CO203 | | |
| Misc Info | : 2126160/2125841/2126599 | | |
| Method | : /var/chem/gcv8b.i/2180418.b/CO2h.m | | |
| Dilution | : 1.0 | | |
| Matrix | : WATER | | |
| Integrator | : HP Genie | Compound Sublist | : all |

Original




Final



7E

ORGANICS CONTINUING CALIBRATION CHECK

| | | | | | |
|---|---|---|---|---|---|
| Report No: | 218040620 | | | CCAL ID: | 1400 |
| GC Column: | | ID | (mm) | Instrument ID: | GCV8B |
| Injection Vol.: | 1.0 | | ( µL ) | Lab File ID: | 2180418/v8025 |
| Init. Calib. Date 1: | 06/30/17 | Time 1: | 0958 | Analyst: | BMR |
| Init. Calib. Date 2: | 06/30/17 | Time 2: | 1025 | Analytical Batch: | 633677 |
| Analysis Date: | 04/18/18 | Time: | 1318 | Analytical Method: | RSK-175 |

| *ANALYTE* | *$\overline{RRF}$* | *RRF CCV* | *%D/%Drift* | *Max %D/ % Drift* | *TYPE* | *Q* |
|---|---|---|---|---|---|---|
| Carbon Dioxide | 4493 | 4806 | -6.96 | 20 | A | |

FORM V II SV

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2180418.b/v8025.d
Lab Smp Id: 1400 Client Smp ID: CO203
Inj Date : 18-APR-2018 13:18
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1400*CO203
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2180418.b/CO2h.m
Meth Date : 18-Apr-2018 13:24 bmr Quant Type: ESTD
Cal Date : 30-JUN-2017 10:14 Cal File: v8003.d
Als bottle: 1 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

| | | | | | AMOUNTS | |
|---|---|---|---|---|---|---|
| | | | | | CAL-AMT | ON-COL |
| Compounds | RT | EXP RT | DLT RT | RESPONSE | ( ug/L) | ( ug/L) |
| 1 Carbon Dioxide | 1.034 | 1.034 | 0.000 | 41526794 | 8640.00 | 9240(M2) |

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8b.i/2180418.b/v8025.d



Date : 18-APR-2018 13:18

Client ID: CO203

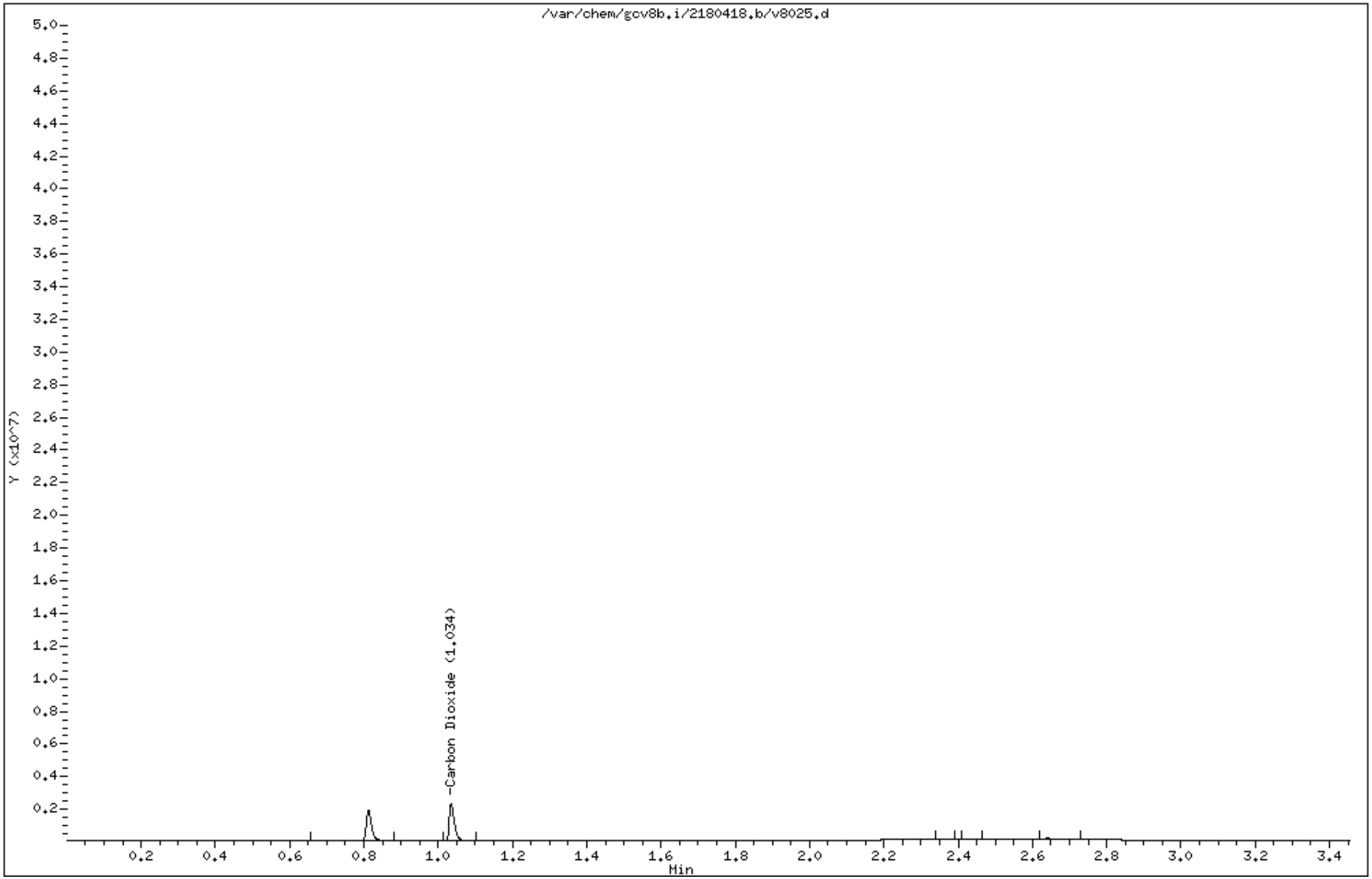
Instrument: gcv8b.i

Sample Info: 1400*CO203

Operator: BMR

Column phase: GS-Q-30

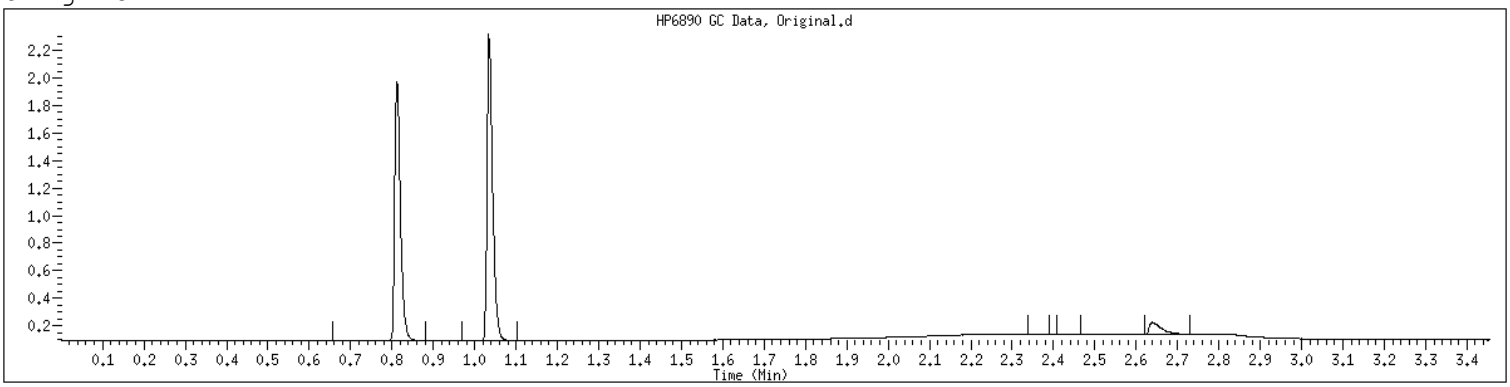
Column diameter: 0.53



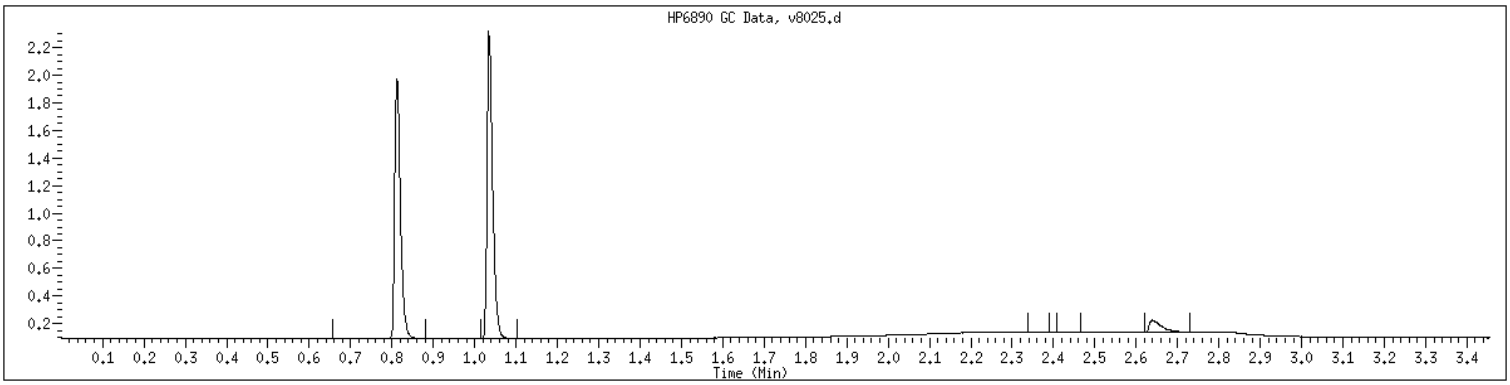
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 1400 SampleType : CCALIB_3
Injection Date: 04/18/2018 13:18 Instrument : gcv8b.i
Operator : BMR
Sample Info : 1400*CO203
Misc Info : 2125155
Method : /var/chem/gcv8b.i/2180418.b/CO2h.m
Dilution : 1.0
Matrix : WATER
Integrator : HP Genie Compound Sublist: co2

Original




Final



# RunLogs

LABORATORY CHRONICLE:  GCV DEPARTMENT

Date: 07/18/2017
Instrument: gcv8a.i
Method File: /var/chem/gcv8a.i/2170718.b/RSK.m
Batch: /var/chem/gcv8a.i/2170718.b
Column-Detector: GS-Q-30M

| Sample ID | Method | DataFile | Wgt/Vol | Injection Time | Dil | Anal | ALS | Comments |
|---|---|---|---|---|---|---|---|---|
| 1201 | | v8001.d | 0.00 ml | 18-JUL-2017 10:34 | 1.0 | BMR | 1 | meae |
| 1202 | | v8002.d | 0.00 ml | 18-JUL-2017 10:47 | 1.0 | BMR | 1 | meae |
| 1203 | | v8003.d | 0.00 ml | 18-JUL-2017 10:56 | 1.0 | BMR | 1 | meae |
| 1204 | | v8004.d | 0.00 ml | 18-JUL-2017 11:07 | 1.0 | BMR | 1 | meae |
| 1205 | | v8005.d | 0.00 ml | 18-JUL-2017 11:16 | 1.0 | BMR | 1 | me&e |
| 1205 | | v8006.d | 0.00 ml | 18-JUL-2017 11:21 | 1.0 | BMR | 1 | ace |
| 1600 | | v8007.d | 0.00 ml | 18-JUL-2017 11:30 | 1.0 | BMR | 1 | meae |
| 1600 | | v8008.d | 0.00 ml | 18-JUL-2017 11:46 | 1.0 | BMR | 1 | meae |
| | | v8009.d | 0.00 ml | 18-JUL-2017 12:02 | 1.0 | BMR | 1 | meae |
| | | v8010.d | 0.00 ml | 18-JUL-2017 12:08 | 1.0 | BMR | 1 | meae |
| 21707120108 | | v8011.d | 0.00 ml | 18-JUL-2017 12:41 | 1.0 | BMR | 1 | meae |
| | | v8012.d | 0.00 ml | 18-JUL-2017 13:06 | 1.0 | BMR | 1 | meae |
| 21707120107 | | v8013.d | 0.00 ml | 18-JUL-2017 13:22 | 1.0 | BMR | 1 | meae |
| 21707121401 | | v8014.d | 0.00 ml | 18-JUL-2017 13:33 | 1.0 | BMR | 1 | meae |
| 21707121402 | | v8015.d | 0.00 ml | 18-JUL-2017 13:46 | 1.0 | BMR | 1 | meae |
| 21707131701 | | v8016.d | 0.00 ml | 18-JUL-2017 14:01 | 1.0 | BMR | 1 | meae |

LABORATORY CHRONICLE:  GCV DEPARTMENT

Date: 04/19/2018
Instrument: gcv8a.i
Method File: /var/chem/gcv8a.i/2180418.b/RSK.m
Batch: /var/chem/gcv8a.i/2180418.b
Column-Detector: GS-Q-30M

| Sample ID | Method | DataFile | Wgt/Vol | Injection Time | Dil | Anal | ALS | Comments |
|---|---|---|---|---|---|---|---|---|
| 1400 | | v8001.d | 0.00 ml | 18-APR-2018 10:24 | 1.0 | BMR | 1 | me&e |
| 1798418 | | v8005.d | 0.00 ml | 18-APR-2018 10:59 | 1.0 | BMR | 1 | me&e |
| 1798419 | | v8006.d | 0.00 ml | 18-APR-2018 11:04 | 1.0 | BMR | 1 | me&e |
| 1798420 | | v8007.d | 0.00 ml | 18-APR-2018 11:10 | 1.0 | BMR | 1 | me&e |
| 21804062001 | | v8008.d | 0.00 ml | 18-APR-2018 11:23 | 1.0 | BMR | 1 | me&e |
| 21804062001 | | v8009.d | 0.00 ml | 18-APR-2018 11:27 | 300.0 | BMR | 1 | me&e |
| 21804062002 | | v8010.d | 0.00 ml | 18-APR-2018 11:37 | 1.0 | BMR | 1 | me&e |
| 21804062002 | | v8011.d | 0.00 ml | 18-APR-2018 11:43 | 300.0 | BMR | 1 | me&e |
| 21804062007 | | v8013.d | 0.00 ml | 18-APR-2018 11:54 | 1.0 | BMR | 1 | me&e |
| 21804062007 | | v8014.d | 0.00 ml | 18-APR-2018 12:00 | 600.0 | BMR | 1 | me&e |
| 21804062008 | | v8016.d | 0.00 ml | 18-APR-2018 12:16 | 1.0 | BMR | 1 | me&e |
| 21804062008 | | v8017.d | 0.00 ml | 18-APR-2018 12:22 | 300.0 | BMR | 1 | me&e |
| 21804062009 | | v8019.d | 0.00 ml | 18-APR-2018 12:35 | 1.0 | BMR | 1 | me&e |
| 21804062009 | | v8020.d | 0.00 ml | 18-APR-2018 12:41 | 600.0 | BMR | 1 | me&e |
| 1400 | | v8022.d | 0.00 ml | 18-APR-2018 12:53 | 1.0 | BMR | 1 | me&e |
| 21804062010 | | v8023.d | 0.00 ml | 18-APR-2018 13:02 | 1.0 | BMR | 1 | me&e |
| 21804063202 | | v8026.d | 0.00 ml | 18-APR-2018 13:23 | 1.0 | BMR | 1 | me&e |
| 21804063203 | | v8027.d | 0.00 ml | 18-APR-2018 13:34 | 1.0 | BMR | 1 | me&e |
| 21804063204 | | v8028.d | 0.00 ml | 18-APR-2018 13:41 | 1.0 | BMR | 1 | me&e |
| 21804063205 | | v8029.d | 0.00 ml | 18-APR-2018 13:54 | 1.0 | BMR | 1 | me&e |
| 21804063206 | | v8030.d | 0.00 ml | 18-APR-2018 14:02 | 1.0 | BMR | 1 | me&e |
| 21804063206 | | v8031.d | 0.00 ml | 18-APR-2018 14:07 | 10.0 | BMR | 1 | me&e |
| 21804063207 | | v8032.d | 0.00 ml | 18-APR-2018 14:14 | 1.0 | BMR | 1 | me&e |
| 21804063208 | | v8033.d | 0.00 ml | 18-APR-2018 14:20 | 1.0 | BMR | 1 | me&e |
| 21804071505 | | v8034.d | 0.00 ml | 18-APR-2018 14:44 | 1.0 | BMR | 1 | me&e |
| 1400 | | v8035.d | 0.00 ml | 18-APR-2018 15:02 | 1.0 | BMR | 1 | me&e |
| 21804071611 | | v8036.d | 0.00 ml | 18-APR-2018 15:07 | 1.0 | BMR | 1 | me&e |
| 21804070801 | | v8037.d | 0.00 ml | 18-APR-2018 15:13 | 1.0 | BMR | 1 | me&e |
| 21804070802 | | v8038.d | 0.00 ml | 18-APR-2018 15:19 | 1.0 | BMR | 1 | me&e |
| 21804070803 | | v8039.d | 0.00 ml | 18-APR-2018 15:24 | 1.0 | BMR | 1 | me&e |
| 21804070804 | | v8040.d | 0.00 ml | 18-APR-2018 15:30 | 1.0 | BMR | 1 | me&e |
| 21804070805 | | v8041.d | 0.00 ml | 18-APR-2018 15:36 | 1.0 | BMR | 1 | me&e |
| 1400 | | v8042.d | 0.00 ml | 18-APR-2018 15:39 | 1.0 | BMR | 1 | me&e |
| 1798599 | | v8043.d | 0.00 ml | 18-APR-2018 15:48 | 1.0 | BMR | 1 | me&e |
| 1798600 | | v8044.d | 0.00 ml | 18-APR-2018 15:53 | 1.0 | BMR | 1 | me&e |
| 1798601 | | v8045.d | 0.00 ml | 18-APR-2018 15:59 | 1.0 | BMR | 1 | me&e |

LABORATORY CHRONICLE:  GCV DEPARTMENT

Date: 04/19/2018
Instrument: gcv8a.i
Method File: /var/chem/gcv8a.i/2180418.b/RSK.m
Batch: /var/chem/gcv8a.i/2180418.b
Column-Detector: GS-Q-30M

| Sample ID | Method | DataFile | Wgt/Vol | Injection Time | Dil | Anal | ALS | Comments |
|---|---|---|---|---|---|---|---|---|
| 21804061801 | | v8046.d | 0.00 ml | 18-APR-2018 16:06 | 1.0 | BMR | 1 | me&e |
| 21804061804 | | v8047.d | 0.00 ml | 18-APR-2018 16:11 | 1.0 | BMR | 1 | me&e |
| 21804102901 | | v8048.d | 0.00 ml | 18-APR-2018 16:17 | 1.0 | JAR | 1 | me&e |
| 21804102901 | | v8049.d | 0.00 ml | 18-APR-2018 16:23 | 1.0 | BMR | 1 | me&e |
| 21804102902 | | v8050.d | 0.00 ml | 18-APR-2018 16:31 | 1.0 | BMR | 1 | me&e |
| 21804102902 | | v8051.d | 0.00 ml | 18-APR-2018 16:37 | 10.0 | JAR | 1 | me&e |
| 21804102903 | | v8052.d | 0.00 ml | 18-APR-2018 16:42 | 1.0 | JAR | 1 | me&e |
| 21804102904 | | v8053.d | 0.00 ml | 18-APR-2018 16:48 | 1.0 | JAR | 1 | me&e |
| 21804102905 | | v8054.d | 0.00 ml | 18-APR-2018 16:53 | 1.0 | JAR | 1 | me&e |
| 21804102906 | | v8055.d | 0.00 ml | 18-APR-2018 16:59 | 1.0 | JAR | 1 | me&e |
| 21804102907 | | v8056.d | 0.00 ml | 18-APR-2018 17:01 | 1.0 | JAR | 1 | me&e |
| 21804102907 | | v8057.d | 0.00 ml | 18-APR-2018 17:32 | 1.0 | JAR | 1 | me&e |
| 1400 | | v8058.d | 0.00 ml | 18-APR-2018 18:06 | 1.0 | JAR | 1 | me&e |
| 21804102908 | | v8059.d | 0.00 ml | 18-APR-2018 18:18 | 1.0 | JAR | 1 | me&e |
| 21804102909 | | v8060.d | 0.00 ml | 18-APR-2018 18:23 | 1.0 | JAR | 1 | me&e |
| 21804102910 | | v8061.d | 0.00 ml | 18-APR-2018 18:25 | 1.0 | JAR | 1 | me&e |
| 21804102912 | | v8062.d | 0.00 ml | 18-APR-2018 18:36 | 1.0 | JAR | 1 | me&e |
| 21804102913 | | v8063.d | 0.00 ml | 18-APR-2018 18:41 | 1.0 | JAR | 1 | me&e |
| 21804102913 | | v8064.d | 0.00 ml | 18-APR-2018 18:43 | 1.0 | JAR | 1 | me&e |
| 21804102913 | | v8065.d | 0.00 ml | 18-APR-2018 18:59 | 1.0 | JAR | 1 | me&e |
| 21804102914 | | v8066.d | 0.00 ml | 18-APR-2018 19:07 | 1.0 | JAR | 1 | me&e |
| 21804102915 | | v8067.d | 0.00 ml | 18-APR-2018 19:18 | 1.0 | JAR | 1 | me&e |
| 21804104104 | | v8068.d | 0.00 ml | 18-APR-2018 19:23 | 1.0 | JAR | 1 | me&e |
| 21804104105 | | v8069.d | 0.00 ml | 18-APR-2018 19:30 | 1.0 | JAR | 1 | me&e |
| 1400 | | v8070.d | 0.00 ml | 18-APR-2018 19:33 | 1.0 | JAR | 1 | me&e |

LABORATORY CHRONICLE:  GCV DEPARTMENT

Date: 06/30/2017
Instrument: gcv8b.i
Method File: /var/chem/gcv8b.i/2170630.b/CO2h.m
Batch: /var/chem/gcv8b.i/2170630.b
Column-Detector: GS-Q-30

| Sample ID | Method | DataFile | Wgt/Vol | Injection Time | Dil | Anal | ALS | Comments |
|---|---|---|---|---|---|---|---|---|
| 1201 | | v8001.d | 0.00 ml | 30-JUN-2017 09:58 | 1.0 | BMR | 1 | co2 |
| 1202 | | v8002.d | 0.00 ml | 30-JUN-2017 10:08 | 1.0 | BMR | 1 | co2 |
| 1203 | | v8003.d | 0.00 ml | 30-JUN-2017 10:14 | 1.0 | BMR | 1 | co2 |
| 1204 | | v8004.d | 0.00 ml | 30-JUN-2017 10:19 | 1.0 | BMR | 1 | co2 |
| 1205 | | v8005.d | 0.00 ml | 30-JUN-2017 10:25 | 1.0 | BMR | 1 | co2 |
| 1600 | | v8006.d | 0.00 ml | 30-JUN-2017 10:31 | 1.0 | BMR | 1 | co2 |
| 1697829 | | v8006L.d | 0.00 ml | 30-JUN-2017 10:31 | 1.0 | BMR | 1 | co2 |
| 1697830 | | v8007.d | 0.00 ml | 30-JUN-2017 10:43 | 1.0 | BMR | 1 | co2 |
| 1697828 | | v8008.d | 0.00 ml | 30-JUN-2017 10:50 | 1.0 | BMR | 1 | co2 |
| 21706270601 | | v8009.d | 0.00 ml | 30-JUN-2017 11:03 | 30.0 | BMR | 1 | co2 |
| 21706270602 | | v8010.d | 0.00 ml | 30-JUN-2017 11:08 | 20.0 | BMR | 1 | co2 |
| 21706270603 | | v8011.d | 0.00 ml | 30-JUN-2017 11:14 | 20.0 | BMR | 1 | co2 |
| 21706270604 | | v8012.d | 0.00 ml | 30-JUN-2017 11:16 | 20.0 | BMR | 1 | co2 |
| 21706270605 | | v8013.d | 0.00 ml | 30-JUN-2017 11:26 | 20.0 | BMR | 1 | co2 |
| 21706270606 | | v8014.d | 0.00 ml | 30-JUN-2017 11:33 | 20.0 | BMR | 1 | co2 |
| 21706281605 | | v8015.d | 0.00 ml | 30-JUN-2017 11:40 | 20.0 | BMR | 1 | co2 |
| 21706281606 | | v8016.d | 0.00 ml | 30-JUN-2017 11:46 | 20.0 | BMR | 1 | co2 |
| 1400 | | v8017.d | 0.00 ml | 30-JUN-2017 11:52 | 1.0 | BMR | 1 | co2 |

LABORATORY CHRONICLE:  GCV DEPARTMENT

Date: 04/20/2018
Instrument: gcv8b.i
Method File: /var/chem/gcv8b.i/2180418.b/CO2h.m
Batch: /var/chem/gcv8b.i/2180418.b
Column-Detector: GS-Q-30

| Sample ID | Method | DataFile | Wgt/Vol | Injection Time | Dil | Anal | ALS | Comments |
|---|---|---|---|---|---|---|---|---|
| 1400 | | v8001.d | 0.00 ml | 18-APR-2018 10:24 | 1.0 | bmR | 1 | all |
| 1798426 | | v8002.d | 0.00 ml | 18-APR-2018 10:33 | 1.0 | BMR | 1 | co2 |
| 1798427 | | v8003.d | 0.00 ml | 18-APR-2018 10:39 | 1.0 | BMR | 1 | co2 |
| 1798428 | | v8004.d | 0.00 ml | 18-APR-2018 10:45 | 1.0 | BMR | 1 | co2 |
| 21804062001 | | v8008.d | 0.00 ml | 18-APR-2018 11:23 | 1.0 | BMR | 1 | co2 |
| 21804062001 | | v8009.d | 0.00 ml | 18-APR-2018 11:27 | 300.0 | BMR | 1 | co2 |
| 21804062002 | | v8010.d | 0.00 ml | 18-APR-2018 11:37 | 1.0 | BMR | 1 | co2 |
| 21804062002 | | v8011.d | 0.00 ml | 18-APR-2018 11:43 | 300.0 | BMR | 1 | co2 |
| 21804062002 | | v8012.d | 0.00 ml | 18-APR-2018 11:49 | 100.0 | BMR | 1 | co2 |
| 21804062007 | | v8013.d | 0.00 ml | 18-APR-2018 11:54 | 1.0 | BMR | 1 | co2 |
| 21804062007 | | v8015.d | 0.00 ml | 18-APR-2018 12:06 | 100.0 | BMR | 1 | co2 |
| 21804062008 | | v8016.d | 0.00 ml | 18-APR-2018 12:16 | 1.0 | BMR | 1 | co2 |
| 21804062008 | | v8017.d | 0.00 ml | 18-APR-2018 12:22 | 300.0 | BMR | 1 | co2 |
| 21804062008 | | v8018.d | 0.00 ml | 18-APR-2018 12:28 | 100.0 | BMR | 1 | co2 |
| 21804062009 | | v8019.d | 0.00 ml | 18-APR-2018 12:35 | 1.0 | BMR | 1 | co2 |
| 21804062009 | | v8021.d | 0.00 ml | 18-APR-2018 12:46 | 20.0 | BMR | 1 | co2 |
| 21804062010 | | v8023.d | 0.00 ml | 18-APR-2018 13:02 | 1.0 | BMR | 1 | co2 |
| 21804062010 | | v8024.d | 0.00 ml | 18-APR-2018 13:09 | 50.0 | BMR | 1 | co2 |
| 1400 | | v8025.d | 0.00 ml | 18-APR-2018 13:18 | 1.0 | BMR | 1 | co2 |

# GCAL ANALYTICAL LABORATORIES, LLC

# CHAIN OF CUSTODY RECORD

7979 GSRI Ave., Baton Rouge, LA 70820-7402
Phone: 225.769.4900 • Fax: 225.767.5717 • www.gcal.com

Client ID: 4859 - AECOM-East
SDG: 218040620
PM: AEC

**Report to:**
Client: AECOM
Address: 3101 Wilson Blvd. Arlington VA 22201
Contact: Naoum Tavantzis
Phone: 919-461-1178
E-mail: naoum.tavantzis@aecom.com

**Bill to:**
Client: AECOM
Address: 3101 Wilson Blvd. Arlington VA 22201
Contact: Megan Donahue
Phone: 703-682-9142
E-mail: megan.donahue@aecom.com

P.O. Number:
Project Name/Number: VANG / 60553852
Sampled By: SUMON CHATTERJEE

Analytical Requests & Method

GCAL use only:
Custody Seal used ☐ yes ☐ no intact ☐ yes ☐ no
Temperature °C 2.2 ES 14 CM

☐ Dissolved Analysis Requested
☐ Field filtered
☐ Lab filtered

| Matrix[1] | Date | Time (2400) | Comp | Grab | Sample Description | No Containers | VOCs (8260B) | Diss. Gases (RSK 175) | Tot. Fe, Mn, As (SM6010C) | Diss. Fe, Mn (SM6010C) | Alk (SM 2320B), Disc. Fe, TDS (SM2540C), TOC (9060A) | Preservative | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W | 040518 | 1045 | | X | MW-13-11-21 | 10 | X | X | X | X | X | X | -1 |
| | | 1310 | | X | MW-11-02-21 | 10 | X | X | X | X | X | X | -2 |
| | | 1010 | | X | S4-MW50-21 | 3 | X | | | | | | -3 |
| | | 1140 | | X | S4-MW51-21 | 3 | X | | | | | | -4 |
| | | 1013 | | X | S4-MW-49-21 | 3 | X | | | | | | -5 |
| | | 1140 | | X | S4-MW-48-21 | 3 | X | | | | | | -6 |
| | | 1450 | | X | MW-11-06-21 | 10 | X | X | X | X | X | X | -7 |
| | | 1715 | | X | MW-11-10-21 | 10 | X | X | X | X | X | X | -8 |
| | | 1450 | | X | MW-11-01-21 | 10 | X | X | X | X | X | X | -9 |
| | | 1635 | | X | RD5-MW-01-21 | 10 | X | X | X | X | X | X | -10 |
| | | 1345 | | X | MW-01-07-21 | 3 | X | | | | | | -11 |
| | | 1310 | | X | S4-MW-46-21 | 3 | X | | | | | | -12 |
| | | 1440 | | X | S4-MW-47-21 | 3 | X | | | | | | -13 |
| | | | | | Trip Blank | 2 | X | | | | | | -14 |

Air Bill No: 8116 6462 9506

Turn Around Time (Business Days): ☐ 24h* ☐ 48h* ☐ 3 days* ☐ 1 week* ☑ Standard (Per Contract/Quote)

| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) | Date: | Time: |
|---|---|---|---|---|---|
| Sumon Chatterjee | 04/05/18 | 1800 | | | |
| Relinquished by: (Signature) FedEx | Date: 4-6-18 | Time: 0935 | Received by: (Signature) | Date: 4-6-18 | Time: 0935 |
| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) | Date: | Time: |

Note:

By submitting these samples, you agree to GCAL's terms and conditions contained in our most recent schedule of services.

Matrix[1]: W = water, S = solid, L = liquid, T = tissue

*Requires prior approval, rush charges may apply.

We cannot accept verbal changes. Please email written changes to your PM.

WHITE: CLIENT FINAL REPORT - CANARY: CLIENT

# CHAIN OF CUSTODY RECORD

GCAL ANALYTICAL LABORATORIES, LLC
7979 GSRI Ave., Baton Rouge, LA 70820-7402
Phone: 225.769.4900 • Fax: 225.767.5717 • www.gcal.com

Client ID: 4859 - AECOM-East
SDG: 218040620
PM: AEC

**Report to:**
Client: AECOM
Address: 3101 Wilson Blvd. Arlington VA 22201
Contact: Naoum Tavantzis
Phone: 919-461-1178
E-mail: naoum.tavantzis@aecom.com

**Bill to:**
Client: AECOM
Address: 3101 Wilson Blvd. Arlington VA 22201
Contact: Megan Donahue
Phone: 703-682-9142
E-mail: megan.donahue@aecom.com

P.O. Number:
Project Name/Number: VANG / 60553852
Sampled By: SUMON CHATTERJEE

Analytical Requests & Method: VOCs (8260B)

GCAL use only:
Custody Seal used ☑ yes ☐ no intact ☑ yes ☐ no
Temperature °C 2.2 E25 14CRM

☐ Dissolved Analysis Requested
☐ Field filtered
☐ Lab filtered

| Matrix[1] | Date | Time (2400) | Comp | Grab | Sample Description | No Containers | HCl | Preservative |
|---|---|---|---|---|---|---|---|---|
| W | 040518 | 1130 | | X | S4-MW28-21 | 3 | X | -15 |
| ↓ | ↓ | 1015 | | X | S4-MW37-21 | 3 | X | -16 |
| ↓ | ↓ | 1540 | | | MW-01-06-21 | 3 | X | -17 |

Air Bill No: 811664629506

Turn Around Time (Business Days): ☐ 24h* ☐ 48h* ☐ 3 days* ☐ 1 week* ☒ Standard (Per Contract/Quote)

| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) | Date: | Time: |
|---|---|---|---|---|---|
| | 04/05/18 | 1800 | | | |
| Relinquished by: (Signature) FedEX | 4-6-18 | 0735 | Received by: (Signature) | 4-6-18 | 0935 |
| Relinquished by: (Signature) | | | Received by: (Signature) | | |

Note:

By submitting these samples, you agree to GCAL's terms and conditions contained in our most recent schedule of services.

Matrix[1]: W = water, S = solid, L = liquid, T = tissue

*Requires prior approval, rush charges may apply.

We cannot accept verbal changes. Please email written changes to your PM.

WHITE: CLIENT FINAL REPORT - CANARY: CLIENT

# SAMPLE RECEIVING CHECKLIST

*2180406 20*

| SAMPLE DELIVERY GROUP 218040620 | |
|---|---|
| **Client** **PM** AEC<br>4859 - AECOM-East | **Transport Method**<br>FEDEX |
| **Profile Number**<br>275420 | **Received By**<br>Reese, Sean M |
| **Line Item(s)**<br>1 - Water | **Receive Date(s)**<br>04/06/18 |

| CHECKLIST | YES | NO |
|---|---|---|
| Samples received with proper thermal preservation? | ☑ | ☐ |
| Radioactivity is <1600 cpm? If no, record cpm value in notes section. | ☑ | ☐ |
| COC relinquished and complete (including sampleIDs, collect times, and sampler)? | ☐ | ☑ |
| All containers received in good condition and within hold time? | ☑ | ☐ |
| All sample labels and containers received match the chain of custody? | ☐ | ☑ |
| Preservative added to any containers? | ☐ | ☑ |
| If received, was headspace for VOC water containers < 6mm? | ☑ | ☐ |
| Samples collected in containers provided by GCAL? | ☑ | ☐ |

**COOLERS**

| Airbill | Thermometer ID: E29 | Temp °C |
|---|---|---|
| 8116 6462 9506 | | 2.2 |

**DISCREPANCIES**

None

**LAB PRESERVATIONS**

None

**NOTES**

RECEIVED DISSOLVED METALS CONTAINERS PRESERVED AND UNFILTERED, WILL USE 500L TDS CONTAINER FOR DISSOLVED ANALYSIS.
RECEIVED SAMPLE ID'S: TW-7-21 AND TW-6-21 NOT LISTED ON CHAIN OF CUSTODY.

Revision 1.6

GCAL ANALYTICAL LABORATORIES, LLC

# PH Analysis Water

*632760*

| START DATE/TIME | 4/6 9:29 | ANALYST | SLZ | BATCH | 632760 |
|---|---|---|---|---|---|

| # | CLIENT | TYPE | GCAL ID | Sample Temp (°C) | Result 1 (pH Units) | Result 2 (pH Units) | Result Time | STANDARDS\ REAGENTS |
|---|---|---|---|---|---|---|---|---|
| 1 | QC | ICV | QC Chk 8.00 | 16.9 | 7.95 | — | 9:38 | Buffer 1 Lot 2126490 |
| 2 | 4859 | SAMP | 21804053507 | 16.2 | 6.26 | 6.26 | | |
| 3 | QC | DUP | 1793848 | 16.5 | 6.25 | 6.26 | | Buffer 1 Exp 7/30/18 |
| 4 | 4859 | FD | 21804053508 | 16.0 | 6.32 | 6.31 | | |
| 5 | 4859 | SAMP | 21804053509 | 16.2 | 6.46 | 6.47 | | Buffer 4 Lot 2126563 |
| 6 | 4859 | MS | 21804053510 | 16.1 | 6.44 | 6.43 | | |
| 7 | 4859 | MSD | 21804053511 | 16.1 | 6.45 | 6.44 | | Buffer 4 Exp 1/30/20 |
| 8 | 4859 | SAMP | 21804053512 | 16.2 | 6.56 | 6.56 | | |
| 9 | 4859 | SAMP | 21804053514 | 16.4 | 6.17 | 6.16 | | Buffer 7 Lot 2126623 |
| 10 | 4859 | SAMP | 21804053515 | 16.5 | 6.03 | 6.03 | | |
| 11 | 4859 | SAMP | 21804053520 | 16.4 | 6.22 | 6.23 | | Buffer 7 Exp 10/30/19 |
| 12 | | | 218040608001 | 17.5 | 7.91 | 7.90 | 14:54 | |
| 13 | | | 218040622001 | 17.0 | 6.22 | 6.21 | | Buffer 10 Lot 2126624 |
| 14 | | | 218040622002 | 17.1 | 6.53 | 6.52 | | |
| 15 | | | 218040622007 | 16.9 | 6.28 | 6.29 | | Buffer 10 Exp 12/30/19 |
| 16 | | | 218040622008 | 16.4 | 6.03 | 6.02 | | |
| 17 | | | 218040622009 | 16.4 | 6.60 | 6.59 | | Buffer 13 Lot 2126439 |
| 18 | | | 218040622010 | 17.0 | 4.58 | 4.57 | | |
| 19 | | | | | | | | Buffer 13 Exp 9/30/18 |
| 20 | | | | | | | | |
| 21 | | | | | | | | Buffer 8 (QC) Lot 2126404 |
| 22 | | | | | | | | |
| 23 | | | | | | | | Buffer 8 (QC) Exp 2/28/19 |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | QC | CCV | QC Chk 8.00 | 17.3 | 7.97 | — | 15:06 | |
| 28 | QC | CCV | QC Chk 8.00 | | | | | |
| 29 | QC | CCV | QC Chk 8.00 | | | | | |
| 30 | | | | | | | | |

**NOTES**

Slope Limits 92-108; QC Limits: True Value +/- 0.05 pH Units. Result 1 and Result 2 must agree within 0.1 pH Units; if not, repeat the test.

**EQUIPMENT\CONDITIONS**

| pH Meter ID | Calibration Slope | |
|---|---|---|
| PH01 | 101.1 | |

**REVIEW**

| TECHNICIAN\DATE | SUPERVISOR\DATE |
|---|---|
| SLZ 4/6/2018 | 4-16-18 DWB |

# TOTAL ORGANIC CARBON
BY METHODS 5310B/SW9060A
WATERS

Date: 4/15/18
Analyst: PLH

Instrument ID: TOC5
HBN: 633249
Batch: 7234

**TC**
Calibration Standard Lot #: 2126310
Calibration Std. Exp: 8-3-19
Calibration ID: 1112-92-2
Calibration Date: 12-10-17
Calibration Exp: 12-10-18

**TC**
TC CCV/LCS Lot #: 1121-84-7
TC CCV/LCS Expiration Date: 5-10-18

**IC**
Calibration Standard Lot #: 2126317
Calibration Std. Exp: 8-31-18
Calibration ID: 1117-65-3
Calibration Date: 1-30-18
Calibration Exp: 8-31-18

**IC**
IC CCV/LCS Lot #: 1121-84-8
IC CCV/LCS Expiration Date: 5-10-18

Note: Calibration expires 1year from calibration date or on the calibration standard expiration date, whichever is sooner.

Revision 006: 05/04/2016

Reviewer/Date: RJD 04/13/18

C:\TOC3201\Data\2018_04_12_001.t32

| | | Sample Name | Sample ID | Manual | Result | Date / Time | Vial | |
|---|---|---|---|---|---|---|---|---|
| | | 1796547 | | 4/23/18 | | | | |
| CCV | 1 | ~~1796208~~/LCS T | 7234,PLH,TOC5 | 1.000 | TOC:45.91mg/L TC:46.97mg/L IC:1.066mg/L | 4/12/2018 8:34:12 PM | 61 | 93.94% |
| | 2 | LCS/CCV IC | 7234,PLH,TOC5 | 1.000 | TOC:2.663mg/L TC:53.38mg/L IC:50.72mg/L | 4/12/2018 9:07:58 PM | 62 | 101.44% |
| MB/CCB | | ~~179267~~1796546 | 7234,PLH,TOC5 | 1.000 | TOC:-0.6065mg/L TC:0.4436mg/L IC:1.050mg/L | 4/12/2018 9:36:57 PM | 63 | |
| | 4 | 21804060307 | 7234,PLH,TOC5 | 1.000 | TOC:12.29mg/L TC:40.68mg/L IC:28.39mg/L | 4/12/2018 10:04:45 PM | 1 | |
| | 5 | 21804060308 | 7234,PLH,TOC5 | 1.000 | TOC:3.360mg/L TC:17.96mg/L IC:14.60mg/L | 4/12/2018 10:32:05 PM | 2 | |
| | 6 | 21804060309/M | 7234,PLH,TOC5 | 1.000 | TOC:51.80mg/L TC:65.54mg/L IC:13.74mg/L | 4/12/2018 10:55:30 PM | 3 | 96.68% |
| | 7 | 21804060310/M | 7234,PLH,TOC5 | 1.000 | TOC:50.55mg/L TC:64.42mg/L IC:13.87mg/L | 4/12/2018 11:18:52 PM | 4 | 94.38% |
| | 8 | 21804060313 | 7234,PLH,TOC5 | 1.000 | TOC:15.28mg/L TC:64.65mg/L IC:49.37mg/L | 4/12/2018 11:41:44 PM | 5 | |
| | 9 | 21804060318 | 7234,PLH,TOC5 | 1.000 | TOC:2.488mg/L TC:17.93mg/L IC:15.44mg/L | 4/13/2018 12:09:01 AM | 6 | |
| | 10 | 21804061301 | 7234,PLH,TOC5 | 1.000 | TOC:13.34mg/L TC:71.50mg/L IC:58.15mg/L | 4/13/2018 12:34:46 AM | 7 | |
| | 11 | 21804061302 | 7234,PLH,TOC5 | 1.000 | TOC:14.64mg/L TC:78.92mg/L IC:64.28mg/L | 4/13/2018 1:09:27 AM | 8 | |
| | 12 | 21804062001 | RERUN | 1.000 | TOC:22.68mg/L TC:132.4mg/L IC:109.7mg/L | 4/13/2018 1:40:15 AM | 9 | |
| | 13 | 21804062002 | RERUN | 1.000 | TOC:129.3mg/L TC:252.4mg/L IC:123.1mg/L | 4/13/2018 2:17:04 AM | 10 | |
| | 14 | 1800 CCV | 7234,PLH,TOC5 | 1.000 | TOC:47.48mg/L TC:49.30mg/L IC:1.820mg/L | 4/13/2018 2:47:18 AM | 64 | 98.6% |
| | 15 | LCS/CCV IC | 7234,PLH,TOC5 | 1.000 | TOC:5.007mg/L TC:56.04mg/L IC:51.03mg/L | 4/13/2018 3:15:08 AM | 65 | 102.06% |
| | 16 | 1900 CCB | 7234,PLH,TOC5 | 1.000 | TOC:-0.4223mg/L TC:0.5444mg/L IC:0.9667mg/L | 4/13/2018 3:38:00 AM | 66 | |
| | 17 | 21804062007 | 7234,PLH,TOC5 | 1.000 | TOC:29.04mg/L TC:91.89mg/L IC:62.85mg/L | 4/13/2018 4:05:23 AM | 11 | |
| | 18 | 21804062008 | 7234,PLH,TOC5 | 1.000 | TOC:17.27mg/L TC:85.05mg/L IC:67.79mg/L | 4/13/2018 4:33:56 AM | 12 | |
| | 19 | 21804062009 | 7234,PLH,TOC5 | 1.000 | TOC:18.95mg/L TC:67.97mg/L IC:49.02mg/L | 4/13/2018 4:56:56 AM | 13 | |
| | 20 | 21804107201 | RERUN | 1.000 | TOC:180.0mg/L TC:203.5mg/L IC:23.50mg/L | 4/13/2018 5:24:54 AM | 14 | |
| | 21 | 21804108001 | 7234,PLH,TOC5 | 1.000 | TOC:12.96mg/L TC:20.55mg/L IC:7.596mg/L | 4/13/2018 5:47:51 AM | 15 | |
| | 22 | 21804122811 | RERUN | 1.000 | TOC:27.82mg/L TC:121.5mg/L IC:93.64mg/L | 4/13/2018 6:16:02 AM | 16 | |
| | 23 | 21804122812 | RERUN | 1.000 | TOC:23.17mg/L TC:113.2mg/L IC:89.98mg/L | 4/13/2018 6:53:47 AM | 17 | |
| | 24 | 21804122813 | 7234,PLH,TOC5 | 1.000 | TOC:5.050mg/L TC:36.54mg/L IC:31.49mg/L | 4/13/2018 7:16:23 AM | 18 | |
| | 25 | 21804122822 | 7234,PLH,TOC5 | 1.000 | TOC:3.959mg/L TC:27.35mg/L IC:23.39mg/L | 4/13/2018 7:41:41 AM | 19 | |
| | 26 | 21804122824 | 7234,PLH,TOC5 | 1.000 | TOC:4.410mg/L TC:27.99mg/L IC:23.58mg/L | 4/13/2018 8:04:10 AM | 20 | |
| | 27 | 1800 CCV | 7234,PLH,TOC5 | 1.000 | TOC:47.59mg/L TC:48.77mg/L IC:1.182mg/L | 4/13/2018 8:32:16 AM | 50 | 97.54% |
| | 28 | LCS/CCV IC | 7234,PLH,TOC5 | 1.000 | TOC:6.001mg/L TC:56.76mg/L IC:50.76mg/L | 4/13/2018 8:59:05 AM | 51 | 101.52% |
| | 29 | 1900 CCB | 7234,PLH,TOC5 | 1.000 | TOC:-0.4206mg/L TC:0.5448mg/L IC:0.9653mg/L | 4/13/2018 9:19:55 AM | 52 | |

Sample

Sample Name: ~~1796268~~ 1796547 LCS TC ICCV
Sample ID: 7234,PLH,TOC5
Origin: TOC4.met
Status Completed (2)(4/13/18
Chk. Result

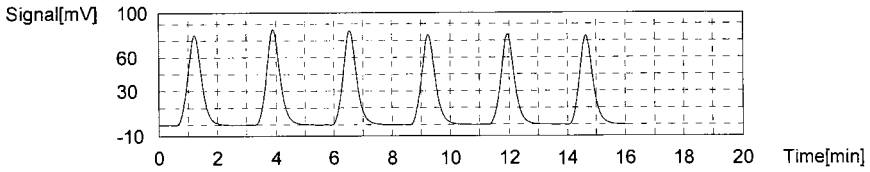
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:45.91mg/L TC:46.97mg/L IC:1.066mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 257.9 | 47.14mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 8:06:51 PM |
| 2 | 268.2 | 49.01mg/L | 50uL | 1 | E | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 8:09:41 PM |
| 3 | 267.1 | 48.81mg/L | 50uL | 1 | E | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 8:12:34 PM |
| 4 | 258.5 | 47.25mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 8:15:26 PM |
| 5 | 254.9 | 46.60mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 8:18:21 PM |
| 6 | 256.6 | 46.91mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 8:21:12 PM |

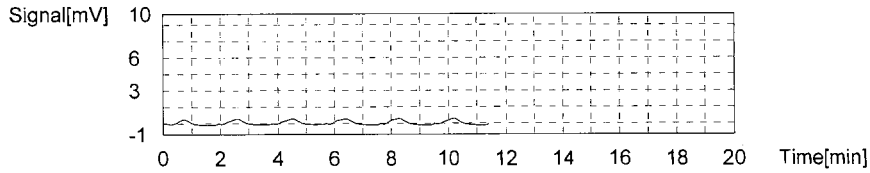
Mean Area 257.0
Mean Conc. 46.97mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 1.092 | 0.9949mg/L | 50uL | 1 | E | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/12/2018 8:23:36 PM |
| 2 | 1.383 | 1.040mg/L | 50uL | 1 | E | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/12/2018 8:25:43 PM |
| 3 | 1.477 | 1.055mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/12/2018 8:27:51 PM |
| 4 | 1.589 | 1.072mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/12/2018 8:29:58 PM |
| 5 | 1.619 | 1.077mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/12/2018 8:32:04 PM |
| 6 | 1.525 | 1.062mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/12/2018 8:34:12 PM |

Mean Area 1.553
Mean Conc. 1.066mg/L



Sample

| | |
|---|---|
| Sample Name: | LCS/CCV IC |
| Sample ID: | 7234,PLH,TOC5 |
| Origin: | TOC4.met |
| Status | Completed |
| Chk. Result | |

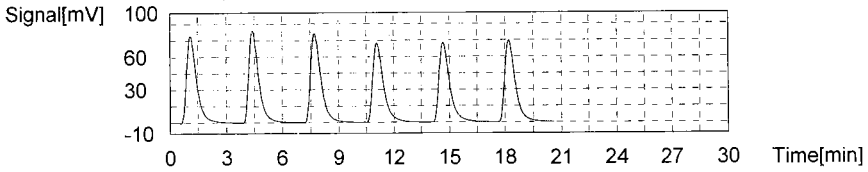
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:2.663mg/L TC:53.38mg/L IC:50.72mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 295.8 | 54.03mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 8:41:05 PM |
| 2 | 310.3 | 56.66mg/L | 50uL | 1 | E | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 8:44:35 PM |
| 3 | 303.4 | 55.41mg/L | 50uL | 1 | E | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 8:48:05 PM |
| 4 | 293.4 | 53.59mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 8:51:53 PM |
| 5 | 287.2 | 52.47mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 8:55:35 PM |
| 6 | 292.5 | 53.43mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 8:59:16 PM |

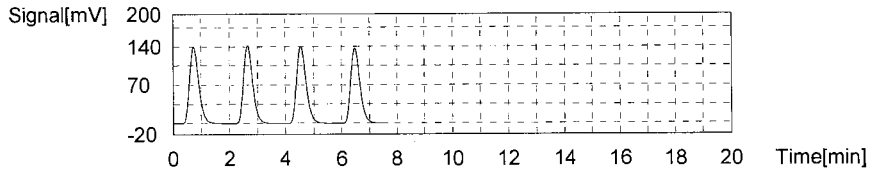
Mean Area 292.2
Mean Conc. 53.38mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 319.9 | 50.39mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/12/2018 9:01:40 PM |
| 2 | 326.8 | 51.46mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/12/2018 9:03:46 PM |
| 3 | 325.6 | 51.27mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/12/2018 9:05:52 PM |
| 4 | 315.8 | 49.75mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/12/2018 9:07:58 PM |

Mean Area 322.0
Mean Conc. 50.72mg/L



Sample

Sample Name: 179546 MB/CCB
Sample ID: ~~179267~~ 7234,PLH,TOC5
Origin: TOC4.met
Status Completed
Chk. Result

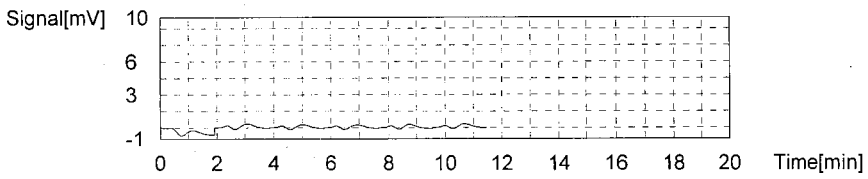
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:-0.6065mg/L TC:0.4436mg/L IC:1.050mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 1.378 | 0.5304mg/L | 50uL | 1 | E | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/12/2018 9:13:35 PM |
| 2 | 1.099 | 0.4797mg/L | 50uL | 1 | E | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/12/2018 9:15:42 PM |
| 3 | 0.9044 | 0.4444mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/12/2018 9:17:47 PM |
| 4 | 0.7822 | 0.4221mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/12/2018 9:19:52 PM |
| 5 | 0.9349 | 0.4499mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/12/2018 9:21:57 PM |
| 6 | 0.9806 | 0.4582mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/12/2018 9:24:02 PM |

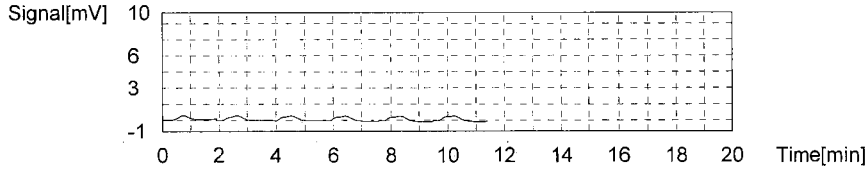
Mean Area 0.9005
Mean Conc. 0.4436mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 0.9294 | 0.9697mg/L | 50uL | 1 | E | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/12/2018 9:26:26 PM |
| 2 | 1.385 | 1.040mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/12/2018 9:28:32 PM |
| 3 | 1.370 | 1.038mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/12/2018 9:30:37 PM |
| 4 | 1.473 | 1.054mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/12/2018 9:32:44 PM |
| 5 | 1.607 | 1.075mg/L | 50uL | 1 | E | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/12/2018 9:34:51 PM |
| 6 | 1.568 | 1.069mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/12/2018 9:36:57 PM |

Mean Area 1.449
Mean Conc. 1.050mg/L



Sample

Sample Name: 1800
Sample ID: 7234,PLH,TOC5
Origin: TOC4.met
Status Completed
Chk. Result

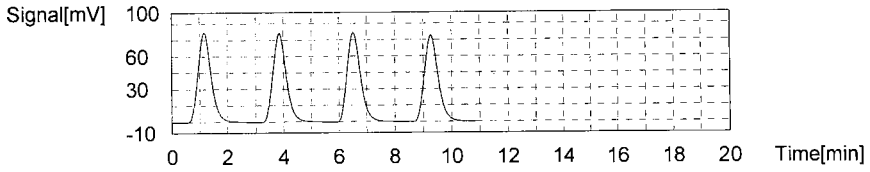
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:47.48mg/L TC:49.30mg/L IC:1.820mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 267.7 | 48.92mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/13/2018 2:23:24 AM |
| 2 | 273.1 | 49.90mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/13/2018 2:26:17 AM |
| 3 | 272.9 | 49.87mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/13/2018 2:29:12 AM |
| 4 | 265.4 | 48.51mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/13/2018 2:32:06 AM |

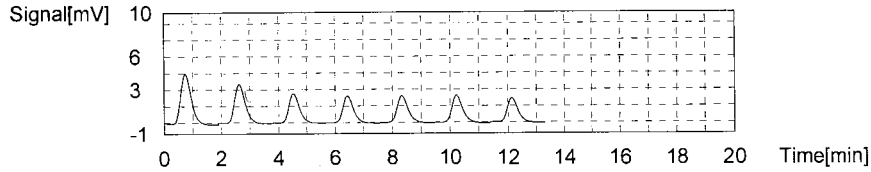
Mean Area 269.8
Mean Conc. 49.30mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 11.55 | 2.615mg/L | 50uL | 1 | E | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 2:34:36 AM |
| 2 | 8.903 | 2.205mg/L | 50uL | 1 | E | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 2:36:41 AM |
| 3 | 6.794 | 1.878mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 2:38:46 AM |
| 4 | 6.238 | 1.792mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 2:40:51 AM |
| 5 | 6.213 | 1.788mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 2:42:56 AM |
| 6 | 6.418 | 1.820mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 2:45:01 AM |
| 7 | 5.368 | 1.657mg/L | 50uL | 1 | E | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 2:47:18 AM |

Mean Area 6.416
Mean Conc. 1.820mg/L



Sample

Sample Name: LCS/CCV IC
Sample ID: 7234,PLH,TOC5
Origin: TOC4.met
Status Completed
Chk. Result

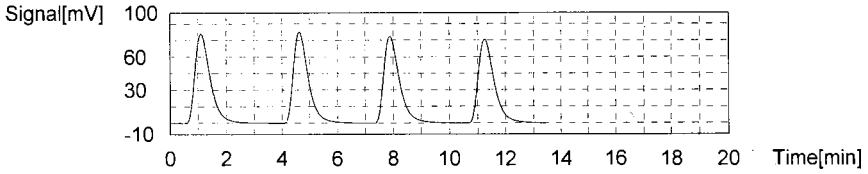
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:5.007mg/L TC:56.04mg/L IC:51.03mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 306.7 | 56.01mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/13/2018 2:54:24 AM |
| 2 | 312.2 | 57.01mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/13/2018 2:57:50 AM |
| 3 | 307.6 | 56.17mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/13/2018 3:01:22 AM |
| 4 | 300.9 | 54.96mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/13/2018 3:04:53 AM |

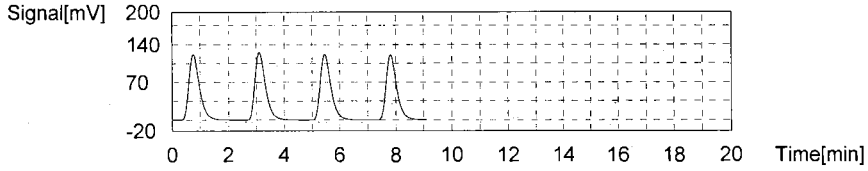
Mean Area 306.9
Mean Conc. 56.04mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 322.3 | 50.76mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 3:07:50 AM |
| 2 | 332.0 | 52.26mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 3:10:22 AM |
| 3 | 324.9 | 51.16mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 3:12:54 AM |
| 4 | 317.0 | 49.94mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 3:15:08 AM |

Mean Area 324.1
Mean Conc. 51.03mg/L



Sample

| | |
|---|---|
| Sample Name: | 1900 |
| Sample ID: | 7234,PLH,TOC5 |
| Origin: | TOC4.met |
| Status | Completed |
| Chk. Result | |

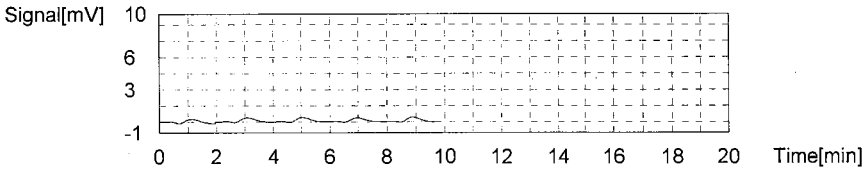
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:-0.4223mg/L TC:0.5444mg/L IC:0.9667mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 1.394 | 0.5333mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/13/2018 3:20:47 AM |
| 2 | 1.490 | 0.5508mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/13/2018 3:22:57 AM |
| 3 | 1.486 | 0.5500mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/13/2018 3:25:03 AM |
| 4 | 1.271 | 0.5110mg/L | 50uL | 1 | E | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/13/2018 3:27:11 AM |
| 5 | 1.450 | 0.5435mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/13/2018 3:29:16 AM |

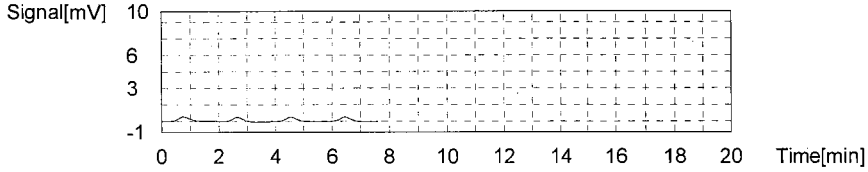
Mean Area 1.455
Mean Conc. 0.5444mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 0.8610 | 0.9591mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 3:31:45 AM |
| 2 | 0.9508 | 0.9730mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 3:33:50 AM |
| 3 | 0.8826 | 0.9624mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 3:35:55 AM |
| 4 | 0.9474 | 0.9725mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 3:38:00 AM |

Mean Area 0.9104
Mean Conc. 0.9667mg/L



Sample

Sample Name: 21804062007
Sample ID: 7234,PLH,TOC5
Origin: TOC4.met
Status Completed
Chk. Result

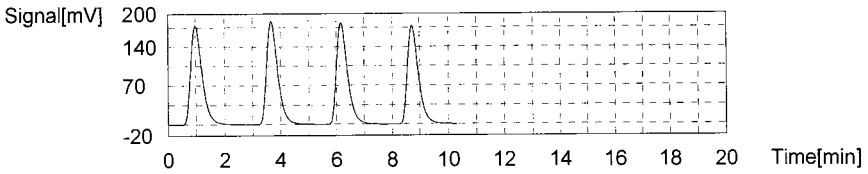
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:29.04mg/L TC:91.89mg/L IC:62.85mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 496.8 | 90.55mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/13/2018 3:44:33 AM |
| 2 | 513.9 | 93.66mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/13/2018 3:47:14 AM |
| 3 | 510.6 | 93.06mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/13/2018 3:49:58 AM |
| 4 | 495.3 | 90.28mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/13/2018 3:52:43 AM |

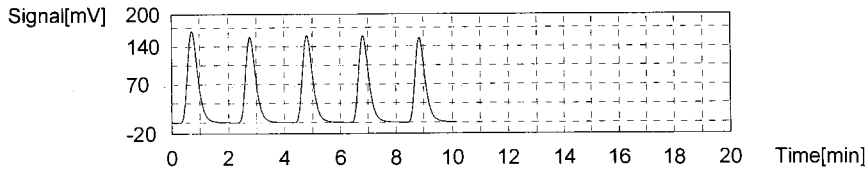
Mean Area 504.2
Mean Conc. 91.89mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 427.2 | 67.01mg/L | 50uL | 1 | E | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 3:55:22 AM |
| 2 | 399.0 | 62.64mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 3:57:53 AM |
| 3 | 406.7 | 63.83mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 4:00:22 AM |
| 4 | 402.4 | 63.17mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 4:02:53 AM |
| 5 | 393.2 | 61.74mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 4:05:23 AM |

Mean Area 400.3
Mean Conc. 62.85mg/L



Sample

Sample Name: 21804062008
Sample ID: 7234,PLH,TOC5
Origin: TOC4.met
Status Completed
Chk. Result

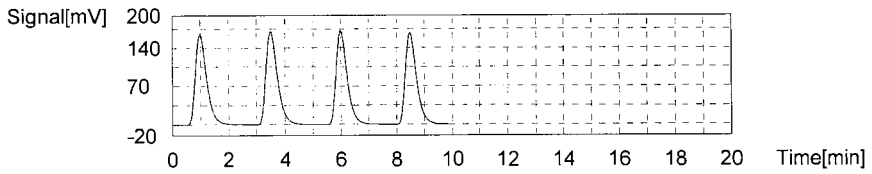
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:17.27mg/L TC:85.05mg/L IC:67.79mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 456.9 | 83.30mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/13/2018 4:11:31 AM |
| 2 | 471.1 | 85.88mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/13/2018 4:14:11 AM |
| 3 | 473.8 | 86.37mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/13/2018 4:16:52 AM |
| 4 | 464.3 | 84.65mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/13/2018 4:19:34 AM |

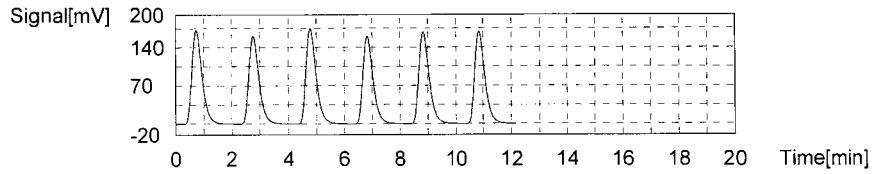
Mean Area 466.5
Mean Conc. 85.05mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 433.7 | 68.02mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/13/2018 4:22:12 AM |
| 2 | 403.8 | 63.39mg/L | 50uL | 1 | E | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/13/2018 4:24:44 AM |
| 3 | 441.0 | 69.15mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/13/2018 4:26:59 AM |
| 4 | 405.2 | 63.60mg/L | 50uL | 1 | E | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/13/2018 4:29:28 AM |
| 5 | 425.0 | 66.67mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/13/2018 4:31:42 AM |
| 6 | 429.1 | 67.30mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/13/2018 4:33:56 AM |

Mean Area 432.2
Mean Conc. 67.79mg/L



Sample

Sample Name: 21804062009
Sample ID: 7234,PLH,TOC5
Origin: TOC4.met
Status Completed
Chk. Result

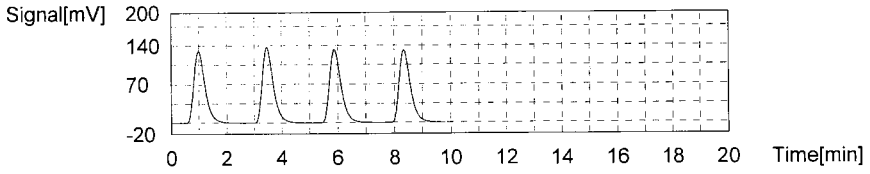
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:18.95mg/L TC:67.97mg/L IC:49.02mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 367.8 | 67.11mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/13/2018 4:39:56 AM |
| 2 | 380.7 | 69.46mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/13/2018 4:42:32 AM |
| 3 | 374.5 | 68.33mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/13/2018 4:45:11 AM |
| 4 | 367.2 | 67.00mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/13/2018 4:47:48 AM |

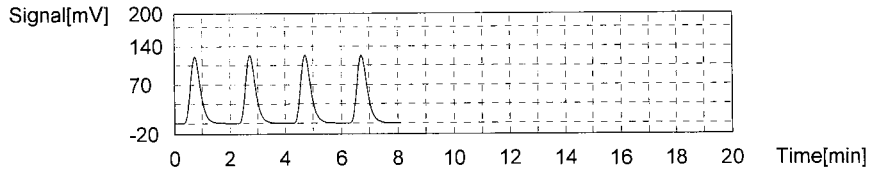
Mean Area 372.6
Mean Conc. 67.97mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 305.6 | 48.17mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 4:50:23 AM |
| 2 | 313.1 | 49.33mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 4:52:34 AM |
| 3 | 314.1 | 49.49mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 4:54:45 AM |
| 4 | 311.6 | 49.10mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 4:56:56 AM |

Mean Area 311.1
Mean Conc. 49.02mg/L



Sample

Sample Name: 1800
Sample ID: 7234,PLH,TOC5
Origin: TOC4.met
Status Completed
Chk. Result

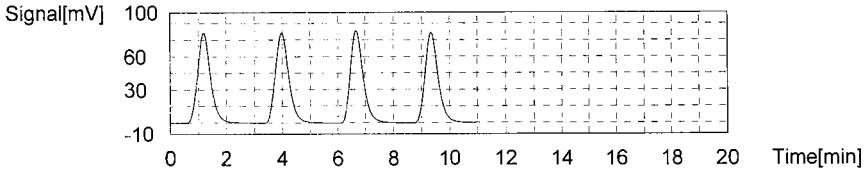
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:47.59mg/L TC:48.77mg/L IC:1.182mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 263.0 | 48.07mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/13/2018 8:10:44 AM |
| 2 | 273.4 | 49.96mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/13/2018 8:13:39 AM |
| 3 | 268.9 | 49.14mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/13/2018 8:16:29 AM |
| 4 | 262.1 | 47.91mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/13/2018 8:19:21 AM |

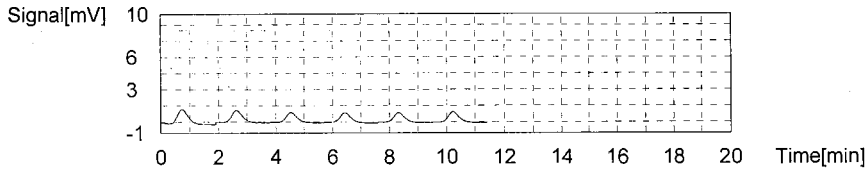
Mean Area 266.9
Mean Conc. 48.77mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 3.215 | 1.324mg/L | 50uL | 1 | E | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 8:21:51 AM |
| 2 | 2.734 | 1.249mg/L | 50uL | 1 | E | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 8:23:56 AM |
| 3 | 2.282 | 1.179mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 8:26:01 AM |
| 4 | 2.239 | 1.173mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 8:28:06 AM |
| 5 | 2.266 | 1.177mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 8:30:11 AM |
| 6 | 2.425 | 1.201mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 8:32:16 AM |

Mean Area 2.303
Mean Conc. 1.182mg/L



Sample

Sample Name: LCS/CCV IC
Sample ID: 7234,PLH,TOC5
Origin: TOC4.met
Status Completed
Chk. Result

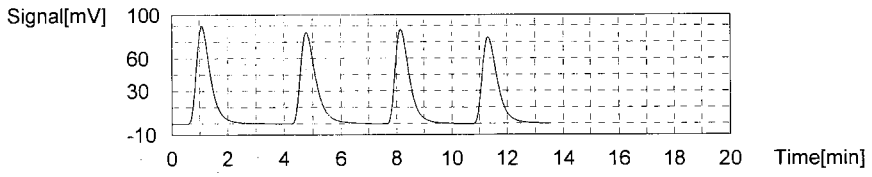
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:6.001mg/L TC:56.76mg/L IC:50.76mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 316.2 | 57.74mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_(| 4/13/2018 8:39:32 AM |
| 2 | 311.7 | 56.92mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_(| 4/13/2018 8:43:05 AM |
| 3 | 311.0 | 56.79mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_(| 4/13/2018 8:46:24 AM |
| 4 | 304.5 | 55.61mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_(| 4/13/2018 8:49:54 AM |

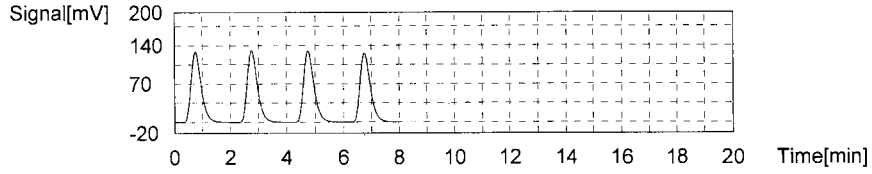
Mean Area 310.9
Mean Conc. 56.76mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 322.5 | 50.79mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 8:52:31 AM |
| 2 | 327.9 | 51.63mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 8:54:42 AM |
| 3 | 323.6 | 50.96mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 8:56:53 AM |
| 4 | 315.3 | 49.67mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 8:59:05 AM |

Mean Area 322.3
Mean Conc. 50.76mg/L



Sample

Sample Name: 1900
Sample ID: 7234,PLH,TOC5
Origin: TOC4.met
Status Completed
Chk. Result

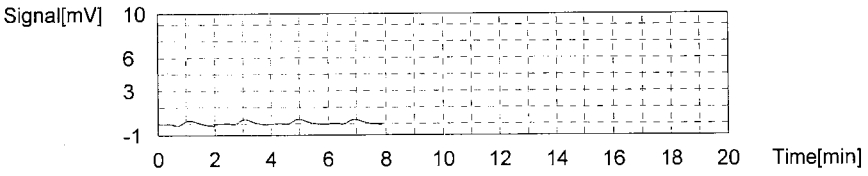
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:-0.4206mg/L TC:0.5448mg/L IC:0.9653mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 1.576 | 0.5664mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/13/2018 9:04:45 AM |
| 2 | 1.410 | 0.5362mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/13/2018 9:06:50 AM |
| 3 | 1.441 | 0.5419mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/13/2018 9:08:58 AM |
| 4 | 1.401 | 0.5346mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/13/2018 9:11:10 AM |

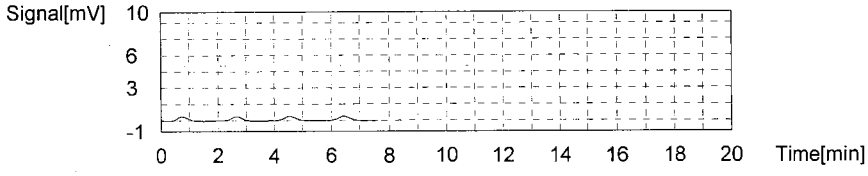
Mean Area 1.457
Mean Conc. 0.5448mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 0.8204 | 0.9528mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 9:13:40 AM |
| 2 | 0.8932 | 0.9641mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 9:15:45 AM |
| 3 | 0.9322 | 0.9701mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 9:17:50 AM |
| 4 | 0.9592 | 0.9743mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/13/2018 9:19:55 AM |

Mean Area 0.9013
Mean Conc. 0.9653mg/L



GCAL ANALYTICAL LABORATORIES, LLC

# TOTAL ORGANIC CARBON

BY METHODS 5310B/SW9060A

WATERS

Date: 1-30-18

Analyst: JGM

Instrument ID: TOC5

HBN: IC Calibration

Batch:

**TC**

Calibration Standard Lot #: 2126310

Calibration Std. Exp: 8-3-19

Calibration ID: 1112-92-2

Calibration Date: 12-10-17

Calibration Exp: 12-10-18

**TC**

TC CCV/LCS Lot #: NA

TC CCV/LCS Expiration Date: ↓

**IC**

Calibration Standard Lot #: 2126317

Calibration Std. Exp: 8-31-18

Calibration ID: 1117-65-3

Calibration Date: 1-30-18

Calibration Exp: 8-31-18

**IC**

IC CCV/LCS Lot #: NA

IC CCV/LCS Expiration Date: ↓

Note: Calibration expires 1year from calibration date or on the calibration standard expiration date, whichever is sooner.

Revision 006: 05/04/2016

Reviewer/Date: DMT 1/31/18

C:\TOC3201\Data\2018_01_30_001.t32

| | Sample Name | Sample ID | Manual | Result | Date / Time | Vial |
|---|---|---|---|---|---|---|
| 1 | IC | 2126317 TOC5 | 1.000 | | 1/30/2018 1:32:08 PM | 1, 2, |
| 2 | ICB | JEM,TOC5 | 1.000 | TOC:-0.4843mg/L TC:0.3891mg/L IC:0.8734mg/L | 1/30/2018 2:04:45 PM | 8 |
| 3 | 2.0 IC | JEM,TOC5 | 1.000 | TOC:-0.3468mg/L TC:2.402mg/L IC:2.749mg/L | 1/30/2018 2:36:01 PM | 14 |
| 4 | 25.0 IC | JEM,TOC5 | 1.000 | TOC:2.729mg/L TC:27.31mg/L IC:24.58mg/L | 1/30/2018 3:14:00 PM | 15 |
| 5 | 75.0 IC | JEM,TOC5 | 1.000 | TOC:8.356mg/L TC:82.02mg/L IC:73.66mg/L | 1/30/2018 3:57:14 PM | 16 |

131/.
98/.
96/.

Cal. Curve

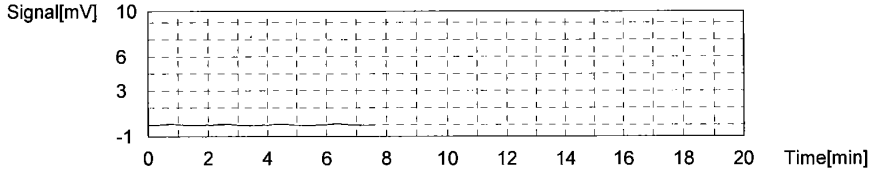
Sample Name: IC
Sample ID: 2126317 TOC5
Cal. Curve: IC_0-1-15-30-60-100-1.2018_01_30_11_48_11.cal
Status Completed

| Type | Anal. |
|---|---|
| Standard | IC |

Conc: 0.000mg/L

| No. | Area | Inj. Vol. | Aut. Dil. | Rem. | Ex. | Date / Time |
|---|---|---|---|---|---|---|
| 1 | 0.000 | 50uL | 1 | ******* | | 1/30/2018 11:53:52 AM |
| 2 | 0.1999 | 50uL | 1 | ******* | | 1/30/2018 11:55:57 AM |
| 3 | 0.000 | 50uL | 1 | ******* | | 1/30/2018 11:58:02 AM |
| 4 | 0.000 | 50uL | 1 | ******* | | 1/30/2018 12:00:07 PM |

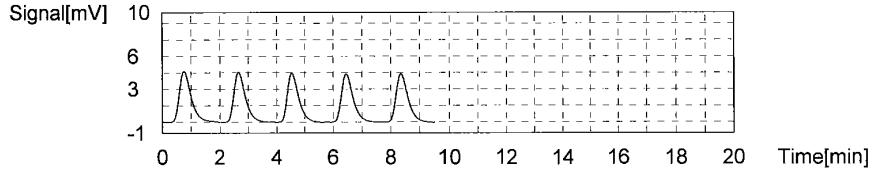
Acid Add. 0.000%
Mean Area 0.04998




Conc: 2.000mg/L

| No. | Area | Inj. Vol. | Aut. Dil. | Rem. | Ex. | Date / Time |
|---|---|---|---|---|---|---|
| 1 | 12.73 | 50uL | 1 | ******* | | 1/30/2018 12:06:13 PM |
| 2 | 12.64 | 50uL | 1 | ******* | | 1/30/2018 12:08:18 PM |
| 3 | 12.30 | 50uL | 1 | ******* | | 1/30/2018 12:10:23 PM |
| 4 | 12.00 | 50uL | 1 | ******* | E | 1/30/2018 12:12:28 PM |
| 5 | 12.24 | 50uL | 1 | ******* | | 1/30/2018 12:14:33 PM |

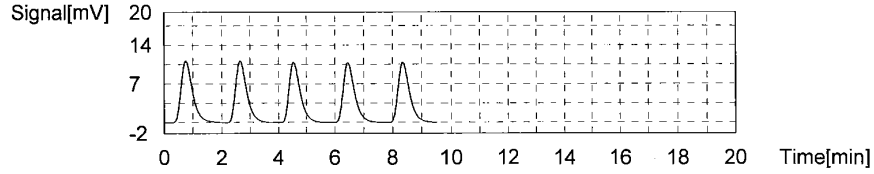
Acid Add. 0.000%
Mean Area 12.48




Conc: 5.000mg/L

| No. | Area | Inj. Vol. | Aut. Dil. | Rem. | Ex. | Date / Time |
|---|---|---|---|---|---|---|
| 1 | 30.65 | 50uL | 1 | ******* | | 1/30/2018 12:20:37 PM |
| 2 | 30.75 | 50uL | 1 | ******* | E | 1/30/2018 12:22:42 PM |
| 3 | 29.77 | 50uL | 1 | ******* | | 1/30/2018 12:24:47 PM |
| 4 | 29.37 | 50uL | 1 | ******* | | 1/30/2018 12:26:52 PM |
| 5 | 29.67 | 50uL | 1 | ******* | | 1/30/2018 12:28:57 PM |

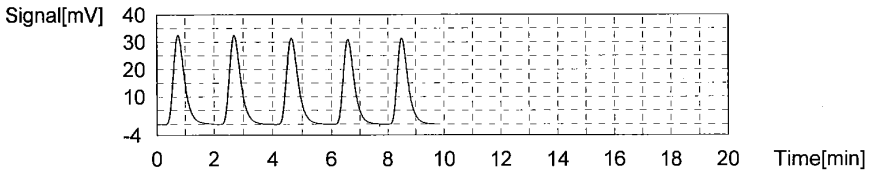
Acid Add. 0.000%
Mean Area 29.87




Conc: 15.00mg/L

| No. | Area | Inj. Vol. | Aut. Dil. | Rem. | Ex. | Date / Time |
|---|---|---|---|---|---|---|
| 1 | 87.65 | 50uL | 1 | ******* | E | 1/30/2018 12:35:04 PM |
| 2 | 87.22 | 50uL | 1 | ******* | | 1/30/2018 12:37:12 PM |
| 3 | 84.91 | 50uL | 1 | ******* | | 1/30/2018 12:39:19 PM |
| 4 | 83.38 | 50uL | 1 | ******* | | 1/30/2018 12:41:26 PM |
| 5 | 84.33 | 50uL | 1 | ******* | | 1/30/2018 12:43:32 PM |

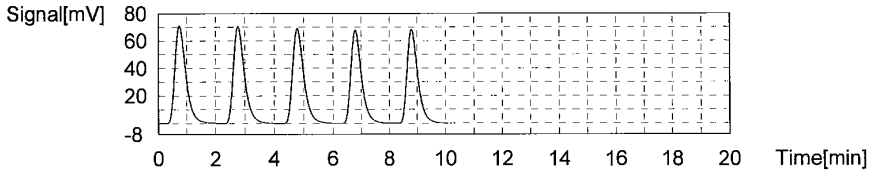
Acid Add. 0.000%
Mean Area 84.96




Conc: 30.00mg/L

| No. | Area | Inj. Vol. | Aut. Dil. | Rem. | Ex. | Date / Time |
|---|---|---|---|---|---|---|
| 1 | 187.7 | 50uL | 1 | ******* | E | 1/30/2018 12:49:44 PM |
| 2 | 186.1 | 50uL | 1 | ******* | | 1/30/2018 12:51:56 PM |
| 3 | 181.0 | 50uL | 1 | ******* | | 1/30/2018 12:54:07 PM |
| 4 | 178.6 | 50uL | 1 | ******* | | 1/30/2018 12:56:19 PM |
| 5 | 180.2 | 50uL | 1 | ******* | | 1/30/2018 12:58:31 PM |

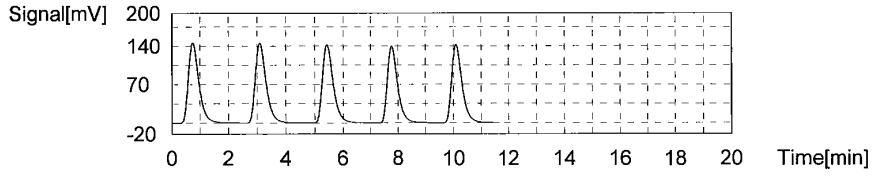
Acid Add. 0.000%
Mean Area 181.5




Conc: 60.00mg/L

| No. | Area | Inj. Vol. | Aut. Dil. | Rem. | Ex. | Date / Time |
|---|---|---|---|---|---|---|
| 1 | 381.7 | 50uL | 1 | ******* | | 1/30/2018 1:05:03 PM |
| 2 | 379.7 | 50uL | 1 | ******* | | 1/30/2018 1:07:34 PM |
| 3 | 370.9 | 50uL | 1 | ******* | | 1/30/2018 1:10:05 PM |
| 4 | 364.4 | 50uL | 1 | ******* | E | 1/30/2018 1:12:36 PM |
| 5 | 369.3 | 50uL | 1 | ******* | | 1/30/2018 1:15:06 PM |

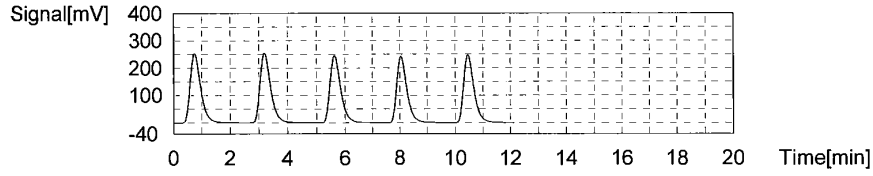
Acid Add. 0.000%
Mean Area 375.4



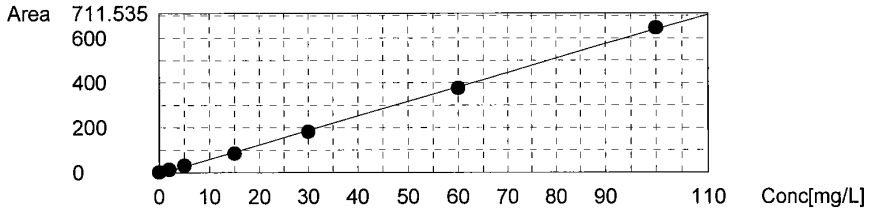

Conc: 100.0mg/L

| No. | Area | Inj. Vol. | Aut. Dil. | Rem. | Ex. | Date / Time |
|---|---|---|---|---|---|---|
| 1 | 657.6 | 50uL | 1 | ******* | | 1/30/2018 1:21:44 PM |
| 2 | 655.7 | 50uL | 1 | ******* | | 1/30/2018 1:24:21 PM |
| 3 | 639.2 | 50uL | 1 | ******* | | 1/30/2018 1:26:57 PM |
| 4 | 624.4 | 50uL | 1 | ******* | E | 1/30/2018 1:29:33 PM |
| 5 | 634.9 | 50uL | 1 | ******* | | 1/30/2018 1:32:08 PM |

Acid Add. 0.000%
Mean Area 646.9



| | |
|---|---|
| Slope: | 6.455 |
| Intercept | -5.330 |
| r^2 | 0.9993 |
| r | 0.9997 |
| Zero Shift | No |



GCAL ANALYTICAL LABORATORIES, LLC

# TOTAL ORGANIC CARBON
BY METHODS 5310B/SW9060A
WATERS

Date: 12-10-17
Analyst: JEm

Instrument ID: TOC5
HBN: ICAL
Batch: DMT 12/13/17

**TC**
Calibration Standard Lot #: 2126310
Calibration Std. Exp: 8-3-19
Calibration ID: 1112-92-2
Calibration Date: 12-10-17
Calibration Exp: 12-10-18

**TC**
TC CCV/LCS Lot #: NA
TC CCV/LCS Expiration Date: ↓

**IC**
Calibration Standard Lot #: 2126317
Calibration Std. Exp: 8-31-18
Calibration ID: 1112-92-3
Calibration Date: 12-10-17
Calibration Exp: 8-31-18

**IC**
IC CCV/LCS Lot #: NA
IC CCV/LCS Expiration Date: ↓

Note: Calibration expires 1year from calibration date or on the calibration standard expiration date, whichever is sooner.

Revision 006: 05/04/2016

Reviewer/Date: DMT 12/13/17

C:\TOC3201\Data\2017_12_11_002.t32

| | Sample Name | Sample ID | Manu | Result | Date / Time | Vial |
|---|---|---|---|---|---|---|
| 1 | TC | JEM,TOC5 | 1.00 | | 12/10/2017 11:29:54 AM | 1, 2 |
| 2 | IC | JEM,TOC5 | 1.00 | | 12/10/2017 1:00:20 PM | 8, 9 |
| 3 | ICB | JEM,TOC5 | 1.00 | TOC:-0.2771mg/L TC:0.3108mg/L IC:0.5880mg/L | 12/10/2017 1:52:47 PM | 15 |
| 4 | 2.0 TC | JEM,TOC5 | 1.00 | TOC:1.621mg/L TC:2.295mg/L IC:0.6737mg/L | 12/10/2017 2:15:17 PM | 16 |
| 5 | 25.0 TC | JEM,TOC5 | 1.00 | TOC:22.80mg/L TC:23.47mg/L IC:0.6672mg/L | 12/10/2017 2:39:18 PM | 17 |
| 6 | 75.0 TC | JEM,TOC5 | 1.00 | TOC:72.36mg/L TC:73.05mg/L IC:0.6946mg/L | 12/10/2017 3:06:47 PM | 18 |
| 7 | ~~2.0 IC~~ | ~~JEM,TOC5~~ | ~~1.00~~ | ~~TOC:-0.2214mg/L TC:2.709mg/L IC:2.930mg/L~~ | ~~12/10/2017 3:32:45 PM~~ | 19 |
| 8 | ~~25.0 IC~~ | ~~JEM,TOC5~~ | ~~1.00~~ | ~~TOC:-0.6521mg/L TC:23.48mg/L IC:24.13mg/L~~ | ~~12/10/2017 4:01:15 PM~~ | 20 |
| 9 | ~~75.0 IC~~ | ~~JEM,TOC5~~ | ~~1.00~~ | ~~TOC:-0.1480mg/L TC:73.95mg/L IC:74.10mg/L~~ | ~~12/10/2017 4:34:44 PM~~ | 21 |
| 10 | 1753232 LCS | 7077,JEM,TOC5 | 1.00 | TOC:48.80mg/L TC:49.50mg/L IC:0.6998mg/L | 12/10/2017 5:00:01 PM | 61 |
| 11 | LCS/CCV IC | 7077,JEM,TOC5 | 1.00 | TOC:-0.9060mg/L TC:48.29mg/L IC:49.19mg/L | 12/10/2017 5:24:35 PM | 62 |
| 12 | 1753231 MB | 7077,JEM,TOC5 | 1.00 | TOC:-0.3040mg/L TC:0.2859mg/L IC:0.5900mg/L | 12/10/2017 5:43:03 PM | 63 |
| 13 | 21712017901 | 7077,JEM,TOC5 | 5.00 | TOC:91.29mg/L TC:113.5mg/L IC:22.17mg/L | 12/10/2017 6:45:41 PM | 1 |
| 14 | 21712066801 | 7077,JEM,TOC5 | 1.00 | TOC:2.120mg/L TC:30.52mg/L IC:28.40mg/L | 12/10/2017 7:03:56 PM | 2 |
| 15 | 1753234 MS | 7077,JEM,TOC5 | 1.00 | TOC:49.01mg/L TC:76.02mg/L IC:27.01mg/L | 12/10/2017 7:23:01 PM | 3 |
| 16 | 1753235 MSD | 7077,JEM,TOC5 | 1.00 | TOC:48.43mg/L TC:73.51mg/L IC:25.09mg/L | 12/10/2017 7:41:35 PM | 3 |
| 17 | 21712066802 | 7077,JEM,TOC5 | 1.00 | TOC:4.400mg/L TC:23.40mg/L IC:19.00mg/L | 12/10/2017 7:59:48 PM | 4 |
| 18 | 21712066803 | 7077,JEM,TOC5 | 1.00 | TOC:4.266mg/L TC:21.64mg/L IC:17.37mg/L | 12/10/2017 8:17:54 PM | 5 |
| 19 | 21712100101 | 7077,JEM,TOC5 | 20.0 | TOC:563.6mg/L TC:605.4mg/L IC:41.73mg/L | 12/10/2017 8:45:46 PM | 6 |
| 20 | 21712100102 | 7077,JEM,TOC5 | 20.0 | TOC:96.40mg/L TC:144.8mg/L IC:48.45mg/L | 12/10/2017 9:08:56 PM | 7 |
| 21 | 21712100103 | 7077,JEM,TOC5 | 20.0 | TOC:267.0mg/L TC:299.4mg/L IC:32.39mg/L | 12/10/2017 9:35:25 PM | 8 |
| 22 | 21712100104 | 7077,JEM,TOC5 | 50.0 | TOC:1029mg/L TC:1081mg/L IC:51.48mg/L | 12/10/2017 9:53:59 PM | 9 |
| 23 | 1753233 LCSD | 7077,JEM,TOC5 | 1.00 | TOC:47.23mg/L TC:47.88mg/L IC:0.6473mg/L | 12/10/2017 10:16:00 PM | 64 |
| 24 | LCS/CCV IC | 7077,JEM,TOC5 | 1.00 | TOC:-1.141mg/L TC:48.57mg/L IC:49.71mg/L | 12/10/2017 10:39:07 PM | 65 |
| 25 | CCB | 7077,JEM,TOC5 | 1.00 | TOC:-0.2836mg/L TC:0.3228mg/L IC:0.6064mg/L | 12/10/2017 11:02:34 PM | 66 |
| 26 | 21712100201 | 7077,JEM,TOC5 | 20.0 | TOC:612.2mg/L TC:637.6mg/L IC:25.37mg/L | 12/10/2017 11:21:33 PM | 10 |
| 27 | 21712100202 | 7077,JEM,TOC5 | 50.0 | TOC:554.3mg/L TC:601.2mg/L IC:46.88mg/L | 12/10/2017 11:43:12 PM | 11 |
| 28 | 21712100203 | 7077,JEM,TOC5 | 100. | TOC:1449mg/L TC:1521mg/L IC:72.01mg/L | 12/11/2017 12:02:03 AM | 12 |
| 29 | 21712100204 | 7077,JEM,TOC5 | 20.0 | TOC:676.4mg/L TC:696.1mg/L IC:19.70mg/L | 12/11/2017 12:20:42 AM | 13 |
| 30 | 21712100205 | 7077,JEM,TOC5 | 20.0 | TOC:428.6mg/L TC:447.0mg/L IC:18.45mg/L | 12/11/2017 12:39:30 AM | 14 |
| 31 | 21712100206 | 7077,JEM,TOC5 | 20.0 | TOC:1071mg/L TC:1093mg/L IC:21.87mg/L | 12/11/2017 12:58:36 AM | 15 |
| 32 | 21712100207 | 7077,JEM,TOC5 | 20.0 | TOC:726.8mg/L TC:753.7mg/L IC:26.97mg/L | 12/11/2017 1:17:25 AM | 16 |
| 33 | 21712100208 | 7077,JEM,TOC5 | 50.0 | TOC:673.6mg/L TC:720.9mg/L IC:47.35mg/L | 12/11/2017 1:36:13 AM | 17 |
| 34 | 21712100209 | 7077,JEM,TOC5 | 20.0 | TOC:748.4mg/L TC:764.4mg/L IC:16.00mg/L | 12/11/2017 2:01:09 AM | 18 |
| 35 | 21712100210 | 7077,JEM,TOC5 | 100. | TOC:999.2mg/L TC:1067mg/L IC:67.45mg/L | 12/11/2017 2:30:23 AM | 19 |
| 36 | LCS/CCV TC | 7077,JEM,TOC5 | 1.00 | TOC:47.55mg/L TC:48.19mg/L IC:0.6384mg/L | 12/11/2017 2:50:05 AM | 51 |
| 37 | LCS/CCV IC | 7077,JEM,TOC5 | 1.00 | TOC:-1.353mg/L TC:48.14mg/L IC:49.49mg/L | 12/11/2017 3:17:49 AM | 52 |
| 38 | CCB | 7077,JEM,TOC5 | 1.00 | TOC:-0.3021mg/L TC:0.2800mg/L IC:0.5821mg/L | 12/11/2017 3:36:49 AM | 53 |

115%
94%
97%
147%
97%
99%

12/11/2017 8:02:03 AM

Instr.Information

| | |
|---|---|
| System | TOC-V |
| Instrument Options | TOC/ASI/IC Unit/ |
| Catalyst | Regular Sensitivity |

Cal. Curve

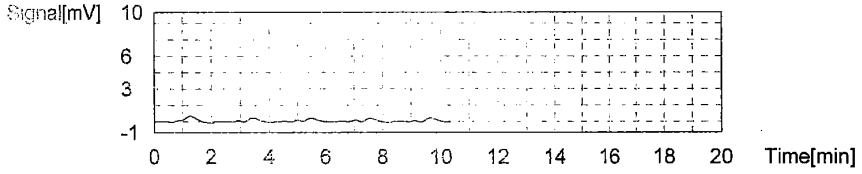
Sample Name: TC
Sample ID: JEM,TOC5
Cal. Curve: TC_0-1-15-30-60-100-2.2017_12_10_09_36_09.cal
Status Completed

| Type | Anal. |
|---|---|
| Standard | TC |

Conc: 0.000mg/L

| No. | Area | Inj. Vol. | Aut. Dil. | Rem. | Ex. | Date / Time |
|---|---|---|---|---|---|---|
| 1 | 1.904 | 50uL | 1 | ******* | E | 12/10/2017 9:42:01 AM |
| 2 | 1.190 | 50uL | 1 | ******* | | 12/10/2017 9:44:15 AM |
| 3 | 1.098 | 50uL | 1 | ******* | | 12/10/2017 9:46:30 AM |
| 4 | 1.115 | 50uL | 1 | ******* | | 12/10/2017 9:48:47 AM |
| 5 | 1.031 | 50uL | 1 | ******* | | 12/10/2017 9:50:58 AM |

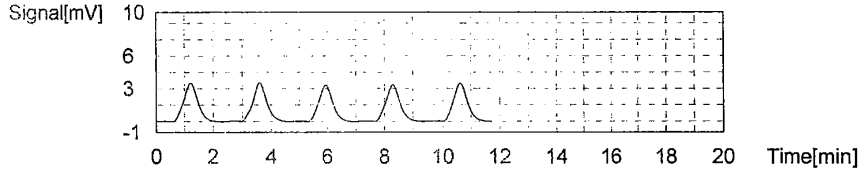
Acid Add. 0.000%
Mean Area 1.109




Conc: 2.000mg/L

| No. | Area | Inj. Vol. | Aut. Dil. | Rem. | Ex. | Date / Time |
|---|---|---|---|---|---|---|
| 1 | 11.87 | 50uL | 1 | ******* | | 12/10/2017 9:57:23 AM |
| 2 | 11.72 | 50uL | 1 | ******* | | 12/10/2017 9:59:56 AM |
| 3 | 11.41 | 50uL | 1 | ******* | | 12/10/2017 10:02:29 AM |
| 4 | 11.33 | 50uL | 1 | ******* | E | 12/10/2017 10:05:00 AM |
| 5 | 11.87 | 50uL | 1 | ******* | | 12/10/2017 10:07:30 AM |

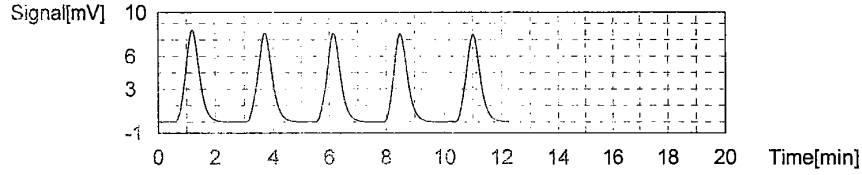
Acid Add. 0.000%
Mean Area 11.72




Conc: 5.000mg/L

| No. | Area | Inj. Vol. | Aut. Dil. | Rem. | Ex. | Date / Time |
|---|---|---|---|---|---|---|
| 1 | 27.85 | 50uL | 1 | ******* | E | 12/10/2017 10:14:03 AM |
| 2 | 27.62 | 50uL | 1 | ******* | | 12/10/2017 10:16:40 AM |
| 3 | 26.76 | 50uL | 1 | ******* | | 12/10/2017 10:19:15 AM |
| 4 | 26.75 | 50uL | 1 | ******* | | 12/10/2017 10:21:55 AM |
| 5 | 27.37 | 50uL | 1 | ******* | | 12/10/2017 10:24:32 AM |

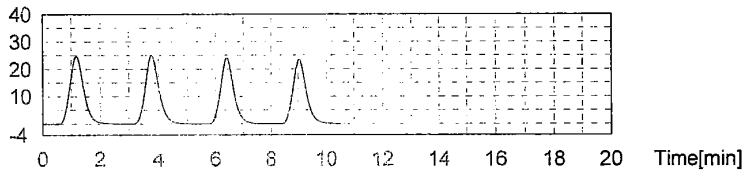
Acid Add. 0.000%
Mean Area 27.13




Conc: 15.00mg/L

| No. | Area | Inj. Vol. | Aut. Dil. | Rem. | Ex. | Date / Time |
|---|---|---|---|---|---|---|
| 1 | 80.34 | 50uL | 1 | ******* | | 12/10/2017 10:31:11 AM |
| 2 | 79.46 | 50uL | 1 | ******* | | 12/10/2017 10:33:59 AM |
| 3 | 78.12 | 50uL | 1 | ******* | | 12/10/2017 10:36:49 AM |
| 4 | 77.38 | 50uL | 1 | ******* | | 12/10/2017 10:39:40 AM |

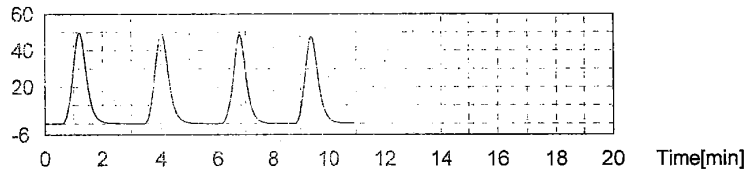
Acid Add. 0.000%
Mean Area 78.83




Conc: 30.00mg/L

| No. | Area | Inj. Vol. | Aut. Dil. | Rem. | Ex. | Date / Time |
|---|---|---|---|---|---|---|
| 1 | 162.1 | 50uL | 1 | ******* | | 12/10/2017 10:46:37 AM |
| 2 | 160.7 | 50uL | 1 | ******* | | 12/10/2017 10:49:29 AM |
| 3 | 157.2 | 50uL | 1 | ******* | | 12/10/2017 10:52:21 AM |
| 4 | 156.2 | 50uL | 1 | ******* | | 12/10/2017 10:55:13 AM |

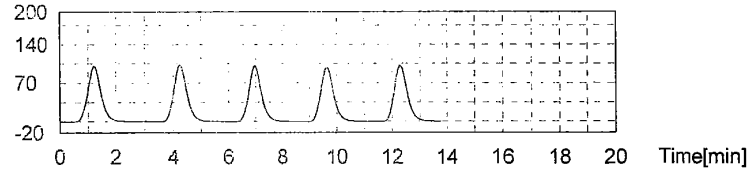
Acid Add. 0.000%
Mean Area 159.1




Conc: 60.00mg/L

| No. | Area | Inj. Vol. | Aut. Dil. | Rem. | Ex. | Date / Time |
|---|---|---|---|---|---|---|
| 1 | 331.0 | 50uL | 1 | ******* | | 12/10/2017 11:02:22 AM |
| 2 | 327.9 | 50uL | 1 | ******* | | 12/10/2017 11:05:15 AM |
| 3 | 319.8 | 50uL | 1 | ******* | | 12/10/2017 11:08:08 AM |
| 4 | 317.3 | 50uL | 1 | ******* | E | 12/10/2017 11:10:59 AM |
| 5 | 326.6 | 50uL | 1 | ******* | | 12/10/2017 11:13:48 AM |

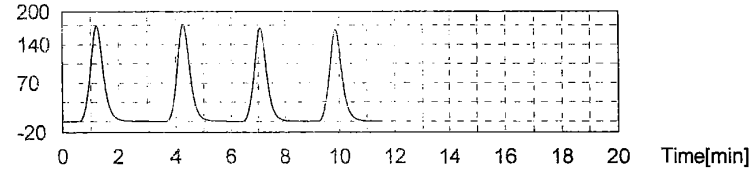
Acid Add. 0.000%
Mean Area 326.3



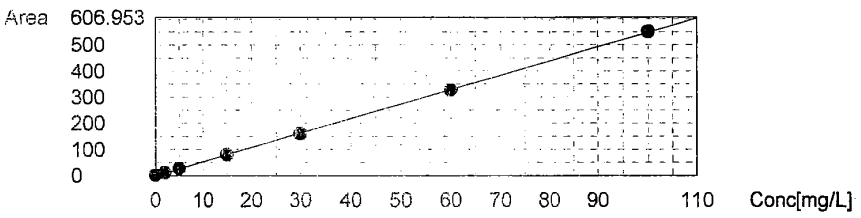

Conc: 100.0mg/L

| No. | Area | Inj. Vol. | Aut. Dil. | Rem. | Ex. | Date / Time |
|---|---|---|---|---|---|---|
| 1 | 564.8 | 50uL | 1 | ******* | | 12/10/2017 11:20:56 AM |
| 2 | 556.4 | 50uL | 1 | ******* | | 12/10/2017 11:23:54 AM |
| 3 | 544.2 | 50uL | 1 | ******* | | 12/10/2017 11:26:54 AM |
| 4 | 541.7 | 50uL | 1 | ******* | | 12/10/2017 11:29:54 AM |

Acid Add. 0.000%
Mean Area 551.8



| | |
|---|---|
| Slope: | 5.503 |
| Intercept | -1.541 |
| r^2 | 0.9998 |
| r | 0.9999 |
| Zero Shift | No |



GCAL ANALYTICAL LABORATORIES, LLC

# SOLIDS DATA SHEET

TS/TSS Oven Temp: 103 - 105 °C
TDS Oven Temp: 180 ± 2 °C
TVS/VSS Muffle Furnace Temp: 550 ± 5% (27) °C
Ash Muffle Furnace Temp: 800 ± 5% (40) °C

Test: TDS HBN: 633120 SOLI Batch Number: 29276

**Initial Weight**
Balance ID: BAL 15
Date/Time: 4-11-18 12:03
Analyst: CJS

Oven ID: NA
Date/Time IN:
Oven Temp °C IN:
Oven Temp °C OUT:
Date/Time OUT/Desiccator#:
Analyst:

TDS Oven ID: 008
Date/Time IN: 4-11-18 12:03
Oven Temp °C IN: 180
Oven Temp °C OUT: 180
Date/Time OUT/Desiccator#: 4-12-18 10:54
Analyst: CJS

**Final Weight 1**
Balance ID: BAL 15
Date/Time: 4-12-18 10:54
Analyst: CJS

Oven ID: 008
Date/Time IN: 4-12-18 10:54
Oven Temp °C IN: 180
Oven Temp °C OUT: 180
Date/Time OUT/Desiccator#: 4-12-18 12:10
Analyst: CJS

**Final Weight 2**
Balance ID: BAL 15
Date/Time: 4-12-18 16:00
Analyst: CJS

Oven ID: NA
Date/Time IN:
Oven Temp °C IN:
Oven Temp °C OUT:
Date/Time OUT/Desiccator#:
Analyst:

**Final Weight 3** (if needed):
Balance ID: NA
Date/Time:
Analyst:

Oven ID:
Date/Time IN:
Oven Temp °C IN:
Oven Temp °C OUT:
Date/Time OUT/Desiccator#:
Analyst:

**Final Weight 4** (if needed):
Balance ID:
Date/Time:
Analyst:

***Comments:***

Rev 005: 10/13/2017

Secondary Reviewer/Date: RJO 04/12/18

## TOTAL DISSOLVED SOLIDS

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HBN | 633120 | | | ANALYST: | CJS | | | | | | DATE: | 4/11/2018 | |
| SOLI | 29276 | | | REVIEW: | RJO 04/12/18 | | | | | | TIME: | 11:21:00 | |
| Sample ID | Sample Volume (ml) | Flask ID | EST TDS | Initial Actual Mass (g) | Final Wt. 1 (g) | Diff (F1-F1) (g) | Final Wt. 2 (g) | Diff(F1-F2) (g) | Final Wt. 3 (g) | Diff(F2-F3) (g) | Final Wt. 4 (g) | Diff (F3-F4) (g) | Conc mg/L |
| 1795704 | 100 | 164 | 0 | 158.5846 | 158.5854 | 0.0008 | 158.5852 | 0.0002 | | | | | 6.0 |
| 21804054301 | 100 | 400 | 121 | 117.7283 | 117.7483 | 0.0200 | 117.7484 | 0.0001 | | | | | 201.0 |
| 1795705 | 100 | 111 | 121 | 96.6732 | 96.6900 | 0.0168 | 96.6897 | 0.0003 | | | | | 165.0 |
| 21804054302 | 100 | 3H | 135 | 119.5833 | 119.6018 | 0.0185 | 119.6015 | 0.0003 | | | | | 182.0 |
| 21804062001 | 100 | FS | 183 | 158.2645 | 158.2894 | 0.0249 | 158.2893 | 0.0001 | | | | | 248.0 |
| 21804064504 | 50 | D | 2061 | 115.2813 | 115.4210 | 0.1397 | 115.4207 | 0.0003 | | | | | 2788.0 |
| 21804062002 | 100 | F3 | 481 | 105.9034 | 105.9743 | 0.0709 | 105.9739 | 0.0004 | | | | | 705.0 |
| 21804062007 | 100 | 1 | 146 | 117.2607 | 117.2788 | 0.0181 | 117.2788 | 0.0000 | | | | | 181.0 |
| 21804062009 | 100 | 12 | 156 | 104.1945 | 104.2127 | 0.0182 | 104.2129 | 0.0002 | | | | | 184.0 |
| 21804062010 | 100 | 181 | 17 | 116.4314 | 116.4379 | 0.0065 | 116.4379 | 0.0000 | | | | | 65.0 |
| 21804062008 | 100 | 3 | 140 | 101.7369 | 101.7523 | 0.0154 | 101.7525 | 0.0002 | | | | | 156.0 |
| 21804064505 | 100 | 120 | 837 | 118.1849 | 118.2953 | 0.1104 | 118.2956 | 0.0003 | | | | | 1107.0 |

**Method 2540C**

TDS mg/L = [(final weight (g))-[initial weight (g))x1,000,000] / sample volume (ml)

TSS Filter Lots:

TDS Spreadsheet, Version 2, 01/26/11

GCAL
STRATEGICAL LABORATORIES, LLC

# 2320 B Alkalinity

*633813*

| START DATE/TIME | 4-19-18 11:37 | END DATE/TIME | 4-19-18 12:44 | BATCH | 633813 |
|---|---|---|---|---|---|

| # | CLIENT | TYPE | CLIENT ID | GCAL ID | ALKT | ALKP | ALKB | ALKC | ALKOH | STANDARDS\ REAGENTS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | QC | MB | MB 1799199 | 1799199 | 0 | | | | | 0.02 N H2SO4 Lot |
| 2 | QC | LCS | LCS 1799200 | 1799200 103% | 10.30 | | | | | 2126597 |
| 3 | QC | LCSD | LCSD 1799201 | 1799201 97% | 9.72 | | | | | 0.02 N H2SO4 Exp |
| 4 | 4859 | SAMP | RD5-MW-01-21 | 21804062010 | 0 | | | | | 7-31-22 |
| 5 | 4859 | FD | MW-11-03-21DUP | 21804110102 | 0 | | | | | LCS Lot |
| 6 | | | | 21804101010 | 0 | | | | | 2126395 |
| 7 | | | | | | | | | | LCS Exp |
| 8 | | | | | | | | | | 9.30-19 |
| 9 | | | | | | | | | | |
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| 28 | | | | | | | | | | |

**NOTES**

**EQUIPMENT\CONDITIONS**

| Probe Serial # | Instrument ID | Analyst |
|---|---|---|
| 4240905 | TITRATOR 01 | |

**REVIEW**

| TECHNICIAN\DATE | SUPERVISOR\DATE |
|---|---|
| RMC 4-19-18 | RJO 04/19/18 |

METTLER TOLEDO DL53 Titrator V2.4 Gulf Coast Analytical
Bator Rouge, LA

Method 09 ALKT LOW 07/31/2017 17:39
Measured 04/19/2018 11:37
User RYC

RAW RESULTS

SAMPLE
No. 1
Identification MB
Titration stand Stand 1
Volume 100.0 mL
Correction factor f 1.0
Mol.mass M 100.00 g/mol
Equivalent number z 1
Temperature sensor Manual

DISPENSE
Titrant H2SO4 0.02 mol/L t = 1.0
Drive No. 2 10 mL
Volume VDISP = 0.0 mL
QDISP = 0.0 mmol

EP TITRATION
Titrant H2SO4 0.02 mol/L t = 1.0
Drive No. 2 10 mL
Sensor DG111
Excess VEX = 0.0000 mL
QEX = 0.00000 mmol

CALCULATION
Result R1 = 0.0000 mL 1st Endpoint

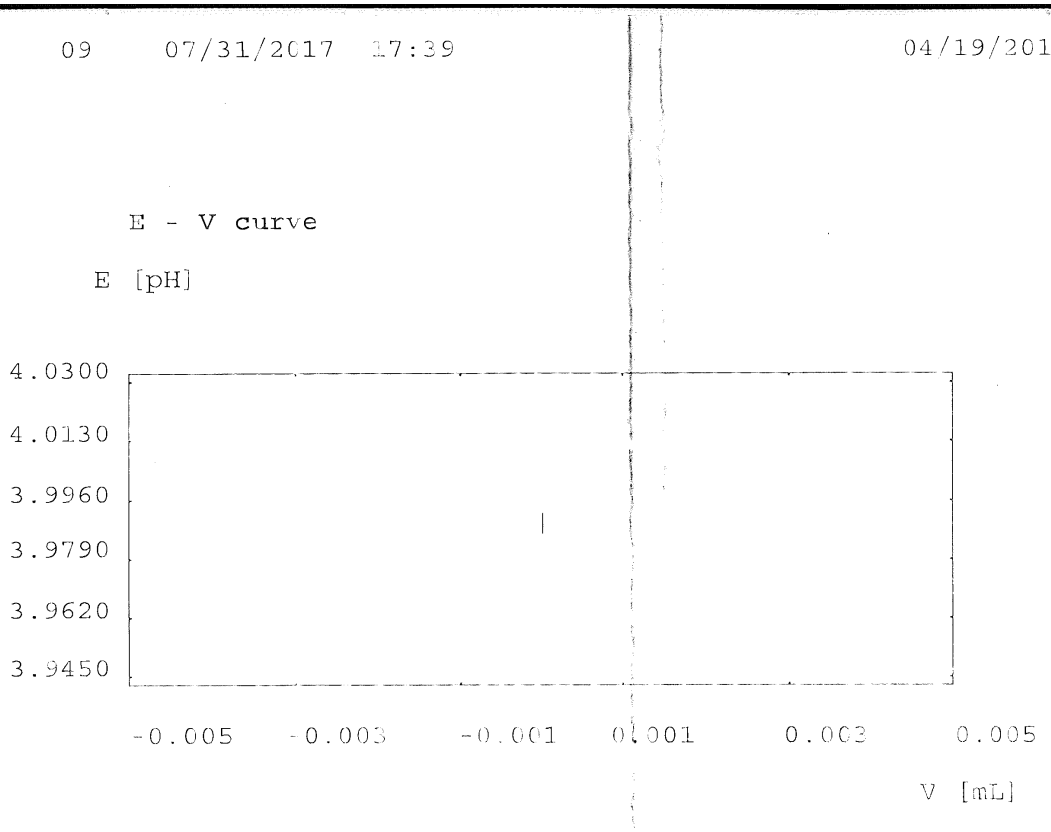
DISPENSE
Titrant H2SO4 0.02 mol/L t = 1.0
Drive No. 2 10 mL
Volume VDISP = 0.0 mL
QDISP = 0.0 mmol

EP TITRATION
Titrant H2SO4 0.02 mol/L t = 1.0
Drive No. 2 10 mL
Sensor DG111
Excess VEX = 0.0000 mL
QEX = 0.00000 mmol

CALCULATION
Result R2 = 0.0000 mg/L Total Alk.

CALCULATION
Result R3 = 0.00 mg/L Total Alk.

09 07/31/2017 17:39 04/19/2018 11:37



METTLER TOLEDO DL53 Titrator V2.4 Gulf Coast Analytical
Baton Rouge, LA

Method 09 ALKT LOW 07/31/2017 17:39
Measured 04/19/2018 11:53
User RYC

RAW RESULTS

SAMPLE

| | |
|---|---|
| No. | 1 |
| Identification | LCS |
| Titration stand | Stand 1 |
| Volume | 100.0 mL |
| Correction factor f | 1.0 |
| Mol.mass M | 100.00 g/mol |
| Equivalent number z | 1 |
| Temperature sensor | Manual |

DISPENSE

| | | | | |
|---|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L | t = 1.0 | |
| Drive | No. 2 | 10 mL | | |
| Volume | | VDISP = 0.0 | | mL |
| | | QDISP = 0.0 | | mmol |

EP TITRATION

| | | | | | |
|---|---|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L | t = 1.0 | | |
| Drive | No. 2 | 10 mL | | | |
| Sensor | DG111 | | | | |
| Consumption | EP | VEQ1 = | 1.0345 | mL | |
| | | Q1 = | 0.02069 | mmol | |
| | | EPOT1 = | 4.500 | pH | |
| Excess | | VEX = | 0.0045 | mL | |
| | | QEX = | 0.00009 | mmol | |

CALCULATION

| | | | | |
|---|---|---|---|---|
| Result | R1 = | 1.0345 | mL | 1st Endpoint |

DISPENSE

| | | | | |
|---|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L | t = 1.0 | |
| Drive | No. 2 | 10 mL | | |
| Volume | | VDISP = 0.0 | | mL |
| | | QDISP = 0.0 | | mmol |

EP TITRATION

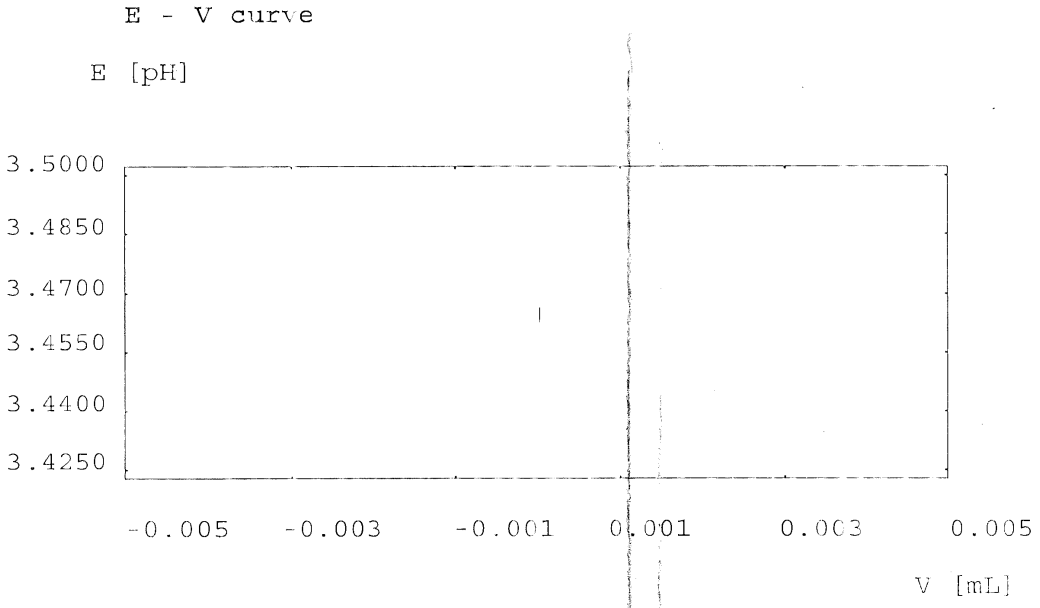
| | | | | | |
|---|---|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L | t = 1.0 | | |
| Drive | No. 2 | 10 mL | | | |
| Sensor | DG111 | | | | |
| Excess | | VEX = | 0.0000 | mL | |
| | | QEX = | 0.00000 | mmol | |

CALCULATION

| | | | | |
|---|---|---|---|---|
| Result | R2 = | 0.0000 | mg/L | Total Alk. |

CALCULATION

| | | | | |
|---|---|---|---|---|
| Result | R3 = | 10.30 | mg/L | Total Alk. |


E - V curve
E [pH]
3.5000
3.4850
3.4700
3.4550
3.4400
3.4250
-0.005
-0.003
-0.001
0.001
0.003
0.005
V [mL]

METTLER TOLEDO DL53 Titrator V2.4 Gulf Coast Analytical
Baton Rouge, LA

Method 09 ALKT LOW 07/31/2017 17:39
Measured 04/19/2018 11:56
User RYC

RAW RESULTS

SAMPLE

| | | | |
|---|---|---|---|
| No. | | 2 | |
| Identification | | LCSD | |
| Titration stand | | Stand 1 | |
| Volume | | 100.0 mL | |
| Correction factor f | | 1.0 | |
| Mol.mass M | | 100.00 g/mol | |
| Equivalent number z | | 1 | |
| Temperature sensor | | Manual | |

DISPENSE

| | | | |
|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L t = 1.0 | |
| Drive | No. 2 | 10 mL | |
| Volume | | VDISP = 0.0 | mL |
| | | QDISP = 0.0 | mmol |

EP TITRATION

| | | | | | |
|---|---|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L t = 1.0 | | | |
| Drive | No. 2 | 10 mL | | | |
| Sensor | DG111 | | | | |
| Consumption | EP | VEQ1 | = | 1.0267 | mL |
| | | Q1 | = | 0.02053 | mmol |
| | | EPOT1 | = | 4.500 | pH |
| Excess | | VEX | = | 0.0543 | mL |
| | | QEX | = | 0.00109 | mmol |

CALCULATION

| | | | | | |
|---|---|---|---|---|---|
| Result | | R1 | = | 1.0267 | mL 1st Endpoint |

DISPENSE

| | | | |
|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L t = 1.0 | |
| Drive | No. 2 | 10 mL | |
| Volume | | VDISP = 0.0 | mL |
| | | QDISP = 0.0 | mmol |

EP TITRATION

| | | | | | |
|---|---|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L t = 1.0 | | | |
| Drive | No. 2 | 10 mL | | | |
| Sensor | DG111 | | | | |
| Excess | | VEX | = | 0.0000 | mL |
| | | QEX | = | 0.00000 | mmol |

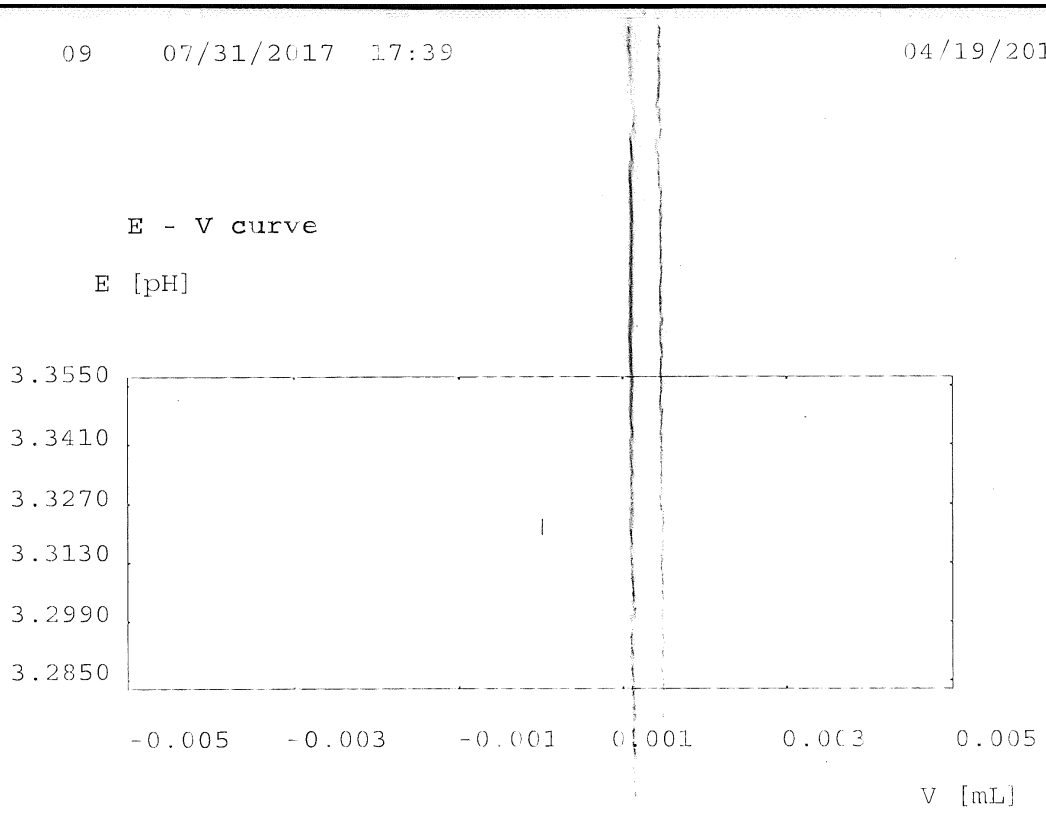
CALCULATION

| | | | | | |
|---|---|---|---|---|---|
| Result | | R2 | = | 0.0000 | mg/L Total Alk. |

CALCULATION

| | | | | | |
|---|---|---|---|---|---|
| Result | | R3 | = | 9.72 | mg/L Total Alk. |

09 07/31/2017 17:39 04/19/2018 11:56



METTLER TOLEDO DL53 Titrator | V2.4 Gulf Coast Analytical
Baton Rouge, LA

| | | |
|---|---|---|
| Method | 09 ALKT LOW | 07/31/2017 17:39 |
| Measured | 04/19/2018 11:59 | |
| User | RYC | |

RAW RESULTS

SAMPLE

| | |
|---|---|
| No. | 3 |
| Identification | 1804062010 |
| Titration stand | Stand 1 |
| Volume | 100.0 mL |
| Correction factor f | 1.0 |
| Mol.mass M | 100.00 g/mol |
| Equivalent number z | 1 |
| Temperature sensor | Manual |

DISPENSE

| | | | |
|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L t = 1.0 | |
| Drive | No. 2 | 10 mL | |
| Volume | | VDISP = 0.0 | mL |
| | | QDISP = 0.0 | mmol |

EP TITRATION

| | | | |
|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L t = 1.0 | |
| Drive | No. 2 | 10 mL | |
| Sensor | DG111 | | |
| Excess | | VEX = 0.0000 | mL |
| | | QEX = 0.00000 | mmol |

CALCULATION

| | | | |
|---|---|---|---|
| Result | R1 = | 0.0000 mL | 1st Endpoint |

DISPENSE

| | | | |
|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L t = 1.0 | |
| Drive | No. 2 | 10 mL | |
| Volume | | VDISP = 0.0 | mL |
| | | QDISP = 0.0 | mmol |

EP TITRATION

| | | | |
|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L t = 1.0 | |
| Drive | No. 2 | 10 mL | |
| Sensor | DG111 | | |
| Excess | | VEX = 0.0000 | mL |
| | | QEX = 0.00000 | mmol |

CALCULATION

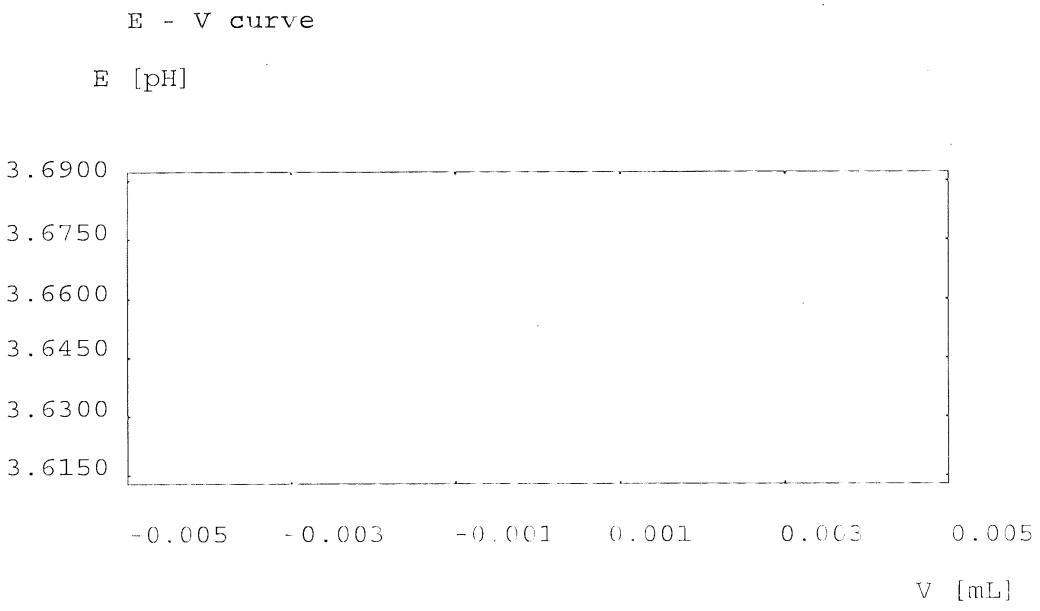
| | | | |
|---|---|---|---|
| Result | R2 = | 0.0000 mg/L | Total Alk. |

CALCULATION

| | | | |
|---|---|---|---|
| Result | R3 = | 0.00 mg/L | Total Alk. |

09 07/31/2017 17:39 04/19/2018 11:59

E - V curve



GCAL ANALYTICAL LABORATORIES, LLC

# 2320 B Alkalinity

*633511*

| START DATE/TIME | 4-16-18 9:36 | END DATE/TIME | 4-16-18 13:07 | BATCH | 633511 |
|---|---|---|---|---|---|

| # | CLIENT | TYPE | CLIENT ID | GCAL ID | ALKT | ALKP | ALKB | ALKC | ALKOH | STANDARDS\ REAGENTS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | QC | MB | MB 1797788 | 1797788 | 0 | | | | | 0.02 N H2SO4 Lot |
| 2 | QC | LCS | LCS 1797789 | 1797789 | 205.11 | | | | | 2126597 |
| 3 | QC | LCSD | LCSD 1797790 | 1797790 | 205.03 | | | | | 0.02 N H2SO4 Exp |
| 4 | 0600 | SAMP | EASC-1354, DTW-04 | 21804031201 | 406.56 | | | | | 7-31-22 |
| 5 | 0600 | SAMP | EASC-1357, DTZ-MWI | 21804031204 | 110.72 | | | | | LCS Lot |
| 6 | 0600 | SAMP | EASC-1358, DTZ-MWU | 21804031205 | 79.78 | | | | | 1121-95-3 |
| 7 | 0600 | SAMP | EASC-1359, SP022 | 21804031206 | 919.96 | | | | | LCS Exp |
| 8 | 0600 | SAMP | EASC-1360, SP020 | 21804043201 | 188.98 | | | | | 4-17-18 |
| 9 | 0600 | SAMP | EASC-1361, SP024 | 21804043202 | 1287.39 | | | | | |
| 10 | 0600 | SAMP | EASC-1362, SP018 | 21804043203 | 717.65 | | | | | |
| 11 | 0600 | SAMP | EASC-1363, SP013 | 21804043204 | 702.82 | | | | | |
| 12 | 4859 | SAMP | B6-MW-05-21 | 21804053514 | 372.24 | | | | | |
| 13 | 0600 | SAMP | EASC-1364, SP023 | 21804052401 | 63.99 | | | | | |
| 14 | 0600 | SAMP | EASC-1365, SP016 | 21804052402 | 132.40 | | | | | |
| 15 | 0600 | SAMP | EASC-1366, SP011 | 21804052403 | 117.58 | | | | | |
| 16 | 0600 | SAMP | EASC-1367, SP004 | 21804052404 | 94.59 | | | | | |
| 17 | 4859 | SAMP | MW-13-11-21 | 21804062001 | 182.36 | | | | | |
| 18 | 4859 | SAMP | MW-11-02-21 | 21804062002 | 473.70 | | | | | |
| 19 | 4859 | SAMP | MW-11-06-21 | 21804062007 | 120.33 | | | | | |
| 20 | 4859 | SAMP | MW-11-10-21 | 21804062008 | 102.21 | | | | | |
| 21 | 4859 | SAMP | MW-11-01-21 | 21804062009 | 163.69 | | | | | |
| 22 | 4271 | SAMP | DZ-9A | 21804064504 | 482.66 | 0 | 482.66 | 0 | | |
| 23 | 4271 | SAMP | DZ-9A | 21804064504 | | | | | | |
| 24 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 26 | | | | | | | | | | |
| 27 | | | | | | | | | | |
| 28 | | | | | | | | | | |

**NOTES**

**EQUIPMENT\CONDITIONS**

| Probe Serial # | Instrument ID | Analyst |
|---|---|---|
| 4290905 | TITRATOR 01 | |

**REVIEW**

| TECHNICIAN\DATE | SUPERVISOR\DATE |
|---|---|
| RLC 4-16-18 | RJO 04/16/18 |

Method 11 Alkalinity 10/04/2012 9:25
Measured 04/16/2018 9:36
User RYC

RAW RESULTS

SAMPLE

| | |
|---|---|
| No. | 2 |
| Identification | MB |
| Titration stand | Stand 1 |
| Volume | 50.0 mL |
| Correction factor f | 1.0 |
| Mol.mass M | 100.00 g/mol |
| Equivalent number z | 1 |
| Temperature sensor | Manual |

DISPENSE

| | | | |
|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L | t = 1.0 |
| Drive | No. 2 | 10 mL | |
| Volume | | VDISP = 0.0 | mL |
| | | QDISP = 0.0 | mmol |

EP TITRATION

| | | | |
|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L | t = 1.0 |
| Drive | No. 2 | 10 mL | |
| Sensor | DG111 | | |
| Excess | | VEX = 0.0000 | mL |
| | | QEX = 0.00000 | mmol |

CALCULATION

| | | | |
|---|---|---|---|
| Result | R1 = | 4.19 | Initial pH |

CALCULATION

| | | | |
|---|---|---|---|
| Result | R2 = | 0.0000 | mg/L ALKP |

DISPENSE

| | | | |
|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L | t = 1.0 |
| Drive | No. 2 | 10 mL | |
| Volume | | VDISP = 0.0 | mL |
| | | QDISP = 0.0 | mmol |

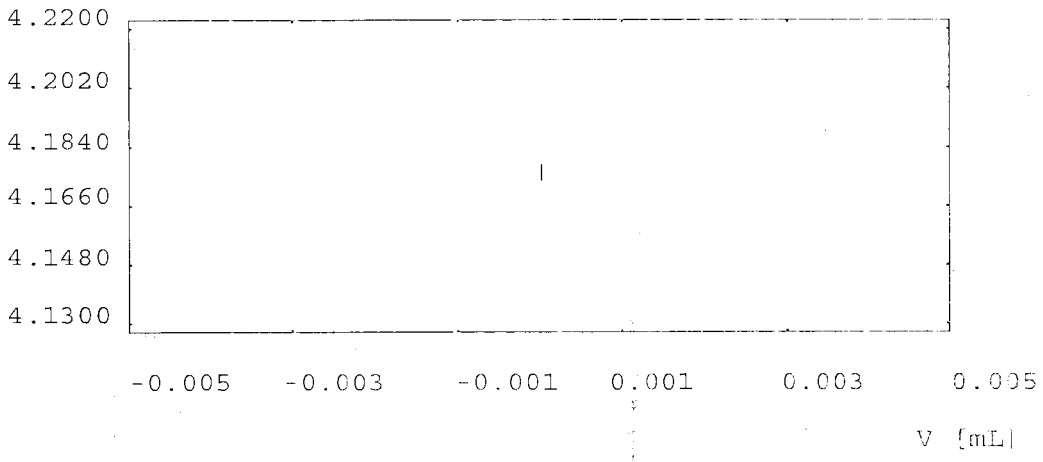
EP TITRATION

| | | | |
|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L | t = 1.0 |
| Drive | No. 2 | 10 mL | |
| Sensor | DG111 | | |
| Excess | | VEX = 0.0000 | mL |
| | | QEX = 0.00000 | mmol |

CALCULATION

| | | | |
|---|---|---|---|
| Result | R3 = | 0.00 | mg/L ALKT |

E - V curve


E [pH]
4.2200
4.2020
4.1840
4.1660
4.1480
4.1300
-0.005
-0.003
-0.001
0.001
0.003
0.005
V [mL]

METTLER TOLEDO DL53 Titrator V2.4 Gulf Coast Analytical
Baton Rouge, LA

Method 11 Alkalinity 10/04/2012 9:25
Measured 04/16/2018 9:37
User RYC

RAW RESULTS

SAMPLE

| | | | |
|---|---|---|---|
| No. | | 3 | |
| Identification | | LCS | |
| Titration stand | | Stand 1 | |
| Volume | | 50.0 mL | |
| Correction factor f | | 1.0 | |
| Mol.mass M | | 100.00 g/mol | |
| Equivalent number z | | 1 | |
| Temperature sensor | | Manual | |

DISPENSE

| | | | |
|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L t = 1.0 | |
| Drive | No. 2 | 10 mL | |
| Volume | | VDISP = 0.0 | mL |
| | | QDISP = 0.0 | mmol |

EP TITRATION

| | | | | |
|---|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L t = 1.0 | | |
| Drive | No. 2 | 10 mL | | |
| Sensor | DG111 | | | |
| Consumption | EP | VEQ1 = | 9.7077 | mL |
| | | Q1 = | 0.19415 | mmol |
| | | EPOT1 = | 8.301 | pH |
| Excess | | VEX = | 0.0513 | mL |
| | | QEX = | 0.00103 | mmol |

CALCULATION

| | | | |
|---|---|---|---|
| Result | R1 = | 10.13 | Initial pH |

CALCULATION

| | | | |
|---|---|---|---|
| Result | R2 = | 195.180 mg/L | ALKP |

DISPENSE

| | | | |
|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L t = 1.0 | |
| Drive | No. 2 | 10 mL | |
| Volume | | VDISP = 0.0 | mL |
| | | QDISP = 0.0 | mmol |

EP TITRATION

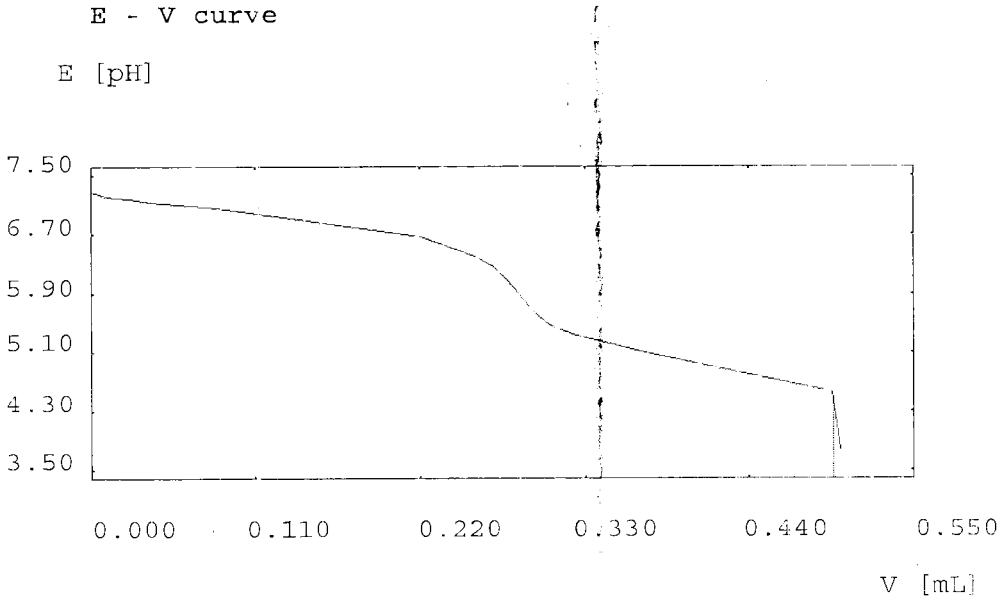
| | | | | |
|---|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L t = 1.0 | | |
| Drive | No. 2 | 10 mL | | |
| Sensor | DG111 | | | |
| Consumption | EP | VEQ1 = | 0.4964 | mL |
| | | Q1 = | 0.00993 | mmol |
| | | EPOT1 = | 4.500 | pH |
| Excess | | VEX = | 0.0046 | mL |
| | | QEX = | 0.00009 | mmol |

CALCULATION

| | | | |
|---|---|---|---|
| Result | R3 = | 205.11 mg/L | ALKT |

11 10/04/2012 9:25 04/16/2018 9:37

E - V curve



METTLER TOLEDO DL53 Titrator V2.4 Gulf Coast Analytical
Baton Rouge, LA

Method 11 Alkalinity 10/04/2012 9:25
Measured 04/16/2018 9:51
User RYC

RAW RESULTS

SAMPLE

| | |
|---|---|
| No. | 4 |
| Identification | LCSD |
| Titration stand | Stand 1 |
| Volume | 50.0 mL |
| Correction factor f | 1.0 |
| Mol.mass M | 100.00 g/mol |
| Equivalent number z | 1 |
| Temperature sensor | Manual |

DISPENSE

| | | | |
|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L | t = 1.0 |
| Drive | No. 2 | 10 mL | |
| Volume | | VDISP = 0.0 | mL |
| | | QDISP = 0.0 | mmol |

EP TITRATION

| | | | | | |
|---|---|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L | t = 1.0 | | |
| Drive | No. 2 | 10 mL | | | |
| Sensor | DG111 | | | | |
| Consumption | EP | VEQ1 = | 9.7282 | mL | |
| | | Q1 = | 0.19456 | mmol | |
| | | EPOT1 = | 8.301 | pH | |
| Excess | | VEX = | 0.1998 | mL | |
| | | QEX = | 0.00400 | mmol | |

CALCULATION

| | | | |
|---|---|---|---|
| Result | R1 = | 10.03 | Initial pH |

CALCULATION

| | | | |
|---|---|---|---|
| Result | R2 = | 198.560 mg/L | ALKP |

DISPENSE

| | | | |
|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L | t = 1.0 |
| Drive | No. 2 | 10 mL | |
| Volume | | VDISP = 0.0 | mL |
| | | QDISP = 0.0 | mmol |

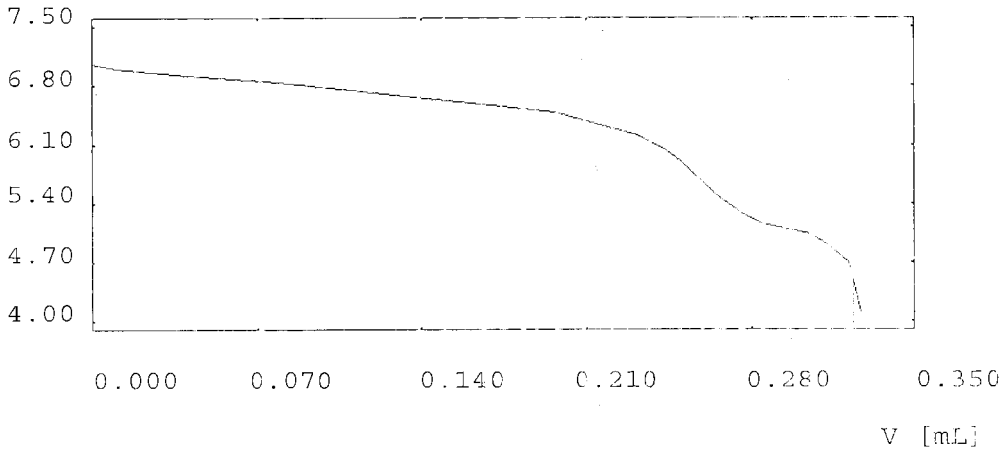
EP TITRATION

| | | | | | |
|---|---|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L | t = 1.0 | | |
| Drive | No. 2 | 10 mL | | | |
| Sensor | DG111 | | | | |
| Consumption | EP | VEQ1 = | 0.3236 | mL | |
| | | Q1 = | 0.00647 | mmol | |
| | | EPOT1 = | 4.500 | pH | |
| Excess | | VEX = | 0.0034 | mL | |
| | | QEX = | 0.00007 | mmol | |

CALCULATION

| | | | |
|---|---|---|---|
| Result | R3 = | 205.03 mg/L | ALKT |

E - V curve



METTLER TOLEDO DL53 Titrator V2.4 Gulf Coast Analytical
Bator Rouge, LA

Method 11 Alkalinity 10/04/2012 9:25
Measured 04/16/2018 10:57
User RYC

RAW RESULTS

SAMPLE

| | |
|---|---|
| No. | 15 |
| Identification | 1804062001 |
| Titration stand | Stand 1 |
| Volume | 20.0 mL |
| Correction factor f | 1.0 |
| Mol.mass M | 100.00 g/mol |
| Equivalent number z | 1 |
| Temperature sensor | Manual |

DISPENSE

| | | | | |
|---|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L | t = 1.0 | |
| Drive | No. 2 | 10 mL | | |
| Volume | | VDISP = 0.0 | | mL |
| | | QDISP = 0.0 | | mmol |

EP TITRATION

| | | | | |
|---|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L | t = 1.0 | |
| Drive | No. 2 | 10 mL | | |
| Sensor | DG111 | | | |
| Excess | | VEX = | 0.0000 | mL |
| | | QEX = | 0.00000 | mmol |

CALCULATION

| | | | |
|---|---|---|---|
| Result | R1 = | 5.02 | Initial pH |

CALCULATION

| | | | |
|---|---|---|---|
| Result | R2 = | 0.0000 mg/L | ALKP |

DISPENSE

| | | | | |
|---|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L | t = 1.0 | |
| Drive | No. 2 | 10 mL | | |
| Volume | | VDISP = 0.0 | | mL |
| | | QDISP = 0.0 | | mmol |

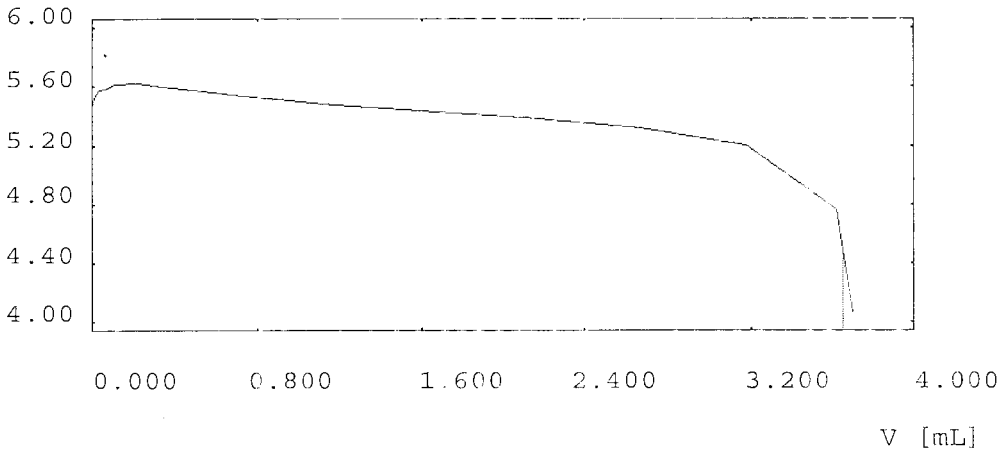
EP TITRATION

| | | | | |
|---|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L | t = 1.0 | |
| Drive | No. 2 | 10 mL | | |
| Sensor | DG111 | | | |
| Consumption | EP | VEQ1 = | 3.6471 | mL |
| | | Q1 = | 0.07294 | mmol |
| | | EPOT1 = | 4.500 | pH |
| Excess | | VEX = | 0.0519 | mL |
| | | QEX = | 0.00104 | mmol |

CALCULATION

| | | | |
|---|---|---|---|
| Result | R3 = | 182.36 mg/L | ALKT |

E - V curve



METTLER TOLEDO DL53 Titrator V2.4 Gulf Coast Analytical
Baton Rouge, LA

Method 11 Alkalinity 10/04/2012 9:25
Measured 04/16/2018 12:59
User RYC

RAW RESULTS

SAMPLE
No. 22
Identification 1804062002
Titration stand Stand 1
Volume 20.0 mL
Correction factor f 1.0
Mol.mass M 100.00 g/mol
Equivalent number z 1
Temperature sensor Manual

DISPENSE
Titrant H2SO4 0.02 mol/L t = 1.0
Drive No. 2 10 mL
Volume VDISP = 0.0 mL
QDISP = 0.0 mmol

EP TITRATION
Titrant H2SO4 0.02 mol/L t = 1.0
Drive No. 2 10 mL
Sensor DG111
Excess VEX = 0.0000 mL
QEX = 0.00000 mmol

CALCULATION
Result R1 = 5.69 Initial pH

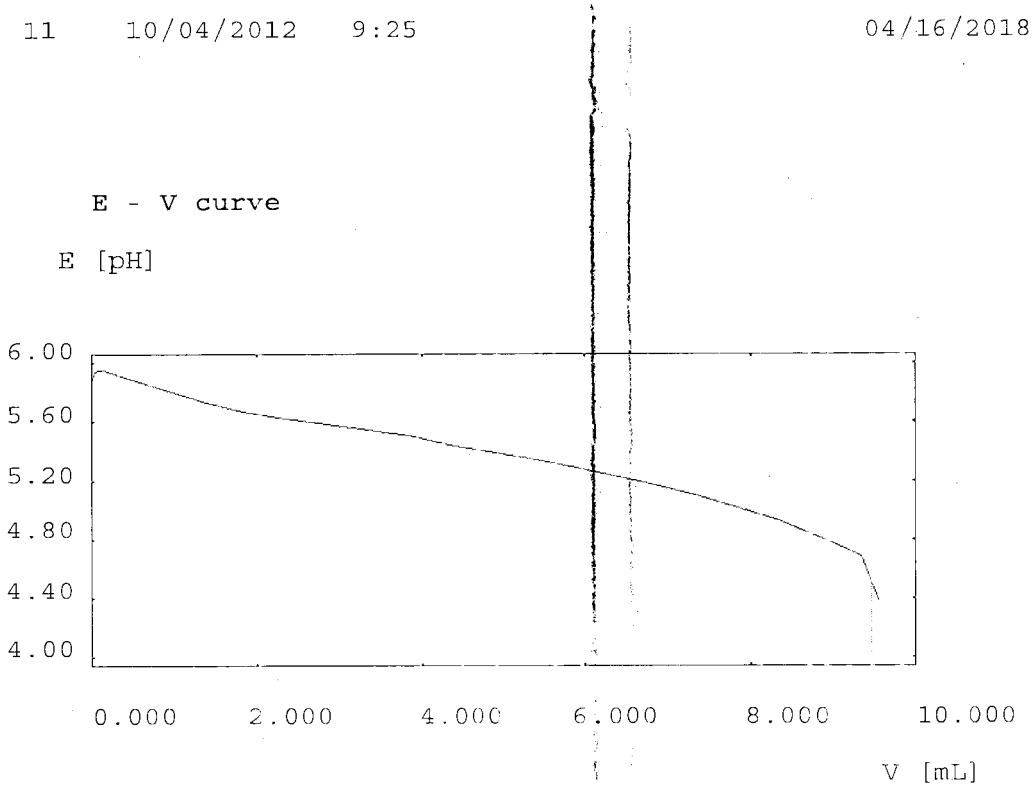
CALCULATION
Result R2 = 0.0000 mg/L ALKP

DISPENSE
Titrant H2SO4 0.02 mol/L t = 1.0
Drive No. 2 10 mL
Volume VDISP = 0.0 mL
QDISP = 0.0 mmol

EP TITRATION
Titrant H2SO4 0.02 mol/L t = 1.0
Drive No. 2 10 mL
Sensor DG111
Consumption EP VEQ1 = 9.4739 mL
Q1 = 0.18948 mmol
EPOT1 = 4.500 pH
Excess VEX = 0.0851 mL
QEX = 0.00170 mmol

CALCULATION
Result R3 = 473.70 mg/L ALKT

11 10/04/2012 9:25 04/16/2018 12:59



METTLER TOLEDO DL53 Titrator V2.4 Gulf Coast Analytical
Baton Rouge, LA

Method 11 Alkalinity 10/04/2012 9:25
Measured 04/16/2018 13:02
User RYC

RAW RESULTS

SAMPLE
No. 23
Identification 1804062007
Titration stand Stand 1
Volume 20.0 mL
Correction factor f 1.0
Mol.mass M 100.00 g/mol
Equivalent number z 1
Temperature sensor Manual

DISPENSE
Titrant H2SO4 0.02 mol/L t = 1.0
Drive No. 2 10 mL
Volume VDISP = 0.0 mL
QDISP = 0.0 mmol

EP TITRATION
Titrant H2SO4 0.02 mol/L t = 1.0
Drive No. 2 10 mL
Sensor DG111
Excess VEX = 0.0000 mL
QEX = 0.00000 mmol

CALCULATION
Result R1 = 4.86 Initial pH

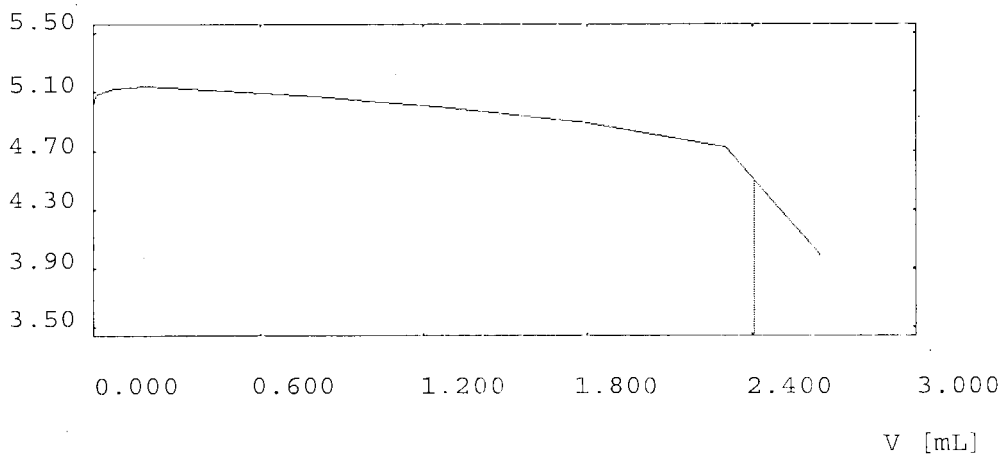
CALCULATION
Result R2 = 0.0000 mg/L ALKP

DISPENSE
Titrant H2SO4 0.02 mol/L t = 1.0
Drive No. 2 10 mL
Volume VDISP = 0.0 mL
QDISP = 0.0 mmol

EP TITRATION
Titrant H2SO4 0.02 mol/L t = 1.0
Drive No. 2 10 mL
Sensor DG111
Consumption EP VEQ1 = 2.4065 mL
Q1 = 0.04813 mmol
EPOT1 = 4.500 pH
Excess VEX = 0.2355 mL
QEX = 0.00471 mmol

CALCULATION
Result R3 = 120.33 mg/L ALKT

E - V curve



Method 11 Alkalinity 10/04/2012 9:25
Measured 04/16/2018 13:05
User RYC

RAW RESULTS

SAMPLE

| | |
|---|---|
| No. | 24 |
| Identification | 1804062008 |
| Titration stand | Stand 1 |
| Volume | 20.0 mL |
| Correction factor f | 1.0 |
| Mol.mass M | 100.00 g/mol |
| Equivalent number z | 1 |
| Temperature sensor | Manual |

DISPENSE

| | | | | |
|---|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L t = 1.0 | | |
| Drive | No. 2 | 10 mL | | |
| Volume | | VDISP = 0.0 | mL | |
| | | QDISP = 0.0 | mmol | |

EP TITRATION

| | | | | |
|---|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L t = 1.0 | | |
| Drive | No. 2 | 10 mL | | |
| Sensor | DG111 | | | |
| Excess | | VEX = 0.0000 | mL | |
| | | QEX = 0.00000 | mmol | |

CALCULATION

| | | | | |
|---|---|---|---|---|
| Result | | R1 = 4.75 | | Initial pH |

CALCULATION

| | | | | |
|---|---|---|---|---|
| Result | | R2 = 0.0000 | mg/L | ALKP |

DISPENSE

| | | | | |
|---|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L t = 1.0 | | |
| Drive | No. 2 | 10 mL | | |
| Volume | | VDISP = 0.0 | mL | |
| | | QDISP = 0.0 | mmol | |

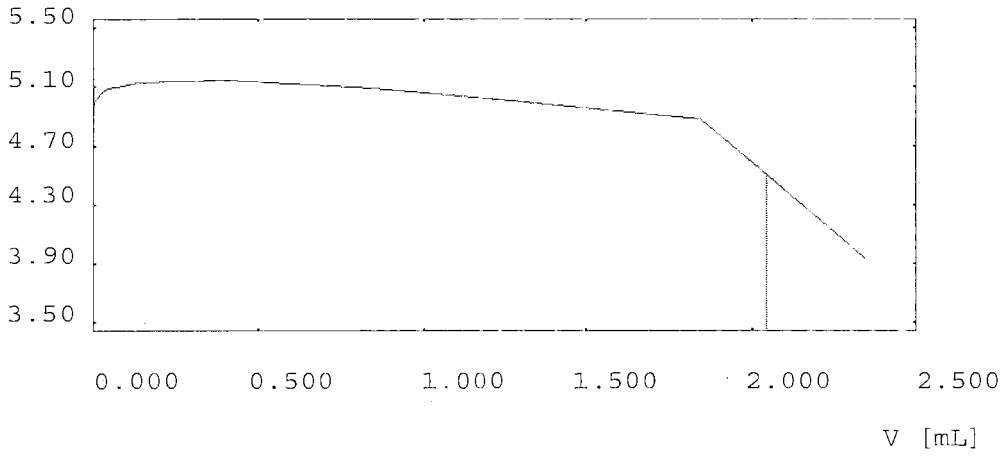
EP TITRATION

| | | | | |
|---|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L t = 1.0 | | |
| Drive | No. 2 | 10 mL | | |
| Sensor | DG111 | | | |
| Consumption | EP | VEQ1 = 2.0441 | mL | |
| | | Q1 = 0.04088 | mmol | |
| | | EPOT1 = 4.500 | pH | |
| Excess | | VEX = 0.3009 | mL | |
| | | QEX = 0.00602 | mmol | |

CALCULATION

| | | | | |
|---|---|---|---|---|
| Result | | R3 = 102.21 | mg/L | ALKT |

E - V curve



Method 11 Alkalinity 10/04/2012 9:25
Measured 04/16/2018 11:00
User RYC

RAW RESULTS

SAMPLE

| | |
|---|---|
| No. | 16 |
| Identification | 1804062009 |
| Titration stand | Stand 1 |
| Volume | 20.0 mL |
| Correction factor f | 1.0 |
| Mol.mass M | 100.00 g/mol |
| Equivalent number z | 1 |
| Temperature sensor | Manual |

DISPENSE

| | | | | |
|---|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L | t = 1.0 | |
| Drive | No. 2 | 10 mL | | |
| Volume | | VDISP = 0.0 | | mL |
| | | QDISP = 0.0 | | mmol |

EP TITRATION

| | | | | |
|---|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L | t = 1.0 | |
| Drive | No. 2 | 10 mL | | |
| Sensor | DG111 | | | |
| Excess | | VEX = | 0.0000 | mL |
| | | QEX = | 0.00000 | mmol |

CALCULATION

| | | | | |
|---|---|---|---|---|
| Result | R1 = | 4.97 | | Initial pH |

CALCULATION

| | | | | |
|---|---|---|---|---|
| Result | R2 = | 0.0000 | mg/L | ALKP |

DISPENSE

| | | | | |
|---|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L | t = 1.0 | |
| Drive | No. 2 | 10 mL | | |
| Volume | | VDISP = 0.0 | | mL |
| | | QDISP = 0.0 | | mmol |

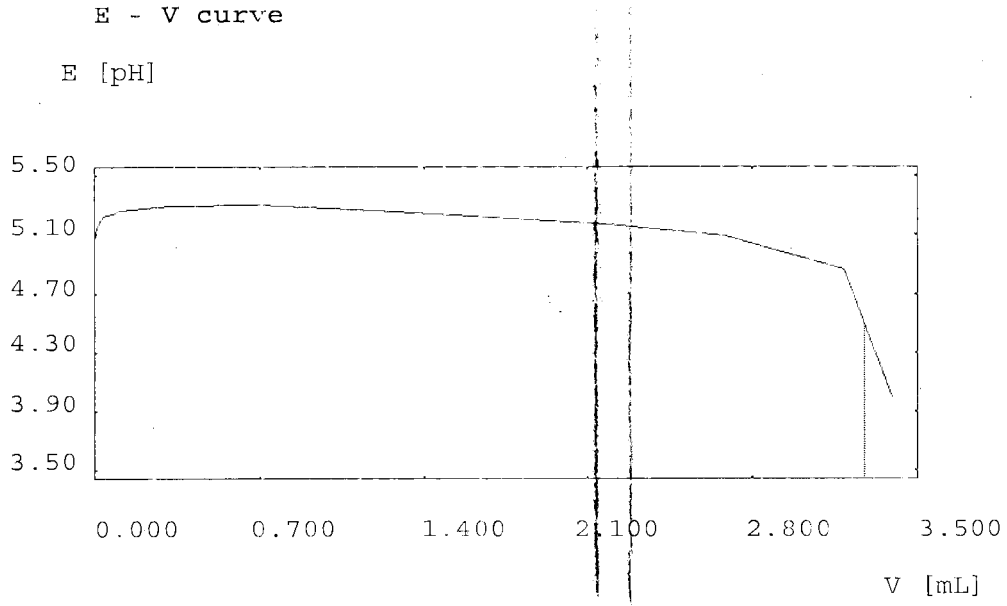
EP TITRATION

| | | | | |
|---|---|---|---|---|
| Titrant | H2SO4 | 0.02 mol/L | t = 1.0 | |
| Drive | No. 2 | 10 mL | | |
| Sensor | DG111 | | | |
| Consumption | EP | VEQ1 = | 3.2738 | mL |
| | | Q1 = | 0.06548 | mmol |
| | | EPOT1 = | 4.500 | pH |
| Excess | | VEX = | 0.1172 | mL |
| | | QEX = | 0.00234 | mmol |

CALCULATION

| | | | | |
|---|---|---|---|---|
| Result | R3 = | 163.69 | mg/L | ALKT |

11 10/04/2012 9:25 04/16/2018 11:00



# TOTAL ORGANIC CARBON
BY METHODS 5310B/SW9060A
WATERS

Date: 4-16-18
Analyst: PLH

Instrument ID: TOC5
HBN: 633404
Batch: 7258

**TC**
Calibration Standard Lot #: 2126310
Calibration Std. Exp: 8-3-19
Calibration ID: 1112-92-2
Calibration Date: 12-10-17
Calibration Exp: 12-10-18

**TC**
TC CCV/LCS Lot #: 1121-92-3
TC CCV/LCS Expiration Date: 5-14-18

**IC**
Calibration Standard Lot #: 2126317
Calibration Std. Exp: 8-31-18
Calibration ID: 1117-65-3
Calibration Date: 1-30-18
Calibration Exp: 8-31-18

**IC**
IC CCV/LCS Lot #: 1121-92-4
IC CCV/LCS Expiration Date: 5-14-18

Note: Calibration expires 1year from calibration date or on the calibration standard expiration date, whichever is sooner.

Revision 006: 05/04/2016

Reviewer/Date: RJO 04/17/18

C:\TOC3201\Data\2018_04_14_001.t32

| | Sample Name | Sample ID | Manu | Result | Date / Time | Vial | |
|---|---|---|---|---|---|---|---|
| 1 | 1797452 | 7238,PLH,TOC5 | 1.000 | TOC:47.35mg/L TC:48.32mg/L IC:0.9729mg/L | 4/14/2018 10:45:50 PM | 61 | 96.64% |
| 2 | LCS/CCV IC | 7238,PLH,TOC5 | 1.000 | TOC:3.880mg/L TC:55.01mg/L IC:51.13mg/L | 4/14/2018 11:17:07 PM | 62 | 102.26% |
| 3 | 1797451 | 7238,PLH,TOC5 | 1.000 | TOC:-0.4308mg/L TC:0.5163mg/L IC:0.9471m | 4/14/2018 11:40:11 PM | 63 | MB |
| 4 | 21804062001 | 7238,PLH,TOC5 | 2.000 | ✓ TOC:12.79mg/L TC:63.28mg/L IC:50.48mg/L | 4/15/2018 12:03:32 AM | 1 | |
| 5 | 21804062002 | 7238,PLH,TOC5 | 5.000 | ✓ TOC:107.6mg/L TC:160.0mg/L IC:52.48mg/L | 4/15/2018 12:26:58 AM | 2 | |
| 6 | 21804111901 | 7238,PLH,TOC5 | 50.00 | ✓ TOC:2244mg/L TC:2313mg/L IC:69.04mg/L | 4/15/2018 12:54:58 AM | 3 | |
| 7 | 21804122803 | 7238,PLH,TOC5 | 1.000 | ✓ TOC:0.3221mg/L TC:2.655mg/L IC:2.333mg/L | 4/15/2018 1:20:48 AM | 4 | |
| 8 | 21804122804 | 7238,PLH,TOC5 | 1.000 | ✓ TOC:1.548mg/L TC:11.32mg/L IC:9.768mg/L | 4/15/2018 1:43:26 AM | 5 | |
| 9 | 21804122805/M | 7238,PLH,TOC5 | 1.000 | ✓ TOC:48.56mg/L TC:57.99mg/L IC:9.428mg/L | 4/15/2018 2:07:09 AM | 6 | 94.02% MS |
| 10 | 21804122806/M | 7238,PLH,TOC5 | 1.000 | ✓ TOC:49.68mg/L TC:58.96mg/L IC:9.274mg/L | 4/15/2018 2:30:54 AM | 7 | 96.26% MSD |
| 11 | 21804122807 | 7238,PLH,TOC5 | 1.000 | ✓ TOC:8.120mg/L TC:42.20mg/L IC:34.08mg/L | 4/15/2018 2:56:32 AM | 8 | |
| 12 | 21804122811 | 7238,PLH,TOC5 | 2.000 | ✓ TOC:16.78mg/L TC:67.68mg/L IC:50.90mg/L | 4/15/2018 3:20:06 AM | 9 | |
| 13 | 21804122812 | 7238,PLH,TOC5 | 2.000 | ✓ TOC:14.80mg/L TC:61.45mg/L IC:46.65mg/L | 4/15/2018 3:43:05 AM | 10 | |
| 14 | 1800 | 7238,PLH,TOC5 | 1.000 | ✓ TOC:47.66mg/L TC:48.85mg/L IC:1.194mg/L | 4/15/2018 4:11:26 AM | 64 | 97.7% |
| 15 | LCS/CCV IC | 7238,PLH,TOC5 | 1.000 | ✓ TOC:4.875mg/L TC:55.80mg/L IC:50.93mg/L | 4/15/2018 4:39:47 AM | 65 | 101.86% |
| 16 | 1900 | 7238,PLH,TOC5 | 1.000 | ✓ TOC:-0.4135mg/L TC:0.5472mg/L IC:0.9607m | 4/15/2018 5:00:38 AM | 66 | |
| 17 | 21804131202 | 7238,PLH,TOC5 | 1.000 | ✓ TOC:11.53mg/L TC:63.32mg/L IC:51.79mg/L | 4/15/2018 5:24:18 AM | 11 | |
| 18 | 21804131409 | 7238,PLH,TOC5 | 1.000 | ✓ TOC:5.836mg/L TC:38.64mg/L IC:32.81mg/L | 4/15/2018 5:47:06 AM | 12 | |
| 19 | 21804131410 | 7238,PLH,TOC5 | 1.000 | ✓ TOC:6.214mg/L TC:39.21mg/L IC:33.00mg/L | 4/15/2018 6:09:59 AM | 13 | |
| 20 | 21804131411 | 7238,PLH,TOC5 | 1.000 | ✓ TOC:5.988mg/L TC:37.70mg/L IC:31.71mg/L | 4/15/2018 6:32:48 AM | 14 | |
| 21 | 21804131414 | 7238,PLH,TOC5 | 1.000 | ✓ TOC:5.425mg/L TC:35.24mg/L IC:29.82mg/L | 4/15/2018 6:55:39 AM | 15 | |
| 22 | 21804140405 | RERUN | 1.000 | TOC:22.38mg/L TC:103.0mg/L IC:80.65mg/L | 4/15/2018 7:23:12 AM | 16 | |
| 23 | 21804140406 | 7238,PLH,TOC5 | 1.000 | ✓ TOC:17.66mg/L TC:87.06mg/L IC:69.40mg/L | 4/15/2018 7:47:00 AM | 17 | |
| 24 | 179471/LCS | 7240,PLH,TOC5 | 1.000 | ✓ TOC:46.53mg/L TC:47.95mg/L IC:1.414mg/L | 4/15/2018 8:23:18 AM | 51 | 95.9% |
| 25 | LCS/CCV IC | 7240,PLH,TOC5 | 1.000 | ✓ TOC:5.056mg/L TC:56.26mg/L IC:51.21mg/L | 4/15/2018 8:51:03 AM | 52 | 102.42% |
| 26 | 1797470/MB | 7240,PLH,TOC5 | 1.000 | ✓ TOC:-0.4061mg/L TC:0.5717mg/L IC:0.9779m | 4/15/2018 9:16:06 AM | 53 | MB |
| 27 | 21804126701 | RERUN | 1.000 | TOC:19.57mg/L TC:111.9mg/L IC:92.32mg/L | 4/15/2018 9:36:18 AM | 18 | |
| 28 | 21804126702 | 7240,PLH,TOC5 | 1.000 | ✓ TOC:14.16mg/L TC:85.31mg/L IC:71.15mg/L | 4/15/2018 9:55:25 AM | 19 | |
| 29 | 21804126703 | 7240,PLH,TOC5 | 1.000 | ✓ TOC:8.797mg/L TC:55.72mg/L IC:46.92mg/L | 4/15/2018 10:13:56 AM | 20 | |
| 30 | 21804126704 | 7240,PLH,TOC5 | 1.000 | ✓ TOC:8.989mg/L TC:58.18mg/L IC:49.19mg/L | 4/15/2018 10:32:26 AM | 21 | |
| 31 | 21804126705 | 7240,PLH,TOC5 | 1.000 | ✓ TOC:10.58mg/L TC:69.12mg/L IC:58.54mg/L | 4/15/2018 10:56:29 AM | 22 | |
| 32 | 21804126706 | 7240,PLH,TOC5 | 1.000 | ✓ TOC:11.12mg/L TC:72.72mg/L IC:61.60mg/L | 4/15/2018 11:16:16 AM | 23 | |
| 33 | 21804126707 | 7240,PLH,TOC5 | 1.000 | ✓ TOC:10.67mg/L TC:69.59mg/L IC:58.92mg/L | 4/15/2018 11:35:54 AM | 24 | |
| 34 | 21804126708 | 7240,PLH,TOC5 | 1.000 | ✓ TOC:9.131mg/L TC:55.08mg/L IC:45.95mg/L | 4/15/2018 11:54:30 AM | 25 | |
| 35 | 21804126709 | 7240,PLH,TOC5 | 1.000 | ✓ TOC:8.289mg/L TC:53.88mg/L IC:45.59mg/L | 4/15/2018 12:13:03 PM | 26 | |
| 36 | 21804126710 | 7240,PLH,TOC5 | 1.000 | ✓ TOC:12.98mg/L TC:75.16mg/L IC:62.17mg/L | 4/15/2018 12:32:44 PM | 27 | |
| 37 | 1800 | 7240,PLH,TOC5 | 1.000 | ✓ TOC:48.06mg/L TC:49.61mg/L IC:1.552mg/L | 4/15/2018 12:57:58 PM | 48 | 99.22% |
| 38 | LCS/CCV IC | 7240,PLH,TOC5 | 1.000 | ✓ TOC:5.067mg/L TC:56.55mg/L IC:51.48mg/L | 4/15/2018 1:19:02 PM | 49 | 102.96% |
| 39 | 1900 | 7240,PLH,TOC5 | 1.000 | ✓ TOC:-0.4145mg/L TC:0.5577mg/L IC:0.9722m | 4/15/2018 1:37:54 PM | 50 | |
| 40 | 21804126711 | RERUN | 1.000 | ✗ TOC:18.89mg/L TC:108.9mg/L IC:89.98mg/L | 4/15/2018 1:58:18 PM | 28 | |
| 41 | 21804126712 | RERUN | 1.000 | ✗ TOC:21.98mg/L TC:140.1mg/L IC:118.1mg/L | 4/15/2018 2:21:02 PM | 29 | |
| 42 | 21804126713 | RERUN | 1.000 | ✗ TOC:18.19mg/L TC:110.2mg/L IC:92.03mg/L | 4/15/2018 2:41:19 PM | 30 | |
| 43 | 21804126714 | 7240,PLH,TOC5 | 1.000 | ✓ TOC:7.741mg/L TC:51.56mg/L IC:43.82mg/L | 4/15/2018 2:59:42 PM | 31 | |
| 44 | 21804126715 | 7240,PLH,TOC5 | 1.000 | ✓ TOC:14.76mg/L TC:85.07mg/L IC:70.31mg/L | 4/15/2018 3:18:58 PM | 32 | |
| 45 | 21804126716 | 7240,PLH,TOC5 | 1.000 | ✓ TOC:11.60mg/L TC:54.19mg/L IC:42.59mg/L | 4/15/2018 3:37:27 PM | 33 | |
| 46 | 21804126717 | 7240,PLH,TOC5 | 1.000 | ✓ TOC:12.35mg/L TC:71.35mg/L IC:59.01mg/L | 4/15/2018 3:56:07 PM | 34 | |
| 47 | 21804131419 | RERUN | 1.000 | ✗ TOC:19.29mg/L TC:110.9mg/L IC:91.59mg/L | 4/15/2018 4:16:19 PM | 35 | MS |
| 48 | 21804131420 | RERUN | 1.000 | ✗ TOC:66.60mg/L TC:131.2mg/L IC:64.61mg/L | 4/15/2018 4:38:16 PM | 36 | 94.62% MSMSD |
| 49 | 21804131421 | 7240,PLH,TOC5 | 1.000 | ✗ TOC:55.45mg/L TC:93.07mg/L IC:37.62mg/L | 4/15/2018 4:57:22 PM | 37 | 72.32% MSD |
| 50 | 1800 | 7240,PLH,TOC5 | 1.000 | ✓ TOC:48.15mg/L TC:49.46mg/L IC:1.313mg/L | 4/15/2018 5:20:39 PM | 54 | 98.92% |
| 51 | LCS/CCV IC | 7240,PLH,TOC5 | 1.000 | ✓ TOC:5.484mg/L TC:57.24mg/L IC:51.76mg/L | 4/15/2018 5:41:11 PM | 55 | 103.52% |

| | Sample Name | Sample ID | Manu | Result | Date / Time | Vial |
|---|---|---|---|---|---|---|
| 52 | 1900 | 7240,PLH,TOC5 | 1.000 | TOC:-0.4270mg/L TC:0.6355mg/L IC:1.063mg/ | 4/15/2018 6:04:39 PM | 56 |

Sample

Sample Name: 1797452
Sample ID: 7238,PLH,TOC5
Origin: TOC4.met
Status Completed
Chk. Result

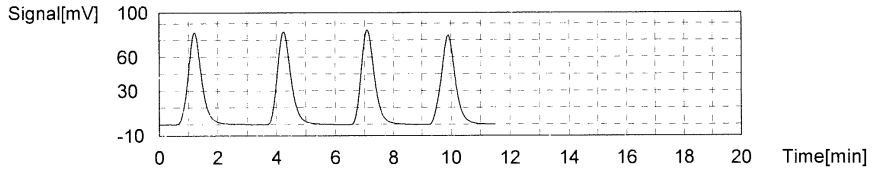
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:47.35mg/L TC:48.32mg/L IC:0.9729mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 263.4 | 48.14mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/14/2018 10:28:06 PM |
| 2 | 265.9 | 48.60mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/14/2018 10:31:09 PM |
| 3 | 267.0 | 48.80mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/14/2018 10:34:03 PM |
| 4 | 261.3 | 47.76mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/14/2018 10:37:04 PM |

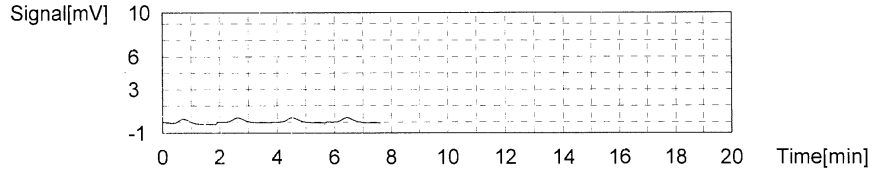
Mean Area 264.4
Mean Conc. 48.32mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 0.9258 | 0.9691mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/14/2018 10:39:35 PM |
| 2 | 0.9679 | 0.9756mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/14/2018 10:41:40 PM |
| 3 | 0.9445 | 0.9720mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/14/2018 10:43:45 PM |
| 4 | 0.9628 | 0.9749mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/14/2018 10:45:50 PM |

Mean Area 0.9503
Mean Conc. 0.9729mg/L



Sample

| | |
|---|---|
| Sample Name: | LCS/CCV IC |
| Sample ID: | 7238,PLH,TOC5 |
| Origin: | TOC4.met |
| Status | Completed |
| Chk. Result | |

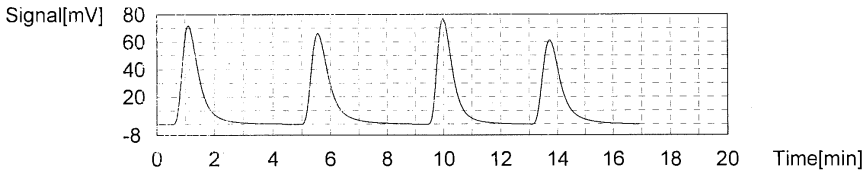
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:3.880mg/L TC:55.01mg/L IC:51.13mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 304.8 | 55.66mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/14/2018 10:53:57 PM |
| 2 | 303.8 | 55.48mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/14/2018 10:58:36 PM |
| 3 | 302.4 | 55.23mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/14/2018 11:02:26 PM |
| 4 | 293.9 | 53.68mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/14/2018 11:06:59 PM |

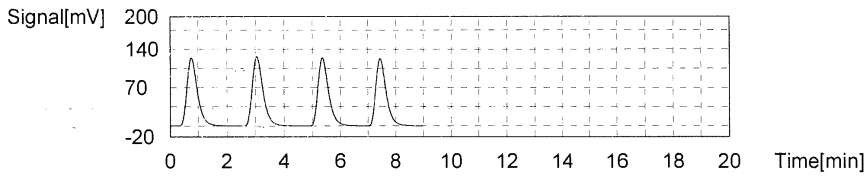
Mean Area 301.2
Mean Conc. 55.01mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 324.7 | 51.13mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/14/2018 11:09:52 PM |
| 2 | 330.4 | 52.01mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/14/2018 11:12:22 PM |
| 3 | 324.2 | 51.05mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/14/2018 11:14:38 PM |
| 4 | 319.6 | 50.34mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/14/2018 11:17:07 PM |

Mean Area 324.7
Mean Conc. 51.13mg/L



Sample

Sample Name: 1797451
Sample ID: 7238,PLH,TOC5
Origin: TOC4.met
Status Completed
Chk. Result

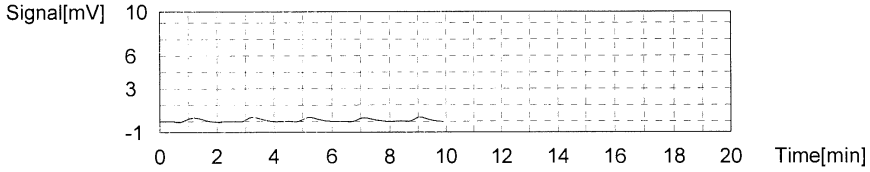
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:-0.4308mg/L TC:0.5163mg/L IC:0.9471mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 1.647 | 0.5793mg/L | 50uL | 1 | E | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/14/2018 11:22:58 PM |
| 2 | 1.419 | 0.5379mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/14/2018 11:25:07 PM |
| 3 | 1.287 | 0.5139mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/14/2018 11:27:12 PM |
| 4 | 1.227 | 0.5030mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/14/2018 11:29:22 PM |
| 5 | 1.268 | 0.5104mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/14/2018 11:31:27 PM |

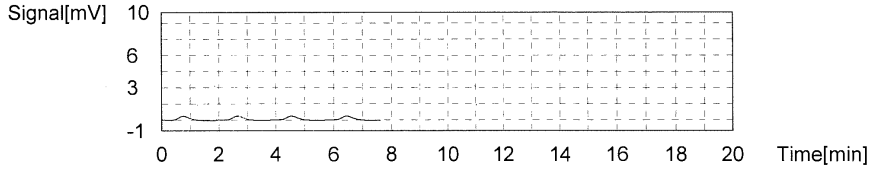
Mean Area 1.300
Mean Conc. 0.5163mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 0.7890 | 0.9479mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/14/2018 11:33:56 PM |
| 2 | 0.7630 | 0.9439mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/14/2018 11:36:01 PM |
| 3 | 0.7949 | 0.9488mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/14/2018 11:38:06 PM |
| 4 | 0.7882 | 0.9478mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/14/2018 11:40:11 PM |

Mean Area 0.7838
Mean Conc. 0.9471mg/L



Sample

Sample Name: 21804062001
Sample ID: 7238,PLH,TOC5
Origin: TOC4.met
Status Completed
Chk. Result

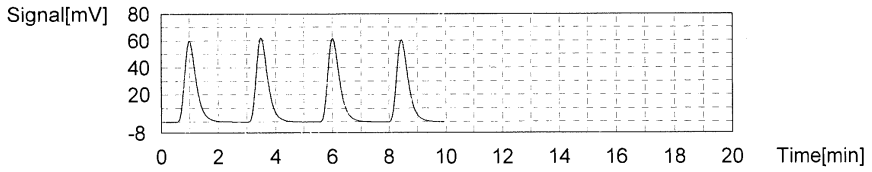
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 2.000 | TOC:12.79mg/L TC:63.28mg/L IC:50.48mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 169.9 | 62.30mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/14/2018 11:46:33 PM |
| 2 | 175.1 | 64.19mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/14/2018 11:49:15 PM |
| 3 | 173.9 | 63.76mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/14/2018 11:51:52 PM |
| 4 | 171.4 | 62.85mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/14/2018 11:54:32 PM |

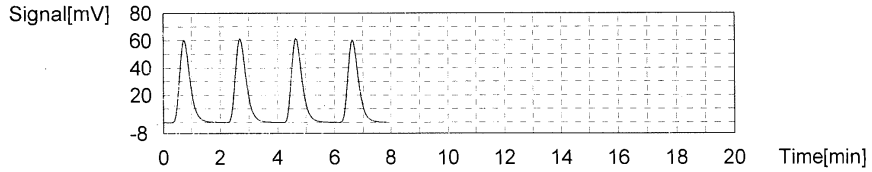
Mean Area 172.6
Mean Conc. 63.28mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 155.0 | 49.68mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/14/2018 11:57:06 PM |
| 2 | 159.2 | 50.98mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/14/2018 11:59:15 PM |
| 3 | 159.6 | 51.10mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/15/2018 12:01:24 AM |
| 4 | 156.6 | 50.17mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/15/2018 12:03:32 AM |

Mean Area 157.6
Mean Conc. 50.48mg/L



Sample

Sample Name: 21804062002
Sample ID: 7238,PLH,TOC5
Origin: TOC4.met
Status Completed
Chk. Result

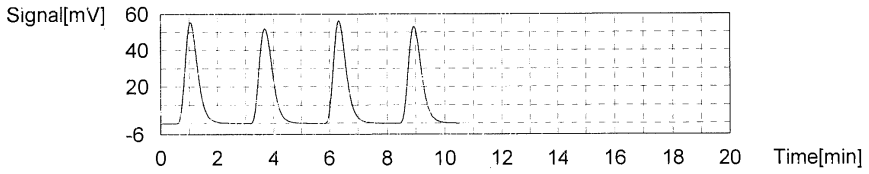
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 5.000 | TOC:107.6mg/L TC:160.0mg/L IC:52.48mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 173.2 | 158.8mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/15/2018 12:09:47 AM |
| 2 | 177.4 | 162.6mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/15/2018 12:12:38 AM |
| 3 | 176.0 | 161.3mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/15/2018 12:15:25 AM |
| 4 | 171.8 | 157.5mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/15/2018 12:18:13 AM |

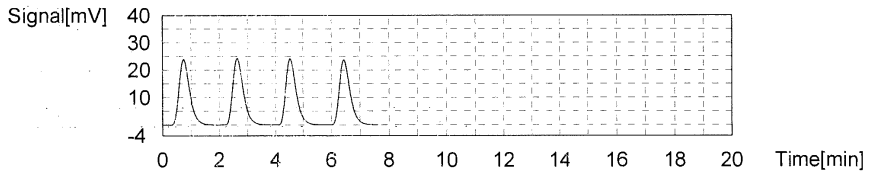
Mean Area 174.6
Mean Conc. 160.0mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 62.13 | 52.26mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/15/2018 12:20:43 AM |
| 2 | 62.92 | 52.87mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/15/2018 12:22:48 AM |
| 3 | 63.12 | 53.02mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/15/2018 12:24:53 AM |
| 4 | 61.50 | 51.77mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/15/2018 12:26:58 AM |

Mean Area 62.42
Mean Conc. 52.48mg/L



Sample

Sample Name: 1800
Sample ID: 7238,PLH,TOC5
Origin: TOC4.met
Status Completed
Chk. Result

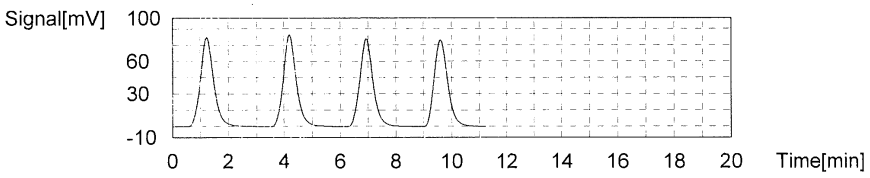
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:47.66mg/L TC:48.85mg/L IC:1.194mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 267.6 | 48.90mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/15/2018 3:49:43 AM |
| 2 | 269.4 | 49.23mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/15/2018 3:52:38 AM |
| 3 | 267.3 | 48.85mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/15/2018 3:55:34 AM |
| 4 | 264.9 | 48.41mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/15/2018 3:58:31 AM |

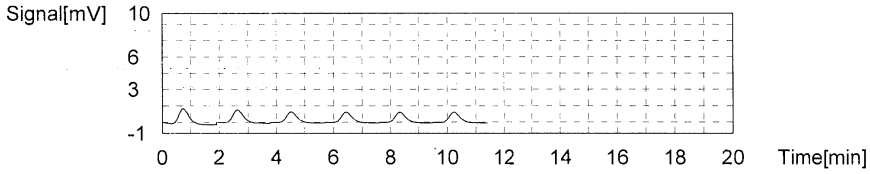
Mean Area 267.3
Mean Conc. 48.85mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 3.344 | 1.344mg/L | 50uL | 1 | E | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/15/2018 4:01:01 AM |
| 2 | 2.914 | 1.277mg/L | 50uL | 1 | E | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/15/2018 4:03:06 AM |
| 3 | 2.444 | 1.204mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/15/2018 4:05:11 AM |
| 4 | 2.319 | 1.185mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/15/2018 4:07:16 AM |
| 5 | 2.374 | 1.193mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/15/2018 4:09:21 AM |
| 6 | 2.365 | 1.192mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/15/2018 4:11:26 AM |

Mean Area 2.376
Mean Conc. 1.194mg/L



Sample

| | |
|---|---|
| Sample Name: | LCS/CCV IC |
| Sample ID: | 7238,PLH,TOC5 |
| Origin: | TOC4.met |
| Status | Completed |
| Chk. Result | |

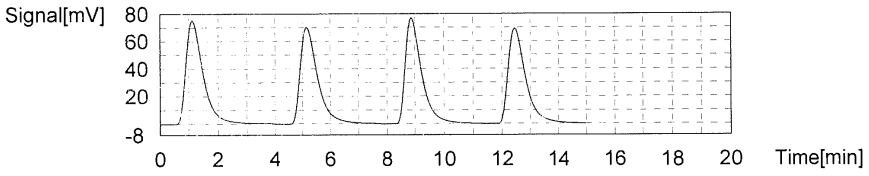
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:4.875mg/L TC:55.80mg/L IC:50.93mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 307.8 | 56.21mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/15/2018 4:19:01 AM |
| 2 | 308.1 | 56.26mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/15/2018 4:22:58 AM |
| 3 | 309.5 | 56.52mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/15/2018 4:26:41 AM |
| 4 | 296.8 | 54.21mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/15/2018 4:30:31 AM |

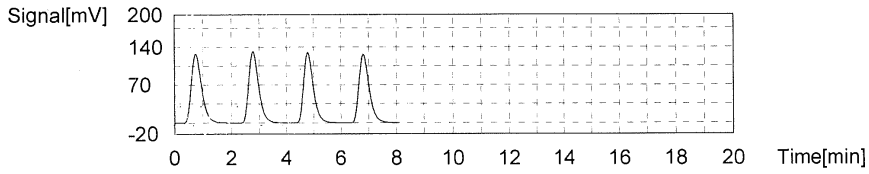
Mean Area 305.6
Mean Conc. 55.80mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 320.3 | 50.45mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/15/2018 4:33:08 AM |
| 2 | 330.6 | 52.04mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/15/2018 4:35:21 AM |
| 3 | 325.0 | 51.18mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/15/2018 4:37:33 AM |
| 4 | 317.6 | 50.03mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/15/2018 4:39:47 AM |

Mean Area 323.4
Mean Conc. 50.93mg/L



Sample

Sample Name: 1900
Sample ID: 7238,PLH,TOC5
Origin: TOC4.met
Status Completed
Chk. Result

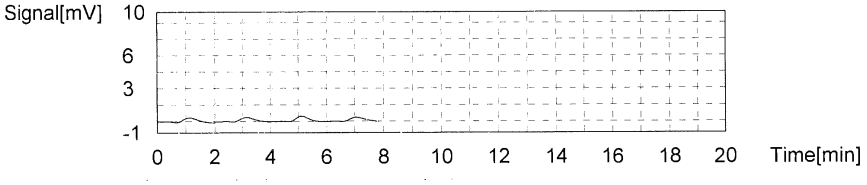
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:-0.4135mg/L TC:0.5472mg/L IC:0.9607mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 1.534 | 0.5588mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/15/2018 4:45:29 AM |
| 2 | 1.483 | 0.5495mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/15/2018 4:47:42 AM |
| 3 | 1.538 | 0.5595mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/15/2018 4:49:47 AM |
| 4 | 1.326 | 0.5210mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/15/2018 4:51:53 AM |

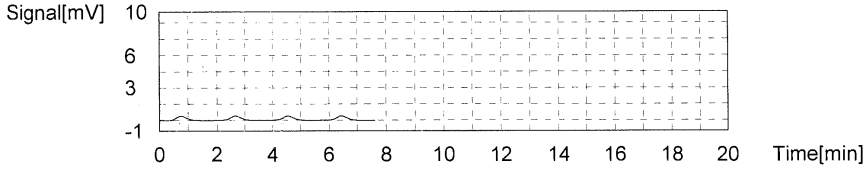
Mean Area 1.470
Mean Conc. 0.5472mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 0.8359 | 0.9552mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/15/2018 4:54:23 AM |
| 2 | 0.8761 | 0.9614mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/15/2018 4:56:28 AM |
| 3 | 0.8600 | 0.9589mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/15/2018 4:58:33 AM |
| 4 | 0.9129 | 0.9671mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/15/2018 5:00:38 AM |

Mean Area 0.8712
Mean Conc. 0.9607mg/L



GCAL ANALYTICAL LABORATORIES, LLC

# TOTAL ORGANIC CARBON

BY METHODS 5310B/SW9060A

WATERS

Date: 4/13/18

Analyst: PLH

Instrument ID: TOC5

HBN: 633140

Batch: 7230

**TC**

Calibration Standard Lot #: 2126310

Calibration Std. Exp: 8-3-19

Calibration ID: 1112-92-2

Calibration Date: 12-10-17

Calibration Exp: 12-10-18

**TC**

TC CCV/LCS Lot #: 1121-84-7

TC CCV/LCS Expiration Date: 5-10-18

**IC**

Calibration Standard Lot #: 2126317

Calibration Std. Exp: 8-31-18

Calibration ID: 1117-65-3

Calibration Date: 1-30-18

Calibration Exp: 8-31-18

**IC**

IC CCV/LCS Lot #: 1121-84-8

IC CCV/LCS Expiration Date: 5-10-18

Note: Calibration expires 1year from calibration date or on the calibration standard expiration date, whichever is sooner.

Revision 006: 05/04/2016

Reviewer/Date: RJD 04/13/18

C:\TOC3201\Data\2018_04_11_001.t32

| | Sample Name | Sample ID | Manual | Result | Date / Time | |
|---|---|---|---|---|---|---|
| 1 | 1795852/CCV T | 7230,PLH,TOC5 | 1.000 | TOC:46.88mg/L TC:47.90mg/L IC:1.022mg/L | 4/11/2018 8:10:03 PM | 95.8% |
| 2 | LCS/CCV IC | 7230,PLH,TOC5 | 1.000 | TOC:3.835mg/L TC:54.76mg/L IC:50.93mg/L | 4/11/2018 8:37:07 PM | 101.86 |
| 3 | 1795851 | 7230,PLH,TOC5 | 1.000 | TOC:-0.5604mg/L TC:0.4729mg/L IC:1.033mg/L | 4/11/2018 9:04:08 PM | MB |
| 4 | 21804053507 | 7230,PLH,TOC5 | 2.000 | TOC:34.99mg/L TC:142.9mg/L IC:107.9mg/L | 4/11/2018 9:27:26 PM | |
| 5 | 21804053508 | 7230,PLH,TOC5 | 2.000 | TOC:37.48mg/L TC:155.4mg/L IC:117.9mg/L | 4/11/2018 9:50:38 PM | |
| 6 | 21804053509 | 7230,PLH,TOC5 | 10.00 | TOC:654.5mg/L TC:755.7mg/L IC:101.2mg/L | 4/11/2018 10:18:22 PM | |
| 7 | 21804053510/M | 7230,PLH,TOC5 | 10.00 | TOC:1137mg/L TC:1205mg/L IC:68.13mg/L | 4/11/2018 10:48:35 PM | MS 96.5% |
| 8 | 21804053511/M | 7230,PLH,TOC5 | 10.00 | TOC:1218mg/L TC:1296mg/L IC:77.46mg/L | 4/11/2018 11:18:01 PM | MSD 112.7% |
| 9 | 21804053514 | 7230,PLH,TOC5 | 5.000 | TOC:64.11mg/L TC:236.1mg/L IC:172.0mg/L | 4/11/2018 11:41:04 PM | |
| 10 | 21804053515 | 7230,PLH,TOC5 | 2.000 | TOC:23.98mg/L TC:116.3mg/L IC:92.28mg/L | 4/12/2018 12:04:09 AM | |
| 11 | 21804053520 | 7230,PLH,TOC5 | 10.00 | TOC:579.2mg/L TC:684.5mg/L IC:105.3mg/L | 4/12/2018 12:27:41 AM | |
| 12 | 21804061801 | 7230,PLH,TOC5 | 1.000 | TOC:9.085mg/L TC:50.20mg/L IC:41.11mg/L | 4/12/2018 12:53:07 AM | |
| 13 | 21804061804 | 7230,PLH,TOC5 | 1.000 | TOC:10.96mg/L TC:58.06mg/L IC:47.10mg/L | 4/12/2018 1:16:05 AM | |
| 14 | 1800 | 7230,PLH,TOC5 | 1.000 | TOC:47.36mg/L TC:48.65mg/L IC:1.295mg/L | 4/12/2018 1:46:32 AM | 97.3% |
| 15 | LCS/CCV IC | 7230,PLH,TOC5 | 1.000 | TOC:5.197mg/L TC:56.25mg/L IC:51.05mg/L | 4/12/2018 2:12:36 AM | 102.1% |
| 16 | 1900 | 7230,PLH,TOC5 | 1.000 | TOC:-0.4690mg/L TC:0.5187mg/L IC:0.9877mg/L | 4/12/2018 2:37:25 AM | |
| 17 | 21804062010 | 7230,PLH,TOC5 | 1.000 | TOC:5.606mg/L TC:31.22mg/L IC:25.61mg/L | 4/12/2018 3:00:20 AM | |
| 18 | 21804070801 | 7230,PLH,TOC5 | 1.000 | TOC:11.80mg/L TC:66.50mg/L IC:54.70mg/L | 4/12/2018 3:23:32 AM | |
| 19 | 21804070802 | 7230,PLH,TOC5 | 1.000 | TOC:15.71mg/L TC:83.87mg/L IC:68.16mg/L | 4/12/2018 3:46:54 AM | |
| 20 | 21804070803 | 7230,PLH,TOC5 | 10.00 | TOC:1.631mg/L TC:49.31mg/L IC:47.68mg/L | 4/12/2018 4:12:53 AM | |
| 21 | 21804070804 | 7230,PLH,TOC5 | 1.000 | TOC:18.78mg/L TC:97.62mg/L IC:78.84mg/L | 4/12/2018 4:39:01 AM | |
| 22 | 21804070805 | 7230,PLH,TOC5 | 10.00 | TOC:1.331mg/L TC:40.63mg/L IC:39.30mg/L | 4/12/2018 5:04:51 AM | |
| 23 | 21804071505 | 7230,PLH,TOC5 | 1.000 | TOC:2.167mg/L TC:14.64mg/L IC:12.47mg/L | 4/12/2018 5:27:17 AM | |
| 24 | 21804071611 | 7230,PLH,TOC5 | 1.000 | TOC:4.144mg/L TC:28.00mg/L IC:23.86mg/L | 4/12/2018 5:49:55 AM | |
| 25 | 21804104104 | 7230,PLH,TOC5 | 1.000 | TOC:2.438mg/L TC:18.60mg/L IC:16.16mg/L | 4/12/2018 6:12:24 AM | |
| 26 | 21804104105 | 7230,PLH,TOC5 | 1.000 | TOC:2.656mg/L TC:19.56mg/L IC:16.90mg/L | 4/12/2018 6:34:53 AM | |
| 27 | 1800 | 7230,PLH,TOC5 | 1.000 | TOC:47.61mg/L TC:48.70mg/L IC:1.092mg/L | 4/12/2018 7:03:11 AM | 97.4% |
| 28 | LCS/CCV IC | 7230,PLH,TOC5 | 1.000 | TOC:5.140mg/L TC:56.20mg/L IC:51.06mg/L | 4/12/2018 7:30:11 AM | 102.12% |
| 29 | 1900 | 7230,PLH,TOC5 | 1.000 | TOC:-0.4362mg/L TC:0.5422mg/L IC:0.9784mg/L | 4/12/2018 7:55:05 AM | |
| 30 | 1796109/LCS T | 7230,PLH,TOC5 | 1.000 | TOC:47.76mg/L TC:48.75mg/L IC:0.9911mg/L | 4/12/2018 8:19:18 AM | 96% |
| 31 | LCS/CCV IC | 7230,PLH,TOC5 | 1.000 | TOC:4.978mg/L TC:55.68mg/L IC:50.70mg/L | 4/12/2018 8:46:53 AM | 101.4% |
| 32 | 1796108/MB | 7231,PLH,TOC5 | 1.000 | TOC:-0.4244mg/L TC:0.5360mg/L IC:0.9604mg/L | 4/12/2018 9:11:59 AM | MB |
| 33 | 21804103908 | 7231,PLH,TOC5 | 1.000 | TOC:19.44mg/L TC:91.56mg/L IC:72.12mg/L | 4/12/2018 9:36:20 AM | |
| 34 | 1796110/MS | 7231,PLH,TOC5 | 1.000 | TOC:68.41mg/L TC:136.3mg/L IC:67.89mg/L | 4/12/2018 10:03:00 AM | 97.91% |
| 35 | 179111/MSD | 7231,PLH,TOC5 | 1.000 | TOC:68.26mg/L TC:132.0mg/L IC:63.72mg/L | 4/12/2018 10:26:42 AM | 97.64% |
| 36 | 21804103909 | 7231,PLH,TOC5 | 1.000 | TOC:20.68mg/L TC:96.44mg/L IC:75.77mg/L | 4/12/2018 10:51:01 AM | |
| 37 | 21804103910 | 7231,PLH,TOC5 | 1.000 | TOC:5.965mg/L TC:34.15mg/L IC:28.19mg/L | 4/12/2018 11:20:25 AM | |
| 38 | 21804103911 | 7231,PLH,TOC5 | 1.000 | TOC:3.243mg/L TC:22.23mg/L IC:18.99mg/L | 4/12/2018 11:43:10 AM | |
| 39 | 21804103914 | 7231,PLH,TOC5 | 1.000 | TOC:4.267mg/L TC:27.41mg/L IC:23.15mg/L | 4/12/2018 12:05:59 PM | |
| 40 | 21804103919 | 7231,PLH,TOC5 | 1.000 | TOC:6.737mg/L TC:40.81mg/L IC:34.08mg/L | 4/12/2018 12:28:59 PM | |
| 41 | 21804110101 | 7231,PLH,TOC5 | 1.000 | TOC:5.162mg/L TC:33.94mg/L IC:28.77mg/L | 4/12/2018 12:51:47 PM | |
| 42 | 21804110102 | 7231,PLH,TOC5 | 1.000 | TOC:5.445mg/L TC:33.55mg/L IC:28.10mg/L | 4/12/2018 1:14:40 PM | |
| 43 | 1800 | 7231,PLH,TOC5 | 1.000 | TOC:48.04mg/L TC:49.26mg/L IC:1.217mg/L | 4/12/2018 1:42:52 PM | 98.52% |
| 44 | LCS/CCV IC | 7231,PLH,TOC5 | 1.000 | TOC:5.363mg/L TC:56.38mg/L IC:51.01mg/L | 4/12/2018 2:09:34 PM | 102.02% |
| 45 | 1900 | 7231,PLH,TOC5 | 1.000 | TOC:-0.4026mg/L TC:0.5742mg/L IC:0.9768mg/L | 4/12/2018 2:30:27 PM | |
| 46 | 21804110106 | 7231,PLH,TOC5 | 1.000 | TOC:13.92mg/L TC:56.97mg/L IC:43.05mg/L | 4/12/2018 2:53:44 PM | |
| 47 | 21804110601 | 7231,PLH,TOC5 | 1.000 | TOC:2.855mg/L TC:17.60mg/L IC:14.75mg/L | 4/12/2018 3:16:11 PM | |
| 48 | 21804110602 | 7231,PLH,TOC5 | 1.000 | TOC:3.335mg/L TC:21.80mg/L IC:18.47mg/L | 4/12/2018 3:38:46 PM | |
| 49 | 21804110606 | 7231,PLH,TOC5 | 1.000 | TOC:0.5295mg/L TC:5.249mg/L IC:4.720mg/L | 4/12/2018 4:00:42 PM | |
| 50 | 21804110607 | 7231,PLH,TOC5 | 1.000 | TOC:4.958mg/L TC:22.35mg/L IC:17.40mg/L | 4/12/2018 4:25:52 PM | |
| 51 | 21804110610 | 7231,PLH,TOC5 | 1.000 | TOC:2.828mg/L TC:19.83mg/L IC:17.00mg/L | 4/12/2018 4:48:24 PM | |

C:\TOC3201\Data\2018_04_11_001.t32

| | Sample Name | Sample ID | Manual | Result | Date / Time |
|---|---|---|---|---|---|
| 52 | 21804110611 | 7231,PLH,TOC5 | 1.000 | TOC:3.356mg/L TC:22.78mg/L IC:19.43mg/L | 4/12/2018 5:10:55 PM |
| 53 | 21804111901 | RERUN | 1.000 | TOC:2255mg/L TC:2265mg/L IC:10.29mg/L | 4/12/2018 6:10:02 PM |
| 54 | 1800 | 7231,PLH,TOC5 | 1.000 | TOC:47.88mg/L TC:48.87mg/L IC:0.9906mg/L | 4/12/2018 6:38:50 PM |
| 55 | CCV/LSC IC | 7231,PLH,TOC5 | 1.000 | TOC:4.897mg/L TC:55.79mg/L IC:50.89mg/L | 4/12/2018 7:08:22 PM |
| 56 | 1900 | 7231,PLH,TOC5 | 1.000 | TOC:-0.5327mg/L TC:0.5308mg/L IC:1.063mg/L | 4/12/2018 7:37:28 PM |

97.74%
101.78%

Sample

Sample Name: 1795852/CCV TC
Sample ID: 7230,PLH,TOC5
Origin: TOC4.met
Status Completed
Chk. Result

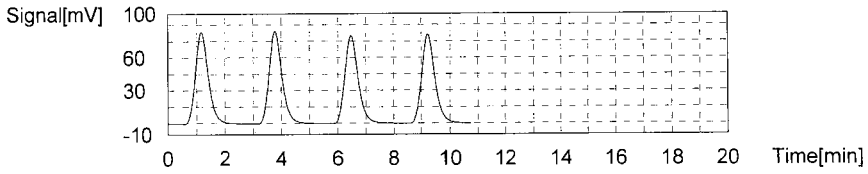
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:46.88mg/L TC:47.90mg/L IC:1.022mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 260.4 | 47.60mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/11/2018 7:50:32 PM |
| 2 | 265.5 | 48.52mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/11/2018 7:53:24 PM |
| 3 | 263.5 | 48.16mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/11/2018 7:56:20 PM |
| 4 | 258.9 | 47.32mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/11/2018 7:59:12 PM |

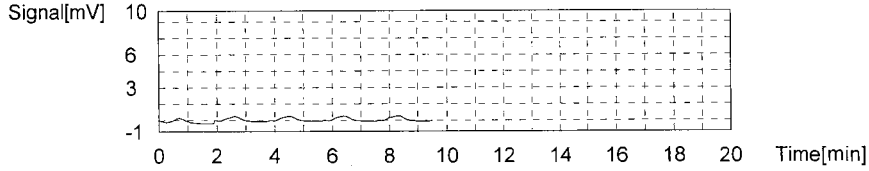
Mean Area 262.1
Mean Conc. 47.90mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 0.8792 | 0.9619mg/L | 50uL | 1 | E | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/11/2018 8:01:42 PM |
| 2 | 1.199 | 1.011mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/11/2018 8:03:47 PM |
| 3 | 1.181 | 1.009mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/11/2018 8:05:52 PM |
| 4 | 1.295 | 1.026mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/11/2018 8:07:57 PM |
| 5 | 1.389 | 1.041mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/11/2018 8:10:03 PM |

Mean Area 1.266
Mean Conc. 1.022mg/L



Sample

| | |
|---|---|
| Sample Name: | LCS/CCV IC |
| Sample ID: | 7230,PLH,TOC5 |
| Origin: | TOC4.met |
| Status | Completed |
| Chk. Result | |

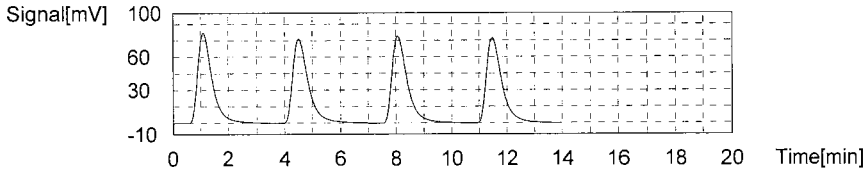
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:3.835mg/L TC:54.76mg/L IC:50.93mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 301.2 | 55.01mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/11/2018 8:17:06 PM |
| 2 | 302.2 | 55.19mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/11/2018 8:20:52 PM |
| 3 | 300.0 | 54.79mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/11/2018 8:24:26 PM |
| 4 | 295.9 | 54.05mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/11/2018 8:28:09 PM |

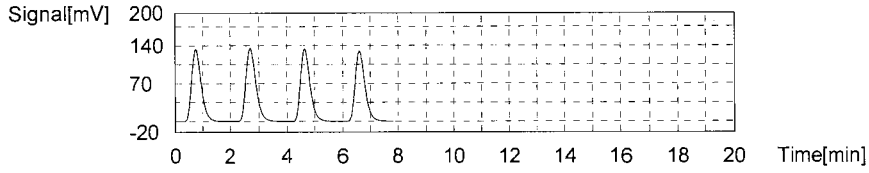
Mean Area 299.8
Mean Conc. 54.76mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 322.6 | 50.81mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/11/2018 8:30:43 PM |
| 2 | 328.9 | 51.78mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/11/2018 8:32:51 PM |
| 3 | 324.8 | 51.15mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/11/2018 8:34:59 PM |
| 4 | 317.2 | 49.97mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/11/2018 8:37:07 PM |

Mean Area 323.4
Mean Conc. 50.93mg/L



Sample

Sample Name: 1795851
Sample ID: 7230,PLH,TOC5
Origin: TOC4.met
Status Completed
Chk. Result

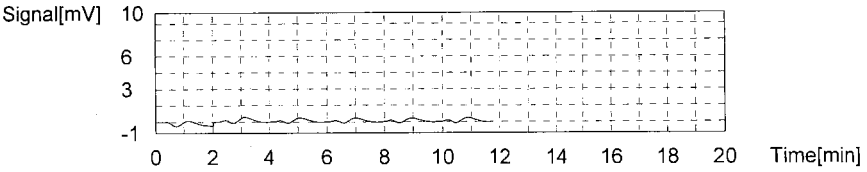
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:-0.5604mg/L TC:0.4729mg/L IC:1.033mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 1.555 | 0.5626mg/L | 50uL | 1 | E | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/11/2018 8:42:50 PM |
| 2 | 1.357 | 0.5266mg/L | 50uL | 1 | E | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/11/2018 8:44:57 PM |
| 3 | 1.108 | 0.4813mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/11/2018 8:47:04 PM |
| 4 | 1.089 | 0.4779mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/11/2018 8:49:10 PM |
| 5 | 0.9849 | 0.4590mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/11/2018 8:51:18 PM |
| 6 | 1.064 | 0.4734mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/11/2018 8:53:24 PM |

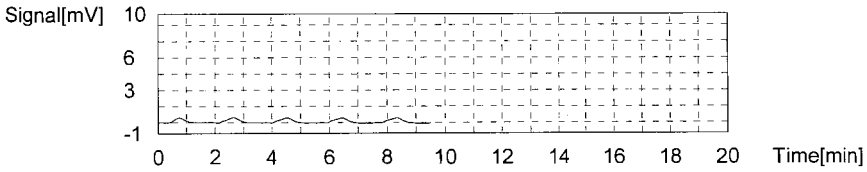
Mean Area 1.061
Mean Conc. 0.4729mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 0.9711 | 0.9761mg/L | 50uL | 1 | E | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/11/2018 8:55:48 PM |
| 2 | 1.347 | 1.034mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/11/2018 8:57:53 PM |
| 3 | 1.291 | 1.026mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/11/2018 8:59:58 PM |
| 4 | 1.339 | 1.033mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/11/2018 9:02:03 PM |
| 5 | 1.384 | 1.040mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/11/2018 9:04:08 PM |

Mean Area 1.340
Mean Conc. 1.033mg/L



Sample

| | |
|---|---|
| Sample Name: | 1800 |
| Sample ID: | 7230,PLH,TOC5 |
| Origin: | TOC4.met |
| Status | Completed |
| Chk. Result | |

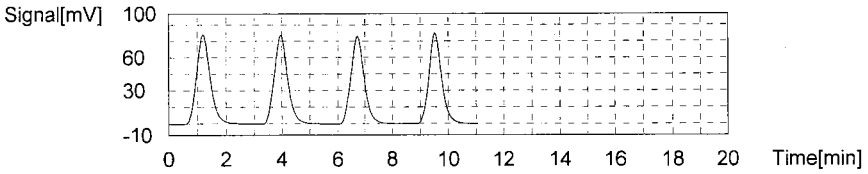
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:47.36mg/L TC:48.65mg/L IC:1.295mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 264.9 | 48.41mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 1:22:29 AM |
| 2 | 270.6 | 49.45mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 1:25:25 AM |
| 3 | 267.6 | 48.90mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 1:28:24 AM |
| 4 | 261.8 | 47.85mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 1:31:20 AM |

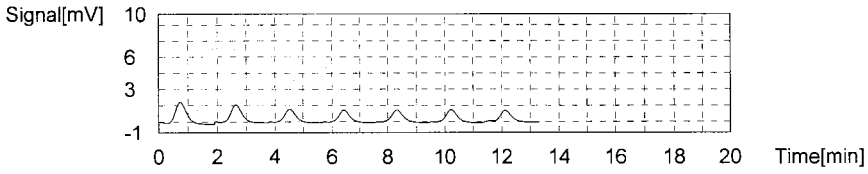
Mean Area 266.2
Mean Conc. 48.65mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 4.965 | 1.595mg/L | 50uL | 1 | E | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/12/2018 1:33:50 AM |
| 2 | 4.179 | 1.473mg/L | 50uL | 1 | E | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/12/2018 1:35:55 AM |
| 3 | 3.213 | 1.323mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/12/2018 1:38:00 AM |
| 4 | 2.929 | 1.279mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/12/2018 1:40:05 AM |
| 5 | 2.964 | 1.285mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/12/2018 1:42:10 AM |
| 6 | 3.023 | 1.294mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/12/2018 1:44:15 AM |
| 7 | 2.408 | 1.199mg/L | 50uL | 1 | E | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/12/2018 1:46:32 AM |

Mean Area 3.032
Mean Conc. 1.295mg/L



Sample

Sample Name: LCS/CCV IC
Sample ID: 7230,PLH,TOC5
Origin: TOC4.met
Status Completed
Chk. Result

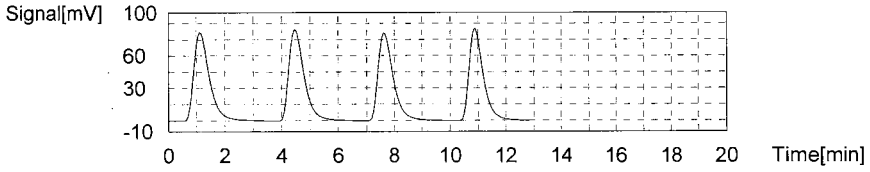
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:5.197mg/L TC:56.25mg/L IC:51.05mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 308.4 | 56.32mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 1:53:28 AM |
| 2 | 314.5 | 57.43mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 1:56:48 AM |
| 3 | 308.9 | 56.41mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 2:00:16 AM |
| 4 | 300.3 | 54.85mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 2:03:29 AM |

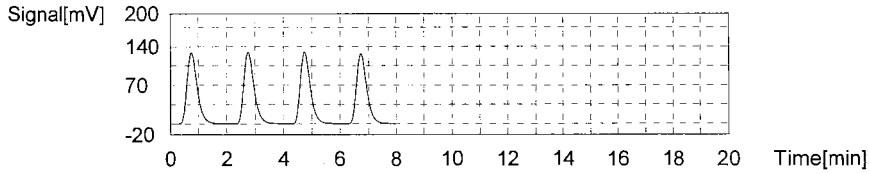
Mean Area 308.0
Mean Conc. 56.25mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 323.4 | 50.93mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/12/2018 2:06:05 AM |
| 2 | 328.7 | 51.75mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/12/2018 2:08:15 AM |
| 3 | 326.0 | 51.33mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/12/2018 2:10:25 AM |
| 4 | 318.7 | 50.20mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/12/2018 2:12:36 AM |

Mean Area 324.2
Mean Conc. 51.05mg/L



Sample

Sample Name: 1900
Sample ID: 7230,PLH,TOC5
Origin: TOC4.met
Status Completed
Chk. Result

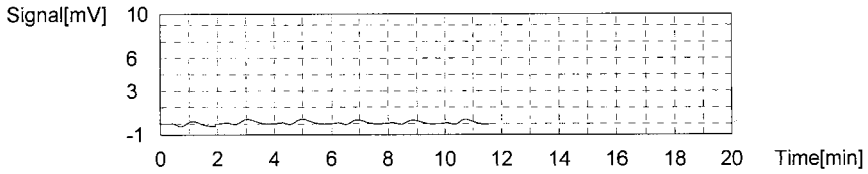
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:-0.4690mg/L TC:0.5187mg/L IC:0.9877mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 1.393 | 0.5331mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/12/2018 2:18:13 AM |
| 2 | 1.369 | 0.5288mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/12/2018 2:20:20 AM |
| 3 | 1.268 | 0.5104mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/12/2018 2:22:28 AM |
| 4 | 1.165 | 0.4917mg/L | 50uL | 1 | E | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/12/2018 2:24:34 AM |
| 5 | 1.016 | 0.4646mg/L | 50uL | 1 | E | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/12/2018 2:26:41 AM |
| 6 | 1.225 | 0.5026mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_( | 4/12/2018 2:28:46 AM |

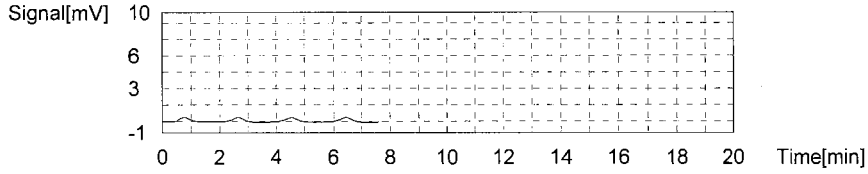
Mean Area 1.314
Mean Conc. 0.5187mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 0.9052 | 0.9659mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/12/2018 2:31:10 AM |
| 2 | 1.076 | 0.9924mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/12/2018 2:33:15 AM |
| 3 | 1.075 | 0.9922mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/12/2018 2:35:20 AM |
| 4 | 1.128 | 1.000mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/12/2018 2:37:25 AM |

Mean Area 1.046
Mean Conc. 0.9877mg/L



Sample

Sample Name: 21804062010
Sample ID: 7230,PLH,TOC5
Origin: TOC4.met
Status Completed
Chk. Result

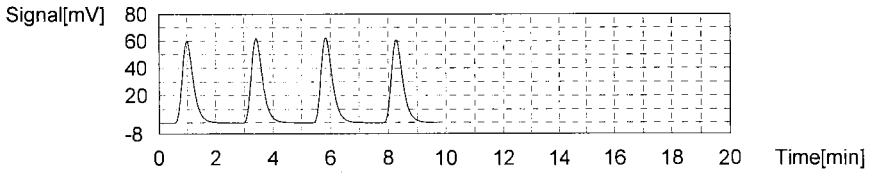
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:5.606mg/L TC:31.22mg/L IC:25.61mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 167.2 | 30.66mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 2:43:42 AM |
| 2 | 172.2 | 31.57mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 2:46:19 AM |
| 3 | 173.1 | 31.73mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 2:48:56 AM |
| 4 | 168.6 | 30.92mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 2:51:32 AM |

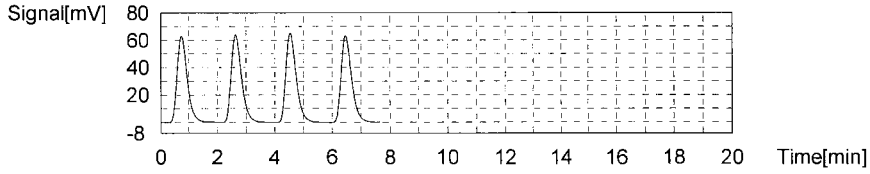
Mean Area 170.3
Mean Conc. 31.22mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 157.0 | 25.15mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/12/2018 2:54:03 AM |
| 2 | 161.0 | 25.77mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/12/2018 2:56:09 AM |
| 3 | 162.9 | 26.06mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/12/2018 2:58:15 AM |
| 4 | 159.1 | 25.47mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/12/2018 3:00:20 AM |

Mean Area 160.0
Mean Conc. 25.61mg/L



Sample

| | |
|---|---|
| Sample Name: | 1800 |
| Sample ID: | 7230,PLH,TOC5 |
| Origin: | TOC4.met |
| Status | Completed |
| Chk. Result | |

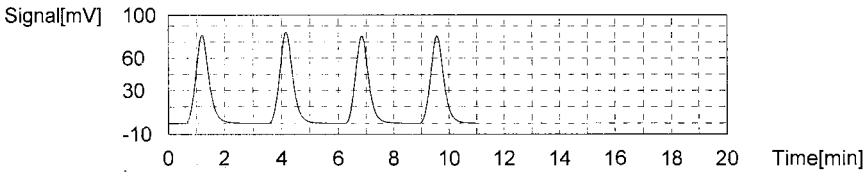
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:47.61mg/L TC:48.70mg/L IC:1.092mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 264.2 | 48.29mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 6:41:37 AM |
| 2 | 270.8 | 49.49mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 6:44:29 AM |
| 3 | 268.3 | 49.03mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 6:47:22 AM |
| 4 | 262.7 | 48.01mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 6:50:16 AM |

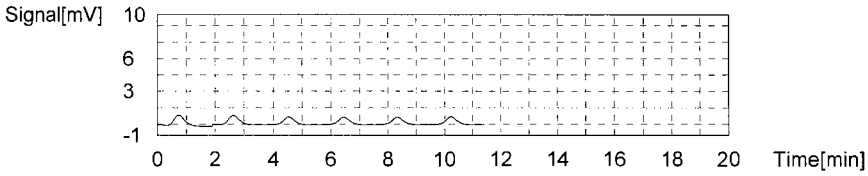
Mean Area 266.5
Mean Conc. 48.70mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 2.275 | 1.178mg/L | 50uL | 1 | E | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/12/2018 6:52:46 AM |
| 2 | 2.023 | 1.139mg/L | 50uL | 1 | E | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/12/2018 6:54:51 AM |
| 3 | 1.693 | 1.088mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/12/2018 6:56:56 AM |
| 4 | 1.701 | 1.089mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/12/2018 6:59:01 AM |
| 5 | 1.672 | 1.085mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/12/2018 7:01:06 AM |
| 6 | 1.803 | 1.105mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/12/2018 7:03:11 AM |

Mean Area 1.717
Mean Conc. 1.092mg/L



Sample

| | |
|---|---|
| Sample Name: | LCS/CCV IC |
| Sample ID: | 7230,PLH,TOC5 |
| Origin: | TOC4.met |
| Status | Completed |
| Chk. Result | |

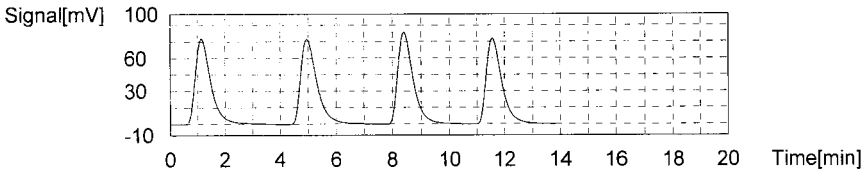
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:5.140mg/L TC:56.20mg/L IC:51.06mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 306.7 | 56.01mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 7:10:35 AM |
| 2 | 311.2 | 56.83mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 7:14:13 AM |
| 3 | 309.8 | 56.57mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 7:17:33 AM |
| 4 | 303.4 | 55.41mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 7:21:06 AM |

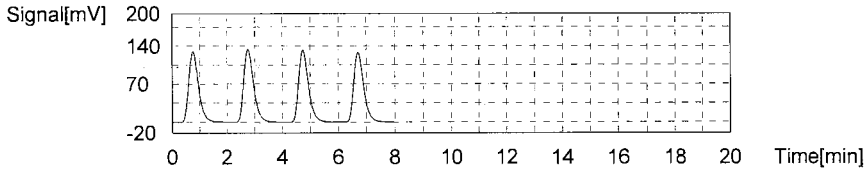
Mean Area 307.8
Mean Conc. 56.20mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 323.4 | 50.93mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/12/2018 7:23:42 AM |
| 2 | 330.1 | 51.97mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/12/2018 7:25:52 AM |
| 3 | 325.6 | 51.27mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/12/2018 7:28:01 AM |
| 4 | 318.0 | 50.09mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_1 | 4/12/2018 7:30:11 AM |

Mean Area 324.3
Mean Conc. 51.06mg/L



Sample

Sample Name: 1900
Sample ID: 7230,PLH,TOC5
Origin: TOC4.met
Status Completed
Chk. Result

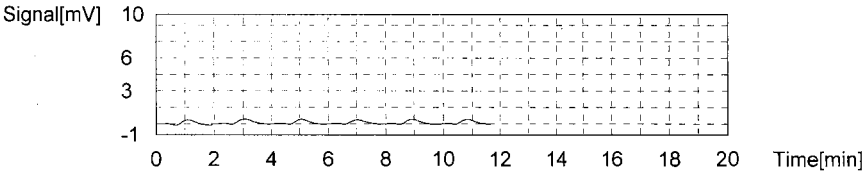
| Type | Anal. | Manual Dilution | Result |
|---|---|---|---|
| Unknown | TOC | 1.000 | TOC:-0.4362mg/L TC:0.5422mg/L IC:0.9784mg/L |

1. Det

Anal.: TC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 1.538 | 0.5595mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 7:35:48 AM |
| 2 | 1.616 | 0.5737mg/L | 50uL | 1 | E | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 7:38:02 AM |
| 3 | 1.392 | 0.5330mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 7:40:08 AM |
| 4 | 1.257 | 0.5084mg/L | 50uL | 1 | E | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 7:42:16 AM |
| 5 | 1.441 | 0.5419mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 7:44:21 AM |
| 6 | 1.400 | 0.5344mg/L | 50uL | 1 | | TC_0-1-15-30-60-100-2.2017_12_10_09_36_0 | 4/12/2018 7:46:26 AM |

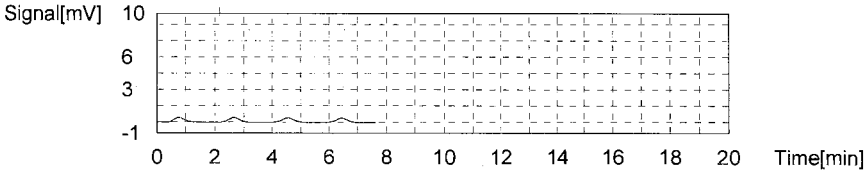
Mean Area 1.443
Mean Conc. 0.5422mg/L




Anal.: IC

| No. | Area | Conc. | Inj. Vol. | Aut. Dil. | Ex. | Cal. Curve | Date / Time |
|---|---|---|---|---|---|---|---|
| 1 | 0.9422 | 0.9717mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/12/2018 7:48:50 AM |
| 2 | 1.031 | 0.9854mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/12/2018 7:50:55 AM |
| 3 | 0.9659 | 0.9753mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/12/2018 7:53:00 AM |
| 4 | 1.003 | 0.9811mg/L | 50uL | 1 | | IC_0-1-15-30-60-100-1.2018_01_30_11_48_14 | 4/12/2018 7:55:05 AM |

Mean Area 0.9855
Mean Conc. 0.9784mg/L



# Appendix E

# Well Concentration and Trend Charts for COCs

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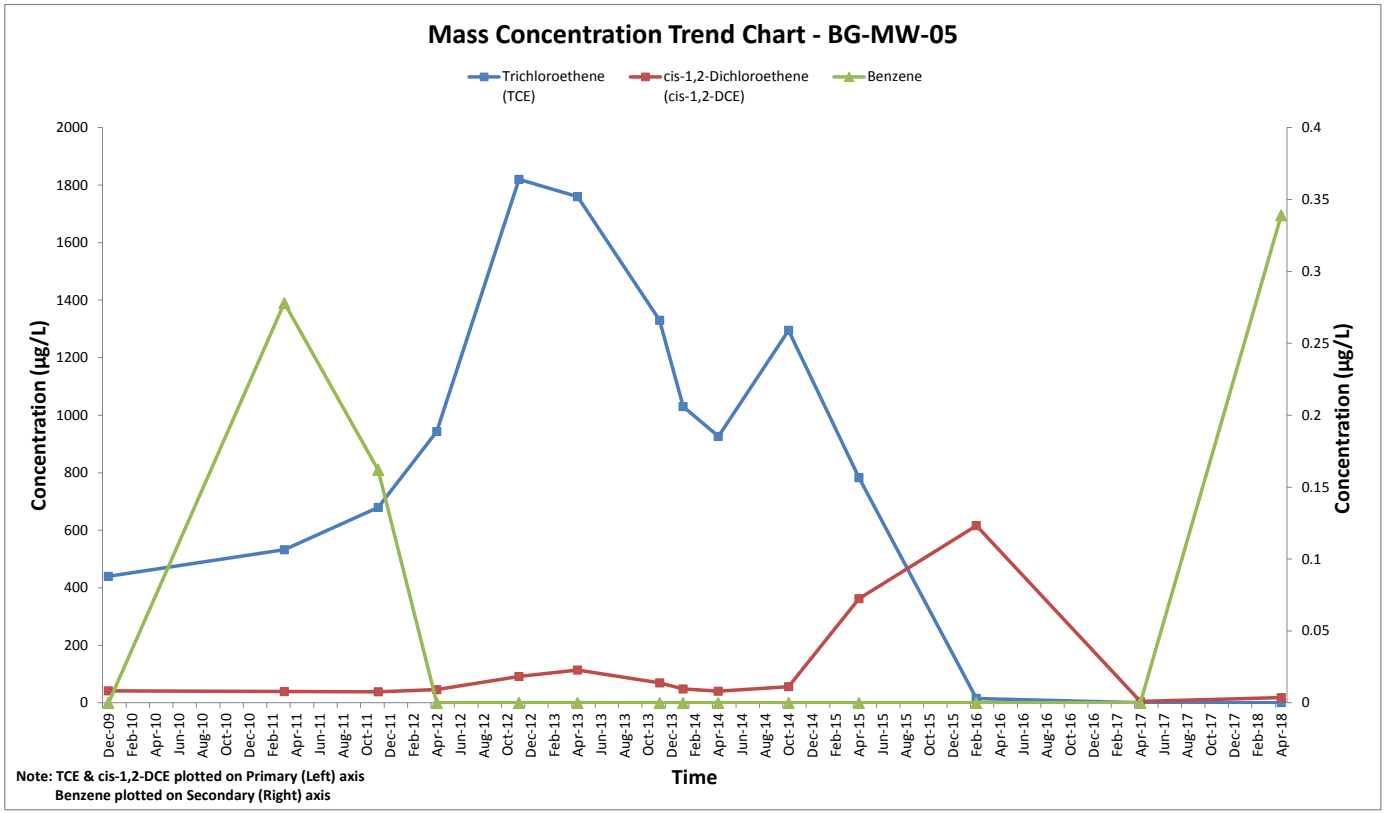
| Well Id | Portion of Aquifer | Portion of Plume |
|---|---|---|
| BG-MW-05 | Upper | Downgradient IRGs Plume |
| BG-MW-06 | Upper | Downgradient IRGs Plume |
| BG-MW-07 | Lower | Downgradient IRGs Plume |
| EW-1 | Upper | Source Area |
| EW-3 | Upper | Source Area |
| MW-01-04 | Lower | MCL Plume |
| MW-01-05 | Upper | MCL Plume |
| MW-01-07 | Upper | MCL Plume |
| MW-01-09 | Upper | Downgradient IRGs Plume |
| MW-01-10 | Upper | MCL Plume |
| MW-01-12 | Upper | MCL Plume |
| MW-01-13 | Lower | MCL Plume |
| MW-01-23 | Upper | MCL Plume |
| MW-01-24 | Lower | MCL Plume |
| MW-01-27 | Upper | MCL Plume |
| MW-01-29 | Upper | MCL Plume |
| MW-01-30 | Lower | MCL Plume |
| MW-03-01 | Upper | MCL Plume |
| MW-11-01 | Lower | Downgradient IRGs Plume |
| MW-11-02 | Upper | Downgradient IRGs Plume |
| MW-11-03 | Upper | Downgradient IRGs Plume |
| MW-11-04R | Upper | Source Area |
| MW-11-05 | Upper | Source Area |
| MW-11-06 | Upper | Downgradient IRGs Plume |
| MW-11-07 | Upper | Downgradient IRGs Plume |
| MW-11-08 | Lower | Downgradient IRGs Plume |
| MW-11-09 | Upper | Downgradient IRGs Plume |
| MW-11-10 | Lower | Downgradient IRGs Plume |
| MW-13-02 | Upper | Source Area |
| MW-13-05 | Upper | Source Area |
| MW-13-07 | Upper | Source Area |
| MW-13-08 | Upper | Source Area |
| MW-13-10 | Upper | Source Area |
| MW-13-11 | Upper | Downgradient IRGs Plume |
| MW-13-14 | Upper | Source Area |
| MW-13-17 | Upper | Source Area |
| MW-13-18 | Upper | Source Area |
| MW-13-19 | Upper | Source Area |
| MW-13-20 | Lower | Downgradient IRGs Plume |
| RD5-MW01 | Upper | MCL Plume |
| S4-MW16 | Lower | MCL Plume |
| S4-MW24 | Upper | MCL Plume |
| S4-MW27 | Upper | MCL Plume |
| S4-MW38 | Lower | MCL Plume |
| S4-MW41 | Upper | MCL Plume |
| S4-MW42 | Lower | MCL Plume |
| S4-MW46 | Upper | MCL Plume |
| S4-MW47 | Lower | MCL Plume |
| S4-MW48 | Upper | MCL Plume |
| S4-MW49 | Lower | MCL Plume |
| S4-MW51 | Lower | MCL Plume |
| S4-MW52 | Upper | MCL Plume |
| S4-MW53 | Lower | MCL Plume |
| S4-MW54 | Lower | MCL Plume |
| S4-MW56 | Upper | MCL Plume |
| S4-MW59 | Upper | MCL Plume |
| S4-MW60 | Lower | MCL Plume |
| S4-MW63 | Lower | MCL Plume |
| S4-MW64 | Lower | MCL Plume |

**Note:**

1. Only wells with more than 1 time points have concentration trend graphs
2. Wells with consistently no detects of COCs haven't been shown (MW-01-15, MW-01-21, MW-01-32, S4-MW44, S4-MW45, S4-MW50 and S4-MW55)

BACK

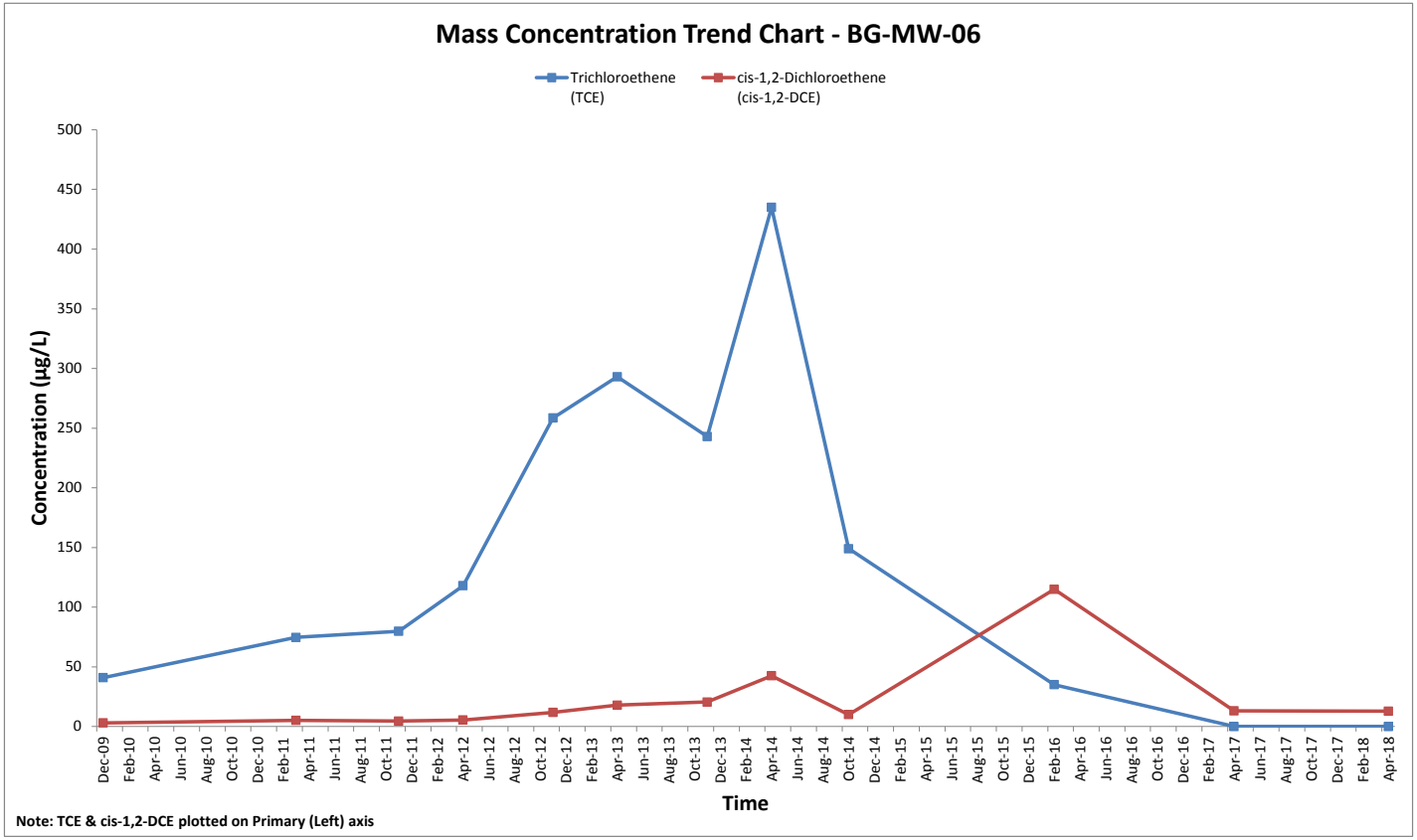



Mass Concentration (µg/L) of COCs for BG-MW-05

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Dec-09 | 1 U | 1 U | 42 | 1 U | 440 | 2 U |
| Mar-11 | 0 U | 0.278 | 38.95 | 0 U | 532.5 | 0 U |
| Nov-11 | 1 U | 0.162 | 38.7 | 1 U | 679 | 1 U |
| Apr-12 | 5 U | 2 U | 45.65 | 5 U | 943.5 | 5 U |
| Nov-12 | 5 U | 2 U | 92 | 5 U | 1820 | 5 U |
| Apr-13 | 10 U | 10 U | 114 | 10 U | 1760 | 10 U |
| Nov-13 | 2.5 U | 2.5 U | 69.6 | 2.5 U | 1330 | 2.5 U |
| Jan-14 | 2.5 U | 2.5 U | 48.65 | 2.5 U | 1030 | 2.5 U |
| Apr-14 | 2.5 U | 2.5 U | 40.7 | 2.5 U | 926 | 2.5 U |
| Oct-14 | 2.5 U | 2.5 U | 56.15 | 2.5 U | 1295 | 2.5 U |
| Apr-15 | 2.5 U | 2.5 U | 362 | 1.57 | 783 | 2.5 U |
| Feb-16 | 3.21 | 1.25 U | 616 | 1.25 U | 15.3 | 16.35 |
| Apr-17 | 2.5 U | 1.25 U | 5.015 | 1.25 U | 0.5 U | 1.625 |
| Apr-18 | 0.5 U | 0.339 | 18 | 1.02 | 1.08 | 3.77 |

* yellow highlight indicates J-flagged value

BACK

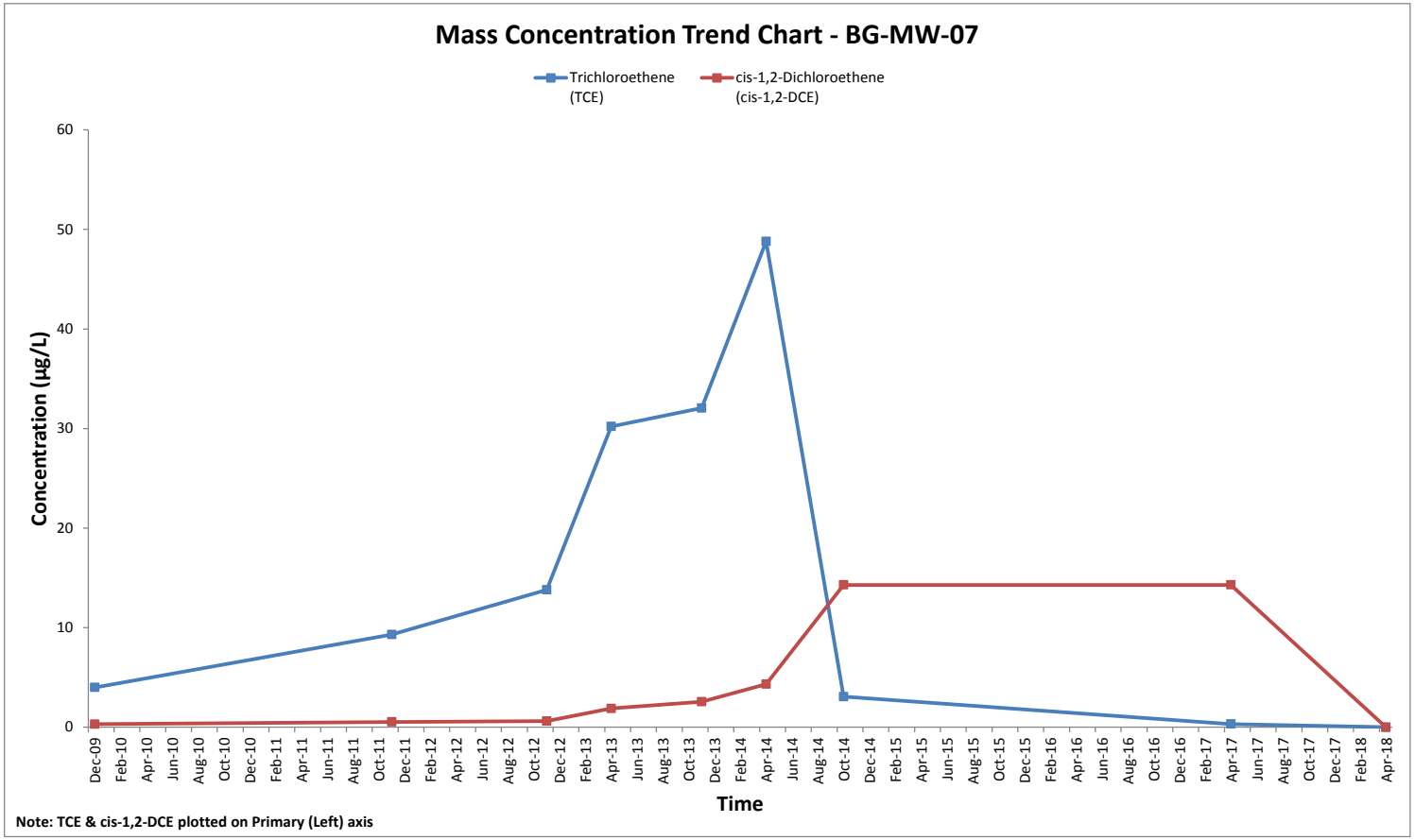



Mass Concentration (µg/L) of COCs for BG-MW-06

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Dec-09 | 1 U | 1 U | 3 | 1 U | 41 | 2 U |
| Mar-11 | 1 U | 0.4 U | 5.16 | 1 U | 74.6 | 1 U |
| Nov-11 | 1 U | 0.4 U | 4.51 | 1 U | 79.8 | 1 U |
| Apr-12 | 1 U | 0.4 U | 5.51 | 1 U | 118 | 1 U |
| Nov-12 | 1 U | 0.4 U | 11.85 | 1 U | 258.5 | 1 U |
| Apr-13 | 2 U | 2 U | 17.9 | 2 U | 293 | 2 U |
| Nov-13 | 0.625 U | 0.625 U | 20.5 | 0.625 U | 243 | 0.625 U |
| Apr-14 | 0.5 U | 0.5 U | 42.6 | 0.5 U | 435 | 0.524 J |
| Oct-14 | 0.25 U | 0.25 U | 10 | 0.25 U | 149 | 0.25 U |
| Feb-16 | 0.616 | 0.5 U | 115 | 0.5 U | 35.1 | 1.32 |
| Apr-17 | 0.5 U | 0.5 U | 13.1 | 0.5 U | 0.5 U | 4.21 |
| Apr-18 | 0.5 U | 0.5 U | 12.9 | 0.5 U | 0.5 U | 2.64 |

* yellow highlight indicates J-flagged value

BACK




Mass Concentration (µg/L) of COCs for BG-MW-07

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Dec-09 | 1 U | 1 U | 0.3 | 1 U | 4 | 2 U |
| Nov-11 | 1 U | 0.4 U | 0.536 | 1 U | 9.3 | 1 U |
| Nov-12 | 1 U | 0.4 U | 0.609 | 1 U | 13.8 | 1 U |
| Apr-13 | 1 U | 1 U | 1.88 | 1 U | 30.2 | 1 U |
| Nov-13 | 0.25 U | 0.25 U | 2.555 | 0.25 U | 32.05 | 0.25 U |
| Apr-14 | 0.25 U | 0.25 U | 4.33 | 0.25 U | 48.8 | 0.25 U |
| Oct-14 | 0.25 U | 0.25 U | 14.3 | 0.25 U | 3.07 | 0.25 U |
| Apr-17 | 0.25 U | 0.25 U | 14.3 | 0.25 U | 0.32 | 0.25 U |
| Apr-18 | 0.5 U | 0.5 U | 0.416 J | 0.5 U | 0.5 U | 0.739 |

* yellow highlight indicates J-flagged value

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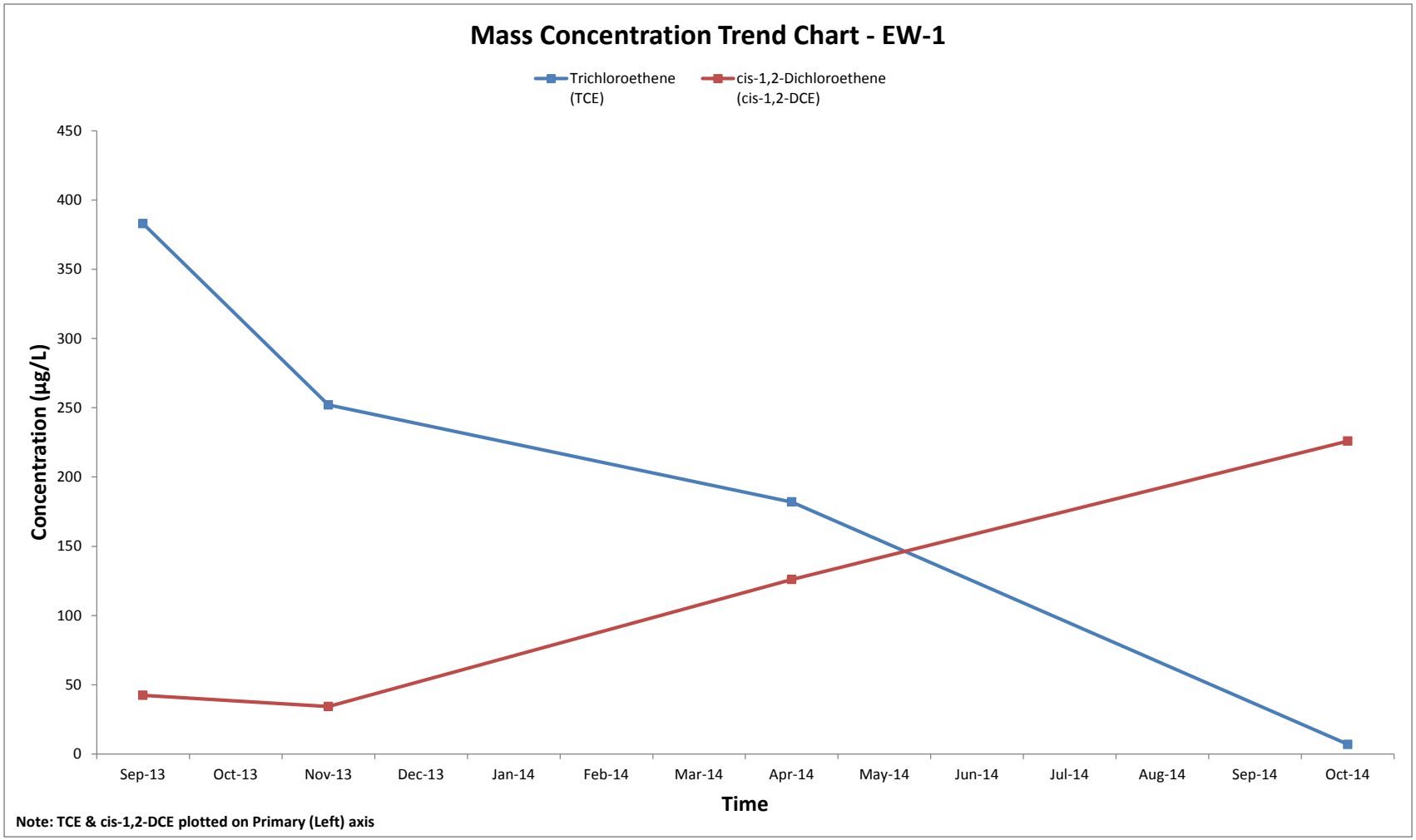
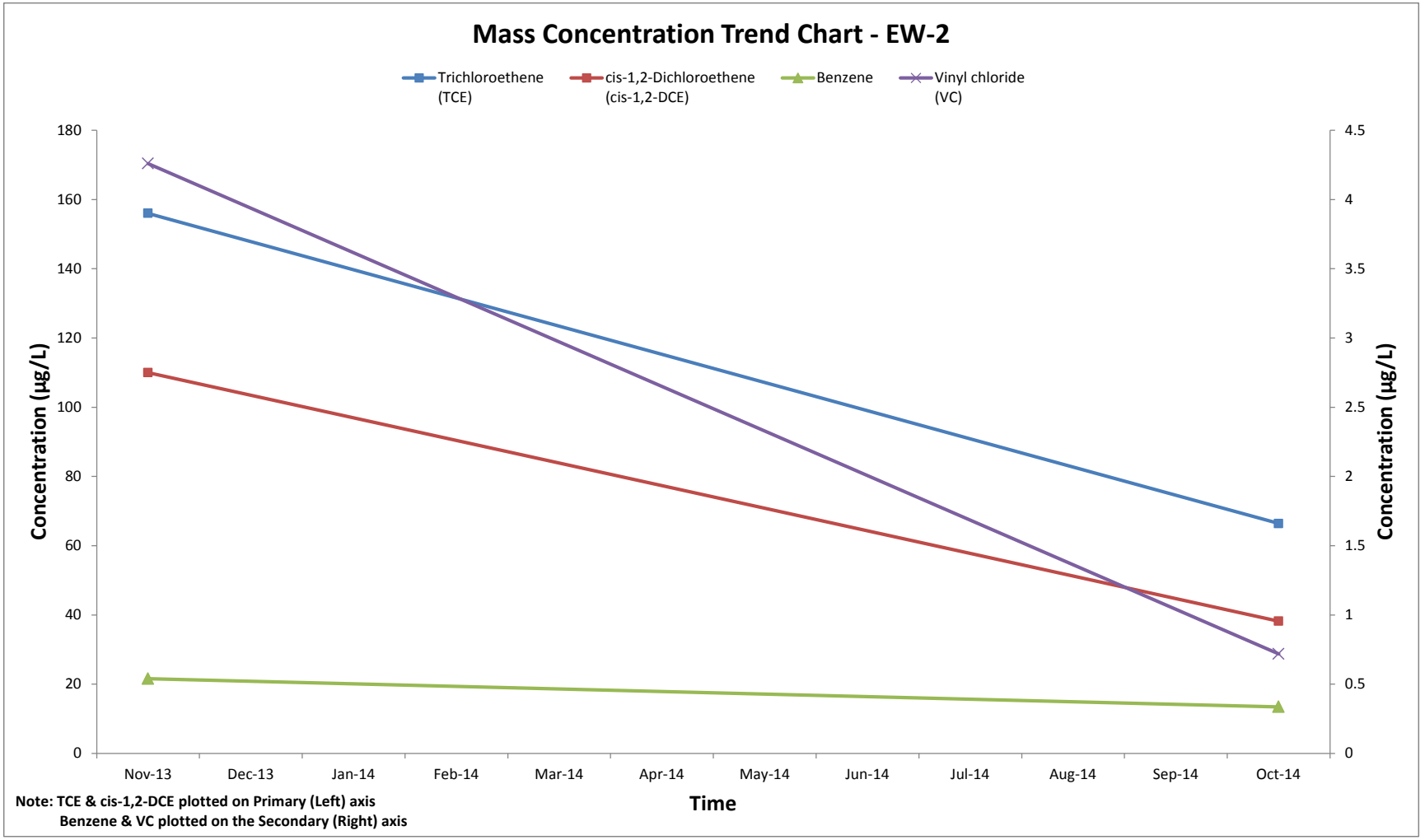



Mass Concentration (µg/L) of COCs for EW-01

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Sep-13 | 0.625 U | 0.625 U | 42.4 | 0.625 U | 383 | 0.625 U |
| Nov-13 | 0.5 U | 0.5 U | 34.3 | 0.5 U | 252 | 0.5 U |
| Apr-14 | 1.19 J | 0.5 U | 126 | 0.5 U | 182 | 1.99 J |
| Oct-14 | 0.828 J | 0.5 U | 226 | 0.552 J | 6.94 | 66.3 |

BACK




Mass Concentration (µg/L) of COCs for EW-02

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Nov-13 | 0.5 U | 0.54 | 110 | 0.5 U | 156 | 4.26 |
| Oct-14 | 0.25 U | 0.336 | 38.2 | 0.25 U | 66.4 | 0.718 |

* yellow highlight indicates J-flagged value

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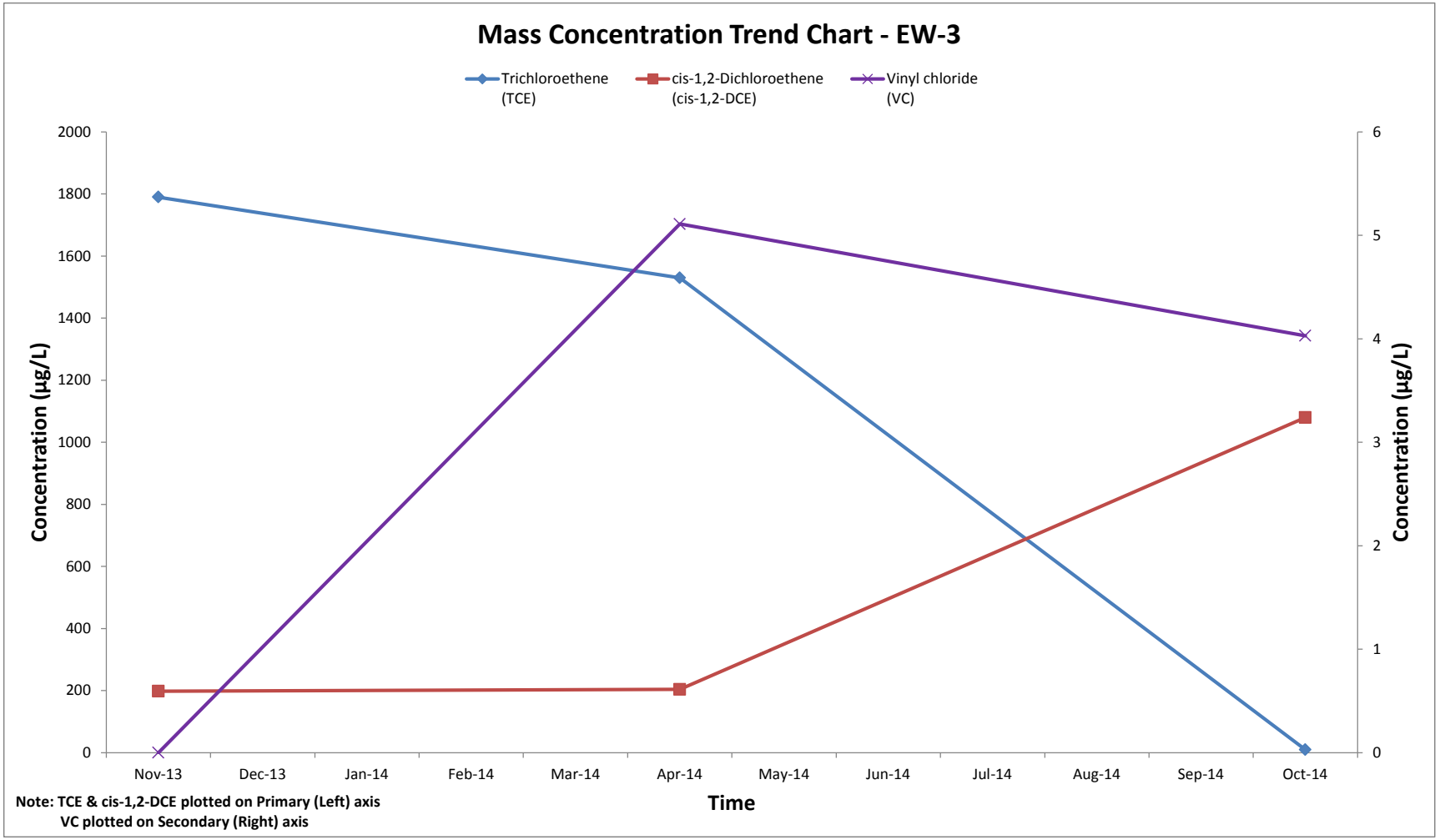


Mass Concentration (µg/L) of COCs for EW-03

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Nov-13 | 5 U | 5U | 198 | 5 U | 1790 | 5 UJ |
| Apr-14 | 5 U | 5 U | 204 | 5 U | 1530 | 5.11 |
| Oct-14 | 3 J | 2.5 U | 1080 | 2.5 U | 9.46 | 4.03 |

* yellow highlight indicates J-flagged value

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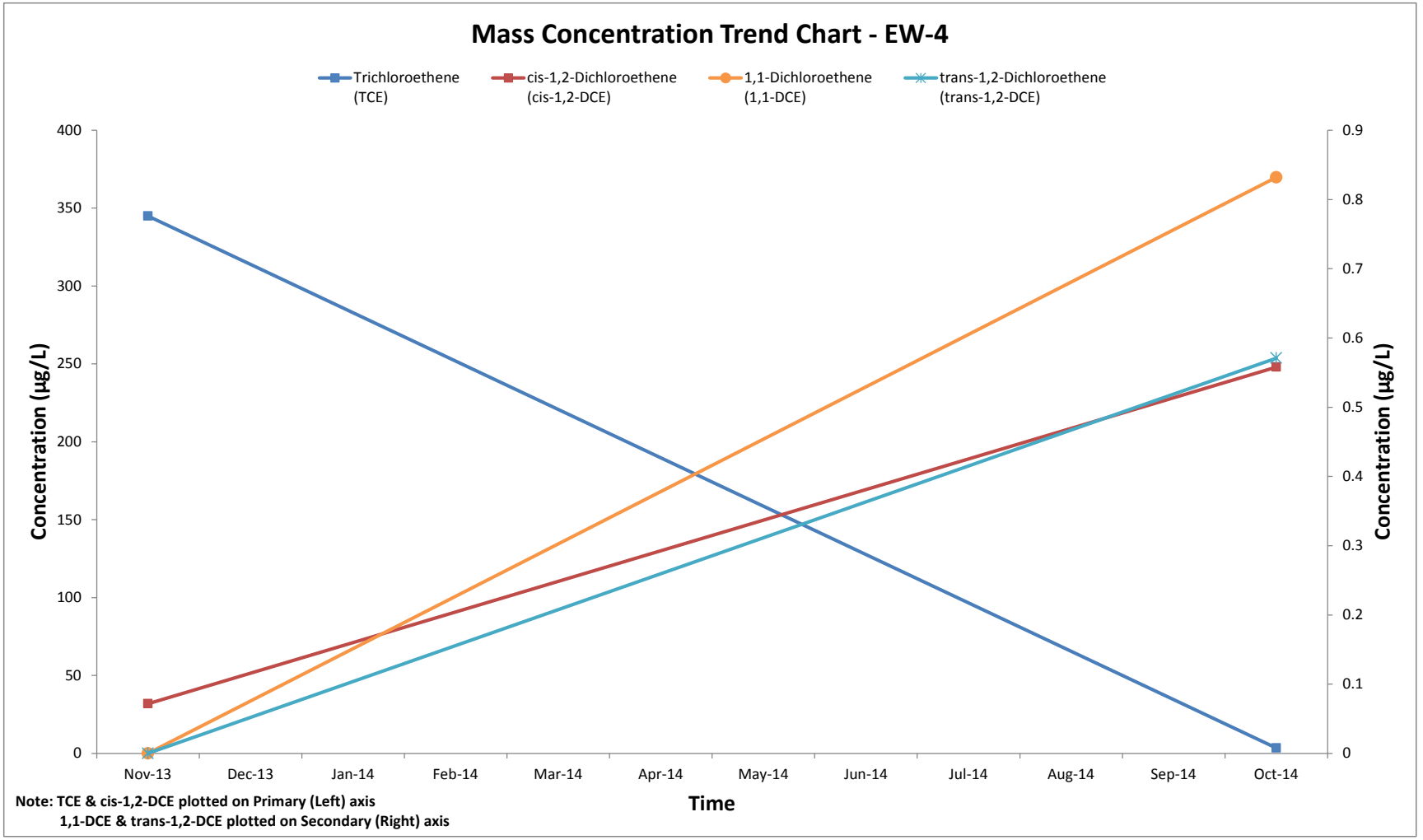


Mass Concentration (µg/L) of COCs for EW-04

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Nov-13 | 0.5 U | 0.5 U | 31.9 | 0.5 U | 345 | 0.5 U |
| Oct-14 | 0.832 | 0.5 U | 248 | 0.571 | 3.45 | 0.5 U |

* yellow highlight indicates J-flagged value

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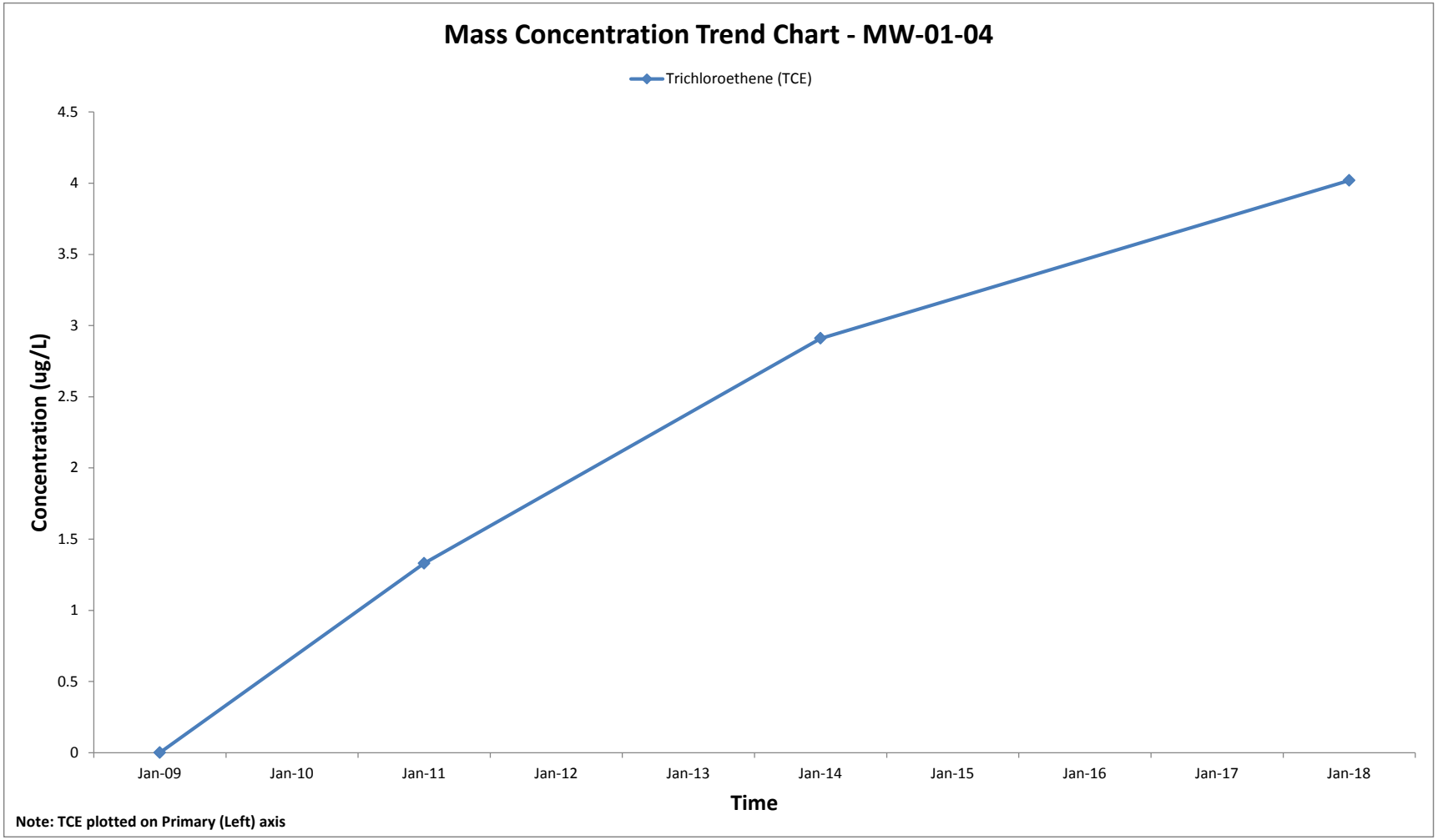


Mass Concentration (µg/L) of COCs for MW-01-04

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Dec-09 | 1 U | 1 U | 1 U | 0.4 J | 2 U | 1 U |
| Nov-11 | 1 U | 0.4 U | 1 U | 1 U | 1.33 | 1 U |
| Apr-14 | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 2.91 | 0.25 U |
| Apr-18 | 0.5 U | 0.5 U | 3.19 | 0.5 U | 4.02 | 0.5 U |

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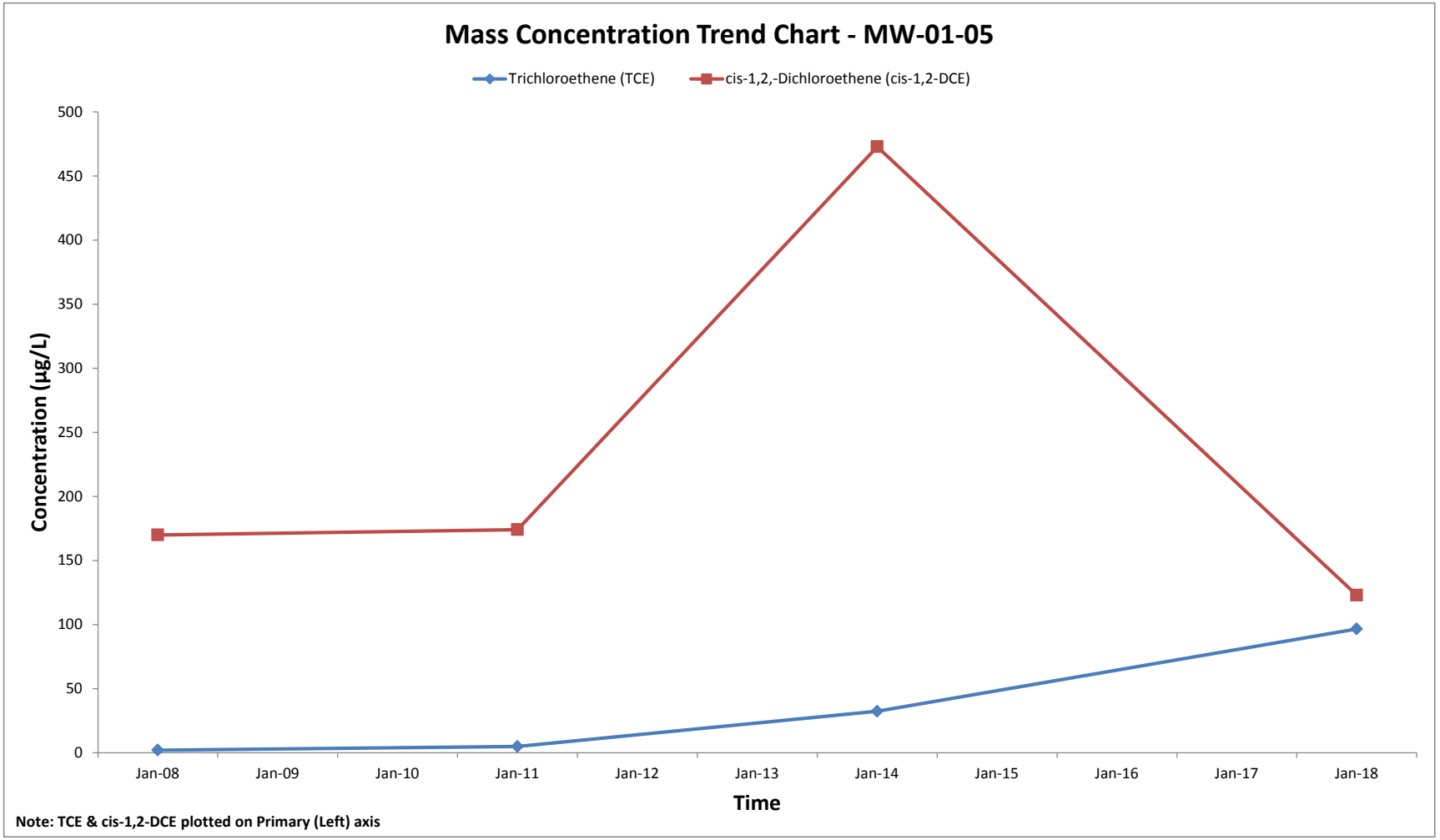
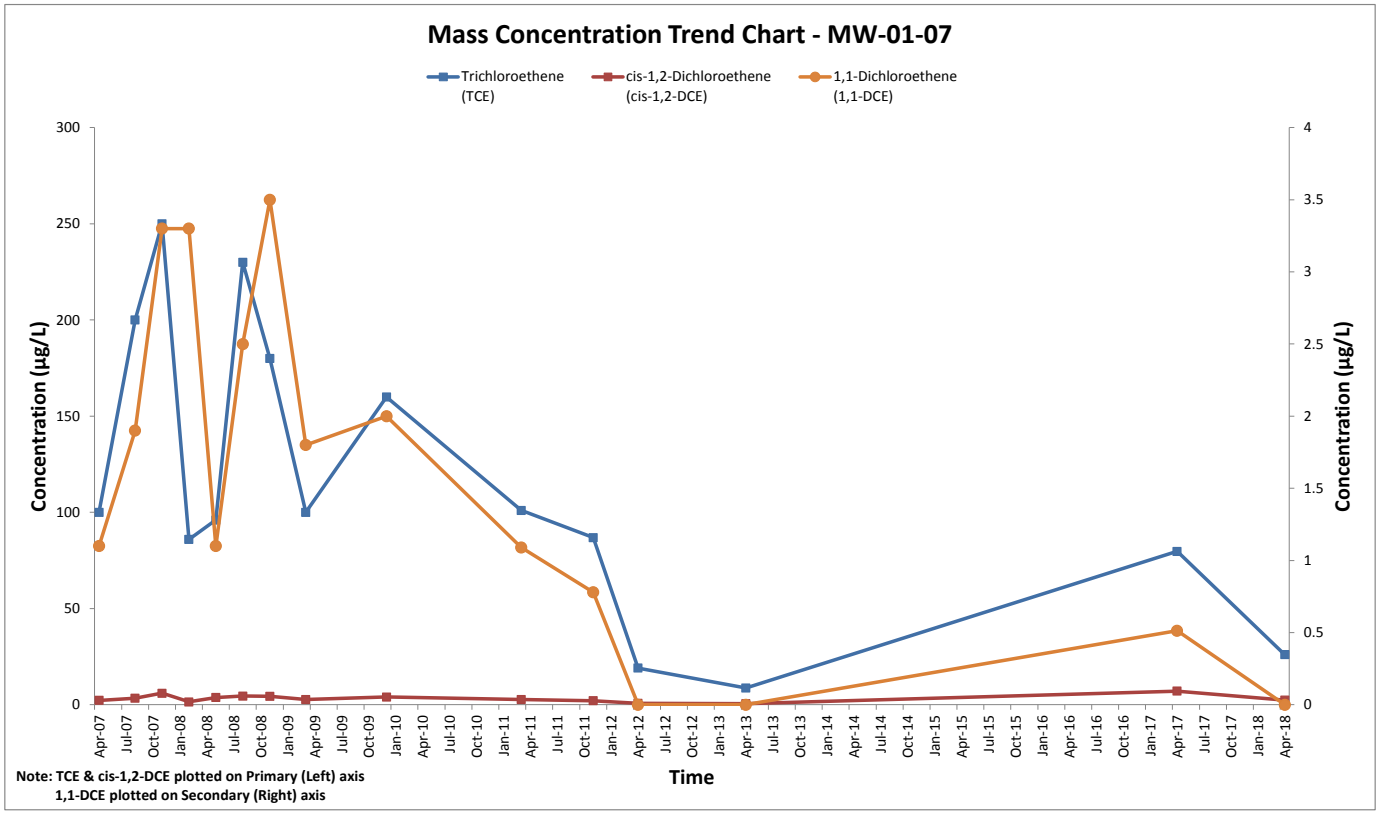



Mass Concentration (µg/L) of COCs for MW-01-05

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Nov-08 | 1 U | 1 U | 170 | 1.6 | 2 | 1 U |
| Nov-11 | 0.552 J | 0.15 J | 174.1 | 1.1 | 4.88 | 1 U |
| Apr-14 | 5.3 J | 2.5 U | 473 | 2.5 U | 32.3 | 4.65 J |
| Apr-18 | 0.549 J | 0.5 U | 123 | 0.786 J | 96.6 | 0.313 J |

BACK




Mass Concentration (µg/L) of COCs for MW-01-07

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Apr-07 | 1.1 | 1 U | 2.3 | 1 U | 100 | 1 U |
| Aug-07 | 1.9 | 1 U | 3.4 | 1 U | 200 | 1 U |
| Nov-07 | 3.3 | 1 U | 6 | 1 U | 250 | 1 U |
| Feb-08 | 3.3 | 1 U | 1.5 | 1 U | 86 | 1 U |
| May-08 | 1.1 | 1 U | 3.8 | 1 U | 96 | 1 U |
| Aug-08 | 2.5 | 1 U | 4.5 | 1 U | 230 | 1 U |
| Nov-08 | 3.5 | 1 U | 4.4 | 1 U | 180 | 1 U |
| Mar-09 | 1.8 | 1 U | 2.7 | 1 U | 100 | 1 U |
| Dec-09 | 2 | 1 U | 4 | 1 U | 160 | 2 U |
| Mar-11 | 1.09 | 0.4 U | 2.77 | 1 U | 101 | 1 U |
| Nov-11 | 0.78 | 0.4 U | 2.1 | 1 U | 86.9 | 1 U |
| Apr-12 | 1 U | 0.4 U | 0.75 | 1 U | 19.1 | 1 U |
| Apr-13 | 1 U | 1 U | 0.58 | 1 U | 8.74 | 1 U |
| Apr-17 | 0.513 | 1 U | 7.13 | 1 U | 79.7 | 1 U |
| Apr-18 | 0.5 U | 0.5 U | 2.43 | 0.5 U | 26.1 | 0.5 U |

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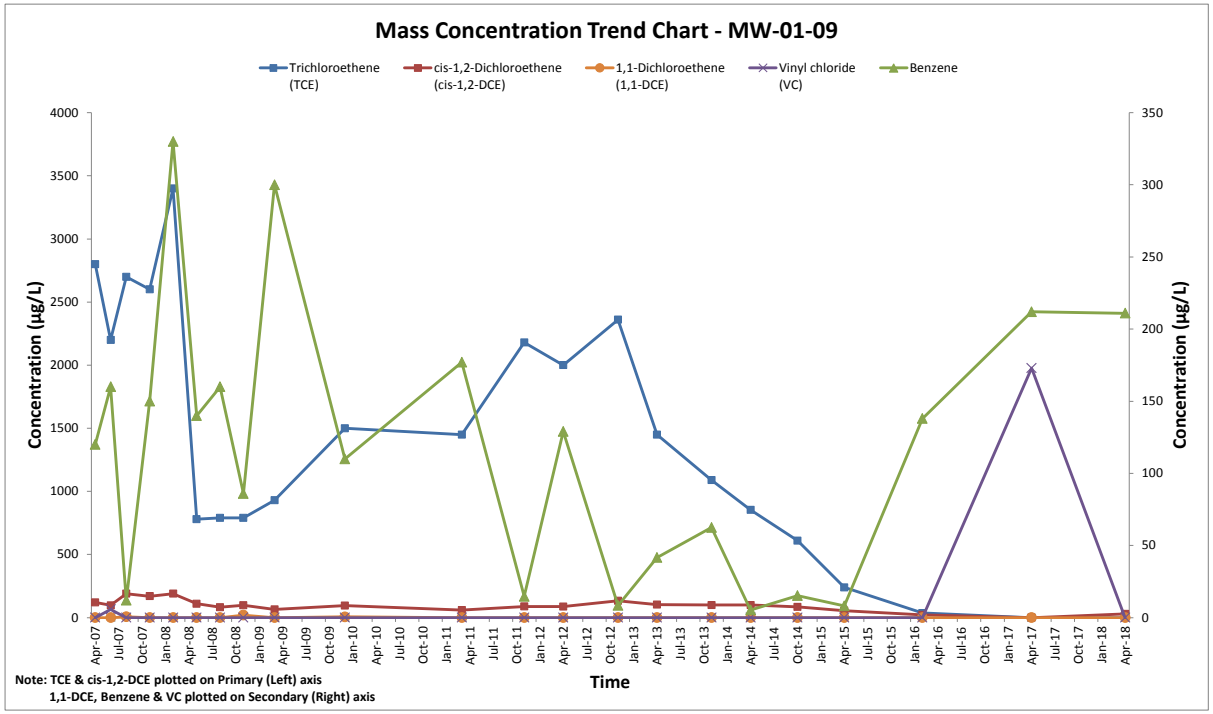


Mass Concentration (µg/L) of COCs for MW-01-09

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Apr-07 | 1 U | 120 | 120 | 0.63 | 2800 | 1 U |
| Jun-07 | 1 U | 160 | 97 | 1 U | 2200 | 5.8 |
| Aug-07 | 0.62 | 12 | 190 | 1.5 | 2700 | 1 U |
| Nov-07 | 1 U | 150 | 170 | 0.44 | 2600 | 1 U |
| Feb-08 | 1 U | 330 | 190 | 1.3 | 3400 | 1 U |
| May-08 | 1 U | 140 | 110 | 0.87 | 780 | 1 U |
| Aug-08 | 1 U | 160 | 82 | 10 U | 790 | 1 U |
| Nov-08 | 1.8 | 86 | 98 | 1.7 | 790 | 4 U |
| Mar-09 | 1 U | 300 | 65 | 1 U | 930 | 1 U |
| Dec-09 | 0.5 | 110 | 95 | 2 | 1500 | 2 U |
| Mar-11 | 1 U | 177 | 60.2 | 0.835 | 1450 | 1 U |
| Nov-11 | 1 U | 14.7 | 88.3 | 1.21 | 2180 | 1 U |
| Apr-12 | 20 U | 129 | 86.9 | 20 U | 2000 | 20 U |
| Nov-12 | 10 U | 8.46 | 133 | 10 U | 2360 | 10 U |
| Apr-13 | 10 U | 41.7 | 103 | 10 U | 1450 | 10 U |
| Nov-13 | 2.5 U | 62.5 | 99.8 | 2.5 U | 1090 | 2.5 U |
| Apr-14 | 2.5 U | 5.36 | 99.4 | 2.5 U | 853 | 2.5 U |
| Oct-14 | 2.5 U | 15.3 | 84.9 | 2.5 U | 610 | 2.5 U |
| Apr-15 | 2.5 U | 8.08 | 55.5 | 2.5 U | 239 | 2.5 U |
| Feb-16 | 6.25 U | 138 | 21 | 6.25 U | 36.4 | 6.25 U |
| Apr-17 | 6.25 U | 212 | 50 U | 6.25 U | 50 U | 173 |
| Apr-18 | 12.5 U | 211 | 29.8 | 12.5 U | 12.5 U | 12.5 U |

* yellow highlight indicates J-flagged value

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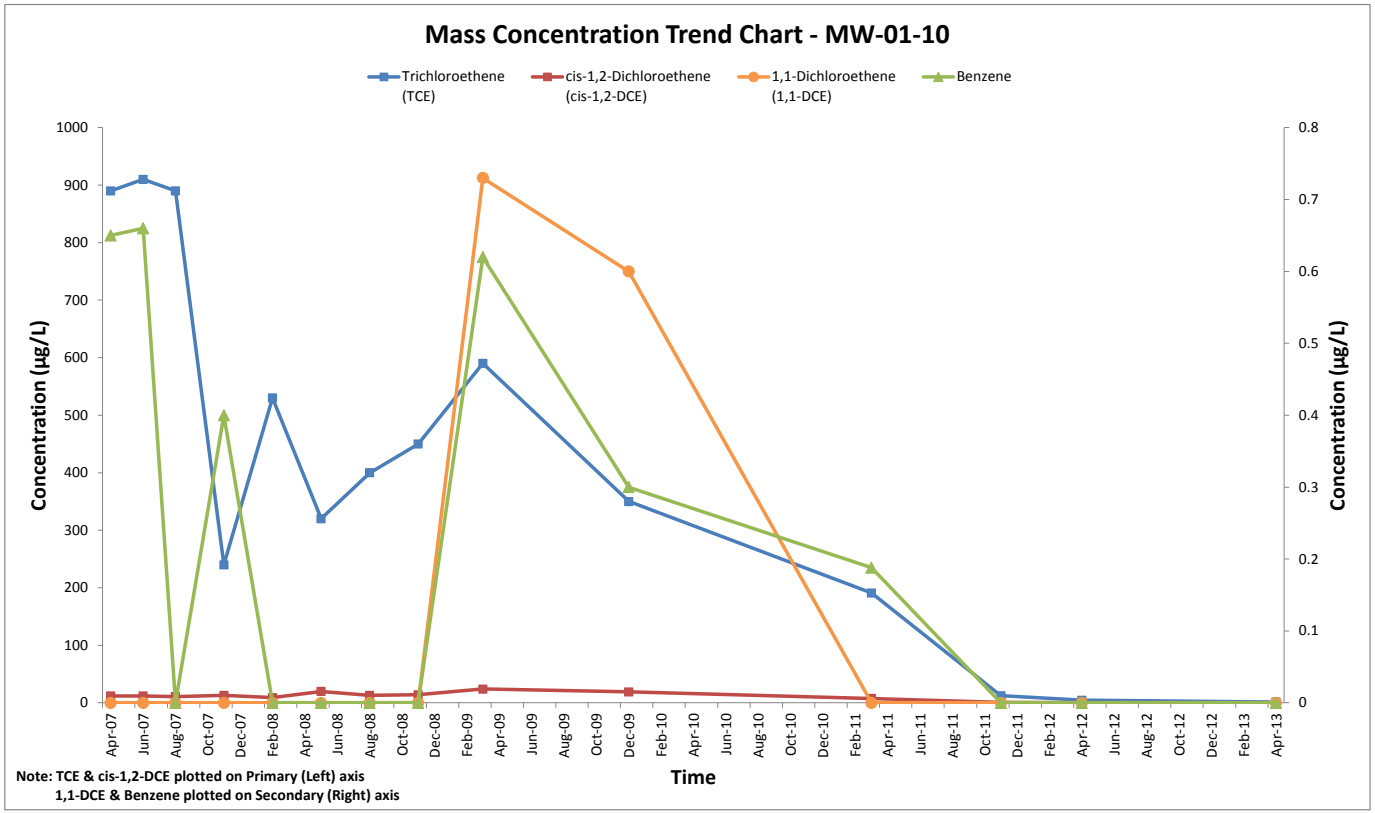


Mass Concentration (µg/L) of COCs for MW-01-10

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Apr-07 | 1 U | 0.65 | 12 | 1 U | 890 | 1 U |
| Jun-07 | 1 U | 0.66 | 12 | 1 U | 910 | 1 U |
| Aug-07 | 1 U | 1 U | 11 | 1 U | 890 | 1 U |
| Nov-07 | 1 U | 0.4 | 13 | 1 U | 240 | 1 U |
| Feb-08 | 1 U | 1 U | 9.1 | 1 U | 530 | 1 U |
| May-08 | 1 U | 1 U | 20 | 1 U | 320 | 1 U |
| Aug-08 | 1 U | 1 U | 13 | 1 U | 400 | 1 U |
| Nov-08 | 4 U | 4 U | 14 | 4 U | 450 | 4 U |
| Mar-09 | 0.73 | 0.62 | 24 | 1 U | 590 | 1 U |
| Dec-09 | 0.6 | 0.3 | 19 | 1 U | 350 | 2 U |
| Mar-11 | 1 U | 0.188 | 7.7 | 1 U | 191 | 1 U |
| Nov-11 | 1 U | 0.4 U | 0.56 | 1 U | 12.4 | 1 U |
| Apr-12 | 1 U | 0.4 U | 1 U | 1 U | 4.46 | 1 U |
| Apr-13 | 1 U | 1 U | 1 U | 1 U | 1.58 | 1 U |

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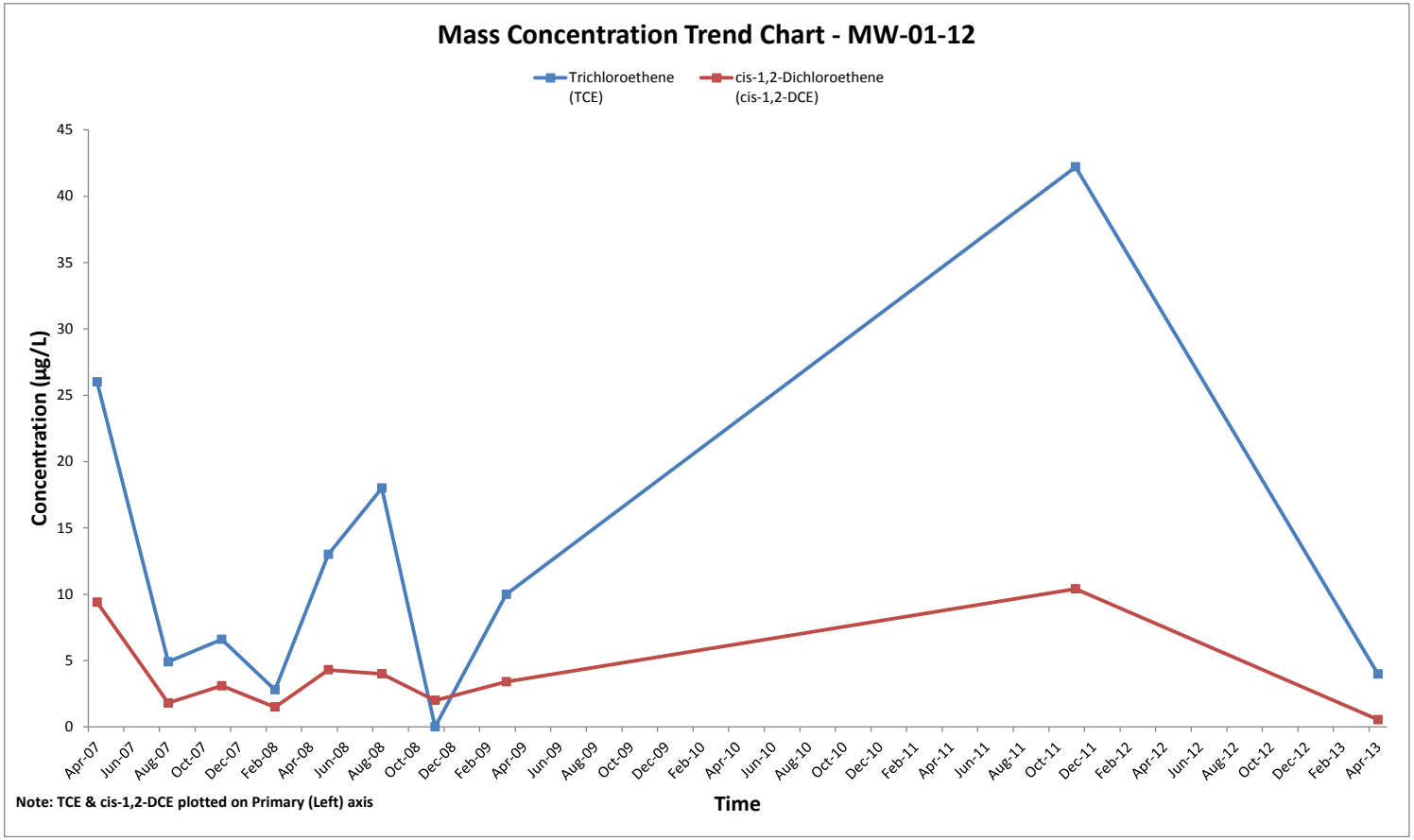
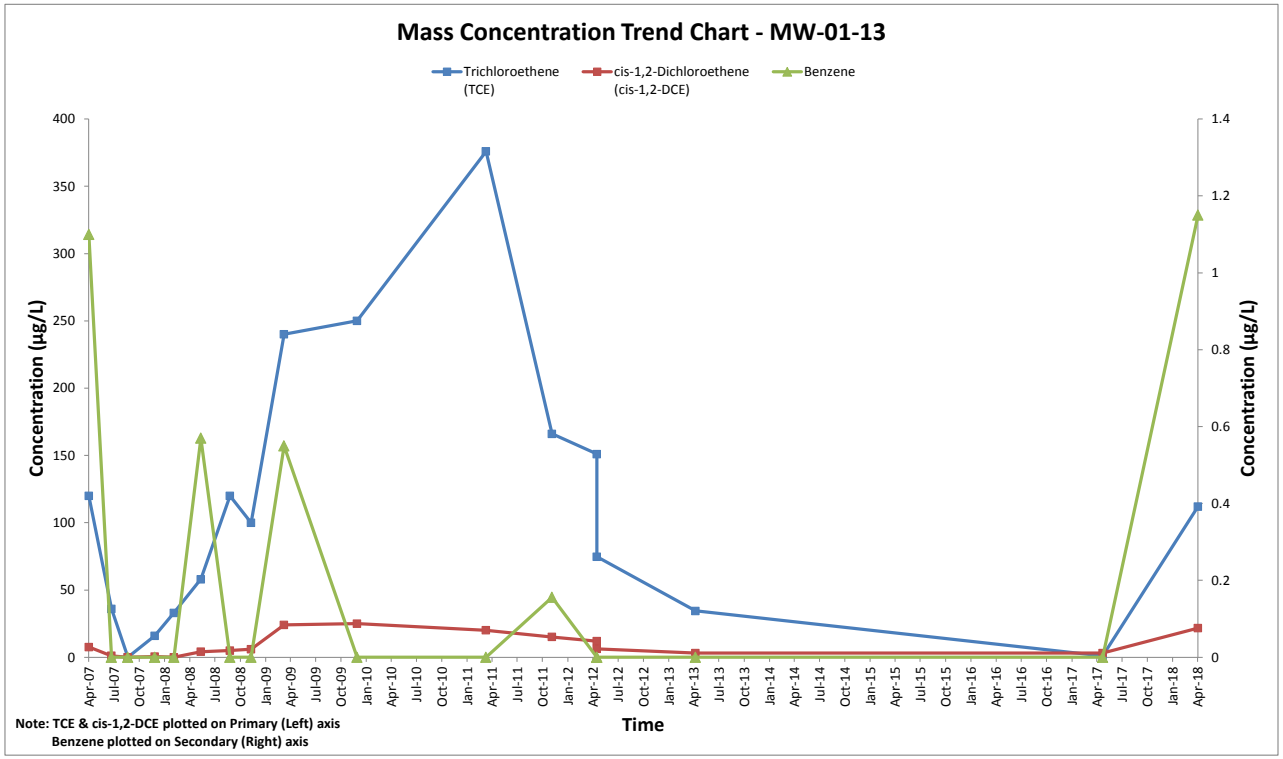



Mass Concentration (µg/L) of COCs for MW-01-12

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Apr-07 | 1 U | 1 U | 9.4 | 1 U | 26 | 1 U |
| Aug-07 | 1 U | 1 U | 1.8 | 1 U | 4.9 | 1 U |
| Nov-07 | 1 U | 1 U | 3.1 | 1 U | 6.6 | 1 U |
| Feb-08 | 1 U | 1 U | 1.5 | 1 U | 2.8 | 1 U |
| May-08 | 1 U | 1 U | 4.3 | 1 U | 13 | 1 U |
| Aug-08 | 1 U | 1 U | 4 | 1 U | 18 | 1 U |
| Nov-08 | 1U | 1U | 2 | 1 U | 1 U | 1 U |
| Mar-09 | 1 U | 1 U | 3.4 | 1 U | 10 | 1 U |
| Nov-11 | 1 U | 0.4 U | 10.4 | 1 U | 42.2 | 1 U |
| Apr-13 | 1 U | 1 U | 0.55 | 1 U | 3.99 | 1 U |

BACK




Mass Concentration (µg/L) of COCs for MW-01-13

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Apr-07 | 1 U | 1.1 | 7.6 | 1 U | 120 | 1 U |
| Jun-07 | 1 U | 1 U | 1.1 | 1 U | 36 | 1 U |
| Aug-07 | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U |
| Nov-07 | 1 U | 1 U | 0.55 | 1 U | 16 | 1 U |
| Feb-08 | 1 U | 1 U | 1 U | 1 U | 33 | 1 U |
| May-08 | 1 U | 0.57 | 4.2 | 0.68 | 58 | 1 U |
| Aug-08 | 1 U | 1 U | 5 | 0.87 | 120 | 1 U |
| Nov-08 | 1 U | 1 U | 6 | 1.6 | 100 | 1 U |
| Mar-09 | 1 U | 0.55 | 24 | 3.7 | 240 | 1 U |
| Dec-09 | 1 U | 1 U | 25 | 3 | 250 | 2 U |
| Mar-11 | 0 U | 0 U | 20.1 | 1.01 | 376 | 1 U |
| Nov-11 | 1 U | 0.156 | 15.1 | 1.4 | 166 | 1 U |
| Apr-12 | 1 U | 0.4 U | 12 | 1.85 | 151 | 1 U |
| Apr-12 | 1 U | 0.4 U | 6.21 | 0.746 | 74.7 | 1 U |
| Apr-13 | 1 U | 1 U | 3.07 | 0.3 | 34.45 | 1 U |
| Apr-17 | 1 U | 1 U | 3.07 | 0.3 | 0.901 | 1 U |
| Apr-18 | 0.5 U | 1.15 | 21.7 | 0.5 U | 112 | 1.27 |

* yellow highlight indicates J-flagged value

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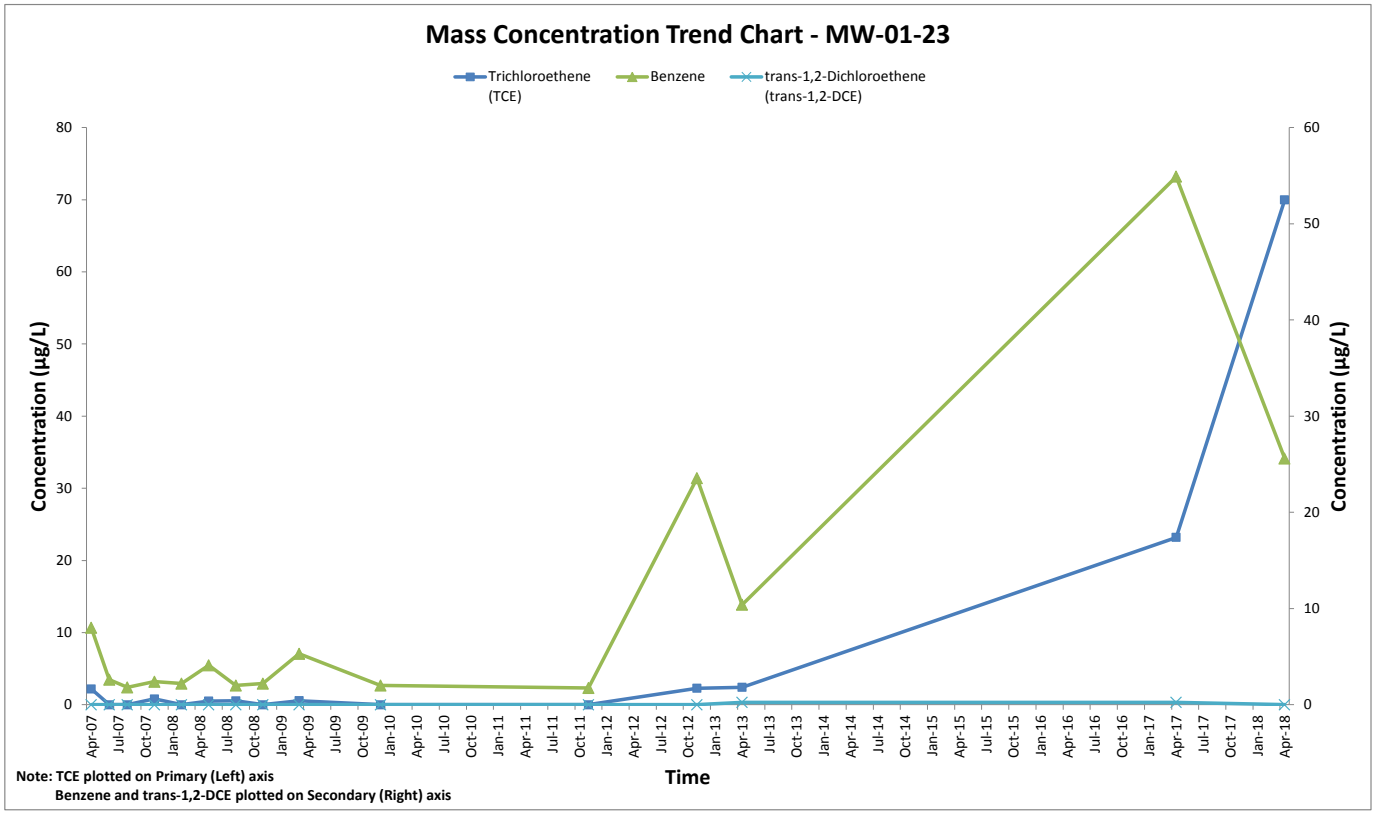


Mass Concentration (µg/L) of COCs for MW-01-23

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Apr-07 | 1 U | 8 | 1 U | 1 U | 2.2 | 1 U |
| Jun-07 | 1 U | 2.6 | 1 U | 1 U | 1 U | 1 U |
| Aug-07 | 1 U | 1.8 | 1 U | 1 U | 1 U | 1 U |
| Nov-07 | 1 U | 2.4 | 1 U | 1 U | 0.8 | 1 U |
| Feb-08 | 1 U | 2.2 | 1 U | 1 U | 1 U | 1 U |
| May-08 | 1 U | 4.1 | 1 U | 1 U | 0.52 | 1 U |
| Aug-08 | 1 U | 2 | 1 U | 1 U | 0.55 | 1 U |
| Nov-08 | 1 U | 2.2 | 1 U | 1 U | 1 U | 1 U |
| Mar-09 | 1 U | 5.3 | 1 U | 1 U | 0.57 | 1 U |
| Dec-09 | 1 U | 2 | 1 U | 1 U | 1 U | 2 U |
| Nov-11 | 1 U | 1.75 | 1 U | 1 U | 1 U | 1 U |
| Nov-12 | 1 U | 23.55 | 1 U | 1 U | 2.3 | 1 U |
| Apr-13 | 1 U | 10.4 | 1 U | 0.25 | 2.42 | 1 U |
| Apr-17 | 1 U | 54.9 | 1 U | 0.25 | 23.2 | 1 U |
| Apr-18 | 0.5 U | 25.6 | 2.97 | 0.5 U | 70 | 0.5 U |

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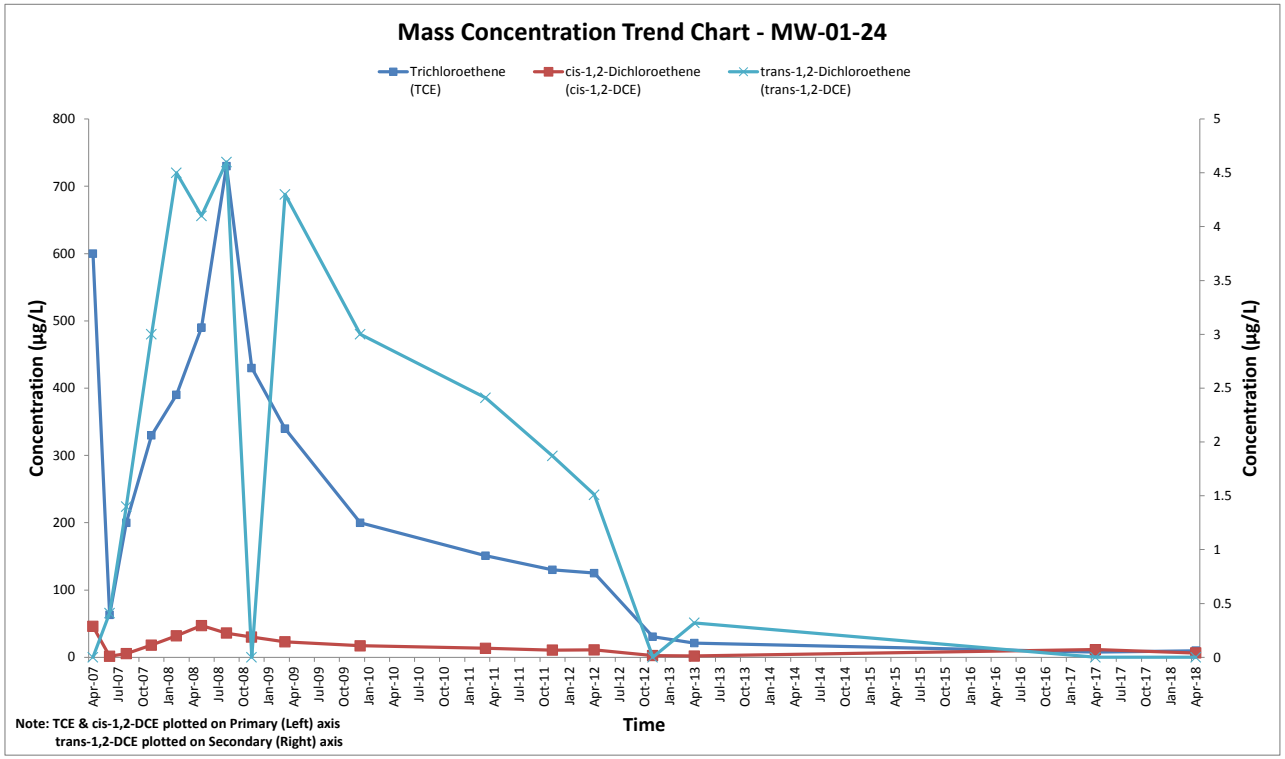


Mass Concentration (µg/L) of COCs for MW-01-24

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Apr-07 | 1 U | 1 U | 46 | 1 U | 600 | 1 U |
| Jun-07 | 1 U | 1 U | 1.5 | 0.41 | 63 | 1 U |
| Aug-07 | 1 U | 1 U | 5.4 | 1.4 | 200 | 1 U |
| Nov-07 | 1 U | 1 U | 18 | 3 | 330 | 1 U |
| Feb-08 | 1 U | 1 U | 32 | 4.5 | 390 | 1 U |
| May-08 | 1 U | 1 U | 47 | 4.1 | 490 | 1 U |
| Aug-08 | 1 U | 1 U | 36 | 4.6 | 730 | 1 U |
| Nov-08 | 5 U | 5 U | 30 | 5 U | 430 | 5 U |
| Mar-09 | 1 U | 1 U | 23 | 4.3 | 340 | 1 U |
| Dec-09 | 1 U | 1 U | 17 | 3 | 200 | 2 U |
| Mar-11 | 1 U | 0.4 U | 13.3 | 2.41 | 151 | 1 U |
| Nov-11 | 1 U | 0.4 U | 10.8 | 1.87 | 130 | 1 U |
| Apr-12 | 1 U | 0.4 U | 11 | 1.51 | 125 | 1 U |
| Nov-12 | 1 U | 0.4 U | 2.56 | 1 U | 30.7 | 1 U |
| Apr-13 | 1 U | 1 U | 1.88 | 0.32 | 21.1 | 1 U |
| Apr-17 | 1 U | 0.924 | 11.3 | 1 U | 7.52 | 1 U |
| Apr-18 | 0.5 U | 1.31 | 6.46 | 0.5 U | 9.83 | 10.6 |

* yellow highlight indicates J-flagged value

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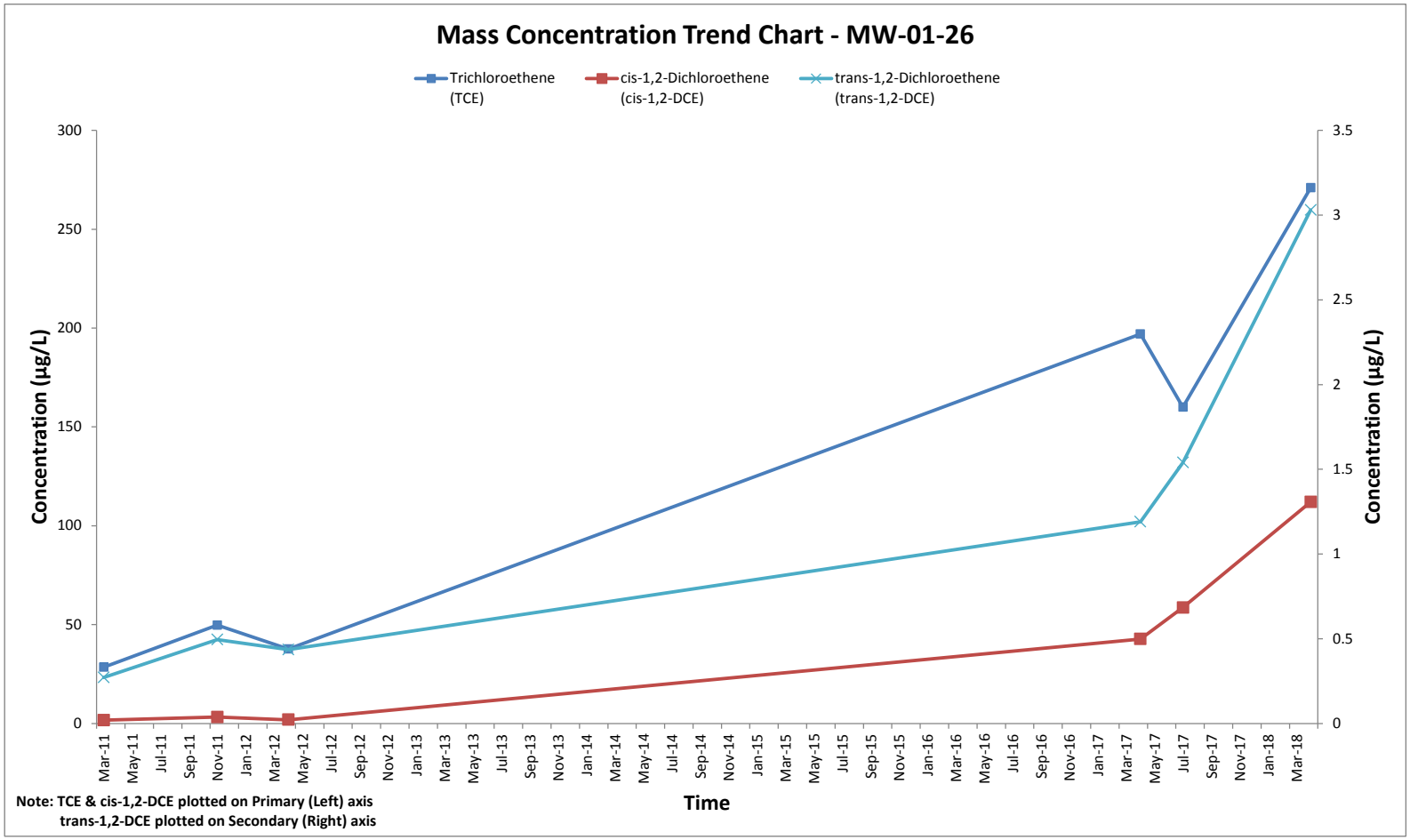
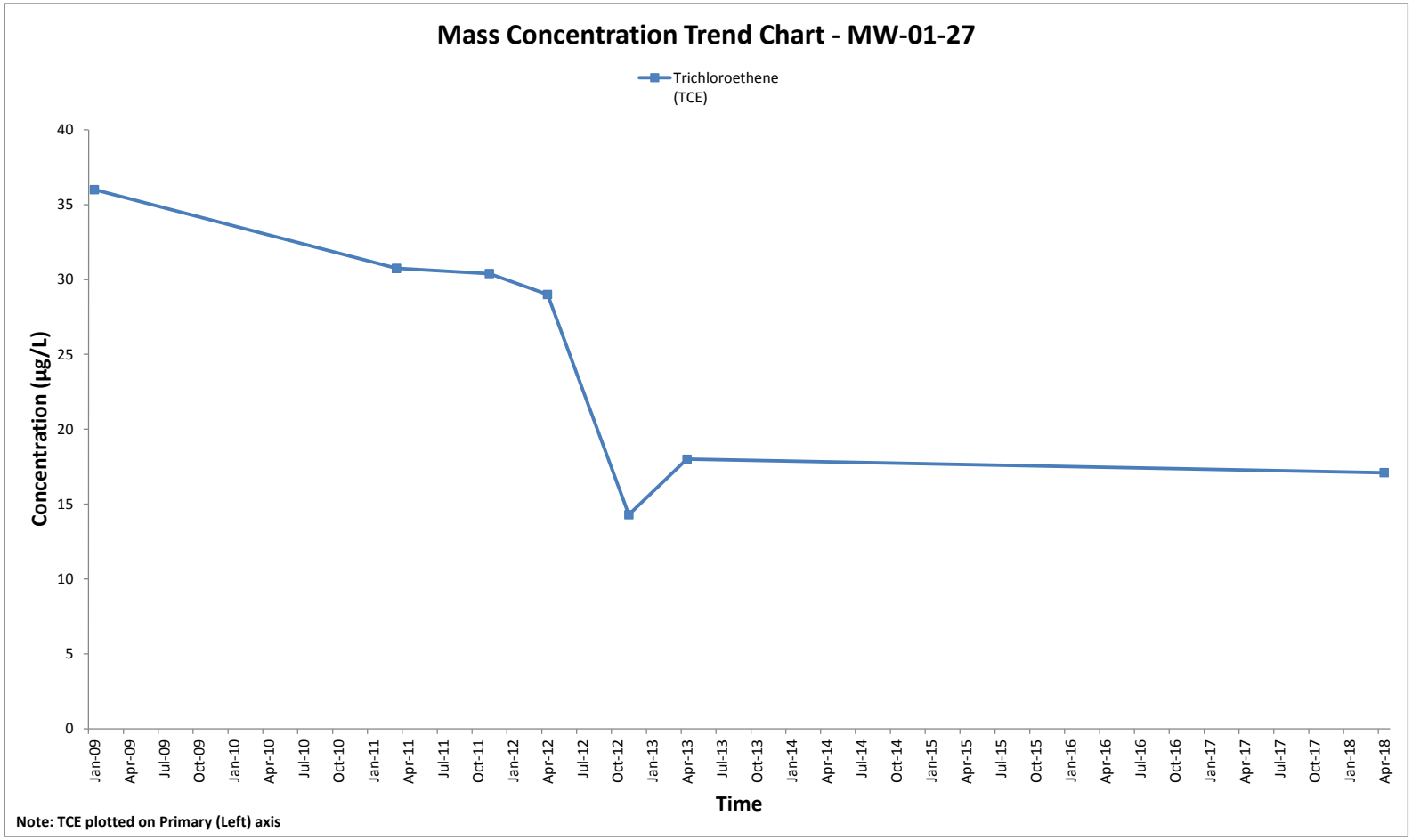



Mass Concentration (µg/L) of COCs for MW-01-26

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Mar-11 | 1 U | 0.4 U | 1.63 | 0.271 | 28.4 | 1 U |
| Nov-11 | 1 U | 0.4 U | 3.22 | 0.495 | 49.7 | 1 U |
| Apr-12 | 1 U | 0.4 U | 1.88 | 0.436 | 37.6 | 1 U |
| Apr-17 | 1 U | 0.4 U | 42.7 | 1.19 | 197 | 1 U |
| Jul-17 | 1.87 | 13.7 | 58.6 | 1.54 | 160 | 88.6 |
| Apr-18 | 1.0 U | 6.16 | 112 | 3.03 | 271 | 63.3 |

* yellow highlight indicates J-flagged value

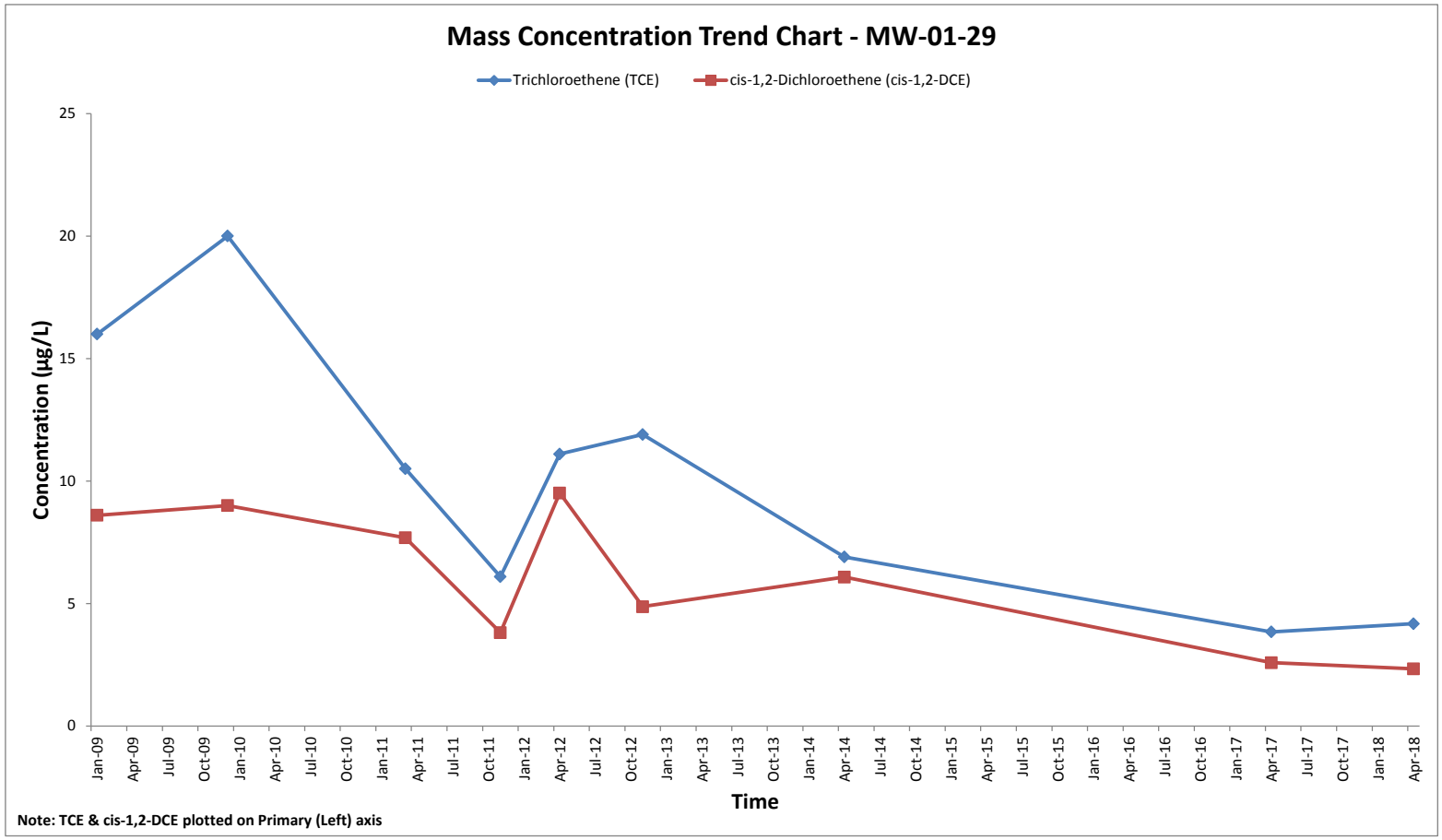
BACK




Mass Concentration (µg/L) of COCs for MW-01-27

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Jan-09 | 10 U | 5 U | 10 U | 10 U | 36 | 10 U |
| Mar-11 | 1 U | 0.4 U | 1 U | 1 U | 30.75 | 1 U |
| Nov-11 | 1 U | 0.4 U | 1 U | 1 U | 30.4 | 1 U |
| Apr-12 | 1 U | 0.4 U | 1 U | 1 U | 29 | 1 U |
| Nov-12 | 1 U | 0.4 U | 1 U | 1 U | 14.3 | 1 U |
| Apr-13 | 1 U | 1 U | 1 U | 1 U | 18 | 1 U |
| Apr-18 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 17.1 | 0.5 U |

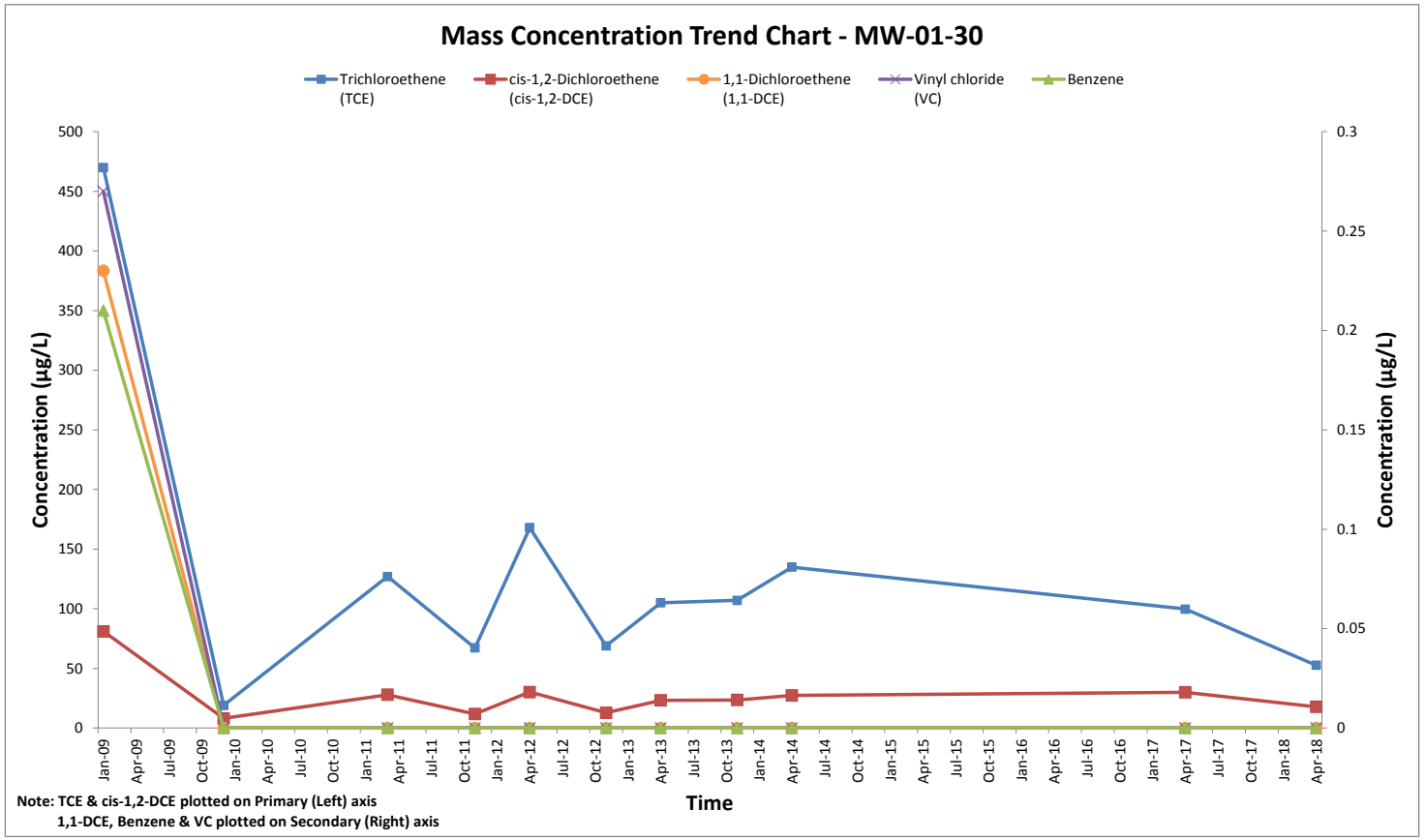
BACK




Mass Concentration (µg/L) of COCs for MW-01-29

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Jan-09 | 10 U | 5 U | 8.6 | 10 U | 16 | 10 U |
| Dec-09 | 1 U | 1 U | 9 | 1 U | 20 | 2 U |
| Mar-11 | 0 U | 0 U | 7.68 | 0 U | 10.5 | 0 U |
| Nov-11 | 1 U | 0.4 U | 3.81 | 1 U | 6.09 | 1 U |
| Apr-12 | 1 U | 0.4 U | 9.51 | 1 U | 11.1 | 1 U |
| Nov-12 | 1 U | 0.4 U | 4.87 | 1 U | 11.9 | 1 U |
| Apr-14 | 0.25 U | 0.25 U | 6.08 | 0.25 U | 6.9 | 0.215 U |
| Apr-17 | 0.25 U | 0.25 U | 2.58 | 0.25 U | 3.84 | 0.215 U |
| Apr-18 | 0.5 U | 0.5 U | 2.34 | 0.5 U | 4.17 | 0.5 U |

BACK




Mass Concentration (µg/L) of COCs for MW-01-30

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Jan-09 | 0.23 | 0.21 | 81 | 0.56 | 470 | 0.27 |
| Dec-09 | 1 U | 1 U | 8 | 1 U | 19 | 2 U |
| Mar-11 | 1 U | 0.4 U | 27.9 | 1 U | 127 | 1 U |
| Nov-11 | 1 U | 0.4 U | 11.8 | 1 U | 67.2 | 1 U |
| Apr-12 | 1 U | 0.4 U | 30.1 | 1 U | 168 | 1 U |
| Nov-12 | 1 U | 0.4 U | 12.8 | 1 U | 68.8 | 1 U |
| Apr-13 | 1 U | 1 U | 23.2 | 1 U | 105 | 1 U |
| Nov-13 | 0.5 U | 0.5 U | 23.5 | 0.5 U | 107 | 0.5 U |
| Apr-14 | 0.25 U | 0.25 U | 27.3 | 0.25 U | 135 | 0.25 U |
| Apr-17 | 0.25 U | 0.25 U | 30 | 0.25 U | 99.7 | 0.25 U |
| Apr-18 | 0.5 U | 0.5 U | 17.85 | 0.5 U | 52.6 | 0.5 U |

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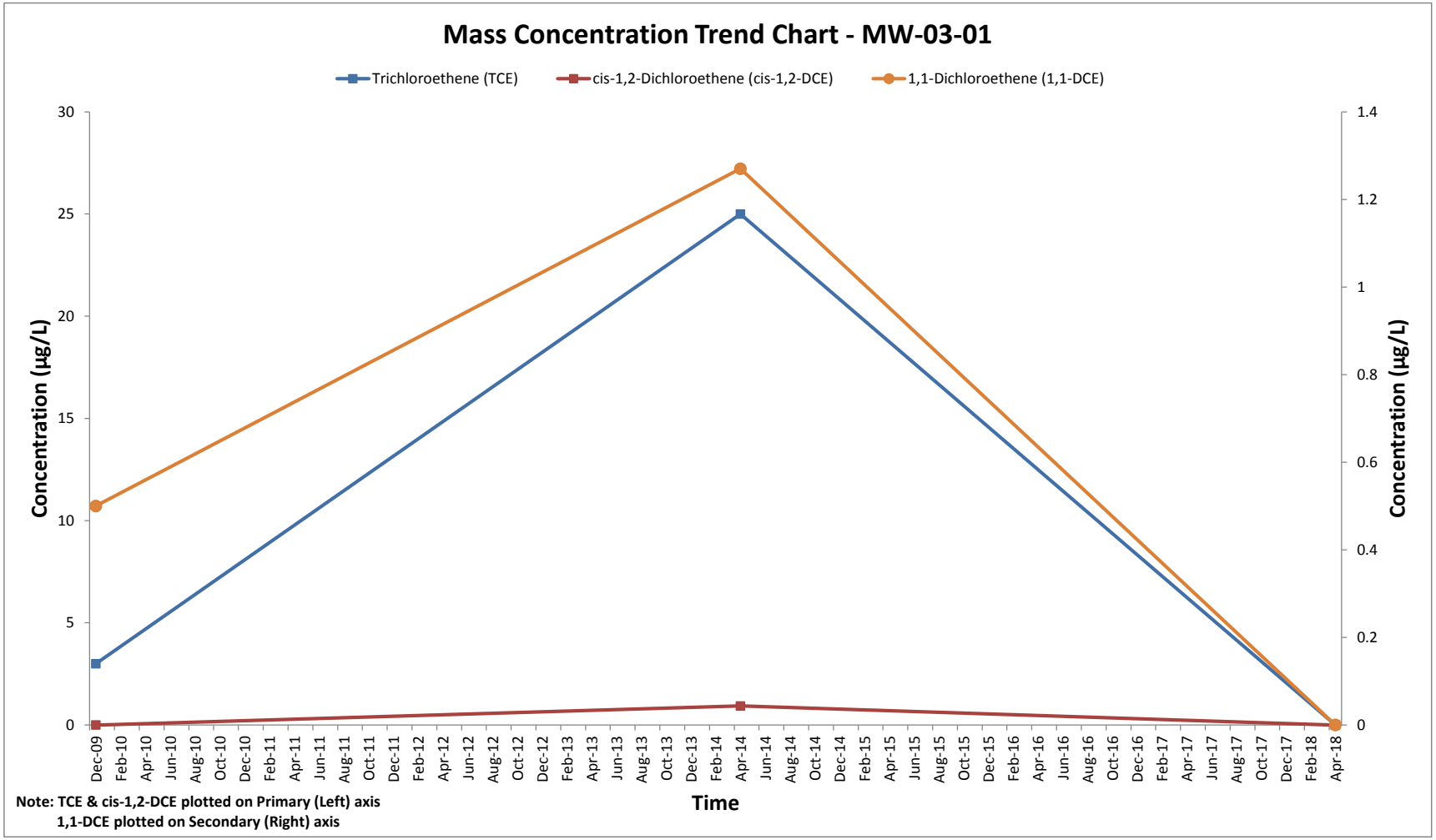


Mass Concentration (µg/L) of COCs for MW-03-01

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Dec-09 | 0.5 | 1 U | 1 U | 1 U | 3 | 2 U |
| Apr-14 | 1.27 | 0.25 U | 0.933 | 0.25 U | 25 | 0.25 U |
| Apr-18 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |

* yellow highlight indicates J-flagged value

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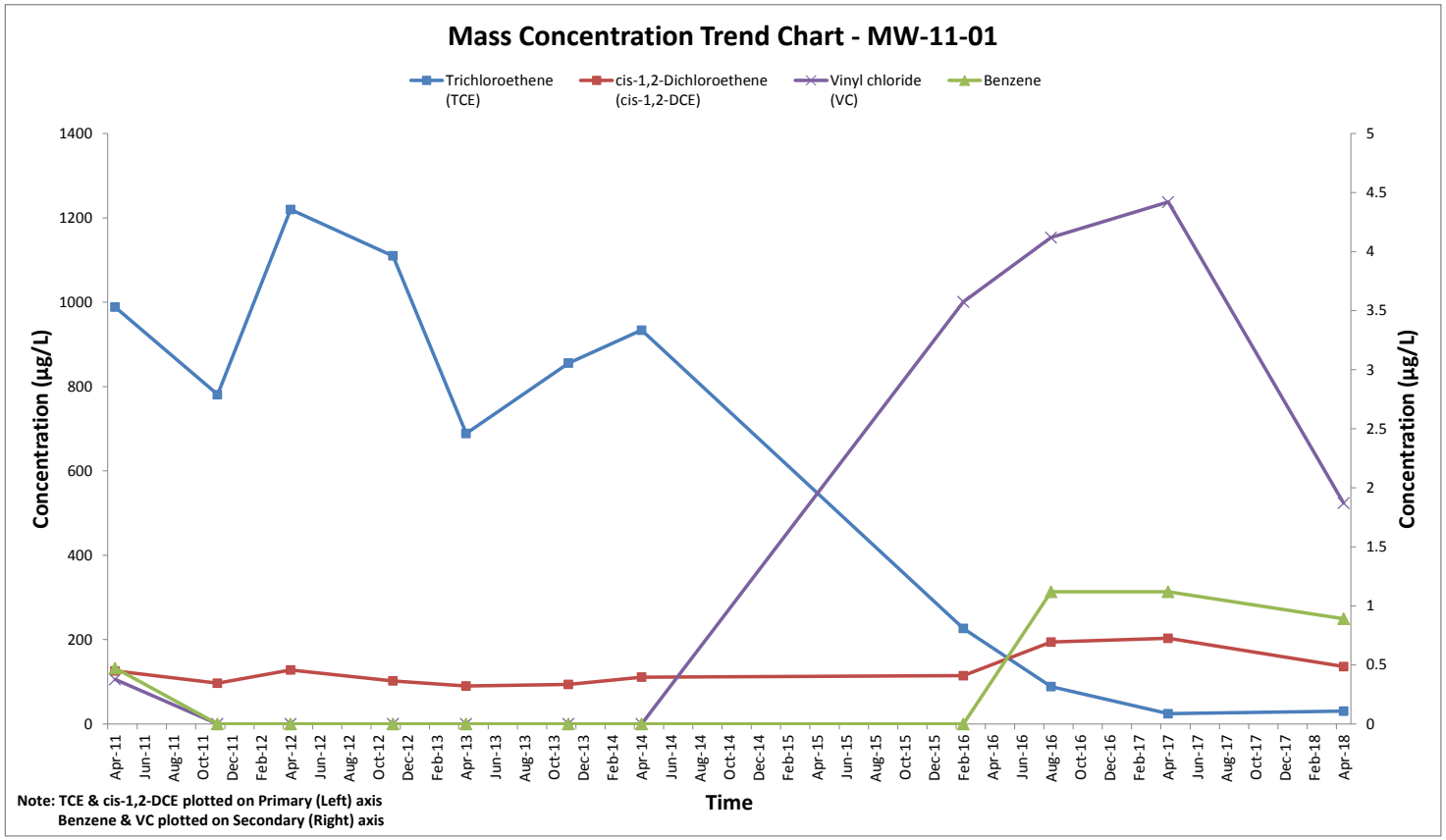


Mass Concentration (µg/L) of COCs for MW-11-01

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Apr-11 | 1 U | 0.473 | 125.5 | 0.457 | 988.5 | 0.377 |
| Nov-11 | 1 U | 0.4 U | 96.7 | 1.64 | 781 | 1 U |
| Apr-12 | 10 U | 4 U | 128 | 10 U | 1220 | 10 U |
| Nov-12 | 5 U | 2 U | 102 | 5 U | 1110 | 5 U |
| Apr-13 | 2.5 U | 2.5 U | 90.2 | 2.5 U | 689 | 2.5 U |
| Nov-13 | 1.25 U | 1.25 U | 93.6 | 1.25 U | 856 | 1.25 UJ |
| Apr-14 | 2.5 U | 2.5 U | 111 | 2.5 U | 934 | 2.5 U |
| Feb-16 | 8.465 | 1.25 U | 114.5 | 1.25 U | 226.5 | 3.575 |
| Aug-16 | 3.21 | 1.12 | 194 | 0.5 U | 88.4 | 4.12 |
| Apr-17 | 0.5 U | 1.12 | 203 | 0.5 U | 24.4 | 4.42 |
| Apr-18 | 0.463 | 0.891 | 136 | 0.5 U | 30.3 | 1.87 |

* yellow highlight indicates J-flagged value

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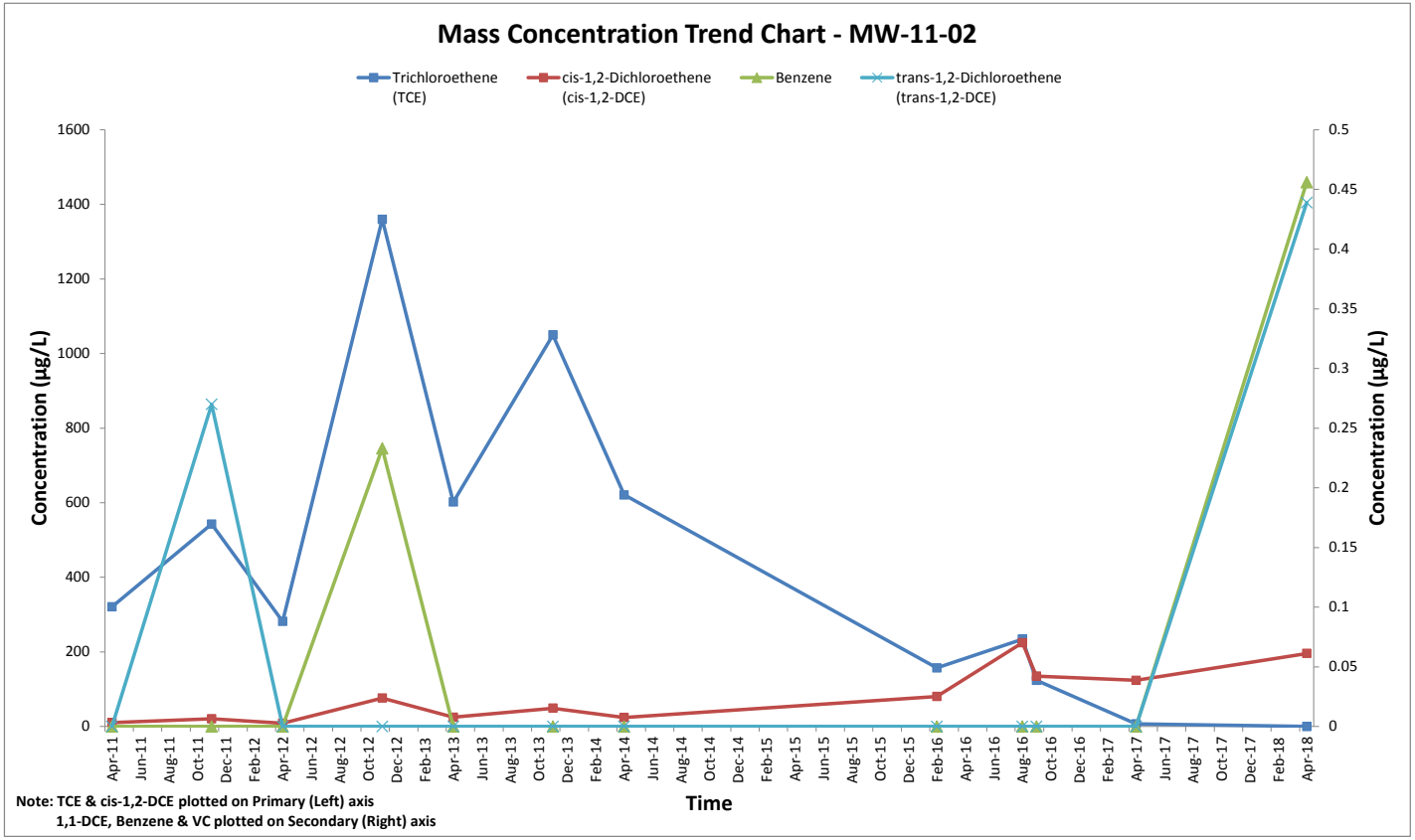


Mass Concentration (µµ/L) of COCs for MW-11-02

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Apr-11 | 1 U | 0.4 U | 10.7 | 1 U | 321 | 1 U |
| Nov-11 | 1 U | 0.4 U | 20.8 | 0.27 | 543 | 1 U |
| Apr-12 | 2 U | 0.8 U | 8.56 | 2 U | 282 | 2 U |
| Nov-12 | 1 U | 0.233 | 76.2 | 1 U | 1360 | 1 U |
| Apr-13 | 5 U | 5 U | 24.7 | 5 U | 602 | 5 U |
| Nov-13 | 2.5 U | 2.5 U | 49.3 | 2.5 U | 1050 | 2.5 UJ |
| Apr-14 | 2.5 U | 2.5 U | 24.4 | 2.5 U | 621 | 2.5 U |
| Feb-16 | 14.2 | 2.5 U | 80.7 | 2.5 U | 157 | 4.08 |
| Aug-16 | 4.23 | 0.5 U | 225 | 0.5 U | 234 | 6.22 |
| Sep-16 | 1.87 | 0.5 U | 135 | 0.5 U | 124 | 3.01 |
| Apr-17 | 2.75 | 0.5 U | 124 | 0.5 U | 7.38 | 3.76 |
| Apr-18 | 0.5 U | 0.456 | 196 | 0.439 | 0.5 U | 2.59 |

* yellow highlight indicates J-flagged value

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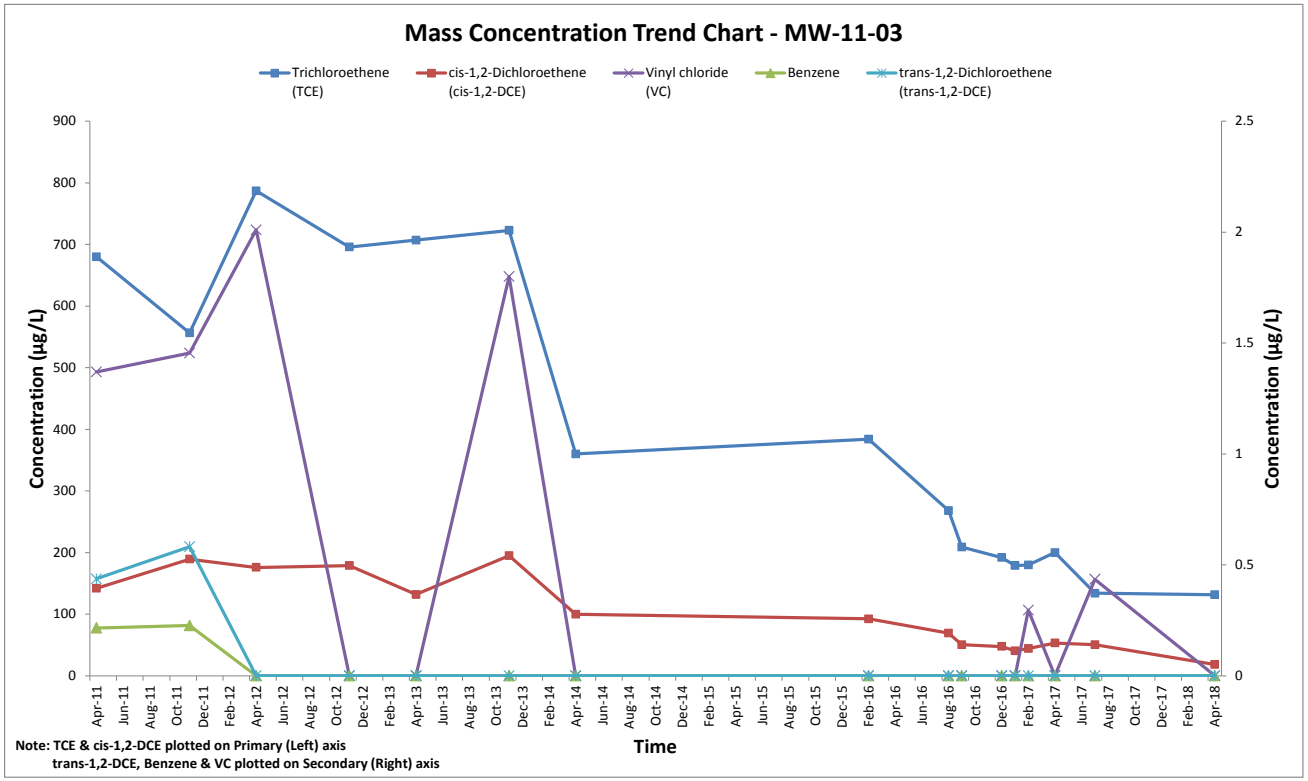


Mass Concentration (µg/L) of COCs for MW-11-03

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Apr-11 | 1 U | 0.216 | 142 | 0.437 | 680 | 1.37 |
| Nov-11 | 1 U | 0.2265 | 189.5 | 0.582 | 556.5 | 1.455 |
| Apr-12 | 5 U | 2 U | 176 | 5 U | 787 | 2.01 |
| Nov-12 | 5 U | 2 U | 179 | 5 U | 696 | 5 U |
| Apr-13 | 10 U | 10 U | 132 | 10 U | 707 | 10 U |
| Nov-13 | 1.25 U | 1.25 U | 195 | 1.25 U | 723 | 1.8 |
| Apr-14 | 1.25 U | 1.25 U | 100 | 1.25 U | 360 | 1.25 U |
| Feb-16 | 2.5 U | 2.5 U | 92.4 | 2.5 U | 384 | 2.5 U |
| Aug-16 | 1.25 U | 1.25 U | 69.25 | 1.25 U | 268 | 1.25 U |
| Sep-16 | 1.25 U | 1.25 U | 50.35 | 0.5 U | 209 | 0.5 U |
| Dec-16 | 1.25 U | 1.25 U | 47.7 | 1.25 U | 192 | 1.25 U |
| Jan-17 | 1.25 U | 1.25 U | 40.5 | 1.25 U | 179 | 1.25 U |
| Feb-17 | 1.25 U | 1.25 U | 44.3 | 1.25 U | 180 | 0.296 |
| Apr-17 | 1.25 U | 1.25 U | 53.4 | 1.25 U | 200 | 1.25 U |
| Jul-17 | 1.25 U | 1.25 U | 50.4 | 1.25 U | 134 | 0.435 |
| Apr-18 | 0.5 U | 0.5 U | 18.5 | 0.5 U | 132 | 0.5 U |

* yellow highlight indicates J-flagged value

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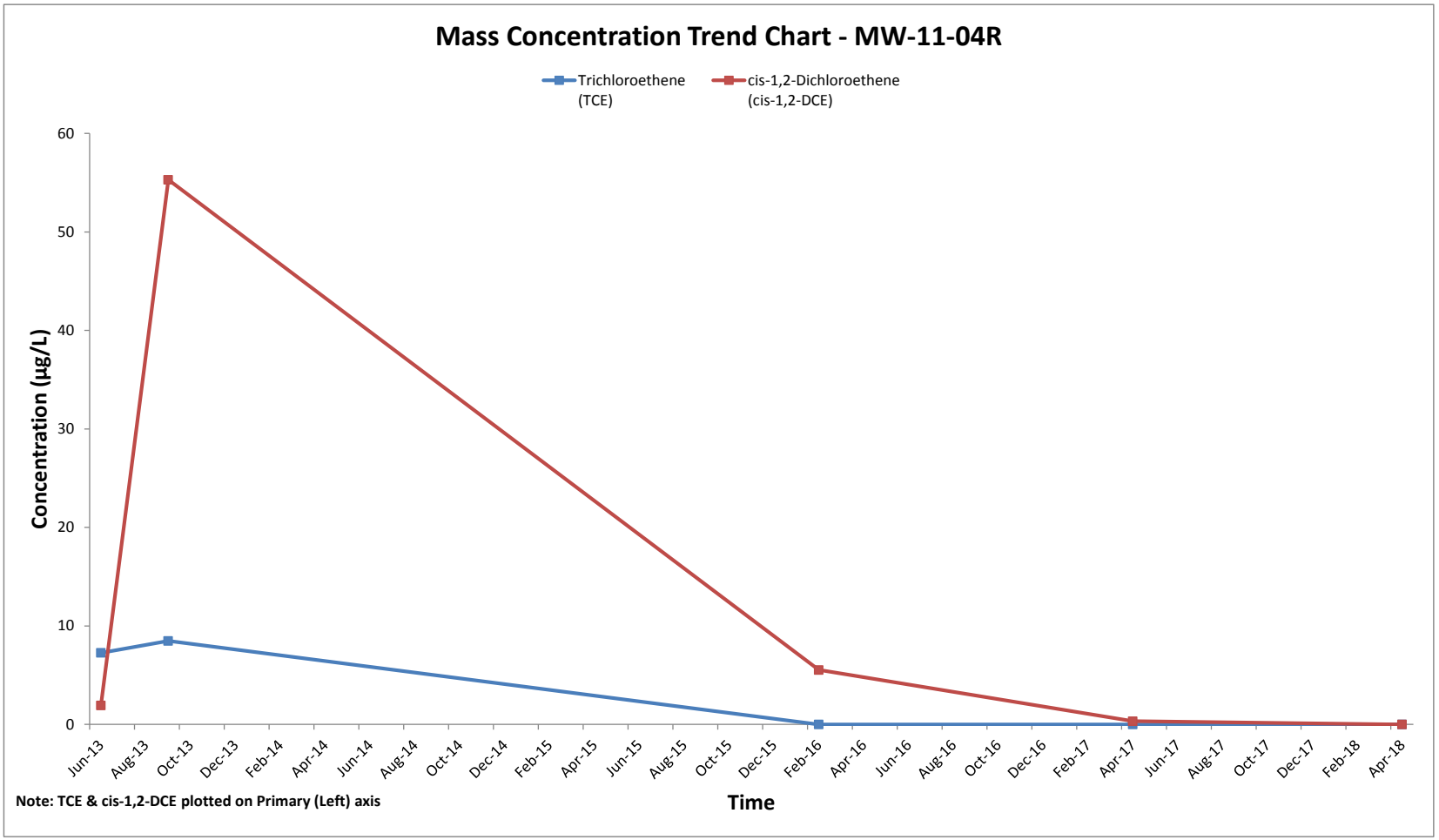


Mass Concentration (µg/L) of COCs for MW-11-04

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Jun-13 | 1 U | 1 U | 1.92 | 1 U | 7.26 | 1 U |
| Sep-13 | 1 U | 1 U | 55.3 | 1 U | 8.47 | 1 U |
| Feb-16 | 0.25 U | 0.25 U | 5.53 | 0.25 U | 0.25 U | 6.85 |
| Apr-17 | 0.25 U | 0.25 U | 0.325 | 0.25 U | 0.25 U | 0.283 |
| Apr-18 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |

* yellow highlight indicates J-flagged value

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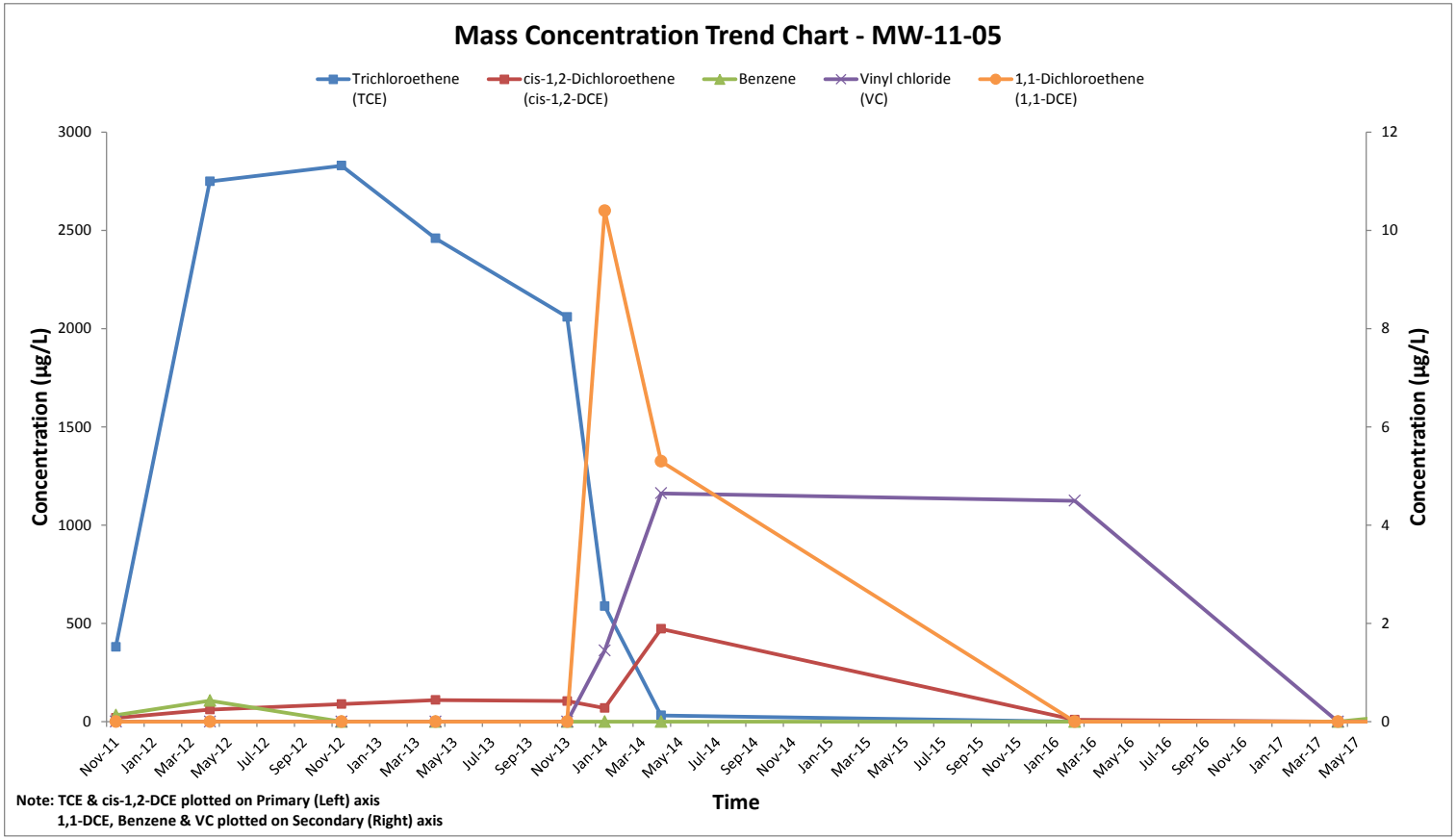


Mass Concentration (µg/L) of COCs for MW-11-05

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Nov-11 | 1 U | 0.133 | 19.3 | 1 U | 381 | 1 U |
| Apr-12 | 2 U | 0.432 | 61.9 | 2 U | 2750 | 2 U |
| Nov-12 | 20 U | 8 U | 89.4 | 20 U | 2830 | 20 U |
| Apr-13 | 20 U | 20 U | 111 | 20 U | 2460 | 20 U |
| Nov-13 | 2.5 U | 2.5 U | 105 | 2.5 U | 2060 | 2.5 U |
| Jan-14 | 10.4 | 2.5 U | 69.6 | 2.5 U | 588 | 1.45 |
| Apr-14 | 5.3 | 2.5 U | 473 | 2.5 U | 32.3 | 4.65 |
| Feb-16 | 0.25 U | 0.25 U | 10.8 | 0.426 | 1.28 | 4.5 |
| Apr-17 | 0.5 U | 0.5 U | 1.17 | 0.5 U | 0.658 | 0.5 U |
| Apr-18 | 0.5 U | 0.458 | 0.428 | 0.866 | 0.5 U | 0.5 U |

* yellow highlight indicates J-flagged value

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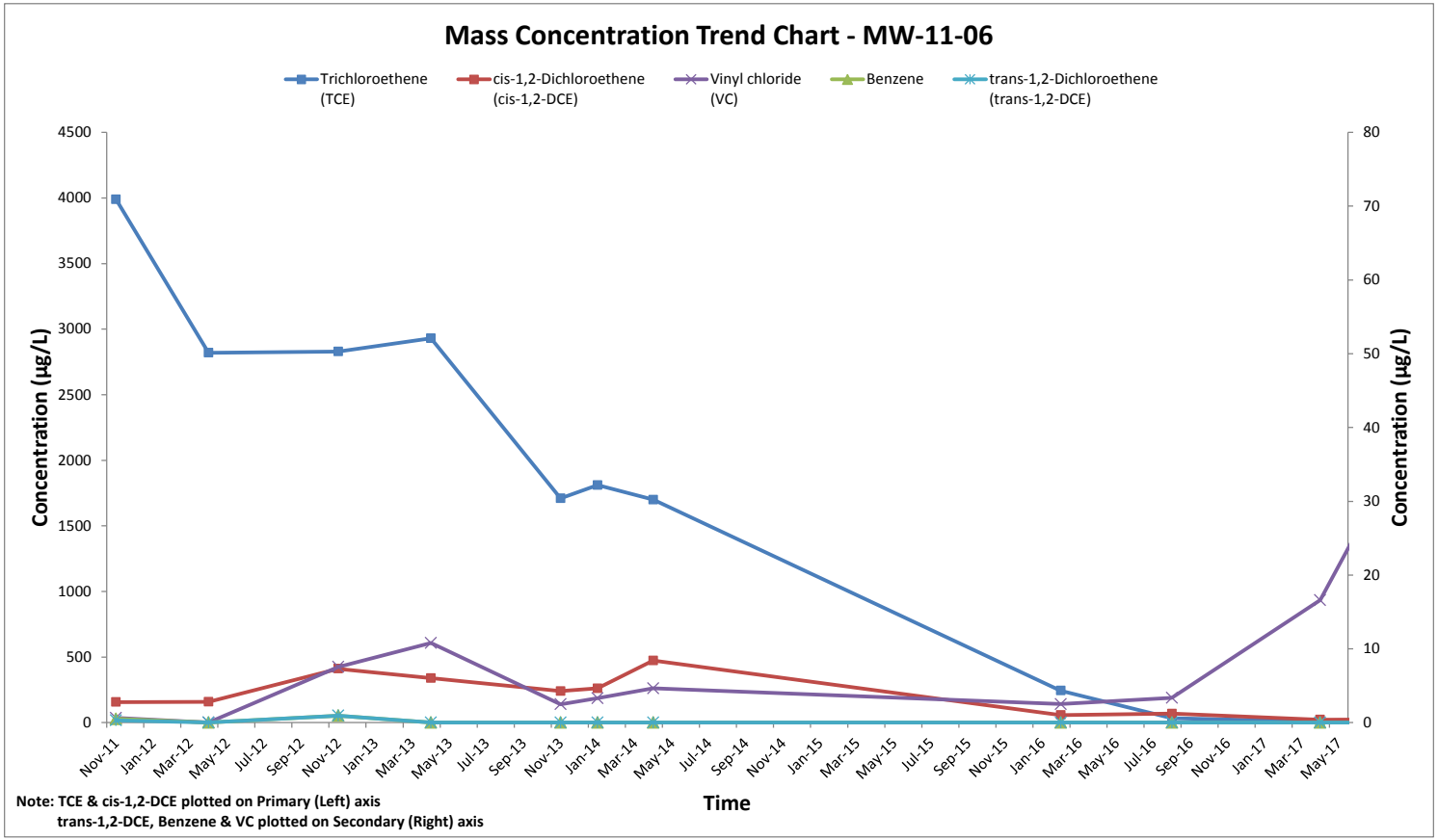
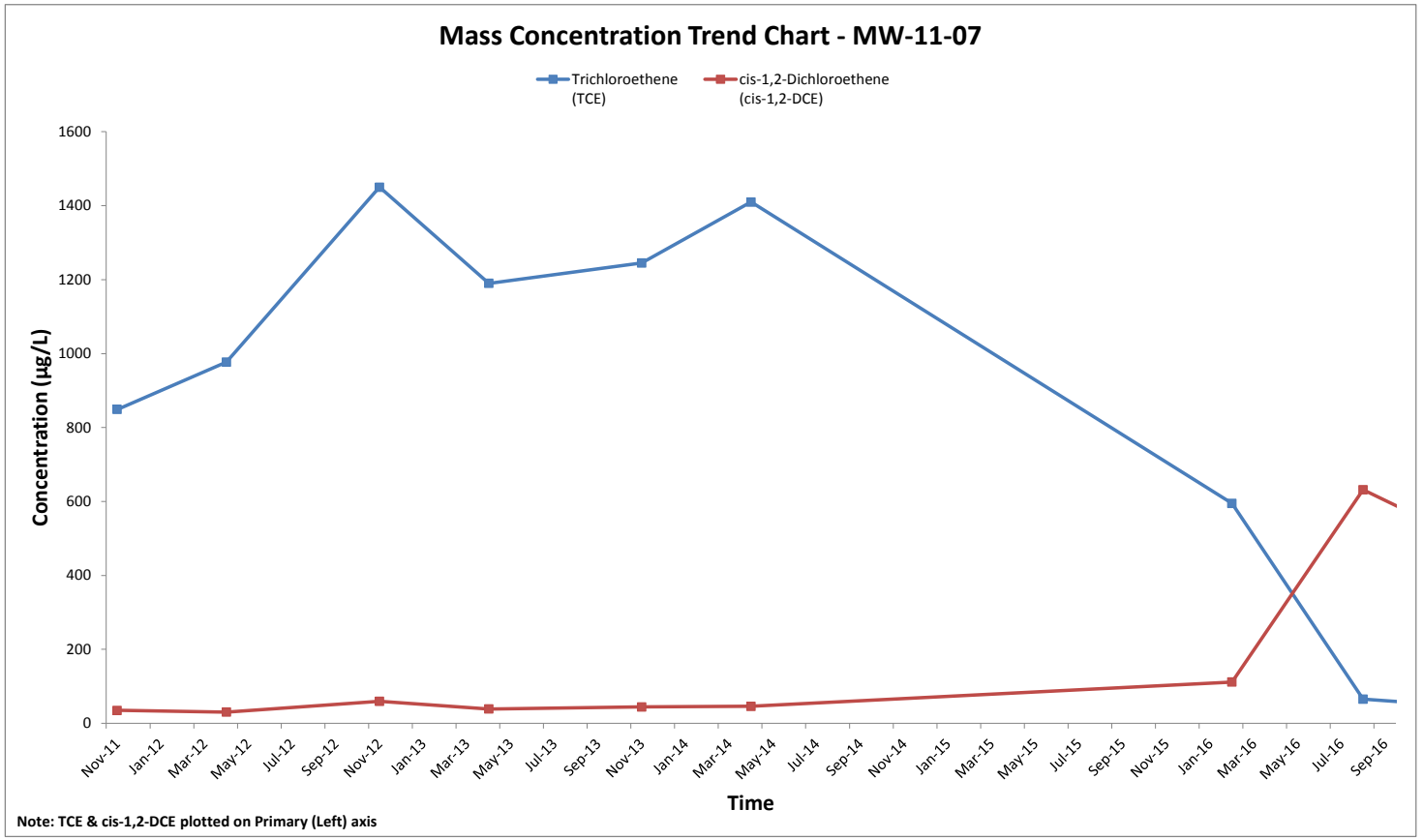



Mass Concentration (µg/L) of COCs for MW-11-06

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Nov-11 | 1 U | 0.5 | 157 | 0.297 | 3990 | 0.631 |
| Apr-12 | 20 U | 8 U | 158 | 20 U | 2820 | 20 U |
| Nov-12 | 100 U | 0.939 | 411 | 0.95 | 2830 | 7.55 |
| Apr-13 | 25 U | 25 U | 340 | 25 U | 2930 | 10.8 |
| Nov-13 | 2.5 U | 2.5 U | 240 | 2.5 U | 1710 | 2.5 |
| Jan-14 | 2.5 U | 2.5 U | 261 | 2.5 U | 1810 | 3.3 |
| Apr-14 | 5 U | 2.5 U | 473 | 2.5 U | 1700 | 4.65 |
| Feb-16 | 4.27 | 0.5 U | 58.1 | 0.5 U | 244 | 2.51 |
| Aug-16 | 1.41 | 0.5 U | 68.3 | 0.5 U | 33.4 | 3.37 |
| Apr-17 | 0.5 U | 0.5 U | 23 | 0.5 U | 8.83 | 16.6 |
| Apr-18 | 0.5 U | 0.5 U | 30.7 | 0.5 U | 16.6 | 72.4 |

BACK




Mass Concentration (µg/L) of COCs for MW-11-07

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Nov-11 | 1 U | 0.4 U | 35 | 1 U | 849 | 1 U |
| Apr-12 | 5 U | 2 U | 30.7 | 5 U | 977 | 5 U |
| Nov-12 | 5 U | 2 U | 59.4 | 5 U | 1450 | 5 U |
| Apr-13 | 10 U | 10 U | 39 | 10 U | 1190 | 10 U |
| Nov-13 | 2.5 U | 2.5 U | 44.25 | 2.5 U | 1245 | 2.5 U |
| Apr-14 | 2.5 U | 2.5 U | 45.9 | 2.5 U | 1410 | 2.5 U |
| Feb-16 | 17.4 | 1.25 U | 112 | 1.25 U | 595 | 3.32 |
| Aug-16 | 9.03 | 1.25 U | 632 | 1.25 U | 65.3 | 10 |
| Apr-17 | 3.38 | 1.25 U | 403 | 1.25 U | 31.6 | 4.44 |
| Apr-18 | 0.439 | 0.401 | 78.7 | 0.5 U | 1.27 | 109 |

* yellow highlight indicates J-flagged value

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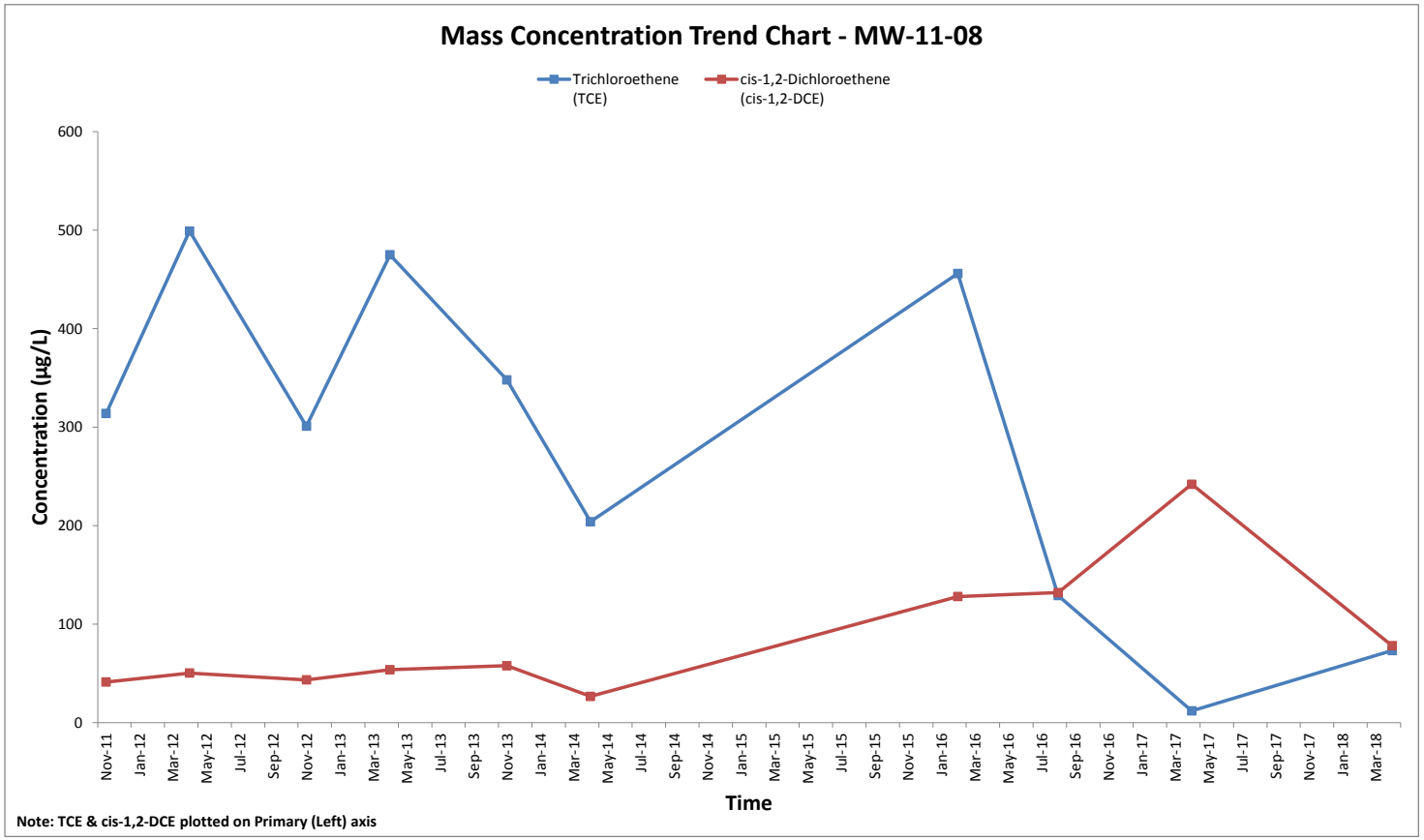


Mass Concentration (µg/L) of COCs for MW-11-08

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Nov-11 | 1 U | 0.4 U | 41.2 | 1 U | 314 | 1 U |
| Apr-12 | 1 U | 0.4 U | 50.3 | 1 U | 499 | 1 U |
| Nov-12 | 2 U | 0.8 U | 43.4 | 2 U | 301 | 2 U |
| Apr-13 | 2.5 U | 2.5 U | 53.8 | 2.5 U | 475 | 2.5 U |
| Nov-13 | 0.625 U | 0.625 U | 57.7 | 0.625 U | 348 | 0.625 U |
| Apr-14 | 0.25 U | 0.25 U | 26.6 | 0.25 U | 204 | 0.25 U |
| Feb-16 | 22 | 0.5 U | 128 | 0.641 | 456 | 5.13 |
| Aug-16 | 5.53 | 0.5 U | 132 | 0.639 | 129 | 5 |
| Apr-17 | 1.7 | 0.5 U | 242 | 0.5 U | 11.9 | 8.88 |
| Apr-18 | 0.5 U | 0.5 U | 78 | 0.327 | 73.1 | 61.5 |

* yellow highlight indicates J-flagged value

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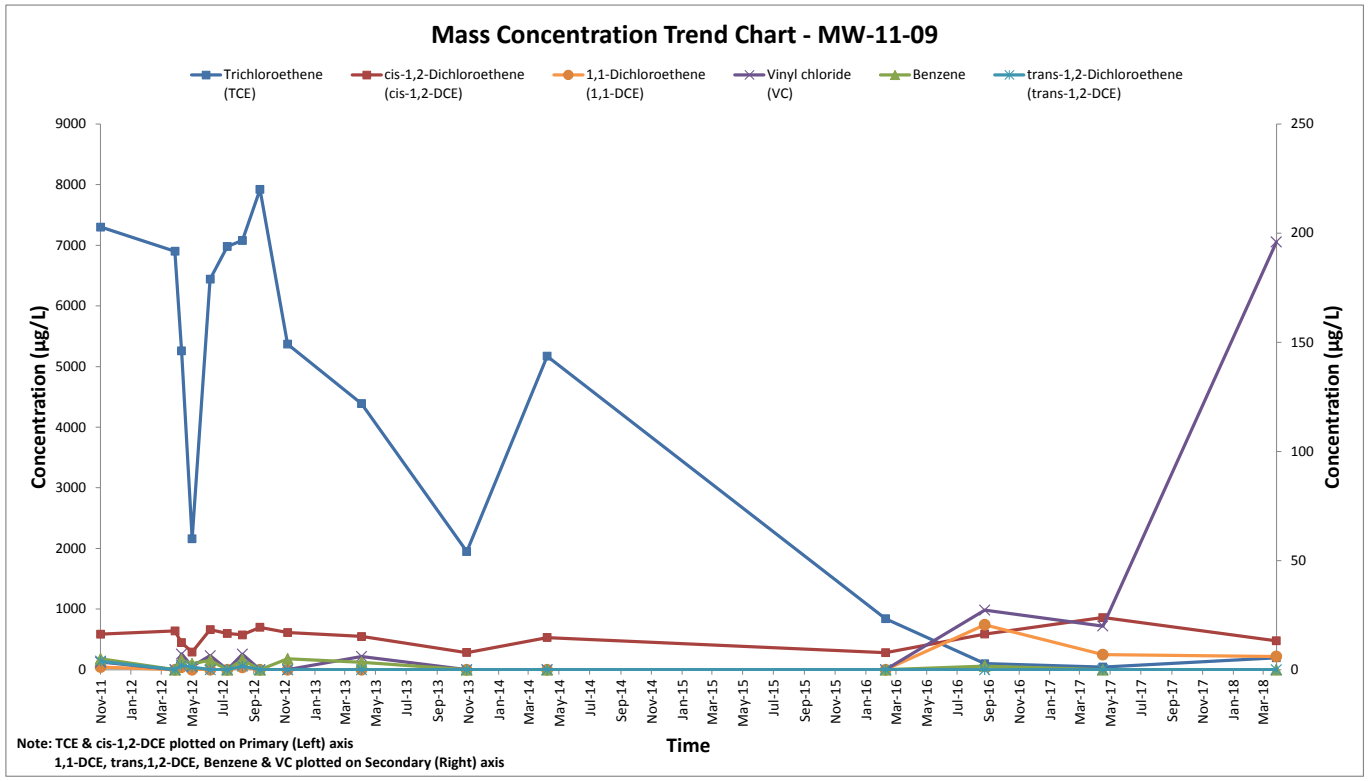


Mass Concentration (µg/L) of COCs for MW-11-09

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Nov-11 | 1.27 | 5.01 | 586 | 3.89 | 7300 | 3.5 |
| Apr-12 | 50 U | 1 U | 641 | 1 U | 6900 | 1 U |
| Apr-12 | 1.18 | 4.46 | 447 | 1.9 | 5260 | 7.2 |
| May-12 | 1 U | 2.77 | 291 | 1.2 | 2160 | 1.49 |
| Jun-12 | 10 U | 4.24 | 660 | 10 U | 6440 | 6.45 |
| Jul-12 | 50 U | 20 U | 598 | 50 U | 6980 | 50 U |
| Aug-12 | 1.05 | 4.63 | 575 | 1.68 | 7080 | 7.14 |
| Sep-12 | 50 U | 20 U | 699 | 50 U | 7920 | 50 U |
| Nov-12 | 25 U | 5.02 | 612 | 25 U | 5370 | 25 U |
| Apr-13 | 10 U | 3.4 | 548 | 10 U | 4390 | 6.1 |
| Nov-13 | 6.25 U | 6.25 U | 284 | 6.25 U | 1950 | 6.25 U |
| Apr-14 | 12.5 U | 12.5 U | 532 | 12.5 U | 5170 | 12.5 U |
| Feb-16 | 25 U | 25 U | 282 | 25 U | 841 | 25 U |
| Aug-16 | 20.6 | 1.71 | 590 | 1.25 U | 99.5 | 27.3 |
| Apr-17 | 6.94 | 2.5 U | 860 | 0.5 U | 44.7 | 20 |
| Apr-18 | 6.1 | 5.0 U | 478 | 5.0 U | 199 | 196 |

* yellow highlight indicates J-flagged value

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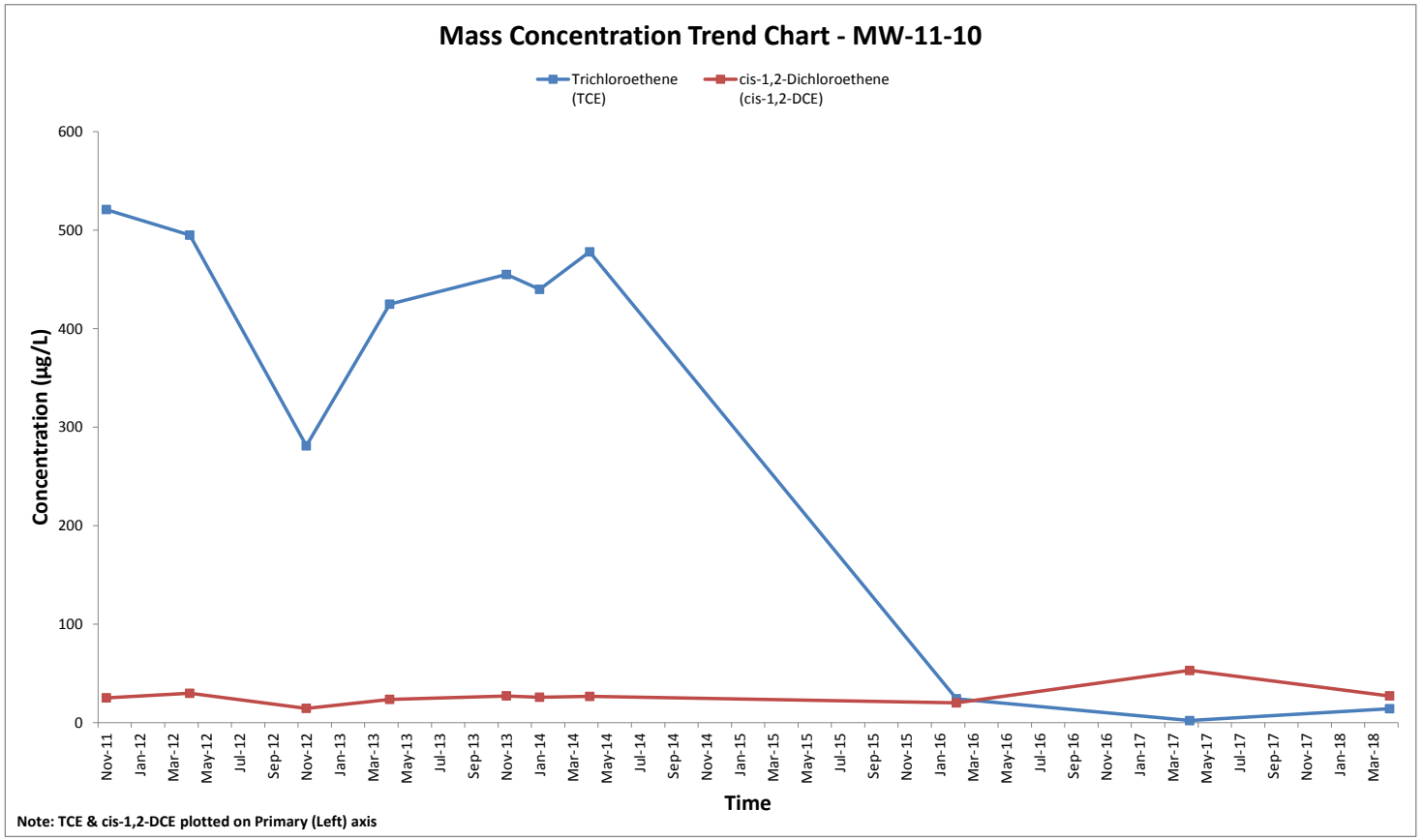


Mass Concentration (µg/L) of COCs for MW-11-10

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Nov-11 | 1 U | 0.4 U | 25.2 | 1 U | 521 | 1 U |
| Apr-12 | 1 U | 0.4 U | 29.7 | 1 U | 495 | 1 U |
| Nov-12 | 1 U | 0.4 U | 14.5 | 1 U | 281 | 1 U |
| Apr-13 | 2.5 U | 2.5 U | 23.6 | 2.5 U | 425 | 2.5 U |
| Nov-13 | 1.25 U | 1.25 U | 27.1 | 1.25 U | 455 | 1.25 U |
| Jan-14 | 1.25 U | 1.25 U | 25.8 | 1.25 U | 440 | 1.25 U |
| Apr-14 | 1.25 U | 1.25 U | 26.6 | 1.25 U | 478 | 1.25 U |
| Feb-16 | 1.35 | 0.5 U | 20.1 | 0.5 U | 24.2 | 0.564 |
| Apr-17 | 1.25 U | 0.5 U | 53 | 0.5 U | 2 | 1.28 |
| Apr-18 | 0.5 U | 0.5 U | 27.1 | 0.5 U | 14.1 | 10.3 |

* yellow highlight indicates J-flagged value

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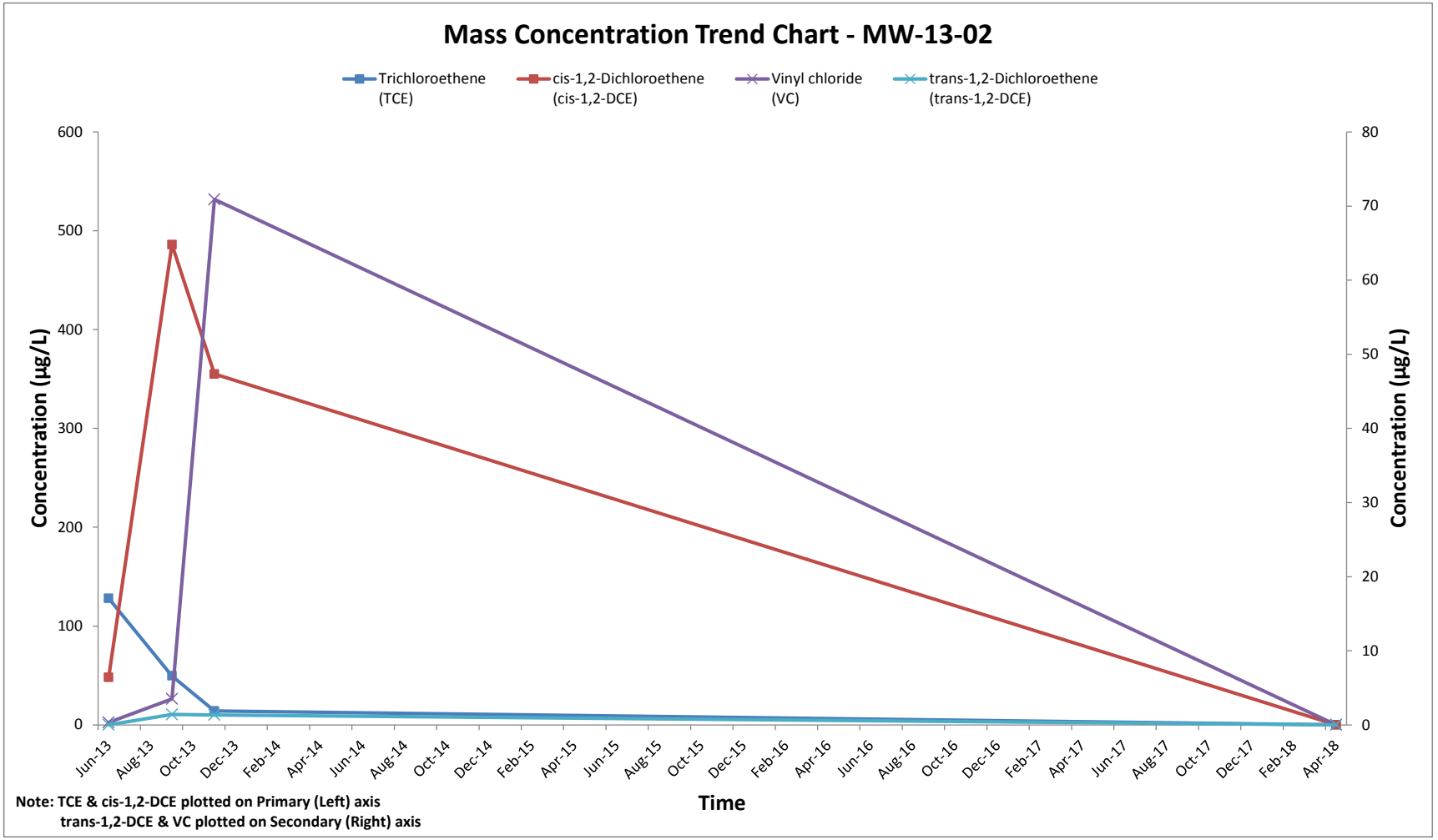
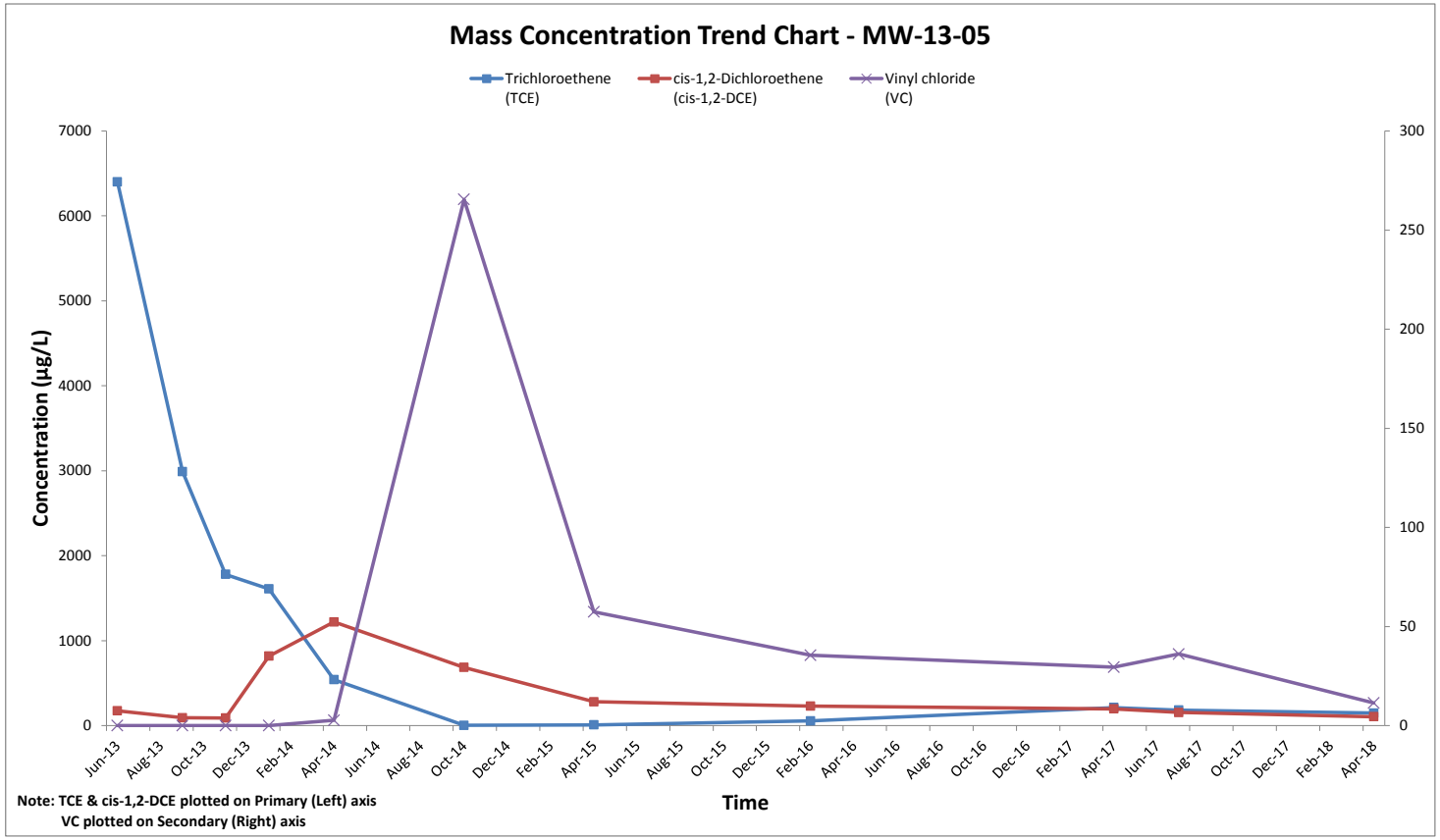



Mass Concentration (µg/L) of COCs for MW-13-02

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Jun-13 | 1 U | 1 U | 48 | 1 U | 128 | 0.32 |
| Sep-13 | 5 U | 5 U | 486 | 1.4 | 49.6 | 3.5 |
| Nov-13 | 1.25 U | 1.25 U | 355 | 1.35 | 14 | 70.9 |
| Apr-18 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |

BACK




Mass Concentration (µg/L) of COCs for MW-13-05

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Jun-13 | 25 U | 25 U | 173 | 25 U | 6400 | 25 U |
| Sep-13 | 5 U | 5 U | 91.4 | 5 U | 2990 | 5 U |
| Nov-13 | 5 U | 5 U | 89.8 | 5 U | 1780 | 5 U |
| Jan-14 | 5 U | 5 U | 818 | 5 U | 1610 | 5 U |
| Apr-14 | 2.5 U | 2.5 U | 1220 | 2.5 U | 541 | 2.67 |
| Oct-14 | 1.25 U | 1.25 U | 685 | 1.25 U | 2.52 | 265.5 |
| Apr-15 | 1.25 U | 1.25 U | 280.5 | 1.055 | 8.935 | 57.4 |
| Feb-16 | 0.5 U | 0.5 U | 229 | 0.862 | 55.7 | 35.5 |
| Apr-17 | 0.5 U | 0.5 U | 197 | 1.1 | 213 | 29.5 |
| Jul-17 | 0.328 | 0.307 | 154 | 1.02 | 183 | 36.1 |
| Apr-18 | 0.5 U | 0.5 U | 105 | 0.566 | 147 | 11.4 |

* yellow highlight indicates J-flagged value

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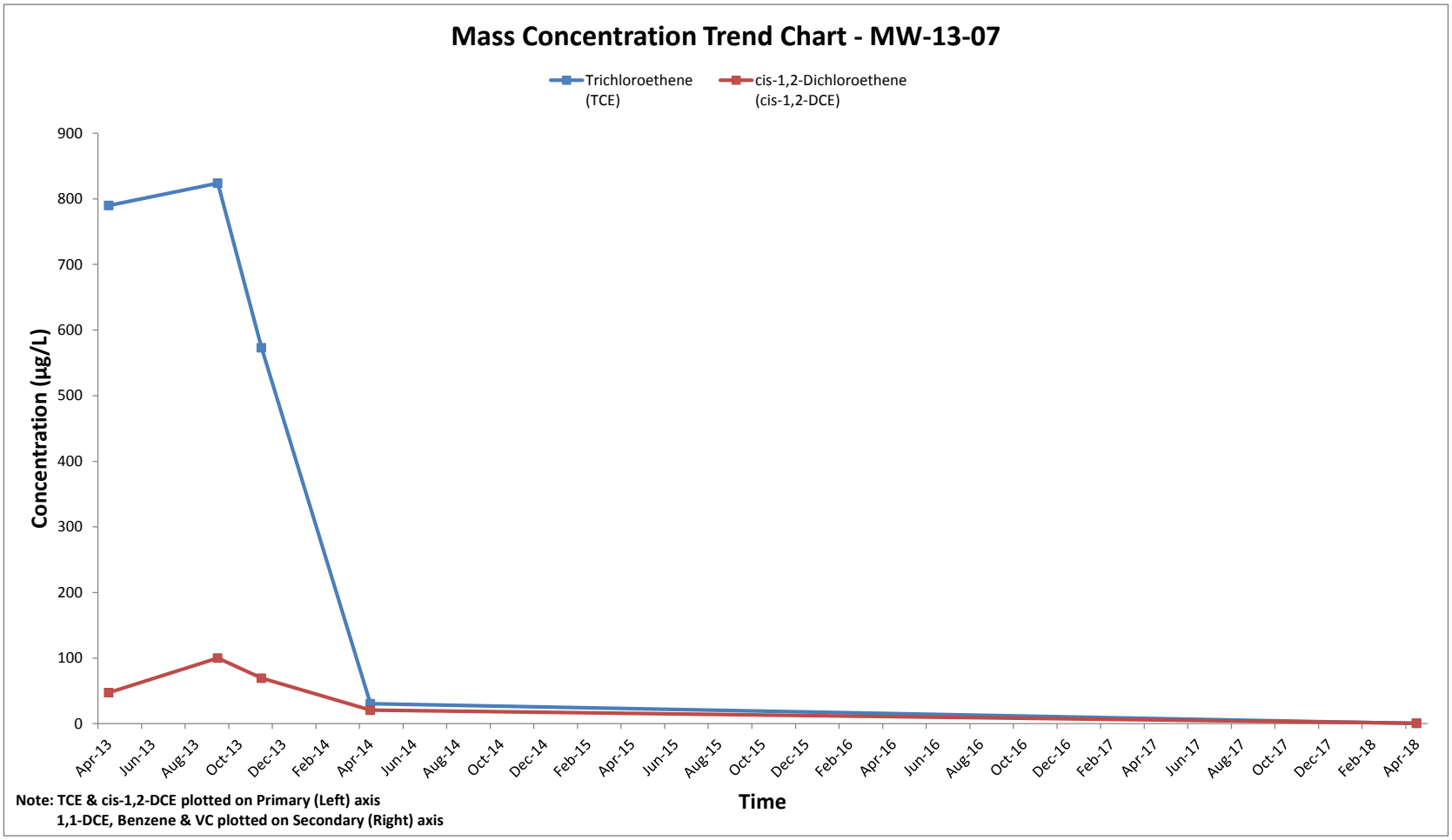


Mass Concentration (µg/L) of COCs for MW-13-07

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Apr-13 | 5 U | 5 U | 47.4 | 5 U | 790 | 5 U |
| Sep-13 | 1.25 U | 1.25 U | 100 | 1.25 U | 824 | 1.25 U |
| Nov-13 | 1.25 U | 1.25 U | 69.3 | 1.25 U | 573 | 1.25 U |
| Apr-14 | 0.5 U | 0.5 U | 20.5 | 0.5 U | 30.5 | 0.5 U |
| Apr-18 | 0.5 U | 0.43 | 0.615 | 0.5 U | 0.512 | 0.459 |

* yellow highlight indicates J-flagged value

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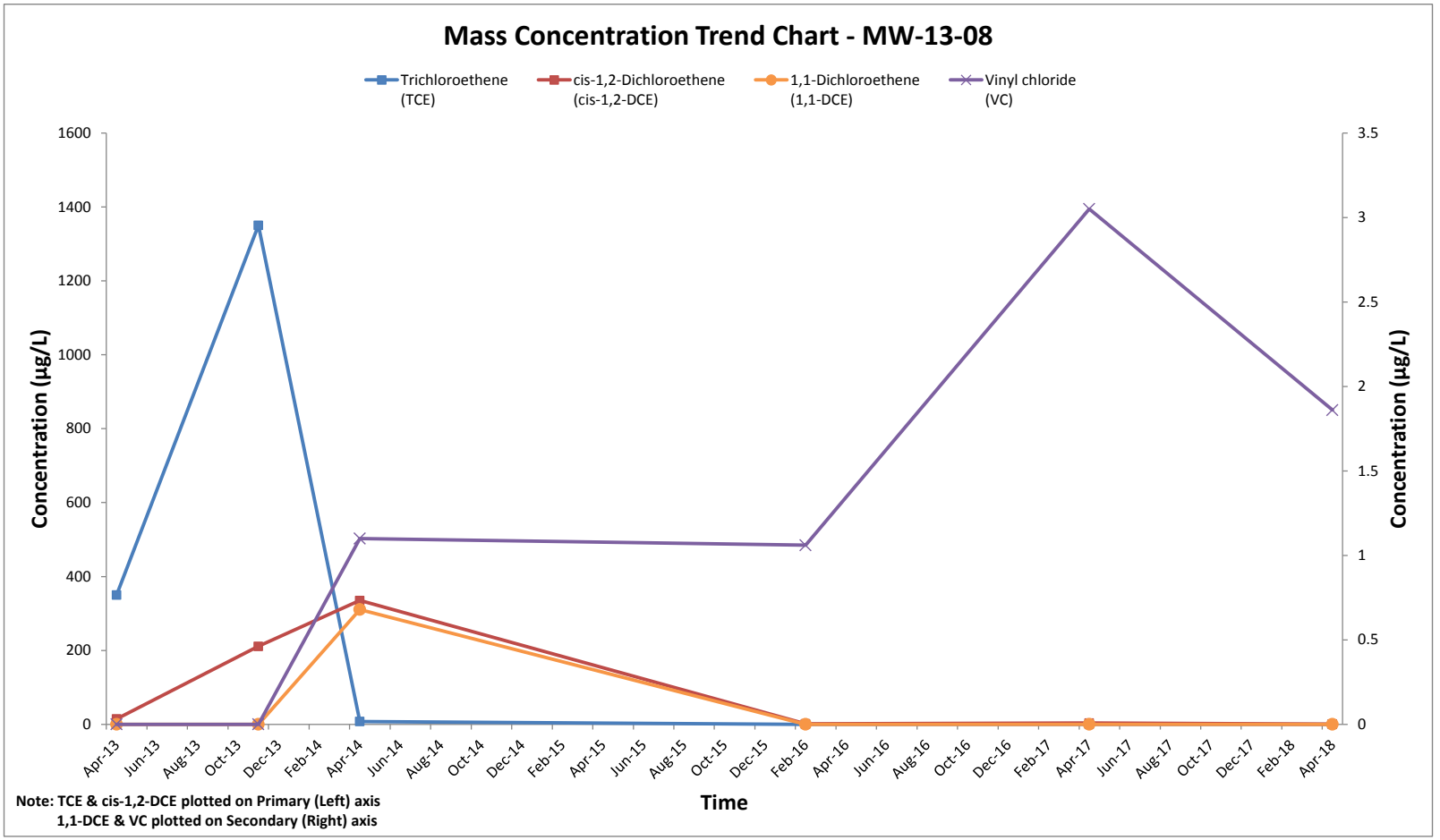


Mass Concentration (µg/L) of COCs for MW-13-08

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Apr-13 | 2.5 U | 2.5 U | 14.4 | 2.5 U | 350 | 2.5 U |
| Nov-13 | 5 U | 5 U | 211 | 5 U | 1350 | 5 U |
| Apr-14 | 0.68 | 0.625 U | 335 | 0.625 U | 7.35 | 1.1 |
| Feb-16 | 0.5 U | 0.5 U | 1.24 | 0.5 U | 0.5 U | 1.06 |
| Apr-17 | 0.5 U | 0.5 U | 3.45 | 0.588 | 0.5 U | 3.05 |
| Apr-18 | 0.5 U | 0.5 U | 0.876 | 0.511 | 0.5 U | 1.86 |

* yellow highlight indicates J-flagged value

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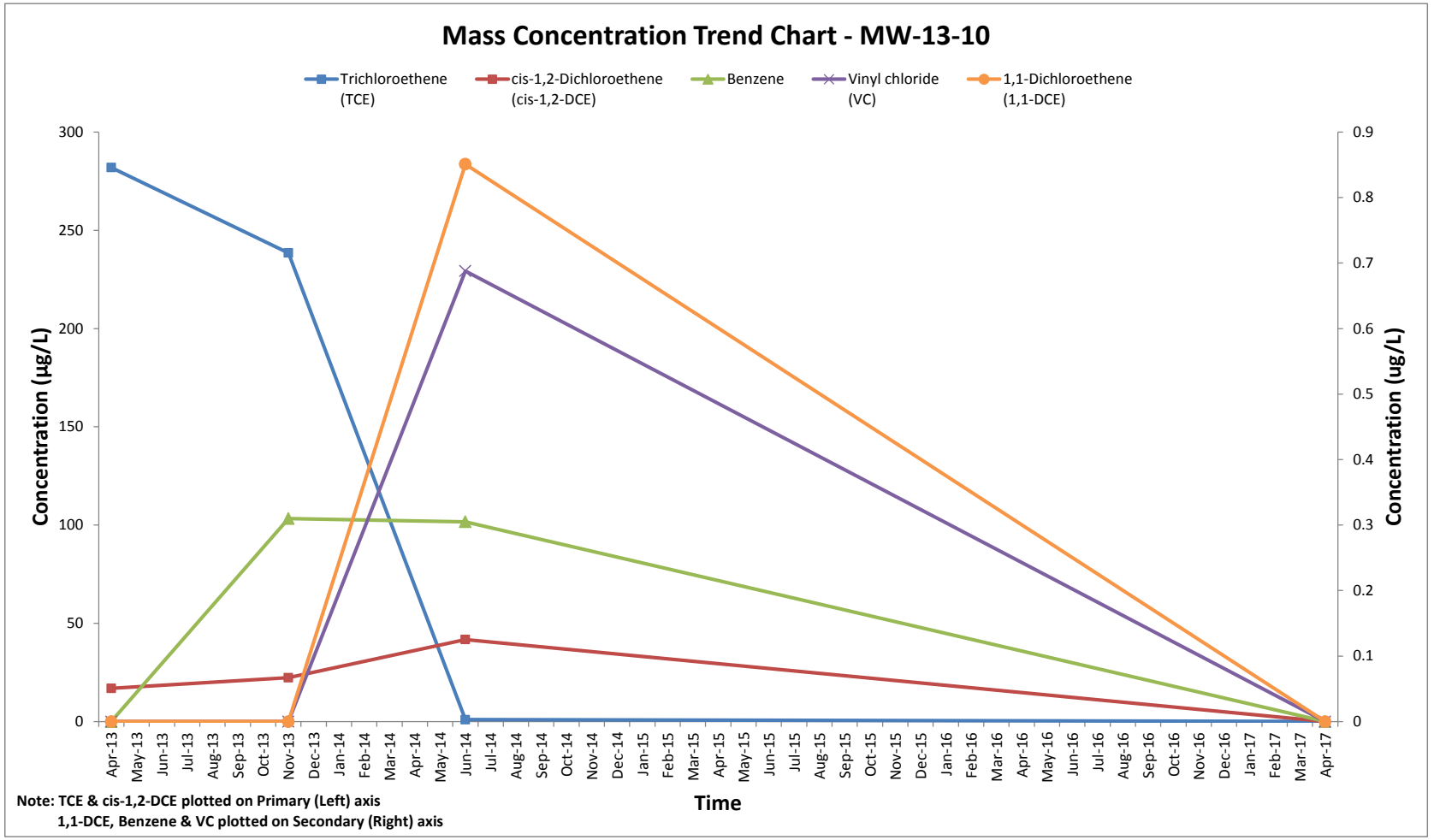


Mass Concentration (µg/L) of COCs for MW-13-10

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Apr-13 | 2 U | 2 U | 16.9 | 2 U | 282 | 2 U |
| Nov-13 | 0.25 U | 0.31 | 22.3 | 0.25 U | 238.5 | 0.25 U |
| Jun-14 | 0.851 | 0.305 | 41.75 | 0.25 U | 0.986 | 0.688 |
| Apr-17 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |

* yellow highlight indicates J-flagged value

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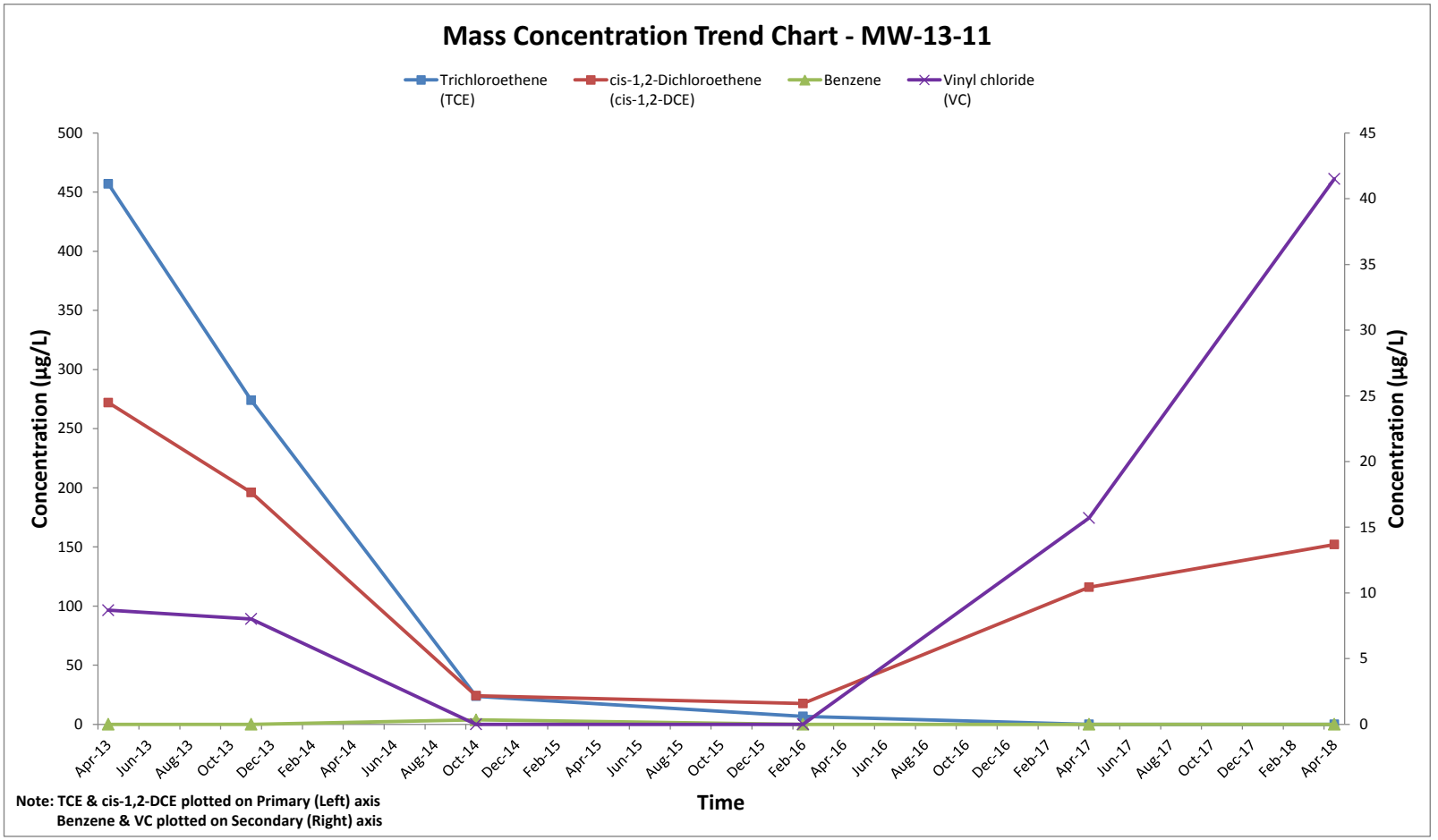


Mass Concentration (µg/L) of COCs for MW-13-11

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Apr-13 | 2.5 U | 2.5 U | 272 | 2.5 U | 457 | 8.68 |
| Nov-13 | 0.625 U | 0.625 U | 196 | 0.625 U | 274 | 8.02 |
| Oct-14 | 0.25 U | 0.336 | 24.2 | 0.25 U | 23.7 | 0.25 U |
| Feb-16 | 0.5 U | 0.5 U | 17.5 | 0.5 U | 6.67 | 0.5 U |
| Apr-17 | 0.5 U | 0.5 U | 116 | 0.5 U | 0.5 U | 15.7 |
| Apr-18 | 0.5 U | 0.5 U | 152 | 0.695 | 0.5 U | 41.5 |

* yellow highlight indicates J-flagged value

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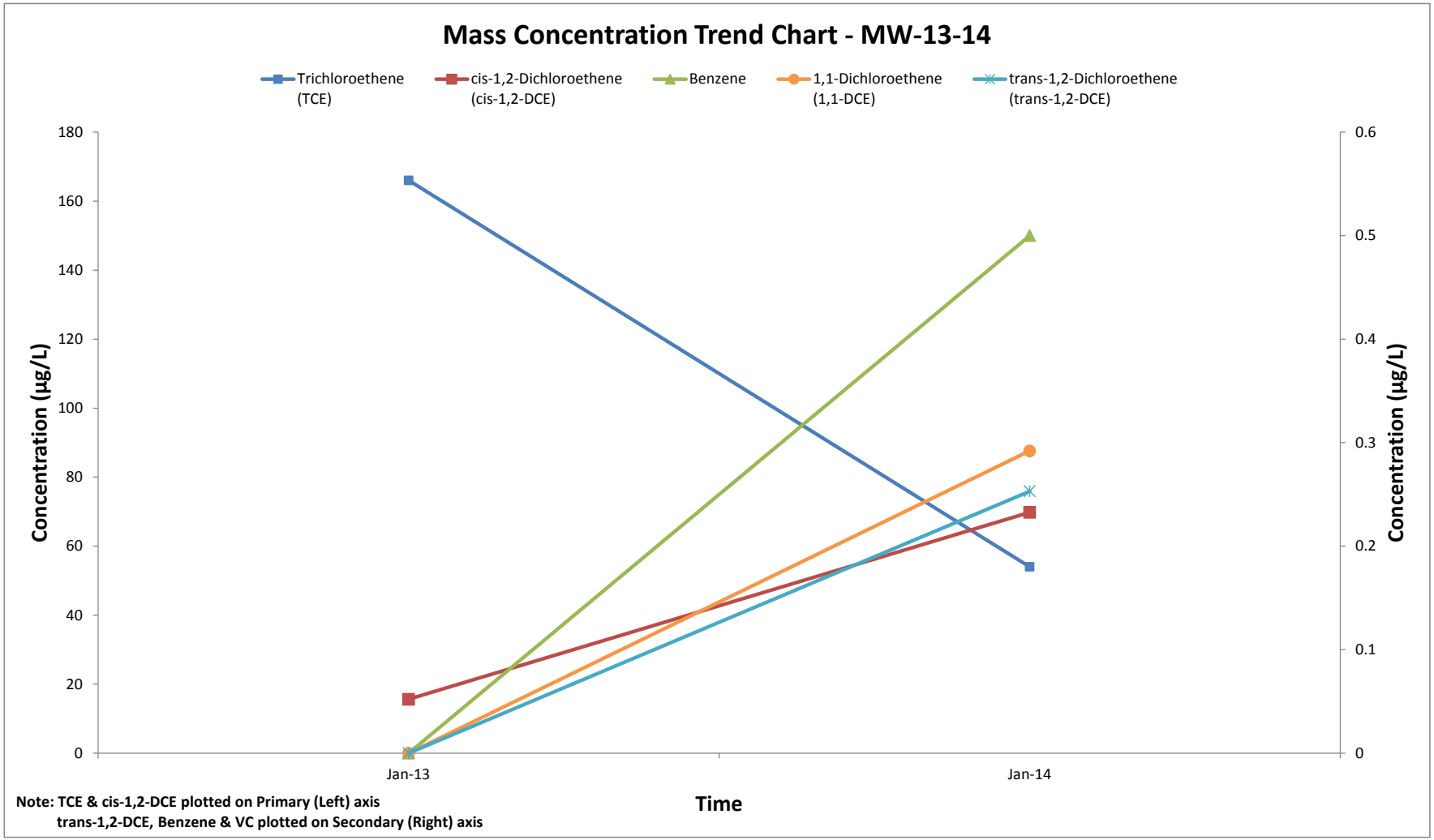


Mass Concentration (µg/L) of COCs for MW-13-14

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Nov-13 | 0.5 U | 0.5 U | 15.6 | 0.5 U | 166 | 0.5 U |
| Jun-14 | 0.292 | 0.5 | 69.8 | 0.253 | 54 | 0.25 U |

* yellow highlight indicates J-flagged value

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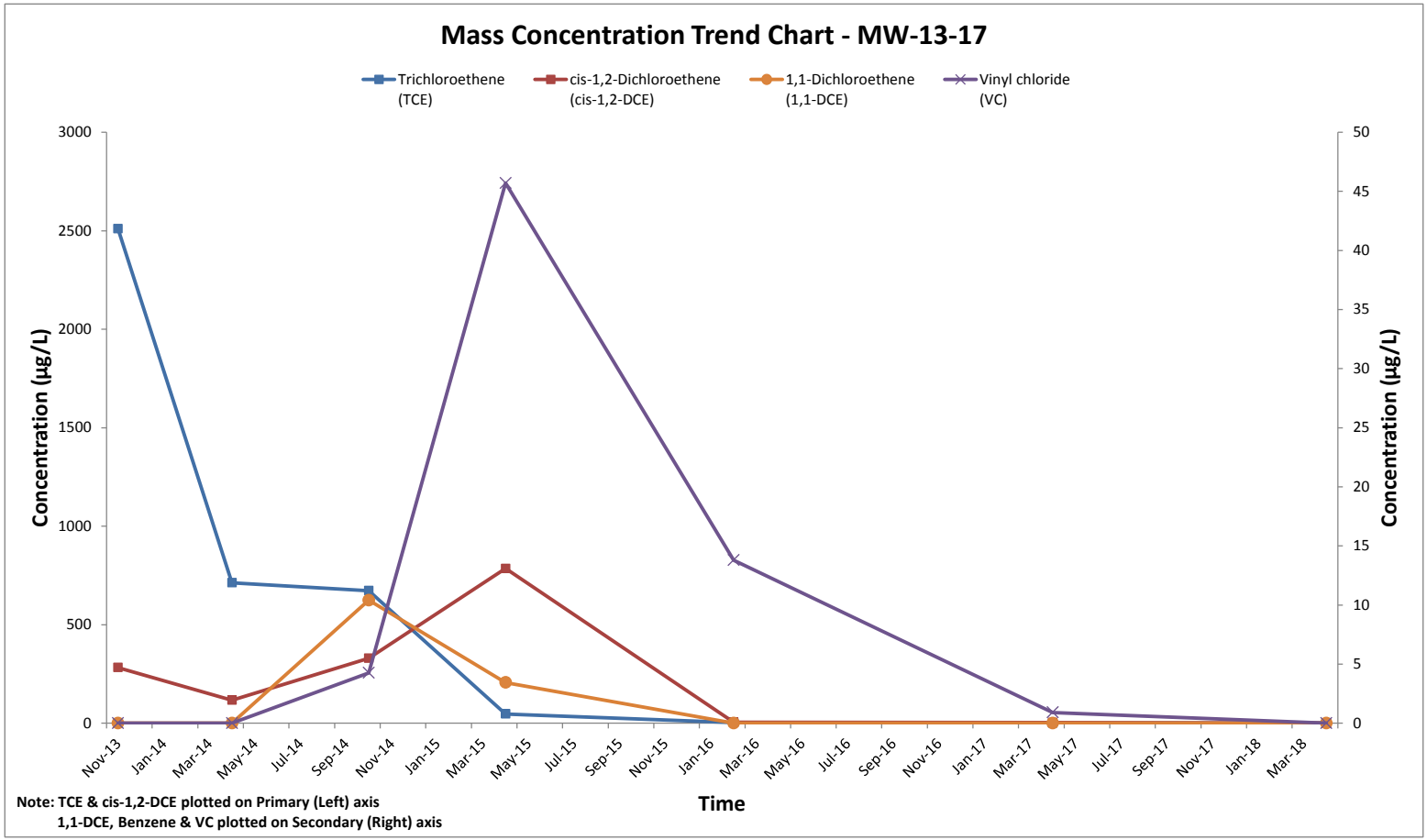


Mass Concentration (µg/L) of COCs for MW-13-17

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Nov-13 | 6.25 U | 6.25 U | 282 | 6.25 U | 2510 | 6.25 UJ |
| Apr-14 | 2.5 U | 2.5 U | 117 | 2.5 U | 713 | 2.5 U |
| Oct-14 | 10.4 | 1.25 U | 329 | 1.25 U | 673 | 4.26 |
| Apr-15 | 3.44 | 1.25 U | 785 | 1.57 | 46.8 | 45.7 |
| Feb-16 | 0.5 U | 0.5 U | 5.18 | 0.5 U | 2.9 | 13.8 |
| Apr-17 | 0.5 U | 0.5 U | 2.46 | 0.5 U | 0.5 U | 0.906 |
| Apr-18 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |

* yellow highlight indicates J-flagged value

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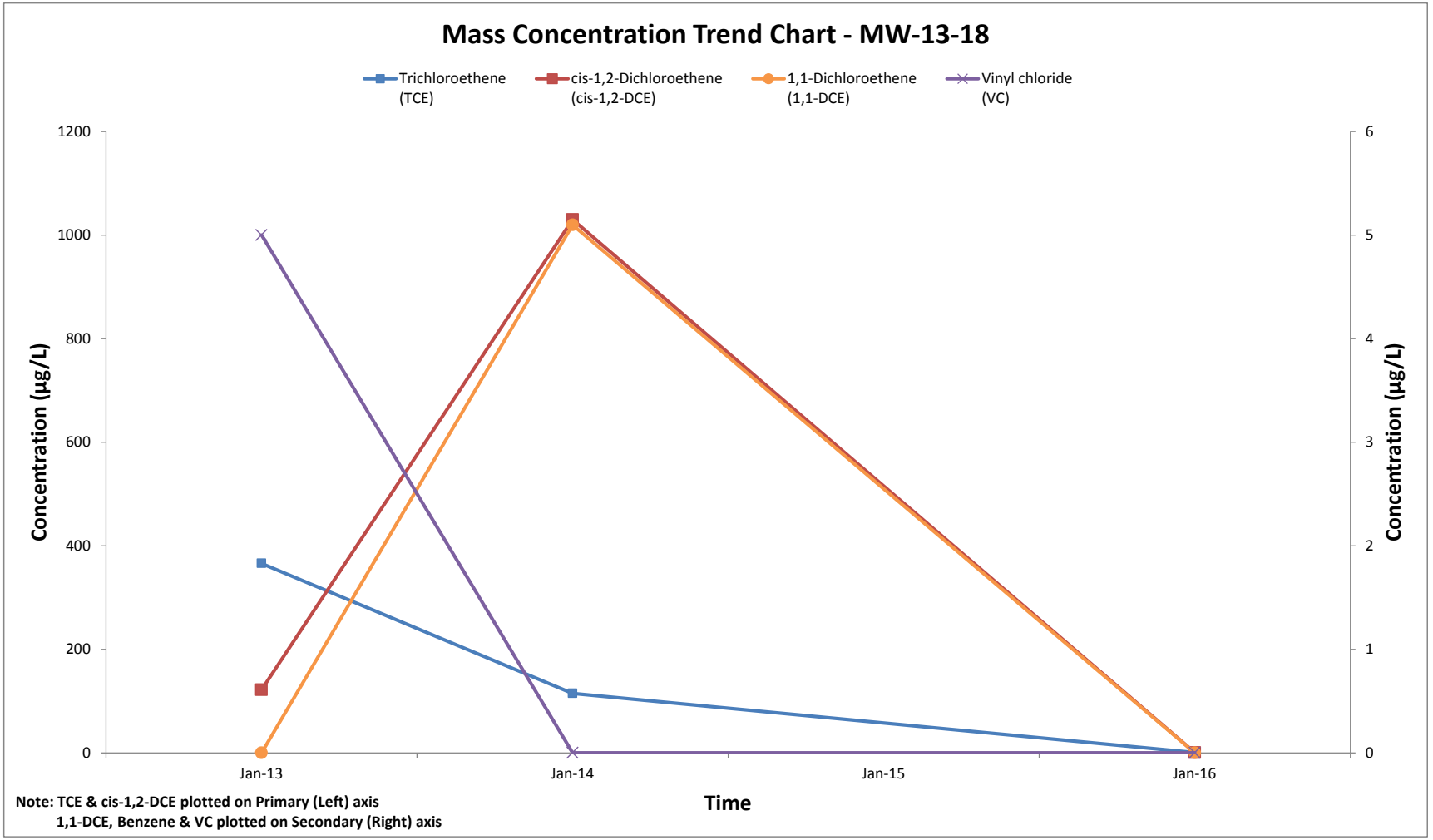


Mass Concentration (µg/L) of COCs for MW-13-18

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Nov-13 | 0.625 U | 0.625 U | 122 | 0.625 U | 366 | 5 |
| Jun-14 | 5.1 | 2.5 U | 1030 | 2.5 U | 115 | 2.5 U |
| Sep-16 | 0.5 U | 0.662 | 0.569 | 0.582 | 0.659 | 0.5 U |

* yellow highlight indicates J-flagged value

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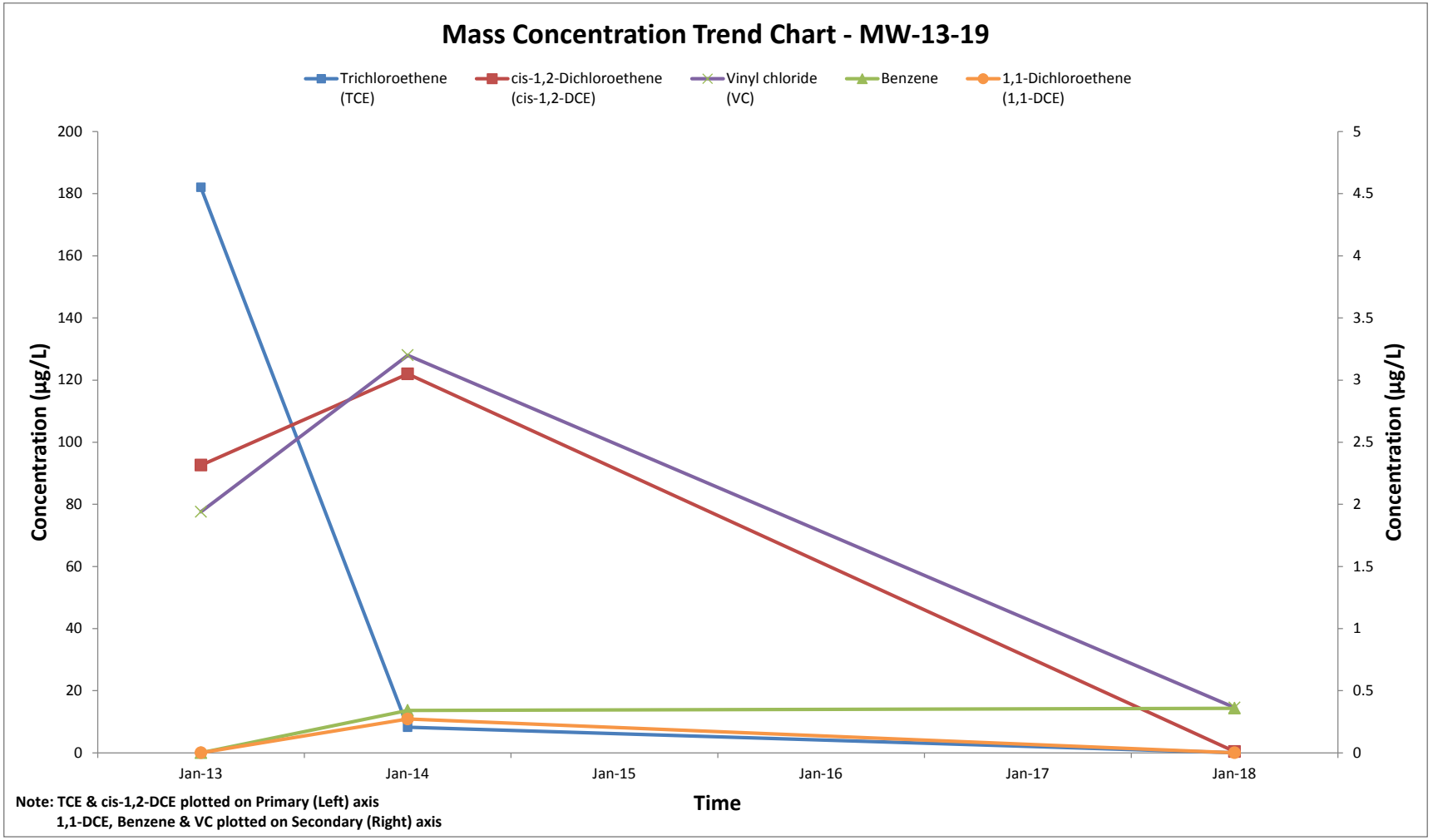


Mass Concentration (µg/L) of COCs for MW-13-19

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Nov-13 | 0.5 U | 0.5 U | 92.6 | 0.5 U | 182 | 1.94 |
| Jun-14 | 0.272 | 0.342 | 122 | 0.25 U | 8.22 | 3.2 |
| Apr-18 | 0.5 U | 0.359 | 0.42 | 0.5 U | 0.5 U | 0.364 |

* yellow highlight indicates J-flagged value

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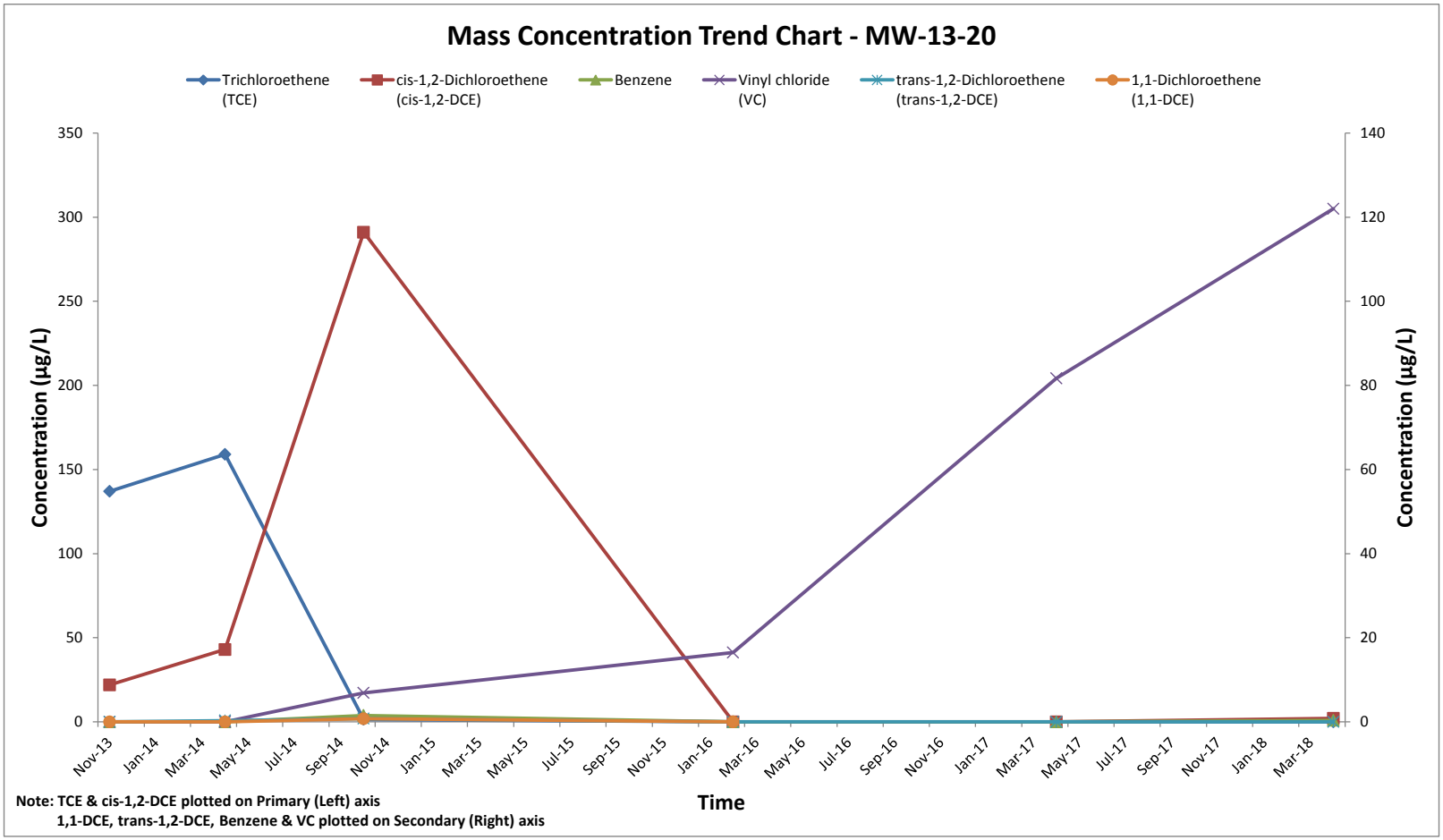


Mass Concentration (µg/L) of COCs for MW-13-20

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Nov-13 | 0.5 U | 0.5 U | 21.9 | 0.5 U | 137 | 0.5 UJ |
| Apr-14 | 0.25 U | 0.25 U | 43 | 0.311 | 159 | 0.25 U |
| Oct-14 | 0.734 | 1.52 | 291 | 0.789 | 1.44 | 6.87 |
| Feb-16 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 16.5 |
| Apr-17 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 81.7 |
| Apr-18 | 0.5 U | 0.358 | 2.12 | 0.5 U | 0.5 U | 122 |

* yellow highlight indicates J-flagged value

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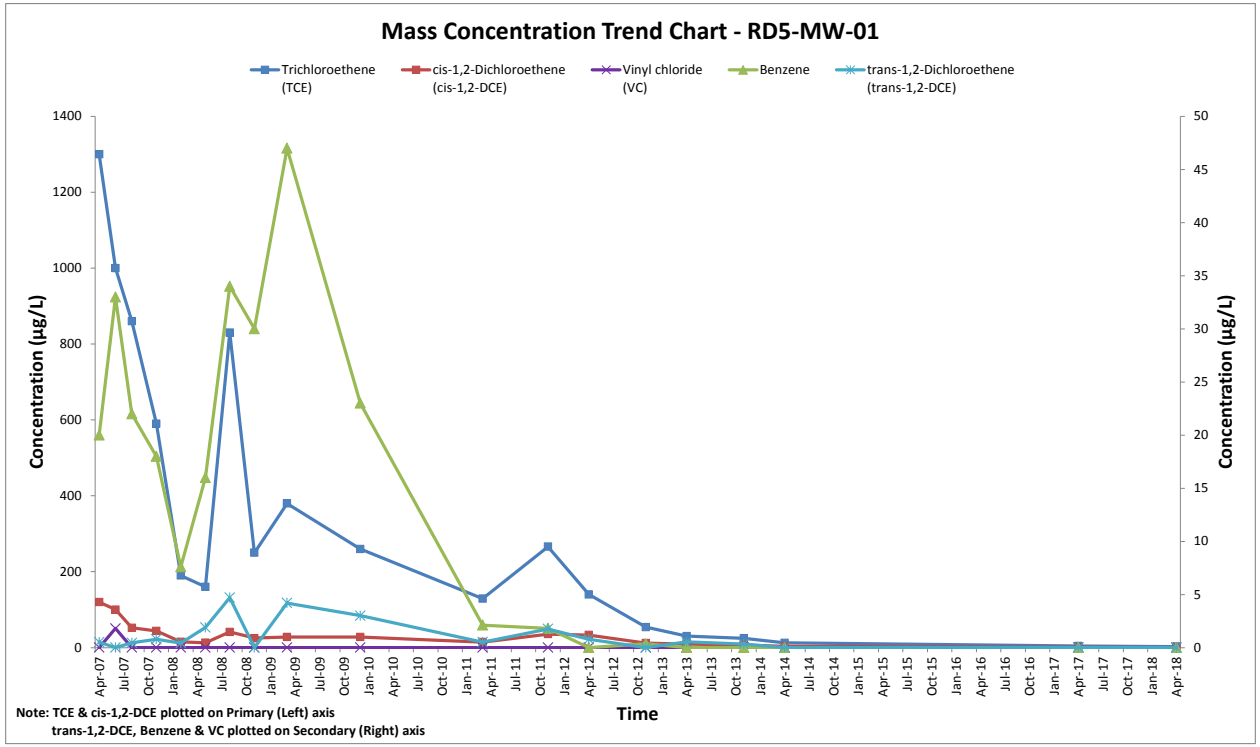


Mass Concentration (µg/L) of COCs for RD5-MW-01

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Apr-07 | 1 U | 20 | 120 | 0.51 | 1300 | 1 U |
| Jun-07 | 1 U | 33 | 100 | 1 U | 1000 | 1.8 |
| Aug-07 | 1 U | 22 | 52 | 0.45 | 860 | 1 U |
| Nov-07 | 1 U | 18 | 44 | 0.79 | 590 | 1 U |
| Feb-08 | 1 U | 7.6 | 15 | 0.43 | 190 | 1 U |
| May-08 | 1 U | 16 | 13 | 1.9 | 160 | 1 U |
| Aug-08 | 1 U | 34 | 41 | 4.7 | 830 | 1 U |
| Nov-08 | 4 U | 30 | 25 | 4 U | 250 | 4 U |
| Mar-09 | 1 U | 47 | 28 | 4.2 | 380 | 1 U |
| Dec-09 | 1 U | 23 | 28 | 3 | 260 | 2 U |
| Mar-11 | 1 U | 2.12 | 14.8 | 0.528 | 129 | 1 U |
| Nov-11 | 1 U | 1.82 | 35.8 | 1.76 | 266 | 1 U |
| Apr-12 | 1 U | 0.4 U | 33.3 | 0.785 | 140 | 1 U |
| Nov-12 | 1 U | 0.353 | 12.2 | 1 U | 54.1 | 1 U |
| Apr-13 | 1 U | 1 U | 9.5 | 0.53 | 30.4 | 1 U |
| Nov-13 | 0.25 U | 0.25 U | 6.83 | 0.33 | 24.7 | 0.25 U |
| Apr-14 | 0.25 U | 0.25 U | 3.29 | 0.25 U | 12.5 | 0.25 U |
| Apr-17 | 0.25 U | 0.25 U | 0.577 | 0.25 U | 4.255 | 0.25 U |
| Apr-18 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.97 | 0.5 U |

* yellow highlight indicates J-flagged value

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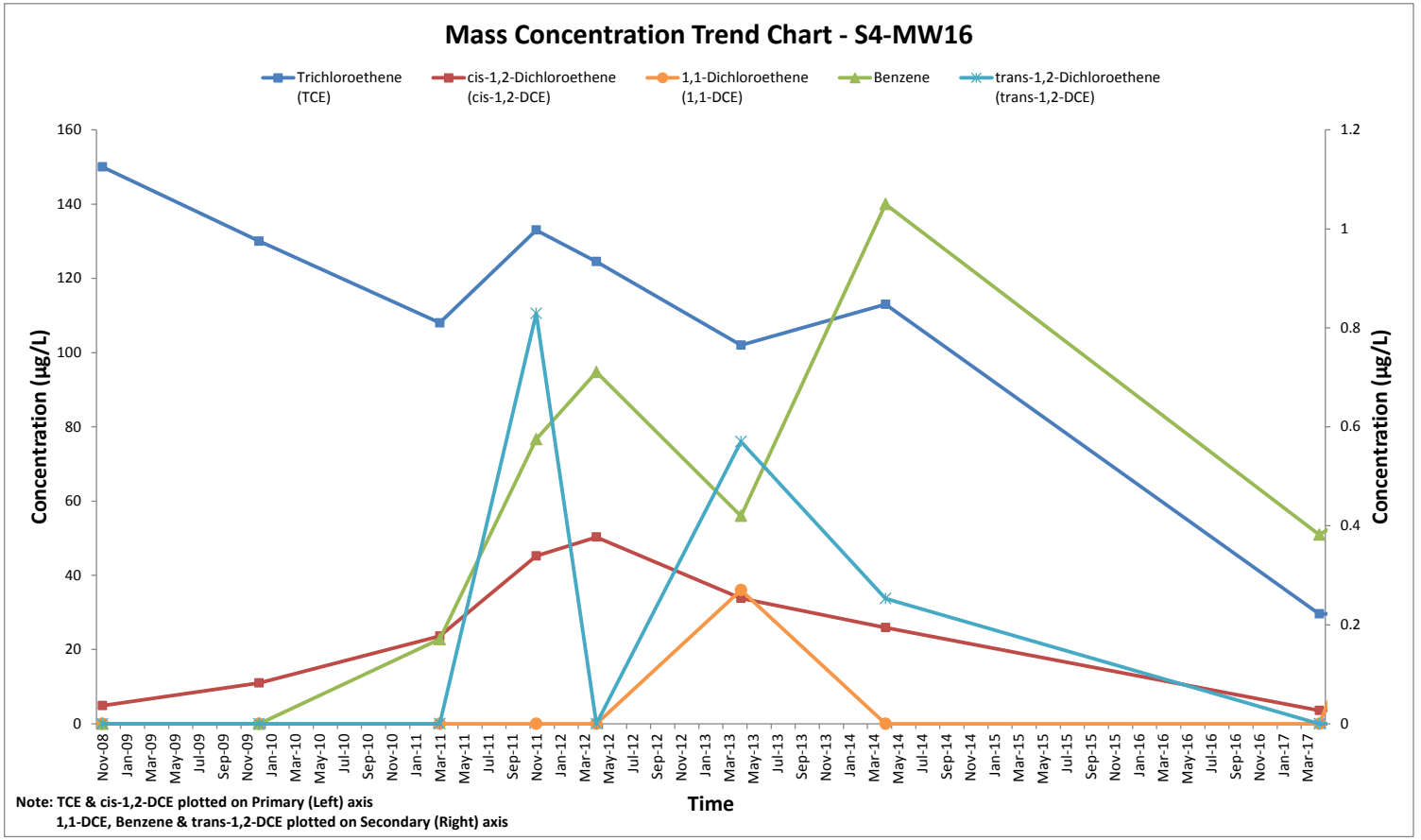


Mass Concentration (µg/L) of COCs for S4-MW16

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Nov-08 | 1 U | 1 U | 4.9 | 1 U | 150 | 1 U |
| Dec-09 | 1 U | 1 U | 11 | 1 U | 130 | 2 U |
| Mar-11 | 1 U | 0.171 | 23.6 | 1 U | 108 | 1 U |
| Nov-11 | 1 U | 0.575 | 45.2 | 0.829 | 133 | 1 U |
| Apr-12 | 1 U | 0.7105 | 50.3 | 1 U | 124.5 | 1 U |
| Apr-13 | 0.27 | 0.42 | 33.8 | 0.57 | 102 | 1 U |
| Apr-14 | 0.25 U | 1.05 | 25.9 | 0.253 | 113 | 0.25 U |
| Apr-17 | 0.25 U | 0.382 | 3.6 | 0.25 U | 29.6 | 0.25 U |
| Apr-18 | 0.712 | 0.561 | 5.38 | 0.5 U | 30.5 | 0.5 U |

* yellow highlight indicates J-flagged value

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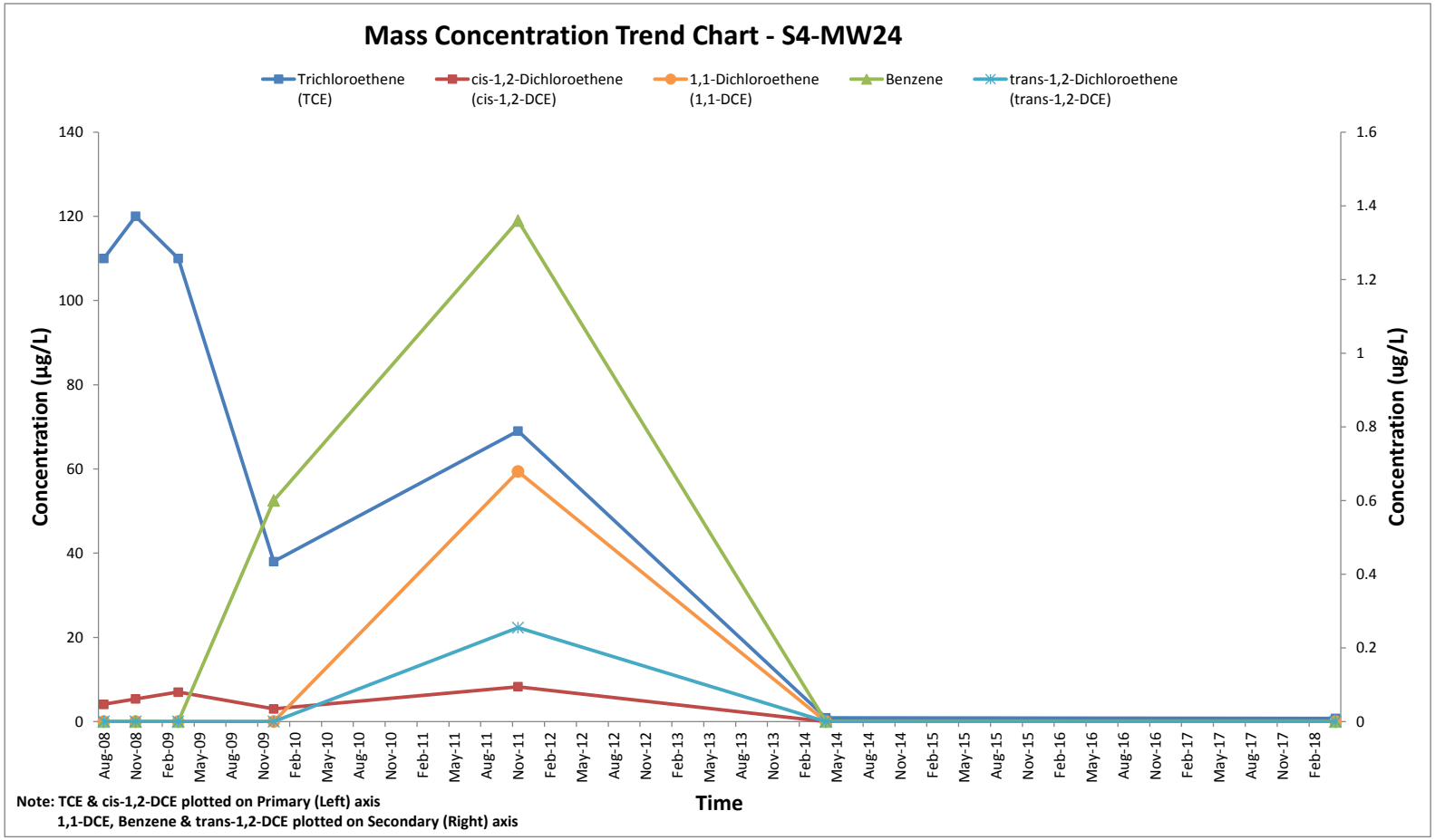


Mass Concentration (µg/L) of COCs for S4-MW24

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Aug-08 | 1 U | 1 U | 4.1 | 1 U | 110 | 1 U |
| Nov-08 | 1 U | 1 U | 5.4 | 1 U | 120 | 1 U |
| Mar-09 | 1 U | 1 U | 7 | 1 U | 110 | 1 U |
| Dec-09 | 1 U | 0.6 | 3 | 1 U | 38 | 2 U |
| Nov-11 | 0.679 | 1.36 | 8.28 | 0.255 | 69 | 1 U |
| Apr-14 | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.915 | 0.25 U |
| Apr-18 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.763 | 0.5 U |

* yellow highlight indicates J-flagged value

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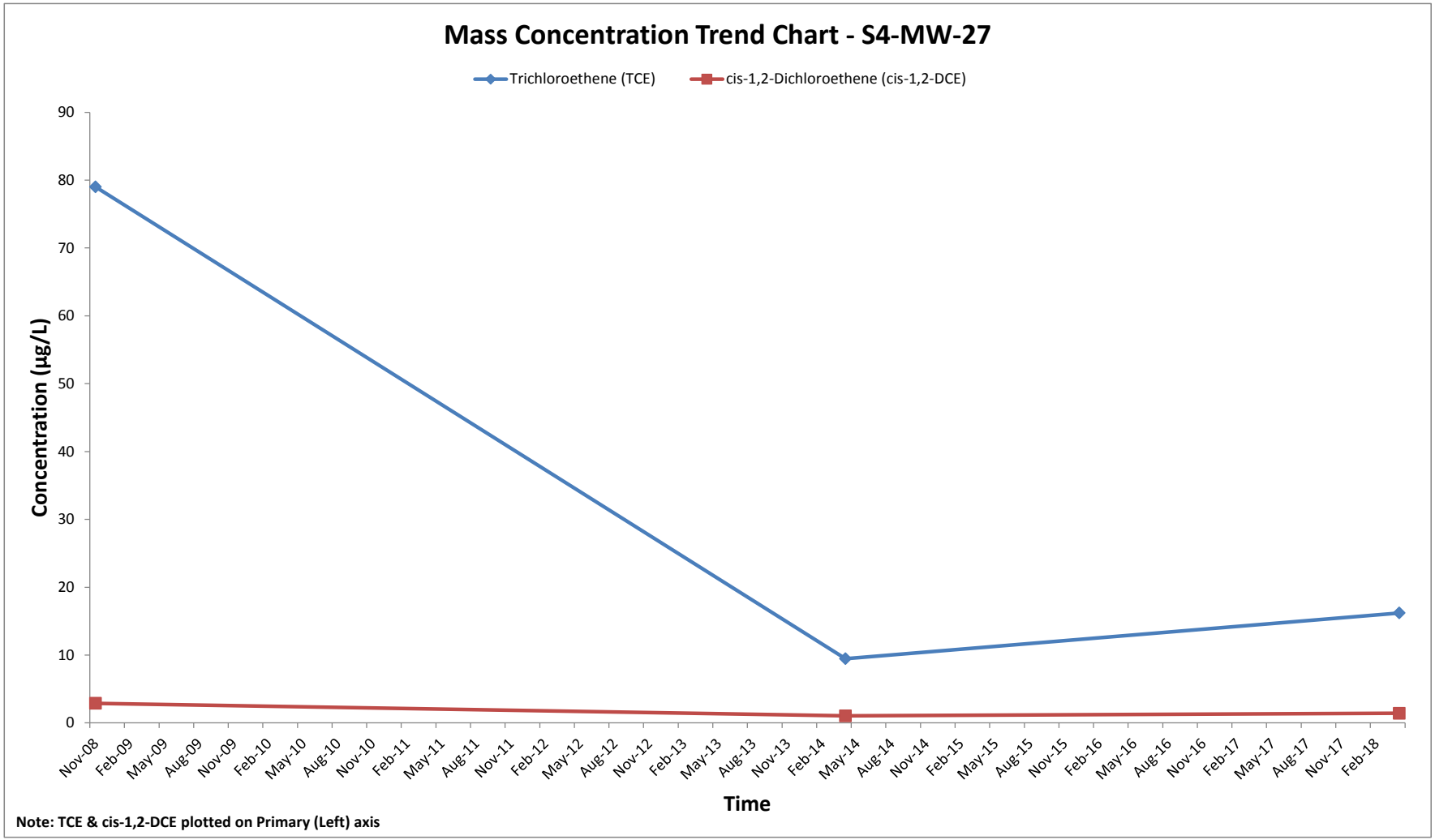


Mass Concentration (µg/L) of COCs for S4-MW27

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Nov-08 | 1 U | 1 U | 2.9 | 1 U | 79 | 1 U |
| Apr-14 | 0.25 U | 0.25 U | 1.03 | 0.25 U | 9.46 | 0.25 U |
| Apr-18 | 0.5 U | 0.5 U | 1.43 | 0.5 U | 16.2 | 0.5 U |

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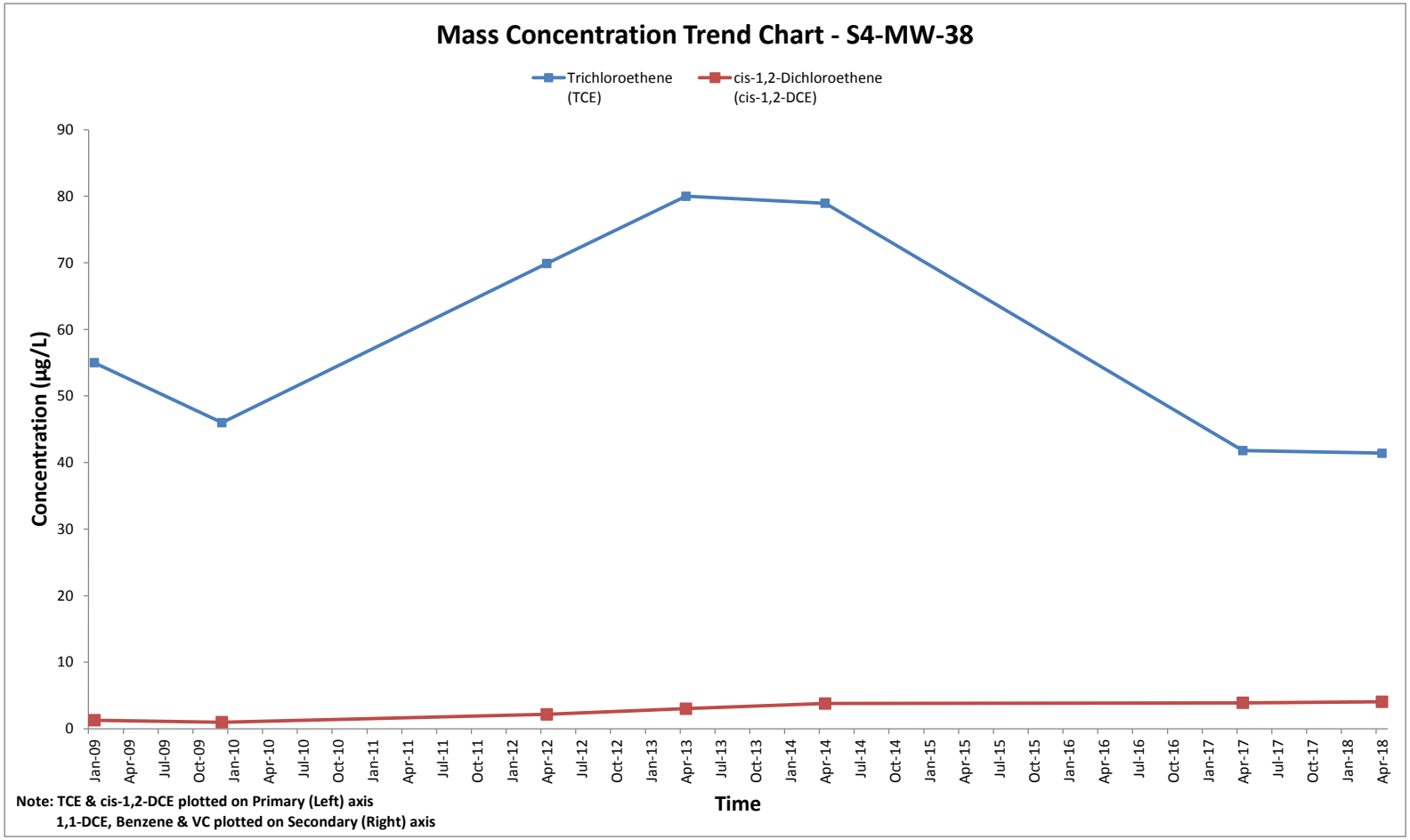


Mass Concentration (µg/L) of COCs for S4-MW38

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Jan-09 | 10 U | 5 U | 1.3 | 10 U | 55 | 10 U |
| Dec-09 | 1 U | 1 U | 1 | 1 U | 46 | 2 U |
| Apr-12 | 1 U | 0.4 U | 2.16 | 1 U | 69.9 | 1 U |
| Apr-13 | 1 U | 1 U | 3.02 | 1 U | 80 | 1 U |
| Apr-14 | 0.25 U | 0.25 U | 3.8 | 0.25 U | 78.95 | 0.25 U |
| Apr-17 | 0.25 U | 0.25 U | 3.9 | 0.25 U | 41.8 | 0.25 U |
| Apr-18 | 0.5 U | 0.5 U | 4.06 | 0.5 U | 41.4 | 0.5 U |

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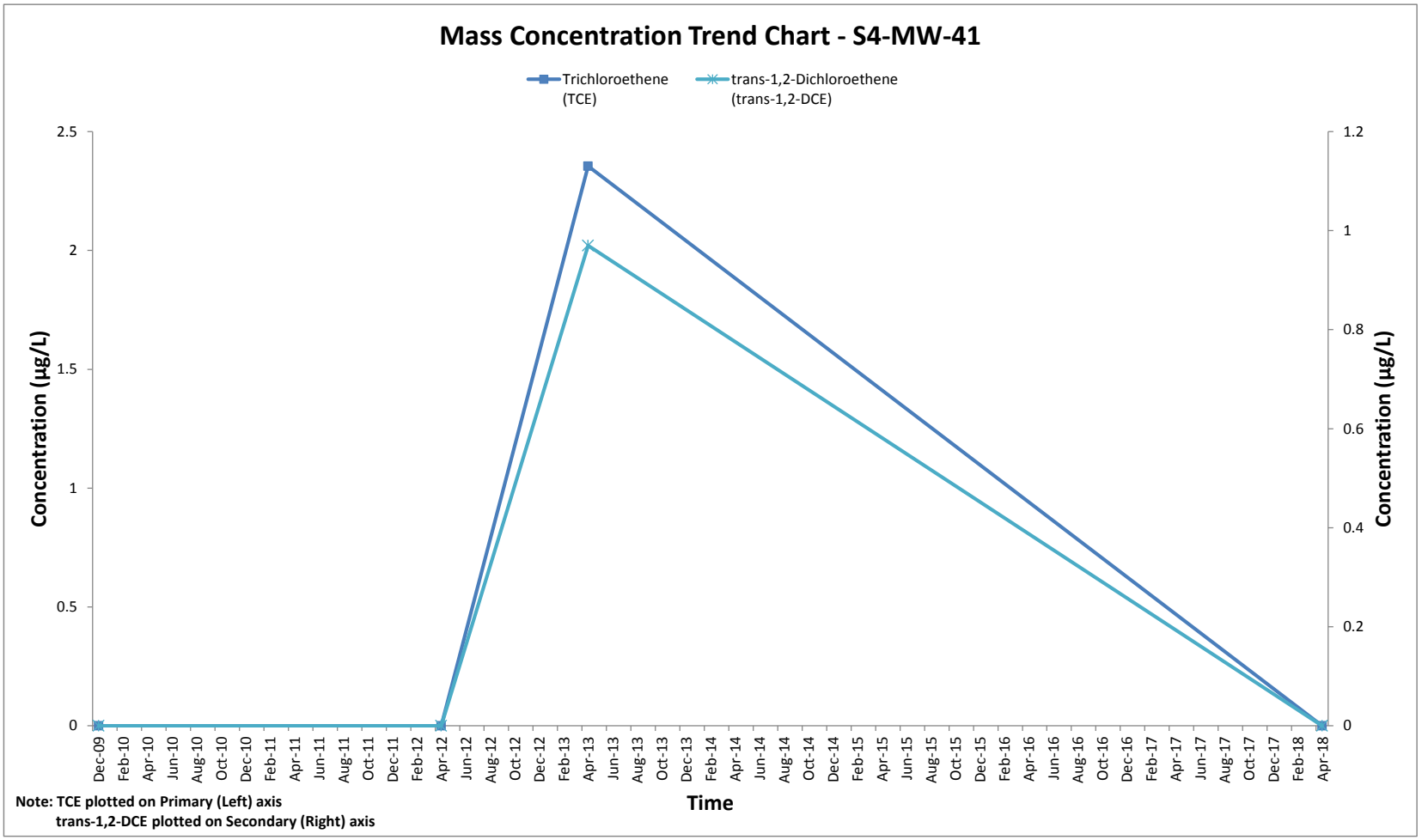


Mass Concentration (µg/L) of COCs for S4-MW41

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Dec-09 | 1 U | 1 U | 1 U | 1 U | 1 U | 2 U |
| Apr-12 | 1 U | 0.4 U | 1 U | 1 U | 1 U | 1 U |
| Apr-13 | 1 U | 1 U | 1 U | 0.97 | 2.355 | 1 U |
| Apr-18 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |

* yellow highlight indicates J-flagged value

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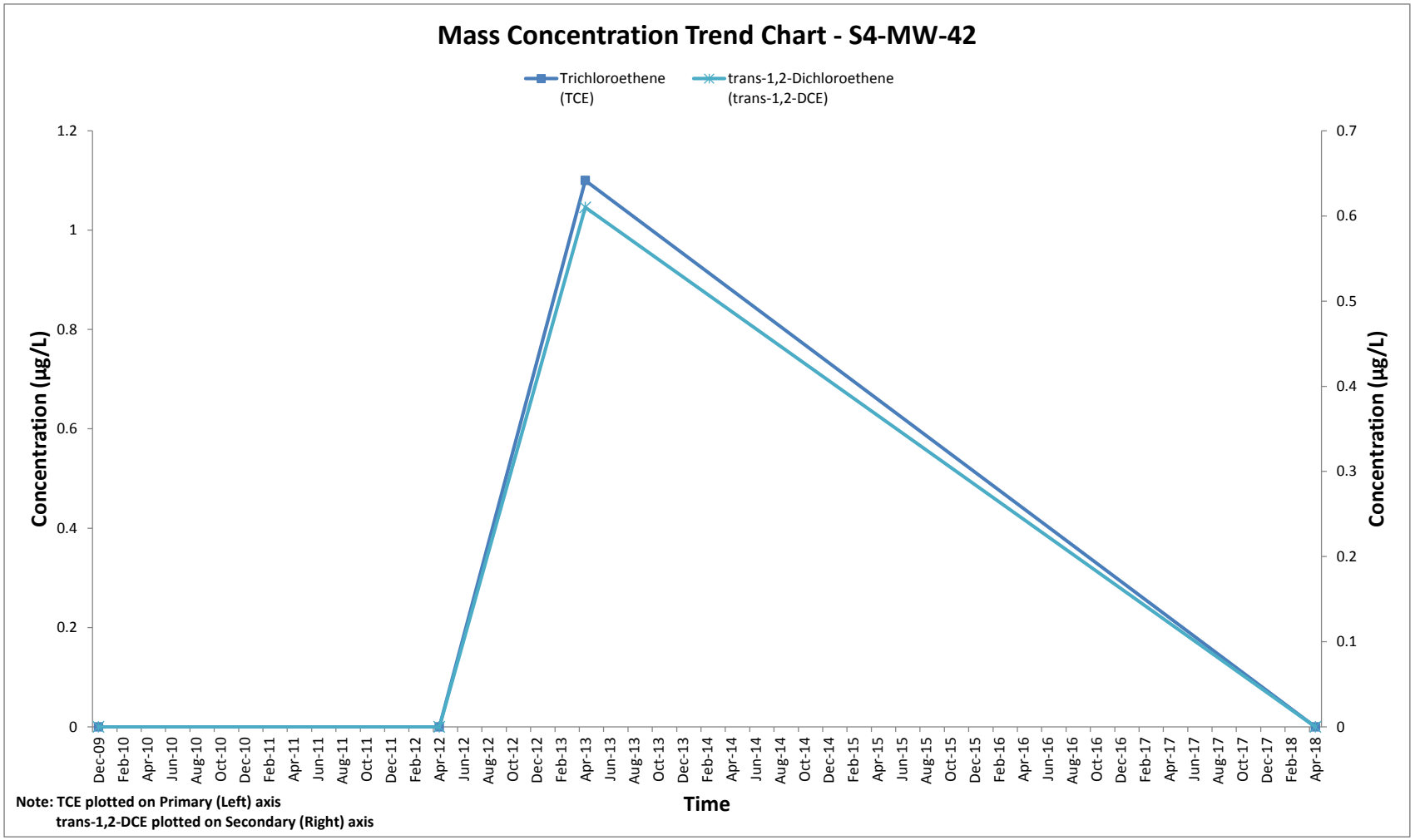
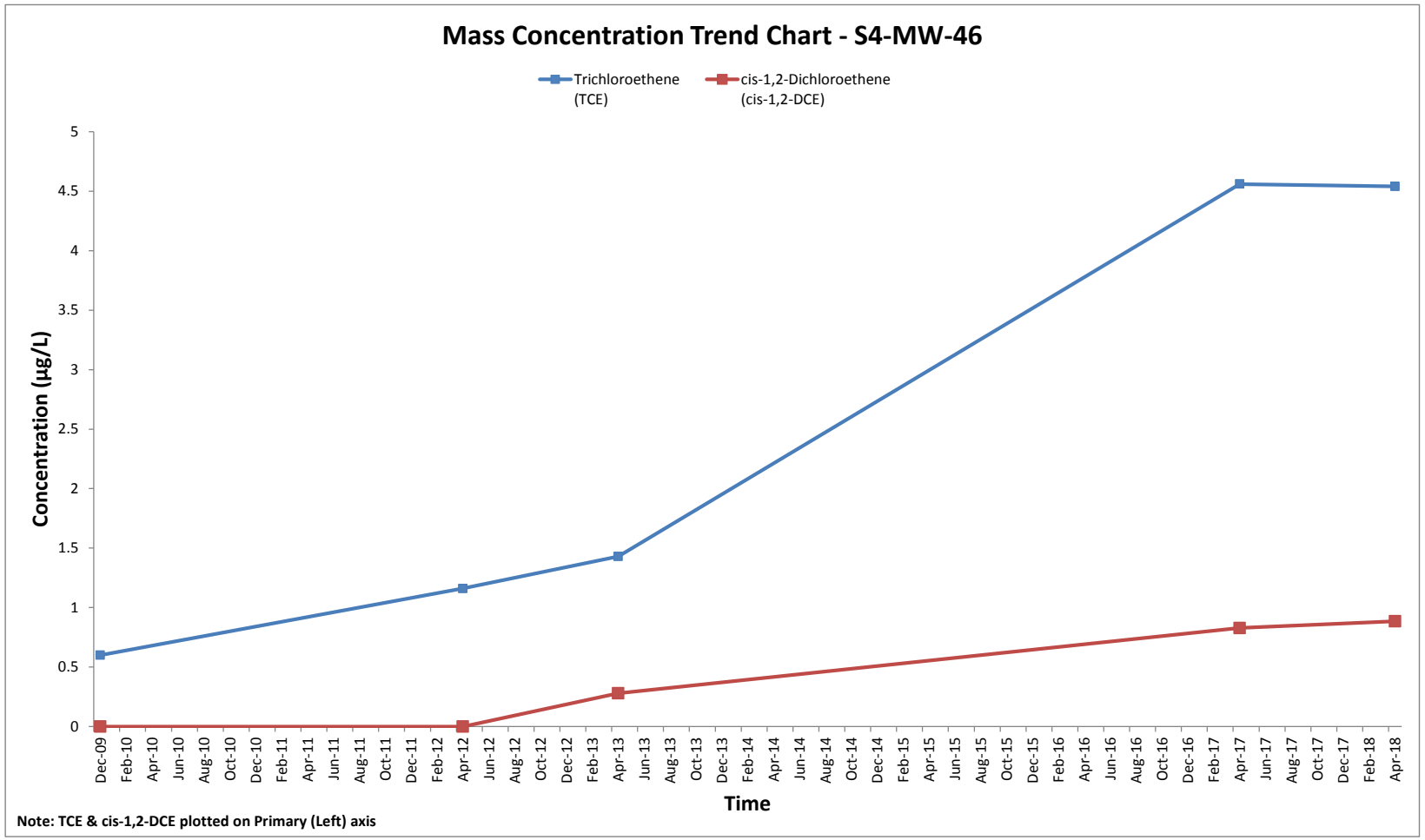



Mass Concentration (µg/L) of COCs for S4-MW42

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Dec-09 | 1 U | 1 U | 1 U | 1 U | 1 U | 2 U |
| Apr-12 | 1 U | 0.4 U | 1 U | 1 U | 1 U | 1 U |
| Apr-13 | 1 U | 1 U | 1 U | 0.61 | 1.1 | 1 U |
| Apr-18 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |

BACK

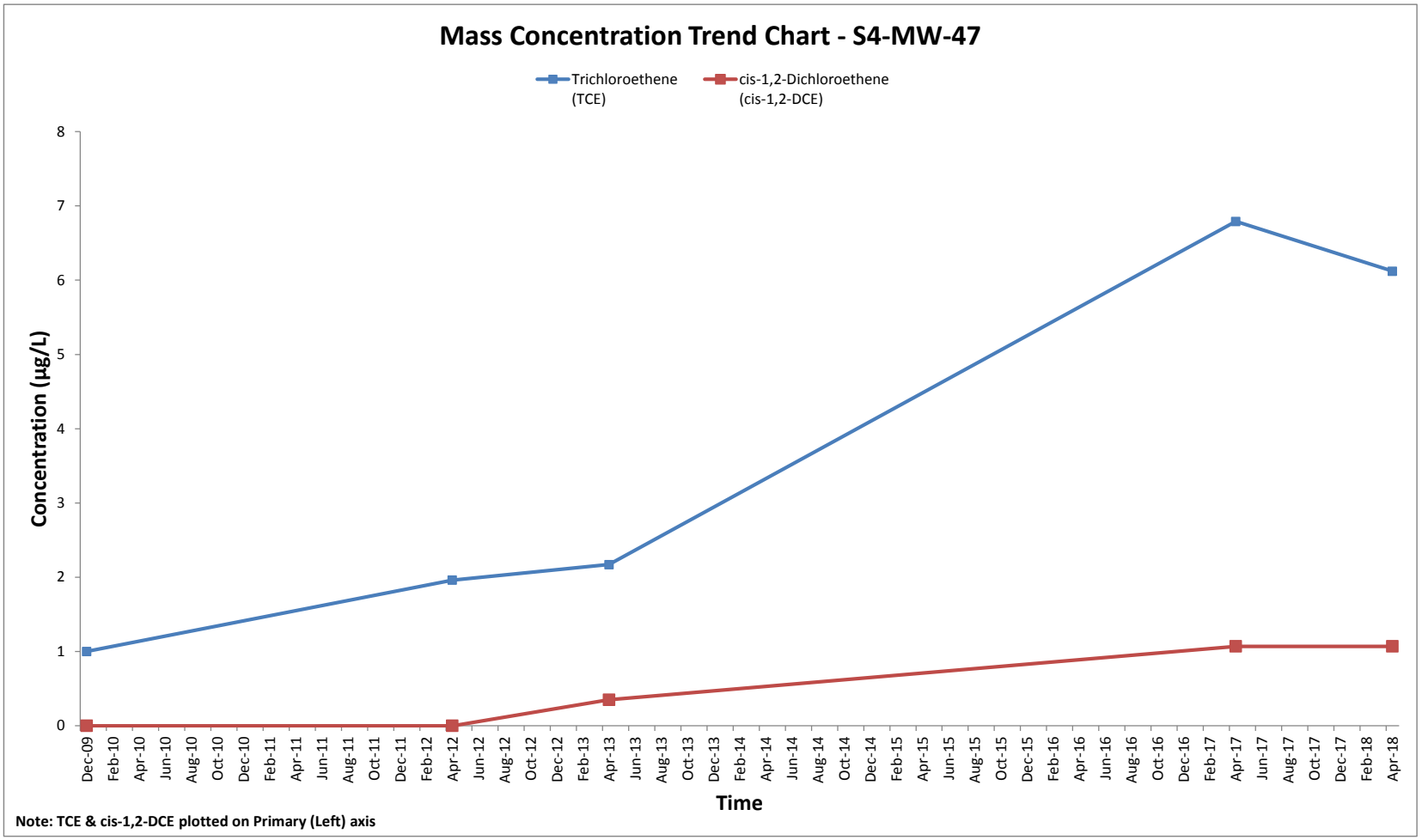



Mass Concentration (µg/L) of COCs for S4-MW46

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Dec-09 | 1 U | 1 U | 1 U | 1 U | 0.6 | 2 U |
| Apr-12 | 1 U | 0.4 U | 1 U | 1 U | 1.16 | 1 U |
| Apr-13 | 1 U | 1 U | 0.28 | 1 U | 1.43 | 1 U |
| Apr-17 | 1 U | 1 U | 0.828 | 1 U | 4.56 | 1 U |
| Apr-18 | 0.5 U | 0.5 U | 0.885 | 0.5 U | 4.54 | 0.5 U |

* yellow highlight indicates J-flagged value

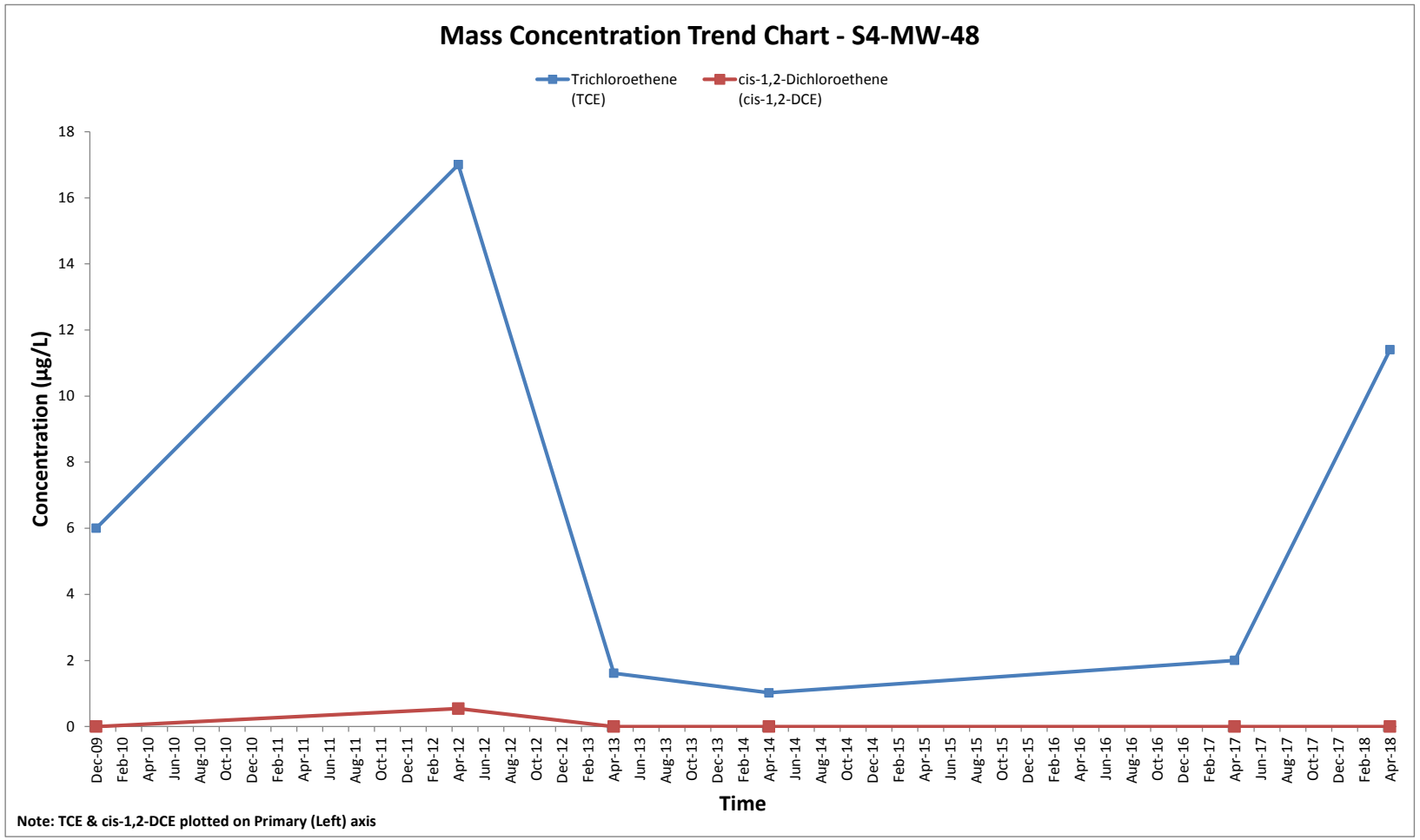
BACK




Mass Concentration (µg/L) of COCs for S4-MW47

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Dec-09 | 1 U | 1 U | 1 U | 1 U | 1 | 2 U |
| Apr-12 | 1 U | 0.4 U | 1 U | 1 U | 1.96 | 1 U |
| Apr-13 | 1 U | 1 U | 0.35 | 1 U | 2.17 | 1 U |
| Apr-17 | 1 U | 1 U | 1.07 | 1 U | 6.79 | 1 U |
| Apr-18 | 0.5 U | 0.5 U | 1.07 | 0.5 U | 6.12 | 0.5 U |

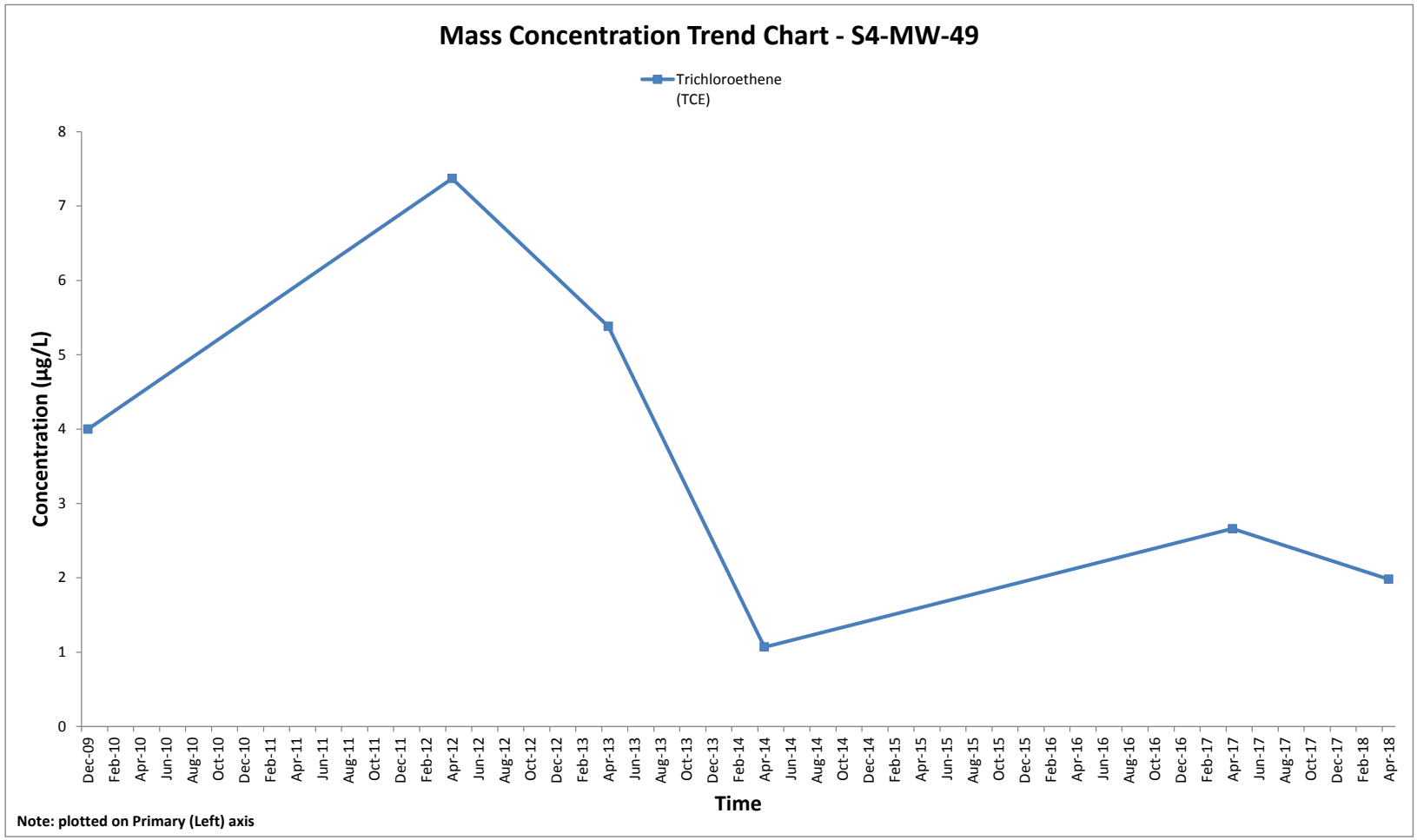
BACK




Mass Concentration (µg/L) of COCs for S4-MW48

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Dec-09 | 1 U | 1 U | 1 U | 1 U | 6 | 2 U |
| Apr-12 | 1 U | 0.4 U | 0.543 | 1 U | 17 | 1 U |
| Apr-13 | 1 U | 1 U | 1 U | 1 U | 1.61 | 1 U |
| Apr-14 | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 1.02 | 0.25 U |
| Apr-17 | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 2 | 0.25 U |
| Apr-18 | 0.5 U | 0.5 U | 0.416 J | 0.5 U | 11.4 | 0.5 U |

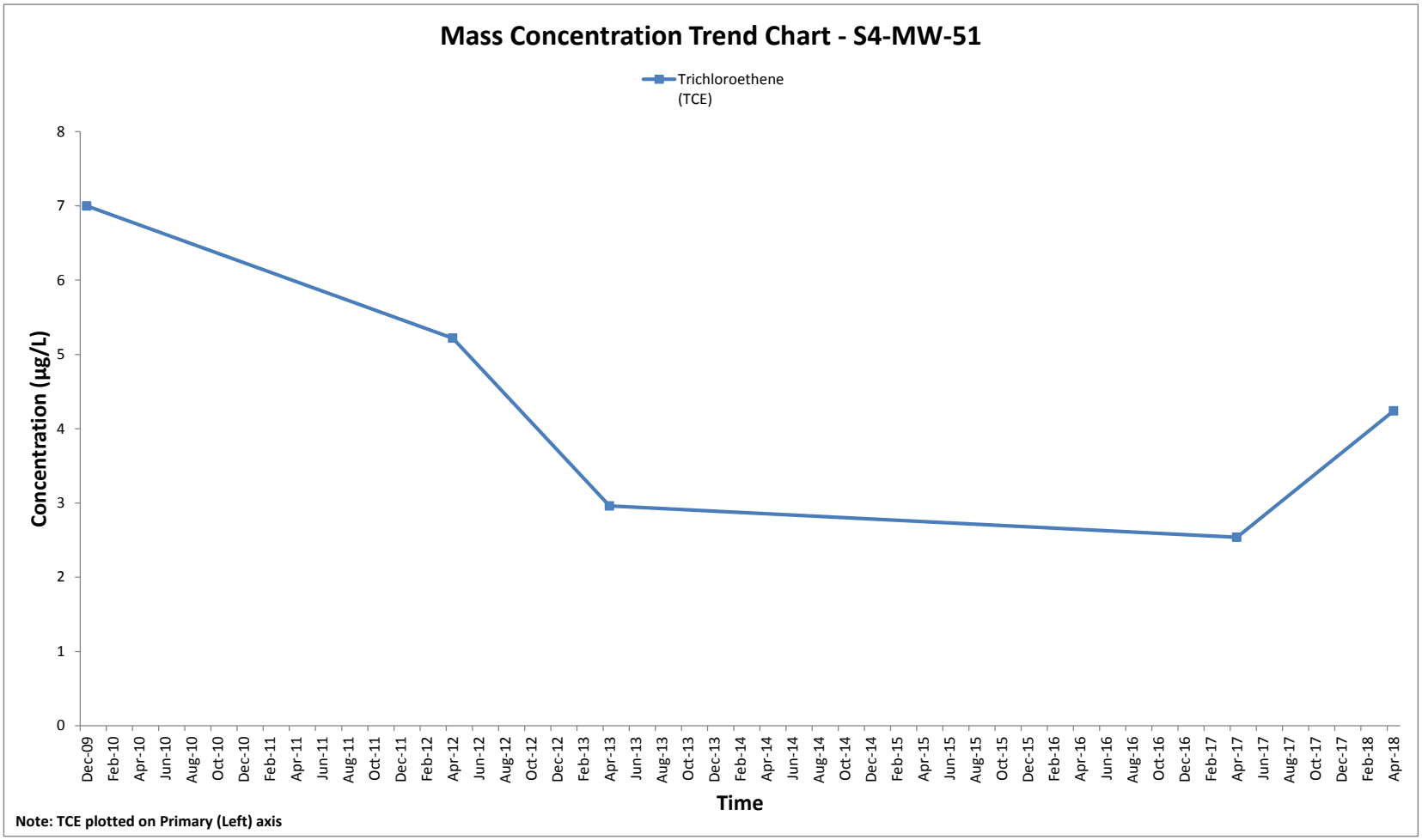
BACK




Mass Concentration (µg/L) of COCs for S4-MW49

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Dec-09 | 1 U | 1 U | 1 U | 1 U | 4 | 2 U |
| Apr-12 | 1 U | 0.4 U | 1 U | 1 U | 7.37 | 1 U |
| Apr-13 | 1 U | 1 U | 1 U | 1 U | 5.38 | 1 U |
| Apr-14 | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 1.07 | 0.25 U |
| Apr-17 | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 2.66 | 0.25 U |
| Apr-18 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 1.98 | 0.5 U |

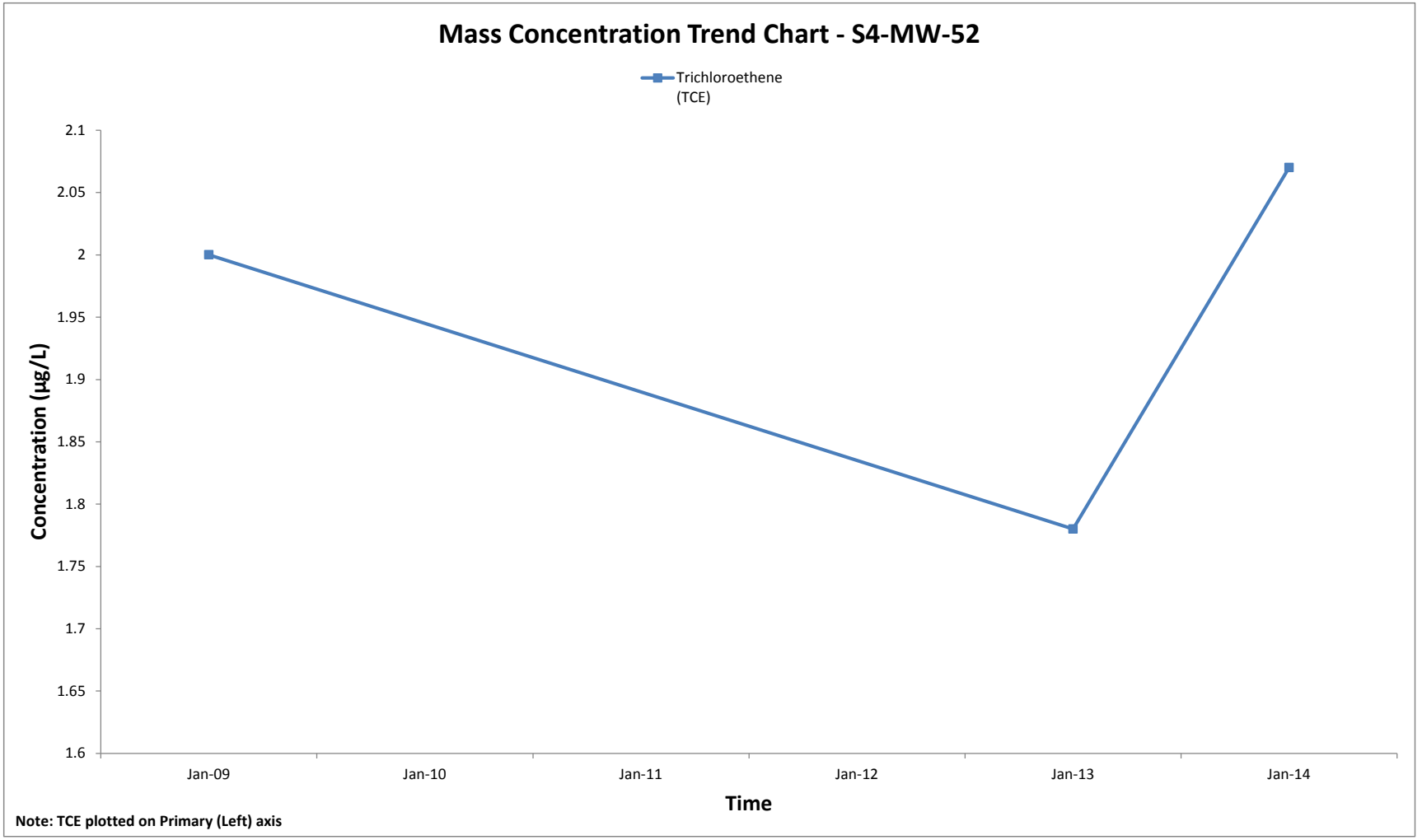
BACK




Mass Concentration (µg/L) of COCs for S4-MW51

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Dec-09 | 1 U | 1 U | 1 U | 1 U | 7 | 2 U |
| Apr-12 | 1 U | 0.4 U | 1 U | 1 U | 5.22 | 1 U |
| Apr-13 | 1 U | 1 U | 1 U | 1 U | 2.96 | 1 U |
| Apr-17 | 1 U | 1 U | 1 U | 1 U | 2.54 | 1 U |
| Apr-18 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 4.24 | 0.5 U |

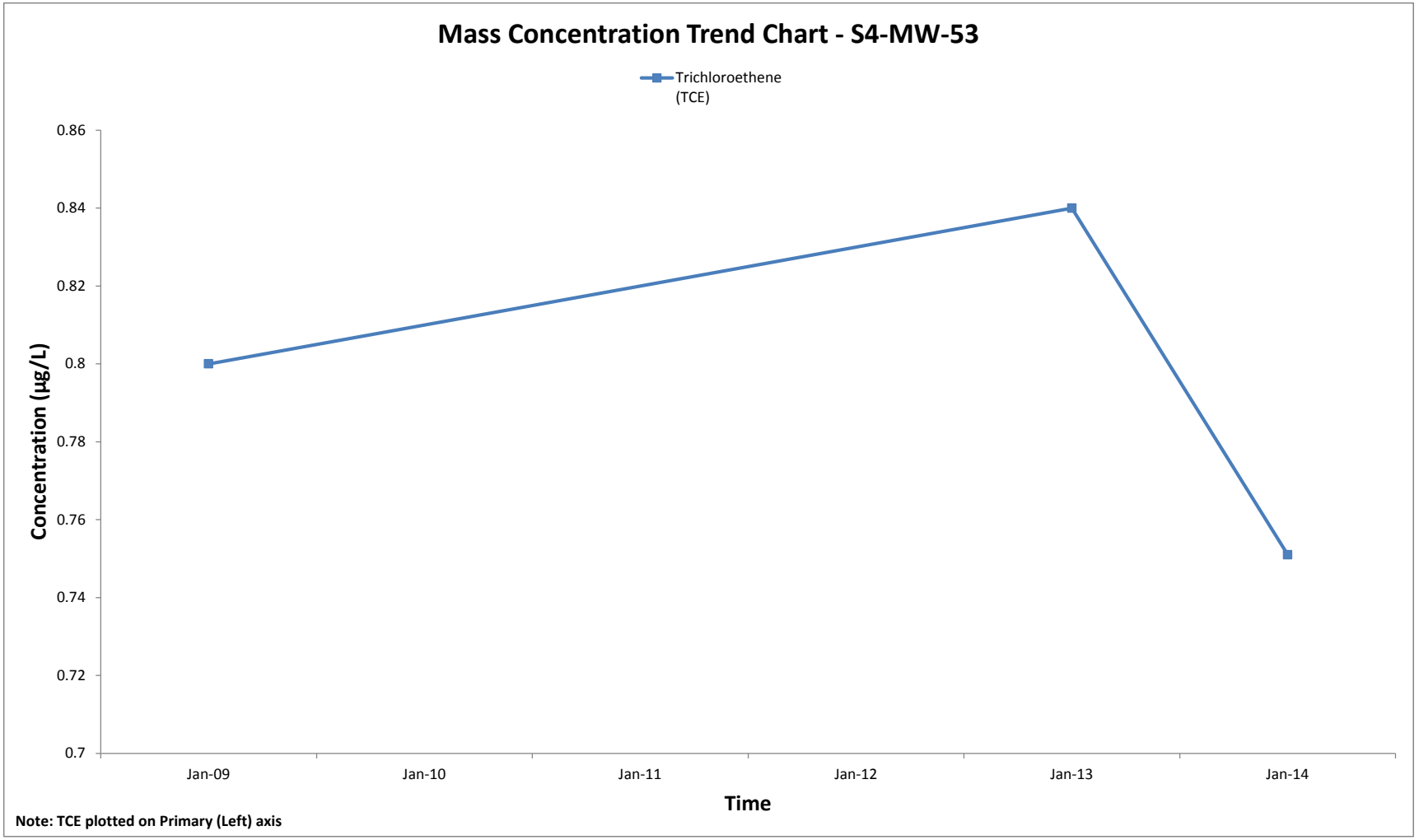
BACK




Mass Concentration (µg/L) of COCs for S4-MW52

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Dec-09 | 1 U | 1 U | 1 U | 1 U | 2 | 2 U |
| Apr-13 | 1 U | 1 U | 1 U | 1 U | 1.78 | 1 U |
| Apr-14 | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 2.07 | 0.25 U |

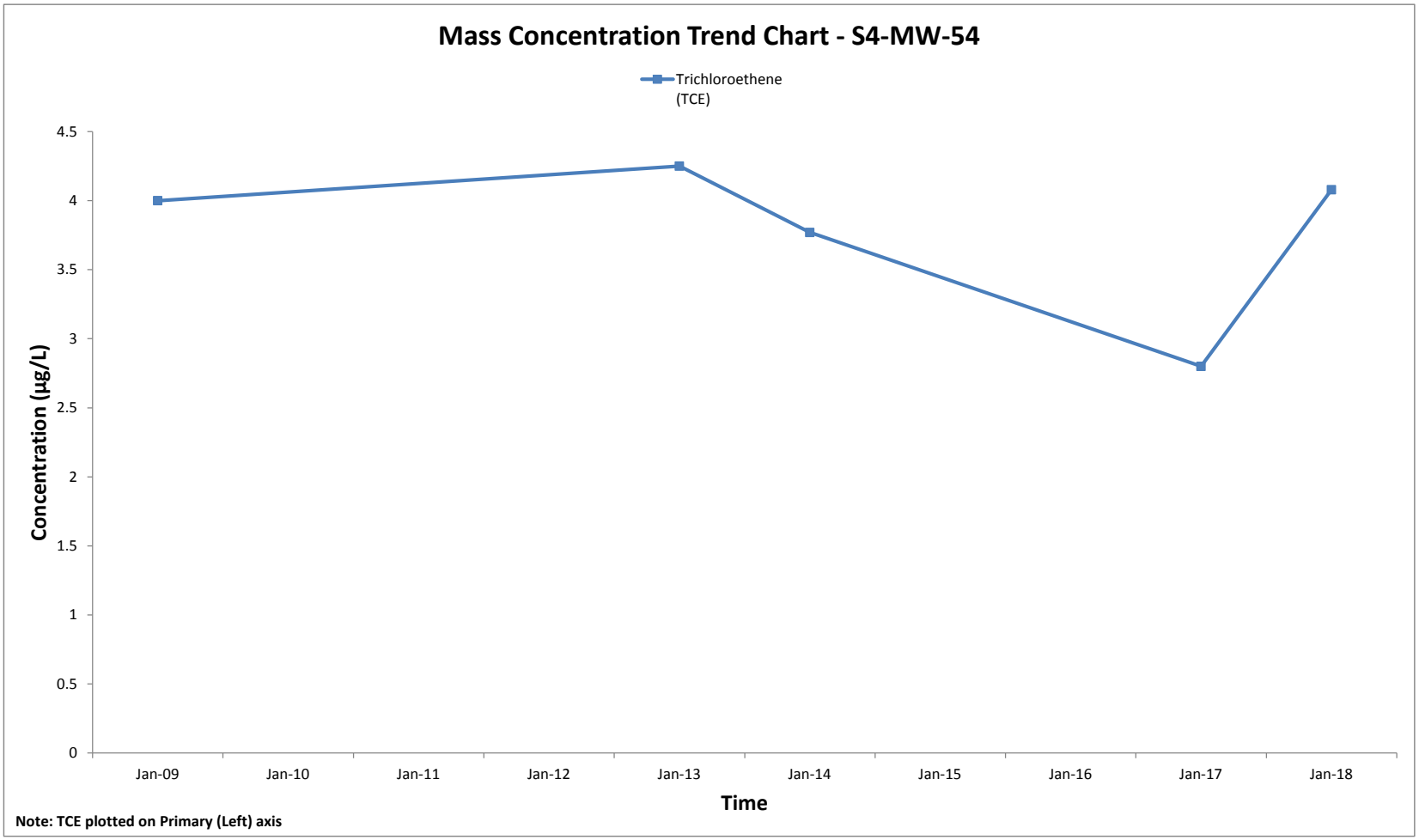
BACK




Mass Concentration (µg/L) of COCs for S4-MW53

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Dec-09 | 1 U | 1 U | 1 U | 1 U | 0.8 | 2 U |
| Apr-13 | 1 U | 1 U | 1 U | 1 U | 0.84 | 1 U |
| Apr-14 | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.751 | 0.25 U |

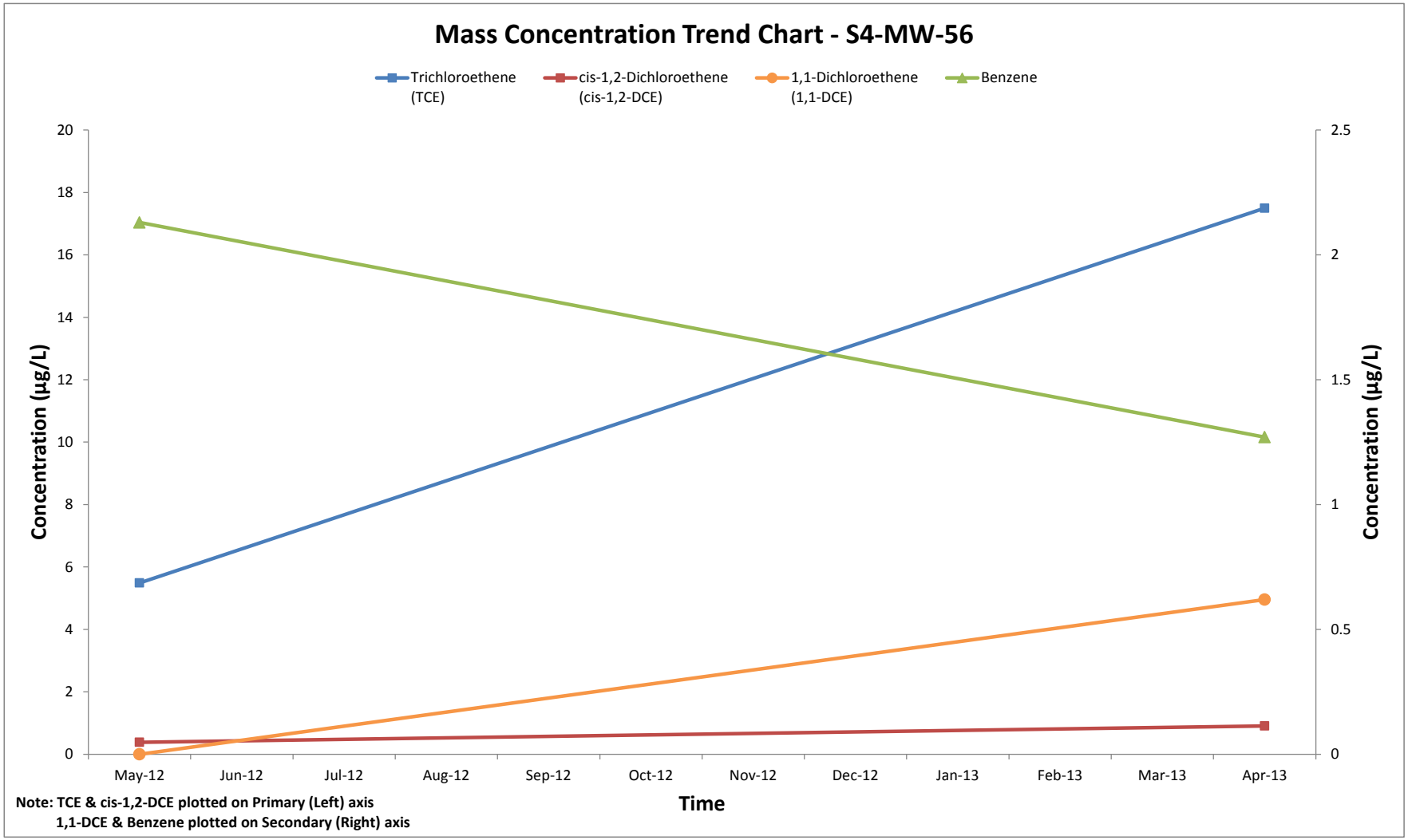
BACK




Mass Concentration (µg/L) of COCs for S4-MW54

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| Dec-09 | 1 U | 1 U | 1 U | 1 U | 4 | 2 U |
| Apr-13 | 1 U | 1 U | 1 U | 1 U | 4.25 | 1 U |
| Apr-14 | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 3.77 | 0.25 U |
| Apr-17 | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 2.8 | 0.25 U |
| Apr-18 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 4.08 | 0.5 U |

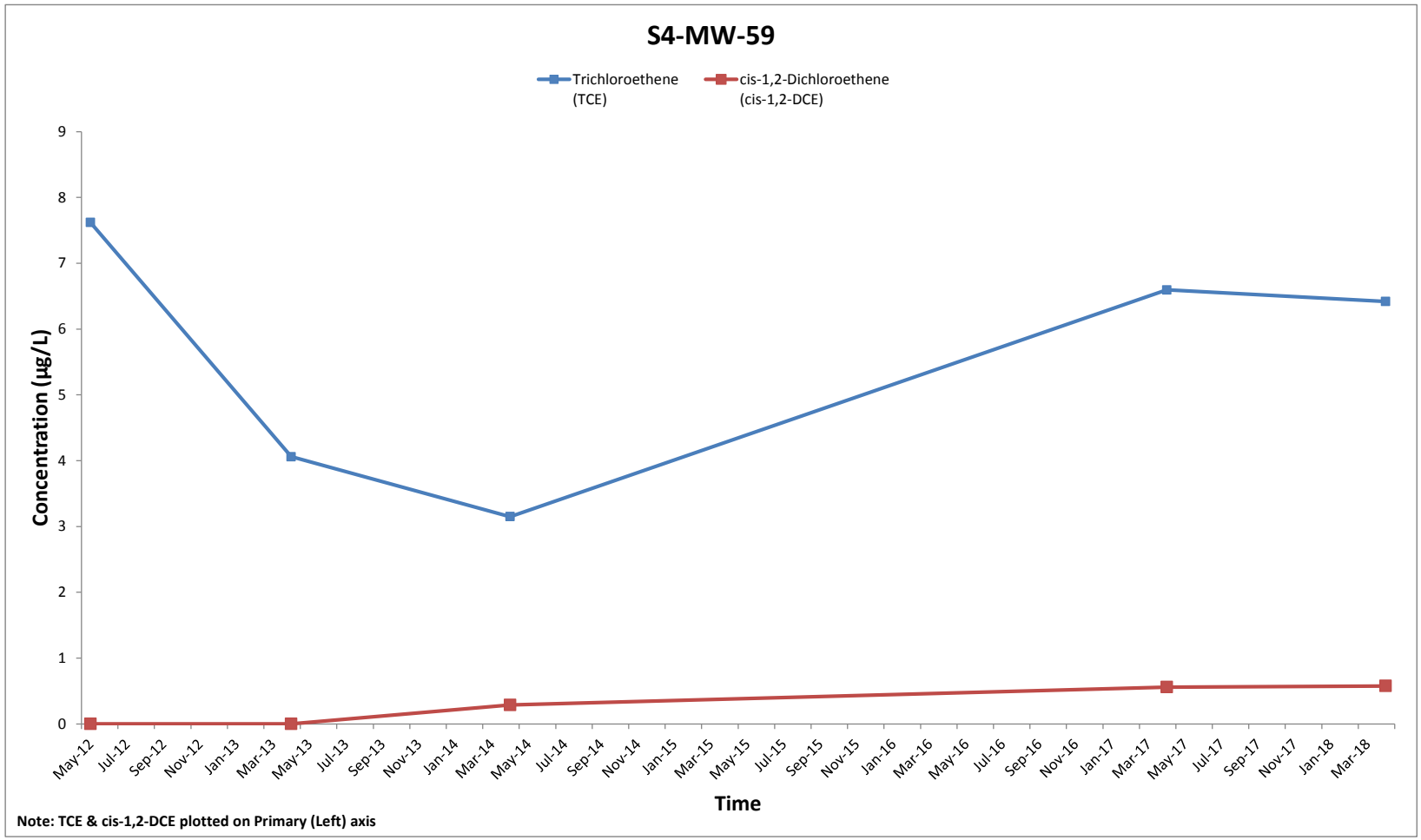
BACK




Mass Concentration (µg/L) of COCs for S4-MW56

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| May-12 | 1 U | 2.13 | 0.387 | 1 U | 5.49 | 1 U |
| Apr-13 | 0.62 | 1.27 | 0.91 | 1 U | 17.5 | 1 U |

BACK

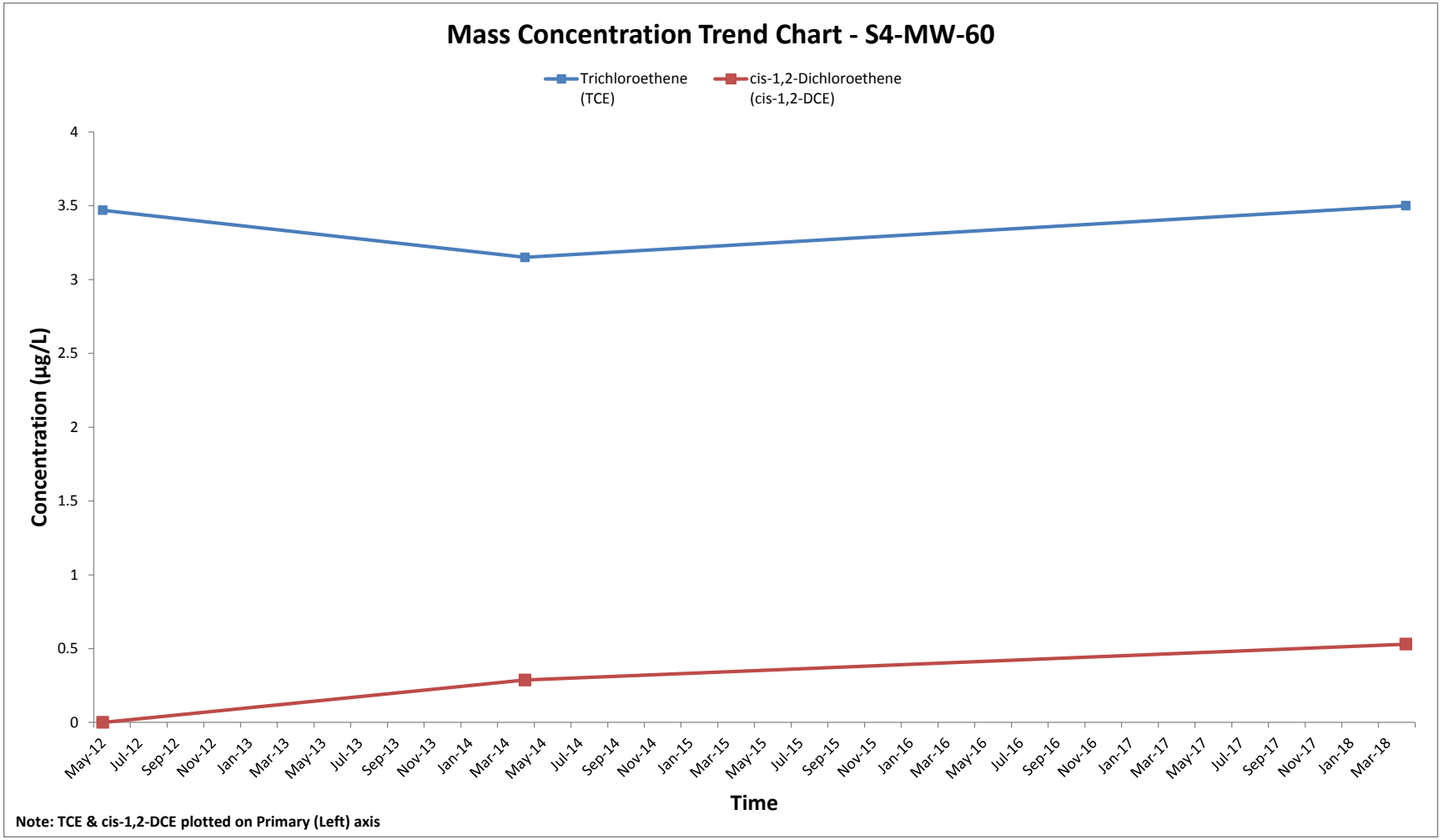



Mass Concentration (µg/L) of COCs for S4-MW59

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| May-12 | 1 U | 0.4 U | 1 U | 1 U | 7.62 | 1 U |
| Apr-13 | 1 U | 1 U | 1 U | 1 U | 4.06 | 1 U |
| Apr-14 | 0.25 U | 0.25 U | 0.287 | 0.25 U | 3.15 | 0.25 U |
| Apr-17 | 0.25 U | 0.25 U | 0.56 | 0.25 U | 6.595 | 0.25 U |
| Apr-18 | 0.5 U | 0.5 U | 0.576 | 0.5 U | 6.42 | 0.5 U |

* yellow highlight indicates J-flagged value

BACK

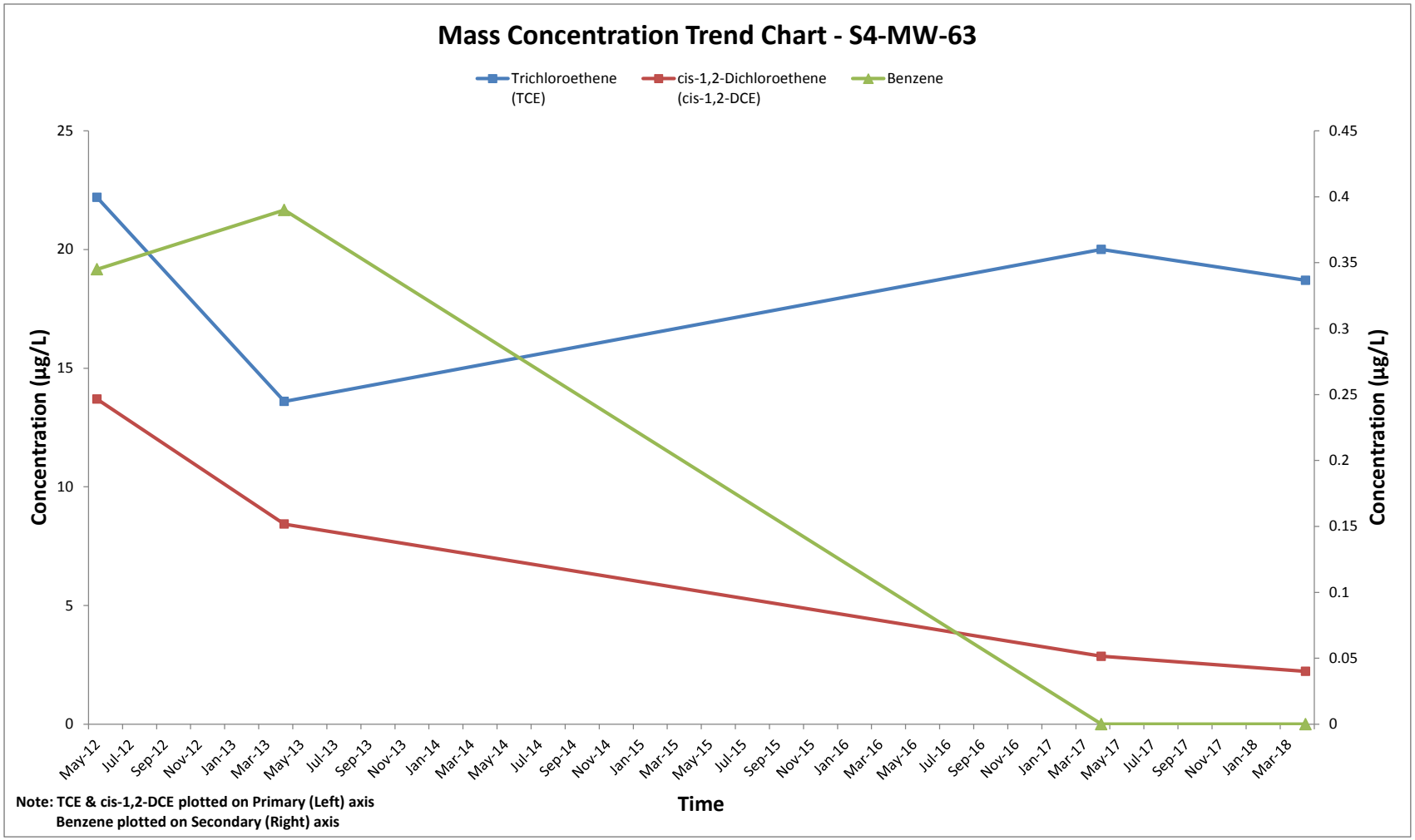



Mass Concentration (µg/L) of COCs for S4-MW60

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| May-12 | 1 U | 0.4 U | 1 U | 1 U | 3.47 | 1 U |
| Apr-14 | 0.25 U | 0.25 U | 0.287 | 0.25 U | 3.15 | 0.25 U |
| Apr-18 | 0.5 U | 0.5 U | 0.53 | 0.5 U | 3.5 | 0.5 U |

* yellow highlight indicates J-flagged value

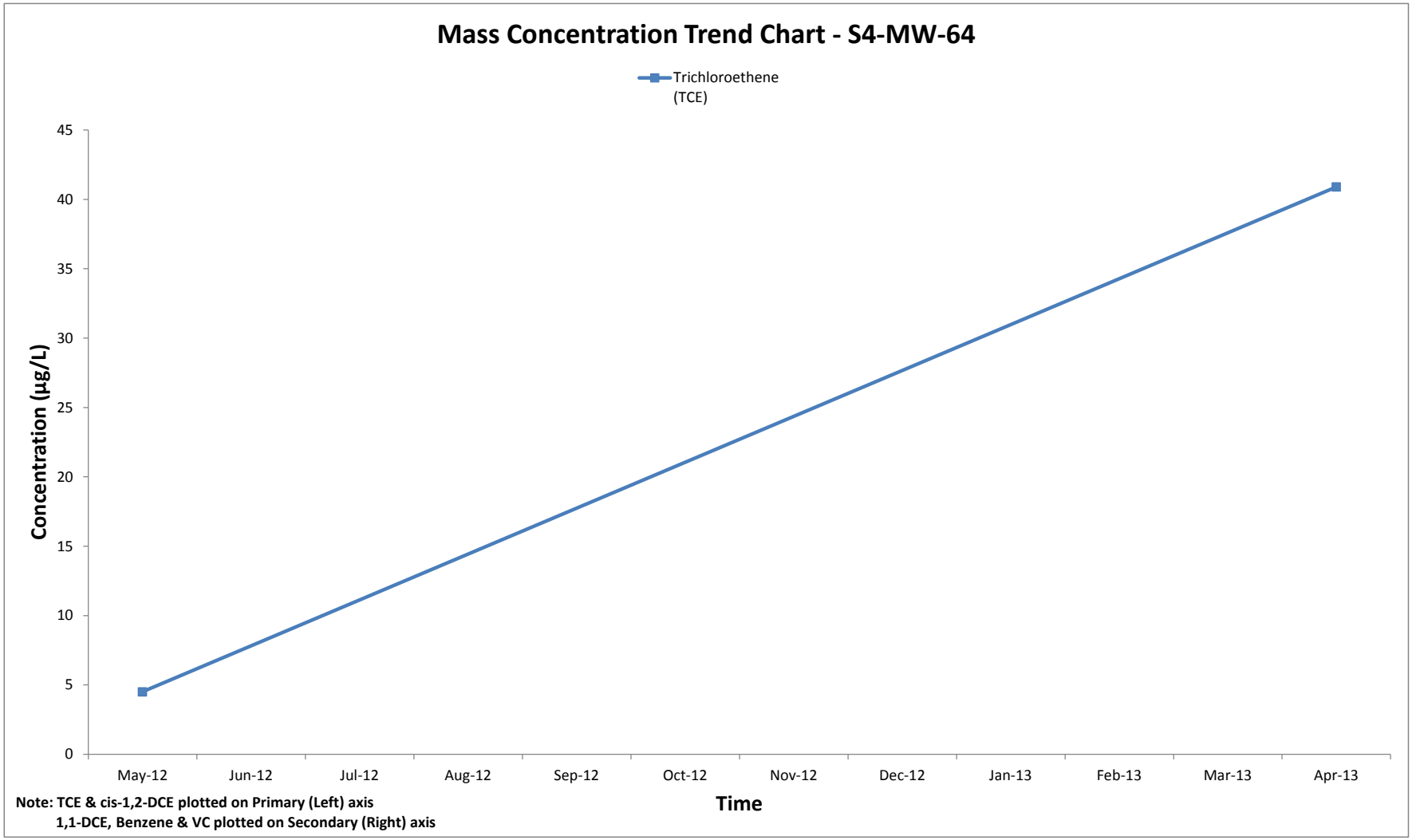
BACK




Mass Concentration (µg/L) of COCs for S4-MW63

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| May-12 | 1 U | 0.345 | 13.7 | 1 U | 22.2 | 1 U |
| Apr-13 | 1 U | 0.39 | 8.43 | 1 U | 13.6 | 1 U |
| Apr-17 | 0.365 | 0.25 U | 2.86 | 1 U | 20 | 1 U |
| Apr-18 | 0.684 J | 0.5 U | 2.23 | 0.5 U | 18.7 | 0.5 U |

BACK




Mass Concentration (µg/L) of COCs for S4-MW64

| Date | 1,1-Dichloroethene (1,1-DCE) | Benzene | cis-1,2-Dichloroethene (cis-1,2-DCE) | trans-1,2-Dichloroethene (trans-1,2-DCE) | Trichloroethene (TCE) | Vinyl chloride (VC) |
|---|---|---|---|---|---|---|
| May-12 | 1 U | 0.4 U | 1 U | 1 U | 4.5 | 1 U |
| Apr-13 | 1 U | 1 U | 1 U | 1 U | 40.9 | 1 U |

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# Appendix F

# BIOCHLOR Model Results

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**TABLE 1**
**BIOCHLOR Modeling Parameters**
**Former Air National Guard Facility**
**Sandston, VA**

| | PARAMETERS | Upper AQUIFER - Calibrate | Upper AQUIFER - FINAL | Lower AQUIFER - Calibrate | Lower AQUIFER - FINAL |
|---|---|---|---|---|---|
| **ADVECTION** | Hydraulic Conductivity | 4 ft/day | 4 ft/day | 9.35 ft/day | 9.35 ft/day |
| | | 0.00141 cm/sec | 0.00141 cm/sec | 0.0033 cm/sec | 0.0033 cm/sec |
| | Hydraulic Gradient | 0.03 | 0.03 | 0.03 | 0.03 |
| | Effective porosity | 0.25 | 0.25 | 0.25 | 0.25 |
| | Seepage Velocity | 175.1 ft/year | 175.1 ft/year | 409.7 ft/year | 409.7 ft/year |
| **DISPERSION** | | Lateral dispersion 100 feet (using a maximum plume length of 1,150 feet and use 9% of that value | Lateral dispersion 100 feet (using a maximum plume length of 500 feet and use 20% of that value | Lateral dispersion 100 feet (using a maximum plume length of 800 feet and use 12% of that value. | Lateral dispersion 100 feet (using a maximum plume length of 500 feet and use 20% of that value. |
| **ADSORPTION** | Soil Bulk Density | 1.6 kg/L | 1.6 kg/L | 1.6 kg/L | 1.6 kg/L |
| | foc | 0.005 | 0.005 | 0.005 | 0.005 |
| | Koc - PCE | 155 | 155 | 155 | 155 |
| | Koc - TCE | 166 | 166 | 166 | 166 |
| | Koc - DCE | 52 | 52 | 52 | 52 |
| | Koc - VC | 19 | 19 | 19 | 19 |
| | Common R | 2.66 | 2.66 | 2.66 | 2.66 |
| **BIO TRANSFORMATION** | | Used one zone with a TCE 1st Order Decay Coefficient of 0.8 (1/yr) for the TCE rate constant. | Used one zone with a TCE 1st Order Decay Coefficient of 0.8 (1/yr) for the TCE rate constant. | Used one zone with a TCE 1st Order Decay Coefficient of 0.8 (1/yr) for the TCE rate constant. | Used one zone with a TCE 1st Order Decay Coefficient of 0.8 (1/yr) for the TCE rate constant. |
| **GENERAL** | Simulation Time | 70 years | 60 years | 70 years | 30 years |
| | Modeled Width | 200 feet | 200 feet | 100 feet | 100 feet |
| | Modeled Length | 1,150 feet | 500 feet | 800 feet | 500 feet |
| **SOURCE DATA:** | Source Thickness | 50 feet | 50 feet | 50 feet | 50 feet |
| | Source Width | 200 feet | 200 feet | 100 feet | 100 feet |
| | Source Decay Constant (ks) | 0.1 | 0.1 | 0.1 | 0.1 |
| **FIELD DATA** | Upper Aquifer - | Calibration Data (TCE in ppb) | | | | FINAL | |
| | | 2013 | 2015 | 2016 | 2017 | 2018 | Distance |
| | MW-11-09 | 4,390 | 841 | 99.5 | 44.7 | 199 | "source area" |
| | MW-01-09 | 1,450 | 239 | 36.4 | 0.001 | 12.5 | 230 feet |
| | | | | | | | |
| | Lower Aquifer - | Calibration Data (TCE in ppm) | | | | FINAL Data (TCE in ppm) | |
| | | | 2015 | 2016 | 2017 | 2018 | Distance |
| | MW-11-08 | | 456 | 129 | 11.9 | 73.1 | "source area" |
| | MW-11-01 | | 226.5 | 88.4 | 24.4 | 30.3 | 70 feet |
| | MW-13-20 | | 1.44 | 0.001 | 0.001 | 0.5 | 400 feet |
| **FINAL RESULTS** | Plume epansion (ft) | NA | **400 - 800 feet** | NA | **200 - 400 feet** |
| | Plume expansion Duration (yrs) | NA | **5 to 7 years** | NA | **2 to 4 years** |
| | Remediation Duration (yrs) | NA | **20 - 24 years** | NA | **12 - 14 years** |
| | Time to reach MCL (yrs) | NA | **56-64 years** | NA | **22 - 28 years** |

= Values that have inputted

# BIOCHLOR Natural Attenuation Decision Support System

*Version 2.2*
Excel 2000

VA - ANG
Lower - FINAL
Run Name

**Data Input Instructions:**

115 → 1. Enter value directly....or
↑ *or* 2. Calculate by filling in gray
0.02 cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button )
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

## 1. ADVECTION

| | | | |
|---|---|---|---|
| Seepage Velocity* | Vs | 409.7 | (ft/yr) |
| ***or*** | | | |
| Hydraulic Conductivity | K | 3.3E-03 | (cm/sec) |
| Hydraulic Gradient | i | 0.03 | (ft/ft) |
| Effective Porosity | n | 0.25 | (-) |

## 2. DISPERSION

| | | | |
|---|---|---|---|
| Alpha x* | 100 | (ft) | Calc. |
| (Alpha y) / (Alpha x)* | 0.1 | (-) | |
| (Alpha z) / (Alpha x)* | 5.E-02 | (-) | |

## 3. ADSORPTION

Retardation Factor* → R
***or***

| | | | | |
|---|---|---|---|---|
| Soil Bulk Density, rho | 1.6 | (kg/L) | | |
| FractionOrganicCarbon, foc | 5.0E-3 | (-) | | |
| Partition Coefficient | Koc | | | |
| PCE | 155 | (L/kg) | 5.96 | (-) |
| TCE | 160 | (L/kg) | 6.12 | (-) |
| DCE | 52 | (L/kg) | 2.66 | (-) |
| VC | 19 | (L/kg) | 1.61 | (-) |
| ETH | | (L/kg) | 1.00 | (-) |
| **Common R (used in model)* =** | | | **2.66** | |

## 4. BIOTRANSFORMATION

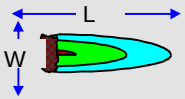
**-1st Order Decay Coefficient***

| | λ (1/yr) | half-life (yrs) | Yield |
|---|---|---|---|
| **Zone 1** | | | |
| PCE → TCE | 0.000 | | 0.79 |
| TCE → DCE | 0.800 | | 0.74 |
| DCE → VC | 0.700 | | 0.64 |
| VC → ETH | 0.000 | | 0.45 |
| **Zone 2** | λ (1/yr) | half-life (yrs) | |
| PCE → TCE | 0.000 | | |
| TCE → DCE | 0.000 | | |
| DCE → VC | 0.000 | | |
| VC → ETH | 0.000 | | |

λ HELP

## 5. GENERAL

| | | | |
|---|---|---|---|
| Simulation Time* | 14 | (yr) | |
| Modeled Area Width* | 100 | (ft) | |
| Modeled Area Length* | 500 | (ft) | |
| Zone 1 Length* | 500 | (ft) | |
| Zone 2 Length* | 0 | (ft) | Zone 2= |




## 6. SOURCE DATA

TYPE: Decaying
Single Planar

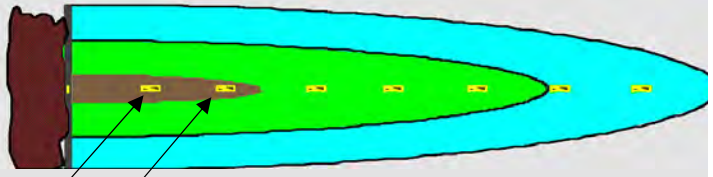
Source Options

Source Thickness in Sat. Zone* 50 (ft)

Y1
Width* (ft) 100

| Conc. (mg/L)* | C1 | $k_s$* (1/yr) |
|---|---|---|
| PCE | | 0.1 |
| TCE | .073 | 0.1 |
| DCE | | 0.1 |
| VC | | 0.1 |
| ETH | | 0.1 |

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

## 7. FIELD DATA FOR COMPARISON

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PCE Conc. (mg/L) | | | | | | | | | | | |
| TCE Conc. (mg/L) | .073 | .03 | .001 | | | | | | | | |
| DCE Conc. (mg/L) | | | | | | | | | | | |
| VC Conc. (mg/L) | | | | | | | | | | | |
| ETH Conc. (mg/L) | | | | | | | | | | | |
| Distance from Source (ft) | 0 | 70 | 400 | | | | | | | | |
| Date Data Collected | 2018 | | | | | | | | | | |

## 8. CHOOSE TYPE OF OUTPUT TO SEE:

**RUN CENTERLINE** | **RUN ARRAY** | ***Help*** | Restore | RESET | ***SEE*** | Paste

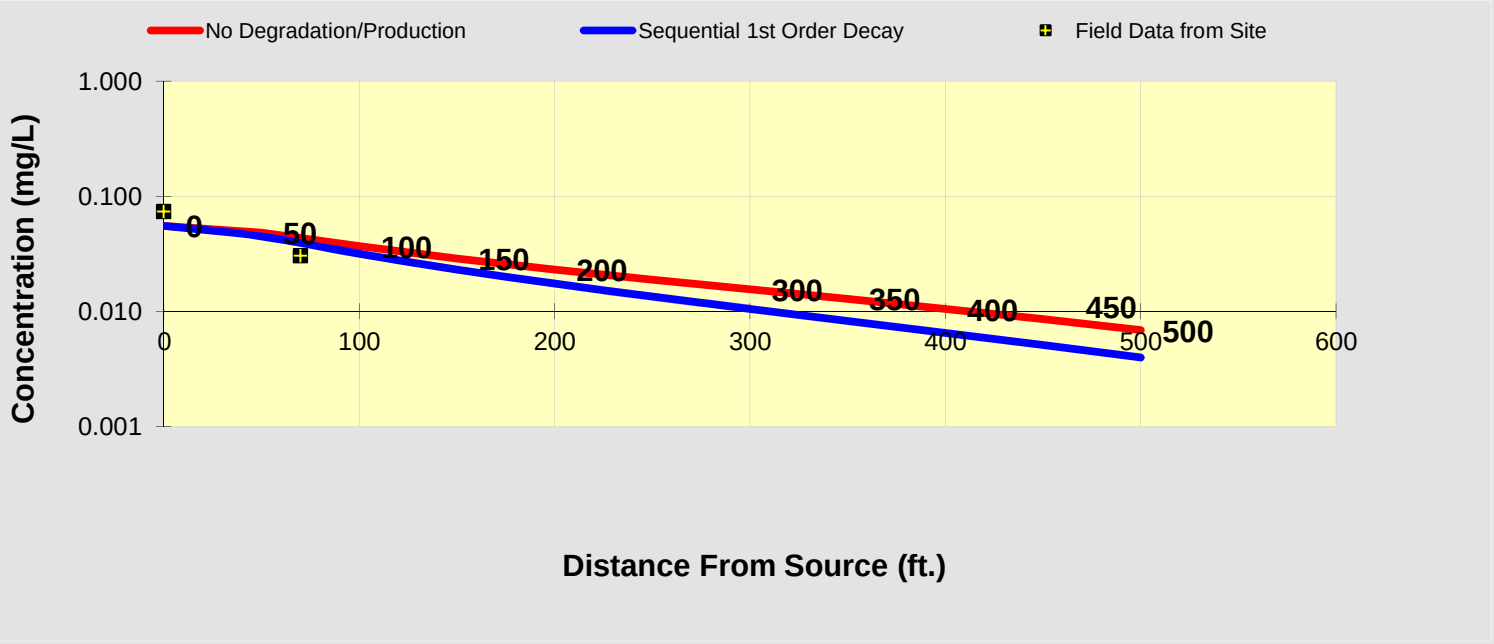
## DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

**Distance from Source (ft)**

| TCE | 0 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No Degradation | 0.055 | 0.048 | 0.037 | 0.029 | 0.023 | 0.019 | 0.016 | 0.013 | 0.011 | 0.009 | 0.007 |
| Biotransformation | 0.0552 | 0.045 | 0.032 | 0.023 | 0.017 | 0.013 | 0.011 | 0.008 | 0.007 | 0.005 | 0.004 |

**Monitoring Well Locations (ft)**

| | 0 | 70 | 400 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Field Data from Site | 0.073 | 0.030 | 0.001 | | | | | | | | |




See PCE

See TCE

See DCE

See VC

See ETH

Replay

Time:

2.8 Years

Log ⟺ Linear

Return to Input

To All

To Array

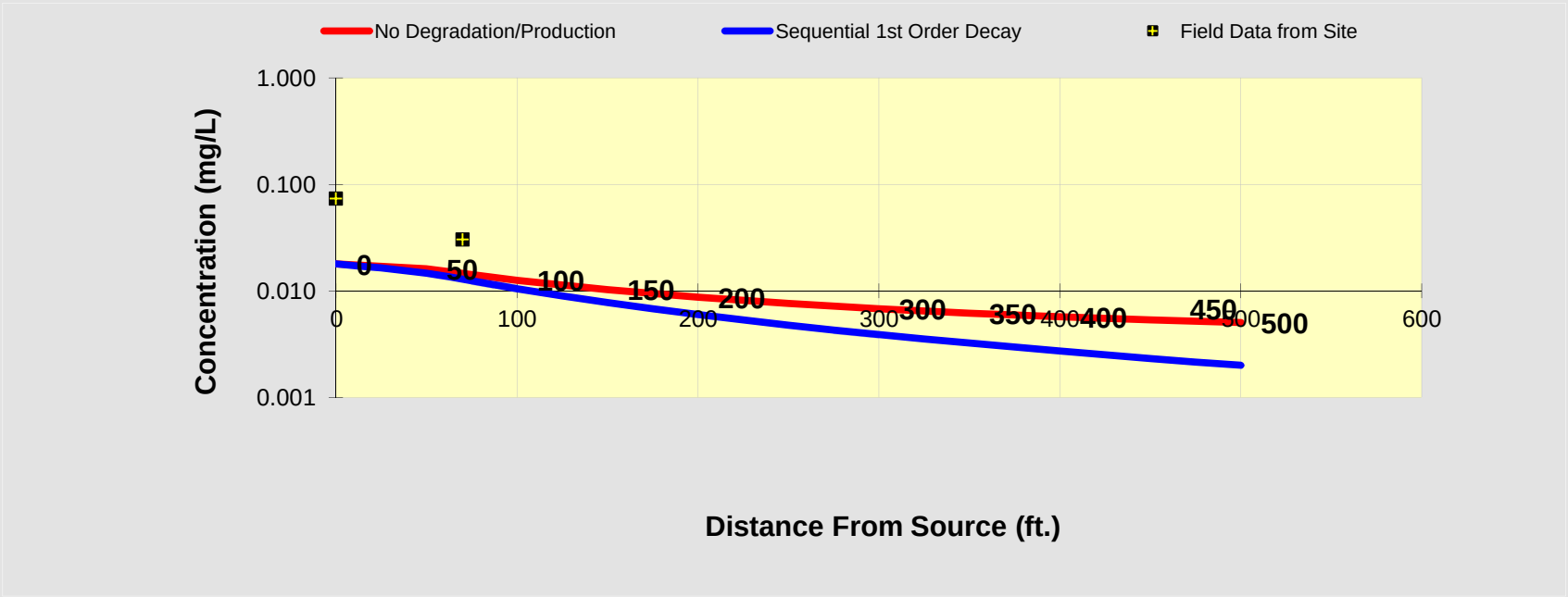
## DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

**Distance from Source (ft)**

| TCE | 0 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No Degradation | 0.018 | 0.016 | 0.013 | 0.010 | 0.009 | 0.008 | 0.007 | 0.006 | 0.006 | 0.005 | 0.005 |
| Biotransformation | 0.0180 | 0.015 | 0.010 | 0.008 | 0.006 | 0.005 | 0.004 | 0.003 | 0.003 | 0.002 | 0.002 |

**Monitoring Well Locations (ft)**

| | 0 | 70 | 400 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Field Data from Site | 0.073 | 0.030 | 0.001 | | | | | | | | |




See PCE

See TCE

See DCE

See VC

See ETH

Replay

Time:

14.0 Years

Log ⟺ Linear

Return to Input

To All

To Array

# BIOCHLOR Natural Attenuation Decision Support System

*Version 2.2*
Excel 2000

VA - ANG
Upper FINAL
Run Name

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

## 1. ADVECTION

| | | | |
|---|---|---|---|
| Seepage Velocity* | Vs | 175.1 | (ft/yr) |
| ***or*** | | | |
| Hydraulic Conductivity | K | 1.4E-03 | (cm/sec) |
| Hydraulic Gradient | i | 0.03 | (ft/ft) |
| Effective Porosity | n | 0.25 | (-) |

## 2. DISPERSION

| | | |
|---|---|---|
| Alpha x* | 100 | (ft) |
| (Alpha y) / (Alpha x)* | 0.1 | (-) |
| (Alpha z) / (Alpha x)* | 5.E-02 | (-) |

Calc.

## 3. ADSORPTION

Retardation Factor* → R

***or***

| | | | | |
|---|---|---|---|---|
| Soil Bulk Density, rho | | 1.6 | (kg/L) | |
| FractionOrganicCarbon, foc | | 5.0E-3 | (-) | |
| Partition Coefficient | Koc | | | |
| PCE | 155 | (L/kg) | 5.96 | (-) |
| TCE | 166 | (L/kg) | 6.31 | (-) |
| DCE | 52 | (L/kg) | 2.66 | (-) |
| VC | 19 | (L/kg) | 1.60 | (-) |
| ETH | | (L/kg) | 1.00 | (-) |
| **Common R (used in model)* =** | | | **2.66** | |

## 4. BIOTRANSFORMATION

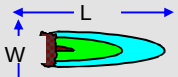
**-1st Order Decay Coefficient***

| | λ (1/yr) | | half-life (yrs) | Yield |
|---|---|---|---|---|
| **Zone 1** | | | | |
| PCE → TCE | 0.000 | ← | | 0.79 |
| TCE → DCE | 0.800 | ← | | 0.74 |
| DCE → VC | 0.700 | ← | | 0.64 |
| VC → ETH | 0.000 | ← | | 0.45 |
| **Zone 2** | λ (1/yr) | | half-life (yrs) | |
| PCE → TCE | 0.000 | ← | | |
| TCE → DCE | 0.000 | ← | | |
| DCE → VC | 0.000 | ← | | |
| VC → ETH | 0.000 | ← | | |

λ HELP

## 5. GENERAL

| | | |
|---|---|---|
| Simulation Time* | 24 | (yr) |
| Modeled Area Width* | 200 | (ft) |
| Modeled Area Length* | 500 | (ft) |
| Zone 1 Length* | 500 | (ft) |
| Zone 2 Length* | 0 | (ft) |




Zone 2=

## 6. SOURCE DATA

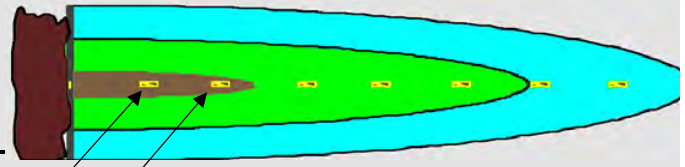
TYPE: Decaying
Single Planar

Source Options

Source Thickness in Sat. Zone* 50 (ft)

| | Y1 | $k_s$* |
|---|---|---|
| Width* (ft) | 200 | |
| Conc. (mg/L)* | C1 | (1/yr) |
| PCE | | 0.1 |
| TCE | .199 | 0.1 |
| DCE | | 0.1 |
| VC | | 0.1 |
| ETH | | 0.1 |

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

## 7. FIELD DATA FOR COMPARISON

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PCE Conc. (mg/L) | | | | | | | | | | | |
| TCE Conc. (mg/L) | .199 | .013 | | | | | | | | | |
| DCE Conc. (mg/L) | | | | | | | | | | | |
| VC Conc. (mg/L) | | | | | | | | | | | |
| ETH Conc. (mg/L) | | | | | | | | | | | |
| Distance from Source (ft) | 0 | 230 | | | | | | | | | |
| Date Data Collected | 2018 | | | | | | | | | | |

## 8. CHOOSE TYPE OF OUTPUT TO SEE:

**RUN CENTERLINE** | **RUN ARRAY**

**Help** | Restore | RESET

***SEE*** | Paste



## Data Input Instructions:

115 → 1. Enter value directly....or
↑ *or*
0.02 → 2. Calculate by filling in gray cells. Press Enter, then C

(To restore formulas, hit "Restore Formulas" button )

Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation

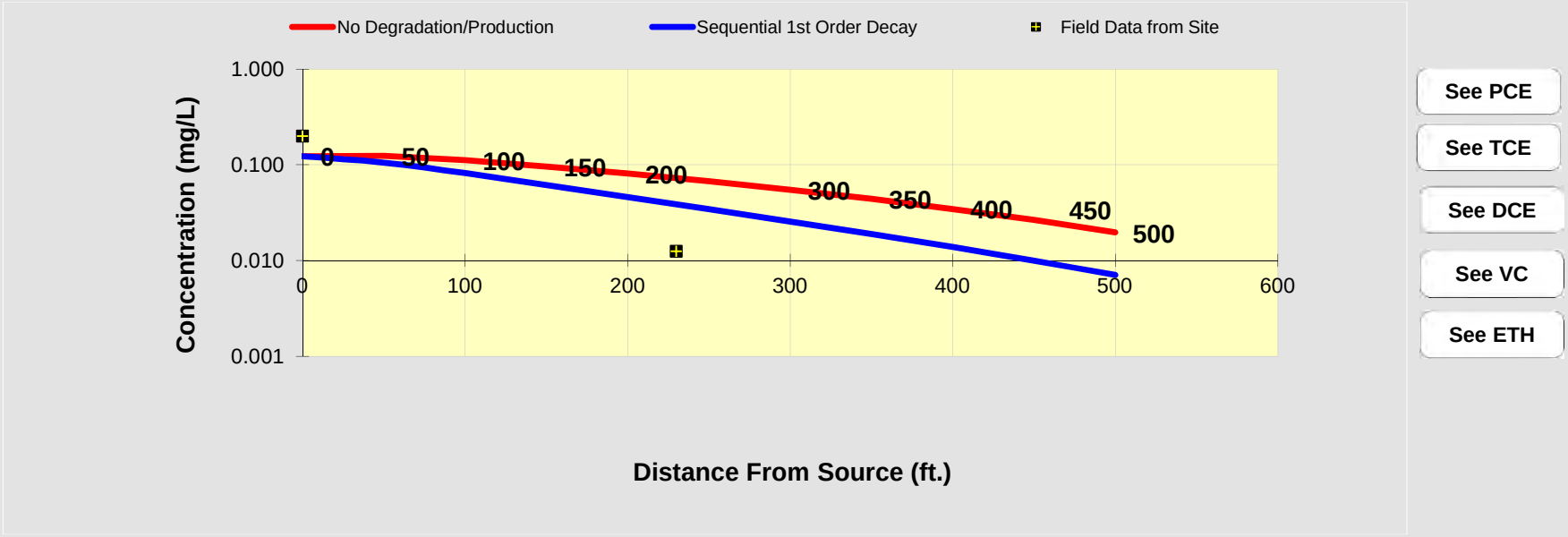
## DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

**Distance from Source (ft)**

| TCE | 0 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No Degradation | 0.123 | 0.124 | 0.112 | 0.096 | 0.081 | 0.067 | 0.055 | 0.044 | 0.035 | 0.026 | 0.020 |
| Biotransformation | 0.1231 | 0.105 | 0.082 | 0.061 | 0.046 | 0.034 | 0.026 | 0.019 | 0.014 | 0.010 | 0.007 |

**Monitoring Well Locations (ft)**

| | 0 | 230 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Field Data from Site | 0.199 | 0.013 | | | | | | | | | |




See PCE

See TCE

See DCE

See VC

See ETH

Replay

Time:

*4.8 Years*

Log ⟺ Linear

Return to Input

To All

To Array

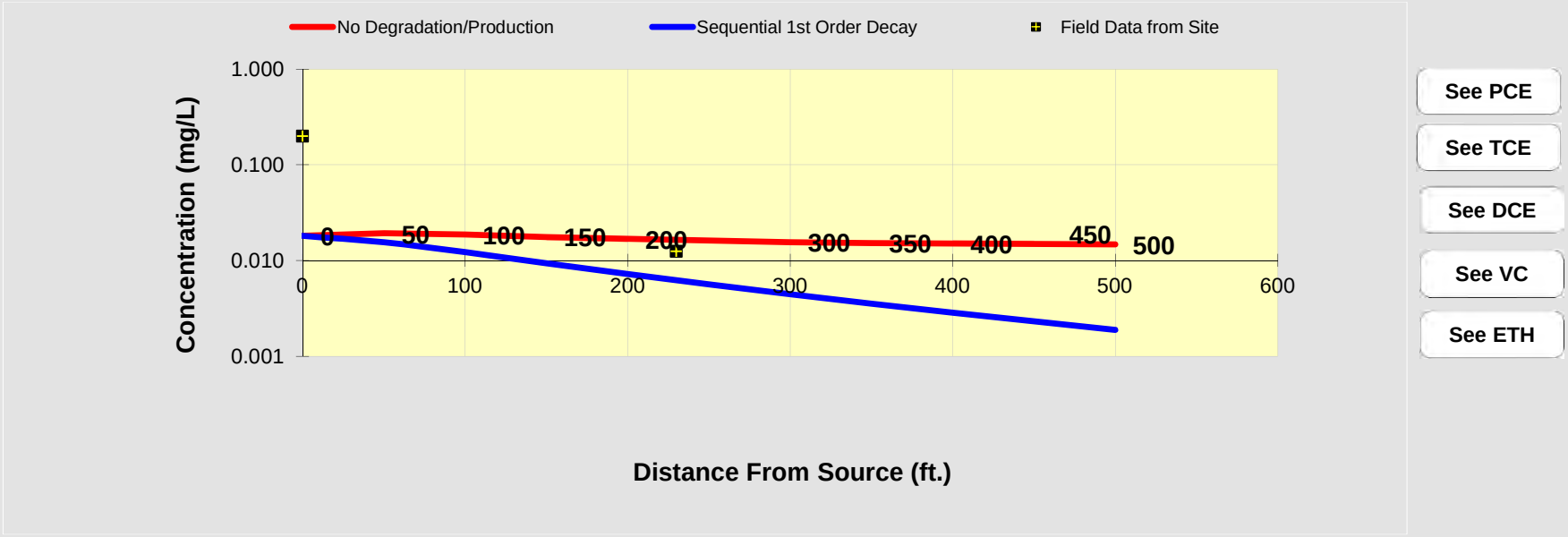
## DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

**Distance from Source (ft)**

| TCE | 0 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No Degradation | 0.018 | 0.019 | 0.019 | 0.018 | 0.017 | 0.016 | 0.016 | 0.015 | 0.015 | 0.015 | 0.015 |
| Biotransformation | 0.0181 | 0.016 | 0.012 | 0.009 | 0.007 | 0.006 | 0.004 | 0.004 | 0.003 | 0.002 | 0.002 |

**Monitoring Well Locations (ft)**

| | 0 | 230 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Field Data from Site | 0.199 | 0.013 | | | | | | | | | |




See PCE
See TCE
See DCE
See VC
See ETH

Replay

Time:
24.0 Years
Log ⟺ Linear

Return to Input
To All
To Array