



Off Depot Air Sparge/ Soil Vapor Extraction System Annual Operations Report, Year Six (January 2016 to May 2017)

Dunn Field - Defense Depot Memphis,
Tennessee

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**Off Depot Air Sparge/ Soil Vapor Extraction System
Annual Operations Report, Year Six (January 2016 to May
2017)**

Dunn Field - Defense Depot Memphis, Tennessee



Department of the Army

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Acronyms and Abbreviations

acfm	actual cubic feet per minute
AS/SVE	air sparging and soil vapor extraction
AWS	air/water separator
bgs	below ground surface
CF	chloroform
CVOC	chlorinated volatile organic compound
DDMT	Defense Depot Memphis, Tennessee
DQE	data quality evaluation
IAQ	intermediate aquifer
IRACR	Interim Remedial Action Completion Report
lb	pound
lb/hr	pounds per hour
LCS	laboratory control sample
LTM	long-term monitoring
MAQ	Memphis Aquifer
MCL	maximum contaminant level
MLGW	Memphis Light, Gas and Water
O&M	operations and maintenance
PID	photoionization detector
PLC	programmable logic controller
ppbv	parts per billion by volume
ppm	parts per million
QAPP	Quality Assurance Project Plan
QC	quality control
RA	remedial action
RL	reporting limit
ROD	Record of Decision
scfm	standard cubic feet per minute
SCHD	Shelby County Health Department
SVE	soil vapor extraction
TC	target concentration
TCE	trichloroethene
TDEC	Tennessee Department of Environment and Conservation
TeCA	1,1,2,2-tetrachloroethane
Trinity	Trinity Analysis & Development Corp.
U.S.	United States
USEPA	United States Environmental Protection Agency
VMP	vapor monitoring point
VOC	volatile organic compound
µg/L	micrograms per liter
%	percent

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1 Introduction

HDR has prepared this Annual Operations Report for the Off Depot air sparging and soil vapor extraction (AS/SVE) system under subcontract to Trinity Analysis & Development Corp. (Trinity) Contract W9128F-11-D-0029, Task Order CK01 with the United States (U.S.) Army Corps of Engineers, Mobile District. This report summarizes the operations and maintenance (O&M) activities and the results of system monitoring for Year Six AS/SVE operations at the Off Depot groundwater plume west of Dunn Field at the former Defense Depot Memphis, Tennessee (DDMT). The report covers operations from 1 January 2016 through 1 May 2017; the AS/SVE system was operated in stand-by mode from 1 January to 6 May 2016 while the Trinity task order was put in place.

Responses to comments from Tennessee Department of Environment and Conservation (TDEC) and U.S. Environmental Protection Agency (USEPA) Region 4 and approval letters are provided in [Appendix A](#).

1.1 Site Description

DDMT, which is located in southeastern Memphis, originated as a military facility in the early 1940s for receipt, warehousing, and distribution of supplies to military services and some civil agencies. The property consists of approximately 632 acres in two adjacent areas, the Main Installation and Dunn Field. Storage and distribution of material ended in September 1997 when the facility was closed under Base Realignment and Closure.

DDMT was added to the National Priorities List in 1992; the USEPA Identification Number is TN4210020570. Responsibility for environmental restoration at DDMT transferred from the Defense Logistics Agency to the Department of the Army in December 2010. The regulatory oversight agencies are USEPA Region 4 and TDEC.

The geologic units of interest at DDMT are (from youngest to oldest): loess, including surface soil; fluvial deposits; Jackson Formation/Upper Claiborne Group (Jackson/Upper Claiborne); and Memphis Sand. The uppermost aquifer is the unconfined Fluvial Aquifer, consisting of saturated sands and gravelly sands in the lower portion of the deposits; the base of the Fluvial Aquifer is controlled by the surface of the uppermost clay in the Upper Claiborne. The Jackson/Upper Claiborne forms the upper confining unit for the Memphis Aquifer (MAQ) on a regional basis and separates the Fluvial Aquifer from the MAQ at DDMT. The Intermediate Aquifer (IAQ) is locally developed in the Upper Claiborne sands. Where the clay is thin or absent, a hydraulic connection or 'window' is created between the Fluvial Aquifer and the IAQ, and potentially, the MAQ. The MAQ is a regional deep, confined aquifer and is the primary source of water for the City of Memphis. The Allen Well Field, which is operated by Memphis Light, Gas & Water (MLGW), is located approximately 2 miles west of Dunn Field.

1.2 Off Depot Remedial Action

The Off Depot remedial action (RA) includes the following components:

- Installation of an AS/SVE system across the core of the plume near the downgradient end.
- Monitored natural attenuation and long-term groundwater monitoring to document remedy performance as indicated by changes in chlorinated volatile organic compound (CVOC) concentrations and/or changes in the lateral or vertical extent of the CVOC plume.
- Institutional controls to prevent access to contaminated groundwater.

RA construction and Year One operations are described in the *Off Depot Groundwater Interim Remedial Action Completion Report, Revision 1* (Off Depot IRACR) (HDR, 2011a), which was approved by USEPA and TDEC in November 2011.

1.3 AS/SVE System Description

AS/SVE is being conducted near the leading edge of the groundwater plume west of Dunn Field to volatilize CVOCs and prevent further plume migration. The AS/SVE system was designed to intercept the majority of the Off Depot CVOC plume and to reduce individual CVOC concentrations below 50 micrograms per liter (µg/L). AS/SVE operations began in December 2009. The AS/SVE system consists of 90 AS points, 12 SVE wells, 10 pairs of vapor monitoring points (VMPs), and control buildings for the AS compressor, SVE blowers and system controls. The system layout is shown on [Figure 1](#).

AS/SVE operations were incorporated in Shelby County Health Department (SCHD) Permit #01030-01P issued for the fluvial soil vapor extraction system on Dunn Field. Permit conditions include maintaining volatile organic compound (VOC) emissions below 5.71 pounds per hour (lb/hr) as documented in an annual emissions report. In May 2016, SCHD cancelled the permit and exempted the remediation system based on emissions consistently below the de minimus limit of 0.1 lb/hr.

The AS system is powered by a Kaeser CSD 100 rotary screw air compressor; air filters minimize oil particles in the air stream from the compressor. The other AS components are the receiving tank, refrigerated dryer, pressure regulator and relief valve, solenoid panel and sparge manifold, and AS wells. The AS wells were installed at the base of the fluvial aquifer at depths of 82 to 115 feet below ground surface (bgs). Individual solenoid valves are used to set operating periods for each AS well.

Approximately one-third of the AS wells operate at any one time. Pulsed operation was selected to decrease the required system injection flow capacity, optimize air distribution by limiting the formation of permanent air channels, and limit groundwater flow around the AS barrier due to reduction in permeability caused by air injection.

The SVE system consists of two Kaeser rotary blowers (Model 420C/53P) installed in parallel. The blowers are connected to 12 SVE wells with 30-foot screens beginning at depths of 35 to 45 feet bgs. The SVE wells were installed on roughly 50-foot centers to capture the vapors from the AS wells; the maximum separation between an AS well and the nearest SVE well is approximately 60 feet. System operations were designed to have the vapor extraction rate be at least 1.5 times the air injection rate.

Extracted vapor from the individual wells combine in a single 6-inch header at the piping manifold outside the SVE building; the SVE wells can be adjusted at the manifold to balance individual flow rates. The vapor stream passes through the air/water separator (AWS) tank to remove entrained vapor and debris from the air stream. No other treatment is performed prior to discharge.

VMPs were installed to monitor the radius of influence of the SVE wells and the CVOC concentrations in the vadose zone. There are ten pairs of nested VMPs with 5-foot screens located 20 to 60 feet from the nearest SVE well; the shallow ('B') VMPs are screened at an average depth of 49 feet bgs and the deep ('A') VMPs are screened at an average depth of 64 feet bgs.

The AS wells and SVE wells are connected via buried piping to two equipment buildings; one housing the compressor for the sparge points and the other housing two blowers for the SVE wells. The AS/SVE system is operated through programmable logic controllers (PLCs) in the AS and SVE control buildings. The AS PLC operates the solenoids to direct air to the individual AS wells for the programmed daily schedule, to monitor operations, and to trigger alarms or shut downs as necessary. The AS compressor has a separate controller to monitor operations and trigger alarms or shut downs as necessary. The SVE PLC monitors blower operations and sends alarm notifications or shuts down the system if necessary.

Condensate from SVE operations is collected in a 160-gallon AWS and then transferred from the AWS to a 505-gallon polyethylene tank outside the SVE building. Once the exterior tank nears capacity, water is pumped to a trailer-mounted transfer tank and transferred to a condensate storage tank on Dunn Field for analysis prior to discharge.

1.4 Previous Operations and Monitoring Results

1.4.1 System Operations and Monitoring

AS/SVE operations were described for Year One in the Off Depot IRACR and for later years in annual operations reports. The most recent annual report, *Off Depot AS/SVE System Annual Operations Report, Year Five, Revision 1* (HDR, 2016) was approved by TDEC and USEPA in August 2016.

System start-up and modifications to address noise issues were completed in May 2010. The AS/SVE system was then operated with both blowers for all 12 SVE wells and 1/3 of the 90 AS wells operating at all times. The AS wells were operated in three groupings (A: AS-1, AS-4, AS-

7...; B: AS-2, AS-5, AS-8...; and C: AS-3, AS-6, AS-9...). Each AS group was operated for four hours before the system switched to the next group.

Groundwater monitoring results in September 2010 indicated the plume was partially diverted around the southern edge of the AS/SVE system, possibly due to decreased permeability from the air injection. In November 2010, normal operations with the AS compressor and both SVE blowers were reduced to 2 days per week; a single blower operated at other times. Normal operations with the AS compressor and both SVE blowers was increased to 3 to 4 days per week in March 2011. Problems with Blower #1 resulted in system operation with the AS compressor and a single blower after August 2011; AS wells continued to operate 3 to 4 days per week.

Following review of groundwater monitoring results from April 2012, systems operations were modified to target areas with higher CVOC concentrations. In June 2012, air sparging was stopped at 24 AS wells and reduced to half-time (4 hours per day) at 18 AS wells; air sparging remained 8 hours per day at the other 48 AS wells. In addition, two SVE wells, SVE-8 and SVE-12, were closed to increase vapor extraction near the operating AS wells. An additional change was made in July to reduce time required to adjust system operations. The AS wells were set to operate 12 hours per day 7 days per week; individual AS wells in the three groups operated 4 hours per day (at the 48 full-time AS wells) or 2 hours per day (at the 18 half-time AS wells). A single SVE blower operated at all times with the two blowers alternating on a 12-hr cycle. In October 2012, SVE wells SVE-8 and SVE-12 were re-opened because of increased photoionization detector (PID) readings. These operating parameters were maintained until February 2014.

The *Off Depot Air Sparge – Soil Vapor Extraction System Annual Operations Report, Year Four, Revision 1* (HDR, 2014) recommended the AS/SVE system be operated in alternating months to restore the northerly groundwater flow observed prior to system operation and increase groundwater flow from MW-159 into the treatment zone; the change was also expected to reduce operating costs. The change in operations was approved by USEPA and TDEC in July 2014.

Year 5 operations began 1 January 2014 and were to be conducted in calendar year 2014. Operations were halted in February 2014 due to extensive AS/SVE equipment damage from a lightning-related power surge. System repairs were completed and operations resumed in March 2015; Year 5 operations were extended through December 2015.

The change to full AS/SVE system operation in alternate months was implemented when the system was restarted in March 2015. The AS wells were still operated in three groups but the groupings and the operating hours were changed slightly: 60 AS points were operated 4 hours per day (full-time), 6 AS points were operated 2 hours per day (half-time) and 24 AS points remained closed ([Figure 1](#)). During full operation, the AS wells are operated 12 hours per day to remove VOCs from groundwater, and the SVE blowers and wells are operated 24 hours per day to remove soil vapor with VOCs from the vadose zone. During limited operations in the alternate months, the AS manifold is closed and the compressor is in stand-by mode, except for brief

operation during site inspections, and the SVE blowers and wells are operated 12 hours per day. These operating parameters were maintained through Year Five (December 2016).

1.4.2 System Monitoring and Mass Removal

Total primary CVOC concentrations in the system effluent decreased from 1201 parts per billion by volume (ppbv) at start-up in December 2009 to 58 ppbv in December 2010. The concentrations then ranged from 21 to 52 ppbv from January 2011 to December 2015.

VOC emission rates decreased from 0.025 lb/hr at startup to 0.001 lb/hr in December 2010. The emission rate has generally been at or below 0.001 lb/hr since that time. A higher emission rate (0.0021 lb/hr) in June 2012 was due to an anomalous toluene concentration. The emissions have not exceeded the de minimus standard of 0.1 lb/hr for the SCHD operating permit since January 2010.

The AS/SVE system uptime percentage (%) and the mass removal in pounds (lbs) during the first 5 years of operations are shown below. The system uptime in Year 5 does not include the period required for equipment repair (February 2014 to March 2015).

Period	System Uptime	VOC Removal (lbs)
Year 1 (2010)	97%	71
Year 2 (2011)	94%	4
Year 3 (2012)	97%	5
Year 4 (2013)	91%	3
Year 5 (2014-2015)	93%	2

1.4.3 Groundwater Monitoring

Long-term monitoring (LTM) results are used to assess the overall effectiveness of the AS/SVE system. The treatment goal for the AS/SVE system is to reduce groundwater concentrations downgradient of the AS/SVE barrier below 50 µg/L for individual CVOCs. The goal was met in the five performance monitoring wells immediately downgradient of the AS/SVE barrier in June 2010. CVOC concentrations in the Off Depot plume have met the treatment goal of 50 µg/L for individual CVOCs in all but one LTM well in the AS/SVE area, MW-159, since October 2012.

1.5 Scope of Work

HDR has performed O&M activities for the AS/SVE system since system startup in December 2009. The goals for O&M are to:

- Maintain system operations through regular field inspections, maintenance, and repairs; and
- Monitor system effectiveness through air injection and vapor extraction flow rates, vacuum measurements, PID measurements, and laboratory analysis of system effluent samples.

O&M activities follow procedures described in the *Dunn Field Off Depot Groundwater Air Sparge and Soil Vapor Extraction System Operations and Maintenance Manual* (AS/SVE O&M Manual) (HDR, 2011b). System monitoring is performed in accordance with the *Dunn Field Off Depot Groundwater Remedial Action Work Plan, Revision 2* (HDR, 2009).

The scope for Year Six AS/SVE operations included the following activities:

- Weekly system inspections with measurements of operating conditions, operational adjustments and system maintenance;
- Bi-weekly readings at AS compressor, SVE wells and system effluent for flow rate and vacuum pressures when the AS manifold is open and monthly readings when the AS manifold is closed;
- Monthly PID measurements at SVE wells and system effluent when the AS manifold is open;
- Quarterly PID and vacuum measurements at VMPs and collection of system effluent samples for laboratory analysis of VOCs;
- Semiannual report to describe O&M activities, system status, performance, and monitoring results; and
- Annual operations report to summarize system operations and monitoring results with data validation and to provide recommendations for future operations.

2 System Operations

The AS/SVE system was operated in stand-by mode from 1 January to 6 May 2016 while the Trinity task order was put in place. The SVE blowers were operated 12 hours per day and the AS compressor was operated with the manifold to the AS wells closed, except for brief periods during system inspections and for a few days in March and April 2016.

System operations in Year Six followed the schedule implemented in Year Five following equipment repairs. The AS wells are operated in three groups of 19 to 22 AS wells; 60 AS points are operated 4 hours per day (full-time), 6 AS points are operated 2 hours per day (half-time), and 24 AS points are closed ([Figure 1](#)). During full operation, the AS wells are operated for a total of 12 hours per day to remove VOCs from groundwater, and the SVE blowers and wells are operated 24 hours per day to remove soil vapor with VOCs from the vadose zone. During limited operations in the alternate months, the AS manifold is closed and the compressor is in stand-by mode except for brief operation during site inspections, and the SVE blowers and wells are operated 12 hours per day.

Blower #1 failed in April 2016 and the SVE system was limited to operating Blower #2 for two 6-hour periods per day during Year Six. When the AS manifold was open for 'full' operation, the AS wells operated for an average of 4.9 hours in each 6-hour period. The AS/SVE system was in full operation during the following periods in Year Six: 29 March to 1 April, 20 to 24 April, 17 May to 17 June, 13 July to 10 August, 14 September to 9 November, 5 to 15 December 2016, 23 January to 22 February, and 22 March to 25 April 2017.

2.1 System Performance

AS/SVE system uptime during periods of full operation in Year Six was approximately 93%, which is comparable to previous performance. System uptime in Years One to Five ranged from 91% to 97%. The periods of full operation in Year Six totaled 196 days with 1930 hours available for system operations. The AS/SVE system was down due to system alarms and other issues for a total of 131 hours. System maintenance and shutdowns are summarized in [Section 2.3](#).

2.2 System Flow Rates and Vacuums

Operating conditions were generally recorded biweekly during full operation in Year Six. The AS parameters include pressure and air temperature at the AS compressor and the manifold, maximum and minimum air flow rates at the manifold, and pressure and flow rate at each operating AS well. The SVE parameters include vacuum and air temperature for each blower and the system effluent, and vacuum and flow rate for each SVE well. Operating hours for each blower and the compressor are also recorded. SVE system effluent flow rates are measured by a Sierra 640S flow meter and flow rates at individual wells are measured by vane-type meters at the well manifold. Vacuum measurements are made using a Dwyer Series 475 Mark 3 digital manometer. Operating conditions are recorded on standardized forms and maintained in the

project files. Remote system monitoring is used to augment the site visits, although not all parameters are available remotely.

AS injection rates, listed on [Table 1](#), ranged from 119 to 184 standard cubic feet per minute (scfm) and averaged 152 scfm. Air extraction rates and vacuum measurements at SVE wells and system effluent are also shown on [Table 1](#). The system was operated with a single blower and all 12 SVE wells during Year Six; average flow rates at individual SVE wells were 37 to 84 actual cubic feet per minute (acfm). Combined flow from all SVE wells averaged 579 scfm at 8.1 inches of mercury.

The combined SVE flow rate was designed at 1.5 times the AS injection rate in order to maintain partial vacuum for vapor capture throughout the treatment area. Based on the average AS injection rate of 152 scfm and the average combined SVE flow rate of 579 scfm, the SVE system extracted approximately 3.8 times the injection rate during Year Six.

2.3 System Maintenance

System inspections are performed by HDR and equipment maintenance is subcontracted to the AS/SVE equipment manufacturer, Kaeser. System inspections are performed weekly and include checking SVE blower v-belts and oil levels, automatic drains in the AS compressor and refrigerated dryer, and air intake filters for the AS building. Semiannual maintenance performed by Kaeser includes checking the AS compressor and SVE blower oil levels and adding or replacing oil as needed, checking and cleaning air filter mats in the compressor control panel, cleaning the compressor and dryer heat exchange radiators, checking tension on blower v-belts, and other tasks per the equipment operating manual. Field notes are recorded on maintenance and inspection forms. General housekeeping at the AS and SVE buildings and equipment compound is performed as needed. Semiannual maintenance reports prepared by Kaeser are included in [Appendix B](#).

Maintenance activities and system shutdowns during Year Six are listed below:

- Blower 1 shutdown on 5 April due to an SVE Low Vacuum alarm. The blower was tested briefly on 7 April and turned off due to a low amperage reading and motor noise.
- Due to a power loss for the system computer on 30 April, system operations were not recorded on the event log from 30 April at 06:36 until 3 May at 12:31. Operating hours for Blower #2 indicate that it operated on schedule during that period.
- During the system inspection on 3 May, the AS air dryer dew point gauge was noted to be moving from green to red and the alarm light indicated the pressure dew point was too high due to inlet high air temperature, low refrigerant level or other problems with the dryer. Kaeser was contacted but could not identify the problem over the phone. Equipment inspection was scheduled with semiannual maintenance in June 2016.
- On 11 May, an ADT Security technician replaced the wireless signal relay box, checked all alarm contacts, and confirmed the system was functioning properly.
- A Kaeser technician inspected the AS/SVE equipment on 30 June:

- Blower #1 was found to need a replacement 'air end' and new belt. The blower motor turned properly with no problems indicated.
 - The electrical switches for the condenser and fan on the AS air dryer were reset and it began to function properly; the dew point gauge returned to the green zone.
 - The air inlet valve for the AS compressor was found to be damaged and required repair; the damaged valve was causing short-cycling and additional operation of the compressor.
 - A water drip from the AS air tank/oil water separator drain was determined to result from the gasket crumpling when the air piston engages. The drain was operating properly and did not require repair at that time.
- An AS compressor alarm was noted during the inspection on 24 August. The alarm was based on operating hours and indicated the bearing lubrication should be checked during Kaeser's next maintenance event.
 - The replacement 'air end' for Blower #1 was brought to the equipment compound on 28 September by technicians from Kaeser and Blackwell. The blower's shaft hub broke as the technicians began to remove the damaged 'air end'. Further inspection of Blower #1 found the motor bearings would fail soon. The 'air end' was returned to storage until arrangements for removal and repair of the entire blower unit could be made.
 - While at the AS/SVE equipment compound on 28 September, the Kaeser technician repaired the AS compressor air inlet valve and lubed the bearings per the maintenance alarm.
 - During field measurements on 19 October, the AS compressor was found to have shutdown on 16 October due to a 'blow-off protection' alarm; the air dryer alarm light was also noted. Kaeser inspected the compressor on 20 October and cleaned the inlet air pressure booster valve, the minimum pressure check valve, and the auxiliary vent valve solenoid. The compressor restarted and the dryer alarm was reset. The technician also replaced the leaking air tank/oil water separator drain.
 - Two AS compressor maintenance alerts (air filter and belt coupling inspection) were noted during the inspection on 2 November.
 - On 7 November, Kaeser technicians removed Blower #1 and transported it to their maintenance shop for evaluation. The technicians fabricated and installed a flange to block the Blower #1 exhaust port and allow Blower #2 to continue operating. The technician reset the AS compressor belt coupler and air filter alerts; inspection of these items was performed during the annual maintenance in December 2016. The technician recommended an AS compressor thermostat be ordered for the maintenance event.
 - On 15 December, Kaeser performed annual maintenance. No major issues were identified although the technician advised that Blower #2 bearings should be lubricated in 2017. The technician also replaced the AS compressor thermostat.
 - HDR replaced AS building air intake filters on 21 December 2016 and 8 March 2017.

- Blower 2 shutdown on 9 January due to an AWS High/High Level alarm. The alarm was due to frozen water in the drain line from the AWS to the outside tank. The water line was cleared on 11 January and operations resumed.
- The AS compressor was not operating during inspection on 29 March. A Kaeser technician inspected the system on 31 March; he noted the electrical current to the compressor was low and found problems with two fuses in the circuit box. A TriState Armature technician replaced the fuses, and the Kaeser technician returned and restarted the compressor.
- The AS air dryer was not operating during inspection on 5 April; the dew point gauge was in the red and the alarm light indicated the pressure dew point was too high. When the power was switched on and the reset button pressed, the dryer began operating properly and the alarm was cleared.
- The AS compressor was off during a remote check on 9 April. A Kaeser technician inspected the system on 11 April and determined a main voltage low alarm caused the compressor to shut down. The technician found no problems with the compressor and re-started it.
- A TriState Armature technician inspected the AS/SVE electrical system, including the surge arrestors, on 12 April to determine the cause of the AS compressor low voltage alerts; no obvious problems were observed. The technician installed a voltage monitor on the AS building breaker box to document power fluctuations.
- A TriState Armature technician removed the voltage monitor on 2 May. Data from the monitor showed fluctuations in the incoming power supply indicating the problem was with the local utility, MLGW. TriState contacted MLGW to request an on-site review; MLGW did not respond to the request, but the frequency of low voltages alarms decreased.

System downtime during periods of full operation of the AS/SVE system and the lost operating hours are listed below:

- Compressor shutdown 16 to 20 October (40.5 hours)
- Removal of Blower #1 on 7 November (8.5 hours)
- Compressor shutdown 28 to 31 March (31.5 hours)
- Compressor 'Low Voltage' events 5 to 25 April (50 hours)

Operating time was reduced by approximately 131 hours of downtime during Year Six.

3 System Monitoring

AS/SVE system monitoring consists of vacuum measurements at VMPs; PID readings at the system effluent, SVE wells, and VMPs; and laboratory analysis of vapor samples from the system effluent. PID readings at the SVE well manifold and the system effluent are collected during months of full AS/SVE operation. PID readings and vacuum measurements at VMPs, and effluent vapor samples are collected quarterly during full operation. Monitoring activities are performed in accordance with the *2017 Uniform Federal Policy-Quality Assurance Project Plan, Revision 0* (2017 QAPP) (HDR, 2017a).

System monitoring was performed during full operation in May, July, October-November, December, February, and April. An AS compressor shutdown was noted on 19 October during the second quarter measurements and vapor sampling. The VMP measurements were completed but the PID readings at SVE wells and effluent, and the vapor sample collection were delayed until 9 November.

3.1 Vacuum Measurements

Vacuum measurements are collected at VMPs by connecting the Dwyer digital manometer to a quick-connect fitting in the sealed cap of each VMP well casing. The measurements are shown on [Table 2](#). Individual measurements at VMPs ranged from 3.6 to 29.0 inches of water and the average at each VMP was 8 to 21 inches of water. The measurements indicate a partial vacuum is created throughout the treatment area by the SVE wells, and therefore air injected during sparging is being captured by the SVE wells.

A chart showing the trend in vacuum readings at VMPs since start-up tests in October 2009 is provided in [Appendix C-1](#). Vacuum measurements at VMPs have generally ranged from 4 to 40 inches of water since operations began in December 2009. Two blowers were often operated in 2010 when the AS manifold was open; this resulted in slightly higher vacuum measurements during that period.

3.2 PID Measurements

VOC concentrations are estimated through field measurements at individual SVE wells, system effluent, and VMPs with a MiniRae 2000 (10.6 eV lamp) PID. Whole air samples are collected from sampling ports at each monitoring point by directly filling a dedicated Tedlar bag using a sampling pump (Thomas Air Pump Model 107CDC). The Tedlar bag is then attached to a calibrated PID and the maximum reading for each bag is recorded. PID readings are made for at least three Tedlar bags at each location; the PID is re-calibrated and additional readings are made if the initial readings are not consistent.

PID measurements from SVE wells and system effluent are shown on [Table 3](#). The estimated VOC concentrations at the SVE wells ranged from 0 to 0.4 parts per million (ppm) and from 0 to 0.2 ppm at the system effluent; the estimated VOC concentrations at all locations was 0 ppm

from November 2016 through April 2017. Measurements could not be made at SVE-10 due to water in the line.

Charts showing the trend in PID measurements at SVE wells and the system effluent since start-up tests in November 2009 are provided in [Appendix C-2](#). PID measurements at SVE wells have ranged from 0.1 to 20 ppm and were at the higher end of the range in 2012. At that time two wells, SVE-8 and -12, were closed to increase vapor extraction at SVE wells near the operating AS wells; the PID measurements decreased after the wells were re-opened later in 2012.

The VMPs are purged of at least three tubing volumes using the sampling pump prior to filling the first Tedlar bag. The VMP PID readings are shown on [Table 4](#). The estimated VOC concentrations were 0 ppm at all VMPs except for concentrations of 0.2 ppm at VMP-5B and -10A in February 2017. Charts showing the trend in PID measurements at VMPs since start-up tests in October 2009 are provided in [Appendix C-3](#). PID measurements at VMPs have a pattern similar to the SVE wells, with slightly lower concentrations.

3.3 Vapor Samples

System effluent samples for laboratory analysis are collected in 6-liter Summa canisters without a flow regulator. The Summa canister is shipped from the laboratory with negative pressure; thus, a sampling pump is not required. The quarterly vapor samples were collected on 19 July and 9 November 2016 and 8 February and 11 April 2017. The samples were submitted to ALS Environmental in Simi Valley, CA for analysis of VOCs by USEPA Method TO-15.

The complete analytical results are presented in [Appendix D, Table D-1](#). [Table 5](#) lists the analytical results for the primary CVOCs historically detected at Dunn Field and for other VOCs detected above the reporting limit (RL) in the sample. The totals for primary CVOCs and for total VOCs (primary CVOCs and other VOCs) are also listed.

Total primary CVOCs in the system effluent ranged from 64.4 to 68.4 ppbv, and total VOCs ranged from 75.1 to 82.4 ppbv; these concentrations are similar to sample results since operations resumed in March 2015. The CVOC detected at the highest concentration was trichloroethene (TCE) at 36 to 57% of the total primary CVOC concentration. System effluent concentration trends from PID measurements and analytical results are shown on [Figure 2](#).

3.4 Data Quality Evaluation

Analytical results for AS/SVE effluent vapor samples collected in Year Six were reviewed by the HDR project chemist based on guidelines in the QAPP. The complete analytical results for field and quality control (QC) samples, including data quality evaluation (DQE) flags, are presented in [Appendix D, Table D-1](#). The laboratory analytical reports are provided in [Appendix E](#) (electronic copies only).

Overall, the VOC data from the vapor samples met project data quality objectives and were determined to be sufficient to support the evaluation of AS/SVE system performance. The

complete DQE for Year Six samples is provided in [Appendix F](#). The main findings from the DQE are summarized separately below.

- The final qualifier for carbon disulfide was J+ in two samples and UJ in one sample due to high laboratory control sample (LCS) recovery. The final qualifier for trichlorofluoromethane and vinyl acetate in one sample was J+ due to high LCS recovery.
- The final qualifier for one parent sample result and one field duplicate sample result was UJ or J for nine analytes (chloromethane, bromomethane, acetonitrile, carbon disulfide, tetrahydrofuran, benzene, bromodichloromethane, dibromochloromethane and bromoform) due to field duplicate results outside control limits.
- Any result reported below the RL but above the method detection limit was qualified J and considered an estimated result (unless overridden by other QC flags).

3.5 Mass Removal Estimate

The VOC mass removed by the AS/SVE system is estimated from the average VOC concentrations in the effluent sample (based on TCE), system operating hours, and flow rates. The molar mass of TCE is used as a surrogate for all VOCs to simplify the calculation. System operating hours are based on operation of the AS compressor and the SVE blower(s); operating hours for the SVE blower without the AS compressor are not included in the mass removal estimate. The mass emission calculations are summarized on [Table 6](#).

The estimated VOC emission rate in the effluent was 0.001 lb/hr during Year Six. The emissions remained well below the SCHD de minimus standard of 0.1 lb/hr. The AS/SVE system removed approximately 1.6 lbs of VOCs in Year Six and 86.1 lbs of VOCs since startup ([Table 6](#)).

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4 Conclusions and Recommendations

4.1 System Operations

The AS/SVE system uptime was approximately 93% during periods of full operation in Year Six (1 January 2016 to 1 May 2017). AS/SVE system is limited to full operations to alternate months in order to maintain northerly groundwater flow in the treatment area.

The SVE system extracted approximately 3.8 times the AS injection rate during Year Six. Vacuum measurements at VMPs indicated vapor capture throughout the AS/SVE treatment area. PID measurements at SVE wells and VMPs were 0 ppm for most readings during Year Six. Total VOC concentrations in effluent vapor samples ranged from 75 to 82 ppbv. The estimated VOC emission rate in the effluent was 0.001 lb/hr during Year Six, below the SCHD de minimus standard. Approximately 86 lbs of VOCs have been removed since startup in 2009.

PID measurements at the system effluent are generally equal to or slightly less than the highest measurements at SVE wells ([Appendix C-2, Figure 1](#)). The total VOCs in the effluent have been below 100 ppbv (0.1 ppm) in all but one analysis since September 2010. The total VOCs (and total CVOCs) in the effluent have had a slight increasing trend since 2012; total VOCs have increased from 28 ppbv in February 2012 to 78 ppbv in April 2017 ([Figure 2](#)). The April 2017 total VOC concentration (82 ppbv) is approximately 6 percent of the concentration at startup in December 2009 (1240 ppbv).

4.2 System Effectiveness

CVOC concentrations in groundwater, as provided in LTM reports, are considered the most useful measure of AS/SVE remedy effectiveness. The AS/SVE system was installed to intercept the majority of the Off Depot CVOC plume and to reduce individual CVOC concentrations below 50 µg/L. Operations are to continue until the upgradient concentrations from the Dunn Field plume do not exceed 50 µg/L for individual CVOCs. AS/SVE in combination with natural attenuation processes is expected to reduce groundwater concentrations to Safe Drinking Water Act maximum contaminant levels (MCLs) in accordance with the RA objectives in the *Dunn Field Record of Decision* (Dunn Field ROD) (CH2M HILL, 2004).

The estimated period of AS/SVE system operations was 5 years, which ended in December 2014. The system operating period has been extended due to individual CVOC concentrations above 50 µg/L in monitoring well MW-159.

Current groundwater data in the AS/SVE area is provided in *April 2017 Long-Term Monitoring Summary Report, Revision 0* (HDR, 2017b). Since April 2012, only TCE in one LTM well near the AS/SVE system, MW-159, has exceeded the 50 µg/L treatment goal. The TCE concentration in MW-159 was 141 µg/L in April 2017. Groundwater elevation contours and the April 2017 analytical results for TCE at LTM wells in the general area of the AS/SVE system are shown on [Figure 3](#).

There are 22 Fluvial Aquifer LTM wells in the immediate vicinity of the AS/SVE system ([Figure 3](#)). CVOC concentrations at six of these wells have been observed above MCLs or the target concentrations (TCs) in the Dunn Field ROD since October 2014. Recent concentrations for 1,1,2,2-tetrachloroethane (TeCA) and TCE, which are most commonly detected above the MCLs or TCs, in the six wells are shown on [Table 7](#). The recent concentration trends are summarized below:

- Concentrations at MW-159 remain above the treatment goal for AS/SVE operations. The low TCE concentrations detected in the April 2016 sample is not considered representative. The initial sample collected in April 2016 did not meet laboratory criteria for analysis and the well was re-sampled in May, and the passive diffusion bag may not have equilibrated between placement and sampling.
- Concentrations have decreased at upgradient wells, MW-54 and MW-150. The decrease is considered due to reduced CVOC concentrations from RA on Dunn Field and groundwater flow from Dunn Field.
- Concentrations at the other three wells (MW-165, MW-243 and MW-246), which are located immediately downgradient of the treatment area, have decreased since AS/SVE operations resumed in March 2015. TeCA concentrations in MW-246 remain above the TC.

In order to address the continued high concentration of TCE at MW-159, additional AS wells will be installed south of MW-159 to increase removal of CVOCs from groundwater. The *Off Depot Air Sparge Well Installation Work Plan, Dunn Field* (Trinity, 2016) was approved by USEPA and TDEC in 2016.

The new AS wells will be installed upon completion of an updated access agreement with MLGW and will be incorporated into system operations following installation. No other changes to AS/SVE operations are recommended. AS/SVE operations are currently planned to continue at least through May 2018.

5 References

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- HDR, 2011b. *Dunn Field Off Depot Groundwater Air Sparge and Soil Vapor Extraction System Operations and Maintenance Manual, Defense Depot Memphis, Tennessee, Department of the Army, Revision 0*. Prepared for the Air Force Center for Engineering and the Environment. March, 2011.
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- Trinity Analysis & Development Corp, 2016. *Uniform Federal Policy-Quality Assurance Project Plan Off Depot Air Sparge Well Installation Work Plan, Dunn Field, Defense Depot Memphis, Tennessee, Department of the Army, Revision 1*. Prepared for the U.S. Army Corps of Engineers, Mobile District. December, 2016.

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Tables



TABLE 1
FLOW RATE AND VACUUM READINGS AT SVE WELLS AND EFFLUENT
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee

Date	Number of Blowers in Operation	AS Compressor	SVE Effluent		SVE-1		SVE-2		SVE-3	
		Flow rate (scfm)	Flow rate (scfm)	Vacuum (in. Hg.)	Flow rate (acfm)	Vacuum (in. H ₂ O)	Flow rate (acfm)	Vacuum (in. H ₂ O)	Flow rate (acfm)	Vacuum (in. H ₂ O)
4/1/2016	1	153	560	9.2	50	66	70	61	60	62
5/19/2016	1	130	570	8.4	60	53	80	60	60	55
6/1/2016	1	121	580	8.3	50	52	80	54	50	42
6/17/2016	1	119	550	8.0	60	53	70	45	60	48
7/6/2016	1	C	560	8.3	70	58	80	58	60	57
7/19/2016	1	122	570	8.0	60	53	80	53	60	53
7/28/2016	1	149	560	7.9	60	52	80	51	60	51
8/10/2016	1	146	560	8.0	60	52	80	50	60	53
9/1/2016	1	C	560	8.1	60	53	80	50	70	52
9/8/2016	1	C	560	8.1	60	54	80	51	60	53
9/21/2016	1	168	570	8.0	60	47	80	46	60	48
9/28/2016	1	131	570	8.1	60	48	80	43	60	47
10/7/2016	1	165	570	8.1	70	51	90	46	70	50
10/14/2016	1	150	580	8.1	60	50	90	45	60	50
10/27/2016	1	149	580	8.3	60	53	80	57	60	52
11/2/2016	1	155	570	8.3	60	53	80	51	60	52
11/9/2016	1	145	590	8.0	70	48	80	46	60	50
12/21/2016	1	C	610	8.2	70	48	90	47	60	49
1/12/2017	1	C	590	8.2	60	55	80	58	60	55
1/25/2017	1	168	590	7.8	80	51	90	49	70	48
2/8/2017	1	184	580	7.9	60	49	80	50	60	49
2/22/2017	1	159	610	7.7	70	45	90	48	60	47
3/8/2017	1	C	600	8.3	70	55	80	55	60	54
3/22/2017	1	137	590	8.2	60	56	90	56	60	56
4/5/2017	1	177	580	8.0	50	49	80	48	60	49
4/12/2017	1	175	610	7.7	70	46	100	42	70	45
4/19/2017	1	172	600	7.5	60	48	80	48	60	45
4/25/2017	1	175	590	7.5	60	45	80	46	60	45
5/17/2017	1	C	590	7.8	70	49	90	49	60	49

Notes

scfm: standard cubic feet per minute

acfm: actual cubic feet per minute

in. Hg: inches of mercury

in. H₂O: inches of water

C: AS manifold closed.

No reading because of water in

NR: line

TABLE 1
FLOW RATE AND VACUUM READINGS AT SVE WELLS AND EFFLUENT
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee

Date	Number of Blowers in Operation	SVE-4		SVE-5		SVE-6		SVE-7		SVE-8	
		Flow rate (acfm)	Vacuum (in. H ₂ O)	Flow rate (acfm)	Vacuum (in. H ₂ O)	Flow rate (acfm)	Vacuum (in. H ₂ O)	Flow rate (acfm)	Vacuum (in. H ₂ O)	Flow rate (acfm)	Vacuum (in. H ₂ O)
4/1/2016	1	70	59	30	73	70	59	50	79	70	66
5/19/2016	1	80	51	50	67	80	52	NR	74	70	61
6/1/2016	1	70	41	50	56	70	49	50	73	70	49
6/17/2016	1	70	38	50	51	70	38	50	63	70	44
7/6/2016	1	70	53	40	69	70	54	30	79	70	63
7/19/2016	1	70	49	40	65	70	48	50	75	70	59
7/28/2016	1	80	48	50	64	80	48	50	74	70	58
8/10/2016	1	70	49	40	66	70	50	50	75	70	59
9/1/2016	1	70	48	40	63	70	48	40	73	80	57
9/8/2016	1	70	49	40	65	80	49	50	75	80	59
9/21/2016	1	70	43	40	60	80	45	50	70	70	54
9/28/2016	1	70	44	50	61	70	44	40	69	80	53
10/7/2016	1	70	46	50	51	80	47	50	73	80	56
10/14/2016	1	70	46	40	61	80	45	50	67	70	53
10/27/2016	1	70	48	50	65	80	49	50	74	80	59
11/2/2016	1	70	49	40	63	70	48	40	72	80	59
11/9/2016	1	70	47	50	62	80	47	50	71	80	57
12/21/2016	1	70	47	50	61	80	44	NR	68	70	53
1/12/2017	1	70	54	50	68	80	53	NR	78	80	63
1/25/2017	1	80	47	50	61	80	45	60	69	80	55
2/8/2017	1	70	46	50	63	80	46	NR	68	70	57
2/22/2017	1	70	45	50	60	80	44	NR	67	80	53
3/8/2017	1	70	52	50	67	80	48	NR	76	80	60
3/22/2017	1	70	53	50	69	80	51	NR	76	80	61
4/5/2017	1	70	47	50	61	80	46	50	69	70	57
4/12/2017	1	70	42	50	57	90	41	50	67	70	52
4/19/2017	1	80	44	50	60	80	43	60	67	80	56
4/25/2017	1	70	39	50	57	80	40	50	64	70	48
5/17/2017	1	80	45	50	60	80	44	60	67	80	51

Notes

scfm: standard cubic feet per minute

acfm: actual cubic feet per minute

in. Hg: inches of mercury

in. H₂O: inches of water

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No reading because of water in

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TABLE 1
FLOW RATE AND VACUUM READINGS AT SVE WELLS AND EFFLUENT
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee

Date	Number of Blowers in Operation	SVE-9		SVE-10		SVE-11		SVE-12	
		Flow rate (acfm)	Vacuum (in. H ₂ O)	Flow rate (acfm)	Vacuum (in. H ₂ O)	Flow rate (acfm)	Vacuum (in. H ₂ O)	Flow rate (acfm)	Vacuum A1(in. H ₂ O)
4/1/2016	1	70	80	NR	62	70	45	NR	55
5/19/2016	1	NR	76	NR	55	70	37	NR	54
6/1/2016	1	100	75	50	53	70	36	80	51
6/17/2016	1	70	77	NR	41	70	37	90	47
7/6/2016	1	70	77	NR	57	70	37	90	48
7/19/2016	1	80	75	NR	55	70	35	80	45
7/28/2016	1	80	74	NR	53	80	35	90	44
8/10/2016	1	70	75	20	55	70	36	80	45
9/1/2016	1	80	76	40	52	80	36	NR	44
9/8/2016	1	70	75	NR	54	70	35	90	42
9/21/2016	1	70	72	NR	50	80	33	80	40
9/28/2016	1	80	71	NR	50	70	33	80	39
10/7/2016	1	70	72	NR	54	70	34	80	40
10/14/2016	1	70	68	NR	47	70	34	80	40
10/27/2016	1	80	74	NR	46	80	35	90	39
11/2/2016	1	80	74	NR	53	80	35	80	42
11/9/2016	1	80	71	NR	NR	90	33	80	41
12/21/2016	1	NR	68	NR	46	80	33	80	44
1/12/2017	1	NR	74	NR	55	80	38	80	49
1/25/2017	1	NR	67	NR	49	80	36	80	47
2/8/2017	1	NR	68	NR	50	70	34	NR	46
2/22/2017	1	NR	68	NR	47	80	33	90	44
3/8/2017	1	NR	75	NR	56	80	38	90	49
3/22/2017	1	NR	74	NR	56	70	39	90	49
4/5/2017	1	80	69	NR	48	80	35	NR	48
4/12/2017	1	80	68	NR	47	70	32	90	41
4/19/2017	1	80	70	NR	49	70	32	NR	43
4/25/2017	1	80	67	NR	43	70	29	NR	39
5/17/2017	1	90	69	NR	46	80	30	NR	41

Notes

scfm: standard cubic feet per minute

acfm: actual cubic feet per minute

in. Hg: inches of mercury

in. H₂O: inches of water

C: AS manifold closed.

No reading because of water in

NR: line

TABLE 2
VACUUM READINGS AT VMPs
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee

Date	7/18/2016	10/19/2016	2/7/2017	4/9/2017
Blowers	1	1	1	1
Sparge	Y	N	Y	N
VMP1A	9.0	29.0	3.6	8.6
VMP1B	8.5	11.0	4.3	8.8
VMP2A	11.2	14.2	11.8	14.4
VMP2B	6.9	14.2	12.8	14.0
VMP3A	21.7	4.8	20.8	14.5
VMP3B	10.7	17.8	12.1	15.0
VMP4A	10.5	22.6	19.0	20.0
VMP4B	10.1	21.3	15.4	18.8
VMP5A	6.5	17.9	10.4	17.5
VMP5B	6.9	18.6	13.7	19.0
VMP6A	15.4	21.1	4.5	17.6
VMP6B	21.2	21.5	5.1	19.1
VMP7A	15.3	22.6	4.8	18.9
VMP7B	17.7	23.0	4.5	19.1
VMP8A	17.3	19.0	13.0	21.4
VMP8B	17.7	19.1	12.6	21.5
VMP9A	20.5	25.6	15.1	21.8
VMP9B	20.6	25.8	15.0	21.4
VMP10A	18.2	15.2	13.3	22.8
VMP10B	20.7	16.1	13.8	17.8

Notes:

- 1) Vacuum measurements made with a digital manometer; units are in inches of water.

TABLE 3
PID MEASUREMENTS AT SVE WELLS AND EFFLUENT
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee

Date	Time	Blowers	Sparge	SVE1	SVE2	SVE3	SVE4	SVE5	SVE6	SVE7	SVE8	SVE9	SVE10	SVE11	SVE12	Effluent
5/24/2016	11:00	1	Y	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.0	0.0	NM	0.0	0.0	0.0
7/19/2016	9:00	1	Y	0.0	0.0	0.0	0.1	0.4	0.4	0.2	0.3	0.4	NM	0.2	0.0	0.2
11/9/2016	10:00	1	Y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NM	0.0	0.0	0.0
12/9/2016	9:30	1	Y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NM	0.0	0.0	0.0
2/6/2017	10:30	1	Y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NM	0.0	0.0	0.0
4/11/2017	9:00	1	Y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NM	0.0	0.0	0.0

Notes:

1) PID measurements made with a MiniRae 2000 (10.6 ev lamp); units are in parts per million

NM: No measurement because of water in SVE line.

TABLE 4
PID MEASUREMENTS AT VMPs
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee

Date	7/18/2016	10/19/2016	2/7/2017	4/9/2017
Blowers	1	1	1	1
Sparge	Y	N	Y	N
VMP1A	0.0	0.0	0.0	0.0
VMP1B	0.0	0.0	0.0	0.0
VMP2A	0.0	0.0	0.0	0.0
VMP2B	0.0	0.0	0.0	0.0
VMP3A	0.0	0.0	0.0	0.0
VMP3B	0.0	0.0	0.0	0.0
VMP4A	0.0	0.0	0.0	0.0
VMP4B	0.0	0.0	0.0	0.0
VMP5A	0.0	0.0	0.0	0.0
VMP5B	0.0	0.0	0.2	0.0
VMP6A	0.0	0.0	0.0	0.0
VMP6B	0.0	0.0	0.0	0.0
VMP7A	0.0	0.0	0.0	0.0
VMP7B	0.0	0.0	0.0	0.0
VMP8A	0.0	0.0	0.0	0.0
VMP8B	0.0	0.0	0.0	0.0
VMP9A	0.0	0.0	0.0	0.0
VMP9B	0.0	0.0	0.0	0.0
VMP10A	0.0	0.0	0.2	0.0
VMP10B	0.0	0.0	0.0	0.0

Notes:

- 1) PID measurements made with a MiniRae 2000 (10.6 eV lamp); units are in parts per million.

TABLE 5
ANALYTICAL RESULTS SUMMARY - SVE EFFLUENT
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis Tennessee

	Sample ID	ODSVE-EFF-Y6Q1	ODSVE-EFF-Y6Q2	ODSVE-EFF-Y6Q3	ODSVE-EFF-Y6Q4
	Lab ID	P1603665-001	P1605349-001	P1700718-001	P1701803-001
	Date	19-Jul-16	9-Nov-16	8-Feb-17	11-Apr-17
Primary CVOCs	Units				
1,1,2,2-Tetrachloroethane	ppbv	0.35	0.6	0.96	0.53
1,1,2-Trichloroethane	ppbv	0.12 U	0.11 U	0.12 U	0.12 U
1,1-Dichloroethene (1,1-DCE)	ppbv	1.5	1.4	1.4	1.2
1,2-Dichloroethane	ppbv	0.16 U	0.15 U	0.16 U	0.16 U
Carbon Tetrachloride	ppbv	0.62	0.41	0.52	0.46
Chloroform	ppbv	4.5	6	6.3	5.4
cis-1,2-Dichloroethene	ppbv	17	25	29	26
Dibromochloromethane	ppbv	0.075 U	0.15 J	0.075 U	0.075 U
Tetrachloroethene	ppbv	3.7	2.9	3.1	3.3
trans-1,2-Dichloroethene	ppbv	0.58	0.52	0.45	0.37
Trichloroethene (TCE)	ppbv	36	30	23	31
Vinyl Chloride	ppbv	0.1 J	0.097 J	0.11 J	0.11 J
Total Primary CVOCs	ppbv	64.4	67.1	64.8	68.4
Other VOCs					
1,1,1-Trichloroethane (TCA)	ppbv	0.54	0.49	0.74	0.51
1,1,2-Trichlorotrifluoroethane	ppbv	6.9	4.2	4.1	4.1
1,1-Dichloroethane (1,1-DCA)	ppbv	0.77	0.8	0.7	0.59
Acetone	ppbv	2.7 U	4.9	3.3	0.57 J
Bromodichloromethane	ppbv	0.033 J	0.27 J	0.15	0.2
Cyclohexane	ppbv	0.14 J	1.1	0.14 J	0.4
Dichlorodifluoromethane (CFC 12)	ppbv	0.82	1.2	2.6	2.3
Ethyl Acetate	ppbv	1.1	0.34 U	0.35 U	0.35 U
n-Heptane	ppbv	0.16 U	0.12 J	0.16 U	0.21
n-Hexane	ppbv	0.058 J	1.3	0.097 J	0.56
Propene	ppbv	0.37 U	0.33 J	0.44	0.13 J
Toluene	ppbv	0.1 J	0.22	0.12 J	0.17 U
Trichlorofluoromethane (CFC 11)	ppbv	0.33	0.37	0.43 J+	0.34
Total VOCs	ppbv	75.1	82.4	77.7	78.3

Notes:

ppbv: part per billion volume

RL: Reporting Limit

-: Not Listed

DQE Flags

U: Not detected above RL

UJ: Not detected, RL estimated

J: Concentration estimated

J+: Concentration estimated, biased high

TABLE 6
 MASS REMOVAL CALCULATIONS
 OFF DEPOT AS/SVE SYSTEM
 ANNUAL OPERATIONS REPORT, YEAR SIX
 Defense Depot Memphis, Tennessee

Start Date	End Date	Hours Operating Between Dates	Average Flow rate (scfm)	Laboratory Total VOC Influent Concentration (ppbv)	Average Influent VOC Concentration (ppbv)	Influent Emission Rate (lb/hr)	Estimated VOC Mass Removal During Period (lbs)	Cumulative Mass Removed From Fluvial Subsurface (lbs)
11/12/2009	12/11/2009	92	977	1240	1240	0.025	2.3	2.3
12/11/2009	1/25/2010	1074	1054	447	844	0.018	19.9	22.2
1/25/2010	2/23/2010	665	926	351	399	0.008	5.1	27.3
2/23/2010	3/31/2010	890	916	267	309	0.006	5.2	32.5
3/31/2010	6/17/2010	1854	1119	633	450	0.010	19.4	51.9
6/17/2010	9/16/2010	1958	1114	73.8	353	0.008	16.0	68.0
9/16/2010	12/7/2010	1695	1006	68.9	71.4	0.001	2.5	70.5
12/7/2010	3/24/2011	872	965	60.4	64.7	0.001	1.1	71.6
3/24/2011	6/17/2011	783	974	66.0	63.2	0.001	1.0	72.6
6/17/2011	9/16/2011	1042	958	50.8	58.4	0.001	1.2	73.8
9/16/2011	12/22/2011	1148	724	38.2	44.5	0.0007	0.8	74.6
12/22/2011	2/16/2012	759	719	27.6	32.9	0.0005	0.4	75.0
2/16/2012	3/31/2012	437	660	36.0	31.8	0.0004	0.2	75.2
3/31/2012	6/30/2012	969	834	208	122	0.0021	2.1	77.2
6/30/2012	9/30/2012	1124	612	42.8	125	0.0016	1.8	79.0
9/30/2012	12/31/2012	1061	628	38.5	40.7	0.0005	0.6	79.6
12/31/2012	3/31/2013	1070	628	46.7	42.6	0.0006	0.6	80.2
3/31/2013	6/30/2013	1070	760	54.5	50.6	0.0008	0.9	81.0
6/30/2013	9/30/2013	730	662	49.2	51.9	0.0007	0.5	81.6
9/30/2013	12/31/2013	1104	763	53.2	51.2	0.0008	0.9	82.5
12/31/2013	3/30/2014	465	810	-	53.2	0.0009	0.4	82.9
3/6/2015	6/30/2015	525	615	86.2	86.2	0.0011	0.6	83.5
6/30/2015	9/30/2015	667	555	65.9	76.1	0.0009	0.6	84.0
9/30/2015	12/31/2015	507	566	72.2	69.1	0.0008	0.4	84.4
12/31/2015	7/31/2016	518	565	75.1	73.7	0.0009	0.4	84.9
7/31/2016	11/30/2016	548	574	82.4	78.8	0.0009	0.5	85.4
11/30/2016	2/28/2017	442	598	77.7	80.1	0.0010	0.4	85.9
2/28/2017	5/5/2017	292	595	78.3	78.0	0.0010	0.3	86.1

Notes:

lbs pounds
 lb/hr pounds per hour
 ppbv parts per billion by volume
 scfm standard cubic feet per minute

Constants:

Mass of TCE: 131.4 lb/lb mol
 Molar Vol Air 379 ft³/lbmol (@ 60 deg F)

TABLE 7
 ADJACENT LTM WELLS EXCEEDING MCL OR TC
 OFF DEPOT AS/SVE SYSTEM
 ANNUAL OPERATIONS REPORT, YEAR SIX
 Defense Depot Memphis, Tennessee

Analyte	TeCA						TCE					
MCL	-						5					
TC	2.2						5					
Units	µg/L						µg/L					
Well ID	Oct 2014	Apr 2015	Oct 2015	Apr 2016	Oct 2016	Apr 2017	Oct 2014	Apr 2015	Oct 2015	Apr 2016	Oct 2016	Apr 2017
MW-54	2.5	2.2	1.1	<0.5	<0.5	0.4	10.0	10.4	5.3	<1.0	<1.0	1.7
MW-150	0.8	1.8	3.1	<0.5	<0.5	0.2	2.3	7.4	9.5	<1.0	<1.0	0.9
MW-159	13.7	11.7	15.7	4.2	9.9	10.1	216	198	227	38.4	171	141
MW-165	0.7	0.4	0.5	0.2 J	<0.5	<0.5	6.3	6.2	3.6	1.9	1.1	1.2
MW-243	2.6	1.7	1.3	1.3	1.2	1.7	5.0	1.7	1.5	2.6	2.4	3.2
MW-246	9.6	5.4	3.3	0.4 J	4.3	4.8	28.5	1.0	0.7	3.6	0.4 J	0.8

Notes:

MCL: Maximum Concentration Level

TC: Target Concentration

µg/L: micrograms per liter

1) Results above MCL or TC shown in **bold**



Figures



Figure 1

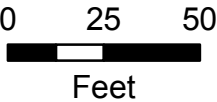
AS/SVE System
Plan Map

Off Depot AS/SVE System
Annual Operations Report,
Year Six

Defense Depot
Memphis, Tennessee

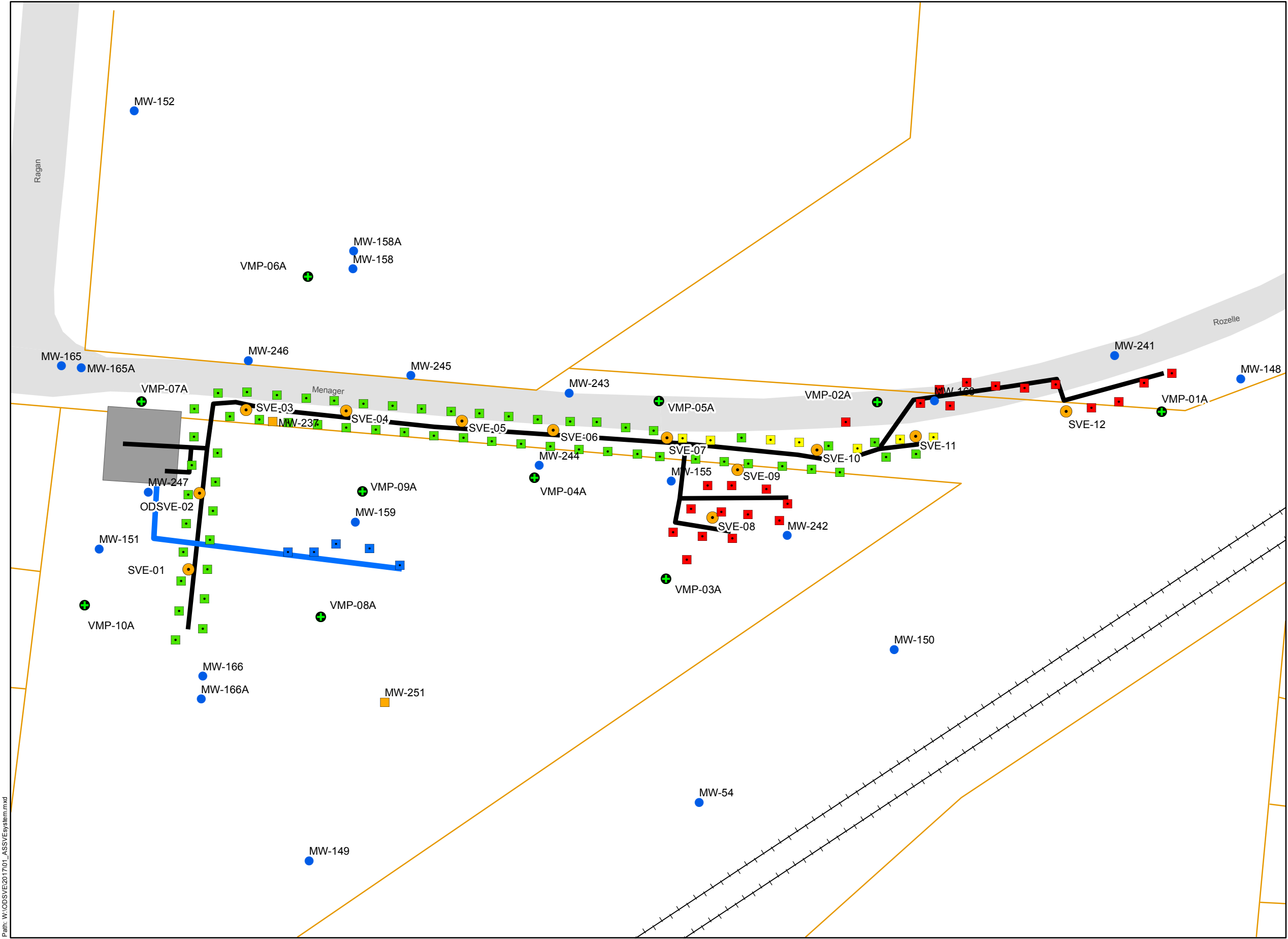
Legend

- Monitoring Well Screened in the Fluvial Aquifer
- Monitoring Well Screened in the Intermediate Aquifer
- AS Location (1/2 time)
- AS Location (full time)
- AS Location (closed)
- New AS Location (planned)
- VMP Location
- SVE Location
- Conveyance Lines
- New Conveyance Line (planned)
- SVE Compound
- Roads
- Railroad
- Parcel Boundary



Projection: NAD 1927 StatePlane Tennessee
Units: Feet, Elevation Units: Feet, mean sea level

Date: 7/21/2017
Edition: Rev 0



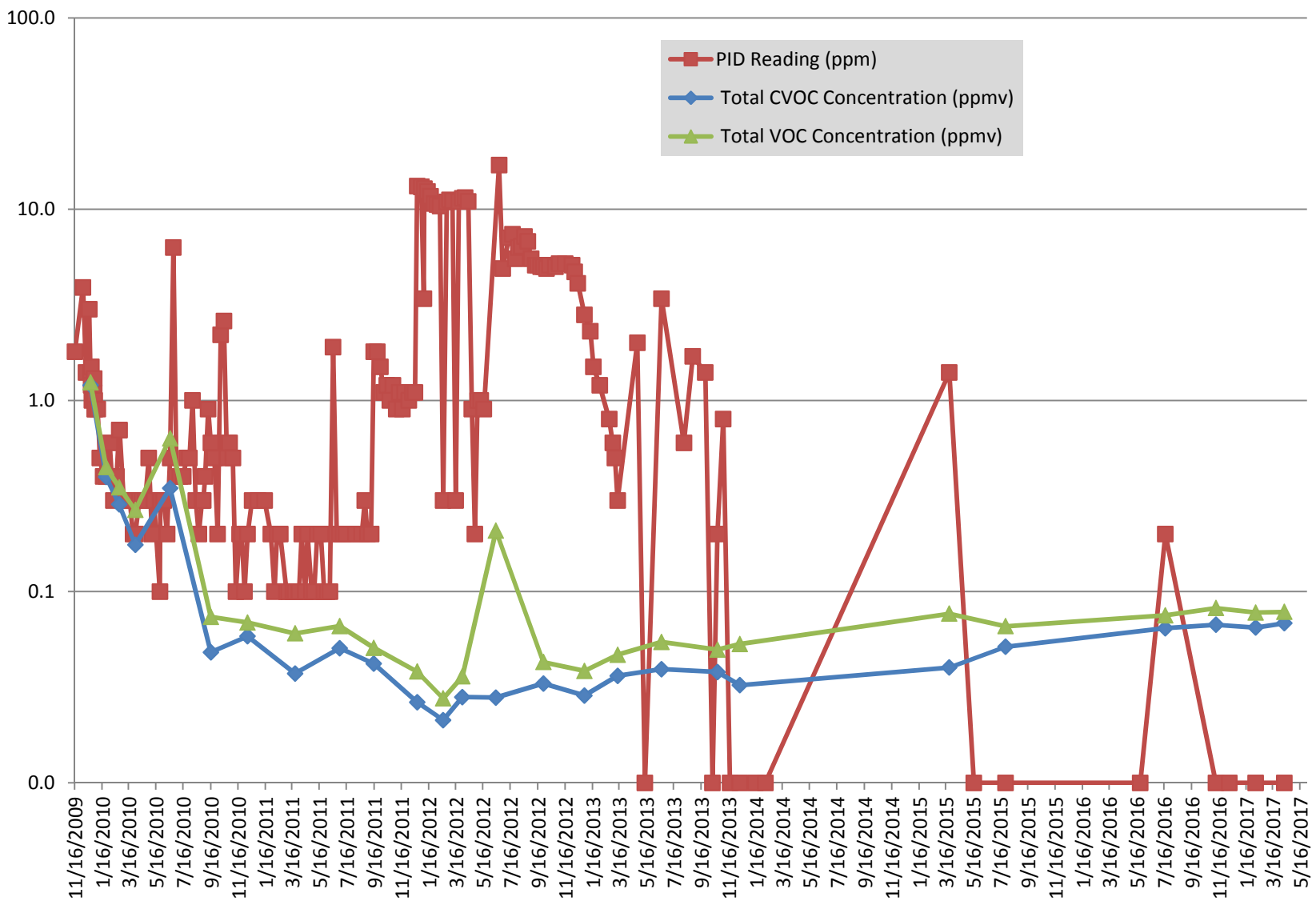


Figure 2
EFFLUENT CONCENTRATION TREND - ANALYTICAL RESULTS AND FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee

Path: W:\ODS\VE2017\03_DE_TCE_Apr_2017.mxd

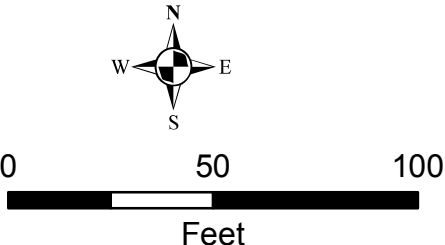
Notes:
1. Analytical results are from the April 2017 LTM event.
2. Highest concentration at well pairs used for contour.
3. Groundwater contours are from the April 2017 LTM event.



Figure 3
Fluvial Aquifer TCE Concentrations,
April 2017

Off Depot AS/SVE System
Annual Operations Report,
Year Six

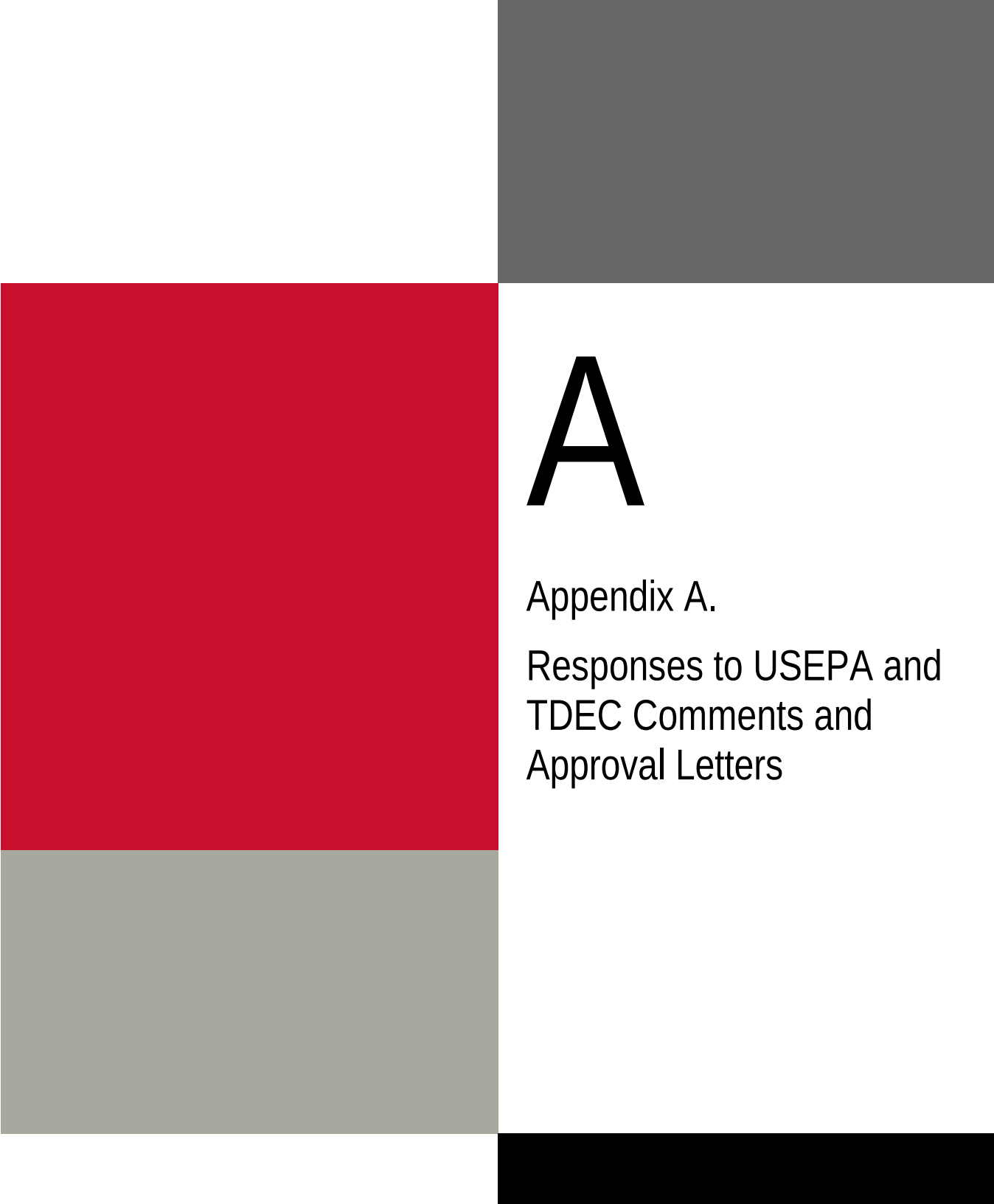
Defense Depot
Memphis, Tennessee



Projection: NAD 1983 StatePlane Tennessee
Units: Feet, Elevation Units: Feet, NAVD83

Date: 6/11/2018
Edition: Rev 0

HDR



A

Appendix A.

Responses to USEPA and
TDEC Comments and
Approval Letters



**TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
MEMPHIS ENVIRONMENTAL FIELD OFFICE**

**8383 WOLF LAKE DRIVE
BARTLETT, TN 38133-4119
PHONE (901) 371-3000 STATEWIDE 1-888-891-8332 FAX (901) 371-3170**

March 8, 2018

James C. Foster
BRAC Program Manager
Headquarters Department of the Army,
Assistant Chief of Staff for
Installation Management (DAIM-ODB)
Army Pentagon,
2530 Crystal Drive,
Arlington, VA 22202-3934

**Subject: AS/SVE Year 6 Annual Operations Report (Rev. 1)
Defense Depot Memphis, Tennessee
TDoR ID # 79-736**

Mr. Foster,

TDEC-DoR has reviewed the response to TDEC comments from T. Holmes (HDRInc), regarding the **AS/SVE Year 6 Annual Operations Report (Rev. 1)**, and approves of the revised document. If there are questions or concerns, please contact me at (901) 371-3041 or at jamie.woods@tn.gov.

Regards,

Jamie A. Woods, P.G.
Project Manager
Division of Remediation
Memphis Environmental Field Office

cc: Tom Holmes (HDR Inc)
D. Lloyd (EPA-PM)
Joan Hutton (CALIBRE)
TDoR NCO: file 79-736
TDoR MEFO: file 79-736

2 System Operations

The AS/SVE system was operated in stand-by mode from 1 January to 6 May 2016 while the Trinity task order was put in place. The SVE blowers were operated 12 hours per day and the AS compressor was operated with the manifold to the AS wells closed, except for brief periods during system inspections and for a few days in March and April 2016.

System operations in Year Six followed the schedule implemented in Year Five following equipment repairs. The AS wells are operated in three groups of 19 to 22 AS wells; 60 AS points are operated 4 hours per day (full-time), 6 AS points are operated 2 hours per day (half-time), and 24 AS points are closed (Figure 1). During full operation, the AS wells are operated for a total of 12 hours per day to remove VOCs from groundwater, and the SVE blowers and wells are operated 24 hours per day to remove soil vapor with VOCs from the vadose zone. During limited operations in the alternate months, the AS manifold is closed and the compressor is in stand-by mode except for brief operation during site inspections, and the SVE blowers and wells are operated 12 hours per day.

Blower #1 failed in April 2016 and the SVE system was limited to operating Blower #2 for two 6-hour periods per day during Year Six. When the AS manifold was open for 'full' operation, the AS wells operated for approximately 5.5 hours in each 6-hour period. The AS/SVE system was in full operation during the following periods in Year Six: 29 March to 1 April, 20 to 24 April, 17 May to 17 June, 13 July to 10 August, 14 September to 9 November, 5 to 15 December 2016, 23 January to 22 February, and 22 March to 25 April 2017.

2.1 System Performance

AS/SVE system uptime during periods of full operation in Year Six was approximately 93%. System maintenance and shutdowns are summarized in Section 2.3.

2.2 System Flow Rates and Vacuums

Operating conditions were generally recorded biweekly during full operation in Year Six. The AS parameters include pressure and air temperature at the AS compressor and the manifold, maximum and minimum air flow rates at the manifold, and pressure and flow rate at each operating AS well. The SVE parameters include vacuum and air temperature for each blower and the system effluent, and vacuum and flow rate for each SVE well. Operating hours for each blower and the compressor are also recorded. SVE system effluent flow rates are measured by a Sierra 640S flow meter and flow rates at individual wells are measured by vane-type meters at the well manifold. Vacuum measurements are made using a Dwyer Series 475 Mark 3 digital manometer. Operating conditions are recorded on standardized forms and maintained in the project files. Remote system monitoring is used to augment the site visits, although not all parameters are available remotely.

AS injection rates, listed on Table 1, ranged from 119 to 184 standard cubic feet per minute (scfm) and averaged 152 scfm. Air extraction rates and vacuum measurements at SVE wells

Summary of Comments on AS-SVE Year 6 Annual Report InternalDraft_072117

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Author: BG38123 Subject: Highlight Date: 12/8/2017 11:08:06 AM

Could you expand more on closed ops and what that means exactly? If no sparging was needed bc of low plume concentrations, except for MW159, then why the need to operate the compressor. Please clarify

Author: THOLMES Subject: Sticky Note Date: 12/8/2017 3:17:11 PM

As stated in the first sentence, this paragraph is describing operations from the end of Year 5 (12/31/15) until a new task order for AS/SVE operations was awarded in May 2016.

HDR continued blower operations and weekly inspections to maintain the system and continue limited remediation by SVE. The AS compressor was turned on during inspections and in March for maintenance; brief operation in April was to limit impact of stand-by operations on LTM samples. This was not related to low plume concentrations or MW-159.

Author: THOLMES Subject: Inserted Text Date: 12/8/2017 1:57:46 PM

Following text to be added per comment on page 2-4 (16):
"which is comparable to previous performance. System uptime in Years One to Five ranged from 91% to 97%."

and system effluent are also shown on [Table 1](#). The system was operated with a single blower and all 12 SVE wells during Year Six; average flow rates at individual SVE wells were 37 to 84 actual cubic feet per minute (acfm). Combined flow from all SVE wells averaged 579 scfm at 8.1 inches of mercury.

The combined SVE flow rate was designed at 1.5 times the AS injection rate in order to maintain partial vacuum for vapor capture throughout the treatment area. Based on the average AS injection rate of 152 scfm and the average combined SVE flow rate of 579 scfm, the SVE system extracted approximately 3.8 times the injection rate during Year Six.

2.3 System Maintenance

System inspections are performed by HDR and equipment maintenance is subcontracted to the AS/SVE equipment manufacturer, Kaeser. System inspections are performed weekly and include checking SVE blower v-belts and oil levels, automatic drains in the AS compressor and refrigerated dryer, and air intake filters for the AS building. Semiannual maintenance performed by Kaeser includes checking the AS compressor and SVE blower oil levels and adding or replacing oil as needed, checking and cleaning air filter mats in the compressor control panel, cleaning the compressor and dryer heat exchange radiators, checking tension on blower v-belts, and other tasks per the equipment operating manual. Field notes are recorded on maintenance and inspection forms. General housekeeping at the AS and SVE buildings and equipment compound is performed as needed. Semiannual maintenance reports prepared by Kaeser are included in [Appendix B](#).

Maintenance activities and system shutdowns during Year Six are listed below:

- Blower 1 shutdown on 5 April due to an SVE Low Vacuum alarm. The blower was tested briefly on 7 April and turned off due to a low amperage reading and motor noise.
- Due to a power outage on 30 April, system operations were not recorded on the event log from 30 April at 06:36 until 3 May at 12:31. Operating hours for Blower #2 indicate that it operated on schedule during that period.
- During the system inspection on 3 May, the AS air dryer dew point gauge was noted to be moving from green to red and the alarm light indicated the pressure dew point was too high due to inlet high air temperature, low refrigerant level or other problems with the dryer. Kaeser was contacted but could not identify the problem over the phone. Equipment inspection was scheduled with semiannual maintenance in June 2016.
- On 11 May, an ADT Security technician replaced the wireless signal relay box, checked all alarm contacts, and confirmed the system was functioning properly.
- A Kaeser technician inspected the AS/SVE equipment on 30 June:
 - Blower #1 was found to need a replacement 'air end' and new belt. The blower motor turned properly with no problems indicated.
 - The electrical switches for the condenser and fan on the AS air dryer were reset and it began to function properly; the dew point gauge returned to the green zone.

Author: BG38123 Subject: Highlight Date: 12/6/2017 8:53:51 PM
Denise Cooper? just curious

Author: THOLMES Subject: Sticky Note Date: 12/8/2017 11:16:37 AM

Yes, weekly inspections are made and system readings recorded by Denise Cooper of HDR. Other staff collect PID readings from SVE wells and effluent, PID and vacuum readings from VMPs and effluent vapor samples.

- The air inlet valve for the AS compressor was found to be damaged and required repair; the damaged valve was causing short-cycling and additional operation of the compressor.
- A water drip from the AS air tank/oil water separator drain was determined to result from the gasket crumpling when the air piston engages. The drain was operating properly and did not require repair at that time.
- An AS compressor alarm was noted during the inspection on 24 August. The alarm was based on operating hours and indicated the bearing lubrication should be checked during Kaeser's next maintenance event.
- The replacement 'air end' for Blower #1 was brought to the equipment compound on 28 September by technicians from Kaeser and Blackwell. The blower's shaft hub broke as the technicians began to remove the damaged 'air end'. Further inspection of Blower #1 found the motor bearings would fail soon. The 'air end' was returned to storage until arrangements for removal and repair of the entire blower unit could be made.
- While at the AS/SVE equipment compound on 28 September, the Kaeser technician repaired the AS compressor air inlet valve and lubed the bearings per the maintenance alarm.
- During field measurements on 19 October, the AS compressor was found to have shutdown on 16 October due to a 'blow-off protection' alarm; the air dryer alarm light was also noted. Kaeser inspected the compressor on 20 October and cleaned the inlet air pressure booster valve, the minimum pressure check valve, and the auxiliary vent valve solenoid. The compressor restarted and the dryer alarm was reset. The technician also replaced the leaking air tank/oil water separator drain.
- Two AS compressor maintenance alerts (air filter and belt coupling inspection) were noted during the inspection on 2 November.
- On 7 November, Kaeser technicians removed Blower #1 and transported it to their maintenance shop for evaluation. The technicians fabricated and installed a flange to block the Blower #1 exhaust port and allow Blower #2 to continue operating. The technician reset the AS compressor belt coupler and air filter alerts; inspection of these items was performed during the annual maintenance in December 2016. The technician recommended an AS compressor thermostat be ordered for the maintenance event.
- On 15 December, Kaeser performed annual maintenance. No major issues were identified although the technician advised that Blower #2 bearings should be lubricated in 2017. The technician also replaced the AS compressor thermostat.
- HDR replaced AS building air intake filters on 21 December 2016 and 8 March 2017.
- Blower 2 shutdown on 9 January due to an AWS High/High Level alarm. The alarm was due to frozen water in the drain line from the AWS to the outside tank. The water line was cleared on 11 January and operations resumed.

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Author: BG38123 Subject: Highlight Date: 12/8/2017 11:21:04 AM
So are these repairs pending? Or was it repaired the same day, per the next bullet?

Author: THOLMES Subject: Sticky Note Date: 12/8/2017 1:56:36 PM
Repairs to SVE Blower #1 were not completed in Year 6 and thus are not discussed in this report. The repairs were made in June 2017 during Year 7.
The next bullet refers to repairs to the AS compressor.

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- The AS compressor was not operating during inspection on 29 March. A Kaeser technician inspected the system on 31 March; he noted the electrical current to the compressor was low and found problems with two fuses in the circuit box. A TriState Armature technician replaced the fuses, and the Kaeser technician returned and restarted the compressor.
- The AS air dryer was not operating during inspection on 5 April; the dew point gauge was in the red and the alarm light indicated the pressure dew point was too high. When the power was switched on and the reset button pressed, the dryer began operating properly and the alarm was cleared.
- The AS compressor was off during a remote check on 9 April. A Kaeser technician inspected the system on 11 April and determined a main voltage low alarm caused the compressor to shut down. The technician found no problems with the compressor and re-started it.
- A TriState Armature technician inspected the AS/SVE electrical system, including the surge arrestors, on 12 April to determine the cause of the AS compressor low voltage alerts; no obvious problems were observed. The technician installed a voltage monitor on the AS building breaker box to document power fluctuations.
- A TriState Armature technician removed the voltage monitor on 2 May. Data from the monitor showed fluctuations in the incoming power supply indicating the problem was with the local utility, MLGW. TriState contacted MLGW to request an on-site review.

System downtime during periods of full operation of the AS/SVE system occurred during the following events:

- Compressor shutdown on 16 October
- Removal of Blower #1 on 7 November
- Compressor shutdown on 29 March
- Compressor 'Low Voltage' events from 5 to 25 April

Operating time was reduced by approximately 125 hours of downtime during Year Six.

Author: BG38123 Subject: Highlight Date: 12/6/2017 8:24:05 PM
Has this happened or still pending?

Author: THOLMES Subject: Sticky Note Date: 12/8/2017 12:44:33 PM
No, but we have not had as many alarms recorded by the compressor in Year 7. Will revise to add "... review; MLGW did not respond to the request but the frequency of low voltage alarms decreased."

Author: BG38123 Subject: Highlight Date: 12/6/2017 8:27:52 PM
How does this compare to previous years? I'm not sure how critical it is, but maybe worthy of a table for purposes of painting the big picture.

Author: THOLMES Subject: Sticky Note Date: 12/8/2017 1:21:20 PM
Summary of past operations was deleted from the annual report to streamline the report for agency review. System uptime during normal operations was stated as 93% in Section 2.1. Will add sentence stating that is comparable to past performance since annual uptime ranged from 91% to 97% in Years 1 to 5.

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from November 2016 through April 2017. Measurements could not be made at SVE-10 due to water in the line.

Charts showing the trend in PID measurements at SVE wells and the system effluent since start-up tests in November 2009 are provided in [Appendix C-2](#). PID measurements at SVE wells have ranged from 0.1 to 20 ppm and were at the higher end of the range in 2012. At that time two wells, SVE-8 and -12, were closed to increase vapor extraction at SVE wells near the operating AS wells; the PID measurements decreased after the wells were re-opened later in 2012.

The VMPs are purged of at least three tubing volumes using the sampling pump prior to filling the first Tedlar bag. The VMP PID readings are shown on [Table 4](#). The estimated VOC concentrations were 0 ppm at all VMPs except for concentrations of 0.2 ppm at VMP-5B and -10A in February 2017. Charts showing the trend in PID measurements at VMPs since start-up tests in October 2009 are provided in [Appendix C-3](#). PID measurements at VMPs have a pattern similar to the SVE wells, with slightly lower concentrations.

3.3 Vapor Samples

System effluent samples for laboratory analysis are collected in 6-liter Summa canisters without a flow regulator. The Summa canister is shipped from the laboratory with negative pressure; thus, a sampling pump is not required. The quarterly vapor samples were collected on 19 July and 9 November 2016 and 8 February and 11 April 2017. The samples were submitted to ALS Environmental in Simi Valley, CA for analysis of VOCs by USEPA Method TO-15.

The complete analytical results are presented in Appendix D. [Table D-1](#). [Table 5](#) lists the analytical results for the primary CVOCs historically detected at Dunn Field and for other VOCs detected above the reporting limit (RL) in the sample. The totals for primary CVOCs and for total VOCs (primary CVOCs and other VOCs) are also listed.

Total primary CVOCs in the system effluent ranged from 64.4 to 68.4 ppbv, and total VOCs ranged from 75.1 to 82.4 ppbv; these concentrations are similar to sample results since operations resumed in March 2015. The CVOC detected at the highest concentration was trichloroethene (TCE) at 36 to 57% of the total primary CVOC concentration. System effluent concentration trends from PID measurements and analytical results are shown on [Figure 2](#).

3.4 Data Quality Evaluation

Analytical results for AS/SVE effluent vapor samples collected in Year Six were reviewed by the HDR project chemist based on guidelines in the QAPP. The complete analytical results for field and quality control (QC) samples, including data quality evaluation (DQE) flags, are presented in Appendix D, [Table D-1](#). The laboratory analytical reports are provided in [Appendix E](#) (electronic copies only).

Overall, the VOC data from the vapor samples met project data quality objectives and were determined to be sufficient to support the evaluation of AS/SVE system performance. The

Author: BG38123 Subject: Highlight Date: 12/6/2017 10:00:01 PM

I think this may be what I commented on in the graph representation (Appendix C-3). Though not as high as some previous ones, any explanation or reason for concern for the spike?

Author: THOLMES Subject: Sticky Note Date: 12/8/2017 1:32:10 PM

Yes, an increase from non-detect (0.0 ppm) to 0.2 ppm is shown as a 'spike' on the figure in Appendix C-3. The reason for the increase is not known and further review is not considered necessary based on the very low concentration.

4 Conclusions and Recommendations

4.1 System Operations

The AS/SVE system uptime was approximately 93% during periods of full operation in Year Six (1 January 2016 to 5 May 2017). AS/SVE system is limited to full operations to alternate months in order to maintain northerly groundwater flow in the treatment area.

The SVE system extracted approximately 3.8 times the AS injection rate during Year Six. Vacuum measurements at VMPs indicated vapor capture throughout the AS/SVE treatment area. PID measurements at SVE wells and VMPs were 0 ppm for most readings during Year Six. Total VOC concentrations in effluent vapor samples ranged from 75 to 82 ppbv. The estimated VOC emission rate in the effluent was 0.001 lb/hr during Year Six, below the SCHD de minimus standard. Approximately 86 pounds of VOCs have been removed since startup in 2009.

PID measurements at the system effluent are generally equal to or slightly less than the highest measurements at SVE wells (Appendix C-2, [Figure 1](#)). The total VOCs in the effluent have been below 100 ppbv (0.1 ppm) in all but one analysis since September 2010. The total VOCs (and total CVOCs) in the effluent have had a slight increasing trend since 2012; total VOCs have increased from 28 ppbv in February 2012 to 78 ppbv in April 2017 ([Figure 2](#)). The April 2017 total VOC concentration (82 ppbv) is approximately 6 percent of the concentration at startup in December 2009 (1240 ppbv).

4.2 System Effectiveness

CVOC concentrations in groundwater, as provided in LTM reports, are considered the most useful measure of AS/SVE remedy effectiveness. The AS/SVE system was installed to intercept the majority of the Off Depot CVOC plume and to reduce individual CVOC concentrations below 50 µg/L. Operations are to continue until the upgradient concentrations from the Dunn Field plume do not exceed 50 µg/L for individual CVOCs. AS/SVE in combination with natural attenuation processes is expected to reduce groundwater concentrations to Safe Drinking Water Act maximum contaminant levels (MCLs) in accordance with the RA objectives in the *Dunn Field Record of Decision* (Dunn Field ROD) (CH2M HILL, 2004).

The estimated period of AS/SVE system operations was 5 years, which ended in December 2014. The system operating period has been extended due to individual CVOC concentrations above 50 µg/L in monitoring well MW-159.

Current groundwater data in the AS/SVE area is provided in *Annual Long-Term Monitoring Report-2016, Revision 0* (HDR, 2017b), which was submitted to USEPA and TDEC in April 2017. Since April 2012, only TCE in one LTM well near the AS/SVE system, MW-159, has exceeded the 50 µg/L objective. The TCE concentration in MW-159 was 171 µg/L in October 2016 and 141 µg/L in April 2017.

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Author: BG38123 Subject: Highlight Date: 12/6/2017 8:56:20 PM

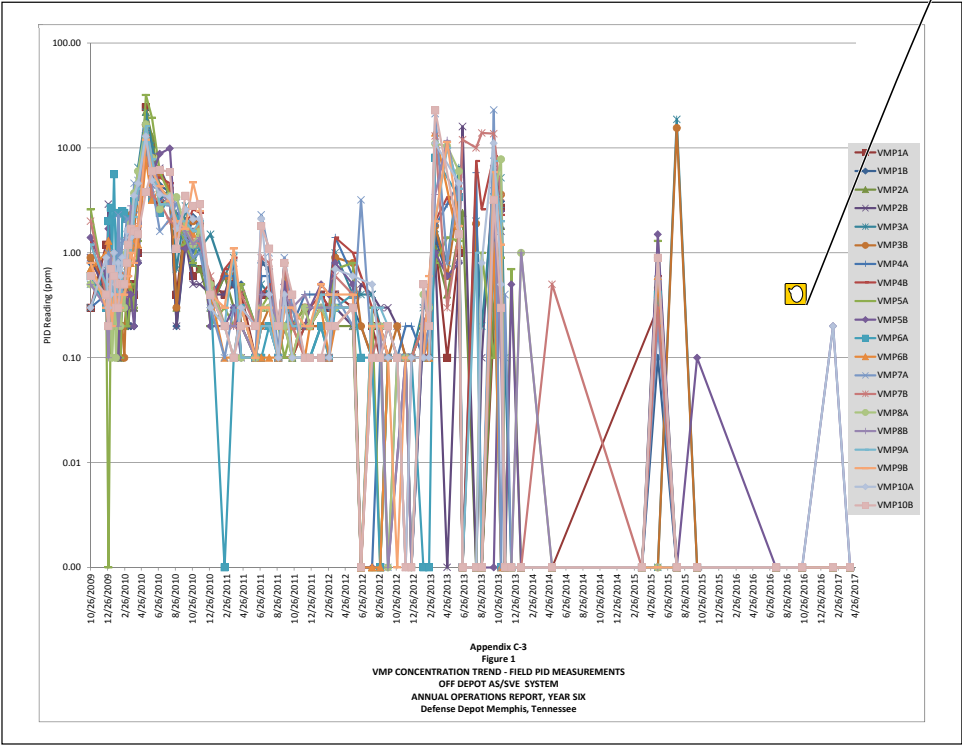
I know we have agreed to install additional sparge wells here, but at one time we talked about some type insitu treatment (injection) here. Since we are having access issues once again, is it something to consider as an alternative, or would it possibly hinder operations of the AS wells if needed in the future? Since this is a federal Site, no local injection permits are needed, we just have to comply with ARARs.

Author: THOLMES Subject: Sticky Note Date: 12/8/2017 1:36:11 PM

In situ treatment was not chosen based on cost, questions about performance and the past success with AS/SVE. It is not clear that in situ treatment would address the access issue, since injections still requires access from MLGW to target the area of MW-159.

Author: BG38123 Subject: Sticky Note Date: 12/8/2017 1:23:33 PM
Its kinda hard to tell from this, but which of the VMPs spiked here and possible explanation

Author: THOLMES Subject: Sticky Note Date: 12/8/2017 1:38:20 PM
The 'spike' was at VMP-10 and was due to increase from 0 to 0.2 ppm. See response to comment on page 3-2 (18).





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

June 04, 2018

UPS NEXT DAY AIR
RETURN RECEIPT REQUESTED

Mr. James Foster
Base Realignment and Closure Division (ACSIM-ODB)
2530 Crystal Drive (Taylor Building), Room 5000
Arlington, VA 22202-3940

Dear Mr. Foster:

The U.S. Environmental Protection Agency (EPA) has reviewed the U.S. Department of Army, Defense Depot of Memphis, Tennessee Off Depot Response to EPA Comments for the Air Sparge-Soil Vapor Extraction, Year 6, Annual and Year 7 Semi-Annual Operations Report for Dunn Field.

US EPA approves the above mentioned reports. Should you have any questions or concerns, please feel free to call me at on my cell number 404-229-9500.

Sincerely,

A handwritten signature in black ink, appearing to read "Diedre Lloyd", is written over a faint circular stamp.

Diedre Lloyd
Remedial Project Manager
Restoration & Sustainability Branch
Superfund Division

cc: Mr. James Foster, (Signed Original), United Parcel Service, Return Receipt
Mr. Jamie A. Woods, PG, Tennessee, Department of Environment and Conservation, Memphis
Environmental Field Office, 8383 Wolf Lake Drive, Bartlett, TN 38133-4119
Ms. Joan Hutton, CALIBRE, 3898 Mountain View Road, Kennesaw, GA 30152
Mr. Thomas Holmes, HDR Environmental, P.O. Box 728, Highlands, NC 28741

**Responses to Comments from
U.S. Environmental Protection Agency (EPA) Region 4 on:
Off Depot Air Sparge/Soil Vapor Extraction System Reports
Annual Operations Report Year Six, Dunn Field, Revision 0, August 2017
Memorandum: Year 7, 1st Semiannual Operations Report Dunn Field, January 2018
Defense Depot Memphis, Tennessee
Comments Received: 16 April 2018**

EPA Comments on the Off Depot AS/SVE Annual Operations, Year 6 Report (May 2016 to April 2017)

1. Section 1, Introduction, Page 1-1: Off Depot Air Sparge/Soil Vapor Extraction System Annual Operations Report, Year Six (May 2016 to April 2017) Dunn Field – Defense Depot Memphis, Tennessee, Revision 0, dated August 2017 (Year 6 Annual Report) states in Section 1, “The report covers operations from 1 January 2016 through 5 May 2017...” Additionally, Section 4.1 states, “the air sparging/soil vapor extraction (AS/SVE) system uptime was approximately 93% during periods of full operation in Year Six (1 January 2016 to 5 May 2017).” However, it is unclear why the dates for the Year 6 Annual Report differ from the title of the report. For clarity and completeness, please revise the Year 6 Annual Report to address this discrepancy.

Response: The title will be revised to include “(January 2016 to May 2017)” and the period of operations will be described as 1 January 2016 to 1 May 2017. The system was operating in standby mode during early May 2017.

2. Section 1, Introduction, Page 1-1: Section 1 states, “...; the AS/SVE system was operated in stand-by mode from 1 January to 6 May 2016 while the Trinity task order was put in place.” However, Section 4.1 states, “The AS/SVE system uptime was approximately 93% during periods of full operation in Year Six (1 January 2016 to 5 May 2017),” (see general comment above). It is unclear if the downtime from 1 January to 6 May 2016 is accounted for in the system runtime for the reporting period. For clarity, please revise the Year 6 Annual Report to address this issue.

Response: The referenced statement in Section 1 is correct. The last paragraph in Section 2 lists periods of full operation, including two short periods between 1 January to 6 May 2016: “The AS/SVE system was in full operation during the following periods in Year Six: 29 March to 1 April, 20 to 24 April, 17 May to 17 June, 13 July to 10 August, 14 September to 9 November, 5 to 15 December 2016, 23 January to 22 February, and 22 March to 25 April 2017.”

The system operated in stand-by mode from 1 January to 6 May 2016 due to contractual issues and not problems with the AS/SVE system. Only equipment problems during the stated periods of full operation are included in calculating the system uptime percentage.

System downtime during periods of full operation are listed at the end of Section 2.3; the downtime in hours will be added for each occurrence. Also, see revisions per response to Comment #3.

3. Section 2, System Operations, Page 2-1: Section 2 states, “the AS/SVE system was in full operation during the following periods in Year Six: 29 March to 1 April, 20 to 24 April, 17 May to 17 June, 13 July to 10 August, 14 September to 9 November, 5 to 15 December 2016, 23 January to 22 February, and 22 March to 25 April 2017.” However, Section 2.1, System Performance, Page 2-1, states, “AS/SVE system uptime during periods of full operation in Year Six was approximately 93%.” It is unclear from the Year 6 Annual Report what the goal runtime for the system for the reporting period would have been and how the operation time of 93% was calculated. For clarity and completeness, please revise the Year 6 Annual Report to address this issue.

Response: The total hours for operation are determined by the start and end times for each separate period of full operation and by the daily periods when the AS compressor and an SVE blower are operating. Section 2 includes “... the SVE system was limited to operating Blower #2 for two 6-hour periods per day during Year Six. When the AS manifold was open for ‘full’ operation, the AS wells operated for approximately 5.5 hours in each 6-hour period.”

The AS wells operate during the times set for each well, when the AS manifold is open and a blower is operating. Because only one blower was operational during Year 6, operating times for the AS wells and the blower were

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Defense Depot Memphis, Tennessee
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offset; the blower continued to operate after the AS wells closed in order to remove CVOCs volatilized by air sparging. During periods of full operation in Year 6, the AS wells were open for approximately 4.5 hours in each 6-hour blower period through November 2016 and for approximately 5.5 hours in each 6-hour blower period from December 2016 through April 2017; this allowed 1930 hours of full operation during Y6. There were 196 days of full operation with the AS wells open for an average of 4.9 hours in each 6-hour blower. Total downtime in Y6 was 131 hours resulting in system uptime at 93.2%.

Section 2 will be revised to state "... the AS wells operated for an average of 4.9 hours in each 6-hour period."

The following will be added in Section 2.1: "The periods of full operation in Year Six totaled 196 days with 1930 hours available for system operations. The AS/SVE system was down due to system alarms and other issues for a total of 131 hours."

4. Section 2.3, System Maintenance, Page 2-2: Section 2.3 states, "Due to a power outage on 30 April, system operations were not recorded on the event log from 30 April at 6:36 until 3 May at 12:31. Operating hours for Blower #2 indicate that it operated on schedule during that period." However, it is unclear if the SVE portion of the system was operational during this time period. Revise the Year 6 Annual Report to address this issue.

Response: Blower #2 was operational during that period but the system was in standby mode with the AS manifold closed.

Blower shutdowns are shown on the event log within the main control screen of the system's control program; operating hours are also recorded separately for each blower. Field notes for the system inspection on 3 May 2016 state "the power to the building was on and Blower 2 was operating, but the computer was off." Apparently, power was lost to the system control computer but not to the entire AS/SVE system. The computer allows changes to be made to blower operations but the system has internal controls and will continue to operate without the computer. As stated in the referenced text, review of the operating hours indicated Blower #2 continued to operate.

The text will be revised to state "Due to a power loss for the system computer on 30 April, system operations were not recorded ..."

5. Section 3.5, Mass Removal Estimate, Page 3-3: Section 3.5 states, "The volatile organic compound (VOC) mass removed by the AS/SVE system is estimated from the average VOC concentrations in the effluent sample (based on trichloroethene (TCE), system operating hours, and flow rates." However, the mass emission calculations summarized on Table 6 are based on VOC influent concentrations. Revise the Year 6 Annual Report to address this discrepancy.

Response: The molar mass of TCE is used to estimate mass removal of VOCs from groundwater because it has generally been the highest concentration VOC in the effluent vapor samples since AS/SVE system operations began in 2009. It is used as a surrogate for all VOCs to simplify the calculation. The estimated mass removal is provided as a general data point for system operations, and a simple and consistent method of calculation is considered appropriate. The effectiveness of the AS/SVE system and the criteria for system shutdown are reduction of CVOC concentrations in groundwater.

The following sentence will be added to Section 3.5: "The molar mass of TCE is used as a surrogate for all VOCs to simplify the calculation."

6. Section 4.2, System Effectiveness, Page 4-2: Section 4.2 states, "In order to address the continued high concentration of TCE at MW-159, additional AS wells will be installed south of MW-159 to increase removal of chlorinated volatile organic compounds (CVOCs) from groundwater." Additionally, the text states, "The new AS wells will be installed upon completion of an updated access agreement with

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Defense Depot Memphis, Tennessee
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Memphis Light, Gas, and Water (MLGW) and will be incorporated into system operations following installation. No other changes to the AS/SVE operations are recommended.” However, a figure depicting the extent of the CVOC groundwater plume, direction of groundwater flow, and the location of the proposed AS wells are not included in the Year 6 Annual Report. For completeness, it is strongly recommended that this report be revised to include the associated figures and address these issues.

Response: **Response:** The report will be revised to include a figure showing the suggested information (extent of the CVOC groundwater plume, direction of groundwater flow, and the location of the proposed AS wells).

EPA Comments on the Memorandum: Off Depot AS/SVE Year 7, 1st Semiannual Operation Report, Dated January 2018

1. Vapor Samples, Page 5: “The June sample contained anomalously high concentrations of 2-butanone, 2-propanol, acetone and propene (Table 5); these analytes may represent laboratory contamination.” However, according to Table 5, the concentrations for 2-butanone, 2-propanol, acetone, and propene were used to calculate the total SVE effluent concentrations in June, August, and October. It is unclear: if these analytes are assumed to represent laboratory contamination: why they are included in the SVE effluent concentration totals calculation? Please revise the Year 7 Semiannual Report to address this issue.

Response: The total VOC concentration used for the mass removal calculation will be revised to omit suspected laboratory contaminants. The change will be made in the Year 7 AS/SVE annual report.

2. Figure 1, AS-SVE System Plan Map: “AS/SVE System Description” on Page 1, “AS/SVE is being conducted near the leading edge of the groundwater plume west of Dunn Field to volatilize chlorinated volatile organic compounds (CVOCs) and prevent further plume migration.” However, Figure 1 does not depict the groundwater plume and does not provide the groundwater flow direction. For clarity and completeness, revise Figure 1 to provide a depiction of the groundwater plume utilizing the most recent groundwater sampling data and the general direction of groundwater flow.

Response: The area shown on Figure 1 is limited to the immediate AS/SVE treatment area. A new figure will be created for an expanded area around the AS/SVE area to show the groundwater plume and direction of groundwater flow. The figure will be provided in the Year 7 AS/SVE annual report.

A decorative graphic on the left side of the page consists of a large red rectangle, a smaller grey rectangle above it, a larger grey rectangle below it, and a black rectangle at the bottom right.

B

Appendix B.

Semiannual Maintenance
Reports

Location	HDR Engineering/e2m 538086 2241 Truitt St Memphis TN 38114-4893	Customer	HDR Engineering/e2m 2241 Truitt St Memphis TN 38114-4893
Responsible	Denise Cooper	Order	1000300000239
Start (approx.)	Thursday, 12/15/16 / 12:00 AM	Service point	Memphis
Service techn.	Jermelle Culbreath	Pers.in charge	

Attachments

Add attachment

Periodical maintenance

Contract No: Maintenance agreement-signe
Maintenance Contract

8:30 AM Start Time
Major on all but 3605982

Scheduled w/Denise,901-268-2478, for 12/15 - CD 12/7

Parts applied per text/ADVS-LE-12/07 72225031-2 12/12 Recvd by: S COATS-

Label all returned goods!

Reason for return	Returned goods	to oper.	Pc	Material No.	Serial No.	Returned by		
Disposal	Oil Filter	0020	1	6.3465.0		☐ Customer ☒ Technician ☐ Waste contractor		
Disposal	Oil Sep	0020	1	6.3623.0		☐ Customer ☒ Technician ☐ Waste contractor		
Disposal	Oil	0020	2	ANM460-5		☐ Customer ☒ Technician ☐ Waste contractor		
Disposal	Oil	0040	2	ANSB-220		☐ Customer ☒ Technician ☐ Waste contractor		

Set up time						Wrap up time									
Date		Duration		Service technician				Date		Duration		Service technician			
12/15/16		15 Min		Jermelle Culbreath		+ -		12/15/16		15 Min		Jermelle Culbreath		+ -	
Start of work		End of work		Breaks		Date / Weekday				Service technician					
9:30 AM		2:00 PM		0 Min		Thursday, 12/15/16				Jermelle Culbreath					
Additional work(not included in contract)				Duration		to Oper		Description							

Minimum charge for any invoice is \$50.00. Invoiced goods remain the property of Kaeser Compressors, Inc. until payment is received. No returns without authorization. Approved returns must be shipped pre-paid and are subject to restocking charges up to 25%. Past due accounts subject to 1½% interest per month (annual rate 18%)

Shorten service interval due to environment or operating conditions?

☒ No ☐ Yes

Work performed acc. to work plan.

Any outstanding deficiencies?

☐ Yes ☒ No

Work accepted.

Confirmed work and material of work plan.

E-mail service manager(for confirmation)

info@kaeser.com

Customer e-mail(for confirmation)

denise.cooper@hdrinc.com

Service
technician's
signatureKaeser Field
Service:PNDigitally signed by
Kaeser Field Service:PN
Date: 2016.12.16
15:57:29 -05'00'☒ Signature unavailable

Remark:

Remark:

Customer not onsite at the time of completion.

Minimum charge for any invoice is \$50.00. Invoiced goods remain the property of Kaeser Compressors, Inc. until payment is received. No returns without authorization. Approved returns must be shipped pre-paid and are subject to restocking charges up to 25%. Past due accounts subject to 1½% interest per month (annual rate 18%)

Oper. 0020 **Maintain screw compressor - package B** 3.0
Type CSD 100 125 psi 460/60 US 1004476825
Material No. 100818.1 **Year** 2009
Serial No. 1234 **EMR** 3498678

Previous service hours 33,764 h **Current service hours** 35,096 h

Work to be done	Comment
>Tasks to be completed and current condition recorded: OK	
☒ -Ensure safe working conditions as described in the manual	LOTO
☒ -Check motor-arend coupling	Checked OK
☒ -Change filter mat(s) in compressor/control cabinet/SFC cabinet	Changed
☒ -Change air filter	Changed
☒ -Check oil filter and change if necessary	Changed
☒ -Check cooler and clean if necessary/check fan blades and guarding	Checked OK
☐ -Maintain condensate drain	NA
☒ -Check electrical cables and cable inlets	
☒ -Tighten mains terminals and check for oxidation	
☒ -Check shutdown function when separator air outlet temp. too high	
☒ -Check overcurrent relays and motor protection switches	
☒ -Check door and guard interlocks and emergency stop function	
☒ -Check oil and change if necessary	Changed
☒ -Check oil separator cartridge difference pressure 0.0 psi/bar,	
change as needed	
☒ -Check motor bearing lubrication, re-grease if needed (Unirex N3!)	
☒ -Check nominal pressure shutdown function,	
shutdown at 125 -18 psi/bar	
☒ -Check shutdown function when arend discharge temp. too high	
☒ -Check control voltage: L1 127.8 V	
☒ -Check power consumption: Line U1 A V1 A W1 A	
☒ -Check pressure relief valve(s)	Checked OK
☒ -Check arend discharge temperature 178 °F/°C	
☒ -Test run, check conditions: start, idle, load and shut-down	
☒ -Check oil level, for leaks (compr.air./oil/water), idling press.	
☒ -Register service: stick label/service manual/controller	
Total h 35,096 Load h 16,065 Ambient temp. 50 °F/°C	
Oil type M-460 Control mode Dual	
Existing safety deficiencies? ☒ No ☐ Yes:	None
Cause(s):	NA
Arising danger:	NA
Safety deficiency rectified? ☐ Yes ☐ No; reason:	NA

Work to be done		Comment
☐	>>>> Equipment not released for use!	
☐	Rectified deficiencies:	None
☒	Tasks fully completed	
☐	Follow-up assignment necessary for:	
☐	Follow-up order issued for:	
☐	Supply spares:	
☐		
Additional comments:		
Tech performed major PM service. Tech removed and replaced oil and air filter elements. Tech also drained the oil from the unit and took a fluid sample. Tech removed and replaced separator element and cleaned suction tube and replaced the strainer. Refilled the unit with new oil and test ran. All OK.		

<u>Consumed material</u>	<u>Material No.</u>	<u>Pc</u>	<u>Serial No.</u>	<u>Part ID/batch</u>	<u>Stock</u>

<u>Material delivered in advance</u>	<u>Material No.</u>	<u>Pc</u>	<u>Serial No.</u>	<u>Return</u>	<u>Returned by</u>

Oil filter	6.3465.0	1		0	☐ Tech. ☐ Customer
Filter mat AM 235P 112x1	6.3572.0	2		0	☐ Tech. ☐ Customer
Air filter cartridge Ø420x130	6.4148.0	1		0	☐ Tech. ☐ Customer
Oil Separator cartridge cpl.	6.3623.0	1		0	☐ Tech. ☐ Customer
M-460 Semi-Synthetic Oil \$(/5 ANM460-5		3		0	☐ Tech. ☐ Customer
Maintenance kit Com.aux.vi	400905.0	1		0	☐ Tech. ☐ Customer
Oil Analysis Kit	ANKCPIND2BR	1		0	☐ Tech. ☐ Customer

Oper. 0040 **Maintain blower - package B** 1.5
Type EB 420 C VAC 40,0 hp 2.460 rpm **1004477108**
Material No. EBC **Year** 2009
Serial No. 2138 **EMR** 3605958

Previous service hours 0 h **Current service hours** 1 h

Work to be done	Comment
>Tasks to be completed and current condition recorded: OK	
☒ -Ensure safe working conditions as described in the manual	LOTO
☒ -Clean surface of airend and motor	Cleaned
☒ -Check that the block mechanism turns freely	Checked OK
☒ -Check the block drive shaft seal	Checked OK
☒ -Check V-belts and change or re-tension as necessary	Changed
☒ -Check guard	Checked OK
☒ -Check extractor blade (enclosure)	
☒ -Change air filter	Changed
☒ -Check oil and change if necessary	Changed
☒ -Check the oil drain lines and connections	Checked OK
☒ -Check pipe connections	
☒ -Check compensator(s) and change if necessary	
☒ -Open and check unloaded start valve	
☒ -Open and check the check valve	
☒ -Check electrical cables and cable inlets	
☒ -Tighten mains terminals and check for oxidation	
☒ -Check overcurrent relays and motor protection switches	
☒ -Check motor bearings, re-grease (Unirex N3 only) as needed/change	
-Check control voltage: L1 V	
☒ -Check power consumption: Line U1 A V1 A W1 A	
☒ -Check overheating shutdown function (option)	Checked OK
☒ -Check pressure relief valve(s)	Checked OK
☒ -Test run, check conditions: start, load and shut-down	
☒ -Check display functions	Checked OK
☒ -Check oil level and check for leaks	Checked OK
☒ -Register service: stick label/service manual/controller	
Operating hours: h Oil type:	
Existing safety deficiencies? ☒ No ☐ Yes:	None
Cause(s):	NA
Arising danger:	NA
Safety deficiency rectified? ☐ Yes ☐ No; reason:	NA
>>>>> Equipment not released for use!	

Work to be done		Comment
	Rectified deficiencies:	None
☒	Tasks fully completed	
☐	Follow-up assignment necessary for:	
☐	Follow-up order issued for:	
☐	Supply spares:	
☐		
Additional comments:		
Tech drained the oil from the blower pack and refilled with new oil. Replaced air filter and V-belts checked block and motor for seal or bearing leaks. Customer requested that the tech check the motor bearing on the unit and may want to have the motor repair before installing unit #1 back into place. Tech found nothing wrong at this time. All OK.		

Consumed material	Material No.	Pc	Serial No.	Part ID/batch	Stock

Material delivered in advance	Material No.	Pc	Serial No.	Return	Returned by
Filter fleece	DN150 (EB..C) 893606.0	1		0	☐ Tech. ☐ Customer
Omega Blower 220 Synthetic C	ANSB-220	2		0	☐ Tech. ☐ Customer
Narrow V-belt set (5pcs)XPZ 2C	893437.0	1		0	☐ Tech. ☐ Customer

Oper. 0060 **Maintain blower - package B** 1.5
Type EB 420 C VAC 40,0 hp 2.460 rpm **1004477109**
Material No. EBC **Year** 2009
Serial No. 2140 **EMR** 3605982

Previous service hours 0 h **Current service hours** 1 h

Work to be done	Comment
☐ >Tasks to be completed and current condition recorded: OK	
☐ -Ensure safe working conditions as described in the manual	
☐ -Clean surface of airend and motor	
☐ -Check that the block mechanism turns freely	
☐ -Check the block drive shaft seal	
☐ -Check V-belts and change or re-tension as necessary	
☐ -Check guard	
☐ -Check extractor blade (enclosure)	
☐ -Change air filter	
☐ -Check oil and change if necessary	
☐ -Check the oil drain lines and connections	
☐ -Check pipe connections	
☐ -Check compensator(s) and change if necessary	
☐ -Open and check unloaded start valve	
☐ -Open and check the check valve	
☐ -Check electrical cables and cable inlets	
☐ -Tighten mains terminals and check for oxidation	
☐ -Check overcurrent relays and motor protection switches	
☐ -Check motor bearings, re-grease (Unirex N3 only) as needed/change	
☐ -Check control voltage: L1 V	
☐ -Check power consumption: Line U1 A V1 A W1 A	
☐ -Check overheating shutdown function (option)	
☐ -Check pressure relief valve(s)	
☐ -Test run, check conditions: start, load and shut-down	
☐ -Check display functions	
☐ -Check oil level and check for leaks	
☐ -Register service: stick label/service manual/controller	
Operating hours: h Oil type:	
Existing safety deficiencies? ☐ No ☐ Yes:	
Cause(s):	
Arising danger:	
Safety deficiency rectified? ☐ Yes ☐ No; reason:	
>>>>> Equipment not released for use!	

Work to be done		Comment
☐	Rectified deficiencies:	
☐	Tasks fully completed	
☐	Follow-up assignment necessary for:	
☐	Follow-up order issued for:	
☐	Supply spares:	
☐		
Additional comments:		
No work performed.		

Consumed material

Material No.

Pc

Serial No.

Part ID/batch

Stock

Material delivered in advance

Material No.

Pc

Serial No.

Return

Returned by

☐ Tech.

☐ Customer

Oper. 0070 **Maintain refrigeration dryer** 2.0
Type Refrig. dryer TE 141 460/3/60 **1004476693**
Material No. 1.8039.00010 **Year** **2009**
Serial No. 1343 **EMR** **3575706**

Work to be done	Comment
>Tasks to be completed and current condition recorded: OK	
☒ -Ensure safe working conditions as described in the manual	
☒ -Check for condensate in air network	Checked OK
☒ -Clean refrigerant condenser and straighten laminations	Checked OK
☒ -Check condensate drain	Doneq
☒ -Repair any damage to the refrigerant circuit thermal insulation	
☒ -Check fan motor, blades and guarding	
☒ -Check electrical cables and cable inlets	
☐ -Check safety shutdown, switch-point °F/°C psi/bar	NA
☒ -Check compressed air temp.: Inlet °F/°C Outlet °F/°C	
☒ -Check dew point: ☐ blue ☒ green ☐ red 35 °F/°C	
Refilled/disposed refrigerant quantity: / kg/lb	
Refrigerant type and total quantity*: / kg/lb	
☒ -Check refrigerant circuit for leaks	
☒ -Check setting and function of the compressed air bypass/diversion	
☒ -Test run	
☒ -Register service: stick label/service manual/controller	
Refrigerant type R134a Ambient temperature 50 °F/°C	
Existing safety deficiencies? ☒ No ☐ Yes:	None
Cause(s):	NA
Arising danger:	NA
Safety deficiency rectified? ☐ Yes ☐ No; reason:	NA
>>>>> Equipment not released for use!	
Rectified deficiencies:	None
☒ Tasks fully completed	
☐ Follow-up assignment necessary for:	
☐ Follow-up order issued for:	
☐ Supply spares:	
☐	
Additional comments:	
Serviced dryer with new ECO 31 drain kit. Tested dryer all OK.	

<u>Consumed material</u>	<u>Material No.</u>	<u>Pc</u>	<u>Serial No.</u>	<u>Part ID/batch</u>	<u>Stock</u>	
<u>Material delivered in advance</u>	<u>Material No.</u>	<u>Pc</u>	<u>Serial No.</u>	<u>Return</u>	<u>Returned by</u>	
Kaeser Eco-Drain 31 Service U	AN8247400370	1		0	☐ Tech. ☐ Customer ☐ Tech. ☐ Customer	

Oper. 0080 **Maintain oil-water sep. - package A** 0.5
Type KCF-100 Condensate Treatment System **1004476695**
Material No. ANKCF100 **Year** 2009
Serial No. 10900584 **EMR** 3486488

Work to be done	Comment
>Tasks to be completed and current condition recorded: OK	
☒ -Ensure safe working conditions as described in the manual	
☒ -Empty oil catcher	Done
☒ -Check activated carbon filter and prefilter, change if necessary	Changed
☒ -Change expansion chamber filter	Changed
☒ -Check settling tank for contamination and clean if necessary	Cleaned
☒ -Check oil drain and clean if necessary	Checked OK
☒ -Check water drain, clean if necessary	Checked OK
☒ -Check for leaks in hoses, connections and air receiver	
☒ -Check heating (option)	NA
☒ -Register service: stick label/service manual/controller	
Existing safety deficiencies? ☒ No ☐ Yes:	None
Cause(s):	NA
Arising danger:	NA
Safety deficiency rectified? ☐ Yes ☐ No; reason:	NA
>>>>> Equipment not released for use!	
Rectified deficiencies:	None
☒ Tasks fully completed	
☐ Follow-up assignment necessary for:	
☐ Follow-up order issued for:	
☐ Supply spares:	
☐	
Additional comments:	
Tech emptied the KCF 100 and drained down the old filter. Cleaned housing and dirt trap and installed new separator. All OK.	

Consumed material **Material No.** **Pc** **Serial No.** **Part ID/batch** **Stock**

Material delivered in advance **Material No.** **Pc** **Serial No.** **Return** **Returned by**

Filter-SET Aquamat KCF100 ANKCF100CAR 1 0

☐ Tech.
☐ Customer
☐ Tech.
☐ Customer

Oper. 0090 **Maintain compr. air filter - package A** 1.0
Type Oil Removal KOR-485.2 1004476696
Material No. USKOR485.2 **Year** 2009
Serial No. * **EMR** 3742806

Work to be done	Comment
>Tasks to be completed and current condition recorded: OK	
☒ -Ensure safe working conditions as described in the manual	
☒ -Change filter element(s)	Changed
☒ -Clean filter housing and control bores in the filter head	Cleaned
☐ -Maintain condensate drain	NA
☒ -Check pressure differential indicator (option)	Checked OK
☒ -Check optional shutdown function, only with user's permission	
☒ -Check for leaks	Checked OK
☒ -Register service: stick label/service manual/controller	
Existing safety deficiencies? ☒ No ☐ Yes:	None
Cause(s):	NA
Arising danger:	NA
Safety deficiency rectified? ☐ Yes ☐ No; reason:	NA
>>>>> Equipment not released for use!	
Rectified deficiencies:	None
☒ Tasks fully completed	
☐ Follow-up assignment necessary for:	
☐ Follow-up order issued for:	
☐ Supply spares:	
☐	
Additional comments:	
Tech removed old KOR filter, cleaned housing and replaced drain. Reinstalled and checked for leaks. All OK.	

Consumed material **Material No.** **Pc** **Serial No.** **Part ID/batch** **Stock**

Material delivered in advance	Material No.	Pc	Serial No.	Return	Returned by
Internal Automatic Drain	US4170-08	1		0	☐ Tech. ☐ Customer
Std 485 KOR Element (RED)	USOR-485	1		0	☐ Tech. ☐ Customer
O Ring, BUNA 5.734 ID	US3098816	1		0	☐ Tech. ☐ Customer
					☐ Tech. ☐ Customer

SERVICE ORDER

KAESER COMPRESSORS

Equipment at customer location 538086 HDR Engineering/e2m, Memphis

Registered machines

- Please enter or correct missing or incorrect years of manufacture, material numbers or serial numbers
- As far as air receivers, ZK, filters and dryers are concerned, please complete information applicable to the condensate drain (if not yet registered) -**ED**= ECO-Drain, **FV**= Float valve, **SV**= Solenoid valve
- If the customer has more than one compressed air station in different locations at the same address, please enter the exact location of each station (e.g. paint shop, number 1 works) etc.

Type	S. Hr.	Year	Material No.	Serial No.		Station	
Refrig. dryer TE 141 460/3/60		2009	1.8039.00010	1343	reg.		-
CSD 100 125 psi 460/60 US		2009	100818.1	1234	reg.		-
OMEGA 53 PLUS cyl.left vert./cpl.		2016	881150.14108	1084	reg.		-
200 Gal Tank		2009	9.9999.9	41588	reg.		-
KCF-100 Condensate Treatment System		2009	ANKCF100	2144292	-----		-
EB 420 C VAC 40,0 hp 2.460 rpm		2009	EBC	2140	reg.		-
EB 420 C VAC 40,0 hp 2.460 rpm		2009	EBC	2138	reg.		-
Oil Removal KOR-485.2		2009	USKOR485.2	1055	-----		-
Particulate KPF-485.2		2009	USKPF485.2	1025	-----		-

Non-registered machines

Type	S. Hr.	Year	Material No.	Serial No.		Station	
							+
							-

Location	HDR Engineering/e2m 538086 2241 Truitt St Memphis TN 38114-4893	Customer	HDR Engineering/e2m 2241 Truitt St Memphis TN 38114-4893
Responsible	Mr. Thomas Holmes 404-295-3279	Order	1000300000239
Start (approx.)	Monday, 6/26/17 / 12:00 AM	Service point	Memphis
Service techn.	Terry Linkous	Pers.in charge	Sam Coats 877-882-8376

Attachments

Add attachment

Periodical maintenance

Contract No: Maintenance agreement-sign
 Maintenance Contract

Minor PM - CSD 100; Major PM - x1 EB 420C Blower (3605958)

Scheduled with Thomas Holmes for 6/26/17 - dlw 6/6/17
 Thomas Holmes 404.295.3279

Delv 06/12 @ 10:59 am Signed for by: JARGROVES. 06/12 ksh

Label all returned goods!

Reason for return	Returned goods	to oper.	Pc	Material No.	Serial No.	Returned by		
						☐ Customer ☐ Technician ☐ Waste contractor		

Set up time					Wrap up time				
Date	Duration	Service technician			Date	Duration	Service technician		
			+	-				+	-

Start of work	End of work	Breaks	Date / Weekday	Service technician		
12:30 PM	4:45 PM	0 Min	Monday, 6/26/17	Terry Linkous		
12:30 PM	4:45 PM	0 Min	Monday, 6/26/17	Ryan Whitby		

Additional work(not included in contract)	Duration	to Oper	Description		

Minimum charge for any invoice is \$50.00. Invoiced goods remain the property of Kaeser Compressors, Inc. until payment is received. No returns without authorization. Approved returns must be shipped pre-paid and are subject to restocking charges up to 25%. Past due accounts subject to 1½% interest per month (annual rate 18%)

Shorten service interval due to environment or operating conditions?

☒ No ☐ Yes

Work performed acc. to work plan.

Any outstanding deficiencies?

☐ Yes ☒ No

Work accepted.

Confirmed work and material of work plan.

E-mail service manager(for confirmation)

sam.coats@kaeser.com

Customer e-mail(for confirmation)

thomas.holmes@hdrinc.com

Service
technician's
signatureKaeser Field
Service:PNDigitally signed by
Kaeser Field Service:PN
Date: 2017.06.27
11:46:05 -05'00'

Remark:

☒ Signature unavailable

Remark:

Ticket not available at time of service.

Minimum charge for any invoice is \$50.00. Invoiced goods remain the property of Kaeser Compressors, Inc. until payment is received. No returns without authorization. Approved returns must be shipped pre-paid and are subject to restocking charges up to 25%. Past due accounts subject to 1½% interest per month (annual rate 18%)

Oper. 0010 **Maintain screw compressor - package A** 1.5
Type CSD 100 125 psi 460/60 US **1005145566**
Material No. 100818.1 **Year** **2009**
Serial No. 1234 **EMR** **3498678**

Previous service hours 35,097 h **Current service hours** 37,673 h

Work to be done	Comment
>Tasks to be completed and current condition recorded: OK	
☒ -Ensure safe working conditions as described in the manual	Ok
☒ -Check motor-airend coupling	Ok
☒ -Change filter mat(s) in compressor/control cabinet/SFC cabinet	Ok
☒ -Change air filter	Ok
☒ -Check oil filter and change if necessary	Ok
☒ -Check cooler and clean if necessary/check fan blades and guarding	Ok
☒ -Maintain condensate drain	Ok
☒ -Check electrical cables and cable inlets	Ok
☒ -Tighten mains terminals and check for oxidation	Ok
☒ -Check shutdown function when separator air outlet temp. too high	Ok
☒ -Check overcurrent relays and motor protection switches	Ok
☒ -Check door and guard interlocks and emergency stop function	Ok
☒ -Check oil and change if necessary	Ok
☒ -Check oil separator cartridge difference pressure 0 psi/bar,	Ok
change as needed	
☒ -Check motor bearing lubrication, re-grease if needed (Unirex N3!)	Ok
☐ -Check nominal pressure shutdown function,	N/A
shutdown at psi/bar	
☒ -Check shutdown function when airend discharge temp. too high	Ok
☒ -Check control voltage: L1 126.4 V	Ok
☒ -Check power consumption: Line U1 128.4 A V1 130.7 A W1 135.3 A	Ok
☒ -Check pressure relief valve(s)	Ok
☒ -Check airend discharge temperature 168 °F/°C	Ok
☒ -Test run, check conditions: start, idle, load and shut-down	Ok
☒ -Check oil level, for leaks (compr.air./oil/water), idling press.	Ok
☒ -Register service: stick label/service manual/controller	Ok
Total h 37673 Load h 16832 Ambient temp. 85 °F/°C	
Oil type M-460 Control mode Dual	
Existing safety deficiencies? ☒ No ☐ Yes:	
Cause(s):	
Arising danger:	
Safety deficiency rectified? ☐ Yes ☐ No; reason:	

Work to be done	Comment
☐ >>>> Equipment not released for use!	
Rectified deficiencies:	
☒ Tasks fully completed	Ok
☐ Follow-up assignment necessary for:	
☐ Follow-up order issued for:	
☐ Supply spares:	
☐	
Additional comments:	
Arrived at customer location and coordinated with the customer. Shutdown unit following LoTo procedures. Replaced air filter and oil filter. Checked oil level. Oil level ok. Inspected airend coupling. Coupling ok. Greased motor bearings. Changed electrical cabinet filters and checked electrical connections. Electrical connections ok. Restarted the compressor. Compressor operating correctly with no problems at this time.	

Consumed material **Material No.** **Pc** **Serial No.** **Part ID/batch** **Stock**

Material delivered in advance **Material No.** **Pc** **Serial No.** **Return** **Returned by**

Filter mat 112x112x10	6.3572.0	2		0	☐ Tech. ☐ Customer
Air filter cartridge Ø420x130	6.4148.0	1		0	☐ Tech. ☐ Customer
Oil filter 16bar	6.3465.0	1		0	☐ Tech. ☐ Customer
Oil Analysis Kit	ANKCPIND2BR	1		0	☐ Tech. ☐ Customer
					☐ Tech. ☐ Customer

Oper. 0020 **Maintain blower - package B** 1.0
Type EB 420 C VAC 40,0 hp 2.460 rpm **1005145915**
Material No. EBC **Year** 2009
Serial No. 2138 **EMR** 3605958

Previous service hours 0 h **Current service hours** 1 h

Work to be done	Comment
>Tasks to be completed and current condition recorded: OK	
☒ -Ensure safe working conditions as described in the manual	Ok
☒ -Clean surface of airend and motor	Ok
☒ -Check that the block mechanism turns freely	Ok
☒ -Check the block drive shaft seal	Ok
☒ -Check V-belts and change or re-tension as necessary	Ok
☒ -Check guard	Ok
☒ -Check extractor blade (enclosure)	Ok
☒ -Change air filter	Ok
☒ -Check oil and change if necessary	Ok
☒ -Check the oil drain lines and connections	Ok
☒ -Check pipe connections	Ok
☒ -Check compensator(s) and change if necessary	Ok
☒ -Open and check unloaded start valve	Ok
☒ -Open and check the check valve	Ok
☒ -Check electrical cables and cable inlets	Ok
☒ -Tighten mains terminals and check for oxidation	Ok
☒ -Check overcurrent relays and motor protection switches	Ok
☒ -Check motor bearings, re-grease (Unirex N3 only) as needed/change	Ok
-Check control voltage: L1 V	
☐ -Check power consumption: Line U1 A V1 A W1 A	N/A
☒ -Check overheating shutdown function (option)	Ok
☒ -Check pressure relief valve(s)	Ok
☒ -Test run, check conditions: start, load and shut-down	Ok
☒ -Check display functions	Ok
☒ -Check oil level and check for leaks	Ok
☒ -Register service: stick label/service manual/controller	Ok
Operating hours: h Oil type:	
Existing safety deficiencies? ☒ No ☐ Yes:	
Cause(s):	
Arising danger:	
Safety deficiency rectified? ☐ Yes ☐ No; reason:	
>>>>> Equipment not released for use!	

Work to be done		Comment
☐	Rectified deficiencies:	
☒	Tasks fully completed	Ok
☐	Follow-up assignment necessary for:	
☐	Follow-up order issued for:	
☐	Supply spares:	
☐		
Additional comments:		
Arrived at customer location and coordinated with the customer. Shutdown the unit following LoTo procedures. Drained the oil and refilled with SB-220 motor oil. Replaced the air filter. Restarted the unit and confirmed proper operation. Unit operating properly with no problems at this time.		

Consumed material	Material No.	Pc	Serial No.	Part ID/batch	Stock

Material delivered in advance	Material No.	Pc	Serial No.	Return	Returned by
Filter non-woven DN150	893606.0	1		0	Tech. Customer
Omega Blower 220 Synthetic C	ANSB-220	2		0	Tech. Customer
					Tech. Customer

Oper. 0030 **Maintain blower - package A** 1.0
Type EB 420 C VAC 40,0 hp 2.460 rpm **1005145916**
Material No. EBC **Year** 2009
Serial No. 2140 **EMR** 3605982

Previous service hours

1 h

Current service hours

2 h

Work to be done	Comment
>Tasks to be completed and current condition recorded: OK	
☒ -Ensure safe working conditions as described in the manual	Ok
☒ -Clean surface of airend and motor	Ok
☒ -Check that the block mechanism turns freely	Ok
☒ -Check the block drive shaft seal	Ok
☒ -Check V-belts and change or re-tension as necessary	Ok
☒ -Check guard	Ok
☒ -Check extractor blade (enclosure)	Ok
☒ -Change air filter	Ok
☒ -Check oil and change if necessary	Ok
☒ -Check the oil drain lines and connections	Ok
☒ -Check pipe connections	Ok
☒ -Check compensator(s) and change if necessary	Ok
☒ -Open and check unloaded start valve	Ok
☒ -Open and check the check valve	Ok
☒ -Check electrical cables and cable inlets	Ok
☒ -Tighten mains terminals and check for oxidation	Ok
☒ -Check overcurrent relays and motor protection switches	Ok
☒ -Check motor bearings, re-grease (Unirex N3 only) as needed/change	Ok
☐ -Check control voltage: L1 V	
☐ -Check power consumption: Line U1 A V1 A W1 A	
☒ -Check overheating shutdown function (option)	Ok
☒ -Check pressure relief valve(s)	Ok
☒ -Test run, check conditions: start, load and shut-down	Ok
☒ -Check display functions	Ok
☒ -Check oil level and check for leaks	Ok
☒ -Register service: stick label/service manual/controller	Ok
Operating hours: h Oil type:	
Existing safety deficiencies? ☒ No ☐ Yes:	
Cause(s):	
Arising danger:	
Safety deficiency rectified? ☐ Yes ☐ No; reason:	
>>>>> Equipment not released for use!	

Work to be done		Comment
☐	Rectified deficiencies:	
☒	Tasks fully completed	Ok
☐	Follow-up assignment necessary for:	
☐	Follow-up order issued for:	
☐	Supply spares:	
☐		
Additional comments:		
Arrived at customer location and coordinated with the customer. Inspected the unit to ensure proper operation. Unit operating properly with no problems at this time.		

Consumed material

Material No.

Pc

Serial No.

Part ID/batch

Stock

Material delivered in advance

Material No.

Pc

Serial No.

Return

Returned by

☐ Tech.

☐ Customer

Oper. 0050 **Maintain refrigeration dryer** 2.0
Type Refrig. dryer TE 141 460/3/60 **1005145338**
Material No. 1.8039.00010 **Year** **2009**
Serial No. 1343 **EMR** **3575706**

Work to be done	Comment
>Tasks to be completed and current condition recorded: OK	
☒ -Ensure safe working conditions as described in the manual	Ok
☒ -Check for condensate in air network	Ok
☒ -Clean refrigerant condenser and straighten laminations	Ok
☒ -Maintain condensate drain	Ok
☒ -Repair any damage to the refrigerant circuit thermal insulation	Ok
☒ -Check fan motor, blades and guarding	Ok
☒ -Check electrical cables and cable inlets	Ok
☐ -Check cut-out pressure: high psi/bar low psi/bar	N/A
☐ -Check compressed air temp.: Inlet °F/°C Outlet °F/°C	N/A
☐ -Check dew point: ☐ blue ☐ green ☐ red °F/°C	N/A
Refilled/disposed refrigerant quantity: / kg/lb	
Refrigerant type and total quantity*: / kg/lb	
☒ -Check refrigerant circuit for leaks	Ok
☒ -Check setting and function of the compressed air bypass/diversion	Ok
☒ -Test run	Ok
☒ -Register service: stick label/service manual	Ok
Refrigerant type Ambient temperature 85 °F/°C	
Existing safety deficiencies? ☒ No ☐ Yes:	
Cause(s):	
Arising danger:	
Safety deficiency rectified? ☐ Yes ☐ No; reason:	
>>>>> Equipment not released for use!	
Rectified deficiencies:	
☒ Tasks fully completed	Ok
☐ Follow-up assignment necessary for:	
☐ Follow-up order issued for:	
☐ Supply spares:	
☐	
Additional comments:	
Arrived at customer location and coordinated with the customer. Inspected dryer. Dryer operating correctly with no problems at this time.	

<u>Consumed material</u>	<u>Material No.</u>	<u>Pc</u>	<u>Serial No.</u>	<u>Part ID/batch</u>	<u>Stock</u>

<u>Material delivered in advance</u>	<u>Material No.</u>	<u>Pc</u>	<u>Serial No.</u>	<u>Return</u>	<u>Returned by</u>

- ☐ Tech.
- ☐ Customer

Oper. 0060	Maintain oil-water sep. - package A	0.5
Type	KCF-100 Condensate Treatment System	1005145340
Material No.	ANKCF100	Year 2009
Serial No.	10900584	EMR 3486488

Work to be done	Comment
>Tasks to be completed and current condition recorded: OK	
☒ -Ensure safe working conditions as described in the manual	Ok
☒ -Empty oil catcher	Ok
☒ -Check activated carbon filter and prefilter, change if necessary	Ok
☒ -Change expansion chamber filter	Ok
☒ -Check settling tank for contamination and clean if necessary	Ok
☒ -Check oil drain and clean if necessary	Ok
☒ -Check water drain, clean if necessary	Ok
☒ -Check for leaks in hoses, connections and air receiver	Ok
☐ -Check heating (option)	N/A
☒ -Register service: stick label/service manual/controller	Ok
Existing safety deficiencies? ☒ No ☐ Yes:	
Cause(s):	
Arising danger:	
Safety deficiency rectified? ☐ Yes ☐ No; reason:	
>>>>> Equipment not released for use!	
Rectified deficiencies:	
☒ Tasks fully completed	Ok
☐ Follow-up assignment necessary for:	
☐ Follow-up order issued for:	
☐ Supply spares:	
☐	
Additional comments:	
Arrived at customer location and coordinated with the customer. Inspected the oil/water separator. Oil/water separator operating correctly with no problems at this time.	

Consumed material	Material No.	Pc	Serial No.	Part ID/batch	Stock

Material delivered in advance	Material No.	Pc	Serial No.	Return	Returned by

☐ Tech.
☐ Customer

Oper. 0080 **Maintain compr. air filter - package B** 1.0
 Type Oil Removal KOR-485.2 1005145341
 Material No. USKOR485.2 Year 2009
 Serial No. * EMR 3742806

Work to be done	Comment
>Tasks to be completed and current condition recorded: OK	
☒ -Ensure safe working conditions as described in the manual	Ok
☐ -Change filter element(s)	N/A
☒ -Clean filter housing and control bores in the filter head	Ok
☒ -Maintain condensate drain	Ok
☒ -Check pressure differential indicator (option)	Ok
☒ -Check optional shutdown function, only with user's permission	Ok
☒ -Check for leaks	Ok
☒ -Register service: stick label/service manual/controller	Ok
Existing safety deficiencies? ☒ No ☐ Yes:	
Cause(s):	
Arising danger:	
Safety deficiency rectified? ☐ Yes ☐ No; reason:	
>>>>> Equipment not released for use!	
Rectified deficiencies:	
☒ Tasks fully completed	Ok
☐ Follow-up assignment necessary for:	
☐ Follow-up order issued for:	
☐ Supply spares:	
☐	
Additional comments:	
Arrived at customer location and coordinated with the customer. Inspected the air filter. Air filter operating correctly with no problems at this time.	

Consumed material Material No. Pc Serial No. Part ID/batch Stock

Material delivered in advance Material No. Pc Serial No. Return Returned by

☐ Tech.
☐ Customer

SERVICE ORDER

KAESER COMPRESSORS

Equipment at customer location 538086 HDR Engineering/e2m, Memphis

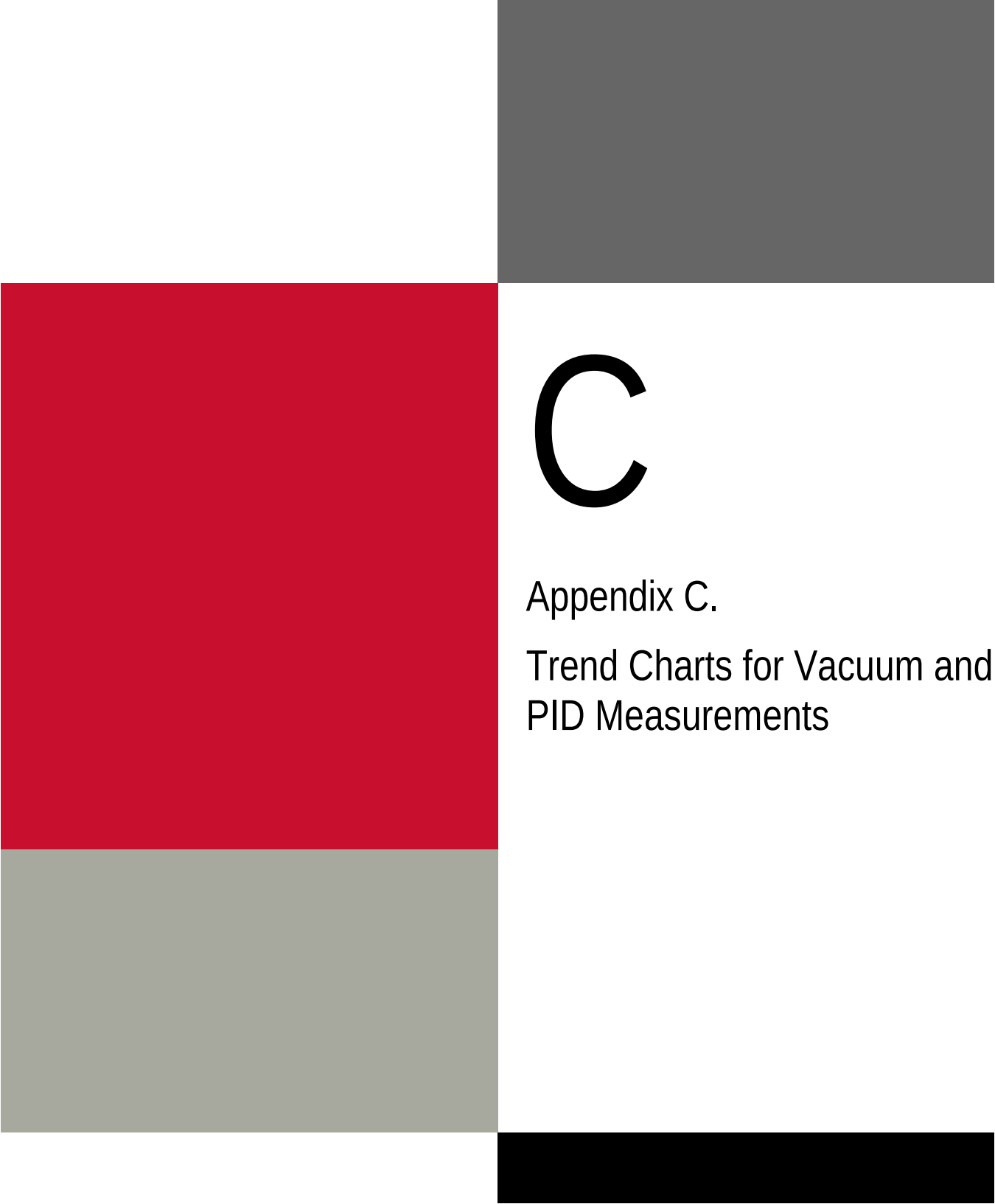
Registered machines

- Please enter or correct missing or incorrect years of manufacture, material numbers or serial numbers
- As far as air receivers, ZK, filters and dryers are concerned, please complete information applicable to the condensate drain (if not yet registered) -**ED**= ECO-Drain, **FV**= Float valve, **SV**= Solenoid valve
- If the customer has more than one compressed air station in different locations at the same address, please enter the exact location of each station (e.g. paint shop, number 1 works) etc.

Type	S. Hr.	Year	Material No.	Serial No.		Station	
Refrig. dryer TE 141 460/3/60		2009	1.8039.00010	1343	reg.		-
CSD 100 125 psi 460/60 US		2009	100818.1	1234	reg.		-
OMEGA 53 PLUS cyl.left vert./cpl.		2009	881150.00108	2242	reg.		-
200 Gal Tank		2009	9.9999.9	41588	reg.		-
KCF-100 Condensate Treatment System		2009	ANKCF100	2144292	-----		-
EB 420 C VAC 40,0 hp 2.460 rpm		2009	EBC	2138	reg.		-
EB 420 C VAC 40,0 hp 2.460 rpm		2009	EBC	2140	reg.		-
Oil Removal KOR-485.2		2009	USKOR485.2	1055	-----		-
Particulate KPF-485.2		2009	USKPF485.2	1025	-----		-

Non-registered machines

Type	S. Hr.	Year	Material No.	Serial No.		Station	
							+
							-



C

Appendix C.

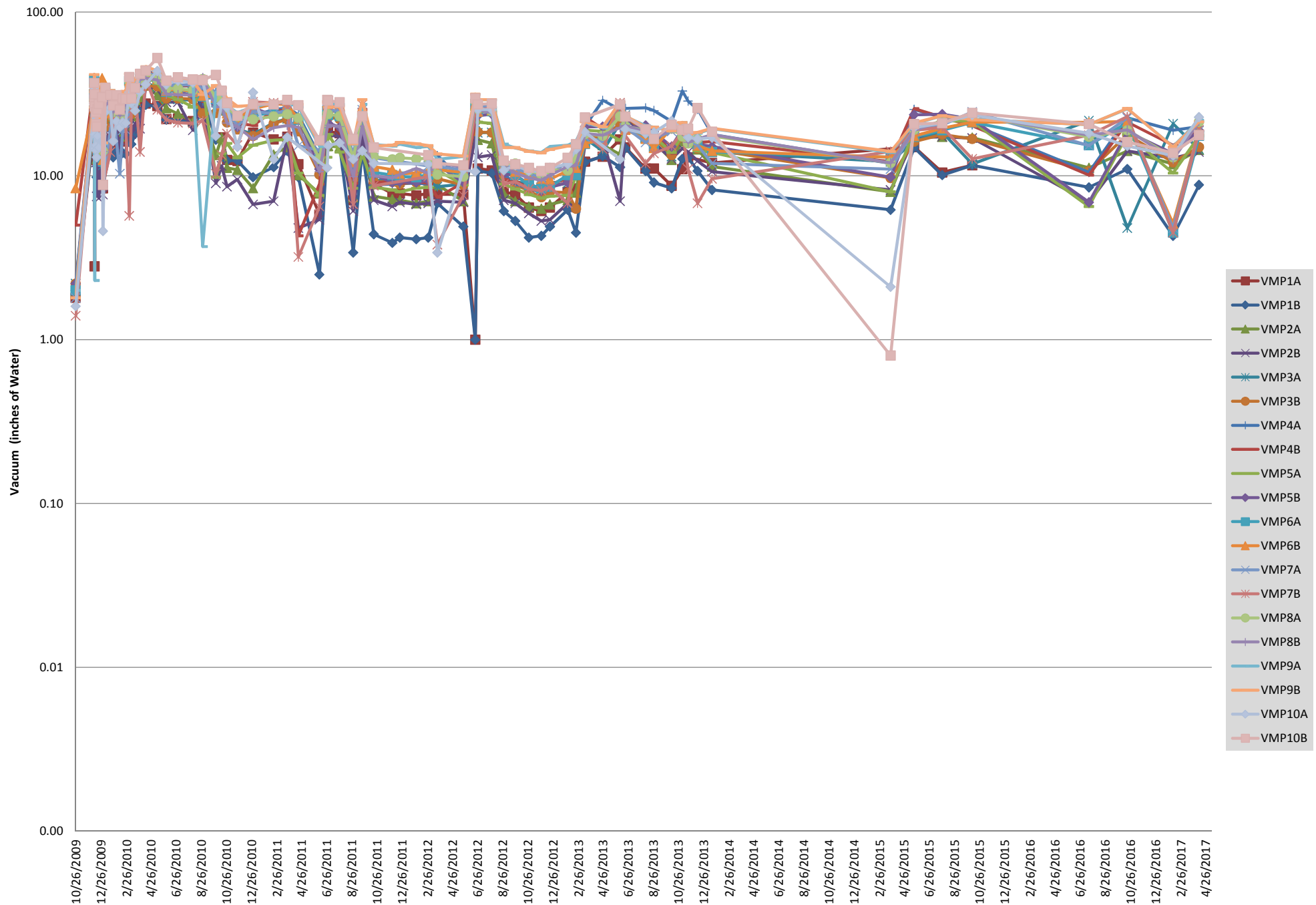
Trend Charts for Vacuum and
PID Measurements



Appendix C-1.

VMP Trends – Vacuum
Readings





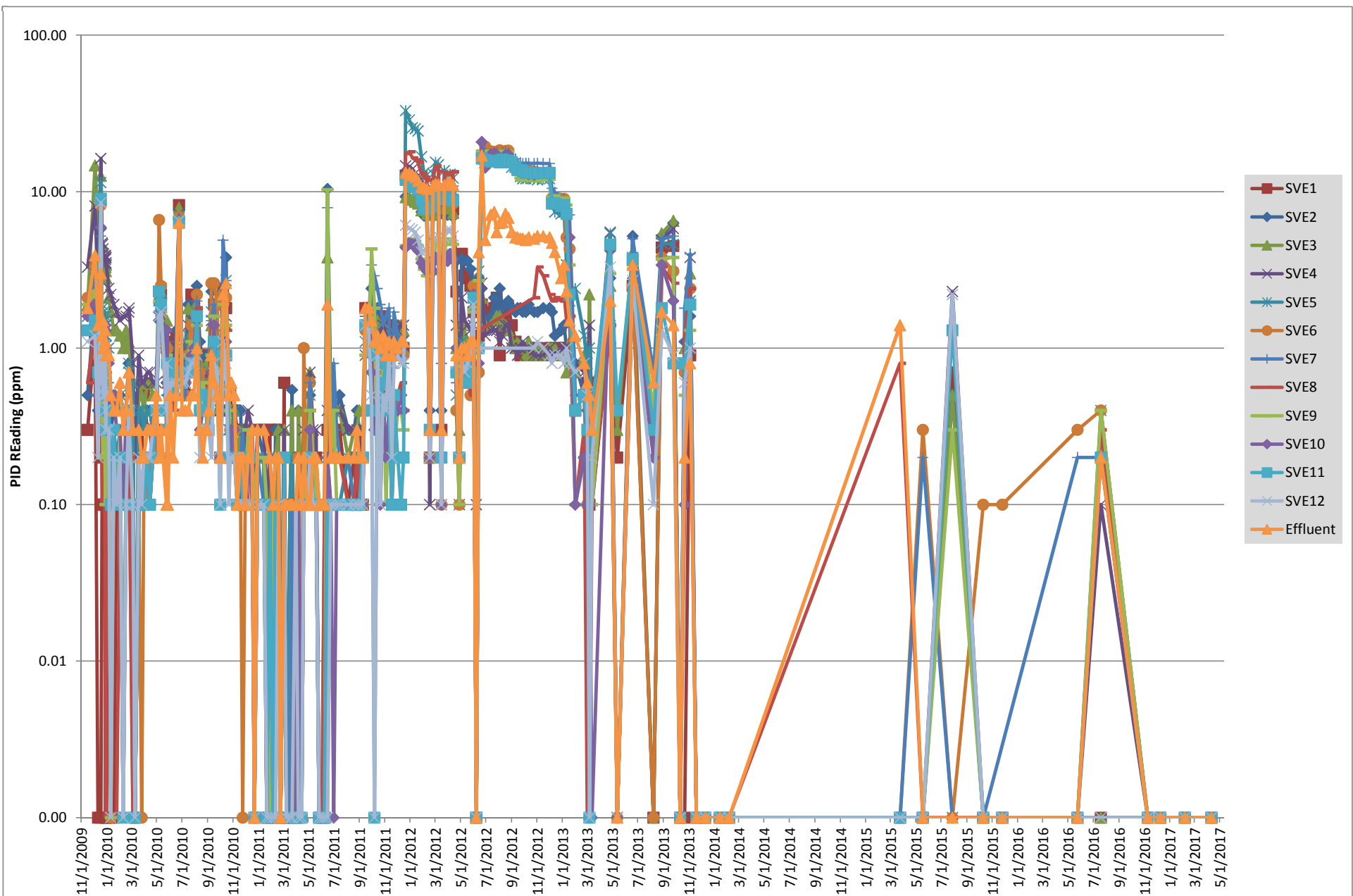
Appendix C-1
Figure 1
VMP TRENDS - VACUUM READINGS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee



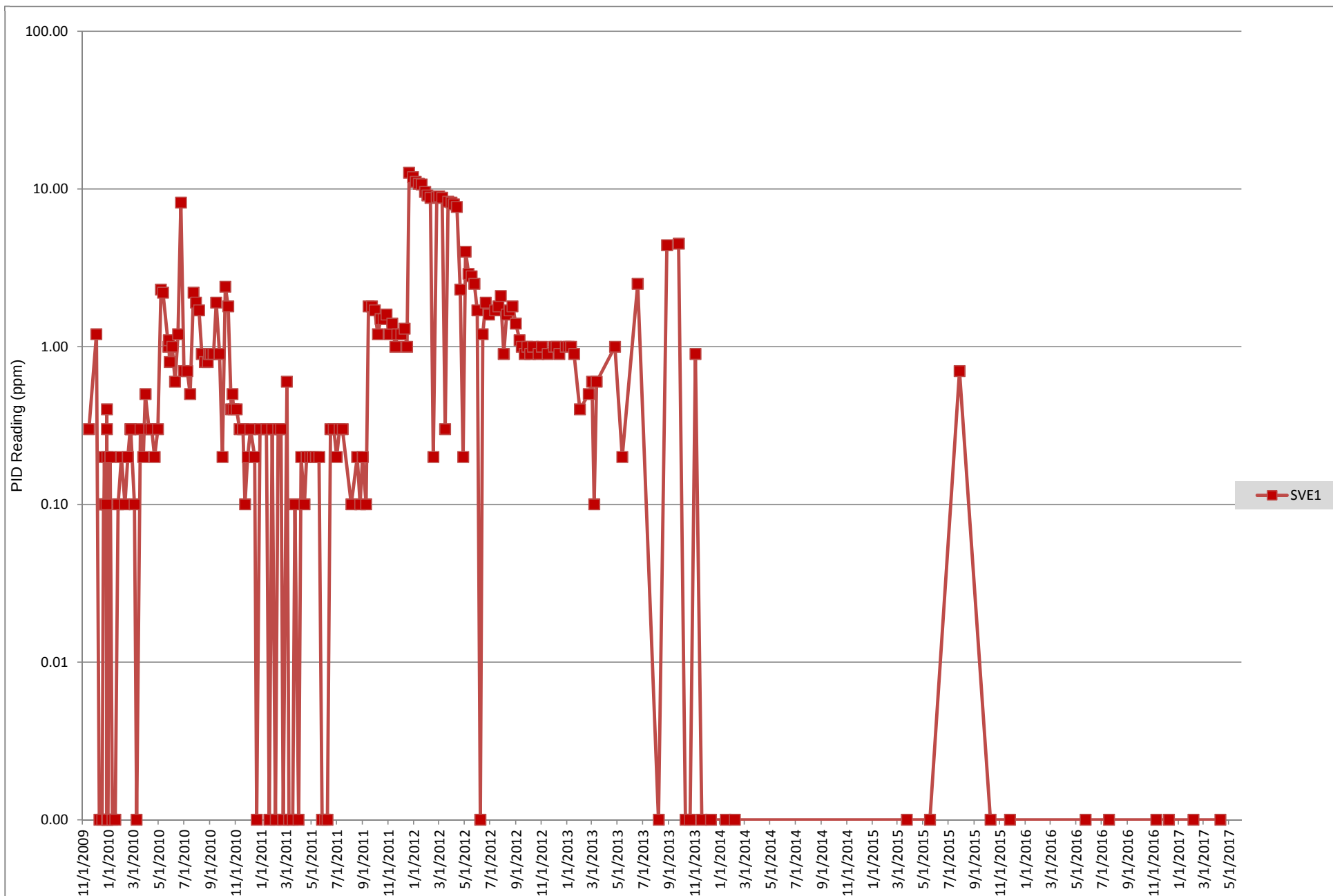
Appendix C-2.

SVE Wells and Effluent
Concentration Trends –
Field PID Measurements

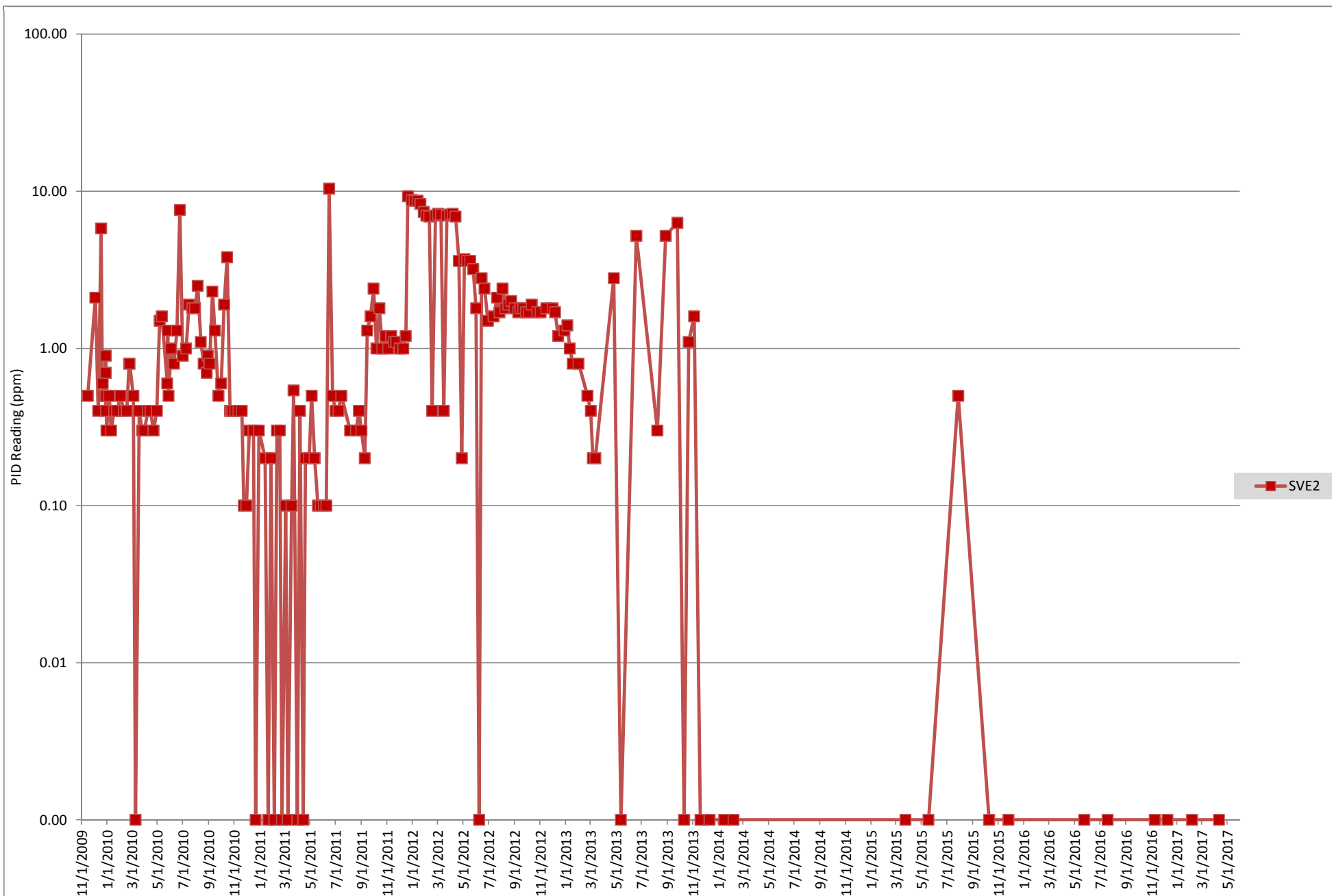




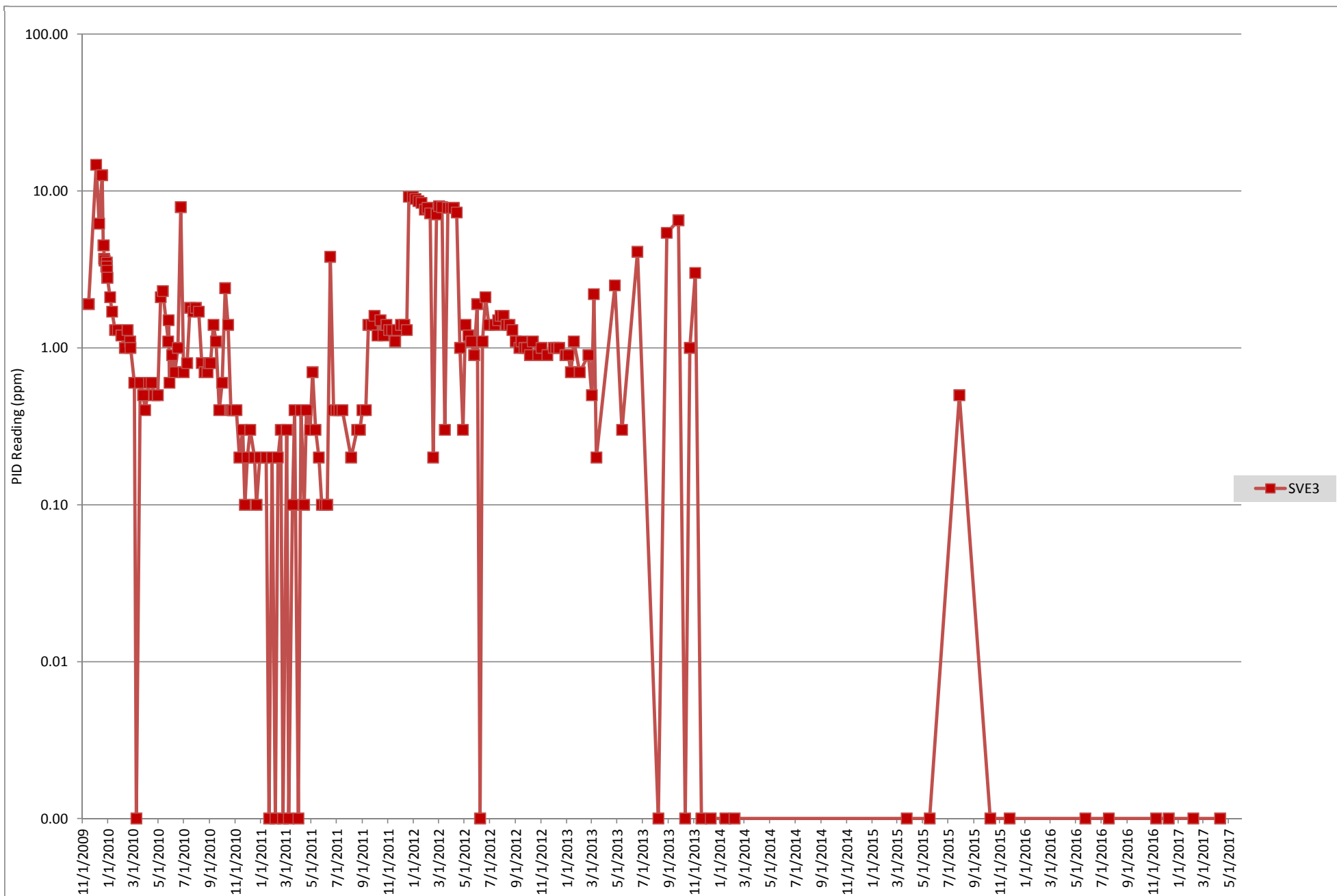
Appendix C-2
 Figure 1
 SVE WELLS AND EFFLUENT CONCENTRATION TREND - FIELD PID MEASUREMENTS
 OFF DEPOT AS/SVE SYSTEM
 ANNUAL OPERATIONS REPORT, YEAR SIX
 Defense Depot Memphis, Tennessee



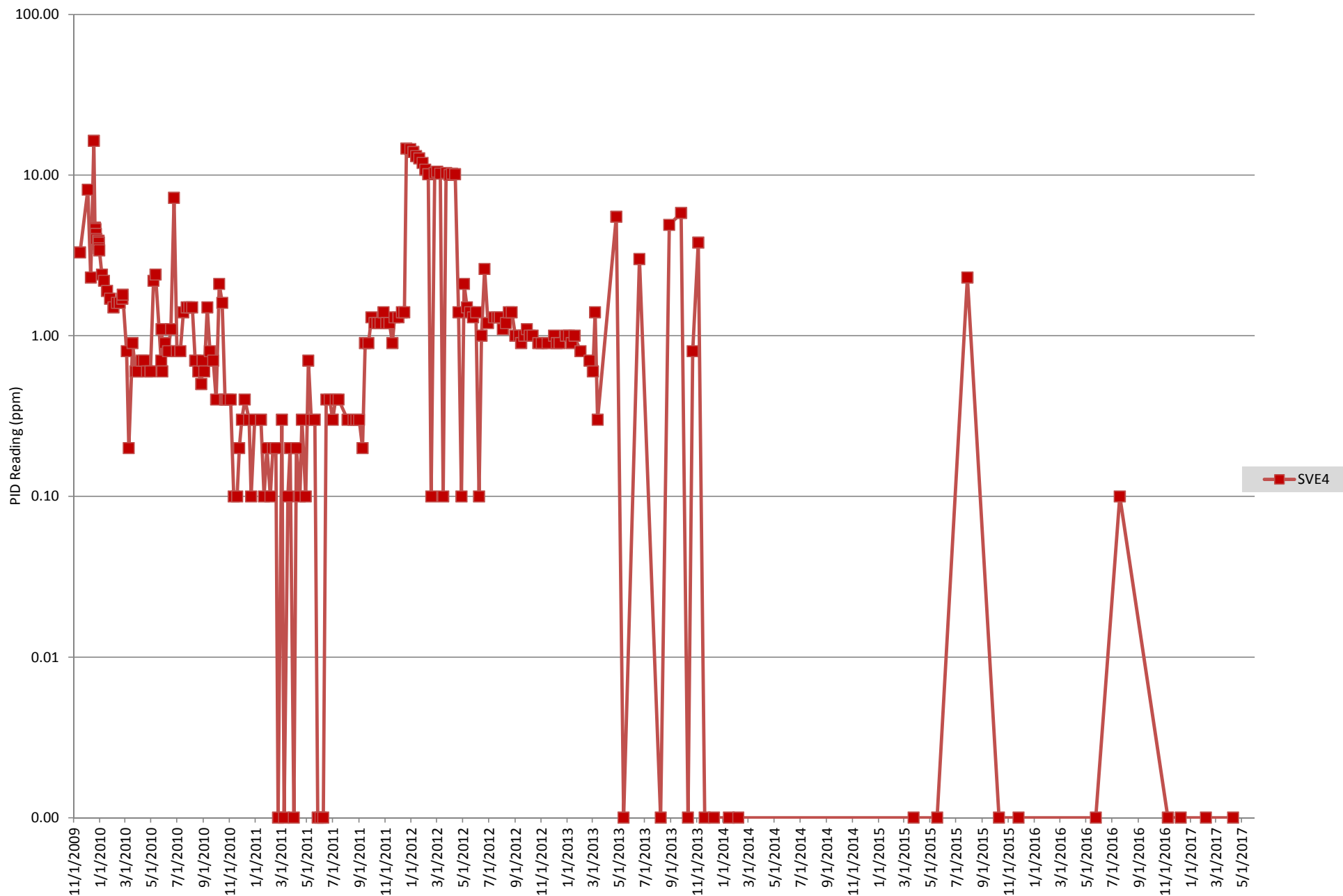
Appendix C-2
Figure 2
SVE WELL #1 CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee



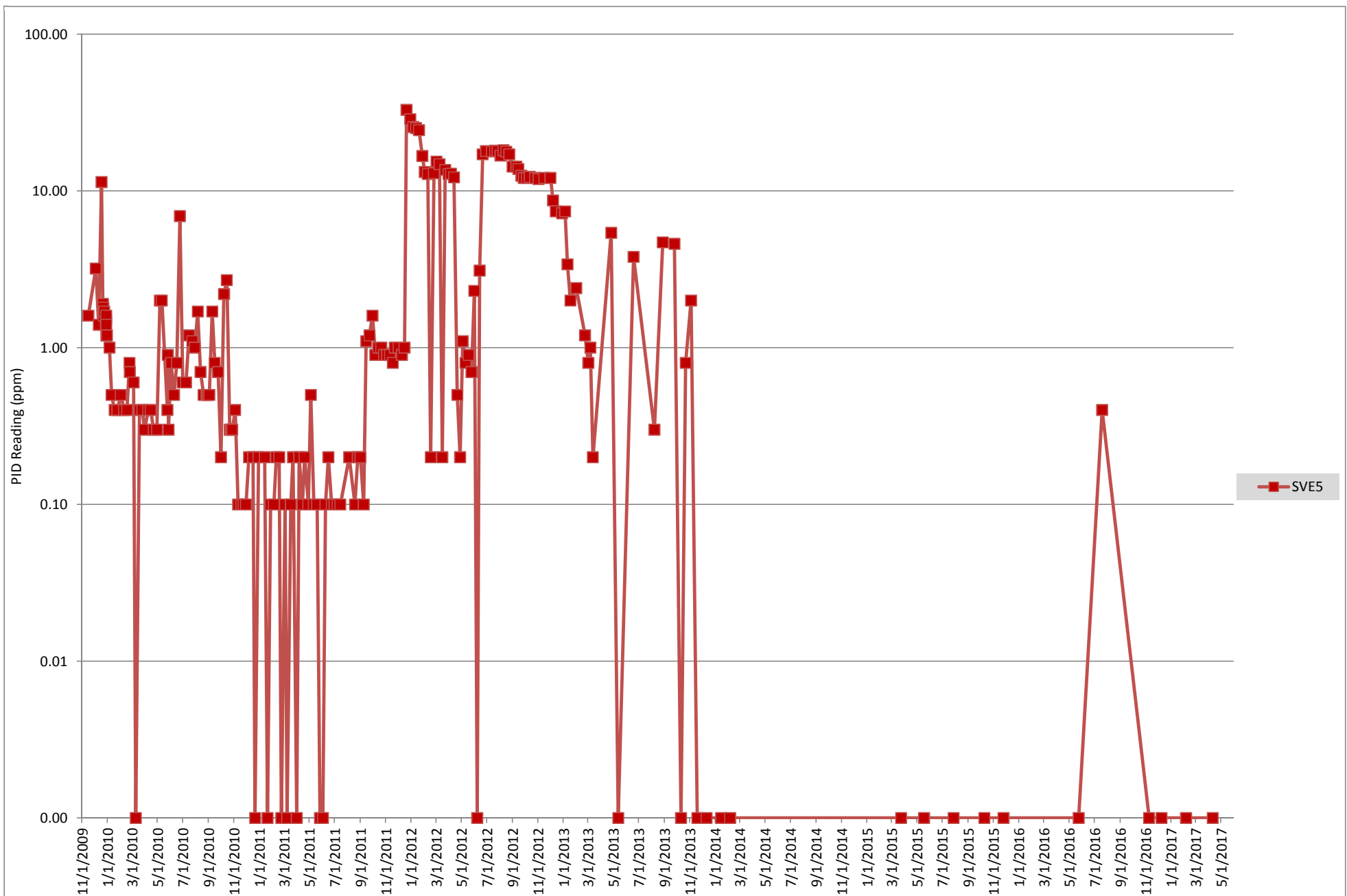
Appendix C-2
Figure 3
SVE WELL #2 CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee



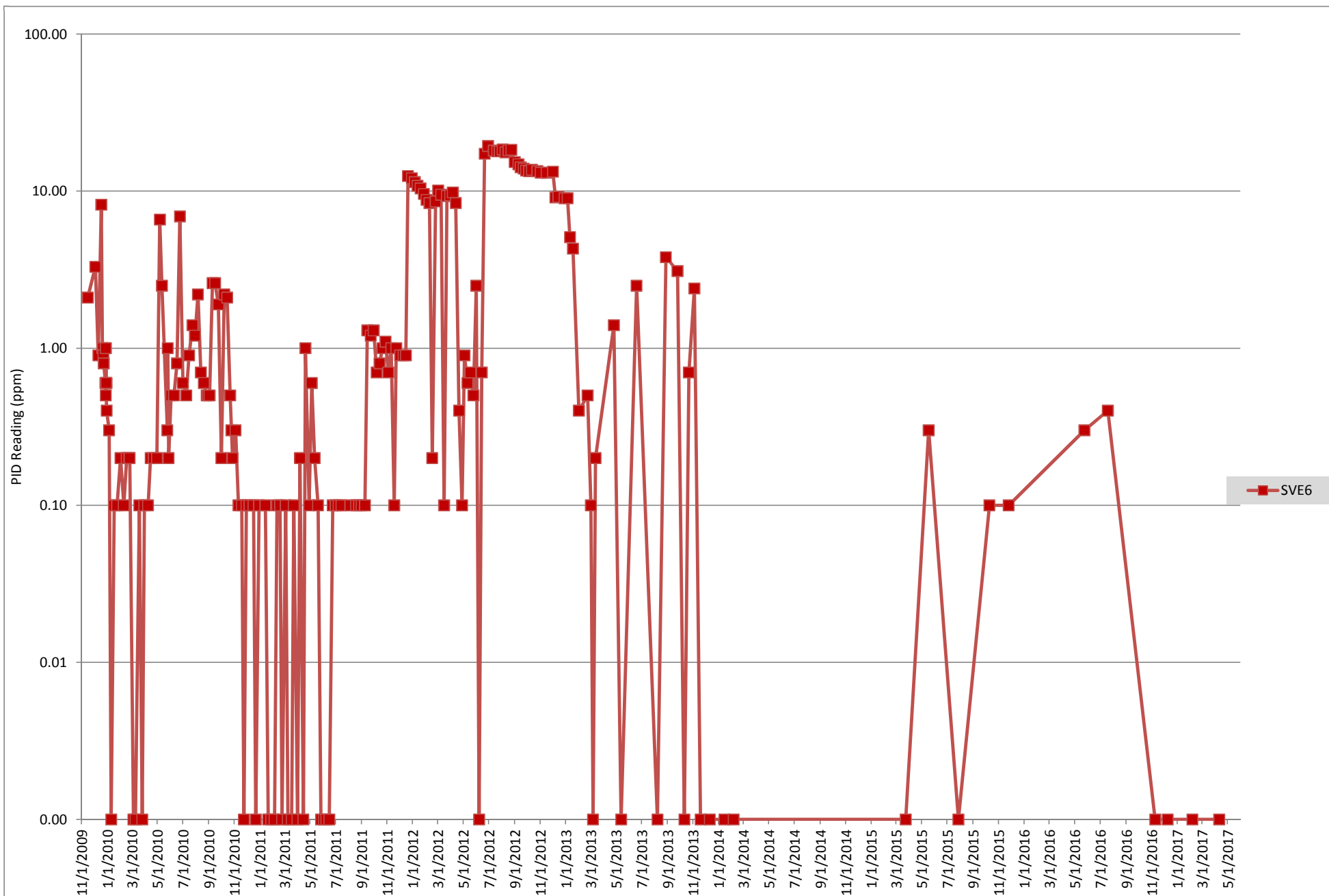
Appendix C-2
Figure 4
SVE WELL # 3 CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee



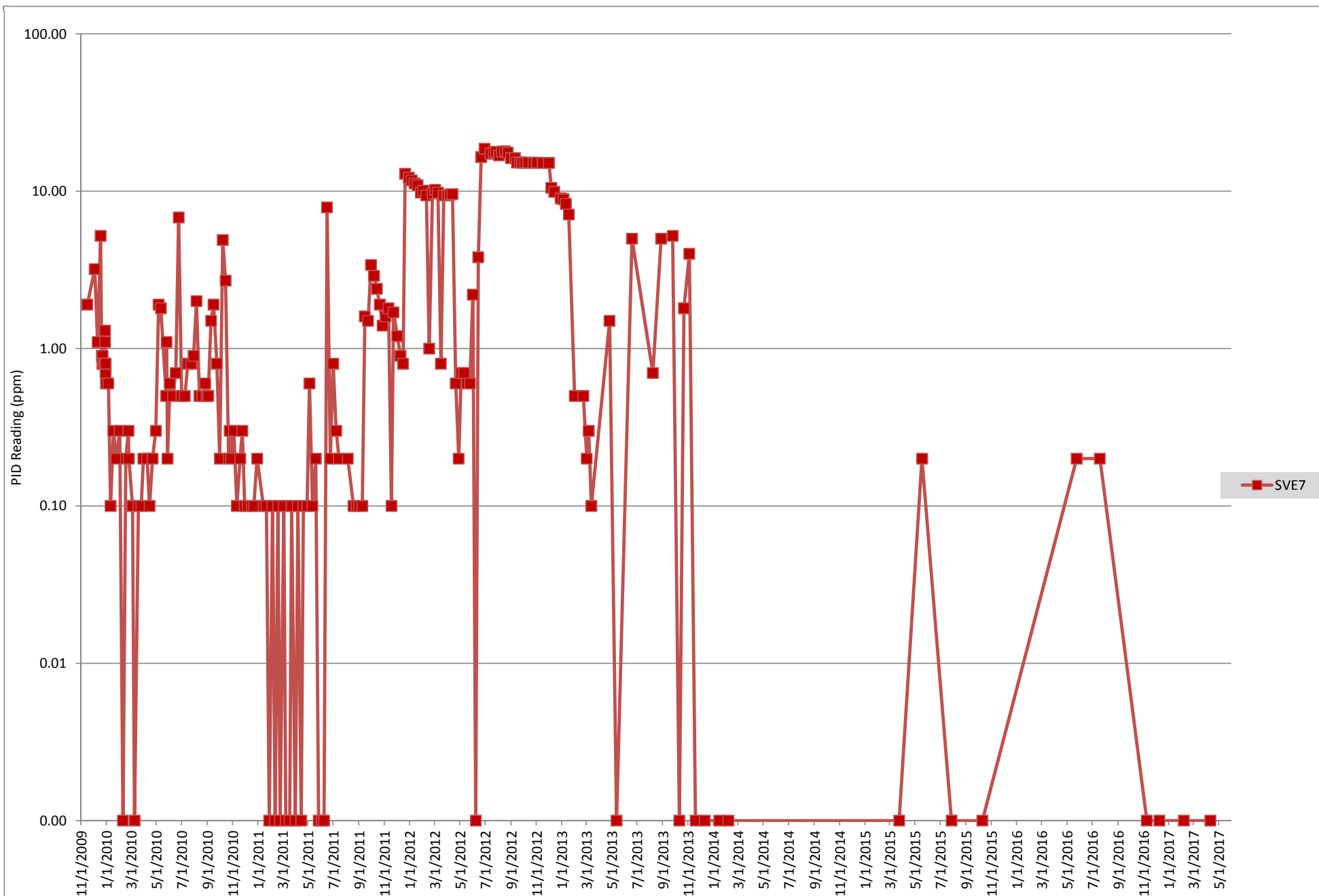
Appendix C-2
Figure 5
SVE WELL #4 CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee



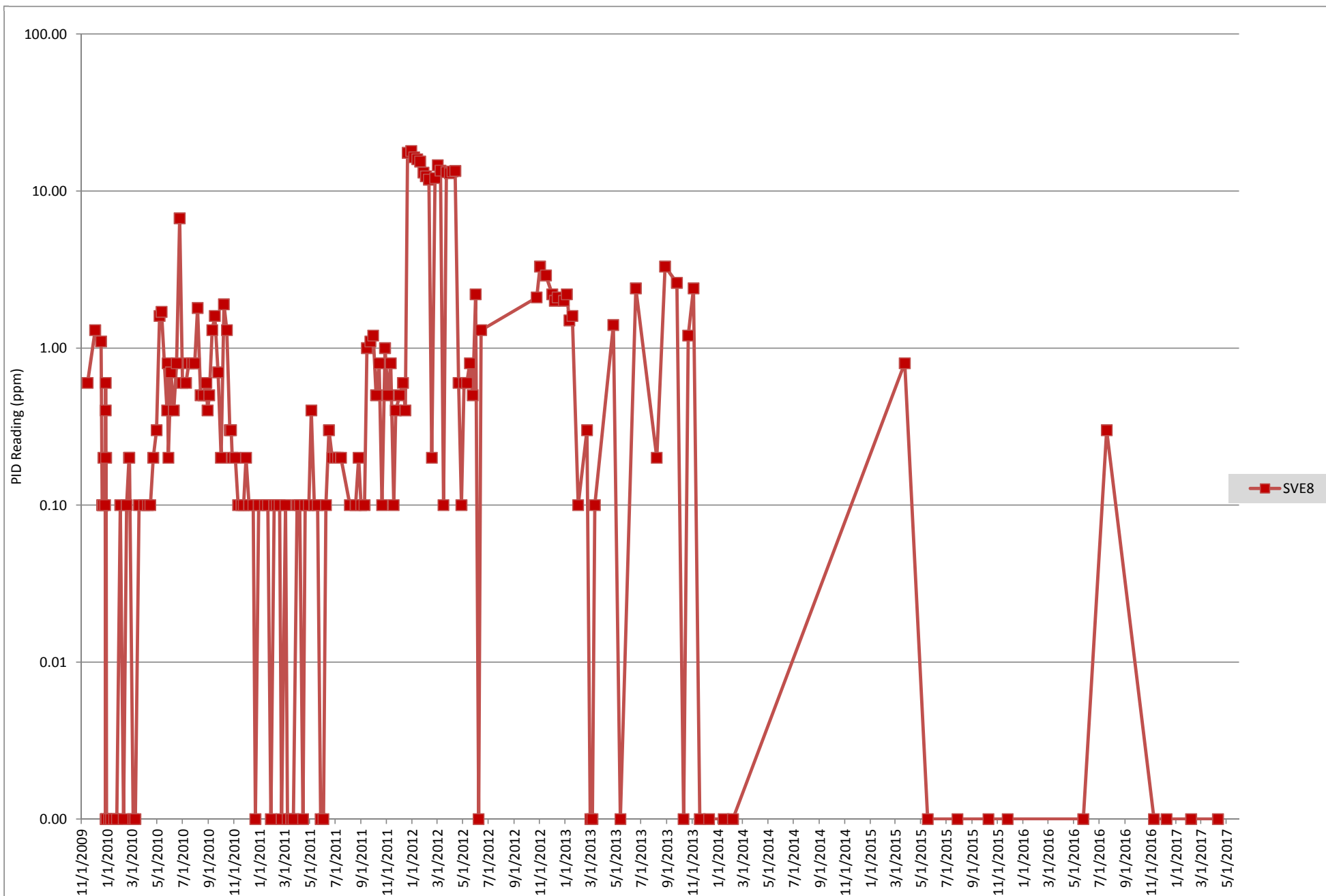
Appendix C-2
Figure 6
SVE WELL #5 CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee



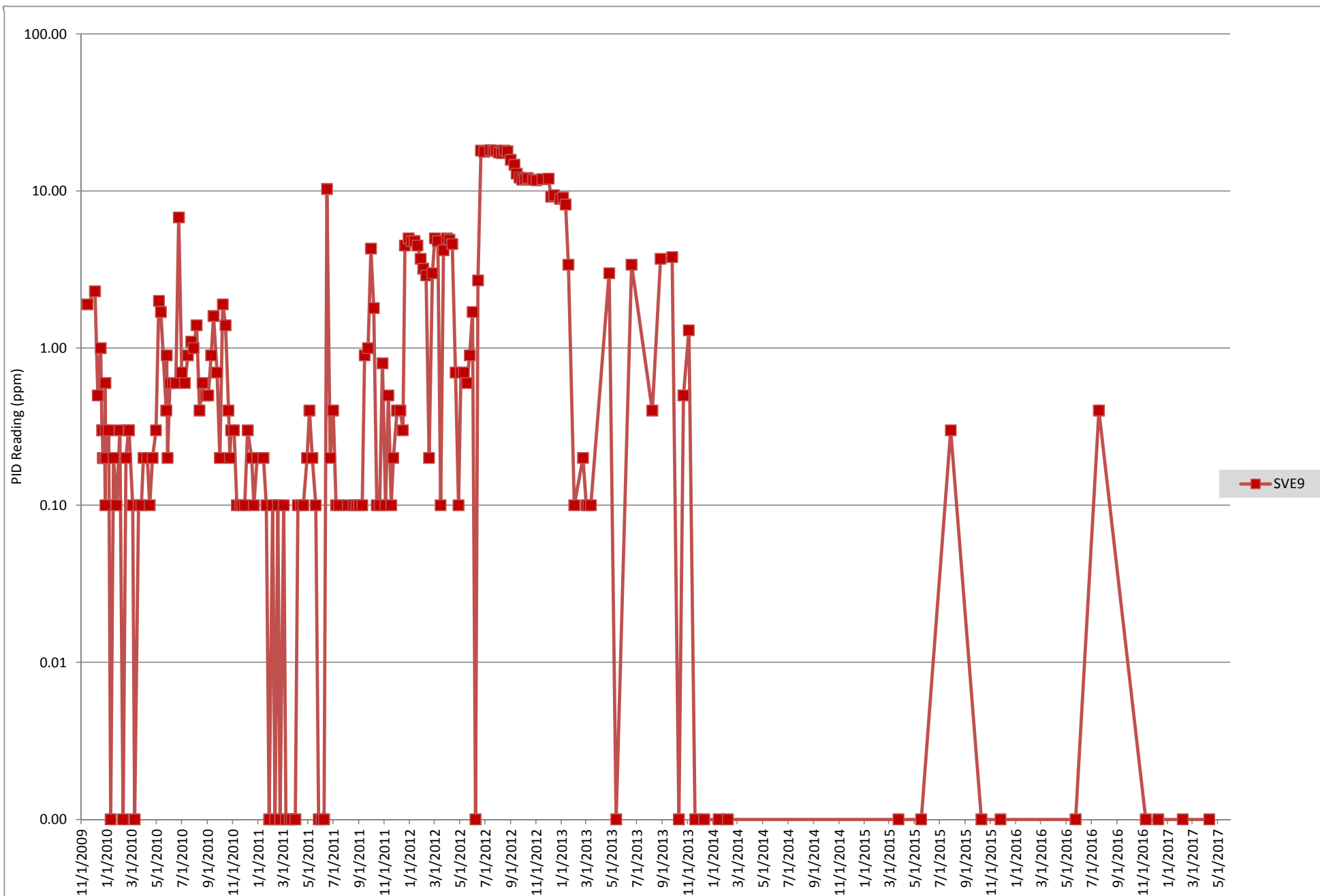
Appendix C-2
Figure 7
SVE WELL #6 CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee



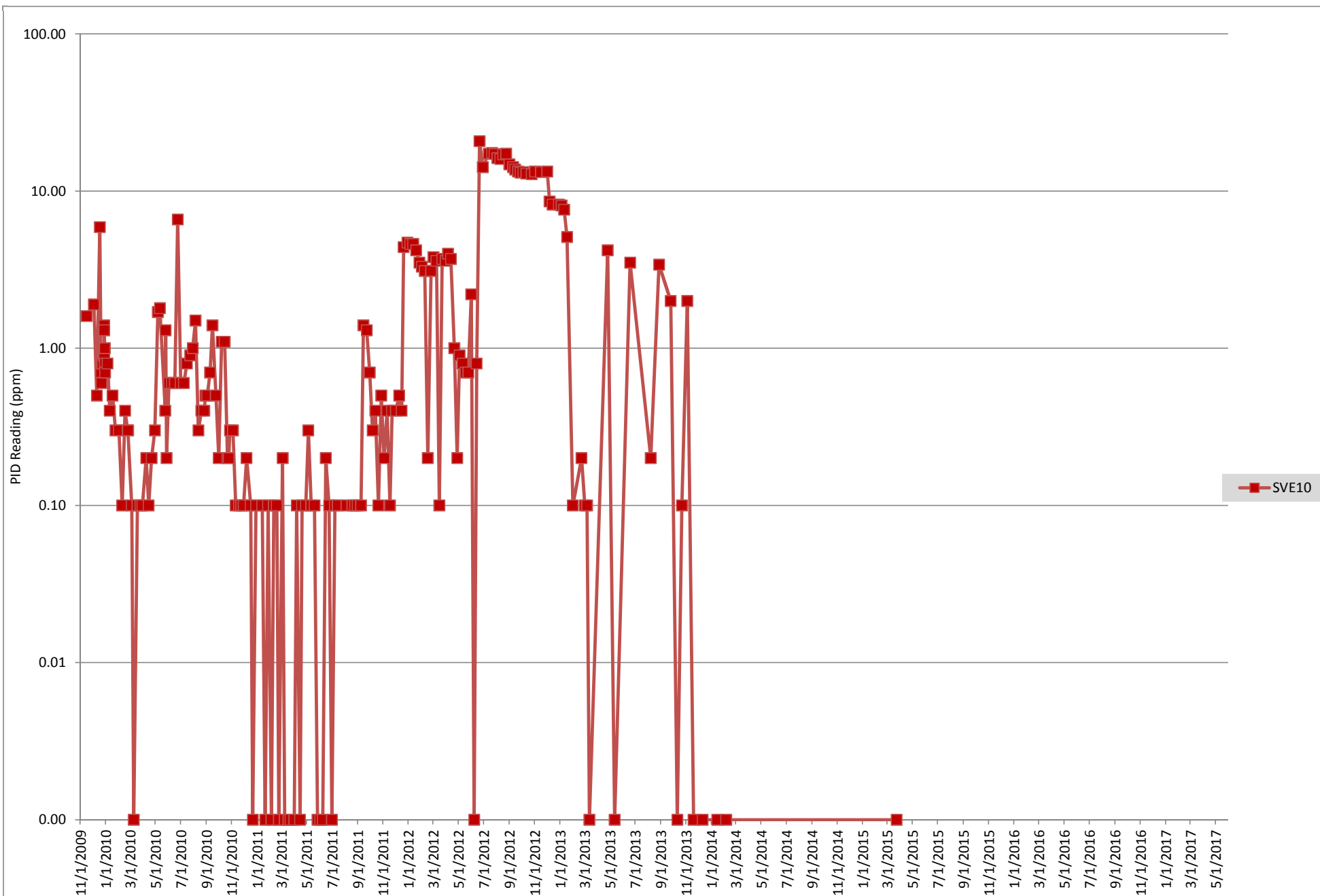
Appendix C-2
Figure 8
SVE WELL #7 CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee



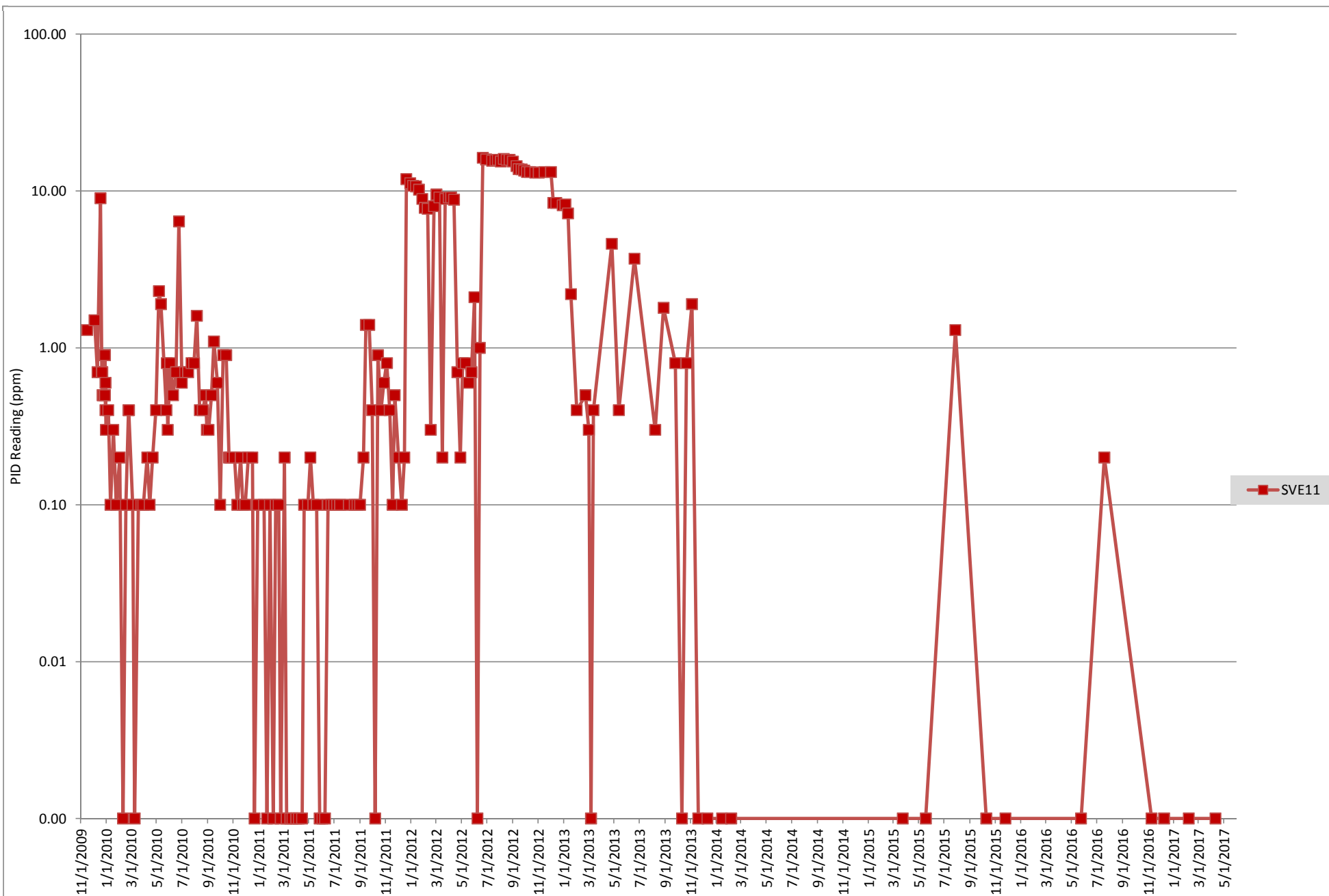
Appendix C-2
Figure 9
SVE WELL #8 CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee



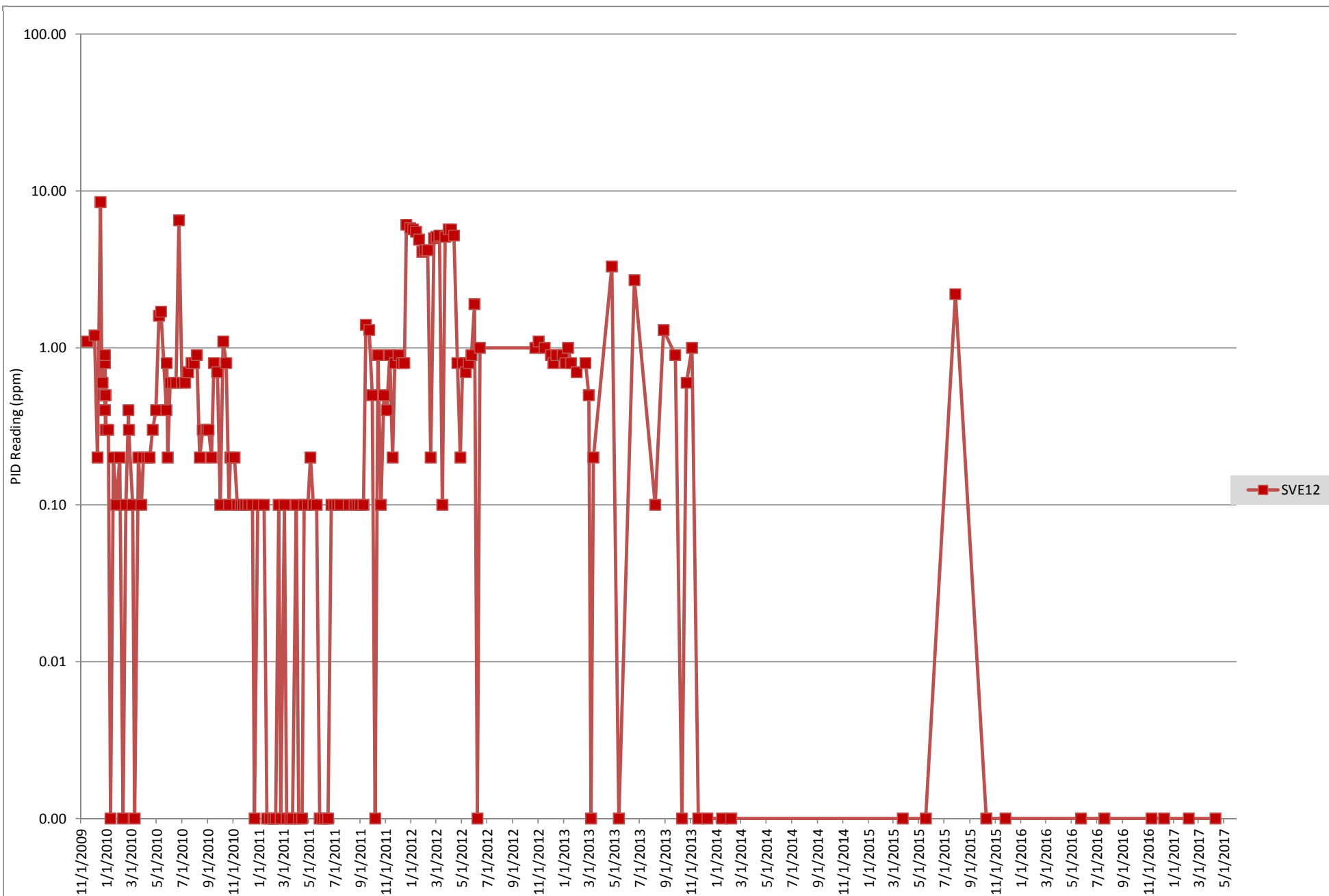
Appendix C-2
Figure 10
SVE WELL #9 CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee



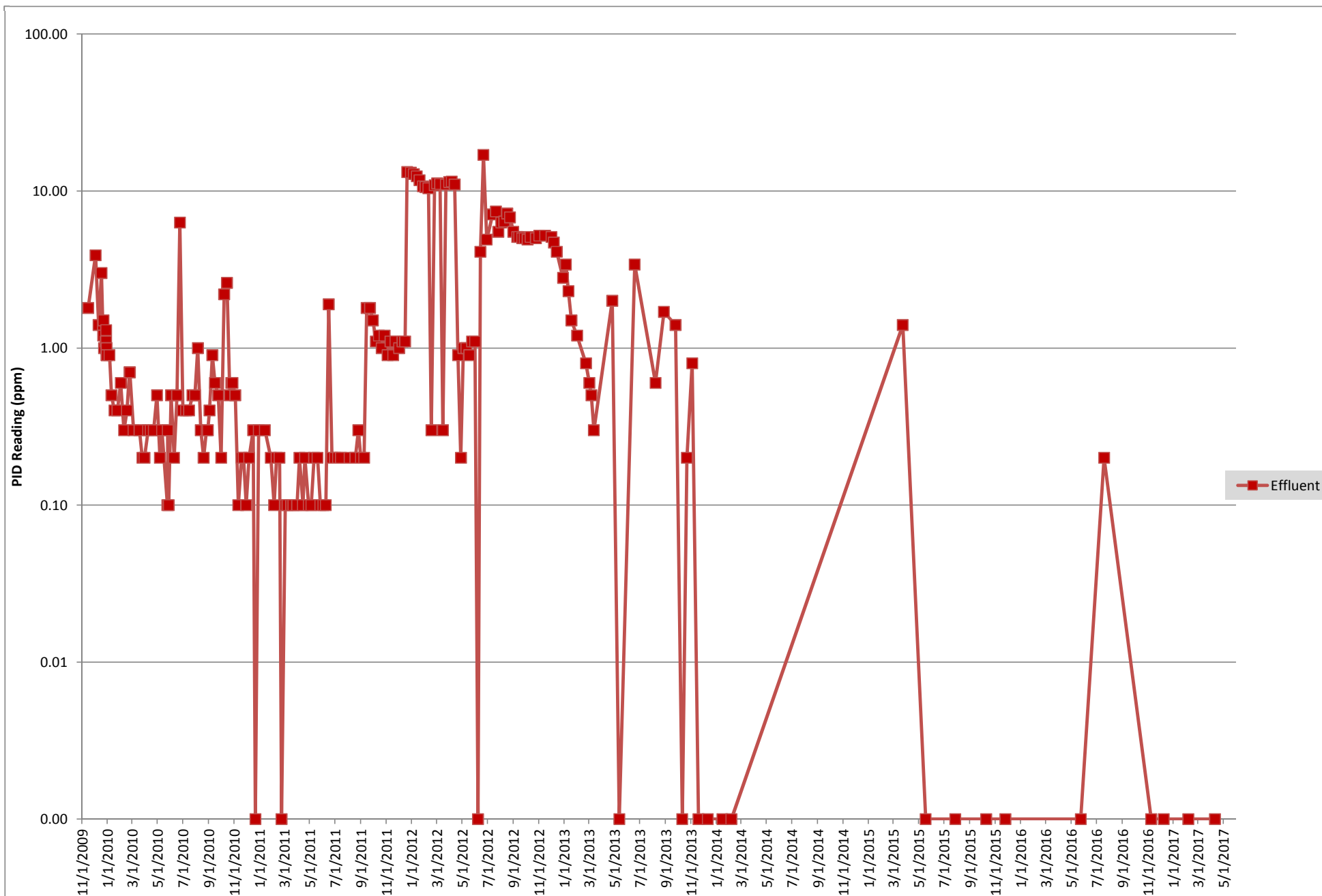
Appendix C-2
Figure 11
SVE WELL #10 CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee



Appendix C-2
Figure 12
SVE WELL #11 CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee



Appendix C-2
Figure 13
SVE WELL #12 CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee



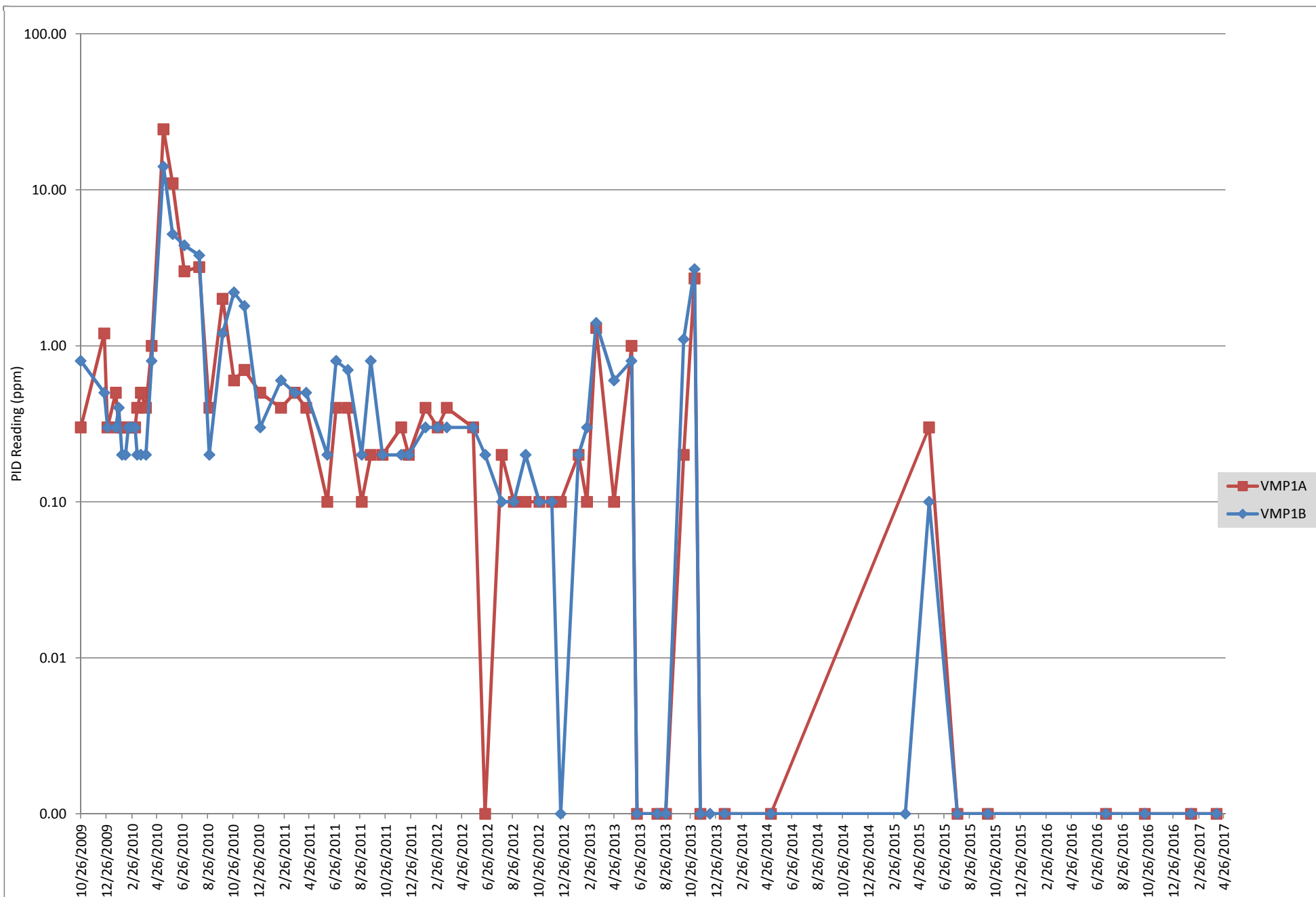
Appendix C-2
Figure 14
EFFLUENT CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee



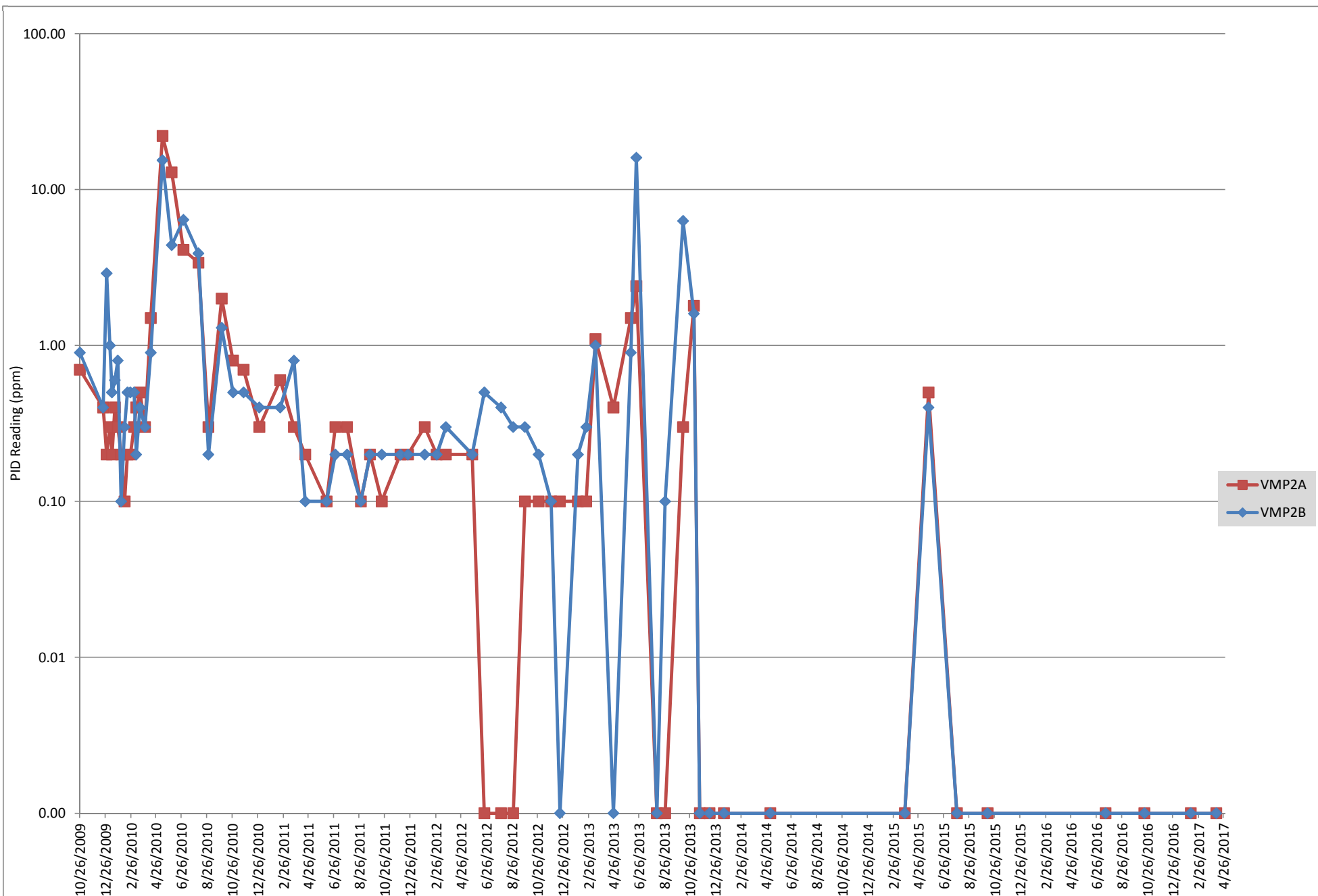
Appendix C-3.

VMP Concentration
Trends – Field PID
Measurements

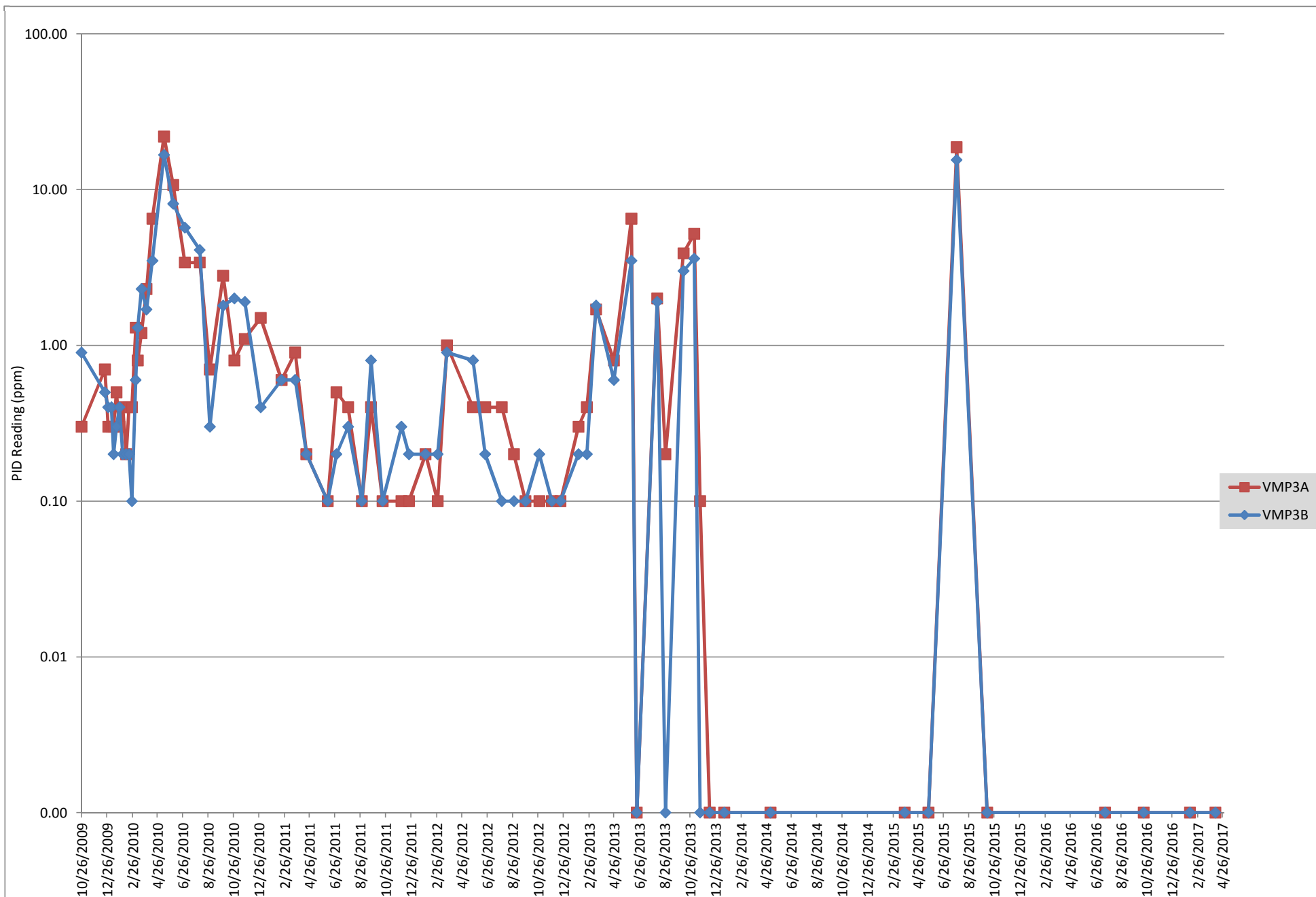




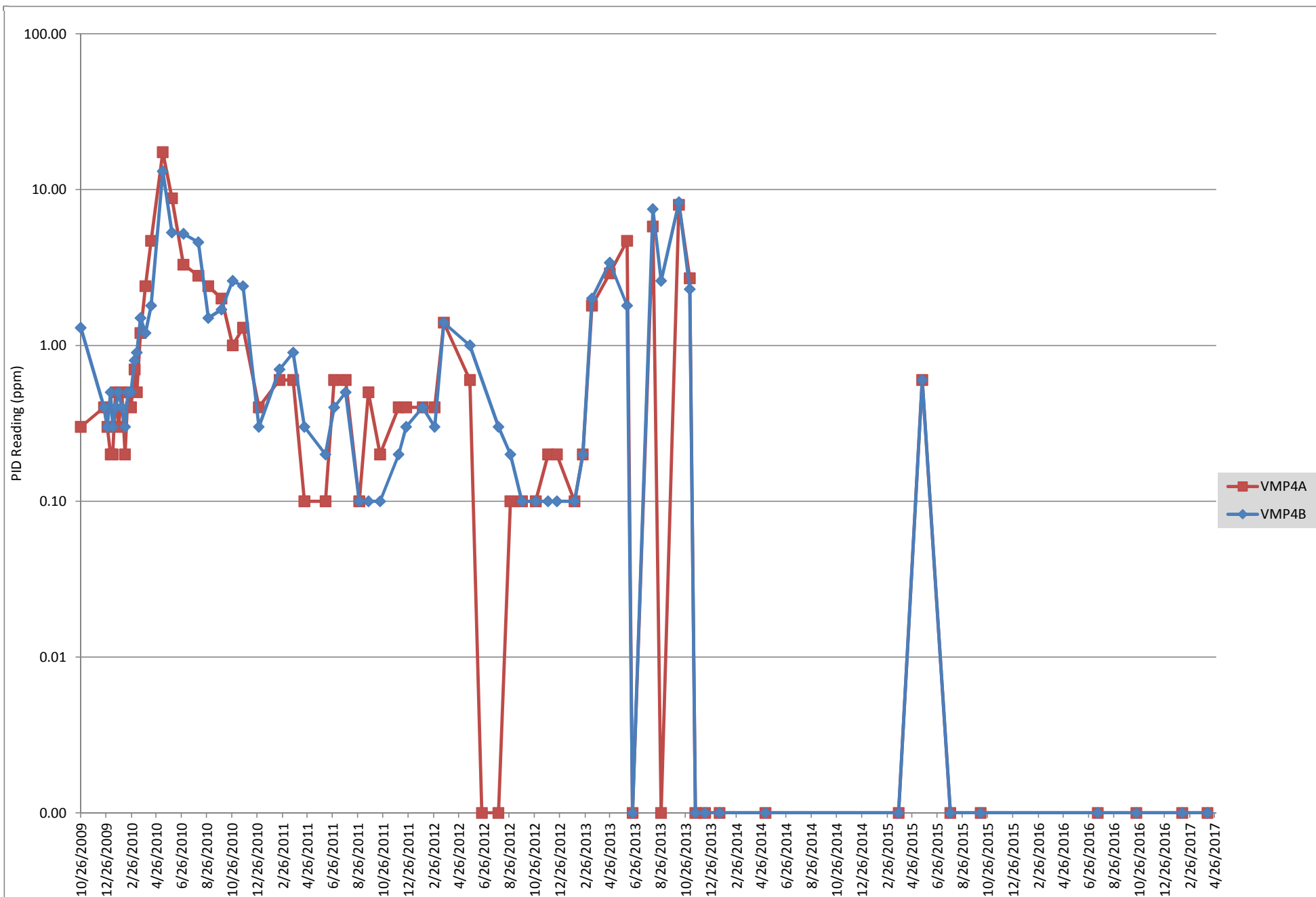
Appendix C-3
Figure 2
VMP 1A/B CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee



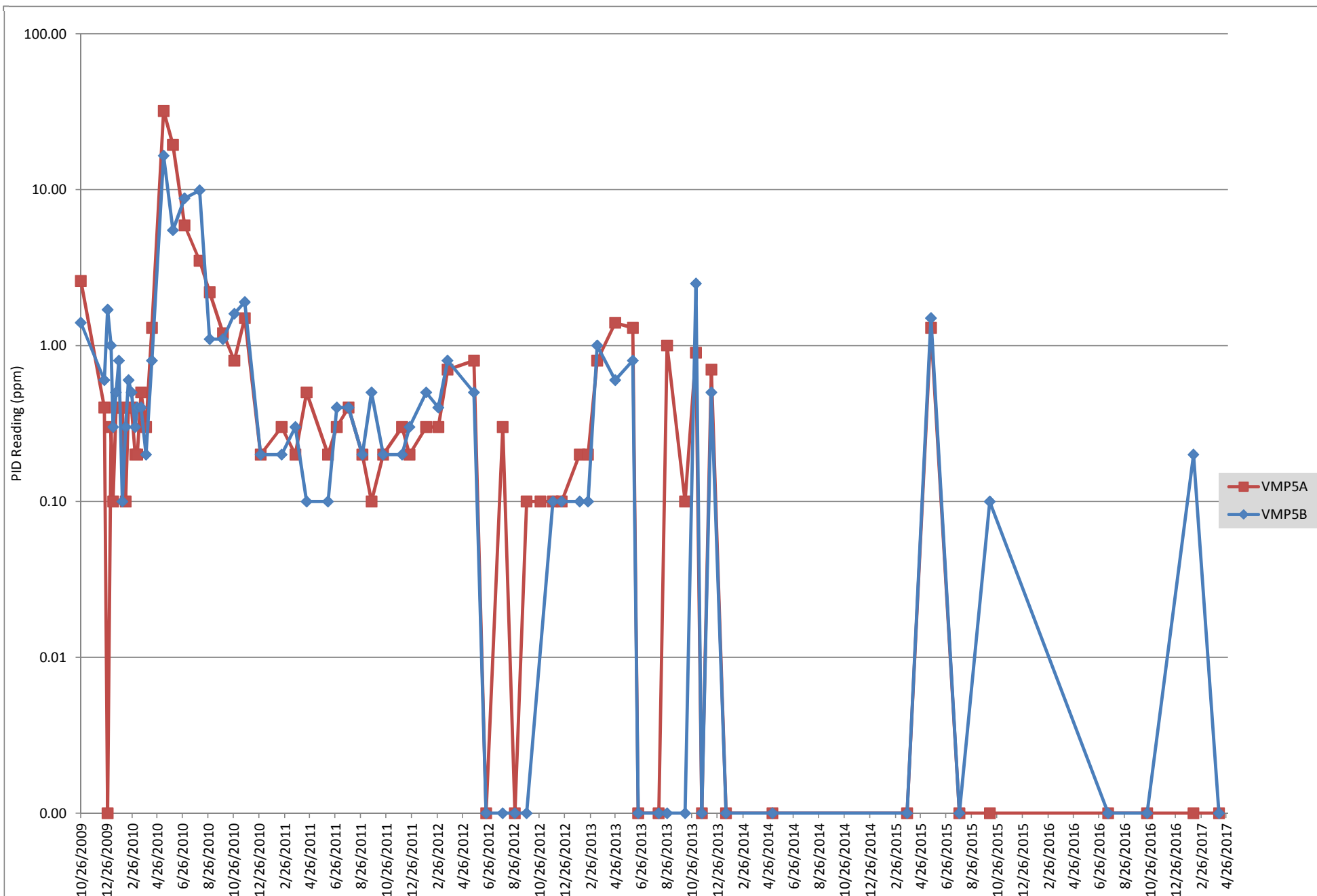
Appendix C-3
Figure 3
VMP 2A/B CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee



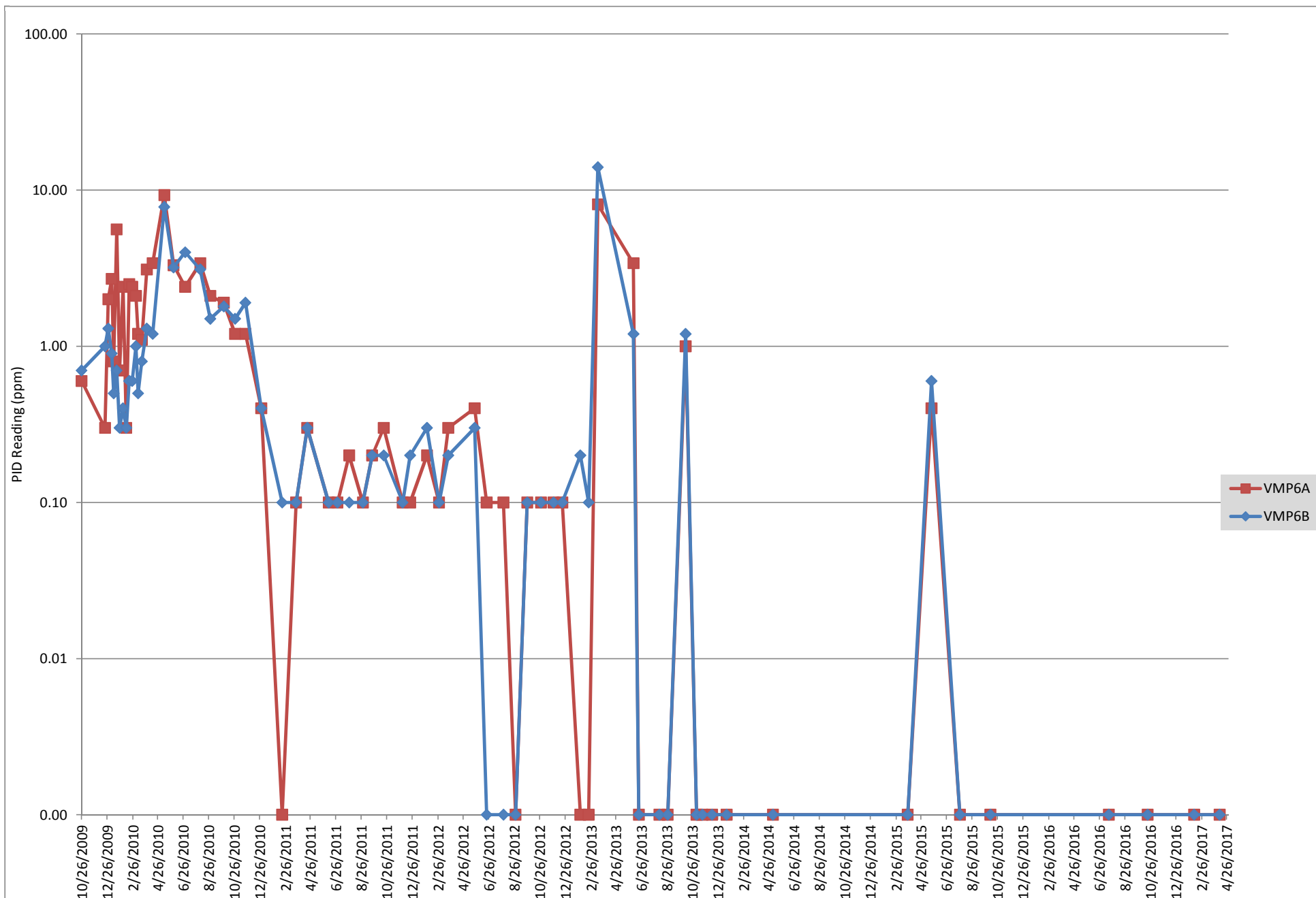
Appendix C-3
Figure 4
VMP 3A/B CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee



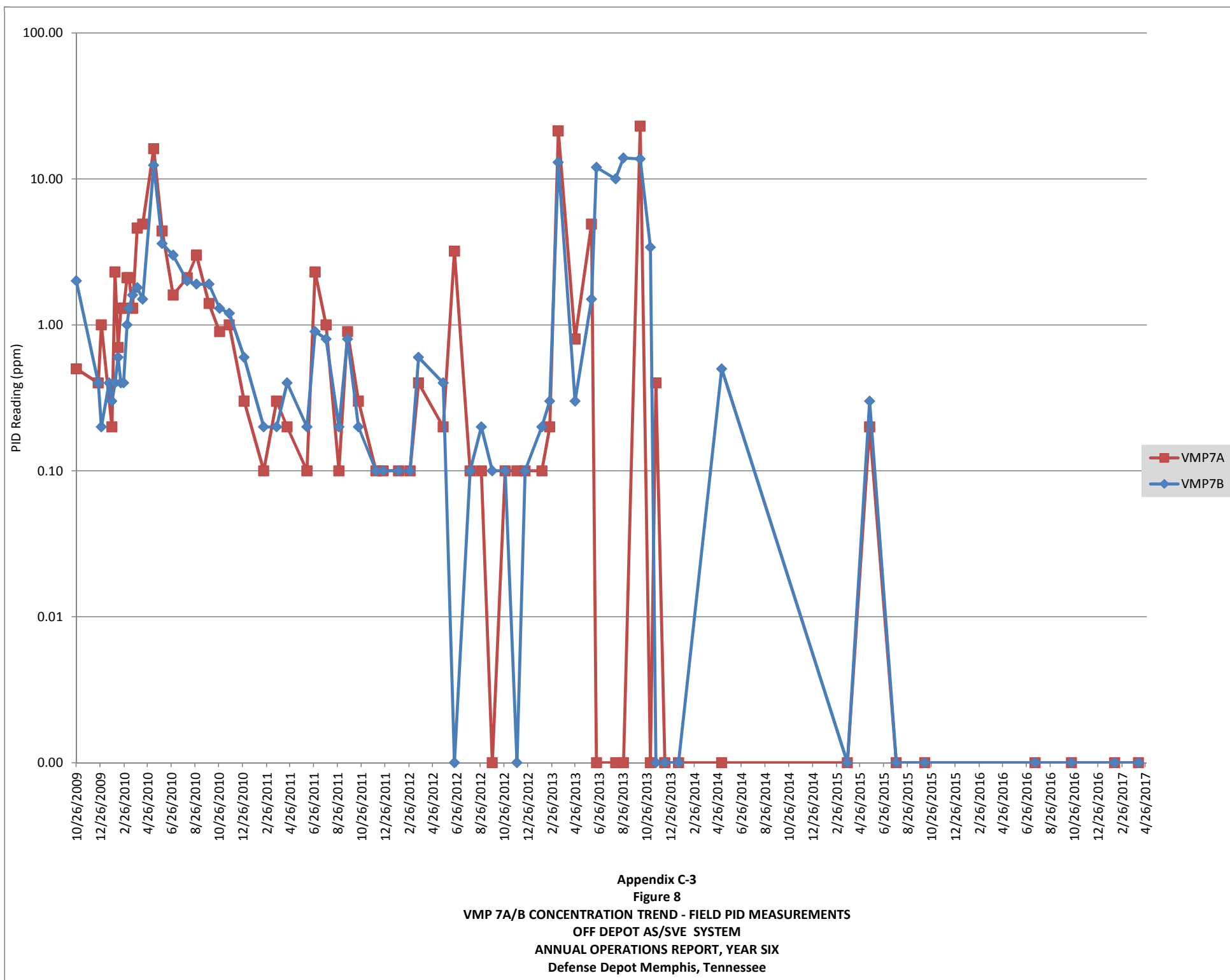
Appendix C-3
Figure 5
VMP 4A/B CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee

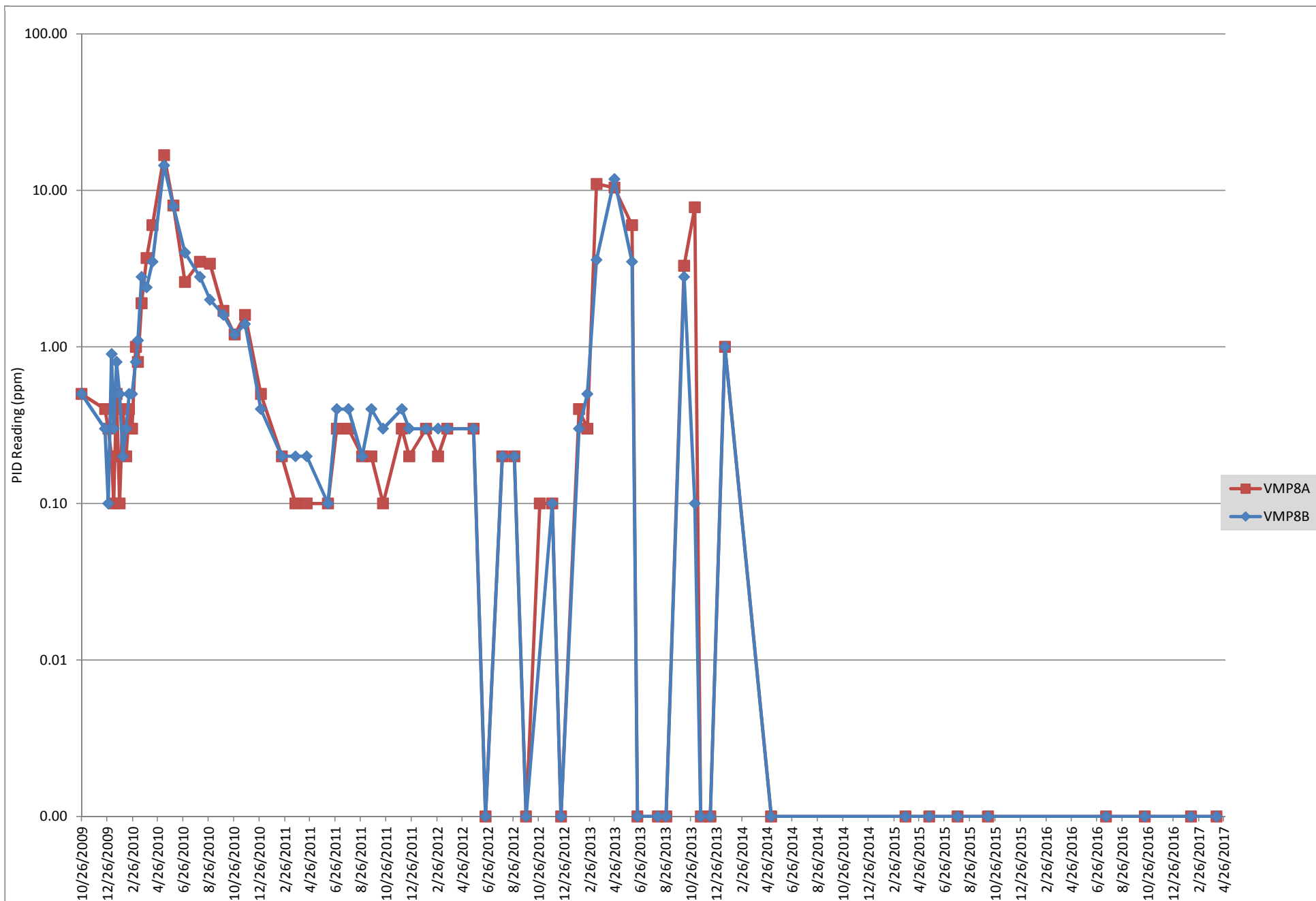


Appendix C-3
Figure 6
VMP 5A/B CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee

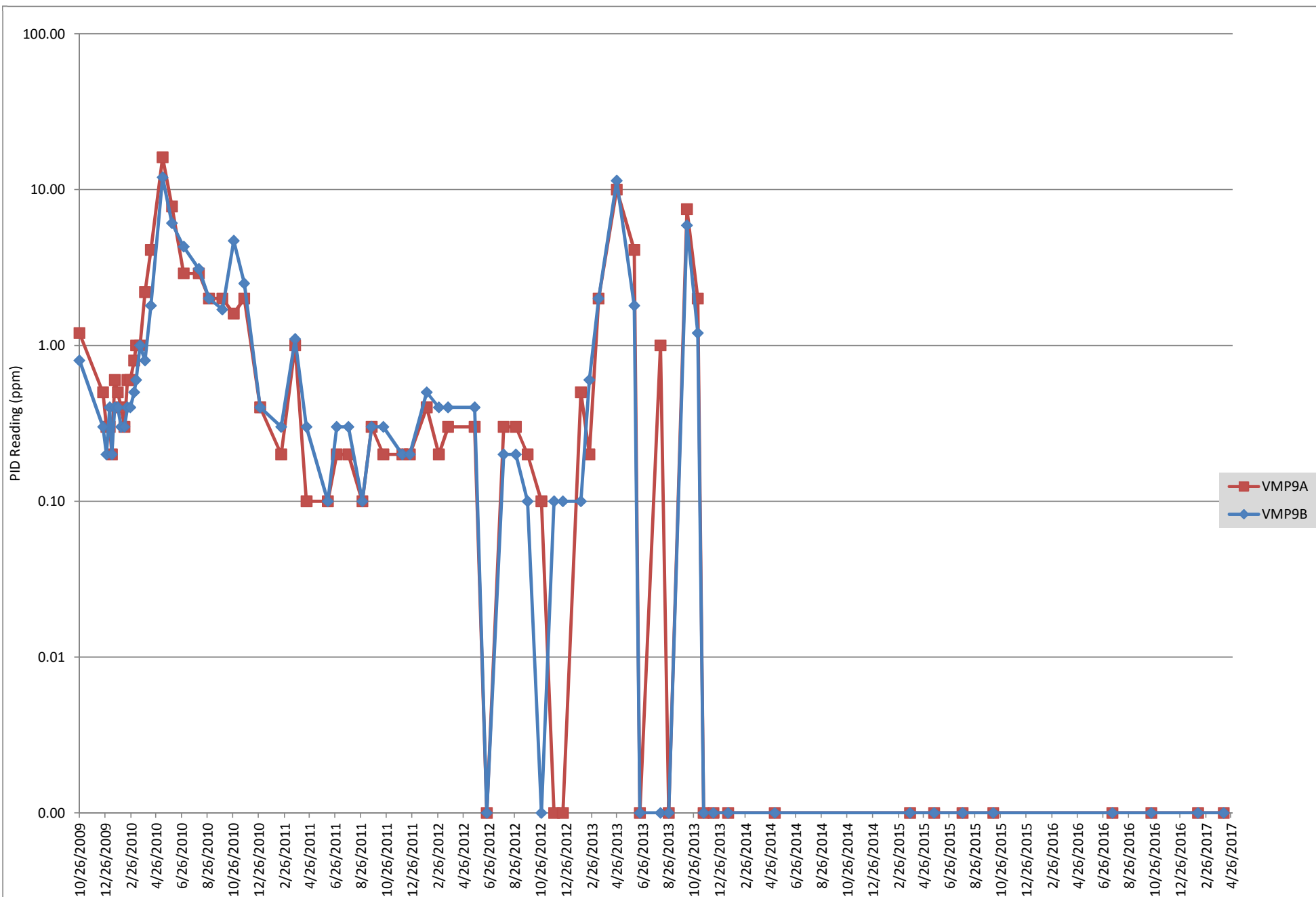


Appendix C-3
Figure 7
VMP 6A/B CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee

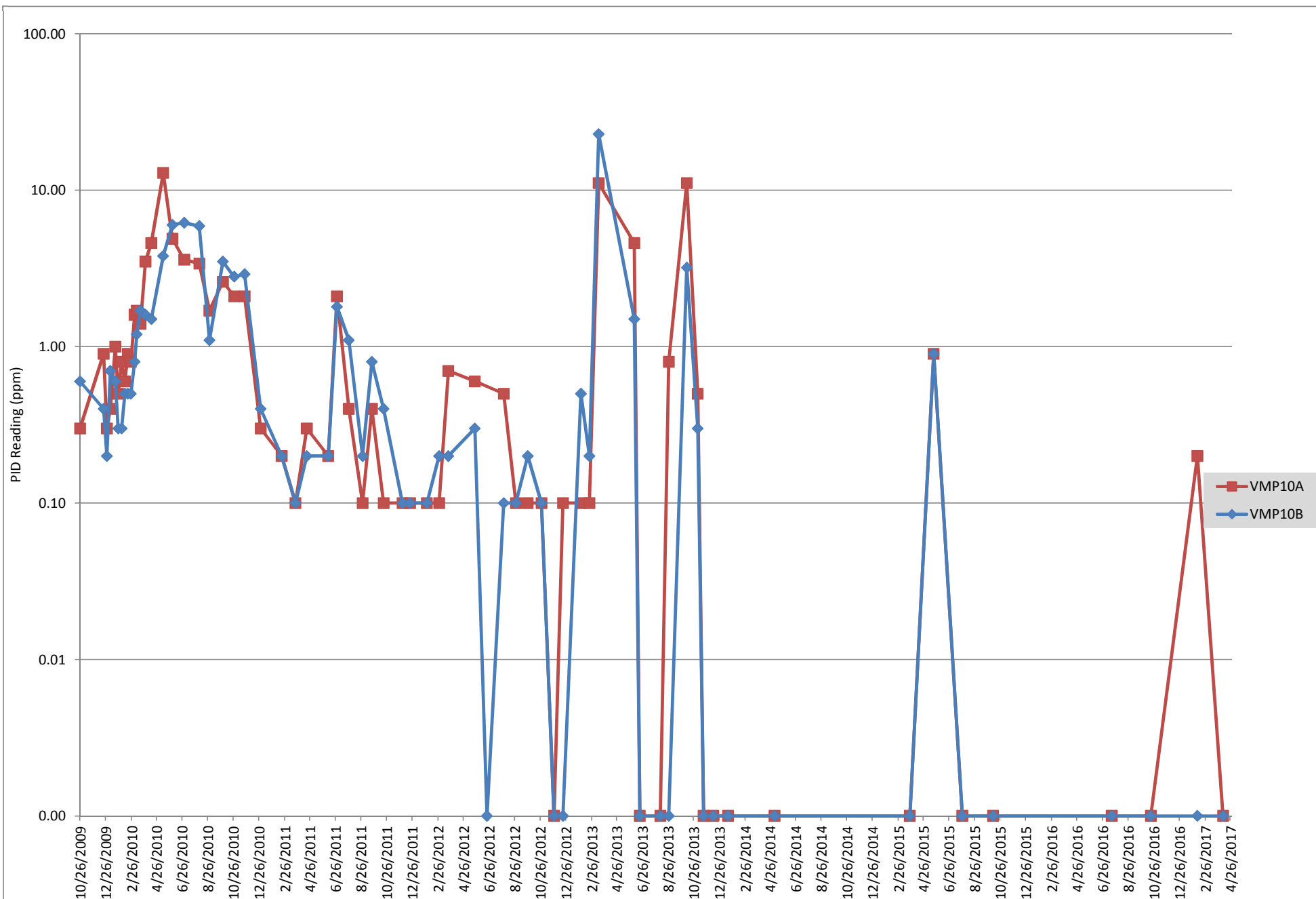




Appendix C-3
Figure 9
VMP 8A/B CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee



Appendix C-3
Figure 10
VMP 9A/B CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee



Appendix C-3
Figure 11
VMP 10A/B CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee

A decorative graphic on the left side of the page consists of several overlapping rectangles. A large red rectangle is positioned in the middle-left. To its right, a dark gray rectangle is at the top, and a light gray rectangle is at the bottom. A black rectangle is located at the bottom right, partially overlapping the light gray one.

D

Appendix D.

Results of Laboratory
Analyses

TABLE D-1
ANALYTICAL RESULTS - SVE EFFLUENT
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Defense Depot Memphis, Tennessee

Sample ID	ODSVE-EFF-Y6Q1	ODSVE-EFF-Y6Q2	ODSVE-DUP1-Y6Q2	ODSVE-EFF-Y6Q3	ODSVE-EFF-Y6Q4
Event	ODSVE-3Q2016	ODSVE-4Q2016	ODSVE-4Q2016	ODSVE1Q17	ODSVE2Q17
Date	19-Jul-16	9-Nov-16	9-Nov-16	8-Feb-17	11-Apr-17
Lab ID	P1603665-001	P1605349-001	P1605349-002	P1700718-001	P1701803-001
Analyte					
1,1,1-Trichloroethane (TCA)	0.54	0.49	0.5	0.74	0.51
1,1,2,2-Tetrachloroethane	0.35	0.6	0.64	0.96	0.53
1,1,2-Trichloroethane	0.12 U	0.11 U	0.11 U	0.12 U	0.12 U
1,1,2-Trichlorotrifluoroethane	6.9	4.2	4.2	4.1	4.1
1,1-Dichloroethane (1,1-DCA)	0.77	0.8	0.81	0.7	0.59
1,1-Dichloroethene (1,1-DCE)	1.5	1.4	1.4	1.4	1.2
1,2,4-Trichlorobenzene	0.086 U	0.082 U	0.083 U	0.086 U	0.086 U
1,2,4-Trimethylbenzene	0.13 U	0.12 U	0.13 U	0.13 U	0.13 U
1,2-Dibromo 3-Chloropropane	0.066 U	0.063 U	0.064 U	0.066 U	0.066 U
1,2-Dibromoethane	0.083 U	0.079 U	0.08 U	0.083 U	0.083 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	0.091 U	0.087 U	0.088 U	0.091 U	0.091 U
1,2-Dichlorobenzene	0.11 U	0.1 U	0.1 U	0.11 U	0.11 U
1,2-Dichloroethane	0.16 U	0.15 U	0.15 U	0.16 U	0.16 U
1,2-Dichloropropane	0.14 U	0.13 U	0.13 U	0.14 U	0.14 U
1,3,5-Trimethylbenzene	0.13 U	0.12 U	0.13 U	0.13 U	0.13 U
1,3-Butadiene	0.29 U	0.27 U	0.28 U	0.29 U	0.29 U
1,3-Dichlorobenzene	0.11 U	0.1 U	0.1 U	0.11 U	0.11 U
1,4-Dichlorobenzene	0.11 U	0.1 U	0.1 U	0.11 U	0.11 U
1,4-Dioxane	0.18 U	0.17 U	0.17 U	0.18 U	0.18 U
2-Butanone (MEK)	0.14 J	0.72 J	0.85 J	0.76 J	0.15 J
2-Hexanone	0.16 U	0.11 J	0.11 J	0.16 U	0.16 U
2-Propanol (Isopropyl Alcohol)	2.6 U	2.5 U	2.5 U	2.6 U	2.6 U
3-Chloro-1-propene (Allyl Chloride)	0.2 U	0.19 U	0.2 U	0.2 U	0.2 U
4-Ethyltoluene	0.13 U	0.12 U	0.13 U	0.13 U	0.13 U
4-Methyl-2-pentanone	0.16 U	0.15 U	0.15 U	0.16 U	0.16 U
Acetone	2.7 U	4.9	5	3.3	0.57 J
Acetonitrile	0.38 U	0.32 J	1.9 J	0.38 U	0.38 U
Acrolein	1.1 U	0.29 J	0.48 J	0.15 J	1.1 U
Acrylonitrile	0.29 U	0.28 U	0.28 U	0.29 U	0.29 U
alpha-Pinene	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
Benzene	0.072 J	0.29 J	0.085 J	0.098 J	0.093 J
Benzyl Chloride	0.12 U	0.12 U	0.032 J	0.12 U	0.12 U
Bromodichloromethane	0.033 J	0.27 J	0.092 UJ	0.15	0.2
Bromoform	0.061 U	0.27 J	0.06 UJ	0.061 U	0.061 U
Bromomethane	0.16 U	0.16 J	0.16 UJ	0.16 U	0.16 U
Carbon Disulfide	2 U	1.9 UJ	2.9 J+	2.2 J+	0.12 J
Carbon Tetrachloride	0.62	0.41	0.4	0.52	0.46
Chlorobenzene	0.14 U	0.13 U	0.13 U	0.14 U	0.14 U
Chloroethane	0.24 U	0.23 U	0.23 U	0.24 U	0.24 U
Chloroform	4.5	6	5.9	6.3	5.4
Chloromethane	0.31 U	0.33 J	0.3 UJ	0.31 U	0.31 U
cis-1,2-Dichloroethene	17	25	26	29	26
cis-1,3-Dichloropropene	0.14 U	0.13 U	0.14 U	0.14 U	0.14 U
Cyclohexane	0.14 J	1.1	1.1	0.14 J	0.4
Dibromochloromethane	0.075 U	0.15 J	0.072 UJ	0.075 U	0.075 U
Dichlorodifluoromethane (CFC 12)	0.82	1.2	1.2	2.6	2.3
Dichloromethane (Methylene Chloride)	0.18 U	0.089 J	0.18 U	0.079 J	0.18 U
d-Limonene	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
Ethanol	3.4 U	1.1 J	0.93 J	3.4 U	0.84 J
Ethyl Acetate	1.1	0.34 U	0.34 U	0.35 U	0.35 U
Ethylbenzene	0.15 U	0.14 U	0.14 U	0.15 U	0.15 U
Hexachlorobutadiene	0.06 U	0.057 U	0.058 U	0.06 U	0.06 U
Isopropylbenzene (Cumene)	0.13 U	0.12 U	0.13 U	0.13 U	0.13 U
m,p-Xylenes	0.29 U	0.1 J	0.28 U	0.29 U	0.29 U
Methyl Methacrylate	0.31 U	0.3 U	0.3 U	0.31 U	0.31 U
Methyl tert-Butyl Ether	0.18 U	0.17 U	0.17 U	0.18 U	0.18 U
Naphthalene	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
n-Butyl Acetate	0.13 U	0.075 J	0.13 U	0.13 U	0.13 U
n-Heptane	0.16 U	0.12 J	0.094 J	0.16 U	0.21
n-Hexane	0.058 J	1.3	1.2	0.097 J	0.56
n-Nonane	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
n-Octane	0.14 U	0.13 U	0.13 U	0.14 U	0.14 U
n-Propylbenzene	0.13 U	0.12 U	0.13 U	0.13 U	0.13 U
o-Xylene	0.15 U	0.14 U	0.14 U	0.15 U	0.15 U
Propene	0.37 U	0.33 J	0.48	0.44	0.13 J
Styrene	0.15 U	0.14 U	0.14 U	0.15 U	0.15 U
Tetrachloroethene	3.7	2.9	3	3.1	3.3
Tetrahydrofuran (THF)	0.22 U	0.54 J	0.21 UJ	0.22 U	0.22 U
Toluene	0.1 J	0.22	0.21	0.12 J	0.17 U
trans-1,2-Dichloroethene	0.58	0.52	0.56	0.45	0.37
trans-1,3-Dichloropropene	0.14 U	0.13 U	0.14 U	0.14 U	0.14 U
Trichloroethene (TCE)	36	30	30	23	31
Trichlorofluoromethane (CFC 11)	0.33	0.37	0.36	0.43 J+	0.34
Vinyl Acetate	1.8 U	1.7 U	1.7 U	0.62 J+	1.8 U
Vinyl Chloride	0.1 J	0.097 J	0.093 J	0.11 J	0.11 J

Notes:

ppbv: part per billion volume

RL: Reporting Limit

:- Not Listed

DQE Flags

U: Not detected above RL

UJ: Not detected, RL estimated

J: Concentration estimated

J+: Concentration estimated, biased high

A decorative graphic on the left side of the page consists of a large red rectangle, a smaller grey rectangle above it, a larger grey rectangle below it, and a black rectangle at the bottom right.

E

Appendix E.

Laboratory Analytical Reports



2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

LABORATORY REPORT

August 22, 2016

Thomas Holmes
HDR Environmental, Operations & Construction, Inc.
9781 South Meridian Blvd., Suite 400
Englewood, CO 80112

RE: DDMT SVE / 10031560-282846-005

Dear Thomas:

Enclosed are the results of the sample submitted to our laboratory on July 22, 2016. For your reference, this analysis has been assigned our service request number P1603665.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

Kate Kaneko
By Kate Kaneko at 11:38 am, 08/22/16

Kate Aguilera
Project Manager



2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

Client: HDR Environmental, Operations & Construction, Inc. Service Request No: P1603665
Project: DDMT SVE / 10031560, 282846-005

CASE NARRATIVE

The sample was received intact under chain of custody on July 22, 2016 and was stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the sample at the time of sample receipt.

Volatile Organic Compound Analysis

The sample was analyzed for volatile organic compounds in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. This procedure is described in laboratory SOP VOA-TO15. The analytical system was comprised of a gas chromatograph / mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation, however it is not part of the AIHA-LAP, LLC accreditation. Any analytes flagged with an X are not included on the NELAP or DoD-ELAP accreditation.

The container was cleaned, prior to sampling, down to the method reporting limit (MRL) reported for this project. Please note, projects which require reporting below the MRL could have results between the MRL and method detection limit (MDL) that are biased high.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.



2655 Park Center Dr., Suite A
 Simi Valley, CA 93065
 T: +1 805 526 7161
 F: +1 805 526 7270
www.alsglobal.com

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
AIHA-LAP, LLC	http://www.aihaaccreditedlabs.org	101661
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0694
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2014025
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	977273
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-003
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413- 16-7
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA01627201 6-6
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: HDR Environmental, Operations & Construction, Inc.
Project ID: DDMT SVE / 10031560-282846-005

Service Request: P1603665

Date Received: 7/22/2016
Time Received: 10:00

TO-15 - VOC Cans

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)
ODSVE-EFF-Y6Q1	P1603665-001	Air	7/19/2016	10:30	SC00283	-0.13	3.84

X



Air - Chain of Custody Record & Analytical Service Request

Page 1 of 1

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10-Day-Standard

ALS Project No. PI003665

Company Name & Address (Reporting Information) HDR 9781 S. Meridian Blvd Ste 400 Englewood, CO 80112				Project Name DDMT SVE				ALS Contact:		Analysis Method	Comments e.g. Actual Preservative or specific instructions	
Project Manager Tom Holmes				Project Number 10031560, 292946-005				TO-15				
Phone 404-295-3279				P.O. # / Billing Information								
Fax												
Email Address for Result Reporting Thomas.Holmes@HDRinc.com				Sampler (Print & Sign) Justin Bills <i>[Signature]</i>								
Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Canister ID (Bar code # - AC, SC, etc.)	Flow Controller ID (Bar code # - FC #)	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	Sample Volume				
ODSVE-EFF-Y6Q1		7/19/16	1030	SC00283	NA	-29.53	0.00	6L				
<i>[Large handwritten signature across the grid]</i>												
Report Tier Levels - please select												
Tier I - Results (Default in not specified) _____				Tier III (Results + QC & Calibration Summaries) _____				EDD required YES / No				Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT
Tier II (Results + QC Summaries) _____				Tier IV (Date Validation Package) 10% Surcharge _____				Type: _____ Units: _____				
Relinquished by: (Signature) <i>[Signature]</i>				Date: 7/19/16		Time: 1140		Received by: (Signature) <i>[Signature]</i>		Date: 7/22/16		
Relinquished by: (Signature)				Date:		Time:		Received by: (Signature)		Date: Time:		
											Cooler / Blank Temperature _____ °C	

Client: <u>HDR Environmental, Operations & Construction, Inc.</u>	Work order: <u>P1603665</u>
Project: <u>DDMT SVE / 10031560-282846-005</u>	
Sample(s) received on: <u>7/22/2016</u>	Date opened: <u>7/22/2016</u> by: <u>KKELPE</u>

		Yes	No	N/A
1	Were sample containers properly marked with client sample ID?	☒	☐	☐
2	Did sample containers arrive in good condition?	☒	☐	☐
3	Were chain-of-custody papers used and filled out?	☒	☐	☐
4	Did sample container labels and/or tags agree with custody papers?	☒	☐	☐
5	Was sample volume received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper temperature (thermal preservation) of cooler at receipt adhered to?	☐	☐	☒
8	Were custody seals on outside of cooler/Box/Container?	☒	☐	☐
	Location of seal(s)? <u>sealing box</u> Sealing Lid?	☒	☐	☐
	Were signature and date included?	☒	☐	☐
	Were seals intact?	☒	☐	☐
9	Do containers have appropriate preservation , according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are pH preserved?	☐	☐	☒
	Were VOA vials checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?	☐	☐	☒
10	Tubes: Are the tubes capped and intact?	☐	☐	☒
11	Badges: Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

[illegible]

Explain any discrepancies: (include lab sample ID numbers):

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: ODSVE-EFF-Y6Q1

Client Project ID: DDMT SVE / 10031560, 282846-005

ALS Project ID: P1603665

ALS Sample ID: P1603665-001

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Analyst: Wida Ang

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC00283

Date Collected: 7/19/16

Date Received: 7/22/16

Date Analyzed: 7/27/16

Volume(s) Analyzed: 1.00 Liter(s)

0.10 Liter(s)

Initial Pressure (psig): -0.13

Final Pressure (psig): 3.84

Canister Dilution Factor: 1.27

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	0.30	0.37	0.30	0.10	U
75-71-8	Dichlorodifluoromethane (CFC 12)	0.82	0.13	0.10	0.044	
74-87-3	Chloromethane	0.24	0.31	0.24	0.092	U
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	0.075	0.091	0.075	0.035	U
75-01-4	Vinyl Chloride	0.10	0.25	0.20	0.084	J
106-99-0	1,3-Butadiene	0.24	0.29	0.24	0.13	U
74-83-9	Bromomethane	0.13	0.16	0.13	0.062	U
75-00-3	Chloroethane	0.19	0.24	0.19	0.082	U
64-17-5	Ethanol	1.3	3.4	1.3	0.54	U
75-05-8	Acetonitrile	0.31	0.38	0.31	0.14	U
107-02-8	Acrolein	0.24	1.1	0.24	0.094	U
67-64-1	Acetone	1.1	2.7	1.1	0.41	U
75-69-4	Trichlorofluoromethane	0.33	0.11	0.090	0.038	
67-63-0	2-Propanol (Isopropyl Alcohol)	0.43	2.6	0.43	0.22	U
107-13-1	Acrylonitrile	0.24	0.29	0.24	0.10	U
75-35-4	1,1-Dichloroethene	1.5	0.16	0.14	0.054	
75-09-2	Methylene Chloride	0.16	0.18	0.16	0.062	U
107-05-1	3-Chloro-1-propene (Allyl Chloride)	0.17	0.20	0.17	0.065	U
76-13-1	Trichlorotrifluoroethane	6.9	0.083	0.071	0.028	
75-15-0	Carbon Disulfide	0.16	2.0	0.16	0.061	U
156-60-5	trans-1,2-Dichloroethene	0.58	0.16	0.13	0.061	
75-34-3	1,1-Dichloroethane	0.77	0.16	0.13	0.050	
1634-04-4	Methyl tert-Butyl Ether	0.15	0.18	0.15	0.060	U
108-05-4	Vinyl Acetate	0.72	1.8	0.72	0.23	U
78-93-3	2-Butanone (MEK)	0.14	2.2	0.19	0.090	J

U = Undetected at the limit of detection: The associated data value is the limit of detection, adjusted by any dilution factor used in the analysis.

LOQ = Limit of Quantitation - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the LOQ but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 2 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: ODSVE-EFF-Y6Q1

Client Project ID: DDMT SVE / 10031560, 282846-005

ALS Project ID: P1603665

ALS Sample ID: P1603665-001

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Analyst: Wida Ang

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC00283

Date Collected: 7/19/16

Date Received: 7/22/16

Date Analyzed: 7/27/16

Volume(s) Analyzed: 1.00 Liter(s)

0.10 Liter(s)

Initial Pressure (psig): -0.13 Final Pressure (psig): 3.84

Canister Dilution Factor: 1.27

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	17	0.16	0.14	0.051	
141-78-6	Ethyl Acetate	1.1	0.35	0.30	0.12	
110-54-3	n-Hexane	0.058	0.18	0.15	0.054	J
67-66-3	Chloroform	4.5	0.13	0.11	0.044	
109-99-9	Tetrahydrofuran (THF)	0.18	0.22	0.18	0.086	U
107-06-2	1,2-Dichloroethane	0.13	0.16	0.13	0.050	U
71-55-6	1,1,1-Trichloroethane	0.54	0.12	0.095	0.040	
71-43-2	Benzene	0.072	0.20	0.17	0.064	J
56-23-5	Carbon Tetrachloride	0.62	0.10	0.087	0.030	
110-82-7	Cyclohexane	0.14	0.37	0.31	0.11	J
78-87-5	1,2-Dichloropropane	0.12	0.14	0.12	0.044	U
75-27-4	Bromodichloromethane	0.033	0.095	0.082	0.028	J
79-01-6	Trichloroethene	36	1.2	0.97	0.33	D
123-91-1	1,4-Dioxane	0.15	0.18	0.15	0.056	U
80-62-6	Methyl Methacrylate	0.26	0.31	0.26	0.096	U
142-82-5	n-Heptane	0.13	0.16	0.13	0.053	U
10061-01-5	cis-1,3-Dichloropropene	0.13	0.14	0.13	0.039	U
108-10-1	4-Methyl-2-pentanone	0.13	0.16	0.13	0.050	U
10061-02-6	trans-1,3-Dichloropropene	0.12	0.14	0.12	0.045	U
79-00-5	1,1,2-Trichloroethane	0.098	0.12	0.098	0.037	U
108-88-3	Toluene	0.10	0.17	0.14	0.057	J
591-78-6	2-Hexanone	0.14	0.16	0.14	0.050	U
124-48-1	Dibromochloromethane	0.066	0.075	0.066	0.024	U
106-93-4	1,2-Dibromoethane	0.071	0.083	0.071	0.026	U
123-86-4	n-Butyl Acetate	0.12	0.13	0.12	0.043	U

U = Undetected at the limit of detection: The associated data value is the limit of detection, adjusted by any dilution factor used in the analysis.

LOQ = Limit of Quantitation - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the LOQ but greater than or equal to the MDL.

D = The reported result is from a dilution.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 3 of 3

Client: HDR Environmental, Operations & Construction, Inc.
Client Sample ID: ODSVE-EFF-Y6Q1
Client Project ID: DDMT SVE / 10031560, 282846-005

ALS Project ID: P1603665
 ALS Sample ID: P1603665-001

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8
Analyst: Wida Ang
Sampling Media: 6.0 L Summa Canister
Test Notes:
Container ID: SC00283

Date Collected: 7/19/16
Date Received: 7/22/16
Date Analyzed: 7/27/16
Volume(s) Analyzed: 1.00 Liter(s)
 0.10 Liter(s)

Initial Pressure (psig): -0.13 Final Pressure (psig): 3.84

Canister Dilution Factor: 1.27

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	0.11	0.14	0.11	0.049	U
127-18-4	Tetrachloroethene	3.7	0.094	0.075	0.026	
108-90-7	Chlorobenzene	0.12	0.14	0.12	0.044	U
100-41-4	Ethylbenzene	0.12	0.15	0.12	0.047	U
179601-23-1	m,p-Xylenes	0.24	0.29	0.24	0.088	U
75-25-2	Bromoform	0.053	0.061	0.053	0.018	U
100-42-5	Styrene	0.13	0.15	0.13	0.045	U
95-47-6	o-Xylene	0.12	0.15	0.12	0.044	U
111-84-2	n-Nonane	0.097	0.12	0.097	0.036	U
79-34-5	1,1,2,2-Tetrachloroethane	0.35	0.093	0.074	0.028	
98-82-8	Cumene	0.10	0.13	0.10	0.039	U
80-56-8	alpha-Pinene	0.093	0.11	0.093	0.032	U
103-65-1	n-Propylbenzene	0.10	0.13	0.10	0.041	U
622-96-8	4-Ethyltoluene	0.11	0.13	0.11	0.041	U
108-67-8	1,3,5-Trimethylbenzene	0.11	0.13	0.11	0.041	U
95-63-6	1,2,4-Trimethylbenzene	0.11	0.13	0.11	0.039	U
100-44-7	Benzyl Chloride	0.11	0.12	0.11	0.027	U
541-73-1	1,3-Dichlorobenzene	0.091	0.11	0.091	0.032	U
106-46-7	1,4-Dichlorobenzene	0.089	0.11	0.089	0.030	U
95-50-1	1,2-Dichlorobenzene	0.091	0.11	0.091	0.032	U
5989-27-5	d-Limonene	0.096	0.11	0.096	0.032	U
96-12-8	1,2-Dibromo-3-chloropropane	0.055	0.066	0.055	0.013	U
120-82-1	1,2,4-Trichlorobenzene	0.072	0.086	0.072	0.027	U
91-20-3	Naphthalene	0.097	0.12	0.097	0.044	U
87-68-3	Hexachlorobutadiene	0.051	0.060	0.051	0.017	U

U = Undetected at the limit of detection: The associated data value is the limit of detection, adjusted by any dilution factor used in the analysis.
 LOQ = Limit of Quantitation - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Method Blank

Client Project ID: DDMT SVE / 10031560, 282846-005

ALS Project ID: P1603665

ALS Sample ID: P160727-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Analyst: Wida Ang

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 7/27/16

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	0.24	0.29	0.24	0.081	U
75-71-8	Dichlorodifluoromethane (CFC 12)	0.081	0.10	0.081	0.034	U
74-87-3	Chloromethane	0.19	0.24	0.19	0.073	U
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	0.059	0.072	0.059	0.027	U
75-01-4	Vinyl Chloride	0.16	0.20	0.16	0.067	U
106-99-0	1,3-Butadiene	0.19	0.23	0.19	0.099	U
74-83-9	Bromomethane	0.10	0.13	0.10	0.049	U
75-00-3	Chloroethane	0.15	0.19	0.15	0.064	U
64-17-5	Ethanol	1.1	2.7	1.1	0.42	U
75-05-8	Acetonitrile	0.24	0.30	0.24	0.11	U
107-02-8	Acrolein	0.19	0.87	0.19	0.074	U
67-64-1	Acetone	0.88	2.1	0.88	0.32	U
75-69-4	Trichlorofluoromethane	0.071	0.089	0.071	0.030	U
67-63-0	2-Propanol (Isopropyl Alcohol)	0.34	2.0	0.34	0.17	U
107-13-1	Acrylonitrile	0.19	0.23	0.19	0.078	U
75-35-4	1,1-Dichloroethene	0.11	0.13	0.11	0.043	U
75-09-2	Methylene Chloride	0.12	0.14	0.12	0.049	U
107-05-1	3-Chloro-1-propene (Allyl Chloride)	0.14	0.16	0.14	0.051	U
76-13-1	Trichlorotrifluoroethane	0.056	0.065	0.056	0.022	U
75-15-0	Carbon Disulfide	0.13	1.6	0.13	0.048	U
156-60-5	trans-1,2-Dichloroethene	0.11	0.13	0.11	0.048	U
75-34-3	1,1-Dichloroethane	0.10	0.12	0.10	0.040	U
1634-04-4	Methyl tert-Butyl Ether	0.12	0.14	0.12	0.047	U
108-05-4	Vinyl Acetate	0.57	1.4	0.57	0.18	U
78-93-3	2-Butanone (MEK)	0.15	1.7	0.15	0.071	U

U = Undetected at the limit of detection: The associated data value is the limit of detection, adjusted by any dilution factor used in the analysis.

LOQ = Limit of Quantitation - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 2 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Method Blank

Client Project ID: DDMT SVE / 10031560, 282846-005

ALS Project ID: P1603665

ALS Sample ID: P160727-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Analyst: Wida Ang

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 7/27/16

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	0.11	0.13	0.11	0.040	U
141-78-6	Ethyl Acetate	0.24	0.28	0.24	0.097	U
110-54-3	n-Hexane	0.12	0.14	0.12	0.043	U
67-66-3	Chloroform	0.088	0.10	0.088	0.035	U
109-99-9	Tetrahydrofuran (THF)	0.14	0.17	0.14	0.068	U
107-06-2	1,2-Dichloroethane	0.10	0.12	0.10	0.040	U
71-55-6	1,1,1-Trichloroethane	0.075	0.092	0.075	0.031	U
71-43-2	Benzene	0.14	0.16	0.14	0.050	U
56-23-5	Carbon Tetrachloride	0.068	0.080	0.068	0.024	U
110-82-7	Cyclohexane	0.24	0.29	0.24	0.084	U
78-87-5	1,2-Dichloropropane	0.091	0.11	0.091	0.035	U
75-27-4	Bromodichloromethane	0.064	0.075	0.064	0.022	U
79-01-6	Trichloroethene	0.076	0.093	0.076	0.026	U
123-91-1	1,4-Dioxane	0.12	0.14	0.12	0.044	U
80-62-6	Methyl Methacrylate	0.20	0.24	0.20	0.076	U
142-82-5	n-Heptane	0.10	0.12	0.10	0.041	U
10061-01-5	cis-1,3-Dichloropropene	0.099	0.11	0.099	0.031	U
108-10-1	4-Methyl-2-pentanone	0.10	0.12	0.10	0.039	U
10061-02-6	trans-1,3-Dichloropropene	0.095	0.11	0.095	0.035	U
79-00-5	1,1,2-Trichloroethane	0.077	0.092	0.077	0.029	U
108-88-3	Toluene	0.11	0.13	0.11	0.045	U
591-78-6	2-Hexanone	0.11	0.12	0.11	0.039	U
124-48-1	Dibromochloromethane	0.052	0.059	0.052	0.019	U
106-93-4	1,2-Dibromoethane	0.056	0.065	0.056	0.021	U
123-86-4	n-Butyl Acetate	0.093	0.11	0.093	0.034	U

U = Undetected at the limit of detection: The associated data value is the limit of detection, adjusted by any dilution factor used in the analysis.

LOQ = Limit of Quantitation - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 3 of 3

Client: HDR Environmental, Operations & Construction, Inc.
Client Sample ID: Method Blank
Client Project ID: DDMT SVE / 10031560, 282846-005

ALS Project ID: P1603665
 ALS Sample ID: P160727-MB

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8
Analyst: Wida Ang
Sampling Media: 6.0 L Summa Canister
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 7/27/16
Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	0.088	0.11	0.088	0.039	U
127-18-4	Tetrachloroethene	0.059	0.074	0.059	0.021	U
108-90-7	Chlorobenzene	0.093	0.11	0.093	0.035	U
100-41-4	Ethylbenzene	0.097	0.12	0.097	0.037	U
179601-23-1	m,p-Xylenes	0.19	0.23	0.19	0.069	U
75-25-2	Bromoform	0.042	0.048	0.042	0.015	U
100-42-5	Styrene	0.10	0.12	0.10	0.035	U
95-47-6	o-Xylene	0.094	0.12	0.094	0.035	U
111-84-2	n-Nonane	0.076	0.095	0.076	0.029	U
79-34-5	1,1,2,2-Tetrachloroethane	0.058	0.073	0.058	0.022	U
98-82-8	Cumene	0.081	0.10	0.081	0.031	U
80-56-8	alpha-Pinene	0.074	0.090	0.074	0.025	U
103-65-1	n-Propylbenzene	0.081	0.10	0.081	0.033	U
622-96-8	4-Ethyltoluene	0.085	0.10	0.085	0.033	U
108-67-8	1,3,5-Trimethylbenzene	0.085	0.10	0.085	0.033	U
95-63-6	1,2,4-Trimethylbenzene	0.085	0.10	0.085	0.031	U
100-44-7	Benzyl Chloride	0.083	0.097	0.083	0.021	U
541-73-1	1,3-Dichlorobenzene	0.072	0.083	0.072	0.025	U
106-46-7	1,4-Dichlorobenzene	0.070	0.083	0.070	0.023	U
95-50-1	1,2-Dichlorobenzene	0.072	0.083	0.072	0.025	U
5989-27-5	d-Limonene	0.075	0.090	0.075	0.025	U
96-12-8	1,2-Dibromo-3-chloropropane	0.043	0.052	0.043	0.010	U
120-82-1	1,2,4-Trichlorobenzene	0.057	0.067	0.057	0.022	U
91-20-3	Naphthalene	0.076	0.095	0.076	0.034	U
87-68-3	Hexachlorobutadiene	0.040	0.047	0.040	0.013	U

U = Undetected at the limit of detection: The associated data value is the limit of detection, adjusted by any dilution factor used in the analysis.
 LOQ = Limit of Quantitation - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

SURROGATE SPIKE RECOVERY RESULTS

Page 1 of 1

Client: HDR Environmental, Operations & Construction, Inc.
Client Project ID: DDMT SVE / 10031560, 282846-005

ALS Project ID: P1603665

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8
Analyst: Wida Ang
Sampling Media: 6.0 L Summa Canister(s)
Test Notes:

Date(s) Collected: 7/19/16

Date(s) Received: 7/22/16

Date(s) Analyzed: 7/27/16

Client Sample ID	ALS Sample ID	1,2-Dichloroethane-d4	Toluene-d8	Bromofluorobenzene	Acceptance Limits	Data Qualifier
		Percent Recovered	Percent Recovered	Percent Recovered		
Method Blank	P160727-MB	101	98	104	70-130	
Lab Control Sample	P160727-LCS	105	94	105	70-130	
ODSVE-EFF-Y6Q1	P1603665-001	99	98	106	70-130	

Surrogate percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly from the on-column percent recovery.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Lab Control Sample

Client Project ID: DDMT SVE / 10031560, 282846-005

ALS Project ID: P1603665

ALS Sample ID: P160727-LCS

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Analyst: Wida Ang

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 7/27/16

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	DOD Acceptance Limits	Data Qualifier
115-07-1	Propene	114	104	91	57-136	
75-71-8	Dichlorodifluoromethane (CFC 12)	38.0	36.6	96	59-128	
74-87-3	Chloromethane	96.9	102	105	59-132	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	29.2	25.8	88	63-121	
75-01-4	Vinyl Chloride	78.3	74.3	95	64-127	
106-99-0	1,3-Butadiene	93.2	89.5	96	66-134	
74-83-9	Bromomethane	52.0	50.7	98	63-134	
75-00-3	Chloroethane	75.8	72.6	96	63-127	
64-17-5	Ethanol	530	529	100	59-125	
75-05-8	Acetonitrile	126	119	94	63-132	
107-02-8	Acrolein	93.4	89.0	95	62-126	
67-64-1	Acetone	454	405	89	58-128	
75-69-4	Trichlorofluoromethane	38.5	32.6	85	62-126	
67-63-0	2-Propanol (Isopropyl Alcohol)	170	178	105	52-125	
107-13-1	Acrylonitrile	97.7	98.8	101	71-137	
75-35-4	1,1-Dichloroethene	54.5	54.5	100	61-133	
75-09-2	Methylene Chloride	63.9	62.8	98	62-115	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	69.7	76.3	109	71-131	
76-13-1	Trichlorotrifluoroethane	28.7	26.7	93	66-126	
75-15-0	Carbon Disulfide	67.5	52.8	78	57-134	
156-60-5	trans-1,2-Dichloroethene	53.0	53.8	102	67-124	
75-34-3	1,1-Dichloroethane	52.4	49.9	95	68-126	
1634-04-4	Methyl tert-Butyl Ether	59.9	56.7	95	66-126	
108-05-4	Vinyl Acetate	295	318	108	56-139	
78-93-3	2-Butanone (MEK)	74.6	77.0	103	67-130	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 2 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Lab Control Sample

Client Project ID: DDMT SVE / 10031560, 282846-005

ALS Project ID: P1603665

ALS Sample ID: P160727-LCS

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Analyst: Wida Ang

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 7/27/16

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	DOD Acceptance Limits	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	55.0	54.5	99	70-121	
141-78-6	Ethyl Acetate	119	118	99	65-128	
110-54-3	n-Hexane	60.2	48.9	81	63-120	
67-66-3	Chloroform	45.9	43.1	94	68-123	
109-99-9	Tetrahydrofuran (THF)	74.6	74.3	100	64-123	
107-06-2	1,2-Dichloroethane	52.9	52.8	100	65-128	
71-55-6	1,1,1-Trichloroethane	38.5	37.8	98	68-125	
71-43-2	Benzene	70.8	62.4	88	69-119	
56-23-5	Carbon Tetrachloride	36.6	34.9	95	68-132	
110-82-7	Cyclohexane	123	109	89	70-117	
78-87-5	1,2-Dichloropropane	46.8	44.1	94	69-123	
75-27-4	Bromodichloromethane	32.6	33.2	102	72-128	
79-01-6	Trichloroethene	40.2	36.0	90	71-123	
123-91-1	1,4-Dioxane	58.3	63.2	108	71-122	
80-62-6	Methyl Methacrylate	103	103	100	70-128	
142-82-5	n-Heptane	52.7	47.6	90	69-123	
10061-01-5	cis-1,3-Dichloropropene	45.8	48.8	107	70-128	
108-10-1	4-Methyl-2-pentanone	53.7	54.8	102	67-130	
10061-02-6	trans-1,3-Dichloropropene	46.3	49.7	107	75-133	
79-00-5	1,1,2-Trichloroethane	39.6	39.5	100	73-119	
108-88-3	Toluene	57.9	48.9	84	66-119	
591-78-6	2-Hexanone	53.7	54.7	102	62-128	
124-48-1	Dibromochloromethane	25.8	26.7	103	70-130	
106-93-4	1,2-Dibromoethane	28.4	28.2	99	74-122	
123-86-4	n-Butyl Acetate	47.6	51.9	109	63-136	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 3 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Lab Control Sample

Client Project ID: DDMT SVE / 10031560, 282846-005

ALS Project ID: P1603665

ALS Sample ID: P160727-LCS

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Analyst: Wida Ang

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 7/27/16

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	DOD Acceptance Limits	Data Qualifier
111-65-9	n-Octane	45.0	39.6	88	69-121	
127-18-4	Tetrachloroethene	29.8	27.4	92	66-124	
108-90-7	Chlorobenzene	47.8	42.1	88	70-119	
100-41-4	Ethylbenzene	50.2	45.6	91	70-124	
179601-23-1	m,p-Xylenes	98.6	89.3	91	61-134	
75-25-2	Bromoform	22.1	20.4	92	66-139	
100-42-5	Styrene	52.2	51.5	99	73-127	
95-47-6	o-Xylene	48.4	43.7	90	67-125	
111-84-2	n-Nonane	38.9	35.8	92	63-128	
79-34-5	1,1,2,2-Tetrachloroethane	30.6	28.5	93	65-127	
98-82-8	Cumene	42.3	38.8	92	68-124	
80-56-8	alpha-Pinene	38.1	36.9	97	66-123	
103-65-1	n-Propylbenzene	41.5	38.8	93	69-123	
622-96-8	4-Ethyltoluene	43.5	40.6	93	67-129	
108-67-8	1,3,5-Trimethylbenzene	43.5	40.2	92	67-130	
95-63-6	1,2,4-Trimethylbenzene	44.4	42.5	96	66-132	
100-44-7	Benzyl Chloride	42.5	45.8	108	50-147	
541-73-1	1,3-Dichlorobenzene	37.9	36.0	95	65-130	
106-46-7	1,4-Dichlorobenzene	34.6	34.0	98	60-131	
95-50-1	1,2-Dichlorobenzene	36.6	35.5	97	63-129	
5989-27-5	d-Limonene	37.7	41.0	109	62-133	
96-12-8	1,2-Dibromo-3-chloropropane	22.6	22.8	101	62-155	
120-82-1	1,2,4-Trichlorobenzene	31.0	31.3	101	55-142	
91-20-3	Naphthalene	41.6	43.1	104	57-138	
87-68-3	Hexachlorobutadiene	21.6	20.8	96	56-138	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: HDR Environmental, Operations & Construction, Inc
Client Project ID: DDMT SVE / 10031560, 282846-005
ALS Project ID: P1603665

Method Blank Summary

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8
Analyst: Wida Ang
Sampling Media: 6.0 L Summa Canister(s)
Test Notes:
Lab File ID: 07271603.D
Date Analyzed: 7/27/16
Time Analyzed: 09:29

Client Sample ID	ALS Sample ID	Lab File ID	Time Analyzed
Lab Control Sample	P160727-LCS	07271606.D	11:25
ODSVE-EFF-Y6Q1	P1603665-001	07271617.D	18:23
ODSVE-EFF-Y6Q1 (Dilution)	P1603665-001	07271623.D	21:39

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: HDR Environmental, Operations & Construction, InALS Project ID: P1603665
Client Project ID: DDMT SVE / 10031560, 282846-005

Internal Standard Area and RT Summary

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8 Lab File ID: 07271602.D
Analyst: Wida Ang Date Analyzed: 7/27/16
Sampling Media: 6.0 L Summa Canister(s) Time Analyzed: 08:57
Test Notes:

	IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
	AREA	#	RT	#	AREA	#
24 Hour Standard	168165		8.80		723007	10.54
Upper Limit	235431		9.13		1012210	10.87
Lower Limit	100899		8.47		433804	10.21

Client Sample ID		IS1 (BCM)	IS2 (DFB)	IS3 (CBZ)
01	Method Blank	171571	8.79	788988
02	Lab Control Sample	167435	8.81	748189
03	ODSVE-EFF-Y6Q1	191444	8.80	876588
04	ODSVE-EFF-Y6Q1 (Dilution)	180808	8.79	815165
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

IS1 (BCM) = Bromochloromethane

IS2 (DFB) = 1,4-Difluorobenzene

IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = 140% of internal standard area

AREA LOWER LIMIT = 60% of internal standard area

RT UPPER LIMIT = 0.33 minutes of internal standard RT

RT LOWER LIMIT = 0.33 minutes of internal standard RT

Column used to flag values outside QC limits with an I.

I = Internal standard not within the specified limits.

Data File: I:\MS08\Data\2016 07\27\07271617.D

Acq On : 27 Jul 2016 18:23

Operator: WA

Sample : P1603665-001 (1000mL)

Misc : S29-07071605

ALS Vial : 9 Sample Multiplier: 1

Quant Time: Aug 01 14:09:45 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 14:41:56 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

IDA 8/1/16

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.80	130	191444	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	10.54	114	876588	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	14.57	82	341999	12.500	ng	-0.01

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.48	65	223477	12.433	ng	-0.03
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.44%
57) Toluene-d8 (SS2)	12.77	98	877060	12.195	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.52%
73) Bromofluorobenzene (SS3)	16.07	174	363379	13.192	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	105.52%

Target Compounds

						Qvalue
2) Propene	0.00	42	0	N.D.	d	
3) Dichlorodifluoromethan...	3.99	85	101849	3.201	ng	99
4) Chloromethane	4.19	50	572	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	4.35	135	1545	N.D.		
6) Vinyl Chloride	4.48	62	4329	0.203	ng	# 40
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	5.38	45	6925	0.632	ng	92
11) Acetonitrile	5.60	41	1111	N.D.		
12) Acrolein	5.73	56	938	0.103	ng	85
13) Acetone	0.00	58	0	N.D.	d	
14) Trichlorofluoromethane	6.01	101	40571	1.451	ng	99
15) 2-Propanol (Isopropanol)	0.00	45	0	N.D.	d	
16) Acrylonitrile	6.39	53	212	N.D.		
17) 1,1-Dichloroethene	6.66	96	71943	4.622	ng	97
18) 2-Methyl-2-Propanol (t...	6.76	59	1472	N.D.		
19) Methylene Chloride	6.79	84	1180	N.D.		
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.		
21) Trichlorotrifluoroethane	7.06	151	651466	41.321	ng	96
22) Carbon Disulfide	0.00	76	0	N.D.	d	
23) trans-1,2-Dichloroethene	7.69	61	36313	1.800	ng	98
24) 1,1-Dichloroethane	7.88	63	65819	2.456	ng	99
25) Methyl tert-Butyl Ether	7.88	73	1523	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.	d	
27) 2-Butanone (MEK)	8.26	72	3341	0.321	ng	# 63
28) cis-1,2-Dichloroethene	8.64	61	1037868	53.629	ng	95
29) Diisopropyl Ether	0.00	87	0	N.D.	d	
30) Ethyl Acetate	8.85	61	16487	3.168	ng	86
31) n-Hexane	8.86	57	4137	0.162	ng	# 95
32) Chloroform	8.91	83	458505	17.442	ng	100
34) Tetrahydrofuran (THF)	0.00	72	0	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	9.58	62	824	N.D.		
38) 1,1,1-Trichloroethane	9.82	97	57123	2.315	ng	98
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	10.23	78	11681	0.181	ng	99
42) Carbon Tetrachloride	10.37	117	62175	3.077	ng	100
43) Cyclohexane	10.48	84	10297	0.366	ng	91
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.	d	
46) Bromodichloromethane	11.13	83	3544	0.175	ng	97
47) Trichloroethene	11.17	130	3173374	155.070	ng	99
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d	

Data File: I:\MS08\Data\2016 07\27\07271617.D

Acq On : 27 Jul 2016 18:23

Operator: WA

Sample : P1603665-001 (1000mL)

Misc : S29-07071605

ALS Vial : 9 Sample Multiplier: 1

Quant Time: Aug 01 14:09:45 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 14:41:56 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	0.00	100	0	N.D.	d	
51) n-Heptane	11.45	71	1043	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	12.38	75	604	N.D.		
55) 1,1,2-Trichloroethane	12.59	97	1189	N.D.		
58) Toluene	12.87	91	22878	0.311	ng	98
59) 2-Hexanone	13.10	43	1680	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	13.69	43	2765	N.D.		
63) n-Octane	0.00	57	0	N.D.		
64) Tetrachloroethene	13.95	166	503714	19.847	ng	99
65) Chlorobenzene	14.62	112	878	N.D.		
66) Ethylbenzene	14.99	91	5607	N.D.		
67) m- & p-Xylenes	15.16	91	13305	0.208	ng	99
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	15.54	104	1844	N.D.		
70) o-Xylene	15.64	91	5098	N.D.		
71) n-Nonane	15.85	43	1556	N.D.		
72) 1,1,2,2-Tetrachloroethane	15.61	83	56483	1.880	ng	100
74) Cumene	0.00	105	0	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	16.71	91	727	N.D.		
77) 3-Ethyltoluene	16.81	105	1439	N.D.		
78) 4-Ethyltoluene	16.84	105	1725	N.D.		
79) 1,3,5-Trimethylbenzene	16.84	105	1725	N.D.		
80) alpha-Methylstyrene	17.26	118	3556	N.D.		
81) 2-Ethyltoluene	17.10	105	553	N.D.		
82) 1,2,4-Trimethylbenzene	17.31	105	1887	N.D.		
83) n-Decane	17.41	57	1986	N.D.		
84) Benzyl Chloride	0.00	91	0	N.D.		
85) 1,3-Dichlorobenzene	17.53	146	1141	N.D.		
86) 1,4-Dichlorobenzene	17.53	146	1141	N.D.		
87) sec-Butylbenzene	17.73	105	892	N.D.		
88) 4-Isopropyltoluene (p-...	17.72	119	4480	N.D.		
89) 1,2,3-Trimethylbenzene	17.73	105	892	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	0.00	68	0	N.D.		
92) 1,2-Dibromo-3-Chloropr...	18.19	157	1205	N.D.		
93) n-Undecane	18.61	57	1992	N.D.		
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	19.57	128	6334	N.D.		
96) n-Dodecane	0.00	57	0	N.D.	d	
97) Hexachlorobutadiene	19.90	225	846	N.D.		
98) Cyclohexanone	15.33	55	1305	N.D.		
99) tert-Butylbenzene	17.26	119	5759	N.D.		
100) n-Butylbenzene	18.12	91	1380	N.D.		

(#)=qualifier out of range (m)=manual integration (+)=signals summed

Data File: I:\MS08\Data\2016 07\27\07271617.D

Acq On : 27 Jul 2016 18:23

Operator: WA

Sample : P1603665-001 (1000mL)

Misc : S29-07071605

ALS Vial : 9 Sample Multiplier: 1

Quant Time: Aug 01 14:09:45 2016

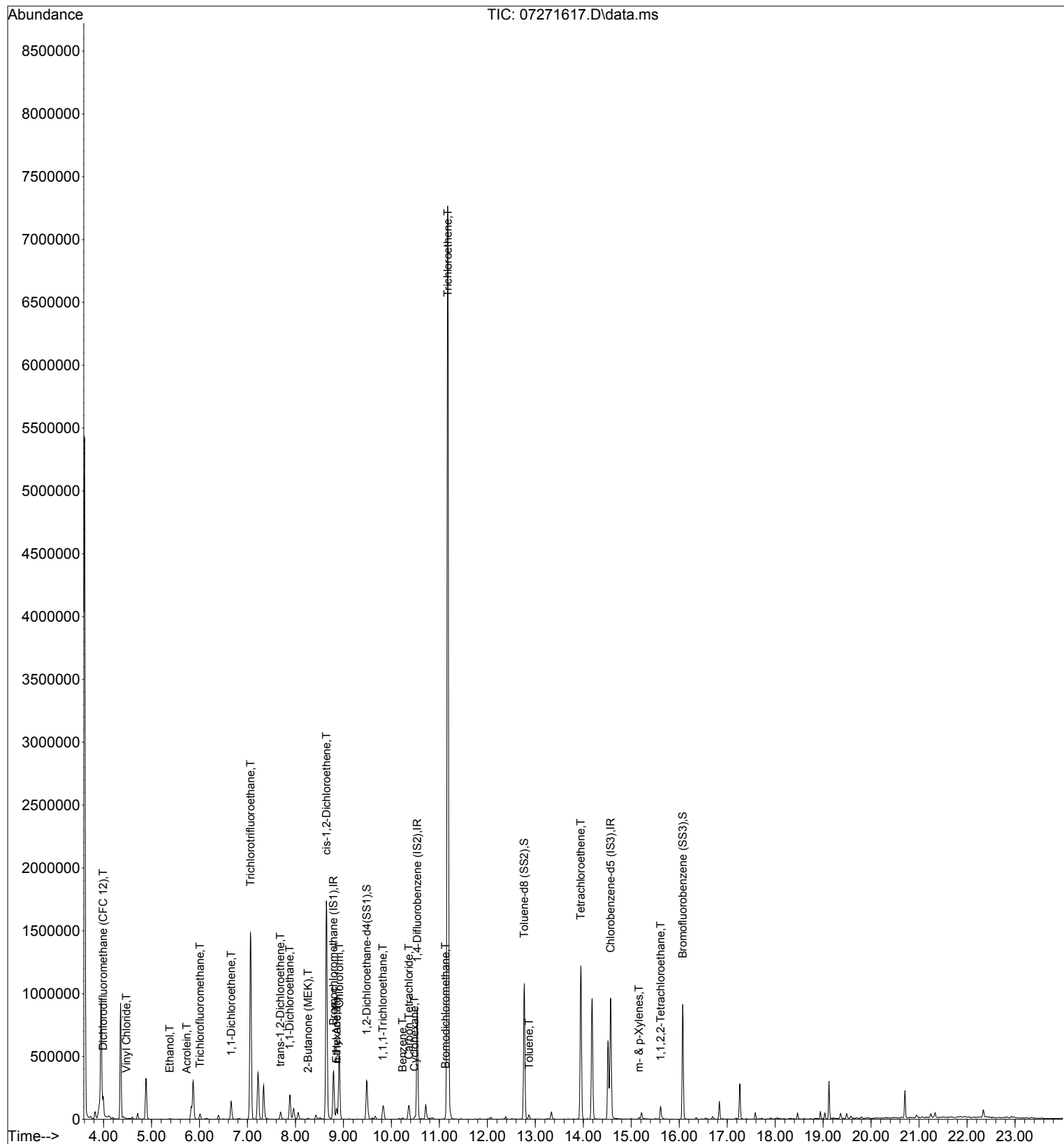
Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 14:41:56 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS08\Data\2016 07\27\07271617.D

Acq On : 27 Jul 2016 18:23

Operator: WA

Sample : P1603665-001 (1000mL)

Misc : S29-07071605

ALS Vial : 9 Sample Multiplier: 1

Quant Time: Aug 01 14:09:45 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 14:41:56 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

107 8/1/16

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.80	130	191444	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	10.54	114	876588	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	14.57	82	341999	12.500	ng	-0.01

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.48	65	223477	12.433	ng	-0.03
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.44%
57) Toluene-d8 (SS2)	12.77	98	877060	12.195	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.52%
73) Bromofluorobenzene (SS3)	16.07	174	363379	13.192	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	105.52%

Target Compounds

						Qvalue
3) Dichlorodifluoromethan...	3.99	85	101849	3.201	ng	99
6) Vinyl Chloride	4.48	62	4329	0.203	ng	# 40
10) Ethanol	5.38	45	6925	0.632	ng	92
12) Acrolein	5.73	56	938	0.103	ng	85
14) Trichlorofluoromethane	6.01	101	40571	1.451	ng	99
17) 1,1-Dichloroethene	6.66	96	71943	4.622	ng	97
21) Trichlorotrifluoroethane	7.06	151	651466	41.321	ng	96
23) trans-1,2-Dichloroethene	7.69	61	36313	1.800	ng	98
24) 1,1-Dichloroethane	7.88	63	65819	2.456	ng	99
27) 2-Butanone (MEK)	8.26	72	3341	0.321	ng	# 63
28) cis-1,2-Dichloroethene	8.64	61	1037868	53.629	ng	95
30) Ethyl Acetate	8.85	61	16487	3.168	ng	86
31) n-Hexane	8.86	57	4137	0.162	ng	# 95
32) Chloroform	8.91	83	458505	17.442	ng	100
38) 1,1,1-Trichloroethane	9.82	97	57123	2.315	ng	98
41) Benzene	10.23	78	11681	0.181	ng	99
42) Carbon Tetrachloride	10.37	117	62175	3.077	ng	100
43) Cyclohexane	10.48	84	10297	0.366	ng	91
46) Bromodichloromethane	11.13	83	3544	0.175	ng	97
47) Trichloroethene	11.17	130	3173374	155.070	ng	99
58) Toluene	12.87	91	22878	0.311	ng	98
64) Tetrachloroethene	13.95	166	503714	19.847	ng	99
67) m- & p-Xylenes	15.16	91	13305	0.208	ng	99
72) 1,1,2,2-Tetrachloroethane	15.61	83	56483	1.880	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File: I:\MS08\Data\2016 07\27\07271617.D

Acq On : 27 Jul 2016 18:23

Operator: WA

Sample : P1603665-001 (1000mL)

Misc : S29-07071605

ALS Vial : 9 Sample Multiplier: 1

Quant Time: Aug 01 14:09:45 2016

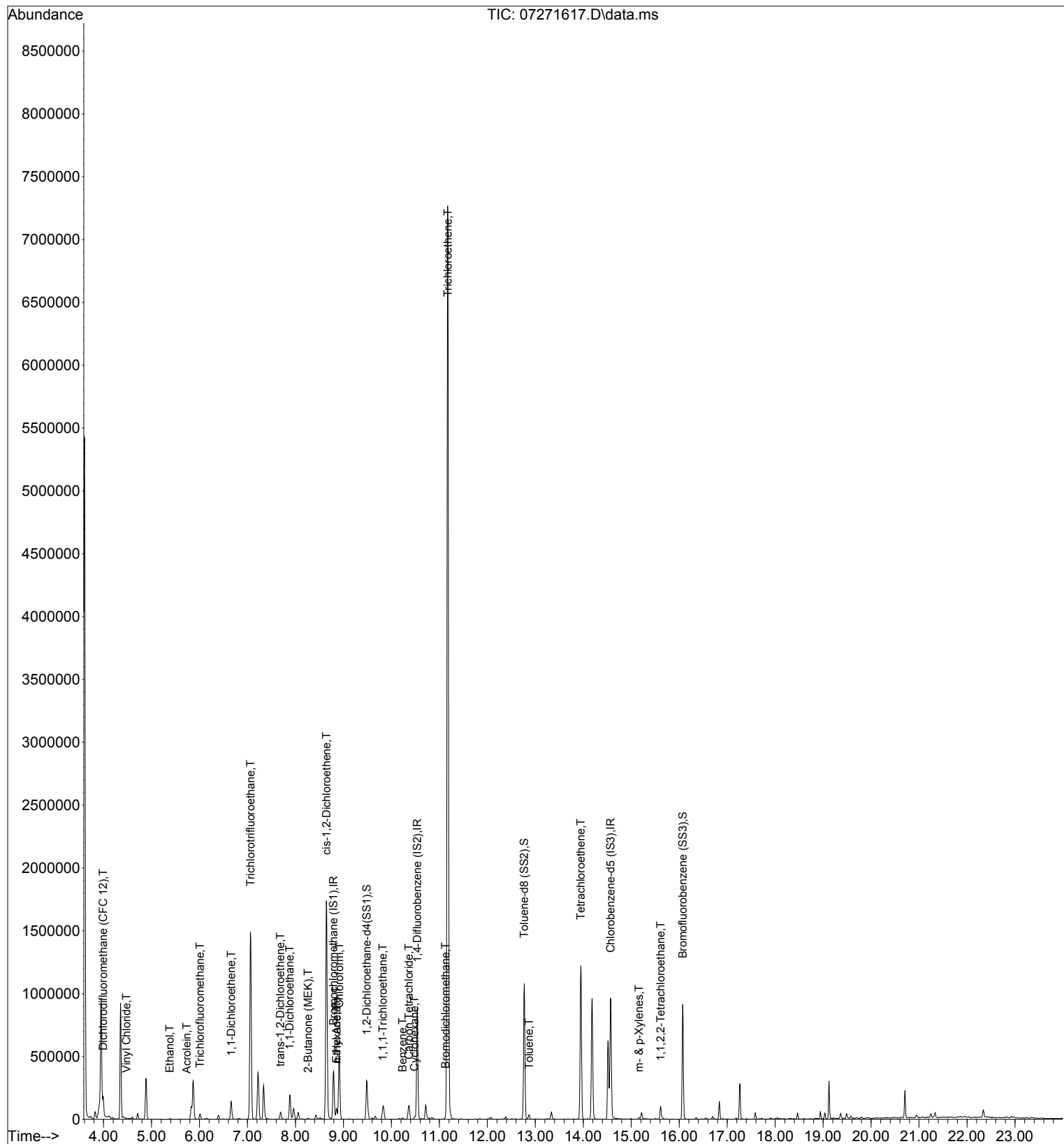
Quant Method : I:\MS08\Methods\R8070816.M

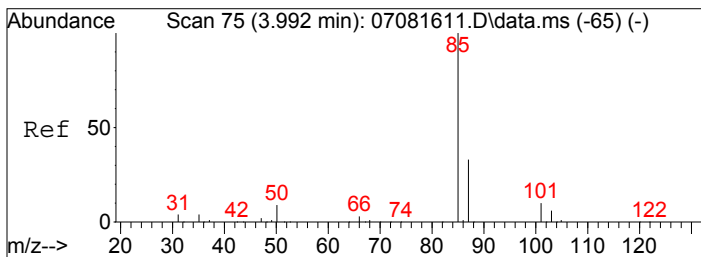
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 14:41:56 2016

Response via : Initial Calibration

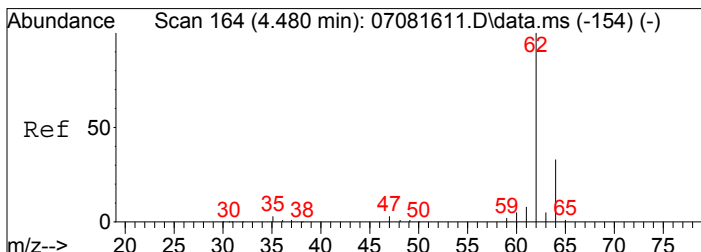
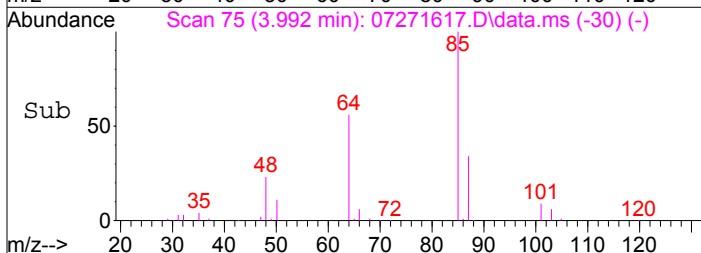
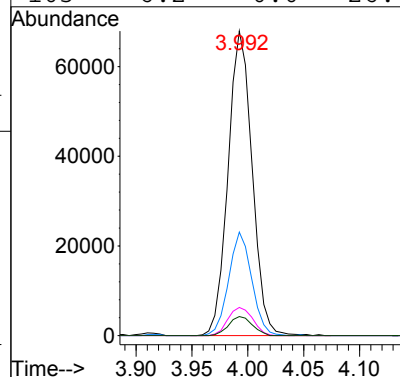
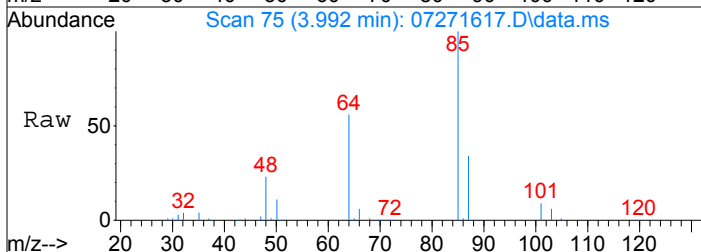
DataAcq Meth:TO15.M





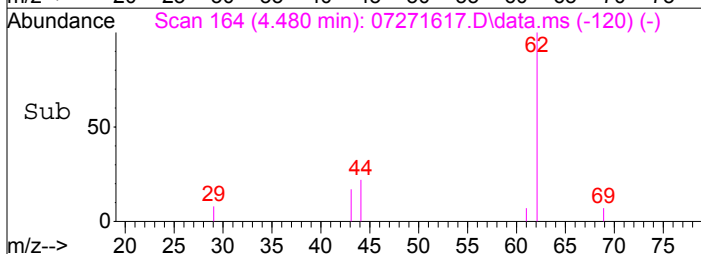
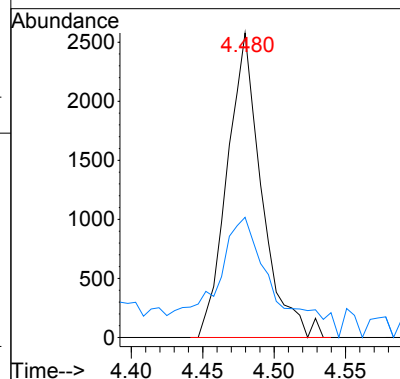
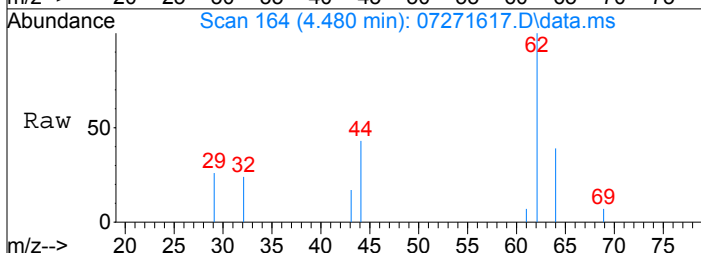
#3
 Dichlorodifluoromethane (CFC 12)
 Concen: 3.20 ng
 RT: 3.99 min Scan# 75
 Delta R.T. -0.005 min
 Lab File: 07271617.D
 Acq: 27 Jul 2016 18:23

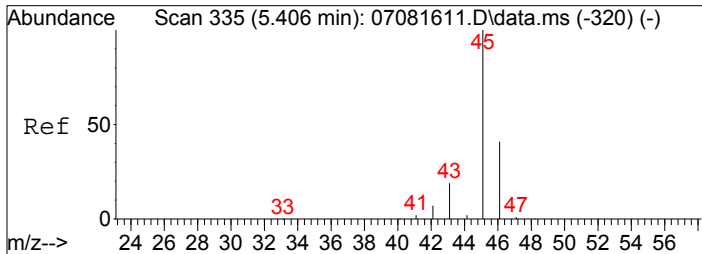
Tgt Ion:	85	Resp:	101849
Ion Ratio	Lower	Upper	
85	100		
87	32.5	12.8	52.8
101	9.5	0.0	29.7
103	6.2	0.0	26.4



#6
 Vinyl Chloride
 Concen: 0.20 ng
 RT: 4.48 min Scan# 164
 Delta R.T. -0.011 min
 Lab File: 07271617.D
 Acq: 27 Jul 2016 18:23

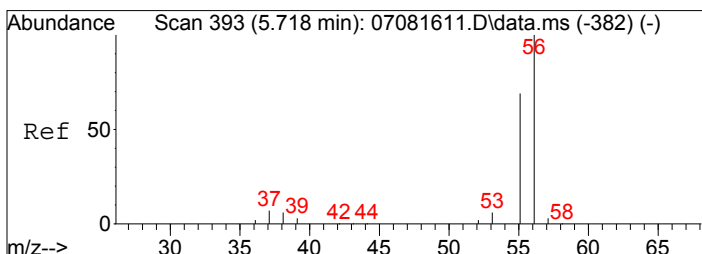
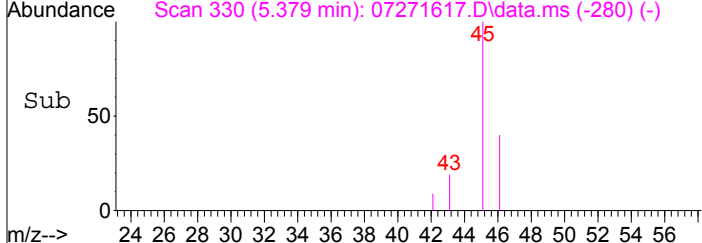
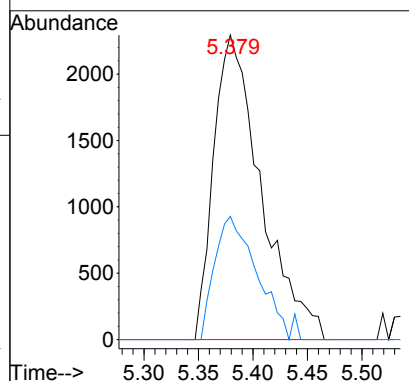
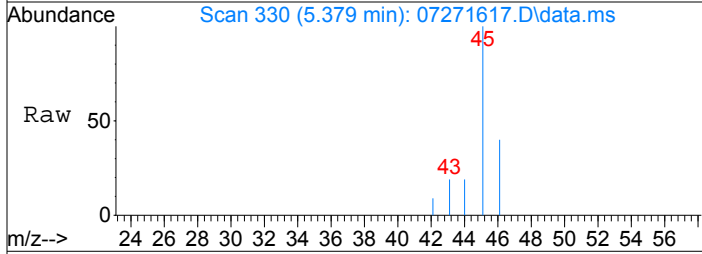
Tgt Ion:	62	Resp:	4329
Ion Ratio	Lower	Upper	
62	100		
64	66.1	12.4	52.4#





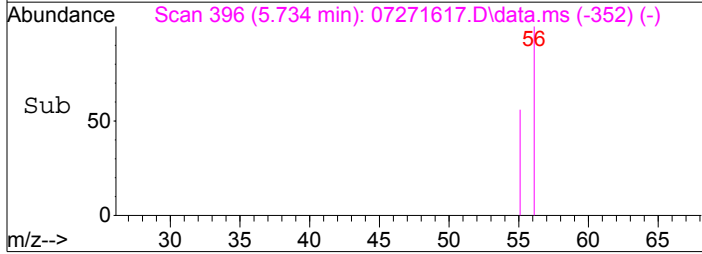
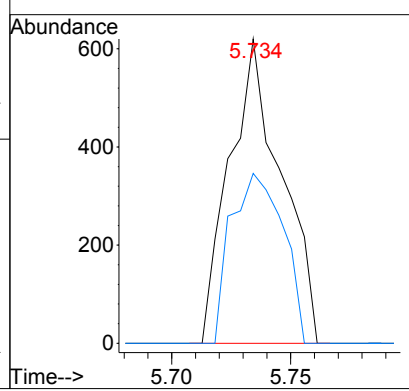
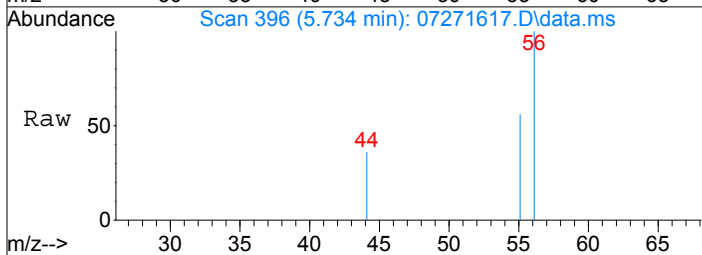
#10
 Ethanol
 Concen: 0.63 ng
 RT: 5.38 min Scan# 330
 Delta R.T. -0.081 min
 Lab File: 07271617.D
 Acq: 27 Jul 2016 18:23

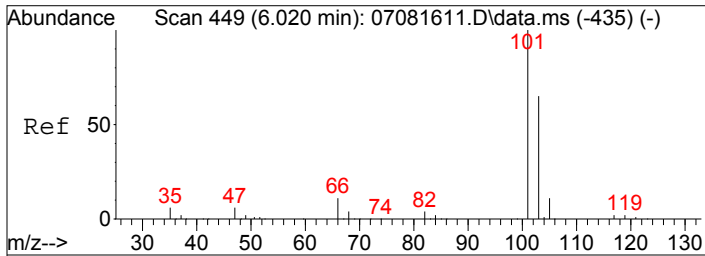
Tgt Ion: 45	Resp: 6925
Ion Ratio	Lower Upper
45	100
46	35.7 20.8 60.8



#12
 Acrolein
 Concen: 0.10 ng
 RT: 5.73 min Scan# 396
 Delta R.T. -0.011 min
 Lab File: 07271617.D
 Acq: 27 Jul 2016 18:23

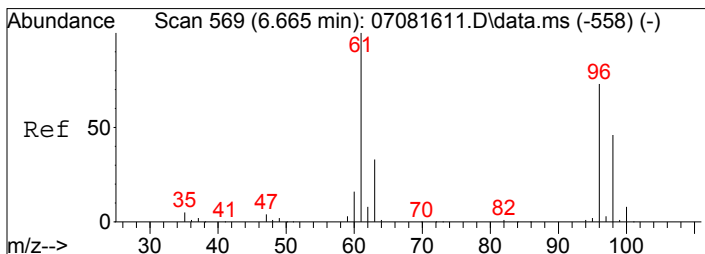
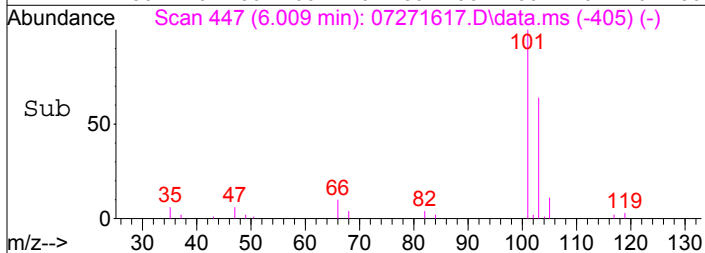
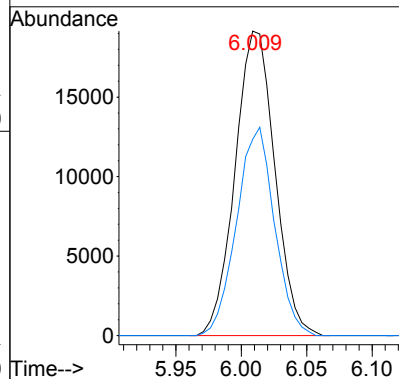
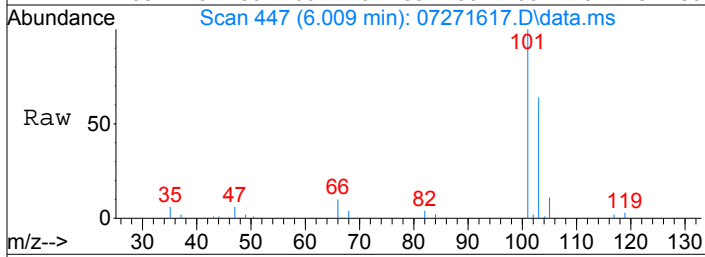
Tgt Ion: 56	Resp: 938
Ion Ratio	Lower Upper
56	100
55	56.5 49.1 89.1





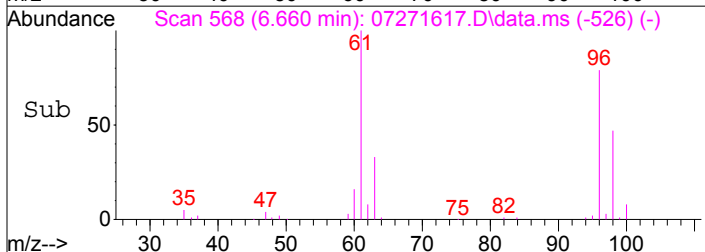
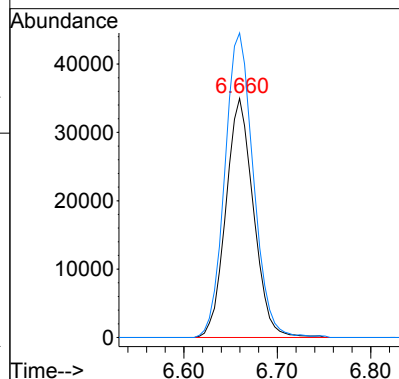
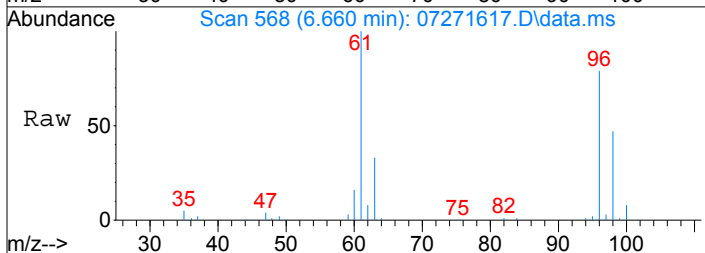
#14
 Trichlorofluoromethane
 Concen: 1.45 ng
 RT: 6.01 min Scan# 447
 Delta R.T. -0.022 min
 Lab File: 07271617.D
 Acq: 27 Jul 2016 18:23

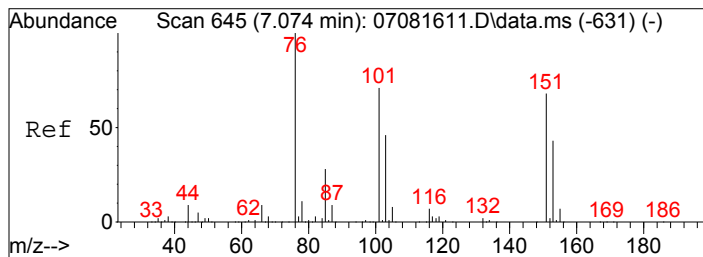
Tgt Ion: 101 Resp: 40571
 Ion Ratio Lower Upper
 101 100
 103 65.1 44.7 84.7



#17
 1,1-Dichloroethene
 Concen: 4.62 ng
 RT: 6.66 min Scan# 568
 Delta R.T. -0.022 min
 Lab File: 07271617.D
 Acq: 27 Jul 2016 18:23

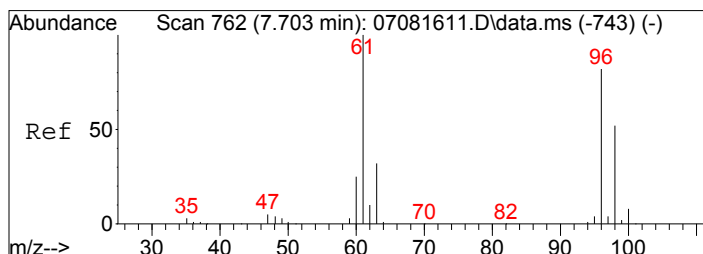
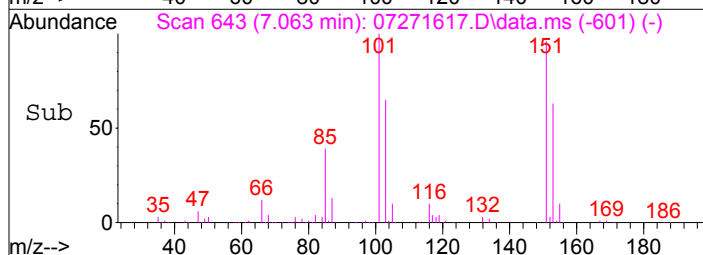
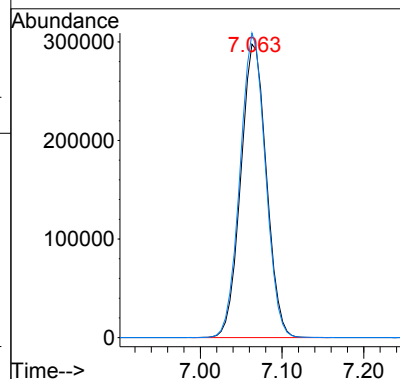
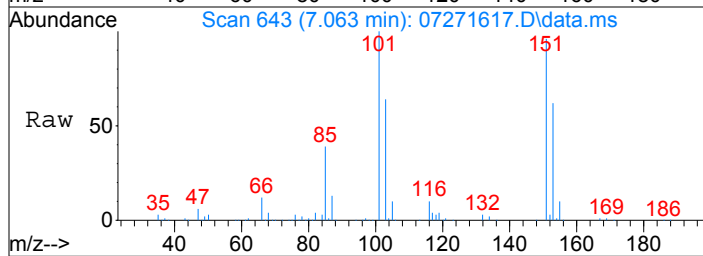
Tgt Ion: 96 Resp: 71943
 Ion Ratio Lower Upper
 96 100
 61 131.9 115.8 155.8





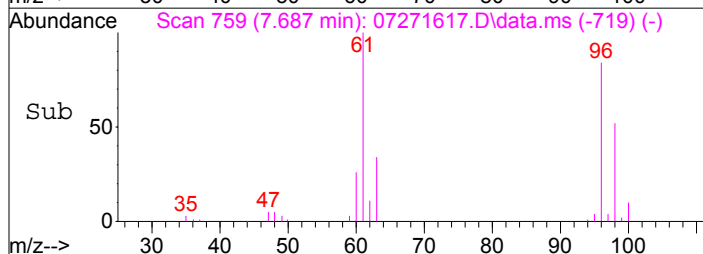
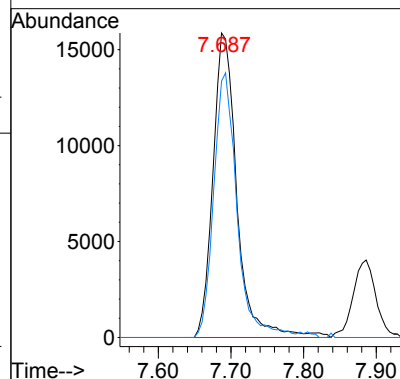
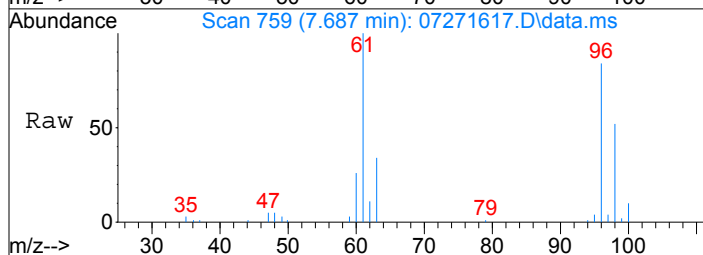
#21
Trichlorotrifluoroethane
Concen: 41.32 ng
RT: 7.06 min Scan# 643
Delta R.T. -0.022 min
Lab File: 07271617.D
Acq: 27 Jul 2016 18:23

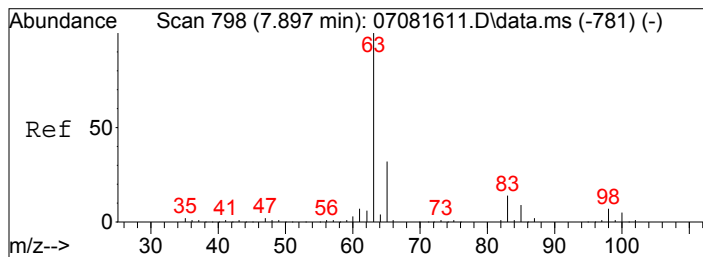
Tgt Ion: 151 Resp: 651466
Ion Ratio Lower Upper
151 100
101 102.5 86.8 126.8



#23
trans-1,2-Dichloroethene
Concen: 1.80 ng
RT: 7.69 min Scan# 759
Delta R.T. -0.032 min
Lab File: 07271617.D
Acq: 27 Jul 2016 18:23

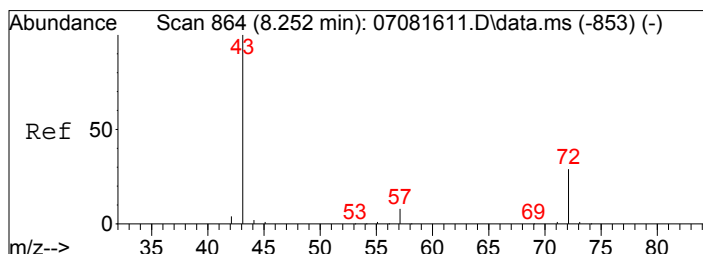
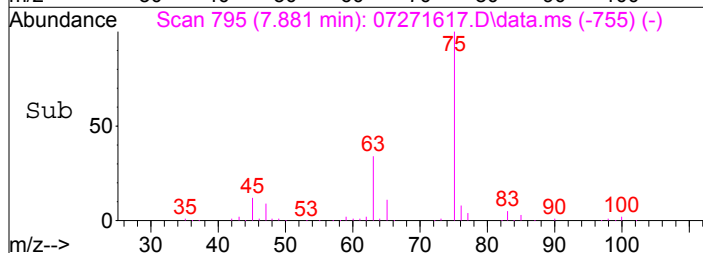
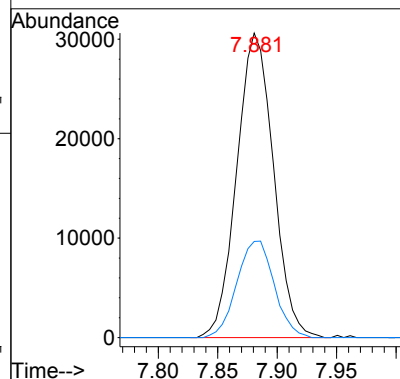
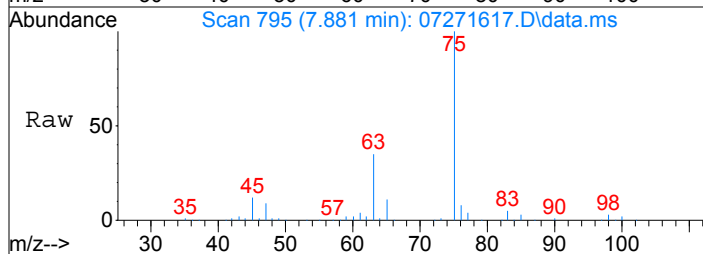
Tgt Ion: 61 Resp: 36313
Ion Ratio Lower Upper
61 100
96 84.4 62.8 102.8





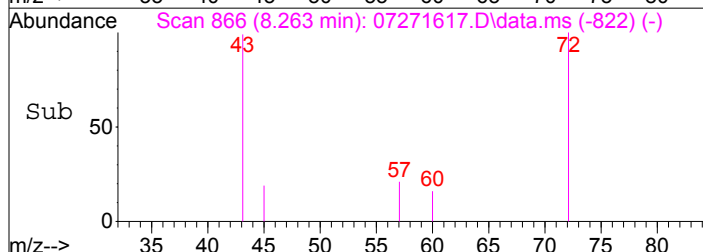
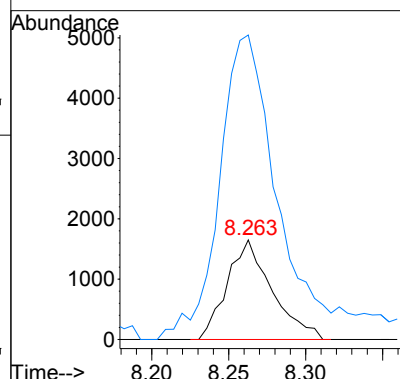
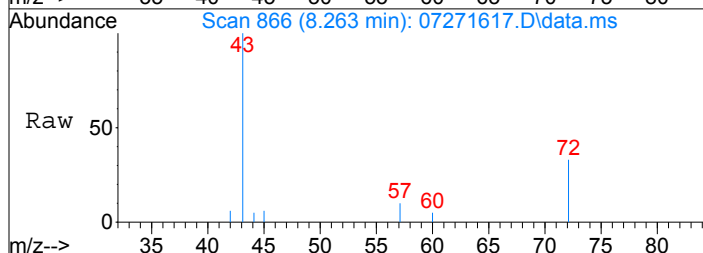
#24
1,1-Dichloroethane
Concen: 2.46 ng
RT: 7.88 min Scan# 795
Delta R.T. -0.032 min
Lab File: 07271617.D
Acq: 27 Jul 2016 18:23

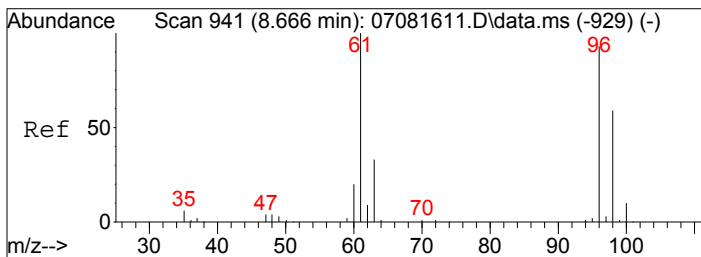
Tgt Ion: 63 Resp: 65819
Ion Ratio Lower Upper
63 100
65 32.3 12.0 52.0



#27
2-Butanone (MEK)
Concen: 0.32 ng
RT: 8.26 min Scan# 866
Delta R.T. -0.011 min
Lab File: 07271617.D
Acq: 27 Jul 2016 18:23

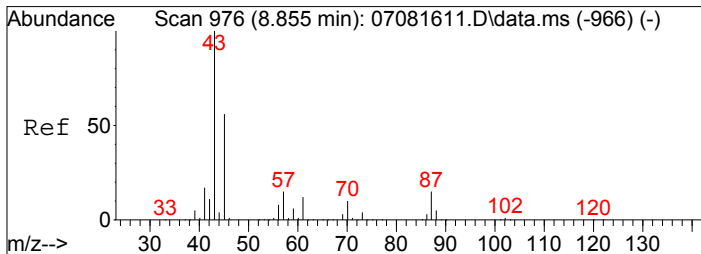
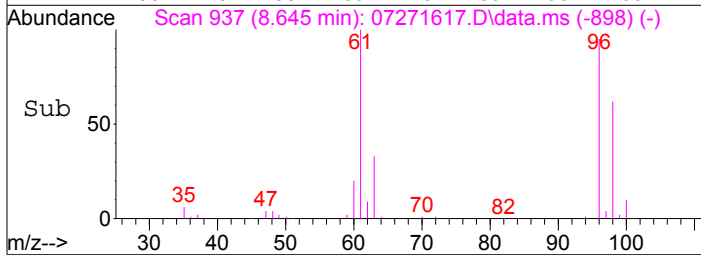
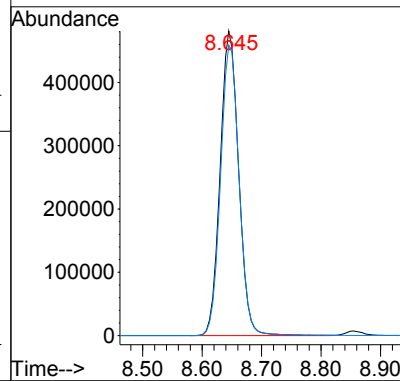
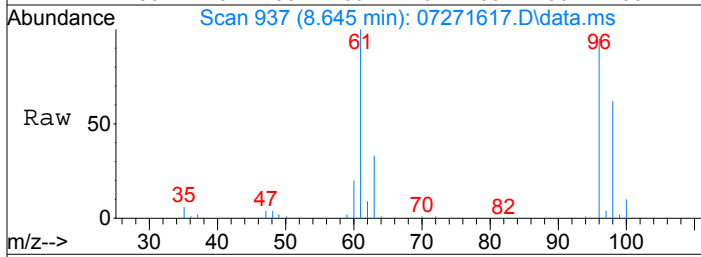
Tgt Ion: 72 Resp: 3341
Ion Ratio Lower Upper
72 100
43 428.5 328.0 368.0#





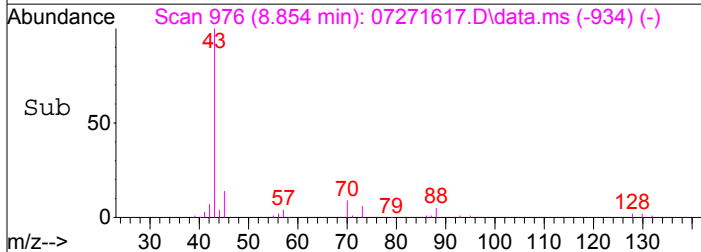
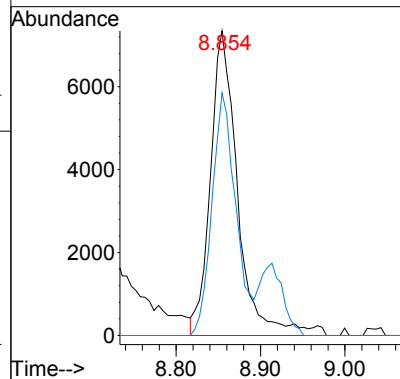
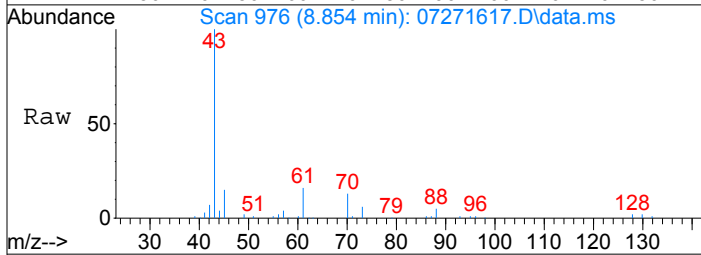
#28
 cis-1,2-Dichloroethene
 Concen: 53.63 ng
 RT: 8.64 min Scan# 937
 Delta R.T. -0.038 min
 Lab File: 07271617.D
 Acq: 27 Jul 2016 18:23

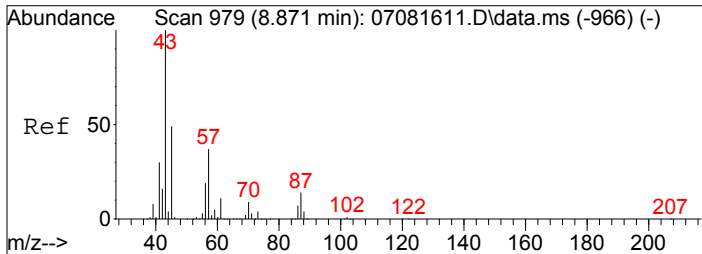
Tgt Ion: 61 Resp: 1037868
 Ion Ratio Lower Upper
 61 100
 96 95.8 71.5 111.5



#30
 Ethyl Acetate
 Concen: 3.17 ng
 RT: 8.85 min Scan# 976
 Delta R.T. -0.022 min
 Lab File: 07271617.D
 Acq: 27 Jul 2016 18:23

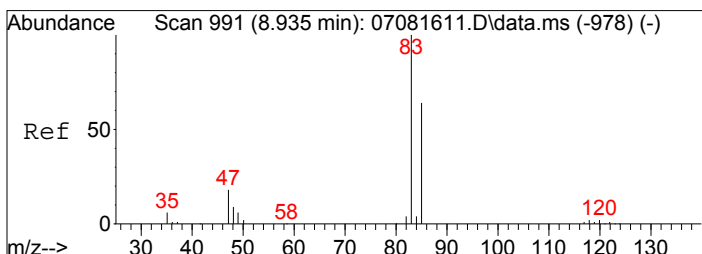
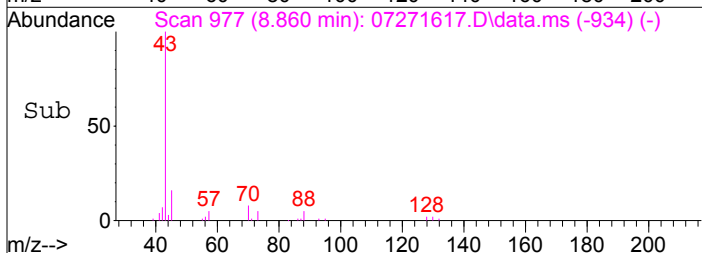
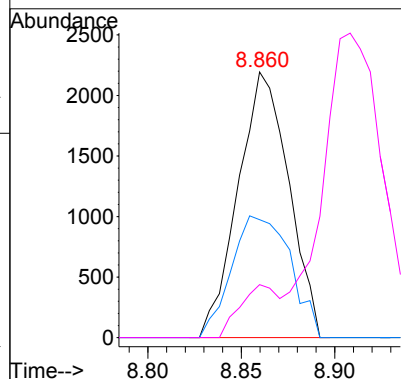
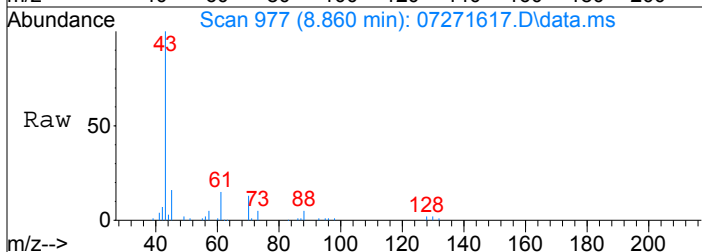
Tgt Ion: 61 Resp: 16487
 Ion Ratio Lower Upper
 61 100
 70 70.0 62.8 102.8





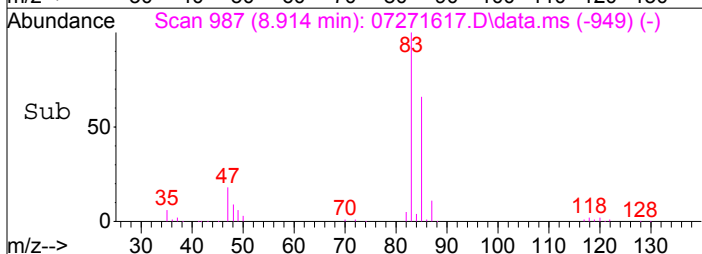
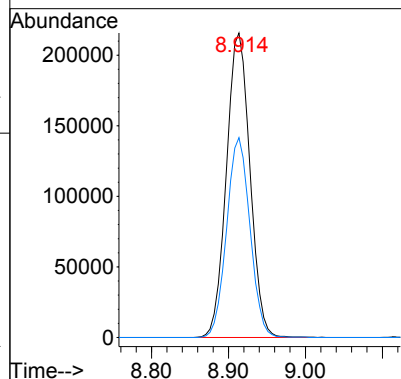
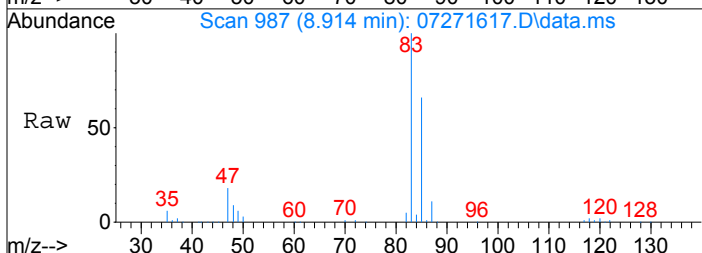
#31
n-Hexane
Concen: 0.16 ng
RT: 8.86 min Scan# 977
Delta R.T. -0.016 min
Lab File: 07271617.D
Acq: 27 Jul 2016 18:23

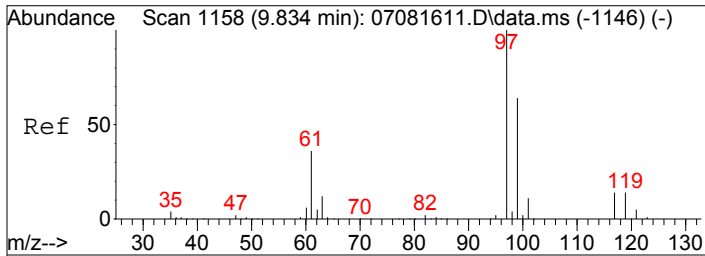
Tgt Ion: 57 Resp: 4137
Ion Ratio Lower Upper
57 100
56 53.1 41.4 62.0
86 15.2 16.2 24.4#



#32
Chloroform
Concen: 17.44 ng
RT: 8.91 min Scan# 987
Delta R.T. -0.043 min
Lab File: 07271617.D
Acq: 27 Jul 2016 18:23

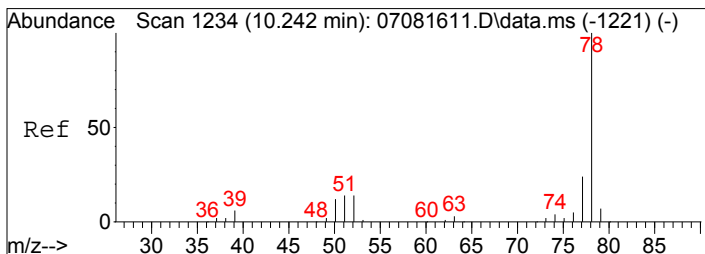
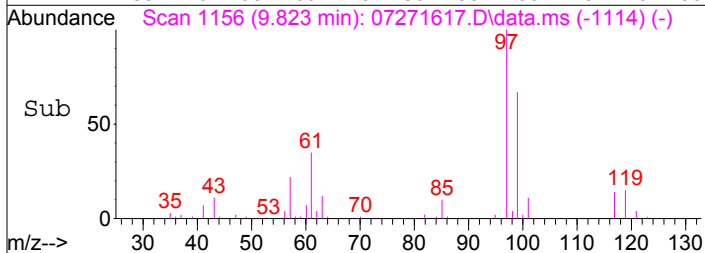
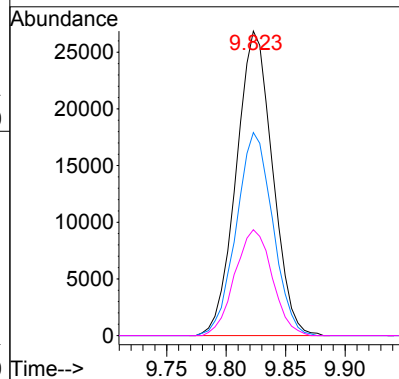
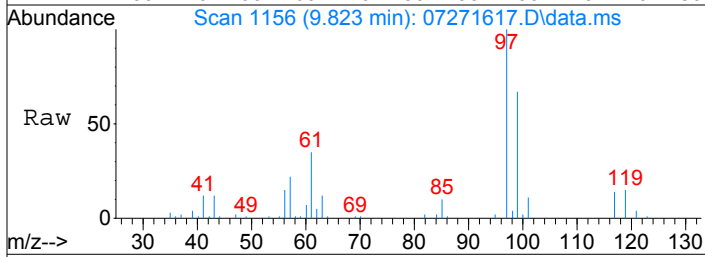
Tgt Ion: 83 Resp: 458505
Ion Ratio Lower Upper
83 100
85 65.0 44.8 84.8





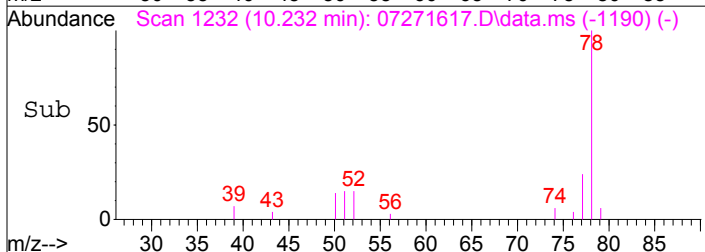
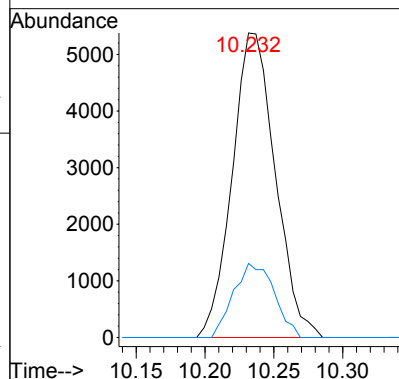
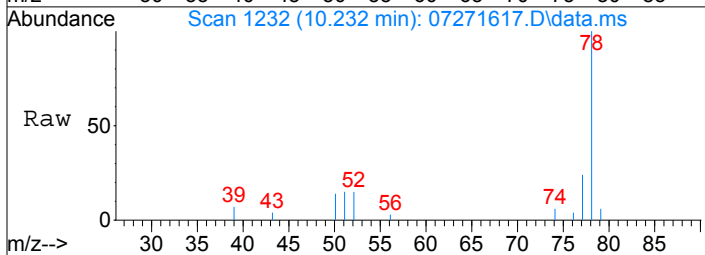
#38
 1,1,1-Trichloroethane
 Concen: 2.32 ng
 RT: 9.82 min Scan# 1156
 Delta R.T. -0.022 min
 Lab File: 07271617.D
 Acq: 27 Jul 2016 18:23

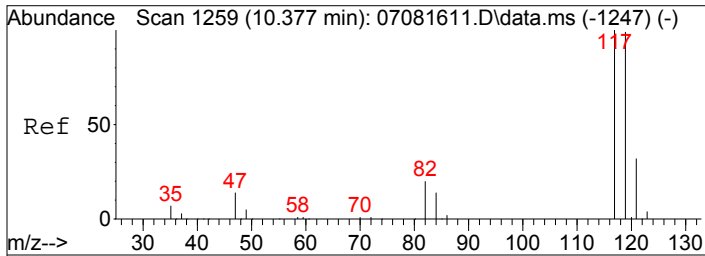
Tgt Ion: 97 Resp: 57123
 Ion Ratio Lower Upper
 97 100
 99 67.0 44.8 84.8
 61 35.8 16.1 56.1



#41
 Benzene
 Concen: 0.18 ng
 RT: 10.23 min Scan# 1232
 Delta R.T. -0.022 min
 Lab File: 07271617.D
 Acq: 27 Jul 2016 18:23

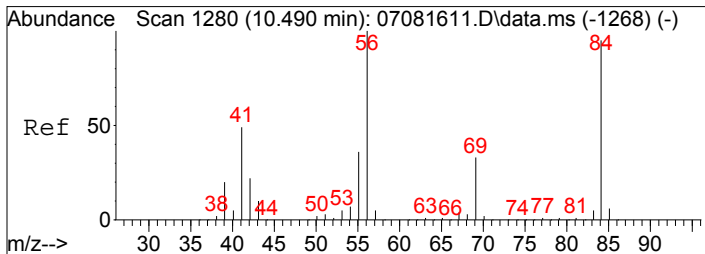
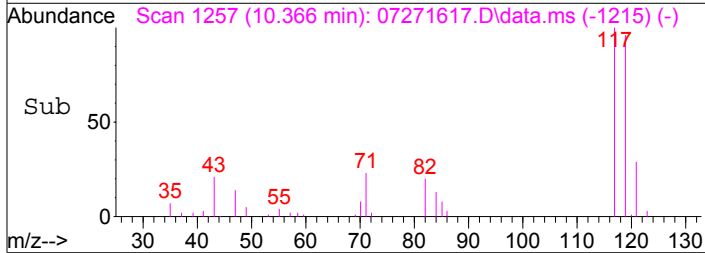
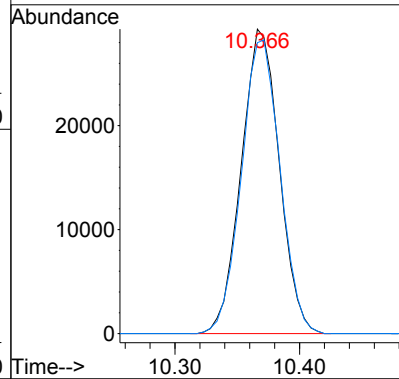
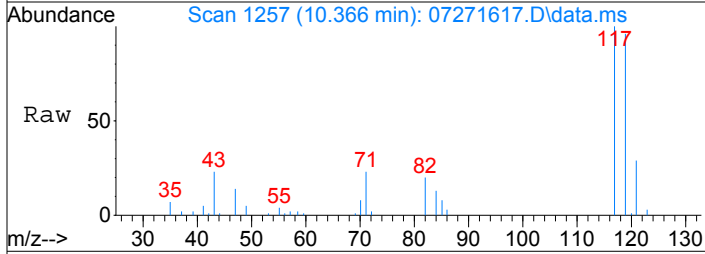
Tgt Ion: 78 Resp: 11681
 Ion Ratio Lower Upper
 78 100
 77 23.0 3.5 43.5





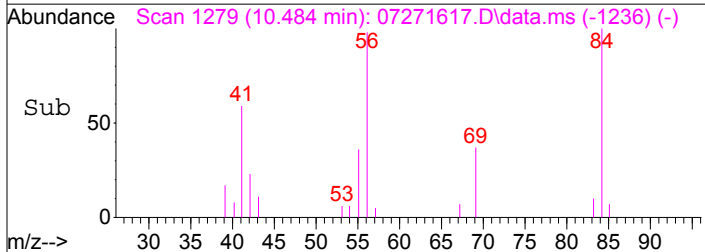
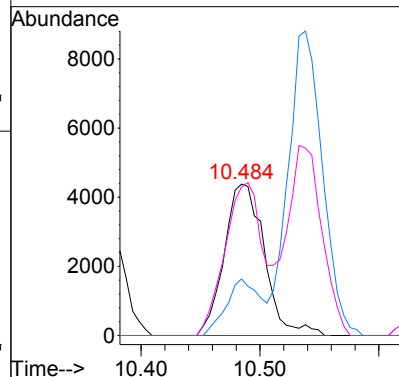
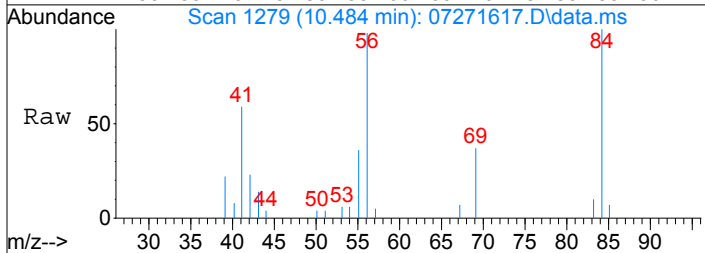
#42
Carbon Tetrachloride
Concen: 3.08 ng
RT: 10.37 min Scan# 1257
Delta R.T. -0.022 min
Lab File: 07271617.D
Acq: 27 Jul 2016 18:23

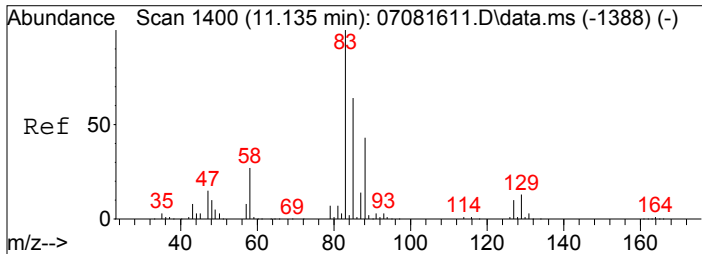
Tgt Ion: 117 Resp: 62175
Ion Ratio Lower Upper
117 100
119 98.0 78.1 118.1



#43
Cyclohexane
Concen: 0.37 ng
RT: 10.48 min Scan# 1279
Delta R.T. -0.016 min
Lab File: 07271617.D
Acq: 27 Jul 2016 18:23

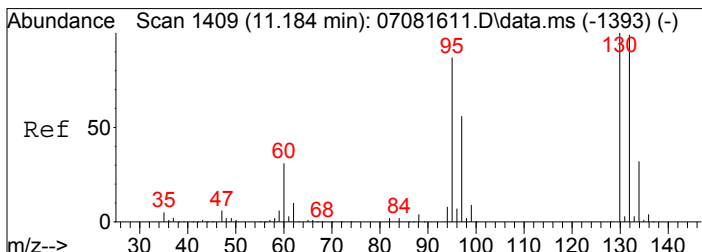
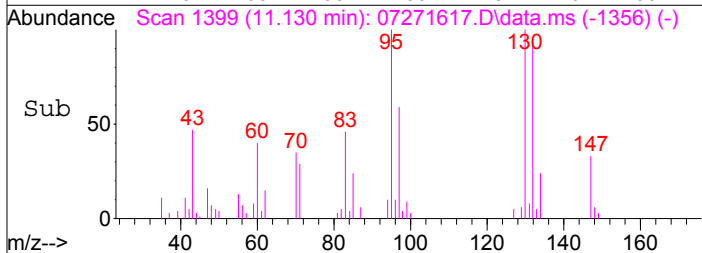
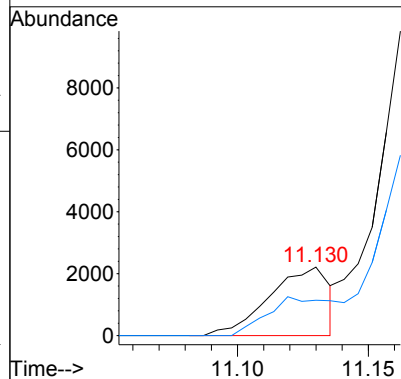
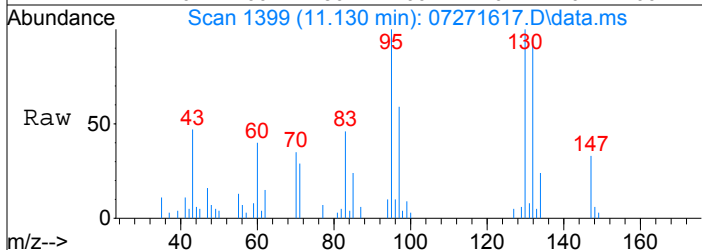
Tgt Ion: 84 Resp: 10297
Ion Ratio Lower Upper
84 100
69 31.7 15.6 55.6
56 97.0 86.5 126.5





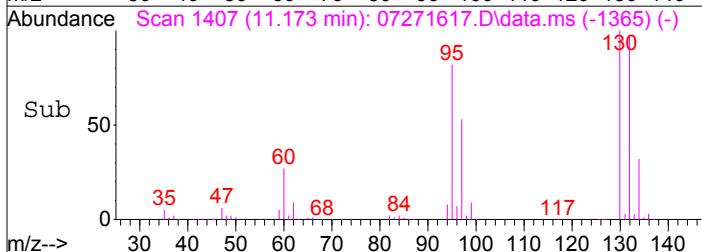
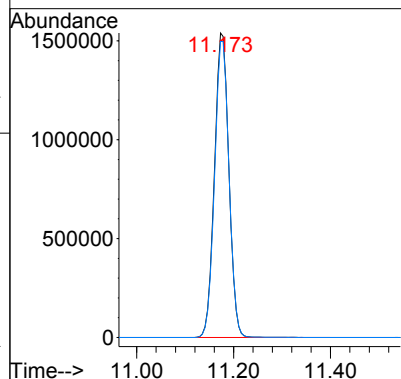
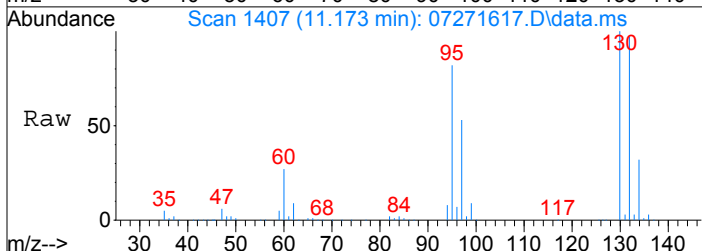
#46
Bromodichloromethane
Concen: 0.18 ng
RT: 11.13 min Scan# 1399
Delta R.T. -0.016 min
Lab File: 07271617.D
Acq: 27 Jul 2016 18:23

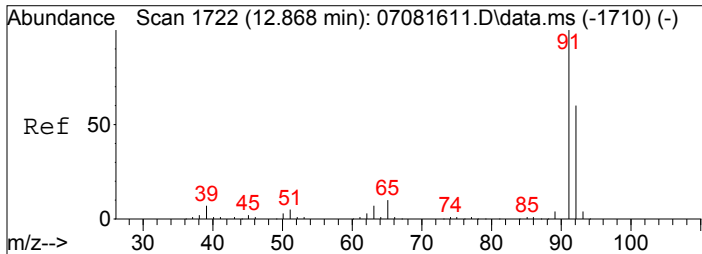
Tgt Ion	83	85	Resp	3544	Lower	Upper
Ion Ratio	100	66.7				
			44.0			84.0



#47
Trichloroethene
Concen: 155.07 ng
RT: 11.17 min Scan# 1407
Delta R.T. -0.022 min
Lab File: 07271617.D
Acq: 27 Jul 2016 18:23

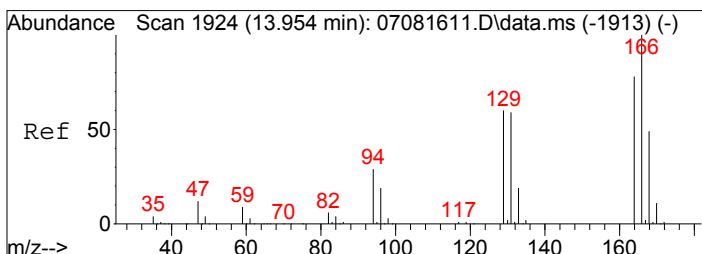
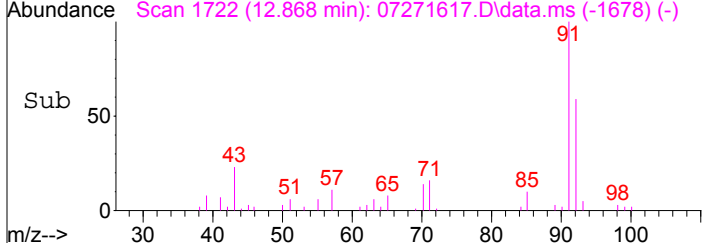
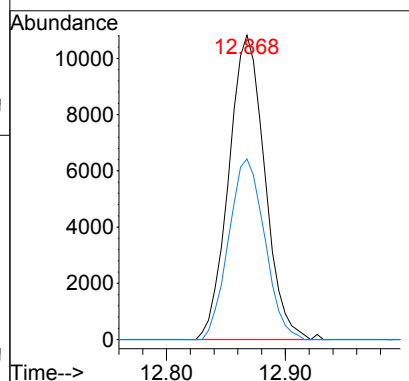
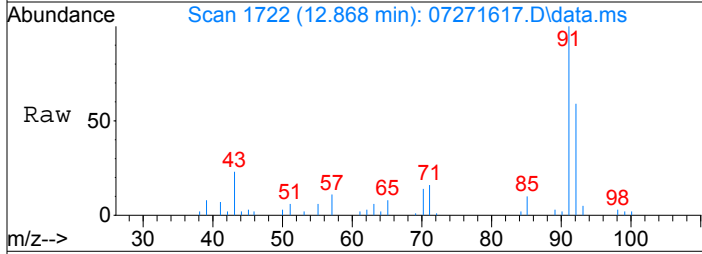
Tgt Ion	130	132	Resp	3173374	Lower	Upper
Ion Ratio	100	97.8				
			78.5			118.5





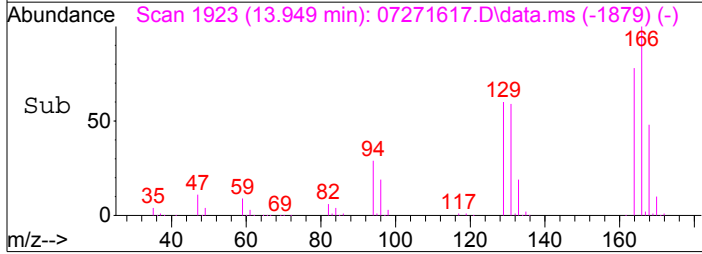
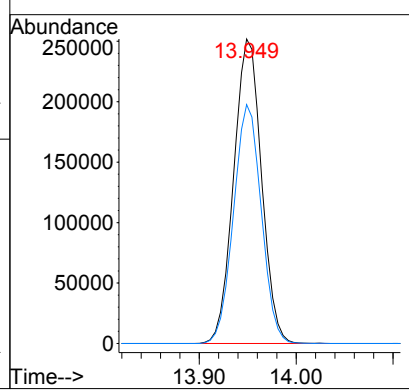
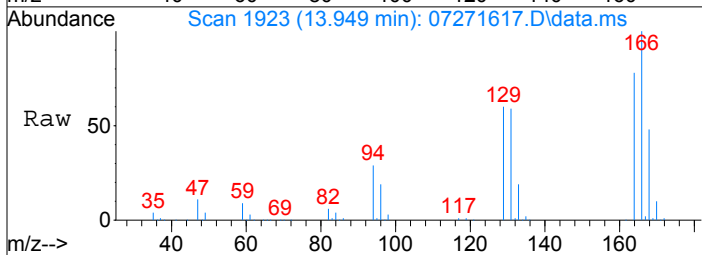
#58
Toluene
Concen: 0.31 ng
RT: 12.87 min Scan# 1722
Delta R.T. -0.011 min
Lab File: 07271617.D
Acq: 27 Jul 2016 18:23

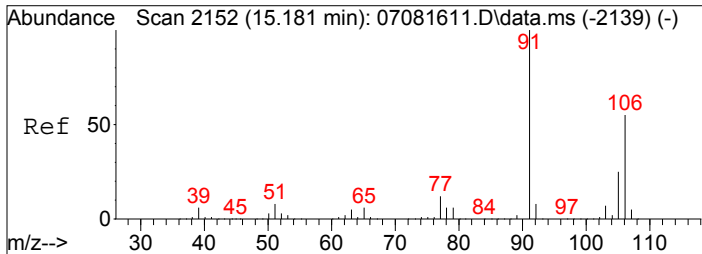
Tgt Ion:	91	Resp:	22878
Ion Ratio	Lower	Upper	
91	100		
92	59.3	40.5	80.5



#64
Tetrachloroethene
Concen: 19.85 ng
RT: 13.95 min Scan# 1923
Delta R.T. -0.011 min
Lab File: 07271617.D
Acq: 27 Jul 2016 18:23

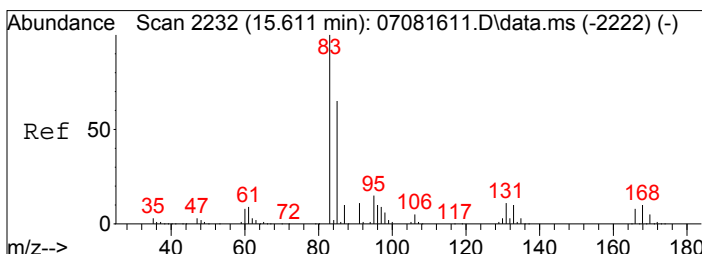
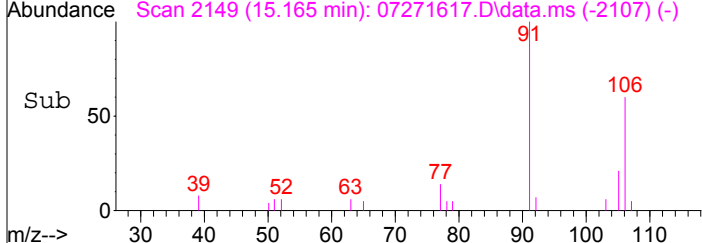
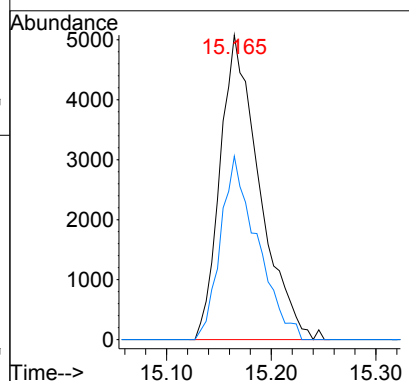
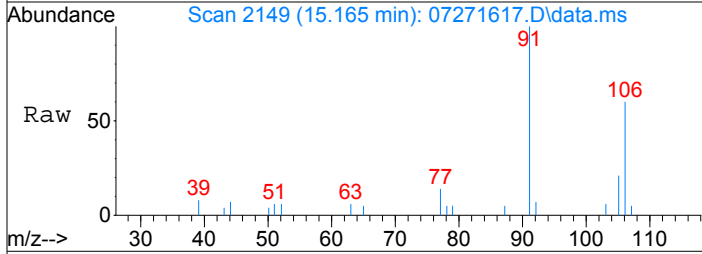
Tgt Ion:	166	Resp:	503714
Ion Ratio	Lower	Upper	
166	100		
164	78.0	58.7	98.7





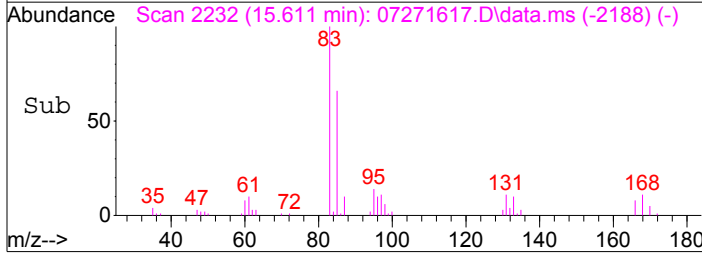
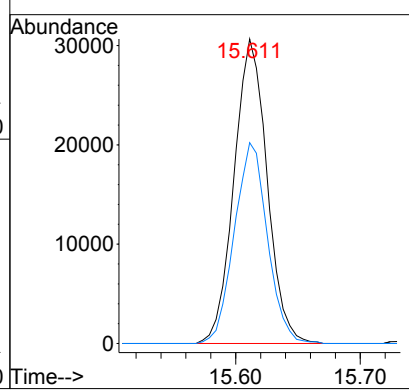
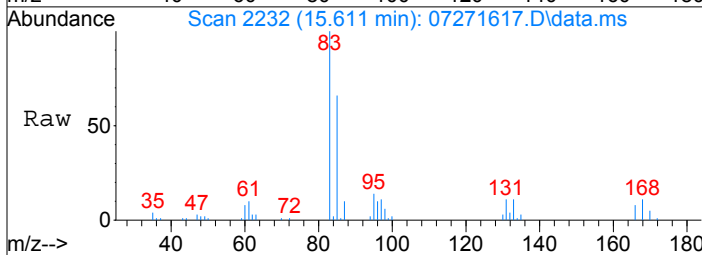
#67
 m- & p-Xylenes
 Concen: 0.21 ng
 RT: 15.16 min Scan# 2149
 Delta R.T. -0.022 min
 Lab File: 07271617.D
 Acq: 27 Jul 2016 18:23

Tgt Ion:	91	Resp:	13305
Ion Ratio	Lower	Upper	
91	100		
106	56.1	35.2	75.2



#72
 1,1,2,2-Tetrachloroethane
 Concen: 1.88 ng
 RT: 15.61 min Scan# 2232
 Delta R.T. -0.011 min
 Lab File: 07271617.D
 Acq: 27 Jul 2016 18:23

Tgt Ion:	83	Resp:	56483
Ion Ratio	Lower	Upper	
83	100		
85	66.2	45.8	85.8



Data File: I:\MS08\Data\2016 07\27\07271623.D

Acq On : 27 Jul 2016 21:39

Operator: WA

Sample : P1603665-001dil (100mL)

Misc : S29-07071605

ALS Vial : 9 Sample Multiplier: 1

Quant Time: Aug 01 14:12:03 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 14:41:56 2016

Response via : Initial Calibration

8/1/16

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.79	130	180808	12.500	ng	-0.04
37) 1,4-Difluorobenzene (IS2)	10.53	114	815165	12.500	ng	-0.03
56) Chlorobenzene-d5 (IS3)	14.57	82	335671	12.500	ng	-0.01

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.48	65	214499	12.636	ng	-0.03
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.12%
57) Toluene-d8 (SS2)	12.77	98	840033	11.900	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.20%
73) Bromofluorobenzene (SS3)	16.07	174	364446	13.480	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	107.84%

Target Compounds

						Qvalue
2) Propene	3.92	42	776	N.D.		
3) Dichlorodifluoromethan...	4.00	85	9660	0.321 ng		98
4) Chloromethane	4.10	50	615	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.		
6) Vinyl Chloride	0.00	62	0	N.D.		
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	5.41	45	591	N.D.		
11) Acetonitrile	0.00	41	0	N.D.		
12) Acrolein	0.00	56	0	N.D. d		
13) Acetone	0.00	58	0	N.D. d		
14) Trichlorofluoromethane	6.02	101	3686	0.140 ng		95
15) 2-Propanol (Isopropanol)	6.16	45	667	N.D.		
16) Acrylonitrile	0.00	53	0	N.D.		
17) 1,1-Dichloroethene	6.66	96	6100	0.415 ng		93
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.		
19) Methylene Chloride	0.00	84	0	N.D.		
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.		
21) Trichlorotrifluoroethane	7.06	151	60318	4.051 ng		96
22) Carbon Disulfide	0.00	76	0	N.D. d		
23) trans-1,2-Dichloroethene	7.70	61	2642	0.139 ng		94
24) 1,1-Dichloroethane	7.88	63	6271	0.248 ng		96
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.		
27) 2-Butanone (MEK)	0.00	72	0	N.D.		
28) cis-1,2-Dichloroethene	8.64	61	99848	5.463 ng		99
29) Diisopropyl Ether	0.00	87	0	N.D. d		
30) Ethyl Acetate	8.87	61	1202	0.245 ng		88
31) n-Hexane	0.00	57	0	N.D.		
32) Chloroform	8.91	83	42555	1.714 ng		98
34) Tetrahydrofuran (THF)	0.00	72	0	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	0.00	62	0	N.D.		
38) 1,1,1-Trichloroethane	9.82	97	5200	0.227 ng		100
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	0.00	56	0	N.D. d		
41) Benzene	10.24	78	1446	N.D.		
42) Carbon Tetrachloride	10.37	117	5627	0.299 ng		100
43) Cyclohexane	10.48	84	1042	N.D.		
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	11.16	63	524	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D. d		
47) Trichloroethene	11.17	130	293220	15.408 ng		99
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	11.22	57	3104	N.D.		

Data File: I:\MS08\Data\2016 07\27\07271623.D

Acq On : 27 Jul 2016 21:39

Operator: WA

Sample : P1603665-001dil (100mL)

Misc : S29-07071605

ALS Vial : 9 Sample Multiplier: 1

Quant Time: Aug 01 14:12:03 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 14:41:56 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.17	100	552	N.D.		
51) n-Heptane	0.00	71	0	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	12.87	91	2418	N.D.		
59) 2-Hexanone	12.87	43	592	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	0.00	43	0	N.D.		
63) n-Octane	0.00	57	0	N.D.		
64) Tetrachloroethene	13.95	166	44899	1.802 ng		100
65) Chlorobenzene	0.00	112	0	N.D.		
66) Ethylbenzene	15.18	91	921	N.D.		
67) m- & p-Xylenes	15.18	91	1008	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	0.00	104	0	N.D.		
70) o-Xylene	0.00	91	0	N.D.		
71) n-Nonane	0.00	43	0	N.D.		
72) 1,1,2,2-Tetrachloroethane	15.61	83	4988	0.169 ng		98
74) Cumene	0.00	105	0	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	0.00	91	0	N.D.		
77) 3-Ethyltoluene	0.00	105	0	N.D.		
78) 4-Ethyltoluene	0.00	105	0	N.D.		
79) 1,3,5-Trimethylbenzene	0.00	105	0	N.D.		
80) alpha-Methylstyrene	0.00	118	0	N.D.		
81) 2-Ethyltoluene	0.00	105	0	N.D.		
82) 1,2,4-Trimethylbenzene	0.00	105	0	N.D.		
83) n-Decane	17.60	57	1585	N.D.		
84) Benzyl Chloride	0.00	91	0	N.D.		
85) 1,3-Dichlorobenzene	0.00	146	0	N.D.		
86) 1,4-Dichlorobenzene	0.00	146	0	N.D.		
87) sec-Butylbenzene	0.00	105	0	N.D.		
88) 4-Isopropyltoluene (p-...	0.00	119	0	N.D.		
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	0.00	68	0	N.D.		
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	0.00	57	0	N.D.		
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	19.60	128	583	N.D.		
96) n-Dodecane	0.00	57	0	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.		
99) tert-Butylbenzene	17.26	119	599	N.D.		
100) n-Butylbenzene	0.00	91	0	N.D.		

(#)=qualifier out of range (m)=manual integration (+)=signals summed

Data File: I:\MS08\Data\2016 07\27\07271623.D

Acq On : 27 Jul 2016 21:39

Operator: WA

Sample : P1603665-001dil (100mL)

Misc : S29-07071605

ALS Vial : 9 Sample Multiplier: 1

Quant Time: Aug 01 14:12:03 2016

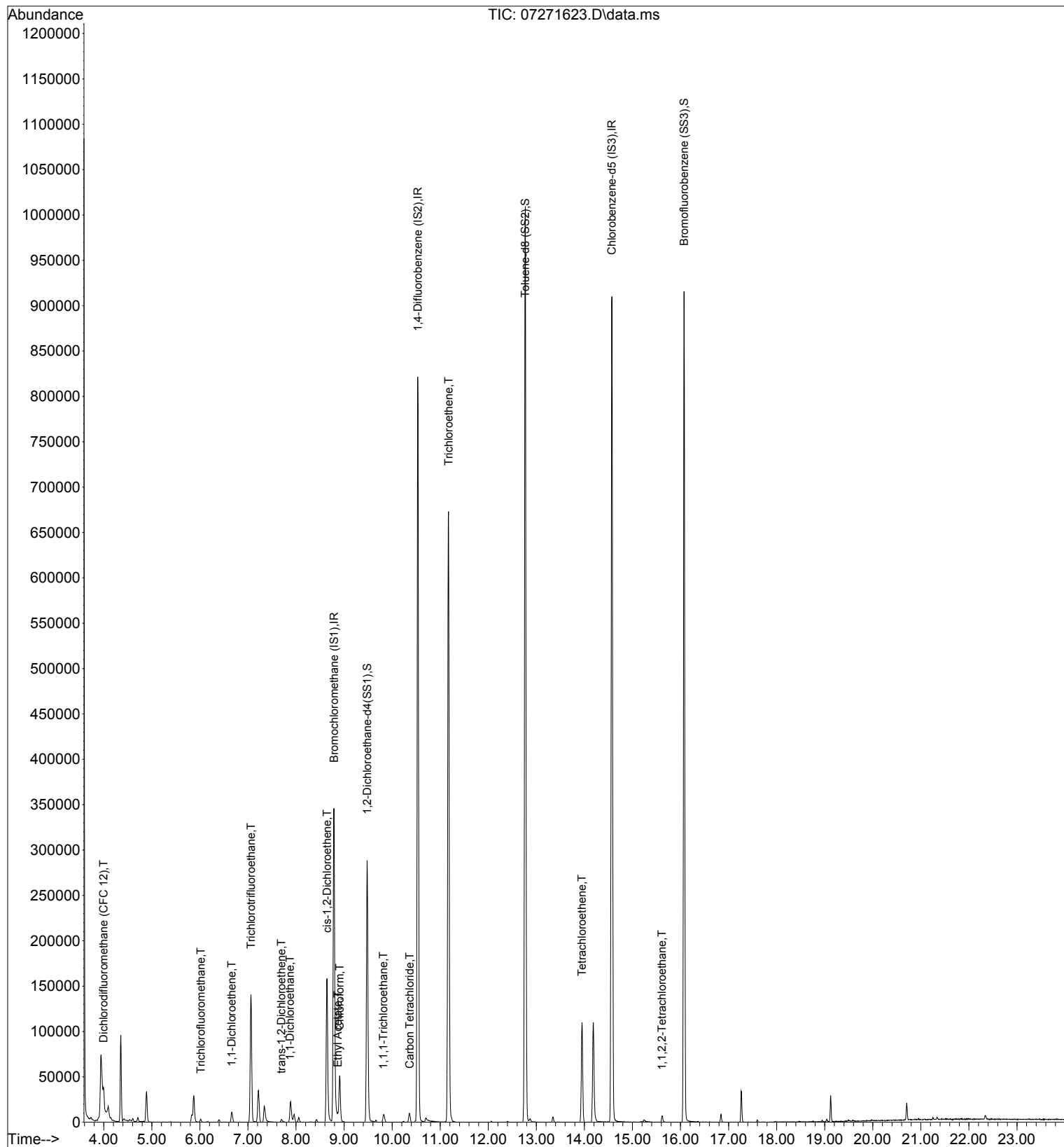
Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 14:41:56 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS08\Data\2016 07\27\07271623.D

Acq On : 27 Jul 2016 21:39

Operator: WA

Sample : P1603665-001dil (100mL)

Misc : S29-07071605

ALS Vial : 9 Sample Multiplier: 1

Quant Time: Jul 28 06:45:48 2016

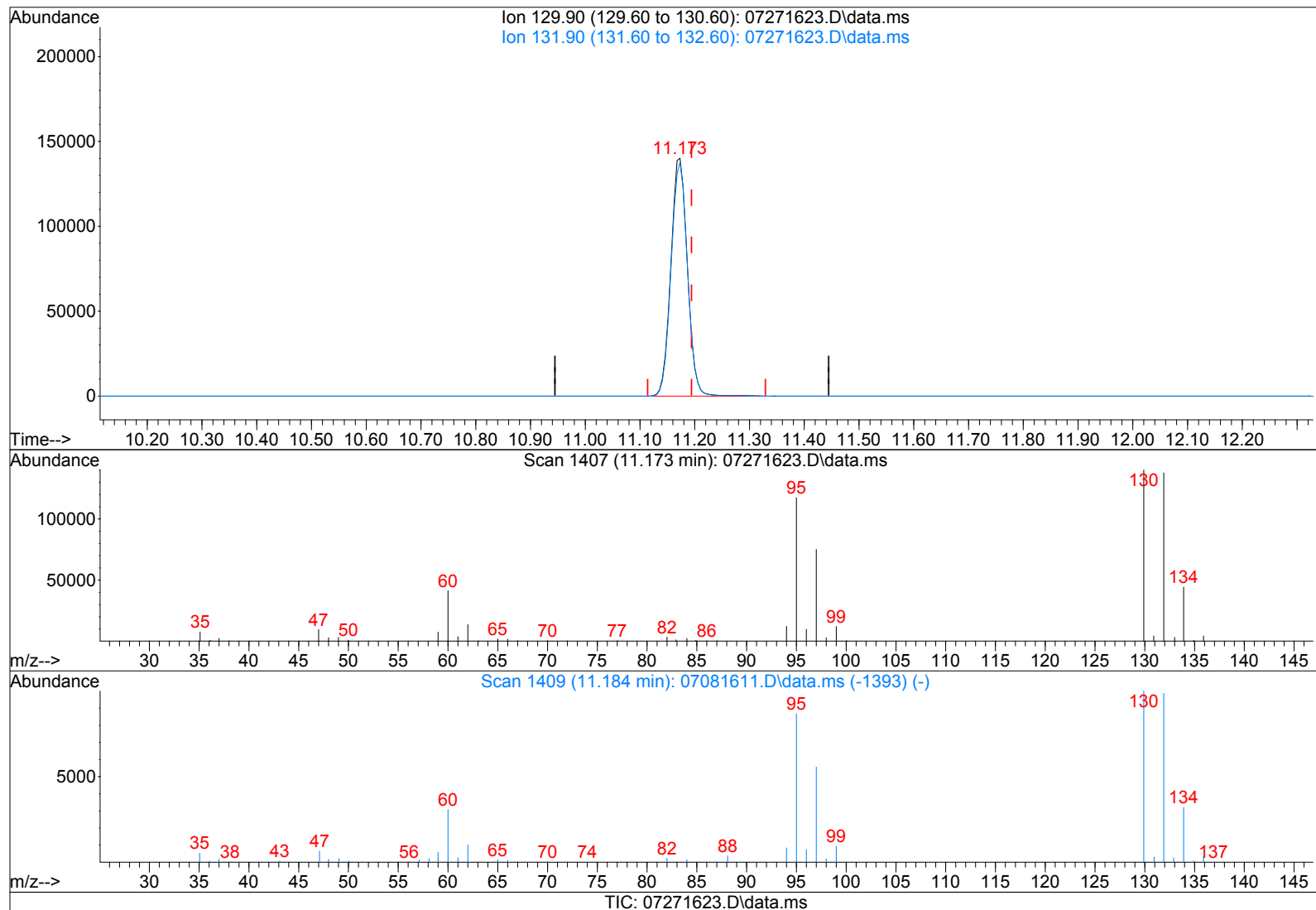
Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 14:41:56 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M



(47) Trichloroethene (T)

11.173min (-0.021) 15.41ng

response 293220

Ion	Exp%	Act%
129.90	100	100
131.90	98.50	97.01
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS08\Data\2016 07\27\07271603.D

Acq On : 27 Jul 2016 9:29

Operator: WA

Sample : MB R8072716 1000mL

Misc : S29-07071605 AS00703

ALS Vial : 1 Sample Multiplier: 1

Quant Time: Jul 27 10:37:32 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 14:41:56 2016

Response via : Initial Calibration

WA 7/27/16

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.79	130	171571	12.500	ng	-0.04
37) 1,4-Difluorobenzene (IS2)	10.53	114	788988	12.500	ng	-0.03
56) Chlorobenzene-d5 (IS3)	14.57	82	307744	12.500	ng	-0.01

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.48	65	203863	12.656	ng	-0.03
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.28%
57) Toluene-d8 (SS2)	12.77	98	791546	12.231	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.84%
73) Bromofluorobenzene (SS3)	16.07	174	322307	13.003	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	104.00%

Target Compounds

						Qvalue
2) Propene	0.00	42	0	N.D.		
3) Dichlorodifluoromethan...	0.00	85	0	N.D.		
4) Chloromethane	4.11	50	739	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.		
6) Vinyl Chloride	0.00	62	0	N.D.		
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	5.41	45	938	0.096	ng	# 64
11) Acetonitrile	5.65	41	642	N.D.		
12) Acrolein	0.00	56	0	N.D.		
13) Acetone	5.90	58	1085	0.098	ng	89
14) Trichlorofluoromethane	0.00	101	0	N.D.		
15) 2-Propanol (Isopropanol)	0.00	45	0	N.D.		
16) Acrylonitrile	0.00	53	0	N.D.		
17) 1,1-Dichloroethene	0.00	96	0	N.D.		
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.		
19) Methylene Chloride	0.00	84	0	N.D.		
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.		
21) Trichlorotrifluoroethane	0.00	151	0	N.D.		
22) Carbon Disulfide	7.08	76	5969	0.099	ng	# 73
23) trans-1,2-Dichloroethene	0.00	61	0	N.D.		
24) 1,1-Dichloroethane	0.00	63	0	N.D.		
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.		
27) 2-Butanone (MEK)	0.00	72	0	N.D.		
28) cis-1,2-Dichloroethene	0.00	61	0	N.D.		
29) Diisopropyl Ether	0.00	87	0	N.D.		
30) Ethyl Acetate	0.00	61	0	N.D.		
31) n-Hexane	0.00	57	0	N.D.		
32) Chloroform	0.00	83	0	N.D.		
34) Tetrahydrofuran (THF)	0.00	72	0	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	0.00	62	0	N.D.		
38) 1,1,1-Trichloroethane	0.00	97	0	N.D.		
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	0.00	56	0	N.D.		
41) Benzene	10.24	78	990	N.D.		
42) Carbon Tetrachloride	0.00	117	0	N.D.		
43) Cyclohexane	0.00	84	0	N.D.		
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D.		
47) Trichloroethene	0.00	130	0	N.D.		
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.		

Data File: I:\MS08\Data\2016 07\27\07271603.D

Acq On : 27 Jul 2016 9:29

Operator: WA

Sample : MB R8072716 1000mL

Misc : S29-07071605 AS00703

ALS Vial : 1 Sample Multiplier: 1

Quant Time: Jul 27 10:37:32 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 14:41:56 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	0.00	100	0	N.D.		
51) n-Heptane	0.00	71	0	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	12.87	91	840	N.D.		
59) 2-Hexanone	0.00	43	0	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	0.00	43	0	N.D.		
63) n-Octane	0.00	57	0	N.D.		
64) Tetrachloroethene	0.00	166	0	N.D.		
65) Chlorobenzene	0.00	112	0	N.D.		
66) Ethylbenzene	0.00	91	0	N.D.		
67) m- & p-Xylenes	0.00	91	0	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	0.00	104	0	N.D.		
70) o-Xylene	0.00	91	0	N.D.		
71) n-Nonane	0.00	43	0	N.D.		
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.		
74) Cumene	16.21	105	1612	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	16.72	91	1047	N.D.		
77) 3-Ethyltoluene	16.82	105	1075	N.D.		
78) 4-Ethyltoluene	16.82	105	1075	N.D.		
79) 1,3,5-Trimethylbenzene	16.93	105	703	N.D.		
80) alpha-Methylstyrene	0.00	118	0	N.D.		
81) 2-Ethyltoluene	17.11	105	518	N.D.		
82) 1,2,4-Trimethylbenzene	17.21	105	753	N.D.		
83) n-Decane	0.00	57	0	N.D.		
84) Benzyl Chloride	0.00	91	0	N.D.		
85) 1,3-Dichlorobenzene	17.55	146	545	N.D.		
86) 1,4-Dichlorobenzene	17.55	146	545	N.D.		
87) sec-Butylbenzene	0.00	105	0	N.D.		
88) 4-Isopropyltoluene (p-...	0.00	119	0	N.D.		
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	0.00	68	0	N.D.		
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	0.00	57	0	N.D.		
94) 1,2,4-Trichlorobenzene	19.48	180	816	N.D.		
95) Naphthalene	19.59	128	4085	N.D.		
96) n-Dodecane	0.00	57	0	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.		
99) tert-Butylbenzene	17.23	119	867	N.D.		
100) n-Butylbenzene	0.00	91	0	N.D.		

(#)=qualifier out of range (m)=manual integration (+)=signals summed

Data File: I:\MS08\Data\2016 07\27\07271603.D

Acq On : 27 Jul 2016 9:29

Operator: WA

Sample : MB R8072716 1000mL

Misc : S29-07071605 AS00703

ALS Vial : 1 Sample Multiplier: 1

Quant Time: Jul 27 10:37:32 2016

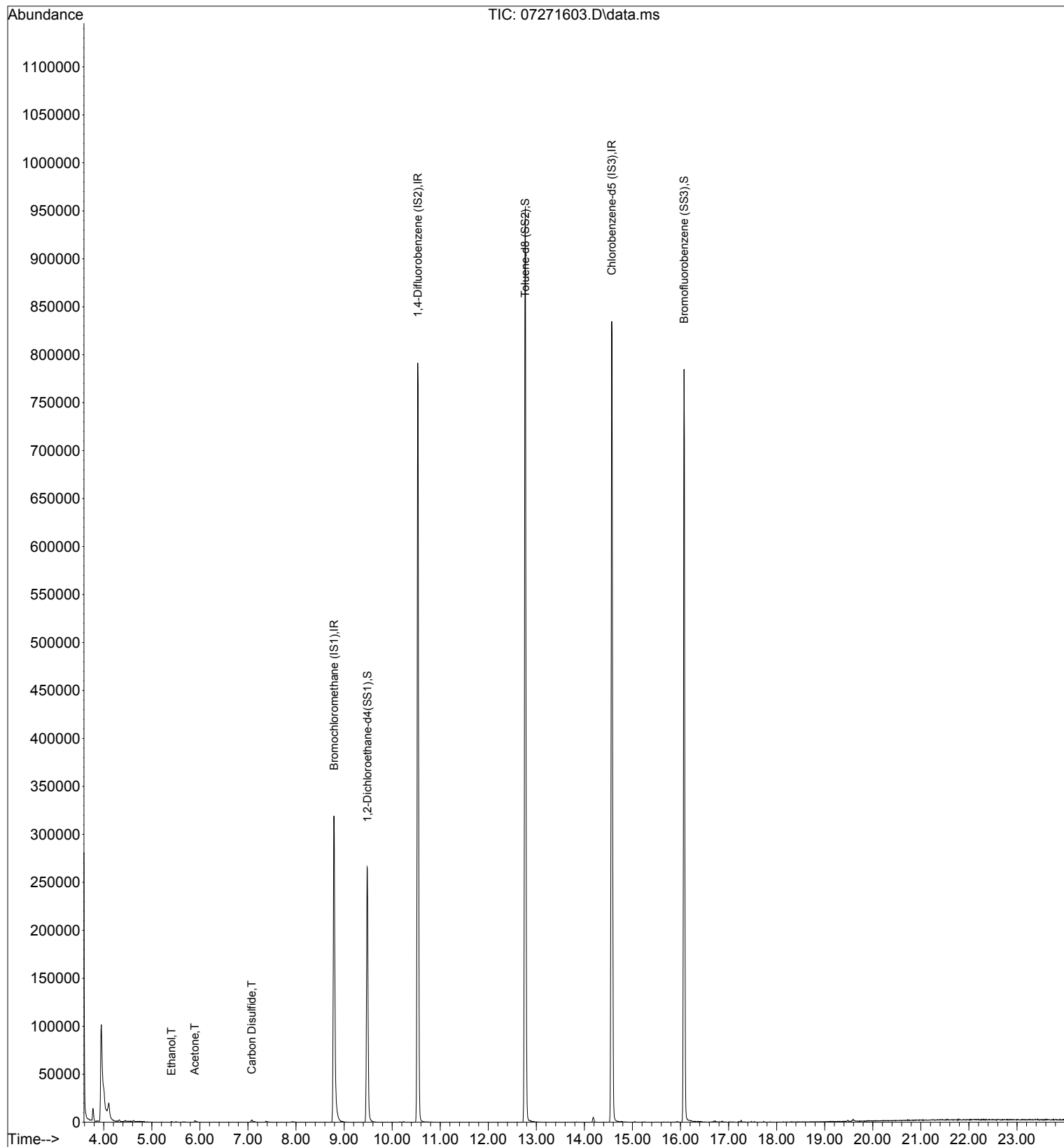
Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 14:41:56 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS08\Data\2016 07\27\07271606.D

Acq On : 27 Jul 2016 11:25

Operator: WA

Sample : LCS R8072716 25ng

Misc : S29-07071605/S29-07221604 (8/20)

ALS Vial : 1 Sample Multiplier: 1

Quant Time: Jul 27 12:41:45 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 14:41:56 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

7/27/16

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.81	130	167435	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	10.54	114	748189	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	14.57	82	305616	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.49	65	206250	13.120	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	104.96%
57) Toluene-d8 (SS2)	12.77	98	759675	11.820	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	94.56%
73) Bromofluorobenzene (SS3)	16.07	174	323800	13.155	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	105.20%

Target Compounds

						Qvalue
2) Propene	3.87	42	320738	22.425	ng	100
3) Dichlorodifluoromethan...	3.99	85	629154	22.606	ng	100
4) Chloromethane	4.19	50	394337	26.219	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.35	135	388065	22.504	ng	99
6) Vinyl Chloride	4.47	62	441993	23.740	ng	100
7) 1,3-Butadiene	4.65	54	336261	24.746	ng	99
8) Bromomethane	4.96	94	323706	24.610	ng	99
9) Chloroethane	5.17	64	263175	23.939	ng	100
10) Ethanol	5.41	45	1193587	124.574	ng	100
11) Acetonitrile	5.59	41	618019	24.865	ng	100
12) Acrolein	5.71	56	203309	25.499	ng	99
13) Acetone	5.85	58	1300042	120.238	ng	98
14) Trichlorofluoromethane	6.01	101	560325	22.915	ng	100
15) 2-Propanol (Isopropanol)	6.16	45	1707719	54.539	ng	99
16) Acrylonitrile	6.35	53	464167	26.802	ng	99
17) 1,1-Dichloroethene	6.66	96	367869	27.020	ng	100
18) 2-Methyl-2-Propanol (t...	6.76	59	1755470	54.776	ng	100
19) Methylene Chloride	6.80	84	365187	27.267	ng	100
20) 3-Chloro-1-propene (Al...	6.92	41	489837	29.848	ng	100
21) Trichlorotrifluoroethane	7.07	151	353197	25.615	ng	99
22) Carbon Disulfide	7.05	76	1211039	20.539	ng	100
23) trans-1,2-Dichloroethene	7.70	61	470596	26.667	ng	99
24) 1,1-Dichloroethane	7.90	63	591880	25.250	ng	100
25) Methyl tert-Butyl Ether	7.94	73	1086046	25.535	ng	99
26) Vinyl Acetate	8.04	86	526019	140.048	ng	99
27) 2-Butanone (MEK)	8.25	72	258324	28.383	ng	99
28) cis-1,2-Dichloroethene	8.66	61	456870	26.993	ng	99
29) Diisopropyl Ether	8.85	87	311909	24.793	ng	96
30) Ethyl Acetate	8.85	61	241958	53.166	ng	100
31) n-Hexane	8.87	57	482553	21.553	ng	100
32) Chloroform	8.94	83	604835	26.308	ng	100
34) Tetrahydrofuran (THF)	9.27	72	250781	27.372	ng	97
35) Ethyl tert-Butyl Ether	9.34	87	472760	25.628	ng	100
36) 1,2-Dichloroethane	9.59	62	415565	26.678	ng	100
38) 1,1,1-Trichloroethane	9.83	97	542457	25.759	ng	100
39) Isopropyl Acetate	10.13	61	418442	55.429	ng	99
40) 1-Butanol	10.15	56	756235	57.414	ng	98
41) Benzene	10.24	78	1369553	24.927	ng	100
42) Carbon Tetrachloride	10.38	117	473612	27.457	ng	99
43) Cyclohexane	10.49	84	1125288	46.858	ng	99
44) tert-Amyl Methyl Ether	10.76	73	1048903	26.036	ng	100
45) 1,2-Dichloropropane	10.97	63	333794	25.458	ng	99
46) Bromodichloromethane	11.13	83	481012	27.829	ng	100
47) Trichloroethene	11.18	130	422778	24.205	ng	99
48) 1,4-Dioxane	11.15	88	323201	28.472	ng	100
49) 2,2,4-Trimethylpentane...	11.23	57	1448625	24.794	ng	100

Data File: I:\MS08\Data\2016 07\27\07271606.D

Acq On : 27 Jul 2016 11:25

Operator: WA

Sample : LCS R8072716 25ng

Misc : S29-07071605/S29-07221604 (8/20)

ALS Vial : 1 Sample Multiplier: 1

Quant Time: Jul 27 12:41:45 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 14:41:56 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.33	100	343158	52.892	ng	98
51) n-Heptane	11.45	71	342204	24.370	ng	99
52) cis-1,3-Dichloropropene	11.95	75	538104	27.683	ng	99
53) 4-Methyl-2-pentanone	11.97	58	339096	28.056	ng	100
54) trans-1,3-Dichloropropene	12.42	75	506060	28.201	ng	99
55) 1,1,2-Trichloroethane	12.59	97	368587	26.913	ng	100
58) Toluene	12.87	91	1514194	23.042	ng	100
59) 2-Hexanone	13.08	43	784077	28.011	ng	100
60) Dibromochloromethane	13.25	129	461001	28.407	ng	99
61) 1,2-Dibromoethane	13.50	107	434159	27.096	ng	99
62) n-Butyl Acetate	13.67	43	888116	30.812	ng	99
63) n-Octane	13.80	57	290987	23.131	ng	99
64) Tetrachloroethene	13.95	166	526082	23.196	ng	97
65) Chlorobenzene	14.62	112	1079310	24.213	ng	99
66) Ethylbenzene	14.99	91	1782454	24.753	ng	100
67) m- & p-Xylenes	15.18	91	2762658	48.444	ng	100
68) Bromoform	15.25	173	445896	26.342	ng	98
69) Styrene	15.53	104	1217694	27.413	ng	99
70) o-Xylene	15.64	91	1431391	23.691	ng	99
71) n-Nonane	15.85	43	671601	23.471	ng	99
72) 1,1,2,2-Tetrachloroethane	15.61	83	656122	24.433	ng	99
74) Cumene	16.21	105	1911880	23.855	ng	100
75) alpha-Pinene	16.59	93	961160	25.719	ng	100
76) n-Propylbenzene	16.70	91	2196634	23.844	ng	100
77) 3-Ethyltoluene	16.80	105	1969854	25.396	ng	100
78) 4-Ethyltoluene	16.84	105	1850532	24.939	ng	100
79) 1,3,5-Trimethylbenzene	16.91	105	1617977	24.703	ng	100
80) alpha-Methylstyrene	17.06	118	946102	25.920	ng	100
81) 2-Ethyltoluene	17.10	105	1880996	24.793	ng	100
82) 1,2,4-Trimethylbenzene	17.31	105	1670351	26.125	ng	99
83) n-Decane	17.41	57	757418	24.072	ng	99
84) Benzyl Chloride	17.43	91	1433725	29.660	ng	99
85) 1,3-Dichlorobenzene	17.46	146	1092399	27.057	ng	99
86) 1,4-Dichlorobenzene	17.52	146	1092558	25.514	ng	100
87) sec-Butylbenzene	17.57	105	2174665	25.526	ng	100
88) 4-Isopropyltoluene (p-...	17.72	119	2124987	25.224	ng	100
89) 1,2,3-Trimethylbenzene	17.71	105	1727067	25.992	ng	100
90) 1,2-Dichlorobenzene	17.84	146	1050304	26.696	ng	99
91) d-Limonene	17.85	68	589197	28.566	ng	99
92) 1,2-Dibromo-3-Chloropr...	18.26	157	399569	27.524	ng	99
93) n-Undecane	18.61	57	772476	24.963	ng	99
94) 1,2,4-Trichlorobenzene	19.46	180	867589	29.064	ng	99
95) Naphthalene	19.57	128	2474333	28.211	ng	100
96) n-Dodecane	19.58	57	715129	24.910	ng	100
97) Hexachlorobutadiene	19.91	225	580109	27.679	ng	99
98) Cyclohexanone	15.32	55	511965	27.859	ng	100
99) tert-Butylbenzene	17.31	119	1691831	24.951	ng	99
100) n-Butylbenzene	18.12	91	1687167	27.394	ng	100

(#)=qualifier out of range (m)=manual integration (+)=signals summed

Method Path : I:\MS08\Methods\
 Method File : R8070816.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Fri Jul 08 14:41:56 2016
 Response Via : Initial Calibration

~~DA~~ 7/8/16

Calibration Files

0.08=07081605.D 0.10=07081606.D 0.20=07081607.D 0.40=07081608.D 1.0 =07081609.D 5.0 =07081610.D 25 =07081611.D
 50 =07081612.D 100 =07081613.D

	Compound	0.08	0.10	0.20	0.40	1.0	5.0	25	50	100	Avg	%RSD
1) IR	Bromochloromethane...	-----ISTD-----										
2) T	Propene	1.294	1.018	1.072	0.963	0.993	1.103	1.082	0.999	1.087	1.068	9.16
3) T	Dichlorodifluo...	2.140	2.132	2.042	2.044	2.069	2.009	2.230	2.089	1.944	2.078	4.00
4) T	Chloromethane	1.089	1.110	1.008	0.631	1.417	0.964	1.531	1.375	0.980	1.123	24.77
5) T	1,2-Dichloro-1...	1.303	1.345	1.186	1.236	1.300	1.220	1.355	1.346	1.296	1.287	4.69
6) T	Vinyl Chloride	1.277	1.200	1.254	1.351	1.471	1.430	1.599	1.485	1.442	1.390	9.25
7) T	1,3-Butadiene	0.949	0.796	0.837	0.937	1.041	1.042	1.246	1.164	1.117	1.014	14.67
8) T	Bromomethane	0.967	0.847	0.852	0.920	1.017	0.987	1.122	1.083	1.043	0.982	9.79
9) T	Chloroethane	0.842	0.761	0.737	0.784	0.847	0.818	0.913	0.863	0.821	0.821	6.59
10) T	Ethanol	0.714	0.652	0.708	0.695	0.765	0.725	0.796	0.728	0.656	0.715	6.46
11) T	Acetonitrile	1.785	1.768	1.674	1.831	1.968	1.886	2.071	1.927	1.791	1.856	6.48
12) T	Acrolein	0.483	0.415	0.705	0.544	0.596	0.605	0.714	0.667	0.627	0.595	16.83
13) T	Acetone			1.069	0.753	0.801	0.767	0.835	0.754	0.672	0.807	15.62
14) T	Trichlorofluor...	1.877	1.897	1.727	1.734	1.809	1.777	1.940	1.864	1.803	1.825	4.04
15) T	2-Propanol (Is...	2.228	2.342	2.221	2.225	2.480	2.255	2.798	2.534	1.956	2.338	10.27
16) T	Acrylonitrile			0.982	1.116	1.305	1.339	1.531	1.432	1.345	1.293	14.43
17) T	1,1-Dichloroet...	0.890	0.940	0.944	0.976	1.034	1.025	1.164	1.113	1.062	1.016	8.67
18) T	2-Methyl-2-Pro...	2.419	2.395	2.222	2.264	2.491	2.192	2.882	2.634	2.035	2.393	10.68
19) T	Methylene Chlo...	0.884	0.882	0.971	0.958	1.032	1.011	1.142	1.087	1.031	1.000	8.64
20) T	3-Chloro-1-pro...	1.007	1.035	1.043	1.116	1.220	1.271	1.541	1.454	1.341	1.225	15.72
21) T	Trichlorotrifl...	0.971	1.045	1.047	0.950	1.027	0.972	1.118	1.081	1.054	1.029	5.39
22) T	Carbon Disulfide			5.227	4.545	4.355	4.060	4.519	4.204	3.904	4.402	9.82
23) T	trans-1,2-Dich...	1.210	1.195	1.156	1.225	1.373	1.356	1.544	1.448	1.351	1.317	9.87
24) T	1,1-Dichloroet...	1.728	1.727	1.653	1.698	1.780	1.742	1.918	1.813	1.690	1.750	4.51
25) T	Methyl tert-Bu...	3.182	3.211	2.927	3.071	3.214	3.142	3.468	3.282	3.082	3.175	4.75
26) T	Vinyl Acetate	0.186	0.244	0.272	0.248	0.271	0.294	0.353	0.339	0.317	0.280	18.56
27) T	2-Butanone (MEK)	0.568	0.520	0.735	0.570	0.692	0.726	0.805	0.770	0.730	0.679	14.89
28) T	cis-1,2-Dichlo...	1.167	1.230	1.130	1.228	1.288	1.291	1.436	1.350	1.253	1.264	7.30
29) T	Diisopropyl Ether	0.875	1.021	0.925	0.916	0.950	0.931	1.007	0.943	0.884	0.939	5.24
30) T	Ethyl Acetate			0.268	0.323	0.361	0.365	0.392	0.359	0.311	0.340	12.28
31) T	n-Hexane	1.811	1.969	1.736	1.717	1.728	1.687	1.627	1.480	1.290	1.672	11.62
32) T	Chloroform	1.767	1.684	1.614	1.656	1.718	1.681	1.868	1.774	1.685	1.716	4.44
33) S	1,2-Dichloroet...	1.171	1.184	1.174	1.185	1.204	1.189	1.169	1.150	1.138	1.174	1.72
34) T	Tetrahydrofura...	0.627	0.607	0.607	0.639	0.712	0.714	0.788	0.750	0.714	0.684	9.68
35) T	Ethyl tert-But...	1.324	1.346	1.296	1.302	1.397	1.363	1.521	1.456	1.389	1.377	5.35
36) T	1,2-Dichloroet...	1.103	1.116	1.092	1.130	1.204	1.160	1.294	1.218	1.148	1.163	5.62
37) IR	1,4-Difluorobenzen...	-----ISTD-----										
38) T	1,1,1-Trichlor...	0.380	0.336	0.313	0.329	0.346	0.341	0.393	0.374	0.354	0.352	7.45
39) T	Isopropyl Acetate	0.115	0.109	0.116	0.123	0.135	0.133	0.148	0.135	0.121	0.126	9.96
40) T	1-Butanol				0.171	0.199	0.219	0.267	0.244	0.220	0.220	15.37
41) T	Benzene	1.156	0.960	0.855	0.859	0.895	0.859	0.950	0.893	0.834	0.918	10.80
42) T	Carbon Tetrach...	0.268	0.269	0.255	0.277	0.273	0.278	0.338	0.324	0.312	0.288	10.01

Method Path : I:\MS08\Methods\													
Method File : R8070816.M													
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)													
43)	T	Cyclohexane	0.464	0.432	0.386	0.380	0.387	0.380	0.423	0.395	0.363	0.401	7.99
44)	T	tert-Amyl Meth...	0.635	0.633	0.626	0.641	0.678	0.672	0.776	0.727	0.669	0.673	7.39
45)	T	1,2-Dichloropr...	0.213	0.209	0.215	0.214	0.222	0.219	0.242	0.226	0.212	0.219	4.70
46)	T	Bromodichlorom...	0.250	0.248	0.279	0.263	0.290	0.291	0.344	0.327	0.307	0.289	11.50
47)	T	Trichloroethene	0.284	0.296	0.274	0.276	0.285	0.282	0.317	0.310	0.302	0.292	5.22
48)	T	1,4-Dioxane	0.162	0.163	0.171	0.182	0.201	0.196	0.223	0.210	0.198	0.190	11.18
49)	T	2,2,4-Trimethy...	0.987	0.982	0.924	0.960	1.012	0.972	1.088	0.984	0.876	0.976	5.95
50)	T	Methyl Methacr...			0.082	0.091	0.105	0.110	0.129	0.124	0.118	0.108	15.94
51)	T	n-Heptane	0.223	0.249	0.235	0.218	0.245	0.235	0.251	0.234	0.223	0.235	5.09
52)	T	cis-1,3-Dichlo...	0.263	0.269	0.268	0.301	0.327	0.347	0.406	0.384	0.359	0.325	16.32
53)	T	4-Methyl-2-pen...			0.160	0.173	0.206	0.208	0.242	0.223	0.201	0.202	13.87
54)	T	trans-1,3-Dich...			0.204	0.239	0.282	0.308	0.375	0.356	0.335	0.300	20.83
55)	T	1,1,2-Trichlor...	0.219	0.205	0.209	0.215	0.228	0.229	0.265	0.251	0.238	0.229	8.69
56)	IR	Chlorobenzene-d5 (... -----ISTD-----)											
57)	S	Toluene-d8 (SS2)	2.679	2.664	2.634	2.644	2.622	2.628	2.585	2.580	2.623	2.629	1.23
58)	T	Toluene	3.024	2.751	2.608	2.546	2.643	2.562	2.834	2.674	2.549	2.688	5.92
59)	T	2-Hexanone			0.960	0.925	1.124	1.195	1.397	1.266	1.147	1.145	14.42
60)	T	Dibromochlorom...	0.488	0.575	0.550	0.590	0.655	0.683	0.835	0.806	0.792	0.664	18.71
61)	T	1,2-Dibromoethane	0.534	0.558	0.553	0.624	0.663	0.672	0.794	0.757	0.742	0.655	14.56
62)	T	n-Butyl Acetate	0.912	0.776	1.020	1.091	1.232	1.331	1.560	1.413	1.275	1.179	21.23
63)	T	n-Octane	0.484	0.523	0.490	0.494	0.531	0.516	0.572	0.527	0.494	0.515	5.43
64)	T	Tetrachloroethene	0.862	0.930	0.880	0.872	0.927	0.891	1.015	0.985	0.987	0.928	6.09
65)	T	Chlorobenzene	1.889	1.928	1.683	1.726	1.813	1.719	1.966	1.876	1.808	1.823	5.44
66)	T	Ethylbenzene	2.963	2.906	2.697	2.792	2.953	2.868	3.314	3.089	2.926	2.945	6.01
67)	T	m- & p-Xylenes	2.391	2.317	2.156	2.215	2.367	2.242	2.601	2.424	2.280	2.332	5.69
68)	T	Bromoform			0.528	0.530	0.611	0.666	0.851	0.829	0.831	0.692	20.71
69)	T	Styrene	1.598	1.583	1.557	1.621	1.813	1.857	2.220	2.097	2.007	1.817	13.59
70)	T	o-Xylene	2.546	2.459	2.327	2.295	2.464	2.396	2.751	2.572	2.430	2.471	5.60
71)	T	n-Nonane	1.164	1.172	1.116	1.138	1.227	1.190	1.325	1.172	1.028	1.170	6.89
72)	T	1,1,2,2-Tetrac...	1.024	1.056	0.951	1.016	1.103	1.116	1.291	1.203	1.124	1.098	9.36
73)	S	Bromofluoroben...	1.012	0.999	0.989	0.992	1.006	1.012	1.022	1.017	1.012	1.007	1.11
74)	T	Cumene	3.405	3.083	3.006	3.078	3.275	3.236	3.722	3.473	3.226	3.278	6.89
75)	T	alpha-Pinene	1.414	1.381	1.318	1.454	1.504	1.536	1.821	1.711	1.620	1.529	10.66
76)	T	n-Propylbenzene	3.807	3.682	3.356	3.592	3.861	3.741	4.318	3.957	3.600	3.768	7.18
77)	T	3-Ethyltoluene	3.099	3.045	2.744	2.955	3.284	3.257	3.697	3.325	3.147	3.173	8.42
78)	T	4-Ethyltoluene	3.144	2.887	2.892	2.811	2.951	2.899	3.433	3.295	3.004	3.035	6.95
79)	T	1,3,5-Trimethy...	2.820	2.545	2.433	2.550	2.709	2.604	3.001	2.806	2.642	2.679	6.51
80)	T	alpha-Methylst...			1.061	1.302	1.423	1.495	1.814	1.707	1.647	1.493	17.30
81)	T	2-Ethyltoluene	3.166	2.925	2.862	2.947	3.161	3.084	3.492	3.262	3.028	3.103	6.28
82)	T	1,2,4-Trimethy...	2.497	2.351	2.377	2.420	2.663	2.640	3.072	2.874	2.642	2.615	9.16
83)	T	n-Decane	1.222	1.211	1.199	1.249	1.361	1.344	1.497	1.338	1.161	1.287	8.25
84)	T	Benzyl Chloride			1.342	1.445	1.719	1.992	2.592	2.457	2.292	1.977	24.95
85)	T	1,3-Dichlorobe...	1.576	1.537	1.479	1.492	1.644	1.618	1.911	1.824	1.781	1.651	9.31
86)	T	1,4-Dichlorobe...	1.747	1.748	1.614	1.613	1.707	1.672	1.975	1.874	1.814	1.751	6.86
87)	T	sec-Butylbenzene	3.489	3.275	3.240	3.271	3.630	3.500	3.969	3.667	3.319	3.484	6.92
88)	T	4-Isopropyltol...	3.309	3.041	3.108	3.270	3.557	3.498	4.040	3.781	3.408	3.446	9.23
89)	T	1,2,3-Trimethy...	2.584	2.505	2.439	2.605	2.771	2.742	3.165	2.958	2.690	2.718	8.39
90)	T	1,2-Dichlorobe...	1.534	1.457	1.467	1.492	1.603	1.596	1.859	1.760	1.715	1.609	8.77
91)	T	d-Limonene	0.659	0.646	0.658	0.816	0.925	0.951	1.110	0.987	0.840	0.844	19.55
92)	T	1,2-Dibromo-3-...			0.439	0.490	0.556	0.603	0.717	0.684	0.666	0.594	17.51
93)	T	n-Undecane	1.136	1.059	1.056	1.303	1.372	1.403	1.525	1.359	1.180	1.266	13.06
94)	T	1,2,4-Trichlor...	1.075	1.029	1.034	1.138	1.260	1.255	1.442	1.389	1.367	1.221	12.98

Method Path : I:\MS08\Methods\
Method File : R8070816.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

95)	T	Naphthalene	3.299	2.715	2.850	3.412	3.755	3.815	4.434	4.172	3.835	3.587	15.95
96)	T	n-Dodecane			0.705	1.270	1.246	1.297	1.435	1.246	1.020	1.174	20.47
97)	T	Hexachlorobuta...	0.890	0.765	0.789	0.811	0.851	0.844	0.941	0.907	0.918	0.857	7.11
98)	T	Cyclohexanone	0.766	0.636	0.654	0.696	0.726	0.754	0.916	0.840	0.778	0.752	11.78
99)	T	tert-Butylbenzene	2.803	2.626	2.559	2.621	2.742	2.708	3.156	2.970	2.775	2.773	6.77
100)	T	n-Butylbenzene	2.281	2.205	2.267	2.425	2.664	2.624	2.994	2.732	2.479	2.519	10.23

(#) = Out of Range

Primary Source Standards Concentrations (Working & Initial Calibration)

7/8/16

1ng/L Std. ID: S29-06291609
4ng/L Std. ID: S29-06291607
20ng/L Std. ID: S29-06291604
200ng/L Std. ID: S29-07081602

Dilution Factors:						Working STD Conc.(ng/L):	1	1	1	4	20	20	200	200	200
						Injection (L):	0.080	0.100	0.200	0.100	0.050	0.25	0.125	0.25	0.50
						ICAL Points:	0.08ng	0.1ng	0.2ng	0.4ng	1ng	5ng	25ng	50ng	100ng
Compounds	Source Std. mg/m ³	200ng/L	20ng/L	4ng/L	1ng/L		0.0824	0.103	0.206	0.412	1.03	5.15	25.75	51.5	103
Propene	1.03	206	20.6	4.12	1.03		0.0800	0.100	0.200	0.400	1.00	5.00	25.00	50.0	100
Dichlorodifluoromethane	1.00	200	20.0	4.00	1.00		0.0784	0.098	0.196	0.392	0.98	4.90	24.50	49.0	98
Chloromethane	0.98	196	19.6	3.92	0.98		0.0824	0.103	0.206	0.412	1.03	5.15	25.75	51.5	103
Freon-114	1.03	206	20.6	4.12	1.03		0.0800	0.100	0.200	0.400	1.00	5.00	25.00	50.0	100
Vinyl Chloride	1.00	200	20.0	4.00	1.00		0.0848	0.106	0.212	0.424	1.06	5.30	26.50	53.0	106
1,3-Butadiene	1.06	212	21.2	4.24	1.06		0.0800	0.100	0.200	0.400	1.00	5.00	25.00	50.0	100
Bromomethane	1.00	200	20.0	4.00	1.00		0.0808	0.101	0.202	0.404	1.01	5.05	25.25	50.5	101
Chloroethane	1.01	202	20.2	4.04	1.01		0.4048	0.506	1.012	2.024	5.06	25.30	126.50	253.0	506
Ethanol	5.06	1012	101.2	20.24	5.06		0.0816	0.102	0.204	0.408	1.02	5.10	25.50	51.0	102
Acetonitrile	1.02	204	20.4	4.08	1.02		0.0856	0.107	0.214	0.428	1.07	5.35	26.75	53.5	107
Acrolein	1.07	214	21.4	4.28	1.07		0.4296	0.537	1.074	2.148	5.37	26.85	134.25	268.5	537
Acetone	5.37	1074	107.4	21.48	5.37		0.0792	0.099	0.198	0.396	0.99	4.95	24.75	49.5	99
Trichlorofluoromethane	0.99	198	19.8	3.96	0.99		0.1672	0.209	0.418	0.836	2.09	10.45	52.25	104.5	209
Isopropanol	2.09	418	41.8	8.36	2.09		0.0824	0.103	0.206	0.412	1.03	5.15	25.75	51.5	103
Acrylonitrile	1.03	206	20.6	4.12	1.03		0.0856	0.107	0.214	0.428	1.07	5.35	26.75	53.5	107
1,1-Dichloroethene	1.07	214	21.4	4.28	1.07		0.1672	0.209	0.418	0.836	2.09	10.45	52.25	104.5	209
tert-Butanol	2.09	418	41.8	8.36	2.09		0.0864	0.108	0.216	0.432	1.08	5.40	27.00	54.0	108
Methylene Chloride	1.08	216	21.6	4.32	1.08		0.0864	0.108	0.216	0.432	1.08	5.40	27.00	54.0	108
Allyl Chloride	1.08	216	21.6	4.32	1.08		0.0864	0.108	0.216	0.432	1.08	5.40	27.00	54.0	108
Trichlorotrifluoroethane	1.08	216	21.6	4.32	1.08		0.0784	0.098	0.196	0.392	0.98	4.90	24.50	49.0	98
Carbon Disulfide	0.98	196	19.6	3.92	0.98		0.0848	0.106	0.212	0.424	1.06	5.30	26.50	53.0	106
trans-1,2-Dichloroethene	1.06	212	21.2	4.24	1.06		0.0832	0.104	0.208	0.416	1.04	5.20	26.00	52.0	104
1,1-Dichloroethane	1.04	208	20.8	4.16	1.04		0.0840	0.105	0.210	0.420	1.05	5.25	26.25	52.5	105
Methyl tert-Butyl Ether	1.05	210	21.0	4.20	1.05		0.4056	0.507	1.014	2.028	5.07	25.35	126.75	253.5	507
Vinyl Acetate	5.07	1014	101.4	20.28	5.07		0.0856	0.107	0.214	0.428	1.07	5.35	26.75	53.5	107
2-Butanone	1.07	214	21.4	4.28	1.07		0.0856	0.107	0.214	0.428	1.07	5.35	26.75	53.5	107
cis-1,2-Dichloroethene	1.07	214	21.4	4.28	1.07		0.0864	0.108	0.216	0.432	1.08	5.40	27.00	54.0	108
Diisopropyl Ether	1.08	216	21.6	4.32	1.08		0.1696	0.212	0.424	0.848	2.12	10.60	53.00	106.0	212
Ethyl Acetate	2.12	424	42.4	8.48	2.12		0.0832	0.104	0.208	0.416	1.04	5.20	26.00	52.0	104
n-Hexane	1.04	208	20.8	4.16	1.04		0.0856	0.107	0.214	0.428	1.07	5.35	26.75	53.5	107
Chloroform	1.07	214	21.4	4.28	1.07		0.0816	0.102	0.204	0.408	1.02	5.10	25.50	51.0	102
Tetrahydrofuran	1.02	204	20.4	4.08	1.02		0.0840	0.105	0.210	0.420	1.05	5.25	26.25	52.5	105
Ethyl tert-Butyl Ether	1.05	210	21.0	4.20	1.05		0.0840	0.105	0.210	0.420	1.05	5.25	26.25	52.5	105
1,2-Dichloroethane	1.05	210	21.0	4.20	1.05		0.0824	0.103	0.206	0.412	1.03	5.15	25.75	51.5	103
1,1,1-Trichloroethane	1.03	206	20.6	4.12	1.03		0.1768	0.221	0.442	0.884	2.21	11.05	55.25	110.5	221
Isopropyl Acetate	2.21	442	44.2	8.84	2.21		0.1808	0.226	0.452	0.904	2.26	11.30	56.50	113.0	226
1-Butanol	2.26	452	45.2	9.04	2.26		0.0888	0.111	0.222	0.444	1.11	5.55	27.75	55.5	111
Benzene	1.11	222	22.2	4.44	1.11		0.0864	0.108	0.216	0.432	1.08	5.40	27.00	54.0	108
Carbon Tetrachloride	1.08	216	21.6	4.32	1.08		0.1672	0.209	0.418	0.836	2.09	10.45	52.25	104.5	209
Cyclohexane	2.09	418	41.8	8.36	2.09		0.0832	0.104	0.208	0.416	1.04	5.20	26.00	52.0	104
tert-Amyl Methyl Ether	1.04	208	20.8	4.16	1.04		0.0840	0.105	0.210	0.420	1.05	5.25	26.25	52.5	105
1,2-Dichloropropane	1.05	210	21.0	4.20	1.05		0.0856	0.107	0.214	0.428	1.07	5.35	26.75	53.5	107
Bromodichloromethane	1.07	214	21.4	4.28	1.07		0.0824	0.103	0.206	0.412	1.03	5.15	25.75	51.5	103
Trichloroethene	1.03	206	20.6	4.12	1.03		0.0864	0.108	0.216	0.432	1.08	5.40	27.00	54.0	108
1,4-Dioxane	1.08	216	21.6	4.32	1.08		0.0824	0.103	0.206	0.412	1.03	5.15	25.75	51.5	103
Isooctane	1.03	206	20.6	4.12	1.03		0.1664	0.208	0.416	0.832	2.08	10.40	52.00	104.0	208
Methyl Methacrylate	2.08	416	41.6	8.32	2.08		0.0856	0.107	0.214	0.428	1.07	5.35	26.75	53.5	107
n-Heptane	1.07	214	21.4	4.28	1.07										

1ng/L Std. ID:	S29-06291609
4ng/L Std. ID:	S29-06291607
20ng/L Std. ID:	S29-06291604
200ng/L Std. ID:	S29-07081602

Dilution Factors:	5	50	250	1000

Primary Source Standards Concentrations (Working & Initial Calibration)

1ng/L Std. ID: S29-06291609

4ng/L Std. ID: S29-06291607

20ng/L Std. ID: S29-06291604

200ng/L Std. ID: S29-07081602

Dilution Factors: 5 50 250 1000

Compounds	Source Std.	Primary Working Standards				Working STD Conc.(ng/L):	1	1	1	4	20	20	200	200	200
	mg/m ³	200ng/L	20ng/L	4ng/L	1ng/L	Injection (L):	0.080	0.100	0.200	0.100	0.050	0.25	0.125	0.25	0.50
						ICAL Points:	0.08ng	0.1ng	0.2ng	0.4ng	1ng	5ng	25ng	50ng	100ng
4-Methyl-2-pentanone	1.08	216	21.6	4.32	1.08		0.0864	0.108	0.216	0.432	1.08	5.40	27.00	54.0	108
trans-1,3-Dichloropropene	1.07	214	21.4	4.28	1.07		0.0856	0.107	0.214	0.428	1.07	5.35	26.75	53.5	107
1,1,2-Trichloroethane	1.05	210	21.0	4.20	1.05		0.0840	0.105	0.210	0.420	1.05	5.25	26.25	52.5	105
Toluene	1.05	210	21.0	4.20	1.05		0.0840	0.105	0.210	0.420	1.05	5.25	26.25	52.5	105
2-Hexanone	1.11	222	22.2	4.44	1.11		0.0888	0.111	0.222	0.444	1.11	5.55	27.75	55.5	111
Dibromochloromethane	1.10	220	22.0	4.40	1.10		0.0880	0.110	0.220	0.440	1.10	5.50	27.50	55.0	110
1,2-Dibromoethane	1.07	214	21.4	4.28	1.07		0.0856	0.107	0.214	0.428	1.07	5.35	26.75	53.5	107
n-Butyl Acetate	1.11	222	22.2	4.44	1.11		0.0888	0.111	0.222	0.444	1.11	5.55	27.75	55.5	111
n-Octane	1.03	206	20.6	4.12	1.03		0.0824	0.103	0.206	0.412	1.03	5.15	25.75	51.5	103
Tetrachloroethene	0.99	198	19.8	3.96	0.99		0.0792	0.099	0.198	0.396	0.99	4.95	24.75	49.5	99
Chlorobenzene	1.07	214	21.4	4.28	1.07		0.0856	0.107	0.214	0.428	1.07	5.35	26.75	53.5	107
Ethylbenzene	1.05	210	21.0	4.20	1.05		0.0840	0.105	0.210	0.420	1.05	5.25	26.25	52.5	105
m-&p-Xylene	2.08	416	41.6	8.32	2.08		0.1664	0.208	0.416	0.832	2.08	10.40	52.00	104.0	208
Bromoform	1.07	214	21.4	4.28	1.07		0.0856	0.107	0.214	0.428	1.07	5.35	26.75	53.5	107
Styrene	1.08	216	21.6	4.32	1.08		0.0864	0.108	0.216	0.432	1.08	5.40	27.00	54.0	108
o-Xylene	1.02	204	20.4	4.08	1.02		0.0816	0.102	0.204	0.408	1.02	5.10	25.50	51.0	102
n-Nonane	1.01	202	20.2	4.04	1.01		0.0808	0.101	0.202	0.404	1.01	5.05	25.25	50.5	101
1,1,2,2-Tetrachloroethane	1.00	200	20.0	4.00	1.00		0.0800	0.100	0.200	0.400	1.00	5.00	25.00	50.0	100
Cumene	1.01	202	20.2	4.04	1.01		0.0808	0.101	0.202	0.404	1.01	5.05	25.25	50.5	101
alpha-Pinene	1.03	206	20.6	4.12	1.03		0.0824	0.103	0.206	0.412	1.03	5.15	25.75	51.5	103
n-Propylbenzene	1.00	200	20.0	4.00	1.00		0.0800	0.100	0.200	0.400	1.00	5.00	25.00	50.0	100
3-Ethyltoluene	1.04	208	20.8	4.16	1.04		0.0832	0.104	0.208	0.416	1.04	5.20	26.00	52.0	104
4-Ethyltoluene	1.05	210	21.0	4.20	1.05		0.0840	0.105	0.210	0.420	1.05	5.25	26.25	52.5	105
1,3,5-Trimethylbenzene	1.04	208	20.8	4.16	1.04		0.0832	0.104	0.208	0.416	1.04	5.20	26.00	52.0	104
alpha-Methylstyrene	1.03	206	20.6	4.12	1.03		0.0824	0.103	0.206	0.412	1.03	5.15	25.75	51.5	103
2-Ethyltoluene	1.04	208	20.8	4.16	1.04		0.0832	0.104	0.208	0.416	1.04	5.20	26.00	52.0	104
1,2,4-Trimethylbenzene	1.04	208	20.8	4.16	1.04		0.0832	0.104	0.208	0.416	1.04	5.20	26.00	52.0	104
n-Decane	1.01	202	20.2	4.04	1.01		0.0808	0.101	0.202	0.404	1.01	5.05	25.25	50.5	101
Benzyl Chloride	1.08	216	21.6	4.32	1.08		0.0864	0.108	0.216	0.432	1.08	5.40	27.00	54.0	108
1,3-Dichlorobenzene	1.08	216	21.6	4.32	1.08		0.0864	0.108	0.216	0.432	1.08	5.40	27.00	54.0	108
1,4-Dichlorobenzene	1.05	210	21.0	4.20	1.05		0.0840	0.105	0.210	0.420	1.05	5.25	26.25	52.5	105
sec-Butylbenzene	1.06	212	21.2	4.24	1.06		0.0848	0.106	0.212	0.424	1.06	5.30	26.50	53.0	106
p-Isopropyltoluene	1.00	200	20.0	4.00	1.00		0.0800	0.100	0.200	0.400	1.00	5.00	25.00	50.0	100
1,2,3-Trimethylbenzene	1.04	208	20.8	4.16	1.04		0.0832	0.104	0.208	0.416	1.04	5.20	26.00	52.0	104
1,2-Dichlorobenzene	1.07	214	21.4	4.28	1.07		0.0856	0.107	0.214	0.428	1.07	5.35	26.75	53.5	107
d-Limonene	1.04	208	20.8	4.16	1.04		0.0832	0.104	0.208	0.416	1.04	5.20	26.00	52.0	104
1,2-Dibromo-3-chloropropane	1.04	208	20.8	4.16	1.04		0.0832	0.104	0.208	0.416	1.04	5.20	26.00	52.0	104
n-Undecane	1.01	202	20.2	4.04	1.01		0.0808	0.101	0.202	0.404	1.01	5.05	25.25	50.5	101
1,2,4-Trichlorobenzene	1.04	208	20.8	4.16	1.04		0.0832	0.104	0.208	0.416	1.04	5.20	26.00	52.0	104
Naphthalene	1.00	200	20.0	4.00	1.00		0.0800	0.100	0.200	0.400	1.00	5.00	25.00	50.0	100
n-Dodecane	1.04	208	20.8	4.16	1.04		0.0832	0.104	0.208	0.416	1.04	5.20	26.00	52.0	104
Hexachloro-1,3-butadiene	1.07	214	21.4	4.28	1.07		0.0856	0.107	0.214	0.428	1.07	5.35	26.75	53.5	107
Methacrylonitrile	1.03	206	20.6	4.12	1.03		0.0824	0.103	0.206	0.412	1.03	5.15	25.75	51.5	103
Cyclohexanone	1.12	224	22.4	4.48	1.12		0.0896	0.112	0.224	0.448	1.12	5.60	28.00	56.0	112
tert-Butylbenzene	1.05	210	21.0	4.20	1.05		0.0840	0.105	0.210	0.420	1.05	5.25	26.25	52.5	105
n-Butylbenzene	1.08	216	21.6	4.32	1.08		0.0864	0.108	0.216	0.432	1.08	5.40	27.00	54.0	108

Method : I:\MS08\Methods\R8070816.M (RTE Integrator)
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Fri Jul 08 14:41:56 2016
 Response via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	0.08	0	13	I:\MS08\Data\2016_07\08\07081605.D
2	0.10	0	13	I:\MS08\Data\2016_07\08\07081606.D
3	0.20	0	13	I:\MS08\Data\2016_07\08\07081607.D
4	0.40	0	13	I:\MS08\Data\2016_07\08\07081608.D
5	1.0	1	13	I:\MS08\Data\2016_07\08\07081609.D
6	5.0	5	13	I:\MS08\Data\2016_07\08\07081610.D
7	25	26	13	I:\MS08\Data\2016_07\08\07081611.D
8	50	52	13	I:\MS08\Data\2016_07\08\07081612.D
9	100	103	13	I:\MS08\Data\2016_07\08\07081613.D

~~10/1~~ 7/8/16

#	ID	Update Time	Quant Time	Acquisition Time
1	0.08	Jul 08 14:40 2016	Jul 08 13:38 2016	8 Jul 2016 9:54
2	0.10	Jul 08 14:40 2016	Jul 08 13:38 2016	8 Jul 2016 10:27
3	0.20	Jul 08 14:40 2016	Jul 08 13:38 2016	8 Jul 2016 10:59
4	0.40	Jul 08 14:40 2016	Jul 08 13:38 2016	8 Jul 2016 11:32
5	1.0	Jul 08 14:41 2016	Jul 08 13:38 2016	8 Jul 2016 12:04
6	5.0	Jul 08 14:41 2016	Jul 08 13:38 2016	8 Jul 2016 12:37
7	25	Jul 08 14:41 2016	Jul 08 13:38 2016	8 Jul 2016 13:09
8	50	Jul 08 14:41 2016	Jul 08 14:07 2016	8 Jul 2016 13:42
9	100	Jul 08 14:41 2016	Jul 08 14:39 2016	8 Jul 2016 14:14

R8070816.M

Fri Jul 08 15:54:39 2016

Data File: I:\MS08\Data\2016 07\08\07081605.D

Acq On : 8 Jul 2016 9:54

Operator: WA

Sample : 0.08ng TO-15 ICAL Std

Misc : S29-07071605/S29-06291609 (7/28)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 08 13:38:10 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 13:37:41 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

7/8/16

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.79	130	204629	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	10.53	114	930763	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	14.57	82	345950	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.48	65	239654	8.322	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	66.56%#
57) Toluene-d8 (SS2)	12.77	98	926716	13.539	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	108.32%
73) Bromofluorobenzene (SS3)	16.07	174	349956	14.118	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	112.96%

Target Compounds

						Qvalue
2) Propene	3.93	42	1745	0.072	ng	88
3) Dichlorodifluoromethan...	4.02	85	2803	0.066	ng	# 91
4) Chloromethane	4.24	50	1398	0.061	ng	# 42
5) 1,2-Dichloro-1,1,2,2-t...	4.38	135	1758	0.092	ng	93
6) Vinyl Chloride	4.52	62	1673	0.066	ng	# 42
7) 1,3-Butadiene	4.69	54	1318	0.070	ng	89
8) Bromomethane	5.00	94	1266	0.088	ng	96
9) Chloroethane	5.20	64	1114	0.075	ng	# 43
10) Ethanol	5.39	45	4729	0.328	ng	90
11) Acetonitrile	5.64	41	2384	0.064	ng	72
12) Acrolein	5.74	56	677	0.059	ng	# 63
13) Acetone	5.86	58	8260	0.518	ng	95
14) Trichlorofluoromethane	6.03	101	2433	0.064	ng	97
15) 2-Propanol (Isopropanol)	6.15	45	6098	0.124	ng	98
16) Acrylonitrile	6.40	53	980	0.040	ng	91
17) 1,1-Dichloroethene	6.68	96	1247	0.076	ng	# 81
18) 2-Methyl-2-Propanol (t...	6.77	59	6620	0.132	ng	89
19) Methylene Chloride	6.79	84	1251	0.080	ng	90
20) 3-Chloro-1-propene (Al...	6.91	41	1424	0.050	ng	# 36
21) Trichlorotrifluoroethane	7.07	151	1374	0.081	ng	82
22) Carbon Disulfide	7.08	76	11064	0.150	ng	87
23) trans-1,2-Dichloroethene	7.70	61	1680	0.063	ng	97
24) 1,1-Dichloroethane	7.88	63	2354	0.067	ng	90
25) Methyl tert-Butyl Ether	7.97	73	4375	0.071	ng	99
26) Vinyl Acetate	8.05	86	1235	0.247	ng	# 42
27) 2-Butanone (MEK)	8.29	72	796	0.063	ng	# 1
28) cis-1,2-Dichloroethene	8.65	61	1635	0.064	ng	97
29) Diisopropyl Ether	8.87	87	1238	0.076	ng	# 77
30) Ethyl Acetate	8.88	61	508	0.081	ng	# 8
31) n-Hexane	8.86	57	2466	0.078	ng	# 80
32) Chloroform	8.92	83	2476	0.076	ng	99
34) Tetrahydrofuran (THF)	9.31	72	837	0.069	ng	# 81
35) Ethyl tert-Butyl Ether	9.34	87	1821	0.073	ng	96
36) 1,2-Dichloroethane	9.58	62	1517	0.054	ng	84
38) 1,1,1-Trichloroethane	9.82	97	2333	0.076	ng	92
39) Isopropyl Acetate	10.14	61	1512	0.153	ng	# 85
40) 1-Butanol	10.19	56	1645	0.092	ng	# 76
41) Benzene	10.23	78	7645	0.107	ng	92
42) Carbon Tetrachloride	10.37	117	1724	0.066	ng	97
43) Cyclohexane	10.48	84	5781	0.193	ng	81
44) tert-Amyl Methyl Ether	10.77	73	3934	0.070	ng	98
45) 1,2-Dichloropropane	10.97	63	1332	0.075	ng	92
46) Bromodichloromethane	11.13	83	1593	0.065	ng	89
47) Trichloroethene	11.18	130	1745	0.085	ng	99
48) 1,4-Dioxane	11.17	88	1043	0.072	ng	100
49) 2,2,4-Trimethylpentane...	11.23	57	6054	0.071	ng	97

Data File: I:\MS08\Data\2016 07\08\07081605.D

Acq On : 8 Jul 2016 9:54

Operator: WA

Sample : 0.08ng TO-15 ICAL Std

Misc : S29-07071605/S29-06291609 (7/28)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 08 13:38:10 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 13:37:41 2016

Response via : Initial Calibration

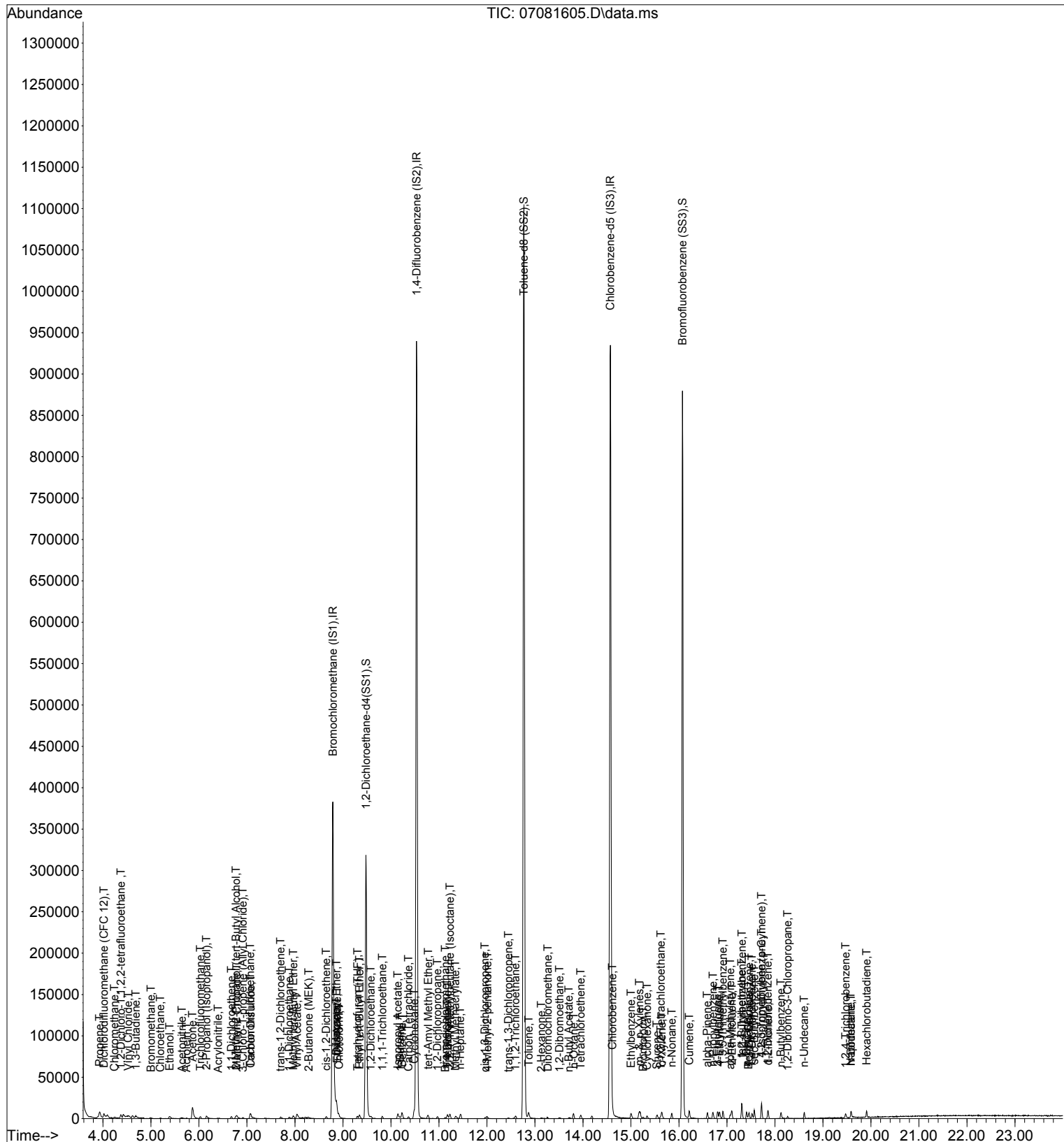
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.34	100	973	0.126	ng	92
51) n-Heptane	11.44	71	1420	0.077	ng	93
52) cis-1,3-Dichloropropene	11.96	75	1755	0.064	ng #	42
53) 4-Methyl-2-pentanone	12.01	58	851	0.051	ng #	40
54) trans-1,3-Dichloropropene	12.45	75	1063	0.040	ng #	42
55) 1,1,2-Trichloroethane	12.59	97	1368	0.084	ng	99
58) Toluene	12.87	91	7031	0.108	ng	94
59) 2-Hexanone	13.13	43	1624	0.042	ng	80
60) Dibromochloromethane	13.27	129	1189	0.071	ng	79
61) 1,2-Dibromoethane	13.51	107	1266	0.074	ng	95
62) n-Butyl Acetate	13.71	43	2242	0.053	ng #	67
63) n-Octane	13.81	57	1103	0.078	ng	89
64) Tetrachloroethene	13.95	166	1889	0.086	ng	97
65) Chlorobenzene	14.61	112	4475	0.101	ng	97
66) Ethylbenzene	15.00	91	6888	0.091	ng	92
67) m- & p-Xylenes	15.18	91	11009	0.182	ng	94
68) Bromoform	15.25	173	1167	0.068	ng	99
69) Styrene	15.54	104	3821	0.091	ng	90
70) o-Xylene	15.64	91	5750	0.090	ng	95
71) n-Nonane	15.85	43	2603	0.067	ng	91
72) 1,1,2,2-Tetrachloroethane	15.62	83	2267	0.085	ng	95
74) Cumene	16.21	105	7614	0.092	ng	100
75) alpha-Pinene	16.59	93	3225	0.082	ng	75
76) n-Propylbenzene	16.71	91	8428	0.084	ng	94
77) 3-Ethyltoluene	16.81	105	7136	0.089	ng	97
78) 4-Ethyltoluene	16.85	105	7308	0.094	ng	98
79) 1,3,5-Trimethylbenzene	16.91	105	6494	0.094	ng	93
80) alpha-Methylstyrene	17.07	118	2427	0.074	ng	88
81) 2-Ethyltoluene	17.10	105	7290	0.094	ng	94
82) 1,2,4-Trimethylbenzene	17.31	105	5749	0.085	ng	97
83) n-Decane	17.41	57	2733	0.072	ng	92
84) Benzyl Chloride	17.45	91	3099	0.056	ng	88
85) 1,3-Dichlorobenzene	17.46	146	3768	0.099	ng	100
86) 1,4-Dichlorobenzene	17.52	146	4061	0.102	ng	93
87) sec-Butylbenzene	17.57	105	8188	0.093	ng	98
88) 4-Isopropyltoluene (p-...	17.72	119	7326	0.084	ng	96
89) 1,2,3-Trimethylbenzene	17.72	105	5950	0.084	ng	98
90) 1,2-Dichlorobenzene	17.85	146	3633	0.096	ng	98
91) d-Limonene	17.86	68	1518	0.069	ng	98
92) 1,2-Dibromo-3-Chloropr...	18.26	157	1072	0.071	ng #	76
93) n-Undecane	18.61	57	2540	0.066	ng	95
94) 1,2,4-Trichlorobenzene	19.47	180	2475	0.081	ng	95
95) Naphthalene	19.58	128	7304	0.087	ng #	71
96) n-Dodecane	19.59	57	1530	0.043	ng	98
97) Hexachlorobutadiene	19.91	225	2109	0.096	ng	94
98) Cyclohexanone	15.34	55	1900	0.086	ng	91
99) tert-Butylbenzene	17.31	119	6517	0.093	ng	95
100) n-Butylbenzene	18.12	91	5455	0.082	ng	98

(#)=qualifier out of range (m)=manual integration (+)=signals summed

ALS Vial : 13 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS08\Data\2016 07\08\07081606.D

Acq On : 8 Jul 2016 10:27

Operator: WA

Sample : 0.10ng TO-15 ICAL Std

Misc : S29-07071605/S29-06291609 (7/28)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 08 13:38:11 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 13:37:41 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

7/8/16

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.80	130	199284	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	10.54	114	920547	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	14.57	82	344338	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.48	65	235853	8.410	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	67.28%#
57) Toluene-d8 (SS2)	12.77	98	917397	13.466	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	107.76%
73) Bromofluorobenzene (SS3)	16.07	174	343844	13.937	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	111.52%

Target Compounds

						Qvalue
2) Propene	3.94	42	1672	0.071	ng	# 77
3) Dichlorodifluoromethan...	4.03	85	3399	0.082	ng	# 85
4) Chloromethane	4.26	50	1734	0.078	ng	# 42
5) 1,2-Dichloro-1,1,2,2-t...	4.38	135	2208	0.118	ng	88
6) Vinyl Chloride	4.53	62	1913	0.077	ng	91
7) 1,3-Butadiene	4.71	54	1346	0.074	ng	88
8) Bromomethane	5.00	94	1351	0.097	ng	99
9) Chloroethane	5.20	64	1225	0.085	ng	# 43
10) Ethanol	5.40	45	5259	0.375	ng	90
11) Acetonitrile	5.64	41	2875	0.080	ng	91
12) Acrolein	5.75	56	708	0.063	ng	92
13) Acetone	5.87	58	9745	0.628	ng	93
14) Trichlorofluoromethane	6.04	101	2994	0.081	ng	98
15) 2-Propanol (Isopropanol)	6.17	45	7803	0.162	ng	95
16) Acrylonitrile	6.40	53	1156	0.049	ng	79
17) 1,1-Dichloroethene	6.69	96	1604	0.101	ng	95
18) 2-Methyl-2-Propanol (t...	6.78	59	7979	0.163	ng	90
19) Methylene Chloride	6.79	84	1519	0.100	ng	86
20) 3-Chloro-1-propene (Al...	6.91	41	1782	0.064	ng	82
21) Trichlorotrifluoroethane	7.07	151	1799	0.109	ng	100
22) Carbon Disulfide	7.07	76	10378	0.144	ng	# 73
23) trans-1,2-Dichloroethene	7.71	61	2019	0.078	ng	100
24) 1,1-Dichloroethane	7.88	63	2863	0.084	ng	93
25) Methyl tert-Butyl Ether	7.97	73	5376	0.090	ng	93
26) Vinyl Acetate	8.05	86	1969	0.405	ng	# 55
27) 2-Butanone (MEK)	8.27	72	887	0.072	ng	# 1
28) cis-1,2-Dichloroethene	8.66	61	2098	0.085	ng	99
29) Diisopropyl Ether	8.87	87	1758	0.111	ng	# 83
30) Ethyl Acetate	8.88	61	554	0.090	ng	# 8
31) n-Hexane	8.87	57	3264	0.105	ng	# 86
32) Chloroform	8.91	83	2873	0.091	ng	99
34) Tetrahydrofuran (THF)	9.30	72	987	0.083	ng	# 85
35) Ethyl tert-Butyl Ether	9.35	87	2253	0.093	ng	96
36) 1,2-Dichloroethane	9.59	62	1868	0.068	ng	99
38) 1,1,1-Trichloroethane	9.82	97	2548	0.083	ng	96
39) Isopropyl Acetate	10.15	61	1771	0.181	ng	# 87
40) 1-Butanol	10.19	56	1791	0.102	ng	# 66
41) Benzene	10.24	78	7847	0.111	ng	100
42) Carbon Tetrachloride	10.37	117	2143	0.084	ng	94
43) Cyclohexane	10.48	84	6646	0.225	ng	90
44) tert-Amyl Methyl Ether	10.78	73	4851	0.088	ng	95
45) 1,2-Dichloropropane	10.97	63	1615	0.092	ng	100
46) Bromodichloromethane	11.14	83	1952	0.080	ng	95
47) Trichloroethene	11.18	130	2244	0.110	ng	97
48) 1,4-Dioxane	11.18	88	1300	0.091	ng	# 60
49) 2,2,4-Trimethylpentane...	11.23	57	7450	0.089	ng	99

Data File: I:\MS08\Data\2016 07\08\07081606.D

Acq On : 8 Jul 2016 10:27

Operator: WA

Sample : 0.10ng TO-15 ICAL Std

Misc : S29-07071605/S29-06291609 (7/28)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 08 13:38:11 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 13:37:41 2016

Response via : Initial Calibration

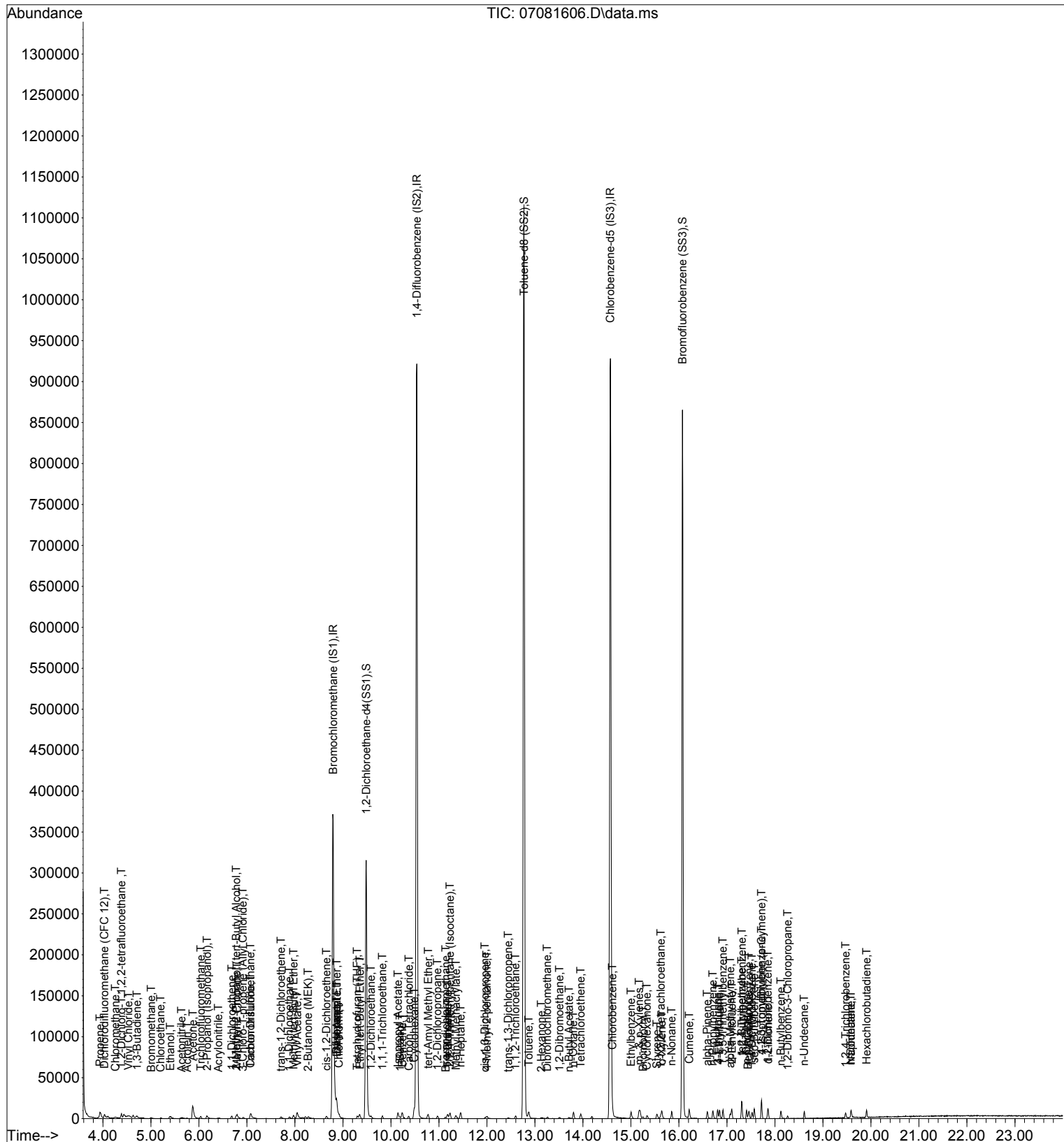
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.36	100	1007	0.132	ng	# 68
51) n-Heptane	11.45	71	1959	0.108	ng	92
52) cis-1,3-Dichloropropene	11.96	75	2219	0.082	ng	# 42
53) 4-Methyl-2-pentanone	12.00	58	935	0.056	ng	# 49
54) trans-1,3-Dichloropropene	12.44	75	1419	0.053	ng	# 42
55) 1,1,2-Trichloroethane	12.59	97	1583	0.099	ng	99
58) Toluene	12.87	91	7958	0.123	ng	100
59) 2-Hexanone	13.13	43	2487	0.065	ng	76
60) Dibromochloromethane	13.26	129	1743	0.105	ng	93
61) 1,2-Dibromoethane	13.51	107	1645	0.096	ng	95
62) n-Butyl Acetate	13.71	43	2374	0.057	ng	# 63
63) n-Octane	13.80	57	1485	0.105	ng	98
64) Tetrachloroethene	13.95	166	2537	0.115	ng	99
65) Chlorobenzene	14.61	112	5682	0.129	ng	97
66) Ethylbenzene	15.00	91	8406	0.112	ng	94
67) m- & p-Xylenes	15.17	91	13276	0.220	ng	97
68) Bromoform	15.25	173	1516	0.089	ng	96
69) Styrene	15.54	104	4709	0.112	ng	90
70) o-Xylene	15.64	91	6910	0.109	ng	97
71) n-Nonane	15.85	43	3262	0.084	ng	98
72) 1,1,2,2-Tetrachloroethane	15.62	83	2910	0.110	ng	90
74) Cumene	16.21	105	8578	0.105	ng	100
75) alpha-Pinene	16.59	93	3918	0.100	ng	82
76) n-Propylbenzene	16.70	91	10144	0.102	ng	97
77) 3-Ethyltoluene	16.81	105	8725	0.110	ng	96
78) 4-Ethyltoluene	16.84	105	8350	0.108	ng	98
79) 1,3,5-Trimethylbenzene	16.91	105	7291	0.106	ng	98
80) alpha-Methylstyrene	17.07	118	2755	0.084	ng	90
81) 2-Ethyltoluene	17.10	105	8381	0.108	ng	97
82) 1,2,4-Trimethylbenzene	17.31	105	6734	0.100	ng	99
83) n-Decane	17.41	57	3369	0.090	ng	92
84) Benzyl Chloride	17.44	91	3812	0.069	ng	87
85) 1,3-Dichlorobenzene	17.46	146	4573	0.120	ng	97
86) 1,4-Dichlorobenzene	17.52	146	5055	0.127	ng	93
87) sec-Butylbenzene	17.57	105	9564	0.109	ng	98
88) 4-Isopropyltoluene (p-...	17.72	119	8376	0.096	ng	99
89) 1,2,3-Trimethylbenzene	17.72	105	7176	0.102	ng	94
90) 1,2-Dichlorobenzene	17.85	146	4295	0.115	ng	98
91) d-Limonene	17.86	68	1852	0.084	ng	90
92) 1,2-Dibromo-3-Chloropr...	18.26	157	1050	0.070	ng	88
93) n-Undecane	18.61	57	2946	0.077	ng	94
94) 1,2,4-Trichlorobenzene	19.47	180	2949	0.097	ng	96
95) Naphthalene	19.59	128	7478	0.089	ng	# 71
96) n-Dodecane	19.58	57	1966	0.056	ng	91
97) Hexachlorobutadiene	19.91	225	2255	0.103	ng	99
98) Cyclohexanone	15.33	55	1961	0.090	ng	93
99) tert-Butylbenzene	17.31	119	7595	0.109	ng	99
100) n-Butylbenzene	18.12	91	6561	0.099	ng	95

(#)=qualifier out of range (m)=manual integration (+)=signals summed

ALS Vial : 13 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS08\Data\2016 07\08\07081607.D

Acq On : 8 Jul 2016 10:59

Operator: WA

Sample : 0.20ng TO-15 ICAL Std

Misc : S29-07071605/S29-06291609 (7/28)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 08 13:38:13 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 13:37:41 2016

Response via : Initial Calibration

WA 7/8/16

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.79	130	199429	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	10.54	114	912478	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	14.57	82	343053	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.48	65	234187	8.345	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	66.72%#
57) Toluene-d8 (SS2)	12.77	98	903549	13.312	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	106.48%
73) Bromofluorobenzene (SS3)	16.07	174	339430	13.809	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	110.48%

Target Compounds

						Qvalue
2) Propene	3.93	42	3522	0.150	ng	96
3) Dichlorodifluoromethan...	4.03	85	6515	0.157	ng	# 97
4) Chloromethane	4.24	50	3152	0.142	ng	91
5) 1,2-Dichloro-1,1,2,2-t...	4.38	135	3898	0.209	ng	100
6) Vinyl Chloride	4.51	62	4002	0.162	ng	99
7) 1,3-Butadiene	4.68	54	2832	0.155	ng	91
8) Bromomethane	5.00	94	2719	0.194	ng	98
9) Chloroethane	5.20	64	2375	0.164	ng	98
10) Ethanol	5.38	45	11427	0.814	ng	90
11) Acetonitrile	5.63	41	5447	0.151	ng	81
12) Acrolein	5.74	56	2408	0.216	ng	# 70
13) Acetone	5.86	58	18325	1.180	ng	94
14) Trichlorofluoromethane	6.03	101	5457	0.147	ng	100
15) 2-Propanol (Isopropanol)	6.15	45	14814	0.308	ng	98
16) Acrylonitrile	6.39	53	3229	0.136	ng	99
17) 1,1-Dichloroethene	6.68	96	3223	0.202	ng	99
18) 2-Methyl-2-Propanol (t...	6.76	59	14816	0.303	ng	92
19) Methylene Chloride	6.79	84	3345	0.220	ng	99
20) 3-Chloro-1-propene (Al...	6.92	41	3594	0.128	ng	94
21) Trichlorotrifluoroethane	7.08	151	3609	0.219	ng	94
22) Carbon Disulfide	7.07	76	16344	0.227	ng	94
23) trans-1,2-Dichloroethene	7.70	61	3910	0.150	ng	96
24) 1,1-Dichloroethane	7.89	63	5486	0.161	ng	98
25) Methyl tert-Butyl Ether	7.97	73	9805	0.163	ng	96
26) Vinyl Acetate	8.04	86	4402	0.905	ng	# 91
27) 2-Butanone (MEK)	8.27	72	2509	0.203	ng	# 43
28) cis-1,2-Dichloroethene	8.66	61	3859	0.155	ng	93
29) Diisopropyl Ether	8.87	87	3188	0.201	ng	# 95
30) Ethyl Acetate	8.87	61	1813	0.296	ng	83
31) n-Hexane	8.87	57	5760	0.186	ng	99
32) Chloroform	8.91	83	5509	0.174	ng	97
34) Tetrahydrofuran (THF)	9.29	72	1974	0.166	ng	# 83
35) Ethyl tert-Butyl Ether	9.34	87	4343	0.179	ng	97
36) 1,2-Dichloroethane	9.59	62	3659	0.133	ng	96
38) 1,1,1-Trichloroethane	9.82	97	4703	0.155	ng	98
39) Isopropyl Acetate	10.14	61	3732	0.384	ng	# 90
40) 1-Butanol	10.18	56	4836	0.277	ng	# 79
41) Benzene	10.23	78	13860	0.198	ng	99
42) Carbon Tetrachloride	10.37	117	4015	0.158	ng	94
43) Cyclohexane	10.49	84	11781	0.402	ng	95
44) tert-Amyl Methyl Ether	10.77	73	9509	0.173	ng	96
45) 1,2-Dichloropropane	10.96	63	3297	0.189	ng	98
46) Bromodichloromethane	11.14	83	4365	0.181	ng	91
47) Trichloroethene	11.18	130	4113	0.204	ng	97
48) 1,4-Dioxane	11.17	88	2699	0.190	ng	94
49) 2,2,4-Trimethylpentane...	11.23	57	13902	0.167	ng	98

Data File: I:\MS08\Data\2016 07\08\07081607.D

Acq On : 8 Jul 2016 10:59

Operator: WA

Sample : 0.20ng TO-15 ICAL Std

Misc : S29-07071605/S29-06291609 (7/28)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 08 13:38:13 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 13:37:41 2016

Response via : Initial Calibration

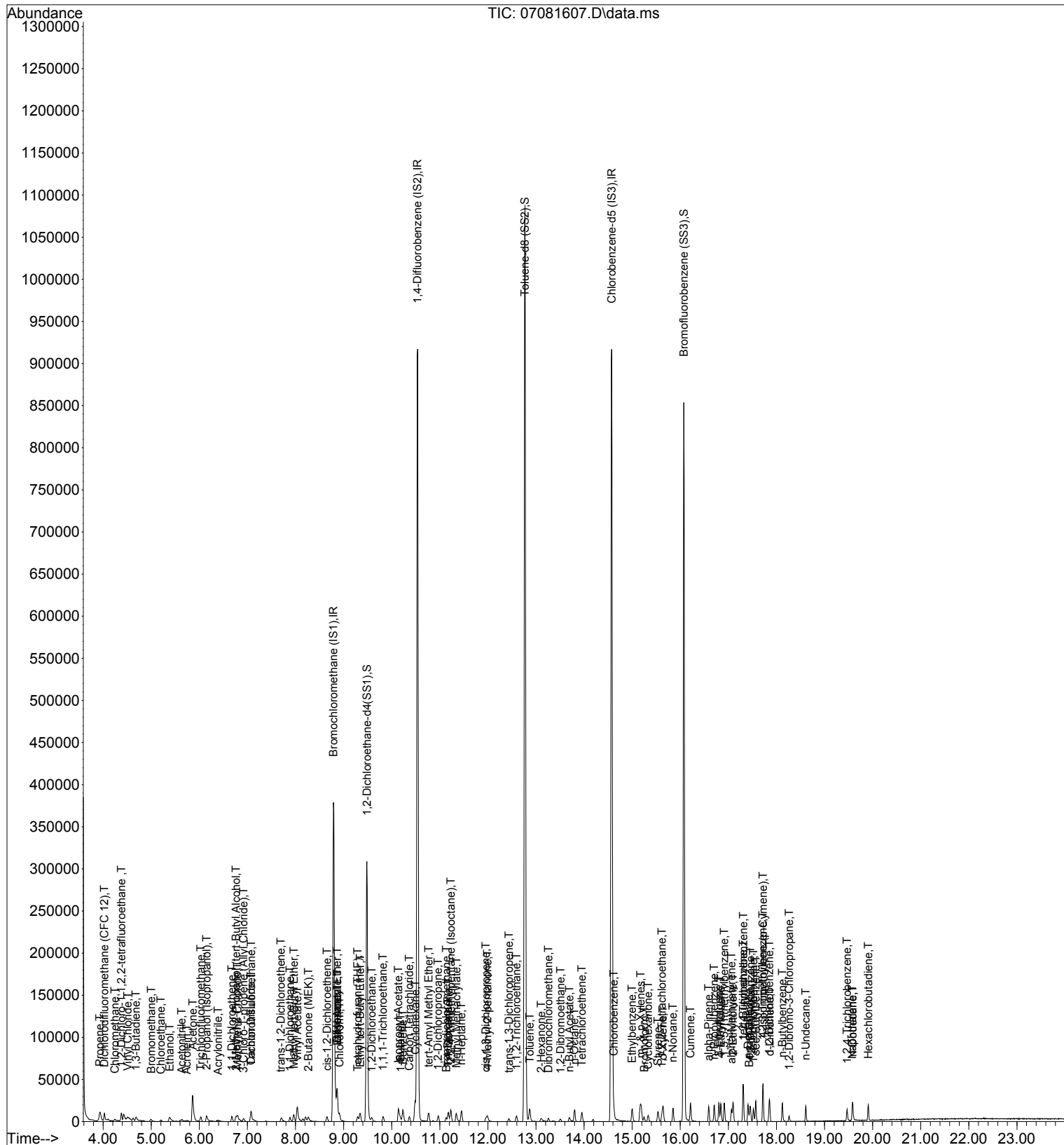
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.35	100	2479	0.327	ng	# 88
51) n-Heptane	11.45	71	3664	0.204	ng	99
52) cis-1,3-Dichloropropene	11.96	75	4375	0.163	ng	99
53) 4-Methyl-2-pentanone	11.99	58	2522	0.153	ng	87
54) trans-1,3-Dichloropropene	12.44	75	3181	0.121	ng	98
55) 1,1,2-Trichloroethane	12.59	97	3208	0.202	ng	94
58) Toluene	12.87	91	15029	0.232	ng	98
59) 2-Hexanone	13.11	43	5850	0.153	ng	84
60) Dibromochloromethane	13.26	129	3322	0.200	ng	98
61) 1,2-Dibromoethane	13.51	107	3250	0.191	ng	97
62) n-Butyl Acetate	13.70	43	6213	0.149	ng	90
63) n-Octane	13.80	57	2768	0.197	ng	93
64) Tetrachloroethene	13.95	166	4780	0.218	ng	97
65) Chlorobenzene	14.62	112	9887	0.225	ng	97
66) Ethylbenzene	15.00	91	15541	0.207	ng	97
67) m- & p-Xylenes	15.18	91	24615	0.410	ng	99
68) Bromoform	15.25	173	3103	0.183	ng	95
69) Styrene	15.54	104	9227	0.220	ng	95
70) o-Xylene	15.64	91	13030	0.207	ng	97
71) n-Nonane	15.85	43	6187	0.161	ng	93
72) 1,1,2,2-Tetrachloroethane	15.62	83	5221	0.198	ng	98
74) Cumene	16.21	105	16663	0.204	ng	99
75) alpha-Pinene	16.59	93	7449	0.191	ng	81
76) n-Propylbenzene	16.70	91	18418	0.185	ng	100
77) 3-Ethyltoluene	16.80	105	15665	0.198	ng	99
78) 4-Ethyltoluene	16.84	105	16666	0.216	ng	99
79) 1,3,5-Trimethylbenzene	16.91	105	13886	0.203	ng	99
80) alpha-Methylstyrene	17.06	118	6000	0.184	ng	89
81) 2-Ethyltoluene	17.10	105	16340	0.212	ng	96
82) 1,2,4-Trimethylbenzene	17.31	105	13567	0.202	ng	99
83) n-Decane	17.41	57	6649	0.177	ng	96
84) Benzyl Chloride	17.44	91	7957	0.146	ng	94
85) 1,3-Dichlorobenzene	17.46	146	8770	0.232	ng	98
86) 1,4-Dichlorobenzene	17.52	146	9304	0.235	ng	100
87) sec-Butylbenzene	17.57	105	18852	0.217	ng	98
88) 4-Isopropyltoluene (p-...	17.72	119	17062	0.197	ng	99
89) 1,2,3-Trimethylbenzene	17.71	105	13921	0.198	ng	96
90) 1,2-Dichlorobenzene	17.85	146	8616	0.231	ng	100
91) d-Limonene	17.86	68	3757	0.172	ng	94
92) 1,2-Dibromo-3-Chloropr...	18.26	157	2508	0.168	ng	90
93) n-Undecane	18.61	57	5852	0.153	ng	97
94) 1,2,4-Trichlorobenzene	19.47	180	5900	0.196	ng	97
95) Naphthalene	19.58	128	15644	0.187	ng	90
96) n-Dodecane	19.59	57	4025	0.115	ng	99
97) Hexachlorobutadiene	19.91	225	4634	0.213	ng	91
98) Cyclohexanone	15.33	55	4018	0.184	ng	99
99) tert-Butylbenzene	17.31	119	14751	0.213	ng	98
100) n-Butylbenzene	18.12	91	13440	0.203	ng	95

(#)=qualifier out of range (m)=manual integration (+)=signals summed

ALS Vial : 13 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS08\Data\2016 07\08\07081608.D

Acq On : 8 Jul 2016 11:32

Operator: WA

Sample : 0.40ng TO-15 ICAL Std

Misc : S29-07071605/S29-06291607 (7/28)

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Jul 08 13:38:15 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 13:37:41 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

7/8/16

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.79	130	208811	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	10.54	114	943657	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	14.57	82	357341	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.48	65	247414	8.420	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	67.36%#
57) Toluene-d8 (SS2)	12.77	98	944934	13.365	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	106.96%
73) Bromofluorobenzene (SS3)	16.07	174	354576	13.849	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	110.80%

Target Compounds

						Qvalue
2) Propene	3.92	42	6627	0.269	ng	98
3) Dichlorodifluoromethan...	4.01	85	13661	0.315	ng	99
4) Chloromethane	4.23	50	4132	0.178	ng	91
5) 1,2-Dichloro-1,1,2,2-t...	4.37	135	8509	0.435	ng	95
6) Vinyl Chloride	4.50	62	9029	0.348	ng	95
7) 1,3-Butadiene	4.67	54	6634	0.346	ng	95
8) Bromomethane	4.98	94	6145	0.419	ng	96
9) Chloroethane	5.19	64	5292	0.350	ng	96
10) Ethanol	5.36	45	23514	1.600	ng	96
11) Acetonitrile	5.64	41	12477	0.330	ng	91
12) Acrolein	5.72	56	3888	0.333	ng	93
13) Acetone	5.85	58	27012	1.661	ng	95
14) Trichlorofluoromethane	6.02	101	11469	0.295	ng	99
15) 2-Propanol (Isopropanol)	6.13	45	31066	0.617	ng	98
16) Acrylonitrile	6.35	53	7678	0.309	ng	99
17) 1,1-Dichloroethene	6.67	96	6977	0.418	ng	94
18) 2-Methyl-2-Propanol (t...	6.75	59	31613	0.617	ng	95
19) Methylene Chloride	6.79	84	6912	0.434	ng	100
20) 3-Chloro-1-propene (Al...	6.91	41	8051	0.275	ng	90
21) Trichlorotrifluoroethane	7.07	151	6854	0.398	ng	97
22) Carbon Disulfide	7.07	76	29763	0.395	ng	98
23) trans-1,2-Dichloroethene	7.70	61	8673	0.318	ng	95
24) 1,1-Dichloroethane	7.88	63	11802	0.331	ng	100
25) Methyl tert-Butyl Ether	7.95	73	21544	0.342	ng	96
26) Vinyl Acetate	8.03	86	8416	1.652	ng	# 78
27) 2-Butanone (MEK)	8.26	72	4072	0.315	ng	# 85
28) cis-1,2-Dichloroethene	8.66	61	8781	0.338	ng	97
29) Diisopropyl Ether	8.85	87	6608	0.399	ng	# 91
30) Ethyl Acetate	8.87	61	4574	0.712	ng	100
31) n-Hexane	8.87	57	11932	0.368	ng	99
32) Chloroform	8.91	83	11840	0.358	ng	97
34) Tetrahydrofuran (THF)	9.28	72	4353	0.349	ng	# 89
35) Ethyl tert-Butyl Ether	9.34	87	9137	0.359	ng	99
36) 1,2-Dichloroethane	9.59	62	7928	0.276	ng	98
38) 1,1,1-Trichloroethane	9.82	97	10240	0.327	ng	98
39) Isopropyl Acetate	10.13	61	8221	0.818	ng	95
40) 1-Butanol	10.16	56	11640	0.645	ng	88
41) Benzene	10.23	78	28780	0.398	ng	99
42) Carbon Tetrachloride	10.37	117	9035	0.344	ng	99
43) Cyclohexane	10.49	84	24003	0.791	ng	95
44) tert-Amyl Methyl Ether	10.76	73	20145	0.355	ng	98
45) 1,2-Dichloropropane	10.96	63	6781	0.376	ng	96
46) Bromodichloromethane	11.13	83	8489	0.341	ng	100
47) Trichloroethene	11.18	130	8593	0.412	ng	98
48) 1,4-Dioxane	11.16	88	5943	0.406	ng	97
49) 2,2,4-Trimethylpentane...	11.23	57	29873	0.348	ng	99

Data File: I:\MS08\Data\2016 07\08\07081608.D

Acq On : 8 Jul 2016 11:32

Operator: WA

Sample : 0.40ng TO-15 ICAL Std

Misc : S29-07071605/S29-06291607 (7/28)

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Jul 08 13:38:15 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 13:37:41 2016

Response via : Initial Calibration

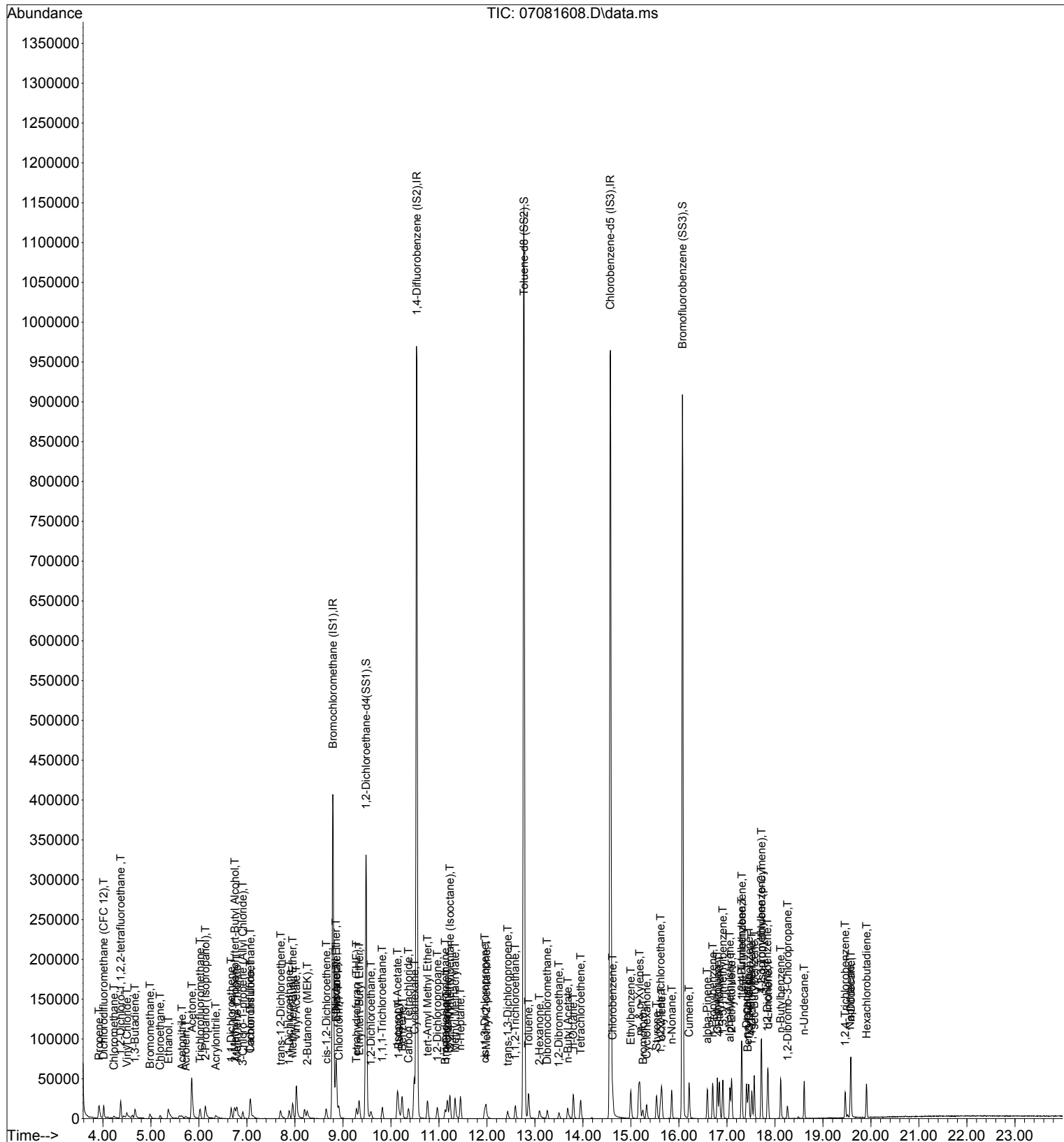
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.33	100	5713	0.728	ng	# 88
51) n-Heptane	11.45	71	7038	0.378	ng	92
52) cis-1,3-Dichloropropene	11.95	75	10183	0.366	ng	100
53) 4-Methyl-2-pentanone	11.99	58	5640	0.331	ng	89
54) trans-1,3-Dichloropropene	12.43	75	7713	0.283	ng	96
55) 1,1,2-Trichloroethane	12.59	97	6815	0.414	ng	97
58) Toluene	12.86	91	30567	0.454	ng	99
59) 2-Hexanone	13.09	43	11740	0.296	ng	99
60) Dibromochloromethane	13.26	129	7418	0.430	ng	98
61) 1,2-Dibromoethane	13.50	107	7638	0.432	ng	93
62) n-Butyl Acetate	13.69	43	13852	0.319	ng	97
63) n-Octane	13.80	57	5814	0.397	ng	99
64) Tetrachloroethene	13.95	166	9875	0.433	ng	98
65) Chlorobenzene	14.62	112	21122	0.462	ng	99
66) Ethylbenzene	15.00	91	33520	0.429	ng	99
67) m- & p-Xylenes	15.18	91	52691	0.842	ng	97
68) Bromoform	15.25	173	6490	0.368	ng	97
69) Styrene	15.54	104	20015	0.459	ng	99
70) o-Xylene	15.64	91	26768	0.408	ng	98
71) n-Nonane	15.85	43	13143	0.327	ng	96
72) 1,1,2,2-Tetrachloroethane	15.62	83	11621	0.423	ng	97
74) Cumene	16.21	105	35545	0.417	ng	97
75) alpha-Pinene	16.59	93	17121	0.420	ng	98
76) n-Propylbenzene	16.70	91	41071	0.396	ng	97
77) 3-Ethyltoluene	16.80	105	35140	0.426	ng	97
78) 4-Ethyltoluene	16.84	105	33755	0.421	ng	97
79) 1,3,5-Trimethylbenzene	16.91	105	30322	0.425	ng	99
80) alpha-Methylstyrene	17.06	118	15334	0.451	ng	93
81) 2-Ethyltoluene	17.10	105	35043	0.436	ng	98
82) 1,2,4-Trimethylbenzene	17.31	105	28777	0.411	ng	99
83) n-Decane	17.41	57	14426	0.369	ng	99
84) Benzyl Chloride	17.44	91	17850	0.313	ng	94
85) 1,3-Dichlorobenzene	17.46	146	18426	0.468	ng	98
86) 1,4-Dichlorobenzene	17.52	146	19361	0.470	ng	99
87) sec-Butylbenzene	17.57	105	39643	0.437	ng	98
88) 4-Isopropyltoluene (p-...	17.72	119	37390	0.415	ng	99
89) 1,2,3-Trimethylbenzene	17.71	105	30980	0.422	ng	97
90) 1,2-Dichlorobenzene	17.84	146	18258	0.469	ng	99
91) d-Limonene	17.86	68	9710	0.426	ng	100
92) 1,2-Dibromo-3-Chloropr...	18.26	157	5829	0.375	ng	93
93) n-Undecane	18.61	57	15045	0.378	ng	96
94) 1,2,4-Trichlorobenzene	19.46	180	13535	0.431	ng	97
95) Naphthalene	19.57	128	39019	0.449	ng	96
96) n-Dodecane	19.59	57	15106	0.414	ng	97
97) Hexachlorobutadiene	19.91	225	9917	0.437	ng	100
98) Cyclohexanone	15.33	55	8908	0.392	ng	99
99) tert-Butylbenzene	17.31	119	31465	0.436	ng	97
100) n-Butylbenzene	18.12	91	29951	0.433	ng	97

(#)=qualifier out of range (m)=manual integration (+)=signals summed

ALS Vial : 14 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS08\Data\2016 07\08\07081609.D

Acq On : 8 Jul 2016 12:04

Operator: WA

Sample : 1.0ng TO-15 ICAL Std

Misc : S29-07071605/S29-06291604 (7/28)

ALS Vial : 16 Sample Multiplier: 1

Quant Time: Jul 08 13:38:17 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 13:37:41 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

WA 7/8/16

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.80	130	187494	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	10.54	114	845964	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	14.57	82	321200	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.48	65	225669	8.553	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	68.40%#
57) Toluene-d8 (SS2)	12.77	98	842108	13.251	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	106.00%
73) Bromofluorobenzene (SS3)	16.07	174	323029	14.036	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	112.32%

Target Compounds

						Qvalue
2) Propene	3.91	42	15341	0.693	ng	94
3) Dichlorodifluoromethan...	4.01	85	31032	0.797	ng	99
4) Chloromethane	4.22	50	20824	0.997	ng	97
5) 1,2-Dichloro-1,1,2,2-t...	4.37	135	20077	1.143	ng	99
6) Vinyl Chloride	4.49	62	22058	0.947	ng	97
7) 1,3-Butadiene	4.66	54	16557	0.961	ng	98
8) Bromomethane	4.97	94	15256	1.158	ng	98
9) Chloroethane	5.18	64	12828	0.944	ng	99
10) Ethanol	5.36	45	58024	4.398	ng	99
11) Acetonitrile	5.58	41	30102	0.887	ng	96
12) Acrolein	5.72	56	9569	0.912	ng	96
13) Acetone	5.84	58	64480	4.416	ng	94
14) Trichlorofluoromethane	6.02	101	26869	0.769	ng	100
15) 2-Propanol (Isopropanol)	6.13	45	77735	1.721	ng	95
16) Acrylonitrile	6.34	53	20158	0.904	ng	99
17) 1,1-Dichloroethene	6.67	96	16594	1.107	ng	97
18) 2-Methyl-2-Propanol (t...	6.73	59	78097	1.699	ng	98
19) Methylene Chloride	6.79	84	16725	1.170	ng	98
20) 3-Chloro-1-propene (Al...	6.91	41	19761	0.751	ng	95
21) Trichlorotrifluoroethane	7.07	151	16641	1.076	ng	99
22) Carbon Disulfide	7.06	76	64023	0.945	ng	99
23) trans-1,2-Dichloroethene	7.69	61	21833	0.891	ng	99
24) 1,1-Dichloroethane	7.88	63	27767	0.866	ng	100
25) Methyl tert-Butyl Ether	7.95	73	50618	0.896	ng	99
26) Vinyl Acetate	8.03	86	20578	4.499	ng	# 78
27) 2-Butanone (MEK)	8.25	72	11102	0.956	ng	# 89
28) cis-1,2-Dichloroethene	8.65	61	20666	0.886	ng	99
29) Diisopropyl Ether	8.85	87	15387	1.034	ng	# 86
30) Ethyl Acetate	8.85	61	11485	1.992	ng	97
31) n-Hexane	8.87	57	26955	0.925	ng	98
32) Chloroform	8.92	83	27578	0.928	ng	99
34) Tetrahydrofuran (THF)	9.27	72	10889	0.974	ng	94
35) Ethyl tert-Butyl Ether	9.34	87	22008	0.963	ng	100
36) 1,2-Dichloroethane	9.58	62	18957	0.734	ng	99
38) 1,1,1-Trichloroethane	9.82	97	24108	0.859	ng	99
39) Isopropyl Acetate	10.13	61	20247	2.247	ng	96
40) 1-Butanol	10.15	56	30446	1.882	ng	89
41) Benzene	10.23	78	67263	1.037	ng	100
42) Carbon Tetrachloride	10.37	117	19944	0.846	ng	97
43) Cyclohexane	10.48	84	54766	2.013	ng	94
44) tert-Amyl Methyl Ether	10.76	73	47702	0.939	ng	98
45) 1,2-Dichloropropane	10.96	63	15761	0.974	ng	99
46) Bromodichloromethane	11.12	83	21009	0.942	ng	98
47) Trichloroethene	11.17	130	19847	1.061	ng	99
48) 1,4-Dioxane	11.15	88	14723	1.121	ng	97
49) 2,2,4-Trimethylpentane...	11.23	57	70545	0.917	ng	100

Data File: I:\MS08\Data\2016 07\08\07081609.D

Acq On : 8 Jul 2016 12:04

Operator: WA

Sample : 1.0ng TO-15 ICAL Std

Misc : S29-07071605/S29-06291604 (7/28)

ALS Vial : 16 Sample Multiplier: 1

Quant Time: Jul 08 13:38:17 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 13:37:41 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.33	100	14782	2.101	ng	90
51) n-Heptane	11.45	71	17742	1.064	ng	98
52) cis-1,3-Dichloropropene	11.95	75	24761	0.993	ng	100
53) 4-Methyl-2-pentanone	11.97	58	15030	0.985	ng	96
54) trans-1,3-Dichloropropene	12.43	75	20435	0.838	ng	99
55) 1,1,2-Trichloroethane	12.59	97	16209	1.099	ng	99
58) Toluene	12.87	91	71313	1.177	ng	100
59) 2-Hexanone	13.08	43	32069	0.898	ng	97
60) Dibromochloromethane	13.26	129	18511	1.193	ng	100
61) 1,2-Dibromoethane	13.50	107	18234	1.147	ng	99
62) n-Butyl Acetate	13.67	43	35141	0.901	ng	99
63) n-Octane	13.80	57	14067	1.068	ng	99
64) Tetrachloroethene	13.95	166	23583	1.151	ng	97
65) Chlorobenzene	14.62	112	49846	1.214	ng	99
66) Ethylbenzene	14.99	91	79666	1.135	ng	98
67) m- & p-Xylenes	15.17	91	126528	2.249	ng	97
68) Bromoform	15.25	173	16789	1.060	ng	100
69) Styrene	15.53	104	50310	1.284	ng	100
70) o-Xylene	15.64	91	64583	1.095	ng	98
71) n-Nonane	15.85	43	31843	0.883	ng	97
72) 1,1,2,2-Tetrachloroethane	15.61	83	28349	1.148	ng	100
74) Cumene	16.21	105	84989	1.110	ng	99
75) alpha-Pinene	16.59	93	39812	1.088	ng	96
76) n-Propylbenzene	16.70	91	99217	1.065	ng	98
77) 3-Ethyltoluene	16.80	105	87757	1.184	ng	100
78) 4-Ethyltoluene	16.84	105	79624	1.104	ng	99
79) 1,3,5-Trimethylbenzene	16.91	105	72399	1.130	ng	98
80) alpha-Methylstyrene	17.06	118	37673	1.232	ng	100
81) 2-Ethyltoluene	17.10	105	84472	1.170	ng	99
82) 1,2,4-Trimethylbenzene	17.31	105	71170	1.131	ng	98
83) n-Decane	17.41	57	35313	1.006	ng	97
84) Benzyl Chloride	17.43	91	47698	0.932	ng	95
85) 1,3-Dichlorobenzene	17.45	146	45630	1.289	ng	99
86) 1,4-Dichlorobenzene	17.52	146	46044	1.245	ng	98
87) sec-Butylbenzene	17.57	105	98867	1.213	ng	98
88) 4-Isopropyltoluene (p-...	17.71	119	91411	1.128	ng	99
89) 1,2,3-Trimethylbenzene	17.71	105	74059	1.123	ng	99
90) 1,2-Dichlorobenzene	17.84	146	44080	1.261	ng	100
91) d-Limonene	17.85	68	24711	1.206	ng	97
92) 1,2-Dibromo-3-Chloropr...	18.26	157	14852	1.062	ng	93
93) n-Undecane	18.61	57	35596	0.996	ng	98
94) 1,2,4-Trichlorobenzene	19.46	180	33674	1.192	ng	99
95) Naphthalene	19.57	128	96483	1.235	ng	99
96) n-Dodecane	19.58	57	33299	1.015	ng	98
97) Hexachlorobutadiene	19.90	225	23387	1.147	ng	98
98) Cyclohexanone	15.32	55	20887	1.024	ng	99
99) tert-Butylbenzene	17.31	119	73986	1.140	ng	100
100) n-Butylbenzene	18.12	91	73935	1.190	ng	98

(#)=qualifier out of range (m)=manual integration (+)=signals summed



Data File: I:\MS08\Data\2016 07\08\07081610.D

Acq On : 8 Jul 2016 12:37

Operator: WA

Sample : 5.0ng TO-15 ICAL Std

Misc : S29-07071605/S29-06291604 (7/28)

ALS Vial : 16 Sample Multiplier: 1

Quant Time: Jul 08 13:38:19 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 13:37:41 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

107 7/8/16

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.80	130	192870	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	10.54	114	869173	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	14.57	82	332695	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.49	65	229278	8.448	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	67.60%#
57) Toluene-d8 (SS2)	12.77	98	874239	13.281	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	106.24%
73) Bromofluorobenzene (SS3)	16.07	174	336784	14.128	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	113.04%

Target Compounds

						Qvalue
2) Propene	3.89	42	87625	3.850	ng	99
3) Dichlorodifluoromethan...	4.00	85	155025	3.870	ng	100
4) Chloromethane	4.20	50	72915	3.394	ng	98
5) 1,2-Dichloro-1,1,2,2-t...	4.36	135	96932	5.363	ng	99
6) Vinyl Chloride	4.47	62	110330	4.605	ng	100
7) 1,3-Butadiene	4.65	54	85182	4.807	ng	99
8) Bromomethane	4.96	94	76133	5.619	ng	99
9) Chloroethane	5.17	64	63750	4.558	ng	99
10) Ethanol	5.37	45	282885	20.843	ng	100
11) Acetonitrile	5.58	41	148416	4.253	ng	99
12) Acrolein	5.71	56	49977	4.629	ng	99
13) Acetone	5.84	58	317616	21.147	ng	96
14) Trichlorofluoromethane	6.01	101	135738	3.775	ng	100
15) 2-Propanol (Isopropanol)	6.13	45	363614	7.824	ng	97
16) Acrylonitrile	6.34	53	106439	4.639	ng	100
17) 1,1-Dichloroethene	6.67	96	84580	5.483	ng	97
18) 2-Methyl-2-Propanol (t...	6.73	59	353492	7.475	ng	98
19) Methylene Chloride	6.79	84	84257	5.731	ng	99
20) 3-Chloro-1-propene (Al...	6.91	41	105878	3.912	ng	98
21) Trichlorotrifluoroethane	7.07	151	80977	5.089	ng	98
22) Carbon Disulfide	7.05	76	306981	4.407	ng	99
23) trans-1,2-Dichloroethene	7.69	61	110887	4.401	ng	99
24) 1,1-Dichloroethane	7.89	63	139741	4.237	ng	100
25) Methyl tert-Butyl Ether	7.94	73	254505	4.378	ng	98
26) Vinyl Acetate	8.03	86	114967	24.433	ng	# 83
27) 2-Butanone (MEK)	8.24	72	59960	5.018	ng	96
28) cis-1,2-Dichloroethene	8.66	61	106541	4.438	ng	100
29) Diisopropyl Ether	8.85	87	77609	5.068	ng	# 88
30) Ethyl Acetate	8.85	61	59644	10.054	ng	99
31) n-Hexane	8.87	57	135325	4.515	ng	99
32) Chloroform	8.92	83	138742	4.540	ng	99
34) Tetrahydrofuran (THF)	9.26	72	56181	4.883	ng	95
35) Ethyl tert-Butyl Ether	9.33	87	110411	4.699	ng	100
36) 1,2-Dichloroethane	9.59	62	93979	3.536	ng	99
38) 1,1,1-Trichloroethane	9.82	97	122096	4.235	ng	99
39) Isopropyl Acetate	10.13	61	101965	11.016	ng	94
40) 1-Butanol	10.13	56	171854	10.340	ng	94
41) Benzene	10.23	78	331499	4.976	ng	100
42) Carbon Tetrachloride	10.37	117	104361	4.310	ng	100
43) Cyclohexane	10.48	84	276433	9.891	ng	96
44) tert-Amyl Methyl Ether	10.76	73	242837	4.651	ng	98
45) 1,2-Dichloropropane	10.96	63	79816	4.801	ng	99
46) Bromodichloromethane	11.13	83	108353	4.727	ng	99
47) Trichloroethene	11.17	130	101109	5.259	ng	98
48) 1,4-Dioxane	11.15	88	73442	5.441	ng	98
49) 2,2,4-Trimethylpentane...	11.23	57	347934	4.400	ng	100

Data File: I:\MS08\Data\2016 07\08\07081610.D

Acq On : 8 Jul 2016 12:37

Operator: WA

Sample : 5.0ng TO-15 ICAL Std

Misc : S29-07071605/S29-06291604 (7/28)

ALS Vial : 16 Sample Multiplier: 1

Quant Time: Jul 08 13:38:19 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 13:37:41 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.33	100	79578	11.011	ng	96
51) n-Heptane	11.45	71	87347	5.096	ng	99
52) cis-1,3-Dichloropropene	11.95	75	134936	5.268	ng	99
53) 4-Methyl-2-pentanone	11.97	58	78253	4.989	ng	96
54) trans-1,3-Dichloropropene	12.42	75	114656	4.574	ng	99
55) 1,1,2-Trichloroethane	12.59	97	83590	5.517	ng	100
58) Toluene	12.87	91	357928	5.706	ng	98
59) 2-Hexanone	13.08	43	176513	4.774	ng	98
60) Dibromochloromethane	13.26	129	99944	6.216	ng	99
61) 1,2-Dibromoethane	13.50	107	95713	5.810	ng	99
62) n-Butyl Acetate	13.67	43	196569	4.865	ng	98
63) n-Octane	13.80	57	70680	5.183	ng	99
64) Tetrachloroethene	13.95	166	117321	5.526	ng	99
65) Chlorobenzene	14.62	112	244711	5.752	ng	99
66) Ethylbenzene	14.99	91	400754	5.511	ng	100
67) m- & p-Xylenes	15.17	91	620551	10.648	ng	100
68) Bromoform	15.25	173	94884	5.785	ng	100
69) Styrene	15.53	104	266869	6.576	ng	99
70) o-Xylene	15.64	91	325190	5.321	ng	99
71) n-Nonane	15.85	43	159949	4.280	ng	98
72) 1,1,2,2-Tetrachloroethane	15.61	83	148545	5.810	ng	100
74) Cumene	16.21	105	434971	5.487	ng	99
75) alpha-Pinene	16.59	93	210519	5.552	ng	98
76) n-Propylbenzene	16.70	91	497817	5.158	ng	99
77) 3-Ethyltoluene	16.80	105	450729	5.869	ng	98
78) 4-Ethyltoluene	16.84	105	405041	5.422	ng	100
79) 1,3,5-Trimethylbenzene	16.91	105	360434	5.432	ng	99
80) alpha-Methylstyrene	17.06	118	204951	6.471	ng	93
81) 2-Ethyltoluene	17.10	105	426767	5.706	ng	99
82) 1,2,4-Trimethylbenzene	17.31	105	365388	5.605	ng	98
83) n-Decane	17.41	57	180646	4.968	ng	98
84) Benzyl Chloride	17.43	91	286367	5.400	ng	98
85) 1,3-Dichlorobenzene	17.45	146	232491	6.340	ng	100
86) 1,4-Dichlorobenzene	17.52	146	233580	6.096	ng	100
87) sec-Butylbenzene	17.57	105	493763	5.849	ng	99
88) 4-Isopropyltoluene (p-...	17.71	119	465529	5.545	ng	99
89) 1,2,3-Trimethylbenzene	17.71	105	379553	5.556	ng	100
90) 1,2-Dichlorobenzene	17.84	146	227191	6.274	ng	99
91) d-Limonene	17.85	68	131566	6.200	ng	99
92) 1,2-Dibromo-3-Chloropr...	18.26	157	83480	5.763	ng	97
93) n-Undecane	18.61	57	188512	5.092	ng	98
94) 1,2,4-Trichlorobenzene	19.46	180	173649	5.936	ng	100
95) Naphthalene	19.57	128	507695	6.273	ng	99
96) n-Dodecane	19.58	57	179559	5.286	ng	98
97) Hexachlorobutadiene	19.90	225	120190	5.692	ng	99
98) Cyclohexanone	15.32	55	112326	5.315	ng	99
99) tert-Butylbenzene	17.31	119	378370	5.627	ng	99
100) n-Butylbenzene	18.12	91	377204	5.863	ng	99

(#)=qualifier out of range (m)=manual integration (+)=signals summed

Data File: I:\MS08\Data\2016 07\08\07081610.D

Acq On : 8 Jul 2016 12:37

Operator: WA

Sample : 5.0ng TO-15 ICAL Std

Misc : S29-07071605/S29-06291604 (7/28)

ALS Vial : 16 Sample Multiplier: 1

Quant Time: Jul 08 13:38:19 2016

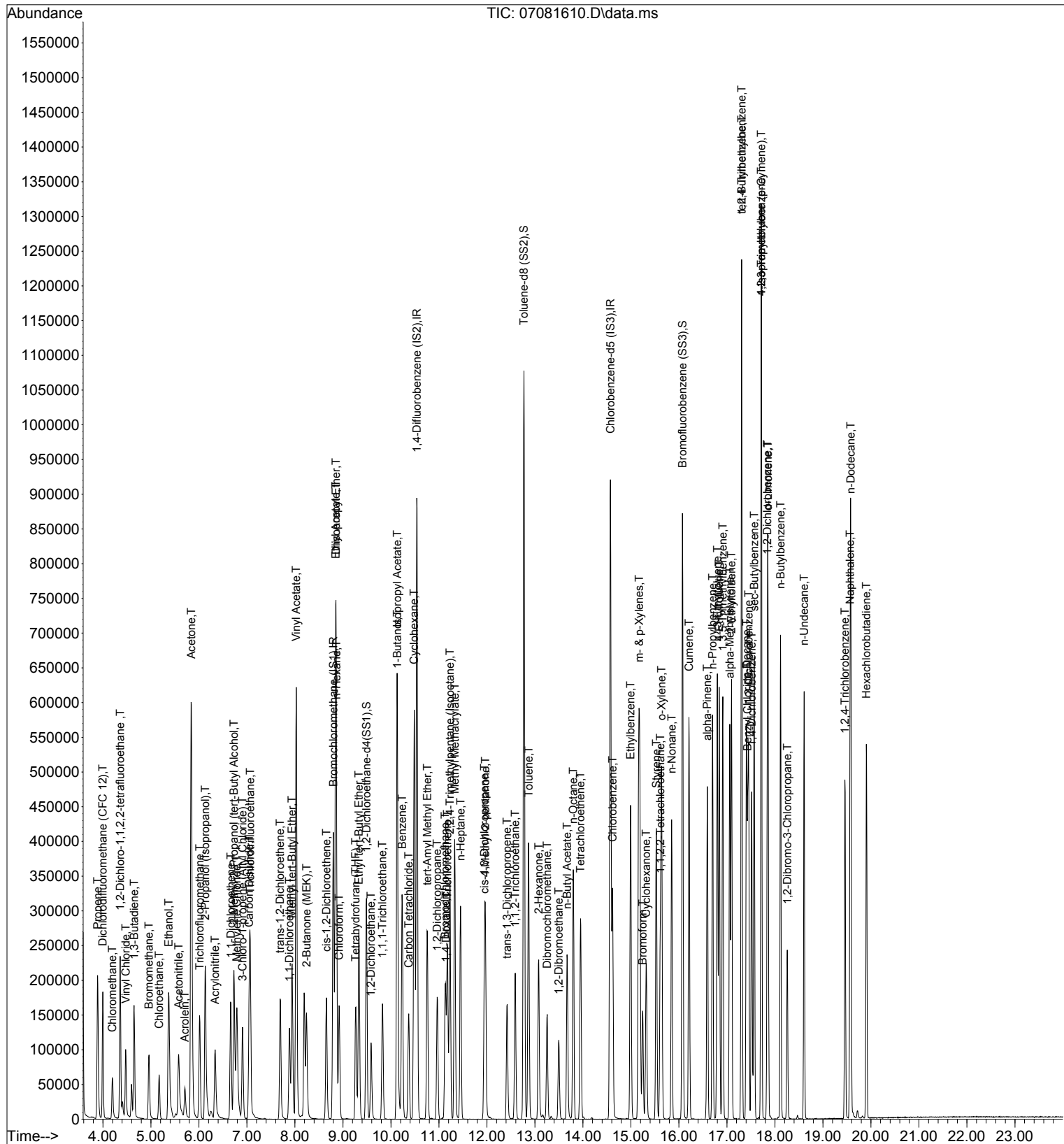
Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 13:37:41 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS08\Data\2016 07\08\07081611.D

Acq On : 8 Jul 2016 13:09

Operator: WA

Sample : 25ng TO-15 ICAL Std

Misc : S29-07071605/S29-07081602 (8/5)

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Jul 08 13:38:21 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 13:37:41 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

7/8/16

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.81	130	200410	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	10.55	114	878718	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	14.57	82	338759	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.50	65	234265	8.307	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	66.48%#
57) Toluene-d8 (SS2)	12.78	98	875651	13.065	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	104.48%
73) Bromofluorobenzene (SS3)	16.07	174	346167	14.262	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	114.08%

Target Compounds

						Qvalue
2) Propene	3.88	42	446853	18.897	ng	100
3) Dichlorodifluoromethan...	3.99	85	893886	21.477	ng	100
4) Chloromethane	4.20	50	601494	26.942	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.36	135	559425	29.788	ng	100
6) Vinyl Chloride	4.48	62	640745	25.735	ng	100
7) 1,3-Butadiene	4.65	54	529523	28.760	ng	100
8) Bromomethane	4.97	94	449767	31.947	ng	100
9) Chloroethane	5.17	64	369705	25.440	ng	100
10) Ethanol	5.41	45	1613520	114.411	ng	100
11) Acetonitrile	5.60	41	846865	23.356	ng	100
12) Acrolein	5.72	56	306357	27.310	ng	100
13) Acetone	5.86	58	1798065	115.212	ng	100
14) Trichlorofluoromethane	6.02	101	769938	20.605	ng	100
15) 2-Propanol (Isopropanol)	6.16	45	2343823	48.536	ng	100
16) Acrylonitrile	6.35	53	632233	26.521	ng	100
17) 1,1-Dichloroethene	6.67	96	499034	31.135	ng	100
18) 2-Methyl-2-Propanol (t...	6.76	59	2414670	49.141	ng	100
19) Methylene Chloride	6.80	84	494213	32.352	ng	100
20) 3-Chloro-1-propene (Al...	6.92	41	667000	23.715	ng	100
21) Trichlorotrifluoroethane	7.07	151	483868	29.267	ng	100
22) Carbon Disulfide	7.05	76	1774917	24.522	ng	100
23) trans-1,2-Dichloroethene	7.70	61	655855	25.051	ng	100
24) 1,1-Dichloroethane	7.90	63	799653	23.332	ng	100
25) Methyl tert-Butyl Ether	7.95	73	1459365	24.161	ng	100
26) Vinyl Acetate	8.04	86	716483	146.539	ng	100
27) 2-Butanone (MEK)	8.25	72	345343	27.815	ng	100
28) cis-1,2-Dichloroethene	8.67	61	615760	24.686	ng	100
29) Diisopropyl Ether	8.85	87	436091	27.404	ng	100
30) Ethyl Acetate	8.85	61	332938	54.012	ng	100
31) n-Hexane	8.87	57	678299	21.781	ng	100
32) Chloroform	8.94	83	801337	25.234	ng	100
34) Tetrahydrofuran (THF)	9.27	72	322363	26.966	ng	100
35) Ethyl tert-Butyl Ether	9.34	87	639972	26.211	ng	100
36) 1,2-Dichloroethane	9.60	62	544787	19.727	ng	100
38) 1,1,1-Trichloroethane	9.83	97	712293	24.437	ng	100
39) Isopropyl Acetate	10.13	61	575233	61.470	ng	100
40) 1-Butanol	10.15	56	1061638	63.184	ng	100
41) Benzene	10.24	78	1852295	27.501	ng	100
42) Carbon Tetrachloride	10.38	117	640634	26.168	ng	100
43) Cyclohexane	10.49	84	1554806	55.030	ng	100
44) tert-Amyl Methyl Ether	10.76	73	1418884	26.882	ng	100
45) 1,2-Dichloropropane	10.97	63	447380	26.616	ng	100
46) Bromodichloromethane	11.14	83	647375	27.934	ng	100
47) Trichloroethene	11.18	130	573959	29.530	ng	100
48) 1,4-Dioxane	11.15	88	422551	30.966	ng	100
49) 2,2,4-Trimethylpentane...	11.23	57	1969634	24.639	ng	100

Data File: I:\MS08\Data\2016 07\08\07081611.D

Acq On : 8 Jul 2016 13:09

Operator: WA

Sample : 25ng TO-15 ICAL Std

Misc : S29-07071605/S29-07081602 (8/5)

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Jul 08 13:38:21 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 13:37:41 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.33	100	470869	64.444	ng	100
51) n-Heptane	11.45	71	472314	27.257	ng	100
52) cis-1,3-Dichloropropene	11.95	75	798580	30.839	ng	100
53) 4-Methyl-2-pentanone	11.97	58	458951	28.943	ng	100
54) trans-1,3-Dichloropropene	12.42	75	704563	27.805	ng	100
55) 1,1,2-Trichloroethane	12.59	97	489300	31.945	ng	100
58) Toluene	12.87	91	2016035	31.562	ng	100
59) 2-Hexanone	13.08	43	1050662	27.906	ng	100
60) Dibromochloromethane	13.26	129	622198	38.007	ng	100
61) 1,2-Dibromoethane	13.50	107	575377	34.303	ng	100
62) n-Butyl Acetate	13.67	43	1173395	28.520	ng	100
63) n-Octane	13.80	57	399093	28.742	ng	100
64) Tetrachloroethene	13.95	166	681110	31.510	ng	100
65) Chlorobenzene	14.62	112	1425552	32.909	ng	100
66) Ethylbenzene	14.99	91	2357755	31.845	ng	100
67) m- & p-Xylenes	15.18	91	3664838	61.758	ng	100
68) Bromoform	15.25	173	616583	36.922	ng	100
69) Styrene	15.53	104	1624360	39.307	ng	100
70) o-Xylene	15.64	91	1900879	30.548	ng	100
71) n-Nonane	15.85	43	906997	23.837	ng	100
72) 1,1,2,2-Tetrachloroethane	15.61	83	874384	33.585	ng	100
74) Cumene	16.21	105	2546693	31.550	ng	100
75) alpha-Pinene	16.59	93	1270448	32.908	ng	100
76) n-Propylbenzene	16.70	91	2925434	29.769	ng	100
77) 3-Ethyltoluene	16.80	105	2605014	33.314	ng	100
78) 4-Ethyltoluene	16.84	105	2441865	32.100	ng	100
79) 1,3,5-Trimethylbenzene	16.91	105	2114363	31.296	ng	100
80) alpha-Methylstyrene	17.06	118	1265699	39.249	ng	100
81) 2-Ethyltoluene	17.10	105	2460880	32.312	ng	100
82) 1,2,4-Trimethylbenzene	17.31	105	2164651	32.613	ng	100
83) n-Decane	17.41	57	1024416	27.667	ng	100
84) Benzyl Chloride	17.43	91	1896821	35.128	ng	100
85) 1,3-Dichlorobenzene	17.46	146	1398406	37.450	ng	100
86) 1,4-Dichlorobenzene	17.52	146	1405200	36.016	ng	100
87) sec-Butylbenzene	17.57	105	2850261	33.157	ng	100
88) 4-Isopropyltoluene (p-...	17.72	119	2737196	32.022	ng	100
89) 1,2,3-Trimethylbenzene	17.71	105	2230238	32.065	ng	100
90) 1,2-Dichlorobenzene	17.84	146	1347890	36.554	ng	100
91) d-Limonene	17.85	68	782127	36.197	ng	100
92) 1,2-Dibromo-3-Chloropr...	18.26	157	505461	34.270	ng	100
93) n-Undecane	18.61	57	1043776	27.688	ng	100
94) 1,2,4-Trichlorobenzene	19.46	180	1015878	34.107	ng	100
95) Naphthalene	19.57	128	3004051	36.453	ng	100
96) n-Dodecane	19.58	57	1011241	29.237	ng	100
97) Hexachlorobutadiene	19.91	225	682055	31.724	ng	100
98) Cyclohexanone	15.32	55	695435	32.317	ng	100
99) tert-Butylbenzene	17.31	119	2244980	32.790	ng	100
100) n-Butylbenzene	18.12	91	2190452	33.438	ng	100

(#)=qualifier out of range (m)=manual integration (+)=signals summed

Data File: I:\MS08\Data\2016 07\08\07081611.D

Acq On : 8 Jul 2016 13:09

Operator: WA

Sample : 25ng TO-15 ICAL Std

Misc : S29-07071605/S29-07081602 (8/5)

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Jul 08 13:38:21 2016

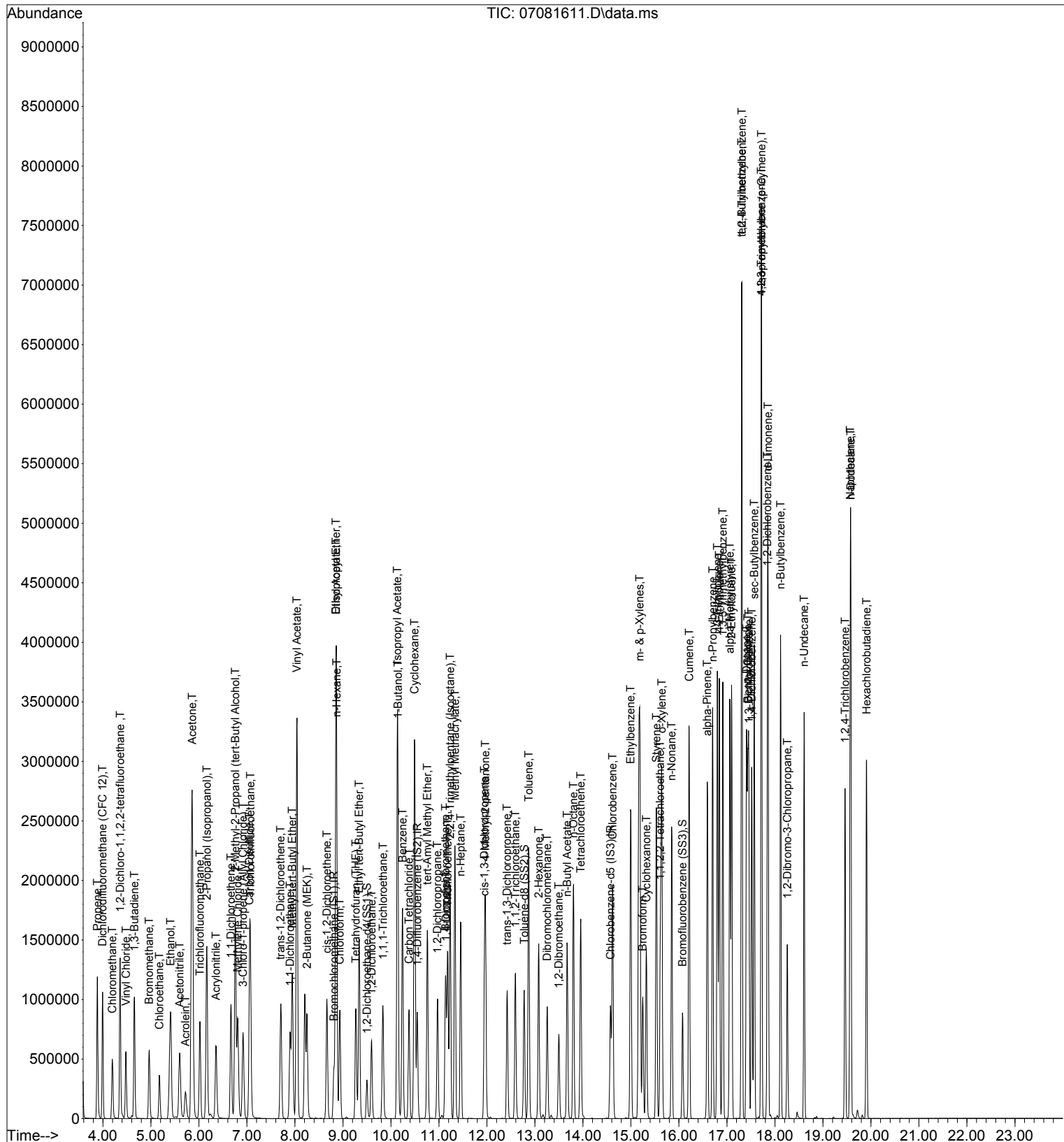
Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 13:37:41 2016

Response via : Initial Calibration

DataAcq Meth:T015.M



Data File: I:\MS08\Data\2016 07\08\07081612.D

Acq On : 8 Jul 2016 13:42

Operator: WA

Sample : 50ng TO-15 ICAL Std

Misc : S29-07071605/S29-07081602 (8/5)

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Jul 08 14:07:02 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 13:38:43 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

7/8/16

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.82	130	210579	12.500	ng	0.01
37) 1,4-Difluorobenzene (IS2)	10.55	114	932918	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	14.57	82	358504	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.51	65	242061	8.168	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	65.36%#
57) Toluene-d8 (SS2)	12.78	98	924914	13.040	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	104.32%
73) Bromofluorobenzene (SS3)	16.08	174	364529	14.191	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	113.52%

Target Compounds

						Qvalue
2) Propene	3.88	42	866632	34.879	ng	100
3) Dichlorodifluoromethan...	3.99	85	1759989	40.244	ng	100
4) Chloromethane	4.20	50	1134986	48.383	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.36	135	1167831	59.180	ng	100
6) Vinyl Chloride	4.48	62	1250760	47.811	ng	100
7) 1,3-Butadiene	4.66	54	1039501	53.733	ng	99
8) Bromomethane	4.97	94	911928	61.647	ng	100
9) Chloroethane	5.18	64	734061	48.073	ng	99
10) Ethanol	5.43	45	3102618	209.376	ng	100
11) Acetonitrile	5.62	41	1655907	43.464	ng	100
12) Acrolein	5.73	56	601231	51.008	ng	99
13) Acetone	5.87	58	3410161	207.956	ng	96
14) Trichlorofluoromethane	6.02	101	1554699	39.598	ng	100
15) 2-Propanol (Isopropanol)	6.18	45	4461181	87.922	ng	99
16) Acrylonitrile	6.37	53	1242053	49.585	ng	100
17) 1,1-Dichloroethene	6.67	96	1003231	59.570	ng	98
18) 2-Methyl-2-Propanol (t...	6.77	59	4636156	89.794	ng	99
19) Methylene Chloride	6.82	84	989189	61.627	ng	96
20) 3-Chloro-1-propene (Al...	6.92	41	1322785	44.761	ng	99
21) Trichlorotrifluoroethane	7.08	151	983191	56.596	ng	99
22) Carbon Disulfide	7.06	76	3470022	45.626	ng	100
23) trans-1,2-Dichloroethene	7.71	61	1293113	47.007	ng	97
24) 1,1-Dichloroethane	7.91	63	1587923	44.095	ng	100
25) Methyl tert-Butyl Ether	7.95	73	2902356	45.731	ng	99
26) Vinyl Acetate	8.05	86	1448426	281.935	ng	# 79
27) 2-Butanone (MEK)	8.26	72	693565	53.164	ng	95
28) cis-1,2-Dichloroethene	8.67	61	1216921	46.430	ng	99
29) Diisopropyl Ether	8.86	87	857892	51.307	ng	# 87
30) Ethyl Acetate	8.87	61	641340	99.020	ng	97
31) n-Hexane	8.87	57	1296723	39.628	ng	99
32) Chloroform	8.95	83	1598835	47.917	ng	99
34) Tetrahydrofuran (THF)	9.27	72	643947	51.266	ng	99
35) Ethyl tert-Butyl Ether	9.34	87	1287752	50.195	ng	97
36) 1,2-Dichloroethane	9.60	62	1077536	37.135	ng	100
38) 1,1,1-Trichloroethane	9.83	97	1438141	46.472	ng	99
39) Isopropyl Acetate	10.14	61	1115095	112.238	ng	94
40) 1-Butanol	10.16	56	2061353	115.555	ng	98
41) Benzene	10.24	78	3700135	51.745	ng	99
42) Carbon Tetrachloride	10.38	117	1306929	50.283	ng	99
43) Cyclohexane	10.50	84	3078416	102.625	ng	97
44) tert-Amyl Methyl Ether	10.76	73	2820098	50.325	ng	99
45) 1,2-Dichloropropane	10.97	63	886727	49.689	ng	100
46) Bromodichloromethane	11.14	83	1305649	53.065	ng	100
47) Trichloroethene	11.18	130	1190491	57.693	ng	99
48) 1,4-Dioxane	11.15	88	847358	58.489	ng	98
49) 2,2,4-Trimethylpentane...	11.24	57	3780805	44.548	ng	100

Data File: I:\MS08\Data\2016 07\08\07081612.D

Acq On : 8 Jul 2016 13:42

Operator: WA

Sample : 50ng TO-15 ICAL Std

Misc : S29-07071605/S29-07081602 (8/5)

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Jul 08 14:07:02 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 13:38:43 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.34	100	960972	123.879	ng	96
51) n-Heptane	11.46	71	934421	50.791	ng	99
52) cis-1,3-Dichloropropene	11.95	75	1604963	58.379	ng	99
53) 4-Methyl-2-pentanone	11.97	58	899851	53.450	ng	96
54) trans-1,3-Dichloropropene	12.42	75	1422524	52.877	ng	100
55) 1,1,2-Trichloroethane	12.59	97	983389	60.473	ng	100
58) Toluene	12.87	91	4026403	59.563	ng	99
59) 2-Hexanone	13.08	43	2014438	50.558	ng	99
60) Dibromochloromethane	13.26	129	1270835	73.354	ng	100
61) 1,2-Dibromoethane	13.50	107	1162116	65.468	ng	100
62) n-Butyl Acetate	13.67	43	2248733	51.647	ng	99
63) n-Octane	13.80	57	778516	52.980	ng	97
64) Tetrachloroethene	13.95	166	1397869	61.107	ng	99
65) Chlorobenzene	14.62	112	2878738	62.795	ng	100
66) Ethylbenzene	15.00	91	4651211	59.362	ng	99
67) m- & p-Xylenes	15.18	91	7229573	115.120	ng	99
68) Bromoform	15.25	173	1271795	71.963	ng	100
69) Styrene	15.53	104	3248245	74.274	ng	100
70) o-Xylene	15.64	91	3762455	57.134	ng	99
71) n-Nonane	15.85	43	1698029	42.168	ng	97
72) 1,1,2,2-Tetrachloroethane	15.62	83	1724974	62.606	ng	100
74) Cumene	16.21	105	5029764	58.880	ng	99
75) alpha-Pinene	16.60	93	2526481	61.838	ng	100
76) n-Propylbenzene	16.70	91	5673912	54.557	ng	99
77) 3-Ethyltoluene	16.81	105	4958849	59.922	ng	99
78) 4-Ethyltoluene	16.84	105	4961181	61.626	ng	98
79) 1,3,5-Trimethylbenzene	16.92	105	4185515	58.541	ng	99
80) alpha-Methylstyrene	17.06	118	2522033	73.900	ng	99
81) 2-Ethyltoluene	17.10	105	4865127	60.362	ng	99
82) 1,2,4-Trimethylbenzene	17.31	105	4286640	61.027	ng	99
83) n-Decane	17.41	57	1937540	49.446	ng	98
84) Benzyl Chloride	17.43	91	3804995	66.585	ng	99
85) 1,3-Dichlorobenzene	17.46	146	2824266	71.469	ng	100
86) 1,4-Dichlorobenzene	17.52	146	2822093	68.348	ng	100
87) sec-Butylbenzene	17.57	105	5574076	61.272	ng	99
88) 4-Isopropyltoluene (p-...	17.72	119	5421430	59.931	ng	99
89) 1,2,3-Trimethylbenzene	17.72	105	4411841	59.937	ng	99
90) 1,2-Dichlorobenzene	17.85	146	2700689	69.207	ng	99
91) d-Limonene	17.86	68	1472298	64.385	ng	96
92) 1,2-Dibromo-3-Chloropr...	18.26	157	1020521	65.379	ng	98
93) n-Undecane	18.61	57	1967939	49.328	ng	98
94) 1,2,4-Trichlorobenzene	19.46	180	2071729	65.726	ng	99
95) Naphthalene	19.57	128	5982519	68.597	ng	99
96) n-Dodecane	19.58	57	1857888	50.758	ng	97
97) Hexachlorobutadiene	19.91	225	1391135	61.142	ng	100
98) Cyclohexanone	15.33	55	1349104	59.240	ng	98
99) tert-Butylbenzene	17.31	119	4471780	61.718	ng	99
100) n-Butylbenzene	18.12	91	4230855	61.028	ng	99

(#)=qualifier out of range (m)=manual integration (+)=signals summed

Data File: I:\MS08\Data\2016 07\08\07081612.D

Acq On : 8 Jul 2016 13:42

Operator: WA

Sample : 50ng TO-15 ICAL Std

Misc : S29-07071605/S29-07081602 (8/5)

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Jul 08 14:07:02 2016

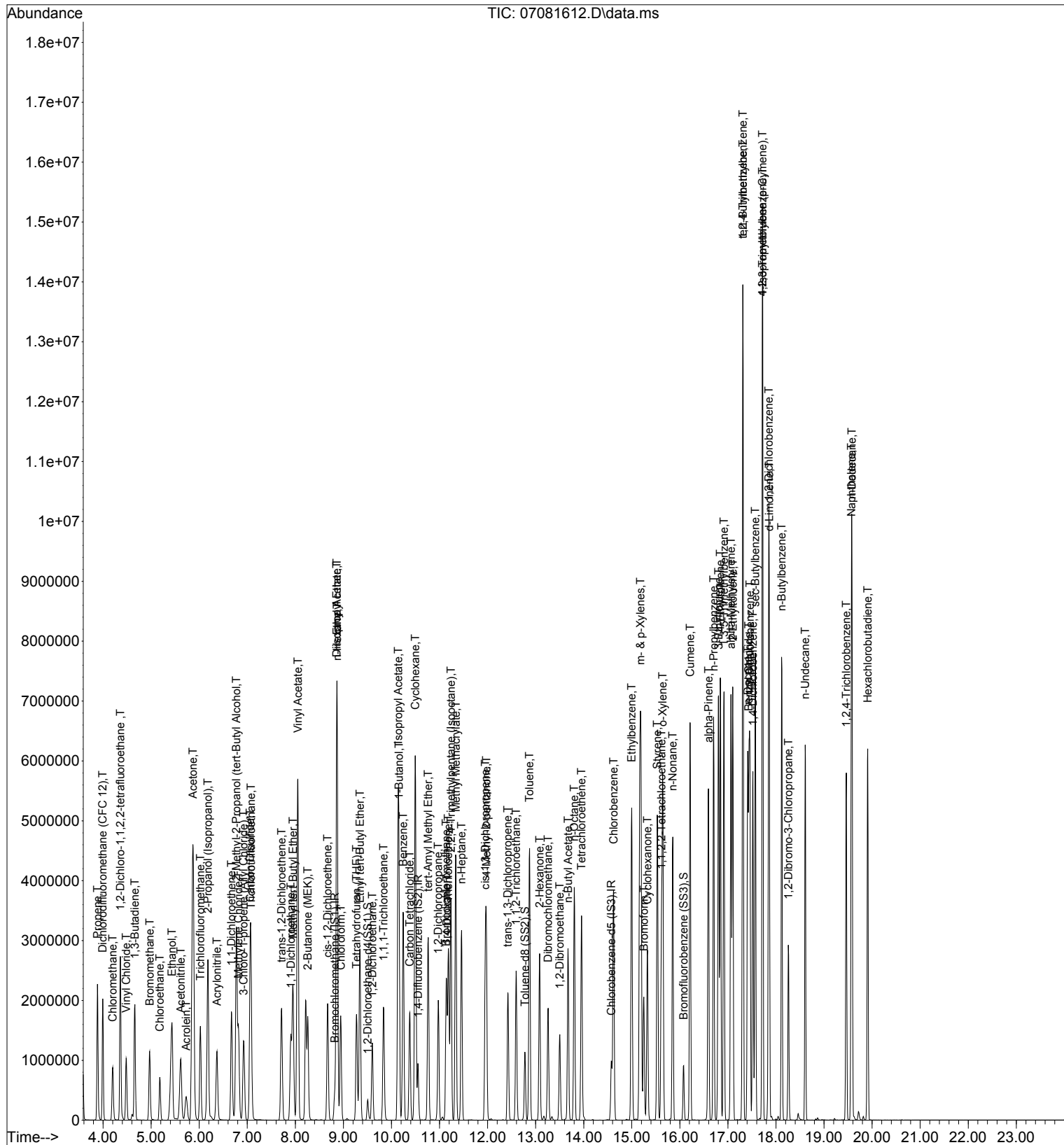
Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 13:38:43 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS08\Data\2016 07\08\07081613.D

Acq On : 8 Jul 2016 14:14

Operator: WA

Sample : 100ng TO-15 ICAL Std

Misc : S29-07071605/S29-07081602 (8/5)

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Jul 08 14:39:27 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 13:38:43 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

7/8/16

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.83	130	221465	12.500	ng	0.02
37) 1,4-Difluorobenzene (IS2)	10.56	114	990308	12.500	ng	0.01
56) Chlorobenzene-d5 (IS3)	14.58	82	370741	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.51	65	251958	8.085	ng	0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	64.64%#
57) Toluene-d8 (SS2)	12.78	98	972546	13.259	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	106.08%
73) Bromofluorobenzene (SS3)	16.08	174	375345	14.130	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	113.04%

Target Compounds

						Qvalue
2) Propene	3.89	42	1982894	75.882	ng	99
3) Dichlorodifluoromethan...	4.00	85	3443540	74.869	ng	99
4) Chloromethane	4.21	50	1701509	68.968	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.36	135	2364458	113.930	ng	100
6) Vinyl Chloride	4.49	62	2555624	92.888	ng	99
7) 1,3-Butadiene	4.67	54	2097225	103.079	ng	96
8) Bromomethane	4.98	94	1848109	118.792	ng	100
9) Chloroethane	5.19	64	1469843	91.528	ng	99
10) Ethanol	5.46	45	5883701	377.538	ng	99
11) Acetonitrile	5.64	41	3236411	80.773	ng	99
12) Acrolein	5.75	56	1188526	95.877	ng	94
13) Acetone	5.89	58	6390232	370.530	ng	91
14) Trichlorofluoromethane	6.03	101	3163249	76.608	ng	100
15) 2-Propanol (Isopropanol)	6.21	45	7243519	135.739	ng	100
16) Acrylonitrile	6.39	53	2454553	93.174	ng	100
17) 1,1-Dichloroethene	6.68	96	2014038	113.712	ng	96
18) 2-Methyl-2-Propanol (t...	6.80	59	7536430	138.793	ng	99
19) Methylene Chloride	6.83	84	1972695	116.859	ng	92
20) 3-Chloro-1-propene (Al...	6.93	41	2565522	82.546	ng	96
21) Trichlorotrifluoroethane	7.08	151	2016241	110.358	ng	96
22) Carbon Disulfide	7.06	76	6778070	84.742	ng	99
23) trans-1,2-Dichloroethene	7.72	61	2536532	87.674	ng	96
24) 1,1-Dichloroethane	7.91	63	3114793	82.243	ng	99
25) Methyl tert-Butyl Ether	7.96	73	5732854	85.889	ng	98
26) Vinyl Acetate	8.07	86	2850005	527.482	ng	# 57
27) 2-Butanone (MEK)	8.27	72	1383931	100.868	ng	# 88
28) cis-1,2-Dichloroethene	8.68	61	2375662	86.186	ng	96
29) Diisopropyl Ether	8.87	87	1691624	96.197	ng	# 64
30) Ethyl Acetate	8.88	61	1166573	171.260	ng	92
31) n-Hexane	8.88	57	2376193	69.048	ng	98
32) Chloroform	8.96	83	3194639	91.036	ng	100
34) Tetrahydrofuran (THF)	9.28	72	1289428	97.608	ng	98
35) Ethyl tert-Butyl Ether	9.35	87	2583629	95.756	ng	93
36) 1,2-Dichloroethane	9.61	62	2136383	70.006	ng	99
38) 1,1,1-Trichloroethane	9.84	97	2887592	87.903	ng	99
39) Isopropyl Acetate	10.15	61	2122134	201.221	ng	# 86
40) 1-Butanol	10.18	56	3944470	208.305	ng	96
41) Benzene	10.25	78	7335566	96.640	ng	98
42) Carbon Tetrachloride	10.39	117	2669267	96.747	ng	100
43) Cyclohexane	10.50	84	6006628	188.639	ng	93
44) tert-Amyl Methyl Ether	10.77	73	5514276	92.701	ng	98
45) 1,2-Dichloropropane	10.98	63	1759751	92.896	ng	100
46) Bromodichloromethane	11.15	83	2598514	99.491	ng	99
47) Trichloroethene	11.19	130	2467918	112.667	ng	99
48) 1,4-Dioxane	11.16	88	1693732	110.135	ng	96
49) 2,2,4-Trimethylpentane...	11.24	57	7147280	79.334	ng	100

Data File: I:\MS08\Data\2016 07\08\07081613.D

Acq On : 8 Jul 2016 14:14

Operator: WA

Sample : 100ng TO-15 ICAL Std

Misc : S29-07071605/S29-07081602 (8/5)

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Jul 08 14:39:27 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 13:38:43 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.35	100	1952513	237.113	ng	90
51) n-Heptane	11.46	71	1887578	96.655	ng	98
52) cis-1,3-Dichloropropene	11.96	75	3186451	109.187	ng	99
53) 4-Methyl-2-pentanone	11.98	58	1723811	96.459	ng	92
54) trans-1,3-Dichloropropene	12.43	75	2839042	99.415	ng	99
55) 1,1,2-Trichloroethane	12.60	97	1983782	114.923	ng	99
58) Toluene	12.88	91	7937116	113.539	ng	98
59) 2-Hexanone	13.09	43	3776419	91.651	ng	96
60) Dibromochloromethane	13.27	129	2585041	144.286	ng	99
61) 1,2-Dibromoethane	13.51	107	2353752	128.223	ng	100
62) n-Butyl Acetate	13.68	43	4196320	93.197	ng	97
63) n-Octane	13.81	57	1510158	99.377	ng	94
64) Tetrachloroethene	13.96	166	2897970	122.501	ng	99
65) Chlorobenzene	14.62	112	5738198	121.038	ng	99
66) Ethylbenzene	15.00	91	9112679	112.464	ng	97
67) m- & p-Xylenes	15.19	91	14065462	216.578	ng	97
68) Bromoform	15.26	173	2637795	144.330	ng	100
69) Styrene	15.54	104	6427732	142.124	ng	99
70) o-Xylene	15.65	91	7352759	107.969	ng	98
71) n-Nonane	15.85	43	3078822	73.934	ng	93
72) 1,1,2,2-Tetrachloroethane	15.62	83	3335164	117.051	ng	99
74) Cumene	16.22	105	9663693	109.393	ng	97
75) alpha-Pinene	16.60	93	4947695	117.103	ng	100
76) n-Propylbenzene	16.70	91	10677099	99.275	ng	96
77) 3-Ethyltoluene	16.81	105	9706050	113.416	ng	97
78) 4-Ethyltoluene	16.85	105	9354002	112.357	ng	95
79) 1,3,5-Trimethylbenzene	16.92	105	8148553	110.209	ng	97
80) alpha-Methylstyrene	17.07	118	5032262	142.586	ng	92
81) 2-Ethyltoluene	17.11	105	9340272	112.060	ng	96
82) 1,2,4-Trimethylbenzene	17.32	105	8149896	112.197	ng	97
83) n-Decane	17.41	57	3479077	85.856	ng	94
84) Benzyl Chloride	17.44	91	7340272	124.211	ng	95
85) 1,3-Dichlorobenzene	17.46	146	5706156	139.631	ng	99
86) 1,4-Dichlorobenzene	17.53	146	5648571	132.287	ng	99
87) sec-Butylbenzene	17.57	105	10435720	110.926	ng	96
88) 4-Isopropyltoluene (p-...	17.73	119	10107338	108.043	ng	97
89) 1,2,3-Trimethylbenzene	17.73	105	8298105	109.014	ng	96
90) 1,2-Dichlorobenzene	17.85	146	5441451	134.838	ng	99
91) d-Limonene	17.87	68	2590046	109.526	ng	88
92) 1,2-Dibromo-3-Chloropr...	18.26	157	2055025	127.309	ng	95
93) n-Undecane	18.61	57	3534607	85.674	ng	95
94) 1,2,4-Trichlorobenzene	19.46	180	4215959	129.337	ng	100
95) Naphthalene	19.58	128	11373276	126.105	ng	97
96) n-Dodecane	19.59	57	3145304	83.094	ng	91
97) Hexachlorobutadiene	19.91	225	2913245	123.814	ng	100
98) Cyclohexanone	15.33	55	2583869	109.715	ng	96
99) tert-Butylbenzene	17.32	119	8642300	115.341	ng	97
100) n-Butylbenzene	18.12	91	7939502	110.744	ng	96

(#)=qualifier out of range (m)=manual integration (+)=signals summed



Data File: I:\MS08\Data\2016 07\08\07081614.D

Acq On : 8 Jul 2016 14:47

Operator: WA

Sample : 25ng TO-15 ICV Std

Misc : S29-06151601/S29-07071606 (8/5)

ALS Vial : 1 Sample Multiplier: 1

Quant Time: Jul 08 15:12:40 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 14:41:56 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

7/8/16

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.81	130	230459	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	10.55	114	1015370	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	14.57	82	384275	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.50	65	258268	11.936	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.52%
57) Toluene-d8 (SS2)	12.78	98	1004482	12.430	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.44%
73) Bromofluorobenzene (SS3)	16.08	174	397957	12.858	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.88%

Target Compounds

						Qvalue
2) Propene	3.88	42	430232	21.855	ng	99
3) Dichlorodifluoromethan...	3.99	85	870026	22.712	ng	100
4) Chloromethane	4.19	50	612357	29.581	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.36	135	606039	25.533	ng	100
6) Vinyl Chloride	4.47	62	682026	26.615	ng	100
7) 1,3-Butadiene	4.65	54	541643	28.960	ng	99
8) Bromomethane	4.96	94	485062	26.793	ng	100
9) Chloroethane	5.17	64	380420	25.141	ng	100
10) Ethanol	5.41	45	1677487	127.200	ng	100
11) Acetonitrile	5.60	41	844588	24.688	ng	99
12) Acrolein	5.72	56	288280	26.268	ng	99
13) Acetone	5.86	58	1833729	123.217	ng	97
14) Trichlorofluoromethane	6.02	101	801977	23.828	ng	100
15) 2-Propanol (Isopropanol)	6.16	45	2380784	55.241	ng	100
16) Acrylonitrile	6.35	53	650701	27.298	ng	99
17) 1,1-Dichloroethene	6.66	96	535089	28.555	ng	97
18) 2-Methyl-2-Propanol (t...	6.76	59	2522991	57.196	ng	99
19) Methylene Chloride	6.81	84	528080	28.647	ng	95
20) 3-Chloro-1-propene (Al...	6.92	41	669027	29.618	ng	97
21) Trichlorotrifluoroethane	7.07	151	535119	28.195	ng	96
22) Carbon Disulfide	7.05	76	1734186	21.368	ng	100
23) trans-1,2-Dichloroethene	7.70	61	662663	27.282	ng	96
24) 1,1-Dichloroethane	7.90	63	836856	25.938	ng	100
25) Methyl tert-Butyl Ether	7.95	73	1558859	26.629	ng	99
26) Vinyl Acetate	8.04	86	767933	148.542	ng	# 85
27) 2-Butanone (MEK)	8.25	72	366827	29.282	ng	92
28) cis-1,2-Dichloroethene	8.67	61	644984	27.685	ng	97
29) Diisopropyl Ether	8.85	87	458699	26.490	ng	# 90
30) Ethyl Acetate	8.85	61	338677	54.067	ng	96
31) n-Hexane	8.87	57	690780	22.416	ng	99
32) Chloroform	8.94	83	860863	27.204	ng	99
34) Tetrahydrofuran (THF)	9.27	72	358291	28.412	ng	95
35) Ethyl tert-Butyl Ether	9.34	87	692769	27.285	ng	95
36) 1,2-Dichloroethane	9.60	62	573480	26.748	ng	100
38) 1,1,1-Trichloroethane	9.83	97	765265	26.777	ng	99
39) Isopropyl Acetate	10.13	61	589092	57.500	ng	97
40) 1-Butanol	10.15	56	1085237	60.711	ng	98
41) Benzene	10.24	78	1974119	26.476	ng	99
42) Carbon Tetrachloride	10.38	117	689569	29.457	ng	99
43) Cyclohexane	10.49	84	1653463	50.734	ng	98
44) tert-Amyl Methyl Ether	10.76	73	1508134	27.584	ng	98
45) 1,2-Dichloropropane	10.97	63	469723	26.398	ng	99
46) Bromodichloromethane	11.14	83	683937	29.157	ng	99
47) Trichloroethene	11.18	130	635878	26.826	ng	99
48) 1,4-Dioxane	11.15	88	464733	30.168	ng	97
49) 2,2,4-Trimethylpentane...	11.23	57	2041022	25.741	ng	99

Data File: I:\MS08\Data\2016 07\08\07081614.D

Acq On : 8 Jul 2016 14:47

Operator: WA

Sample : 25ng TO-15 ICV Std

Misc : S29-06151601/S29-07071606 (8/5)

ALS Vial : 1 Sample Multiplier: 1

Quant Time: Jul 08 15:12:40 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 14:41:56 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.33	100	510395	57.968	ng	96
51) n-Heptane	11.45	71	493123	25.877	ng	99
52) cis-1,3-Dichloropropene	11.95	75	778369	29.507	ng	100
53) 4-Methyl-2-pentanone	11.97	58	473197	28.849	ng	96
54) trans-1,3-Dichloropropene	12.42	75	727762	29.884	ng	100
55) 1,1,2-Trichloroethane	12.59	97	532779	28.665	ng	99
58) Toluene	12.87	91	2198664	26.609	ng	100
59) 2-Hexanone	13.08	43	1061645	30.164	ng	98
60) Dibromochloromethane	13.25	129	667568	32.715	ng	99
61) 1,2-Dibromoethane	13.50	107	621770	30.862	ng	100
62) n-Butyl Acetate	13.67	43	1192893	32.915	ng	99
63) n-Octane	13.80	57	408586	25.831	ng	96
64) Tetrachloroethene	13.95	166	751742	26.361	ng	100
65) Chlorobenzene	14.62	112	1562042	27.870	ng	100
66) Ethylbenzene	15.00	91	2539807	28.051	ng	100
67) m- & p-Xylenes	15.18	91	3954595	55.151	ng	100
68) Bromoform	15.25	173	649179	30.501	ng	99
69) Styrene	15.53	104	1760379	31.518	ng	100
70) o-Xylene	15.64	91	2043573	26.900	ng	99
71) n-Nonane	15.85	43	913245	25.383	ng	97
72) 1,1,2,2-Tetrachloroethane	15.61	83	932951	27.630	ng	99
74) Cumene	16.21	105	2736578	27.155	ng	100
75) alpha-Pinene	16.59	93	1376106	29.285	ng	100
76) n-Propylbenzene	16.70	91	3105991	26.813	ng	100
77) 3-Ethyltoluene	16.80	105	2773206	28.434	ng	100
78) 4-Ethyltoluene	16.84	105	2653663	28.442	ng	100
79) 1,3,5-Trimethylbenzene	16.91	105	2285693	27.755	ng	100
80) alpha-Methylstyrene	17.06	118	1355562	29.536	ng	99
81) 2-Ethyltoluene	17.10	105	2669689	27.986	ng	100
82) 1,2,4-Trimethylbenzene	17.31	105	2360693	29.365	ng	100
83) n-Decane	17.41	57	1054559	26.655	ng	99
84) Benzyl Chloride	17.43	91	2051880	33.760	ng	99
85) 1,3-Dichlorobenzene	17.46	146	1560627	30.741	ng	99
86) 1,4-Dichlorobenzene	17.52	146	1545277	28.700	ng	100
87) sec-Butylbenzene	17.57	105	3050423	28.477	ng	100
88) 4-Isopropyltoluene (p-...	17.72	119	3028710	28.592	ng	99
89) 1,2,3-Trimethylbenzene	17.71	105	2435615	29.152	ng	100
90) 1,2-Dichlorobenzene	17.84	146	1485879	30.036	ng	99
91) d-Limonene	17.85	68	819765	31.609	ng	98
92) 1,2-Dibromo-3-Chloropr...	18.26	157	571048	31.285	ng	97
93) n-Undecane	18.61	57	1089600	28.004	ng	99
94) 1,2,4-Trichlorobenzene	19.46	180	1244021	33.144	ng	100
95) Naphthalene	19.57	128	3549275	32.184	ng	100
96) n-Dodecane	19.58	57	1103329	30.566	ng	98
97) Hexachlorobutadiene	19.91	225	795874	30.201	ng	100
98) Cyclohexanone	15.32	55	693976	30.034	ng	98
99) tert-Butylbenzene	17.31	119	2419585	28.380	ng	100
100) n-Butylbenzene	18.12	91	2344852	30.279	ng	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File: I:\MS08\Data\2016 07\08\07081614.D

Acq On : 8 Jul 2016 14:47

Operator: WA

Sample : 25ng TO-15 ICV Std

Misc : S29-06151601/S29-07071606 (8/5)

ALS Vial : 1 Sample Multiplier: 1

Quant Time: Jul 08 15:12:40 2016

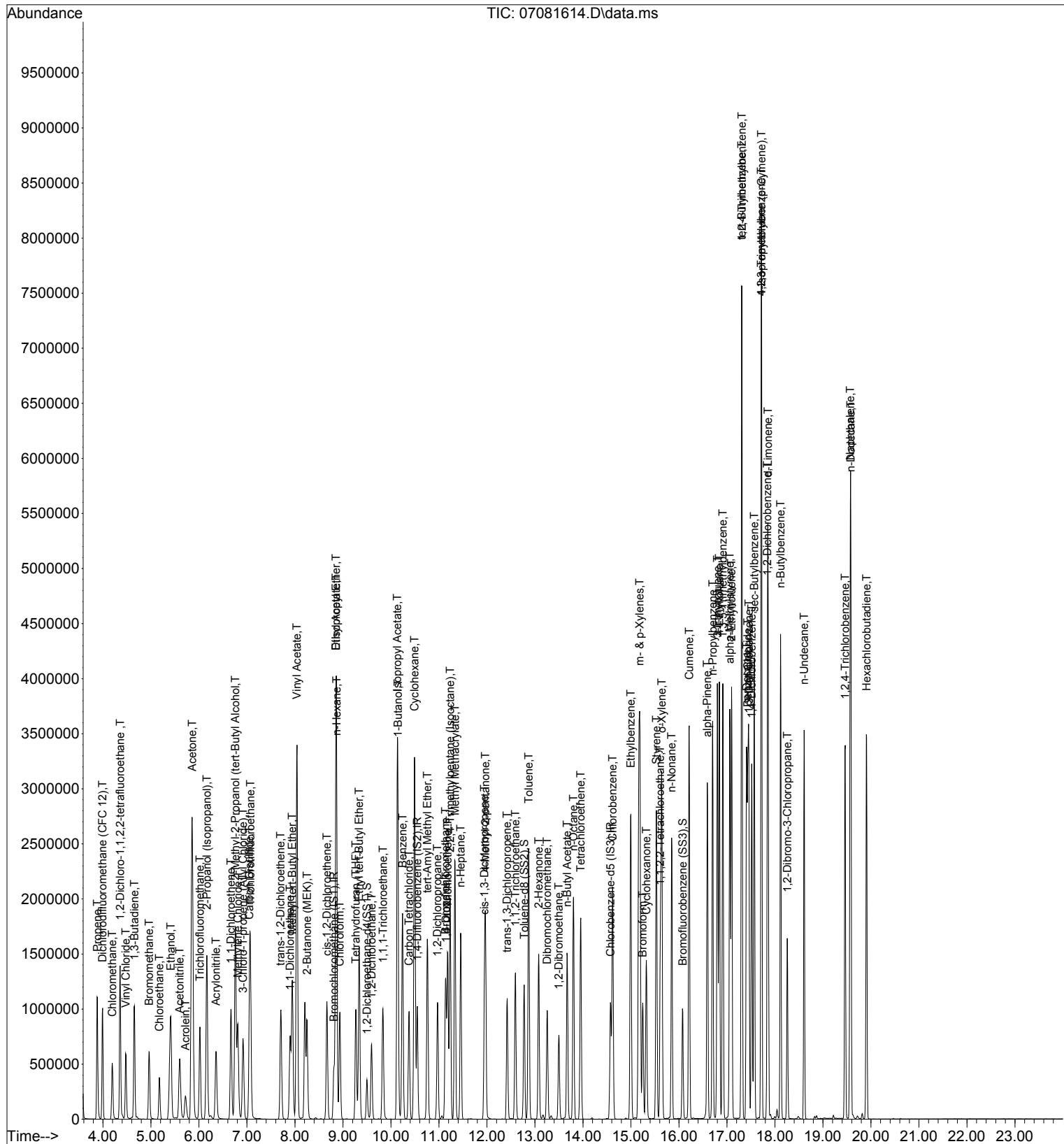
Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 14:41:56 2016

Response via : Initial Calibration

DataAcq Meth:T015.M



INITIAL CALIBRATION VERIFICATION CHECK SHEET

7/8/16

Data File Name: 07081614.D

Acq. Method File: TO15.M

Data File Path: I:\MS08\Data\2016_07\08\

Sample Name: 25ng TO-15 ICV Std

Operator: WA

Misc Info: S29-06151601/S29-07071606 (

Date Acquired: 7/8/2016

14:47

Instrument Name: Instrument #MS08

#	Compound Name	Ret. Time	Amt. (ng)	Spike Amt.(ng)	% Rec.	Lower Limit	Upper Limit	* OR Fail
2)	Propene	3.88	21.9	24.50	89	70	130	*
3)	Dichlorodifluoromethane (CFC 12)	3.99	22.7	23.50	97	70	130	*
4)	Chloromethane	4.19	29.6	25.00	118	70	130	*
5)	1,2-Dichloro-1,1,2,2-tetrafluoroethane	4.36	25.5	25.50	100	70	130	*
6)	Vinyl Chloride	4.47	26.6	25.00	106	70	130	*
7)	1,3-Butadiene	4.65	29.0	25.75	113	70	130	*
8)	Bromomethane	4.97	26.8	25.25	106	70	130	*
9)	Chloroethane	5.17	25.1	25.00	100	70	130	*
10)	Ethanol	5.41	127	124.75	102	70	130	*
11)	Acetonitrile	5.60	24.7	26.50	93	70	130	*
12)	Acrolein	5.72	26.3	26.75	98	70	130	*
13)	Acetone	5.86	123	134.75	91	70	130	*
14)	Trichlorofluoromethane	6.02	23.8	27.00	88	70	130	*
15)	2-Propanol (Isopropanol)	6.16	55.2	52.25	106	70	130	*
16)	Acrylonitrile	6.35	27.3	26.50	103	70	130	*
17)	1,1-Dichloroethene	6.66	28.6	27.00	106	70	130	*
18)	2-Methyl-2-Propanol (tert-Butyl Alcohol)	6.76	57.2	50.00	114	70	130	*
19)	Methylene Chloride	6.81	28.6	27.75	103	70	130	*
20)	3-Chloro-1-propene (Allyl Chloride)	6.92	29.6	27.25	109	70	130	*
21)	Trichlorotrifluoroethane	7.07	28.2	27.50	103	70	130	*
22)	Carbon Disulfide	7.05	21.4	26.25	82	70	130	*
23)	trans-1,2-Dichloroethene	7.70	27.3	26.25	104	70	130	*
24)	1,1-Dichloroethane	7.90	25.9	26.50	98	70	130	*
25)	Methyl tert-Butyl Ether	7.95	26.6	27.00	99	70	130	*
26)	Vinyl Acetate	8.04	149	129.75	115	70	130	*
27)	2-Butanone (MEK)	8.25	29.3	27.50	107	70	130	*
28)	cis-1,2-Dichloroethene	8.67	27.7	27.25	102	70	130	*
29)	Diisopropyl Ether	8.85	26.5	27.00	98	70	130	*
30)	Ethyl Acetate	8.85	54.1	53.50	101	70	130	*
31)	n-Hexane	8.87	22.4	26.50	85	70	130	*
32)	Chloroform	8.94	27.2	28.00	97	70	130	*
34)	Tetrahydrofuran (THF)	9.27	28.4	27.50	103	70	130	*
35)	Ethyl tert-Butyl Ether	9.34	27.3	26.75	102	70	130	*
36)	1,2-Dichloroethane	9.60	26.7	26.75	100	70	130	*
38)	1,1,1-Trichloroethane	9.83	26.8	26.25	102	70	130	*
39)	Isopropyl Acetate	10.13	57.5	57.25	100	70	130	*
40)	1-Butanol	10.15	60.7	51.25	118	70	130	*
41)	Benzene	10.24	26.5	28.25	94	70	130	*
42)	Carbon Tetrachloride	10.38	29.5	28.75	103	70	130	*
43)	Cyclohexane	10.49	50.7	53.00	96	70	130	*
44)	tert-Amyl Methyl Ether	10.76	27.6	26.75	103	70	130	*
45)	1,2-Dichloropropane	10.97	26.4	27.00	98	70	130	*
46)	Bromodichloromethane	11.14	29.2	27.25	107	70	130	*
47)	Trichloroethene	11.18	26.8	27.00	99	70	130	*
48)	1,4-Dioxane	11.15	30.2	26.25	115	70	130	*
49)	2,2,4-Trimethylpentane (Isooctane)	11.23	25.7	26.75	96	70	130	*

INITIAL CALIBRATION VERIFICATION CHECK SHEET

Data File Name: **07081614.D**

Acq. Method File: **TO15.M**

Data File Path: **I:\MS08\Data\2016_07\08**

Sample Name: **25ng TO-15 ICV Std**

Operator: **WA**

Misc Info: **S29-06151601/S29-07071606 (**

Date Acquired: **7/8/2016**

14:47

Instrument Name: **Instrument #MS08**

#	Compound Name	Ret. Time	Amt. (ng)	Spike Amt.(ng)	% Rec.	Lower Limit	Upper Limit	* OR Fail
50)	Methyl Methacrylate	11.33	58.0	52.75	110	70	130	*
51)	n-Heptane	11.45	25.9	27.00	96	70	130	*
52)	cis-1,3-Dichloropropene	11.95	29.5	26.00	113	70	130	*
53)	4-Methyl-2-pentanone	11.97	28.8	27.50	105	70	130	*
54)	trans-1,3-Dichloropropene	12.42	29.9	26.25	114	70	130	*
55)	1,1,2-Trichloroethane	12.59	28.7	27.00	106	70	130	*
58)	Toluene	12.87	26.6	27.25	98	70	130	*
59)	2-Hexanone	13.08	30.2	27.50	110	70	130	*
60)	Dibromochloromethane	13.25	32.7	27.50	119	70	130	*
61)	1,2-Dibromoethane	13.50	30.9	27.25	113	70	130	*
62)	n-Butyl Acetate	13.67	32.9	28.25	116	70	130	*
63)	n-Octane	13.80	25.8	26.25	98	70	130	*
64)	Tetrachloroethene	13.95	26.4	25.25	105	70	130	*
65)	Chlorobenzene	14.62	27.9	27.50	101	70	130	*
66)	Ethylbenzene	15.00	28.1	27.25	103	70	130	*
67)	m- & p-Xylenes	15.18	55.2	53.50	103	70	130	*
68)	Bromoform	15.25	30.5	28.50	107	70	130	*
69)	Styrene	15.53	31.5	27.75	114	70	130	*
70)	o-Xylene	15.64	26.9	26.25	102	70	130	*
71)	n-Nonane	15.85	25.4	25.50	100	70	130	*
72)	1,1,2,2-Tetrachloroethane	15.61	27.6	26.25	105	70	130	*
74)	Cumene	16.21	27.2	26.00	105	70	130	*
75)	alpha-Pinene	16.59	29.3	26.50	111	70	130	*
76)	n-Propylbenzene	16.70	26.8	25.50	105	70	130	*
77)	3-Ethyltoluene	16.80	28.4	26.75	106	70	130	*
78)	4-Ethyltoluene	16.84	28.4	26.75	106	70	130	*
79)	1,3,5-Trimethylbenzene	16.91	27.8	26.75	104	70	130	*
80)	alpha-Methylstyrene	17.06	29.5	26.25	112	70	130	*
81)	2-Ethyltoluene	17.10	28.0	26.75	105	70	130	*
82)	1,2,4-Trimethylbenzene	17.31	29.4	27.25	108	70	130	*
83)	n-Decane	17.41	26.7	26.25	102	70	130	*
84)	Benzyl Chloride	17.43	33.8	27.50	123	70	130	*
85)	1,3-Dichlorobenzene	17.46	30.7	28.50	108	70	130	*
86)	1,4-Dichlorobenzene	17.52	28.7	26.00	110	70	130	*
87)	sec-Butylbenzene	17.57	28.5	27.25	105	70	130	*
88)	4-Isopropyltoluene (p-Cymene)	17.72	28.6	26.00	110	70	130	*
89)	1,2,3-Trimethylbenzene	17.71	29.2	26.50	110	70	130	*
90)	1,2-Dichlorobenzene	17.84	30.0	27.50	109	70	130	*
91)	d-Limonene	17.85	31.6	26.25	120	70	130	*
92)	1,2-Dibromo-3-Chloropropane	18.26	31.3	27.25	115	70	130	*
93)	n-Undecane	18.61	28.0	25.25	111	70	130	*
94)	1,2,4-Trichlorobenzene	19.46	33.1	28.75	115	70	130	*
95)	Naphthalene	19.57	32.2	27.25	118	70	130	*
96)	n-Dodecane	19.58	30.6	27.25	112	70	130	*
97)	Hexachlorobutadiene	19.91	30.2	28.75	105	70	130	*
98)	Cyclohexanone	15.32	30.0	27.50	109	70	130	*
99)	tert-Butylbenzene	17.31	28.4	26.75	106	70	130	*
100)	n-Butylbenzene	18.12	30.3	28.00	108	70	130	*

Bold = 75 Compound List

*** = Pass**

Data File: I:\MS08\Data\2016 07\27\07271602.D

Acq On : 27 Jul 2016 8:57

Operator: WA

Sample : CCV R8072716 5ng

Misc : S29-07071605/S29-07081602 (8/5)

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Jul 27 09:23:49 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 14:41:56 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min

7/27/16

Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1 IR	Bromochloromethane (IS1)	1.000	1.000	0.0	87	-0.03
2 T	Propene	1.068	0.883	17.3	70	0.00
3 T	Dichlorodifluoromethane (CF	2.078	1.972	5.1	86	-0.01
4 T	Chloromethane	1.123	1.308	-16.5	118	-0.02
5 T	1,2-Dichloro-1,1,2,2-tetra	1.287	1.188	7.7	85	-0.02
6 T	Vinyl Chloride	1.390	1.331	4.2	81	-0.02
7 T	1,3-Butadiene	1.014	0.968	4.5	81	-0.03
8 T	Bromomethane	0.982	0.969	1.3	86	-0.03
9 T	Chloroethane	0.821	0.788	4.0	84	-0.03
10 T	Ethanol	0.715	0.671	6.2	81	-0.10
11 T	Acetonitrile	1.856	1.673	9.9	77	-0.06
12 T	Acrolein	0.595	0.596	-0.2	86	-0.04
13 T	Acetone	0.807	0.718	11.0	82	-0.06
14 T	Trichlorofluoromethane	1.825	1.729	5.3	85	-0.02
15 T	2-Propanol (Isopropanol)	2.338	2.305	1.4	89	-0.09
16 T	Acrylonitrile	1.293	1.244	3.8	81	-0.05
17 T	1,1-Dichloroethene	1.016	0.995	2.1	85	-0.02
18 T	2-Methyl-2-Propanol (tert-B	2.393	2.439	-1.9	97	-0.08
19 T	Methylene Chloride	1.000	0.974	2.6	84	-0.04
20 T	3-Chloro-1-propene (Allyl C	1.225	1.187	3.1	81	-0.03
21 T	Trichlorotrifluoroethane	1.029	0.982	4.6	88	-0.02
22 T	Carbon Disulfide	4.402	3.918	11.0	84	-0.02
23 T	trans-1,2-Dichloroethene	1.317	1.284	2.5	83	-0.03
24 T	1,1-Dichloroethane	1.750	1.629	6.9	82	-0.03
25 T	Methyl tert-Butyl Ether	3.175	2.980	6.1	83	-0.02
26 T	Vinyl Acetate	0.280	0.297	-6.1	88	-0.04
27 T	2-Butanone (MEK)	0.679	0.662	2.5	80	-0.04
28 T	cis-1,2-Dichloroethene	1.264	1.210	4.3	82	-0.03
29 T	Diisopropyl Ether	0.939	0.866	7.8	81	-0.03
30 T	Ethyl Acetate	0.340	0.330	2.9	79	-0.03
31 T	n-Hexane	1.672	1.436	14.1	74	-0.02
32 T	Chloroform	1.716	1.604	6.5	83	-0.04
33 S	1,2-Dichloroethane-d4 (SS1)	1.174	1.148	2.2	84	-0.03
34 T	Tetrahydrofuran (THF)	0.684	0.663	3.1	81	-0.02
35 T	Ethyl tert-Butyl Ether	1.377	1.293	6.1	83	-0.02
36 T	1,2-Dichloroethane	1.163	1.097	5.7	82	-0.02
37 IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	83	-0.02
38 T	1,1,1-Trichloroethane	0.352	0.349	0.9	85	-0.02
39 T	Isopropyl Acetate	0.126	0.128	-1.6	81	-0.02
40 T	1-Butanol	0.220	0.215	2.3	82	-0.05
41 T	Benzene	0.918	0.837	8.8	81	-0.02
42 T	Carbon Tetrachloride	0.288	0.300	-4.2	90	-0.02
43 T	Cyclohexane	0.401	0.372	7.2	81	-0.02
44 T	tert-Amyl Methyl Ether	0.673	0.676	-0.4	84	-0.02
45 T	1,2-Dichloropropane	0.219	0.207	5.5	79	-0.02
46 T	Bromodichloromethane	0.289	0.293	-1.4	84	-0.02
47 T	Trichloroethene	0.292	0.276	5.5	81	-0.02
48 T	1,4-Dioxane	0.190	0.191	-0.5	81	-0.02
49 T	2,2,4-Trimethylpentane (Iso	0.976	0.952	2.5	82	-0.02
50 T	Methyl Methacrylate	0.108	0.110	-1.9	83	-0.02
51 T	n-Heptane	0.235	0.220	6.4	78	-0.02
52 T	cis-1,3-Dichloropropene	0.325	0.343	-5.5	82	-0.02
53 T	4-Methyl-2-pentanone	0.202	0.204	-1.0	81	-0.02
54 T	trans-1,3-Dichloropropene	0.300	0.305	-1.7	82	-0.01

Data File: I:\MS08\Data\2016 07\27\07271602.D

Acq On : 27 Jul 2016 8:57

Operator: WA

Sample : CCV R8072716 5ng

Misc : S29-07071605/S29-07081602 (8/5)

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Jul 27 09:23:49 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 14:41:56 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min

Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
55 T	1,1,2-Trichloroethane	0.229	0.228	0.4	83	-0.01
56 IR	Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	86	-0.01
57 S	Toluene-d8 (SS2)	2.629	2.564	2.5	84	-0.01
58 T	Toluene	2.688	2.426	9.7	81	-0.02
59 T	2-Hexanone	1.145	1.143	0.2	82	-0.02
60 T	Dibromochloromethane	0.664	0.690	-3.9	87	-0.02
61 T	1,2-Dibromoethane	0.655	0.667	-1.8	85	-0.02
62 T	n-Butyl Acetate	1.179	1.256	-6.5	81	-0.01
63 T	n-Octane	0.515	0.475	7.8	79	-0.01
64 T	Tetrachloroethene	0.928	0.876	5.6	84	-0.01
65 T	Chlorobenzene	1.823	1.676	8.1	84	0.00
66 T	Ethylbenzene	2.945	2.759	6.3	83	-0.01
67 T	m- & p-Xylenes	2.332	2.177	6.6	83	-0.02
68 T	Bromoform	0.692	0.676	2.3	87	-0.01
69 T	Styrene	1.817	1.775	2.3	82	-0.01
70 T	o-Xylene	2.471	2.322	6.0	83	-0.01
71 T	n-Nonane	1.170	1.091	6.8	79	0.00
72 T	1,1,2,2-Tetrachloroethane	1.098	1.080	1.6	83	-0.01
73 S	Bromofluorobenzene (SS3)	1.007	1.061	-5.4	90	0.00
74 T	Cumene	3.278	3.133	4.4	83	-0.01
75 T	alpha-Pinene	1.529	1.428	6.6	80	0.00
76 T	n-Propylbenzene	3.768	3.645	3.3	84	0.00
77 T	3-Ethyltoluene	3.173	3.200	-0.9	84	0.00
78 T	4-Ethyltoluene	3.035	2.827	6.9	84	-0.01
79 T	1,3,5-Trimethylbenzene	2.679	2.555	4.6	84	0.00
80 T	alpha-Methylstyrene	1.493	1.354	9.3	78	-0.01
81 T	2-Ethyltoluene	3.103	2.970	4.3	83	-0.01
82 T	1,2,4-Trimethylbenzene	2.615	2.554	2.3	83	-0.01
83 T	n-Decane	1.287	1.248	3.0	80	0.00
84 T	Benzyl Chloride	1.977	1.933	2.2	83	-0.01
85 T	1,3-Dichlorobenzene	1.651	1.602	3.0	85	-0.01
86 T	1,4-Dichlorobenzene	1.751	1.661	5.1	85	-0.01
87 T	sec-Butylbenzene	3.484	3.406	2.2	84	-0.01
88 T	4-Isopropyltoluene (p-Cymen	3.446	3.407	1.1	84	-0.01
89 T	1,2,3-Trimethylbenzene	2.718	2.634	3.1	82	-0.01
90 T	1,2-Dichlorobenzene	1.609	1.565	2.7	84	-0.01
91 T	d-Limonene	0.844	0.825	2.3	74	-0.01
92 T	1,2-Dibromo-3-Chloropropane	0.594	0.593	0.2	84	0.00
93 T	n-Undecane	1.266	1.273	-0.6	78	0.00
94 T	1,2,4-Trichlorobenzene	1.221	1.197	2.0	82	0.00
95 T	Naphthalene	3.587	3.521	1.8	79	-0.01
96 T	n-Dodecane	1.174	1.153	1.8	76	0.00
97 T	Hexachlorobutadiene	0.857	0.809	5.6	82	0.00
98 T	Cyclohexanone	0.752	0.720	4.3	82	-0.02
99 T	tert-Butylbenzene	2.773	2.643	4.7	84	-0.01
100 T	n-Butylbenzene	2.519	2.518	0.0	82	0.00

(#)= Out of Range

SPCC's out = 0 CCC's out = 0

Data File: I:\MS08\Data\2016 07\27\07271602.D

Acq On : 27 Jul 2016 8:57

Operator: WA

Sample : CCV R8072716 5ng

Misc : S29-07071605/S29-07081602 (8/5)

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Jul 27 09:23:49 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 14:41:56 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

7/27/16

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.80	130	168165	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	10.54	114	723007	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	14.57	82	285555	12.500	ng	-0.01

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.48	65	193021	12.225	ng	-0.03
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.84%
57) Toluene-d8 (SS2)	12.77	98	732120	12.191	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.52%
73) Bromofluorobenzene (SS3)	16.07	174	303062	13.177	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	105.44%

Target Compounds

						Qvalue
2) Propene	3.88	42	61178	4.259	ng	100
3) Dichlorodifluoromethan...	3.99	85	132681	4.747	ng	99
4) Chloromethane	4.18	50	86255	5.710	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.35	135	82336	4.754	ng	100
6) Vinyl Chloride	4.47	62	89510	4.787	ng	100
7) 1,3-Butadiene	4.64	54	69055	5.060	ng	99
8) Bromomethane	4.95	94	65210	4.936	ng	100
9) Chloroethane	5.16	64	53509	4.846	ng	100
10) Ethanol	5.36	45	228236	23.717	ng	100
11) Acetonitrile	5.57	41	114764	4.597	ng	99
12) Acrolein	5.70	56	42896	5.357	ng	97
13) Acetone	5.83	58	259422	23.889	ng	99
14) Trichlorofluoromethane	6.01	101	115130	4.688	ng	100
15) 2-Propanol (Isopropanol)	6.12	45	324059	10.304	ng	98
16) Acrylonitrile	6.33	53	86218	4.957	ng	99
17) 1,1-Dichloroethene	6.66	96	71599	5.236	ng	100
18) 2-Methyl-2-Propanol (t...	6.72	59	342924	10.654	ng	99
19) Methylene Chloride	6.79	84	70740	5.259	ng	94
20) 3-Chloro-1-propene (Al...	6.90	41	86244	5.232	ng	99
21) Trichlorotrifluoroethane	7.06	151	71352	5.152	ng	98
22) Carbon Disulfide	7.04	76	258289	4.361	ng	99
23) trans-1,2-Dichloroethene	7.69	61	91545	5.165	ng	96
24) 1,1-Dichloroethane	7.88	63	113940	4.840	ng	100
25) Methyl tert-Butyl Ether	7.93	73	210487	4.928	ng	99
26) Vinyl Acetate	8.03	86	101248	26.839	ng	98
27) 2-Butanone (MEK)	8.24	72	47683	5.216	ng	97
28) cis-1,2-Dichloroethene	8.65	61	87068	5.122	ng	99
29) Diisopropyl Ether	8.84	87	62901	4.978	ng	96
30) Ethyl Acetate	8.84	61	47119	10.309	ng	97
31) n-Hexane	8.86	57	100462	4.468	ng	99
32) Chloroform	8.92	83	115461	5.000	ng	99
34) Tetrahydrofuran (THF)	9.26	72	45477	4.942	ng	98
35) Ethyl tert-Butyl Ether	9.33	87	91315	4.929	ng	99
36) 1,2-Dichloroethane	9.59	62	77478	4.952	ng	100
38) 1,1,1-Trichloroethane	9.82	97	103961	5.109	ng	100
39) Isopropyl Acetate	10.12	61	82088	11.252	ng	97
40) 1-Butanol	10.13	56	140652	11.050	ng	96
41) Benzene	10.23	78	268631	5.060	ng	100
42) Carbon Tetrachloride	10.37	117	93831	5.629	ng	98
43) Cyclohexane	10.48	84	224792	9.687	ng	97
44) tert-Amyl Methyl Ether	10.75	73	203177	5.219	ng	100
45) 1,2-Dichloropropane	10.96	63	62839	4.960	ng	100
46) Bromodichloromethane	11.12	83	90553	5.421	ng	99
47) Trichloroethene	11.17	130	82268	4.874	ng	99
48) 1,4-Dioxane	11.14	88	59583	5.432	ng	99
49) 2,2,4-Trimethylpentane...	11.23	57	283699	5.025	ng	99

Data File: I:\MS08\Data\2016 07\27\07271602.D

Acq On : 27 Jul 2016 8:57

Operator: WA

Sample : CCV R8072716 5ng

Misc : S29-07071605/S29-07081602 (8/5)

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Jul 27 09:23:49 2016

Quant Method : I:\MS08\Methods\R8070816.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 08 14:41:56 2016

Response via : Initial Calibration

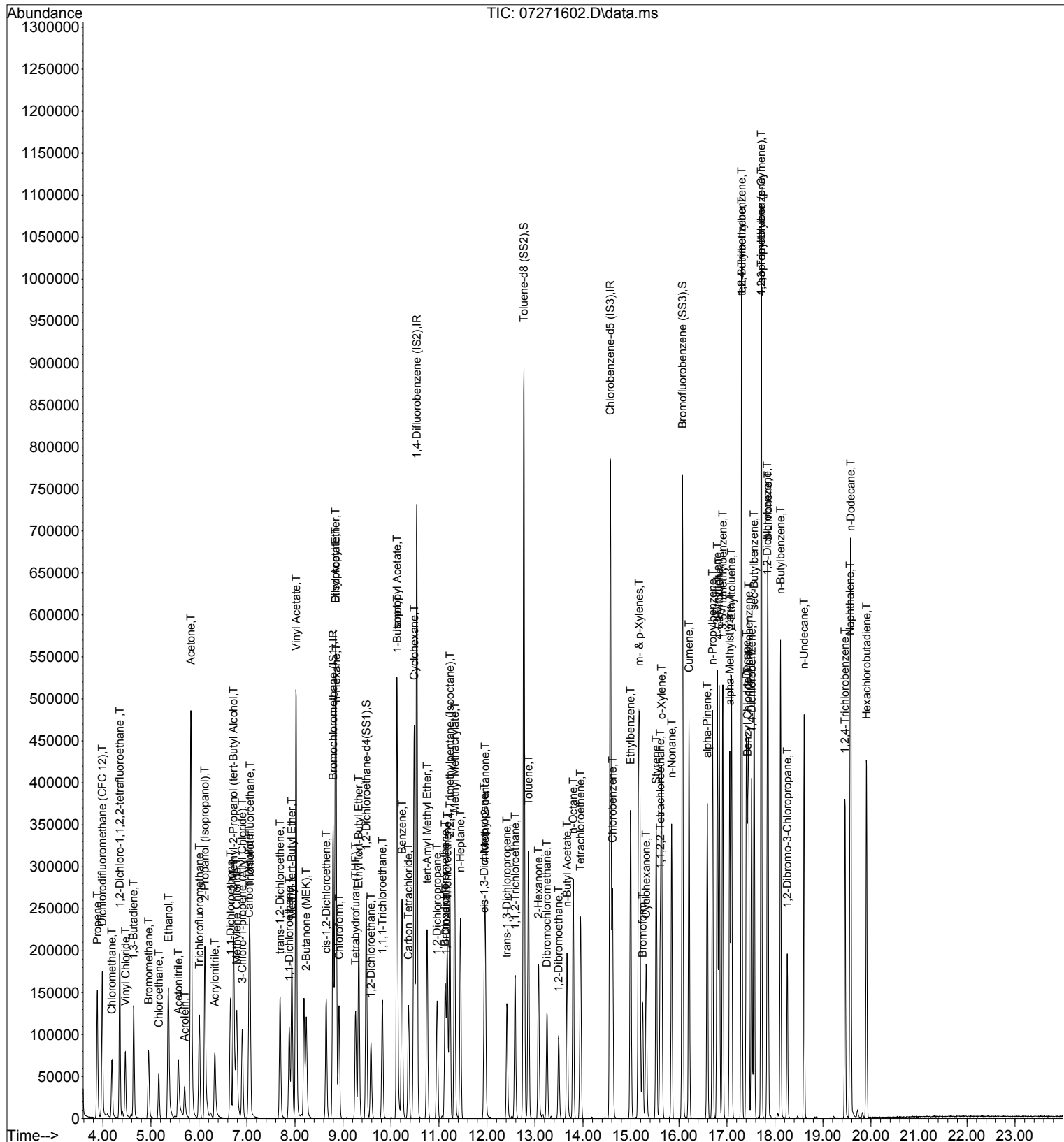
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.33	100	66310	10.577	ng	100
51) n-Heptane	11.45	71	68137	5.021	ng	99
52) cis-1,3-Dichloropropene	11.94	75	111018	5.910	ng	98
53) 4-Methyl-2-pentanone	11.96	58	63623	5.447	ng	100
54) trans-1,3-Dichloropropene	12.42	75	94234	5.434	ng	99
55) 1,1,2-Trichloroethane	12.59	97	69125	5.223	ng	99
58) Toluene	12.86	91	290975	4.739	ng	100
59) 2-Hexanone	13.07	43	144869	5.539	ng	98
60) Dibromochloromethane	13.25	129	86641	5.714	ng	100
61) 1,2-Dibromoethane	13.49	107	81518	5.445	ng	99
62) n-Butyl Acetate	13.67	43	159228	5.912	ng	100
63) n-Octane	13.80	57	55828	4.750	ng	99
64) Tetrachloroethene	13.95	166	99073	4.675	ng	99
65) Chlorobenzene	14.62	112	204838	4.918	ng	98
66) Ethylbenzene	14.99	91	330886	4.918	ng	100
67) m- & p-Xylenes	15.17	91	517153	9.706	ng	100
68) Bromoform	15.25	173	82659	5.226	ng	98
69) Styrene	15.53	104	218995	5.276	ng	100
70) o-Xylene	15.64	91	270564	4.793	ng	100
71) n-Nonane	15.85	43	125903	4.709	ng	100
72) 1,1,2,2-Tetrachloroethane	15.61	83	123331	4.915	ng	98
74) Cumene	16.21	105	361413	4.826	ng	100
75) alpha-Pinene	16.59	93	167973	4.810	ng	100
76) n-Propylbenzene	16.70	91	416288	4.836	ng	100
77) 3-Ethyltoluene	16.80	105	380155	5.245	ng	99
78) 4-Ethyltoluene	16.84	105	338999	4.890	ng	100
79) 1,3,5-Trimethylbenzene	16.91	105	303471	4.959	ng	100
80) alpha-Methylstyrene	17.06	118	159257	4.670	ng	99
81) 2-Ethyltoluene	17.10	105	352808	4.977	ng	100
82) 1,2,4-Trimethylbenzene	17.31	105	303367	5.078	ng	100
83) n-Decane	17.41	57	143925	4.896	ng	98
84) Benzyl Chloride	17.43	91	238443	5.279	ng	99
85) 1,3-Dichlorobenzene	17.45	146	197655	5.239	ng	99
86) 1,4-Dichlorobenzene	17.52	146	199225	4.979	ng	99
87) sec-Butylbenzene	17.56	105	412350	5.180	ng	99
88) 4-Isopropyltoluene (p-...	17.71	119	389203	4.944	ng	100
89) 1,2,3-Trimethylbenzene	17.71	105	312925	5.040	ng	100
90) 1,2-Dichlorobenzene	17.84	146	191292	5.204	ng	99
91) d-Limonene	17.85	68	97997	5.085	ng	100
92) 1,2-Dibromo-3-Chloropr...	18.26	157	70388	5.189	ng	99
93) n-Undecane	18.61	57	146839	5.079	ng	98
94) 1,2,4-Trichlorobenzene	19.46	180	142142	5.096	ng	98
95) Naphthalene	19.57	128	402186	4.908	ng	100
96) n-Dodecane	19.58	57	136961	5.106	ng	98
97) Hexachlorobutadiene	19.91	225	98828	5.047	ng	100
98) Cyclohexanone	15.32	55	92098	5.364	ng	98
99) tert-Butylbenzene	17.31	119	316991	5.003	ng	100
100) n-Butylbenzene	18.12	91	310610	5.398	ng	100

(#)= qualifier out of range (m)= manual integration (+)= signals summed

ALS Vial : 15 Sample Multiplier: 1

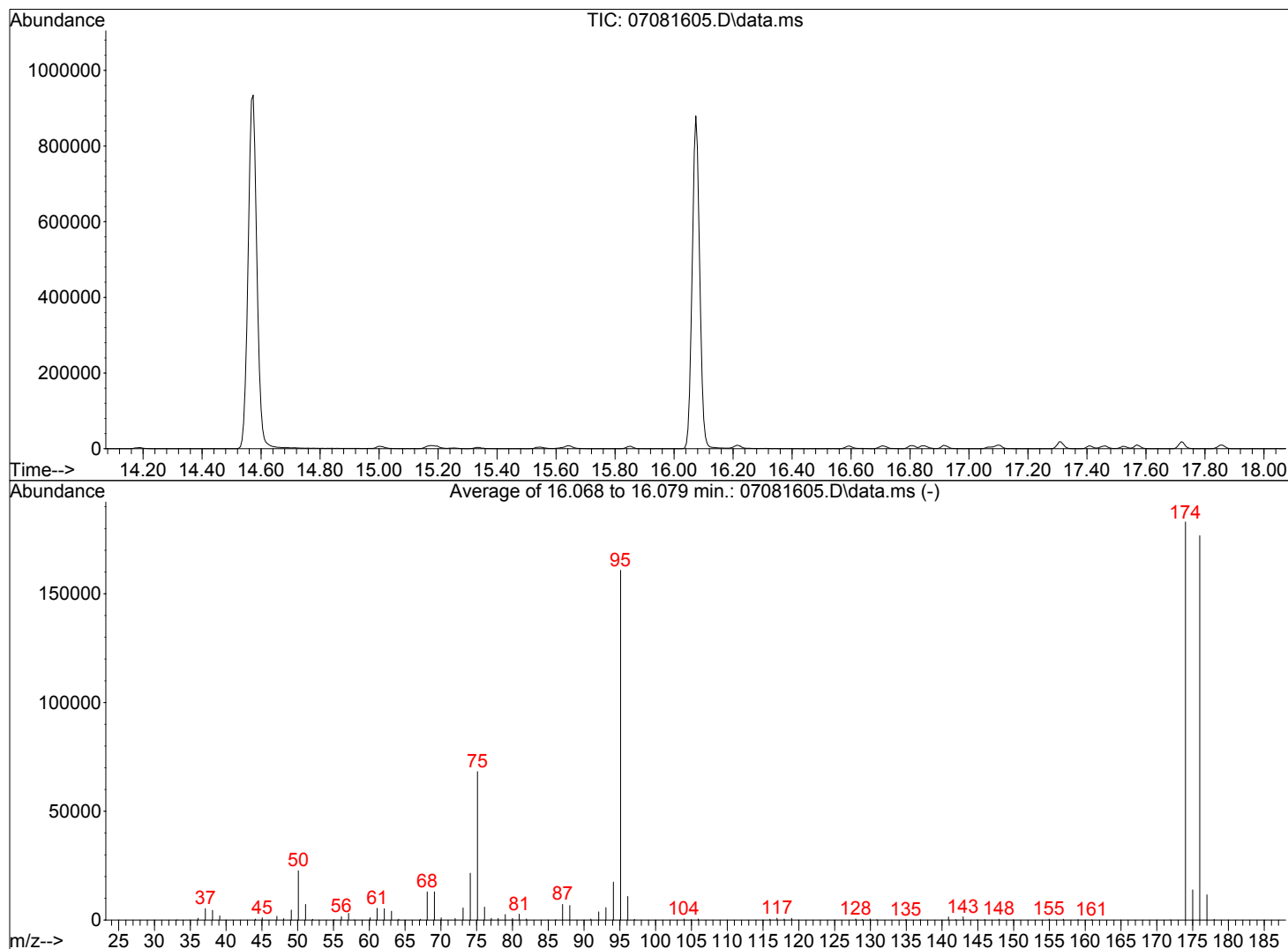
DataAcq Meth:T015.M



Data Path : I:\MS08\Data\2016 07\08\
 Data File : 07081605.D
 Acq On : 8 Jul 2016 9:54
 Operator : WA
 Sample : 0.08ng TO-15 ICAL Std
 Misc : S29-07071605/S29-06291609 (7/28)
 ALS Vial : 13 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS08\Methods\R8070816.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Fri Jul 08 14:41:56 2016



AutoFind: Scans 2317, 2318, 2319; Background Corrected with Scan 2309

WA 7/8/16

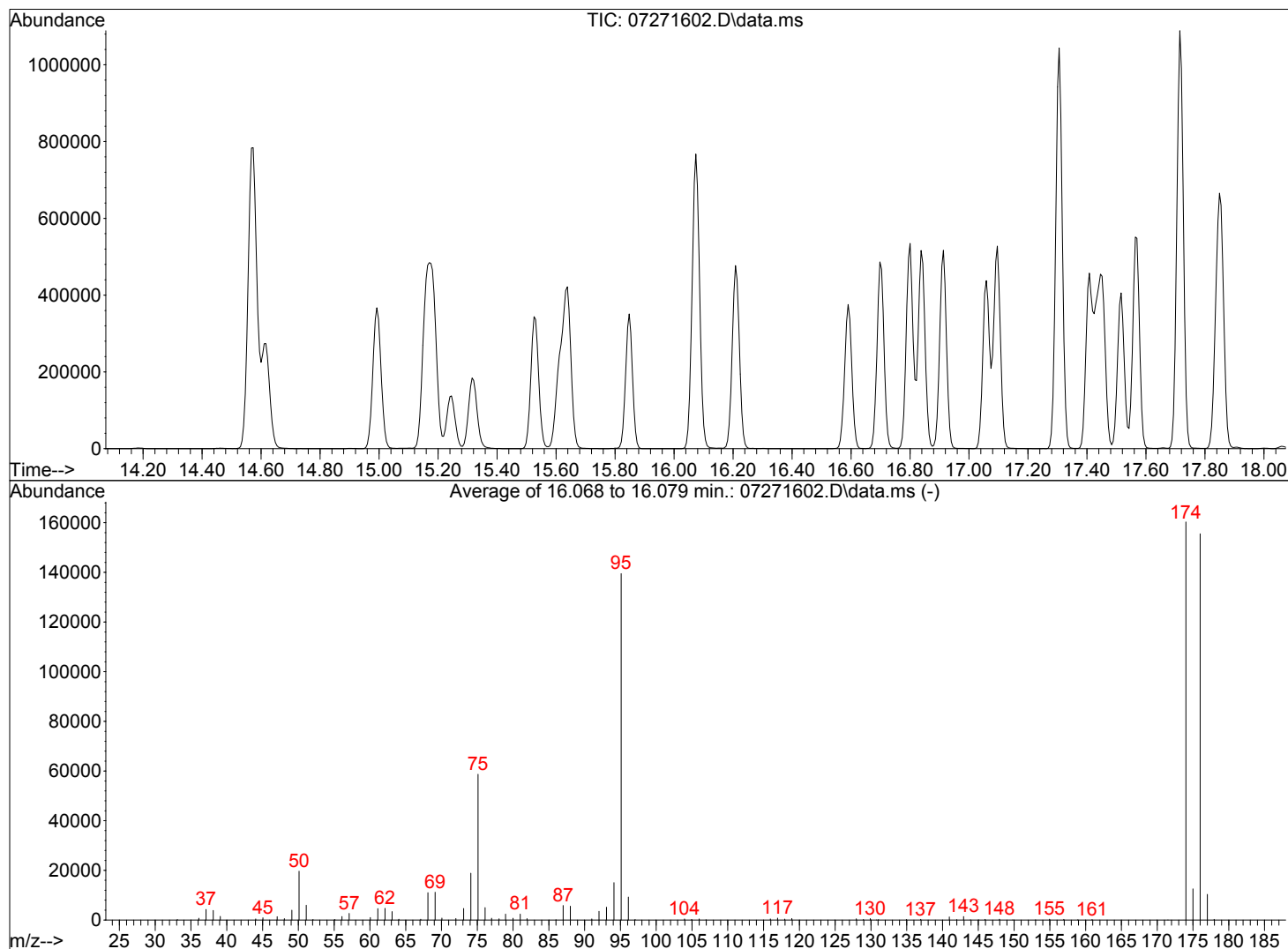
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	14.1	22675	PASS
75	95	30	66	42.5	68256	PASS
95	95	100	100	100.0	160768	PASS
96	95	5	9	6.7	10831	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	113.8	183019	PASS
175	174	4	9	7.6	13868	PASS
176	174	93	101	96.6	176747	PASS
177	176	5	9	6.6	11585	PASS

Data Path : I:\MS08\Data\2016 07\27\
 Data File : 07271602.D
 Acq On : 27 Jul 2016 8:57
 Operator : WA
 Sample : CCV R8072716 5ng
 Misc : S29-07071605/S29-07081602 (8/5)
 ALS Vial : 15 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS08\Methods\R8070816.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Fri Jul 08 14:41:56 2016

~~107~~ 7/27/16



AutoFind: Scans 2317, 2318, 2319; Background Corrected with Scan 2308

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	14.1	19659	PASS
75	95	30	66	42.1	58720	PASS
95	95	100	100	100.0	139509	PASS
96	95	5	9	6.7	9293	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	114.9	160299	PASS
175	174	4	9	7.8	12547	PASS
176	174	93	101	97.0	155541	PASS
177	176	5	9	6.7	10371	PASS

Injection Log

Directory: J:\MS08\Data\2016_07\08\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	7/8/16 7:46	07081601.D	Blank (Fil 2)	S29-06151601	WA	1	
2	7/8/16 8:17	07081602.D	std check 0.1ng	S29-06151601	WA	13	test
3	7/8/16 8:50	07081603.D	std check 0.1ng	S29-07071605/S29-06291609 (7/28)	WA	13	test
4	7/8/16 9:22	07081604.D	std check 1.0ng	S29-07071605/S29-06291604 (7/28)	WA	16	test
5	7/8/16 9:54	07081605.D	0.08ng TO-15 ICAL Std	S29-07071605/S29-06291609 (7/28)	WA	13	
6	7/8/16 10:27	07081606.D	0.10ng TO-15 ICAL Std	S29-07071605/S29-06291609 (7/28)	WA	13	
7	7/8/16 10:59	07081607.D	0.20ng TO-15 ICAL Std	S29-07071605/S29-06291609 (7/28)	WA	13	
8	7/8/16 11:32	07081608.D	0.40ng TO-15 ICAL Std	S29-07071605/S29-06291607 (7/28)	WA	14	
9	7/8/16 12:04	07081609.D	1.0ng TO-15 ICAL Std	S29-07071605/S29-06291604 (7/28)	WA	16	
10	7/8/16 12:37	07081610.D	5.0ng TO-15 ICAL Std	S29-07071605/S29-06291604 (7/28)	WA	16	
11	7/8/16 13:09	07081611.D	25ng TO-15 ICAL Std	S29-07071605/S29-07081602 (8/5)	WA	15	
12	7/8/16 13:42	07081612.D	50ng TO-15 ICAL Std	S29-07071605/S29-07081602 (8/5)	WA	15	
13	7/8/16 14:14	07081613.D	100ng TO-15 ICAL Std	S29-07071605/S29-07081602 (8/5)	WA	15	
14	7/8/16 14:47	07081614.D	25ng TO-15 ICV Std	S29-06151601/S29-07071606 (8/5)	WA	1	Passed all cmpds
Saved as R8070816.M: good for low level 75 compounds list. Ranges 0.2ng --> 100ng for Acrylonitrile, CS2, MeMethacrylate, MIBK,							
trans-1,3-DCP, 2-Hexanone, Bromoform, alpha-Mestyrene, Benzyl-Cl, 1,2-DBCP, Dodecane; 0.4ng --> 200ng for Ethyl acetate,							
1.0ng -->500ng for Acetone and 1.0ng --> 200ng for 1-Butanol							

~~107~~ 7/14/16

Injection Log

Directory: I:\MS08\Data\2016_07\27\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	7/27/16 8:25	07271601.D	CCV C8072716_5ng	S29-07071605/S29-07011606 (7/29)	WA	1	Passed
2	7/27/16 8:57	07271602.D	CCV R8072716_5ng	S29-07071605/S29-07081602 (8/5)	WA	15	Passed
3	7/27/16 9:29	07271603.D	MB R8072716_1000mL	S29-07071605_AS00703	WA	1	Passed
4	7/27/16 10:21	07271604.D	072716 AS00927 B19345	Pass 75 LL, SO2 as TIC @ 3.9ng	WA	2	
5	7/27/16 10:54	07271605.D	072716 AC02123 B19349	Pass for 75 LL, (SO2 as TIC @ 3.9ng)	WA	5	
6	7/27/16 11:25	07271606.D	LCS R8072716_25ng	S29-07071605/S29-07221604 (8/20)	WA	1	Passed
7	7/27/16 12:04	07271607.D	P1603617-001 (15mL)	S29-07071605	WA	4	
8	7/27/16 12:36	07271608.D	P1603636-001 (60mL)	S29-07071605	WA	3	
9	7/27/16 13:08	07271609.D	P1603617-001 (7.5mL)	S29-07071605	WA	4	
10	7/27/16 13:49	07271610.D	P1603617-005 (10mL)	S29-07071605	WA	4	
11	7/27/16 14:56	07271611.D	J1605315-001 (100mL)	S29-07071605	WA	12	
12	7/27/16 15:28	07271612.D	J1605315-002 (100mL)	S29-07071605	WA	13	
13	7/27/16 16:07	07271613.D	Blank	S29-07071605	WA	14	
14	7/27/16 16:39	07271614.D	LCSD R8072716_25ng	S29-07071605/S29-07221604 (8/20)	WA	1	not used
15	7/27/16 17:18	07271615.D	J1605315-003 (100mL)	S29-07071605	WA	14	
16	7/27/16 17:51	07271616.D	SSC00241 (1000mL)	Pass 75 LL, no TIC	WA	10	
17	7/27/16 18:23	07271617.D	P1603665-001 (1000mL)	S29-07071605	WA	9	
18	7/27/16 18:55	07271618.D	P1603665-001dup (1000mL)	S29-07071605	WA	9	Passed for dup
19	7/27/16 19:28	07271619.D	P1603664-001 (1000mL)	S29-07071605	WA	5	
20	7/27/16 20:00	07271620.D	P1603664-002 (1000mL)	S29-07071605	WA	6	
21	7/27/16 20:33	07271621.D	P1603664-003 (1000mL)	S29-07071605	WA	7	
22	7/27/16 21:06	07271622.D	P1603664-004 (1000mL)	S29-07071605	WA	8	
23	7/27/16 21:39	07271623.D	P1603665-001dil (100mL)	S29-07071605	WA	9	
24	7/27/16 22:12	07271624.D	P1603666-001 (1000mL)	S29-07071605	WA	2	
25	7/27/16 22:45	07271625.D	P1603666-001dil (100mL)	S29-07071605	WA	2	
26	7/27/16 23:17	07271626.D	P1603666-002 (1000mL)	S29-07071605	WA	3	
27	7/27/16 23:50	07271627.D	P1603666-002dil (100mL)	S29-07071605	WA	3	
28	7/28/16 0:23	07271628.D	SSC00185 (1000mL)	Pass 75 LL + TIC	WA	11	
29	7/28/16 0:55	07271629.D	SSC00136 (1000mL)	Pass 75 LL + TIC	WA	12	
30	7/28/16 1:28	07271630.D	SSC00096 (1000mL)	Pass 75 LL + TIC	WA	13	

~~WA~~ 7/28/16



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LABORATORY REPORT

December 7, 2016

Thomas Holmes
HDR Environmental, Operations & Construction, Inc.
9781 South Meridian Blvd., Suite 400
Englewood, CO 80112

RE: DDMT SVE / 10031560-282846-005

Dear Thomas:

Enclosed are the results of the samples submitted to our laboratory on November 15, 2016. For your reference, these analyses have been assigned our service request number P1605349.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

Kate Kaneko
By Kate Kaneko at 10:11 am, 12/07/16

Kate Kaneko
Project Manager



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Simi Valley, CA 93065
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www.alsglobal.com

Client: HDR Environmental, Operations & Construction, Inc. Service Request No: P1605349
Project: DDMT SVE / 10031560-282846-005

CASE NARRATIVE

The samples were received intact under chain of custody on November 15, 2016 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Volatile Organic Compound Analysis

The samples were analyzed for volatile organic compounds in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. This procedure is described in laboratory SOP VOA-TO15. The analytical system was comprised of a gas chromatograph / mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the NELAP or DoD-ELAP accreditation.

The spike recoveries in the Laboratory Control Sample (LCS) for the following compounds were outside the Laboratory generated control criteria: carbon disulfide analyzed on November 21, 2016; acetonitrile and carbon disulfide analyzed on November 22, 2016. The recovery errors equate to a potential high bias. However, the recoveries in question were within the method criteria, therefore, the data quality is not significantly affected. No corrective action was taken.

The containers were cleaned, prior to sampling, down to the method reporting limit (MRL) reported for this project. Please note, projects which require reporting below the MRL could have results between the MRL and method detection limit (MDL) that are biased high.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.



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www.alsglobal.com

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0694
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2016036
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	977273
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-003
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413- 16-7
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA01627201 6-6
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: HDR Environmental, Operations & Construction, Inc.
Project ID: DDMT SVE / 10031560-282846-005

Service Request: P1605349

Date Received: 11/15/2016
Time Received: 09:15

TO-15 - VOC Cans

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	
ODSVE-EFF-Y6Q2	P1605349-001	Air	11/9/2016	10:40	SC00928	0.46	3.70	X
ODSVE-DUP1-Y6Q2	P1605349-002	Air	11/9/2016	10:40	SC00999	0.61	4.11	X



Air - Chain of Custody Record & Analytical Service Request

Page 1 of 1

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Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10-Day-Standard

ALS Project No. H1605349

Company Name & Address (Reporting Information) HDR 9781 S. Meridian Blvd Ste. 400 Englewood, CO 80112				Project Name DDMT SVE				ALS Contact:		Analysis Method	Comments e.g. Actual Preservative or specific instructions
Project Manager Tom Holmes				Project Number 10031560, 282846-005							
Phone 404-295-3279				P.O. # / Billing Information							
Email Address for Result Reporting thomas.holmes@HDRinc.com				Sampler (Print & Sign) Justin Bills							
Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Canister ID (Bar code # - AC, SC, etc.)	Flow Controller ID (Bar code # - FC #)	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	Sample Volume			
ODSVE-EFF-Y6Q2		11/9/16	1040	SC00928	NA	<-30.00	0.00	6L	x		
ODSVE-DUP1-Y6Q2		11/9/116	1040	SC00999	NA	<-30.00	0.00	6L	x		
<i>[Large diagonal signature across the table]</i>											
Report Tier Levels - please select											
Tier I - Results (Default in not specified) _____ Tier III (Results + QC & Calibration Summaries) _____											
Tier II (Results + QC Summaries) _____ Tier IV (Date Validation Package) 10% Surcharge _____											
Relinquished by: (Signature) <i>[Signature]</i>						Date: 11/9/16 Time: 1730		Received by: (Signature) <i>[Signature]</i>		Date: _____ Time: _____	
Relinquished by: (Signature) <i>[Signature]</i>						Date: _____ Time: _____		Received by: (Signature) <i>[Signature]</i>		Date: 11/5/16 Time: 0715	
Chain of Custody Seal: (Circle) <u>INTACT</u> <u>BROKEN</u> <u>ABSENT</u>										Project Requirements (MRLs, QAPP)	
Cooler / Blank Temperature _____ °C											

ALS Environmental Sample Acceptance Check Form

Client: HDR Environmental, Operations & Construction, Inc. Work order: P1605349
 Project: DDMT SVE / 10031560-282846-005
 Sample(s) received on: 11/15/16 Date opened: 11/15/16 by: ADAVID

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

	Yes	No	N/A
1 Were sample containers properly marked with client sample ID?	☒	☐	☐
2 Did sample containers arrive in good condition?	☒	☐	☐
3 Were chain-of-custody papers used and filled out?	☒	☐	☐
4 Did sample container labels and/or tags agree with custody papers?	☒	☐	☐
5 Was sample volume received adequate for analysis?	☒	☐	☐
6 Are samples within specified holding times?	☒	☐	☐
7 Was proper temperature (thermal preservation) of cooler at receipt adhered to?	☐	☐	☒
8 Were custody seals on outside of cooler/Box/Container?	☐	☒	☐
Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
Were signature and date included?	☐	☐	☒
Were seals intact?	☐	☐	☒
9 Do containers have appropriate preservation , according to method/SOP or Client specified information?	☐	☐	☒
Is there a client indication that the submitted samples are pH preserved?	☐	☐	☒
Were VOA vials checked for presence/absence of air bubbles?	☐	☐	☒
Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?	☐	☐	☒
10 Tubes: Are the tubes capped and intact?	☐	☐	☒
11 Badges: Are the badges properly capped and intact?	☐	☐	☒
Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1605349-001.01	6.0 L Source Can					
P1605349-002.01	6.0 L Source Can					

Explain any discrepancies: (include lab sample ID numbers): _____

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: HDR Environmental, Operations & Construction, Inc.
Client Sample ID: ODSVE-EFF-Y6Q2
Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1605349
 ALS Sample ID: P1605349-001

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9
Analyst: Simon Cao
Sample Type: 6.0 L Summa Canister
Test Notes:
Container ID: SC00928

Date Collected: 11/9/16
Date Received: 11/15/16
Date Analyzed: 11/21 - 11/22/16
Volume(s) Analyzed: 1.00 Liter(s)
 0.10 Liter(s)

Initial Pressure (psig): 0.46 Final Pressure (psig): 3.70

Canister Dilution Factor: 1.21

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	0.57	0.61	0.17	0.33	0.35	0.098	J
75-71-8	Dichlorodifluoromethane (CFC 12)	5.7	0.61	0.21	1.2	0.12	0.042	
74-87-3	Chloromethane	0.67	0.61	0.18	0.33	0.29	0.088	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.61	0.23	ND	0.087	0.033	
75-01-4	Vinyl Chloride	0.25	0.61	0.21	0.097	0.24	0.081	J
106-99-0	1,3-Butadiene	ND	0.61	0.27	ND	0.27	0.12	
74-83-9	Bromomethane	0.61	0.61	0.23	0.16	0.16	0.059	
75-00-3	Chloroethane	ND	0.61	0.21	ND	0.23	0.078	
64-17-5	Ethanol	2.1	6.1	0.97	1.1	3.2	0.51	J
75-05-8	Acetonitrile	0.53	0.61	0.22	0.32	0.36	0.13	J
107-02-8	Acrolein	0.66	2.4	0.21	0.29	1.1	0.090	J
67-64-1	Acetone	12	6.1	0.93	4.9	2.5	0.39	
75-69-4	Trichlorofluoromethane	2.1	0.61	0.21	0.37	0.11	0.037	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	6.1	0.51	ND	2.5	0.21	
107-13-1	Acrylonitrile	ND	0.61	0.21	ND	0.28	0.095	
75-35-4	1,1-Dichloroethene	5.6	0.61	0.21	1.4	0.15	0.052	
75-09-2	Methylene Chloride	0.31	0.61	0.21	0.089	0.17	0.059	J
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.61	0.19	ND	0.19	0.062	
76-13-1	Trichlorotrifluoroethane	32	0.61	0.21	4.2	0.079	0.027	
75-15-0	Carbon Disulfide	ND	6.1	0.18	ND	1.9	0.058	
156-60-5	trans-1,2-Dichloroethene	2.1	0.61	0.23	0.52	0.15	0.058	
75-34-3	1,1-Dichloroethane	3.2	0.61	0.19	0.80	0.15	0.048	
1634-04-4	Methyl tert-Butyl Ether	ND	0.61	0.21	ND	0.17	0.057	
108-05-4	Vinyl Acetate	ND	6.1	0.79	ND	1.7	0.22	
78-93-3	2-Butanone (MEK)	2.1	6.1	0.25	0.72	2.1	0.086	J

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 2 of 3

Client: HDR Environmental, Operations & Construction, Inc.
Client Sample ID: ODSVE-EFF-Y6Q2
Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1605349
 ALS Sample ID: P1605349-001

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9
Analyst: Simon Cao
Sample Type: 6.0 L Summa Canister
Test Notes:
Container ID: SC00928

Date Collected: 11/9/16
Date Received: 11/15/16
Date Analyzed: 11/21 - 11/22/16
Volume(s) Analyzed: 1.00 Liter(s)
 0.10 Liter(s)

Initial Pressure (psig): 0.46 Final Pressure (psig): 3.70

Canister Dilution Factor: 1.21

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	99	0.61	0.19	25	0.15	0.049	
141-78-6	Ethyl Acetate	ND	1.2	0.42	ND	0.34	0.12	
110-54-3	n-Hexane	4.5	0.61	0.18	1.3	0.17	0.052	
67-66-3	Chloroform	29	0.61	0.21	6.0	0.12	0.042	
109-99-9	Tetrahydrofuran (THF)	1.6	0.61	0.24	0.54	0.21	0.082	
107-06-2	1,2-Dichloroethane	ND	0.61	0.19	ND	0.15	0.048	
71-55-6	1,1,1-Trichloroethane	2.7	0.61	0.21	0.49	0.11	0.038	
71-43-2	Benzene	0.94	0.61	0.19	0.29	0.19	0.061	
56-23-5	Carbon Tetrachloride	2.6	0.61	0.18	0.41	0.096	0.029	
110-82-7	Cyclohexane	3.9	1.2	0.35	1.1	0.35	0.10	
78-87-5	1,2-Dichloropropane	ND	0.61	0.19	ND	0.13	0.042	
75-27-4	Bromodichloromethane	1.8	0.61	0.18	0.27	0.090	0.027	
79-01-6	Trichloroethene	160	6.1	1.7	30	1.1	0.32	D
123-91-1	1,4-Dioxane	ND	0.61	0.19	ND	0.17	0.054	
80-62-6	Methyl Methacrylate	ND	1.2	0.38	ND	0.30	0.092	
142-82-5	n-Heptane	0.50	0.61	0.21	0.12	0.15	0.050	J
10061-01-5	cis-1,3-Dichloropropene	ND	0.61	0.17	ND	0.13	0.037	
108-10-1	4-Methyl-2-pentanone	ND	0.61	0.19	ND	0.15	0.047	
10061-02-6	trans-1,3-Dichloropropene	ND	0.61	0.19	ND	0.13	0.043	
79-00-5	1,1,2-Trichloroethane	ND	0.61	0.19	ND	0.11	0.035	
108-88-3	Toluene	0.84	0.61	0.21	0.22	0.16	0.055	
591-78-6	2-Hexanone	0.45	0.61	0.19	0.11	0.15	0.047	J
124-48-1	Dibromochloromethane	1.3	0.61	0.19	0.15	0.071	0.023	
106-93-4	1,2-Dibromoethane	ND	0.61	0.19	ND	0.079	0.025	
123-86-4	n-Butyl Acetate	0.36	0.61	0.19	0.075	0.13	0.041	J

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

D = The reported result is from a dilution.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 3 of 3

Client: HDR Environmental, Operations & Construction, Inc.
Client Sample ID: ODSVE-EFF-Y6Q2
Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1605349
 ALS Sample ID: P1605349-001

Test Code: EPA TO-15
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Analyst: Simon Cao
Sample Type: 6.0 L Summa Canister
Test Notes:
Container ID: SC00928

Date Collected: 11/9/16
Date Received: 11/15/16
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Volume(s) Analyzed: 1.00 Liter(s)
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Initial Pressure (psig): 0.46 Final Pressure (psig): 3.70

Canister Dilution Factor: 1.21

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.61	0.22	ND	0.13	0.047	
127-18-4	Tetrachloroethene	20	0.61	0.17	2.9	0.089	0.025	
108-90-7	Chlorobenzene	ND	0.61	0.19	ND	0.13	0.042	
100-41-4	Ethylbenzene	ND	0.61	0.19	ND	0.14	0.045	
179601-23-1	m,p-Xylenes	0.45	1.2	0.36	0.10	0.28	0.084	J
75-25-2	Bromoform	2.8	0.61	0.18	0.27	0.059	0.018	
100-42-5	Styrene	ND	0.61	0.18	ND	0.14	0.043	
95-47-6	o-Xylene	ND	0.61	0.18	ND	0.14	0.042	
111-84-2	n-Nonane	ND	0.61	0.18	ND	0.12	0.035	
79-34-5	1,1,2,2-Tetrachloroethane	4.1	0.61	0.18	0.60	0.088	0.026	
98-82-8	Cumene	ND	0.61	0.18	ND	0.12	0.037	
80-56-8	alpha-Pinene	ND	0.61	0.17	ND	0.11	0.030	
103-65-1	n-Propylbenzene	ND	0.61	0.19	ND	0.12	0.039	
622-96-8	4-Ethyltoluene	ND	0.61	0.19	ND	0.12	0.039	
108-67-8	1,3,5-Trimethylbenzene	ND	0.61	0.19	ND	0.12	0.039	
95-63-6	1,2,4-Trimethylbenzene	ND	0.61	0.18	ND	0.12	0.037	
100-44-7	Benzyl Chloride	ND	0.61	0.13	ND	0.12	0.026	
541-73-1	1,3-Dichlorobenzene	ND	0.61	0.18	ND	0.10	0.030	
106-46-7	1,4-Dichlorobenzene	ND	0.61	0.17	ND	0.10	0.028	
95-50-1	1,2-Dichlorobenzene	ND	0.61	0.18	ND	0.10	0.030	
5989-27-5	d-Limonene	ND	0.61	0.17	ND	0.11	0.030	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.61	0.12	ND	0.063	0.012	
120-82-1	1,2,4-Trichlorobenzene	ND	0.61	0.19	ND	0.082	0.026	
91-20-3	Naphthalene	ND	0.61	0.22	ND	0.12	0.042	
87-68-3	Hexachlorobutadiene	ND	0.61	0.17	ND	0.057	0.016	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: ODSVE-DUP1-Y6Q2

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1605349

ALS Sample ID: P1605349-002

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 6.0 L Summa Canister

Test Notes:

Container ID: SC00999

Date Collected: 11/9/16

Date Received: 11/15/16

Date Analyzed: 11/21 - 11/22/16

Volume(s) Analyzed: 1.00 Liter(s)

0.10 Liter(s)

Initial Pressure (psig): 0.61 Final Pressure (psig): 4.11

Canister Dilution Factor: 1.23

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	0.83	0.62	0.17	0.48	0.36	0.10	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.8	0.62	0.21	1.2	0.12	0.042	
74-87-3	Chloromethane	ND	0.62	0.18	ND	0.30	0.089	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.62	0.23	ND	0.088	0.033	
75-01-4	Vinyl Chloride	0.24	0.62	0.21	0.093	0.24	0.082	J
106-99-0	1,3-Butadiene	ND	0.62	0.27	ND	0.28	0.12	
74-83-9	Bromomethane	ND	0.62	0.23	ND	0.16	0.060	
75-00-3	Chloroethane	ND	0.62	0.21	ND	0.23	0.079	
64-17-5	Ethanol	1.8	6.2	0.98	0.93	3.3	0.52	J
75-05-8	Acetonitrile	3.3	0.62	0.22	1.9	0.37	0.13	
107-02-8	Acrolein	1.1	2.5	0.21	0.48	1.1	0.091	J
67-64-1	Acetone	12	6.2	0.95	5.0	2.6	0.40	
75-69-4	Trichlorofluoromethane	2.0	0.62	0.21	0.36	0.11	0.037	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	6.2	0.52	ND	2.5	0.21	
107-13-1	Acrylonitrile	ND	0.62	0.21	ND	0.28	0.096	
75-35-4	1,1-Dichloroethene	5.6	0.62	0.21	1.4	0.16	0.053	
75-09-2	Methylene Chloride	ND	0.62	0.21	ND	0.18	0.060	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.62	0.20	ND	0.20	0.063	
76-13-1	Trichlorotrifluoroethane	32	0.62	0.21	4.2	0.080	0.027	
75-15-0	Carbon Disulfide	8.9	6.2	0.18	2.9	2.0	0.059	
156-60-5	trans-1,2-Dichloroethene	2.2	0.62	0.23	0.56	0.16	0.059	
75-34-3	1,1-Dichloroethane	3.3	0.62	0.20	0.81	0.15	0.049	
1634-04-4	Methyl tert-Butyl Ether	ND	0.62	0.21	ND	0.17	0.058	
108-05-4	Vinyl Acetate	ND	6.2	0.80	ND	1.7	0.23	
78-93-3	2-Butanone (MEK)	2.5	6.2	0.26	0.85	2.1	0.088	J

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 2 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: ODSVE-DUP1-Y6Q2

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1605349

ALS Sample ID: P1605349-002

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 6.0 L Summa Canister

Test Notes:

Container ID: SC00999

Date Collected: 11/9/16

Date Received: 11/15/16

Date Analyzed: 11/21 - 11/22/16

Volume(s) Analyzed: 1.00 Liter(s)

0.10 Liter(s)

Initial Pressure (psig): 0.61 Final Pressure (psig): 4.11

Canister Dilution Factor: 1.23

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	100	0.62	0.20	26	0.16	0.050	
141-78-6	Ethyl Acetate	ND	1.2	0.43	ND	0.34	0.12	
110-54-3	n-Hexane	4.4	0.62	0.18	1.2	0.17	0.052	
67-66-3	Chloroform	29	0.62	0.21	5.9	0.13	0.043	
109-99-9	Tetrahydrofuran (THF)	ND	0.62	0.25	ND	0.21	0.083	
107-06-2	1,2-Dichloroethane	ND	0.62	0.20	ND	0.15	0.049	
71-55-6	1,1,1-Trichloroethane	2.7	0.62	0.21	0.50	0.11	0.038	
71-43-2	Benzene	0.27	0.62	0.20	0.085	0.19	0.062	J
56-23-5	Carbon Tetrachloride	2.5	0.62	0.18	0.40	0.098	0.029	
110-82-7	Cyclohexane	3.9	1.2	0.36	1.1	0.36	0.10	
78-87-5	1,2-Dichloropropane	ND	0.62	0.20	ND	0.13	0.043	
75-27-4	Bromodichloromethane	ND	0.62	0.18	ND	0.092	0.028	
79-01-6	Trichloroethene	160	6.2	1.7	30	1.1	0.32	D
123-91-1	1,4-Dioxane	ND	0.62	0.20	ND	0.17	0.055	
80-62-6	Methyl Methacrylate	ND	1.2	0.38	ND	0.30	0.093	
142-82-5	n-Heptane	0.38	0.62	0.21	0.094	0.15	0.051	J
10061-01-5	cis-1,3-Dichloropropene	ND	0.62	0.17	ND	0.14	0.038	
108-10-1	4-Methyl-2-pentanone	ND	0.62	0.20	ND	0.15	0.048	
10061-02-6	trans-1,3-Dichloropropene	ND	0.62	0.20	ND	0.14	0.043	
79-00-5	1,1,2-Trichloroethane	ND	0.62	0.20	ND	0.11	0.036	
108-88-3	Toluene	0.79	0.62	0.21	0.21	0.16	0.056	
591-78-6	2-Hexanone	0.45	0.62	0.20	0.11	0.15	0.048	J
124-48-1	Dibromochloromethane	ND	0.62	0.20	ND	0.072	0.023	
106-93-4	1,2-Dibromoethane	ND	0.62	0.20	ND	0.080	0.026	
123-86-4	n-Butyl Acetate	ND	0.62	0.20	ND	0.13	0.041	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

D = The reported result is from a dilution.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 3 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: ODSVE-DUP1-Y6Q2

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1605349

ALS Sample ID: P1605349-002

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 6.0 L Summa Canister

Test Notes:

Container ID: SC00999

Date Collected: 11/9/16

Date Received: 11/15/16

Date Analyzed: 11/21 - 11/22/16

Volume(s) Analyzed: 1.00 Liter(s)

0.10 Liter(s)

Initial Pressure (psig): 0.61 Final Pressure (psig): 4.11

Canister Dilution Factor: 1.23

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.62	0.22	ND	0.13	0.047	
127-18-4	Tetrachloroethene	20	0.62	0.17	3.0	0.091	0.025	
108-90-7	Chlorobenzene	ND	0.62	0.20	ND	0.13	0.043	
100-41-4	Ethylbenzene	ND	0.62	0.20	ND	0.14	0.045	
179601-23-1	m,p-Xylenes	ND	1.2	0.37	ND	0.28	0.085	
75-25-2	Bromoform	ND	0.62	0.18	ND	0.060	0.018	
100-42-5	Styrene	ND	0.62	0.18	ND	0.14	0.043	
95-47-6	o-Xylene	ND	0.62	0.18	ND	0.14	0.042	
111-84-2	n-Nonane	ND	0.62	0.18	ND	0.12	0.035	
79-34-5	1,1,2,2-Tetrachloroethane	4.4	0.62	0.18	0.64	0.090	0.027	
98-82-8	Cumene	ND	0.62	0.18	ND	0.13	0.038	
80-56-8	alpha-Pinene	ND	0.62	0.17	ND	0.11	0.031	
103-65-1	n-Propylbenzene	ND	0.62	0.20	ND	0.13	0.040	
622-96-8	4-Ethyltoluene	ND	0.62	0.20	ND	0.13	0.040	
108-67-8	1,3,5-Trimethylbenzene	ND	0.62	0.20	ND	0.13	0.040	
95-63-6	1,2,4-Trimethylbenzene	ND	0.62	0.18	ND	0.13	0.038	
100-44-7	Benzyl Chloride	0.16	0.62	0.14	0.032	0.12	0.026	J
541-73-1	1,3-Dichlorobenzene	ND	0.62	0.18	ND	0.10	0.031	
106-46-7	1,4-Dichlorobenzene	ND	0.62	0.17	ND	0.10	0.029	
95-50-1	1,2-Dichlorobenzene	ND	0.62	0.18	ND	0.10	0.031	
5989-27-5	d-Limonene	ND	0.62	0.17	ND	0.11	0.031	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.62	0.12	ND	0.064	0.013	
120-82-1	1,2,4-Trichlorobenzene	ND	0.62	0.20	ND	0.083	0.027	
91-20-3	Naphthalene	ND	0.62	0.22	ND	0.12	0.042	
87-68-3	Hexachlorobutadiene	ND	0.62	0.17	ND	0.058	0.016	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Method Blank

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1605349

ALS Sample ID: P161121-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 11/21/16

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	ND	0.50	0.14	ND	0.29	0.081	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.50	0.17	ND	0.10	0.034	
74-87-3	Chloromethane	ND	0.50	0.15	ND	0.24	0.073	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.50	0.19	ND	0.072	0.027	
75-01-4	Vinyl Chloride	ND	0.50	0.17	ND	0.20	0.067	
106-99-0	1,3-Butadiene	ND	0.50	0.22	ND	0.23	0.099	
74-83-9	Bromomethane	ND	0.50	0.19	ND	0.13	0.049	
75-00-3	Chloroethane	ND	0.50	0.17	ND	0.19	0.064	
64-17-5	Ethanol	ND	5.0	0.80	ND	2.7	0.42	
75-05-8	Acetonitrile	ND	0.50	0.18	ND	0.30	0.11	
107-02-8	Acrolein	ND	2.0	0.17	ND	0.87	0.074	
67-64-1	Acetone	ND	5.0	0.77	ND	2.1	0.32	
75-69-4	Trichlorofluoromethane	ND	0.50	0.17	ND	0.089	0.030	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	5.0	0.42	ND	2.0	0.17	
107-13-1	Acrylonitrile	ND	0.50	0.17	ND	0.23	0.078	
75-35-4	1,1-Dichloroethene	ND	0.50	0.17	ND	0.13	0.043	
75-09-2	Methylene Chloride	ND	0.50	0.17	ND	0.14	0.049	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.50	0.16	ND	0.16	0.051	
76-13-1	Trichlorotrifluoroethane	ND	0.50	0.17	ND	0.065	0.022	
75-15-0	Carbon Disulfide	ND	5.0	0.15	ND	1.6	0.048	
156-60-5	trans-1,2-Dichloroethene	ND	0.50	0.19	ND	0.13	0.048	
75-34-3	1,1-Dichloroethane	ND	0.50	0.16	ND	0.12	0.040	
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	0.17	ND	0.14	0.047	
108-05-4	Vinyl Acetate	ND	5.0	0.65	ND	1.4	0.18	
78-93-3	2-Butanone (MEK)	ND	5.0	0.21	ND	1.7	0.071	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 2 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Method Blank

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1605349

ALS Sample ID: P161121-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 11/21/16

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.50	0.16	ND	0.13	0.040	
141-78-6	Ethyl Acetate	ND	1.0	0.35	ND	0.28	0.097	
110-54-3	n-Hexane	ND	0.50	0.15	ND	0.14	0.043	
67-66-3	Chloroform	ND	0.50	0.17	ND	0.10	0.035	
109-99-9	Tetrahydrofuran (THF)	ND	0.50	0.20	ND	0.17	0.068	
107-06-2	1,2-Dichloroethane	ND	0.50	0.16	ND	0.12	0.040	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.17	ND	0.092	0.031	
71-43-2	Benzene	ND	0.50	0.16	ND	0.16	0.050	
56-23-5	Carbon Tetrachloride	ND	0.50	0.15	ND	0.080	0.024	
110-82-7	Cyclohexane	ND	1.0	0.29	ND	0.29	0.084	
78-87-5	1,2-Dichloropropane	ND	0.50	0.16	ND	0.11	0.035	
75-27-4	Bromodichloromethane	ND	0.50	0.15	ND	0.075	0.022	
79-01-6	Trichloroethene	ND	0.50	0.14	ND	0.093	0.026	
123-91-1	1,4-Dioxane	ND	0.50	0.16	ND	0.14	0.044	
80-62-6	Methyl Methacrylate	ND	1.0	0.31	ND	0.24	0.076	
142-82-5	n-Heptane	ND	0.50	0.17	ND	0.12	0.041	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.14	ND	0.11	0.031	
108-10-1	4-Methyl-2-pentanone	ND	0.50	0.16	ND	0.12	0.039	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.16	ND	0.11	0.035	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.16	ND	0.092	0.029	
108-88-3	Toluene	ND	0.50	0.17	ND	0.13	0.045	
591-78-6	2-Hexanone	ND	0.50	0.16	ND	0.12	0.039	
124-48-1	Dibromochloromethane	ND	0.50	0.16	ND	0.059	0.019	
106-93-4	1,2-Dibromoethane	ND	0.50	0.16	ND	0.065	0.021	
123-86-4	n-Butyl Acetate	ND	0.50	0.16	ND	0.11	0.034	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 3 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Method Blank

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1605349

ALS Sample ID: P161121-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 11/21/16

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.50	0.18	ND	0.11	0.039	
127-18-4	Tetrachloroethene	ND	0.50	0.14	ND	0.074	0.021	
108-90-7	Chlorobenzene	ND	0.50	0.16	ND	0.11	0.035	
100-41-4	Ethylbenzene	ND	0.50	0.16	ND	0.12	0.037	
179601-23-1	m,p-Xylenes	ND	1.0	0.30	ND	0.23	0.069	
75-25-2	Bromoform	ND	0.50	0.15	ND	0.048	0.015	
100-42-5	Styrene	ND	0.50	0.15	ND	0.12	0.035	
95-47-6	o-Xylene	ND	0.50	0.15	ND	0.12	0.035	
111-84-2	n-Nonane	ND	0.50	0.15	ND	0.095	0.029	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.15	ND	0.073	0.022	
98-82-8	Cumene	ND	0.50	0.15	ND	0.10	0.031	
80-56-8	alpha-Pinene	ND	0.50	0.14	ND	0.090	0.025	
103-65-1	n-Propylbenzene	ND	0.50	0.16	ND	0.10	0.033	
622-96-8	4-Ethyltoluene	ND	0.50	0.16	ND	0.10	0.033	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.16	ND	0.10	0.033	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.15	ND	0.10	0.031	
100-44-7	Benzyl Chloride	ND	0.50	0.11	ND	0.097	0.021	
541-73-1	1,3-Dichlorobenzene	ND	0.50	0.15	ND	0.083	0.025	
106-46-7	1,4-Dichlorobenzene	ND	0.50	0.14	ND	0.083	0.023	
95-50-1	1,2-Dichlorobenzene	ND	0.50	0.15	ND	0.083	0.025	
5989-27-5	d-Limonene	ND	0.50	0.14	ND	0.090	0.025	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.50	0.099	ND	0.052	0.010	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.16	ND	0.067	0.022	
91-20-3	Naphthalene	ND	0.50	0.18	ND	0.095	0.034	
87-68-3	Hexachlorobutadiene	ND	0.50	0.14	ND	0.047	0.013	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Method Blank

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1605349

ALS Sample ID: P161122-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 11/22/16

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	ND	0.50	0.14	ND	0.29	0.081	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.50	0.17	ND	0.10	0.034	
74-87-3	Chloromethane	ND	0.50	0.15	ND	0.24	0.073	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.50	0.19	ND	0.072	0.027	
75-01-4	Vinyl Chloride	ND	0.50	0.17	ND	0.20	0.067	
106-99-0	1,3-Butadiene	ND	0.50	0.22	ND	0.23	0.099	
74-83-9	Bromomethane	ND	0.50	0.19	ND	0.13	0.049	
75-00-3	Chloroethane	ND	0.50	0.17	ND	0.19	0.064	
64-17-5	Ethanol	ND	5.0	0.80	ND	2.7	0.42	
75-05-8	Acetonitrile	ND	0.50	0.18	ND	0.30	0.11	
107-02-8	Acrolein	ND	2.0	0.17	ND	0.87	0.074	
67-64-1	Acetone	ND	5.0	0.77	ND	2.1	0.32	
75-69-4	Trichlorofluoromethane	ND	0.50	0.17	ND	0.089	0.030	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	5.0	0.42	ND	2.0	0.17	
107-13-1	Acrylonitrile	ND	0.50	0.17	ND	0.23	0.078	
75-35-4	1,1-Dichloroethene	ND	0.50	0.17	ND	0.13	0.043	
75-09-2	Methylene Chloride	ND	0.50	0.17	ND	0.14	0.049	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.50	0.16	ND	0.16	0.051	
76-13-1	Trichlorotrifluoroethane	ND	0.50	0.17	ND	0.065	0.022	
75-15-0	Carbon Disulfide	ND	5.0	0.15	ND	1.6	0.048	
156-60-5	trans-1,2-Dichloroethene	ND	0.50	0.19	ND	0.13	0.048	
75-34-3	1,1-Dichloroethane	ND	0.50	0.16	ND	0.12	0.040	
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	0.17	ND	0.14	0.047	
108-05-4	Vinyl Acetate	ND	5.0	0.65	ND	1.4	0.18	
78-93-3	2-Butanone (MEK)	ND	5.0	0.21	ND	1.7	0.071	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 2 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Method Blank

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1605349

ALS Sample ID: P161122-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 11/22/16

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.50	0.16	ND	0.13	0.040	
141-78-6	Ethyl Acetate	ND	1.0	0.35	ND	0.28	0.097	
110-54-3	n-Hexane	ND	0.50	0.15	ND	0.14	0.043	
67-66-3	Chloroform	ND	0.50	0.17	ND	0.10	0.035	
109-99-9	Tetrahydrofuran (THF)	ND	0.50	0.20	ND	0.17	0.068	
107-06-2	1,2-Dichloroethane	ND	0.50	0.16	ND	0.12	0.040	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.17	ND	0.092	0.031	
71-43-2	Benzene	ND	0.50	0.16	ND	0.16	0.050	
56-23-5	Carbon Tetrachloride	ND	0.50	0.15	ND	0.080	0.024	
110-82-7	Cyclohexane	ND	1.0	0.29	ND	0.29	0.084	
78-87-5	1,2-Dichloropropane	ND	0.50	0.16	ND	0.11	0.035	
75-27-4	Bromodichloromethane	ND	0.50	0.15	ND	0.075	0.022	
79-01-6	Trichloroethene	ND	0.50	0.14	ND	0.093	0.026	
123-91-1	1,4-Dioxane	ND	0.50	0.16	ND	0.14	0.044	
80-62-6	Methyl Methacrylate	ND	1.0	0.31	ND	0.24	0.076	
142-82-5	n-Heptane	ND	0.50	0.17	ND	0.12	0.041	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.14	ND	0.11	0.031	
108-10-1	4-Methyl-2-pentanone	ND	0.50	0.16	ND	0.12	0.039	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.16	ND	0.11	0.035	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.16	ND	0.092	0.029	
108-88-3	Toluene	ND	0.50	0.17	ND	0.13	0.045	
591-78-6	2-Hexanone	ND	0.50	0.16	ND	0.12	0.039	
124-48-1	Dibromochloromethane	ND	0.50	0.16	ND	0.059	0.019	
106-93-4	1,2-Dibromoethane	ND	0.50	0.16	ND	0.065	0.021	
123-86-4	n-Butyl Acetate	ND	0.50	0.16	ND	0.11	0.034	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 3 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Method Blank

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1605349

ALS Sample ID: P161122-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 11/22/16

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.50	0.18	ND	0.11	0.039	
127-18-4	Tetrachloroethene	ND	0.50	0.14	ND	0.074	0.021	
108-90-7	Chlorobenzene	ND	0.50	0.16	ND	0.11	0.035	
100-41-4	Ethylbenzene	ND	0.50	0.16	ND	0.12	0.037	
179601-23-1	m,p-Xylenes	ND	1.0	0.30	ND	0.23	0.069	
75-25-2	Bromoform	ND	0.50	0.15	ND	0.048	0.015	
100-42-5	Styrene	ND	0.50	0.15	ND	0.12	0.035	
95-47-6	o-Xylene	ND	0.50	0.15	ND	0.12	0.035	
111-84-2	n-Nonane	ND	0.50	0.15	ND	0.095	0.029	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.15	ND	0.073	0.022	
98-82-8	Cumene	ND	0.50	0.15	ND	0.10	0.031	
80-56-8	alpha-Pinene	ND	0.50	0.14	ND	0.090	0.025	
103-65-1	n-Propylbenzene	ND	0.50	0.16	ND	0.10	0.033	
622-96-8	4-Ethyltoluene	ND	0.50	0.16	ND	0.10	0.033	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.16	ND	0.10	0.033	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.15	ND	0.10	0.031	
100-44-7	Benzyl Chloride	ND	0.50	0.11	ND	0.097	0.021	
541-73-1	1,3-Dichlorobenzene	ND	0.50	0.15	ND	0.083	0.025	
106-46-7	1,4-Dichlorobenzene	ND	0.50	0.14	ND	0.083	0.023	
95-50-1	1,2-Dichlorobenzene	ND	0.50	0.15	ND	0.083	0.025	
5989-27-5	d-Limonene	ND	0.50	0.14	ND	0.090	0.025	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.50	0.099	ND	0.052	0.010	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.16	ND	0.067	0.022	
91-20-3	Naphthalene	ND	0.50	0.18	ND	0.095	0.034	
87-68-3	Hexachlorobutadiene	ND	0.50	0.14	ND	0.047	0.013	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

SURROGATE SPIKE RECOVERY RESULTS

Page 1 of 1

Client: HDR Environmental, Operations & Construction, Inc.
Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1605349

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9
Analyst: Simon Cao
Sample Type: 6.0 L Summa Canister(s)
Test Notes:

Date(s) Collected: 11/9/16
Date(s) Received: 11/15/16
Date(s) Analyzed: 11/21 - 11/22/16

Client Sample ID	ALS Sample ID	1,2-Dichloroethane-d4	Toluene-d8	Bromofluorobenzene	Acceptance Limits	Data Qualifier
		Percent Recovered	Percent Recovered	Percent Recovered		
Method Blank	P161121-MB	107	98	94	70-130	
Method Blank	P161122-MB	111	97	90	70-130	
Lab Control Sample	P161121-LCS	105	97	96	70-130	
Lab Control Sample	P161122-LCS	111	96	92	70-130	
ODSVE-EFF-Y6Q2	P1605349-001	106	96	92	70-130	
ODSVE-DUP1-Y6Q2	P1605349-002	108	97	93	70-130	

Surrogate percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly from the on-column percent recovery.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Lab Control Sample

ALS Project ID: P1605349

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Sample ID: P161121-LCS

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Date Received: NA

Analyst: Simon Cao

Date Analyzed: 11/21/16

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 0.125 Liter(s)

Test Notes:

CAS #	Compound	Spike Amount µg/m ³	Result µg/m ³	% Recovery	ALS Acceptance Limits	Data Qualifier
115-07-1	Propene	210	226	108	52-127	
75-71-8	Dichlorodifluoromethane (CFC 12)	210	201	96	68-109	
74-87-3	Chloromethane	210	208	99	51-130	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	211	183	87	66-114	
75-01-4	Vinyl Chloride	210	185	88	61-125	
106-99-0	1,3-Butadiene	210	213	101	62-144	
74-83-9	Bromomethane	210	206	98	73-123	
75-00-3	Chloroethane	210	215	102	69-122	
64-17-5	Ethanol	1,060	1190	112	62-124	
75-05-8	Acetonitrile	213	232	109	57-114	
107-02-8	Acrolein	212	214	101	62-116	
67-64-1	Acetone	1,060	1040	98	57-117	
75-69-4	Trichlorofluoromethane	210	199	95	63-98	
67-63-0	2-Propanol (Isopropyl Alcohol)	424	450	106	66-121	
107-13-1	Acrylonitrile	213	231	108	68-123	
75-35-4	1,1-Dichloroethene	213	206	97	76-118	
75-09-2	Methylene Chloride	212	196	92	60-118	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	212	233	110	65-126	
76-13-1	Trichlorotrifluoroethane	212	197	93	73-114	
75-15-0	Carbon Disulfide	213	230	108	57-102	L
156-60-5	trans-1,2-Dichloroethene	213	219	103	74-123	
75-34-3	1,1-Dichloroethane	212	209	99	69-111	
1634-04-4	Methyl tert-Butyl Ether	213	181	85	69-113	
108-05-4	Vinyl Acetate	1,060	1000	94	76-128	
78-93-3	2-Butanone (MEK)	212	216	102	63-127	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

L = Laboratory control sample recovery outside the specified limits, results may be biased high.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 2 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Lab Control Sample

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1605349

ALS Sample ID: P161121-LCS

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 11/21/16

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount µg/m ³	Result µg/m ³	% Recovery	ALS Acceptance Limits	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	212	217	102	72-117	
141-78-6	Ethyl Acetate	426	461	108	68-127	
110-54-3	n-Hexane	213	233	109	55-116	
67-66-3	Chloroform	212	206	97	70-109	
109-99-9	Tetrahydrofuran (THF)	213	206	97	72-113	
107-06-2	1,2-Dichloroethane	212	212	100	69-113	
71-55-6	1,1,1-Trichloroethane	212	195	92	72-115	
71-43-2	Benzene	212	196	92	65-107	
56-23-5	Carbon Tetrachloride	213	197	92	71-113	
110-82-7	Cyclohexane	425	407	96	71-115	
78-87-5	1,2-Dichloropropane	212	215	101	71-115	
75-27-4	Bromodichloromethane	214	209	98	75-118	
79-01-6	Trichloroethene	212	199	94	68-114	
123-91-1	1,4-Dioxane	213	212	100	81-131	
80-62-6	Methyl Methacrylate	424	424	100	72-130	
142-82-5	n-Heptane	213	212	100	68-116	
10061-01-5	cis-1,3-Dichloropropene	210	212	101	77-126	
108-10-1	4-Methyl-2-pentanone	213	221	104	69-126	
10061-02-6	trans-1,3-Dichloropropene	213	216	101	79-125	
79-00-5	1,1,2-Trichloroethane	212	205	97	75-119	
108-88-3	Toluene	212	187	88	59-118	
591-78-6	2-Hexanone	213	219	103	69-129	
124-48-1	Dibromochloromethane	213	195	92	74-136	
106-93-4	1,2-Dibromoethane	212	196	92	73-131	
123-86-4	n-Butyl Acetate	216	222	103	69-130	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 3 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Lab Control Sample

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1605349

ALS Sample ID: P161121-LCS

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 11/21/16

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount µg/m ³	Result µg/m ³	% Recovery	ALS Acceptance Limits	Data Qualifier
111-65-9	n-Octane	212	216	102	66-120	
127-18-4	Tetrachloroethene	213	190	89	65-130	
108-90-7	Chlorobenzene	212	190	90	68-120	
100-41-4	Ethylbenzene	212	194	92	68-122	
179601-23-1	m,p-Xylenes	424	389	92	68-123	
75-25-2	Bromoform	212	195	92	69-130	
100-42-5	Styrene	212	198	93	71-133	
95-47-6	o-Xylene	212	195	92	68-122	
111-84-2	n-Nonane	212	214	101	65-120	
79-34-5	1,1,2,2-Tetrachloroethane	212	201	95	69-130	
98-82-8	Cumene	212	192	91	70-123	
80-56-8	alpha-Pinene	213	192	90	70-128	
103-65-1	n-Propylbenzene	214	198	93	69-125	
622-96-8	4-Ethyltoluene	212	202	95	67-130	
108-67-8	1,3,5-Trimethylbenzene	212	192	91	67-124	
95-63-6	1,2,4-Trimethylbenzene	212	196	92	67-129	
100-44-7	Benzyl Chloride	212	212	100	79-138	
541-73-1	1,3-Dichlorobenzene	212	197	93	65-136	
106-46-7	1,4-Dichlorobenzene	213	202	95	66-141	
95-50-1	1,2-Dichlorobenzene	212	199	94	67-136	
5989-27-5	d-Limonene	212	188	89	71-134	
96-12-8	1,2-Dibromo-3-chloropropane	212	211	100	73-136	
120-82-1	1,2,4-Trichlorobenzene	212	218	103	64-134	
91-20-3	Naphthalene	214	228	107	62-136	
87-68-3	Hexachlorobutadiene	213	202	95	60-133	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Lab Control Sample

ALS Project ID: P1605349

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Sample ID: P161122-LCS

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Date Received: NA

Analyst: Simon Cao

Date Analyzed: 11/22/16

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 0.125 Liter(s)

Test Notes:

CAS #	Compound	Spike Amount µg/m ³	Result µg/m ³	% Recovery	ALS Acceptance Limits	Data Qualifier
115-07-1	Propene	210	250	119	52-127	
75-71-8	Dichlorodifluoromethane (CFC 12)	210	207	99	68-109	
74-87-3	Chloromethane	210	226	108	51-130	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	211	185	88	66-114	
75-01-4	Vinyl Chloride	210	195	93	61-125	
106-99-0	1,3-Butadiene	210	218	104	62-144	
74-83-9	Bromomethane	210	209	100	73-123	
75-00-3	Chloroethane	210	225	107	69-122	
64-17-5	Ethanol	1,060	1280	121	62-124	
75-05-8	Acetonitrile	213	254	119	57-114	L
107-02-8	Acrolein	212	221	104	62-116	
67-64-1	Acetone	1,060	1100	104	57-117	
75-69-4	Trichlorofluoromethane	210	200	95	63-98	
67-63-0	2-Propanol (Isopropyl Alcohol)	424	481	113	66-121	
107-13-1	Acrylonitrile	213	246	115	68-123	
75-35-4	1,1-Dichloroethene	213	209	98	76-118	
75-09-2	Methylene Chloride	212	201	95	60-118	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	212	254	120	65-126	
76-13-1	Trichlorotrifluoroethane	212	196	92	73-114	
75-15-0	Carbon Disulfide	213	237	111	57-102	L
156-60-5	trans-1,2-Dichloroethene	213	228	107	74-123	
75-34-3	1,1-Dichloroethane	212	218	103	69-111	
1634-04-4	Methyl tert-Butyl Ether	213	187	88	69-113	
108-05-4	Vinyl Acetate	1,060	1020	96	76-128	
78-93-3	2-Butanone (MEK)	212	225	106	63-127	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

L = Laboratory control sample recovery outside the specified limits, results may be biased high.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 2 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Lab Control Sample

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1605349

ALS Sample ID: P161122-LCS

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 11/22/16

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount µg/m ³	Result µg/m ³	% Recovery	ALS Acceptance Limits	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	212	226	107	72-117	
141-78-6	Ethyl Acetate	426	485	114	68-127	
110-54-3	n-Hexane	213	242	114	55-116	
67-66-3	Chloroform	212	211	100	70-109	
109-99-9	Tetrahydrofuran (THF)	213	212	100	72-113	
107-06-2	1,2-Dichloroethane	212	222	105	69-113	
71-55-6	1,1,1-Trichloroethane	212	195	92	72-115	
71-43-2	Benzene	212	199	94	65-107	
56-23-5	Carbon Tetrachloride	213	194	91	71-113	
110-82-7	Cyclohexane	425	411	97	71-115	
78-87-5	1,2-Dichloropropane	212	222	105	71-115	
75-27-4	Bromodichloromethane	214	210	98	75-118	
79-01-6	Trichloroethene	212	196	92	68-114	
123-91-1	1,4-Dioxane	213	214	100	81-131	
80-62-6	Methyl Methacrylate	424	423	100	72-130	
142-82-5	n-Heptane	213	214	100	68-116	
10061-01-5	cis-1,3-Dichloropropene	210	214	102	77-126	
108-10-1	4-Methyl-2-pentanone	213	227	107	69-126	
10061-02-6	trans-1,3-Dichloropropene	213	220	103	79-125	
79-00-5	1,1,2-Trichloroethane	212	204	96	75-119	
108-88-3	Toluene	212	183	86	59-118	
591-78-6	2-Hexanone	213	227	107	69-129	
124-48-1	Dibromochloromethane	213	188	88	74-136	
106-93-4	1,2-Dibromoethane	212	190	90	73-131	
123-86-4	n-Butyl Acetate	216	229	106	69-130	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 3 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Lab Control Sample

ALS Project ID: P1605349

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Sample ID: P161122-LCS

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Date Received: NA

Analyst: Simon Cao

Date Analyzed: 11/22/16

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 0.125 Liter(s)

Test Notes:

CAS #	Compound	Spike Amount µg/m ³	Result µg/m ³	% Recovery	ALS Acceptance Limits	Data Qualifier
111-65-9	n-Octane	212	219	103	66-120	
127-18-4	Tetrachloroethene	213	180	85	65-130	
108-90-7	Chlorobenzene	212	184	87	68-120	
100-41-4	Ethylbenzene	212	191	90	68-122	
179601-23-1	m,p-Xylenes	424	384	91	68-123	
75-25-2	Bromoform	212	187	88	69-130	
100-42-5	Styrene	212	193	91	71-133	
95-47-6	o-Xylene	212	193	91	68-122	
111-84-2	n-Nonane	212	224	106	65-120	
79-34-5	1,1,2,2-Tetrachloroethane	212	201	95	69-130	
98-82-8	Cumene	212	188	89	70-123	
80-56-8	alpha-Pinene	213	188	88	70-128	
103-65-1	n-Propylbenzene	214	196	92	69-125	
622-96-8	4-Ethyltoluene	212	198	93	67-130	
108-67-8	1,3,5-Trimethylbenzene	212	188	89	67-124	
95-63-6	1,2,4-Trimethylbenzene	212	194	92	67-129	
100-44-7	Benzyl Chloride	212	211	100	79-138	
541-73-1	1,3-Dichlorobenzene	212	193	91	65-136	
106-46-7	1,4-Dichlorobenzene	213	195	92	66-141	
95-50-1	1,2-Dichlorobenzene	212	194	92	67-136	
5989-27-5	d-Limonene	212	190	90	71-134	
96-12-8	1,2-Dibromo-3-chloropropane	212	202	95	73-136	
120-82-1	1,2,4-Trichlorobenzene	212	210	99	64-134	
91-20-3	Naphthalene	214	222	104	62-136	
87-68-3	Hexachlorobutadiene	213	193	91	60-133	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: HDR Environmental, Operations & Construction, Inc.

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1605349

Internal Standard Area and RT Summary

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Lab File ID: 11211602.D

Analyst: Simon Cao

Date Analyzed: 11/21/16

Sample Type: 6.0 L Summa Canister(s)

Time Analyzed: 08:27

Test Notes:

	IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
	AREA	#	RT	#	AREA	#
24 Hour Standard	168228		9.19		836584	11.16
Upper Limit	235519		9.52		1171218	11.49
Lower Limit	100937		8.86		501950	10.83

Client Sample ID		IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
		AREA	#	RT	#	AREA	#
01	Method Blank	154209		9.17		771956	11.14
02	Lab Control Sample	158870		9.19		780906	11.16
03	ODSVE-EFF-Y6Q2	150266		9.18		739531	11.15
04	ODSVE-DUP1-Y6Q2	149930		9.18		740979	11.15
05							
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

IS1 (BCM) = Bromochloromethane

IS2 (DFB) = 1,4-Difluorobenzene

IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = 140% of internal standard area

AREA LOWER LIMIT = 60% of internal standard area

RT UPPER LIMIT = 0.33 minutes of internal standard RT

RT LOWER LIMIT = 0.33 minutes of internal standard RT

Column used to flag values outside QC limits with an I.

I = Internal standard not within the specified limits.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: HDR Environmental, Operations & Construction, Inc.

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1605349

Internal Standard Area and RT Summary

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Lab File ID: 11221601.D

Analyst: Simon Cao

Date Analyzed: 11/22/16

Sample Type: 6.0 L Summa Canister(s)

Time Analyzed: 09:23

Test Notes:

	IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
	AREA	#	RT	#	AREA	#
24 Hour Standard	153754		9.19		767383	11.16
Upper Limit	215256		9.52		1074336	11.49
Lower Limit	92252		8.86		460430	10.83

Client Sample ID		IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
		AREA	#	RT	#	AREA	#
01	Method Blank	147738		9.17		747604	11.14
02	Lab Control Sample	149773		9.20		745685	11.16
03	ODSVE-EFF-Y6Q2 (Dilution)	150244		9.17		744542	11.14
04	ODSVE-DUP1-Y6Q2 (Dilution)	148365		9.17		741618	11.15
05							
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

IS1 (BCM) = Bromochloromethane

IS2 (DFB) = 1,4-Difluorobenzene

IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = 140% of internal standard area

AREA LOWER LIMIT = 60% of internal standard area

RT UPPER LIMIT = 0.33 minutes of internal standard RT

RT LOWER LIMIT = 0.33 minutes of internal standard RT

Column used to flag values outside QC limits with an I.

I = Internal standard not within the specified limits.

Data File: I:\MS09\Data\2016 11\21\11211620.D

Acq On : 21 Nov 2016 19:28

Operator: SC

Sample : P1605349-001 (1000mL)

Misc : S29-10261601

ALS Vial : 10 Sample Multiplier: 1

 11/22/16

Quant Time: Nov 22 09:35:39 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.18	130	150266	12.500	ng	-0.04
37) 1,4-Difluorobenzene (IS2)	11.15	114	739531	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	15.51	82	335721	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.96	65	238267	13.252	ng	-0.03
Spiked Amount	12.500	Range	70 - 130	Recovery	=	106.00%
57) Toluene-d8 (SS2)	13.59	98	819640	12.025	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	96.16%
73) Bromofluorobenzene (SS3)	17.09	174	211083	11.554	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	92.40%

Target Compounds

						Qvalue
2) Propene	3.89	42	10153m	0.467	ng	
3) Dichlorodifluoromethan...	4.00	85	148425	4.747	ng	99
4) Chloromethane	4.19	50	16043	0.557	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.36	135	1281	N.D.		
6) Vinyl Chloride	4.47	62	5584	0.204	ng	93
7) 1,3-Butadiene	0.00	54	0	N.D.	d	
8) Bromomethane	4.96	94	7917	0.508	ng	99
9) Chloroethane	5.18	64	1912	0.145	ng	91
10) Ethanol	5.37	45	22464	1.732	ng	96
11) Acetonitrile	5.59	41	15493	0.441	ng	99
12) Acrolein	5.74	56	6402	0.546	ng	97
13) Acetone	5.89	58	132742	9.557	ng	88
14) Trichlorofluoromethane	6.05	101	43647	1.703	ng	98
15) 2-Propanol (Isopropanol)	6.19	45	13807	0.324	ng	100
16) Acrylonitrile	6.41	53	111	N.D.		
17) 1,1-Dichloroethene	6.75	96	77013	4.648	ng	95
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.	d	
19) Methylene Chloride	6.89	84	4763	0.254	ng	85
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.	d	
21) Trichlorotrifluoroethane	7.22	151	343325	26.490	ng	96
22) Carbon Disulfide	0.00	76	0	N.D.	d	
23) trans-1,2-Dichloroethene	7.92	61	43141	1.715	ng	95
24) 1,1-Dichloroethane	8.14	63	85186	2.680	ng	99
25) Methyl tert-Butyl Ether	8.17	73	925	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.	d	
27) 2-Butanone (MEK)	8.57	72	21341	1.757	ng	# 57
28) cis-1,2-Dichloroethene	9.01	61	1956403	82.205	ng	95
29) Diisopropyl Ether	0.00	87	0	N.D.	d	
30) Ethyl Acetate	0.00	61	0	N.D.	d	
31) n-Hexane	9.27	57	103206	3.748	ng	96
32) Chloroform	9.32	83	686144	24.268	ng	99
34) Tetrahydrofuran (THF)	9.73	72	16143	1.304	ng	# 78
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	0.00	62	0	N.D.	d	
38) 1,1,1-Trichloroethane	10.34	97	54670	2.231	ng	98
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	10.80	78	58036	0.776	ng	100
42) Carbon Tetrachloride	10.95	117	44525	2.132	ng	99
43) Cyclohexane	11.08	84	87327	3.247	ng	# 85
44) tert-Amyl Methyl Ether	11.34	73	433	N.D.		
45) 1,2-Dichloropropane	11.62	63	489	N.D.		
46) Bromodichloromethane	11.80	83	33968	1.509	ng	85
47) Trichloroethene	11.85	130	2169585	126.361	ng	100
48) 1,4-Dioxane	11.84	88	1132	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d	

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Data File: I:\MS09\Data\2016 11\21\11211620.D

Acq On : 21 Nov 2016 19:28

Operator: SC

Sample : P1605349-001 (1000mL)

Misc : S29-10261601

ALS Vial : 10 Sample Multiplier: 1

Quant Time: Nov 22 09:35:39 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	0.00	100	0	N.D.	d	
51) n-Heptane	12.17	71	7484	0.411	ng	91
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.	d	
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.	d	
58) Toluene	13.70	91	54093	0.693	ng	100
59) 2-Hexanone	13.94	43	14480	0.368	ng	# 71
60) Dibromochloromethane	14.10	129	20961	1.087	ng	99
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	14.58	43	13025	0.295	ng	# 61
63) n-Octane	14.71	57	1453	N.D.		
64) Tetrachloroethene	14.85	166	301713	16.382	ng	100
65) Chlorobenzene	15.56	112	1511	N.D.		
66) Ethylbenzene	15.95	91	8902	0.105	ng	99
67) m- & p-Xylenes	16.13	91	23782	0.369	ng	98
68) Bromoform	16.21	173	35179	2.307	ng	100
69) Styrene	16.51	104	895	N.D.		
70) o-Xylene	16.63	91	7687	0.117	ng	100
71) n-Nonane	16.87	43	3639m	0.095	ng	
72) 1,1,2,2-Tetrachloroethane	16.60	83	109576	3.392	ng	99
74) Cumene	17.24	105	1190	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	17.77	91	1806	N.D.		
77) 3-Ethyltoluene	17.88	105	2956	N.D.		
78) 4-Ethyltoluene	17.92	105	1949	N.D.		
79) 1,3,5-Trimethylbenzene	18.00	105	1769	N.D.		
80) alpha-Methylstyrene	18.16	118	1215	N.D.		
81) 2-Ethyltoluene	18.20	105	1682	N.D.		
82) 1,2,4-Trimethylbenzene	0.00	105	0	N.D.	d	
83) n-Decane	0.00	57	0	N.D.	d	
84) Benzyl Chloride	18.56	91	544	N.D.		
85) 1,3-Dichlorobenzene	18.66	146	635	N.D.		
86) 1,4-Dichlorobenzene	18.66	146	635	N.D.		
87) sec-Butylbenzene	18.88	105	3244	N.D.		
88) 4-Isopropyltoluene (p-...	0.00	119	0	N.D.	d	
89) 1,2,3-Trimethylbenzene	18.88	105	3244	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	19.02	68	459	N.D.		
92) 1,2-Dibromo-3-Chloropr...	19.39	157	498	N.D.		
93) n-Undecane	19.88	57	1855	N.D.		
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	20.94	128	3012	N.D.		
96) n-Dodecane	20.97	57	1539	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.	d	
99) tert-Butylbenzene	0.00	119	0	N.D.	d	
100) n-Butylbenzene	19.31	91	2449	N.D.		

(#)= qualifier out of range (m)= manual integration (+)= signals summed

Data File: I:\MS09\Data\2016 11\21\11211620.D

Acq On : 21 Nov 2016 19:28

Operator: SC

Sample : P1605349-001 (1000mL)

Misc : S29-10261601

ALS Vial : 10 Sample Multiplier: 1

Quant Time: Nov 22 09:35:39 2016

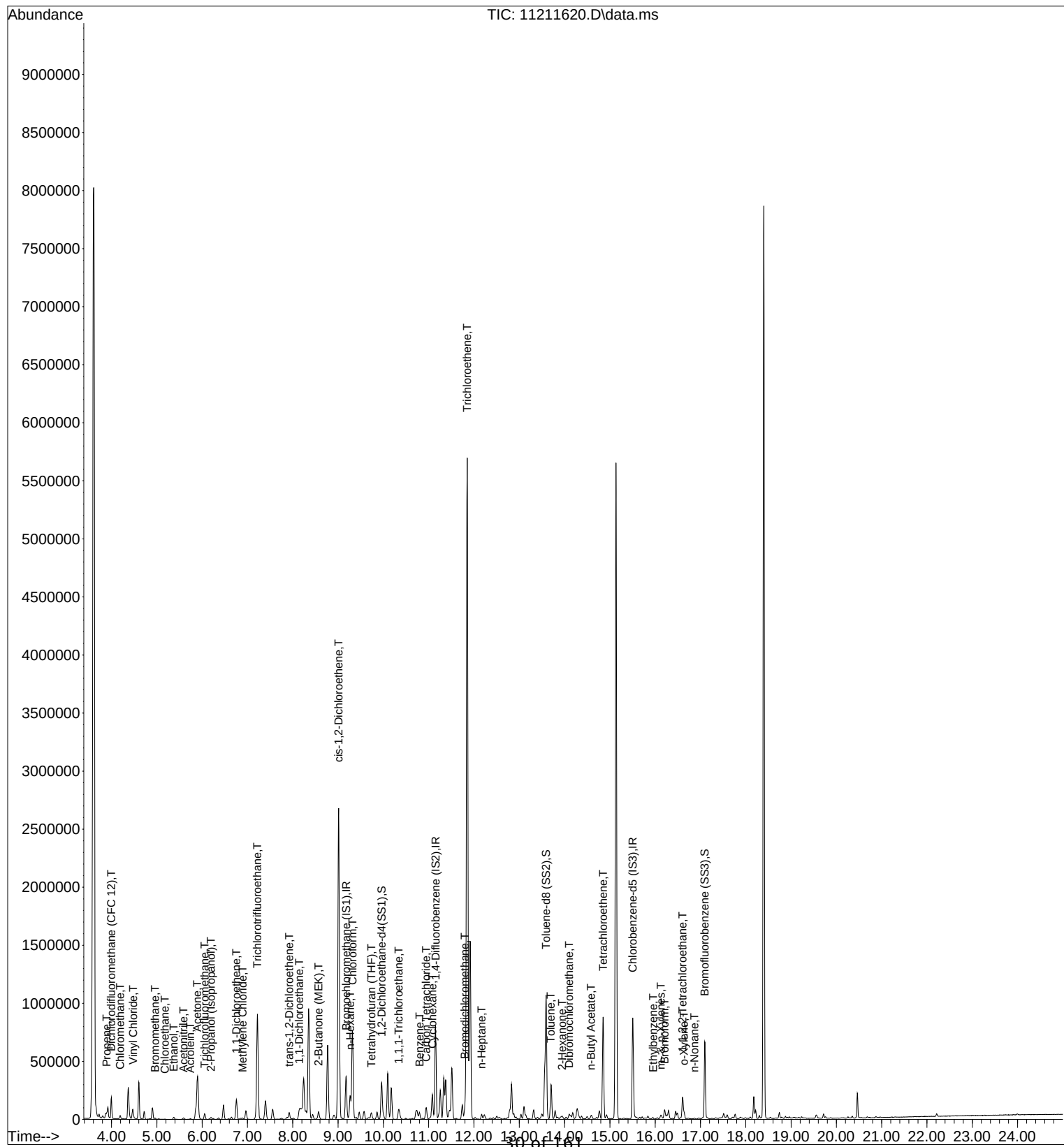
Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS09\Data\2016 11\21\11211620.D

Acq On : 21 Nov 2016 19:28

Operator: SC

Sample : P1605349-001 (1000mL)

Misc : S29-10261601

ALS Vial : 10 Sample Multiplier: 1

Quant Time: Nov 22 09:35:39 2016

 11/22/16

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.18	130	150266	12.500	ng	-0.04
37) 1,4-Difluorobenzene (IS2)	11.15	114	739531	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	15.51	82	335721	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.96	65	238267	13.252	ng	-0.03
Spiked Amount	12.500	Range	70 - 130	Recovery	=	106.00%
57) Toluene-d8 (SS2)	13.59	98	819640	12.025	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	96.16%
73) Bromofluorobenzene (SS3)	17.09	174	211083	11.554	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	92.40%

Target Compounds

						Qvalue
2) Propene	3.89	42	10153m	0.467	ng	
3) Dichlorodifluoromethan...	4.00	85	148425	4.747	ng	99
4) Chloromethane	4.19	50	16043	0.557	ng	99
6) Vinyl Chloride	4.47	62	5584	0.204	ng	93
8) Bromomethane	4.96	94	7917	0.508	ng	99
9) Chloroethane	5.18	64	1912	0.145	ng	91
10) Ethanol	5.37	45	22464	1.732	ng	96
11) Acetonitrile	5.59	41	15493	0.441	ng	99
12) Acrolein	5.74	56	6402	0.546	ng	97
13) Acetone	5.89	58	132742	9.557	ng	88
14) Trichlorofluoromethane	6.05	101	43647	1.703	ng	98
15) 2-Propanol (Isopropanol)	6.19	45	13807	0.324	ng	100
17) 1,1-Dichloroethene	6.75	96	77013	4.648	ng	95
19) Methylene Chloride	6.89	84	4763	0.254	ng	85
21) Trichlorotrifluoroethane	7.22	151	343325	26.490	ng	96
23) trans-1,2-Dichloroethene	7.92	61	43141	1.715	ng	95
24) 1,1-Dichloroethane	8.14	63	85186	2.680	ng	99
27) 2-Butanone (MEK)	8.57	72	21341	1.757	ng	# 57
28) cis-1,2-Dichloroethene	9.01	61	1956403	82.205	ng	95
31) n-Hexane	9.27	57	103206	3.748	ng	96
32) Chloroform	9.32	83	686144	24.268	ng	99
34) Tetrahydrofuran (THF)	9.73	72	16143	1.304	ng	# 78
38) 1,1,1-Trichloroethane	10.34	97	54670	2.231	ng	98
41) Benzene	10.80	78	58036	0.776	ng	100
42) Carbon Tetrachloride	10.95	117	44525	2.132	ng	99
43) Cyclohexane	11.08	84	87327	3.247	ng	# 85
46) Bromodichloromethane	11.80	83	33968	1.509	ng	85
47) Trichloroethene	11.85	130	2169585	126.361	ng	100
51) n-Heptane	12.17	71	7484	0.411	ng	91
58) Toluene	13.70	91	54093	0.693	ng	100
59) 2-Hexanone	13.94	43	14480	0.368	ng	# 71
60) Dibromochloromethane	14.10	129	20961	1.087	ng	99
62) n-Butyl Acetate	14.58	43	13025	0.295	ng	# 61
64) Tetrachloroethene	14.85	166	301713	16.382	ng	100
66) Ethylbenzene	15.95	91	8902	0.105	ng	99
67) m- & p-Xylenes	16.13	91	23782	0.369	ng	98
68) Bromoform	16.21	173	35179	2.307	ng	100
70) o-Xylene	16.63	91	7687	0.117	ng	100
71) n-Nonane	16.87	43	3639m	0.095	ng	
72) 1,1,2,2-Tetrachloroethane	16.60	83	109576	3.392	ng	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File: I:\MS09\Data\2016 11\21\11211620.D

Acq On : 21 Nov 2016 19:28

Operator: SC

Sample : P1605349-001 (1000mL)

Misc : S29-10261601

ALS Vial : 10 Sample Multiplier: 1

Quant Time: Nov 22 09:35:39 2016

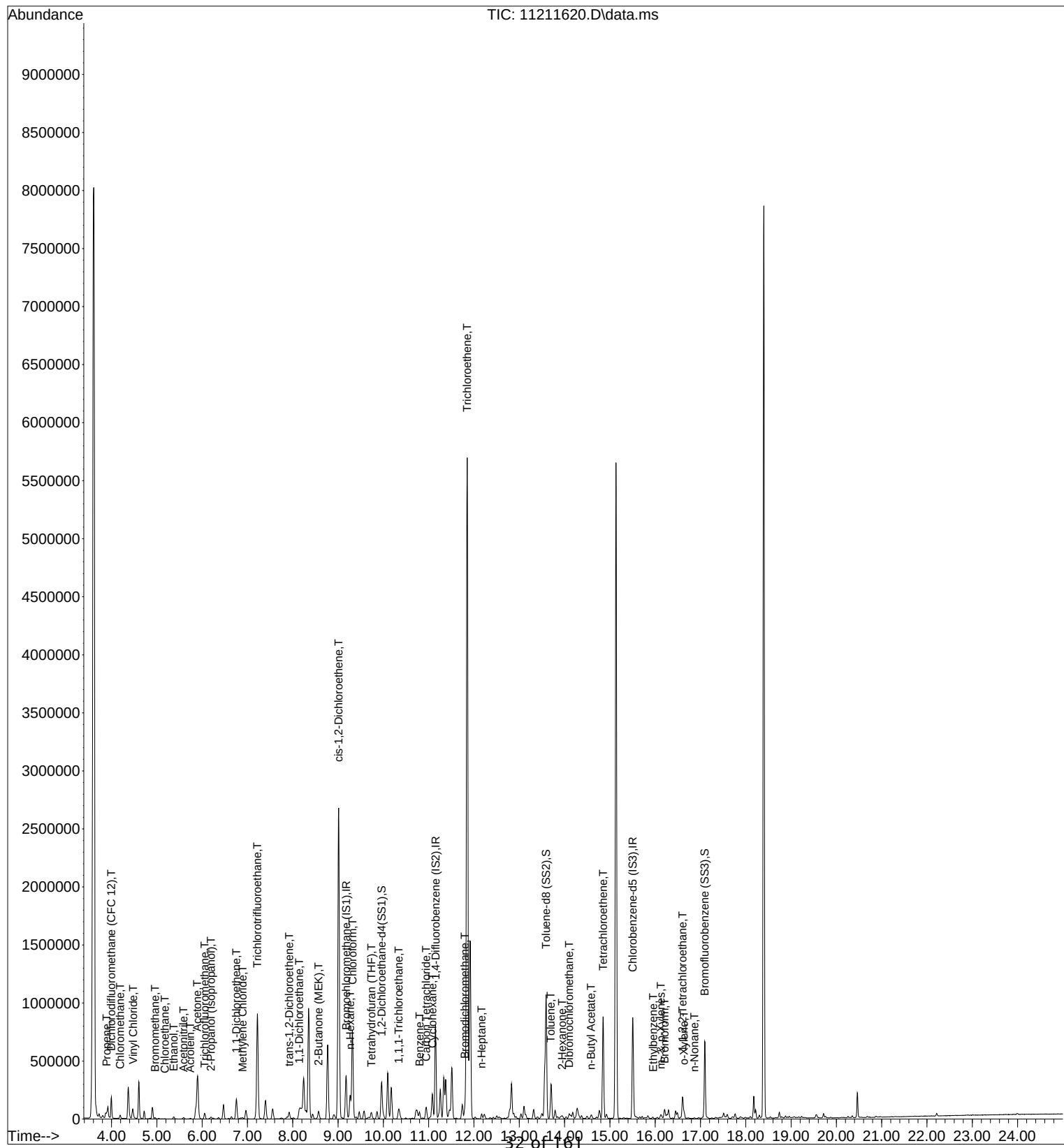
Quant Method : I:\MS09\Methods\R9110716.M

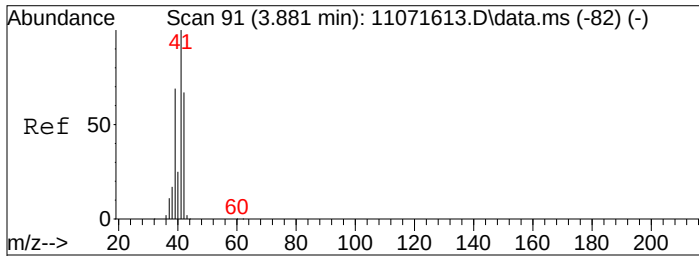
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M





#2

Propene

Concen: 0.47 ng m

RT: 3.89 min Scan# 93

Delta R.T. 0.006 min

Lab File: 11211620.D

Acq: 21 Nov 2016 19:28

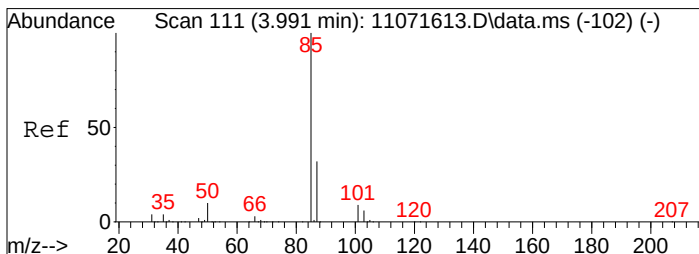
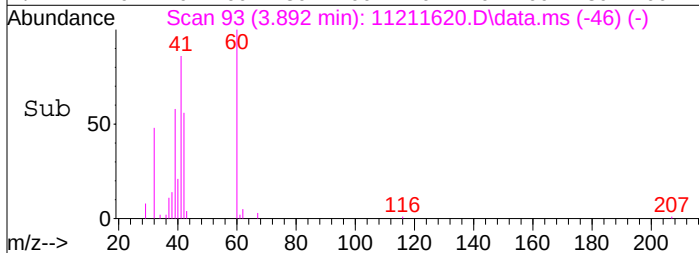
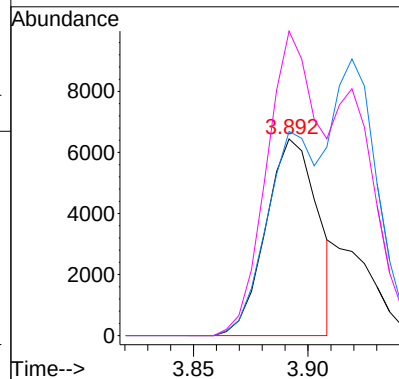
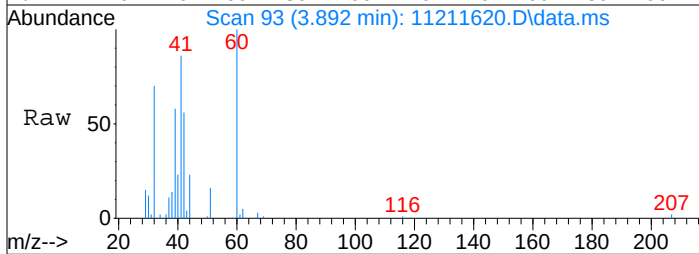
Tgt Ion: 42 Resp: 10153

Ion Ratio Lower Upper

42 100

39 95.8 92.5 132.5

41 157.5 130.5 170.5



#3

Dichlorodifluoromethane (CFC 12)

Concen: 4.75 ng

RT: 4.00 min Scan# 112

Delta R.T. 0.000 min

Lab File: 11211620.D

Acq: 21 Nov 2016 19:28

Tgt Ion: 85 Resp: 148425

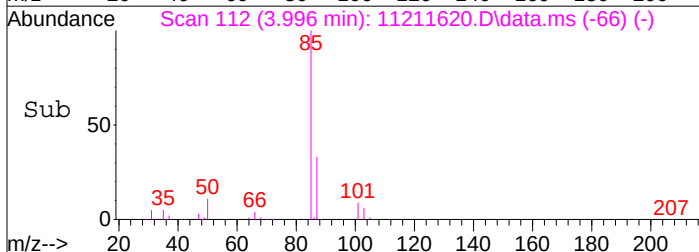
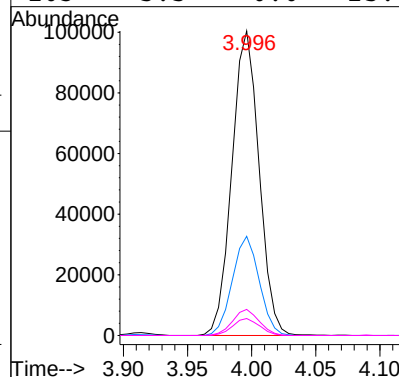
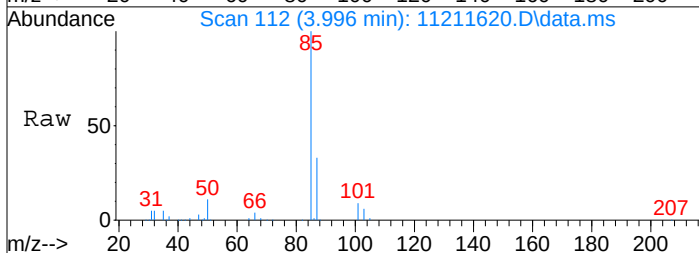
Ion Ratio Lower Upper

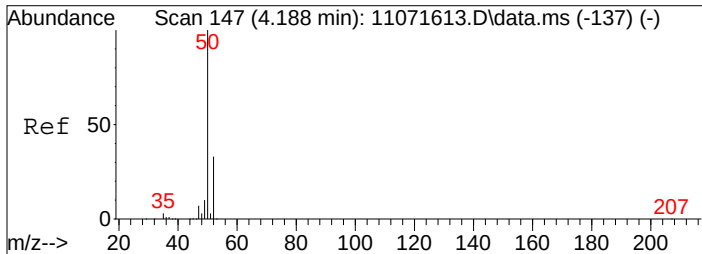
85 100

87 32.2 12.5 52.5

101 8.4 0.0 29.0

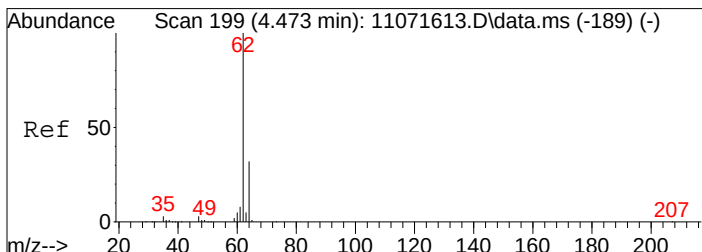
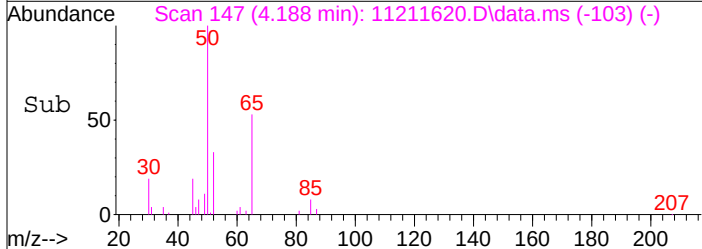
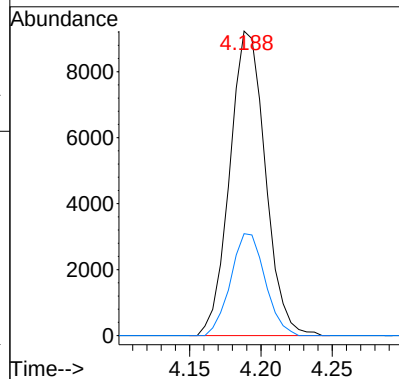
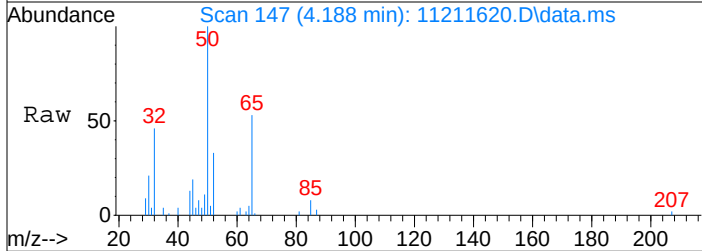
103 5.5 0.0 25.8





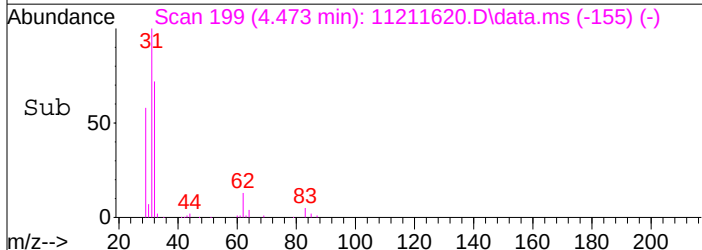
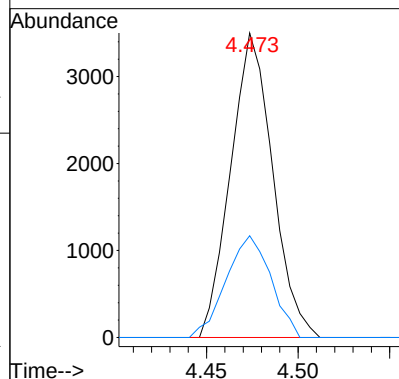
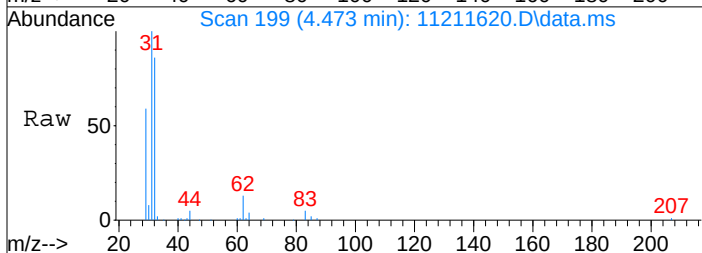
#4
Chloromethane
Concen: 0.56 ng
RT: 4.19 min Scan# 147
Delta R.T. -0.011 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

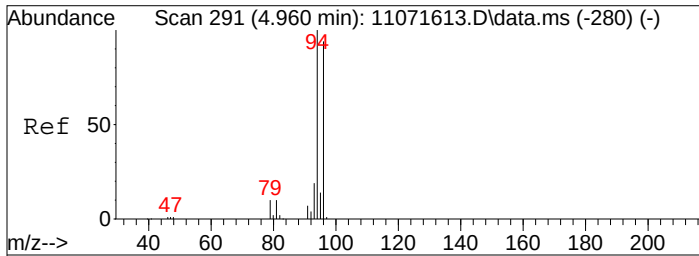
Tgt Ion: 50 Resp: 16043
Ion Ratio Lower Upper
50 100
52 32.4 13.1 53.1



#6
Vinyl Chloride
Concen: 0.20 ng
RT: 4.47 min Scan# 199
Delta R.T. -0.011 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

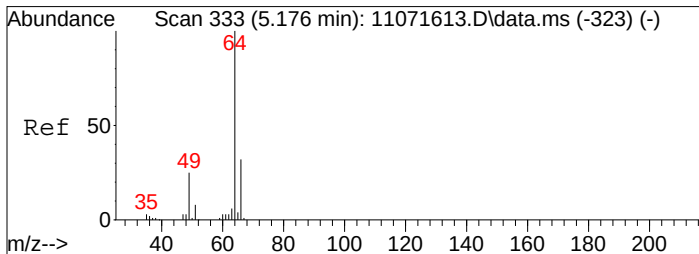
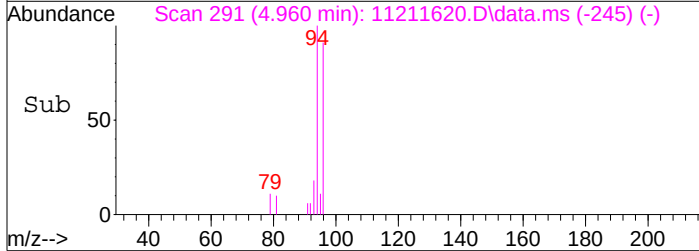
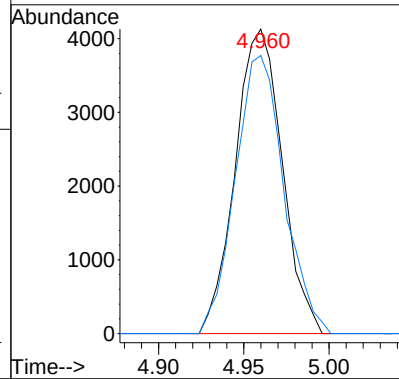
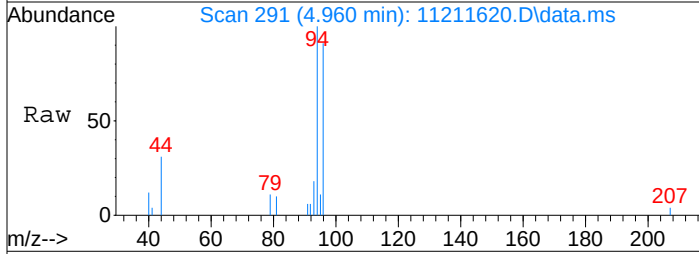
Tgt Ion: 62 Resp: 5584
Ion Ratio Lower Upper
62 100
64 35.7 12.0 52.0





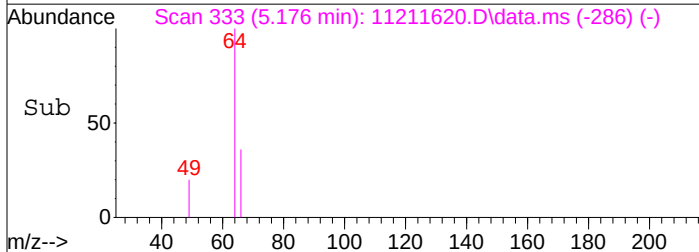
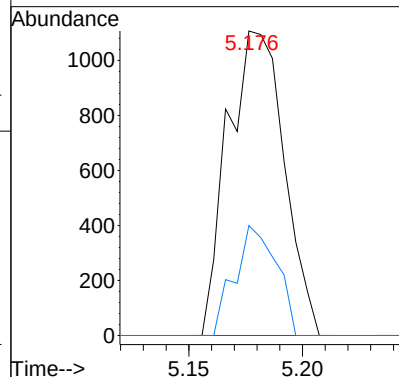
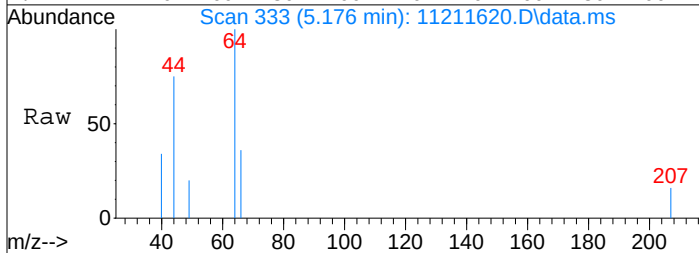
#8
Bromomethane
Concen: 0.51 ng
RT: 4.96 min Scan# 291
Delta R.T. -0.015 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

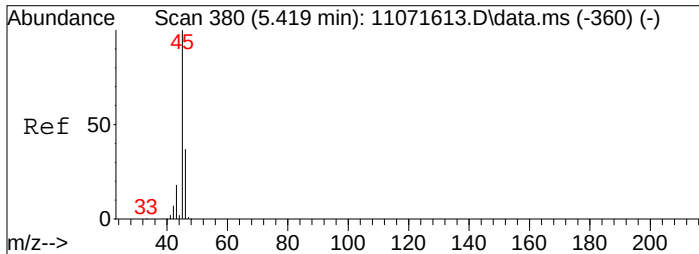
Tgt Ion: 94 Resp: 7917
Ion Ratio Lower Upper
94 100
96 94.5 73.5 113.5



#9
Chloroethane
Concen: 0.14 ng
RT: 5.18 min Scan# 333
Delta R.T. -0.010 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

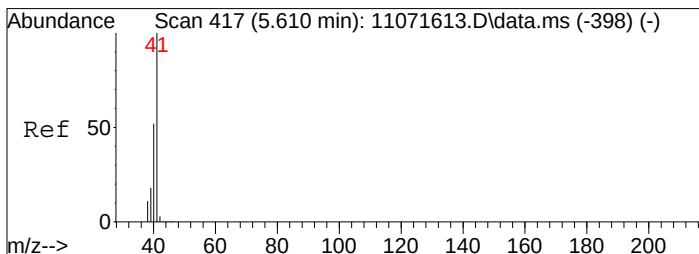
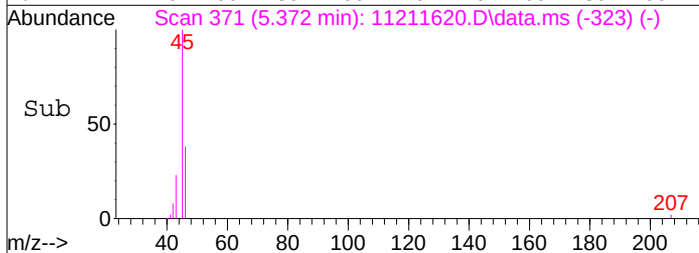
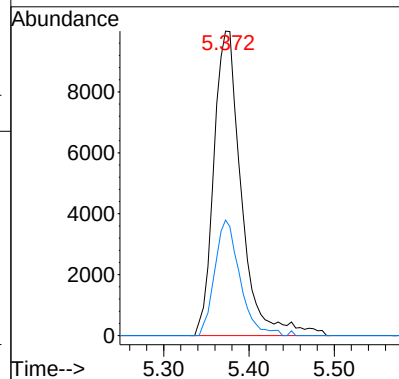
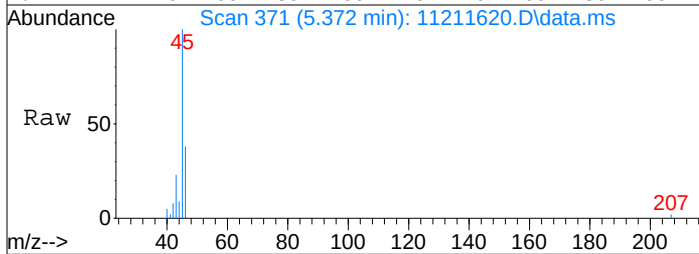
Tgt Ion: 64 Resp: 1912
Ion Ratio Lower Upper
64 100
66 26.8 11.9 51.9





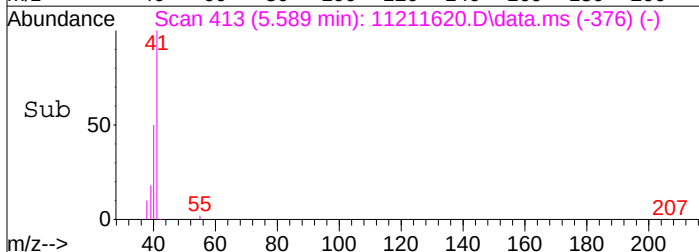
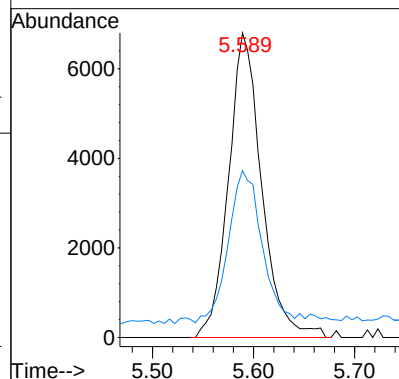
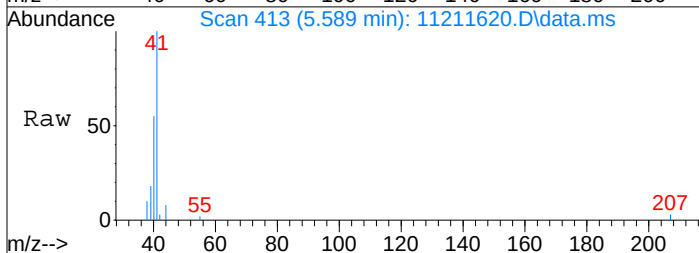
#10
Ethanol
Concen: 1.73 ng
RT: 5.37 min Scan# 371
Delta R.T. -0.103 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

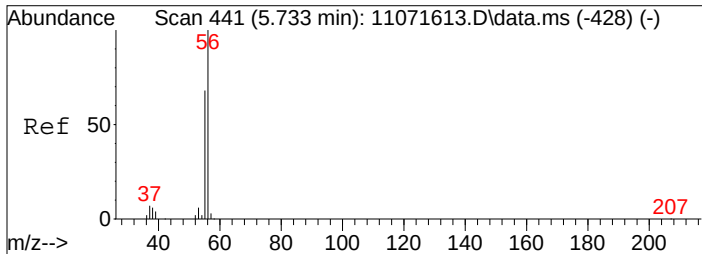
Tgt Ion: 45 Resp: 22464
Ion Ratio Lower Upper
45 100
46 34.5 16.7 56.7



#11
Acetonitrile
Concen: 0.44 ng
RT: 5.59 min Scan# 413
Delta R.T. -0.062 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

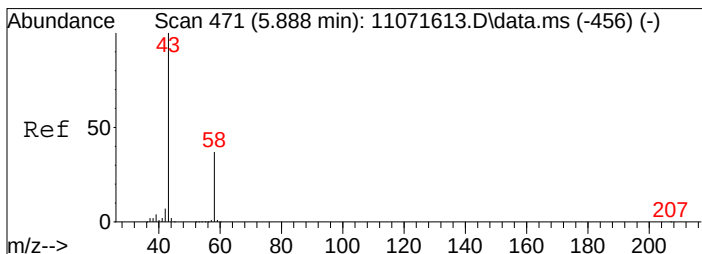
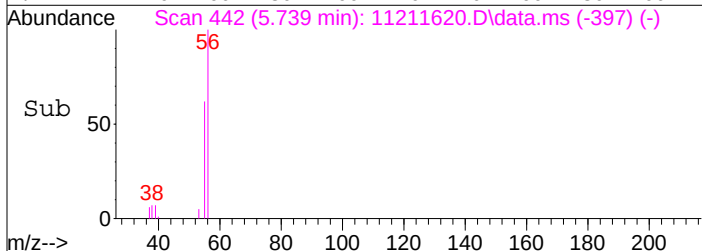
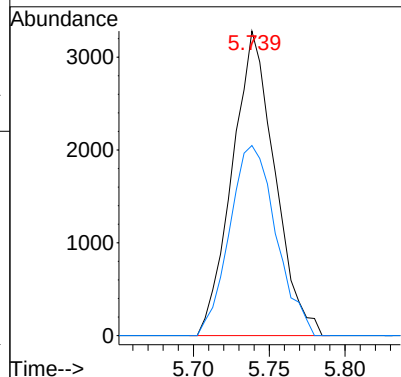
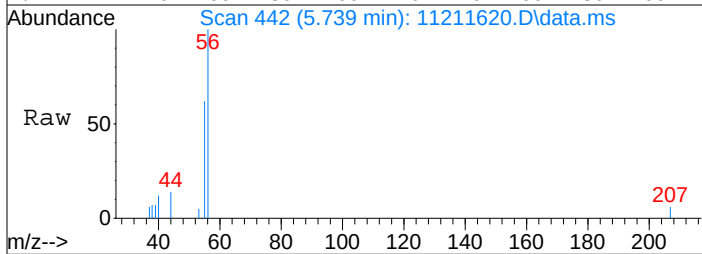
Tgt Ion: 41 Resp: 15493
Ion Ratio Lower Upper
41 100
40 53.9 33.0 73.0





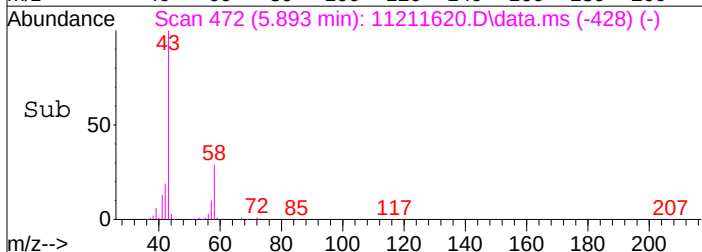
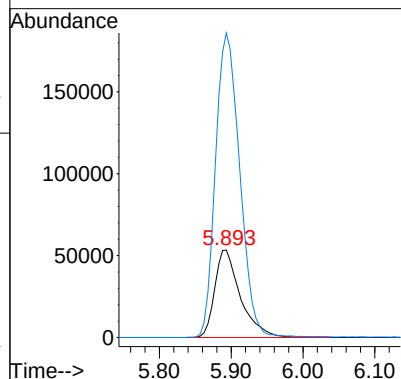
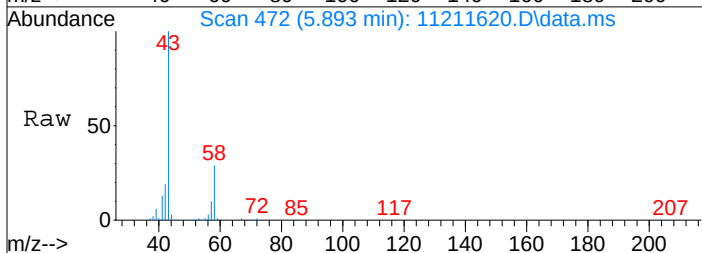
#12
Acrolein
Concen: 0.55 ng
RT: 5.74 min Scan# 442
Delta R.T. -0.020 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

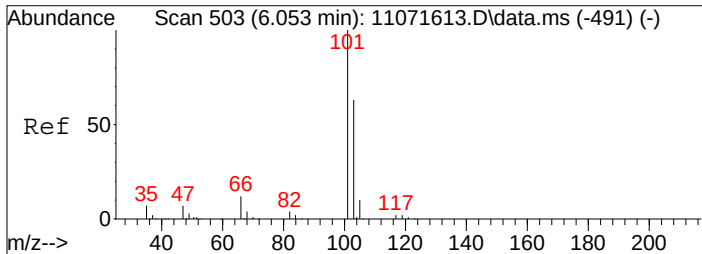
Tgt Ion: 56 Resp: 6402
Ion Ratio Lower Upper
56 100
55 68.3 50.4 90.4



#13
Acetone
Concen: 9.56 ng
RT: 5.89 min Scan# 472
Delta R.T. -0.026 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

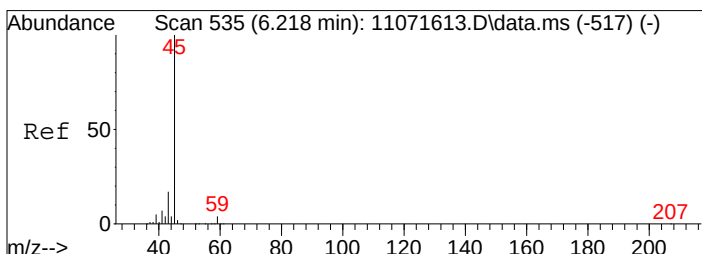
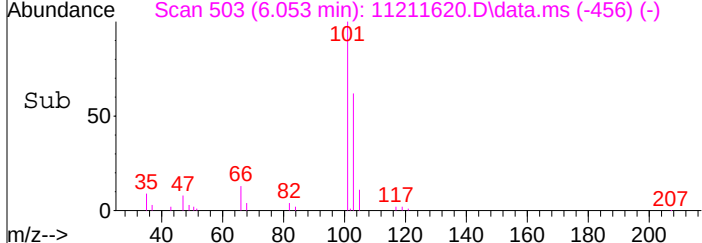
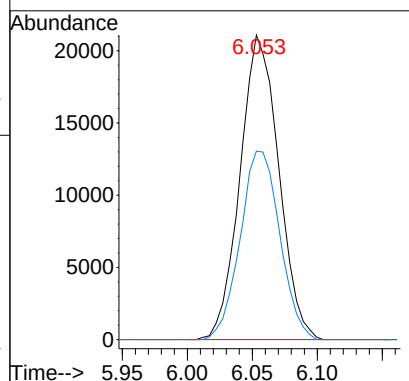
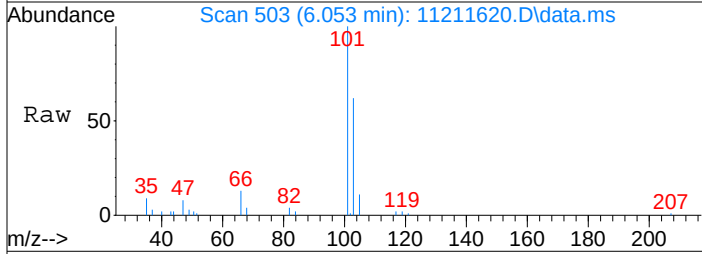
Tgt Ion: 58 Resp: 132742
Ion Ratio Lower Upper
58 100
43 330.1 276.2 336.2





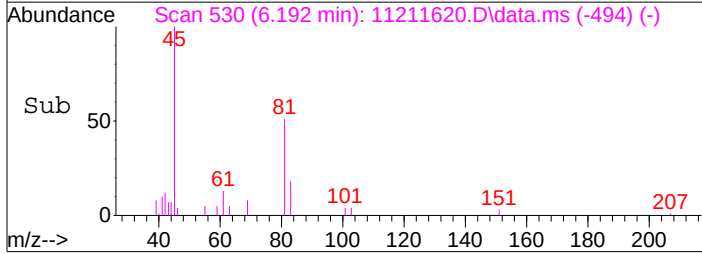
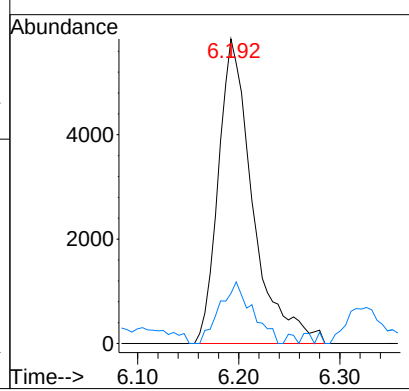
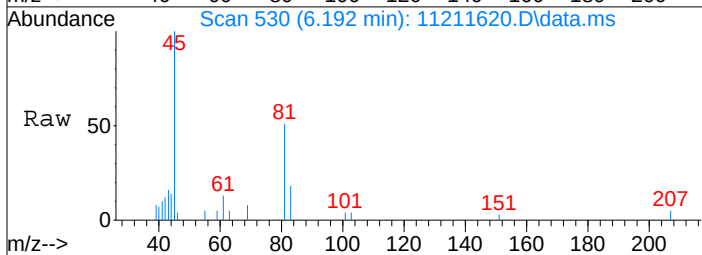
#14
 Trichlorofluoromethane
 Concen: 1.70 ng
 RT: 6.05 min Scan# 503
 Delta R.T. -0.010 min
 Lab File: 11211620.D
 Acq: 21 Nov 2016 19:28

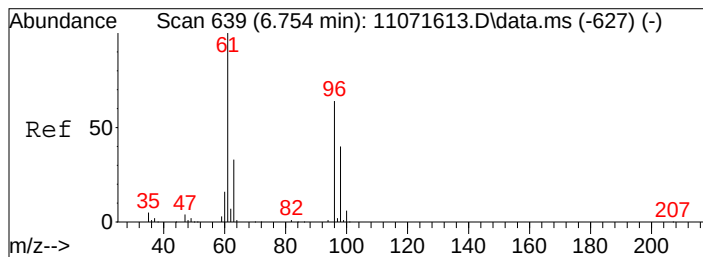
Tgt Ion: 101	Resp: 43647
Ion Ratio	Lower Upper
101	100
103	63.5 45.1 85.1



#15
 2-Propanol (Isopropanol)
 Concen: 0.32 ng
 RT: 6.19 min Scan# 530
 Delta R.T. -0.067 min
 Lab File: 11211620.D
 Acq: 21 Nov 2016 19:28

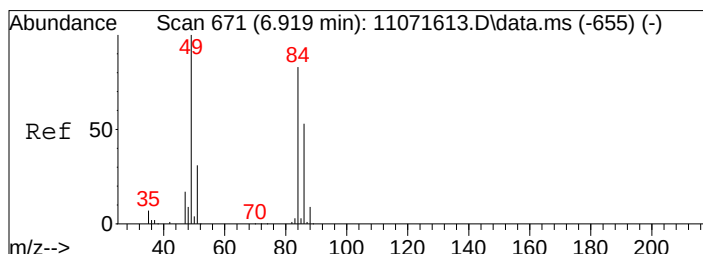
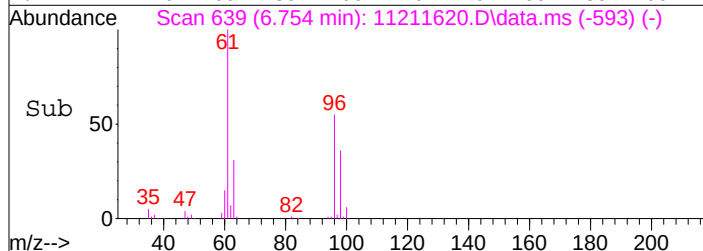
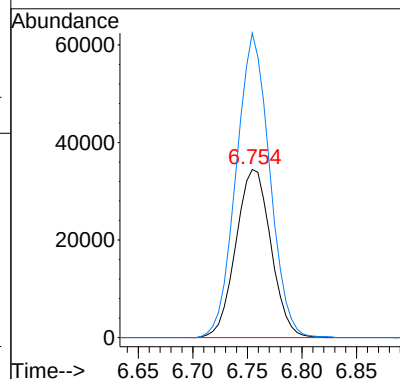
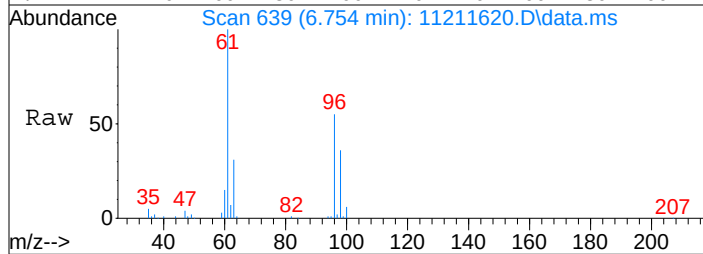
Tgt Ion: 45	Resp: 13807
Ion Ratio	Lower Upper
45	100
43	19.1 0.0 39.2





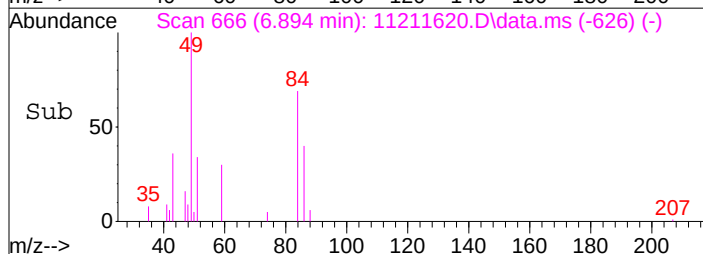
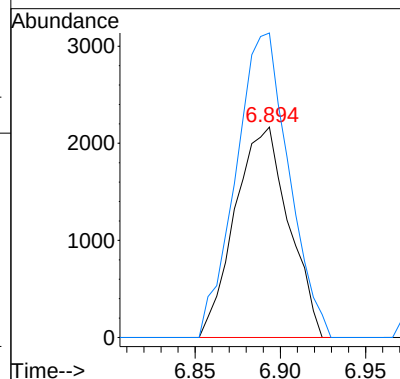
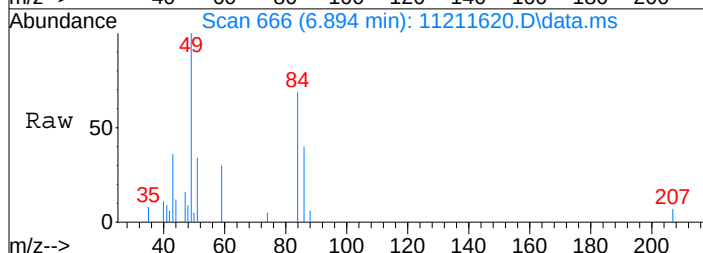
#17
1,1-Dichloroethene
Concen: 4.65 ng
RT: 6.75 min Scan# 639
Delta R.T. -0.015 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

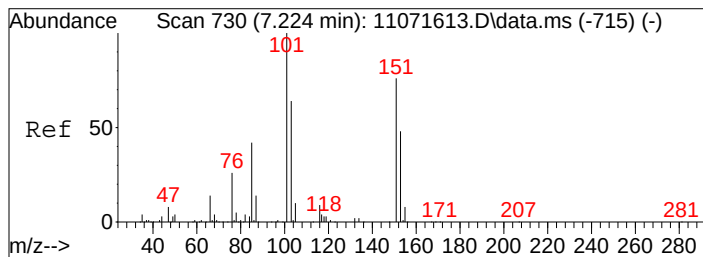
Tgt Ion: 96 Resp: 77013
Ion Ratio Lower Upper
96 100
61 173.0 145.9 185.9



#19
Methylene Chloride
Concen: 0.25 ng
RT: 6.89 min Scan# 666
Delta R.T. -0.046 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

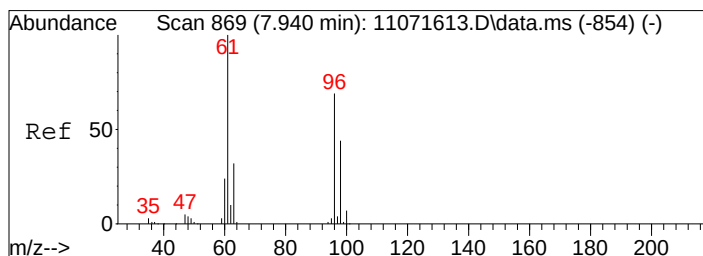
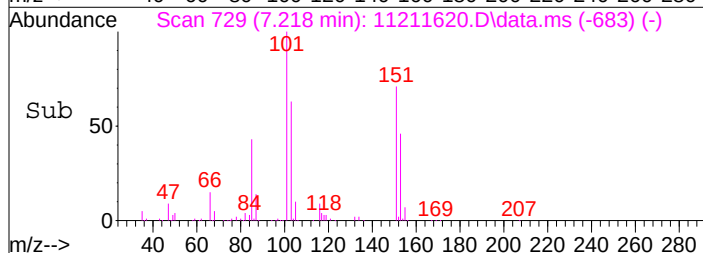
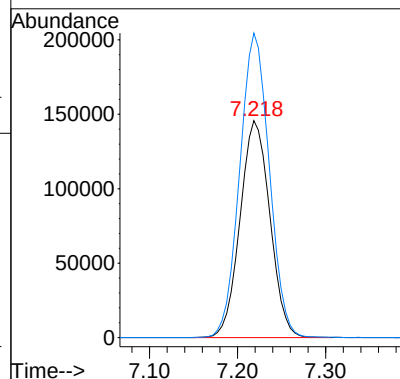
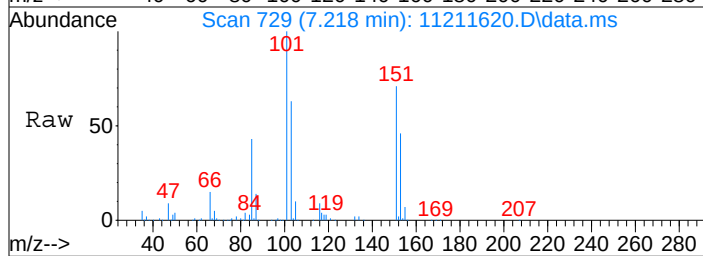
Tgt Ion: 84 Resp: 4763
Ion Ratio Lower Upper
84 100
49 142.7 100.9 150.9





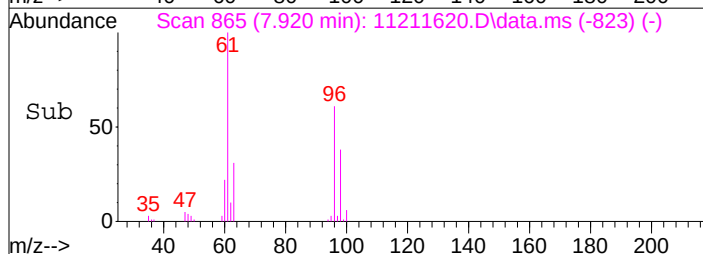
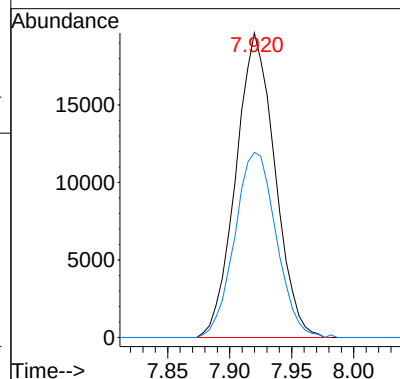
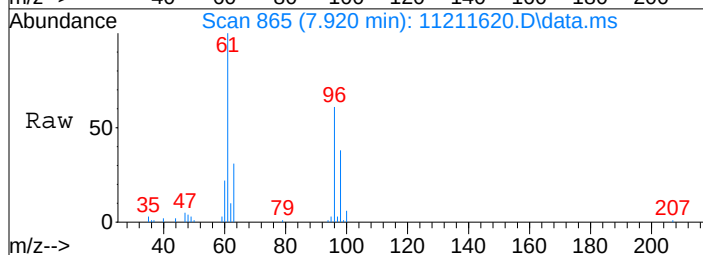
#21
Trichlorotrifluoroethane
Concen: 26.49 ng
RT: 7.22 min Scan# 729
Delta R.T. -0.015 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

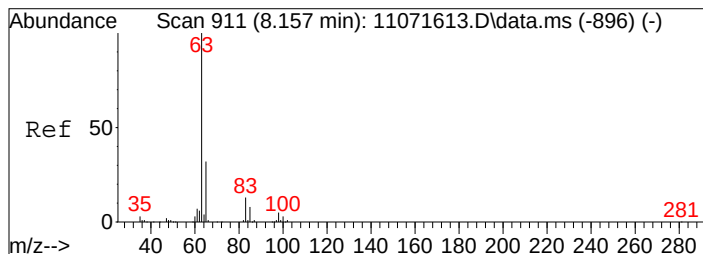
Tgt Ion: 151 Resp: 343325
Ion Ratio Lower Upper
151 100
101 139.1 114.4 154.4



#23
trans-1,2-Dichloroethene
Concen: 1.72 ng
RT: 7.92 min Scan# 865
Delta R.T. -0.036 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

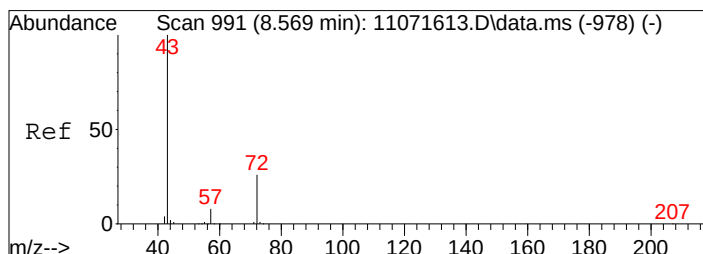
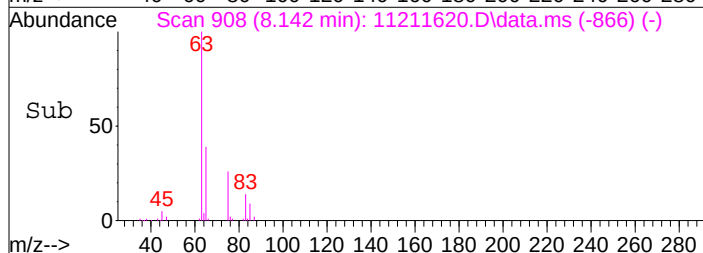
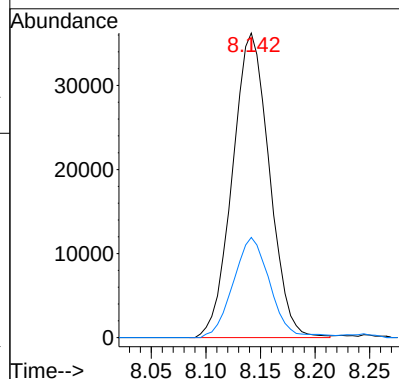
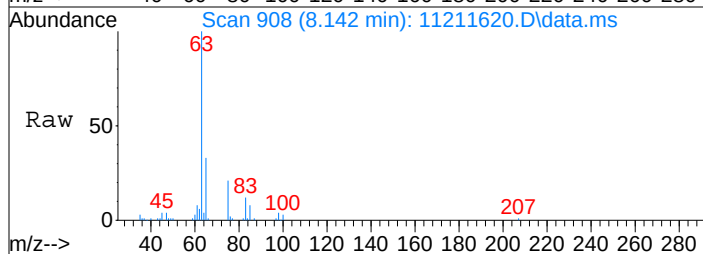
Tgt Ion: 61 Resp: 43141
Ion Ratio Lower Upper
61 100
96 64.6 48.5 88.5





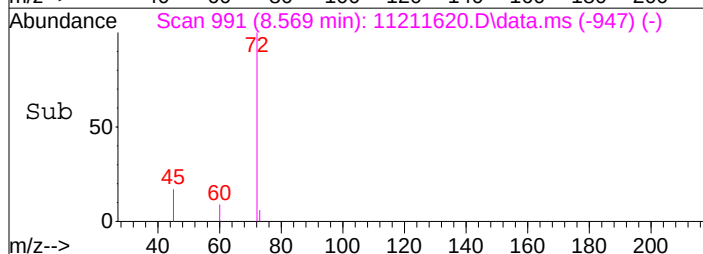
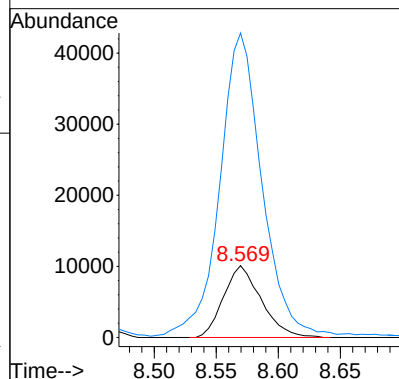
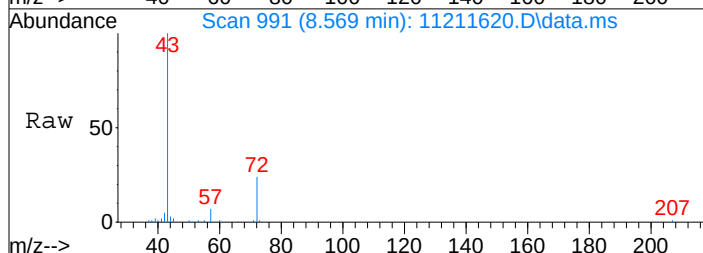
#24
1,1-Dichloroethane
Concen: 2.68 ng
RT: 8.14 min Scan# 908
Delta R.T. -0.036 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

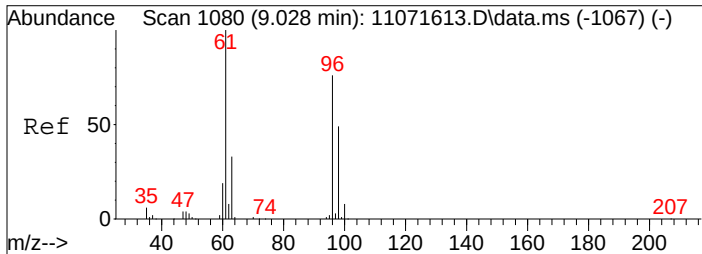
Tgt Ion: 63 Resp: 85186
Ion Ratio Lower Upper
63 100
65 32.9 12.1 52.1



#27
2-Butanone (MEK)
Concen: 1.76 ng
RT: 8.57 min Scan# 991
Delta R.T. -0.026 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

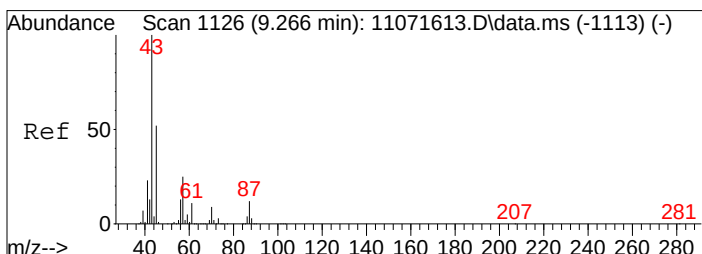
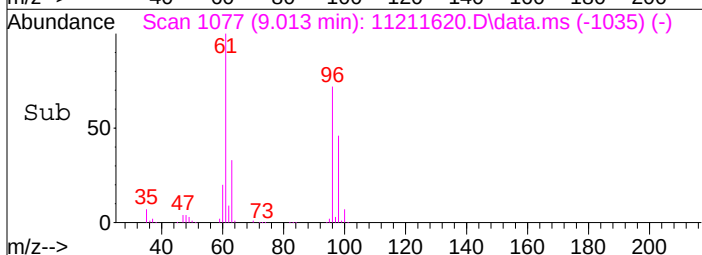
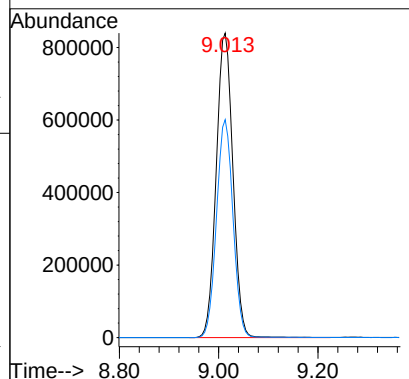
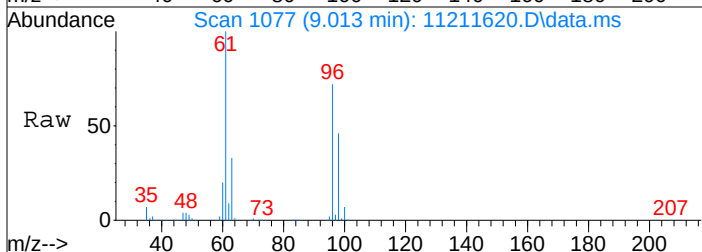
Tgt Ion: 72 Resp: 21341
Ion Ratio Lower Upper
72 100
43 472.3 354.3 394.3#





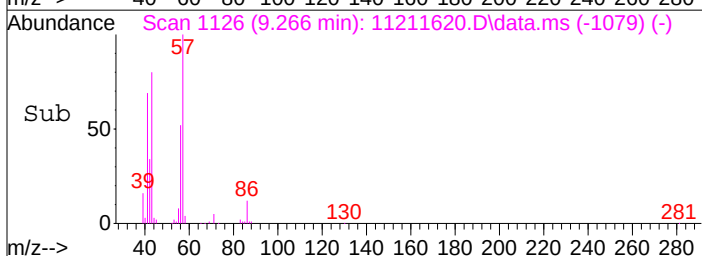
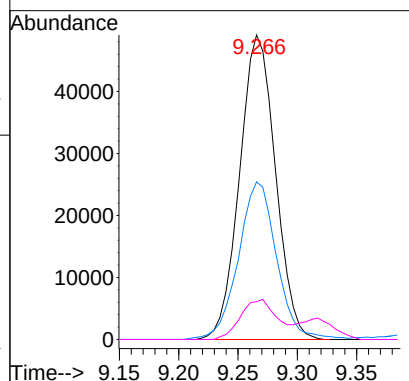
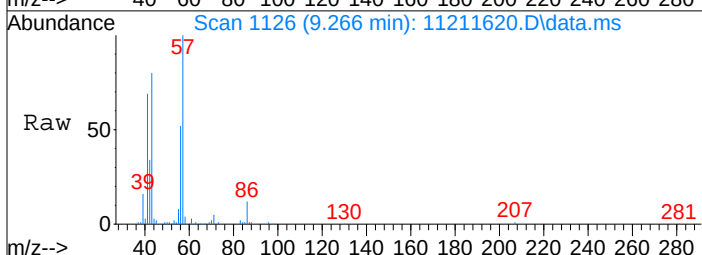
#28
 cis-1,2-Dichloroethene
 Concen: 82.21 ng
 RT: 9.01 min Scan# 1077
 Delta R.T. -0.036 min
 Lab File: 11211620.D
 Acq: 21 Nov 2016 19:28

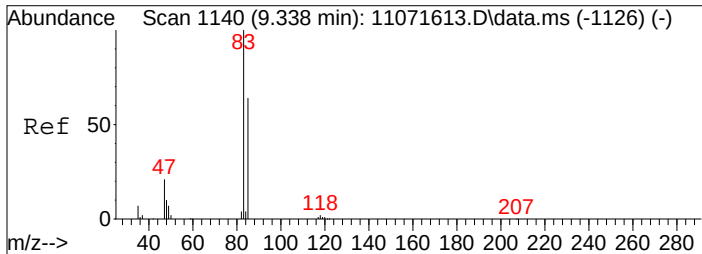
Tgt Ion: 61 Resp: 1956403
 Ion Ratio Lower Upper
 61 100
 96 70.9 55.6 95.6



#31
 n-Hexane
 Concen: 3.75 ng
 RT: 9.27 min Scan# 1126
 Delta R.T. -0.005 min
 Lab File: 11211620.D
 Acq: 21 Nov 2016 19:28

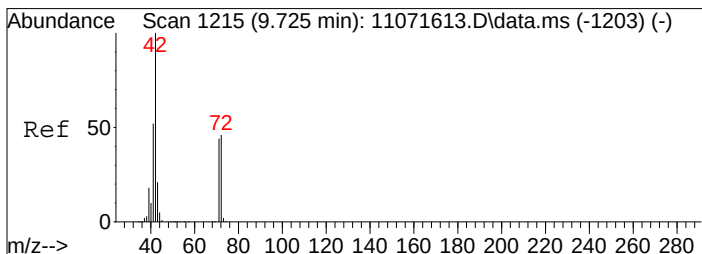
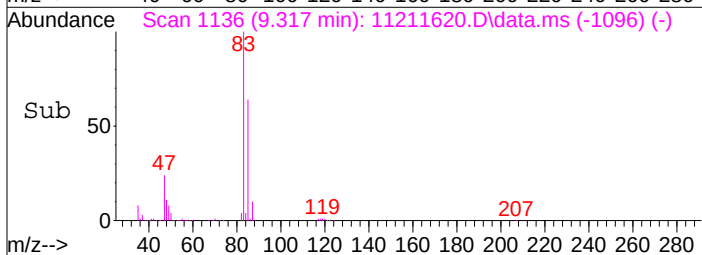
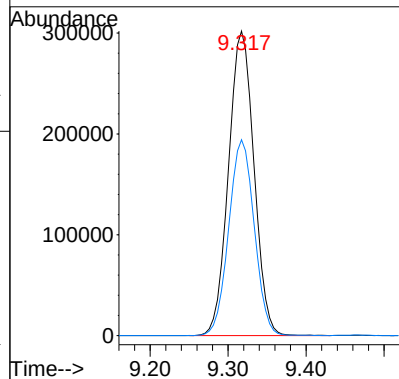
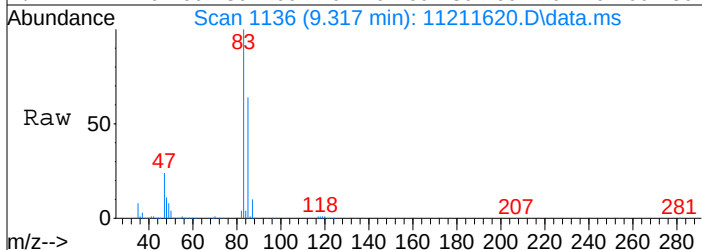
Tgt Ion: 57 Resp: 103206
 Ion Ratio Lower Upper
 57 100
 56 55.2 41.4 62.2
 86 13.8 11.8 17.8





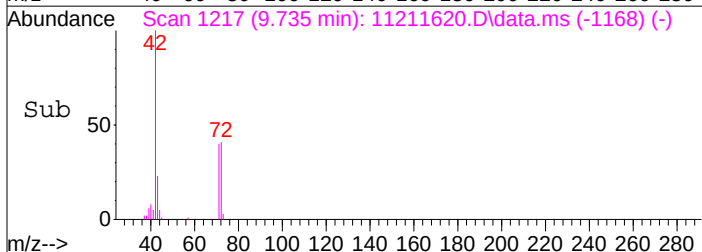
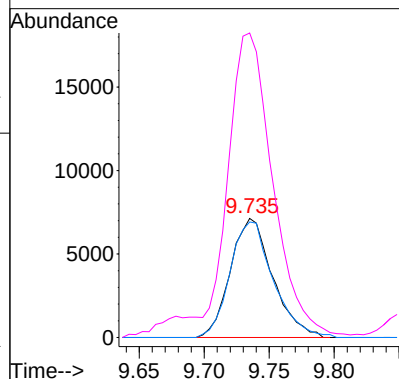
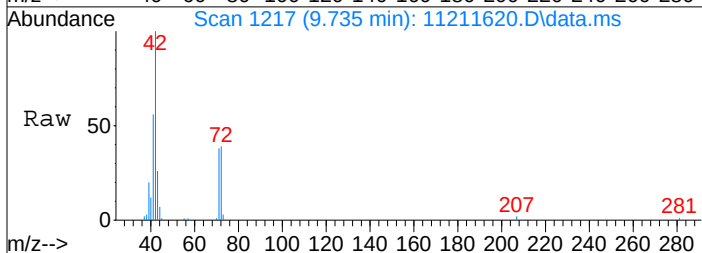
#32
 Chloroform
 Concen: 24.27 ng
 RT: 9.32 min Scan# 1136
 Delta R.T. -0.046 min
 Lab File: 11211620.D
 Acq: 21 Nov 2016 19:28

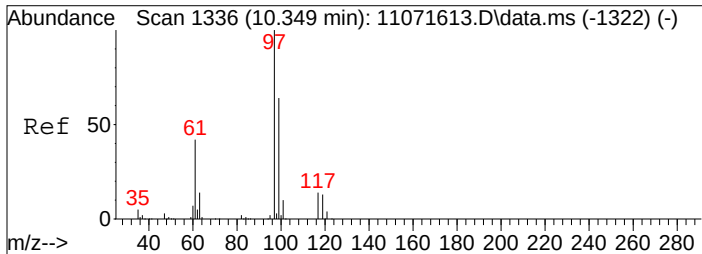
Tgt Ion	83	85	Resp	686144
Ion Ratio	100	64.4	45.5	85.5



#34
 Tetrahydrofuran (THF)
 Concen: 1.30 ng
 RT: 9.73 min Scan# 1217
 Delta R.T. 0.000 min
 Lab File: 11211620.D
 Acq: 21 Nov 2016 19:28

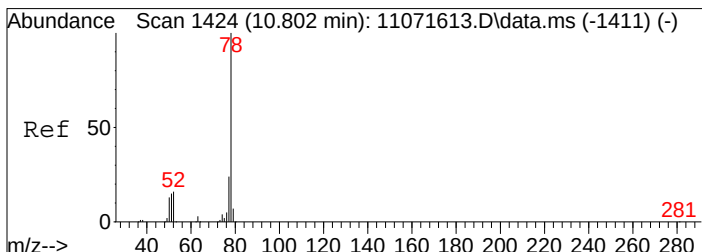
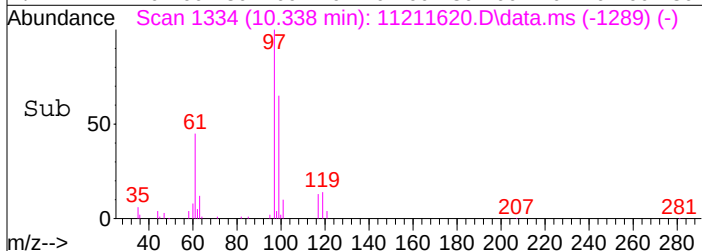
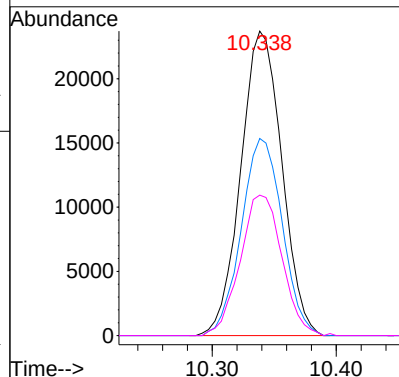
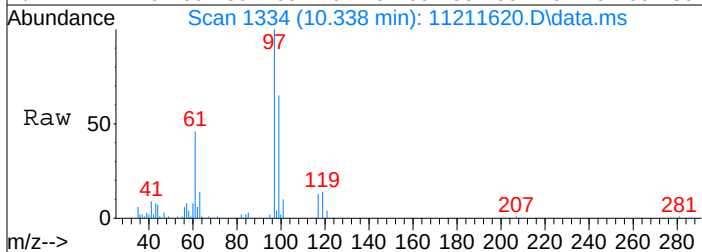
Tgt Ion	72	71	42	Resp	16143
Ion Ratio	100	99.2	263.1	77.1	117.1
				194.1	234.1#





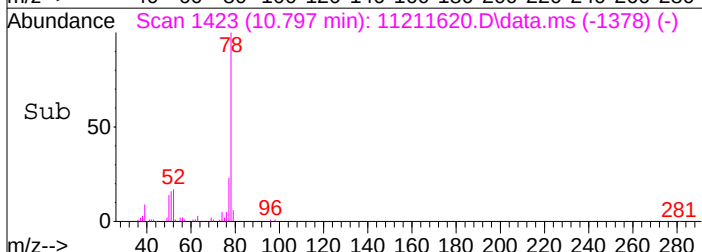
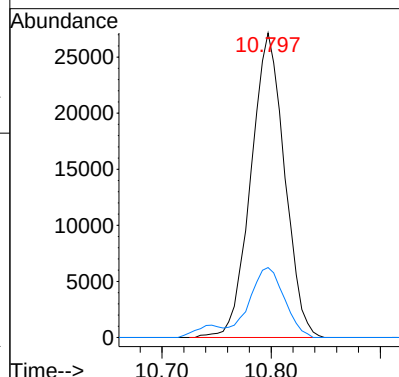
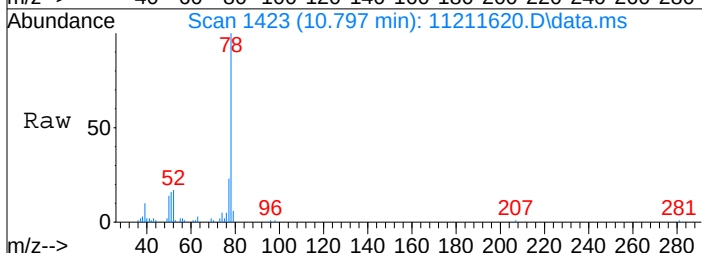
#38
 1,1,1-Trichloroethane
 Concen: 2.23 ng
 RT: 10.34 min Scan# 1334
 Delta R.T. -0.020 min
 Lab File: 11211620.D
 Acq: 21 Nov 2016 19:28

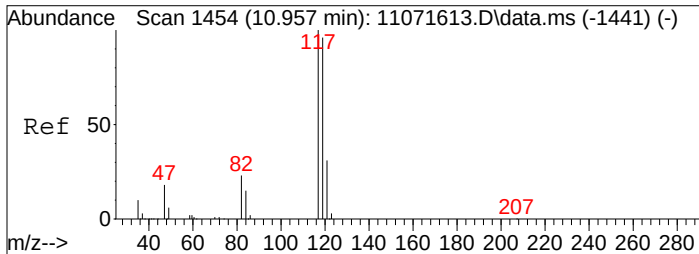
Tgt Ion: 97	Resp: 54670
Ion Ratio	Lower Upper
97	100
99	64.5 44.1 84.1
61	47.1 24.6 64.6



#41
 Benzene
 Concen: 0.78 ng
 RT: 10.80 min Scan# 1423
 Delta R.T. -0.020 min
 Lab File: 11211620.D
 Acq: 21 Nov 2016 19:28

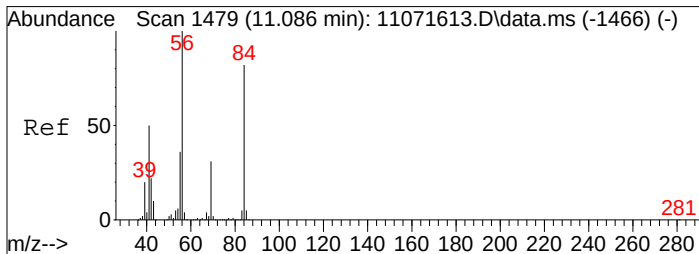
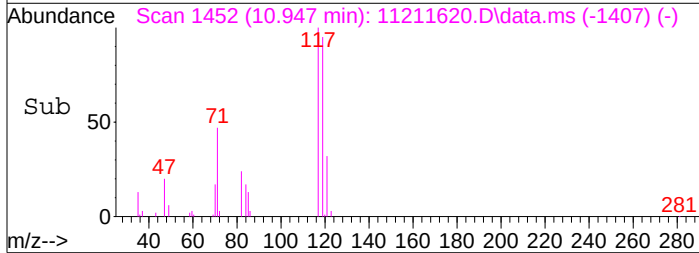
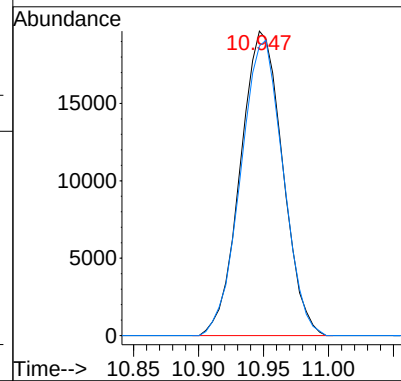
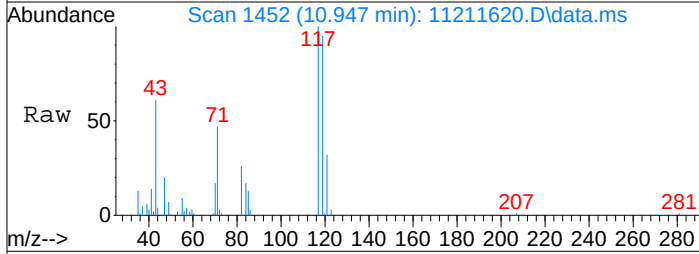
Tgt Ion: 78	Resp: 58036
Ion Ratio	Lower Upper
78	100
77	24.0 3.9 43.9





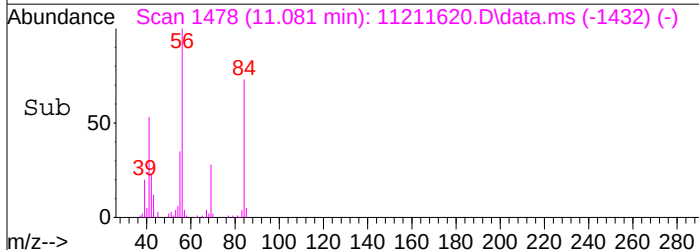
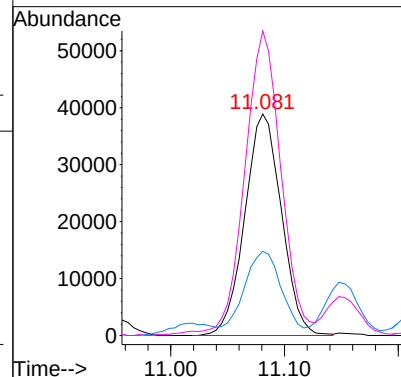
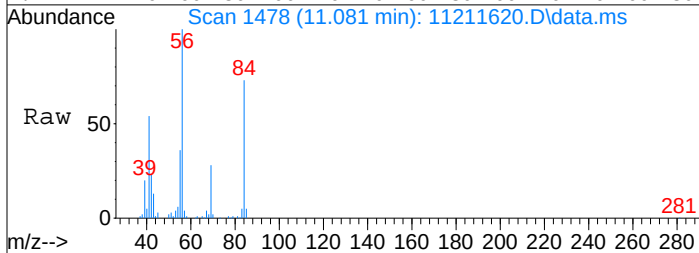
#42
Carbon Tetrachloride
Concen: 2.13 ng
RT: 10.95 min Scan# 1452
Delta R.T. -0.020 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

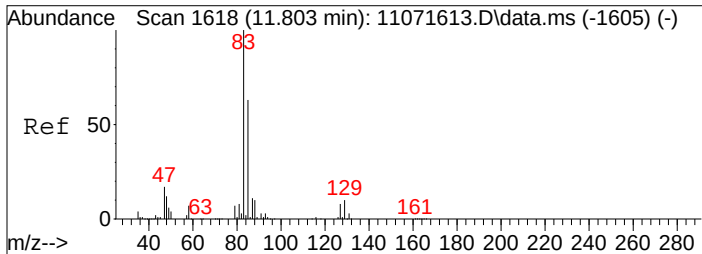
Tgt Ion: 117 Resp: 44525
Ion Ratio Lower Upper
117 100
119 97.0 75.6 115.6



#43
Cyclohexane
Concen: 3.25 ng
RT: 11.08 min Scan# 1478
Delta R.T. -0.015 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

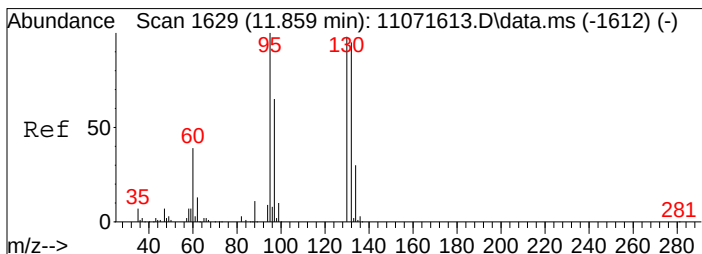
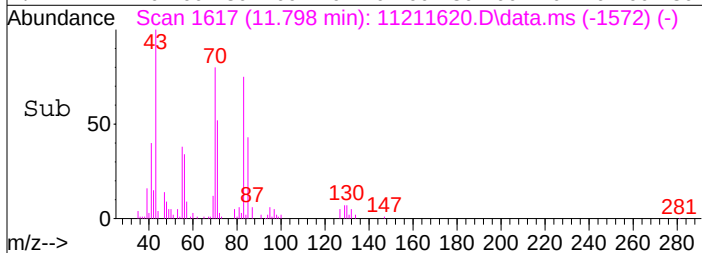
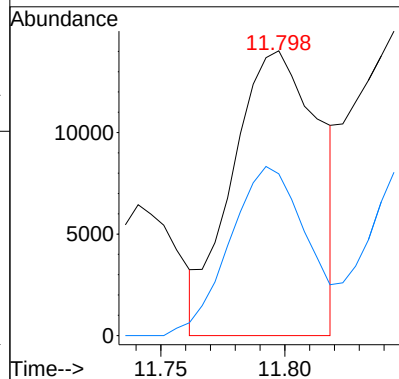
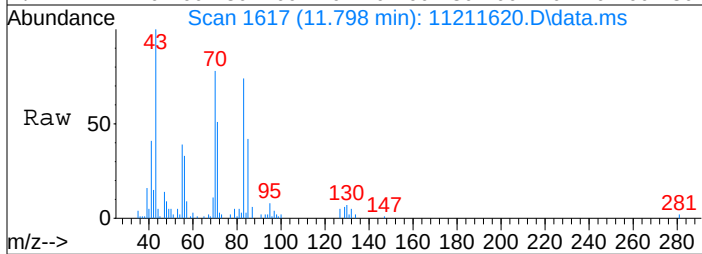
Tgt Ion: 84 Resp: 87327
Ion Ratio Lower Upper
84 100
69 39.4 17.5 57.5
56 136.9 96.9 136.9#





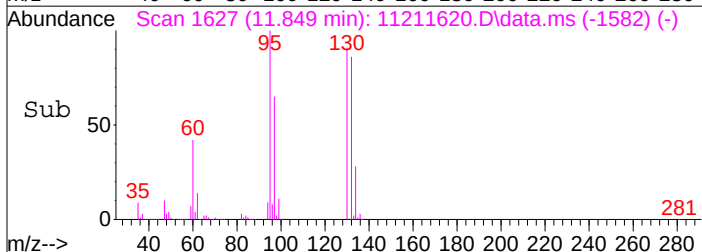
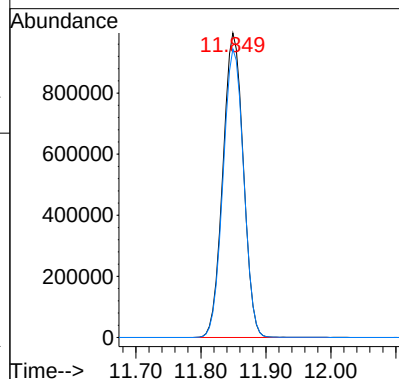
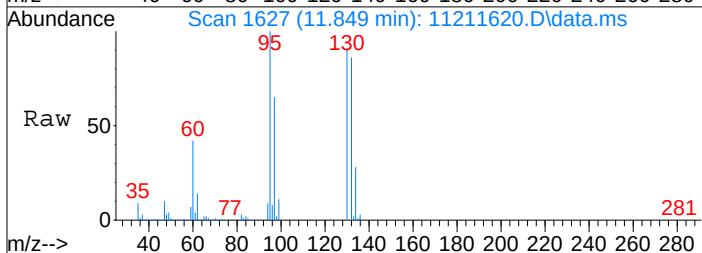
#46
Bromodichloromethane
Concen: 1.51 ng
RT: 11.80 min Scan# 1617
Delta R.T. -0.020 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

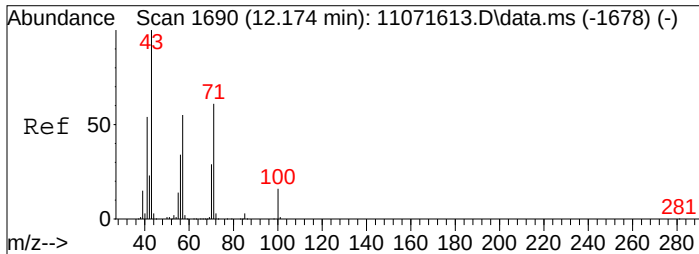
Tgt Ion: 83 Resp: 33968
Ion Ratio Lower Upper
83 100
85 52.5 43.9 83.9



#47
Trichloroethene
Concen: 126.36 ng
RT: 11.85 min Scan# 1627
Delta R.T. -0.020 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

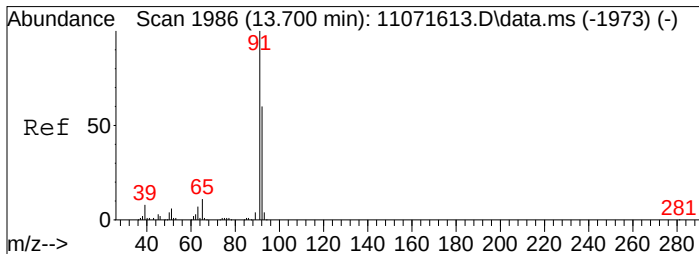
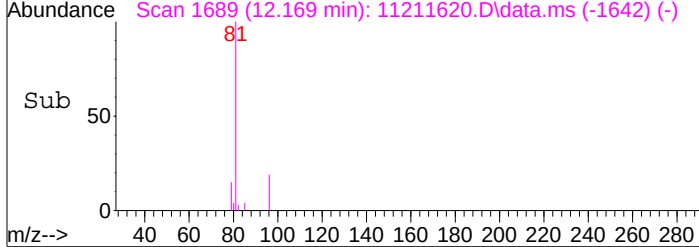
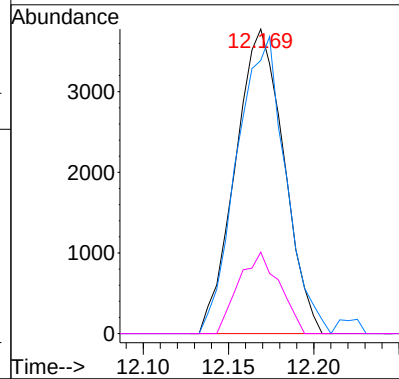
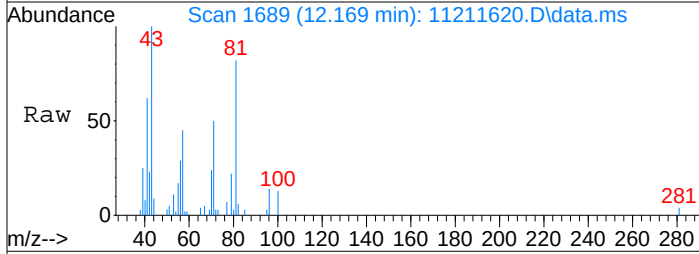
Tgt Ion: 130 Resp: 2169585
Ion Ratio Lower Upper
130 100
132 95.7 75.3 115.3





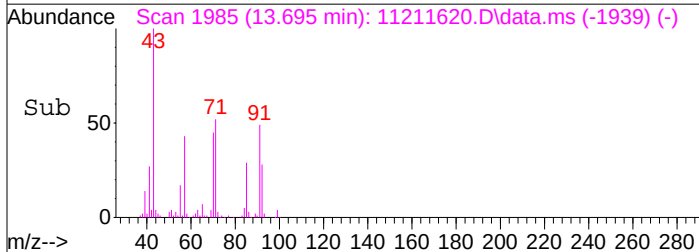
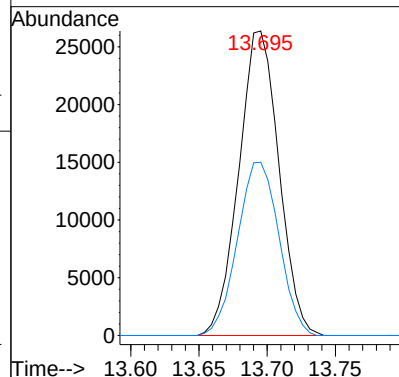
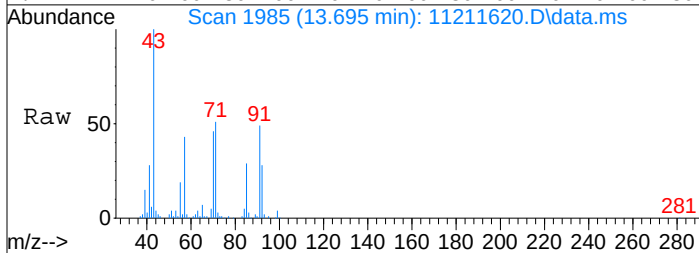
#51
n-Heptane
Concen: 0.41 ng
RT: 12.17 min Scan# 1689
Delta R.T. -0.010 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

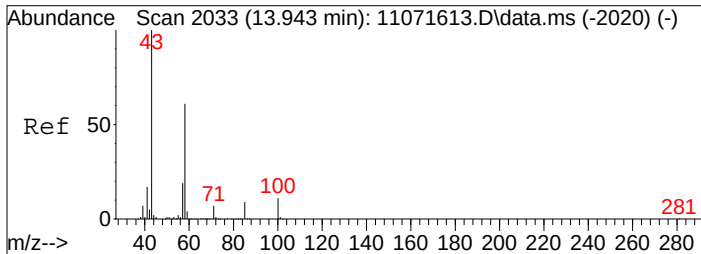
Tgt Ion: 71 Resp: 7484
Ion Ratio Lower Upper
71 100
57 97.9 69.2 109.2
100 22.5 6.2 46.2



#58
Toluene
Concen: 0.69 ng
RT: 13.70 min Scan# 1985
Delta R.T. -0.015 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

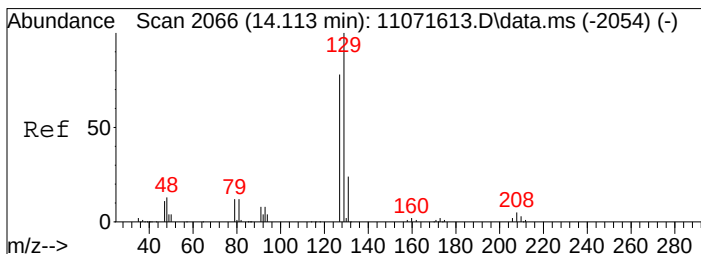
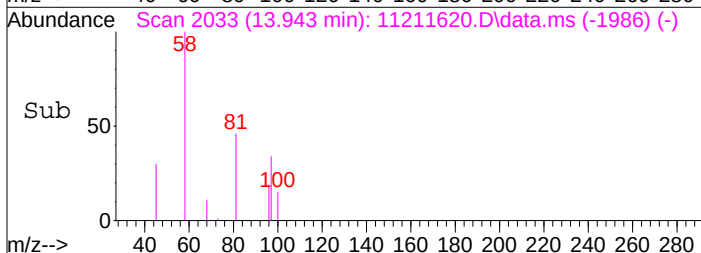
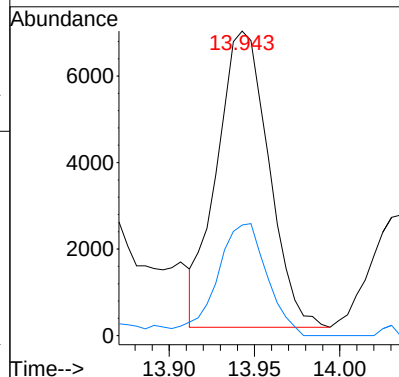
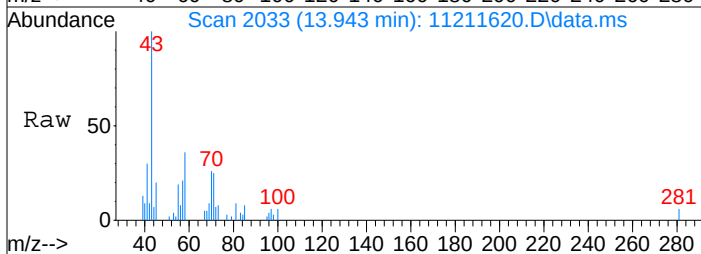
Tgt Ion: 91 Resp: 54093
Ion Ratio Lower Upper
91 100
92 58.7 38.4 78.4





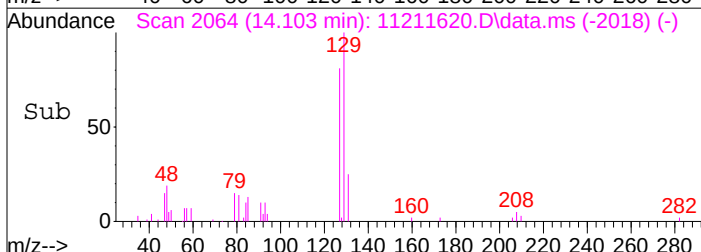
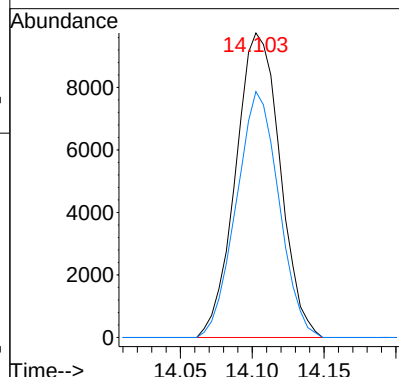
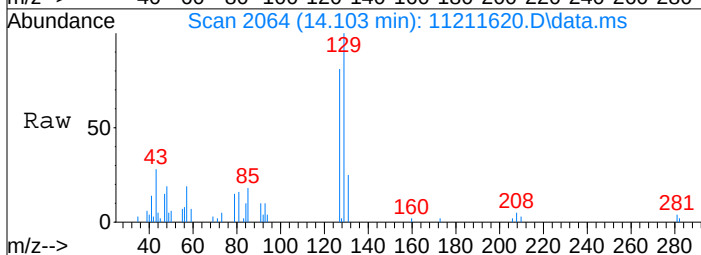
#59
2-Hexanone
Concen: 0.37 ng
RT: 13.94 min Scan# 2033
Delta R.T. -0.010 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

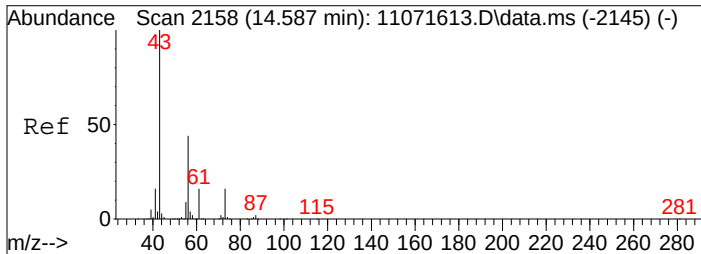
Tgt Ion: 43 Resp: 14480
Ion Ratio Lower Upper
43 100
58 36.3 38.3 78.3#



#60
Dibromochloromethane
Concen: 1.09 ng
RT: 14.10 min Scan# 2064
Delta R.T. -0.015 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

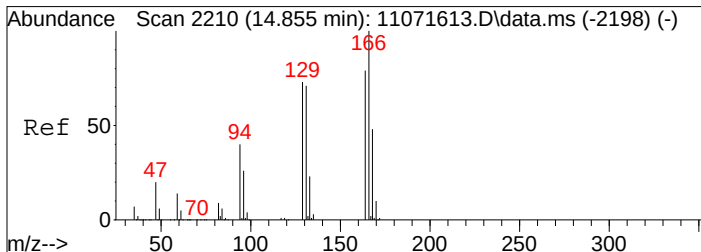
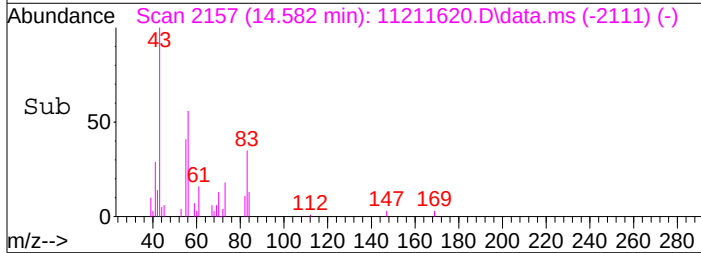
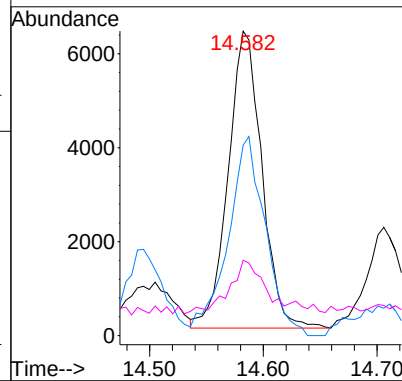
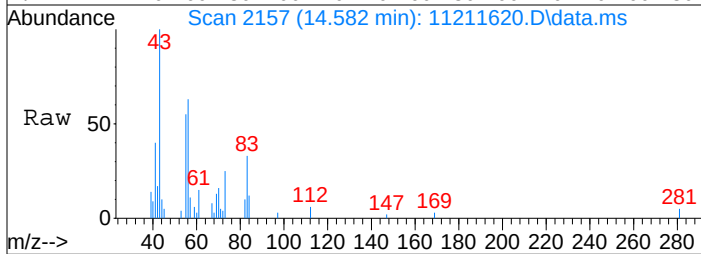
Tgt Ion: 129 Resp: 20961
Ion Ratio Lower Upper
129 100
127 77.3 57.8 97.8





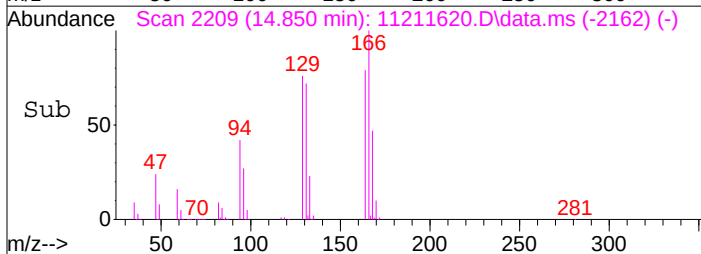
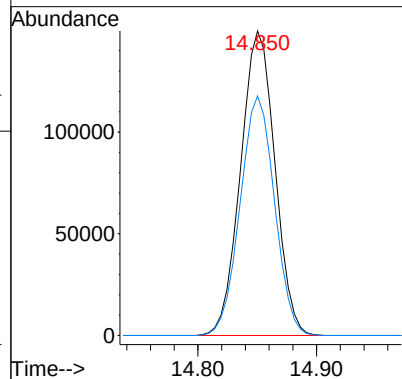
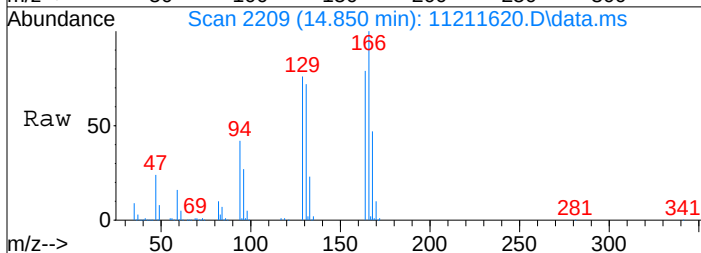
#62
n-Butyl Acetate
Concen: 0.29 ng
RT: 14.58 min Scan# 2157
Delta R.T. -0.015 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

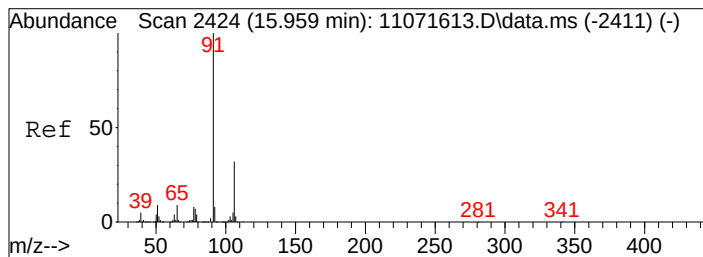
Tgt Ion: 43 Resp: 13025
Ion Ratio Lower Upper
43 100
56 74.6 23.2 63.2#
73 20.9 0.0 35.6



#64
Tetrachloroethene
Concen: 16.38 ng
RT: 14.85 min Scan# 2209
Delta R.T. -0.010 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

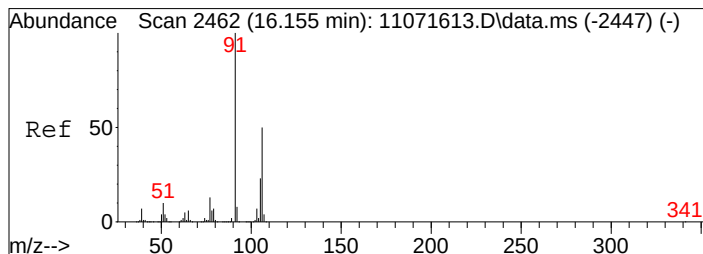
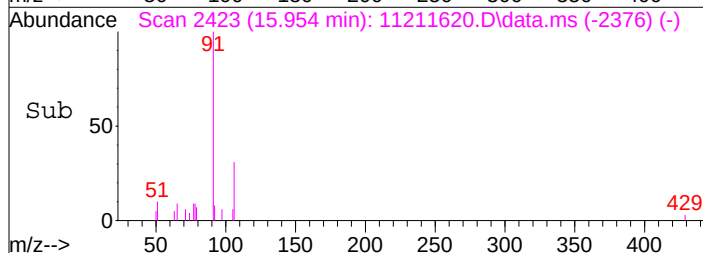
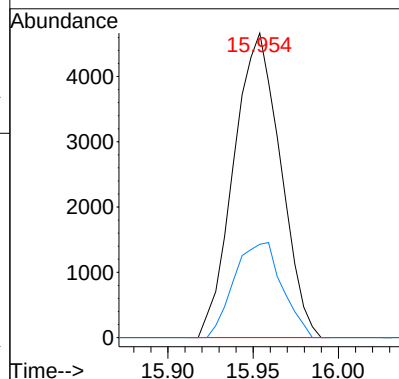
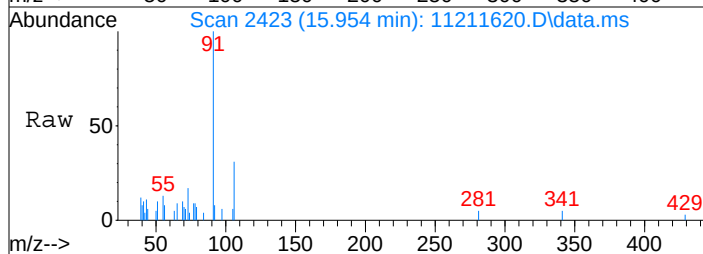
Tgt Ion: 166 Resp: 301713
Ion Ratio Lower Upper
166 100
164 78.6 58.7 98.7





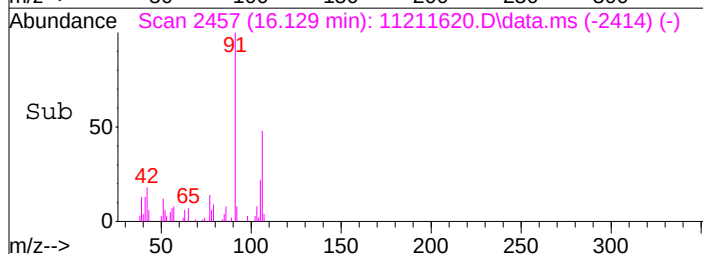
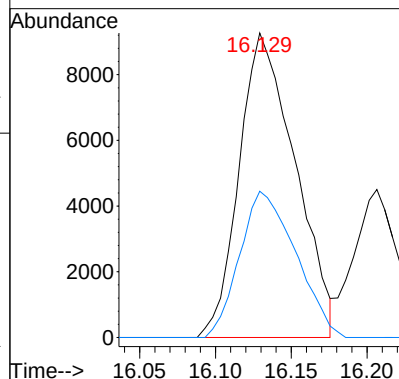
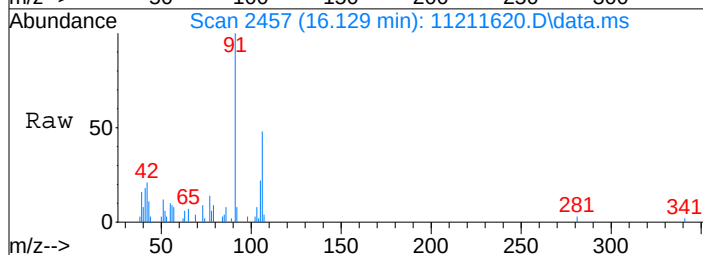
#66
Ethylbenzene
Concen: 0.11 ng
RT: 15.95 min Scan# 2423
Delta R.T. -0.010 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

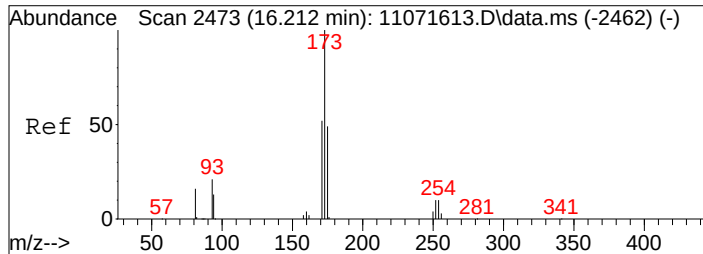
Tgt Ion: 91 Resp: 8902
Ion Ratio Lower Upper
91 100
106 32.0 11.5 51.5



#67
m- & p-Xylenes
Concen: 0.37 ng
RT: 16.13 min Scan# 2457
Delta R.T. -0.031 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

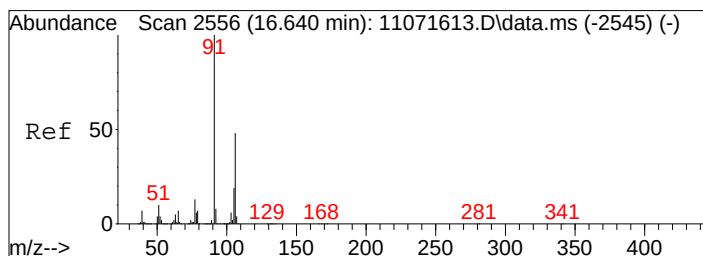
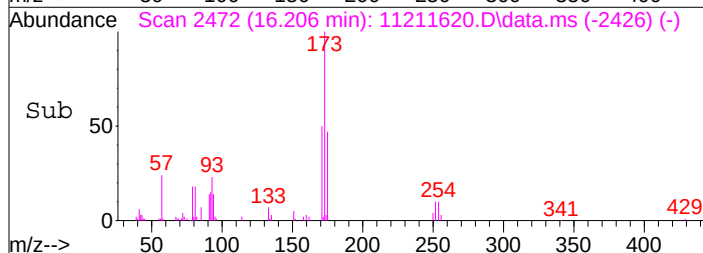
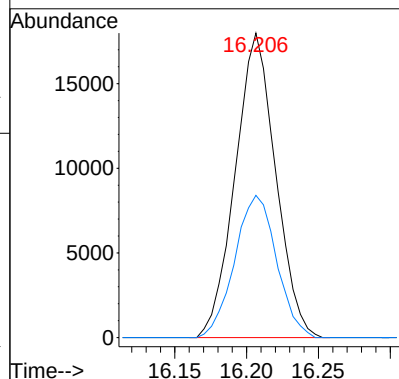
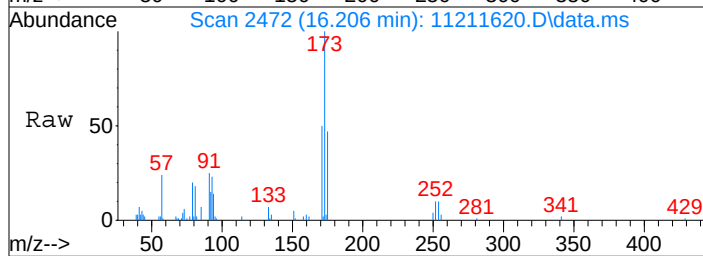
Tgt Ion: 91 Resp: 23782
Ion Ratio Lower Upper
91 100
106 48.0 29.1 69.1





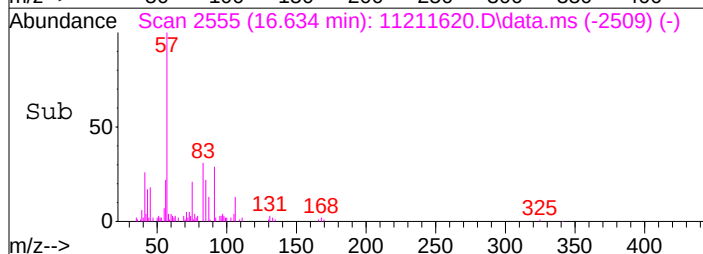
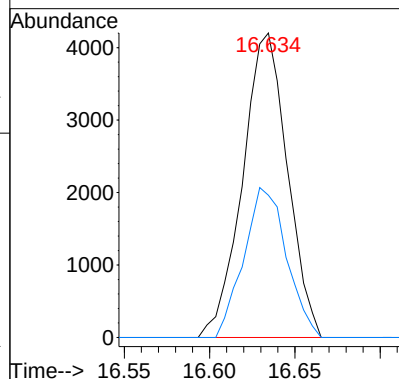
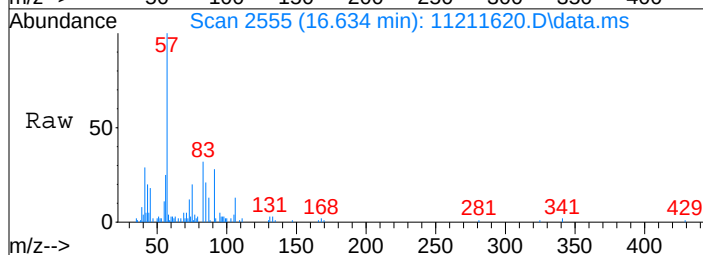
#68
Bromoform
Concen: 2.31 ng
RT: 16.21 min Scan# 2472
Delta R.T. -0.015 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

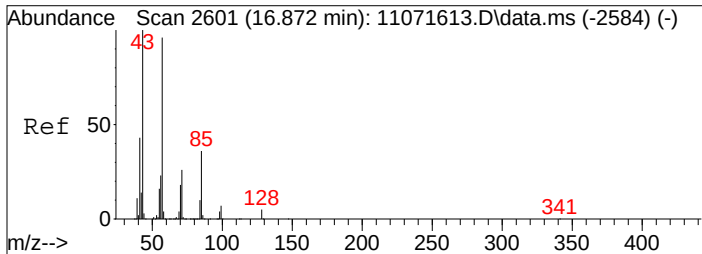
Tgt Ion: 173 Resp: 35179
Ion Ratio Lower Upper
173 100
175 48.4 28.6 68.6



#70
o-Xylene
Concen: 0.12 ng
RT: 16.63 min Scan# 2555
Delta R.T. -0.015 min
Lab File: 11211620.D
Acq: 21 Nov 2016 19:28

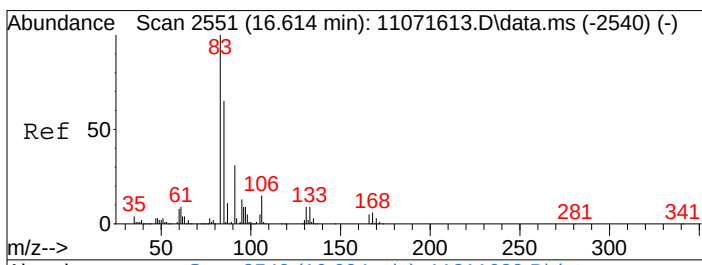
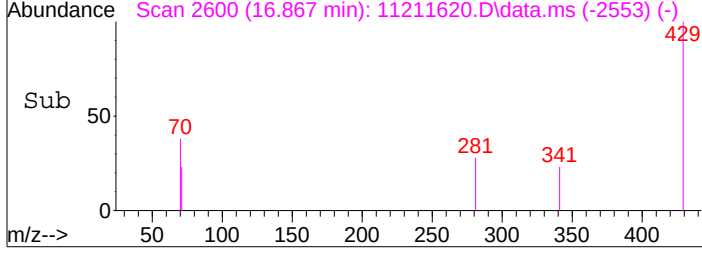
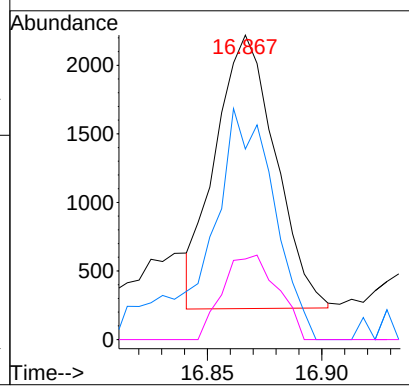
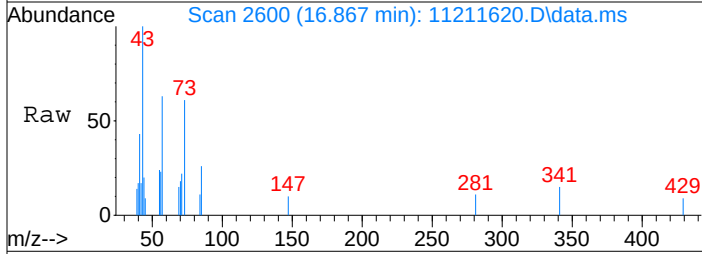
Tgt Ion: 91 Resp: 7687
Ion Ratio Lower Upper
91 100
106 46.9 26.7 66.7





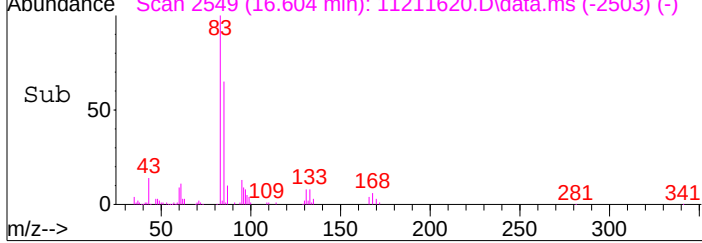
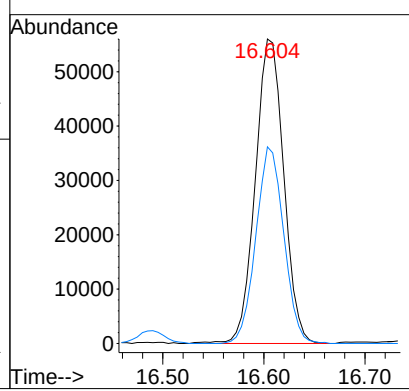
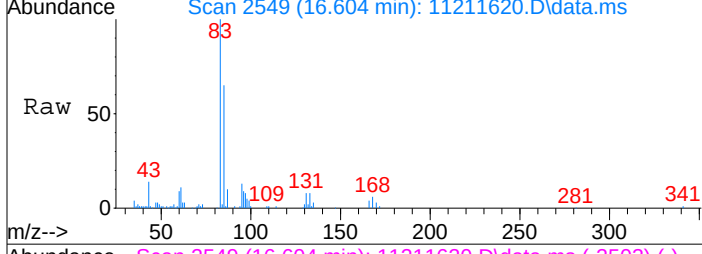
#71
 n-Nonane
 Concen: 0.09 ng m
 RT: 16.87 min Scan# 2600
 Delta R.T. -0.010 min
 Lab File: 11211620.D
 Acq: 21 Nov 2016 19:28

Tgt Ion: 43	Resp: 3639
Ion Ratio	Lower Upper
43	100
57	93.8 74.5 114.5
85	28.3 16.8 56.8



#72
 1,1,2,2-Tetrachloroethane
 Concen: 3.39 ng
 RT: 16.60 min Scan# 2549
 Delta R.T. -0.015 min
 Lab File: 11211620.D
 Acq: 21 Nov 2016 19:28

Tgt Ion: 83	Resp: 109576
Ion Ratio	Lower Upper
83	100
85	63.3 44.5 84.5



Data File: I:\MS09\Data\2016 11\21\11211620.D

Acq On : 21 Nov 2016 19:28

Operator: SC

Sample : P1605349-001 (1000mL)

Misc : S29-10261601

ALS Vial : 10 Sample Multiplier: 1

Quant Time: Nov 22 09:29:36 2016

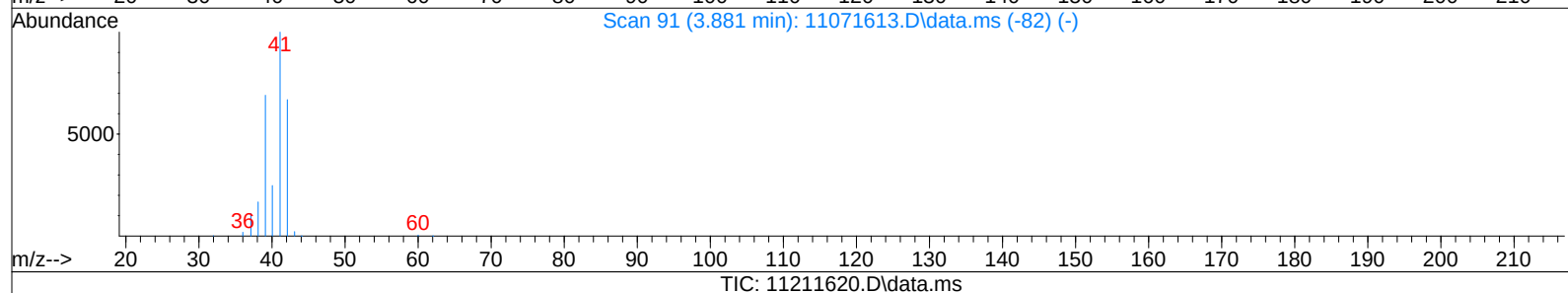
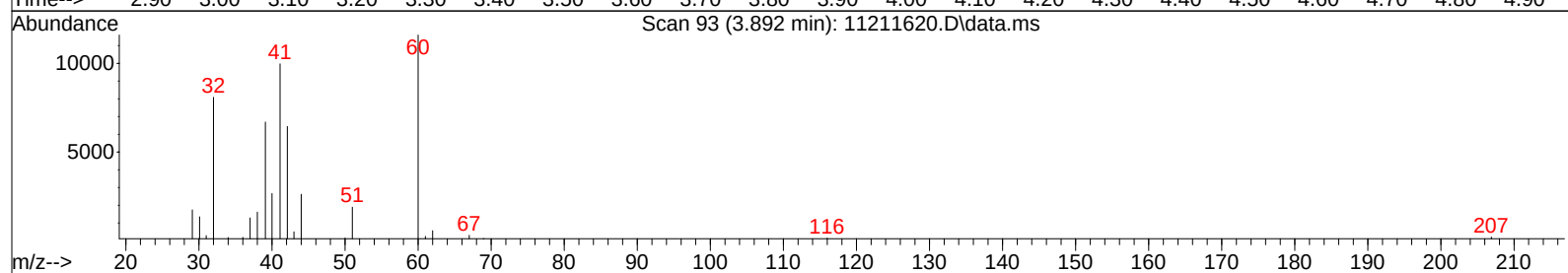
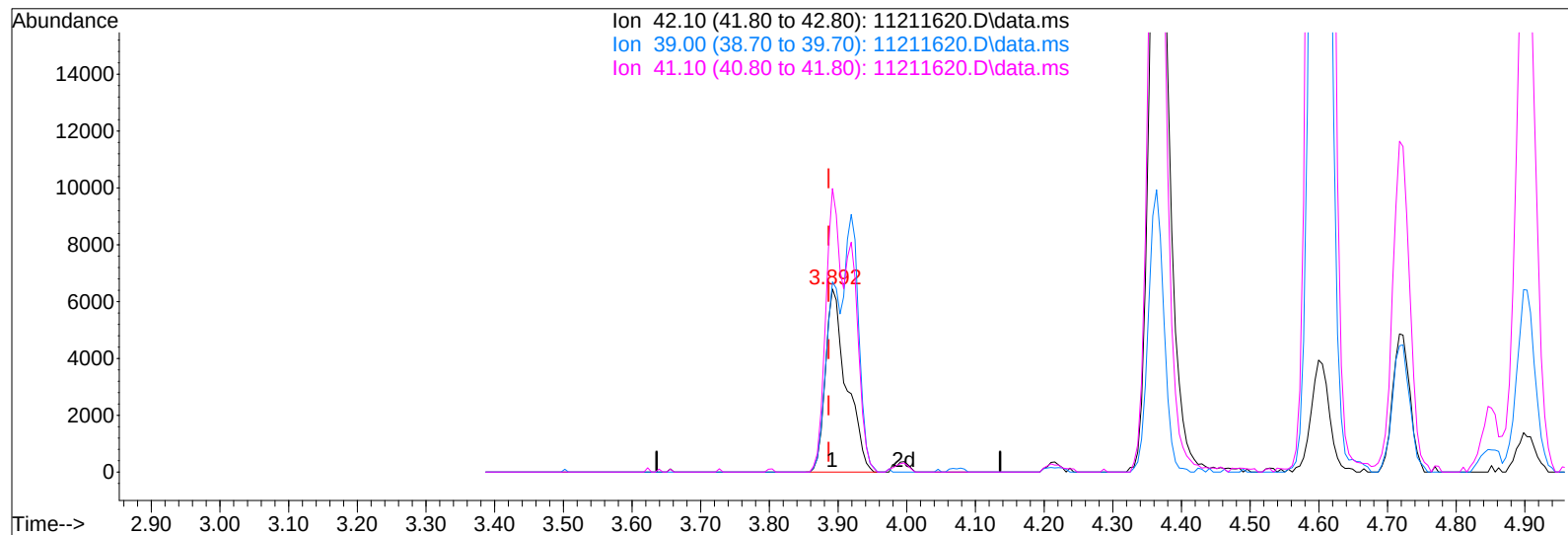
Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 11211620.D\data.ms

(2) Propene (T)

3.892min (+0.006) 0.63ng

response 13711

Ion	Exp%	Act%
42.10	100	100
39.00	112.50	70.96#
41.10	150.50	116.67#
0.00	0.00	0.00

Data File: I:\MS09\Data\2016 11\21\11211620.D

Acq On : 21 Nov 2016 19:28

Operator: SC

Sample : P1605349-001 (1000mL)

Misc : S29-10261601

ALS Vial : 10 Sample Multiplier: 1

Quant Time: Nov 22 09:29:36 2016

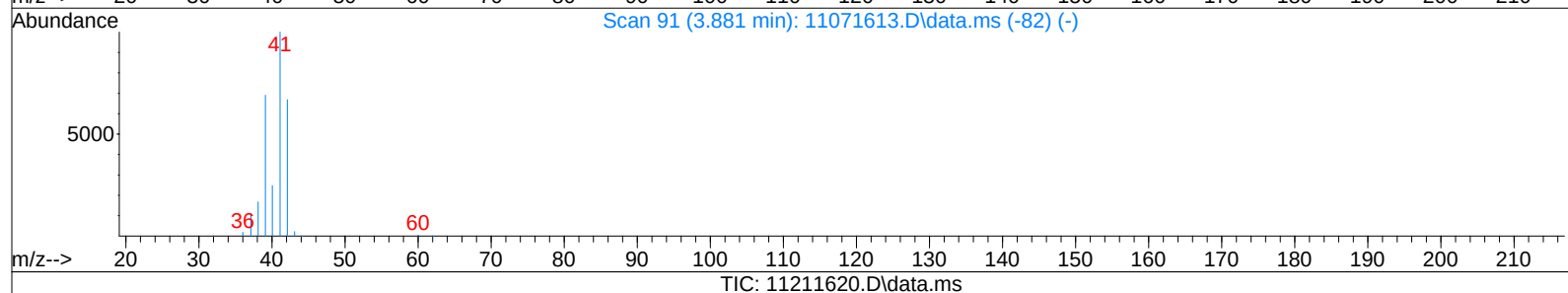
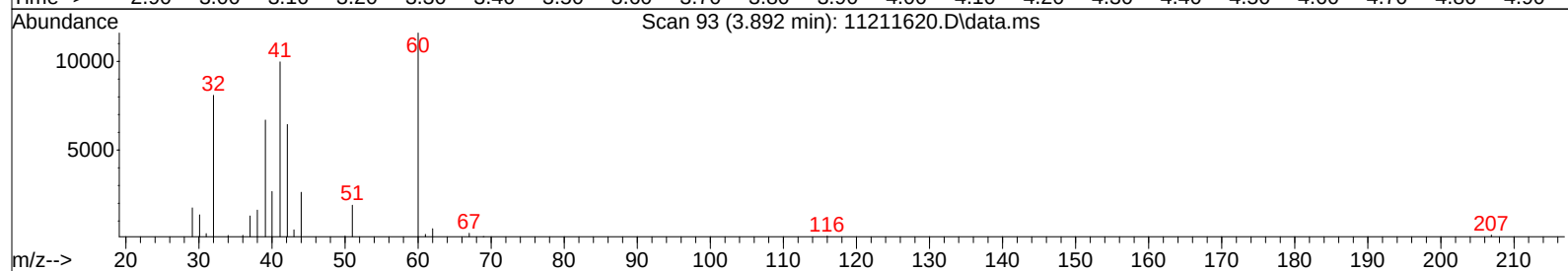
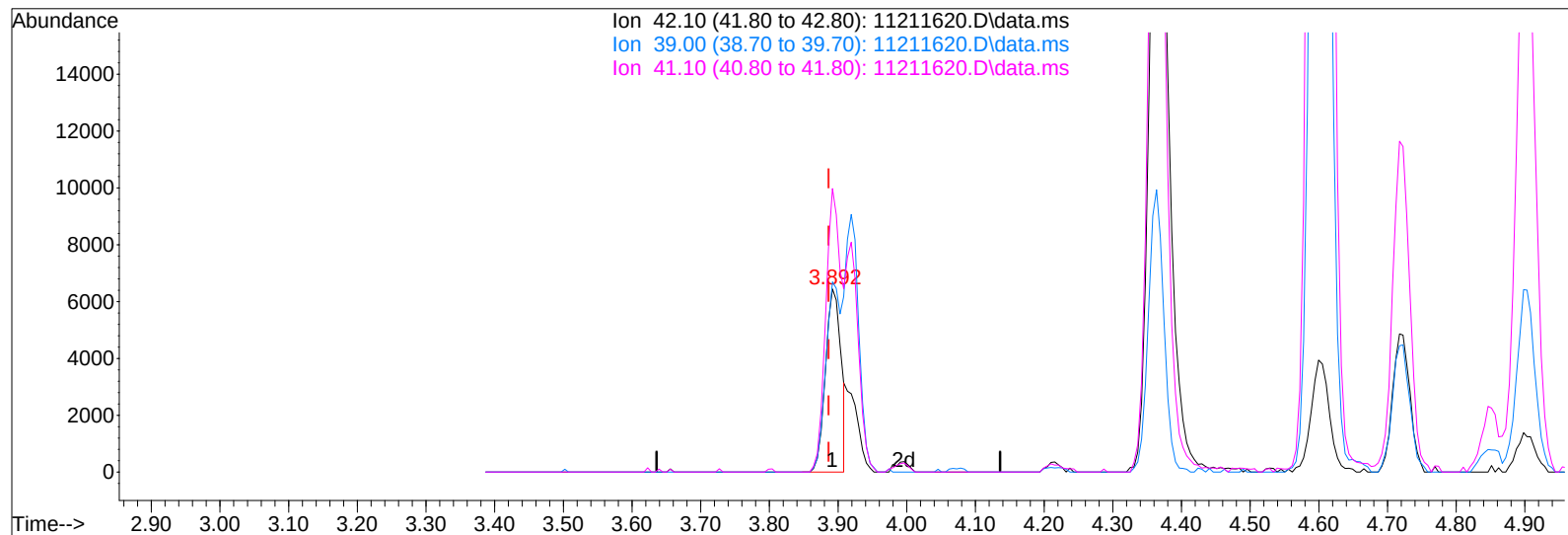
Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 11211620.D\data.ms

(2) Propene (T)

3.892min (+0.006) 0.47ng m

response 10153

Ion	Exp%	Act%
42.10	100	100
39.00	112.50	95.82
41.10	150.50	157.55
0.00	0.00	0.00

IPC

11/22/16

11/28/16

Data File: I:\MS09\Data\2016 11\21\11211620.D

Acq On : 21 Nov 2016 19:28

Operator: SC

Sample : P1605349-001 (1000mL)

Misc : S29-10261601

ALS Vial : 10 Sample Multiplier: 1

Quant Time: Nov 22 09:29:36 2016

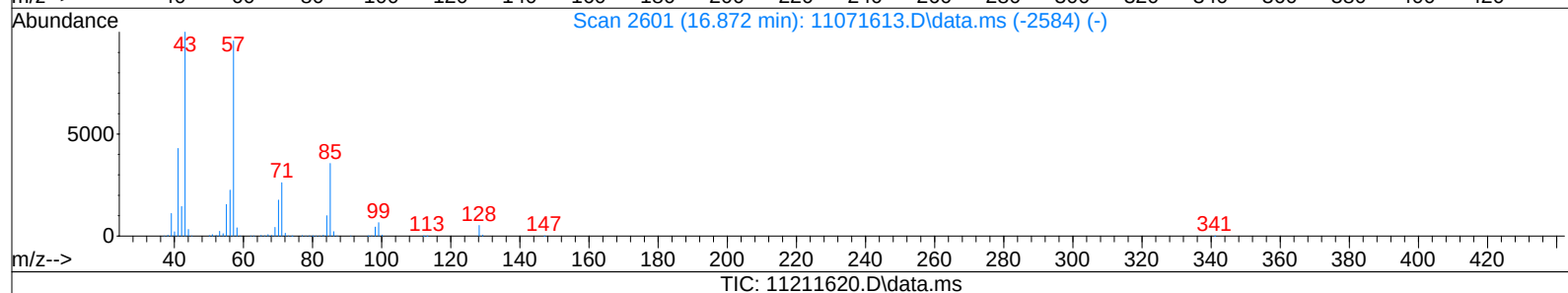
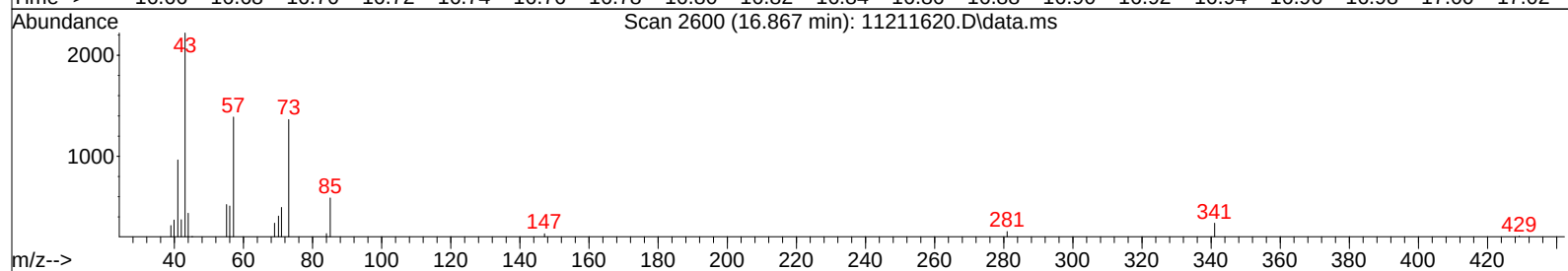
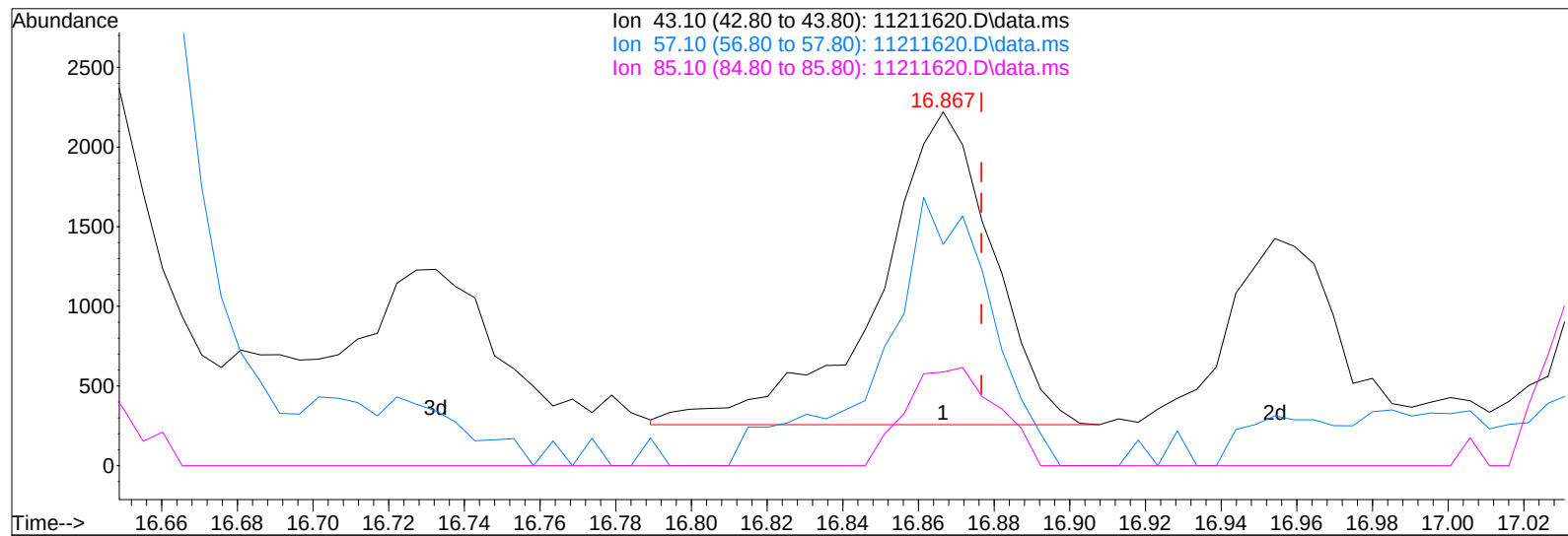
Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M



(71) n-Nonane (T)

16.867min (-0.010) 0.11ng

response 4174

Ion	Exp%	Act%
43.10	100	100
57.10	94.50	81.82
85.10	36.80	24.68
0.00	0.00	0.00

Data File: I:\MS09\Data\2016 11\21\11211620.D

Acq On : 21 Nov 2016 19:28

Operator: SC

Sample : P1605349-001 (1000mL)

Misc : S29-10261601

ALS Vial : 10 Sample Multiplier: 1

Quant Time: Nov 22 09:29:36 2016

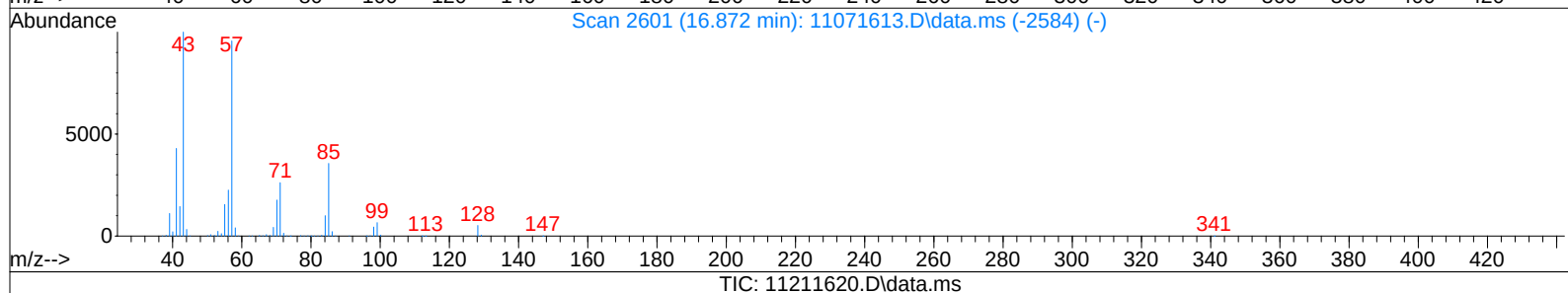
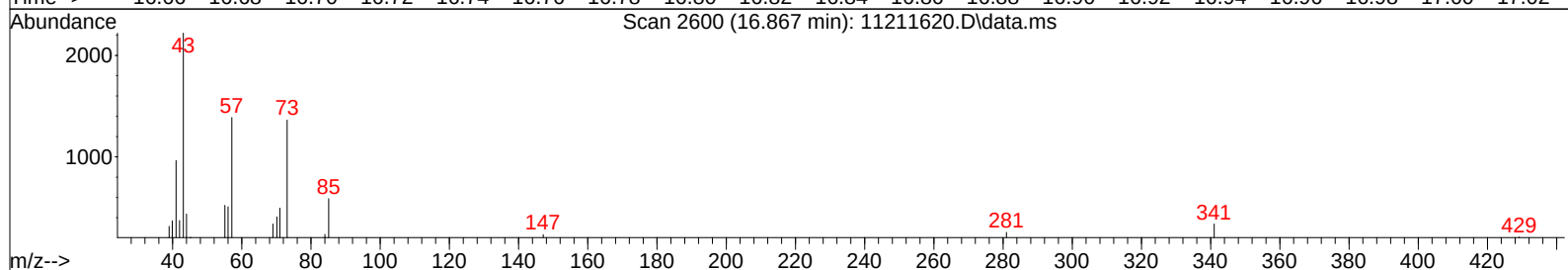
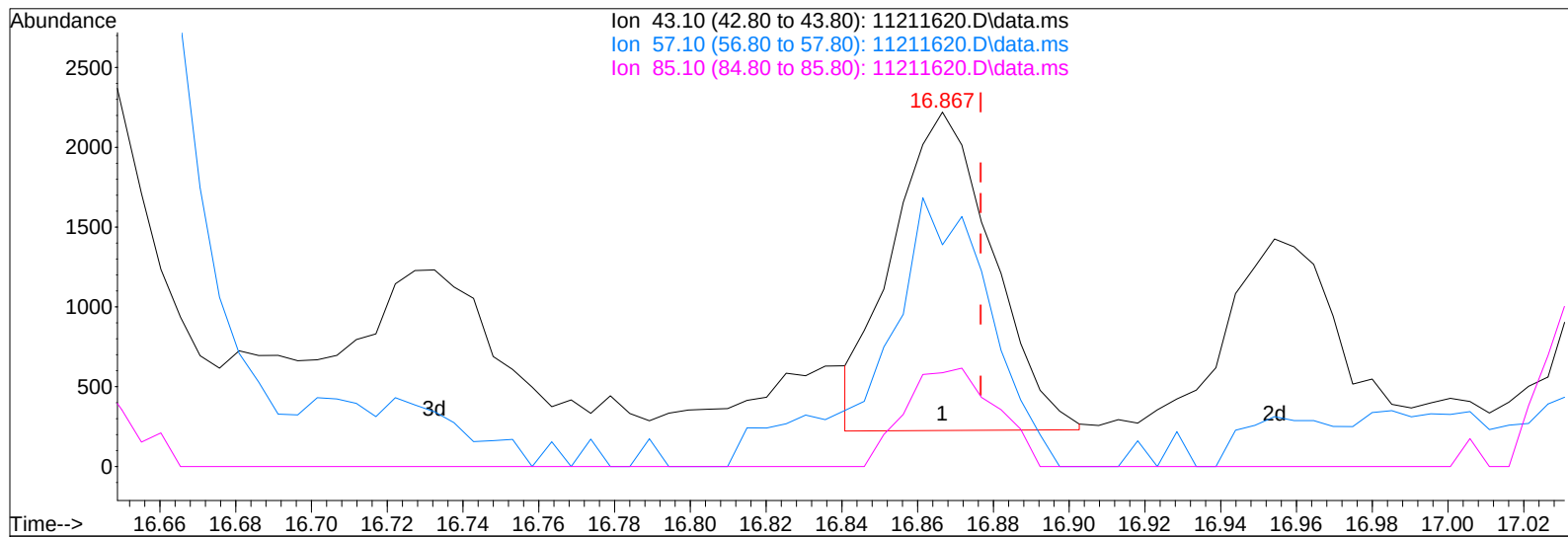
Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M



(71) n-Nonane (T)

IPC

16.867min (-0.010) 0.09ng m

11/22/16

response 3639

Ion	Exp%	Act%
43.10	100	100
57.10	94.50	93.84
85.10	36.80	28.30
0.00	0.00	0.00

11/28/16

Data File: I:\MS09\Data\2016 11\22\11221607.D

Acq On : 22 Nov 2016 13:51

Operator: SC

Sample : P1605349-001Dil (100mL)

Misc : S29-10261601

ALS Vial : 10 Sample Multiplier: 1

 11/22/16

Quant Time: Nov 22 14:18:58 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.17	130	150244	12.500	ng	-0.05
37) 1,4-Difluorobenzene (IS2)	11.14	114	744542	12.500	ng	-0.03
56) Chlorobenzene-d5 (IS3)	15.51	82	340359	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.95	65	245597	13.661	ng	-0.04
Spiked Amount	12.500	Range	70 - 130	Recovery	=	109.28%
57) Toluene-d8 (SS2)	13.59	98	828952	11.996	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	96.00%
73) Bromofluorobenzene (SS3)	17.09	174	212683	11.483	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	91.84%

Target Compounds

						Qvalue
2) Propene	3.91	42	1495	N.D.		
3) Dichlorodifluoromethan...	4.01	85	15536	0.497 ng		99
4) Chloromethane	4.20	50	3644	0.127 ng		96
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.		
6) Vinyl Chloride	4.48	62	520	N.D.		
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	4.97	94	1066	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	5.47	45	59	N.D.		
11) Acetonitrile	5.59	41	2152	N.D.		
12) Acrolein	5.74	56	683	N.D.		
13) Acetone	5.89	58	17552	1.264 ng		95
14) Trichlorofluoromethane	6.06	101	4648	0.181 ng		97
15) 2-Propanol (Isopropanol)	6.20	45	2949	N.D.		
16) Acrylonitrile	6.39	53	61	N.D.		
17) 1,1-Dichloroethene	6.76	96	7722	0.466 ng		94
18) 2-Methyl-2-Propanol (t...	6.88	59	1810	N.D.		
19) Methylene Chloride	6.89	84	681	N.D.		
20) 3-Chloro-1-propene (Al...	6.97	41	2203	N.D.		
21) Trichlorotrifluoroethane	7.22	151	35402	2.732 ng		98
22) Carbon Disulfide	7.18	76	6333	0.105 ng		87
23) trans-1,2-Dichloroethene	7.92	61	4299	0.171 ng		100
24) 1,1-Dichloroethane	8.14	63	8977	0.283 ng		99
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.	d	
27) 2-Butanone (MEK)	8.59	72	2100	0.173 ng	#	49
28) cis-1,2-Dichloroethene	9.00	61	206445	8.676 ng		93
29) Diisopropyl Ether	0.00	87	0	N.D.	d	
30) Ethyl Acetate	0.00	61	0	N.D.		
31) n-Hexane	9.26	57	10989	0.399 ng		97
32) Chloroform	9.31	83	70573	2.496 ng		99
34) Tetrahydrofuran (THF)	9.74	72	1982	0.160 ng	#	74
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	0.00	62	0	N.D.		
38) 1,1,1-Trichloroethane	10.33	97	6346	0.257 ng		98
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	10.79	78	7405	0.098 ng		97
42) Carbon Tetrachloride	10.94	117	4992	0.237 ng		98
43) Cyclohexane	11.07	84	9429	0.348 ng	#	83
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	11.79	83	3231	0.143 ng		89
47) Trichloroethene	11.84	130	229846	13.297 ng		100
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d	

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Data File: I:\MS09\Data\2016 11\22\11221607.D

Acq On : 22 Nov 2016 13:51

Operator: SC

Sample : P1605349-001Dil (100mL)

Misc : S29-10261601

ALS Vial : 10 Sample Multiplier: 1

Quant Time: Nov 22 14:18:58 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.92	100	404	N.D.		
51) n-Heptane	12.16	71	687	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	13.69	91	6173	N.D.		
59) 2-Hexanone	13.95	43	1915	N.D.		
60) Dibromochloromethane	14.10	129	1976	0.101	ng	100
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	14.58	43	1599	N.D.		
63) n-Octane	0.00	57	0	N.D.		
64) Tetrachloroethene	14.85	166	30566	1.637	ng	100
65) Chlorobenzene	0.00	112	0	N.D.		
66) Ethylbenzene	15.95	91	1209	N.D.		
67) m- & p-Xylenes	16.12	91	2917	N.D.		
68) Bromoform	16.21	173	3249	0.210	ng	94
69) Styrene	0.00	104	0	N.D.		
70) o-Xylene	16.63	91	1003	N.D.		
71) n-Nonane	16.87	43	682	N.D.		
72) 1,1,2,2-Tetrachloroethane	16.60	83	10814	0.330	ng	100
74) Cumene	0.00	105	0	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	0.00	91	0	N.D.		
77) 3-Ethyltoluene	17.88	105	437	N.D.		
78) 4-Ethyltoluene	17.88	105	437	N.D.		
79) 1,3,5-Trimethylbenzene	17.88	105	437	N.D.		
80) alpha-Methylstyrene	0.00	118	0	N.D.		
81) 2-Ethyltoluene	18.39	105	2242	N.D.		
82) 1,2,4-Trimethylbenzene	18.42	105	828	N.D.		
83) n-Decane	18.54	57	470	N.D.		
84) Benzyl Chloride	0.00	91	0	N.D.		
85) 1,3-Dichlorobenzene	0.00	146	0	N.D.		
86) 1,4-Dichlorobenzene	0.00	146	0	N.D.		
87) sec-Butylbenzene	0.00	105	0	N.D.		
88) 4-Isopropyltoluene (p-...	18.88	119	878	N.D.		
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	0.00	68	0	N.D.		
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	19.87	57	439	N.D.		
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	20.94	128	2452	N.D.		
96) n-Dodecane	20.97	57	507	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.	d	
99) tert-Butylbenzene	0.00	119	0	N.D.	d	
100) n-Butylbenzene	0.00	91	0	N.D.		

(#)=qualifier out of range (m)=manual integration (+)=signals summed

Data File: I:\MS09\Data\2016 11\22\11221607.D

Acq On : 22 Nov 2016 13:51

Operator: SC

Sample : P1605349-001Dil (100mL)

Misc : S29-10261601

ALS Vial : 10 Sample Multiplier: 1

Quant Time: Nov 22 14:18:58 2016

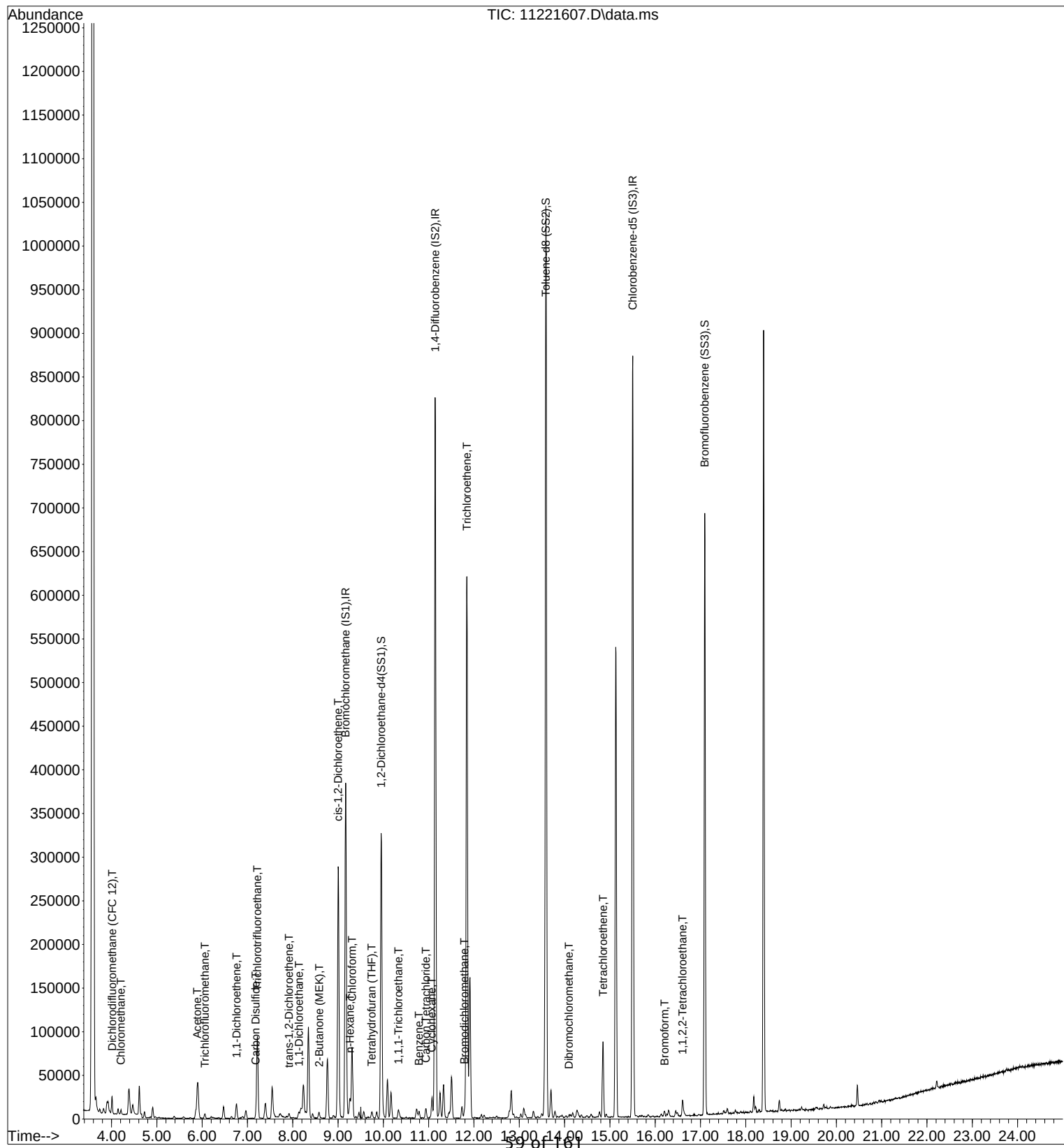
Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS09\Data\2016 11\22\11221607.D

Acq On : 22 Nov 2016 13:51

Operator: SC

Sample : P1605349-001Dil (100mL)

Misc : S29-10261601

ALS Vial : 10 Sample Multiplier: 1

Quant Time: Nov 22 14:16:31 2016

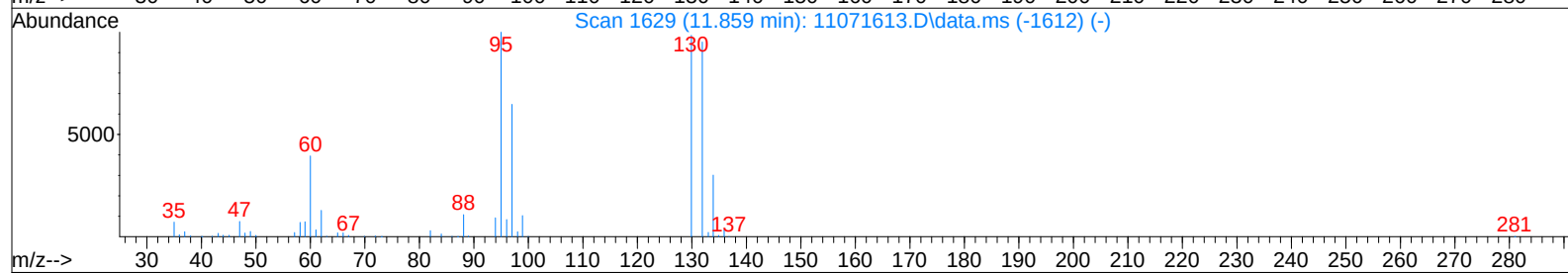
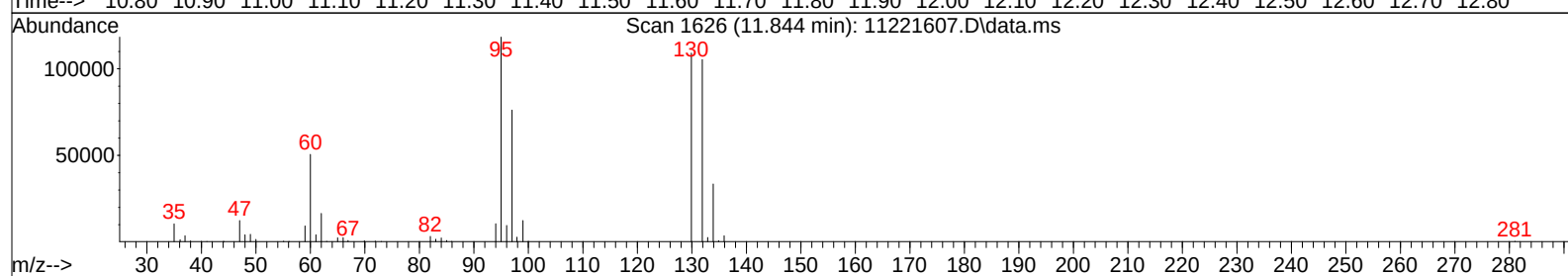
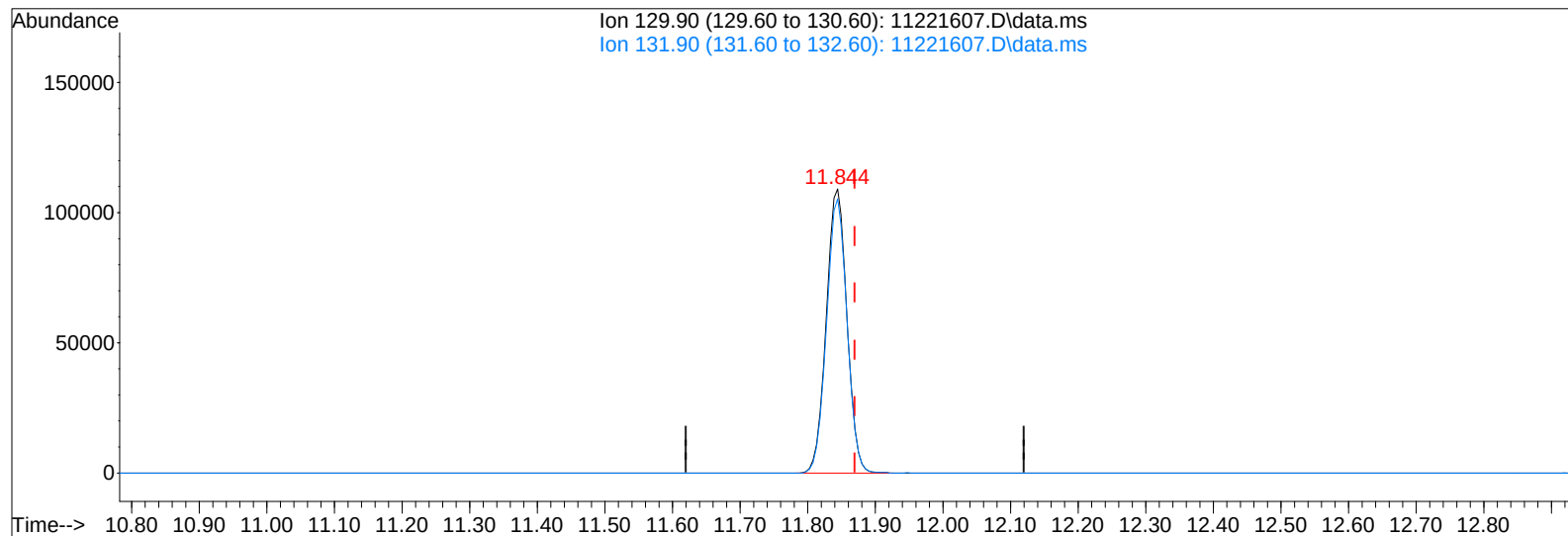
Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 11221607.D\data.ms

(47) Trichloroethene (T)

11.844min (-0.026) 13.30ng

response 229846

Ion	Exp%	Act%
129.90	100	100
131.90	95.30	95.68
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS09\Data\2016 11\21\11211621.D

Acq On : 21 Nov 2016 20:02

Operator: SC

Sample : P1605349-002 (1000mL)

Misc : S29-10261601

ALS Vial : 11 Sample Multiplier: 1

 11/22/16

Quant Time: Nov 22 09:42:06 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.18	130	149930	12.500	ng	-0.04
37) 1,4-Difluorobenzene (IS2)	11.15	114	740979	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	15.51	82	334443	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.96	65	241125	13.441	ng	-0.03
Spiked Amount	12.500	Range	70 - 130	Recovery	=	107.52%
57) Toluene-d8 (SS2)	13.59	98	819517	12.069	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	96.56%
73) Bromofluorobenzene (SS3)	17.10	174	211547	11.624	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	92.96%

Target Compounds

						Qvalue
2) Propene	3.90	42	14700m	0.678	ng	
3) Dichlorodifluoromethan...	4.00	85	145992	4.679	ng	99
4) Chloromethane	4.19	50	3223	0.112	ng	94
5) 1,2-Dichloro-1,1,2,2-t...	4.36	135	1241	N.D.		
6) Vinyl Chloride	4.47	62	5294	0.193	ng	89
7) 1,3-Butadiene	4.61	54	767	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	5.18	64	787	N.D.		
10) Ethanol	5.37	45	18416	1.423	ng	95
11) Acetonitrile	5.59	41	92909	2.649	ng	98
12) Acrolein	5.74	56	10444	0.893	ng	100
13) Acetone	5.89	58	134977	9.739	ng	88
14) Trichlorofluoromethane	6.06	101	42222	1.651	ng	99
15) 2-Propanol (Isopropanol)	6.21	45	14891	0.350	ng	91
16) Acrylonitrile	6.40	53	176	N.D.		
17) 1,1-Dichloroethene	6.75	96	74758	4.522	ng	95
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.	d	
19) Methylene Chloride	6.89	84	2311	0.124	ng	84
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.	d	
21) Trichlorotrifluoroethane	7.22	151	336801	26.045	ng	96
22) Carbon Disulfide	7.18	76	435118	7.240	ng	96
23) trans-1,2-Dichloroethene	7.92	61	45051	1.795	ng	94
24) 1,1-Dichloroethane	8.14	63	84913	2.678	ng	99
25) Methyl tert-Butyl Ether	8.25	73	1027	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.	d	
27) 2-Butanone (MEK)	8.57	72	24587	2.029	ng	# 1
28) cis-1,2-Dichloroethene	9.01	61	1981677	83.454	ng	94
29) Diisopropyl Ether	0.00	87	0	N.D.	d	
30) Ethyl Acetate	0.00	61	0	N.D.	d	
31) n-Hexane	9.27	57	98153	3.573	ng	96
32) Chloroform	9.32	83	655988	23.253	ng	98
34) Tetrahydrofuran (THF)	9.75	72	2030	0.164	ng	# 42
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	10.08	62	1475	N.D.		
38) 1,1,1-Trichloroethane	10.34	97	54181	2.206	ng	98
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	10.80	78	16558	0.221	ng	97
42) Carbon Tetrachloride	10.95	117	42377	2.025	ng	98
43) Cyclohexane	11.08	84	86192	3.199	ng	89
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.	d	
45) 1,2-Dichloropropane	11.51	63	616	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D.	d	
47) Trichloroethene	11.85	130	2161278	125.632	ng	100
48) 1,4-Dioxane	0.00	88	0	N.D.	d	
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d	

61 of 161

Data File: I:\MS09\Data\2016 11\21\11211621.D

Acq On : 21 Nov 2016 20:02

Operator: SC

Sample : P1605349-002 (1000mL)

Misc : S29-10261601

ALS Vial : 11 Sample Multiplier: 1

Quant Time: Nov 22 09:42:06 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	0.00	100	0	N.D.	d	
51) n-Heptane	12.16	71	5693	0.312	ng	87
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.	d	
54) trans-1,3-Dichloropropene	13.23	75	571	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.	d	
58) Toluene	13.70	91	50165	0.646	ng	100
59) 2-Hexanone	13.94	43	14316	0.366	ng	77
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	14.59	43	2674	N.D.		
63) n-Octane	14.70	57	1159	N.D.		
64) Tetrachloroethene	14.85	166	302337	16.479	ng	99
65) Chlorobenzene	15.55	112	1066	N.D.		
66) Ethylbenzene	15.95	91	8975	0.107	ng	95
67) m- & p-Xylenes	16.13	91	11040	0.172	ng	100
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	16.52	104	1900	N.D.		
70) o-Xylene	16.63	91	3074	N.D.		
71) n-Nonane	16.87	43	3770	0.098	ng	92
72) 1,1,2,2-Tetrachloroethane	16.60	83	115617	3.593	ng	98
74) Cumene	17.25	105	1212	N.D.		
75) alpha-Pinene	17.66	93	574	N.D.		
76) n-Propylbenzene	17.77	91	2005	N.D.		
77) 3-Ethyltoluene	17.88	105	2304	N.D.		
78) 4-Ethyltoluene	17.92	105	1071	N.D.		
79) 1,3,5-Trimethylbenzene	18.00	105	1150	N.D.		
80) alpha-Methylstyrene	18.16	118	754	N.D.		
81) 2-Ethyltoluene	18.20	105	1229	N.D.		
82) 1,2,4-Trimethylbenzene	18.43	105	4372	N.D.		
83) n-Decane	0.00	57	0	N.D.	d	
84) Benzyl Chloride	18.56	91	7885	0.133	ng	99
85) 1,3-Dichlorobenzene	18.65	146	1798	N.D.		
86) 1,4-Dichlorobenzene	18.65	146	1798	N.D.		
87) sec-Butylbenzene	18.72	105	496	N.D.		
88) 4-Isopropyltoluene (p-...	0.00	119	0	N.D.	d	
89) 1,2,3-Trimethylbenzene	18.87	105	3198	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	19.03	68	1671	N.D.		
92) 1,2-Dibromo-3-Chloropr...	19.40	157	628	N.D.		
93) n-Undecane	0.00	57	0	N.D.	d	
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	20.94	128	8942	0.114	ng	99
96) n-Dodecane	0.00	57	0	N.D.	d	
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.	d	
99) tert-Butylbenzene	0.00	119	0	N.D.	d	
100) n-Butylbenzene	19.30	91	4403	N.D.		

(#)=qualifier out of range (m)=manual integration (+)=signals summed

Data File: I:\MS09\Data\2016 11\21\11211621.D

Acq On : 21 Nov 2016 20:02

Operator: SC

Sample : P1605349-002 (1000mL)

Misc : S29-10261601

ALS Vial : 11 Sample Multiplier: 1

Quant Time: Nov 22 09:42:06 2016

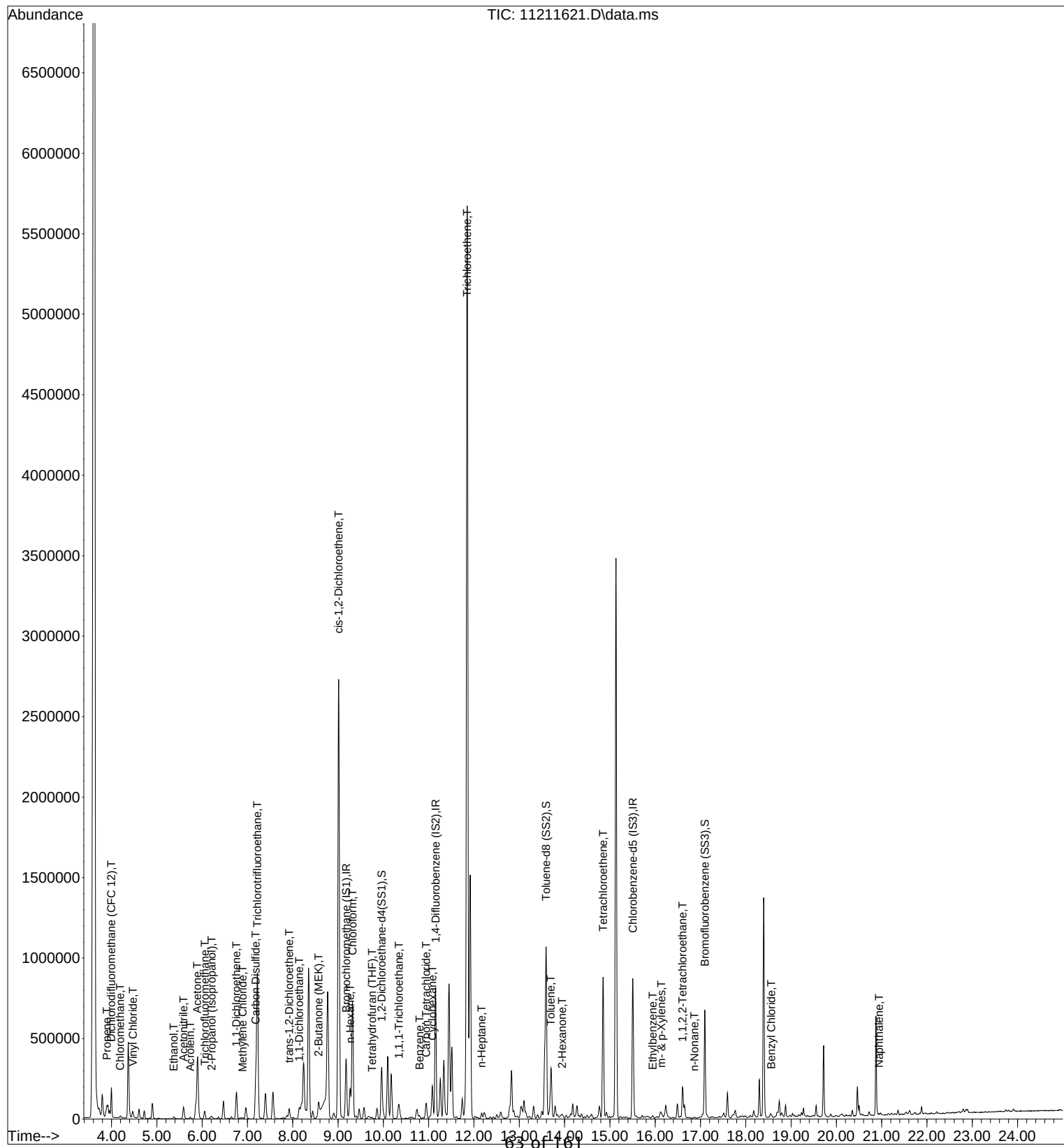
Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS09\Data\2016 11\21\11211621.D

Acq On : 21 Nov 2016 20:02

Operator: SC

Sample : P1605349-002 (1000mL)

Misc : S29-10261601

ALS Vial : 11 Sample Multiplier: 1

Quant Time: Nov 22 09:42:06 2016

 11/22/16

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.18	130	149930	12.500	ng	-0.04
37) 1,4-Difluorobenzene (IS2)	11.15	114	740979	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	15.51	82	334443	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.96	65	241125	13.441	ng	-0.03
Spiked Amount	12.500	Range	70 - 130	Recovery	=	107.52%
57) Toluene-d8 (SS2)	13.59	98	819517	12.069	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	96.56%
73) Bromofluorobenzene (SS3)	17.10	174	211547	11.624	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	92.96%

Target Compounds

						Qvalue
2) Propene	3.90	42	14700m	0.678	ng	
3) Dichlorodifluoromethan...	4.00	85	145992	4.679	ng	99
4) Chloromethane	4.19	50	3223	0.112	ng	94
6) Vinyl Chloride	4.47	62	5294	0.193	ng	89
10) Ethanol	5.37	45	18416	1.423	ng	95
11) Acetonitrile	5.59	41	92909	2.649	ng	98
12) Acrolein	5.74	56	10444	0.893	ng	100
13) Acetone	5.89	58	134977	9.739	ng	88
14) Trichlorofluoromethane	6.06	101	42222	1.651	ng	99
15) 2-Propanol (Isopropanol)	6.21	45	14891	0.350	ng	91
17) 1,1-Dichloroethene	6.75	96	74758	4.522	ng	95
19) Methylene Chloride	6.89	84	2311	0.124	ng	84
21) Trichlorotrifluoroethane	7.22	151	336801	26.045	ng	96
22) Carbon Disulfide	7.18	76	435118	7.240	ng	96
23) trans-1,2-Dichloroethene	7.92	61	45051	1.795	ng	94
24) 1,1-Dichloroethane	8.14	63	84913	2.678	ng	99
27) 2-Butanone (MEK)	8.57	72	24587	2.029	ng	# 1
28) cis-1,2-Dichloroethene	9.01	61	1981677	83.454	ng	94
31) n-Hexane	9.27	57	98153	3.573	ng	96
32) Chloroform	9.32	83	655988	23.253	ng	98
34) Tetrahydrofuran (THF)	9.75	72	2030	0.164	ng	# 42
38) 1,1,1-Trichloroethane	10.34	97	54181	2.206	ng	98
41) Benzene	10.80	78	16558	0.221	ng	97
42) Carbon Tetrachloride	10.95	117	42377	2.025	ng	98
43) Cyclohexane	11.08	84	86192	3.199	ng	89
47) Trichloroethene	11.85	130	2161278	125.632	ng	100
51) n-Heptane	12.16	71	5693	0.312	ng	87
58) Toluene	13.70	91	50165	0.646	ng	100
59) 2-Hexanone	13.94	43	14316	0.366	ng	77
64) Tetrachloroethene	14.85	166	302337	16.479	ng	99
66) Ethylbenzene	15.95	91	8975	0.107	ng	95
67) m- & p-Xylenes	16.13	91	11040	0.172	ng	100
71) n-Nonane	16.87	43	3770	0.098	ng	92
72) 1,1,2,2-Tetrachloroethane	16.60	83	115617	3.593	ng	98
84) Benzyl Chloride	18.56	91	7885	0.133	ng	99
95) Naphthalene	20.94	128	8942	0.114	ng	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File: I:\MS09\Data\2016 11\21\11211621.D

Acq On : 21 Nov 2016 20:02

Operator: SC

Sample : P1605349-002 (1000mL)

Misc : S29-10261601

ALS Vial : 11 Sample Multiplier: 1

Quant Time: Nov 22 09:42:06 2016

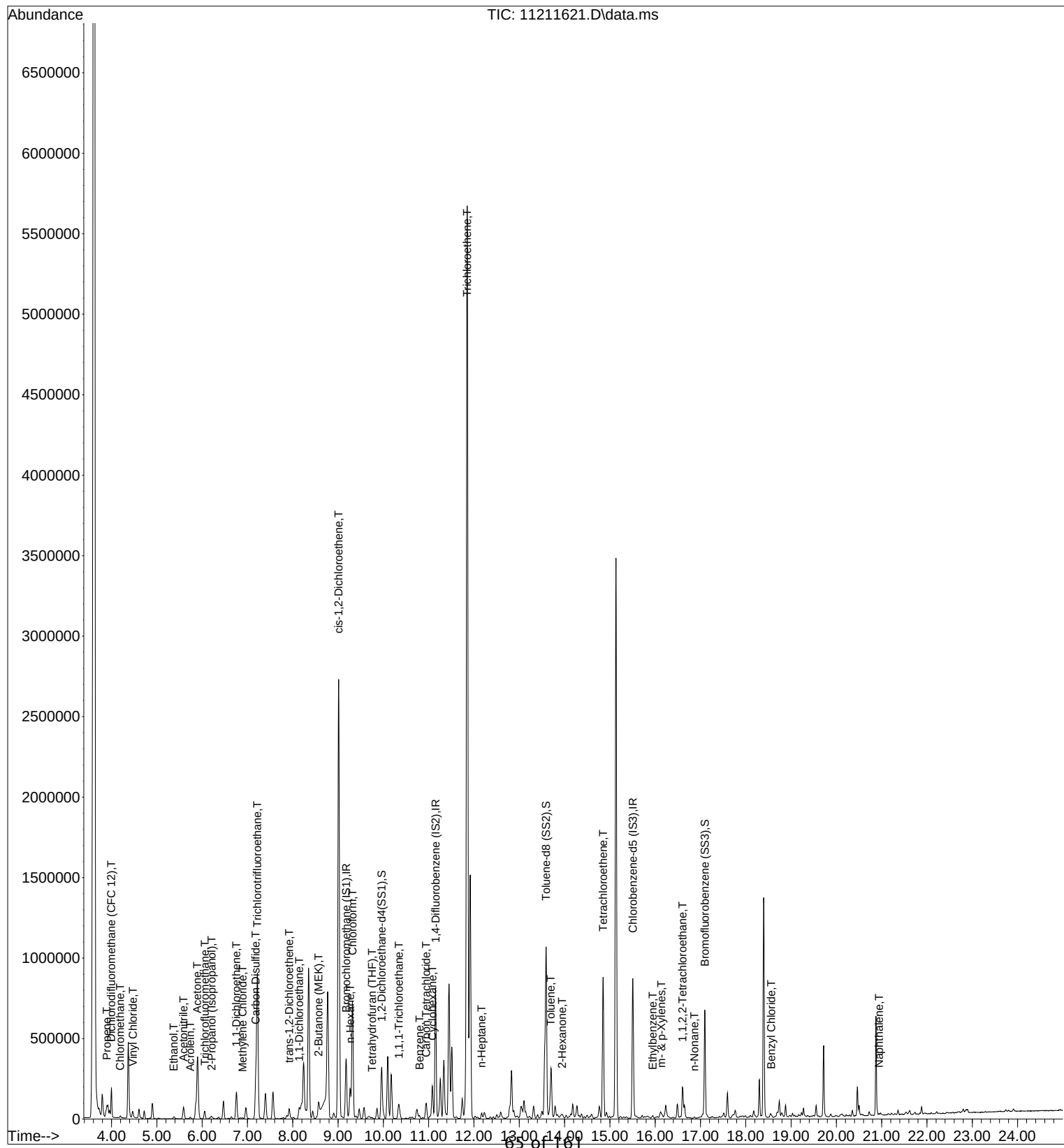
Quant Method : I:\MS09\Methods\R9110716.M

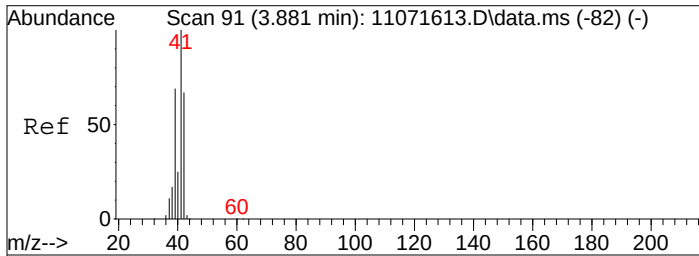
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M





#2

Propene

Concen: 0.68 ng m

RT: 3.90 min Scan# 94

Delta R.T. 0.011 min

Lab File: 11211621.D

Acq: 21 Nov 2016 20:02

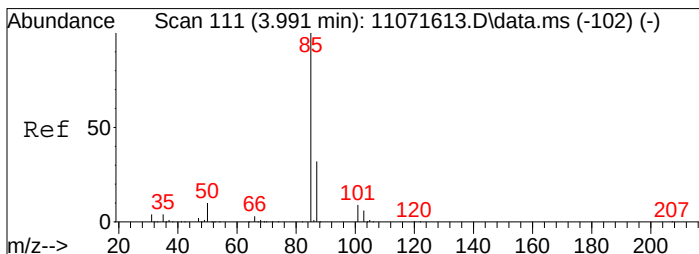
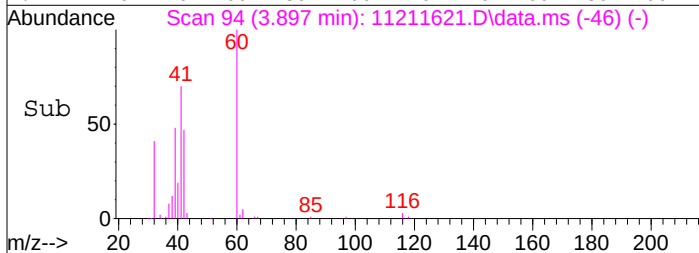
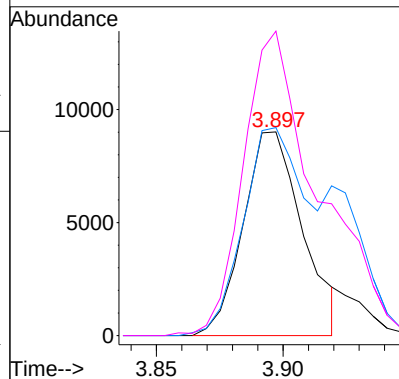
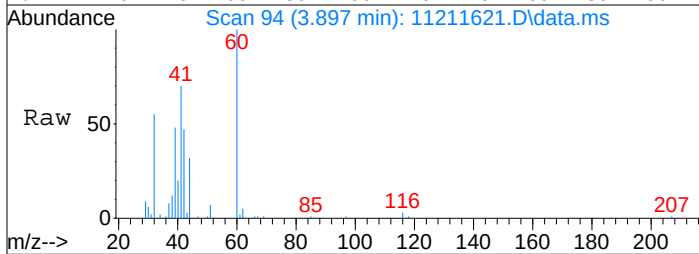
Tgt Ion: 42 Resp: 14700

Ion Ratio Lower Upper

42 100

39 108.9 92.5 132.5

41 189.0 130.5 170.5#



#3

Dichlorodifluoromethane (CFC 12)

Concen: 4.68 ng

RT: 4.00 min Scan# 112

Delta R.T. 0.000 min

Lab File: 11211621.D

Acq: 21 Nov 2016 20:02

Tgt Ion: 85 Resp: 145992

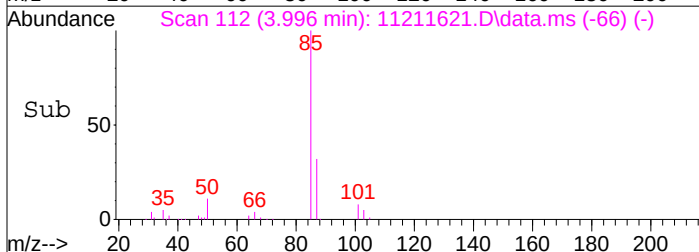
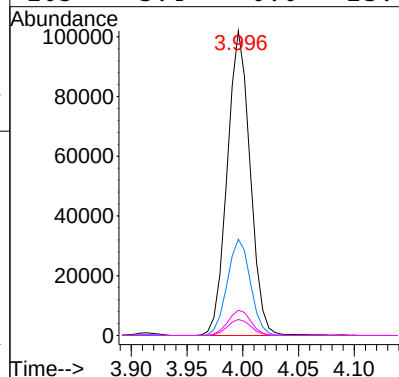
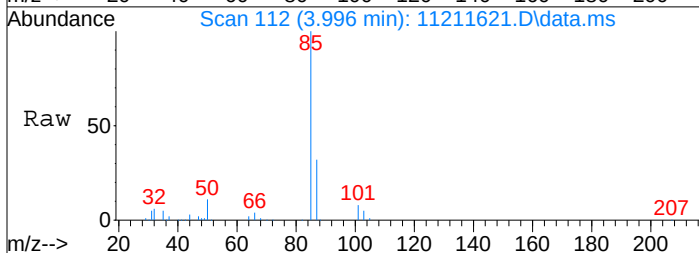
Ion Ratio Lower Upper

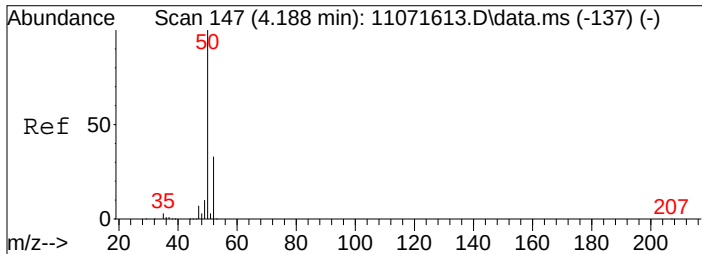
85 100

87 31.8 12.5 52.5

101 8.4 0.0 29.0

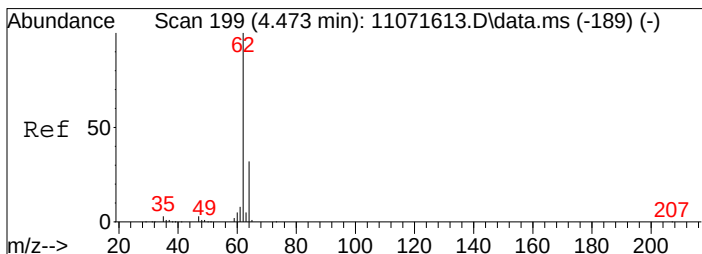
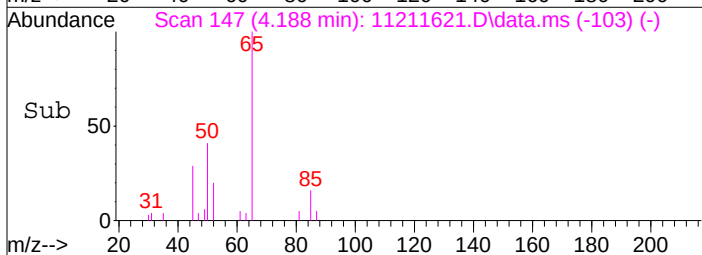
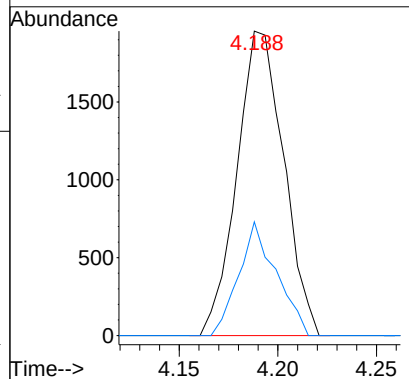
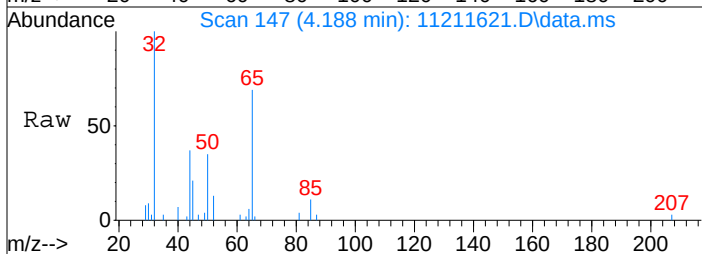
103 5.4 0.0 25.8





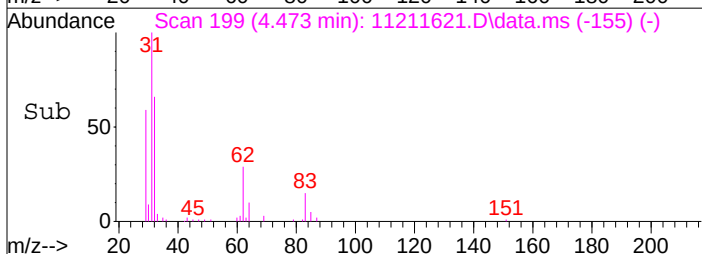
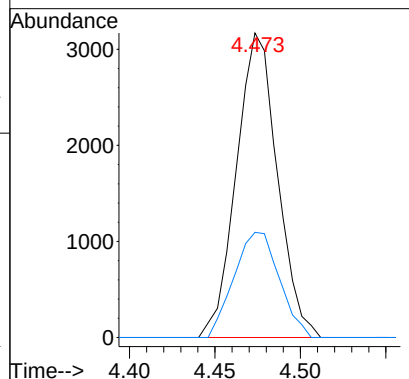
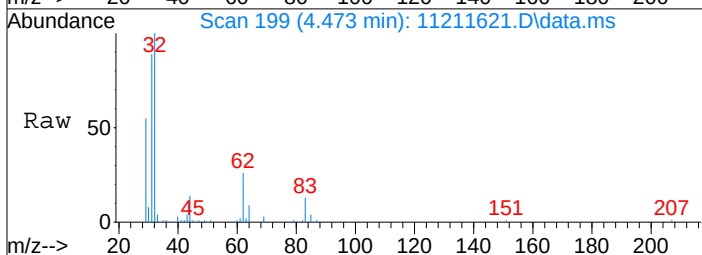
#4
Chloromethane
Concen: 0.11 ng
RT: 4.19 min Scan# 147
Delta R.T. -0.011 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

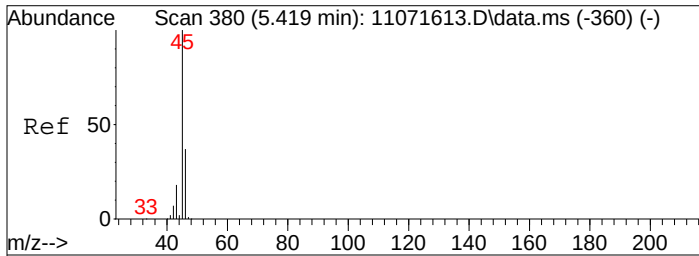
Tgt Ion: 50 Resp: 3223
Ion Ratio Lower Upper
50 100
52 30.0 13.1 53.1



#6
Vinyl Chloride
Concen: 0.19 ng
RT: 4.47 min Scan# 199
Delta R.T. -0.011 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

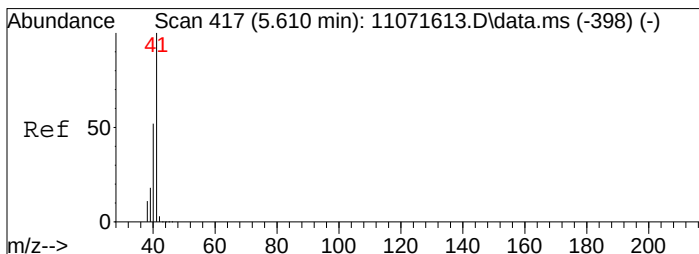
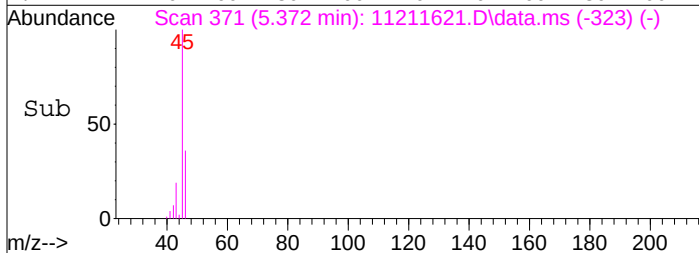
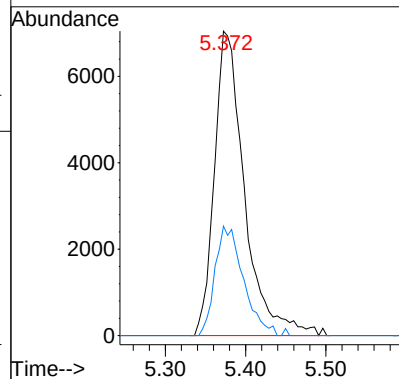
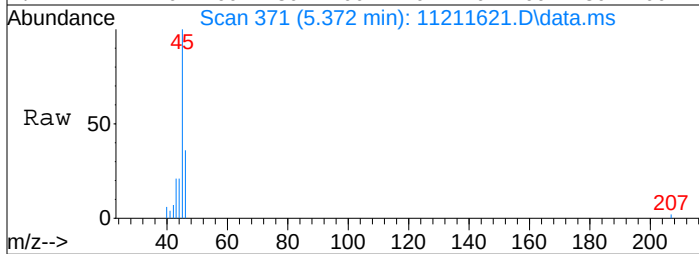
Tgt Ion: 62 Resp: 5294
Ion Ratio Lower Upper
62 100
64 38.1 12.0 52.0





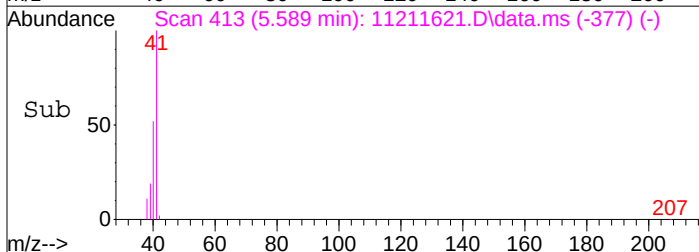
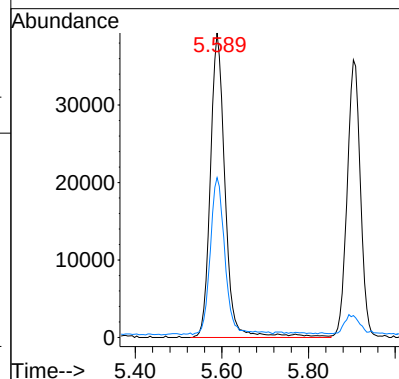
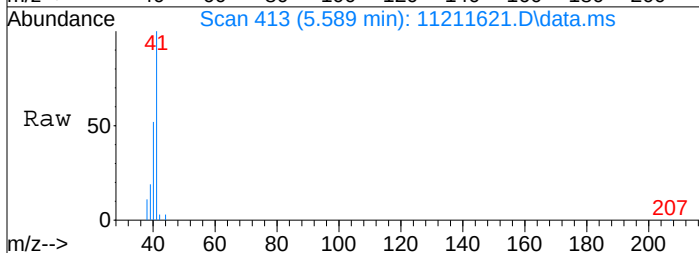
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Ethanol
Concen: 1.42 ng
RT: 5.37 min Scan# 371
Delta R.T. -0.103 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

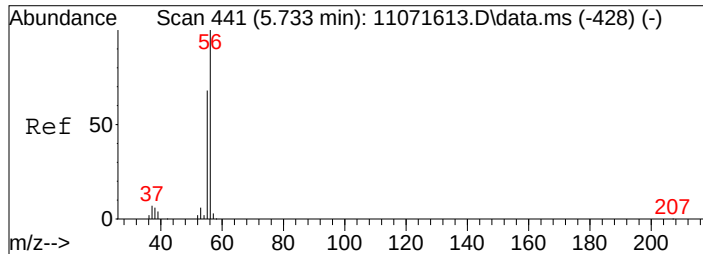
Tgt Ion: 45 Resp: 18416
Ion Ratio Lower Upper
45 100
46 33.7 16.7 56.7



#11
Acetonitrile
Concen: 2.65 ng
RT: 5.59 min Scan# 413
Delta R.T. -0.062 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

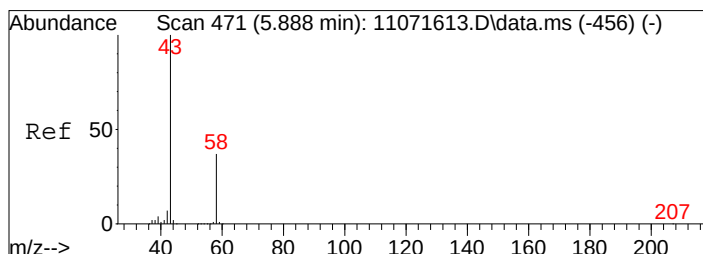
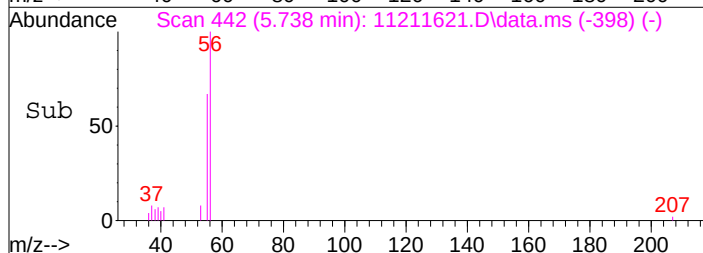
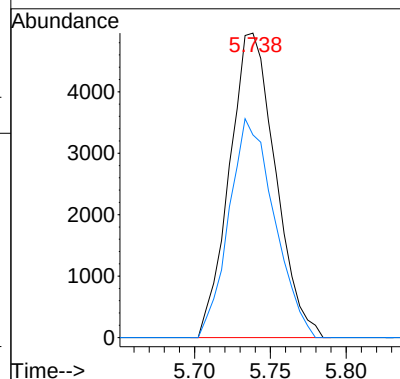
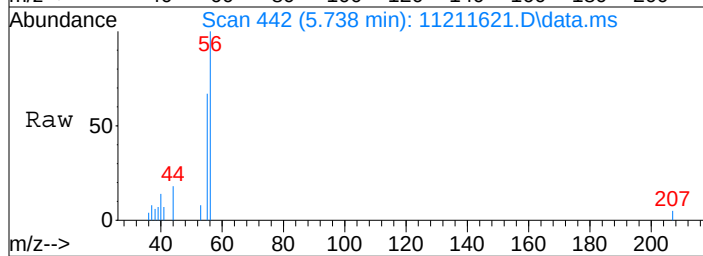
Tgt Ion: 41 Resp: 92909
Ion Ratio Lower Upper
41 100
40 51.4 33.0 73.0





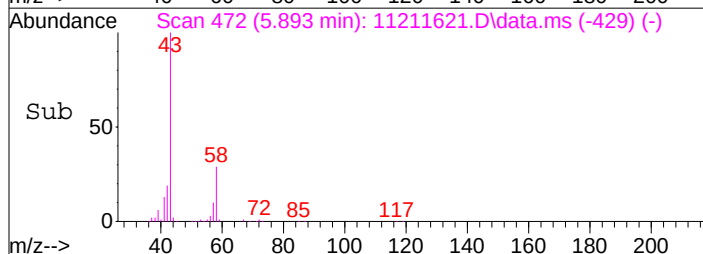
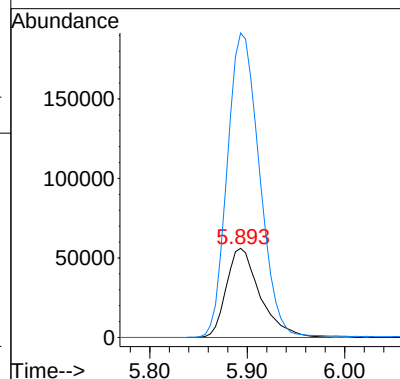
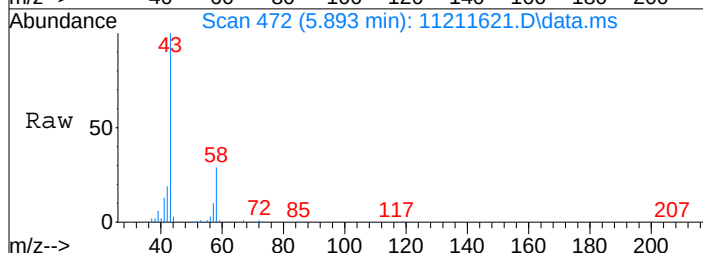
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Acrolein
Concen: 0.89 ng
RT: 5.74 min Scan# 442
Delta R.T. -0.021 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

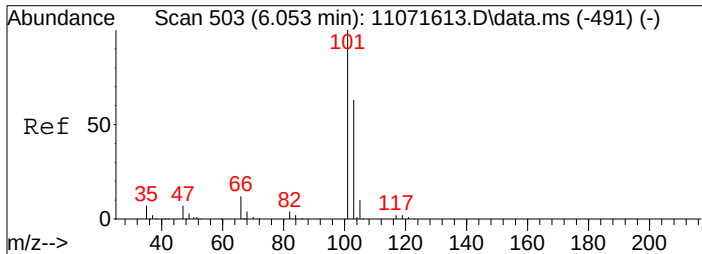
Tgt Ion: 56 Resp: 10444
Ion Ratio Lower Upper
56 100
55 70.8 50.4 90.4



#13
Acetone
Concen: 9.74 ng
RT: 5.89 min Scan# 472
Delta R.T. -0.026 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

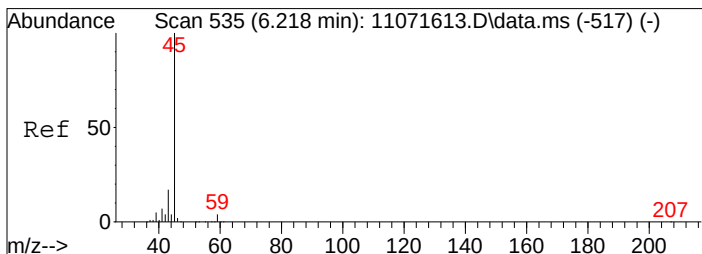
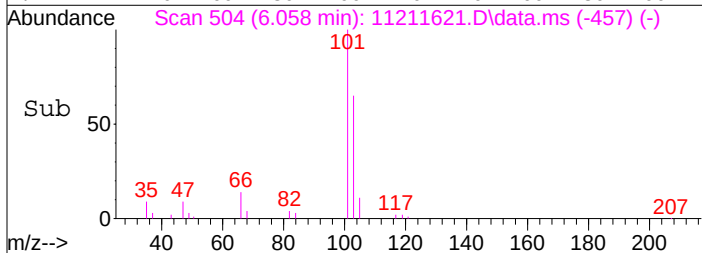
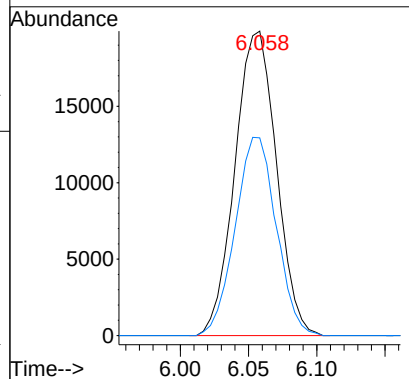
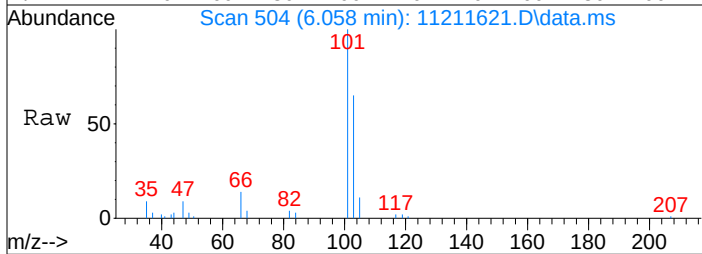
Tgt Ion: 58 Resp: 134977
Ion Ratio Lower Upper
58 100
43 329.3 276.2 336.2





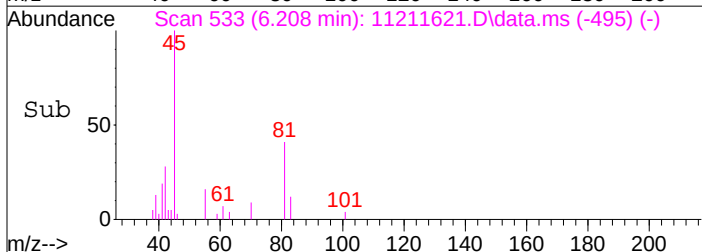
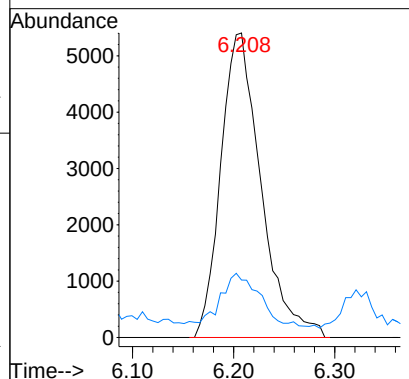
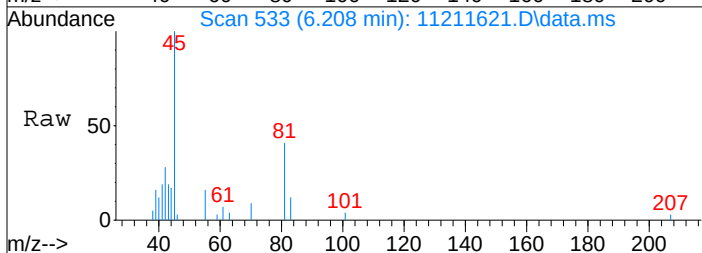
#14
 Trichlorofluoromethane
 Concen: 1.65 ng
 RT: 6.06 min Scan# 504
 Delta R.T. -0.005 min
 Lab File: 11211621.D
 Acq: 21 Nov 2016 20:02

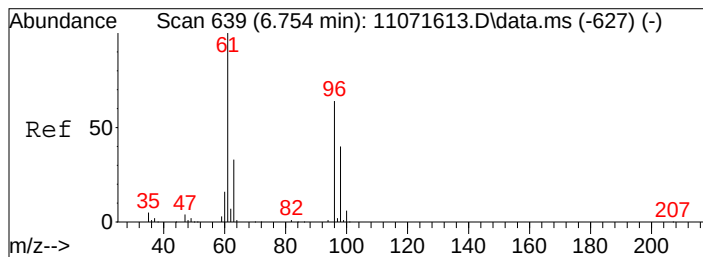
Tgt Ion: 101 Resp: 42222
 Ion Ratio Lower Upper
 101 100
 103 64.5 45.1 85.1



#15
 2-Propanol (Isopropanol)
 Concen: 0.35 ng
 RT: 6.21 min Scan# 533
 Delta R.T. -0.051 min
 Lab File: 11211621.D
 Acq: 21 Nov 2016 20:02

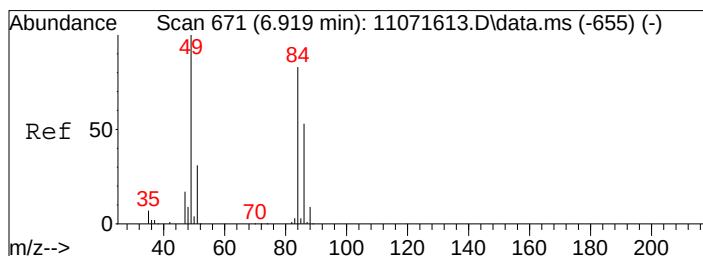
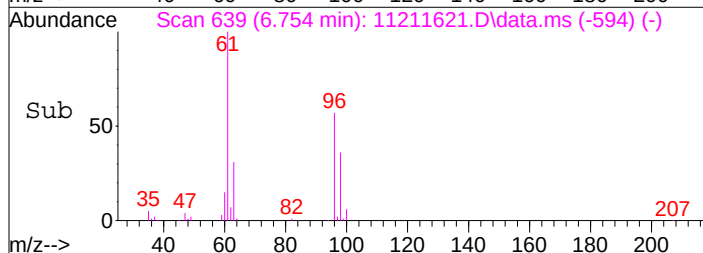
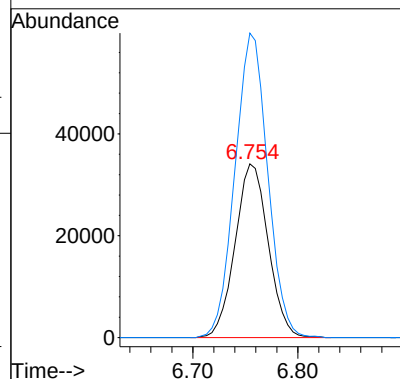
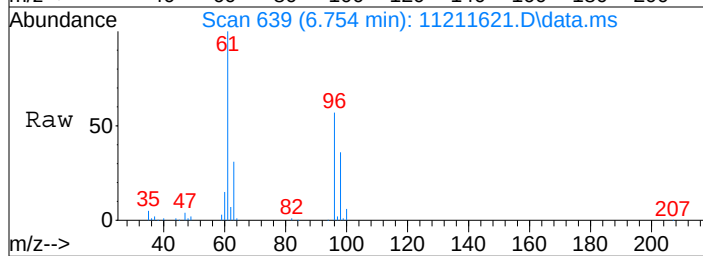
Tgt Ion: 45 Resp: 14891
 Ion Ratio Lower Upper
 45 100
 43 15.2 0.0 39.2





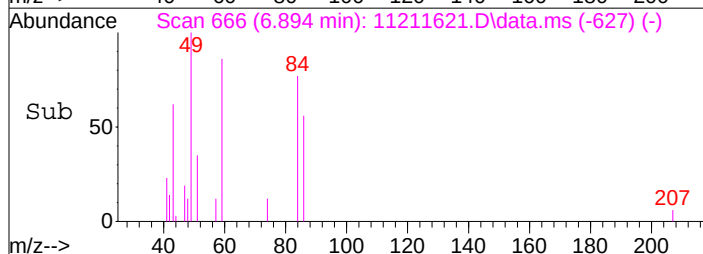
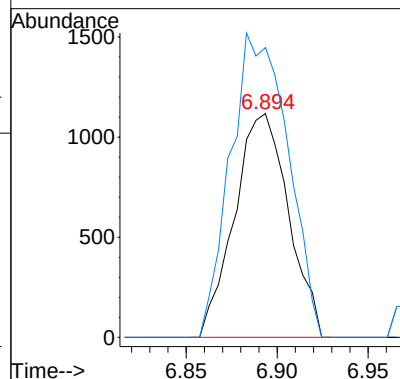
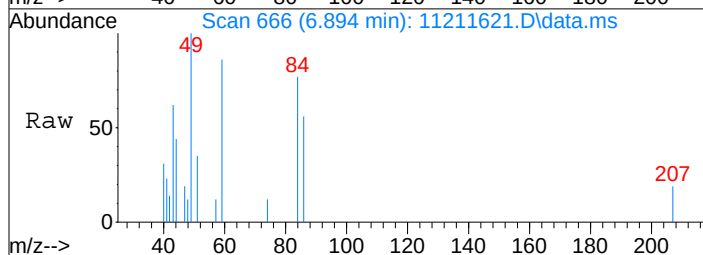
#17
1,1-Dichloroethene
Concen: 4.52 ng
RT: 6.75 min Scan# 639
Delta R.T. -0.015 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

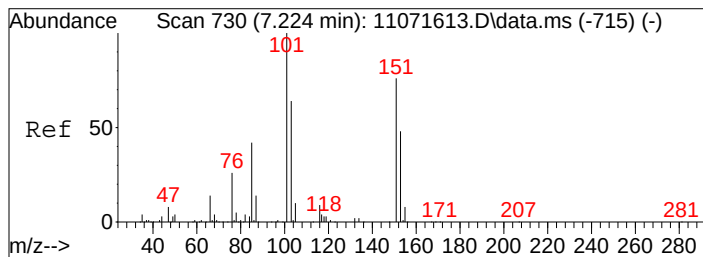
Tgt Ion: 96 Resp: 74758
Ion Ratio Lower Upper
96 100
61 172.9 145.9 185.9



#19
Methylene Chloride
Concen: 0.12 ng
RT: 6.89 min Scan# 666
Delta R.T. -0.046 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

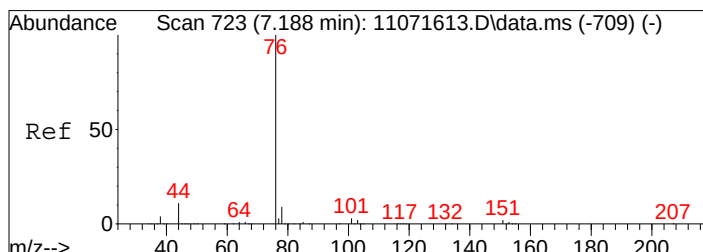
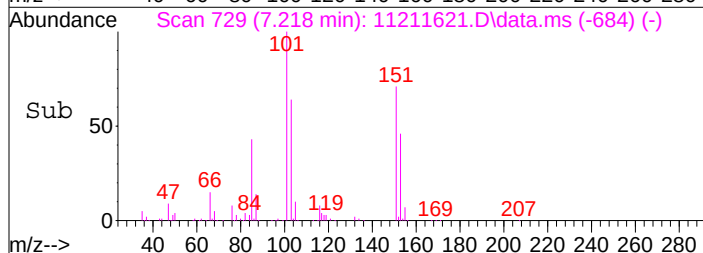
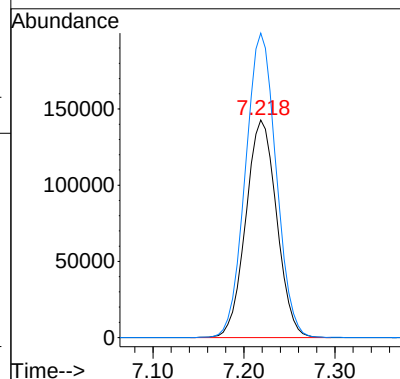
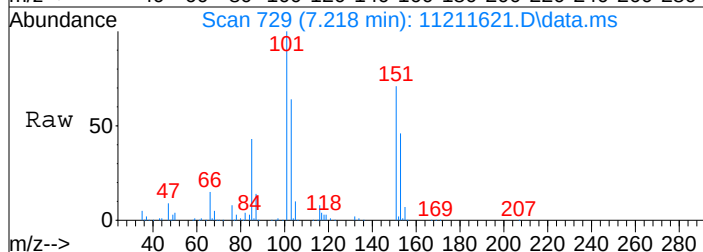
Tgt Ion: 84 Resp: 2311
Ion Ratio Lower Upper
84 100
49 144.3 100.9 150.9





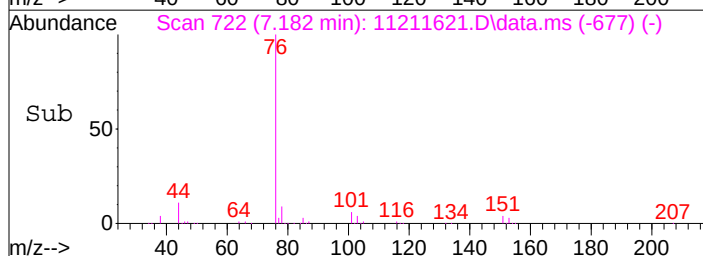
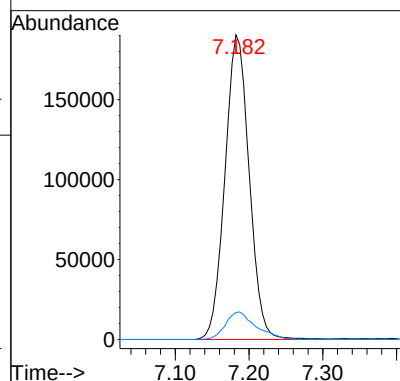
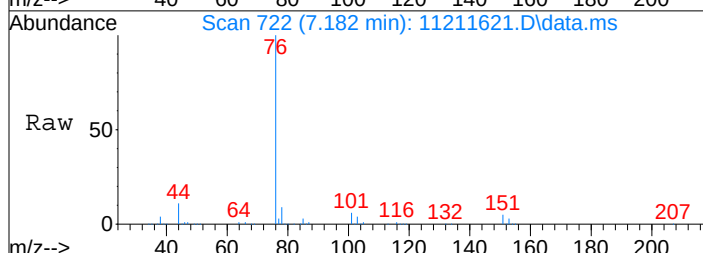
#21
Trichlorotrifluoroethane
Concen: 26.04 ng
RT: 7.22 min Scan# 729
Delta R.T. -0.015 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

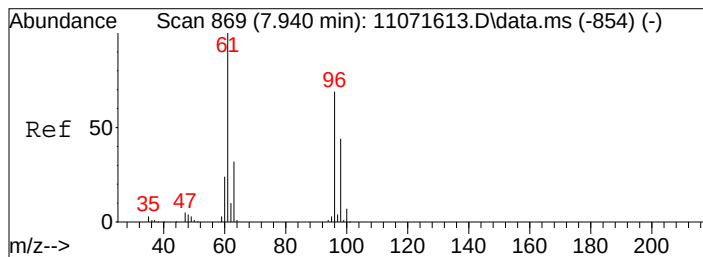
Tgt Ion: 151 Resp: 336801
Ion Ratio Lower Upper
151 100
101 139.3 114.4 154.4



#22
Carbon Disulfide
Concen: 7.24 ng
RT: 7.18 min Scan# 722
Delta R.T. -0.016 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

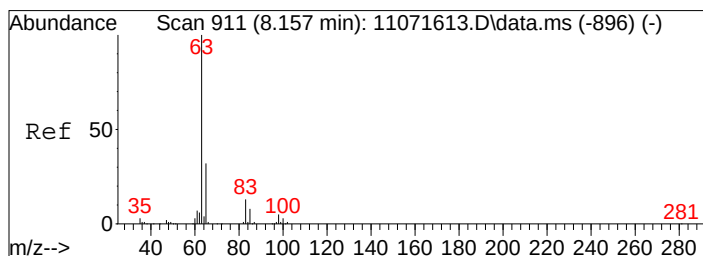
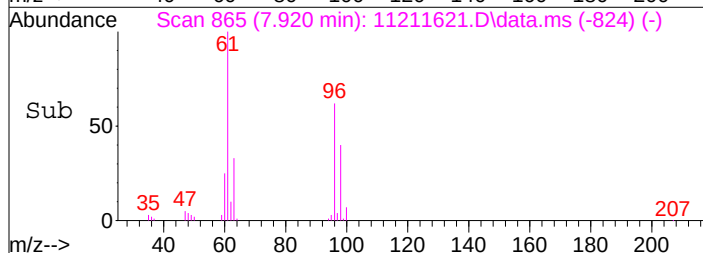
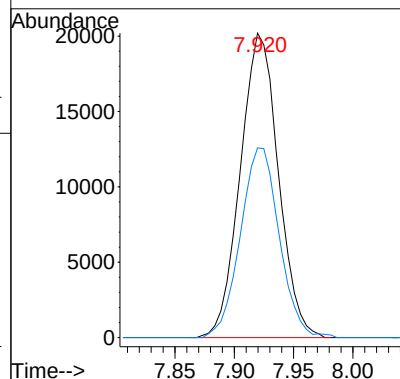
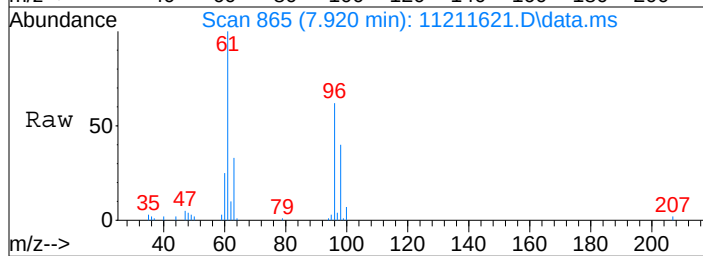
Tgt Ion: 76 Resp: 435118
Ion Ratio Lower Upper
76 100
78 11.2 0.0 29.8





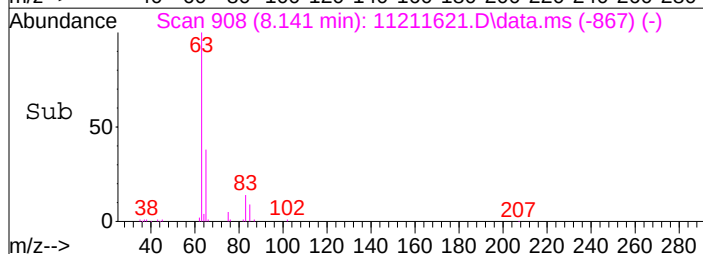
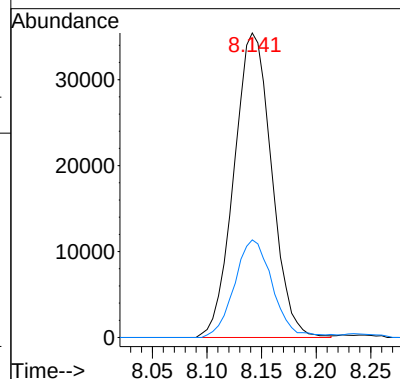
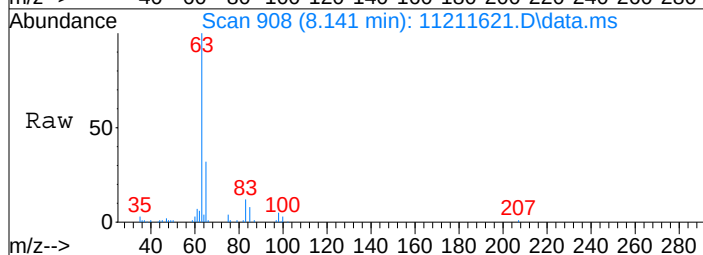
#23
trans-1,2-Dichloroethene
Concen: 1.80 ng
RT: 7.92 min Scan# 865
Delta R.T. -0.036 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

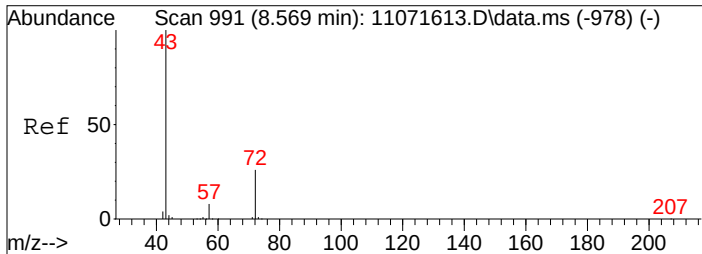
Tgt Ion: 61 Resp: 45051
Ion Ratio Lower Upper
61 100
96 63.7 48.5 88.5



#24
1,1-Dichloroethane
Concen: 2.68 ng
RT: 8.14 min Scan# 908
Delta R.T. -0.036 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

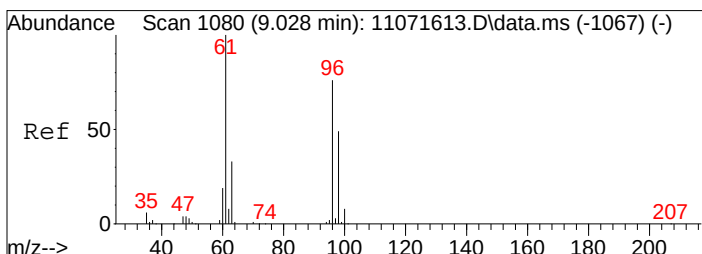
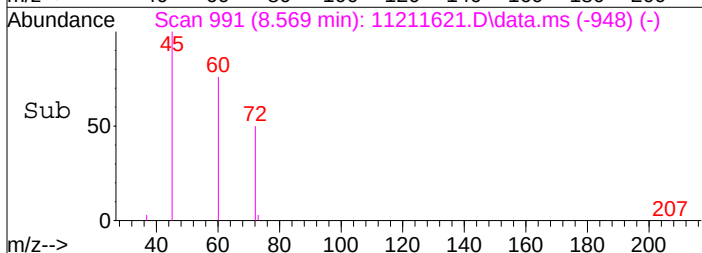
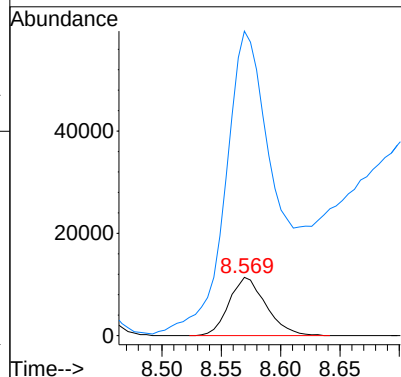
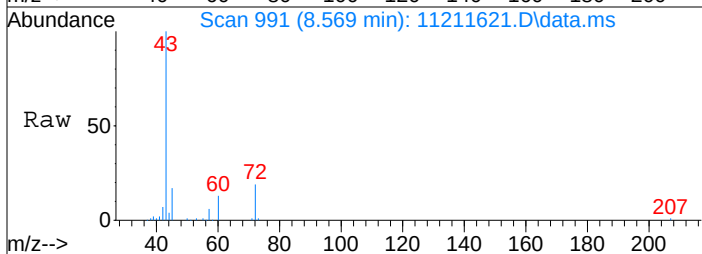
Tgt Ion: 63 Resp: 84913
Ion Ratio Lower Upper
63 100
65 32.7 12.1 52.1





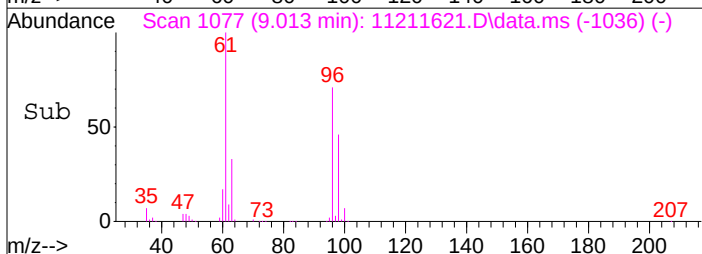
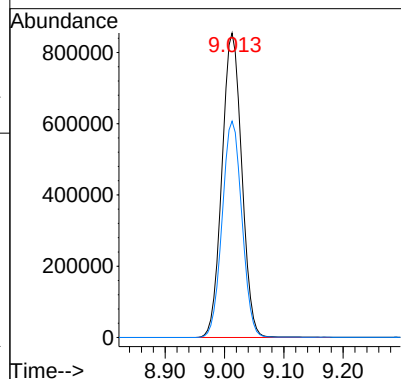
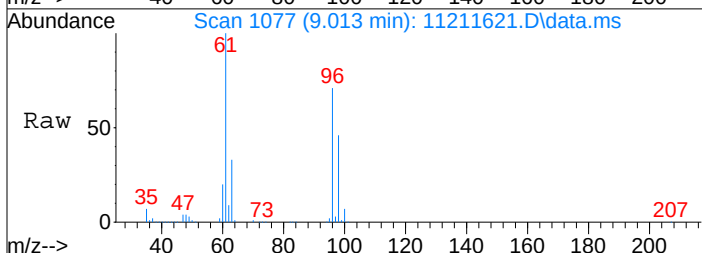
#27
2-Butanone (MEK)
Concen: 2.03 ng
RT: 8.57 min Scan# 991
Delta R.T. -0.026 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

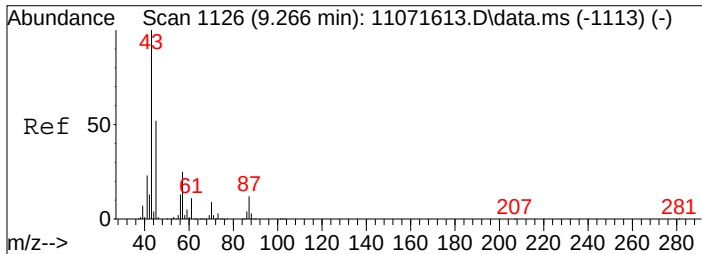
Tgt Ion: 72 Resp: 24587
Ion Ratio Lower Upper
72 100
43 741.4 354.3 394.3#



#28
cis-1,2-Dichloroethene
Concen: 83.45 ng
RT: 9.01 min Scan# 1077
Delta R.T. -0.036 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

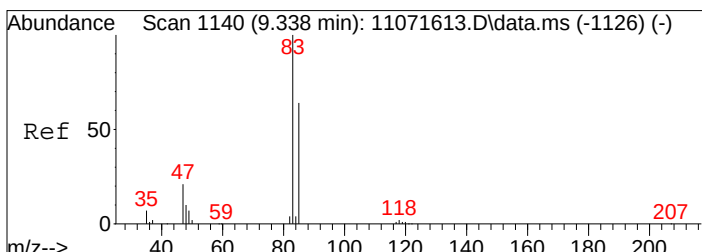
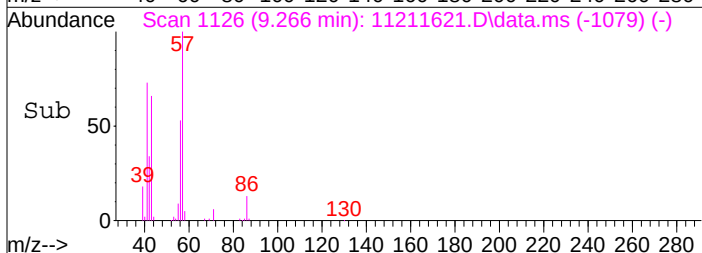
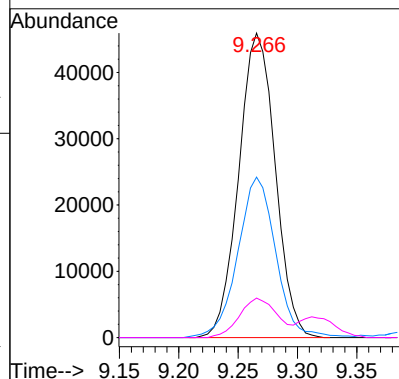
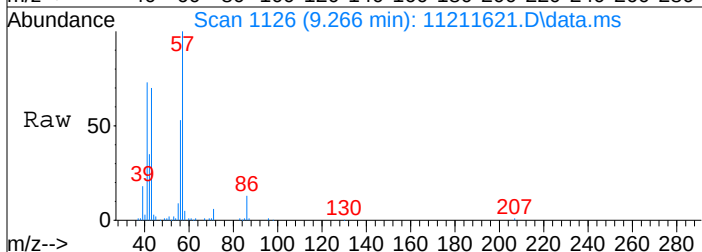
Tgt Ion: 61 Resp: 1981677
Ion Ratio Lower Upper
61 100
96 70.9 55.6 95.6





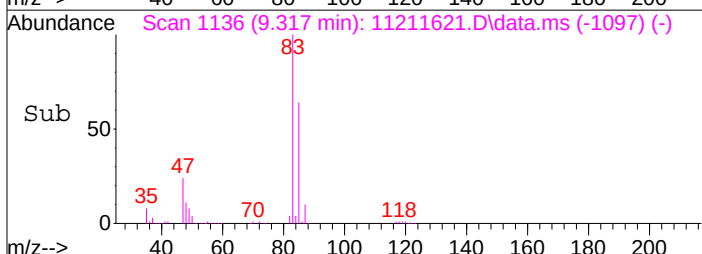
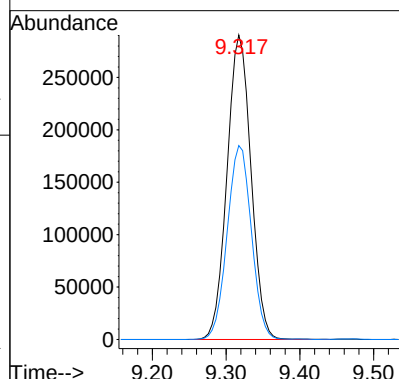
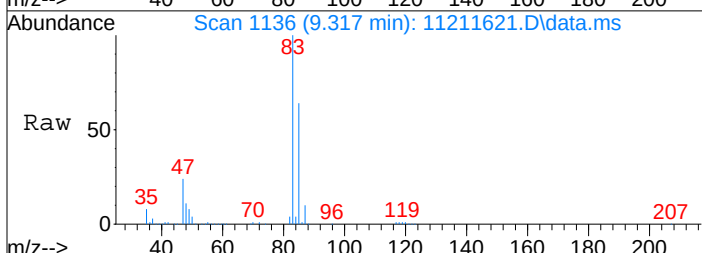
#31
n-Hexane
Concen: 3.57 ng
RT: 9.27 min Scan# 1126
Delta R.T. -0.005 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

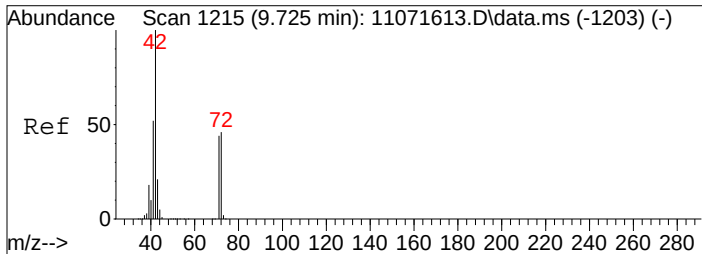
Tgt Ion	57	Resp	98153
Ion Ratio	57	100	
Lower	56	54.9	41.4
Upper	86	13.7	11.8



#32
Chloroform
Concen: 23.25 ng
RT: 9.32 min Scan# 1136
Delta R.T. -0.046 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

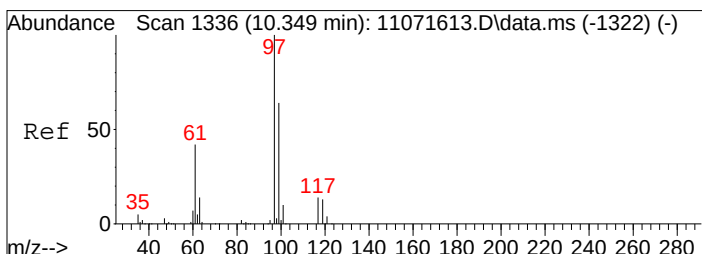
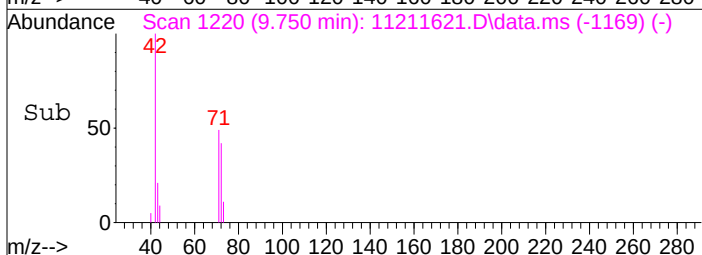
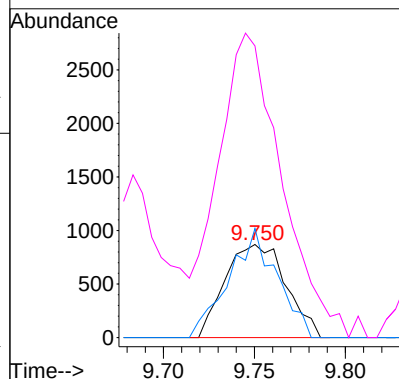
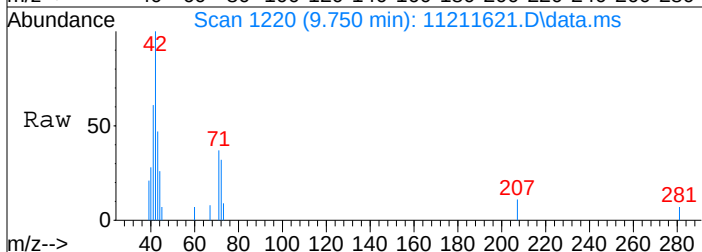
Tgt Ion	83	Resp	655988
Ion Ratio	83 <td>100</td> <td></td>	100	
Lower	85	64.3	45.5
Upper			85.5





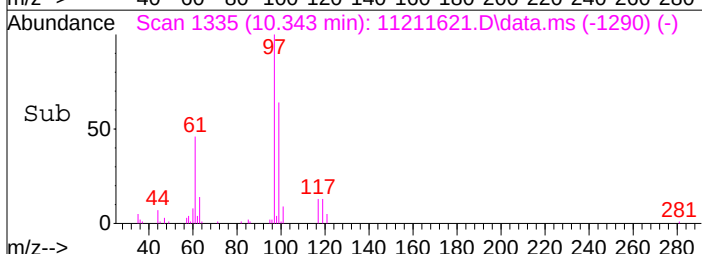
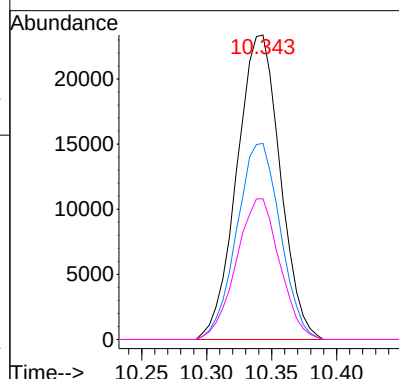
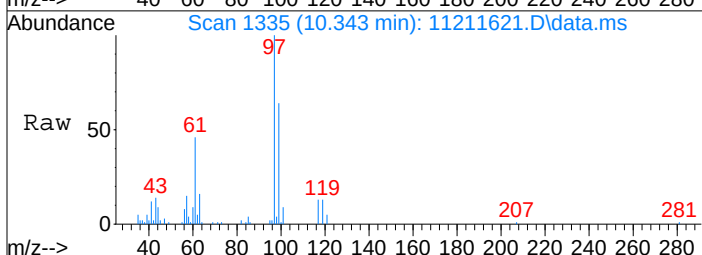
#34
Tetrahydrofuran (THF)
Concen: 0.16 ng
RT: 9.75 min Scan# 1220
Delta R.T. 0.016 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

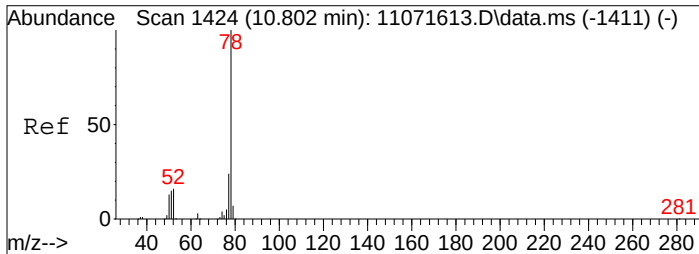
Tgt Ion: 72 Resp: 2030
Ion Ratio Lower Upper
72 100
71 92.5 77.1 117.1
42 343.4 194.1 234.1#



#38
1,1,1-Trichloroethane
Concen: 2.21 ng
RT: 10.34 min Scan# 1335
Delta R.T. -0.015 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

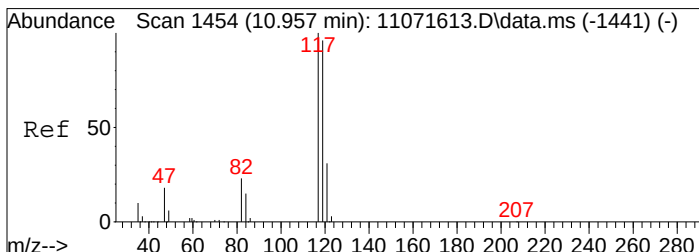
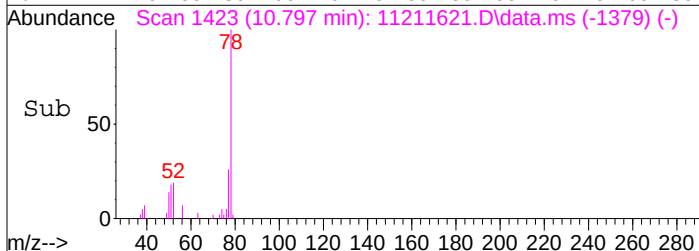
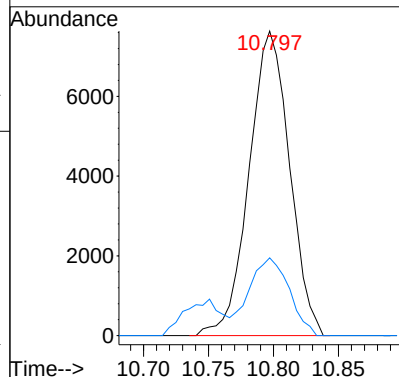
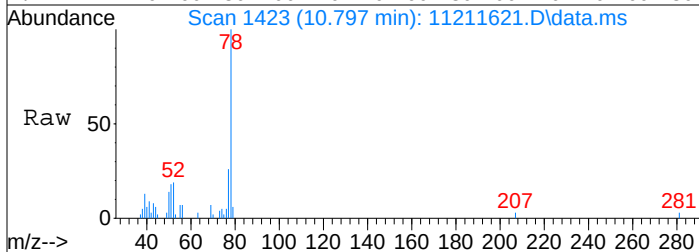
Tgt Ion: 97 Resp: 54181
Ion Ratio Lower Upper
97 100
99 64.8 44.1 84.1
61 46.3 24.6 64.6





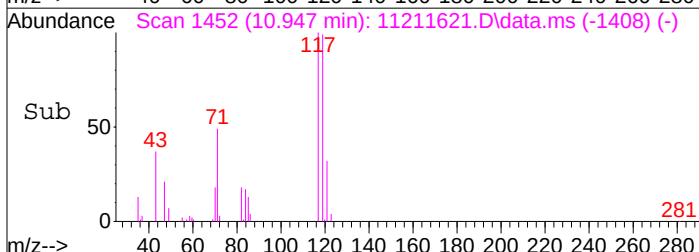
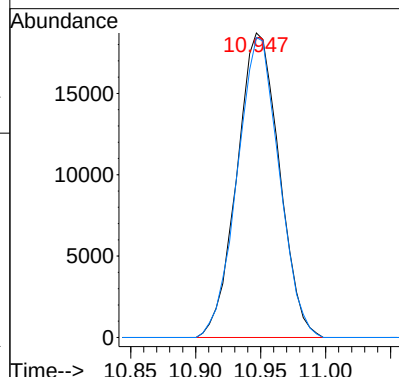
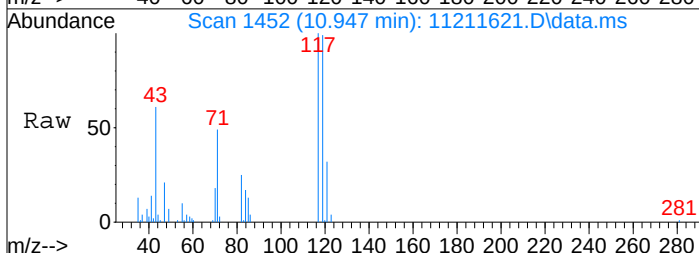
#41
Benzene
Concen: 0.22 ng
RT: 10.80 min Scan# 1423
Delta R.T. -0.021 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

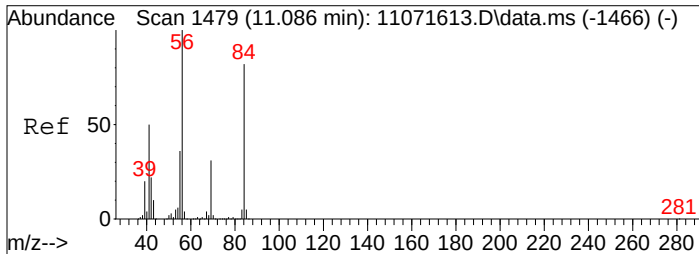
Tgt Ion: 78 Resp: 16558
Ion Ratio Lower Upper
78 100
77 25.3 3.9 43.9



#42
Carbon Tetrachloride
Concen: 2.03 ng
RT: 10.95 min Scan# 1452
Delta R.T. -0.021 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

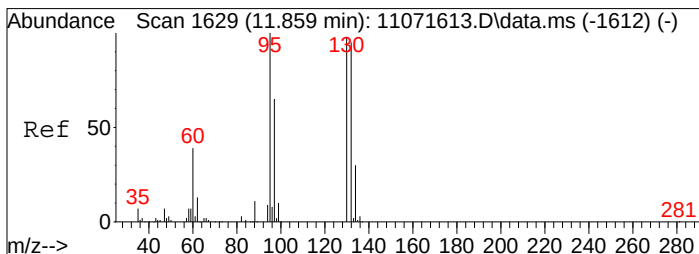
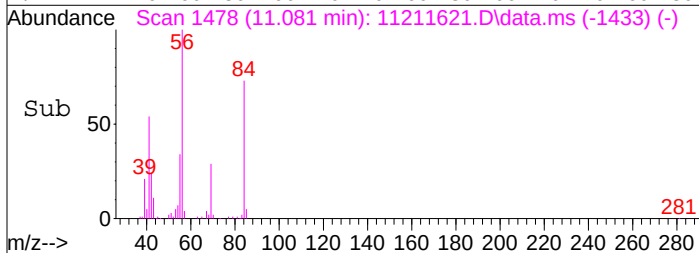
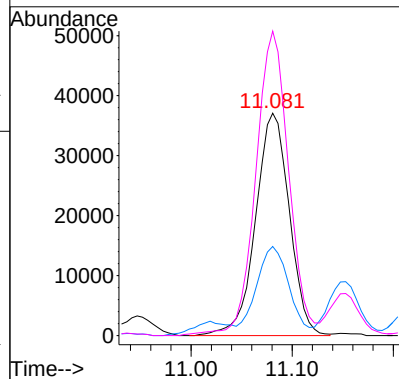
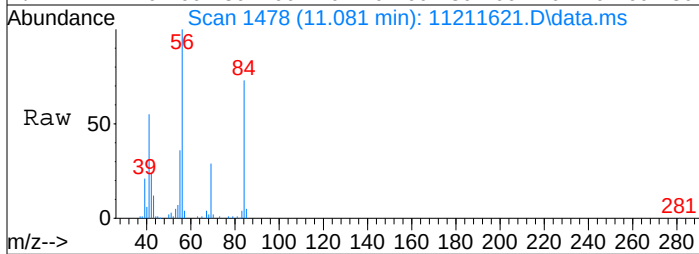
Tgt Ion: 117 Resp: 42377
Ion Ratio Lower Upper
117 100
119 97.4 75.6 115.6





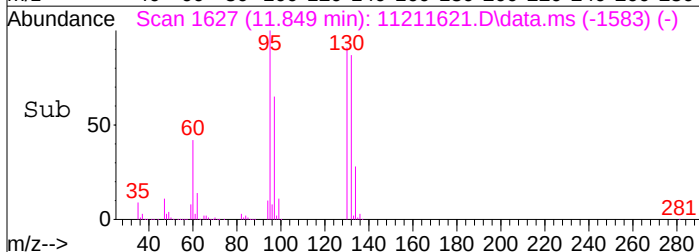
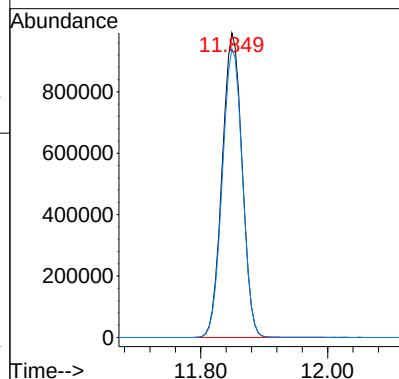
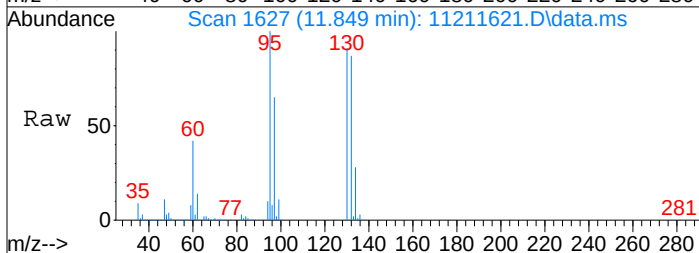
#43
Cyclohexane
Concen: 3.20 ng
RT: 11.08 min Scan# 1478
Delta R.T. -0.015 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

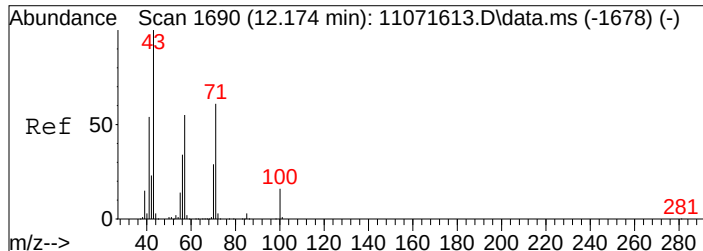
Tgt Ion: 84 Resp: 86192
Ion Ratio Lower Upper
84 100
69 38.5 17.5 57.5
56 132.7 96.9 136.9



#47
Trichloroethene
Concen: 125.63 ng
RT: 11.85 min Scan# 1627
Delta R.T. -0.021 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

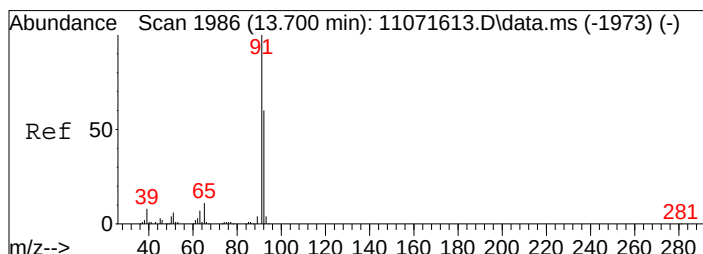
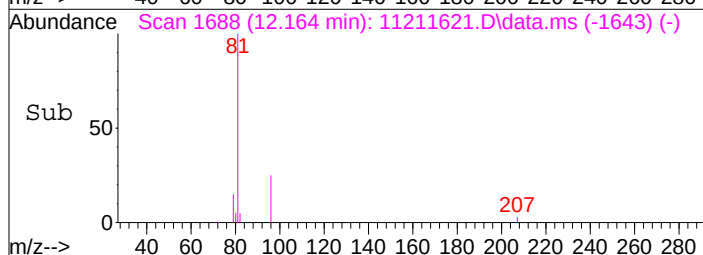
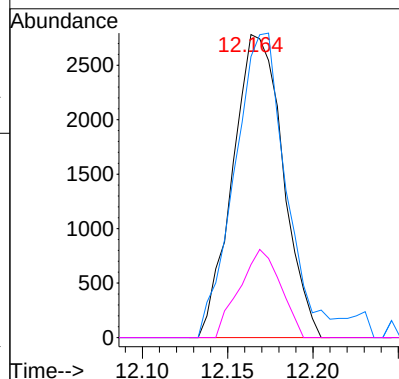
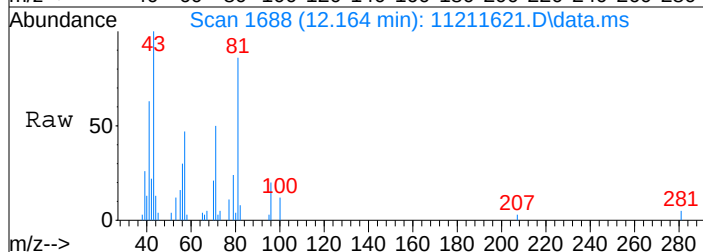
Tgt Ion: 130 Resp: 2161278
Ion Ratio Lower Upper
130 100
132 95.5 75.3 115.3





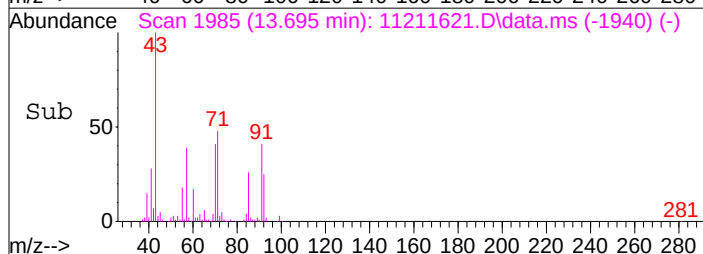
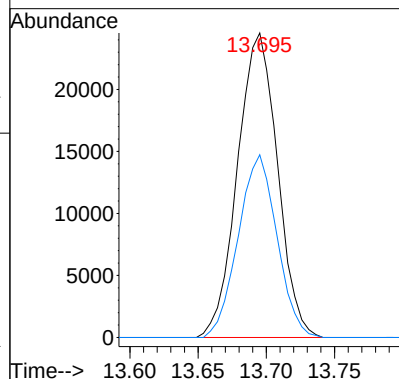
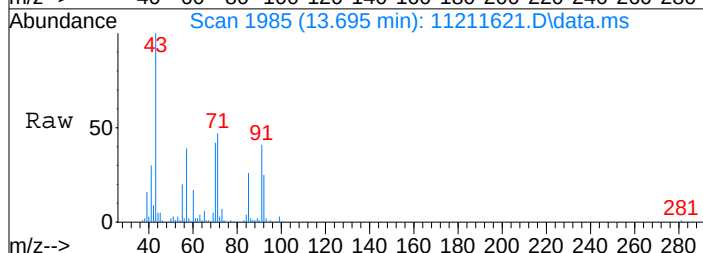
#51
n-Heptane
Concen: 0.31 ng
RT: 12.16 min Scan# 1688
Delta R.T. -0.015 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

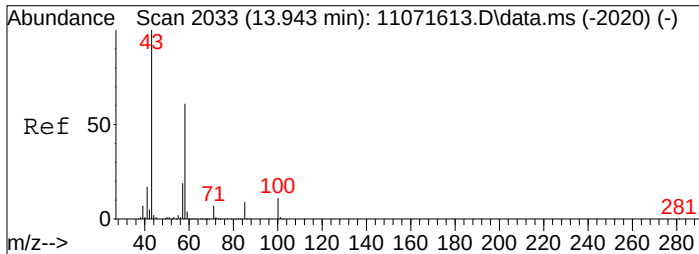
Tgt Ion: 71 Resp: 5693
Ion Ratio Lower Upper
71 100
57 103.1 69.2 109.2
100 23.9 6.2 46.2



#58
Toluene
Concen: 0.65 ng
RT: 13.70 min Scan# 1985
Delta R.T. -0.015 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

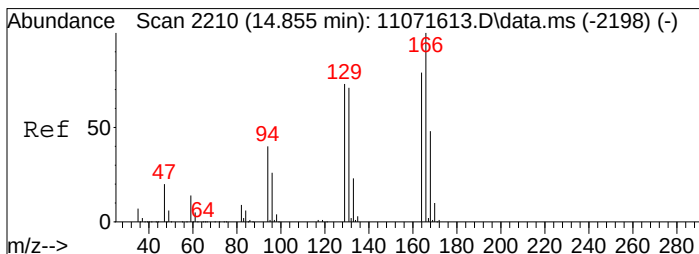
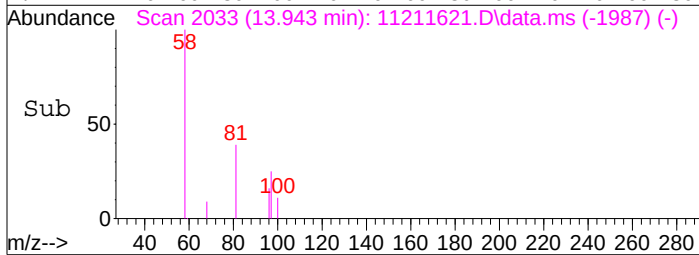
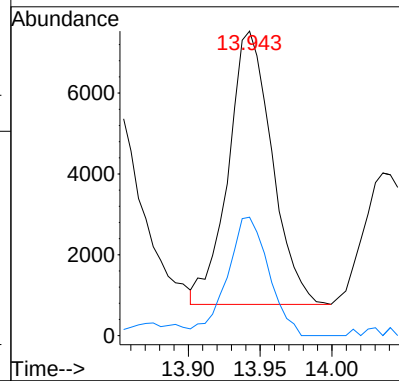
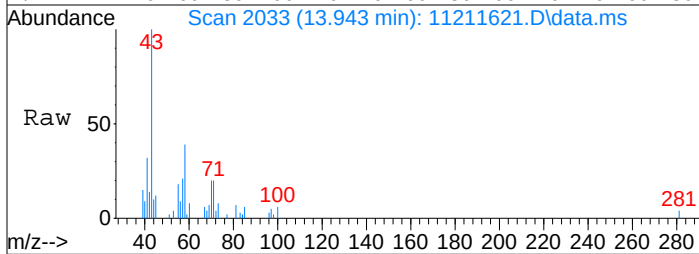
Tgt Ion: 91 Resp: 50165
Ion Ratio Lower Upper
91 100
92 58.1 38.4 78.4





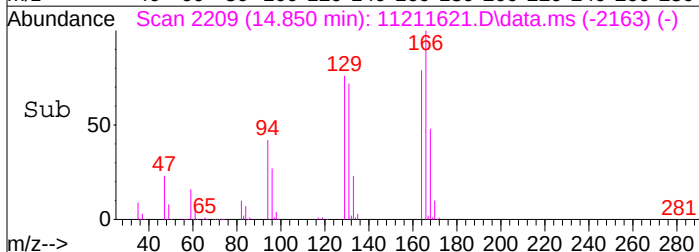
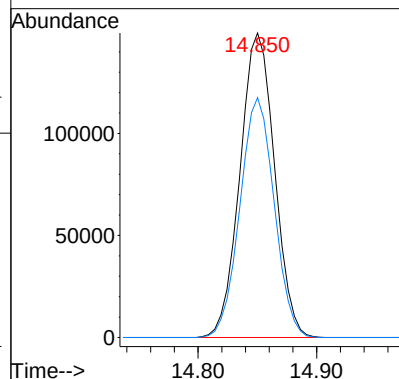
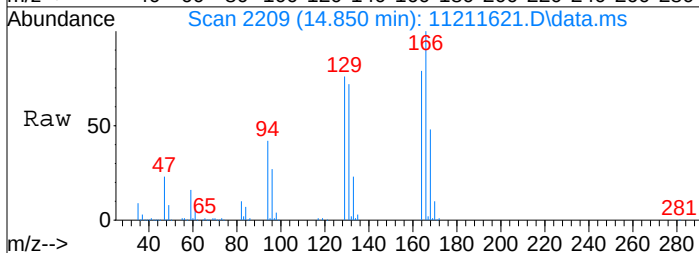
#59
2-Hexanone
Concen: 0.37 ng
RT: 13.94 min Scan# 2033
Delta R.T. -0.010 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

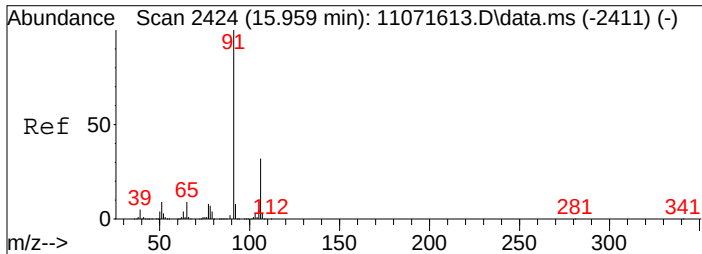
Tgt Ion: 43 Resp: 14316
Ion Ratio Lower Upper
43 100
58 40.9 38.3 78.3



#64
Tetrachloroethene
Concen: 16.48 ng
RT: 14.85 min Scan# 2209
Delta R.T. -0.010 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

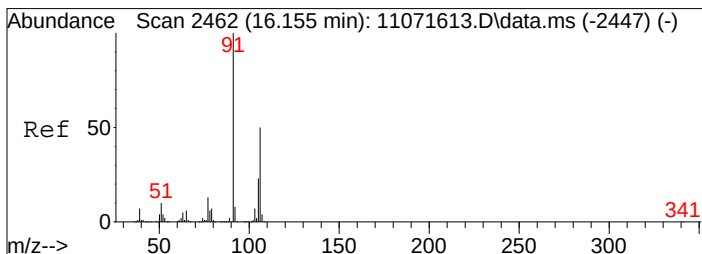
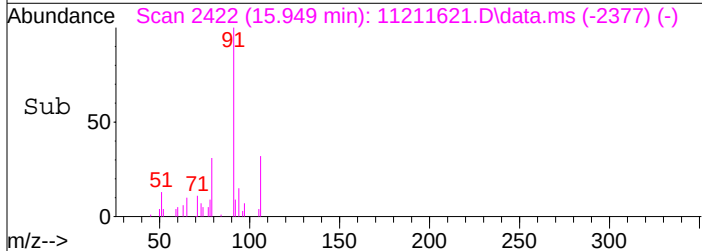
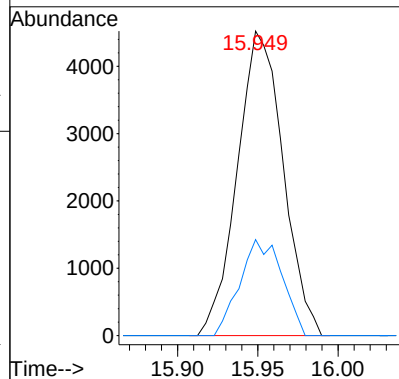
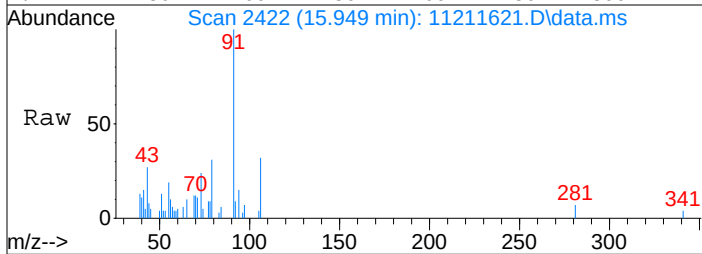
Tgt Ion: 166 Resp: 302337
Ion Ratio Lower Upper
166 100
164 78.0 58.7 98.7





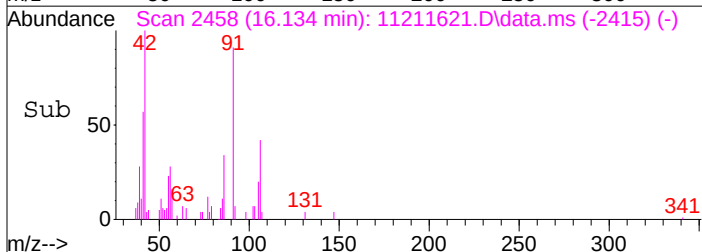
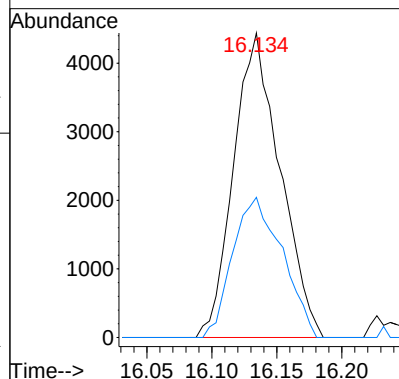
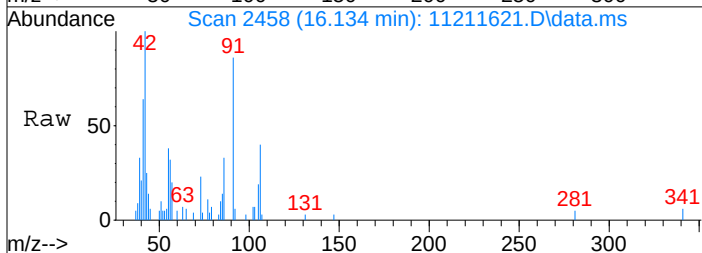
#66
Ethylbenzene
Concen: 0.11 ng
RT: 15.95 min Scan# 2422
Delta R.T. -0.015 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

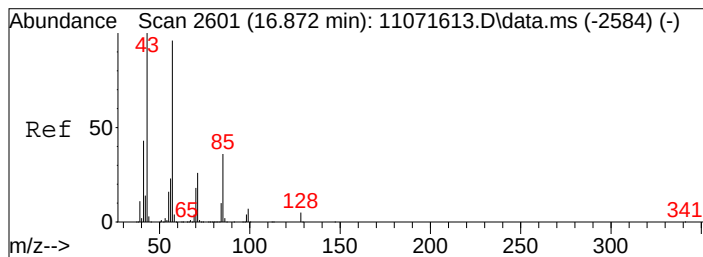
Tgt Ion: 91 Resp: 8975
Ion Ratio Lower Upper
91 100
106 29.0 11.5 51.5



#67
m- & p-Xylenes
Concen: 0.17 ng
RT: 16.13 min Scan# 2458
Delta R.T. -0.026 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

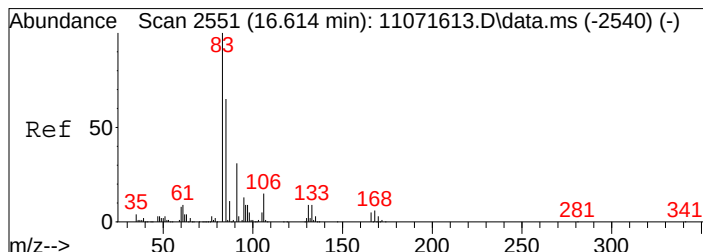
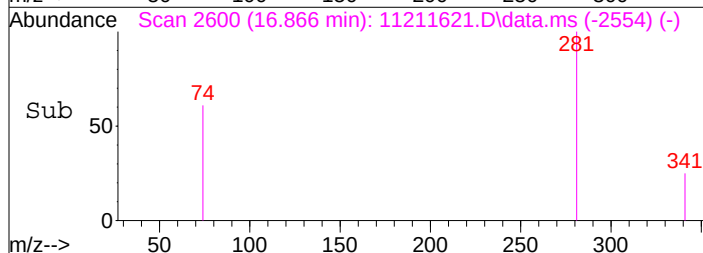
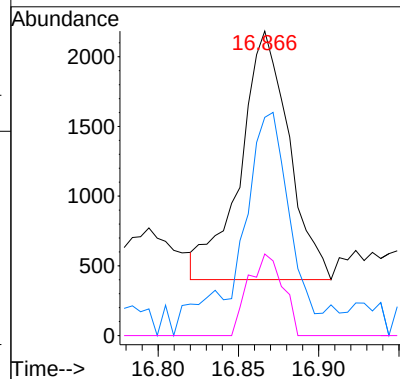
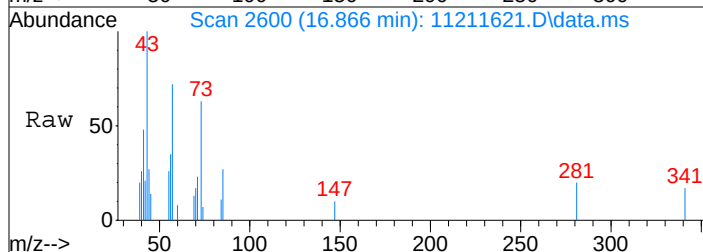
Tgt Ion: 91 Resp: 11040
Ion Ratio Lower Upper
91 100
106 49.1 29.1 69.1





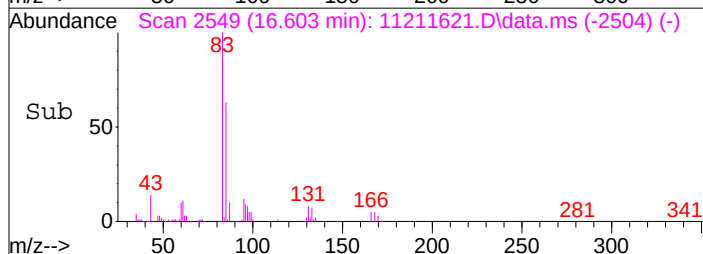
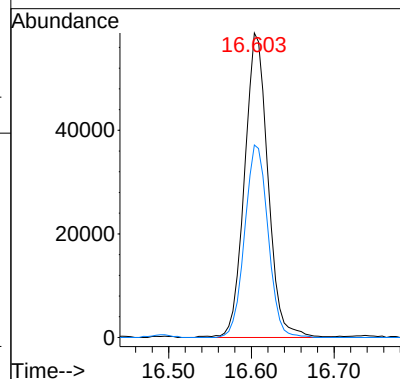
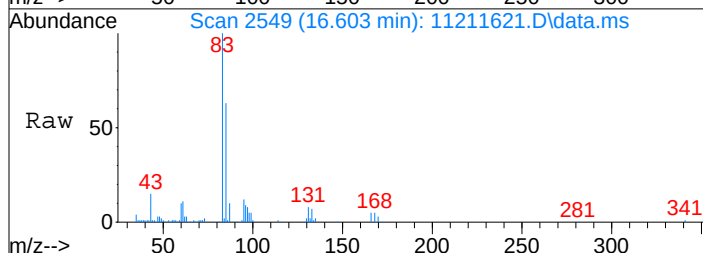
#71
n-Nonane
Concen: 0.10 ng
RT: 16.87 min Scan# 2600
Delta R.T. -0.010 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

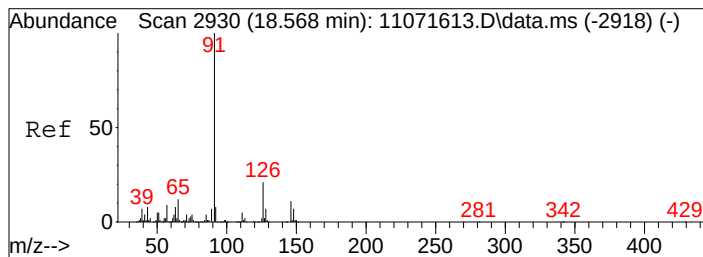
Tgt Ion: 43 Resp: 3770
Ion Ratio Lower Upper
43 100
57 92.9 74.5 114.5
85 23.1 16.8 56.8



#72
1,1,2,2-Tetrachloroethane
Concen: 3.59 ng
RT: 16.60 min Scan# 2549
Delta R.T. -0.015 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

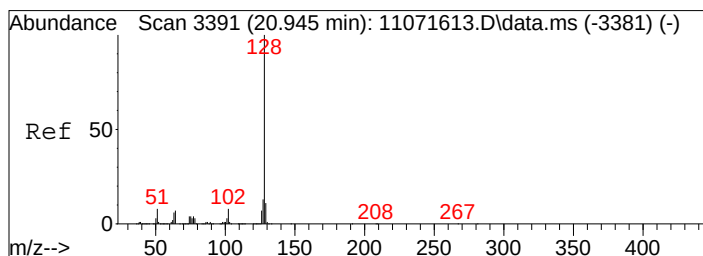
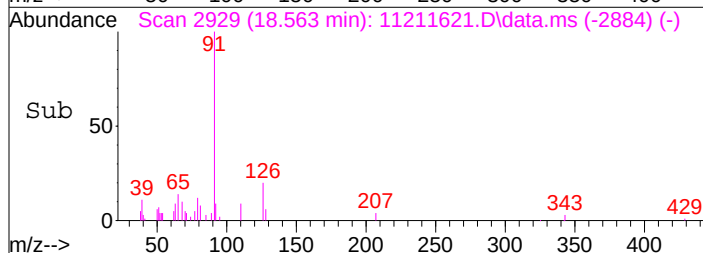
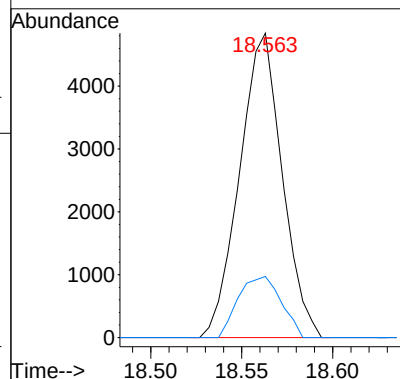
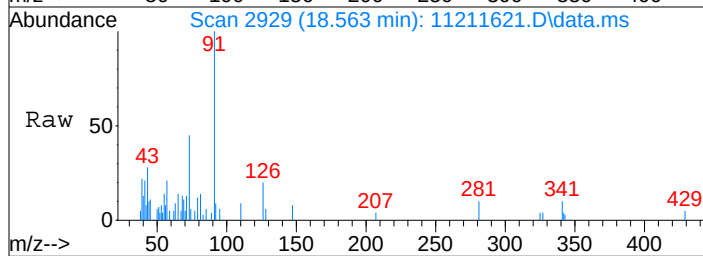
Tgt Ion: 83 Resp: 115617
Ion Ratio Lower Upper
83 100
85 63.0 44.5 84.5





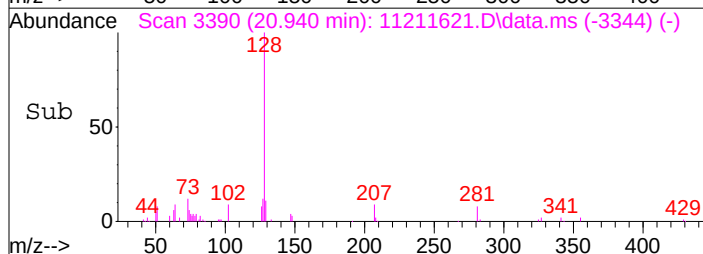
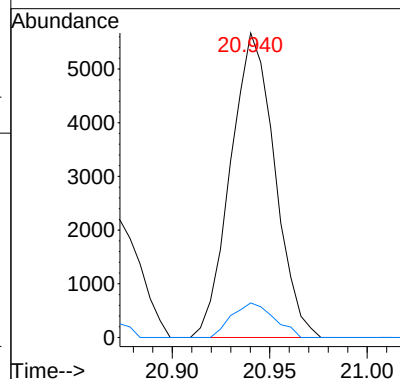
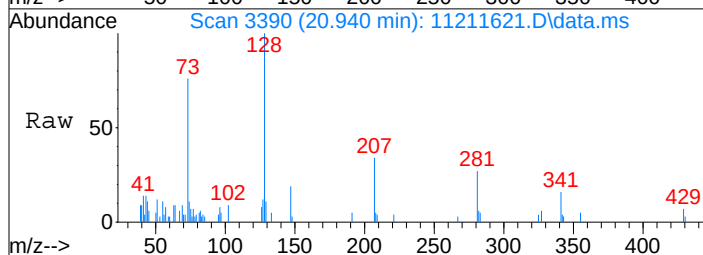
#84
Benzyl Chloride
Concen: 0.13 ng
RT: 18.56 min Scan# 2929
Delta R.T. -0.015 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

Tgt Ion: 91 Resp: 7885
Ion Ratio Lower Upper
91 100
126 20.2 0.8 40.8



#95
Naphthalene
Concen: 0.11 ng
RT: 20.94 min Scan# 3390
Delta R.T. -0.010 min
Lab File: 11211621.D
Acq: 21 Nov 2016 20:02

Tgt Ion: 128 Resp: 8942
Ion Ratio Lower Upper
128 100
129 10.9 0.0 31.1



Data File: I:\MS09\Data\2016 11\21\11211621.D

Acq On : 21 Nov 2016 20:02

Operator: SC

Sample : P1605349-002 (1000mL)

Misc : S29-10261601

ALS Vial : 11 Sample Multiplier: 1

Quant Time: Nov 22 09:39:11 2016

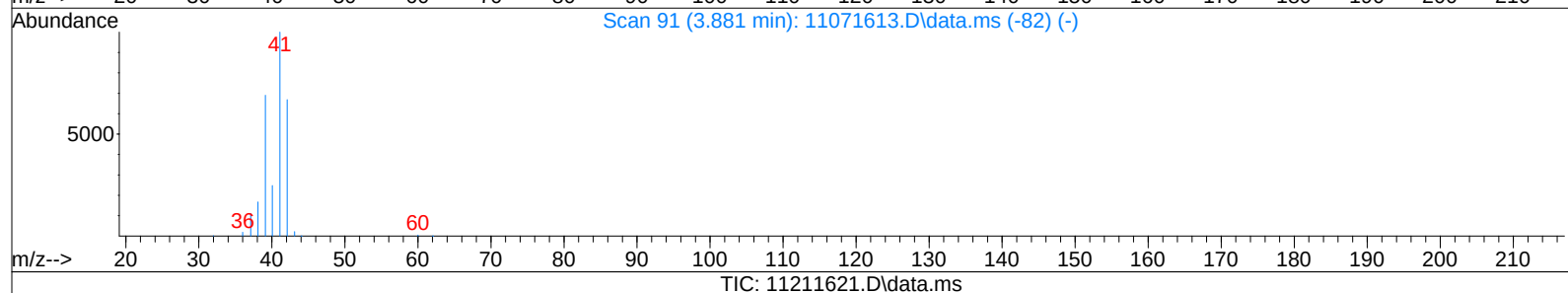
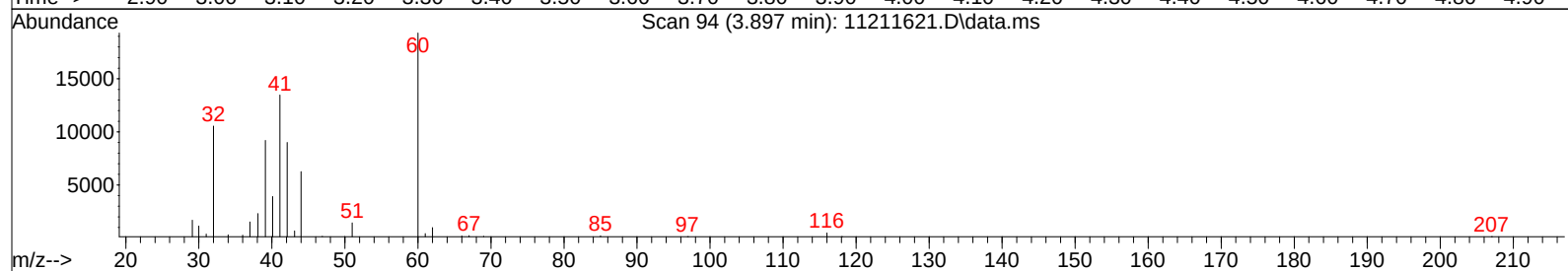
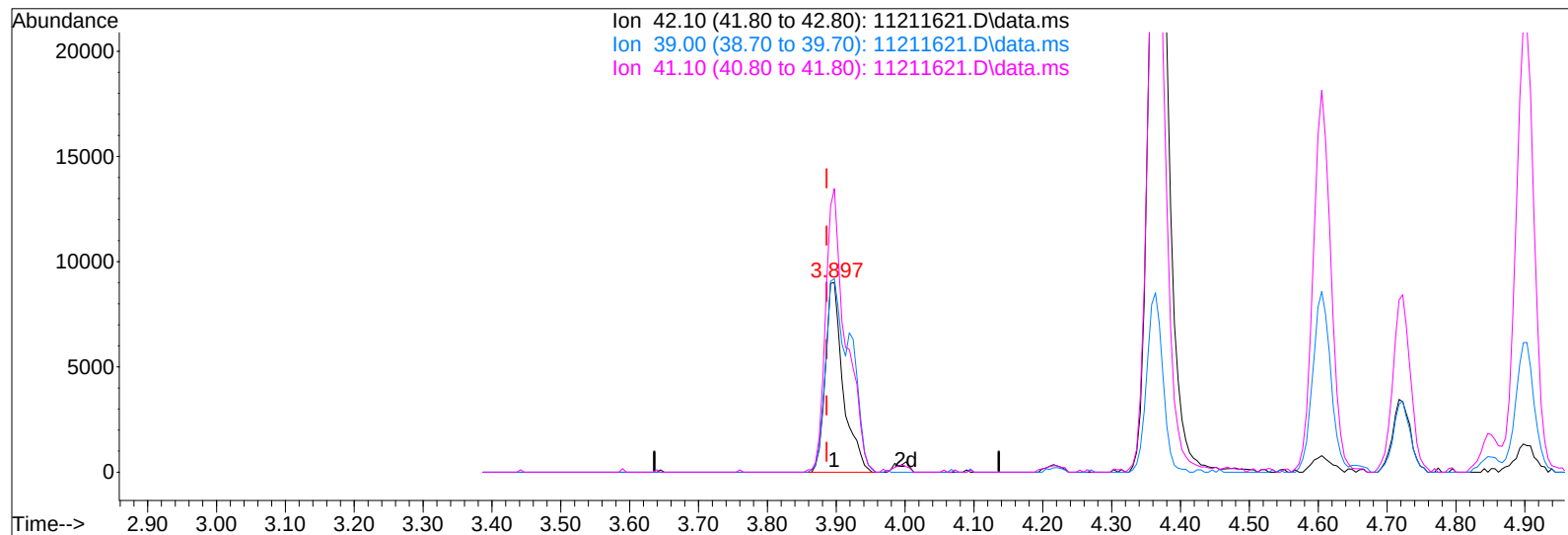
Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 11211621.D\data.ms

(2) Propene (T)

3.897min (+0.011) 0.75ng

response 16222

Ion	Exp%	Act%
42.10	100	100
39.00	112.50	98.64
41.10	150.50	171.27#
0.00	0.00	0.00

Data File: I:\MS09\Data\2016 11\21\11211621.D

Acq On : 21 Nov 2016 20:02

Operator: SC

Sample : P1605349-002 (1000mL)

Misc : S29-10261601

ALS Vial : 11 Sample Multiplier: 1

Quant Time: Nov 22 09:39:11 2016

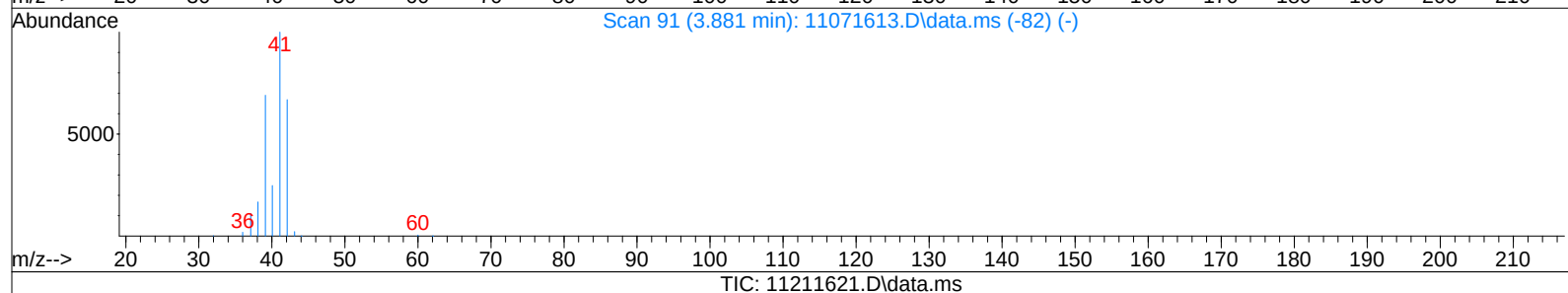
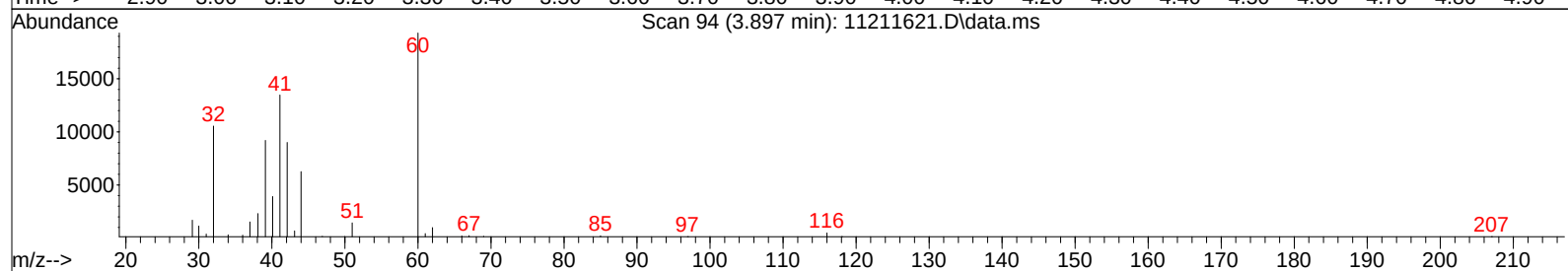
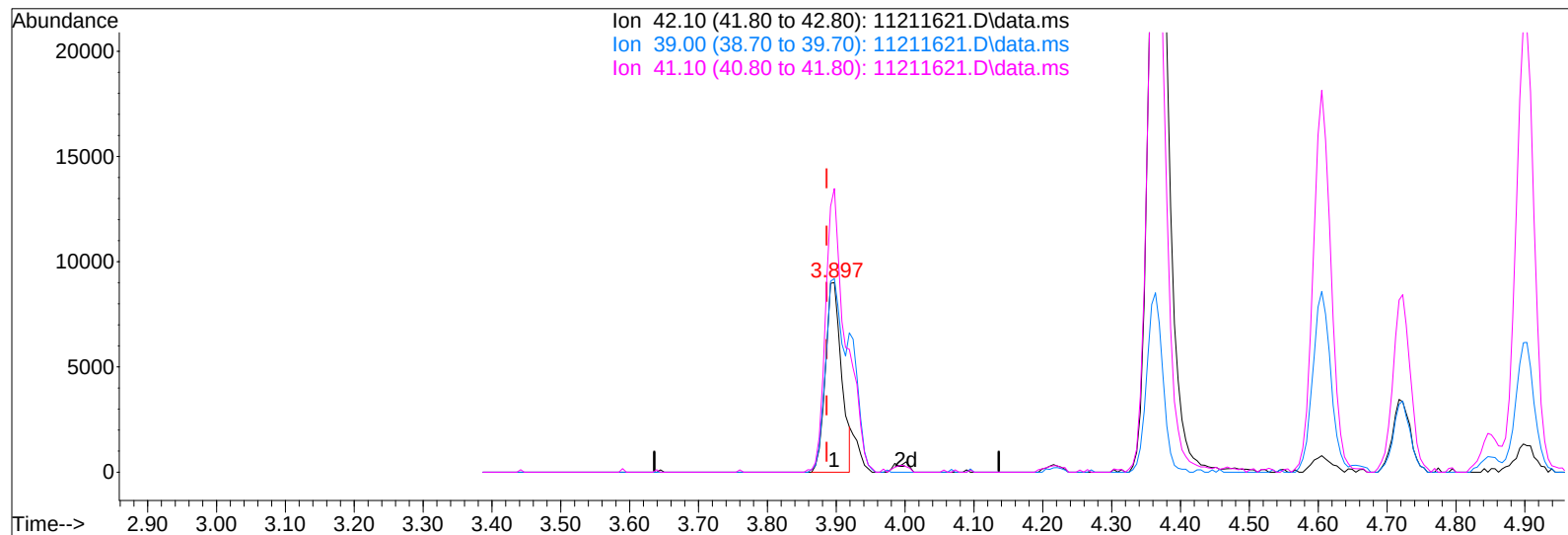
Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 11211621.D\data.ms

(2) Propene (T)

3.897min (+0.011) 0.68ng m

response 14700

IPC

Ion	Exp%	Act%
42.10	100	100
39.00	112.50	108.85
41.10	150.50	189.00#
0.00	0.00	0.00

11/22/16

11/28/16

Data File: I:\MS09\Data\2016 11\22\11221608.D

Acq On : 22 Nov 2016 14:24

Operator: SC

Sample : P1605349-002Dil (100mL)

Misc : S29-10261601

ALS Vial : 11 Sample Multiplier: 1

 11/22/16

Quant Time: Nov 22 14:54:41 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.17	130	148365	12.500	ng	-0.05
37) 1,4-Difluorobenzene (IS2)	11.15	114	741618	12.500	ng	-0.03
56) Chlorobenzene-d5 (IS3)	15.51	82	341267	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.96	65	246174	13.867	ng	-0.04
Spiked Amount	12.500	Range	70 - 130	Recovery	=	110.96%
57) Toluene-d8 (SS2)	13.59	98	827924	11.949	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.60%
73) Bromofluorobenzene (SS3)	17.09	174	211571	11.393	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	91.12%

Target Compounds

						Qvalue
2) Propene	0.00	42	0	N.D.	d	
3) Dichlorodifluoromethan...	4.02	85	15054	0.488	ng	99
4) Chloromethane	4.21	50	964	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.		
6) Vinyl Chloride	4.50	62	520	N.D.		
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	5.45	45	55	N.D.		
11) Acetonitrile	5.59	41	10372	0.299	ng	97
12) Acrolein	5.74	56	1136	0.098	ng	95
13) Acetone	5.90	58	18281	1.333	ng	92
14) Trichlorofluoromethane	6.06	101	4272	0.169	ng	99
15) 2-Propanol (Isopropanol)	6.20	45	2957	N.D.		
16) Acrylonitrile	0.00	53	0	N.D.		
17) 1,1-Dichloroethene	6.76	96	7658	0.468	ng	97
18) 2-Methyl-2-Propanol (t...	6.88	59	1498	N.D.		
19) Methylene Chloride	6.89	84	467	N.D.		
20) 3-Chloro-1-propene (Al...	6.97	41	2183	N.D.		
21) Trichlorotrifluoroethane	7.22	151	34102	2.665	ng	95
22) Carbon Disulfide	7.18	76	48228	0.811	ng	96
23) trans-1,2-Dichloroethene	7.92	61	4549	0.183	ng	96
24) 1,1-Dichloroethane	8.14	63	8716	0.278	ng	99
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.	d	
27) 2-Butanone (MEK)	8.58	72	2306	0.192	ng	# 40
28) cis-1,2-Dichloroethene	9.01	61	213253	9.075	ng	93
29) Diisopropyl Ether	0.00	87	0	N.D.	d	
30) Ethyl Acetate	0.00	61	0	N.D.	d	
31) n-Hexane	9.26	57	10623	0.391	ng	99
32) Chloroform	9.31	83	66618	2.386	ng	99
34) Tetrahydrofuran (THF)	0.00	72	0	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	0.00	62	0	N.D.		
38) 1,1,1-Trichloroethane	10.33	97	6306	0.257	ng	98
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	10.79	78	2538	N.D.		
42) Carbon Tetrachloride	10.95	117	4725	0.226	ng	98
43) Cyclohexane	11.08	84	9138	0.339	ng	86
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	11.74	83	1429	N.D.		
47) Trichloroethene	11.84	130	226236	13.139	ng	99
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d	

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Data File: I:\MS09\Data\2016 11\22\11221608.D

Acq On : 22 Nov 2016 14:24

Operator: SC

Sample : P1605349-002Dil (100mL)

Misc : S29-10261601

ALS Vial : 11 Sample Multiplier: 1

Quant Time: Nov 22 14:54:41 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.84	100	420	N.D.		
51) n-Heptane	12.16	71	508	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	13.69	91	5795	N.D.		
59) 2-Hexanone	13.94	43	1803	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	14.59	43	432	N.D.		
63) n-Octane	0.00	57	0	N.D.		
64) Tetrachloroethene	14.85	166	30141	1.610 ng		99
65) Chlorobenzene	0.00	112	0	N.D.		
66) Ethylbenzene	15.95	91	1191	N.D.		
67) m- & p-Xylenes	16.13	91	1753	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	0.00	104	0	N.D.		
70) o-Xylene	0.00	91	0	N.D.		
71) n-Nonane	16.88	43	401	N.D.		
72) 1,1,2,2-Tetrachloroethane	16.61	83	11216	0.342 ng		99
74) Cumene	0.00	105	0	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	0.00	91	0	N.D.		
77) 3-Ethyltoluene	0.00	105	0	N.D.		
78) 4-Ethyltoluene	0.00	105	0	N.D.		
79) 1,3,5-Trimethylbenzene	0.00	105	0	N.D.		
80) alpha-Methylstyrene	0.00	118	0	N.D.		
81) 2-Ethyltoluene	18.42	105	531	N.D.		
82) 1,2,4-Trimethylbenzene	18.42	105	709	N.D.		
83) n-Decane	18.54	57	872	N.D.		
84) Benzyl Chloride	18.56	91	930	N.D.		
85) 1,3-Dichlorobenzene	0.00	146	0	N.D.		
86) 1,4-Dichlorobenzene	0.00	146	0	N.D.		
87) sec-Butylbenzene	0.00	105	0	N.D.		
88) 4-Isopropyltoluene (p-...	18.88	119	4228	N.D.		
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	0.00	68	0	N.D.		
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	19.87	57	852	N.D.		
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	20.94	128	2468	N.D.		
96) n-Dodecane	20.97	57	760	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	16.29	55	641	N.D.		
99) tert-Butylbenzene	18.39	119	1388	N.D.		
100) n-Butylbenzene	19.32	91	517	N.D.		

(#)=qualifier out of range (m)=manual integration (+)=signals summed

Data File: I:\MS09\Data\2016 11\22\11221608.D

Acq On : 22 Nov 2016 14:24

Operator: SC

Sample : P1605349-002Dil (100mL)

Misc : S29-10261601

ALS Vial : 11 Sample Multiplier: 1

Quant Time: Nov 22 14:54:41 2016

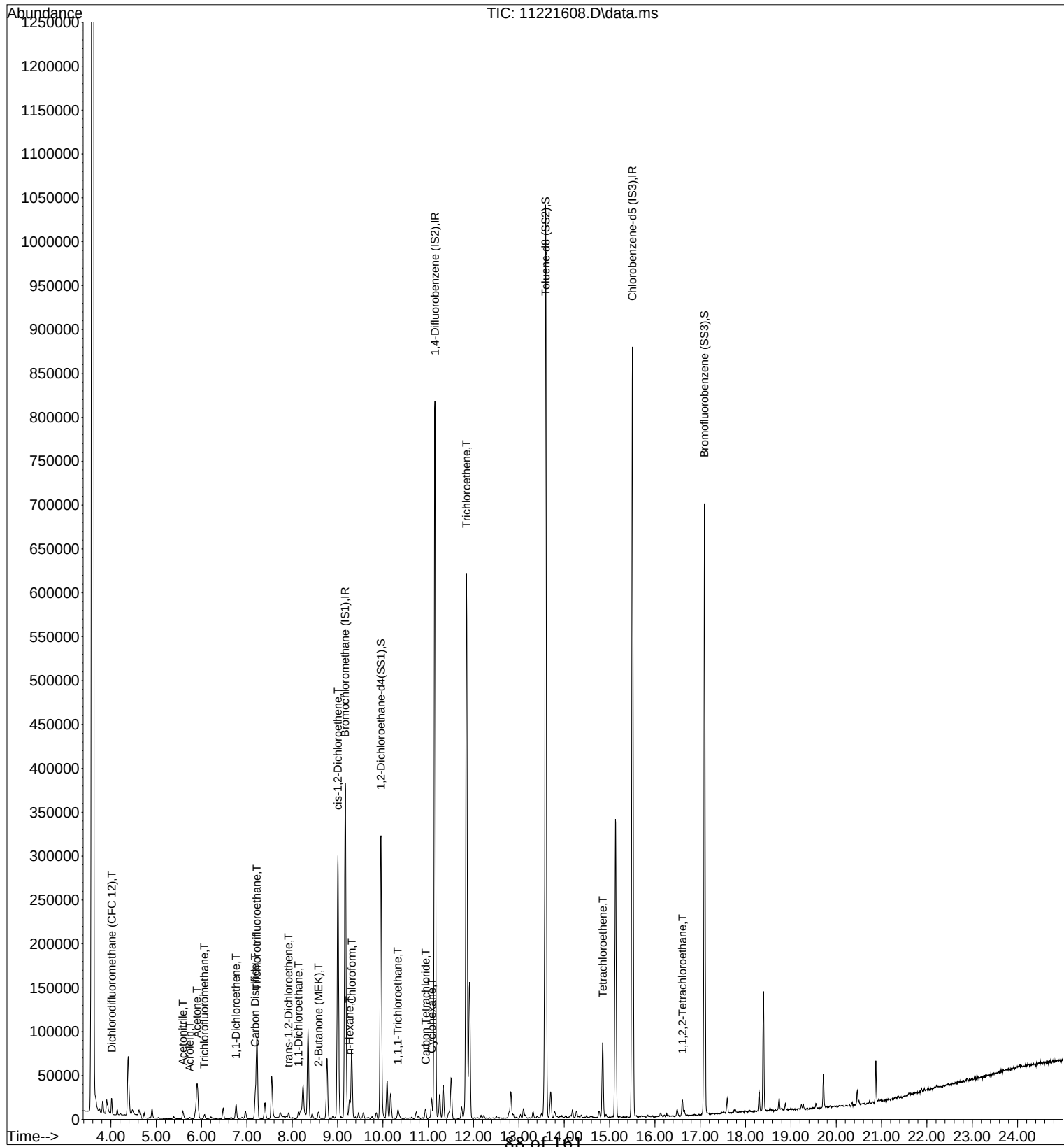
Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS09\Data\2016 11\22\11221608.D

Acq On : 22 Nov 2016 14:24

Operator: SC

Sample : P1605349-002Dil (100mL)

Misc : S29-10261601

ALS Vial : 11 Sample Multiplier: 1

Quant Time: Nov 22 14:53:26 2016

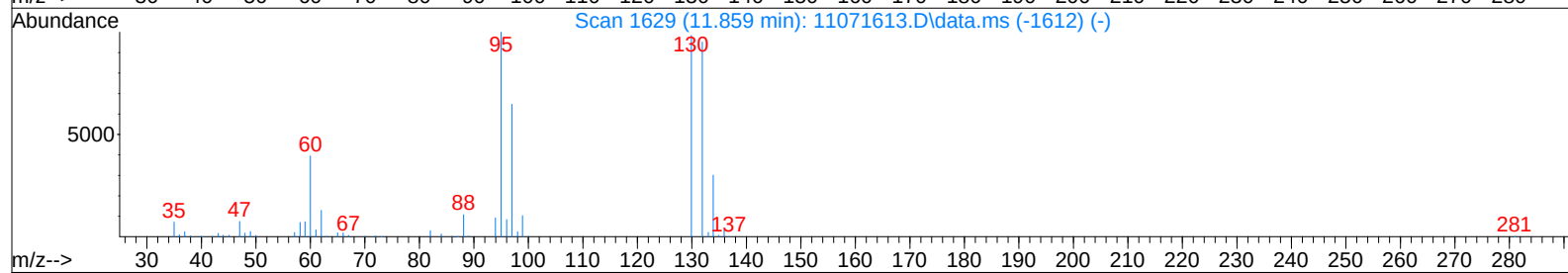
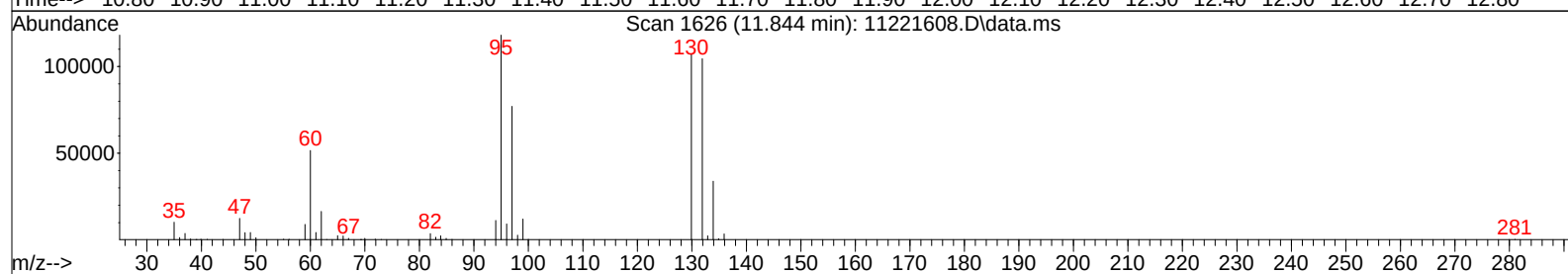
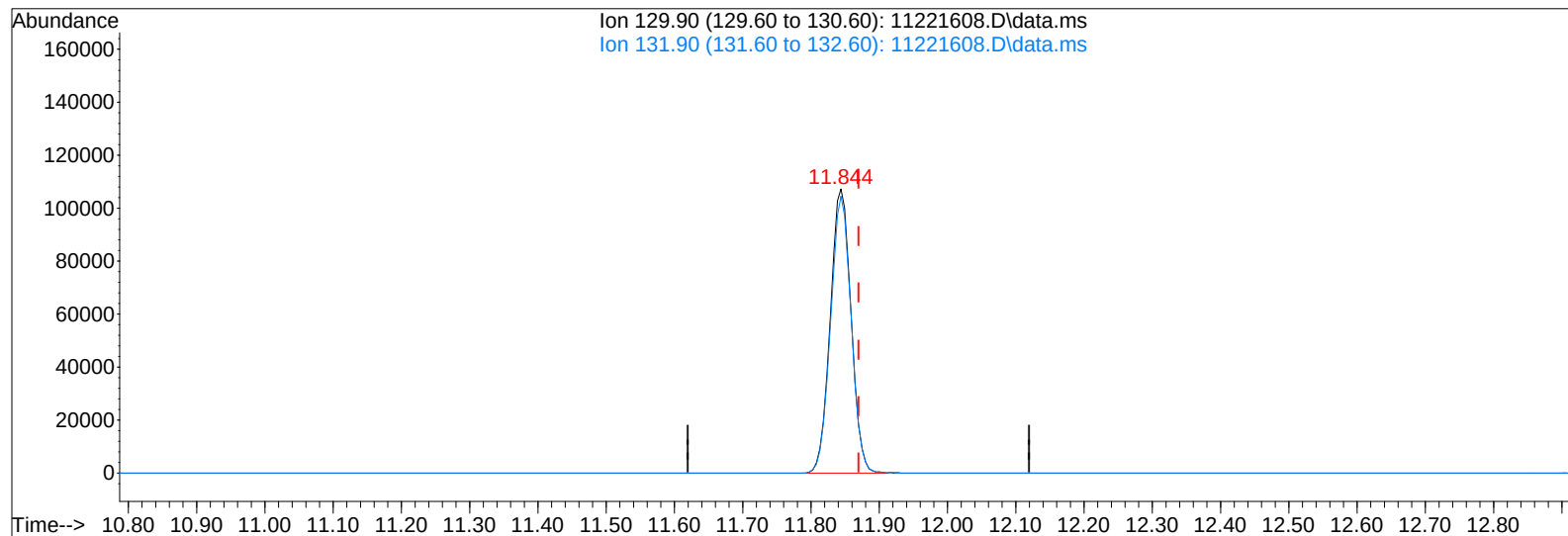
Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 11221608.D\data.ms

(47) Trichloroethene (T)

11.844min (-0.026) 13.14ng

response 226236

Ion	Exp%	Act%
129.90	100	100
131.90	95.30	96.15
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS09\Data\2016 11\21\11211606.D

Acq On : 21 Nov 2016 11:06

Operator: SC

Sample : MB R9112116 1000mL

Misc : S29-10261601

ALS Vial : 2 Sample Multiplier: 1

11/21/16

Quant Time: Nov 21 11:42:22 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.17	130	154209	12.500	ng	-0.05
37) 1,4-Difluorobenzene (IS2)	11.14	114	771956	12.500	ng	-0.03
56) Chlorobenzene-d5 (IS3)	15.51	82	340824	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.95	65	247559	13.416	ng	-0.04
Spiked Amount	12.500	Range	70 - 130	Recovery	=	107.36%
57) Toluene-d8 (SS2)	13.59	98	849714	12.279	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.24%
73) Bromofluorobenzene (SS3)	17.09	174	218608	11.787	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	94.32%

Target Compounds

						Qvalue
2) Propene	3.92	42	675	N.D.		
3) Dichlorodifluoromethan...	0.00	85	0	N.D.		
4) Chloromethane	0.00	50	0	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.		
6) Vinyl Chloride	0.00	62	0	N.D.		
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	5.39	45	866	N.D.		
11) Acetonitrile	5.59	41	825	N.D.		
12) Acrolein	5.75	56	637	N.D.		
13) Acetone	5.90	58	6586	0.462	ng	# 76
14) Trichlorofluoromethane	0.00	101	0	N.D.		
15) 2-Propanol (Isopropanol)	6.22	45	297	N.D.		
16) Acrylonitrile	0.00	53	0	N.D.		
17) 1,1-Dichloroethene	0.00	96	0	N.D.		
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.		
19) Methylene Chloride	0.00	84	0	N.D.		
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.		
21) Trichlorotrifluoroethane	0.00	151	0	N.D.		
22) Carbon Disulfide	7.20	76	2719	N.D.		
23) trans-1,2-Dichloroethene	0.00	61	0	N.D.		
24) 1,1-Dichloroethane	0.00	63	0	N.D.		
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.		
26) Vinyl Acetate	8.29	86	680	0.164	ng	# 57
27) 2-Butanone (MEK)	8.58	72	538	N.D.		
28) cis-1,2-Dichloroethene	0.00	61	0	N.D.		
29) Diisopropyl Ether	0.00	87	0	N.D.		
30) Ethyl Acetate	0.00	61	0	N.D.		
31) n-Hexane	0.00	57	0	N.D.		
32) Chloroform	0.00	83	0	N.D.		
34) Tetrahydrofuran (THF)	0.00	72	0	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	0.00	62	0	N.D.		
38) 1,1,1-Trichloroethane	0.00	97	0	N.D.		
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	10.74	56	1495	N.D.		
41) Benzene	10.79	78	1521	N.D.		
42) Carbon Tetrachloride	0.00	117	0	N.D.		
43) Cyclohexane	11.14	84	587	N.D.		
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D.		
47) Trichloroethene	0.00	130	0	N.D.		
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.		

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Data File: I:\MS09\Data\2016 11\21\11211606.D

Acq On : 21 Nov 2016 11:06

Operator: SC

Sample : MB R9112116 1000mL

Misc : S29-10261601

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Nov 21 11:42:22 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	0.00	100	0	N.D.		
51) n-Heptane	0.00	71	0	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	13.70	91	1898	N.D.		
59) 2-Hexanone	0.00	43	0	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	0.00	43	0	N.D.		
63) n-Octane	0.00	57	0	N.D.		
64) Tetrachloroethene	0.00	166	0	N.D.		
65) Chlorobenzene	0.00	112	0	N.D.		
66) Ethylbenzene	16.13	91	470	N.D.		
67) m- & p-Xylenes	16.13	91	470	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	0.00	104	0	N.D.		
70) o-Xylene	0.00	91	0	N.D.		
71) n-Nonane	0.00	43	0	N.D.		
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.		
74) Cumene	0.00	105	0	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	0.00	91	0	N.D.		
77) 3-Ethyltoluene	0.00	105	0	N.D.		
78) 4-Ethyltoluene	0.00	105	0	N.D.		
79) 1,3,5-Trimethylbenzene	0.00	105	0	N.D.		
80) alpha-Methylstyrene	0.00	118	0	N.D.		
81) 2-Ethyltoluene	0.00	105	0	N.D.		
82) 1,2,4-Trimethylbenzene	0.00	105	0	N.D.		
83) n-Decane	0.00	57	0	N.D.	d	
84) Benzyl Chloride	0.00	91	0	N.D.		
85) 1,3-Dichlorobenzene	0.00	146	0	N.D.		
86) 1,4-Dichlorobenzene	0.00	146	0	N.D.		
87) sec-Butylbenzene	0.00	105	0	N.D.		
88) 4-Isopropyltoluene (p-...	0.00	119	0	N.D.		
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	0.00	68	0	N.D.		
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	19.72	57	1024	N.D.		
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	20.94	128	716	N.D.		
96) n-Dodecane	0.00	57	0	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.		
99) tert-Butylbenzene	0.00	119	0	N.D.		
100) n-Butylbenzene	0.00	91	0	N.D.		

(#)=qualifier out of range (m)=manual integration (+)=signals summed

Data File: I:\MS09\Data\2016 11\21\11211606.D

Acq On : 21 Nov 2016 11:06

Operator: SC

Sample : MB R9112116 1000mL

Misc : S29-10261601

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Nov 21 11:42:22 2016

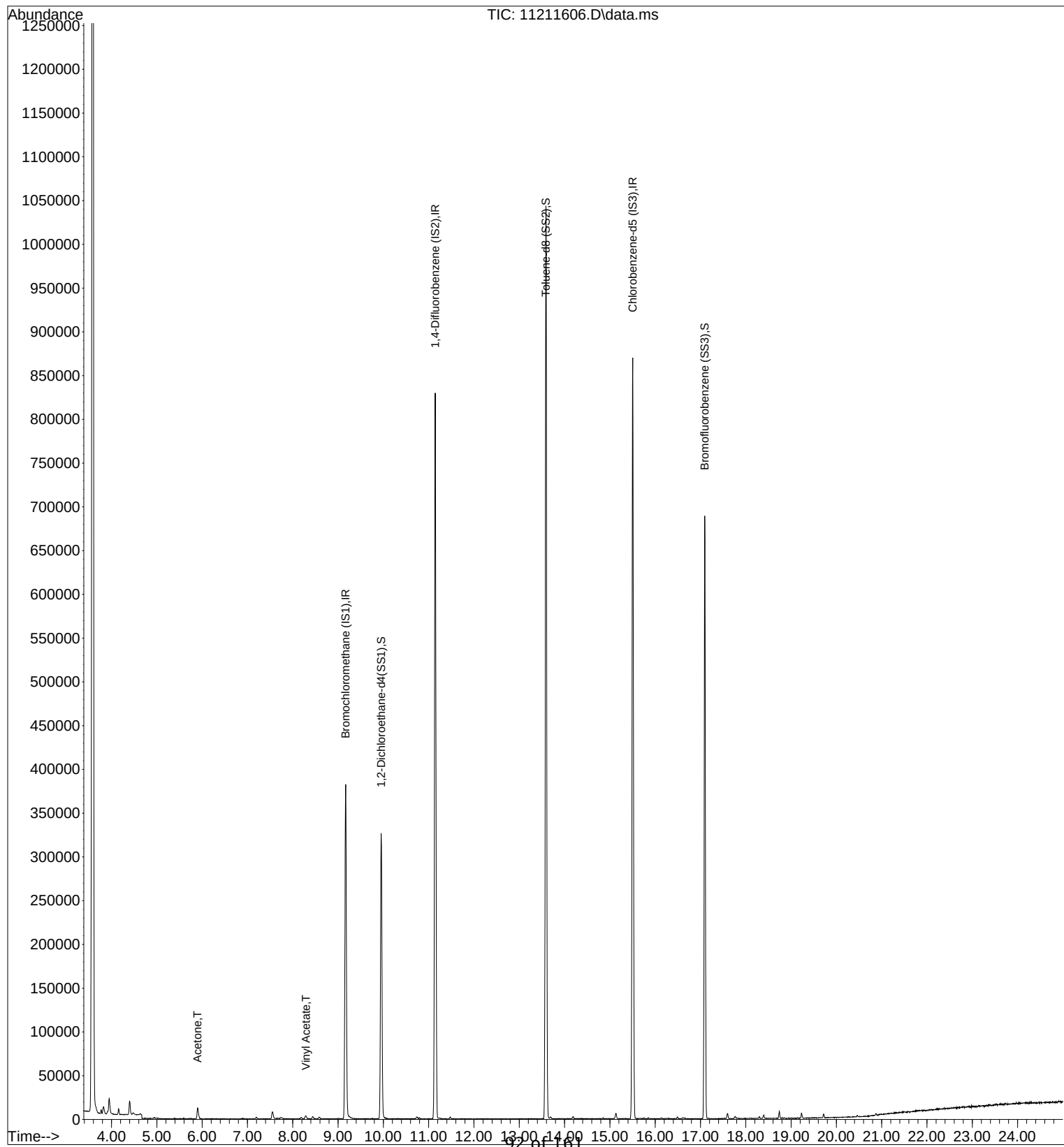
Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS09\Data\2016 11\22\11221603.D

Acq On : 22 Nov 2016 10:31

Operator: SC

Sample : MB R9112216 1000mL

Misc : S29-10261601

ALS Vial : 2 Sample Multiplier: 1

11/22/16

Quant Time: Nov 22 11:16:41 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.17	130	147738	12.500	ng	-0.05
37) 1,4-Difluorobenzene (IS2)	11.14	114	747604	12.500	ng	-0.03
56) Chlorobenzene-d5 (IS3)	15.51	82	336288	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.95	65	245749	13.902	ng	-0.04
Spiked Amount	12.500	Range	70 - 130	Recovery	=	111.20%
57) Toluene-d8 (SS2)	13.59	98	826124	12.099	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	96.80%
73) Bromofluorobenzene (SS3)	17.09	174	204752	11.189	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	89.52%

Target Compounds

						Qvalue
2) Propene	3.93	42	868	N.D.		
3) Dichlorodifluoromethan...	0.00	85	0	N.D.		
4) Chloromethane	0.00	50	0	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.		
6) Vinyl Chloride	0.00	62	0	N.D.		
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	5.38	45	1627	0.128	ng	75
11) Acetonitrile	5.60	41	1498	N.D.		
12) Acrolein	5.74	56	745	N.D.		
13) Acetone	5.90	58	7230	0.529	ng	# 80
14) Trichlorofluoromethane	0.00	101	0	N.D.		
15) 2-Propanol (Isopropanol)	6.23	45	120	N.D.		
16) Acrylonitrile	0.00	53	0	N.D.		
17) 1,1-Dichloroethene	0.00	96	0	N.D.		
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.		
19) Methylene Chloride	0.00	84	0	N.D.		
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.		
21) Trichlorotrifluoroethane	0.00	151	0	N.D.		
22) Carbon Disulfide	7.20	76	2325	N.D.		
23) trans-1,2-Dichloroethene	0.00	61	0	N.D.		
24) 1,1-Dichloroethane	0.00	63	0	N.D.		
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.		
26) Vinyl Acetate	8.29	86	753	0.190	ng	# 80
27) 2-Butanone (MEK)	8.58	72	647	N.D.		
28) cis-1,2-Dichloroethene	0.00	61	0	N.D.		
29) Diisopropyl Ether	0.00	87	0	N.D.		
30) Ethyl Acetate	0.00	61	0	N.D.		
31) n-Hexane	0.00	57	0	N.D.		
32) Chloroform	0.00	83	0	N.D.		
34) Tetrahydrofuran (THF)	0.00	72	0	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	0.00	62	0	N.D.		
38) 1,1,1-Trichloroethane	0.00	97	0	N.D.		
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	10.74	56	1542	N.D.		
41) Benzene	10.79	78	1950	N.D.		
42) Carbon Tetrachloride	0.00	117	0	N.D.		
43) Cyclohexane	11.14	84	464	N.D.		
44) tert-Amyl Methyl Ether	11.30	73	515	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D.		
47) Trichloroethene	0.00	130	0	N.D.		
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.		

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Data File: I:\MS09\Data\2016 11\22\11221603.D

Acq On : 22 Nov 2016 10:31

Operator: SC

Sample : MB R9112216 1000mL

Misc : S29-10261601

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Nov 22 11:16:41 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	0.00	100	0	N.D.		
51) n-Heptane	0.00	71	0	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	13.69	91	1314	N.D.		
59) 2-Hexanone	13.95	43	753	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	0.00	43	0	N.D.		
63) n-Octane	0.00	57	0	N.D.		
64) Tetrachloroethene	0.00	166	0	N.D.		
65) Chlorobenzene	0.00	112	0	N.D.		
66) Ethylbenzene	0.00	91	0	N.D.		
67) m- & p-Xylenes	0.00	91	0	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	0.00	104	0	N.D.		
70) o-Xylene	16.63	91	495	N.D.		
71) n-Nonane	0.00	43	0	N.D.		
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.		
74) Cumene	0.00	105	0	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	17.73	91	421	N.D.		
77) 3-Ethyltoluene	0.00	105	0	N.D.		
78) 4-Ethyltoluene	0.00	105	0	N.D.		
79) 1,3,5-Trimethylbenzene	0.00	105	0	N.D.		
80) alpha-Methylstyrene	0.00	118	0	N.D.		
81) 2-Ethyltoluene	0.00	105	0	N.D.		
82) 1,2,4-Trimethylbenzene	0.00	105	0	N.D.		
83) n-Decane	18.74	57	3097	N.D.		
84) Benzyl Chloride	0.00	91	0	N.D.		
85) 1,3-Dichlorobenzene	0.00	146	0	N.D.		
86) 1,4-Dichlorobenzene	0.00	146	0	N.D.		
87) sec-Butylbenzene	0.00	105	0	N.D.		
88) 4-Isopropyltoluene (p-...	0.00	119	0	N.D.		
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	0.00	68	0	N.D.		
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	19.72	57	685	N.D.		
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	20.94	128	2337	N.D.		
96) n-Dodecane	0.00	57	0	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.		
99) tert-Butylbenzene	0.00	119	0	N.D.		
100) n-Butylbenzene	0.00	91	0	N.D.		

(#)=qualifier out of range (m)=manual integration (+)=signals summed

Data File: I:\MS09\Data\2016 11\22\11221603.D

Acq On : 22 Nov 2016 10:31

Operator: SC

Sample : MB R9112216 1000mL

Misc : S29-10261601

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Nov 22 11:16:41 2016

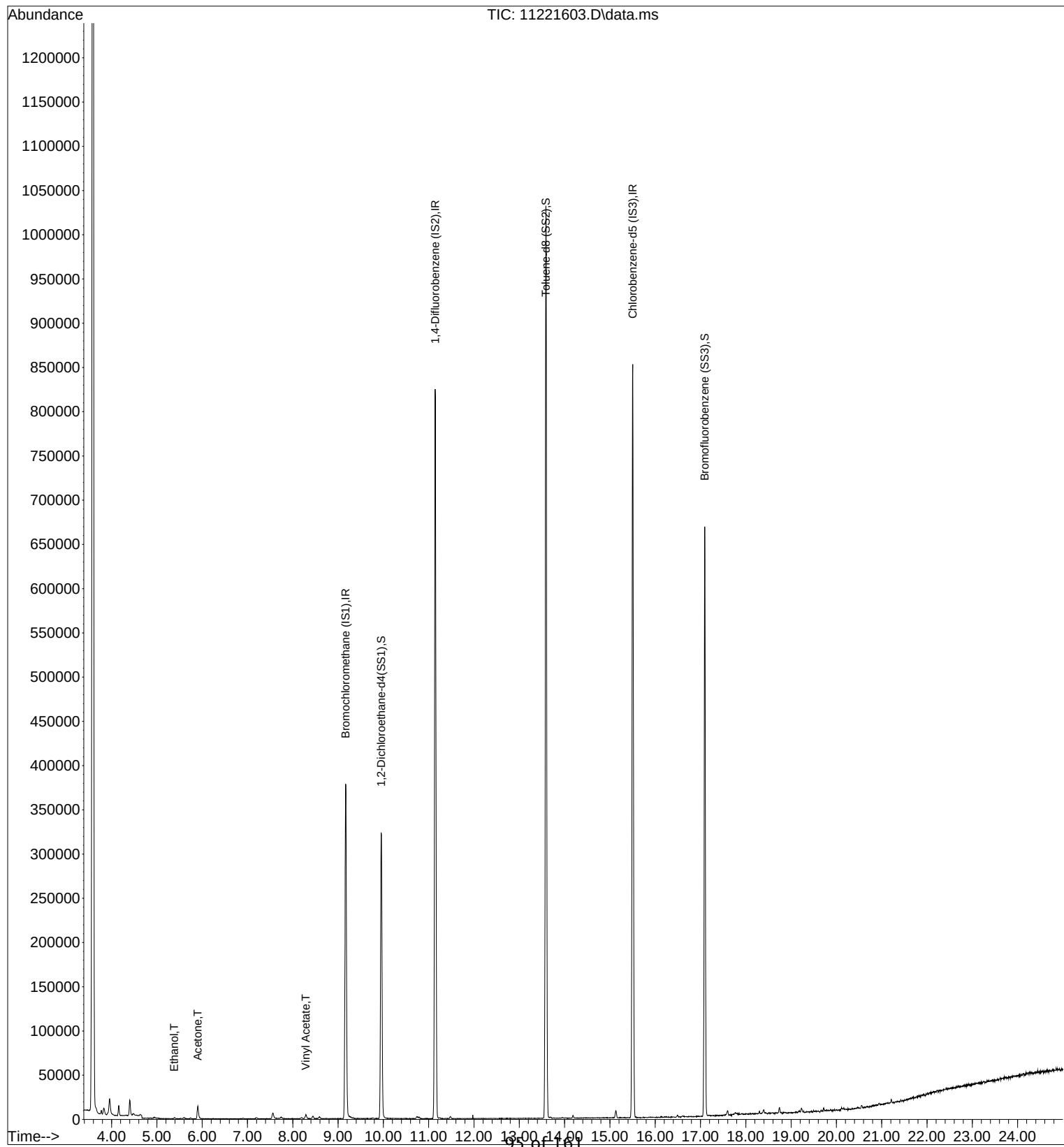
Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS09\Data\2016 11\21\11211607.D

Acq On : 21 Nov 2016 11:39

Operator: SC

Sample : LCS R9112116 25ng

Misc : S29-10261601/S29-10271604 (11/25)

ALS Vial : 4 Sample Multiplier: 1

Quant Time: Nov 21 12:20:19 2016

 11/21/16

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.19	130	158870	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	11.16	114	780906	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	15.51	82	348940	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.97	65	250368	13.171	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	105.36%
57) Toluene-d8 (SS2)	13.60	98	856321	12.087	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	96.72%
73) Bromofluorobenzene (SS3)	17.10	174	226760	11.942	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.52%

Target Compounds

						Qvalue
2) Propene	3.89	42	649155	28.236	ng	96
3) Dichlorodifluoromethan...	3.99	85	831362	25.147	ng	99
4) Chloromethane	4.19	50	792244	26.011	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.36	135	378621	22.872	ng	100
6) Vinyl Chloride	4.48	62	669382	23.080	ng	100
7) 1,3-Butadiene	4.65	54	493141	26.591	ng	99
8) Bromomethane	4.96	94	424976	25.807	ng	100
9) Chloroethane	5.18	64	375506	26.923	ng	100
10) Ethanol	5.42	45	2033694	148.267	ng	100
11) Acetonitrile	5.61	41	1079309	29.037	ng	98
12) Acrolein	5.73	56	332095	26.808	ng	98
13) Acetone	5.89	58	1911317	130.151	ng	93
14) Trichlorofluoromethane	6.06	101	673236	24.850	ng	99
15) 2-Propanol (Isopropanol)	6.22	45	2533405	56.228	ng	95
16) Acrylonitrile	6.42	53	741271	28.887	ng	99
17) 1,1-Dichloroethene	6.76	96	450199	25.698	ng	97
18) 2-Methyl-2-Propanol (t...	6.87	59	1923649	44.240	ng	97
19) Methylene Chloride	6.92	84	483898	24.454	ng	91
20) 3-Chloro-1-propene (Al...	7.04	41	848200	29.072	ng	94
21) Trichlorotrifluoroethane	7.22	151	336913	24.587	ng	97
22) Carbon Disulfide	7.19	76	1834410	28.805	ng	99
23) trans-1,2-Dichloroethene	7.94	61	727571	27.363	ng	95
24) 1,1-Dichloroethane	8.16	63	878642	26.150	ng	100
25) Methyl tert-Butyl Ether	8.22	73	1256357	22.610	ng	96
26) Vinyl Acetate	8.33	86	534353	125.075	ng	# 70
27) 2-Butanone (MEK)	8.57	72	347106	27.030	ng	# 81
28) cis-1,2-Dichloroethene	9.03	61	681425	27.082	ng	96
29) Diisopropyl Ether	9.27	87	381654	24.356	ng	# 72
30) Ethyl Acetate	9.27	61	383359	57.648	ng	97
31) n-Hexane	9.27	57	846516	29.078	ng	99
32) Chloroform	9.34	83	770846	25.787	ng	99
34) Tetrahydrofuran (THF)	9.72	72	337099	25.756	ng	# 85
35) Ethyl tert-Butyl Ether	9.81	87	552702	25.575	ng	# 88
36) 1,2-Dichloroethane	10.08	62	571790	26.511	ng	100
38) 1,1,1-Trichloroethane	10.34	97	630727	24.370	ng	99
39) Isopropyl Acetate	10.71	61	656647	53.891	ng	99
40) 1-Butanol	10.72	56	1003902	55.336	ng	95
41) Benzene	10.80	78	1931171	24.439	ng	99
42) Carbon Tetrachloride	10.95	117	542172	24.586	ng	100
43) Cyclohexane	11.08	84	1445615	50.909	ng	89
44) tert-Amyl Methyl Ether	11.40	73	1400495	24.318	ng	98
45) 1,2-Dichloropropane	11.62	63	514752	26.903	ng	99
46) Bromodichloromethane	11.80	83	621123	26.125	ng	100
47) Trichloroethene	11.85	130	450405	24.843	ng	100
48) 1,4-Dioxane	11.83	88	391514	26.551	ng	89
49) 2,2,4-Trimethylpentane...	11.92	57	2220224	27.197	ng	96

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Data File: I:\MS09\Data\2016 11\21\11211607.D

Acq On : 21 Nov 2016 11:39

Operator: SC

Sample : LCS R9112116 25ng

Misc : S29-10261601/S29-10271604 (11/25)

ALS Vial : 4 Sample Multiplier: 1

Quant Time: Nov 21 12:20:19 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

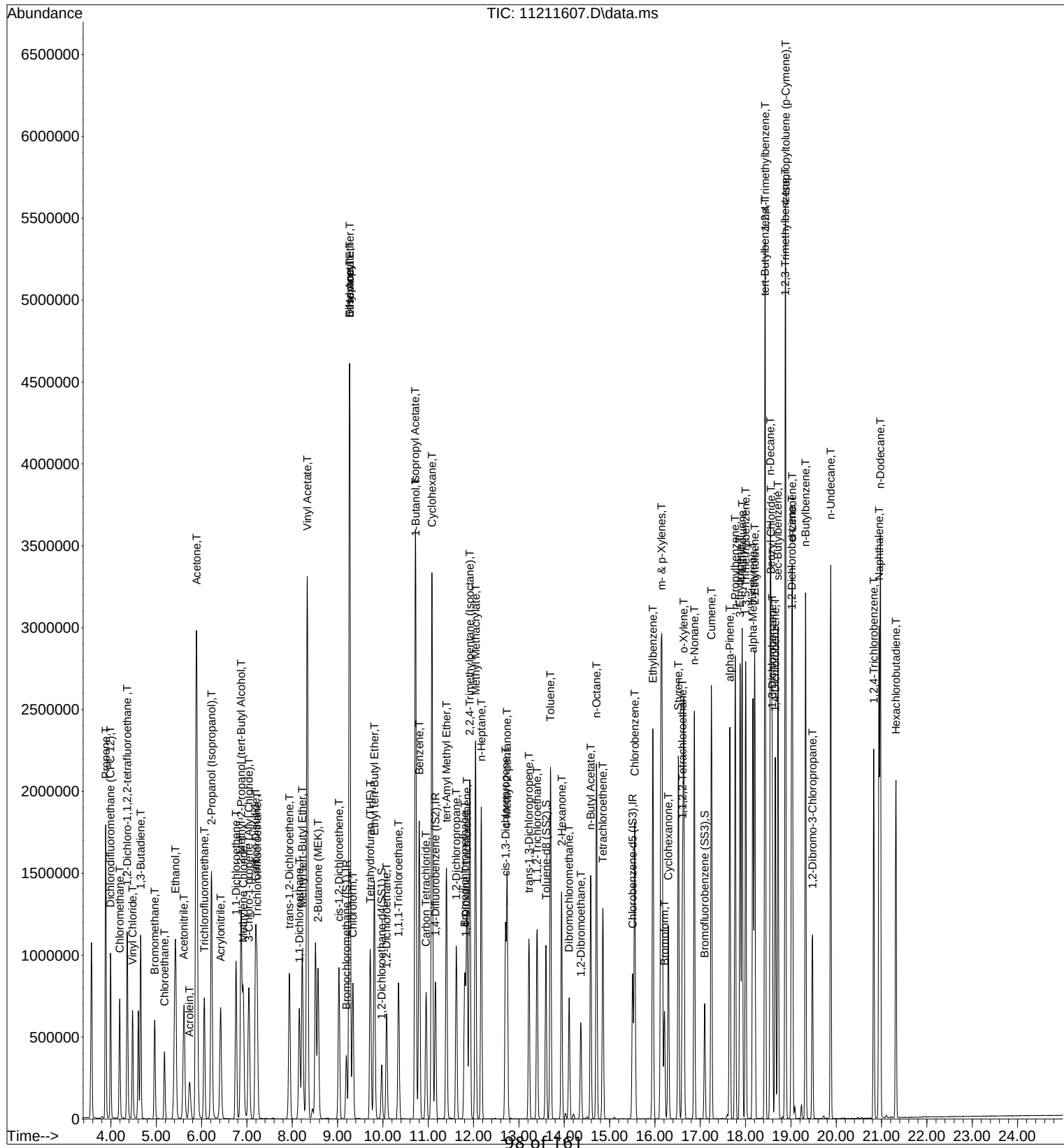
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.05	100	372269	53.024	ng	89
51) n-Heptane	12.17	71	508891	26.497	ng	94
52) cis-1,3-Dichloropropene	12.71	75	807222	26.438	ng	100
53) 4-Methyl-2-pentanone	12.74	58	487479	27.581	ng	94
54) trans-1,3-Dichloropropene	13.22	75	729965	27.012	ng	100
55) 1,1,2-Trichloroethane	13.40	97	452698	25.679	ng	96
58) Toluene	13.70	91	1893012	23.349	ng	100
59) 2-Hexanone	13.94	43	1116322	27.328	ng	98
60) Dibromochloromethane	14.11	129	488001	24.355	ng	99
61) 1,2-Dibromoethane	14.37	107	494881	24.489	ng	99
62) n-Butyl Acetate	14.58	43	1274624	27.773	ng	97
63) n-Octane	14.71	57	457720	27.008	ng	91
64) Tetrachloroethene	14.85	166	455246	23.782	ng	99
65) Chlorobenzene	15.55	112	1189309	23.756	ng	100
66) Ethylbenzene	15.95	91	2134142	24.304	ng	99
67) m- & p-Xylenes	16.14	91	3262751	48.645	ng	100
68) Bromoform	16.21	173	387129	24.425	ng	100
69) Styrene	16.52	104	1296871	24.763	ng	100
70) o-Xylene	16.63	91	1667766	24.398	ng	100
71) n-Nonane	16.87	43	1072055	26.791	ng	93
72) 1,1,2,2-Tetrachloroethane	16.61	83	843462	25.121	ng	99
74) Cumene	17.25	105	2049775	23.999	ng	99
75) alpha-Pinene	17.65	93	1091966	23.942	ng	99
76) n-Propylbenzene	17.77	91	2558024	24.719	ng	99
77) 3-Ethyltoluene	17.88	105	2035514	23.522	ng	96
78) 4-Ethyltoluene	17.92	105	1974858	25.293	ng	98
79) 1,3,5-Trimethylbenzene	18.00	105	1671525	23.973	ng	100
80) alpha-Methylstyrene	18.16	118	850513	23.548	ng	99
81) 2-Ethyltoluene	18.20	105	1992581	24.454	ng	99
82) 1,2,4-Trimethylbenzene	18.43	105	1691439	24.542	ng	100
83) n-Decane	18.55	57	1097666	29.503	ng	95
84) Benzyl Chloride	18.56	91	1645682	26.534	ng	99
85) 1,3-Dichlorobenzene	18.59	146	946147	24.666	ng	100
86) 1,4-Dichlorobenzene	18.66	146	963825	25.208	ng	100
87) sec-Butylbenzene	18.71	105	2282966	24.310	ng	99
88) 4-Isopropyltoluene (p-...	18.88	119	2008469	23.855	ng	98
89) 1,2,3-Trimethylbenzene	18.88	105	1734690	25.207	ng	100
90) 1,2-Dichlorobenzene	19.02	146	914309	24.925	ng	100
91) d-Limonene	19.03	68	717524	23.545	ng	92
92) 1,2-Dibromo-3-Chloropr...	19.48	157	341480	26.427	ng	99
93) n-Undecane	19.88	57	1178858	31.484	ng	94
94) 1,2,4-Trichlorobenzene	20.83	180	708990	27.190	ng	100
95) Naphthalene	20.95	128	2333937	28.494	ng	100
96) n-Dodecane	20.97	57	1181848	32.052	ng	94
97) Hexachlorobutadiene	21.32	225	407030	25.291	ng	99
98) Cyclohexanone	16.29	55	620229	22.293	ng	95
99) tert-Butylbenzene	18.43	119	1578291	23.970	ng	99
100) n-Butylbenzene	19.32	91	1914920	25.035	ng	99

(#)=qualifier out of range (m)=manual integration (+)=signals summed

ALS Vial : 4 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS09\Data\2016 11\22\11221604.D

Acq On : 22 Nov 2016 11:05

Operator: SC

Sample : LCS R9112216 25ng

Misc : S29-10261601/S29-10271604 (11/25)

ALS Vial : 4 Sample Multiplier: 1

 11/22/16

Quant Time: Nov 22 12:49:15 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.20	130	149773	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	11.16	114	745685	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	15.51	82	339830	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.98	65	247858	13.830	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	110.64%
57) Toluene-d8 (SS2)	13.60	98	826630	11.981	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.84%
73) Bromofluorobenzene (SS3)	17.10	174	212235	11.477	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	91.84%

Target Compounds

						Qvalue
2) Propene	3.89	42	676678	31.221	ng	96
3) Dichlorodifluoromethan...	4.00	85	806611	25.880	ng	99
4) Chloromethane	4.19	50	811298	28.254	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.36	135	360579	23.105	ng	100
6) Vinyl Chloride	4.48	62	665876	24.353	ng	100
7) 1,3-Butadiene	4.66	54	476833	27.273	ng	96
8) Bromomethane	4.96	94	406044	26.155	ng	100
9) Chloroethane	5.18	64	370476	28.176	ng	99
10) Ethanol	5.43	45	2069275	160.024	ng	99
11) Acetonitrile	5.62	41	1112417	31.746	ng	99
12) Acrolein	5.74	56	323311	27.684	ng	99
13) Acetone	5.89	58	1897373	137.049	ng	95
14) Trichlorofluoromethane	6.06	101	638610	25.003	ng	99
15) 2-Propanol (Isopropanol)	6.22	45	2553509	60.116	ng	95
16) Acrylonitrile	6.42	53	743642	30.739	ng	99
17) 1,1-Dichloroethene	6.76	96	430535	26.068	ng	94
18) 2-Methyl-2-Propanol (t...	6.88	59	1948902	47.544	ng	97
19) Methylene Chloride	6.92	84	468011	25.088	ng	85
20) 3-Chloro-1-propene (Al...	7.04	41	873304	31.750	ng	90
21) Trichlorotrifluoroethane	7.23	151	316291	24.484	ng	95
22) Carbon Disulfide	7.19	76	1775589	29.574	ng	99
23) trans-1,2-Dichloroethene	7.94	61	715173	28.531	ng	93
24) 1,1-Dichloroethane	8.16	63	864173	27.282	ng	99
25) Methyl tert-Butyl Ether	8.22	73	1225090	23.387	ng	95
26) Vinyl Acetate	8.33	86	515039	127.877	ng	# 54
27) 2-Butanone (MEK)	8.57	72	339872	28.074	ng	# 72
28) cis-1,2-Dichloroethene	9.03	61	668994	28.203	ng	93
29) Diisopropyl Ether	9.27	87	364212	24.655	ng	# 57
30) Ethyl Acetate	9.27	61	380291	60.660	ng	95
31) n-Hexane	9.27	57	829963	30.241	ng	98
32) Chloroform	9.34	83	743208	26.373	ng	99
34) Tetrahydrofuran (THF)	9.72	72	326806	26.486	ng	# 79
35) Ethyl tert-Butyl Ether	9.81	87	531667	26.096	ng	# 84
36) 1,2-Dichloroethane	10.09	62	563769	27.727	ng	99
38) 1,1,1-Trichloroethane	10.35	97	600898	24.314	ng	99
39) Isopropyl Acetate	10.71	61	647350	55.638	ng	95
40) 1-Butanol	10.72	56	987645	57.011	ng	92
41) Benzene	10.80	78	1874041	24.836	ng	100
42) Carbon Tetrachloride	10.95	117	510240	24.231	ng	100
43) Cyclohexane	11.08	84	1392565	51.357	ng	86
44) tert-Amyl Methyl Ether	11.40	73	1354132	24.624	ng	96
45) 1,2-Dichloropropane	11.62	63	506135	27.702	ng	100
46) Bromodichloromethane	11.80	83	595267	26.220	ng	100
47) Trichloroethene	11.85	130	423148	24.442	ng	100
48) 1,4-Dioxane	11.83	88	376309	26.725	ng	87
49) 2,2,4-Trimethylpentane...	11.92	57	2192967	28.132	ng	97

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Data File: I:\MS09\Data\2016 11\22\11221604.D

Acq On : 22 Nov 2016 11:05

Operator: SC

Sample : LCS R9112216 25ng

Misc : S29-10261601/S29-10271604 (11/25)

ALS Vial : 4 Sample Multiplier: 1

Quant Time: Nov 22 12:49:15 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.04	100	354709	52.910	ng	# 86
51) n-Heptane	12.17	71	489832	26.710	ng	93
52) cis-1,3-Dichloropropene	12.71	75	780912	26.785	ng	99
53) 4-Methyl-2-pentanone	12.74	58	479496	28.411	ng	91
54) trans-1,3-Dichloropropene	13.22	75	708076	27.440	ng	100
55) 1,1,2-Trichloroethane	13.40	97	428691	25.465	ng	95
58) Toluene	13.70	91	1808142	22.900	ng	100
59) 2-Hexanone	13.94	43	1127578	28.343	ng	96
60) Dibromochloromethane	14.11	129	457711	23.456	ng	99
61) 1,2-Dibromoethane	14.37	107	468016	23.780	ng	100
62) n-Butyl Acetate	14.58	43	1282104	28.685	ng	96
63) n-Octane	14.71	57	452364	27.407	ng	89
64) Tetrachloroethene	14.85	166	420540	22.558	ng	99
65) Chlorobenzene	15.56	112	1123913	23.052	ng	100
66) Ethylbenzene	15.95	91	2042108	23.879	ng	98
67) m- & p-Xylenes	16.15	91	3133458	47.969	ng	99
68) Bromoform	16.21	173	360410	23.349	ng	100
69) Styrene	16.52	104	1231823	24.151	ng	100
70) o-Xylene	16.63	91	1605382	24.115	ng	99
71) n-Nonane	16.87	43	1091797	28.015	ng	91
72) 1,1,2,2-Tetrachloroethane	16.61	83	820251	25.085	ng	99
74) Cumene	17.25	105	1957200	23.529	ng	98
75) alpha-Pinene	17.65	93	1045763	23.544	ng	99
76) n-Propylbenzene	17.77	91	2474207	24.550	ng	98
77) 3-Ethyltoluene	17.88	105	1962346	23.285	ng	95
78) 4-Ethyltoluene	17.92	105	1882249	24.753	ng	98
79) 1,3,5-Trimethylbenzene	18.00	105	1599604	23.557	ng	100
80) alpha-Methylstyrene	18.16	118	807745	22.964	ng	99
81) 2-Ethyltoluene	18.20	105	1915817	24.142	ng	99
82) 1,2,4-Trimethylbenzene	18.43	105	1625111	24.212	ng	100
83) n-Decane	18.54	57	1099325	30.340	ng	96
84) Benzyl Chloride	18.56	91	1593311	26.379	ng	98
85) 1,3-Dichlorobenzene	18.58	146	898950	24.064	ng	100
86) 1,4-Dichlorobenzene	18.66	146	908140	24.389	ng	100
87) sec-Butylbenzene	18.71	105	2192834	23.976	ng	99
88) 4-Isopropyltoluene (p-...	18.88	119	1928031	23.514	ng	99
89) 1,2,3-Trimethylbenzene	18.88	105	1669450	24.909	ng	100
90) 1,2-Dichlorobenzene	19.01	146	865533	24.228	ng	100
91) d-Limonene	19.03	68	705897	23.785	ng	91
92) 1,2-Dibromo-3-Chloropr...	19.48	157	317904	25.262	ng	94
93) n-Undecane	19.88	57	1180388	32.370	ng	93
94) 1,2,4-Trichlorobenzene	20.83	180	666925	26.262	ng	100
95) Naphthalene	20.95	128	2216945	27.792	ng	100
96) n-Dodecane	20.97	57	1190207	33.144	ng	92
97) Hexachlorobutadiene	21.32	225	377445	24.081	ng	100
98) Cyclohexanone	16.29	55	609104	22.480	ng	95
99) tert-Butylbenzene	18.43	119	1510363	23.553	ng	99
100) n-Butylbenzene	19.32	91	1862715	25.006	ng	99

(#)=qualifier out of range (m)=manual integration (+)=signals summed

Method Path : I:\MS09\Methods\
 Method File : R9110716.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Tue Nov 08 09:00:48 2016
 Response Via : Initial Calibration

 11/8/16

Calibration Files

0.08=11071607.D 0.10=11071608.D 0.20=11071609.D 0.40=11071610.D 1.0 =11071611.D 5.0 =11071612.D 25 =11071613.D
 50 =11071614.D 100 =11071615.D

	Compound	0.08	0.10	0.20	0.40	1.0	5.0	25	50	100	Avg	%RSD
1) IR	Bromochloromethane...	-----ISTD-----										
2) T	Propene	2.356	2.261	1.844	1.769	0.990	1.560	1.685	1.811	2.004	1.809	22.22
3) T	Dichlorodifluo...	3.408	3.104	2.756	2.690	1.567	2.458	2.696	2.452	2.279	2.601	19.98
4) T	Chloromethane	3.169	2.975	2.618	2.501	1.456	2.239	2.474	2.235	1.901	2.396	21.78
5) T	1,2-Dichloro-1...	1.578	1.549	1.354	1.386	0.777	1.243	1.359	1.283	1.192	1.302	18.03
6) T	Vinyl Chloride	2.946	2.876	2.388	2.373	1.382	2.138	2.330	2.147	1.957	2.282	20.62
7) T	1,3-Butadiene	1.796	1.724	1.454	1.497	0.827	1.365	1.635	1.499	1.336	1.459	19.39
8) T	Bromomethane	1.567	1.598	1.451	1.356	0.792	1.163	1.395	1.197	1.142	1.296	19.43
9) T	Chloroethane	1.295	1.247	1.183	1.153	0.676	1.047	1.160	1.084	1.032	1.097	16.44
10) T	Ethanol	1.300	1.262	1.148	1.106	0.689	1.069	1.144	1.047	0.946	1.079	16.79
11) T	Acetonitrile	3.921	3.600	3.109	2.999	1.707	2.735	2.945	2.723	2.583	2.925	21.51
12) T	Acrolein	1.304	1.134	1.046	1.066	0.581	0.873	0.990	0.912	0.866	0.975	20.80
13) T	Acetone	1.592	1.510	1.269	1.201	0.710	1.094	1.131	1.001	0.891	1.155	24.25
14) T	Trichlorofluor...	2.756	2.550	2.189	2.263	1.288	1.987	2.170	2.032	1.949	2.132	19.36
15) T	2-Propanol (Is...	4.588	4.287	4.068	3.989	2.298	3.581	3.937	3.059	2.098	3.545	24.73
16) T	Acrylonitrile	2.530	2.389	2.076	2.032	1.194	1.915	2.145	1.993	1.898	2.019	18.57
17) T	1,1-Dichloroet...	1.795	1.594	1.448	1.402	0.798	1.252	1.448	1.357	1.310	1.378	19.67
18) T	2-Methyl-2-Pro...			4.184	4.149	2.250	3.347	3.772	2.824		3.421	22.52
19) T	Methylene Chlo...	2.147	2.054	1.632	1.571	0.883	1.376	1.545	1.439	1.366	1.557	24.23
20) T	3-Chloro-1-pro...	2.951	2.904	2.502	2.430	1.293	2.070	2.337	2.144	2.030	2.296	21.85
21) T	Trichlorotrifl...	1.276	1.298	1.062	1.105	0.640	1.035	1.154	1.083	1.050	1.078	17.61
22) T	Carbon Disulfide				5.934	3.336	5.038	5.660	5.244	4.852	5.011	18.20
23) T	trans-1,2-Dich...	2.586	2.430	2.193	2.180	1.234	1.975	2.220	2.055	1.956	2.092	18.22
24) T	1,1-Dichloroet...	3.380	3.281	2.816	2.726	1.549	2.448	2.698	2.512	2.382	2.644	20.33
25) T	Methyl tert-Bu...	5.866	5.536	4.765	4.683	2.589	4.101	4.532	4.046	3.231	4.372	23.61
26) T	Vinyl Acetate	0.401	0.398	0.341	0.344	0.202	0.330	0.373	0.339	0.297	0.336	17.98
27) T	2-Butanone (MEK)	1.263	1.142	0.997	1.027	0.613	0.988	1.085	1.012	0.966	1.010	17.41
28) T	cis-1,2-Dichlo...	2.390	2.399	2.079	2.047	1.188	1.871	2.081	1.935	1.827	1.980	18.15
29) T	Diisopropyl Ether	1.653	1.520	1.430	1.282	0.768	1.140	1.240	1.111	0.952	1.233	22.54
30) T	Ethyl Acetate	0.612	0.578	0.567	0.558	0.331	0.535	0.589	0.515	0.424	0.523	17.24
31) T	n-Hexane			2.833	2.771	1.567	2.404	2.502	2.172	1.786	2.291	20.90
32) T	Chloroform	2.847	2.827	2.338	2.505	1.415	2.240	2.491	2.314	2.191	2.352	17.98
33) S	1,2-Dichloroet...	1.513	1.525	1.521	1.504	1.508	1.490	1.470	1.471	1.458	1.496	1.62
34) T	Tetrahydrofura...	1.284	1.260	1.116	1.084	0.580	0.944	1.062	0.992	0.946	1.030	20.25
35) T	Ethyl tert-But...	2.241	1.842	1.762	1.784	0.976	1.595	1.811	1.691	1.602	1.700	19.52
36) T	1,2-Dichloroet...	1.986	2.036	1.751	1.771	1.040	1.621	1.807	1.675	1.584	1.697	17.04
37) IR	1,4-Difluorobenzen...	-----ISTD-----										
38) T	1,1,1-Trichlor...	0.525	0.489	0.420	0.430	0.246	0.390	0.440	0.406	0.383	0.414	18.85
39) T	Isopropyl Acetate	0.231	0.236	0.208	0.209	0.118	0.191	0.211	0.187	0.165	0.195	18.51
40) T	1-Butanol				0.320	0.200	0.327	0.336	0.298	0.262	0.290	17.81
41) T	Benzene	1.719	1.643	1.358	1.323	0.729	1.146	1.257	1.146	1.063	1.265	23.67
42) T	Carbon Tetrach...	0.435	0.415	0.362	0.363	0.210	0.329	0.377	0.351	0.334	0.353	18.12

Method	Path : I:\MS09\Methods\												
Method	File : R9110716.M												
Title	: EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)												
43)	T	Cyclohexane	0.576	0.544	0.483	0.474	0.274	0.436	0.484	0.437	0.381	0.455	19.62
44)	T	tert-Amyl Meth...	1.255	1.228	0.978	0.954	0.499	0.802	0.934	0.854	0.792	0.922	24.97
45)	T	1,2-Dichloropr...	0.378	0.359	0.320	0.321	0.187	0.287	0.324	0.297	0.282	0.306	17.85
46)	T	Bromodichlorom...	0.475	0.433	0.381	0.395	0.226	0.361	0.412	0.381	0.361	0.381	18.01
47)	T	Trichloroethene	0.351	0.320	0.296	0.307	0.177	0.277	0.317	0.292	0.276	0.290	16.72
48)	T	1,4-Dioxane	0.286	0.248	0.232	0.231	0.144	0.232	0.268	0.250	0.233	0.236	16.74
49)	T	2,2,4-Trimethy...	1.679	1.594	1.359	1.361	0.781	1.242	1.379	1.245	1.120	1.307	20.09
50)	T	Methyl Methacr...	0.124	0.120	0.110	0.115	0.066	0.114	0.130	0.121	0.111	0.112	16.40
51)	T	n-Heptane	0.379	0.381	0.309	0.328	0.185	0.291	0.322	0.296	0.275	0.307	19.10
52)	T	cis-1,3-Dichlo...	0.580	0.581	0.508	0.493	0.285	0.467	0.534	0.490	0.460	0.489	18.02
53)	T	4-Methyl-2-pen...	0.348	0.315	0.288	0.284	0.173	0.277	0.311	0.286	0.264	0.283	17.06
54)	T	trans-1,3-Dich...	0.511	0.494	0.435	0.433	0.256	0.420	0.480	0.443	0.421	0.433	17.13
55)	T	1,1,2-Trichlor...	0.338	0.327	0.292	0.291	0.169	0.267	0.307	0.282	0.267	0.282	17.34
56)	IR	Chlorobenzene-d5 (...)	-----ISTD-----										
57)	S	Toluene-d8 (SS2)	2.535	2.548	2.557	2.538	2.546	2.526	2.527	2.536	2.529	2.538	0.42
58)	T	Toluene	3.872	3.536	3.119	3.015	1.698	2.705	2.983	2.734	2.475	2.904	21.46
59)	T	2-Hexanone	1.802	1.725	1.461	1.413	0.909	1.491	1.594	1.453	1.322	1.463	17.60
60)	T	Dibromochlorom...	0.822	0.810	0.728	0.736	0.424	0.692	0.795	0.746	0.706	0.718	16.60
61)	T	1,2-Dibromoethane	0.858	0.805	0.726	0.743	0.430	0.697	0.798	0.749	0.709	0.724	16.81
62)	T	n-Butyl Acetate	1.985	1.868	1.628	1.618	1.035	1.684	1.811	1.658	1.511	1.644	16.46
63)	T	n-Octane			0.729	0.701	0.404	0.598	0.661	0.607	0.550	0.607	17.94
64)	T	Tetrachloroethene	0.797	0.784	0.708	0.711	0.417	0.652	0.743	0.698	0.663	0.686	16.35
65)	T	Chlorobenzene	2.266	2.105	1.866	1.831	1.081	1.706	1.903	1.762	1.619	1.793	18.55
66)	T	Ethylbenzene	3.974	3.742	3.274	3.233	1.898	3.030	3.354	3.067	2.738	3.146	18.98
67)	T	m- & p-Xylenes	3.072	2.879	2.534	2.457	1.462	2.315	2.565	2.321	2.020	2.403	19.56
68)	T	Bromoform	0.652	0.620	0.544	0.561	0.327	0.541	0.651	0.620	0.594	0.568	17.54
69)	T	Styrene	2.310	2.123	1.843	1.862	1.121	1.857	2.094	1.928	1.747	1.876	17.76
70)	T	o-Xylene	3.090	2.939	2.581	2.503	1.465	2.347	2.611	2.389	2.114	2.449	19.33
71)	T	n-Nonane	1.970	1.785	1.532	1.517	0.872	1.342	1.457	1.303	1.123	1.433	22.95
72)	T	1,1,2,2-Tetrac...	1.466	1.402	1.225	1.221	0.734	1.183	1.311	1.206	1.076	1.203	17.59
73)	S	Bromofluoroben...	0.670	0.666	0.668	0.669	0.668	0.686	0.693	0.697	0.706	0.680	2.26
74)	T	Cumene	3.886	3.690	3.153	3.192	1.840	2.967	3.269	2.957	2.584	3.060	19.62
75)	T	alpha-Pinene	2.063	2.019	1.708	1.692	0.888	1.508	1.770	1.623	1.433	1.634	21.34
76)	T	n-Propylbenzene	4.742	4.419	3.883	3.809	2.283	3.646	3.953	3.549	3.080	3.707	19.38
77)	T	3-Ethyltoluene	3.931	3.736	3.201	3.226	1.888	3.016	3.234	3.003	2.667	3.100	19.13
78)	T	4-Ethyltoluene	3.515	3.290	2.834	2.830	1.721	2.769	3.123	2.750	2.341	2.797	18.91
79)	T	1,3,5-Trimethy...	3.121	2.946	2.596	2.563	1.522	2.417	2.699	2.455	2.161	2.498	18.55
80)	T	alpha-Methylst...	1.486	1.421	1.294	1.297	0.778	1.309	1.486	1.360	1.214	1.294	16.56
81)	T	2-Ethyltoluene	3.642	3.432	3.109	2.995	1.768	2.854	3.155	2.838	2.477	2.919	18.82
82)	T	1,2,4-Trimethy...	3.174	2.921	2.630	2.597	1.515	2.450	2.710	2.358	1.865	2.469	20.70
83)	T	n-Decane				1.640	0.888	1.402	1.574	1.381	1.111	1.333	21.39
84)	T	Benzyl Chloride	2.658	2.449	2.159	2.183	1.325	2.272	2.628	2.365	1.958	2.222	18.20
85)	T	1,3-Dichlorobe...	1.625	1.630	1.369	1.367	0.850	1.353	1.525	1.404	1.244	1.374	17.15
86)	T	1,4-Dichlorobe...	1.666	1.514	1.332	1.346	0.842	1.356	1.547	1.425	1.298	1.370	16.91
87)	T	sec-Butylbenzene	4.231	4.011	3.588	3.519	2.046	3.291	3.601	3.231	2.759	3.364	19.45
88)	T	4-Isopropyltol...	3.939	3.697	3.203	3.204	1.884	3.038	3.262	2.779	2.137	3.016	22.11
89)	T	1,2,3-Trimethy...	3.099	2.995	2.579	2.582	1.519	2.463	2.725	2.370	1.857	2.465	20.54
90)	T	1,2-Dichlorobe...	1.540	1.535	1.350	1.328	0.815	1.305	1.468	1.338	1.148	1.314	17.06
91)	T	d-Limonene	1.397	1.309	1.178	1.128	0.633	1.074	1.196	1.064	0.846	1.092	21.28
92)	T	1,2-Dibromo-3-...	0.478	0.475	0.448	0.460	0.280	0.478	0.546	0.513	0.487	0.463	16.06
93)	T	n-Undecane				1.666	0.784	1.215	1.660	1.481	1.242	1.341	25.02
94)	T	1,2,4-Trichlor...	1.026	1.015	0.890	0.872	0.545	0.918	1.113	1.051	0.977	0.934	17.75

Method Path : I:\MS09\Methods\
Method File : R9110716.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

95)	T	Naphthalene	3.285	3.106	2.795	2.788	1.773	3.002	3.590	3.263	2.805	2.934	17.47
96)	T	n-Dodecane				1.467	0.675	1.043	1.564	1.403	1.168	1.220	27.03
97)	T	Hexachlorobuta...	0.649	0.616	0.584	0.585	0.355	0.555	0.650	0.615	0.580	0.577	15.45
98)	T	Cyclohexanone	1.325	1.214	1.000	0.957	0.601	0.984	1.041	0.960	0.888	0.997	20.34
99)	T	tert-Butylbenzene	3.020	2.865	2.550	2.510	1.460	2.349	2.541	2.190	1.744	2.359	21.20
100)	T	n-Butylbenzene	3.467	3.327	2.785	2.814	1.689	2.713	2.956	2.647	2.263	2.740	19.43

(#) = Out of Range

Primary Source Standards Concentrations (Working & Initial Calibration)

11/8/16

1ng/L Std. ID:
4ng/L Std. ID: S29-11041608
20ng/L Std. ID: S29-11041605
200ng/L Std. ID: S29-11041603

Dilution Factors: 5 50 250 1000

200ng/L Std. ID: S29-11041603						Working STD Conc.(ng/L):										
Dilution Factors:		5	50	250	1000		4	4	4	4	20	20	200	200	200	
Compounds	Source Std. mg/m ³	Primary Working Standards				Injection (L):	0.020	0.025	0.050	0.100	0.050	0.25	0.125	0.25	0.50	
		200ng/L	20ng/L	4ng/L	1ng/L	ICAL Points:	0.08ng	0.1ng	0.2ng	0.4ng	1ng	5ng	25ng	50ng	100ng	
Propene	1.036	207.2	20.72	4.144	1.036		0.08288	0.1036	0.2072	0.4144	1.036	5.180	25.900	51.80	103.6	
Dichlorodifluoromethane	1.047	209.4	20.94	4.188	1.047		0.08376	0.1047	0.2094	0.4188	1.047	5.235	26.175	52.35	104.7	
Chloromethane	1.005	201.0	20.10	4.020	1.005		0.08040	0.1005	0.2010	0.4020	1.005	5.025	25.125	50.25	100.5	
Freon-114	1.005	201.0	20.10	4.020	1.005		0.08040	0.1005	0.2010	0.4020	1.005	5.025	25.125	50.25	100.5	
Vinyl Chloride	1.023	204.6	20.46	4.092	1.023		0.08184	0.1023	0.2046	0.4092	1.023	5.115	25.575	51.15	102.3	
1,3-Butadiene	1.057	211.4	21.14	4.228	1.057		0.08456	0.1057	0.2114	0.4228	1.057	5.285	26.425	52.85	105.7	
Bromomethane	0.993	198.6	19.86	3.972	0.993		0.07944	0.0993	0.1986	0.3972	0.993	4.965	24.825	49.65	99.3	
Chloroethane	1.009	201.8	20.18	4.036	1.009		0.08072	0.1009	0.2018	0.4036	1.009	5.045	25.225	50.45	100.9	
Ethanol	5.207	1041.4	104.14	20.828	5.207		0.41656	0.5207	1.0414	2.0828	5.207	26.035	130.175	260.35	520.7	
Acetonitrile	1.046	209.2	20.92	4.184	1.046		0.08368	0.1046	0.2092	0.4184	1.046	5.230	26.150	52.30	104.6	
Acrolein	1.041	208.2	20.82	4.164	1.041		0.08328	0.1041	0.2082	0.4164	1.041	5.205	26.025	52.05	104.1	
Acetone	5.313	1062.6	106.26	21.252	5.313		0.42504	0.5313	1.0626	2.1252	5.313	26.565	132.825	265.65	531.3	
Trichlorofluoromethane	1.049	209.8	20.98	4.196	1.049		0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	52.45	104.9	
Isopropanol	2.105	421.0	42.10	8.420	2.105		0.16840	0.2105	0.4210	0.8420	2.105	10.525	52.625	105.25	210.5	
Acrylonitrile	1.055	211.0	21.10	4.220	1.055		0.08440	0.1055	0.2110	0.4220	1.055	5.275	26.375	52.75	105.5	
1,1-Dichloroethene	1.059	211.8	21.18	4.236	1.059		0.08472	0.1059	0.2118	0.4236	1.059	5.295	26.475	52.95	105.9	
tert-Butanol	2.114	422.8	42.28	8.456	2.114		0.16912	0.2114	0.4228	0.8456	2.114	10.570	52.850	105.70	211.4	
Methylene Chloride	1.057	211.4	21.14	4.228	1.057		0.08456	0.1057	0.2114	0.4228	1.057	5.285	26.425	52.85	105.7	
Allyl Chloride	1.052	210.4	21.04	4.208	1.052		0.08416	0.1052	0.2104	0.4208	1.052	5.260	26.300	52.60	105.2	
Trichlorotrifluoroethane	1.049	209.8	20.98	4.196	1.049		0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	52.45	104.9	
Carbon Disulfide	1.061	212.2	21.22	4.244	1.061		0.08488	0.1061	0.2122	0.4244	1.061	5.305	26.525	53.05	106.1	
trans-1,2-Dichloroethene	1.067	213.4	21.34	4.268	1.067		0.08536	0.1067	0.2134	0.4268	1.067	5.335	26.675	53.35	106.7	
1,1-Dichloroethane	1.020	204.0	20.40	4.080	1.020		0.08160	0.1020	0.2040	0.4080	1.020	5.100	25.500	51.00	102.0	
Methyl tert-Butyl Ether	1.066	213.2	21.32	4.264	1.066		0.08528	0.1066	0.2132	0.4264	1.066	5.330	26.650	53.30	106.6	
Vinyl Acetate	5.265	1053.0	105.30	21.060	5.265		0.42120	0.5265	1.0530	2.1060	5.265	26.325	131.625	263.25	526.5	
2-Butanone	1.049	209.8	20.98	4.196	1.049		0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	52.45	104.9	
cis-1,2-Dichloroethene	1.064	212.8	21.28	4.256	1.064		0.08512	0.1064	0.2128	0.4256	1.064	5.320	26.600	53.20	106.4	
Diisopropyl Ether	1.062	212.4	21.24	4.248	1.062		0.08496	0.1062	0.2124	0.4248	1.062	5.310	26.550	53.10	106.2	
Ethyl Acetate	2.129	425.8	42.58	8.516	2.129		0.17032	0.2129	0.4258	0.8516	2.129	10.645	53.225	106.45	212.9	
n-Hexane	1.063	212.6	21.26	4.252	1.063		0.08504	0.1063	0.2126	0.4252	1.063	5.315	26.575	53.15	106.3	
Chloroform	1.058	211.6	21.16	4.232	1.058		0.08464	0.1058	0.2116	0.4232	1.058	5.290	26.450	52.90	105.8	
Tetrahydrofuran	1.062	212.4	21.24	4.248	1.062		0.08496	0.1062	0.2124	0.4248	1.062	5.310	26.550	53.10	106.2	
Ethyl tert-Butyl Ether	1.057	211.4	21.14	4.228	1.057		0.08456	0.1057	0.2114	0.4228	1.057	5.285	26.425	52.85	105.7	
1,2-Dichloroethane	1.052	210.4	21.04	4.208	1.052		0.08416	0.1052	0.2104	0.4208	1.052	5.260	26.300	52.60	105.2	
1,1,1-Trichloroethane	1.074	214.8	21.48	4.296	1.074		0.08592	0.1074	0.2148	0.4296	1.074	5.370	26.850	53.70	107.4	
Isopropyl Acetate	2.104	420.8	42.08	8.416	2.104		0.16832	0.2104	0.4208	0.8416	2.104	10.520	52.600	105.20	210.4	
1-Butanol	2.105	421.0	42.10	8.420	2.105		0.16840	0.2105	0.4210	0.8420	2.105	10.525	52.625	105.25	210.5	
Benzene	1.052	210.4	21.04	4.208	1.052		0.08416	0.1052	0.2104	0.4208	1.052	5.260	26.300	52.60	105.2	
Carbon Tetrachloride	1.055	211.0	21.10	4.220	1.055		0.08440	0.1055	0.2110	0.4220	1.055	5.275	26.375	52.75	105.5	
Cyclohexane	2.130	426.0	42.60	8.520	2.130		0.17040	0.2130	0.4260	0.8520	2.130	10.650	53.250	106.50	213.0	
tert-Amyl Methyl Ether	1.054	210.8	21.08	4.216	1.054		0.08432	0.1054	0.2108	0.4216	1.054	5.270	26.350	52.70	105.4	
1,2-Dichloropropane	1.062	212.4	21.24	4.248	1.062		0.08496	0.1062	0.2124	0.4248	1.062	5.310	26.550	53.10	106.2	
Bromodichloromethane	1.066	213.2	21.32	4.264	1.066		0.08528	0.1066	0.2132	0.4264	1.066	5.330	26.650	53.30	106.6	
Trichloroethene	1.060	212.0	21.20	4.240	1.060		0.08480	0.1060	0.2120	0.4240	1.060	5.300	26.500	53.00	106.0	
1,4-Dioxane	1.062	212.4	21.24	4.248	1.062		0.08496	0.1062	0.2124	0.4248	1.062	5.310	26.550	53.10	106.2	
Isooctane	1.059	211.8	21.18	4.236	1.059		0.08472	0.1059	0.2118	0.4236	1.059	5.295	26.475	52.95	105.9	
Methyl Methacrylate	2.110	422.0	42.20	8.440	2.110		0.16880	0.2110	0.4220	0.8440	2.110	10.550	52.750	105.50	211.0	
n-Heptane	1.062	212.4	21.24	4.248	1.062		0.08496	0.1062	0.2124	0.4248	1.062	5.310	26.550	53.10	106.2	
cis-1,3-Dichloropropene	1.116	223.2	22.32	4.464	1.116		0.08928	0.1116	0.2232	0.4464	1.116	5.580	27.900	55.80	111.6	
4-Methyl-2-pentanone	1.058	211.6	21.16	4.232	1.058		0.08464	0.1058	0.2116	0.4232	1.058	5.290	26.450	52.90	105.8	
trans-1,3-Dichloropropene	1.064	212.8	21.28	4.256	1.064		0.08512	0.1064	0.2128	0.4256	1.064	5.320	26.600	53.20	106.4	
1,1,2-Trichloroethane	1.061	212.2	21.22	4.244	1.061		0.08488	0.1061	0.2122	0.4244	1.061	5.305	26.525	53.05	106.1	
Toluene	1.053	210.6	21.06	4.212	1.053		0.08424	0.1053	0.2106	0.4212	1.053	5.265	26.325	52.65	105.3	
2-Hexanone	1.061	212.2	21.22	4.244	1.061		0.08488	0.1061	0.2122	0.4244	1.061	5.305	26.525	53.05	106.1	

Primary Source Standards Concentrations (Working & Initial Calibration)

1ng/L Std. ID:
 4ng/L Std. ID: S29-11041608
 20ng/L Std. ID: S29-11041605
 200ng/L Std. ID: S29-11041603

Dilution Factors:					Working STD Conc.(ng/L):									
						4	4	4	4	20	20	200	200	200
					Source Std.	Primary Working Standards								
					mg/m ³	200ng/L	20ng/L	4ng/L	1ng/L	Injection (L):				
					ICAL Points:	0.08ng	0.1ng	0.2ng	0.4ng	1ng	5ng	25ng	50ng	100ng
Dibromochloromethane	1.062	212.4	21.24	4.248	1.062	0.08496	0.1062	0.2124	0.4248	1.062	5.310	26.550	53.10	106.2
1,2-Dibromoethane	1.056	211.2	21.12	4.224	1.056	0.08448	0.1056	0.2112	0.4224	1.056	5.280	26.400	52.80	105.6
n-Butyl Acetate	1.064	212.8	21.28	4.256	1.064	0.08512	0.1064	0.2128	0.4256	1.064	5.320	26.600	53.20	106.4
n-Octane	1.057	211.4	21.14	4.228	1.057	0.08456	0.1057	0.2114	0.4228	1.057	5.285	26.425	52.85	105.7
Tetrachloroethene	1.061	212.2	21.22	4.244	1.061	0.08488	0.1061	0.2122	0.4244	1.061	5.305	26.525	53.05	106.1
Chlorobenzene	1.061	212.2	21.22	4.244	1.061	0.08488	0.1061	0.2122	0.4244	1.061	5.305	26.525	53.05	106.1
Ethylbenzene	1.055	211.0	21.10	4.220	1.055	0.08440	0.1055	0.2110	0.4220	1.055	5.275	26.375	52.75	105.5
m-&p-Xylene	2.123	424.6	42.46	8.492	2.123	0.16984	0.2123	0.4246	0.8492	2.123	10.615	53.075	106.15	212.3
Bromoform	1.063	212.6	21.26	4.252	1.063	0.08504	0.1063	0.2126	0.4252	1.063	5.315	26.575	53.15	106.3
Styrene	1.061	212.2	21.22	4.244	1.061	0.08488	0.1061	0.2122	0.4244	1.061	5.305	26.525	53.05	106.1
o-Xylene	1.054	210.8	21.08	4.216	1.054	0.08432	0.1054	0.2108	0.4216	1.054	5.270	26.350	52.70	105.4
n-Nonane	1.054	210.8	21.08	4.216	1.054	0.08432	0.1054	0.2108	0.4216	1.054	5.270	26.350	52.70	105.4
1,1,2,2-Tetrachloroethane	1.056	211.2	21.12	4.224	1.056	0.08448	0.1056	0.2112	0.4224	1.056	5.280	26.400	52.80	105.6
Cumene	1.050	210.0	21.00	4.200	1.050	0.08400	0.1050	0.2100	0.4200	1.050	5.250	26.250	52.50	105.0
alpha-Pinene	1.044	208.8	20.88	4.176	1.044	0.08352	0.1044	0.2088	0.4176	1.044	5.220	26.100	52.20	104.4
n-Propylbenzene	1.063	212.6	21.26	4.252	1.063	0.08504	0.1063	0.2126	0.4252	1.063	5.315	26.575	53.15	106.3
3-Ethyltoluene	1.050	210.0	21.00	4.200	1.050	0.08400	0.1050	0.2100	0.4200	1.050	5.250	26.250	52.50	105.0
4-Ethyltoluene	1.049	209.8	20.98	4.196	1.049	0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	52.45	104.9
1,3,5-Trimethylbenzene	1.049	209.8	20.98	4.196	1.049	0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	52.45	104.9
alpha-Methylstyrene	1.050	210.0	21.00	4.200	1.050	0.08400	0.1050	0.2100	0.4200	1.050	5.250	26.250	52.50	105.0
2-Ethyltoluene	1.062	212.4	21.24	4.248	1.062	0.08496	0.1062	0.2124	0.4248	1.062	5.310	26.550	53.10	106.2
1,2,4-Trimethylbenzene	1.052	210.4	21.04	4.208	1.052	0.08416	0.1052	0.2104	0.4208	1.052	5.260	26.300	52.60	105.2
n-Decane	1.053	210.6	21.06	4.212	1.053	0.08424	0.1053	0.2106	0.4212	1.053	5.265	26.325	52.65	105.3
Benzyl Chloride	1.061	212.2	21.22	4.244	1.061	0.08488	0.1061	0.2122	0.4244	1.061	5.305	26.525	53.05	106.1
1,3-Dichlorobenzene	1.058	211.6	21.16	4.232	1.058	0.08464	0.1058	0.2116	0.4232	1.058	5.290	26.450	52.90	105.8
1,4-Dichlorobenzene	1.058	211.6	21.16	4.232	1.058	0.08464	0.1058	0.2116	0.4232	1.058	5.290	26.450	52.90	105.8
sec-Butylbenzene	1.054	210.8	21.08	4.216	1.054	0.08432	0.1054	0.2108	0.4216	1.054	5.270	26.350	52.70	105.4
p-Isopropyltoluene	1.027	205.4	20.54	4.108	1.027	0.08216	0.1027	0.2054	0.4108	1.027	5.135	25.675	51.35	102.7
1,2,3-Trimethylbenzene	1.027	205.4	20.54	4.108	1.027	0.08216	0.1027	0.2054	0.4108	1.027	5.135	25.675	51.35	102.7
1,2-Dichlorobenzene	1.058	211.6	21.16	4.232	1.058	0.08464	0.1058	0.2116	0.4232	1.058	5.290	26.450	52.90	105.8
d-Limonene	1.005	201.0	20.10	4.020	1.005	0.08040	0.1005	0.2010	0.4020	1.005	5.025	25.125	50.25	100.5
1,2-Dibromo-3-chloropropane	1.053	210.6	21.06	4.212	1.053	0.08424	0.1053	0.2106	0.4212	1.053	5.265	26.325	52.65	105.3
n-Undecane	1.054	210.8	21.08	4.216	1.054	0.08432	0.1054	0.2108	0.4216	1.054	5.270	26.350	52.70	105.4
1,2,4-Trichlorobenzene	1.043	208.6	20.86	4.172	1.043	0.08344	0.1043	0.2086	0.4172	1.043	5.215	26.075	52.15	104.3
Naphthalene	1.083	216.6	21.66	4.332	1.083	0.08664	0.1083	0.2166	0.4332	1.083	5.415	27.075	54.15	108.3
n-Dodecane	1.045	209.0	20.90	4.180	1.045	0.08360	0.1045	0.2090	0.4180	1.045	5.225	26.125	52.25	104.5
Hexachloro-1,3-butadiene	1.059	211.8	21.18	4.236	1.059	0.08472	0.1059	0.2118	0.4236	1.059	5.295	26.475	52.95	105.9
Methacrylonitrile	1.065	213.0	21.30	4.260	1.065	0.08520	0.1065	0.2130	0.4260	1.065	5.325	26.625	53.25	106.5
Cyclohexanone	1.056	211.2	21.12	4.224	1.056	0.08448	0.1056	0.2112	0.4224	1.056	5.280	26.400	52.80	105.6
tert-Butylbenzene	1.051	210.2	21.02	4.204	1.051	0.08408	0.1051	0.2102	0.4204	1.051	5.255	26.275	52.55	105.1
n-Butylbenzene	1.056	211.2	21.12	4.224	1.056	0.08448	0.1056	0.2112	0.4224	1.056	5.280	26.400	52.80	105.6

Method : I:\MS09\Methods\R9110716.M (RTE Integrator)
 Title : EPA T0-15 per SOP VOA-T015 (CASS T0-15/GC-MS)
 Last Update : Tue Nov 08 09:00:48 2016
 Response via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	0.08	0	13	I:\MS09\Data\2016_11\07\11071607.D
2	0.10	0	13	I:\MS09\Data\2016_11\07\11071608.D
3	0.20	0	13	I:\MS09\Data\2016_11\07\11071609.D
4	0.40	0	13	I:\MS09\Data\2016_11\07\11071610.D
5	1.0	1	13	I:\MS09\Data\2016_11\07\11071611.D
6	5.0	5	13	I:\MS09\Data\2016_11\07\11071612.D
7	25	26	13	I:\MS09\Data\2016_11\07\11071613.D
8	50	52	13	I:\MS09\Data\2016_11\07\11071614.D
9	100	104	13	I:\MS09\Data\2016_11\07\11071615.D

#	ID	Update Time	Quant Time	Acquisition Time
1	0.08	Nov 08 08:57 2016	Nov 08 08:52 2016	7 Nov 2016 14:47
2	0.10	Nov 08 08:57 2016	Nov 08 08:50 2016	7 Nov 2016 15:21
3	0.20	Nov 08 08:59 2016	Nov 08 08:48 2016	7 Nov 2016 15:54
4	0.40	Nov 08 08:59 2016	Nov 08 08:45 2016	7 Nov 2016 16:28
5	1.0	Nov 08 08:59 2016	Nov 08 08:43 2016	7 Nov 2016 17:02
6	5.0	Nov 08 09:00 2016	Nov 08 08:41 2016	7 Nov 2016 17:36
7	25	Nov 08 09:00 2016	Nov 08 08:36 2016	7 Nov 2016 18:09
8	50	Nov 08 09:00 2016	Nov 08 08:54 2016	7 Nov 2016 18:43
9	100	Nov 08 09:00 2016	Nov 08 08:55 2016	7 Nov 2016 19:17

R9110716.M

Mon Nov 21 09:25:18 2016

 11/21/16

Data File: I:\MS09\Data\2016 11\07\11071607.D

Acq On : 7 Nov 2016 14:47

Operator: SC

Sample : 0.08ng TO-15 ICAL STD

Misc : S29-10261601/S29-11041608 (12/2)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 08 08:52:29 2016

Quant Method : I:\MS09\Methods\R9110716.M

 11/8/16

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 08:41:37 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.17	130	143487	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	11.15	114	706376	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	15.50	82	301467	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.96	65	217064	10.124	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	80.96%
57) Toluene-d8 (SS2)	13.59	98	764346	12.879	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.04%
73) Bromofluorobenzene (SS3)	17.10	174	202055	13.863	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	110.88%

Target Compounds

						Qvalue
2) Propene	3.92	42	2241	0.072	ng	93
3) Dichlorodifluoromethan...	4.02	85	3277	0.081	ng	# 92
4) Chloromethane	4.22	50	2925	0.070	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.39	135	1456	0.078	ng	95
6) Vinyl Chloride	4.50	62	2768	0.069	ng	94
7) 1,3-Butadiene	4.67	54	1743	0.064	ng	# 82
8) Bromomethane	4.98	94	1429	0.075	ng	90
9) Chloroethane	5.20	64	1200	0.075	ng	96
10) Ethanol	5.37	45	6217m	0.346	ng	
11) Acetonitrile	5.59	41	3766	0.080	ng	92
12) Acrolein	5.74	56	1247	0.085	ng	97
13) Acetone	5.89	58	7767	0.429	ng	96
14) Trichlorofluoromethane	6.07	101	2655	0.088	ng	92
15) 2-Propanol (Isopropanol)	6.19	45	8868	0.153	ng	90
16) Acrylonitrile	6.39	53	2451	0.081	ng	94
17) 1,1-Dichloroethene	6.77	96	1746	0.093	ng	96
18) 2-Methyl-2-Propanol (t...	6.88	59	9753	0.191	ng	# 73
19) Methylene Chloride	6.90	84	2084	0.097	ng	96
20) 3-Chloro-1-propene (Al...	7.04	41	2851	0.081	ng	81
21) Trichlorotrifluoroethane	7.23	151	1229	0.091	ng	94
22) Carbon Disulfide	7.20	76	8717	0.115	ng	92
23) trans-1,2-Dichloroethene	7.92	61	2534	0.084	ng	98
24) 1,1-Dichloroethane	8.14	63	3166	0.081	ng	100
25) Methyl tert-Butyl Ether	8.24	73	5742	0.095	ng	98
26) Vinyl Acetate	8.32	86	1940	0.436	ng	# 69
27) 2-Butanone (MEK)	8.57	72	1217	0.087	ng	# 80
28) cis-1,2-Dichloroethene	9.01	61	2335	0.081	ng	90
29) Diisopropyl Ether	9.28	87	1612	0.099	ng	# 96
30) Ethyl Acetate	9.27	61	1196	0.148	ng	100
31) n-Hexane	9.27	57	3466	0.090	ng	# 91
32) Chloroform	9.31	83	2766	0.081	ng	99
34) Tetrahydrofuran (THF)	9.73	72	1252	0.088	ng	# 76
35) Ethyl tert-Butyl Ether	9.82	87	2175	0.100	ng	99
36) 1,2-Dichloroethane	10.07	62	1919	0.071	ng	93
38) 1,1,1-Trichloroethane	10.33	97	2548	0.096	ng	92
39) Isopropyl Acetate	10.71	61	2196	0.166	ng	# 79
40) 1-Butanol	10.72	56	4692	0.202	ng	97
41) Benzene	10.79	78	8177	0.097	ng	98
42) Carbon Tetrachloride	10.95	117	2075	0.095	ng	99
43) Cyclohexane	11.08	84	5551	0.190	ng	93
44) tert-Amyl Methyl Ether	11.41	73	5982	0.106	ng	94
45) 1,2-Dichloropropane	11.62	63	1815	0.085	ng	95
46) Bromodichloromethane	11.79	83	2287	0.093	ng	96
47) Trichloroethene	11.84	130	1680	0.095	ng	97
48) 1,4-Dioxane	11.83	88	1373	0.090	ng	98
49) 2,2,4-Trimethylpentane...	11.92	57	8038	0.090	ng	99

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Data File: I:\MS09\Data\2016 11\07\11071607.D

Acq On : 7 Nov 2016 14:47

Operator: SC

Sample : 0.08ng TO-15 ICAL STD

Misc : S29-10261601/S29-11041608 (12/2)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 08 08:52:29 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 08:41:37 2016

Response via : Initial Calibration

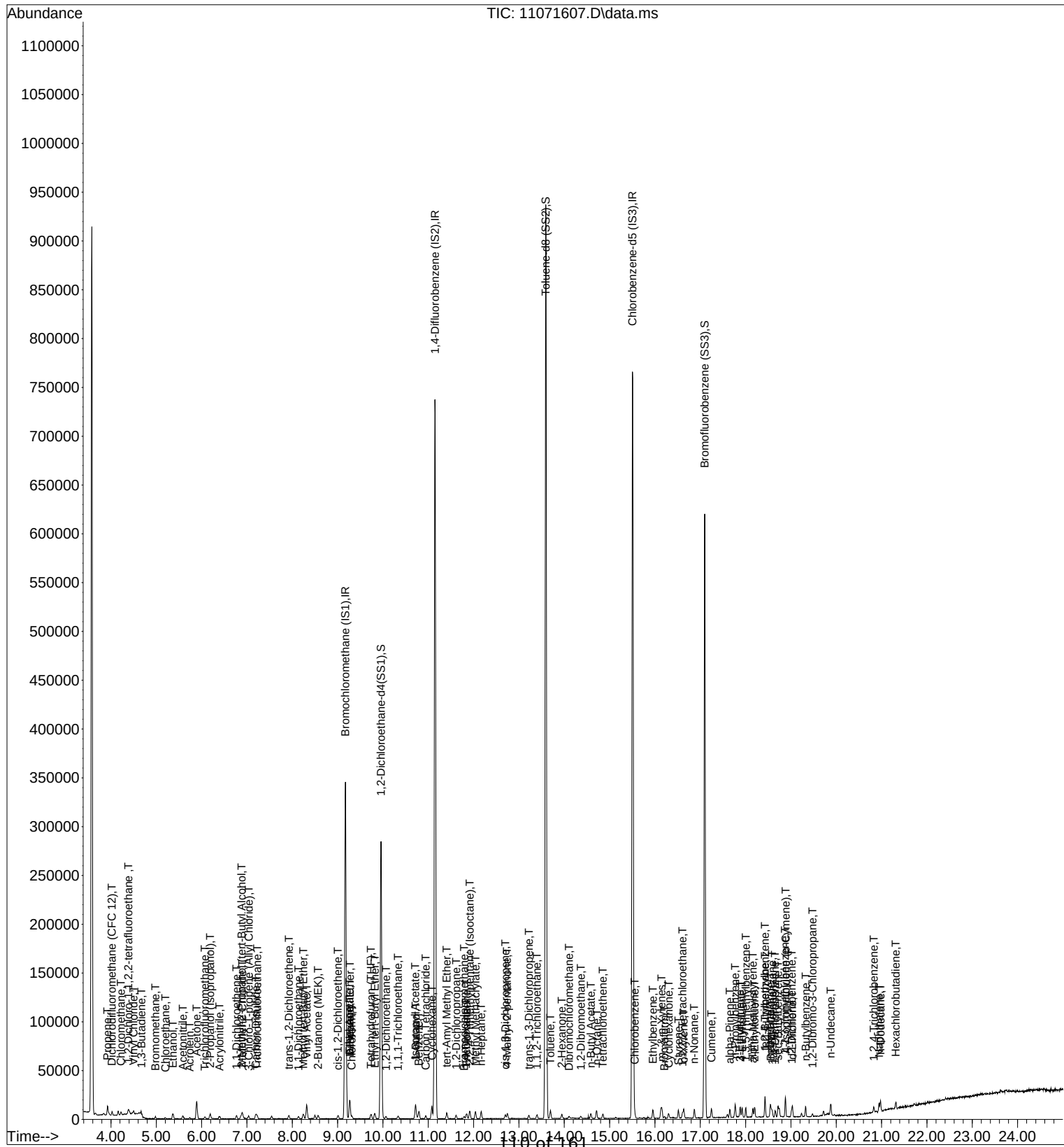
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.04	100	1185	0.177	ng	# 85
51) n-Heptane	12.17	71	1819	0.090	ng	# 86
52) cis-1,3-Dichloropropene	12.70	75	2927	0.093	ng	100
53) 4-Methyl-2-pentanone	12.74	58	1666	0.089	ng	# 92
54) trans-1,3-Dichloropropene	13.22	75	2459	0.088	ng	93
55) 1,1,2-Trichloroethane	13.40	97	1621	0.091	ng	91
58) Toluene	13.70	91	7867	0.107	ng	97
59) 2-Hexanone	13.95	43	3689	0.083	ng	93
60) Dibromochloromethane	14.11	129	1684	0.099	ng	95
61) 1,2-Dibromoethane	14.37	107	1748	0.097	ng	92
62) n-Butyl Acetate	14.59	43	4074	0.082	ng	96
63) n-Octane	14.72	57	2010	0.118	ng	# 77
64) Tetrachloroethene	14.85	166	1631	0.103	ng	98
65) Chlorobenzene	15.56	112	4639	0.104	ng	99
66) Ethylbenzene	15.95	91	8090	0.101	ng	100
67) m- & p-Xylenes	16.14	91	12582	0.205	ng	98
68) Bromoform	16.21	173	1337	0.105	ng	89
69) Styrene	16.52	104	4729	0.103	ng	97
70) o-Xylene	16.63	91	6284	0.100	ng	99
71) n-Nonane	16.87	43	4007	0.095	ng	90
72) 1,1,2,2-Tetrachloroethane	16.61	83	2987	0.092	ng	99
74) Cumene	17.25	105	7872	0.104	ng	100
75) alpha-Pinene	17.66	93	4156	0.104	ng	96
76) n-Propylbenzene	17.77	91	9726	0.100	ng	93
77) 3-Ethyltoluene	17.88	105	7963	0.105	ng	95
78) 4-Ethyltoluene	17.92	105	7115	0.097	ng	98
79) 1,3,5-Trimethylbenzene	18.01	105	6316	0.101	ng	99
80) alpha-Methylstyrene	18.16	118	3011	0.097	ng	96
81) 2-Ethyltoluene	18.20	105	7462	0.101	ng	99
82) 1,2,4-Trimethylbenzene	18.43	105	6443	0.101	ng	100
83) n-Decane	18.55	57	4087	0.094	ng	95
84) Benzyl Chloride	18.56	91	5441	0.094	ng	95
85) 1,3-Dichlorobenzene	18.58	146	3317	0.097	ng	98
86) 1,4-Dichlorobenzene	18.65	146	3401	0.098	ng	99
87) sec-Butylbenzene	18.72	105	8605	0.100	ng	98
88) 4-Isopropyltoluene (p-...	18.88	119	7806	0.102	ng	97
89) 1,2,3-Trimethylbenzene	18.87	105	6140	0.096	ng	94
90) 1,2-Dichlorobenzene	19.02	146	3143	0.095	ng	94
91) d-Limonene	19.03	68	2708	0.097	ng	92
92) 1,2-Dibromo-3-Chloropr...	19.48	157	972	0.089	ng	86
93) n-Undecane	19.88	57	5389	0.119	ng	91
94) 1,2,4-Trichlorobenzene	20.83	180	2064	0.086	ng	96
95) Naphthalene	20.95	128	6865	0.087	ng	99
96) n-Dodecane	20.98	57	4469	0.101	ng	88
97) Hexachlorobutadiene	21.31	225	1327	0.098	ng	96
98) Cyclohexanone	16.30	55	2700	0.098	ng	# 90
99) tert-Butylbenzene	18.43	119	6123	0.104	ng	95
100) n-Butylbenzene	19.33	91	7063	0.096	ng	95

(#)=qualifier out of range (m)=manual integration (+)=signals summed

ALS Vial : 13 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS09\Data\2016 11\07\11071607.D

Acq On : 7 Nov 2016 14:47

Operator: SC

Sample : 0.08ng TO-15 ICAL STD

Misc : S29-10261601/S29-11041608 (12/2)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 08 08:52:10 2016

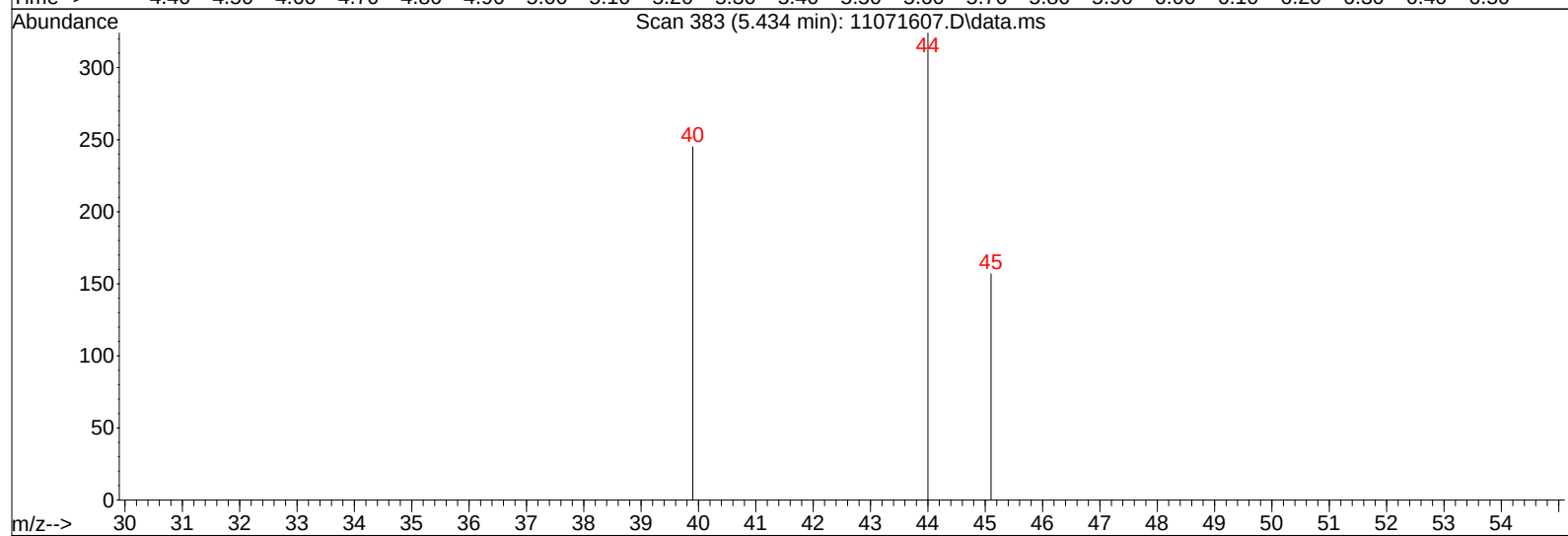
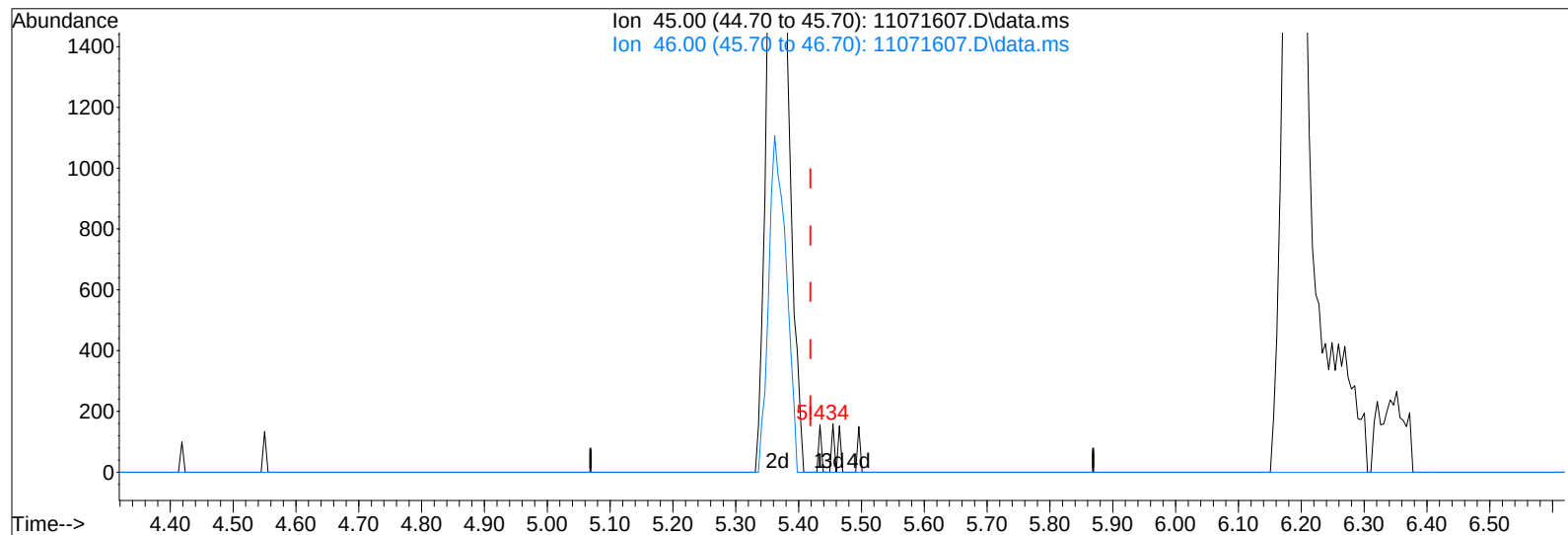
Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 08:41:37 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 11071607.D\data.ms

(10) Ethanol (T)

5.434min (+0.015) 0.00ng

response 49

Ion	Exp%	Act%
45.00	100	100
46.00	36.70	0.00#
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS09\Data\2016 11\07\11071607.D

Acq On : 7 Nov 2016 14:47

Operator: SC

Sample : 0.08ng TO-15 ICAL STD

Misc : S29-10261601/S29-11041608 (12/2)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 08 08:52:10 2016

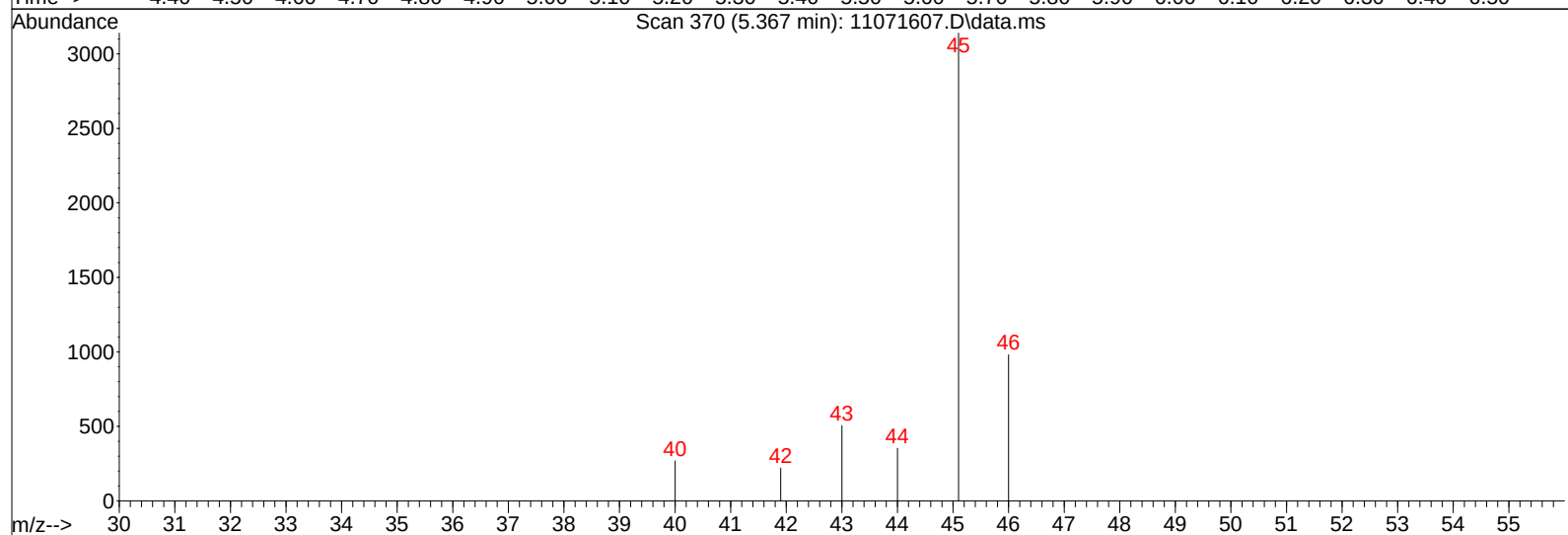
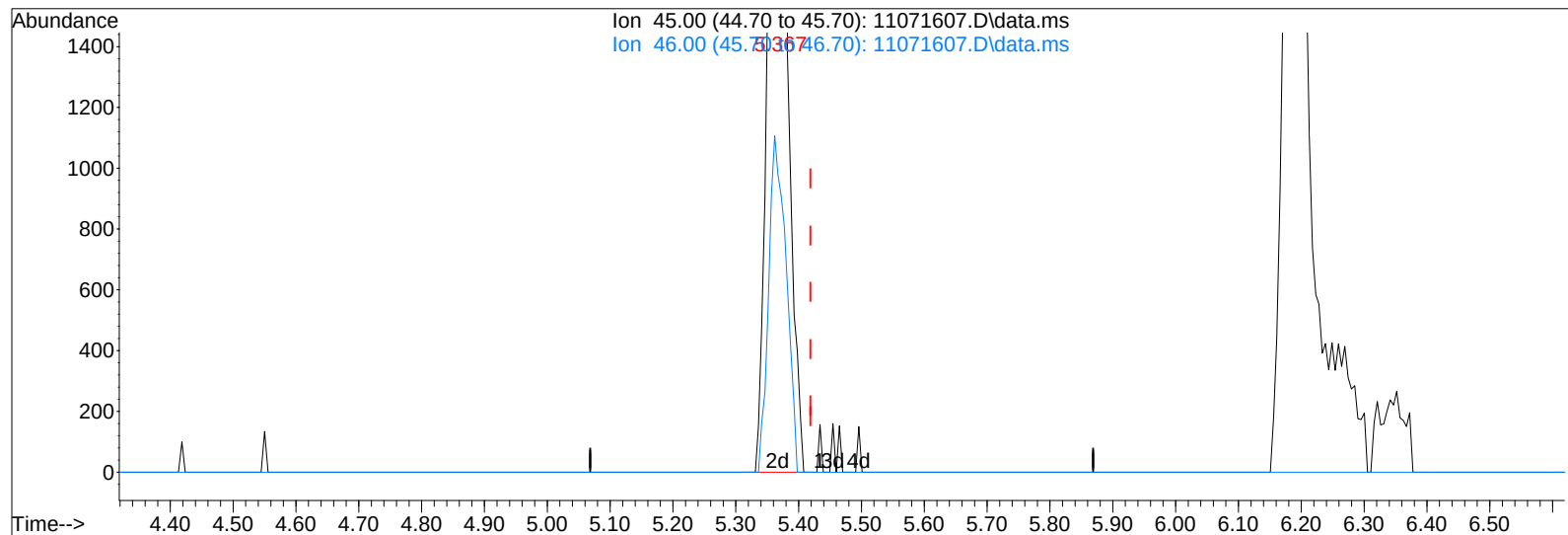
Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 08:41:37 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 11071607.D\data.ms

(10) Ethanol (T)

5.367min (-0.052) 0.35ng m

response 6217

MP

 11/8/16

Ion	Exp%	Act%

45.00	100	100

46.00	36.70	0.00#

0.00	0.00	0.00

0.00	0.00	0.00

 11/21/16

Data File: I:\MS09\Data\2016 11\07\11071608.D

Acq On : 7 Nov 2016 15:21

Operator: SC

Sample : 0.10ng TO-15 ICAL STD

Misc : S29-10261601/S29-11041608 (12/2)

ALS Vial : 13 Sample Multiplier: 1

11/8/16

Quant Time: Nov 08 08:50:44 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 08:41:37 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.17	130	141206	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	11.15	114	695556	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	15.51	82	297627	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.96	65	215370	10.207	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	81.68%
57) Toluene-d8 (SS2)	13.59	98	758373	12.943	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.52%
73) Bromofluorobenzene (SS3)	17.10	174	198081	13.766	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	110.16%

Target Compounds

						Qvalue
2) Propene	3.91	42	2646	0.086	ng	98
3) Dichlorodifluoromethan...	4.02	85	3671	0.092	ng	# 92
4) Chloromethane	4.22	50	3377	0.082	ng	94
5) 1,2-Dichloro-1,1,2,2-t...	4.38	135	1759	0.096	ng	96
6) Vinyl Chloride	4.50	62	3324	0.085	ng	95
7) 1,3-Butadiene	4.67	54	2058	0.077	ng	# 84
8) Bromomethane	4.98	94	1792	0.096	ng	96
9) Chloroethane	5.20	64	1421	0.090	ng	# 43
10) Ethanol	5.36	45	7422	0.420	ng	97
11) Acetonitrile	5.58	41	4254	0.091	ng	# 68
12) Acrolein	5.74	56	1333	0.092	ng	88
13) Acetone	5.88	58	9064	0.508	ng	93
14) Trichlorofluoromethane	6.07	101	3022	0.102	ng	99
15) 2-Propanol (Isopropanol)	6.18	45	10194	0.179	ng	93
16) Acrylonitrile	6.39	53	2847	0.096	ng	94
17) 1,1-Dichloroethene	6.76	96	1907	0.103	ng	98
18) 2-Methyl-2-Propanol (t...	6.87	59	11348	0.225	ng	# 82
19) Methylene Chloride	6.89	84	2452	0.116	ng	98
20) 3-Chloro-1-propene (Al...	7.03	41	3451	0.099	ng	81
21) Trichlorotrifluoroethane	7.23	151	1538	0.116	ng	97
22) Carbon Disulfide	7.19	76	9778	0.131	ng	96
23) trans-1,2-Dichloroethene	7.92	61	2929	0.098	ng	98
24) 1,1-Dichloroethane	8.13	63	3781	0.099	ng	92
25) Methyl tert-Butyl Ether	8.24	73	6666	0.112	ng	99
26) Vinyl Acetate	8.32	86	2370	0.541	ng	# 83
27) 2-Butanone (MEK)	8.56	72	1353	0.098	ng	# 72
28) cis-1,2-Dichloroethene	9.01	61	2884	0.101	ng	99
29) Diisopropyl Ether	9.27	87	1823	0.114	ng	97
30) Ethyl Acetate	9.27	61	1391	0.175	ng	87
31) n-Hexane	9.27	57	3863	0.102	ng	# 90
32) Chloroform	9.32	83	3379	0.101	ng	95
34) Tetrahydrofuran (THF)	9.74	72	1512	0.108	ng	# 81
35) Ethyl tert-Butyl Ether	9.82	87	2199	0.103	ng	# 80
36) 1,2-Dichloroethane	10.06	62	2419	0.091	ng	95
38) 1,1,1-Trichloroethane	10.33	97	2921	0.112	ng	93
39) Isopropyl Acetate	10.71	61	2759	0.212	ng	97
40) 1-Butanol	10.72	56	4987	0.218	ng	93
41) Benzene	10.79	78	9617	0.116	ng	98
42) Carbon Tetrachloride	10.95	117	2438	0.113	ng	100
43) Cyclohexane	11.08	84	6449	0.224	ng	94
44) tert-Amyl Methyl Ether	11.41	73	7203	0.130	ng	90
45) 1,2-Dichloropropane	11.61	63	2123	0.101	ng	98
46) Bromodichloromethane	11.79	83	2570	0.106	ng	94
47) Trichloroethene	11.85	130	1888	0.109	ng	94
48) 1,4-Dioxane	11.84	88	1466	0.097	ng	92
49) 2,2,4-Trimethylpentane...	11.92	57	9394	0.107	ng	96

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Data File: I:\MS09\Data\2016 11\07\11071608.D

Acq On : 7 Nov 2016 15:21

Operator: SC

Sample : 0.10ng TO-15 ICAL STD

Misc : S29-10261601/S29-11041608 (12/2)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 08 08:50:44 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 08:41:37 2016

Response via : Initial Calibration

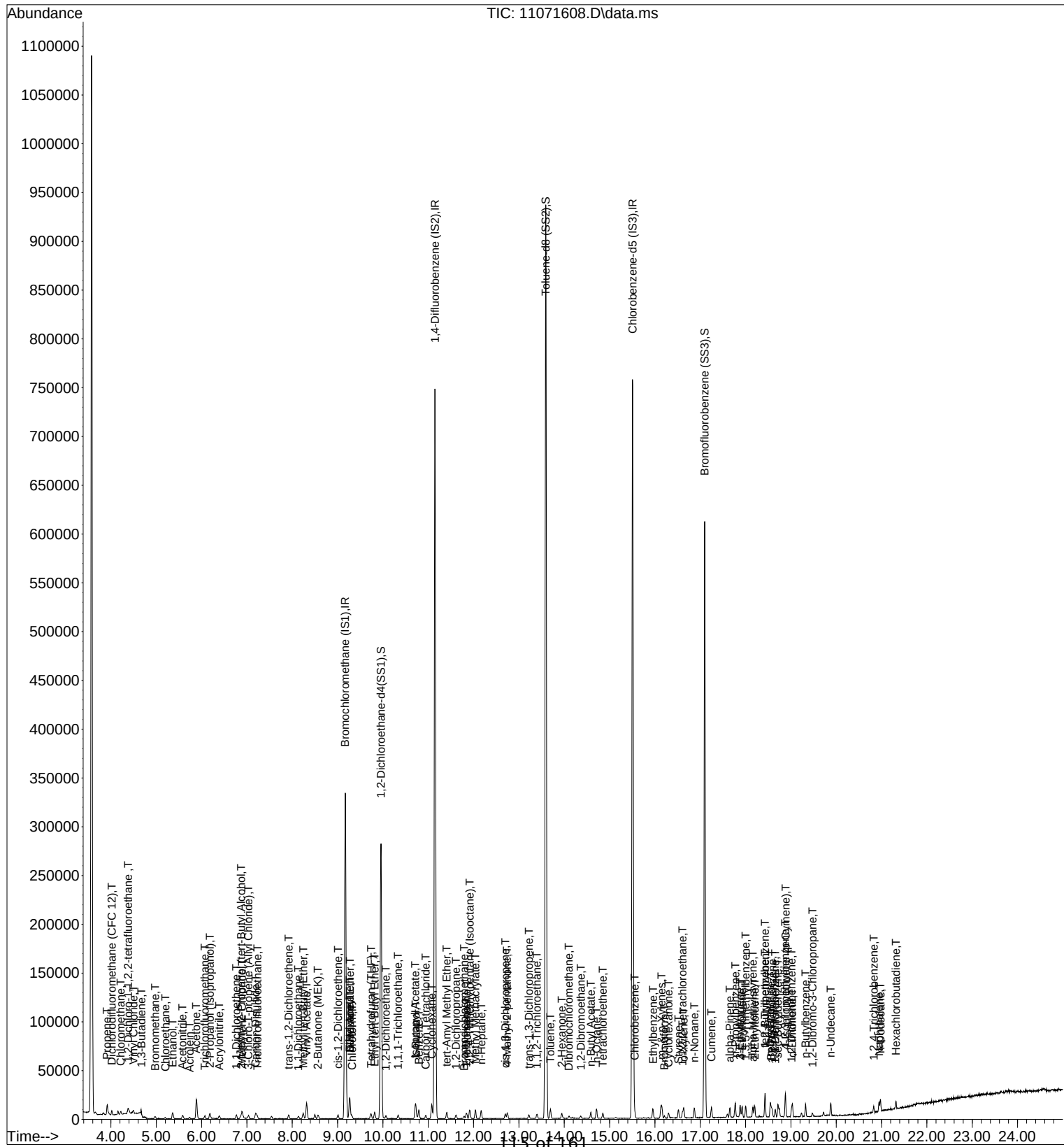
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.04	100	1408	0.214	ng	# 84
51) n-Heptane	12.17	71	2253	0.114	ng	# 87
52) cis-1,3-Dichloropropene	12.70	75	3607	0.116	ng	95
53) 4-Methyl-2-pentanone	12.74	58	1856	0.100	ng	# 86
54) trans-1,3-Dichloropropene	13.22	75	2924	0.106	ng	97
55) 1,1,2-Trichloroethane	13.40	97	1929	0.110	ng	97
58) Toluene	13.70	91	8866	0.122	ng	98
59) 2-Hexanone	13.94	43	4359	0.099	ng	91
60) Dibromochloromethane	14.10	129	2048	0.123	ng	95
61) 1,2-Dibromoethane	14.37	107	2025	0.114	ng	98
62) n-Butyl Acetate	14.59	43	4732	0.096	ng	96
63) n-Octane	14.71	57	2363	0.140	ng	# 78
64) Tetrachloroethene	14.85	166	1980	0.127	ng	97
65) Chlorobenzene	15.55	112	5318	0.120	ng	99
66) Ethylbenzene	15.96	91	9401	0.119	ng	98
67) m- & p-Xylenes	16.14	91	14554	0.240	ng	99
68) Bromoform	16.21	173	1570	0.125	ng	85
69) Styrene	16.52	104	5363	0.119	ng	100
70) o-Xylene	16.63	91	7376	0.119	ng	99
71) n-Nonane	16.87	43	4480	0.107	ng	92
72) 1,1,2,2-Tetrachloroethane	16.61	83	3526	0.109	ng	98
74) Cumene	17.25	105	9226	0.123	ng	97
75) alpha-Pinene	17.65	93	5020	0.128	ng	100
76) n-Propylbenzene	17.77	91	11184	0.117	ng	96
77) 3-Ethyltoluene	17.88	105	9339	0.125	ng	94
78) 4-Ethyltoluene	17.92	105	8217	0.114	ng	99
79) 1,3,5-Trimethylbenzene	18.00	105	7358	0.119	ng	100
80) alpha-Methylstyrene	18.16	118	3552	0.116	ng	96
81) 2-Ethyltoluene	18.20	105	8679	0.119	ng	98
82) 1,2,4-Trimethylbenzene	18.43	105	7317	0.116	ng	95
83) n-Decane	18.55	57	4790	0.111	ng	94
84) Benzyl Chloride	18.56	91	6187	0.109	ng	94
85) 1,3-Dichlorobenzene	18.58	146	4106	0.122	ng	98
86) 1,4-Dichlorobenzene	18.66	146	3814	0.112	ng	95
87) sec-Butylbenzene	18.71	105	10065	0.118	ng	98
88) 4-Isopropyltoluene (p-...	18.88	119	9041	0.120	ng	94
89) 1,2,3-Trimethylbenzene	18.88	105	7323	0.116	ng	96
90) 1,2-Dichlorobenzene	19.01	146	3866	0.119	ng	98
91) d-Limonene	19.03	68	3133	0.114	ng	97
92) 1,2-Dibromo-3-Chloropr...	19.48	157	1190	0.110	ng	82
93) n-Undecane	19.88	57	5148	0.115	ng	93
94) 1,2,4-Trichlorobenzene	20.83	180	2521	0.106	ng	98
95) Naphthalene	20.95	128	8010	0.103	ng	100
96) n-Dodecane	20.98	57	4191	0.096	ng	98
97) Hexachlorobutadiene	21.32	225	1554	0.116	ng	94
98) Cyclohexanone	16.30	55	3052	0.112	ng	91
99) tert-Butylbenzene	18.43	119	7169	0.123	ng	99
100) n-Butylbenzene	19.32	91	8366	0.115	ng	94

(#)=qualifier out of range (m)=manual integration (+)=signals summed

ALS Vial : 13 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS09\Data\2016 11\07\11071609.D

Acq On : 7 Nov 2016 15:54

Operator: SC

Sample : 0.20ng TO-15 ICAL STD

Misc : S29-10261601/S29-11041608 (12/2)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 08 08:48:17 2016

 11/8/16

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 08:41:37 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.17	130	140306	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	11.15	114	691736	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	15.51	82	293215	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.96	65	213471	10.182	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	81.44%
57) Toluene-d8 (SS2)	13.59	98	749780	12.989	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.92%
73) Bromofluorobenzene (SS3)	17.10	174	195747	13.809	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	110.48%

Target Compounds

						Qvalue
2) Propene	3.91	42	4289	0.140	ng	96
3) Dichlorodifluoromethan...	4.01	85	6478	0.164	ng	# 96
4) Chloromethane	4.21	50	5907	0.144	ng	95
5) 1,2-Dichloro-1,1,2,2-t...	4.37	135	3054	0.168	ng	98
6) Vinyl Chloride	4.49	62	5483	0.141	ng	100
7) 1,3-Butadiene	4.67	54	3451	0.130	ng	97
8) Bromomethane	4.97	94	3234	0.174	ng	100
9) Chloroethane	5.19	64	2680	0.171	ng	92
10) Ethanol	5.36	45	13424	0.764	ng	92
11) Acetonitrile	5.57	41	7300	0.158	ng	# 65
12) Acrolein	5.73	56	2445	0.170	ng	93
13) Acetone	5.88	58	15135	0.854	ng	91
14) Trichlorofluoromethane	6.06	101	5156	0.175	ng	98
15) 2-Propanol (Isopropanol)	6.17	45	19223	0.340	ng	93
16) Acrylonitrile	6.39	53	4917	0.166	ng	98
17) 1,1-Dichloroethene	6.76	96	3443	0.188	ng	93
18) 2-Methyl-2-Propanol (t...	6.85	59	19855	0.397	ng	96
19) Methylene Chloride	6.89	84	3873	0.185	ng	95
20) 3-Chloro-1-propene (Al...	7.03	41	5908	0.171	ng	91
21) Trichlorotrifluoroethane	7.22	151	2501	0.190	ng	94
22) Carbon Disulfide	7.19	76	15261	0.206	ng	98
23) trans-1,2-Dichloroethene	7.92	61	5252	0.177	ng	95
24) 1,1-Dichloroethane	8.13	63	6448	0.169	ng	97
25) Methyl tert-Butyl Ether	8.24	73	11402	0.193	ng	100
26) Vinyl Acetate	8.31	86	4027	0.925	ng	# 78
27) 2-Butanone (MEK)	8.56	72	2349	0.172	ng	# 80
28) cis-1,2-Dichloroethene	9.01	61	4966	0.176	ng	100
29) Diisopropyl Ether	9.27	87	3409	0.214	ng	# 86
30) Ethyl Acetate	9.26	61	2708	0.343	ng	96
31) n-Hexane	9.27	57	6760	0.179	ng	98
32) Chloroform	9.31	83	5552	0.167	ng	96
34) Tetrahydrofuran (THF)	9.73	72	2661	0.191	ng	93
35) Ethyl tert-Butyl Ether	9.81	87	4181	0.197	ng	91
36) 1,2-Dichloroethane	10.06	62	4136	0.157	ng	92
38) 1,1,1-Trichloroethane	10.33	97	4990	0.193	ng	97
39) Isopropyl Acetate	10.71	61	4845	0.374	ng	96
40) 1-Butanol	10.72	56	7948	0.349	ng	98
41) Benzene	10.79	78	15806	0.192	ng	98
42) Carbon Tetrachloride	10.95	117	4227	0.197	ng	100
43) Cyclohexane	11.08	84	11396	0.398	ng	96
44) tert-Amyl Methyl Ether	11.41	73	11405	0.206	ng	97
45) 1,2-Dichloropropane	11.61	63	3760	0.181	ng	99
46) Bromodichloromethane	11.79	83	4498	0.186	ng	98
47) Trichloroethene	11.85	130	3471	0.201	ng	98
48) 1,4-Dioxane	11.84	88	2730	0.182	ng	99
49) 2,2,4-Trimethylpentane...	11.91	57	15931	0.183	ng	99

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Data File: I:\MS09\Data\2016 11\07\11071609.D

Acq On : 7 Nov 2016 15:54

Operator: SC

Sample : 0.20ng TO-15 ICAL STD

Misc : S29-10261601/S29-11041608 (12/2)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 08 08:48:17 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 08:41:37 2016

Response via : Initial Calibration

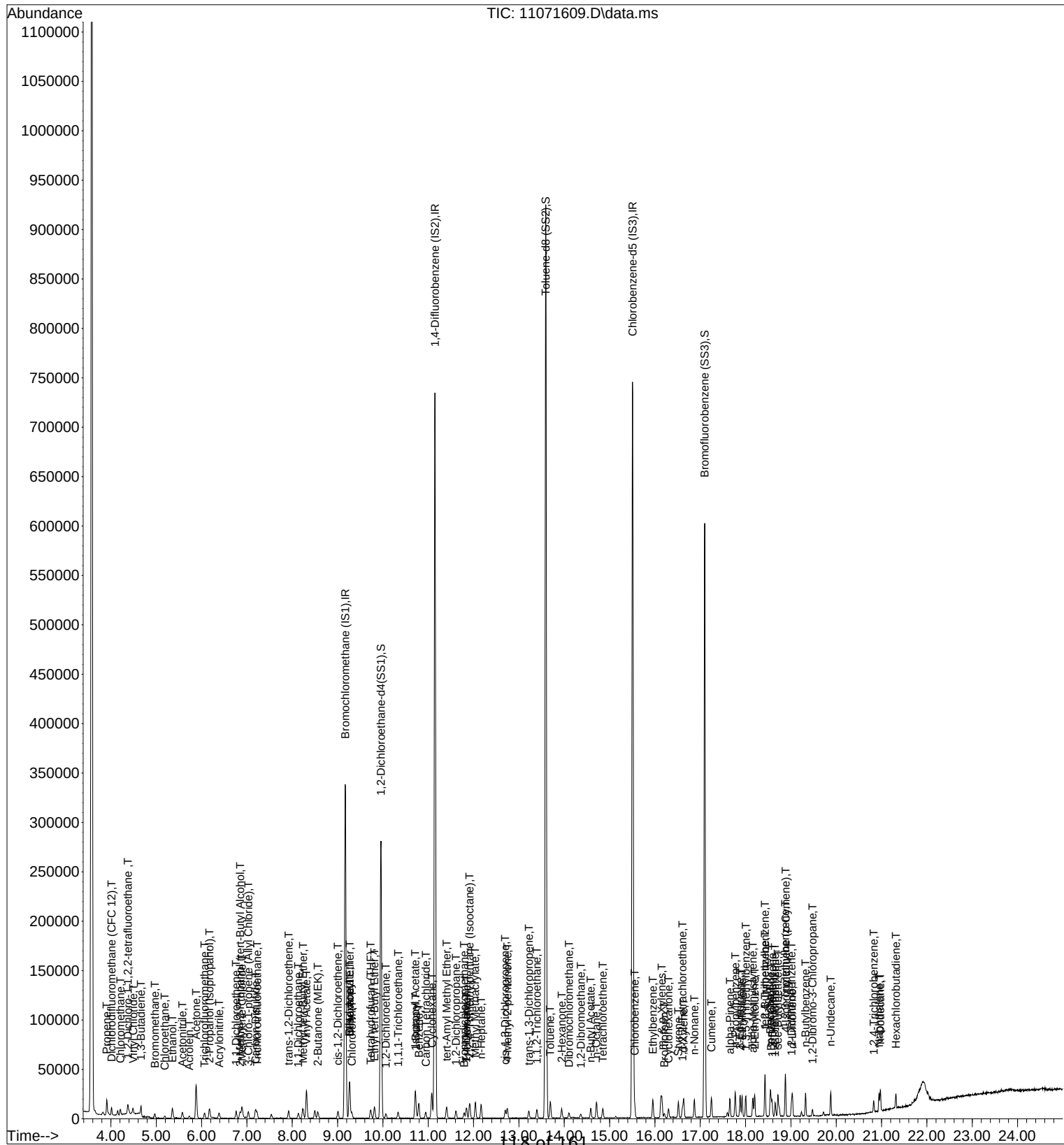
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.03	100	2571	0.393	ng	90
51) n-Heptane	12.16	71	3633	0.185	ng	92
52) cis-1,3-Dichloropropene	12.69	75	6276	0.203	ng	97
53) 4-Methyl-2-pentanone	12.75	58	3367	0.183	ng	98
54) trans-1,3-Dichloropropene	13.22	75	5126	0.187	ng	99
55) 1,1,2-Trichloroethane	13.40	97	3433	0.196	ng	99
58) Toluene	13.69	91	15408	0.215	ng	98
59) 2-Hexanone	13.94	43	7270	0.168	ng	96
60) Dibromochloromethane	14.11	129	3627	0.220	ng	99
61) 1,2-Dibromoethane	14.37	107	3596	0.206	ng	99
62) n-Butyl Acetate	14.58	43	8127	0.167	ng	97
63) n-Octane	14.71	57	3615	0.217	ng	85
64) Tetrachloroethene	14.85	166	3522	0.229	ng	98
65) Chlorobenzene	15.55	112	9290	0.213	ng	99
66) Ethylbenzene	15.95	91	16205	0.209	ng	99
67) m- & p-Xylenes	16.15	91	25236	0.422	ng	99
68) Bromoform	16.21	173	2713	0.220	ng	95
69) Styrene	16.52	104	9173	0.206	ng	99
70) o-Xylene	16.63	91	12762	0.208	ng	99
71) n-Nonane	16.87	43	7575	0.184	ng	95
72) 1,1,2,2-Tetrachloroethane	16.61	83	6071	0.191	ng	99
74) Cumene	17.24	105	15533	0.211	ng	99
75) alpha-Pinene	17.66	93	8365	0.216	ng	100
76) n-Propylbenzene	17.77	91	19365	0.206	ng	97
77) 3-Ethyltoluene	17.88	105	15768	0.214	ng	97
78) 4-Ethyltoluene	17.92	105	13949	0.196	ng	95
79) 1,3,5-Trimethylbenzene	18.01	105	12778	0.209	ng	99
80) alpha-Methylstyrene	18.16	118	6374	0.211	ng	99
81) 2-Ethyltoluene	18.20	105	15489	0.215	ng	99
82) 1,2,4-Trimethylbenzene	18.43	105	12979	0.209	ng	100
83) n-Decane	18.55	57	7998	0.189	ng	93
84) Benzyl Chloride	18.56	91	10745	0.191	ng	99
85) 1,3-Dichlorobenzene	18.59	146	6794	0.204	ng	97
86) 1,4-Dichlorobenzene	18.65	146	6612	0.196	ng	96
87) sec-Butylbenzene	18.71	105	17743	0.212	ng	98
88) 4-Isopropyltoluene (p-...	18.88	119	15434	0.207	ng	99
89) 1,2,3-Trimethylbenzene	18.88	105	12426	0.199	ng	95
90) 1,2-Dichlorobenzene	19.01	146	6699	0.209	ng	97
91) d-Limonene	19.03	68	5555	0.205	ng	88
92) 1,2-Dibromo-3-Chloropr...	19.48	157	2212	0.208	ng	99
93) n-Undecane	19.88	57	8683	0.198	ng	94
94) 1,2,4-Trichlorobenzene	20.83	180	4356	0.187	ng	97
95) Naphthalene	20.95	128	14200	0.186	ng	100
96) n-Dodecane	20.97	57	7654	0.177	ng	92
97) Hexachlorobutadiene	21.32	225	2900	0.220	ng	94
98) Cyclohexanone	16.30	55	4954	0.185	ng	94
99) tert-Butylbenzene	18.43	119	12573	0.219	ng	100
100) n-Butylbenzene	19.32	91	13797	0.192	ng	99

(#)=qualifier out of range (m)=manual integration (+)=signals summed

ALS Vial : 13 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS09\Data\2016 11\07\11071610.D

Acq On : 7 Nov 2016 16:28

Operator: SC

Sample : 0.40ng TO-15 ICAL STD

Misc : S29-10261601/S29-11041608 (12/2)

ALS Vial : 13 Sample Multiplier: 1

 11/8/16

Quant Time: Nov 08 08:45:50 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 08:41:37 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.17	130	136603	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	11.15	114	670495	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	15.51	82	285432	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.96	65	205462	10.066	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	80.56%
57) Toluene-d8 (SS2)	13.59	98	724405	12.892	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.12%
73) Bromofluorobenzene (SS3)	17.10	174	190885	13.833	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	110.64%

Target Compounds

						Qvalue
2) Propene	3.90	42	8010	0.269	ng	96
3) Dichlorodifluoromethan...	4.01	85	12311	0.319	ng	99
4) Chloromethane	4.20	50	10988	0.276	ng	98
5) 1,2-Dichloro-1,1,2,2-t...	4.37	135	6090	0.344	ng	99
6) Vinyl Chloride	4.48	62	10612	0.280	ng	100
7) 1,3-Butadiene	4.66	54	6915	0.268	ng	89
8) Bromomethane	4.97	94	5884	0.325	ng	96
9) Chloroethane	5.19	64	5087	0.334	ng	100
10) Ethanol	5.36	45	25168	1.471	ng	98
11) Acetonitrile	5.57	41	13711	0.304	ng	90
12) Acrolein	5.72	56	4852	0.347	ng	99
13) Acetone	5.87	58	27897	1.618	ng	94
14) Trichlorofluoromethane	6.06	101	10376	0.362	ng	98
15) 2-Propanol (Isopropanol)	6.17	45	36709	0.667	ng	96
16) Acrylonitrile	6.38	53	9373	0.326	ng	99
17) 1,1-Dichloroethene	6.76	96	6492	0.364	ng	99
18) 2-Methyl-2-Propanol (t...	6.84	59	38338	0.787	ng	97
19) Methylene Chloride	6.89	84	7261	0.356	ng	98
20) 3-Chloro-1-propene (Al...	7.03	41	11175	0.333	ng	92
21) Trichlorotrifluoroethane	7.23	151	5066	0.395	ng	95
22) Carbon Disulfide	7.19	76	27521	0.382	ng	97
23) trans-1,2-Dichloroethene	7.91	61	10167	0.352	ng	99
24) 1,1-Dichloroethane	8.14	63	12155	0.328	ng	99
25) Methyl tert-Butyl Ether	8.23	73	21820	0.380	ng	99
26) Vinyl Acetate	8.31	86	7918	1.868	ng	# 76
27) 2-Butanone (MEK)	8.56	72	4710	0.353	ng	93
28) cis-1,2-Dichloroethene	9.01	61	9519	0.346	ng	98
29) Diisopropyl Ether	9.27	87	5952	0.383	ng	95
30) Ethyl Acetate	9.26	61	5189	0.675	ng	100
31) n-Hexane	9.26	57	12876	0.350	ng	98
32) Chloroform	9.31	83	11585	0.358	ng	98
34) Tetrahydrofuran (THF)	9.72	72	5034	0.371	ng	94
35) Ethyl tert-Butyl Ether	9.81	87	8243	0.399	ng	94
36) 1,2-Dichloroethane	10.06	62	8145	0.318	ng	98
38) 1,1,1-Trichloroethane	10.33	97	9900	0.394	ng	98
39) Isopropyl Acetate	10.71	61	9427	0.752	ng	# 92
40) 1-Butanol	10.71	56	14445	0.655	ng	95
41) Benzene	10.79	78	29861	0.375	ng	99
42) Carbon Tetrachloride	10.95	117	8223	0.395	ng	100
43) Cyclohexane	11.08	84	21682	0.782	ng	95
44) tert-Amyl Methyl Ether	11.40	73	21572	0.403	ng	98
45) 1,2-Dichloropropane	11.61	63	7325	0.363	ng	99
46) Bromodichloromethane	11.79	83	9033	0.386	ng	99
47) Trichloroethene	11.84	130	6983	0.417	ng	97
48) 1,4-Dioxane	11.83	88	5272	0.363	ng	96
49) 2,2,4-Trimethylpentane...	11.91	57	30925	0.366	ng	95

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Data File: I:\MS09\Data\2016 11\07\11071610.D

Acq On : 7 Nov 2016 16:28

Operator: SC

Sample : 0.40ng TO-15 ICAL STD

Misc : S29-10261601/S29-11041608 (12/2)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 08 08:45:50 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 08:41:37 2016

Response via : Initial Calibration

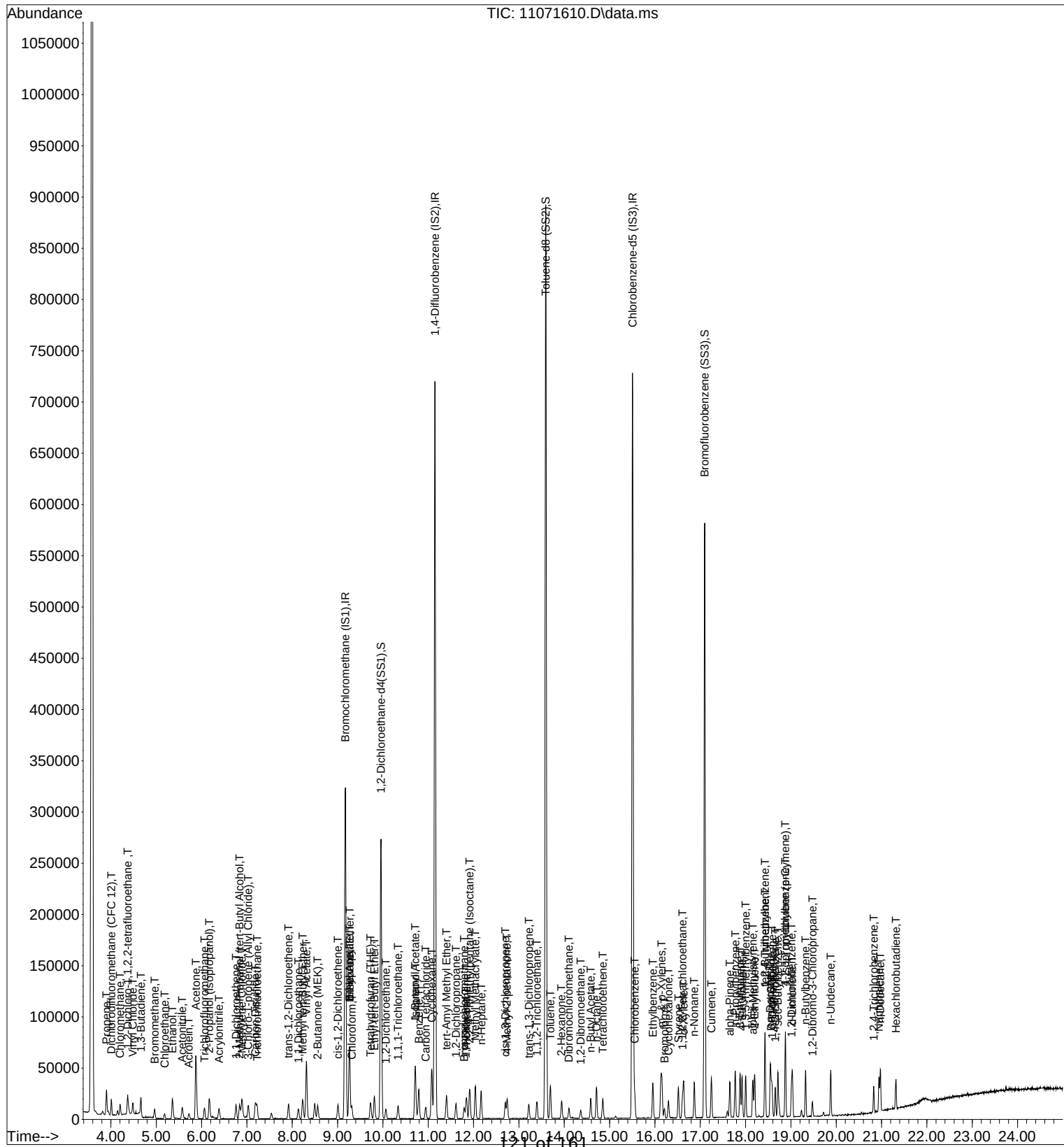
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.04	100	5212	0.822	ng	96
51) n-Heptane	12.17	71	7478	0.392	ng	99
52) cis-1,3-Dichloropropene	12.70	75	11812	0.395	ng	100
53) 4-Methyl-2-pentanone	12.74	58	6452	0.361	ng	95
54) trans-1,3-Dichloropropene	13.22	75	9886	0.372	ng	100
55) 1,1,2-Trichloroethane	13.40	97	6615	0.390	ng	98
58) Toluene	13.70	91	28996	0.415	ng	98
59) 2-Hexanone	13.94	43	13691	0.325	ng	99
60) Dibromochloromethane	14.10	129	7136	0.445	ng	97
61) 1,2-Dibromoethane	14.36	107	7171	0.422	ng	99
62) n-Butyl Acetate	14.58	43	15726	0.333	ng	98
63) n-Octane	14.71	57	6763	0.418	ng	90
64) Tetrachloroethene	14.85	166	6891	0.460	ng	100
65) Chlorobenzene	15.55	112	17747	0.419	ng	100
66) Ethylbenzene	15.95	91	31151	0.412	ng	99
67) m- & p-Xylenes	16.14	91	47648	0.819	ng	98
68) Bromoform	16.21	173	5451	0.454	ng	97
69) Styrene	16.52	104	18048	0.416	ng	98
70) o-Xylene	16.63	91	24099	0.404	ng	99
71) n-Nonane	16.87	43	14600	0.365	ng	94
72) 1,1,2,2-Tetrachloroethane	16.61	83	11781	0.381	ng	98
74) Cumene	17.25	105	30613	0.426	ng	98
75) alpha-Pinene	17.65	93	16139	0.428	ng	97
76) n-Propylbenzene	17.77	91	36979	0.403	ng	98
77) 3-Ethyltoluene	17.88	105	30939	0.431	ng	98
78) 4-Ethyltoluene	17.92	105	27113	0.391	ng	98
79) 1,3,5-Trimethylbenzene	18.00	105	24556	0.413	ng	98
80) alpha-Methylstyrene	18.16	118	12437	0.423	ng	99
81) 2-Ethyltoluene	18.20	105	29052	0.414	ng	100
82) 1,2,4-Trimethylbenzene	18.43	105	24958	0.413	ng	98
83) n-Decane	18.54	57	15769	0.382	ng	94
84) Benzyl Chloride	18.56	91	21153	0.387	ng	99
85) 1,3-Dichlorobenzene	18.58	146	13214	0.409	ng	99
86) 1,4-Dichlorobenzene	18.66	146	13010	0.397	ng	96
87) sec-Butylbenzene	18.71	105	33879	0.416	ng	98
88) 4-Isopropyltoluene (p-...	18.88	119	30053	0.415	ng	99
89) 1,2,3-Trimethylbenzene	18.88	105	24217	0.399	ng	98
90) 1,2-Dichlorobenzene	19.01	146	12838	0.410	ng	99
91) d-Limonene	19.03	68	10351	0.392	ng	94
92) 1,2-Dibromo-3-Chloropr...	19.48	157	4428	0.427	ng	96
93) n-Undecane	19.88	57	16037	0.375	ng	94
94) 1,2,4-Trichlorobenzene	20.83	180	8306	0.366	ng	99
95) Naphthalene	20.94	128	27583	0.371	ng	99
96) n-Dodecane	20.97	57	14006	0.334	ng	96
97) Hexachlorobutadiene	21.32	225	5655	0.440	ng	99
98) Cyclohexanone	16.30	55	9231	0.353	ng	97
99) tert-Butylbenzene	18.43	119	24099	0.431	ng	98
100) n-Butylbenzene	19.32	91	27140	0.388	ng	98

(#)= qualifier out of range (m)= manual integration (+)= signals summed

ALS Vial : 13 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS09\Data\2016 11\07\11071611.D

Acq On : 7 Nov 2016 17:02

Operator: SC

Sample : 1.0ng TO-15 ICAL STD

Misc : S29-10261601/S29-11041605 (12/2)

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Nov 08 08:43:06 2016

11/8/16

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 08:41:37 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.17	130	139491	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	11.15	114	682985	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	15.51	82	290186	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.96	65	210317	10.090	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	80.72%
57) Toluene-d8 (SS2)	13.59	98	738727	12.931	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.44%
73) Bromofluorobenzene (SS3)	17.10	174	193888	13.820	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	110.56%

Target Compounds

						Qvalue
2) Propene	3.90	42	11441	0.376	ng	96
3) Dichlorodifluoromethan...	4.01	85	18312	0.465	ng	99
4) Chloromethane	4.20	50	16328	0.401	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.36	135	8718	0.483	ng	98
6) Vinyl Chloride	4.48	62	15781	0.407	ng	99
7) 1,3-Butadiene	4.65	54	9759	0.370	ng	99
8) Bromomethane	4.96	94	8775	0.475	ng	97
9) Chloroethane	5.18	64	7611	0.489	ng	99
10) Ethanol	5.36	45	40041	2.292	ng	98
11) Acetonitrile	5.57	41	19922	0.433	ng	99
12) Acrolein	5.72	56	6750	0.472	ng	99
13) Acetone	5.87	58	42074	2.389	ng	91
14) Trichlorofluoromethane	6.06	101	15083	0.515	ng	99
15) 2-Propanol (Isopropanol)	6.17	45	53987	0.960	ng	97
16) Acrylonitrile	6.38	53	14052	0.479	ng	99
17) 1,1-Dichloroethene	6.76	96	9436	0.518	ng	100
18) 2-Methyl-2-Propanol (t...	6.83	59	53089	1.067	ng	97
19) Methylene Chloride	6.89	84	10415	0.499	ng	98
20) 3-Chloro-1-propene (Al...	7.03	41	15174	0.443	ng	98
21) Trichlorotrifluoroethane	7.22	151	7497	0.572	ng	99
22) Carbon Disulfide	7.18	76	39498	0.536	ng	99
23) trans-1,2-Dichloroethene	7.91	61	14694	0.498	ng	99
24) 1,1-Dichloroethane	8.13	63	17630	0.466	ng	100
25) Methyl tert-Butyl Ether	8.22	73	30798	0.525	ng	99
26) Vinyl Acetate	8.31	86	11856	2.739	ng	# 80
27) 2-Butanone (MEK)	8.56	72	7179	0.528	ng	# 88
28) cis-1,2-Dichloroethene	9.00	61	14107	0.502	ng	100
29) Diisopropyl Ether	9.26	87	9106	0.574	ng	97
30) Ethyl Acetate	9.26	61	7867	1.002	ng	97
31) n-Hexane	9.27	57	18592	0.495	ng	99
32) Chloroform	9.31	83	16712	0.506	ng	100
34) Tetrahydrofuran (THF)	9.72	72	6868	0.496	ng	# 86
35) Ethyl tert-Butyl Ether	9.81	87	11509	0.546	ng	96
36) 1,2-Dichloroethane	10.06	62	12213	0.467	ng	100
38) 1,1,1-Trichloroethane	10.33	97	14413	0.564	ng	97
39) Isopropyl Acetate	10.71	61	13572	1.062	ng	99
40) 1-Butanol	10.71	56	22981	1.022	ng	98
41) Benzene	10.79	78	41931	0.517	ng	100
42) Carbon Tetrachloride	10.94	117	12120	0.572	ng	98
43) Cyclohexane	11.08	84	31897	1.129	ng	96
44) tert-Amyl Methyl Ether	11.40	73	28728	0.526	ng	97
45) 1,2-Dichloropropane	11.61	63	10856	0.528	ng	99
46) Bromodichloromethane	11.79	83	13139	0.552	ng	98
47) Trichloroethene	11.84	130	10227	0.600	ng	99
48) 1,4-Dioxane	11.83	88	8330	0.563	ng	95
49) 2,2,4-Trimethylpentane...	11.92	57	45214	0.525	ng	95

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Data File: I:\MS09\Data\2016 11\07\11071611.D

Acq On : 7 Nov 2016 17:02

Operator: SC

Sample : 1.0ng TO-15 ICAL STD

Misc : S29-10261601/S29-11041605 (12/2)

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Nov 08 08:43:06 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 08:41:37 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.03	100	7634	1.182	ng	90
51) n-Heptane	12.16	71	10750	0.553	ng	98
52) cis-1,3-Dichloropropene	12.70	75	17384	0.570	ng	98
53) 4-Methyl-2-pentanone	12.74	58	9988	0.549	ng	97
54) trans-1,3-Dichloropropene	13.22	75	14861	0.549	ng	99
55) 1,1,2-Trichloroethane	13.40	97	9789	0.567	ng	97
58) Toluene	13.70	91	41518	0.585	ng	98
59) 2-Hexanone	13.94	43	22394	0.523	ng	99
60) Dibromochloromethane	14.10	129	10457	0.642	ng	100
61) 1,2-Dibromoethane	14.36	107	10541	0.611	ng	98
62) n-Butyl Acetate	14.58	43	25555	0.532	ng	100
63) n-Octane	14.71	57	9905	0.602	ng	91
64) Tetrachloroethene	14.85	166	10260	0.673	ng	98
65) Chlorobenzene	15.55	112	26634	0.618	ng	99
66) Ethylbenzene	15.95	91	46495	0.605	ng	99
67) m- & p-Xylenes	16.14	91	72035	1.217	ng	100
68) Bromoform	16.21	173	8073	0.662	ng	99
69) Styrene	16.52	104	27616	0.626	ng	99
70) o-Xylene	16.63	91	35839	0.591	ng	99
71) n-Nonane	16.87	43	21348	0.525	ng	95
72) 1,1,2,2-Tetrachloroethane	16.60	83	17982	0.572	ng	100
74) Cumene	17.25	105	44844	0.614	ng	100
75) alpha-Pinene	17.66	93	21527	0.562	ng	98
76) n-Propylbenzene	17.77	91	56350	0.604	ng	99
77) 3-Ethyltoluene	17.88	105	46009	0.630	ng	96
78) 4-Ethyltoluene	17.92	105	41904	0.595	ng	98
79) 1,3,5-Trimethylbenzene	18.00	105	37057	0.613	ng	100
80) alpha-Methylstyrene	18.16	118	18962	0.634	ng	99
81) 2-Ethyltoluene	18.20	105	43596	0.611	ng	100
82) 1,2,4-Trimethylbenzene	18.43	105	36990	0.601	ng	98
83) n-Decane	18.55	57	21705	0.517	ng	97
84) Benzyl Chloride	18.56	91	32642	0.587	ng	98
85) 1,3-Dichlorobenzene	18.58	146	20872	0.635	ng	98
86) 1,4-Dichlorobenzene	18.66	146	20671	0.621	ng	99
87) sec-Butylbenzene	18.71	105	50066	0.604	ng	99
88) 4-Isopropyltoluene (p-...	18.88	119	44913	0.609	ng	99
89) 1,2,3-Trimethylbenzene	18.88	105	36211	0.587	ng	96
90) 1,2-Dichlorobenzene	19.01	146	20024	0.630	ng	99
91) d-Limonene	19.03	68	14775	0.551	ng	95
92) 1,2-Dibromo-3-Chloropr...	19.48	157	6853	0.650	ng	98
93) n-Undecane	19.88	57	19175	0.441	ng	95
94) 1,2,4-Trichlorobenzene	20.83	180	13196	0.571	ng	97
95) Naphthalene	20.95	128	44577	0.589	ng	99
96) n-Dodecane	20.98	57	16381	0.384	ng	95
97) Hexachlorobutadiene	21.32	225	8725	0.668	ng	100
98) Cyclohexanone	16.30	55	14729	0.555	ng	97
99) tert-Butylbenzene	18.43	119	35630	0.627	ng	100
100) n-Butylbenzene	19.32	91	41404	0.583	ng	99

(#)=qualifier out of range (m)=manual integration (+)=signals summed

Data File: I:\MS09\Data\2016 11\07\11071611.D

Acq On : 7 Nov 2016 17:02

Operator: SC

Sample : 1.0ng TO-15 ICAL STD

Misc : S29-10261601/S29-11041605 (12/2)

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Nov 08 08:43:06 2016

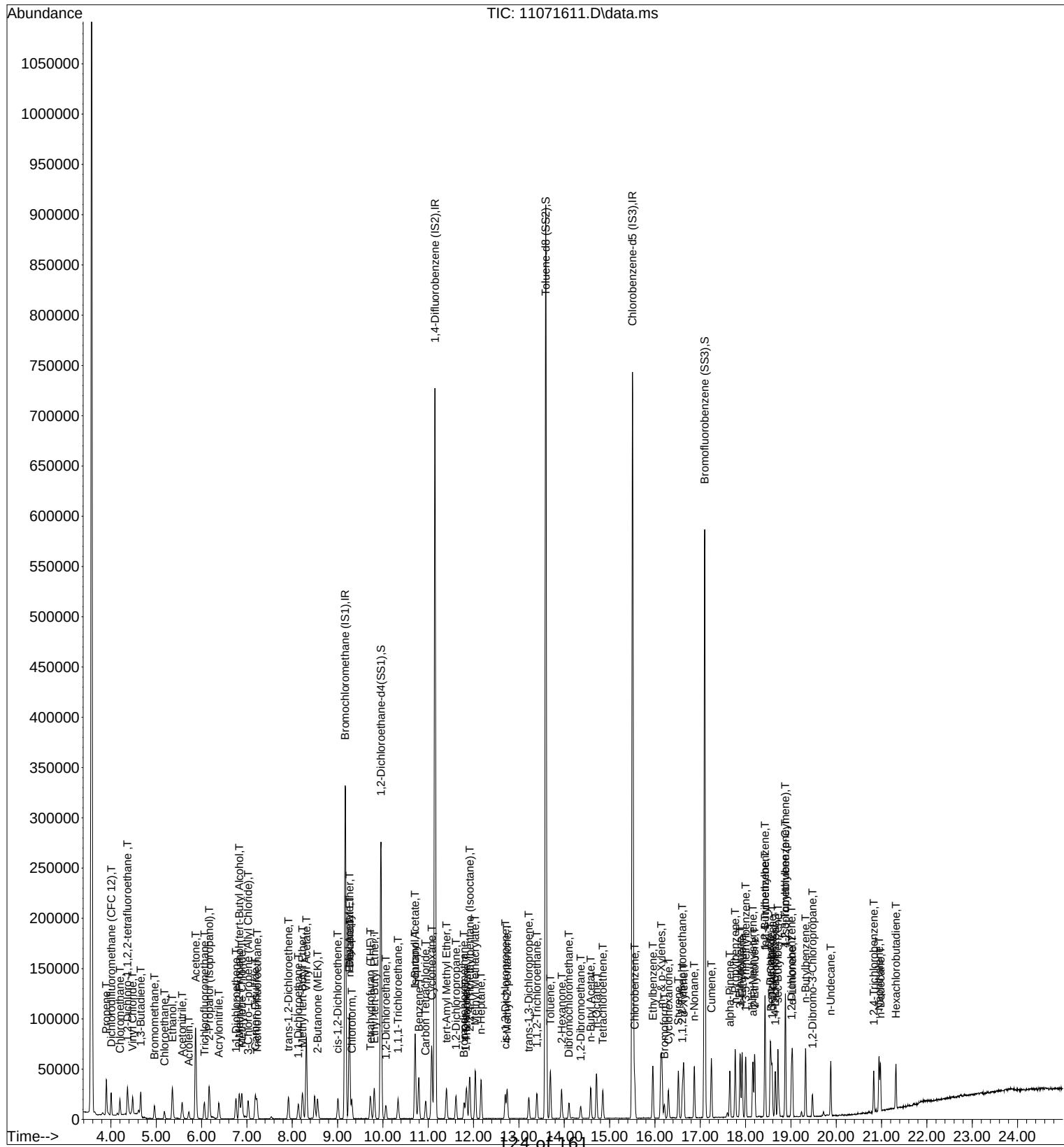
Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 08:41:37 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS09\Data\2016 11\07\11071612.D

Acq On : 7 Nov 2016 17:36

Operator: SC

Sample : 5.0ng TO-15 ICAL STD

Misc : S29-10261601/S29-11041605 (12/2)

ALS Vial : 14 Sample Multiplier: 1

 11/8/16

Quant Time: Nov 08 08:41:53 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 08:41:37 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.18	130	139291	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	11.15	114	678241	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	15.51	82	289322	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.96	65	207566	9.973	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	79.76%
57) Toluene-d8 (SS2)	13.60	98	730725	12.829	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.64%
73) Bromofluorobenzene (SS3)	17.10	174	198561	14.196	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	113.60%

Target Compounds

						Qvalue
2) Propene	3.89	42	90065	2.966	ng	96
3) Dichlorodifluoromethan...	4.00	85	143414	3.647	ng	99
4) Chloromethane	4.19	50	125375	3.084	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.36	135	69628	3.862	ng	100
6) Vinyl Chloride	4.47	62	121868	3.151	ng	99
7) 1,3-Butadiene	4.65	54	80374	3.054	ng	96
8) Bromomethane	4.95	94	64354	3.486	ng	99
9) Chloroethane	5.17	64	58832	3.787	ng	99
10) Ethanol	5.39	45	310236	17.784	ng	99
11) Acetonitrile	5.59	41	159382	3.469	ng	97
12) Acrolein	5.72	56	50660	3.549	ng	100
13) Acetone	5.87	58	323793	18.414	ng	90
14) Trichlorofluoromethane	6.05	101	116115	3.973	ng	99
15) 2-Propanol (Isopropanol)	6.19	45	419996	7.480	ng	95
16) Acrylonitrile	6.40	53	112540	3.839	ng	98
17) 1,1-Dichloroethene	6.75	96	73897	4.060	ng	98
18) 2-Methyl-2-Propanol (t...	6.85	59	394266	7.937	ng	98
19) Methylene Chloride	6.90	84	81030	3.892	ng	99
20) 3-Chloro-1-propene (Al...	7.03	41	121310	3.544	ng	98
21) Trichlorotrifluoroethane	7.22	151	60507	4.625	ng	99
22) Carbon Disulfide	7.18	76	297834	4.050	ng	99
23) trans-1,2-Dichloroethene	7.92	61	117393	3.986	ng	100
24) 1,1-Dichloroethane	8.15	63	139130	3.679	ng	99
25) Methyl tert-Butyl Ether	8.22	73	243556	4.157	ng	99
26) Vinyl Acetate	8.32	86	96760	22.382	ng	# 83
27) 2-Butanone (MEK)	8.56	72	57759	4.251	ng	92
28) cis-1,2-Dichloroethene	9.02	61	110946	3.952	ng	100
29) Diisopropyl Ether	9.26	87	67462	4.261	ng	# 90
30) Ethyl Acetate	9.26	61	63482	8.100	ng	99
31) n-Hexane	9.27	57	142354	3.798	ng	98
32) Chloroform	9.33	83	132023	4.003	ng	99
34) Tetrahydrofuran (THF)	9.72	72	55859	4.036	ng	93
35) Ethyl tert-Butyl Ether	9.81	87	93936	4.460	ng	97
36) 1,2-Dichloroethane	10.08	62	95037	3.641	ng	99
38) 1,1,1-Trichloroethane	10.34	97	113729	4.478	ng	98
39) Isopropyl Acetate	10.71	61	108899	8.584	ng	98
40) 1-Butanol	10.71	56	186676	8.363	ng	98
41) Benzene	10.80	78	327013	4.057	ng	99
42) Carbon Tetrachloride	10.95	117	94146	4.473	ng	99
43) Cyclohexane	11.08	84	251979	8.981	ng	96
44) tert-Amyl Methyl Ether	11.40	73	229450	4.233	ng	98
45) 1,2-Dichloropropane	11.62	63	82708	4.054	ng	99
46) Bromodichloromethane	11.80	83	104522	4.419	ng	99
47) Trichloroethene	11.85	130	79731	4.707	ng	100
48) 1,4-Dioxane	11.82	88	66727	4.538	ng	96
49) 2,2,4-Trimethylpentane...	11.92	57	356813	4.171	ng	94

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Data File: I:\MS09\Data\2016 11\07\11071612.D

Acq On : 7 Nov 2016 17:36

Operator: SC

Sample : 5.0ng TO-15 ICAL STD

Misc : S29-10261601/S29-11041605 (12/2)

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Nov 08 08:41:53 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 08:41:37 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.04	100	65264	10.173	ng	97
51) n-Heptane	12.17	71	83753	4.339	ng	99
52) cis-1,3-Dichloropropene	12.70	75	141490	4.672	ng	99
53) 4-Methyl-2-pentanone	12.74	58	79492	4.398	ng	99
54) trans-1,3-Dichloropropene	13.22	75	121278	4.508	ng	100
55) 1,1,2-Trichloroethane	13.40	97	76975	4.491	ng	99
58) Toluene	13.70	91	329655	4.660	ng	99
59) 2-Hexanone	13.94	43	183039	4.285	ng	99
60) Dibromochloromethane	14.11	129	85095	5.237	ng	99
61) 1,2-Dibromoethane	14.37	107	85173	4.950	ng	99
62) n-Butyl Acetate	14.58	43	207306	4.326	ng	100
63) n-Octane	14.71	57	73186	4.460	ng	95
64) Tetrachloroethene	14.85	166	80040	5.267	ng	99
65) Chlorobenzene	15.56	112	209427	4.874	ng	100
66) Ethylbenzene	15.95	91	369947	4.826	ng	100
67) m- & p-Xylenes	16.14	91	568898	9.644	ng	99
68) Bromoform	16.21	173	66556	5.470	ng	100
69) Styrene	16.52	104	228040	5.187	ng	98
70) o-Xylene	16.63	91	286256	4.736	ng	99
71) n-Nonane	16.87	43	163654	4.038	ng	98
72) 1,1,2,2-Tetrachloroethane	16.61	83	144614	4.617	ng	100
74) Cumene	17.25	105	360492	4.952	ng	99
75) alpha-Pinene	17.66	93	182169	4.771	ng	96
76) n-Propylbenzene	17.77	91	448548	4.826	ng	98
77) 3-Ethyltoluene	17.88	105	366439	5.031	ng	97
78) 4-Ethyltoluene	17.92	105	336103	4.787	ng	98
79) 1,3,5-Trimethylbenzene	18.00	105	293421	4.870	ng	98
80) alpha-Methylstyrene	18.16	118	159030	5.335	ng	100
81) 2-Ethyltoluene	18.20	105	350774	4.928	ng	99
82) 1,2,4-Trimethylbenzene	18.43	105	298258	4.864	ng	98
83) n-Decane	18.55	57	170904	4.084	ng	98
84) Benzyl Chloride	18.56	91	278979	5.034	ng	100
85) 1,3-Dichlorobenzene	18.58	146	165698	5.054	ng	100
86) 1,4-Dichlorobenzene	18.66	146	166078	5.002	ng	100
87) sec-Butylbenzene	18.71	105	401382	4.857	ng	98
88) 4-Isopropyltoluene (p-...	18.88	119	361055	4.914	ng	96
89) 1,2,3-Trimethylbenzene	18.88	105	292713	4.758	ng	98
90) 1,2-Dichlorobenzene	19.01	146	159757	5.039	ng	100
91) d-Limonene	19.03	68	124902	4.668	ng	96
92) 1,2-Dibromo-3-Chloropr...	19.48	157	58256	5.541	ng	95
93) n-Undecane	19.88	57	148203	3.418	ng	96
94) 1,2,4-Trichlorobenzene	20.83	180	110825	4.813	ng	99
95) Naphthalene	20.95	128	376259	4.990	ng	99
96) n-Dodecane	20.98	57	126148	2.965	ng	96
97) Hexachlorobutadiene	21.32	225	68059	5.228	ng	99
98) Cyclohexanone	16.29	55	120228	4.540	ng	95
99) tert-Butylbenzene	18.43	119	285672	5.040	ng	99
100) n-Butylbenzene	19.32	91	331521	4.681	ng	100

(#)=qualifier out of range (m)=manual integration (+)=signals summed

Data File: I:\MS09\Data\2016 11\07\11071612.D

Acq On : 7 Nov 2016 17:36

Operator: SC

Sample : 5.0ng TO-15 ICAL STD

Misc : S29-10261601/S29-11041605 (12/2)

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Nov 08 08:41:53 2016

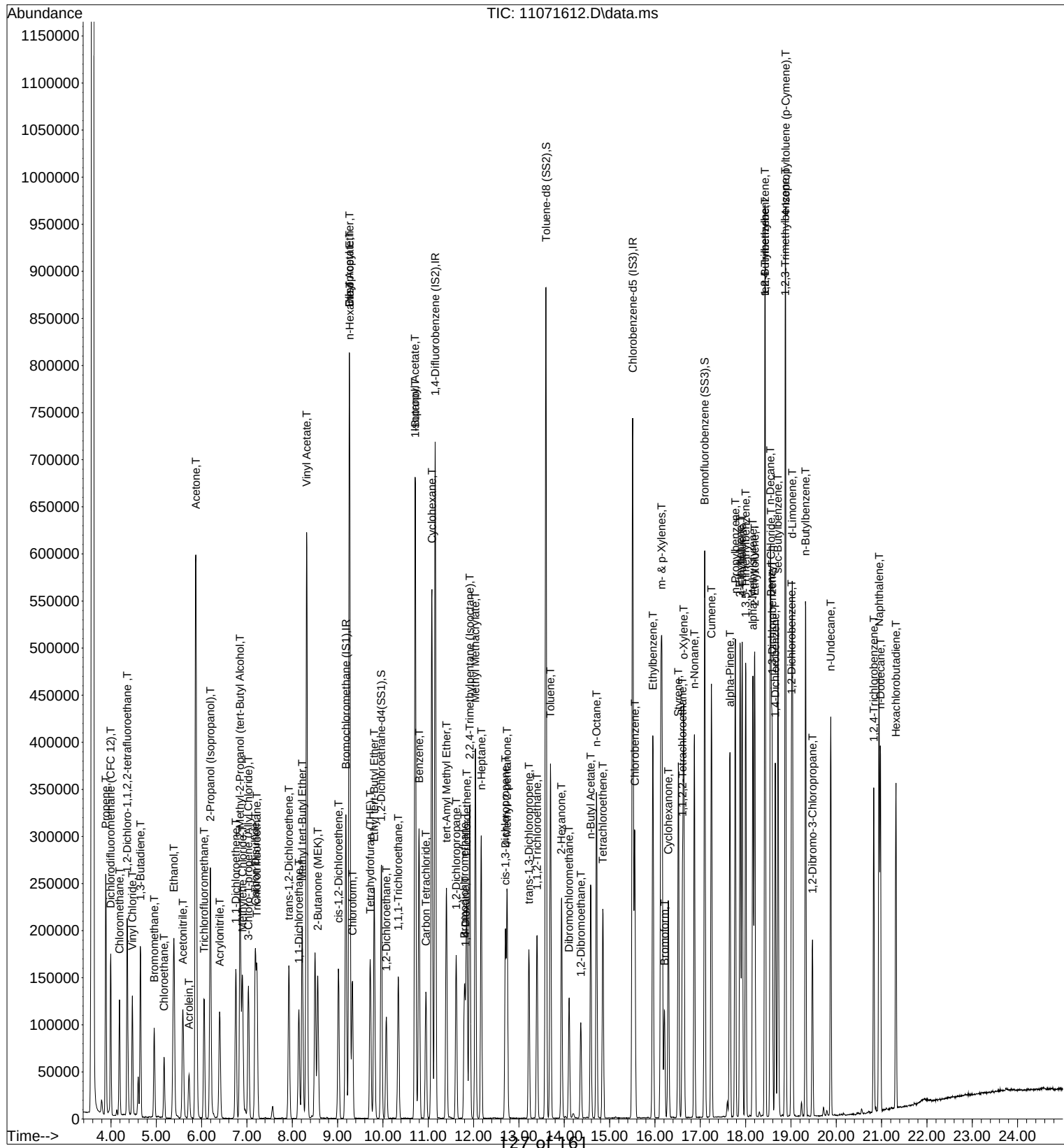
Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 08:41:37 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS09\Data\2016 11\07\11071613.D

Acq On : 7 Nov 2016 18:09

Operator: SC

Sample : 25ng TO-15 ICAL STD

Misc : S29-10261601/S29-11041603 (12/2)

ALS Vial : 15 Sample Multiplier: 1

 11/8/16

Quant Time: Nov 08 08:36:14 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Oct 28 09:10:57 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.20	130	139427	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	11.16	114	671817	12.500	ng	-0.03
56) Chlorobenzene-d5 (IS3)	15.51	82	288222	12.500	ng	-0.02

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.98	65	205005	9.840	ng	-0.03
Spiked Amount	12.500	Range	70 - 130	Recovery	=	78.72%
57) Toluene-d8 (SS2)	13.60	98	728201	12.834	ng	-0.03
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.64%
73) Bromofluorobenzene (SS3)	17.10	174	199607	14.325	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	114.56%

Target Compounds

						Qvalue
2) Propene	3.88	42	486925	16.019	ng	96
3) Dichlorodifluoromethan...	3.99	85	787191	20.001	ng	100
4) Chloromethane	4.19	50	693319	17.035	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.35	135	380956	21.109	ng	100
6) Vinyl Chloride	4.47	62	664751	17.172	ng	100
7) 1,3-Butadiene	4.65	54	482055	18.301	ng	97
8) Bromomethane	4.96	94	386367	20.906	ng	100
9) Chloroethane	5.18	64	326376	20.990	ng	100
10) Ethanol	5.42	45	1661718	95.165	ng	99
11) Acetonitrile	5.61	41	858899	18.675	ng	99
12) Acrolein	5.73	56	287280	20.106	ng	99
13) Acetone	5.89	58	1676163	95.229	ng	86
14) Trichlorofluoromethane	6.05	101	634690	21.695	ng	99
15) 2-Propanol (Isopropanol)	6.22	45	2311176	41.121	ng	95
16) Acrylonitrile	6.42	53	631094	21.505	ng	99
17) 1,1-Dichloroethene	6.75	96	427505	23.465	ng	94
18) 2-Methyl-2-Propanol (t...	6.87	59	2223840	44.725	ng	98
19) Methylene Chloride	6.92	84	455251	21.844	ng	98
20) 3-Chloro-1-propene (Al...	7.04	41	685514	20.006	ng	100
21) Trichlorotrifluoroethane	7.22	151	337536	25.778	ng	99
22) Carbon Disulfide	7.19	76	1674497	22.746	ng	100
23) trans-1,2-Dichloroethene	7.94	61	660677	22.413	ng	100
24) 1,1-Dichloroethane	8.16	63	767486	20.274	ng	100
25) Methyl tert-Butyl Ether	8.22	73	1347202	22.971	ng	98
26) Vinyl Acetate	8.33	86	548181	126.678	ng	99
27) 2-Butanone (MEK)	8.57	72	317280	23.329	ng	98
28) cis-1,2-Dichloroethene	9.03	61	617370	21.969	ng	99
29) Diisopropyl Ether	9.27	87	367248	23.172	ng	98
30) Ethyl Acetate	9.27	61	349513	44.555	ng	99
31) n-Hexane	9.27	57	741674	19.771	ng	99
32) Chloroform	9.34	83	734835	22.256	ng	99
34) Tetrahydrofuran (THF)	9.72	72	314628	22.710	ng	96
35) Ethyl tert-Butyl Ether	9.81	87	533810	25.322	ng	97
36) 1,2-Dichloroethane	10.08	62	530095	20.286	ng	100
38) 1,1,1-Trichloroethane	10.35	97	635644	25.270	ng	98
39) Isopropyl Acetate	10.71	61	595316	47.372	ng	# 90
40) 1-Butanol	10.73	56	951181	43.022	ng	97
41) Benzene	10.80	78	1777012	22.254	ng	99
42) Carbon Tetrachloride	10.96	117	534684	25.648	ng	100
43) Cyclohexane	11.09	84	1386311	49.881	ng	96
44) tert-Amyl Methyl Ether	11.40	73	1322668	24.636	ng	98
45) 1,2-Dichloropropane	11.62	63	462092	22.868	ng	100
46) Bromodichloromethane	11.80	83	590336	25.195	ng	100
47) Trichloroethene	11.86	130	450849	26.871	ng	100
48) 1,4-Dioxane	11.83	88	382781	26.283	ng	96
49) 2,2,4-Trimethylpentane...	11.92	57	1962689	23.161	ng	94

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Data File: I:\MS09\Data\2016 11\07\11071613.D

Acq On : 7 Nov 2016 18:09

Operator: SC

Sample : 25ng TO-15 ICAL STD

Misc : S29-10261601/S29-11041603 (12/2)

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Nov 08 08:36:14 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Oct 28 09:10:57 2016

Response via : Initial Calibration

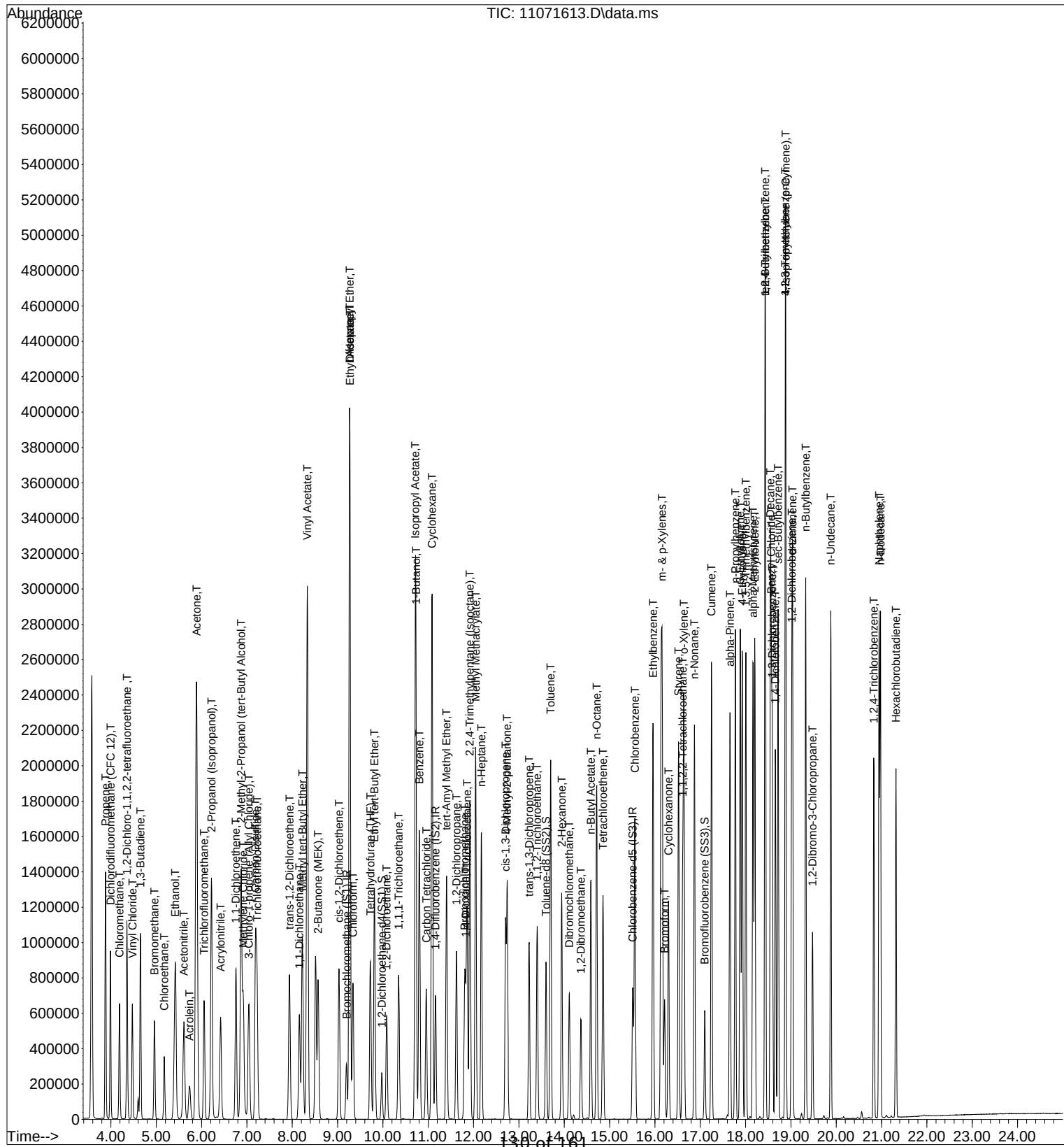
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.05	100	368218	57.944	ng	100
51) n-Heptane	12.17	71	459759	24.047	ng	98
52) cis-1,3-Dichloropropene	12.71	75	800325	26.679	ng	100
53) 4-Methyl-2-pentanone	12.74	58	441913	24.684	ng	97
54) trans-1,3-Dichloropropene	13.23	75	685968	25.740	ng	100
55) 1,1,2-Trichloroethane	13.40	97	437059	25.746	ng	99
58) Toluene	13.70	91	1810708	25.693	ng	99
59) 2-Hexanone	13.94	43	974600	22.904	ng	97
60) Dibromochloromethane	14.11	129	486771	30.074	ng	100
61) 1,2-Dibromoethane	14.37	107	485680	28.332	ng	99
62) n-Butyl Acetate	14.59	43	1110955	23.273	ng	99
63) n-Octane	14.72	57	402741	24.637	ng	97
64) Tetrachloroethene	14.86	166	454578	30.026	ng	100
65) Chlorobenzene	15.56	112	1163967	27.192	ng	100
66) Ethylbenzene	15.96	91	2039441	26.707	ng	100
67) m- & p-Xylenes	16.15	91	3138868	53.411	ng	99
68) Bromoform	16.21	173	398730	32.895	ng	100
69) Styrene	16.52	104	1280600	29.242	ng	99
70) o-Xylene	16.64	91	1586139	26.344	ng	99
71) n-Nonane	16.87	43	885370	21.927	ng	99
72) 1,1,2,2-Tetrachloroethane	16.61	83	797786	25.569	ng	100
74) Cumene	17.25	105	1978399	27.280	ng	100
75) alpha-Pinene	17.66	93	1064962	27.996	ng	97
76) n-Propylbenzene	17.77	91	2422075	26.159	ng	99
77) 3-Ethyltoluene	17.88	105	1957376	26.978	ng	97
78) 4-Ethyltoluene	17.92	105	1888404	27.000	ng	97
79) 1,3,5-Trimethylbenzene	18.01	105	1631888	27.188	ng	99
80) alpha-Methylstyrene	18.17	118	899324	30.284	ng	100
81) 2-Ethyltoluene	18.20	105	1931330	27.237	ng	100
82) 1,2,4-Trimethylbenzene	18.43	105	1643292	26.900	ng	99
83) n-Decane	18.55	57	955430	22.919	ng	98
84) Benzyl Chloride	18.57	91	1607092	29.112	ng	99
85) 1,3-Dichlorobenzene	18.59	146	930059	28.475	ng	100
86) 1,4-Dichlorobenzene	18.66	146	943608	28.528	ng	100
87) sec-Butylbenzene	18.72	105	2187904	26.577	ng	99
88) 4-Isopropyltoluene (p-...	18.88	119	1931312	26.383	ng	98
89) 1,2,3-Trimethylbenzene	18.88	105	1613324	26.325	ng	99
90) 1,2-Dichlorobenzene	19.02	146	895504	28.355	ng	99
91) d-Limonene	19.04	68	692788	25.993	ng	98
92) 1,2-Dibromo-3-Chloropr...	19.48	157	331455	31.648	ng	92
93) n-Undecane	19.88	57	1008407	23.345	ng	98
94) 1,2,4-Trichlorobenzene	20.83	180	669449	29.184	ng	100
95) Naphthalene	20.95	128	2241199	29.838	ng	100
96) n-Dodecane	20.98	57	942104	22.226	ng	98
97) Hexachlorobutadiene	21.32	225	396708	30.592	ng	100
98) Cyclohexanone	16.30	55	633748	24.022	ng	96
99) tert-Butylbenzene	18.43	119	1539705	27.266	ng	100
100) n-Butylbenzene	19.33	91	1799248	25.504	ng	100

(#)=qualifier out of range (m)=manual integration (+)=signals summed

ALS Vial : 15 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS09\Data\2016 11\07\11071614.D

Acq On : 7 Nov 2016 18:43

Operator: SC

Sample : 50ng TO-15 ICAL STD

Misc : S29-10261601/S29-11041603 (12/2)

ALS Vial : 15 Sample Multiplier: 1

 11/8/16

Quant Time: Nov 08 08:54:14 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 08:41:37 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.20	130	142971	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	11.17	114	695457	12.500	ng	0.01
56) Chlorobenzene-d5 (IS3)	15.51	82	295551	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.98	65	210312	9.844	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	78.72%
57) Toluene-d8 (SS2)	13.60	98	749541	12.882	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.04%
73) Bromofluorobenzene (SS3)	17.10	174	205905	14.410	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	115.28%

Target Compounds

						Qvalue
2) Propene	3.88	42	1072788	34.418	ng	96
3) Dichlorodifluoromethan...	3.99	85	1468229	36.379	ng	100
4) Chloromethane	4.19	50	1284441	30.777	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.36	135	737426	39.849	ng	100
6) Vinyl Chloride	4.48	62	1255934	31.639	ng	100
7) 1,3-Butadiene	4.65	54	906162	33.549	ng	98
8) Bromomethane	4.96	94	679881	35.876	ng	100
9) Chloroethane	5.18	64	625624	39.237	ng	100
10) Ethanol	5.44	45	3119099	174.199	ng	99
11) Acetonitrile	5.62	41	1629008	34.541	ng	99
12) Acrolein	5.74	56	542911	37.055	ng	99
13) Acetone	5.90	58	3042124	168.549	ng	# 84
14) Trichlorofluoromethane	6.06	101	1219047	40.636	ng	99
15) 2-Propanol (Isopropanol)	6.24	45	3682082	63.888	ng	95
16) Acrylonitrile	6.43	53	1202452	39.958	ng	99
17) 1,1-Dichloroethene	6.76	96	821929	43.996	ng	93
18) 2-Methyl-2-Propanol (t...	6.89	59	3414475	66.969	ng	98
19) Methylene Chloride	6.93	84	869605	40.691	ng	97
20) 3-Chloro-1-propene (Al...	7.05	41	1290138	36.718	ng	99
21) Trichlorotrifluoroethane	7.22	151	649590	48.380	ng	98
22) Carbon Disulfide	7.19	76	3182070	42.152	ng	100
23) trans-1,2-Dichloroethene	7.95	61	1253853	41.482	ng	99
24) 1,1-Dichloroethane	8.16	63	1465472	37.753	ng	100
25) Methyl tert-Butyl Ether	8.23	73	2466741	41.018	ng	98
26) Vinyl Acetate	8.34	86	1020108	229.891	ng	# 87
27) 2-Butanone (MEK)	8.58	72	606988	43.525	ng	99
28) cis-1,2-Dichloroethene	9.04	61	1177435	40.861	ng	98
29) Diisopropyl Ether	9.27	87	674764	41.520	ng	# 91
30) Ethyl Acetate	9.28	61	627541	78.014	ng	98
31) n-Hexane	9.27	57	1320180	34.320	ng	100
32) Chloroform	9.35	83	1399968	41.350	ng	99
34) Tetrahydrofuran (THF)	9.73	72	602288	42.396	ng	98
35) Ethyl tert-Butyl Ether	9.82	87	1022199	47.287	ng	99
36) 1,2-Dichloroethane	10.09	62	1007811	37.612	ng	100
38) 1,1,1-Trichloroethane	10.35	97	1212799	46.576	ng	98
39) Isopropyl Acetate	10.72	61	1096359	84.278	ng	# 86
40) 1-Butanol	10.74	56	1743577	76.182	ng	96
41) Benzene	10.81	78	3353848	40.574	ng	100
42) Carbon Tetrachloride	10.96	117	1031316	47.789	ng	100
43) Cyclohexane	11.09	84	2587732	89.945	ng	97
44) tert-Amyl Methyl Ether	11.41	73	2504934	45.071	ng	98
45) 1,2-Dichloropropane	11.63	63	878559	42.000	ng	99
46) Bromodichloromethane	11.81	83	1130720	46.617	ng	100
47) Trichloroethene	11.86	130	861676	49.612	ng	100
48) 1,4-Dioxane	11.83	88	738826	49.006	ng	97
49) 2,2,4-Trimethylpentane...	11.92	57	3667983	41.813	ng	94

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Data File: I:\MS09\Data\2016 11\07\11071614.D

Acq On : 7 Nov 2016 18:43

Operator: SC

Sample : 50ng TO-15 ICAL STD

Misc : S29-10261601/S29-11041603 (12/2)

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Nov 08 08:54:14 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 08:41:37 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.05	100	707423	107.538	ng	97
51) n-Heptane	12.17	71	874024	44.160	ng	99
52) cis-1,3-Dichloropropene	12.71	75	1522104	49.014	ng	100
53) 4-Methyl-2-pentanone	12.75	58	841493	45.405	ng	95
54) trans-1,3-Dichloropropene	13.23	75	1312272	47.567	ng	100
55) 1,1,2-Trichloroethane	13.41	97	832710	47.385	ng	98
58) Toluene	13.71	91	3403797	47.100	ng	99
59) 2-Hexanone	13.95	43	1823018	41.781	ng	97
60) Dibromochloromethane	14.11	129	937092	56.459	ng	100
61) 1,2-Dibromoethane	14.37	107	934658	53.171	ng	100
62) n-Butyl Acetate	14.59	43	2085516	42.605	ng	98
63) n-Octane	14.72	57	758961	45.277	ng	98
64) Tetrachloroethene	14.86	166	875099	56.369	ng	100
65) Chlorobenzene	15.56	112	2210464	50.359	ng	100
66) Ethylbenzene	15.96	91	3825240	48.851	ng	99
67) m- & p-Xylenes	16.15	91	5825652	96.672	ng	99
68) Bromoform	16.22	173	778870	62.663	ng	100
69) Styrene	16.52	104	2418218	53.850	ng	99
70) o-Xylene	16.64	91	2976956	48.219	ng	98
71) n-Nonane	16.87	43	1623627	39.214	ng	98
72) 1,1,2,2-Tetrachloroethane	16.61	83	1505494	47.054	ng	100
74) Cumene	17.25	105	3670094	49.352	ng	99
75) alpha-Pinene	17.66	93	2002963	51.348	ng	98
76) n-Propylbenzene	17.77	91	4459896	46.973	ng	99
77) 3-Ethyltoluene	17.89	105	3727663	50.103	ng	98
78) 4-Ethyltoluene	17.93	105	3410865	47.558	ng	96
79) 1,3,5-Trimethylbenzene	18.01	105	3044493	49.465	ng	99
80) alpha-Methylstyrene	18.17	118	1688172	55.438	ng	99
81) 2-Ethyltoluene	18.21	105	3563410	49.008	ng	99
82) 1,2,4-Trimethylbenzene	18.44	105	2933051	46.822	ng	99
83) n-Decane	18.55	57	1719572	40.227	ng	99
84) Benzyl Chloride	18.57	91	2966162	52.399	ng	98
85) 1,3-Dichlorobenzene	18.59	146	1756050	52.431	ng	100
86) 1,4-Dichlorobenzene	18.66	146	1782249	52.545	ng	99
87) sec-Butylbenzene	18.72	105	4025910	47.692	ng	99
88) 4-Isopropyltoluene (p-...	18.89	119	3374622	44.957	ng	99
89) 1,2,3-Trimethylbenzene	18.88	105	2877097	45.782	ng	99
90) 1,2-Dichlorobenzene	19.02	146	1673119	51.664	ng	99
91) d-Limonene	19.04	68	1264720	46.274	ng	99
92) 1,2-Dibromo-3-Chloropr...	19.48	157	639160	59.514	ng	91
93) n-Undecane	19.88	57	1845739	41.670	ng	99
94) 1,2,4-Trichlorobenzene	20.83	180	1295706	55.085	ng	100
95) Naphthalene	20.95	128	4177068	54.233	ng	100
96) n-Dodecane	20.98	57	1733756	39.888	ng	99
97) Hexachlorobutadiene	21.32	225	769838	57.894	ng	100
98) Cyclohexanone	16.30	55	1198753	44.311	ng	96
99) tert-Butylbenzene	18.43	119	2720932	46.990	ng	99
100) n-Butylbenzene	19.33	91	3304926	45.685	ng	99

(#)=qualifier out of range (m)=manual integration (+)=signals summed

Data File: I:\MS09\Data\2016 11\07\11071615.D

Acq On : 7 Nov 2016 19:17

Operator: SC

Sample : 100ng TO-15 ICAL STD

Misc : S29-10261601/S29-11041603 (12/2)

ALS Vial : 15 Sample Multiplier: 1

 11/8/16

Quant Time: Nov 08 08:55:48 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 08:41:37 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.21	130	143194	12.500	ng	0.01
37) 1,4-Difluorobenzene (IS2)	11.17	114	695491	12.500	ng	0.02
56) Chlorobenzene-d5 (IS3)	15.52	82	297735	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.99	65	208837	9.760	ng	0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	78.08%
57) Toluene-d8 (SS2)	13.61	98	752988	12.847	ng	0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.80%
73) Bromofluorobenzene (SS3)	17.10	174	210241	14.606	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	116.88%

Target Compounds

						Qvalue
2) Propene	3.89	42	2378834	76.200	ng	96
3) Dichlorodifluoromethan...	4.00	85	2732841	67.608	ng	99
4) Chloromethane	4.20	50	2188848	52.366	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.36	135	1372719	74.063	ng	99
6) Vinyl Chloride	4.48	62	2293202	57.680	ng	99
7) 1,3-Butadiene	4.67	54	1617118	59.777	ng	98
8) Bromomethane	4.98	94	1299568	68.469	ng	100
9) Chloroethane	5.19	64	1192409	74.668	ng	100
10) Ethanol	5.48	45	5645743	314.819	ng	99
11) Acetonitrile	5.65	41	3095170	65.527	ng	99
12) Acrolein	5.76	56	1032391	70.354	ng	99
13) Acetone	5.92	58	5421620	299.918	ng	# 84
14) Trichlorofluoromethane	6.06	101	2342391	77.960	ng	99
15) 2-Propanol (Isopropanol)	6.26	45	5059603	87.653	ng	95
16) Acrylonitrile	6.46	53	2293780	76.105	ng	99
17) 1,1-Dichloroethene	6.77	96	1588852	84.916	ng	92
18) 2-Methyl-2-Propanol (t...	6.91	59	4448653	87.116	ng	98
19) Methylene Chloride	6.94	84	1654303	77.288	ng	95
20) 3-Chloro-1-propene (Al...	7.06	41	2446589	69.524	ng	98
21) Trichlorotrifluoroethane	7.23	151	1262247	93.863	ng	97
22) Carbon Disulfide	7.20	76	5897852	78.006	ng	100
23) trans-1,2-Dichloroethene	7.96	61	2390596	78.966	ng	98
24) 1,1-Dichloroethane	8.18	63	2783185	71.588	ng	100
25) Methyl tert-Butyl Ether	8.23	73	3945505	65.505	ng	98
26) Vinyl Acetate	8.36	86	1791302	403.059	ng	# 74
27) 2-Butanone (MEK)	8.60	72	1160352	83.074	ng	95
28) cis-1,2-Dichloroethene	9.05	61	2227300	77.174	ng	97
29) Diisopropyl Ether	9.28	87	1158380	71.167	ng	# 81
30) Ethyl Acetate	9.30	61	1034943	128.461	ng	95
31) n-Hexane	9.27	57	2174343	56.437	ng	99
32) Chloroform	9.36	83	2655810	78.322	ng	100
34) Tetrahydrofuran (THF)	9.73	72	1150703	80.873	ng	100
35) Ethyl tert-Butyl Ether	9.83	87	1939729	89.592	ng	98
36) 1,2-Dichloroethane	10.10	62	1909347	71.147	ng	99
38) 1,1,1-Trichloroethane	10.36	97	2289716	87.929	ng	98
39) Isopropyl Acetate	10.73	61	1934093	148.667	ng	# 83
40) 1-Butanol	10.77	56	3066457	133.975	ng	97
41) Benzene	10.82	78	6219983	75.244	ng	100
42) Carbon Tetrachloride	10.97	117	1957656	90.710	ng	100
43) Cyclohexane	11.10	84	4516857	156.990	ng	99
44) tert-Amyl Methyl Ether	11.42	73	4643952	83.555	ng	99
45) 1,2-Dichloropropane	11.63	63	1668782	79.773	ng	100
46) Bromodichloromethane	11.82	83	2139096	88.187	ng	100
47) Trichloroethene	11.87	130	1626238	93.628	ng	100
48) 1,4-Dioxane	11.84	88	1377610	91.373	ng	97
49) 2,2,4-Trimethylpentane...	11.93	57	6597082	75.199	ng	96

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Data File: I:\MS09\Data\2016 11\07\11071615.D

Acq On : 7 Nov 2016 19:17

Operator: SC

Sample : 100ng TO-15 ICAL STD

Misc : S29-10261601/S29-11041603 (12/2)

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Nov 08 08:55:48 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 08:41:37 2016

Response via : Initial Calibration

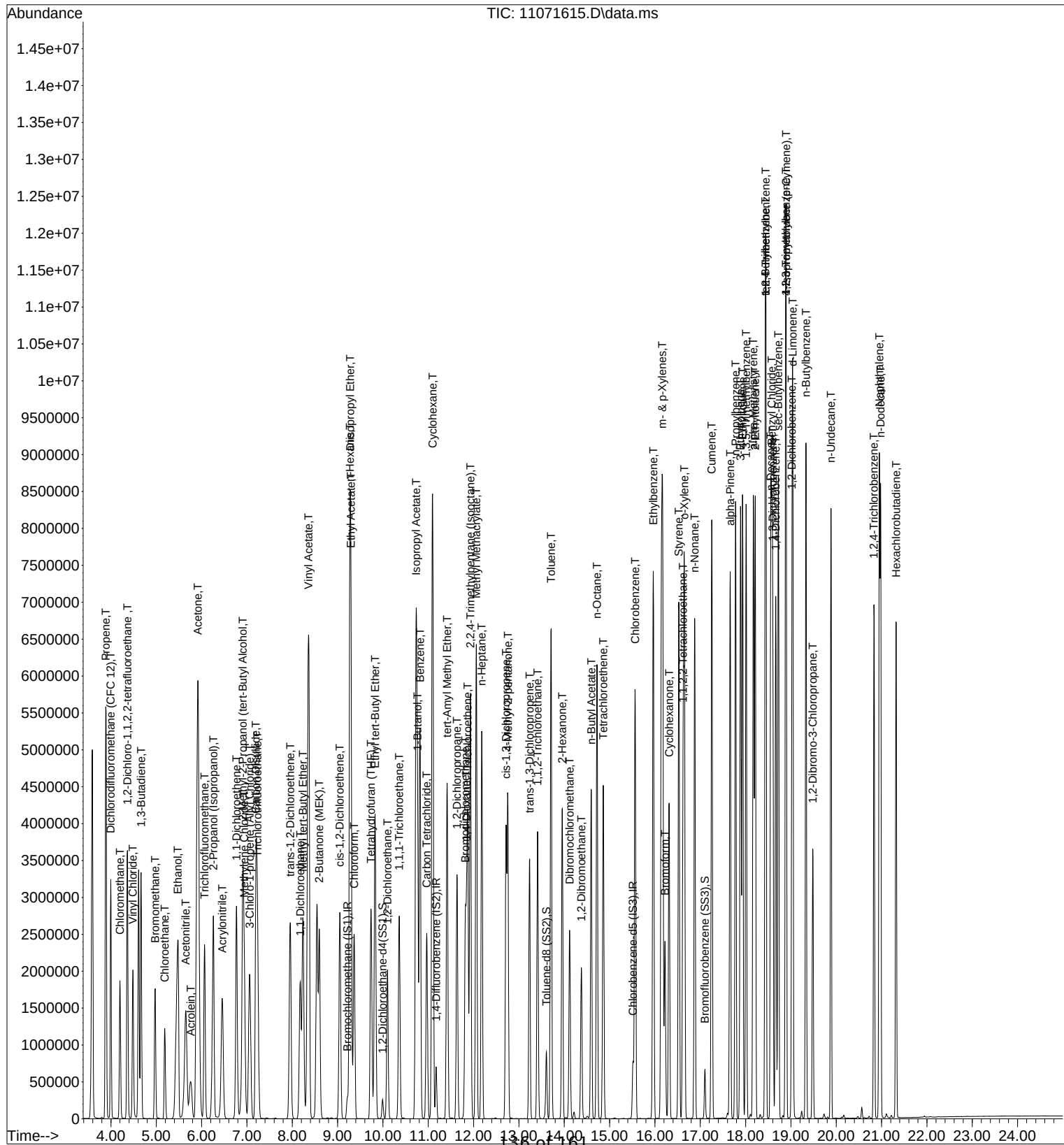
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.06	100	1308149	198.847	ng	94
51) n-Heptane	12.18	71	1627224	82.212	ng	99
52) cis-1,3-Dichloropropene	12.72	75	2854587	91.917	ng	100
53) 4-Methyl-2-pentanone	12.76	58	1556191	83.965	ng	93
54) trans-1,3-Dichloropropene	13.24	75	2490691	90.277	ng	99
55) 1,1,2-Trichloroethane	13.41	97	1577076	89.738	ng	98
58) Toluene	13.71	91	6208322	85.278	ng	98
59) 2-Hexanone	13.95	43	3342143	76.035	ng	95
60) Dibromochloromethane	14.12	129	1787120	106.883	ng	100
61) 1,2-Dibromoethane	14.38	107	1783718	100.729	ng	100
62) n-Butyl Acetate	14.60	43	3828413	77.638	ng	97
63) n-Octane	14.72	57	1384702	82.001	ng	99
64) Tetrachloroethene	14.86	166	1675996	107.166	ng	99
65) Chlorobenzene	15.56	112	4092129	92.543	ng	99
66) Ethylbenzene	15.96	91	6880151	87.219	ng	98
67) m- & p-Xylenes	16.16	91	10213268	168.237	ng	99
68) Bromoform	16.22	173	1503039	120.039	ng	99
69) Styrene	16.53	104	4414036	97.573	ng	99
70) o-Xylene	16.65	91	5307550	85.337	ng	98
71) n-Nonane	16.88	43	2819142	67.589	ng	97
72) 1,1,2,2-Tetrachloroethane	16.62	83	2707158	83.991	ng	100
74) Cumene	17.25	105	6462205	86.261	ng	98
75) alpha-Pinene	17.66	93	3563196	90.677	ng	99
76) n-Propylbenzene	17.78	91	7799172	81.541	ng	97
77) 3-Ethyltoluene	17.89	105	6668965	88.980	ng	99
78) 4-Ethyltoluene	17.93	105	5848477	80.947	ng	94
79) 1,3,5-Trimethylbenzene	18.01	105	5399675	87.086	ng	98
80) alpha-Methylstyrene	18.17	118	3036952	98.999	ng	99
81) 2-Ethyltoluene	18.21	105	6266578	85.553	ng	98
82) 1,2,4-Trimethylbenzene	18.44	105	4673255	74.055	ng	99
83) n-Decane	18.55	57	2787687	64.736	ng	99
84) Benzyl Chloride	18.58	91	4947682	86.762	ng	96
85) 1,3-Dichlorobenzene	18.60	146	3133868	92.882	ng	99
86) 1,4-Dichlorobenzene	18.67	146	3271932	95.758	ng	99
87) sec-Butylbenzene	18.72	105	6926769	81.454	ng	98
88) 4-Isopropyltoluene (p-...	18.89	119	5228295	69.141	ng	98
89) 1,2,3-Trimethylbenzene	18.89	105	4541930	71.743	ng	100
90) 1,2-Dichlorobenzene	19.02	146	2893337	88.688	ng	99
91) d-Limonene	19.04	68	2024805	73.541	ng	97
92) 1,2-Dibromo-3-Chloropr...	19.48	157	1221375	112.892	ng	90
93) n-Undecane	19.88	57	3118931	69.897	ng	99
94) 1,2,4-Trichlorobenzene	20.83	180	2425976	102.380	ng	100
95) Naphthalene	20.95	128	7236390	93.264	ng	99
96) n-Dodecane	20.98	57	2907928	66.411	ng	99
97) Hexachlorobutadiene	21.32	225	1462274	109.160	ng	99
98) Cyclohexanone	16.31	55	2233161	81.942	ng	97
99) tert-Butylbenzene	18.44	119	4365150	74.832	ng	98
100) n-Butylbenzene	19.33	91	5691805	78.102	ng	97

(#)=qualifier out of range (m)=manual integration (+)=signals summed

ALS Vial : 15 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS09\Data\2016 11\07\11071617.D

Acq On : 7 Nov 2016 20:25

Operator: SC

Sample : 25ng TO-15 ICV STD

Misc : S29-10261601/S29-10271604 (11/25)

ALS Vial : 4 Sample Multiplier: 1

Quant Time: Nov 08 09:30:31 2016

11/8/16

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.20	130	139449	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	11.16	114	680266	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	15.51	82	290254	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.98	65	205802	12.334	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.64%
57) Toluene-d8 (SS2)	13.60	98	734249	12.459	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.68%
73) Bromofluorobenzene (SS3)	17.10	174	202402	12.814	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.48%

Target Compounds

						Qvalue
2) Propene	3.89	42	486802	24.123	ng	96
3) Dichlorodifluoromethan...	3.99	85	769580	26.520	ng	100
4) Chloromethane	4.19	50	709274	26.530	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.36	135	387933	26.698	ng	100
6) Vinyl Chloride	4.48	62	672492	26.416	ng	100
7) 1,3-Butadiene	4.65	54	480494	29.518	ng	98
8) Bromomethane	4.96	94	405065	28.024	ng	100
9) Chloroethane	5.18	64	335663	27.418	ng	100
10) Ethanol	5.42	45	1700567	141.247	ng	99
11) Acetonitrile	5.61	41	856725	26.259	ng	98
12) Acrolein	5.74	56	285700	26.275	ng	99
13) Acetone	5.89	58	1651388	128.112	ng	86
14) Trichlorofluoromethane	6.06	101	633868	26.655	ng	99
15) 2-Propanol (Isopropanol)	6.22	45	2250038	56.893	ng	95
16) Acrylonitrile	6.42	53	621607	27.597	ng	99
17) 1,1-Dichloroethene	6.76	96	420489	27.345	ng	94
18) 2-Methyl-2-Propanol (t...	6.87	59	2132099	55.863	ng	97
19) Methylene Chloride	6.92	84	448109	25.799	ng	98
20) 3-Chloro-1-propene (Al...	7.04	41	693076	27.063	ng	99
21) Trichlorotrifluoroethane	7.22	151	334833	27.838	ng	98
22) Carbon Disulfide	7.19	76	1657099	29.644	ng	100
23) trans-1,2-Dichloroethene	7.94	61	643283	27.563	ng	99
24) 1,1-Dichloroethane	8.16	63	781988	26.515	ng	100
25) Methyl tert-Butyl Ether	8.22	73	1317332	27.009	ng	98
26) Vinyl Acetate	8.33	86	531337	141.690	ng	97
27) 2-Butanone (MEK)	8.57	72	315865	28.023	ng	100
28) cis-1,2-Dichloroethene	9.03	61	599507	27.144	ng	98
29) Diisopropyl Ether	9.27	87	360208	26.189	ng	98
30) Ethyl Acetate	9.27	61	341706	58.540	ng	100
31) n-Hexane	9.27	57	722364	28.269	ng	99
32) Chloroform	9.34	83	716485	27.307	ng	99
34) Tetrahydrofuran (THF)	9.72	72	306219	26.655	ng	97
35) Ethyl tert-Butyl Ether	9.81	87	523674	27.607	ng	98
36) 1,2-Dichloroethane	10.09	62	522445	27.597	ng	100
38) 1,1,1-Trichloroethane	10.35	97	613982	27.233	ng	98
39) Isopropyl Acetate	10.71	61	579971	54.640	ng	# 91
40) 1-Butanol	10.73	56	959884	60.737	ng	96
41) Benzene	10.81	78	1761451	25.589	ng	100
42) Carbon Tetrachloride	10.96	117	531765	27.681	ng	99
43) Cyclohexane	11.09	84	1357220	54.868	ng	96
44) tert-Amyl Methyl Ether	11.41	73	1291093	25.735	ng	98
45) 1,2-Dichloropropane	11.62	63	452816	27.167	ng	100
46) Bromodichloromethane	11.80	83	586180	28.303	ng	100
47) Trichloroethene	11.86	130	444067	28.117	ng	100
48) 1,4-Dioxane	11.83	88	376043	29.275	ng	97
49) 2,2,4-Trimethylpentane...	11.92	57	1914907	26.927	ng	94

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Data File: I:\MS09\Data\2016 11\07\11071617.D

Acq On : 7 Nov 2016 20:25

Operator: SC

Sample : 25ng TO-15 ICV STD

Misc : S29-10261601/S29-10271604 (11/25)

ALS Vial : 4 Sample Multiplier: 1

Quant Time: Nov 08 09:30:31 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

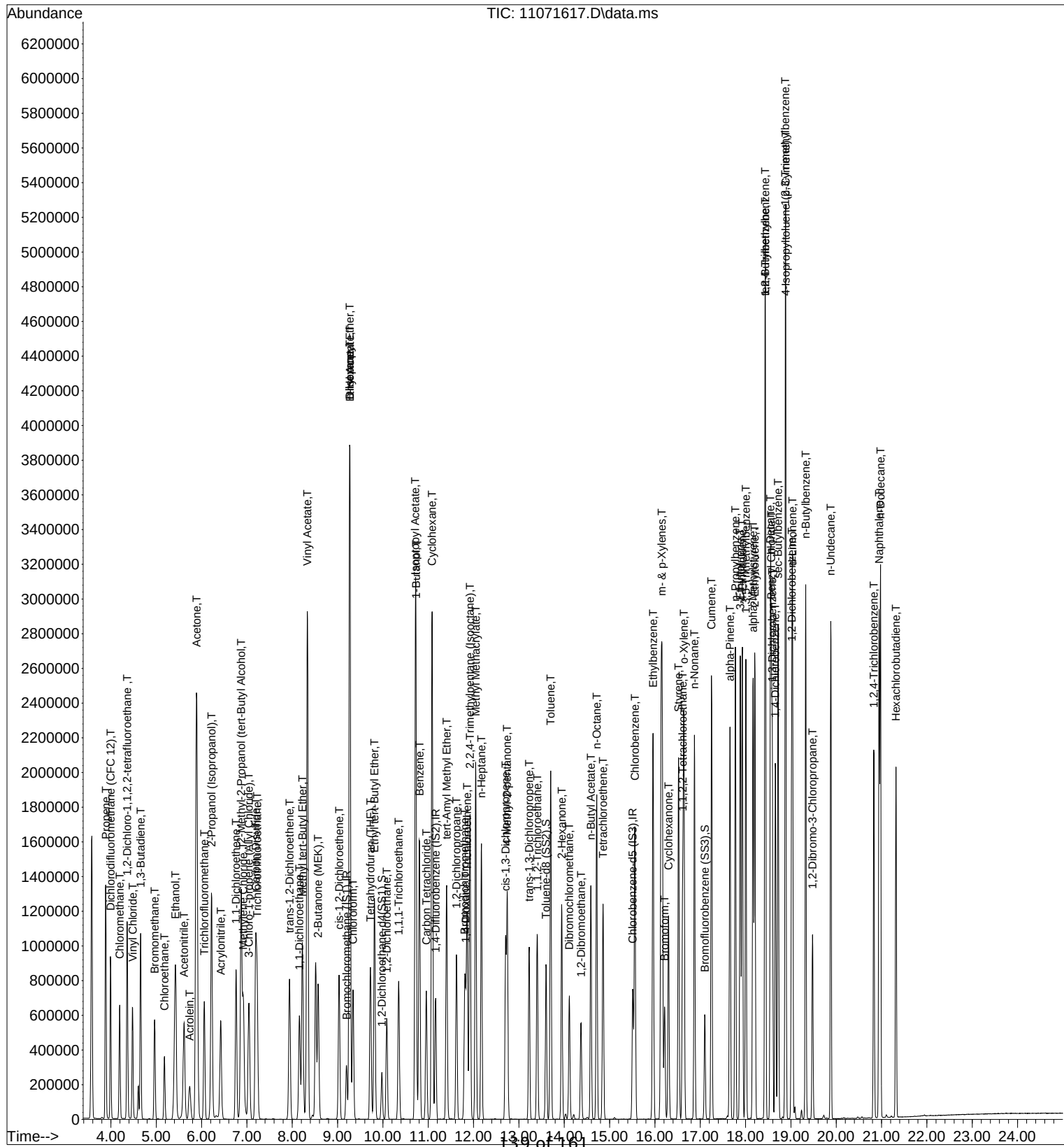
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.05	100	364392	59.581	ng	99
51) n-Heptane	12.17	71	452470	27.045	ng	99
52) cis-1,3-Dichloropropene	12.71	75	747541	28.106	ng	100
53) 4-Methyl-2-pentanone	12.74	58	432287	28.077	ng	97
54) trans-1,3-Dichloropropene	13.23	75	680078	28.889	ng	100
55) 1,1,2-Trichloroethane	13.41	97	429135	27.943	ng	99
58) Toluene	13.70	91	1783370	26.445	ng	99
59) 2-Hexanone	13.94	43	952234	28.024	ng	98
60) Dibromochloromethane	14.11	129	480815	28.848	ng	99
61) 1,2-Dibromoethane	14.37	107	479620	28.532	ng	100
62) n-Butyl Acetate	14.59	43	1096201	28.714	ng	99
63) n-Octane	14.72	57	395878	28.082	ng	97
64) Tetrachloroethene	14.86	166	450077	28.266	ng	100
65) Chlorobenzene	15.56	112	1150599	27.630	ng	100
66) Ethylbenzene	15.96	91	2008866	27.503	ng	100
67) m- & p-Xylenes	16.15	91	3085980	55.312	ng	99
68) Bromoform	16.21	173	389440	29.539	ng	100
69) Styrene	16.52	104	1257553	28.867	ng	99
70) o-Xylene	16.64	91	1569716	27.606	ng	99
71) n-Nonane	16.87	43	867095	26.050	ng	98
72) 1,1,2,2-Tetrachloroethane	16.61	83	778666	27.881	ng	100
74) Cumene	17.25	105	1970337	27.733	ng	100
75) alpha-Pinene	17.66	93	1051963	27.728	ng	97
76) n-Propylbenzene	17.77	91	2395318	27.826	ng	99
77) 3-Ethyltoluene	17.88	105	1895251	26.329	ng	97
78) 4-Ethyltoluene	17.93	105	1951168	30.043	ng	97
79) 1,3,5-Trimethylbenzene	18.01	105	1615517	27.855	ng	99
80) alpha-Methylstyrene	18.17	118	880558	29.310	ng	99
81) 2-Ethyltoluene	18.20	105	1906472	28.128	ng	100
82) 1,2,4-Trimethylbenzene	18.43	105	1630451	28.440	ng	99
83) n-Decane	18.55	57	948261	30.641	ng	98
84) Benzyl Chloride	18.57	91	1593918	30.896	ng	99
85) 1,3-Dichlorobenzene	18.59	146	930047	29.149	ng	100
86) 1,4-Dichlorobenzene	18.66	146	942524	29.635	ng	100
87) sec-Butylbenzene	18.72	105	2174861	27.841	ng	99
88) 4-Isopropyltoluene (p-...	18.88	119	1951255	27.862	ng	98
89) 1,2,3-Trimethylbenzene	18.88	105	1666827	29.118	ng	99
90) 1,2-Dichlorobenzene	19.02	146	896003	29.364	ng	99
91) d-Limonene	19.04	68	681950	26.903	ng	97
92) 1,2-Dibromo-3-Chloropr...	19.48	157	340776	31.704	ng	91
93) n-Undecane	19.88	57	1016550	32.639	ng	98
94) 1,2,4-Trichlorobenzene	20.83	180	706042	32.552	ng	100
95) Naphthalene	20.95	128	2328029	34.169	ng	100
96) n-Dodecane	20.98	57	1038529	33.860	ng	98
97) Hexachlorobutadiene	21.32	225	404747	30.234	ng	100
98) Cyclohexanone	16.30	55	600544	25.950	ng	96
99) tert-Butylbenzene	18.43	119	1532631	27.983	ng	100
100) n-Butylbenzene	19.33	91	1795524	28.221	ng	99

(#)=qualifier out of range (m)=manual integration (+)=signals summed

ALS Vial : 4 Sample Multiplier: 1

DataAcq Meth:T015.M



Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: 11071617.D

Acq. Method File: TO15.M

11/8/16

Data File Path: I:\MS09\Data\2016_11\071

Sample Name: 25ng TO-15 ICV STD

Operator: SC

Misc Info: S29-10261601/S29-10271604 (

Date Acquired: 11/7/16

20:25

Instrument Name: MS09

#	Compound Name	Ret. Time	Amt. (ng)	Spike Amt.(ng)	% Rec.	Lower Limit	Upper Limit	* OR Fail	ICV/AZ 70-130%
2)	Propene	3.89	24.123	26.275	92	52	127	*	*
3)	Dichlorodifluoromethane (CFC 12)	3.99	26.520	26.250	101	68	109	*	*
4)	Chloromethane	4.19	26.530	26.225	101	51	130	*	*
5)	1,2-Dichloro-1,1,2,2-tetrafluoroethane	4.36	26.698	26.375	101	66	114	*	*
6)	Vinyl Chloride	4.48	26.416	26.250	101	61	125	*	*
7)	1,3-Butadiene	4.65	29.518	26.250	112	62	144	*	*
8)	Bromomethane	4.96	28.024	26.250	107	73	123	*	*
9)	Chloroethane	5.18	27.418	26.225	105	69	122	*	*
10)	Ethanol	5.42	141.247	132.650	106	62	124	*	*
11)	Acetonitrile	5.61	26.259	26.650	99	57	114	*	*
12)	Acrolein	5.74	26.275	26.525	99	62	116	*	*
13)	Acetone	5.89	128.112	133.050	96	57	117	*	*
14)	Trichlorofluoromethane	6.06	26.655	26.275	101	63	98	FAIL	*
15)	2-Propanol (Isopropanol)	6.22	56.893	53.025	107	66	121	*	*
16)	Acrylonitrile	6.42	27.597	26.575	104	68	123	*	*
17)	1,1-Dichloroethene	6.76	27.345	26.575	103	76	118	*	*
18)	2-Methyl-2-Propanol (tert-Butyl Alcohol)	6.87	55.863	53.275	105	74	126	*	*
19)	Methylene Chloride	6.92	25.799	26.550	97	60	118	*	*
20)	3-Chloro-1-propene (Allyl Chloride)	7.04	27.063	26.500	102	65	126	*	*
21)	Trichlorotrifluoroethane	7.22	27.838	26.450	105	73	114	*	*
22)	Carbon Disulfide	7.19	29.644	26.675	111	57	102	FAIL	*
23)	trans-1,2-Dichloroethene	7.94	27.563	26.675	103	74	123	*	*
24)	1,1-Dichloroethane	8.16	26.515	26.550	100	69	111	*	*
25)	Methyl tert-Butyl Ether	8.22	27.009	26.600	102	69	113	*	*
26)	Vinyl Acetate	8.33	141.690	132.550	107	76	128	*	*
27)	2-Butanone (MEK)	8.57	28.023	26.550	106	63	127	*	*
28)	cis-1,2-Dichloroethene	9.03	27.144	26.475	103	72	117	*	*
29)	Diisopropyl Ether	9.27	26.189	26.575	99	64	118	*	*
30)	Ethyl Acetate	9.27	58.540	53.275	110	68	127	*	*
31)	n-Hexane	9.27	28.269	26.600	106	55	116	*	*
32)	Chloroform	9.34	27.307	26.475	103	70	109	*	*
34)	Tetrahydrofuran (THF)	9.72	26.655	26.575	100	72	113	*	*
35)	Ethyl tert-Butyl Ether	9.81	27.607	26.525	104	73	117	*	*
36)	1,2-Dichloroethane	10.09	27.597	26.500	104	69	113	*	*
38)	1,1,1-Trichloroethane	10.35	27.233	26.475	103	72	115	*	*
39)	Isopropyl Acetate	10.71	54.640	53.050	103	68	122	*	*
40)	1-Butanol	10.73	60.737	53.075	114	75	141	*	*
41)	Benzene	10.81	25.589	26.525	96	65	107	*	*
42)	Carbon Tetrachloride	10.96	27.681	26.600	104	71	113	*	*
43)	Cyclohexane	11.09	54.868	53.125	103	71	115	*	*
44)	tert-Amyl Methyl Ether	11.41	25.735	26.525	97	73	115	*	*
45)	1,2-Dichloropropane	11.62	27.167	26.525	102	71	115	*	*
46)	Bromodichloromethane	11.80	28.303	26.700	106	75	118	*	*
47)	Trichloroethene	11.86	28.117	26.550	106	68	114	*	*
48)	1,4-Dioxane	11.83	29.275	26.600	110	81	131	*	*
49)	2,2,4-Trimethylpentane (Isooctane)	11.92	26.927	26.525	102	68	112	*	*

Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: 11071617.D

TO15.M

Data File Path: I:\MS09\Data\2016_11\07\

Sample Name: 25ng TO-15 ICV STD

Operator: SC

Misc Info: S29-10261601/S29-10271604 (

Date Acquired: 11/7/16

20:25

Instrument Name: MS09

#	Compound Name	Ret. Time	Amt. (ng)	Spike Amt.(ng)	% Rec.	Lower Limit	Upper Limit	* OR Fail	ICV/AZ 70-130%
50)	Methyl Methacrylate	12.05	59.581	53.000	112	72	130	*	*
51)	n-Heptane	12.17	27.045	26.600	102	68	116	*	*
52)	cis-1,3-Dichloropropene	12.71	28.106	26.275	107	77	126	*	*
53)	4-Methyl-2-pentanone	12.74	28.077	26.575	106	69	126	*	*
54)	trans-1,3-Dichloropropene	13.23	28.889	26.675	108	79	125	*	*
55)	1,1,2-Trichloroethane	13.41	27.943	26.525	105	75	119	*	*
58)	Toluene	13.70	26.445	26.450	100	59	118	*	*
59)	2-Hexanone	13.94	28.024	26.575	105	69	129	*	*
60)	Dibromochloromethane	14.11	28.848	26.600	108	74	136	*	*
61)	1,2-Dibromoethane	14.37	28.532	26.450	108	73	131	*	*
62)	n-Butyl Acetate	14.59	28.714	26.950	107	69	130	*	*
63)	n-Octane	14.72	28.082	26.500	106	66	120	*	*
64)	Tetrachloroethene	14.86	28.266	26.575	106	65	130	*	*
65)	Chlorobenzene	15.56	27.630	26.500	104	68	120	*	*
66)	Ethylbenzene	15.96	27.503	26.450	104	68	122	*	*
67)	m- & p-Xylenes	16.15	55.312	53.025	104	68	123	*	*
68)	Bromoform	16.21	29.539	26.550	111	69	130	*	*
69)	Styrene	16.52	28.867	26.475	109	71	133	*	*
70)	o-Xylene	16.64	27.606	26.450	104	68	122	*	*
71)	n-Nonane	16.87	26.050	26.475	98	65	120	*	*
72)	1,1,2,2-Tetrachloroethane	16.61	27.881	26.500	105	69	130	*	*
74)	Cumene	17.25	27.733	26.525	105	70	123	*	*
75)	alpha-Pinene	17.66	27.728	26.575	104	70	128	*	*
76)	n-Propylbenzene	17.77	27.826	26.725	104	69	125	*	*
77)	3-Ethyltoluene	17.88	26.329	26.550	99	67	128	*	*
78)	4-Ethyltoluene	17.93	30.043	26.525	113	67	130	*	*
79)	1,3,5-Trimethylbenzene	18.01	27.855	26.525	105	67	124	*	*
80)	alpha-Methylstyrene	18.17	29.310	26.550	110	67	141	*	*
81)	2-Ethyltoluene	18.20	28.128	26.550	106	67	124	*	*
82)	1,2,4-Trimethylbenzene	18.43	28.440	26.525	107	67	129	*	*
83)	n-Decane	18.55	30.641	26.525	116	66	124	*	*
84)	Benzyl Chloride	18.57	30.896	26.550	116	79	138	*	*
85)	1,3-Dichlorobenzene	18.59	29.149	26.475	110	65	136	*	*
86)	1,4-Dichlorobenzene	18.66	29.635	26.650	111	66	141	*	*
87)	sec-Butylbenzene	18.72	27.841	26.550	105	68	125	*	*
88)	4-Isopropyltoluene (p-Cymene)	18.88	27.862	26.550	105	68	131	*	*
89)	1,2,3-Trimethylbenzene	18.88	29.118	26.500	110	68	132	*	*
90)	1,2-Dichlorobenzene	19.02	29.364	26.550	111	67	136	*	*
91)	d-Limonene	19.04	26.903	26.550	101	71	134	*	*
92)	1,2-Dibromo-3-Chloropropane	19.48	31.704	26.475	120	73	136	*	*
93)	n-Undecane	19.88	32.639	26.600	123	68	132	*	*
94)	1,2,4-Trichlorobenzene	20.83	32.552	26.500	123	64	134	*	*
95)	Naphthalene	20.95	34.169	26.700	128	62	136	*	*
96)	n-Dodecane	20.98	33.860	26.550	128	61	137	*	*
97)	Hexachlorobutadiene	21.32	30.234	26.575	114	60	133	*	*
98)	Cyclohexanone	16.30	25.950	26.575	98	64	131	*	*
99)	tert-Butylbenzene	18.43	27.983	26.500	106	67	128	*	*
100)	n-Butylbenzene	19.33	28.221	26.500	106	68	128	*	*

Bold = 75 Compound List
*** = Pass**

Data File: I:\MS09\Data\2016 11\21\11211602.D

Acq On : 21 Nov 2016 8:27

Operator: LH

Sample : CCV R9112116 25ng

Misc : S29-10261601/S29-11041603 (12/2)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Nov 21 08:55:44 2016

 11/21/16

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min

Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1 IR	Bromochloromethane (IS1)	1.000	1.000	0.0	121	-0.02
2 T	Propene	1.809	1.839	-1.7	132	0.00
3 T	Dichlorodifluoromethane (CF	2.601	2.499	3.9	112	0.00
4 T	Chloromethane	2.396	2.401	-0.2	117	-0.01
5 T	1,2-Dichloro-1,1,2,2-tetra	1.302	1.155	11.3	102	0.00
6 T	Vinyl Chloride	2.282	2.009	12.0	104	-0.01
7 T	1,3-Butadiene	1.459	1.493	-2.3	110	-0.01
8 T	Bromomethane	1.296	1.283	1.0	111	-0.01
9 T	Chloroethane	1.097	1.133	-3.3	118	0.00
10 T	Ethanol	1.079	1.196	-10.8	126	-0.05
11 T	Acetonitrile	2.925	3.174	-8.5	130	-0.04
12 T	Acrolein	0.975	0.991	-1.6	121	-0.03
13 T	Acetone	1.155	1.127	2.4	120	-0.03
14 T	Trichlorofluoromethane	2.132	2.014	5.5	112	0.00
15 T	2-Propanol (Isopropanol)	3.545	3.941	-11.2	121	-0.04
16 T	Acrylonitrile	2.019	2.193	-8.6	123	-0.04
17 T	1,1-Dichloroethene	1.378	1.332	3.3	111	-0.01
18 T	2-Methyl-2-Propanol (tert-B	3.421	3.248	5.1	104	-0.04
19 T	Methylene Chloride	1.557	1.443	7.3	113	-0.02
20 T	3-Chloro-1-propene (Allyl C	2.296	2.470	-7.6	128	-0.02
21 T	Trichlorotrifluoroethane	1.078	1.032	4.3	108	-0.01
22 T	Carbon Disulfide	5.011	5.398	-7.7	115	-0.01
23 T	trans-1,2-Dichloroethene	2.092	2.159	-3.2	117	-0.02
24 T	1,1-Dichloroethane	2.644	2.622	0.8	117	-0.02
25 T	Methyl tert-Butyl Ether	4.372	4.069	6.9	108	-0.01
26 T	Vinyl Acetate	0.336	0.320	4.8	103	-0.03
27 T	2-Butanone (MEK)	1.010	1.035	-2.5	115	-0.03
28 T	cis-1,2-Dichloroethene	1.980	2.027	-2.4	118	-0.02
29 T	Diisopropyl Ether	1.233	1.121	9.1	109	-0.02
30 T	Ethyl Acetate	0.523	0.563	-7.6	115	-0.03
31 T	n-Hexane	2.291	2.490	-8.7	120	0.00
32 T	Chloroform	2.352	2.311	1.7	112	-0.03
33 S	1,2-Dichloroethane-d4 (SS1)	1.496	1.584	-5.9	130	-0.02
34 T	Tetrahydrofuran (THF)	1.030	1.009	2.0	115	-0.02
35 T	Ethyl tert-Butyl Ether	1.700	1.663	2.2	111	-0.02
36 T	1,2-Dichloroethane	1.697	1.711	-0.8	114	-0.02
37 IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	125	-0.02
38 T	1,1,1-Trichloroethane	0.414	0.384	7.2	109	-0.02
39 T	Isopropyl Acetate	0.195	0.197	-1.0	116	-0.02
40 T	1-Butanol	0.290	0.304	-4.8	112	-0.04
41 T	Benzene	1.265	1.151	9.0	114	-0.02
42 T	Carbon Tetrachloride	0.353	0.326	7.6	108	-0.02
43 T	Cyclohexane	0.455	0.433	4.8	111	-0.02
44 T	tert-Amyl Methyl Ether	0.922	0.846	8.2	113	-0.02
45 T	1,2-Dichloropropane	0.306	0.307	-0.3	118	-0.01
46 T	Bromodichloromethane	0.381	0.367	3.7	111	-0.02
47 T	Trichloroethene	0.290	0.271	6.6	107	-0.02
48 T	1,4-Dioxane	0.236	0.238	-0.8	110	-0.02
49 T	2,2,4-Trimethylpentane (Iso	1.307	1.319	-0.9	119	-0.02
50 T	Methyl Methacrylate	0.112	0.114	-1.8	109	-0.02
51 T	n-Heptane	0.307	0.301	2.0	117	-0.01
52 T	cis-1,3-Dichloropropene	0.489	0.482	1.4	112	-0.01
53 T	4-Methyl-2-pentanone	0.283	0.295	-4.2	118	-0.02
54 T	trans-1,3-Dichloropropene	0.433	0.432	0.2	112	-0.02

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Data File: I:\MS09\Data\2016 11\21\11211602.D

Acq On : 21 Nov 2016 8:27

Operator: LH

Sample : CCV R9112116 25ng

Misc : S29-10261601/S29-11041603 (12/2)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Nov 21 08:55:44 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min

Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
55 T	1,1,2-Trichloroethane	0.282	0.270	4.3	110	-0.01
56 IR	Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	126	0.00
57 S	Toluene-d8 (SS2)	2.538	2.492	1.8	125	-0.01
58 T	Toluene	2.904	2.628	9.5	111	-0.02
59 T	2-Hexanone	1.463	1.559	-6.6	124	-0.01
60 T	Dibromochloromethane	0.718	0.671	6.5	107	-0.01
61 T	1,2-Dibromoethane	0.724	0.684	5.5	108	-0.01
62 T	n-Butyl Acetate	1.644	1.747	-6.3	122	-0.02
63 T	n-Octane	0.607	0.630	-3.8	120	-0.01
64 T	Tetrachloroethene	0.686	0.625	8.9	106	-0.01
65 T	Chlorobenzene	1.793	1.626	9.3	108	-0.01
66 T	Ethylbenzene	3.146	2.932	6.8	110	-0.01
67 T	m- & p-Xylenes	2.403	2.232	7.1	110	-0.01
68 T	Bromoform	0.568	0.542	4.6	105	-0.01
69 T	Styrene	1.876	1.776	5.3	107	-0.01
70 T	o-Xylene	2.449	2.287	6.6	111	-0.02
71 T	n-Nonane	1.433	1.465	-2.2	127	0.00
72 T	1,1,2,2-Tetrachloroethane	1.203	1.165	3.2	112	-0.01
73 S	Bromofluorobenzene (SS3)	0.680	0.648	4.7	118	0.00
74 T	Cumene	3.060	2.817	7.9	109	0.00
75 T	alpha-Pinene	1.634	1.525	6.7	109	-0.01
76 T	n-Propylbenzene	3.707	3.468	6.4	111	0.00
77 T	3-Ethyltoluene	3.100	2.862	7.7	112	0.00
78 T	4-Ethyltoluene	2.797	2.612	6.6	106	-0.01
79 T	1,3,5-Trimethylbenzene	2.498	2.318	7.2	109	-0.01
80 T	alpha-Methylstyrene	1.294	1.207	6.7	103	-0.01
81 T	2-Ethyltoluene	2.919	2.708	7.2	108	-0.01
82 T	1,2,4-Trimethylbenzene	2.469	2.311	6.4	108	-0.01
83 T	n-Decane	1.333	1.487	-11.6	119	0.00
84 T	Benzyl Chloride	2.222	2.194	1.3	105	-0.02
85 T	1,3-Dichlorobenzene	1.374	1.271	7.5	105	-0.01
86 T	1,4-Dichlorobenzene	1.370	1.283	6.4	105	-0.01
87 T	sec-Butylbenzene	3.364	3.121	7.2	109	-0.01
88 T	4-Isopropyltoluene (p-Cymen	3.016	2.770	8.2	107	-0.01
89 T	1,2,3-Trimethylbenzene	2.465	2.338	5.2	108	-0.01
90 T	1,2-Dichlorobenzene	1.314	1.225	6.8	105	0.00
91 T	d-Limonene	1.092	1.061	2.8	112	-0.01
92 T	1,2-Dibromo-3-Chloropropane	0.463	0.449	3.0	104	0.00
93 T	n-Undecane	1.341	1.560	-16.3	119	0.00
94 T	1,2,4-Trichlorobenzene	0.934	0.902	3.4	102	0.00
95 T	Naphthalene	2.934	2.885	1.7	102	0.00
96 T	n-Dodecane	1.321	1.444	-9.3	117	0.00
97 T	Hexachlorobutadiene	0.577	0.542	6.1	105	0.00
98 T	Cyclohexanone	0.997	0.933	6.4	113	-0.02
99 T	tert-Butylbenzene	2.359	2.141	9.2	106	-0.01
100 T	n-Butylbenzene	2.740	2.579	5.9	110	-0.01

(#) = Out of Range

SPCC's out = 0 CCC's out = 0

Data File: I:\MS09\Data\2016 11\21\11211602.D

Acq On : 21 Nov 2016 8:27

Operator: LH

Sample : CCV R9112116 25ng

Misc : S29-10261601/S29-11041603 (12/2)

ALS Vial : 2 Sample Multiplier: 1

11/21/16

Quant Time: Nov 21 08:55:44 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.19	130	168228	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	11.16	114	836584	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	15.51	82	364041	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.97	65	266432	13.236	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	105.92%
57) Toluene-d8 (SS2)	13.60	98	907264	12.275	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.16%
73) Bromofluorobenzene (SS3)	17.10	174	235907	11.908	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.28%

Target Compounds

						Qvalue
2) Propene	3.88	42	640874	26.325	ng	96
3) Dichlorodifluoromethan...	3.99	85	880391	25.149	ng	99
4) Chloromethane	4.19	50	811731	25.168	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.36	135	390398	22.271	ng	100
6) Vinyl Chloride	4.47	62	691427	22.514	ng	100
7) 1,3-Butadiene	4.65	54	530856	27.033	ng	97
8) Bromomethane	4.96	94	428665	24.583	ng	99
9) Chloroethane	5.18	64	384805	26.055	ng	99
10) Ethanol	5.42	45	2095135	144.250	ng	99
11) Acetonitrile	5.61	41	1117202	28.385	ng	98
12) Acrolein	5.73	56	347213	26.469	ng	99
13) Acetone	5.89	58	2014641	129.556	ng	93
14) Trichlorofluoromethane	6.06	101	710779	24.776	ng	99
15) 2-Propanol (Isopropanol)	6.22	45	2790916	58.497	ng	95
16) Acrylonitrile	6.42	53	778591	28.653	ng	99
17) 1,1-Dichloroethene	6.76	96	474645	25.586	ng	98
18) 2-Methyl-2-Propanol (t...	6.87	59	2310061	50.172	ng	97
19) Methylene Chloride	6.92	84	513022	24.484	ng	91
20) 3-Chloro-1-propene (Al...	7.04	41	874278	28.299	ng	94
21) Trichlorotrifluoroethane	7.22	151	364203	25.100	ng	98
22) Carbon Disulfide	7.19	76	1927106	28.577	ng	99
23) trans-1,2-Dichloroethene	7.94	61	775091	27.529	ng	95
24) 1,1-Dichloroethane	8.16	63	899832	25.291	ng	100
25) Methyl tert-Butyl Ether	8.22	73	1459416	24.804	ng	96
26) Vinyl Acetate	8.33	86	566364	125.194	ng	# 71
27) 2-Butanone (MEK)	8.57	72	365399	26.872	ng	# 81
28) cis-1,2-Dichloroethene	9.03	61	725590	27.233	ng	96
29) Diisopropyl Ether	9.26	87	400474	24.135	ng	# 72
30) Ethyl Acetate	9.27	61	403129	57.248	ng	97
31) n-Hexane	9.27	57	890620	28.891	ng	99
32) Chloroform	9.34	83	822491	25.984	ng	99
34) Tetrahydrofuran (THF)	9.72	72	360417	26.006	ng	# 86
35) Ethyl tert-Butyl Ether	9.81	87	591493	25.848	ng	# 89
36) 1,2-Dichloroethane	10.08	62	605524	26.514	ng	100
38) 1,1,1-Trichloroethane	10.34	97	690098	24.890	ng	100
39) Isopropyl Acetate	10.71	61	692062	53.018	ng	99
40) 1-Butanol	10.72	56	1070056	55.057	ng	95
41) Benzene	10.80	78	2025967	23.932	ng	99
42) Carbon Tetrachloride	10.95	117	574894	24.335	ng	100
43) Cyclohexane	11.08	84	1542110	50.693	ng	89
44) tert-Amyl Methyl Ether	11.40	73	1492120	24.185	ng	98
45) 1,2-Dichloropropane	11.62	63	544679	26.573	ng	99
46) Bromodichloromethane	11.80	83	654348	25.691	ng	100
47) Trichloroethene	11.85	130	480970	24.763	ng	100
48) 1,4-Dioxane	11.83	88	422616	26.753	ng	90
49) 2,2,4-Trimethylpentane...	11.92	57	2337482	26.727	ng	96

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Data File: I:\MS09\Data\2016 11\21\11211602.D

Acq On : 21 Nov 2016 8:27

Operator: LH

Sample : CCV R9112116 25ng

Misc : S29-10261601/S29-11041603 (12/2)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Nov 21 08:55:44 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.04	100	401048	53.322	ng	91
51) n-Heptane	12.17	71	535661	26.035	ng	94
52) cis-1,3-Dichloropropene	12.70	75	899733	27.507	ng	100
53) 4-Methyl-2-pentanone	12.74	58	522676	27.605	ng	95
54) trans-1,3-Dichloropropene	13.22	75	769274	26.572	ng	100
55) 1,1,2-Trichloroethane	13.40	97	478826	25.353	ng	97
58) Toluene	13.70	91	2014574	23.818	ng	100
59) 2-Hexanone	13.94	43	1204002	28.251	ng	98
60) Dibromochloromethane	14.11	129	519188	24.837	ng	100
61) 1,2-Dibromoethane	14.37	107	526233	24.960	ng	100
62) n-Butyl Acetate	14.58	43	1353285	28.263	ng	97
63) n-Octane	14.71	57	484910	27.425	ng	91
64) Tetrachloroethene	14.85	166	482702	24.170	ng	100
65) Chlorobenzene	15.55	112	1255958	24.047	ng	100
66) Ethylbenzene	15.95	91	2252401	24.587	ng	99
67) m- & p-Xylenes	16.15	91	3450563	49.311	ng	100
68) Bromoform	16.21	173	419196	25.352	ng	100
69) Styrene	16.52	104	1371635	25.104	ng	100
70) o-Xylene	16.63	91	1755235	24.612	ng	100
71) n-Nonane	16.87	43	1124155	26.927	ng	93
72) 1,1,2,2-Tetrachloroethane	16.61	83	895579	25.567	ng	99
74) Cumene	17.25	105	2153870	24.172	ng	99
75) alpha-Pinene	17.65	93	1158864	24.355	ng	98
76) n-Propylbenzene	17.77	91	2684250	24.862	ng	99
77) 3-Ethyltoluene	17.88	105	2187627	24.231	ng	96
78) 4-Ethyltoluene	17.92	105	1994716	24.488	ng	98
79) 1,3,5-Trimethylbenzene	18.00	105	1770636	24.341	ng	100
80) alpha-Methylstyrene	18.16	118	922935	24.493	ng	99
81) 2-Ethyltoluene	18.20	105	2094145	24.634	ng	99
82) 1,2,4-Trimethylbenzene	18.43	105	1769742	24.613	ng	100
83) n-Decane	18.55	57	1140011	29.370	ng	97
84) Benzyl Chloride	18.56	91	1694725	26.192	ng	99
85) 1,3-Dichlorobenzene	18.59	146	978925	24.462	ng	100
86) 1,4-Dichlorobenzene	18.66	146	988456	24.780	ng	100
87) sec-Butylbenzene	18.71	105	2394715	24.442	ng	99
88) 4-Isopropyltoluene (p-...	18.88	119	2071379	23.582	ng	98
89) 1,2,3-Trimethylbenzene	18.88	105	1748449	24.353	ng	100
90) 1,2-Dichlorobenzene	19.02	146	943363	24.650	ng	100
91) d-Limonene	19.03	68	776227	24.415	ng	93
92) 1,2-Dibromo-3-Chloropr...	19.48	157	344131	25.527	ng	99
93) n-Undecane	19.88	57	1197115	30.646	ng	94
94) 1,2,4-Trichlorobenzene	20.83	180	684951	25.178	ng	100
95) Naphthalene	20.95	128	2275171	26.625	ng	100
96) n-Dodecane	20.97	57	1098890	28.566	ng	94
97) Hexachlorobutadiene	21.32	225	417730	24.879	ng	100
98) Cyclohexanone	16.30	55	717386	24.716	ng	95
99) tert-Butylbenzene	18.43	119	1638251	23.848	ng	100
100) n-Butylbenzene	19.32	91	1982883	24.849	ng	99

(#)=qualifier out of range (m)=manual integration (+)=signals summed

Data File: I:\MS09\Data\2016 11\21\11211602.D

Acq On : 21 Nov 2016 8:27

Operator: LH

Sample : CCV R9112116 25ng

Misc : S29-10261601/S29-11041603 (12/2)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Nov 21 08:55:44 2016

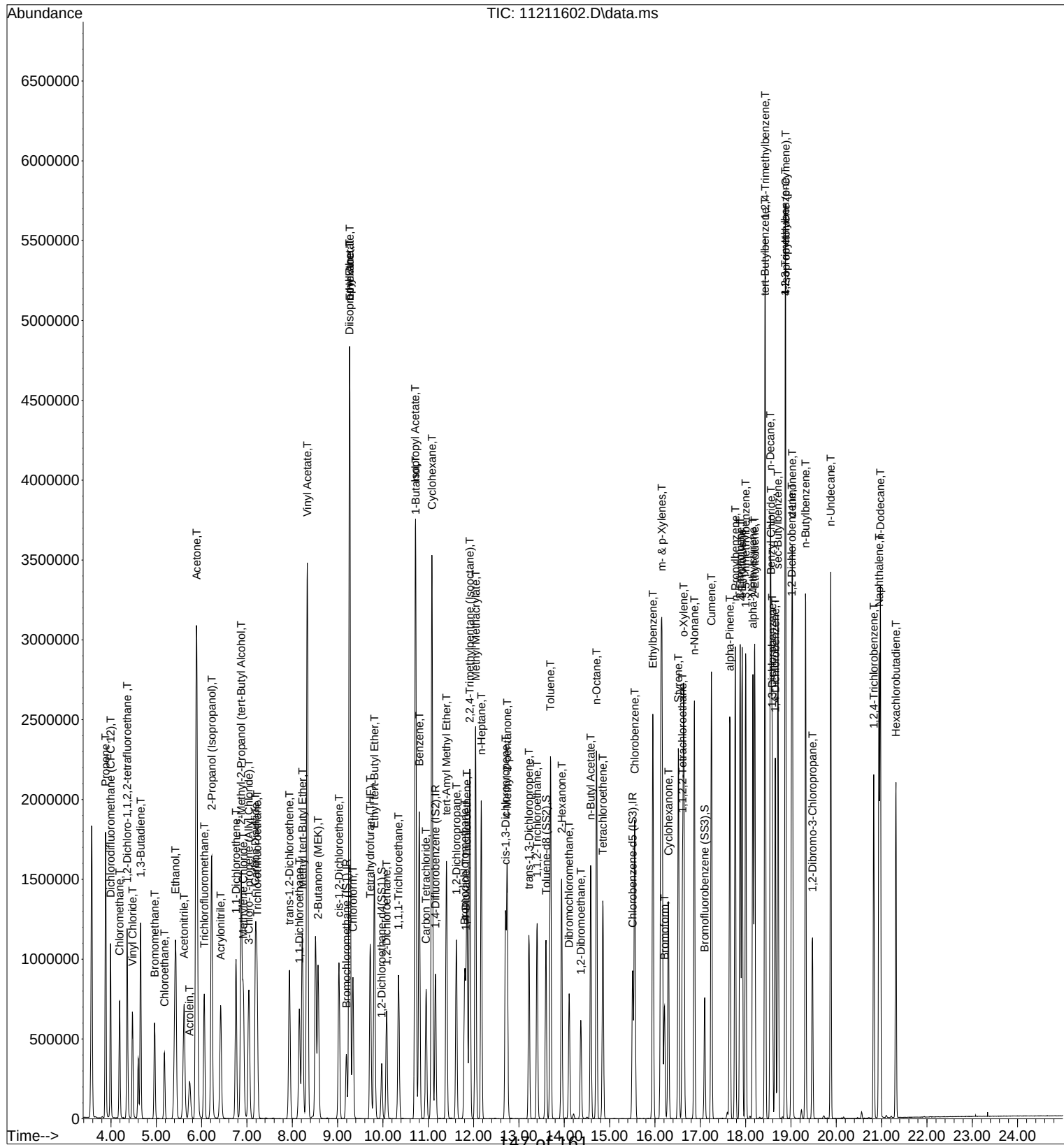
Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS09\Data\2016 11\22\11221601.D

Acq On : 22 Nov 2016 9:23

Operator: SC

Sample : CCV R9112216 25ng

Misc : S29-10261601/S29-11041603 (12/2)

ALS Vial : 2 Sample Multiplier: 1

 11/22/16

Quant Time: Nov 22 10:08:56 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min

Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1 IR	Bromochloromethane (IS1)	1.000	1.000	0.0	110	-0.02
2 T	Propene	1.809	2.069	-14.4	135	0.00
3 T	Dichlorodifluoromethane (CF	2.601	2.580	0.8	106	0.00
4 T	Chloromethane	2.396	2.651	-10.6	118	-0.01
5 T	1,2-Dichloro-1,1,2,2-tetra	1.302	1.175	9.8	95	0.00
6 T	Vinyl Chloride	2.282	2.156	5.5	102	-0.01
7 T	1,3-Butadiene	1.459	1.559	-6.9	105	-0.01
8 T	Bromomethane	1.296	1.286	0.8	102	-0.01
9 T	Chloroethane	1.097	1.182	-7.7	112	0.00
10 T	Ethanol	1.079	1.302	-20.7	125	-0.05
11 T	Acetonitrile	2.925	3.509	-20.0	131	-0.04
12 T	Acrolein	0.975	1.034	-6.1	115	-0.02
13 T	Acetone	1.155	1.194	-3.4	116	-0.03
14 T	Trichlorofluoromethane	2.132	2.033	4.6	103	0.00
15 T	2-Propanol (Isopropanol)	3.545	4.263	-20.3	119	-0.04
16 T	Acrylonitrile	2.019	2.352	-16.5	121	-0.04
17 T	1,1-Dichloroethene	1.378	1.344	2.5	102	-0.02
18 T	2-Methyl-2-Propanol (tert-B	3.421	3.394	0.8	99	-0.04
19 T	Methylene Chloride	1.557	1.473	5.4	105	-0.02
20 T	3-Chloro-1-propene (Allyl C	2.296	2.683	-16.9	127	-0.02
21 T	Trichlorotrifluoroethane	1.078	1.002	7.1	96	-0.02
22 T	Carbon Disulfide	5.011	5.568	-11.1	108	-0.01
23 T	trans-1,2-Dichloroethene	2.092	2.246	-7.4	112	-0.02
24 T	1,1-Dichloroethane	2.644	2.728	-3.2	111	-0.02
25 T	Methyl tert-Butyl Ether	4.372	3.982	8.9	97	-0.02
26 T	Vinyl Acetate	0.336	0.329	2.1	97	-0.03
27 T	2-Butanone (MEK)	1.010	1.072	-6.1	109	-0.03
28 T	cis-1,2-Dichloroethene	1.980	2.126	-7.4	113	-0.02
29 T	Diisopropyl Ether	1.233	1.157	6.2	103	-0.02
30 T	Ethyl Acetate	0.523	0.599	-14.5	112	-0.03
31 T	n-Hexane	2.291	2.673	-16.7	118	0.00
32 T	Chloroform	2.352	2.374	-0.9	105	-0.03
33 S	1,2-Dichloroethane-d4 (SS1)	1.496	1.651	-10.4	124	-0.02
34 T	Tetrahydrofuran (THF)	1.030	1.040	-1.0	108	-0.02
35 T	Ethyl tert-Butyl Ether	1.700	1.686	0.8	103	-0.02
36 T	1,2-Dichloroethane	1.697	1.784	-5.1	109	-0.02
37 IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	114	-0.01
38 T	1,1,1-Trichloroethane	0.414	0.383	7.5	99	-0.02
39 T	Isopropyl Acetate	0.195	0.208	-6.7	113	-0.02
40 T	1-Butanol	0.290	0.322	-11.0	109	-0.04
41 T	Benzene	1.265	1.182	6.6	107	-0.02
42 T	Carbon Tetrachloride	0.353	0.325	7.9	98	-0.02
43 T	Cyclohexane	0.455	0.443	2.6	104	-0.02
44 T	tert-Amyl Methyl Ether	0.922	0.868	5.9	106	-0.02
45 T	1,2-Dichloropropane	0.306	0.320	-4.6	113	-0.02
46 T	Bromodichloromethane	0.381	0.374	1.8	104	-0.02
47 T	Trichloroethene	0.290	0.266	8.3	96	-0.02
48 T	1,4-Dioxane	0.236	0.241	-2.1	103	-0.02
49 T	2,2,4-Trimethylpentane (Iso	1.307	1.395	-6.7	116	-0.02
50 T	Methyl Methacrylate	0.112	0.114	-1.8	100	-0.02
51 T	n-Heptane	0.307	0.311	-1.3	110	-0.01
52 T	cis-1,3-Dichloropropene	0.489	0.494	-1.0	106	-0.01
53 T	4-Methyl-2-pentanone	0.283	0.309	-9.2	114	-0.02
54 T	trans-1,3-Dichloropropene	0.433	0.443	-2.3	105	-0.02

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Data File: I:\MS09\Data\2016 11\22\11221601.D

Acq On : 22 Nov 2016 9:23

Operator: SC

Sample : CCV R9112216 25ng

Misc : S29-10261601/S29-11041603 (12/2)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Nov 22 10:08:56 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min

Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
55 T	1,1,2-Trichloroethane	0.282	0.273	3.2	102	-0.01
56 IR	Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	118	0.00
57 S	Toluene-d8 (SS2)	2.538	2.474	2.5	116	-0.01
58 T	Toluene	2.904	2.618	9.8	104	-0.02
59 T	2-Hexanone	1.463	1.659	-13.4	123	-0.02
60 T	Dibromochloromethane	0.718	0.651	9.3	97	-0.01
61 T	1,2-Dibromoethane	0.724	0.667	7.9	99	-0.01
62 T	n-Butyl Acetate	1.644	1.852	-12.7	121	-0.02
63 T	n-Octane	0.607	0.653	-7.6	117	0.00
64 T	Tetrachloroethene	0.686	0.600	12.5	95	-0.01
65 T	Chlorobenzene	1.793	1.602	10.7	99	-0.01
66 T	Ethylbenzene	3.146	2.934	6.7	103	-0.01
67 T	m- & p-Xylenes	2.403	2.234	7.0	103	-0.01
68 T	Bromoform	0.568	0.517	9.0	94	-0.02
69 T	Styrene	1.876	1.757	6.3	99	-0.01
70 T	o-Xylene	2.449	2.293	6.4	104	-0.02
71 T	n-Nonane	1.433	1.567	-9.4	127	-0.01
72 T	1,1,2,2-Tetrachloroethane	1.203	1.178	2.1	106	-0.01
73 S	Bromofluorobenzene (SS3)	0.680	0.624	8.2	106	0.00
74 T	Cumene	3.060	2.795	8.7	101	-0.01
75 T	alpha-Pinene	1.634	1.525	6.7	102	-0.01
76 T	n-Propylbenzene	3.707	3.490	5.9	104	-0.01
77 T	3-Ethyltoluene	3.100	2.890	6.8	106	-0.01
78 T	4-Ethyltoluene	2.797	2.568	8.2	97	-0.01
79 T	1,3,5-Trimethylbenzene	2.498	2.315	7.3	101	-0.01
80 T	alpha-Methylstyrene	1.294	1.193	7.8	95	-0.01
81 T	2-Ethyltoluene	2.919	2.715	7.0	102	-0.02
82 T	1,2,4-Trimethylbenzene	2.469	2.334	5.5	102	-0.02
83 T	n-Decane	1.333	1.566	-17.5	118	-0.01
84 T	Benzyl Chloride	2.222	2.219	0.1	100	-0.02
85 T	1,3-Dichlorobenzene	1.374	1.259	8.4	98	-0.02
86 T	1,4-Dichlorobenzene	1.370	1.265	7.7	97	-0.01
87 T	sec-Butylbenzene	3.364	3.122	7.2	102	-0.01
88 T	4-Isopropyltoluene (p-Cymen	3.016	2.776	8.0	101	-0.02
89 T	1,2,3-Trimethylbenzene	2.465	2.353	4.5	102	-0.01
90 T	1,2-Dichlorobenzene	1.314	1.215	7.5	98	-0.01
91 T	d-Limonene	1.092	1.101	-0.8	109	-0.01
92 T	1,2-Dibromo-3-Chloropropane	0.463	0.435	6.0	94	0.00
93 T	n-Undecane	1.341	1.637	-22.1	117	0.00
94 T	1,2,4-Trichlorobenzene	0.934	0.882	5.6	94	0.00
95 T	Naphthalene	2.934	2.870	2.2	94	-0.01
96 T	n-Dodecane	1.321	1.527	-15.6	115	0.00
97 T	Hexachlorobutadiene	0.577	0.522	9.5	95	0.00
98 T	Cyclohexanone	0.997	0.963	3.4	109	-0.02
99 T	tert-Butylbenzene	2.359	2.146	9.0	100	-0.01
100 T	n-Butylbenzene	2.740	2.619	4.4	105	-0.01

(#)= Out of Range

SPCC's out = 0 CCC's out = 0

Data File: I:\MS09\Data\2016 11\22\11221601.D

Acq On : 22 Nov 2016 9:23

Operator: SC

Sample : CCV R9112216 25ng

Misc : S29-10261601/S29-11041603 (12/2)

ALS Vial : 2 Sample Multiplier: 1

 11/22/16

Quant Time: Nov 22 10:08:56 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.19	130	153754	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	11.16	114	767383	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	15.51	82	340469	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.97	65	253907	13.801	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	110.40%
57) Toluene-d8 (SS2)	13.60	98	842194	12.183	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.44%
73) Bromofluorobenzene (SS3)	17.10	174	212400	11.464	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	91.68%

Target Compounds

						Qvalue
2) Propene	3.88	42	659156	29.625	ng	96
3) Dichlorodifluoromethan...	3.99	85	830790	25.966	ng	99
4) Chloromethane	4.19	50	819149	27.789	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.36	135	363025	22.659	ng	100
6) Vinyl Chloride	4.47	62	678289	24.165	ng	100
7) 1,3-Butadiene	4.65	54	506698	28.231	ng	96
8) Bromomethane	4.97	94	392598	24.634	ng	100
9) Chloroethane	5.18	64	366835	27.176	ng	99
10) Ethanol	5.43	45	2084649	157.039	ng	99
11) Acetonitrile	5.61	41	1128633	31.375	ng	99
12) Acrolein	5.74	56	330888	27.599	ng	99
13) Acetone	5.89	58	1950567	137.244	ng	96
14) Trichlorofluoromethane	6.06	101	655695	25.007	ng	99
15) 2-Propanol (Isopropanol)	6.22	45	2759510	63.284	ng	95
16) Acrylonitrile	6.42	53	762933	30.720	ng	99
17) 1,1-Dichloroethene	6.75	96	437563	25.808	ng	93
18) 2-Methyl-2-Propanol (t...	6.87	59	2206521	52.435	ng	97
19) Methylene Chloride	6.92	84	478792	25.001	ng	85
20) 3-Chloro-1-propene (Al...	7.04	41	868086	30.743	ng	90
21) Trichlorotrifluoroethane	7.22	151	323076	24.362	ng	93
22) Carbon Disulfide	7.19	76	1816804	29.477	ng	99
23) trans-1,2-Dichloroethene	7.94	61	737089	28.644	ng	92
24) 1,1-Dichloroethane	8.16	63	855682	26.314	ng	99
25) Methyl tert-Butyl Ether	8.22	73	1305241	24.272	ng	95
26) Vinyl Acetate	8.33	86	532629	128.820	ng	# 52
27) 2-Butanone (MEK)	8.57	72	345818	27.826	ng	# 70
28) cis-1,2-Dichloroethene	9.03	61	695530	28.562	ng	93
29) Diisopropyl Ether	9.26	87	377934	24.921	ng	# 57
30) Ethyl Acetate	9.27	61	392433	60.976	ng	95
31) n-Hexane	9.27	57	873909	31.017	ng	98
32) Chloroform	9.34	83	772210	26.693	ng	99
34) Tetrahydrofuran (THF)	9.72	72	339563	26.807	ng	# 79
35) Ethyl tert-Butyl Ether	9.81	87	547884	26.196	ng	# 84
36) 1,2-Dichloroethane	10.08	62	577054	27.646	ng	100
38) 1,1,1-Trichloroethane	10.34	97	631655	24.836	ng	99
39) Isopropyl Acetate	10.71	61	670056	55.961	ng	94
40) 1-Butanol	10.73	56	1039924	58.331	ng	92
41) Benzene	10.80	78	1908533	24.578	ng	100
42) Carbon Tetrachloride	10.95	117	526549	24.298	ng	100
43) Cyclohexane	11.08	84	1448147	51.897	ng	86
44) tert-Amyl Methyl Ether	11.40	73	1403532	24.801	ng	96
45) 1,2-Dichloropropane	11.62	63	522015	27.764	ng	99
46) Bromodichloromethane	11.80	83	611174	26.160	ng	99
47) Trichloroethene	11.85	130	433459	24.329	ng	100
48) 1,4-Dioxane	11.83	88	393470	27.154	ng	87
49) 2,2,4-Trimethylpentane...	11.92	57	2267213	28.262	ng	97

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Data File: I:\MS09\Data\2016 11\22\11221601.D

Acq On : 22 Nov 2016 9:23

Operator: SC

Sample : CCV R9112216 25ng

Misc : S29-10261601/S29-11041603 (12/2)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Nov 22 10:08:56 2016

Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.04	100	368726	53.445	ng	# 86
51) n-Heptane	12.17	71	506906	26.859	ng	92
52) cis-1,3-Dichloropropene	12.71	75	846567	28.216	ng	99
53) 4-Methyl-2-pentanone	12.74	58	502188	28.914	ng	90
54) trans-1,3-Dichloropropene	13.22	75	723586	27.248	ng	100
55) 1,1,2-Trichloroethane	13.40	97	444129	25.637	ng	95
58) Toluene	13.70	91	1877161	23.730	ng	100
59) 2-Hexanone	13.94	43	1198846	30.078	ng	96
60) Dibromochloromethane	14.11	129	470512	24.067	ng	100
61) 1,2-Dibromoethane	14.37	107	479753	24.331	ng	99
62) n-Butyl Acetate	14.58	43	1341757	29.963	ng	96
63) n-Octane	14.71	57	470075	28.427	ng	88
64) Tetrachloroethene	14.85	166	433352	23.201	ng	100
65) Chlorobenzene	15.55	112	1157385	23.694	ng	100
66) Ethylbenzene	15.95	91	2107459	24.597	ng	98
67) m- & p-Xylenes	16.15	91	3229553	49.348	ng	99
68) Bromoform	16.21	173	374399	24.210	ng	100
69) Styrene	16.52	104	1269317	24.840	ng	100
70) o-Xylene	16.63	91	1646006	24.679	ng	99
71) n-Nonane	16.87	43	1124990	28.813	ng	91
72) 1,1,2,2-Tetrachloroethane	16.61	83	847348	25.865	ng	99
74) Cumene	17.24	105	1998257	23.978	ng	99
75) alpha-Pinene	17.65	93	1084148	24.362	ng	99
76) n-Propylbenzene	17.77	91	2526318	25.020	ng	98
77) 3-Ethyltoluene	17.88	105	2066289	24.472	ng	95
78) 4-Ethyltoluene	17.92	105	1834213	24.076	ng	98
79) 1,3,5-Trimethylbenzene	18.00	105	1653522	24.305	ng	100
80) alpha-Methylstyrene	18.16	118	853252	24.212	ng	98
81) 2-Ethyltoluene	18.20	105	1963381	24.695	ng	99
82) 1,2,4-Trimethylbenzene	18.43	105	1672035	24.864	ng	99
83) n-Decane	18.54	57	1122703	30.927	ng	95
84) Benzyl Chloride	18.56	91	1603251	26.493	ng	98
85) 1,3-Dichlorobenzene	18.58	146	906943	24.233	ng	100
86) 1,4-Dichlorobenzene	18.66	146	911303	24.428	ng	100
87) sec-Butylbenzene	18.71	105	2240475	24.451	ng	99
88) 4-Isopropyltoluene (p-...	18.88	119	1941511	23.634	ng	98
89) 1,2,3-Trimethylbenzene	18.88	105	1645612	24.507	ng	100
90) 1,2-Dichlorobenzene	19.01	146	875402	24.458	ng	100
91) d-Limonene	19.03	68	753664	25.347	ng	91
92) 1,2-Dibromo-3-Chloropr...	19.48	157	311814	24.731	ng	94
93) n-Undecane	19.88	57	1175168	32.166	ng	93
94) 1,2,4-Trichlorobenzene	20.83	180	626506	24.624	ng	100
95) Naphthalene	20.94	128	2116429	26.482	ng	100
96) n-Dodecane	20.97	57	1086645	30.204	ng	92
97) Hexachlorobutadiene	21.32	225	376716	23.990	ng	100
98) Cyclohexanone	16.29	55	692821	25.522	ng	95
99) tert-Butylbenzene	18.43	119	1535570	23.901	ng	99
100) n-Butylbenzene	19.32	91	1882904	25.229	ng	99

(#)=qualifier out of range (m)=manual integration (+)=signals summed

Data File: I:\MS09\Data\2016 11\22\11221601.D

Acq On : 22 Nov 2016 9:23

Operator: SC

Sample : CCV R9112216 25ng

Misc : S29-10261601/S29-11041603 (12/2)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Nov 22 10:08:56 2016

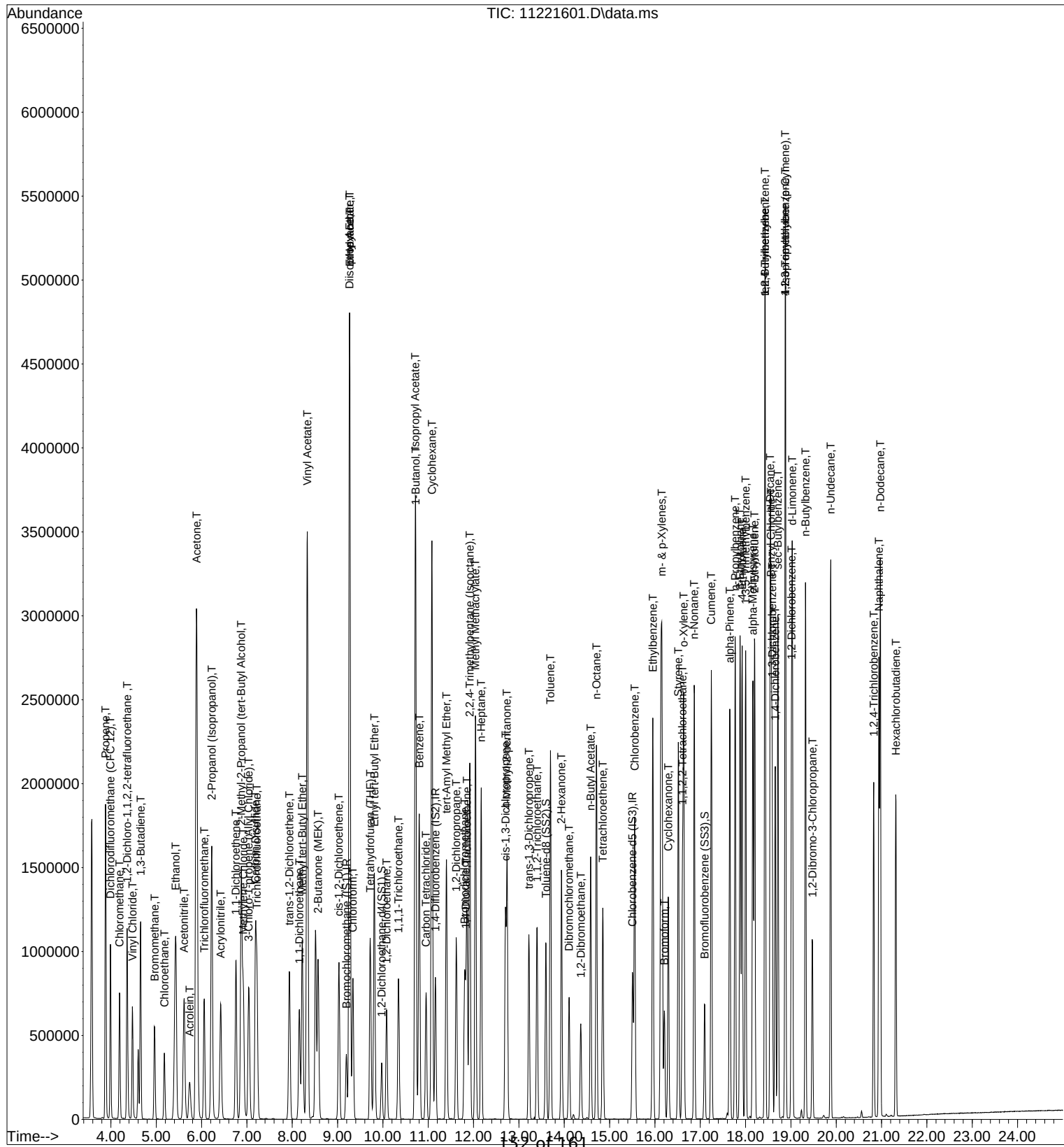
Quant Method : I:\MS09\Methods\R9110716.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 08 09:00:48 2016

Response via : Initial Calibration

DataAcq Meth:TO15.M

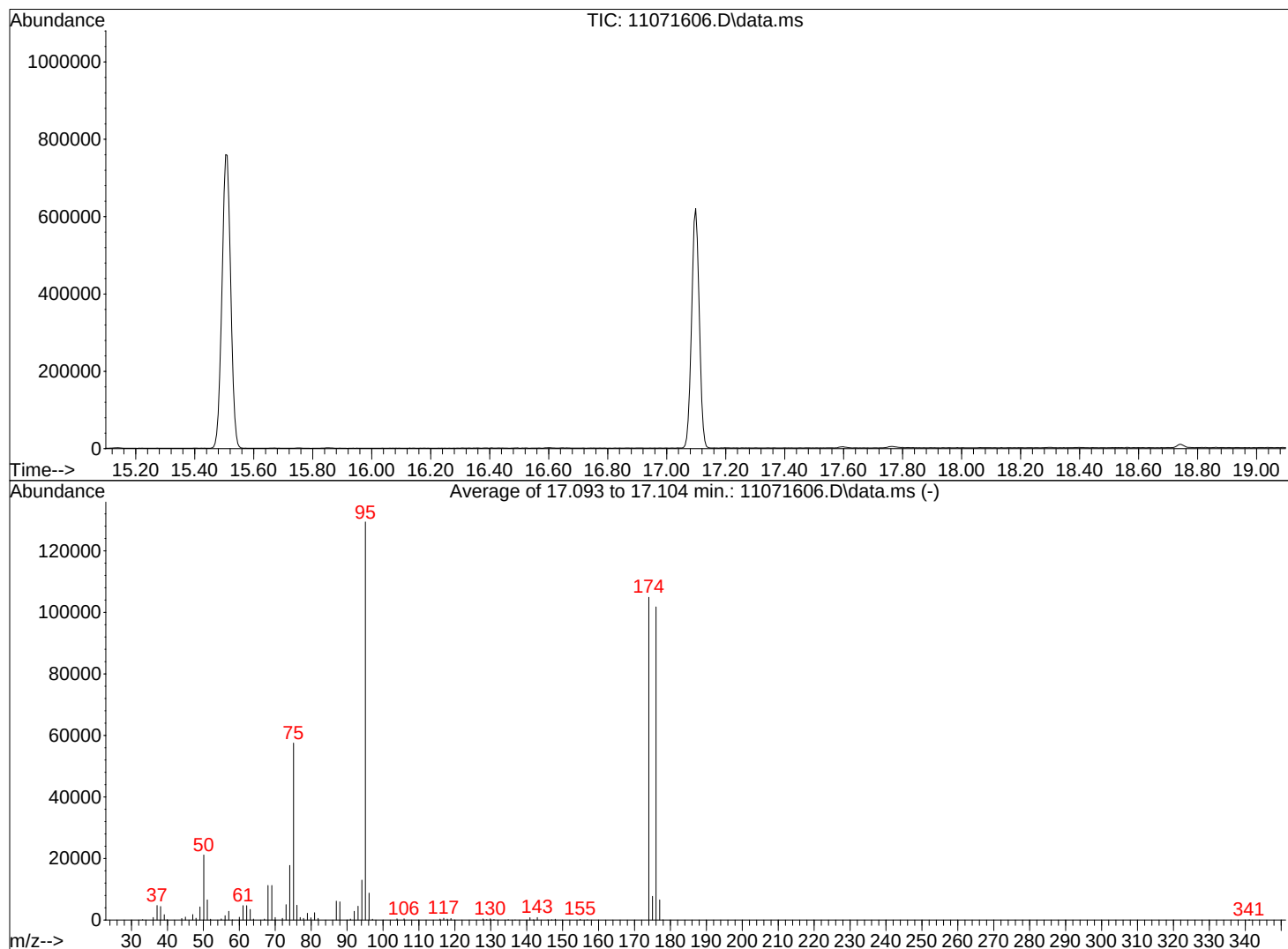


Data Path : I:\MS09\Data\2016 11\07\
 Data File : 11071606.D
 Acq On : 7 Nov 2016 14:13
 Operator : SC
 Sample : 12.5ng TO-15 BFB
 Misc : S29-10261601
 ALS Vial : 2 Sample Multiplier: 1

Integration File: LSCINT.P

 11/8/16

Method : I:\MS09\Methods\R9110716.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Tue Nov 08 08:41:37 2016



AutoFind: Scans 2644, 2645, 2646; Background Corrected with Scan 2635

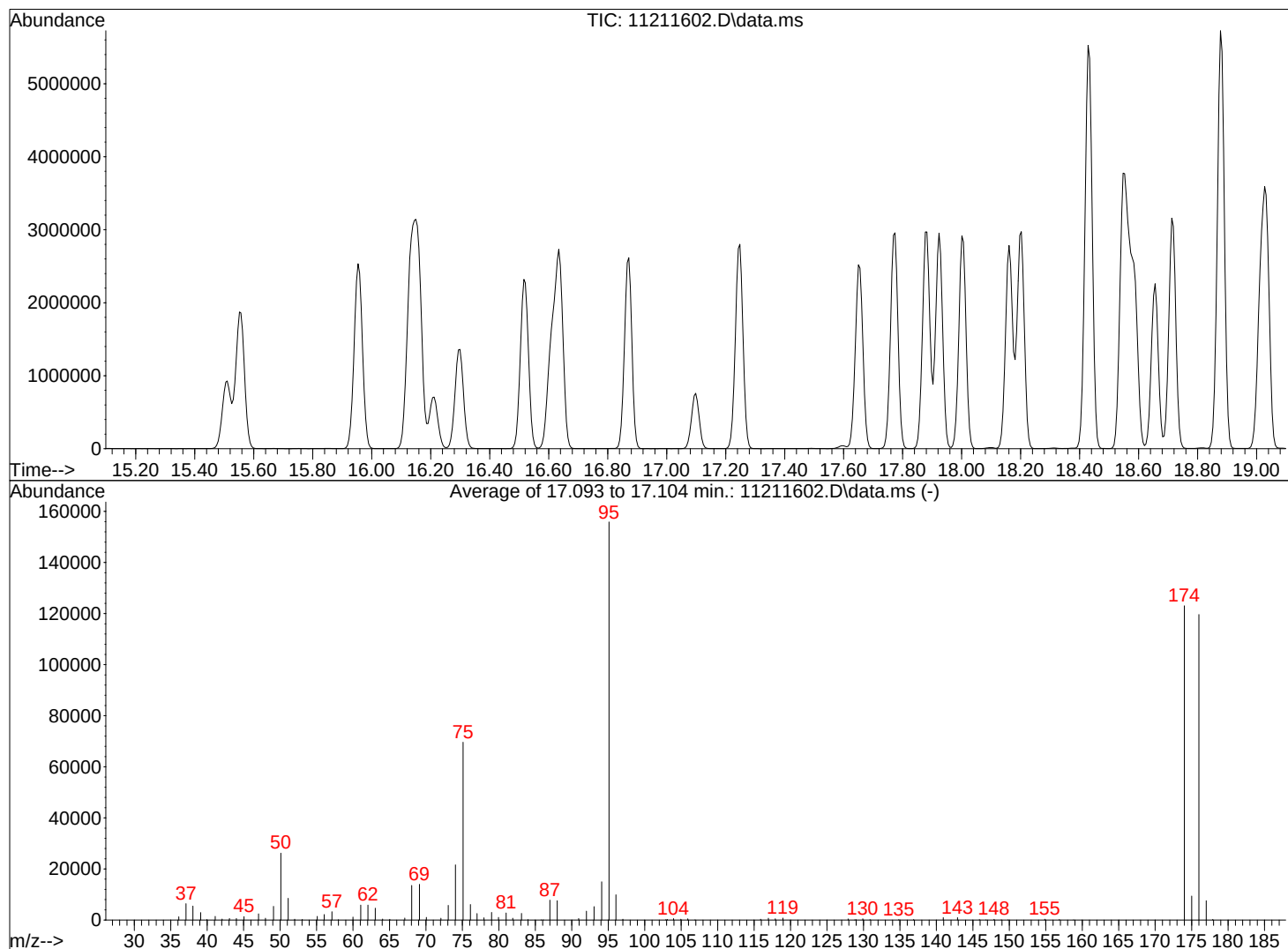
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	16.3	21136	PASS
75	95	30	66	44.5	57528	PASS
95	95	100	100	100.0	129384	PASS
96	95	5	9	6.8	8782	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	81.1	104915	PASS
175	174	4	9	7.3	7709	PASS
176	174	93	101	97.0	101773	PASS
177	176	5	9	6.4	6545	PASS

Data Path : I:\MS09\Data\2016 11\21\
 Data File : 11211602.D
 Acq On : 21 Nov 2016 8:27
 Operator : LH
 Sample : CCV R9112116 25ng
 Misc : S29-10261601/S29-11041603 (12/2)
 ALS Vial : 2 Sample Multiplier: 1

11/21/16

Integration File: LSCINT.P

Method : I:\MS09\Methods\R9110716.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Tue Nov 08 09:00:48 2016



AutoFind: Scans 2644, 2645, 2646; Background Corrected with Scan 2635

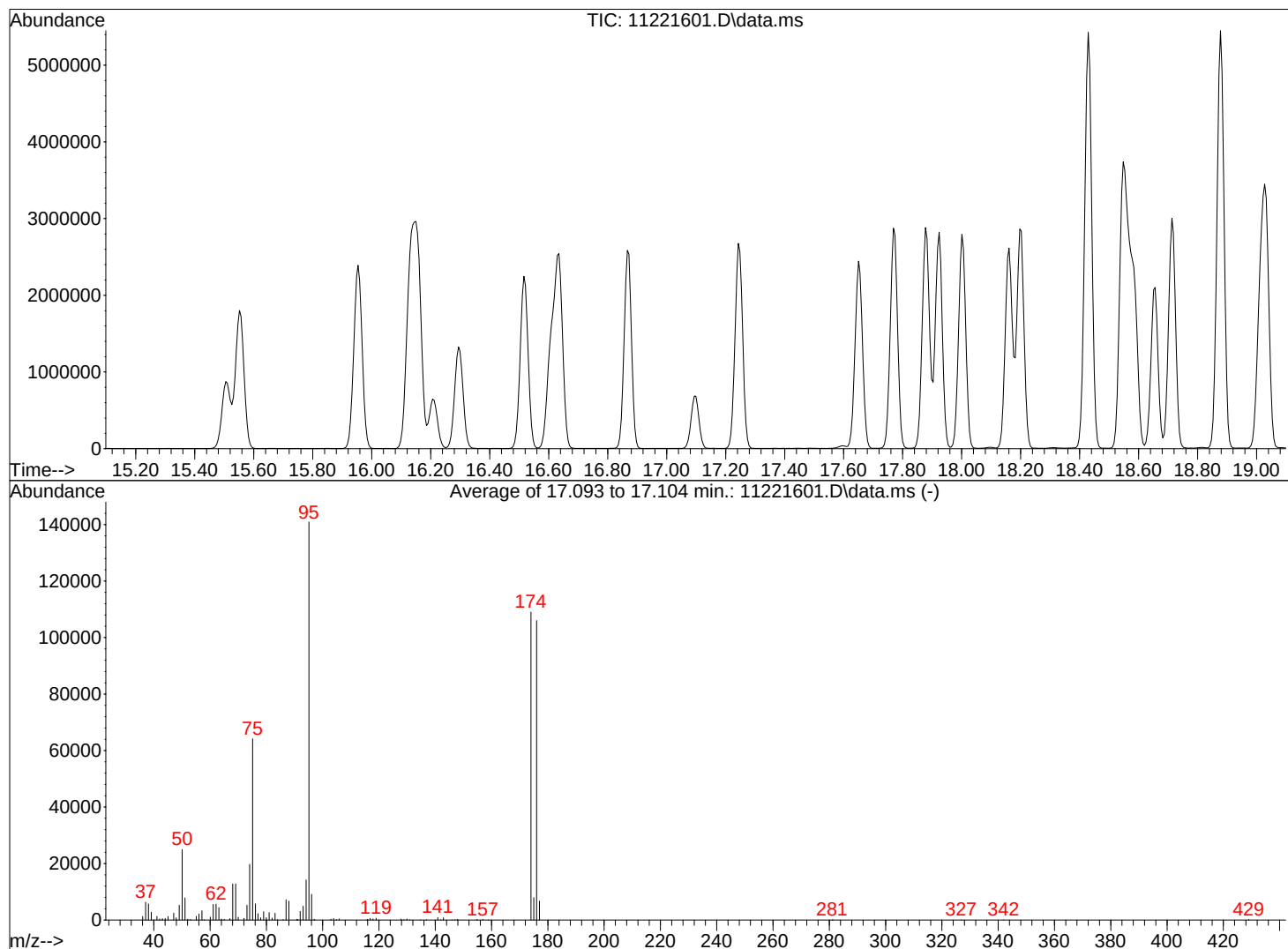
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	16.8	26219	PASS
75	95	30	66	44.7	69621	PASS
95	95	100	100	100.0	155883	PASS
96	95	5	9	6.3	9890	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	79.0	123077	PASS
175	174	4	9	7.6	9368	PASS
176	174	93	101	97.2	119621	PASS
177	176	5	9	6.3	7591	PASS

Data Path : I:\MS09\Data\2016 11\22\
 Data File : 11221601.D
 Acq On : 22 Nov 2016 9:23
 Operator : SC
 Sample : CCV R9112216 25ng
 Misc : S29-10261601/S29-11041603 (12/2)
 ALS Vial : 2 Sample Multiplier: 1

11/22/16

Integration File: LSCINT.P

Method : I:\MS09\Methods\R9110716.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Tue Nov 08 09:00:48 2016



AutoFind: Scans 2644, 2645, 2646; Background Corrected with Scan 2635

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	17.7	24949	PASS
75	95	30	66	45.5	64155	PASS
95	95	100	100	100.0	140939	PASS
96	95	5	9	6.5	9101	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	77.3	109008	PASS
175	174	4	9	7.3	7969	PASS
176	174	93	101	97.3	106019	PASS
177	176	5	9	6.4	6758	PASS

Injection Log

Directory: J:\MS09\Data\2016_11\07\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	11/7/16 9:37	11071601.D	Blank (100mL)	S29-10261601	SC	2	
2	11/7/16 10:24	11071602.D	Blank (100mL)	S29-10261601	SC	2	
3	11/7/16 12:16	11071603.D	Blank (100mL)	S29-10261601	SC	2	
4	11/7/16 12:51	11071604.D	Blank (100mL)	S29-10261601	SC	2	
5	11/7/16 13:40	11071605.D	Blank (100mL)	S29-10261601	SC	2	
6	11/7/16 14:13	11071606.D	12.5ng TO-15 BFB	S29-10261601	SC	2	pass
7	11/7/16 14:47	11071607.D	0.08ng TO-15 ICAL STD	S29-10261601/S29-11041608 (12/2)	SC	13	
8	11/7/16 15:21	11071608.D	0.10ng TO-15 ICAL STD	S29-10261601/S29-11041608 (12/2)	SC	13	
9	11/7/16 15:54	11071609.D	0.20ng TO-15 ICAL STD	S29-10261601/S29-11041608 (12/2)	SC	13	
10	11/7/16 16:28	11071610.D	0.40ng TO-15 ICAL STD	S29-10261601/S29-11041608 (12/2)	SC	13	
11	11/7/16 17:02	11071611.D	1.0ng TO-15 ICAL STD	S29-10261601/S29-11041605 (12/2)	SC	14	
12	11/7/16 17:36	11071612.D	5.0ng TO-15 ICAL STD	S29-10261601/S29-11041605 (12/2)	SC	14	
13	11/7/16 18:09	11071613.D	25ng TO-15 ICAL STD	S29-10261601/S29-11041603 (12/2)	SC	15	
14	11/7/16 18:43	11071614.D	50ng TO-15 ICAL STD	S29-10261601/S29-11041603 (12/2)	SC	15	
15	11/7/16 19:17	11071615.D	100ng TO-15 ICAL STD	S29-10261601/S29-11041603 (12/2)	SC	15	
16	11/7/16 19:51	11071616.D	Blank (100mL)	S29-10261601	SC	2	
17	11/7/16 20:25	11071617.D	25ng TO-15 ICV STD	S29-10261601/S29-10271604 (11/25)	SC	4	
18	11/7/16 20:59	11071618.D	25ng TO-15 ICV STD	S29-10261601/S29-10271604 (11/25)	SC	4	cf
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Injection Log

Directory: J:\MS09\Data\2016_11\21\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	11/21/16 7:53	11211601.D	Blank (100mL)	S29-10261601	LH	2	
2	11/21/16 8:27	11211602.D	CCV R9112116_25ng	S29-10261601/S29-11041603 (12/2)	LH	2	pass
3	11/21/16 9:00	11211603.D	CCV C9112116_25ng	S29-10261601/S29-11161604 (12/25)	LH	2	pass
4	11/21/16 9:34	11211604.D	MB R9112116_1000mL	S29-10261601	LH	2	cf
5	11/21/16 10:32	11211605.D	Blank (100mL)	S29-10261601	SC	2	
6	11/21/16 11:06	11211606.D	MB R9112116_1000mL	S29-10261601	SC	2	pass
7	11/21/16 11:39	11211607.D	LCS R9112116_25ng	S29-10261601/S29-10271604 (11/25)	SC	4	pass
8	11/21/16 12:13	11211608.D	LCSD R9112116_25ng	S29-10261601/S29-10271604 (11/25)	SC	4	pass
9	11/21/16 12:47	11211609.D	P1605284-002Dil (5.0mL)	S29-10261601	SC	1	
10	11/21/16 13:22	11211610.D	P1605284-007Dil (5.0mL)	S29-10261601	SC	1	
11	11/21/16 14:00	11211611.D	P1605411-001 (0.3mL)	S29-10261601	SC	1	
12	11/21/16 14:58	11211612.D	P1605411-001 (0.6mL)	S29-10261601	SC	1	
13	11/21/16 15:32	11211613.D	P1605411-002 (1000mL)	S29-10261601	SC	3	IS failed
14	11/21/16 16:06	11211614.D	P1605411-002Dil(100mL)	S29-10261601	SC	3	
15	11/21/16 16:39	11211615.D	P1605374-001 (1000mL)	S29-10261601	SC	5	
16	11/21/16 17:13	11211616.D	P1605374-002 (1000mL)	S29-10261601	SC	6	
17	11/21/16 17:47	11211617.D	P1605374-003 (1000mL)	S29-10261601	SC	7	
18	11/21/16 18:21	11211618.D	P1605355-001 (400mL)	S29-10261601	SC	8	
19	11/21/16 18:55	11211619.D	P1605355-002 (400mL)	S29-10261601	SC	9	
20	11/21/16 19:28	11211620.D	P1605349-001 (1000mL)	S29-10261601	SC	10	
21	11/21/16 20:02	11211621.D	P1605349-002 (1000mL)	S29-10261601	SC	11	
22	11/21/16 20:35	11211622.D	P1605350-001 (75mL)	S29-10261601	SC	12	
23	11/21/16 21:09	11211623.D	P1605350-001dup (75mL)	S29-10261601	SC	12	pass
24	11/21/16 21:43	11211624.D	P1605350-002 (1000mL)	S29-10261601	SC	13	
25	11/21/16 22:16	11211625.D	P1605418-001 (200mL)	S29-10261601	SC	14	
26	11/21/16 22:50	11211626.D	P1605418-002 (1000mL)	S29-10261601	SC	15	
27	11/21/16 23:24	11211627.D	P1605418-002 (100mL)	S29-10261601	SC	15	cf
28	11/21/16 23:58	11211628.D	P1605418-003 (1000mL)	S29-10261601	SC	16	
29	11/22/16 8:50	11211630.D	Blank (100mL)	S29-10261601	SC	2	
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Injection Log

Directory: J:\MS09\Data\2016_11\22\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	11/22/16 9:23	11221601.D	CCV R9112216_25ng	S29-10261601/S29-11041603 (12/2)	SC	2	pass
2	11/22/16 9:57	11221602.D	CCV C9112216_25ng	S29-10261601/S29-11161604 (12/25)	SC	2	pass
3	11/22/16 10:31	11221603.D	MB R9112216_1000mL	S29-10261601	SC	2	pass
4	11/22/16 11:05	11221604.D	LCS R9112216_25ng	S29-10261601/S29-10271604 (11/25)	SC	4	pass
5	11/22/16 11:38	11221605.D	LCSD R9112216_25ng	S29-10261601/S29-10271604 (11/25)	SC	4	pass
6	11/22/16 13:17	11221606.D	P1605411-002 (200mL)	S29-10261601	SC	3	
7	11/22/16 13:51	11221607.D	P1605349-001Dil (100mL)	S29-10261601	SC	10	
8	11/22/16 14:24	11221608.D	P1605349-002Dil (100mL)	S29-10261601	SC	11	
9	11/22/16 14:58	11221609.D	P1605418-001 (1000mL)	S29-10261601	SC	14	
10	11/22/16 15:31	11221610.D	P1605418-004 (1000mL)	S29-10261601	SC	5	
11	11/22/16 16:05	11221611.D	Chamber QC_112216	S29-10261601/AS00610	SC	8	pass
12	11/22/16 16:39	11221612.D	P1605460-001 (100mL)	S29-10261601	SC	7	
13	11/22/16 17:39	11221613.D	P1605460-002 (5.0mL)	S29-10261601	SC	1	
14	11/22/16 18:13	11221614.D	P1605428-001 (1000mL)	S29-10261601	SC	5	
15	11/22/16 18:47	11221615.D	P1605428-002 (1000mL)	S29-10261601	SC	8	
16	11/22/16 19:21	11221616.D	P1605405-001 (1000mL)	S29-10261601	SC	6	IS failed
17	11/22/16 19:55	11221617.D	P1605405-001 (100mL)	S29-10261601	SC	6	
18	11/22/16 20:29	11221618.D	P1605420-001 (1000mL)	S29-10261601	SC	9	
19	11/22/16 21:03	11221619.D	P1605420-002 (1000mL)	S29-10261601	SC	10	
20	11/22/16 21:37	11221620.D	P1605420-003 (1000mL)	S29-10261601	SC	11	
21	11/22/16 22:10	11221621.D	P1605420-004 (1000mL)	S29-10261601	SC	12	
22	11/22/16 22:44	11221622.D	P1605423-001 (400mL)	S29-10261601	SC	13	
23	11/22/16 23:18	11221623.D	P1605423-002 (400mL)	S29-10261601	SC	14	
24	11/22/16 23:52	11221624.D	P1605423-002 (40mL)	S29-10261601	SC	14	
25	11/23/16 0:25	11221625.D	P1605423-003 (100mL)	S29-10261601	SC	15	
26	11/23/16 0:59	11221626.D	P1605423-003dup (100mL)	S29-10261601	SC	15	pass
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SIMIVALLEY QC Certification

Conditioner: P-Conditioner-05

Cycles: 99

Batch: 19519

Batch Started By: KPAZ on 8/31/16 0856

Finished Cleaning By: KPAZ on 9/20/16 1059

Container IDs	Cleaned Date	QC Date Analyzed	QC Results	Initial Vacuum			Final Vacuum			Comments
				Vacuum	Date/Time	User	Vacuum	Date/Time	User	
AC02021	8/31/16	8/31/16	Pass w/ Conditions	-14.3	9/20/16 1059	KPAZ	-14.0	9/1/16 0321	KPAZ	
AS00999	8/31/16	8/31/16	Pass w/ Conditions	-14.3	9/20/16 1059	KPAZ	-14.0	9/20/16 1117	KPAZ	
AS01117	8/31/16	8/31/16	Pass w/ Conditions	-14.3	9/20/16 1059	KPAZ				
AC01570	8/31/16	8/31/16	Pass w/ Conditions	-14.3	9/20/16 1059	KPAZ	-14.0	9/2/16 0136	SMOH	
AC00908	8/31/16	8/31/16	Pass w/ Conditions	-14.3	9/20/16 1059	KPAZ	-14.0	9/2/16 0136	SMOH	
AS00901	8/31/16	8/31/16	Pass w/ Conditions	-14.3	9/20/16 1059	KPAZ	-14.0	9/2/16 0137	SMOH	
AS01141	8/31/16	8/31/16	Pass w/ Conditions	-14.3	9/20/16 1059	KPAZ				
AC01169	8/31/16	8/31/16	Pass w/ Conditions	-14.3	9/20/16 1059	KPAZ	-14.0	9/2/16 0215	SMOH	
AC00819	8/31/16	8/31/16	Pass w/ Conditions	-14.3	9/20/16 1059	KPAZ	-14.0	9/2/16 0136	SMOH	
AS00338	8/31/16	8/31/16	Pass w/ Conditions	-14.3	9/20/16 1059	KPAZ	-14.0	9/2/16 0215	SMOH	
AS00506	8/31/16	8/31/16	Pass w/ Conditions	-14.3	9/20/16 1059	KPAZ	-14.0	9/20/16 1117	KPAZ	
AS00986	8/31/16	8/31/16	Pass w/ Conditions	-14.3	9/20/16 1059	KPAZ	-14.0	9/2/16 0138	SMOH	
AC01267*	8/31/16	8/31/16	Pass w/ Conditions	-14.3	8/31/16 1648	SMOH	-14.0	9/2/16 0138	SMOH	MS21 08/31/16
AS00967	8/31/16	8/31/16	Pass w/ Conditions	-14.3	9/20/16 1059	KPAZ	-14.0	9/2/16 0137	SMOH	
AS01111	8/31/16	8/31/16	Pass w/ Conditions	-14.3	9/20/16 1059	KPAZ	-14.0	9/2/16 0215	SMOH	
AS00663	8/31/16	8/31/16	Pass w/ Conditions	-14.3	9/20/16 1059	KPAZ	-14.0	9/21/16 0855	KPAZ	

Passed For: EPA TO-15 (75 Cmpds. LL + TICs)

Exceptions:

COMPONENTID	Date / Time	MODULE	USER	COMMENTS

Batch Comment:

*** QC Canister**

SIMIVALLEY QC Certification

Conditioner: P-Conditioner-01

Cycles: 1

Batch: 19635

Batch Started By: SMOH on 9/22/16 1121

Finished Cleaning By: WHENTON on 9/20/16 08:00

Container IDs	Cleaned Date	QC Date Analyzed	QC Results	Initial Vacuum			Final Vacuum			Comments
				Vacuum	Date/Time	User	Vacuum	Date/Time	User	
AS01122*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ	73409
AS00896*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ	
AS00781*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ	
AS00064*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ	
AS01110*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ	
AS00947*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ	
AS01011*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ	
AC01220*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ	
AC02061*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ	
AC02179*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ	
AS00172*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ	
AC02157*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ	
AS01056*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ	
AS00803*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ	
AS00814*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ	
AS00770*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ	
AS00741*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ	
AS00958*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ	
AS00746*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ	
AS00794*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ	
AS00190*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ	
AS00962*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ	
AS00245*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ	
AS01089*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ	
AS01152*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ	

AC01900*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ
AS00400*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ
AC00982*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ
AC02103*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ
AS00974*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ
AC01815*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ

Passed For: EPA TO-15 (Client Specified)

AS01095*	9/22/16	9/22/16	Pass w/ Conditions	-14.3	9/22/16 1127	WHENTON	-14.0	9/22/16 0216	KPAZ

Passed For: TO-15 (client specified)

Exceptions:

COMPONENTID	Date / Time	MODULE	USER	COMMENTS

Batch Comment: cleaned at various times and in mr 73409

* QC Canister

SIMIVALLEY QC Certification

Conditioner: P-Conditioner-07

Cycles: 99

Batch: 19937

Batch Started By: SMOH on 11/10/16 0217

Finished Cleaning By: SMOH on 11/11/16 0302

Container IDs	Cleaned Date	QC Date Analyzed	QC Results	Initial Vacuum			Final Vacuum			Comments
				Vacuum	Date/Time	User	Vacuum	Date/Time	User	
SSC00264	11/10/16	1/1/01	Pass w/ Conditions	-14.3	11/11/16 0302	SMOH	-8.4	11/14/16 1154	KPAZ	MS21 11111607.D
SC00689	11/10/16	1/1/01	Pass w/ Conditions	-14.3	11/11/16 0302	SMOH	-14.0	11/14/16 1049	KPAZ	
SC01781	11/10/16	1/1/01	Pass w/ Conditions	-14.3	11/11/16 0302	SMOH	-14.0	11/14/16 1038	KPAZ	
SC00163	11/10/16	1/1/01	Pass w/ Conditions	-14.3	11/11/16 0302	SMOH	-14.0	11/14/16 1049	KPAZ	
SC01486	11/10/16	1/1/01	Pass w/ Conditions	-14.3	11/11/16 0302	SMOH	-14.0	11/14/16 1053	KPAZ	
SC02150	11/10/16	1/1/01	Pass w/ Conditions	-14.3	11/11/16 0302	SMOH	-14.0	11/14/16 1038	KPAZ	
SC02086	11/10/16	1/1/01	Pass w/ Conditions	-14.3	11/11/16 0302	SMOH	-14.0	11/14/16 1038	KPAZ	
SC01041	11/10/16	1/1/01	Pass w/ Conditions	-14.3	11/11/16 0302	SMOH	-14.0	11/14/16 1109	KPAZ	
SC00860	11/10/16	1/1/01	Pass w/ Conditions	-14.3	11/11/16 0302	SMOH	-14.0	11/14/16 1038	KPAZ	
SC01653	11/10/16	1/1/01	Pass w/ Conditions	-14.3	11/11/16 0302	SMOH	-14.0	11/14/16 1053	KPAZ	

Passed For: TO-15 (75 Comp 0.1 ug/m3 + TICs)

Exceptions:

COMPONENTID	Date / Time	MODULE	USER	COMMENTS

Batch Comment:

* QC Canister



MR: 74844

Individual Summa Canister and Combination Summa Canister/Flow Controller QC Check

Client: AECOM
Method: TO-15
Instrument: Entech Autosampler/Agilent 5975Cinert/7890A/MS21
Analyte List: See below
MRL: 0.5 ug/m3
Media Request: 74844

<u>Canister</u>	<u>Flow Controller</u>	<u>Date Analyzed</u>	
AS00896	FCR00106	11/03/16	PASS
AS00958	FCR00019	11/03/16	PASS

Analytes: Client Specified

Data Path : I:\MS21\DATA\2016 11\03\
 Data File : 11031620.D
 Acq On : 3 Nov 2016 9:20 pm
 Operator : SM
 Sample : AS00896 FCR00106
 Misc : 74844 (Sig #1); S29-10211606 (Sig #2)
 ALS Vial : 13 Sample Multiplier: 1

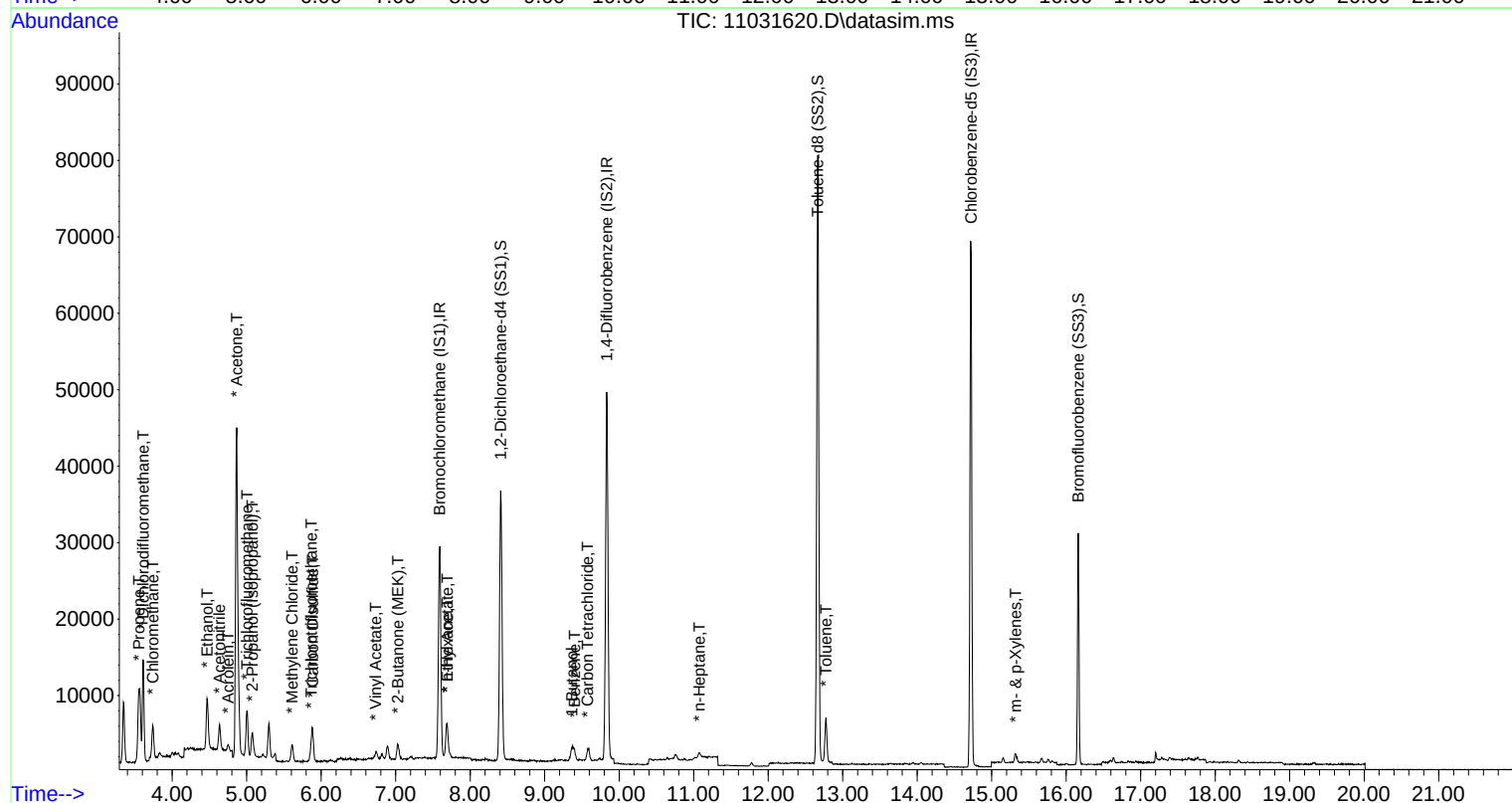
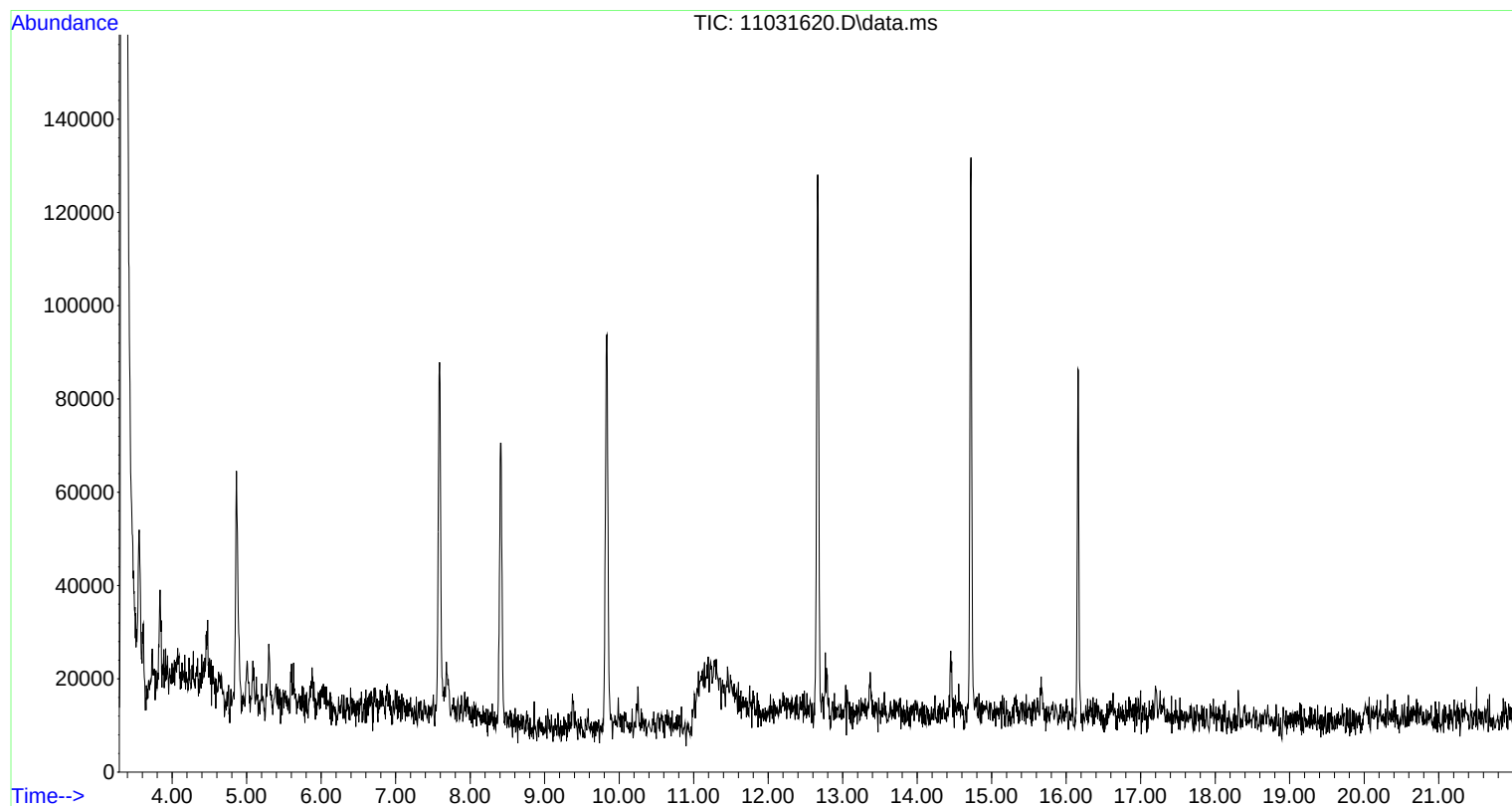
Quant Time: Nov 04 08:28:24 2016
 Quant Method : I:\MS21\Methods\F21100116.M
 Quant Title : EPA TO-15
 QLast Update : Mon Oct 03 11:52:16 2016
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	7.59	130	34043	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.83	114	88833	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.72	117	70135	1000.000	pg	0.00
System Monitoring Compounds						
33) 1,2-Dichloroethane-d4 ...	8.41	65	53176	825.989	pg	0.00
Spiked Amount 1000.000			Recovery	=	82.60%	
57) Toluene-d8 (SS2)	12.67	98	87429	1137.812	pg	0.00
Spiked Amount 1000.000			Recovery	=	113.78%	
74) Bromofluorobenzene (SS3)	16.16	174	21229	698.709	pg	0.00
Spiked Amount 1000.000			Recovery	=	69.87%	
Target Compounds						Qvalue
2) * Propene	3.55	42	5133	194.627	pg	79
3) * Dichlorodifluoromethane	3.61	85	14818	108.321	pg	99
4) * Chloromethane	3.74	50	5559	96.542	pg	99
10) * Ethanol	4.47	45	8488	358.139	pg	94
11) * Acetonitrile	4.64	41	4115	74.350	pg	86
12) * Acrolein	4.75	56	949	49.453	pg	85
13) * Acetone	4.87	58	21807	863.060	pg	# 57
14) * Trichlorofluoromethane	5.00	101	7123	61.576	pg	100
15) * 2-Propanol (Isopropa...	5.07	45	4225	59.469	pg	98
19) * Methylene Chloride	5.61	84	2066	52.693	pg	97
21) * Trichlorotrifluoroet...	5.87	151	1460	31.427	pg	# 83
22) * Carbon Disulfide	5.89	76	7477	50.089	pg	96
26) * Vinyl Acetate	6.73	86	228	32.141	pg	# 54
27) * 2-Butanone (MEK)	7.03	72	800	40.959	pg	95
30) * Ethyl Acetate	7.69	61	839	94.541	pg	100
31) * n-Hexane	7.69	57	664	18.000	pg	# 89
39) * Benzene	9.40	78	2040	21.286	pg	# 82
41) 1-Butanol	9.36	56	1372	89.900	pg	# 70
42) * Carbon Tetrachloride	9.58	117	2004	31.239	pg	94
51) * n-Heptane	11.07	71	508	21.300	pg	# 78
58) * Toluene	12.78	91	6763	76.569	pg	96
67) * m- & p-Xylenes	15.32	91	1604	23.760	pg	88

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : I:\MS21\DATA\2016 11\03\
Data File : 11031620.D
Acq On : 3 Nov 2016 9:20 pm
Operator : SM
Sample : AS00896 FCR00106
Misc : 74844 (Sig #1); S29-10211606 (Sig #2)
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 04 08:28:24 2016
Quant Method : I:\MS21\Methods\F21100116.M
Quant Title : EPA TO-15
QLast Update : Mon Oct 03 11:52:16 2016
Response via : Initial Calibration



Data Path : I:\MS21\DATA\2016 11\03\
 Data File : 11031623.D
 Acq On : 3 Nov 2016 11:22 pm
 Operator : SM
 Sample : AS00958 FCR00019
 Misc : 74844 (Sig #1); S29-10211606 (Sig #2)
 ALS Vial : 16 Sample Multiplier: 1

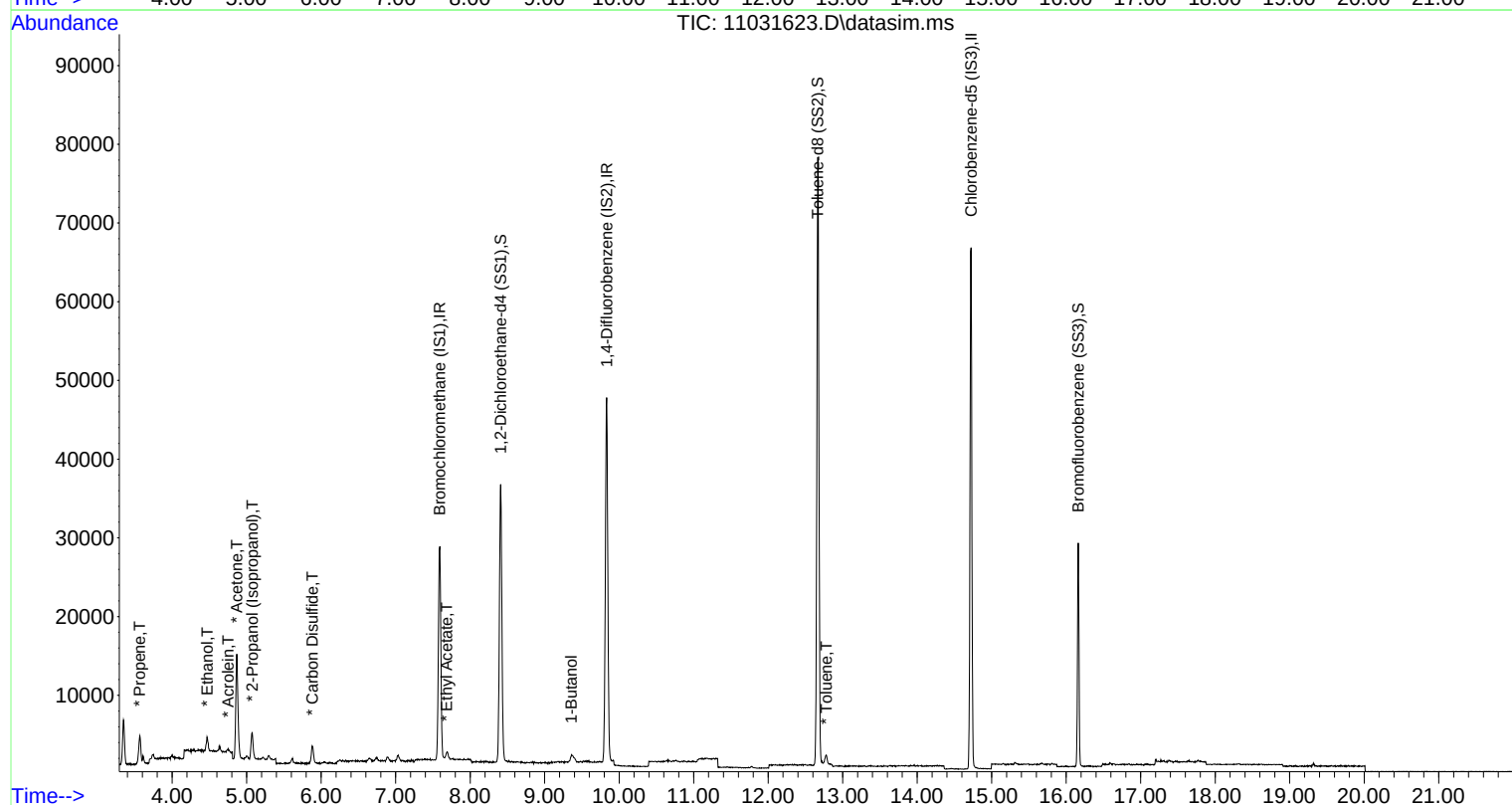
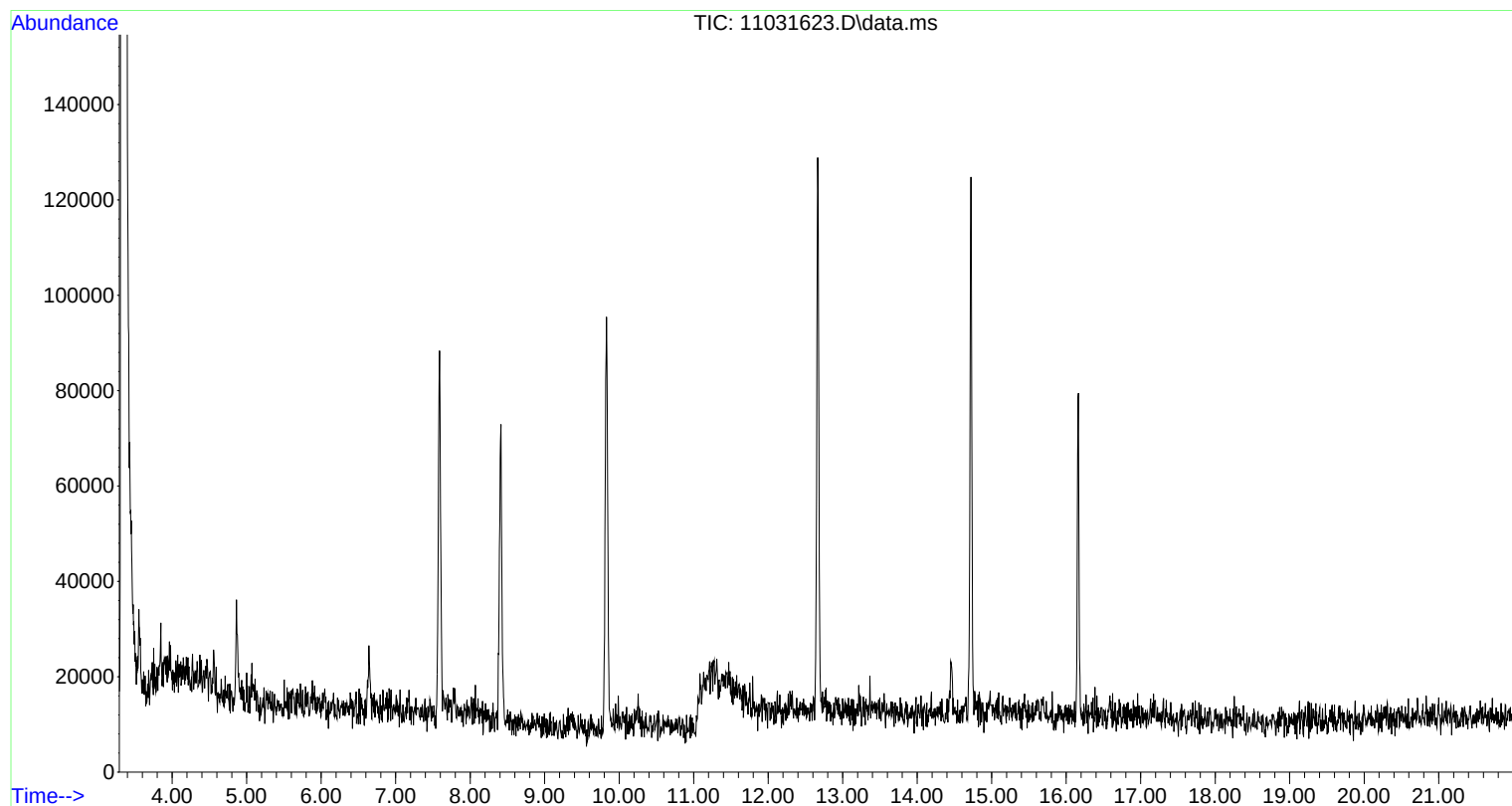
Quant Time: Nov 04 08:28:39 2016
 Quant Method : I:\MS21\Methods\F21100116.M
 Quant Title : EPA TO-15
 QLast Update : Mon Oct 03 11:52:16 2016
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	7.59	130	33524	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.83	114	85987	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.72	117	67588	1000.000	pg	0.00
System Monitoring Compounds						
33) 1,2-Dichloroethane-d4 ...	8.41	65	52617	829.959	pg	0.00
Spiked Amount 1000.000			Recovery	=	83.00%	
57) Toluene-d8 (SS2)	12.67	98	85258	1151.371	pg	0.00
Spiked Amount 1000.000			Recovery	=	115.14%	
74) Bromofluorobenzene (SS3)	16.16	174	19928	680.606	pg	0.00
Spiked Amount 1000.000			Recovery	=	68.06%	
Target Compounds						Qvalue
2) * Propene	3.56	42	1461	56.254	pg	# 52
10) * Ethanol	4.47	45	2186	93.663	pg	95
12) * Acrolein	4.75	56	525	27.782	pg	100
13) * Acetone	4.87	58	6665	267.866	pg	# 56
15) * 2-Propanol (Isopropa...	5.07	45	4420	63.176	pg	98
22) * Carbon Disulfide	5.88	76	4251	28.919	pg	# 84
30) * Ethyl Acetate	7.68	61	174	19.910	pg	# 68
41) 1-Butanol	9.36	56	723	48.942	pg	# 70
58) * Toluene	12.78	91	1479	17.376	pg	96

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : I:\MS21\DATA\2016 11\03\
Data File : 11031623.D
Acq On : 3 Nov 2016 11:22 pm
Operator : SM
Sample : AS00958 FCR00019
Misc : 74844 (Sig #1); S29-10211606 (Sig #2)
ALS Vial : 16 Sample Multiplier: 1

Quant Time: Nov 04 08:28:39 2016
Quant Method : I:\MS21\Methods\F21100116.M
Quant Title : EPA TO-15
QLast Update : Mon Oct 03 11:52:16 2016
Response via : Initial Calibration





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LABORATORY REPORT

March 8, 2017

Thomas Holmes
HDR Environmental, Operations & Construction, Inc.
9781 South Meridian Blvd., Suite 400
Englewood, CO 80112

RE: DDMT SVE / 10031560-282846-005

Dear Thomas:

Enclosed are the results of the sample submitted to our laboratory on February 15, 2017. For your reference, these analyses have been assigned our service request number P1700718.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

By Kate Kaneko at 11:55 am, 03/08/17

Kate Kaneko
Project Manager



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www.alsglobal.com

Client: HDR Environmental, Operations & Construction, Inc. Service Request No: P1700718
Project: DDMT SVE / 10031560-282846-005

CASE NARRATIVE

The sample was received intact under chain of custody on February 15, 2017 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the sample at the time of sample receipt.

Volatile Organic Compound Analysis

The sample was analyzed for volatile organic compounds in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. This procedure is described in laboratory SOP VOA-TO15. The analytical system was comprised of a gas chromatograph / mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the NELAP or DoD-ELAP accreditation.

The spike recoveries of trichlorofluoromethane, carbon disulfide and vinyl acetate in the Laboratory Control Sample (LCS) analyzed on February 21, 2017 were outside the Laboratory generated control criteria. The recovery errors equate to a potential high bias. However, the recoveries in question were within the method criteria, therefore, the data quality is not significantly affected. No further corrective action was taken.

The containers were cleaned, prior to sampling, down to the method reporting limit (MRL) reported for this project. Please note, projects which require reporting below the MRL could have results between the MRL and method detection limit (MDL) that are biased high.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.



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ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2016036
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1177034
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-003
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413-16-7
Utah DOH (NELAP)	http://health.utah.gov/lab/environmental-lab-certification/	CA01627201 6-6
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: HDR Environmental, Operations & Construction, Inc.
Project ID: DDMT SVE / 10031560-282846-005

Service Request: P1700718

Date Received: 2/15/2017
Time Received: 09:20

TO-15 - VOC Cans

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)
ODSVE-EFF-Y6Q3	P1700718-001	Air	2/8/2017	09:15	SC02220	0.03	4.04

X

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: HDR Environmental, Operations & Construction, Inc.
Client Sample ID: ODSVE-EFF-Y6Q3
Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1700718
 ALS Sample ID: P1700718-001

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Lusine Hakobyan
Sample Type: 6.0 L Summa Canister
Test Notes:
Container ID: SC02220

Date Collected: 2/8/17
Date Received: 2/15/17
Date Analyzed: 2/21/17 & 2/23/17
Volume(s) Analyzed: 1.00 Liter(s)
 0.25 Liter(s)

Initial Pressure (psig): 0.03 Final Pressure (psig): 4.04

Canister Dilution Factor: 1.27

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	0.75	0.64	0.18	0.44	0.37	0.10	
75-71-8	Dichlorodifluoromethane (CFC 12)	13	0.64	0.22	2.6	0.13	0.044	
74-87-3	Chloromethane	ND	0.64	0.19	ND	0.31	0.092	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.64	0.24	ND	0.091	0.035	
75-01-4	Vinyl Chloride	0.29	0.64	0.22	0.11	0.25	0.084	J
106-99-0	1,3-Butadiene	ND	0.64	0.28	ND	0.29	0.13	
74-83-9	Bromomethane	ND	0.64	0.24	ND	0.16	0.062	
75-00-3	Chloroethane	ND	0.64	0.22	ND	0.24	0.082	
64-17-5	Ethanol	ND	6.4	1.0	ND	3.4	0.54	
75-05-8	Acetonitrile	ND	0.64	0.23	ND	0.38	0.14	
107-02-8	Acrolein	0.35	2.5	0.22	0.15	1.1	0.094	J
67-64-1	Acetone	7.7	6.4	0.98	3.3	2.7	0.41	
75-69-4	Trichlorofluoromethane (CFC 11)	2.4	0.64	0.22	0.43	0.11	0.038	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	6.4	0.53	ND	2.6	0.22	
107-13-1	Acrylonitrile	ND	0.64	0.22	ND	0.29	0.10	
75-35-4	1,1-Dichloroethene	5.5	0.64	0.22	1.4	0.16	0.054	
75-09-2	Methylene Chloride	0.27	0.64	0.22	0.079	0.18	0.062	J
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.64	0.20	ND	0.20	0.065	
76-13-1	Trichlorotrifluoroethane (CFC 113)	31	0.64	0.22	4.1	0.083	0.028	
75-15-0	Carbon Disulfide	6.7	6.4	0.19	2.2	2.0	0.061	
156-60-5	trans-1,2-Dichloroethene	1.8	0.64	0.24	0.45	0.16	0.061	
75-34-3	1,1-Dichloroethane	2.8	0.64	0.20	0.70	0.16	0.050	
1634-04-4	Methyl tert-Butyl Ether	ND	0.64	0.22	ND	0.18	0.060	
108-05-4	Vinyl Acetate	2.2	6.4	0.83	0.62	1.8	0.23	J
78-93-3	2-Butanone (MEK)	2.2	6.4	0.27	0.76	2.2	0.090	J

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 2 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: ODSVE-EFF-Y6Q3

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1700718

ALS Sample ID: P1700718-001

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Summa Canister

Test Notes:

Container ID: SC02220

Date Collected: 2/8/17

Date Received: 2/15/17

Date Analyzed: 2/21/17 & 2/23/17

Volume(s) Analyzed: 1.00 Liter(s)

0.25 Liter(s)

Initial Pressure (psig): 0.03 Final Pressure (psig): 4.04

Canister Dilution Factor: 1.27

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	110	0.64	0.20	29	0.16	0.051	
141-78-6	Ethyl Acetate	ND	1.3	0.44	ND	0.35	0.12	
110-54-3	n-Hexane	0.34	0.64	0.19	0.097	0.18	0.054	J
67-66-3	Chloroform	31	0.64	0.22	6.3	0.13	0.044	
109-99-9	Tetrahydrofuran (THF)	ND	0.64	0.25	ND	0.22	0.086	
107-06-2	1,2-Dichloroethane	ND	0.64	0.20	ND	0.16	0.050	
71-55-6	1,1,1-Trichloroethane	4.0	0.64	0.22	0.74	0.12	0.040	
71-43-2	Benzene	0.31	0.64	0.20	0.098	0.20	0.064	J
56-23-5	Carbon Tetrachloride	3.2	0.64	0.19	0.52	0.10	0.030	
110-82-7	Cyclohexane	0.47	1.3	0.37	0.14	0.37	0.11	J
78-87-5	1,2-Dichloropropane	ND	0.64	0.20	ND	0.14	0.044	
75-27-4	Bromodichloromethane	0.98	0.64	0.19	0.15	0.095	0.028	
79-01-6	Trichloroethene	120	2.5	0.71	23	0.47	0.13	D
123-91-1	1,4-Dioxane	ND	0.64	0.20	ND	0.18	0.056	
80-62-6	Methyl Methacrylate	ND	1.3	0.39	ND	0.31	0.096	
142-82-5	n-Heptane	ND	0.64	0.22	ND	0.16	0.053	
10061-01-5	cis-1,3-Dichloropropene	ND	0.64	0.18	ND	0.14	0.039	
108-10-1	4-Methyl-2-pentanone	ND	0.64	0.20	ND	0.16	0.050	
10061-02-6	trans-1,3-Dichloropropene	ND	0.64	0.20	ND	0.14	0.045	
79-00-5	1,1,2-Trichloroethane	ND	0.64	0.20	ND	0.12	0.037	
108-88-3	Toluene	0.46	0.64	0.22	0.12	0.17	0.057	J
591-78-6	2-Hexanone	ND	0.64	0.20	ND	0.16	0.050	
124-48-1	Dibromochloromethane	ND	0.64	0.20	ND	0.075	0.024	
106-93-4	1,2-Dibromoethane	ND	0.64	0.20	ND	0.083	0.026	
123-86-4	n-Butyl Acetate	ND	0.64	0.20	ND	0.13	0.043	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

D = The reported result is from a dilution.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 3 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: ODSVE-EFF-Y6Q3

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1700718

ALS Sample ID: P1700718-001

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Summa Canister

Test Notes:

Container ID: SC02220

Date Collected: 2/8/17

Date Received: 2/15/17

Date Analyzed: 2/21/17 & 2/23/17

Volume(s) Analyzed: 1.00 Liter(s)

0.25 Liter(s)

Initial Pressure (psig): 0.03 Final Pressure (psig): 4.04

Canister Dilution Factor: 1.27

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.64	0.23	ND	0.14	0.049	
127-18-4	Tetrachloroethene	21	0.64	0.18	3.1	0.094	0.026	
108-90-7	Chlorobenzene	ND	0.64	0.20	ND	0.14	0.044	
100-41-4	Ethylbenzene	ND	0.64	0.20	ND	0.15	0.047	
179601-23-1	m,p-Xylenes	ND	1.3	0.38	ND	0.29	0.088	
75-25-2	Bromoform	ND	0.64	0.19	ND	0.061	0.018	
100-42-5	Styrene	ND	0.64	0.19	ND	0.15	0.045	
95-47-6	o-Xylene	ND	0.64	0.19	ND	0.15	0.044	
111-84-2	n-Nonane	ND	0.64	0.19	ND	0.12	0.036	
79-34-5	1,1,2,2-Tetrachloroethane	6.6	0.64	0.19	0.96	0.093	0.028	
98-82-8	Cumene	ND	0.64	0.19	ND	0.13	0.039	
80-56-8	alpha-Pinene	ND	0.64	0.18	ND	0.11	0.032	
103-65-1	n-Propylbenzene	ND	0.64	0.20	ND	0.13	0.041	
622-96-8	4-Ethyltoluene	ND	0.64	0.20	ND	0.13	0.041	
108-67-8	1,3,5-Trimethylbenzene	ND	0.64	0.20	ND	0.13	0.041	
95-63-6	1,2,4-Trimethylbenzene	ND	0.64	0.19	ND	0.13	0.039	
100-44-7	Benzyl Chloride	ND	0.64	0.14	ND	0.12	0.027	
541-73-1	1,3-Dichlorobenzene	ND	0.64	0.19	ND	0.11	0.032	
106-46-7	1,4-Dichlorobenzene	ND	0.64	0.18	ND	0.11	0.030	
95-50-1	1,2-Dichlorobenzene	ND	0.64	0.19	ND	0.11	0.032	
5989-27-5	d-Limonene	ND	0.64	0.18	ND	0.11	0.032	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.64	0.13	ND	0.066	0.013	
120-82-1	1,2,4-Trichlorobenzene	ND	0.64	0.20	ND	0.086	0.027	
91-20-3	Naphthalene	ND	0.64	0.23	ND	0.12	0.044	
87-68-3	Hexachlorobutadiene	ND	0.64	0.18	ND	0.060	0.017	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Method Blank

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1700718

ALS Sample ID: P170221-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 2/21/17

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	ND	0.50	0.14	ND	0.29	0.081	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.50	0.17	ND	0.10	0.034	
74-87-3	Chloromethane	ND	0.50	0.15	ND	0.24	0.073	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.50	0.19	ND	0.072	0.027	
75-01-4	Vinyl Chloride	ND	0.50	0.17	ND	0.20	0.067	
106-99-0	1,3-Butadiene	ND	0.50	0.22	ND	0.23	0.099	
74-83-9	Bromomethane	ND	0.50	0.19	ND	0.13	0.049	
75-00-3	Chloroethane	ND	0.50	0.17	ND	0.19	0.064	
64-17-5	Ethanol	ND	5.0	0.80	ND	2.7	0.42	
75-05-8	Acetonitrile	ND	0.50	0.18	ND	0.30	0.11	
107-02-8	Acrolein	ND	2.0	0.17	ND	0.87	0.074	
67-64-1	Acetone	ND	5.0	0.77	ND	2.1	0.32	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	0.50	0.17	ND	0.089	0.030	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	5.0	0.42	ND	2.0	0.17	
107-13-1	Acrylonitrile	ND	0.50	0.17	ND	0.23	0.078	
75-35-4	1,1-Dichloroethene	ND	0.50	0.17	ND	0.13	0.043	
75-09-2	Methylene Chloride	ND	0.50	0.17	ND	0.14	0.049	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.50	0.16	ND	0.16	0.051	
76-13-1	Trichlorotrifluoroethane (CFC 113)	ND	0.50	0.17	ND	0.065	0.022	
75-15-0	Carbon Disulfide	ND	5.0	0.15	ND	1.6	0.048	
156-60-5	trans-1,2-Dichloroethene	ND	0.50	0.19	ND	0.13	0.048	
75-34-3	1,1-Dichloroethane	ND	0.50	0.16	ND	0.12	0.040	
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	0.17	ND	0.14	0.047	
108-05-4	Vinyl Acetate	ND	5.0	0.65	ND	1.4	0.18	
78-93-3	2-Butanone (MEK)	ND	5.0	0.21	ND	1.7	0.071	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 2 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Method Blank

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1700718

ALS Sample ID: P170221-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 2/21/17

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.50	0.16	ND	0.13	0.040	
141-78-6	Ethyl Acetate	ND	1.0	0.35	ND	0.28	0.097	
110-54-3	n-Hexane	ND	0.50	0.15	ND	0.14	0.043	
67-66-3	Chloroform	ND	0.50	0.17	ND	0.10	0.035	
109-99-9	Tetrahydrofuran (THF)	ND	0.50	0.20	ND	0.17	0.068	
107-06-2	1,2-Dichloroethane	ND	0.50	0.16	ND	0.12	0.040	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.17	ND	0.092	0.031	
71-43-2	Benzene	ND	0.50	0.16	ND	0.16	0.050	
56-23-5	Carbon Tetrachloride	ND	0.50	0.15	ND	0.080	0.024	
110-82-7	Cyclohexane	ND	1.0	0.29	ND	0.29	0.084	
78-87-5	1,2-Dichloropropane	ND	0.50	0.16	ND	0.11	0.035	
75-27-4	Bromodichloromethane	ND	0.50	0.15	ND	0.075	0.022	
79-01-6	Trichloroethene	ND	0.50	0.14	ND	0.093	0.026	
123-91-1	1,4-Dioxane	ND	0.50	0.16	ND	0.14	0.044	
80-62-6	Methyl Methacrylate	ND	1.0	0.31	ND	0.24	0.076	
142-82-5	n-Heptane	ND	0.50	0.17	ND	0.12	0.041	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.14	ND	0.11	0.031	
108-10-1	4-Methyl-2-pentanone	ND	0.50	0.16	ND	0.12	0.039	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.16	ND	0.11	0.035	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.16	ND	0.092	0.029	
108-88-3	Toluene	ND	0.50	0.17	ND	0.13	0.045	
591-78-6	2-Hexanone	ND	0.50	0.16	ND	0.12	0.039	
124-48-1	Dibromochloromethane	ND	0.50	0.16	ND	0.059	0.019	
106-93-4	1,2-Dibromoethane	ND	0.50	0.16	ND	0.065	0.021	
123-86-4	n-Butyl Acetate	ND	0.50	0.16	ND	0.11	0.034	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Method Blank

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1700718

ALS Sample ID: P170221-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 2/21/17

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.50	0.18	ND	0.11	0.039	
127-18-4	Tetrachloroethene	ND	0.50	0.14	ND	0.074	0.021	
108-90-7	Chlorobenzene	ND	0.50	0.16	ND	0.11	0.035	
100-41-4	Ethylbenzene	ND	0.50	0.16	ND	0.12	0.037	
179601-23-1	m,p-Xylenes	ND	1.0	0.30	ND	0.23	0.069	
75-25-2	Bromoform	ND	0.50	0.15	ND	0.048	0.015	
100-42-5	Styrene	ND	0.50	0.15	ND	0.12	0.035	
95-47-6	o-Xylene	ND	0.50	0.15	ND	0.12	0.035	
111-84-2	n-Nonane	ND	0.50	0.15	ND	0.095	0.029	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.15	ND	0.073	0.022	
98-82-8	Cumene	ND	0.50	0.15	ND	0.10	0.031	
80-56-8	alpha-Pinene	ND	0.50	0.14	ND	0.090	0.025	
103-65-1	n-Propylbenzene	ND	0.50	0.16	ND	0.10	0.033	
622-96-8	4-Ethyltoluene	ND	0.50	0.16	ND	0.10	0.033	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.16	ND	0.10	0.033	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.15	ND	0.10	0.031	
100-44-7	Benzyl Chloride	ND	0.50	0.11	ND	0.097	0.021	
541-73-1	1,3-Dichlorobenzene	ND	0.50	0.15	ND	0.083	0.025	
106-46-7	1,4-Dichlorobenzene	ND	0.50	0.14	ND	0.083	0.023	
95-50-1	1,2-Dichlorobenzene	ND	0.50	0.15	ND	0.083	0.025	
5989-27-5	d-Limonene	ND	0.50	0.14	ND	0.090	0.025	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.50	0.099	ND	0.052	0.010	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.16	ND	0.067	0.022	
91-20-3	Naphthalene	ND	0.50	0.18	ND	0.095	0.034	
87-68-3	Hexachlorobutadiene	ND	0.50	0.14	ND	0.047	0.013	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Method Blank

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1700718

ALS Sample ID: P170223-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 2/23/17

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	ND	0.50	0.14	ND	0.29	0.081	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.50	0.17	ND	0.10	0.034	
74-87-3	Chloromethane	ND	0.50	0.15	ND	0.24	0.073	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.50	0.19	ND	0.072	0.027	
75-01-4	Vinyl Chloride	ND	0.50	0.17	ND	0.20	0.067	
106-99-0	1,3-Butadiene	ND	0.50	0.22	ND	0.23	0.099	
74-83-9	Bromomethane	ND	0.50	0.19	ND	0.13	0.049	
75-00-3	Chloroethane	ND	0.50	0.17	ND	0.19	0.064	
64-17-5	Ethanol	ND	5.0	0.80	ND	2.7	0.42	
75-05-8	Acetonitrile	ND	0.50	0.18	ND	0.30	0.11	
107-02-8	Acrolein	ND	2.0	0.17	ND	0.87	0.074	
67-64-1	Acetone	ND	5.0	0.77	ND	2.1	0.32	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	0.50	0.17	ND	0.089	0.030	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	5.0	0.42	ND	2.0	0.17	
107-13-1	Acrylonitrile	ND	0.50	0.17	ND	0.23	0.078	
75-35-4	1,1-Dichloroethene	ND	0.50	0.17	ND	0.13	0.043	
75-09-2	Methylene Chloride	ND	0.50	0.17	ND	0.14	0.049	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.50	0.16	ND	0.16	0.051	
76-13-1	Trichlorotrifluoroethane (CFC 113)	ND	0.50	0.17	ND	0.065	0.022	
75-15-0	Carbon Disulfide	ND	5.0	0.15	ND	1.6	0.048	
156-60-5	trans-1,2-Dichloroethene	ND	0.50	0.19	ND	0.13	0.048	
75-34-3	1,1-Dichloroethane	ND	0.50	0.16	ND	0.12	0.040	
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	0.17	ND	0.14	0.047	
108-05-4	Vinyl Acetate	ND	5.0	0.65	ND	1.4	0.18	
78-93-3	2-Butanone (MEK)	ND	5.0	0.21	ND	1.7	0.071	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 2 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Method Blank

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1700718

ALS Sample ID: P170223-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 2/23/17

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.50	0.16	ND	0.13	0.040	
141-78-6	Ethyl Acetate	ND	1.0	0.35	ND	0.28	0.097	
110-54-3	n-Hexane	ND	0.50	0.15	ND	0.14	0.043	
67-66-3	Chloroform	ND	0.50	0.17	ND	0.10	0.035	
109-99-9	Tetrahydrofuran (THF)	ND	0.50	0.20	ND	0.17	0.068	
107-06-2	1,2-Dichloroethane	ND	0.50	0.16	ND	0.12	0.040	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.17	ND	0.092	0.031	
71-43-2	Benzene	ND	0.50	0.16	ND	0.16	0.050	
56-23-5	Carbon Tetrachloride	ND	0.50	0.15	ND	0.080	0.024	
110-82-7	Cyclohexane	ND	1.0	0.29	ND	0.29	0.084	
78-87-5	1,2-Dichloropropane	ND	0.50	0.16	ND	0.11	0.035	
75-27-4	Bromodichloromethane	ND	0.50	0.15	ND	0.075	0.022	
79-01-6	Trichloroethene	ND	0.50	0.14	ND	0.093	0.026	
123-91-1	1,4-Dioxane	ND	0.50	0.16	ND	0.14	0.044	
80-62-6	Methyl Methacrylate	ND	1.0	0.31	ND	0.24	0.076	
142-82-5	n-Heptane	ND	0.50	0.17	ND	0.12	0.041	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.14	ND	0.11	0.031	
108-10-1	4-Methyl-2-pentanone	ND	0.50	0.16	ND	0.12	0.039	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.16	ND	0.11	0.035	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.16	ND	0.092	0.029	
108-88-3	Toluene	ND	0.50	0.17	ND	0.13	0.045	
591-78-6	2-Hexanone	ND	0.50	0.16	ND	0.12	0.039	
124-48-1	Dibromochloromethane	ND	0.50	0.16	ND	0.059	0.019	
106-93-4	1,2-Dibromoethane	ND	0.50	0.16	ND	0.065	0.021	
123-86-4	n-Butyl Acetate	ND	0.50	0.16	ND	0.11	0.034	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 3 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Method Blank

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1700718

ALS Sample ID: P170223-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 2/23/17

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.50	0.18	ND	0.11	0.039	
127-18-4	Tetrachloroethene	ND	0.50	0.14	ND	0.074	0.021	
108-90-7	Chlorobenzene	ND	0.50	0.16	ND	0.11	0.035	
100-41-4	Ethylbenzene	ND	0.50	0.16	ND	0.12	0.037	
179601-23-1	m,p-Xylenes	ND	1.0	0.30	ND	0.23	0.069	
75-25-2	Bromoform	ND	0.50	0.15	ND	0.048	0.015	
100-42-5	Styrene	ND	0.50	0.15	ND	0.12	0.035	
95-47-6	o-Xylene	ND	0.50	0.15	ND	0.12	0.035	
111-84-2	n-Nonane	ND	0.50	0.15	ND	0.095	0.029	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.15	ND	0.073	0.022	
98-82-8	Cumene	ND	0.50	0.15	ND	0.10	0.031	
80-56-8	alpha-Pinene	ND	0.50	0.14	ND	0.090	0.025	
103-65-1	n-Propylbenzene	ND	0.50	0.16	ND	0.10	0.033	
622-96-8	4-Ethyltoluene	ND	0.50	0.16	ND	0.10	0.033	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.16	ND	0.10	0.033	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.15	ND	0.10	0.031	
100-44-7	Benzyl Chloride	ND	0.50	0.11	ND	0.097	0.021	
541-73-1	1,3-Dichlorobenzene	ND	0.50	0.15	ND	0.083	0.025	
106-46-7	1,4-Dichlorobenzene	ND	0.50	0.14	ND	0.083	0.023	
95-50-1	1,2-Dichlorobenzene	ND	0.50	0.15	ND	0.083	0.025	
5989-27-5	d-Limonene	ND	0.50	0.14	ND	0.090	0.025	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.50	0.099	ND	0.052	0.010	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.16	ND	0.067	0.022	
91-20-3	Naphthalene	ND	0.50	0.18	ND	0.095	0.034	
87-68-3	Hexachlorobutadiene	ND	0.50	0.14	ND	0.047	0.013	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

SURROGATE SPIKE RECOVERY RESULTS

Page 1 of 1

Client: HDR Environmental, Operations & Construction, Inc.
Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1700718

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Lusine Hakobyan
Sample Type: 6.0 L Summa Canister(s)
Test Notes:

Date(s) Collected: 2/8/17
Date(s) Received: 2/15/17
Date(s) Analyzed: 2/21 - 2/23/17

Client Sample ID	ALS Sample ID	1,2-Dichloroethane-d4	Toluene-d8	Bromofluorobenzene	Acceptance Limits	Data Qualifier
		Percent Recovered	Percent Recovered	Percent Recovered		
Method Blank	P170221-MB	97	102	101	70-130	
Method Blank	P170223-MB	90	105	94	70-130	
Lab Control Sample	P170221-LCS	93	100	106	70-130	
Lab Control Sample	P170223-LCS	89	106	97	70-130	
ODSVE-EFF-Y6Q3	P1700718-001	110	98	100	70-130	

Surrogate percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly from the on-column percent recovery.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Lab Control Sample

ALS Project ID: P1700718

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Sample ID: P170221-LCS

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: NA

Analyst: Lusine Hakobyan

Date Analyzed: 2/21/17

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 0.125 Liter(s)

Test Notes:

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	ALS Acceptance Limits	Data Qualifier
115-07-1	Propene	122	123	101	52-127	
75-71-8	Dichlorodifluoromethane (CFC 12)	42.5	45.8	108	68-109	
74-87-3	Chloromethane	102	117	115	51-130	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	30.2	31.4	104	66-114	
75-01-4	Vinyl Chloride	82.2	94.2	115	61-125	
106-99-0	1,3-Butadiene	95.0	117	123	62-144	
74-83-9	Bromomethane	54.1	65.8	122	73-123	
75-00-3	Chloroethane	79.5	88.7	112	69-122	
64-17-5	Ethanol	563	602	107	62-124	
75-05-8	Acetonitrile	127	136	107	57-114	
107-02-8	Acrolein	92.6	106	114	62-116	
67-64-1	Acetone	448	487	109	57-117	
75-69-4	Trichlorofluoromethane (CFC 11)	37.4	39.3	105	63-98	L
67-63-0	2-Propanol (Isopropyl Alcohol)	173	201	116	66-121	
107-13-1	Acrylonitrile	98.0	113	115	68-123	
75-35-4	1,1-Dichloroethene	53.6	60.4	113	76-118	
75-09-2	Methylene Chloride	61.2	65.7	107	60-118	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	67.8	82.1	121	65-126	
76-13-1	Trichlorotrifluoroethane (CFC 113)	27.6	30.9	112	73-114	
75-15-0	Carbon Disulfide	68.6	77.0	112	57-102	L
156-60-5	trans-1,2-Dichloroethene	53.8	61.7	115	74-123	
75-34-3	1,1-Dichloroethane	52.5	55.6	106	69-111	
1634-04-4	Methyl tert-Butyl Ether	59.0	63.2	107	69-113	
108-05-4	Vinyl Acetate	301	405	135	76-128	L
78-93-3	2-Butanone (MEK)	72.0	77.7	108	63-127	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

L = Laboratory control sample recovery outside the specified limits, results may be biased high.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 2 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Lab Control Sample

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1700718

ALS Sample ID: P170221-LCS

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 2/21/17

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	ALS Acceptance Limits	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	53.4	57.1	107	72-117	
141-78-6	Ethyl Acetate	118	133	113	68-127	
110-54-3	n-Hexane	60.4	60.9	101	55-116	
67-66-3	Chloroform	43.4	45.6	105	70-109	
109-99-9	Tetrahydrofuran (THF)	72.1	75.5	105	72-113	
107-06-2	1,2-Dichloroethane	52.4	53.7	102	69-113	
71-55-6	1,1,1-Trichloroethane	38.8	41.1	106	72-115	
71-43-2	Benzene	66.5	69.9	105	65-107	
56-23-5	Carbon Tetrachloride	33.8	37.4	111	71-113	
110-82-7	Cyclohexane	124	135	109	71-115	
78-87-5	1,2-Dichloropropane	45.9	49.6	108	71-115	
75-27-4	Bromodichloromethane	31.9	35.1	110	75-118	
79-01-6	Trichloroethene	39.5	44.4	112	68-114	
123-91-1	1,4-Dioxane	59.1	66.7	113	81-131	
80-62-6	Methyl Methacrylate	104	122	117	72-130	
142-82-5	n-Heptane	51.9	55.9	108	68-116	
10061-01-5	cis-1,3-Dichloropropene	46.3	53.2	115	77-126	
108-10-1	4-Methyl-2-pentanone	51.9	59.4	114	69-126	
10061-02-6	trans-1,3-Dichloropropene	47.0	56.4	120	79-125	
79-00-5	1,1,2-Trichloroethane	38.9	42.8	110	75-119	
108-88-3	Toluene	56.2	60.9	108	59-118	
591-78-6	2-Hexanone	51.9	59.0	114	69-129	
124-48-1	Dibromochloromethane	25.0	28.9	116	74-136	
106-93-4	1,2-Dibromoethane	27.5	31.2	113	73-131	
123-86-4	n-Butyl Acetate	45.4	53.9	119	69-130	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 3 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Lab Control Sample

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1700718

ALS Sample ID: P170221-LCS

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 2/21/17

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	ALS Acceptance Limits	Data Qualifier
111-65-9	n-Octane	45.4	48.3	106	66-120	
127-18-4	Tetrachloroethene	31.4	34.6	110	65-130	
108-90-7	Chlorobenzene	46.1	50.6	110	68-120	
100-41-4	Ethylbenzene	48.7	53.1	109	68-122	
179601-23-1	m,p-Xylenes	97.7	107	110	68-123	
75-25-2	Bromoform	20.6	24.8	120	69-130	
100-42-5	Styrene	49.8	58.3	117	71-133	
95-47-6	o-Xylene	48.7	53.4	110	68-122	
111-84-2	n-Nonane	40.4	41.5	103	65-120	
79-34-5	1,1,2,2-Tetrachloroethane	30.9	33.9	110	69-130	
98-82-8	Cumene	43.2	47.6	110	70-123	
80-56-8	alpha-Pinene	38.2	44.0	115	70-128	
103-65-1	n-Propylbenzene	43.5	47.7	110	69-125	
622-96-8	4-Ethyltoluene	43.2	48.6	113	67-130	
108-67-8	1,3,5-Trimethylbenzene	43.2	47.4	110	67-124	
95-63-6	1,2,4-Trimethylbenzene	43.2	48.2	112	67-129	
100-44-7	Benzyl Chloride	41.0	53.0	129	79-138	
541-73-1	1,3-Dichlorobenzene	35.2	40.3	114	65-136	
106-46-7	1,4-Dichlorobenzene	35.5	40.7	115	66-141	
95-50-1	1,2-Dichlorobenzene	35.3	39.6	112	67-136	
5989-27-5	d-Limonene	38.1	45.2	119	71-134	
96-12-8	1,2-Dibromo-3-chloropropane	21.9	26.1	119	73-136	
120-82-1	1,2,4-Trichlorobenzene	28.6	33.3	116	64-134	
91-20-3	Naphthalene	40.8	50.7	124	62-136	
87-68-3	Hexachlorobutadiene	19.9	23.5	118	60-133	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Lab Control Sample

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1700718

ALS Sample ID: P170223-LCS

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 2/23/17

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	ALS Acceptance Limits	Data Qualifier
115-07-1	Propene	122	86.9	71	52-127	
75-71-8	Dichlorodifluoromethane (CFC 12)	42.5	32.7	77	68-109	
74-87-3	Chloromethane	102	77.5	76	51-130	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	30.2	23.0	76	66-114	
75-01-4	Vinyl Chloride	82.2	65.8	80	61-125	
106-99-0	1,3-Butadiene	95.0	89.0	94	62-144	
74-83-9	Bromomethane	54.1	47.7	88	73-123	
75-00-3	Chloroethane	79.5	65.1	82	69-122	
64-17-5	Ethanol	563	432	77	62-124	
75-05-8	Acetonitrile	127	96.6	76	57-114	
107-02-8	Acrolein	92.6	76.9	83	62-116	
67-64-1	Acetone	448	350	78	57-117	
75-69-4	Trichlorofluoromethane (CFC 11)	37.4	28.2	75	63-98	
67-63-0	2-Propanol (Isopropyl Alcohol)	173	141	82	66-121	
107-13-1	Acrylonitrile	98.0	81.2	83	68-123	
75-35-4	1,1-Dichloroethene	53.6	44.4	83	76-118	
75-09-2	Methylene Chloride	61.2	48.0	78	60-118	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	67.8	57.0	84	65-126	
76-13-1	Trichlorotrifluoroethane (CFC 113)	27.6	23.0	83	73-114	
75-15-0	Carbon Disulfide	68.6	56.2	82	57-102	
156-60-5	trans-1,2-Dichloroethene	53.8	44.4	83	74-123	
75-34-3	1,1-Dichloroethane	52.5	40.2	77	69-111	
1634-04-4	Methyl tert-Butyl Ether	59.0	45.9	78	69-113	
108-05-4	Vinyl Acetate	301	294	98	76-128	
78-93-3	2-Butanone (MEK)	72.0	56.4	78	63-127	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 2 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Lab Control Sample

ALS Project ID: P1700718

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Sample ID: P170223-LCS

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: NA

Analyst: Lusine Hakobyan

Date Analyzed: 2/23/17

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 0.125 Liter(s)

Test Notes:

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	ALS Acceptance Limits	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	53.4	41.3	77	72-117	
141-78-6	Ethyl Acetate	118	95.8	81	68-127	
110-54-3	n-Hexane	60.4	44.2	73	55-116	
67-66-3	Chloroform	43.4	33.0	76	70-109	
109-99-9	Tetrahydrofuran (THF)	72.1	53.1	74	72-113	
107-06-2	1,2-Dichloroethane	52.4	38.3	73	69-113	
71-55-6	1,1,1-Trichloroethane	38.8	29.7	77	72-115	
71-43-2	Benzene	66.5	51.1	77	65-107	
56-23-5	Carbon Tetrachloride	33.8	27.0	80	71-113	
110-82-7	Cyclohexane	124	98.5	79	71-115	
78-87-5	1,2-Dichloropropane	45.9	35.6	78	71-115	
75-27-4	Bromodichloromethane	31.9	25.2	79	75-118	
79-01-6	Trichloroethene	39.5	32.7	83	68-114	
123-91-1	1,4-Dioxane	59.1	48.1	81	81-131	
80-62-6	Methyl Methacrylate	104	89.8	86	72-130	
142-82-5	n-Heptane	51.9	40.7	78	68-116	
10061-01-5	cis-1,3-Dichloropropene	46.3	38.1	82	77-126	
108-10-1	4-Methyl-2-pentanone	51.9	42.1	81	69-126	
10061-02-6	trans-1,3-Dichloropropene	47.0	40.7	87	79-125	
79-00-5	1,1,2-Trichloroethane	38.9	31.4	81	75-119	
108-88-3	Toluene	56.2	48.2	86	59-118	
591-78-6	2-Hexanone	51.9	44.1	85	69-129	
124-48-1	Dibromochloromethane	25.0	22.8	91	74-136	
106-93-4	1,2-Dibromoethane	27.5	24.8	90	73-131	
123-86-4	n-Butyl Acetate	45.4	40.6	89	69-130	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 3 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Lab Control Sample

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1700718

ALS Sample ID: P170223-LCS

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 2/23/17

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	ALS Acceptance Limits	Data Qualifier
111-65-9	n-Octane	45.4	38.1	84	66-120	
127-18-4	Tetrachloroethene	31.4	27.9	89	65-130	
108-90-7	Chlorobenzene	46.1	40.3	87	68-120	
100-41-4	Ethylbenzene	48.7	41.9	86	68-122	
179601-23-1	m,p-Xylenes	97.7	84.1	86	68-123	
75-25-2	Bromoform	20.6	19.6	95	69-130	
100-42-5	Styrene	49.8	46.2	93	71-133	
95-47-6	o-Xylene	48.7	42.2	87	68-122	
111-84-2	n-Nonane	40.4	32.1	79	65-120	
79-34-5	1,1,2,2-Tetrachloroethane	30.9	26.7	86	69-130	
98-82-8	Cumene	43.2	37.6	87	70-123	
80-56-8	alpha-Pinene	38.2	34.8	91	70-128	
103-65-1	n-Propylbenzene	43.5	37.7	87	69-125	
622-96-8	4-Ethyltoluene	43.2	39.4	91	67-130	
108-67-8	1,3,5-Trimethylbenzene	43.2	37.6	87	67-124	
95-63-6	1,2,4-Trimethylbenzene	43.2	37.8	88	67-129	
100-44-7	Benzyl Chloride	41.0	41.3	101	79-138	
541-73-1	1,3-Dichlorobenzene	35.2	32.0	91	65-136	
106-46-7	1,4-Dichlorobenzene	35.5	32.5	92	66-141	
95-50-1	1,2-Dichlorobenzene	35.3	31.4	89	67-136	
5989-27-5	d-Limonene	38.1	35.1	92	71-134	
96-12-8	1,2-Dibromo-3-chloropropane	21.9	20.5	94	73-136	
120-82-1	1,2,4-Trichlorobenzene	28.6	26.2	92	64-134	
91-20-3	Naphthalene	40.8	39.0	96	62-136	
87-68-3	Hexachlorobutadiene	19.9	18.7	94	60-133	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: HDR Environmental, Operations & Construction, InALS Project ID: P1700718
Client Project ID: DDMT SVE / 10031560-282846-005

Internal Standard Area and RT Summary

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13 Lab File ID: 02211701.D
Analyst: Lusine Hakobyan Date Analyzed: 2/21/17
Sample Type: 6.0 L Summa Canister(s) Time Analyzed: 05:12
Test Notes:

	IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
	AREA	#	RT	#	AREA	#
24 Hour Standard	117628	11.17	569838	13.29	241687	17.61
Upper Limit	164679	11.50	797773	13.62	338362	17.94
Lower Limit	70577	10.84	341903	12.96	145012	17.28

Client Sample ID		IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
		AREA	#	RT	#	AREA	#
01	Method Blank	107219	11.16	522600	13.29	220315	17.61
02	Lab Control Sample	122897	11.17	593776	13.30	253936	17.61
03	ODSVE-EFF-Y6Q3	72754	11.16	360358	13.29	159695	17.61
04							
05							
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

IS1 (BCM) = Bromochloromethane

IS2 (DFB) = 1,4-Difluorobenzene

IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = 140% of internal standard area

AREA LOWER LIMIT = 60% of internal standard area

RT UPPER LIMIT = 0.33 minutes of internal standard RT

RT LOWER LIMIT = 0.33 minutes of internal standard RT

Column used to flag values outside QC limits with an I.

I = Internal standard not within the specified limits.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: HDR Environmental, Operations & Construction, InALS Project ID: P1700718
Client Project ID: DDMT SVE / 10031560-282846-005

Internal Standard Area and RT Summary

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13 Lab File ID: 02231701.D
Analyst: Lusine Hakobyan Date Analyzed: 2/23/17
Sample Type: 6.0 L Summa Canister(s) Time Analyzed: 05:10
Test Notes:

	IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
	AREA	# RT	AREA	# RT	AREA	# RT
24 Hour Standard	145267	11.17	704460	13.29	276451	17.61
Upper Limit	203374	11.50	986244	13.62	387031	17.94
Lower Limit	87160	10.84	422676	12.96	165871	17.28

Client Sample ID		IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
		AREA	# RT	AREA	# RT	AREA	# RT
01	Method Blank	140281	11.15	684295	13.29	269355	17.61
02	Lab Control Sample	149889	11.17	727238	13.29	287651	17.61
03	ODSVE-EFF-Y6Q3 (Dilution)	147724	11.15	712714	13.28	281485	17.61
04							
05							
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

IS1 (BCM) = Bromochloromethane

IS2 (DFB) = 1,4-Difluorobenzene

IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = 140% of internal standard area

AREA LOWER LIMIT = 60% of internal standard area

RT UPPER LIMIT = 0.33 minutes of internal standard RT

RT LOWER LIMIT = 0.33 minutes of internal standard RT

Column used to flag values outside QC limits with an I.

I = Internal standard not within the specified limits.

Data File : I:\MS13\DATA\2017 02\21\02211722.D
 Acq On : 21 Feb 2017 23:57
 Sample : P1700718-001 (1000ml)
 Misc : S29-01311701

Vial: 14
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 24 10:45:43 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 11:57:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

CL 2/24/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.16	130	72754	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.29	114	360358	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.61	82	159695	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.01	65	130159	13.795	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	110.40%
57) Toluene-d8 (SS2)	15.74	98	373485	12.141	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.12%
73) Bromofluorobenzene (SS3)	19.06	174	149115	12.517	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.16%

Target Compounds

						Qvalue
2) Propene	4.11	42	5537m	0.590	ng	
3) Dichlorodifluoromethan...	4.26	85	156040	10.065	ng	99
4) Chloromethane	4.56	50	394	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	4.82	135	873	0.101	ng	95
6) Vinyl Chloride	4.98	62	2457	0.225	ng	98
7) 1,3-Butadiene	5.32	54	343	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.35	45	2433	0.442	ng	85
11) Acetonitrile	6.64	41	1042	N.D.		
12) Acrolein	6.83	56	1201	0.278	ng	95
13) Acetone	7.03	58	33455	6.097	ng	# 4
14) Trichlorofluoromethane	7.26	101	26787	1.905	ng	98
15) 2-Propanol (Isopropanol)	7.52	45	5027	0.267	ng	88
16) Acrylonitrile	0.00	53	0	N.D.	d	
17) 1,1-Dichloroethene	8.22	96	30913	4.343	ng	96
18) 2-Methyl-2-Propanol (t...	8.42	59	1046	N.D.		
19) Methylene Chloride	8.43	84	1658	0.215	ng	99
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.	d	
21) Trichlorotrifluoroethane	8.86	151	179606	24.467	ng	99
22) Carbon Disulfide	8.72	76	142958	5.302	ng	98
23) trans-1,2-Dichloroethene	9.72	61	14777	1.396	ng	98
24) 1,1-Dichloroethane	9.96	63	31384	2.227	ng	99
25) Methyl tert-Butyl Ether	10.12	73	2008	N.D.		
26) Vinyl Acetate	10.19	86	2644	1.721	ng	# 58
27) 2-Butanone (MEK)	10.48	72	9440	1.757	ng	93
28) cis-1,2-Dichloroethene	10.98	61	956896	89.287	ng	99
29) Diisopropyl Ether	0.00	87	0	N.D.	d	
30) Ethyl Acetate	0.00	61	0	N.D.	d	
31) n-Hexane	11.28	57	3562	0.268	ng	# 31
32) Chloroform	11.32	83	332517	24.282	ng	99
34) Tetrahydrofuran (THF)	11.78	72	377	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.13	62	512	N.D.		
38) 1,1,1-Trichloroethane	12.42	97	40085	3.168	ng	99
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	12.90	78	7848	0.247	ng	99
42) Carbon Tetrachloride	13.06	117	28527	2.555	ng	99
43) Cyclohexane	13.19	84	4385	0.367	ng	97
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	13.93	83	8335	0.774	ng	99
47) Trichloroethene	13.99	130	1208862	137.840	ng	99
48) 1,4-Dioxane	13.98	88	113	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d	
50) Methyl Methacrylate	0.00	100	0	N.D.	d	

Data File : I:\MS13\DATA\2017 02\21\02211722.D
 Acq On : 21 Feb 2017 23:57
 Sample : P1700718-001 (1000ml)
 Misc : S29-01311701

Vial: 14
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 24 10:45:43 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 11:57:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

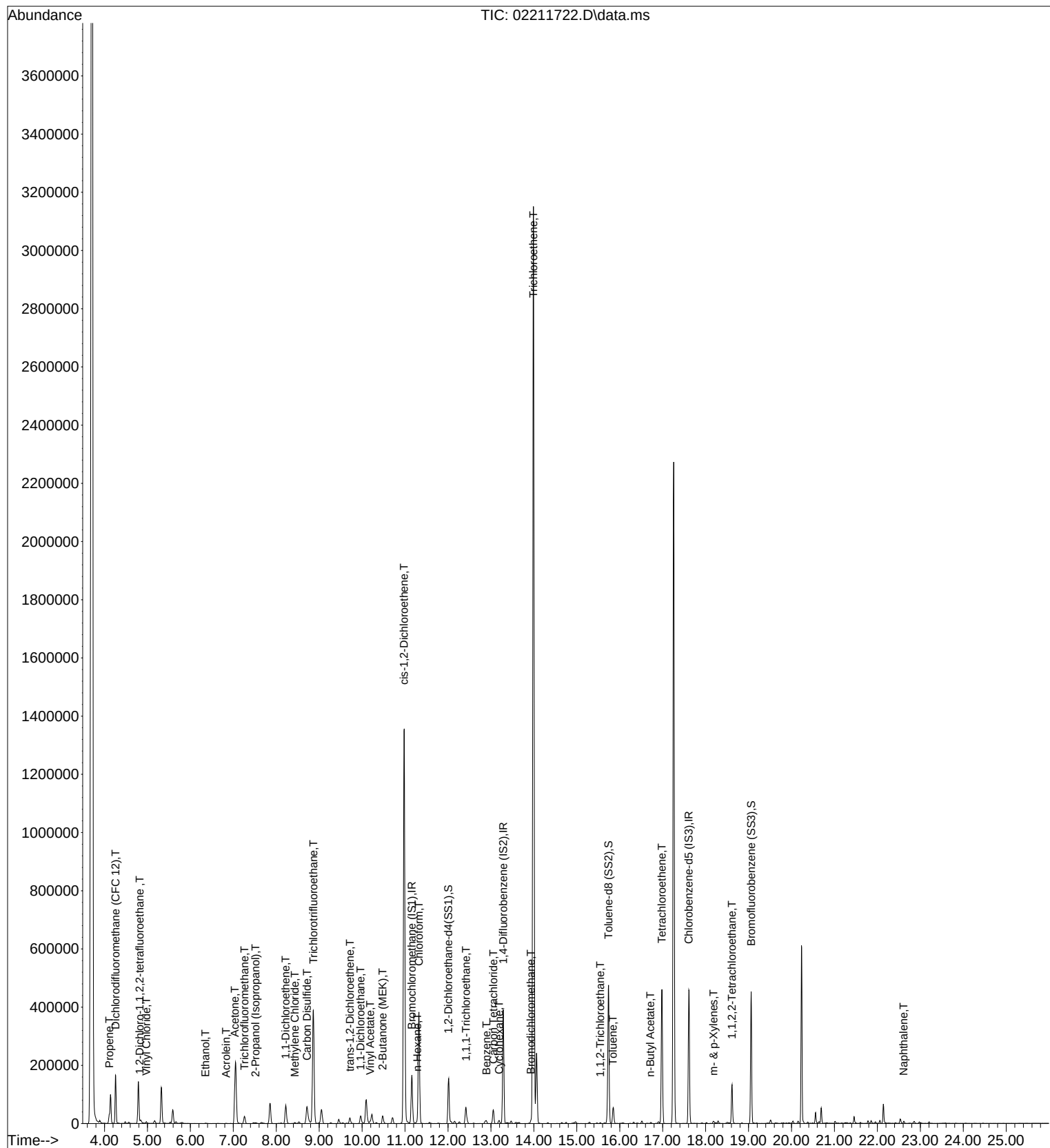
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.33	71	353	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	14.90	58	366	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	15.55	97	1188	0.156	ng	98
58) Toluene	15.84	91	12175	0.366	ng	96
59) 2-Hexanone	16.09	43	1402	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.71	43	2031	0.104	ng	# 66
63) n-Octane	16.83	57	116	N.D.		
64) Tetrachloroethene	16.98	166	165737	16.578	ng	100
65) Chlorobenzene	17.65	112	399	N.D.		
66) Ethylbenzene	18.02	91	2951	N.D.		
67) m- & p-Xylenes	18.19	91	6634	0.228	ng	99
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.53	104	1065	N.D.		
70) o-Xylene	18.64	91	2182	N.D.		
71) n-Nonane	18.85	43	969	N.D.		
72) 1,1,2,2-Tetrachloroethane	18.61	83	71365	5.179	ng	99
74) Cumene	19.20	105	1242	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	19.68	91	586	N.D.		
77) 3-Ethyltoluene	19.77	105	1157	N.D.		
78) 4-Ethyltoluene	19.81	105	778	N.D.		
79) 1,3,5-Trimethylbenzene	19.88	105	460	N.D.		
80) alpha-Methylstyrene	0.00	118	0	N.D.	d	
81) 2-Ethyltoluene	20.07	105	540	N.D.		
82) 1,2,4-Trimethylbenzene	20.28	105	2709	N.D.		
83) n-Decane	0.00	57	0	N.D.	d	
84) Benzyl Chloride	20.28	91	289	N.D.		
85) 1,3-Dichlorobenzene	20.42	146	161	N.D.		
86) 1,4-Dichlorobenzene	20.50	146	954	N.D.		
87) sec-Butylbenzene	20.69	105	1947	N.D.		
88) 4-Isopropyltoluene (p-...	0.00	119	0	N.D.	d	
89) 1,2,3-Trimethylbenzene	20.69	105	1947	N.D.		
90) 1,2-Dichlorobenzene	20.83	146	113	N.D.		
91) d-Limonene	20.84	68	133	N.D.		
92) 1,2-Dibromo-3-Chloropr...	21.38	157	175	N.D.		
93) n-Undecane	21.60	57	1276	N.D.		
94) 1,2,4-Trichlorobenzene	22.50	180	142	N.D.		
95) Naphthalene	22.61	128	4380	0.121	ng	98
96) n-Dodecane	22.62	57	957	N.D.		
97) Hexachlorobutadiene	22.95	225	223	N.D.		
98) Cyclohexanone	18.34	55	522	N.D.		
99) tert-Butylbenzene	0.00	119	0	N.D.	d	
100) n-Butylbenzene	21.09	91	937	N.D.		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2017 02\21\02211722.D
Acq On : 21 Feb 2017 23:57
Sample : P1700718-001 (1000ml)
Misc : S29-01311701

Vial: 14
Operator: LH/AMF
Inst : MS13

Quant Time: Feb 24 10:45:43 2017
Quant Method : I:\MS13\METHODS\R13022017.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Feb 21 11:57:41 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2017 02\21\02211722.D
 Acq On : 21 Feb 2017 23:57
 Sample : P1700718-001 (1000ml)
 Misc : S29-01311701

Vial: 14
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 24 10:45:43 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 11:57:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

CL 2/24/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	11.16	130	72754	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.29	114	360358	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.61	82	159695	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.01	65	130159	13.795	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	110.40%
57) Toluene-d8 (SS2)	15.74	98	373485	12.141	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.12%
73) Bromofluorobenzene (SS3)	19.06	174	149115	12.517	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.16%

Target Compounds

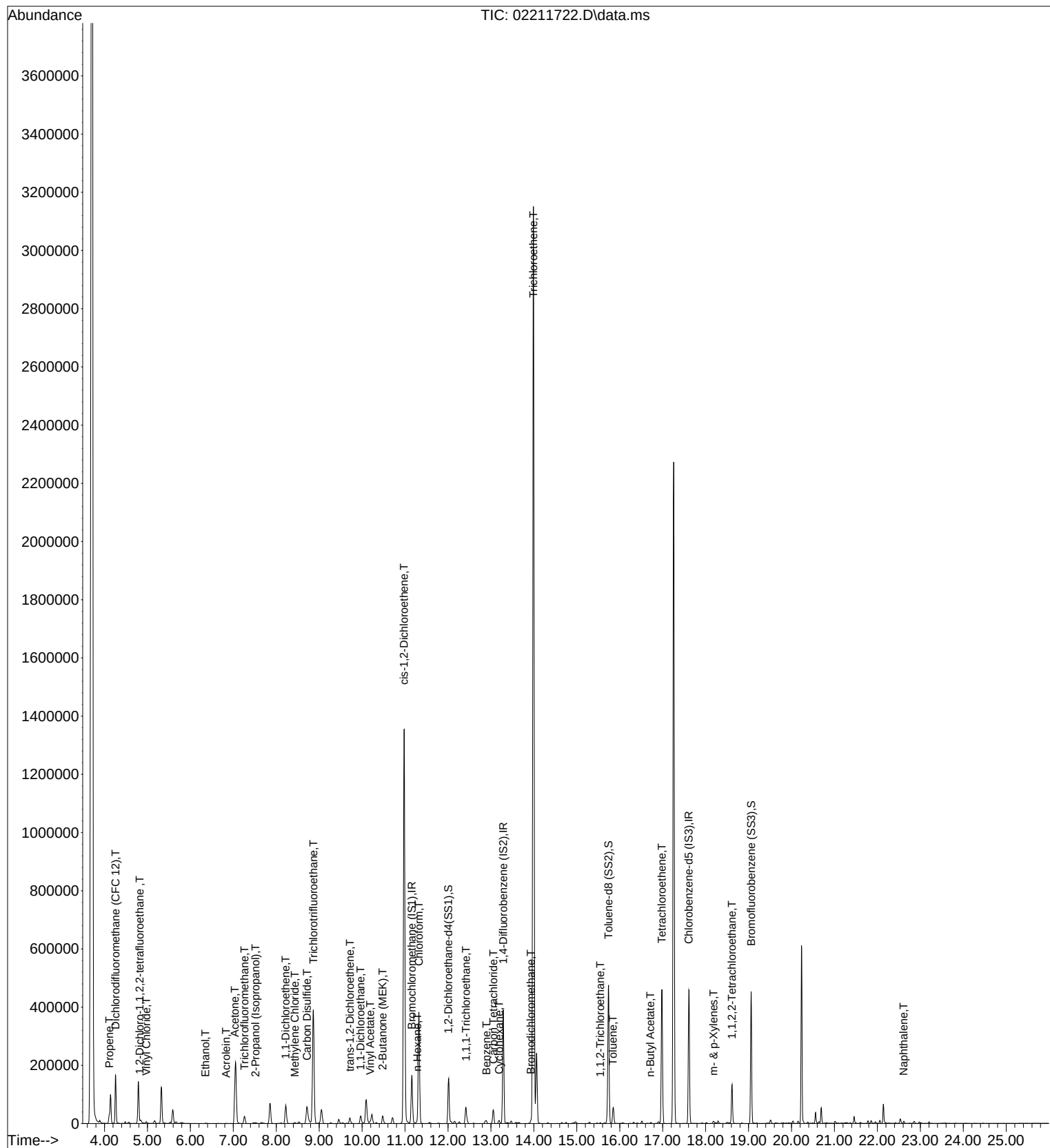
						Qvalue
2) Propene	4.11	42	5537m	0.590	ng	
3) Dichlorodifluoromethan...	4.26	85	156040	10.065	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.82	135	873	0.101	ng	95
6) Vinyl Chloride	4.98	62	2457	0.225	ng	98
10) Ethanol	6.35	45	2433	0.442	ng	85
12) Acrolein	6.83	56	1201	0.278	ng	95
13) Acetone	7.03	58	33455	6.097	ng	# 4
14) Trichlorofluoromethane	7.26	101	26787	1.905	ng	98
15) 2-Propanol (Isopropanol)	7.52	45	5027	0.267	ng	88
17) 1,1-Dichloroethene	8.22	96	30913	4.343	ng	96
19) Methylene Chloride	8.43	84	1658	0.215	ng	99
21) Trichlorotrifluoroethane	8.86	151	179606	24.467	ng	99
22) Carbon Disulfide	8.72	76	142958	5.302	ng	98
23) trans-1,2-Dichloroethene	9.72	61	14777	1.396	ng	98
24) 1,1-Dichloroethane	9.96	63	31384	2.227	ng	99
26) Vinyl Acetate	10.19	86	2644	1.721	ng	# 58
27) 2-Butanone (MEK)	10.48	72	9440	1.757	ng	93
28) cis-1,2-Dichloroethene	10.98	61	956896	89.287	ng	99
31) n-Hexane	11.28	57	3562	0.268	ng	# 31
32) Chloroform	11.32	83	332517	24.282	ng	99
38) 1,1,1-Trichloroethane	12.42	97	40085	3.168	ng	99
41) Benzene	12.90	78	7848	0.247	ng	99
42) Carbon Tetrachloride	13.06	117	28527	2.555	ng	99
43) Cyclohexane	13.19	84	4385	0.367	ng	97
46) Bromodichloromethane	13.93	83	8335	0.774	ng	99
47) Trichloroethene	13.99	130	1208862	137.840	ng	99
55) 1,1,2-Trichloroethane	15.55	97	1188	0.156	ng	98
58) Toluene	15.84	91	12175	0.366	ng	96
62) n-Butyl Acetate	16.71	43	2031	0.104	ng	# 66
64) Tetrachloroethene	16.98	166	165737	16.578	ng	100
67) m- & p-Xylenes	18.19	91	6634	0.228	ng	99
72) 1,1,2,2-Tetrachloroethane	18.61	83	71365	5.179	ng	99
95) Naphthalene	22.61	128	4380	0.121	ng	98

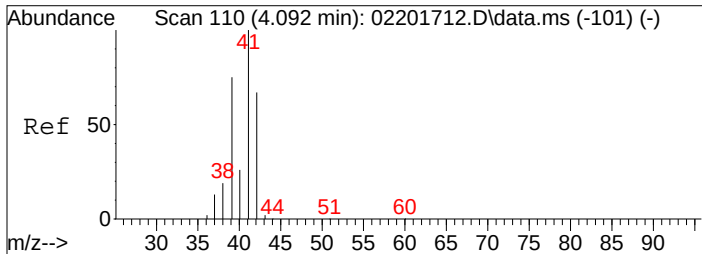
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2017 02\21\02211722.D
Acq On : 21 Feb 2017 23:57
Sample : P1700718-001 (1000ml)
Misc : S29-01311701

Vial: 14
Operator: LH/AMF
Inst : MS13

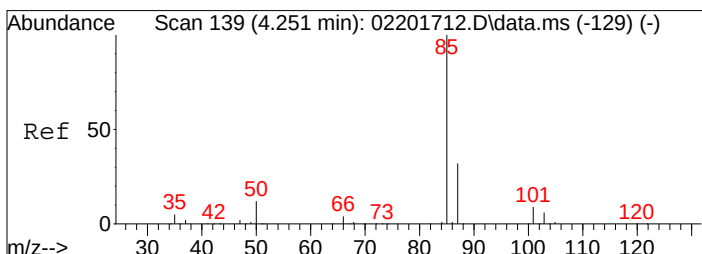
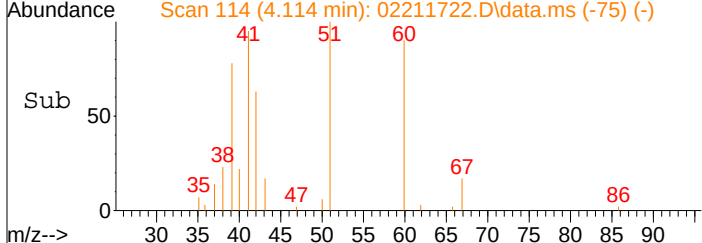
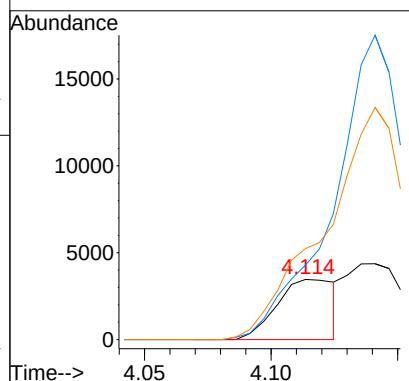
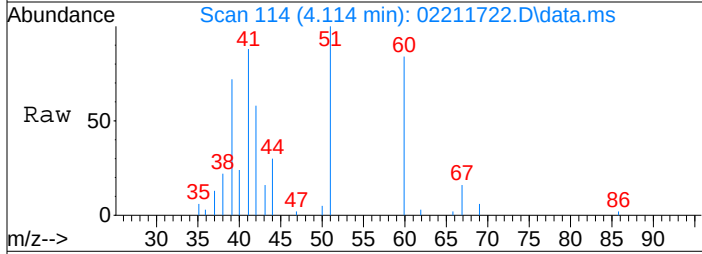
Quant Time: Feb 24 10:45:43 2017
Quant Method : I:\MS13\METHODS\R13022017.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Feb 21 11:57:41 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M





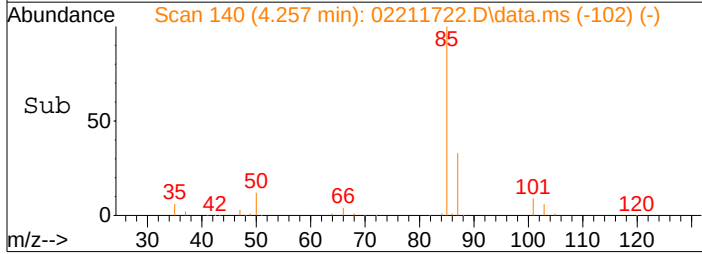
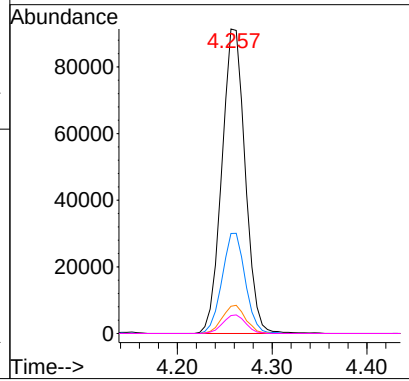
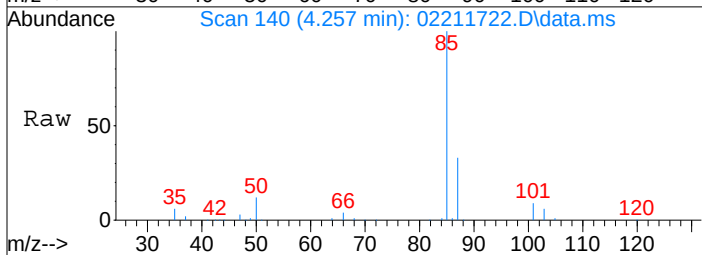
#2
 Propene
 Concen: 0.59 ng m
 RT: 4.11 min Scan# 114
 Delta R.T. -0.033 min
 Lab File: 02211722.D
 Acq: 21 Feb 2017 23:57

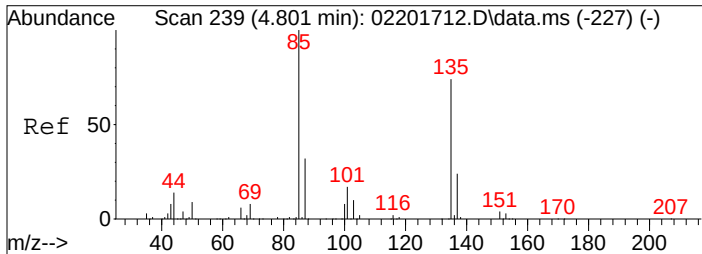
Tgt Ion:	42	Resp:	5537
Ion Ratio	Lower	Upper	
42	100		
39	627.6	91.8	131.8#
41	539.2	129.8	169.8#



#3
 Dichlorodifluoromethane (CFC 12)
 Concen: 10.06 ng
 RT: 4.26 min Scan# 140
 Delta R.T. -0.038 min
 Lab File: 02211722.D
 Acq: 21 Feb 2017 23:57

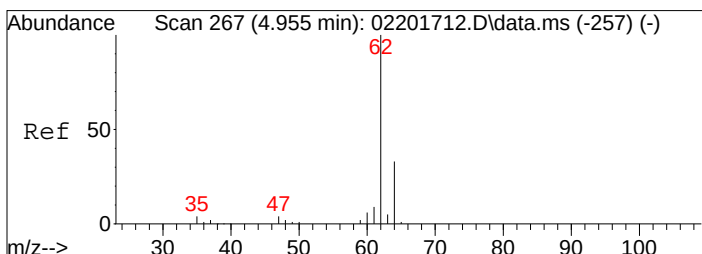
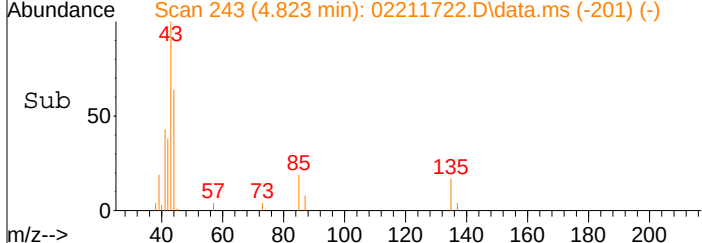
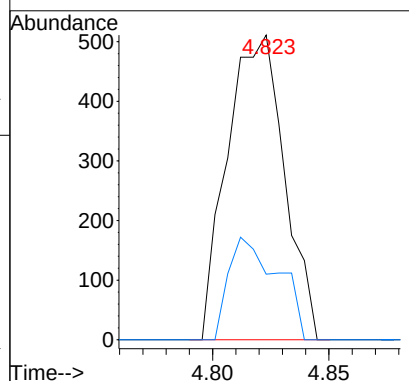
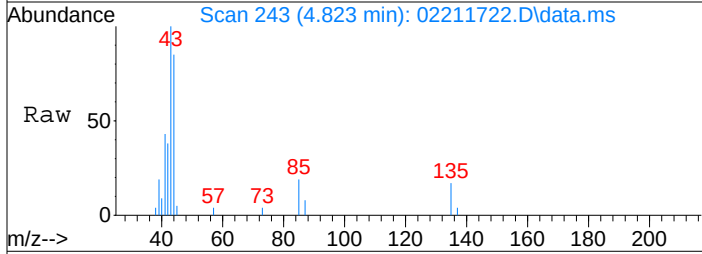
Tgt Ion:	85	Resp:	156040
Ion Ratio	Lower	Upper	
85	100		
87	32.7	12.3	52.3
101	9.2	0.0	29.1
103	6.0	0.0	26.0





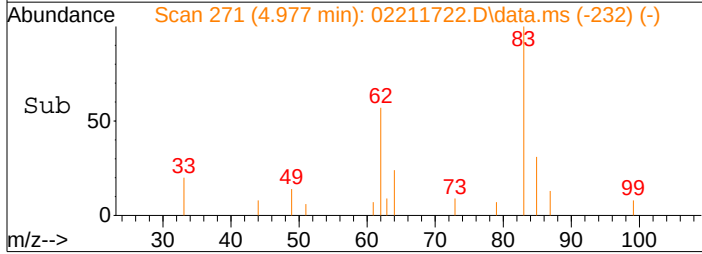
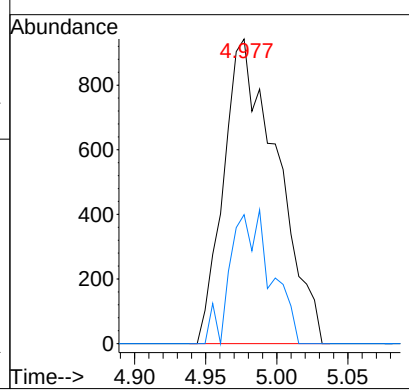
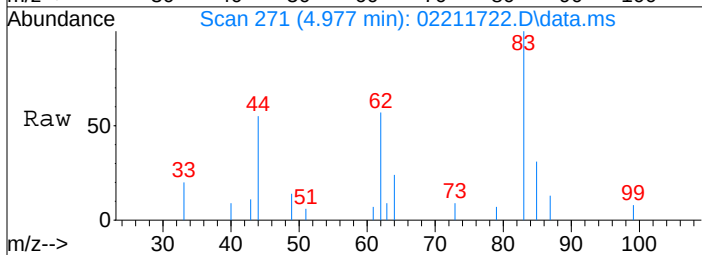
#5
 1,2-Dichloro-1,1,2,2-tetrafluoroethane
 Concen: 0.10 ng
 RT: 4.82 min Scan# 243
 Delta R.T. -0.017 min
 Lab File: 02211722.D
 Acq: 21 Feb 2017 23:57

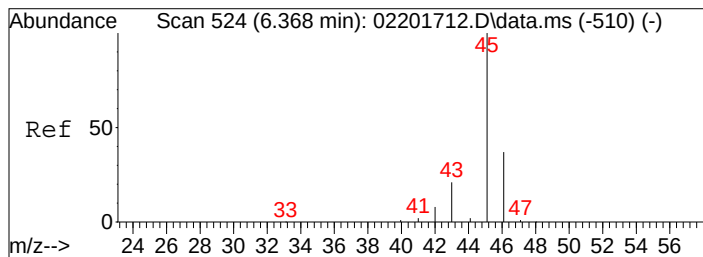
Tgt Ion: 135	Resp: 873
Ion Ratio	Lower Upper
135	100
137	29.1 11.9 51.9



#6
 Vinyl Chloride
 Concen: 0.22 ng
 RT: 4.98 min Scan# 271
 Delta R.T. -0.033 min
 Lab File: 02211722.D
 Acq: 21 Feb 2017 23:57

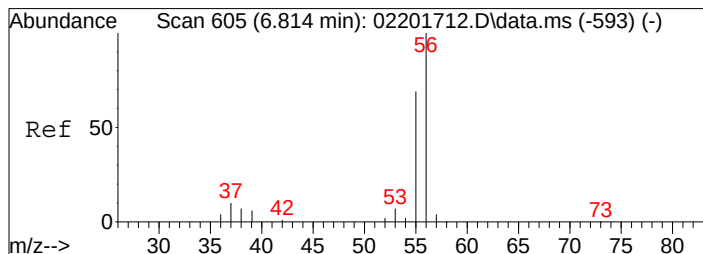
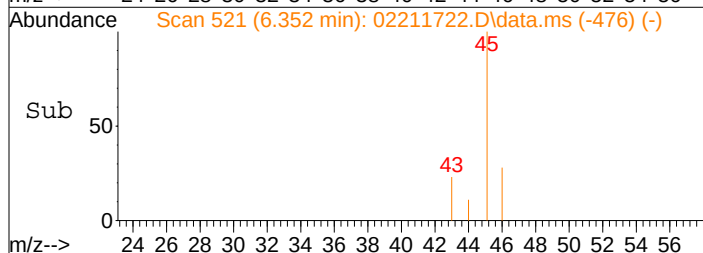
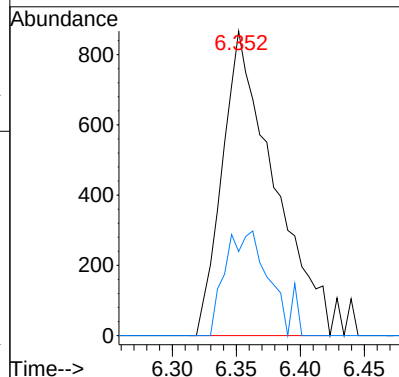
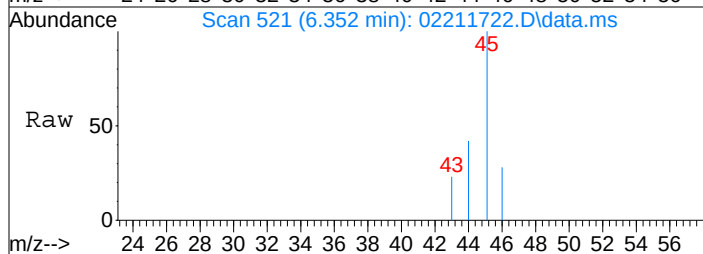
Tgt Ion: 62	Resp: 2457
Ion Ratio	Lower Upper
62	100
64	33.3 12.0 52.0





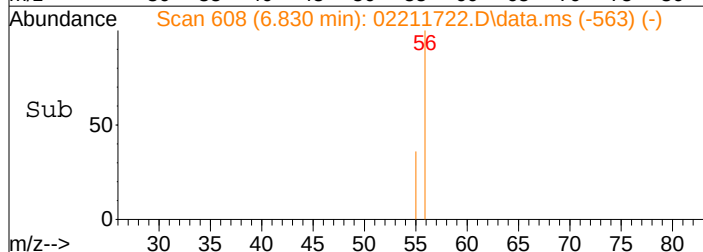
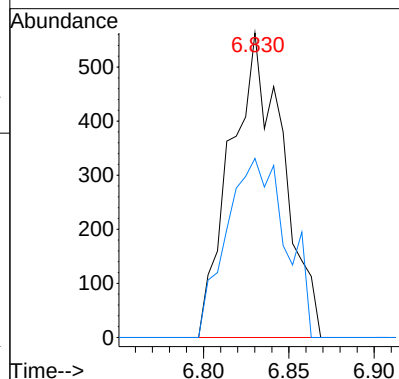
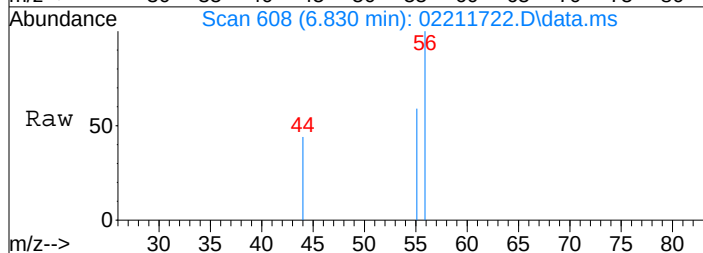
#10
Ethanol
Concen: 0.44 ng
RT: 6.35 min Scan# 521
Delta R.T. -0.000 min
Lab File: 02211722.D
Acq: 21 Feb 2017 23:57

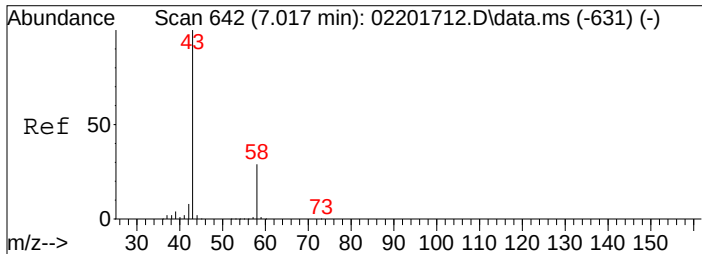
Tgt Ion: 45 Resp: 2433
Ion Ratio Lower Upper
45 100
46 27.9 17.0 57.0



#12
Acrolein
Concen: 0.28 ng
RT: 6.83 min Scan# 608
Delta R.T. 0.000 min
Lab File: 02211722.D
Acq: 21 Feb 2017 23:57

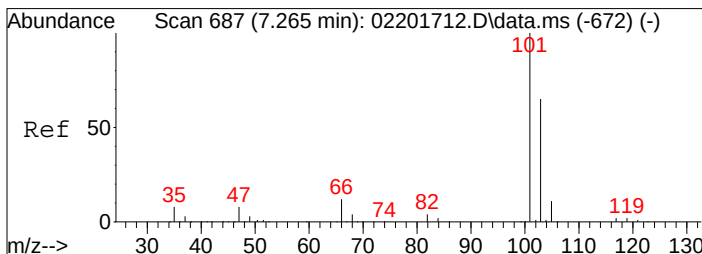
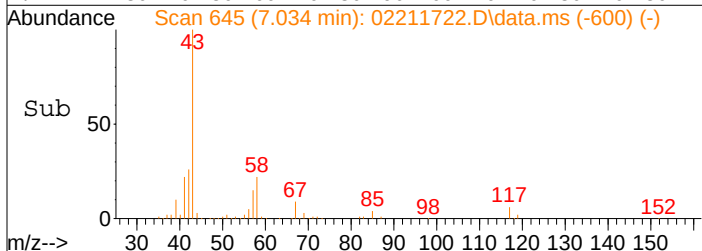
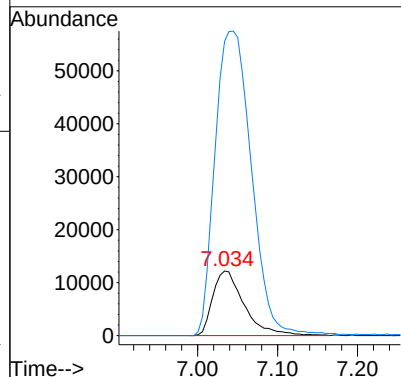
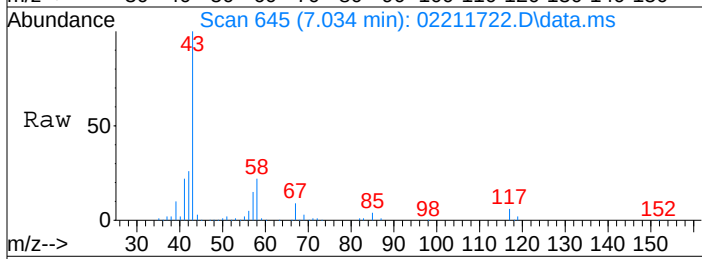
Tgt Ion: 56 Resp: 1201
Ion Ratio Lower Upper
56 100
55 66.7 50.8 90.8





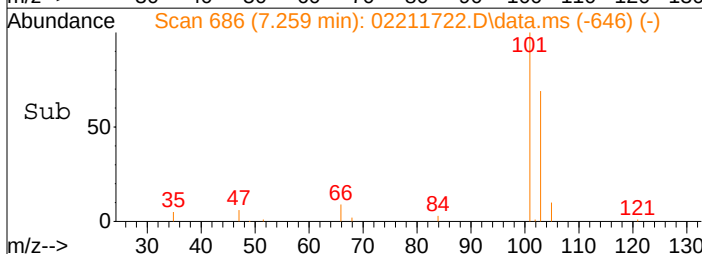
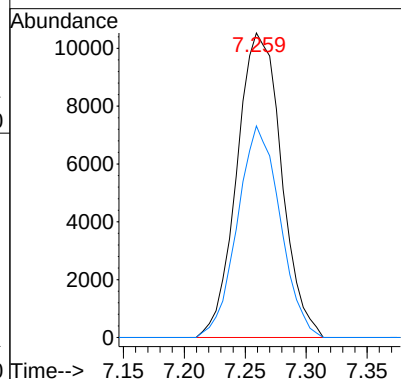
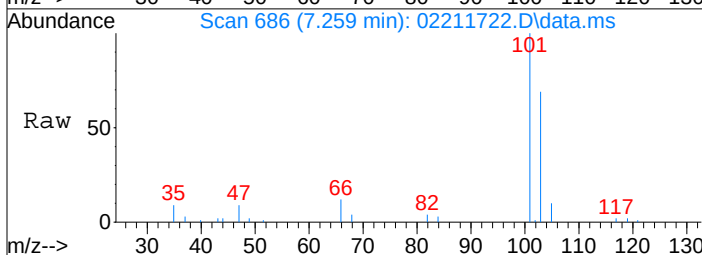
#13
Acetone
Concen: 6.10 ng
RT: 7.03 min Scan# 645
Delta R.T. -0.000 min
Lab File: 02211722.D
Acq: 21 Feb 2017 23:57

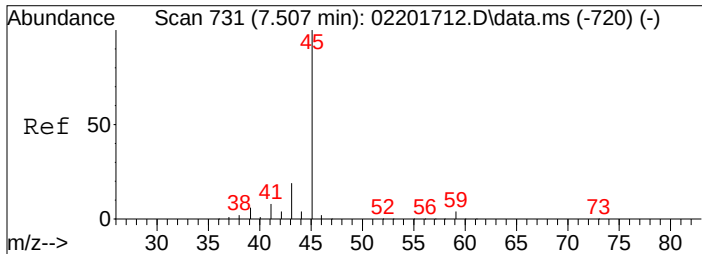
Tgt Ion	Ratio	Lower	Upper
58	100		
43	546.3	311.5	371.5#



#14
Trichlorofluoromethane
Concen: 1.90 ng
RT: 7.26 min Scan# 686
Delta R.T. -0.028 min
Lab File: 02211722.D
Acq: 21 Feb 2017 23:57

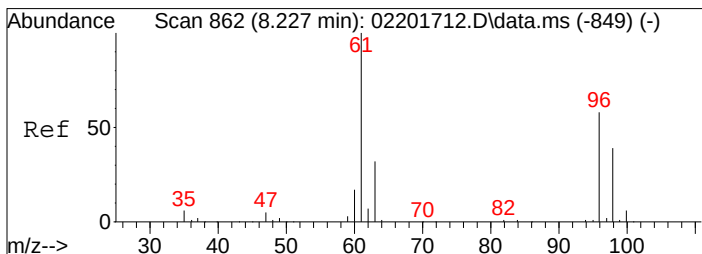
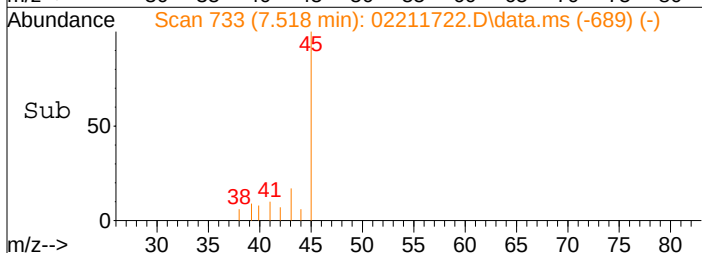
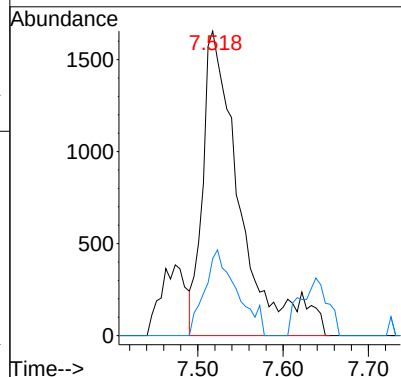
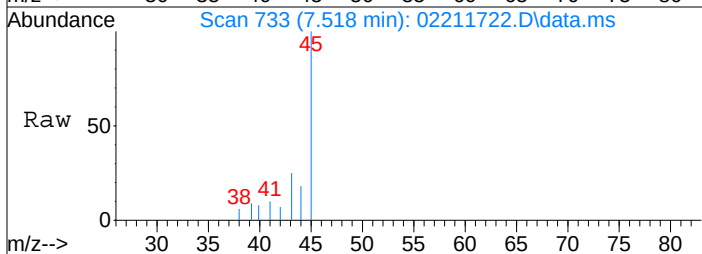
Tgt Ion	Ratio	Lower	Upper
101	100		
103	66.7	44.9	84.9





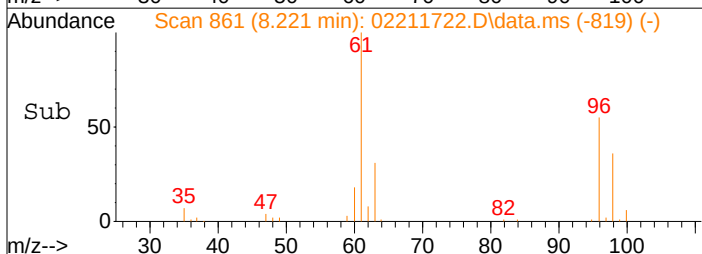
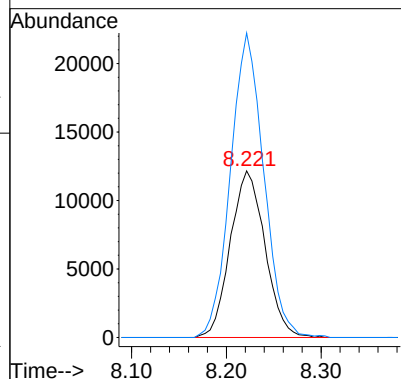
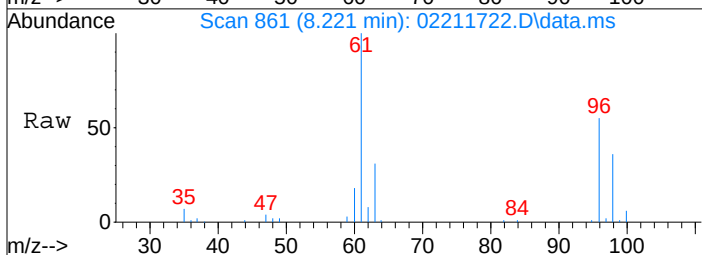
#15
2-Propanol (Isopropanol)
Concen: 0.27 ng
RT: 7.52 min Scan# 733
Delta R.T. -0.005 min
Lab File: 02211722.D
Acq: 21 Feb 2017 23:57

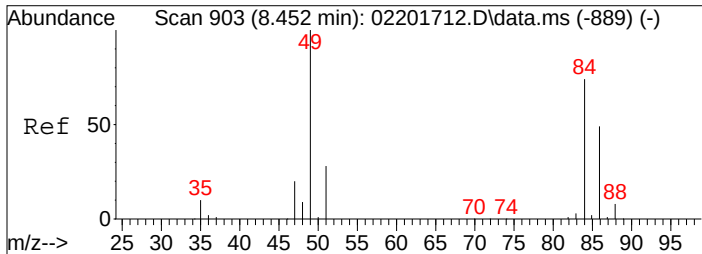
Tgt Ion	Ratio	Lower	Upper
45	100		
43	24.3	0.0	39.0



#17
1,1-Dichloroethene
Concen: 4.34 ng
RT: 8.22 min Scan# 861
Delta R.T. -0.017 min
Lab File: 02211722.D
Acq: 21 Feb 2017 23:57

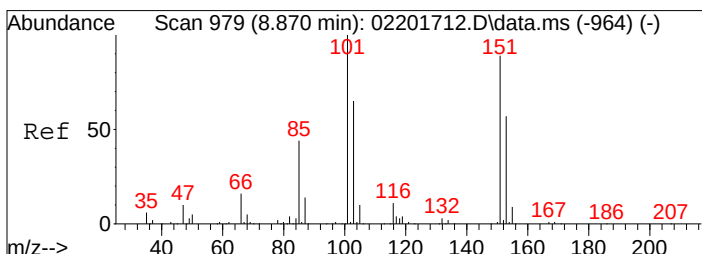
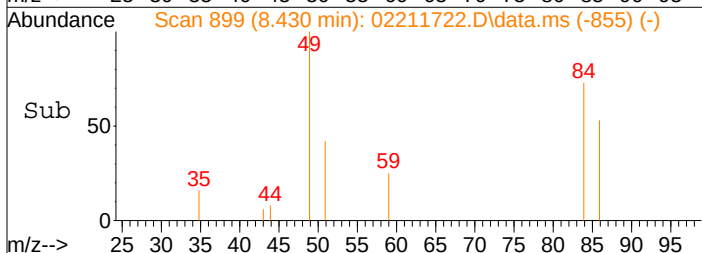
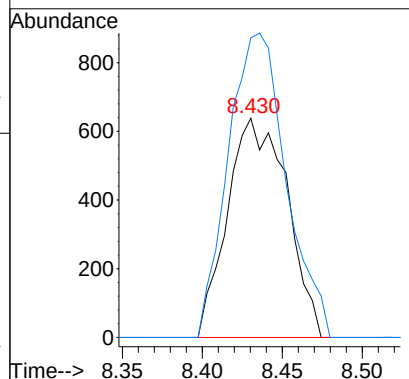
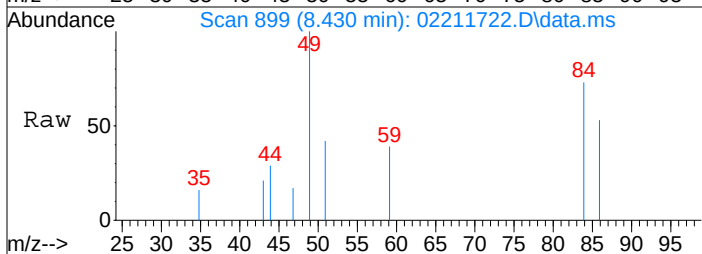
Tgt Ion	Ratio	Lower	Upper
96	100		
61	175.2	149.9	189.9





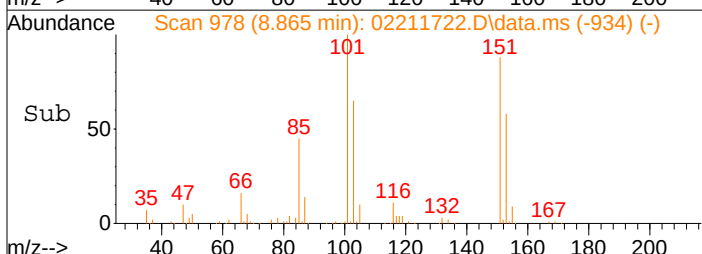
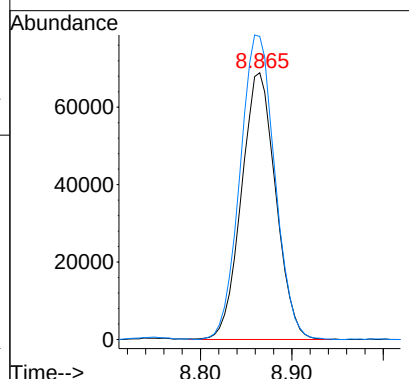
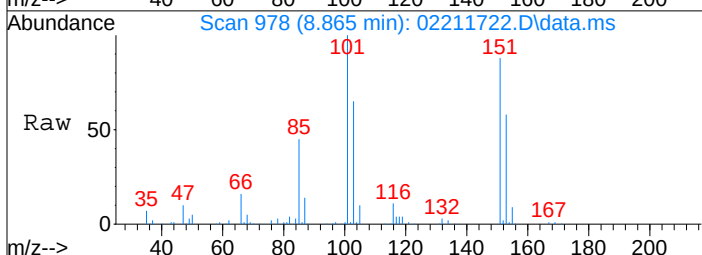
#19
Methylene Chloride
Concen: 0.22 ng
RT: 8.43 min Scan# 899
Delta R.T. -0.006 min
Lab File: 02211722.D
Acq: 21 Feb 2017 23:57

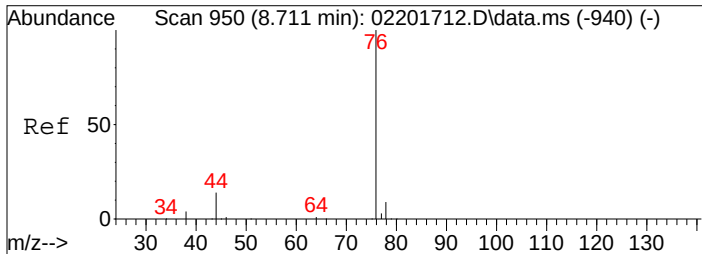
Tgt Ion	84	Resp	1658
Ion Ratio	Lower	Upper	
84	100		
49	135.1	108.4	158.4



#21
Trichlorotrifluoroethane
Concen: 24.47 ng
RT: 8.86 min Scan# 978
Delta R.T. -0.006 min
Lab File: 02211722.D
Acq: 21 Feb 2017 23:57

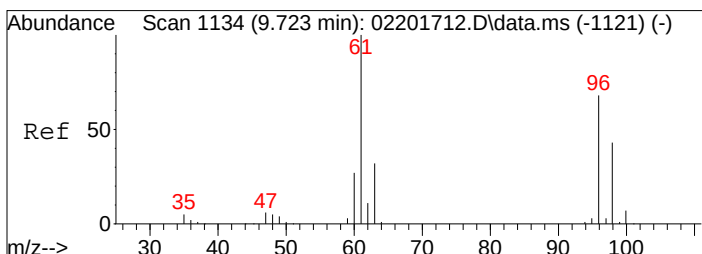
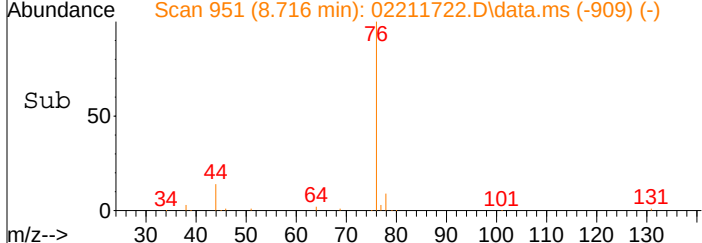
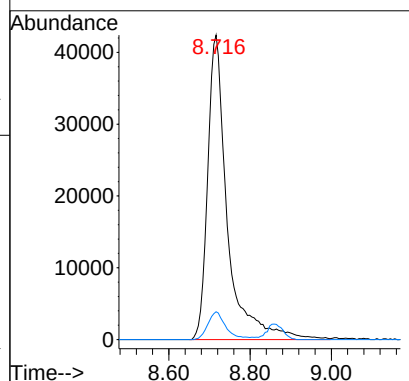
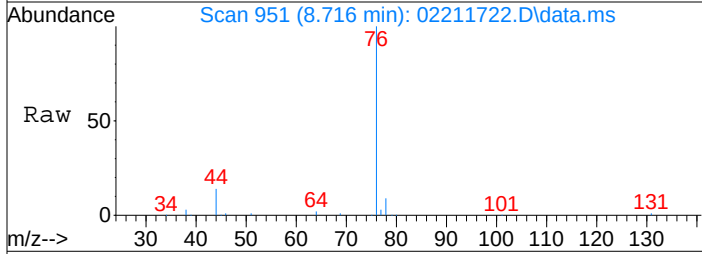
Tgt Ion	151	Resp	179606
Ion Ratio	Lower	Upper	
151	100		
101	116.0	95.1	135.1





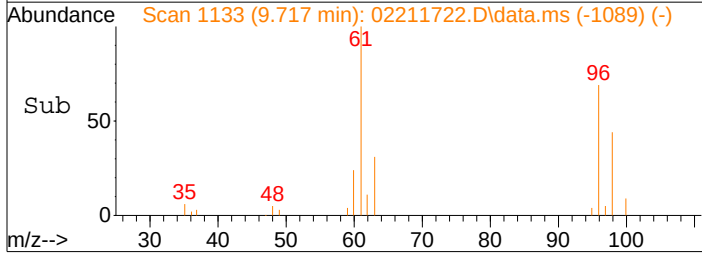
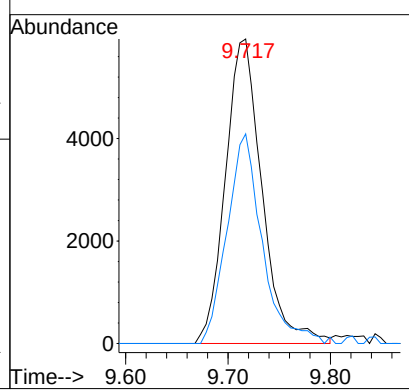
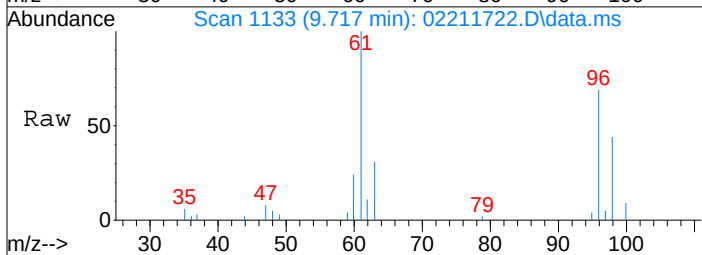
#22
Carbon Disulfide
Concen: 5.30 ng
RT: 8.72 min Scan# 951
Delta R.T. -0.022 min
Lab File: 02211722.D
Acq: 21 Feb 2017 23:57

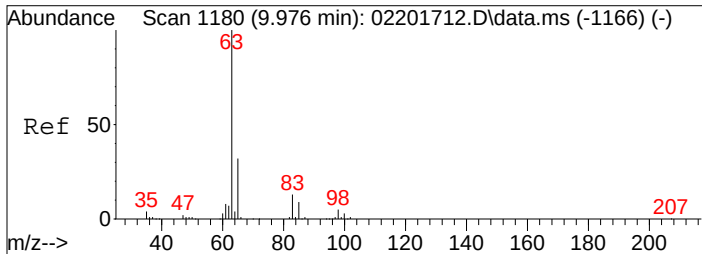
Tgt Ion:	76	Resp:	142958
Ion Ratio	Lower	Upper	
76	100		
78	8.5	0.0	29.1



#23
trans-1,2-Dichloroethene
Concen: 1.40 ng
RT: 9.72 min Scan# 1133
Delta R.T. -0.006 min
Lab File: 02211722.D
Acq: 21 Feb 2017 23:57

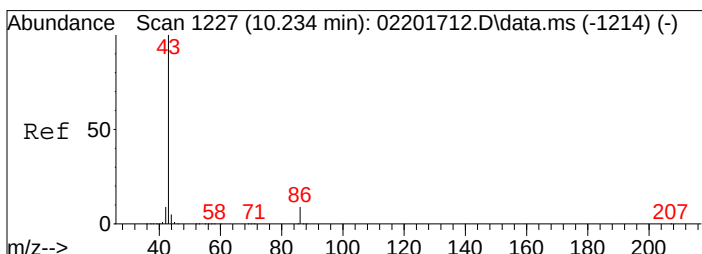
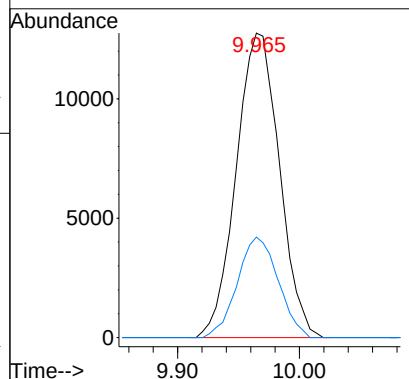
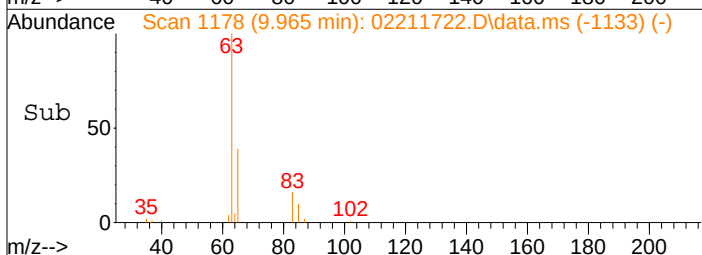
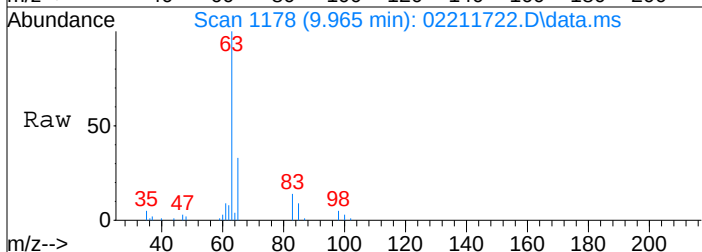
Tgt Ion:	61	Resp:	14777
Ion Ratio	Lower	Upper	
61	100		
96	66.2	48.0	88.0





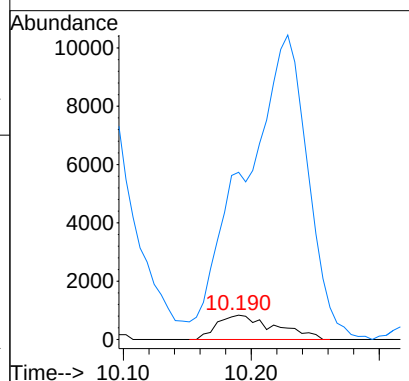
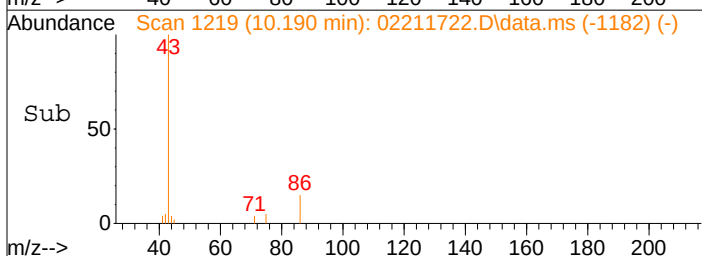
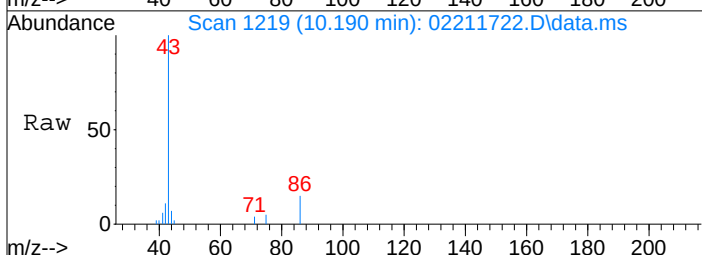
#24
 1,1-Dichloroethane
 Concen: 2.23 ng
 RT: 9.96 min Scan# 1178
 Delta R.T. -0.000 min
 Lab File: 02211722.D
 Acq: 21 Feb 2017 23:57

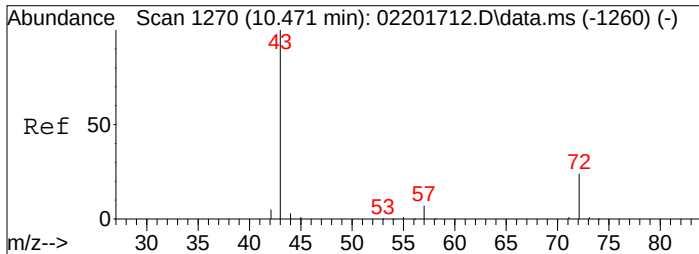
Tgt Ion	63	65	Resp	31384	Lower	Upper
Ion Ratio	100	31.3			11.8	51.8



#26
 Vinyl Acetate
 Concen: 1.72 ng
 RT: 10.19 min Scan# 1219
 Delta R.T. -0.044 min
 Lab File: 02211722.D
 Acq: 21 Feb 2017 23:57

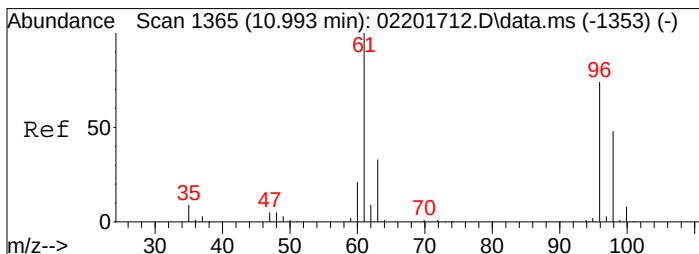
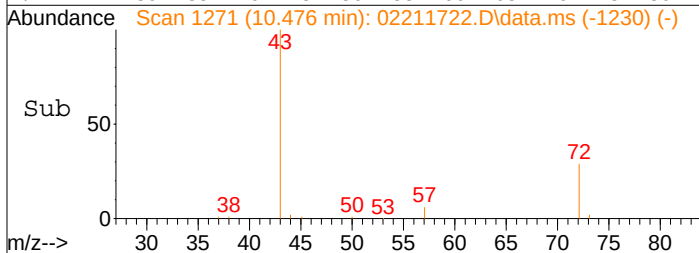
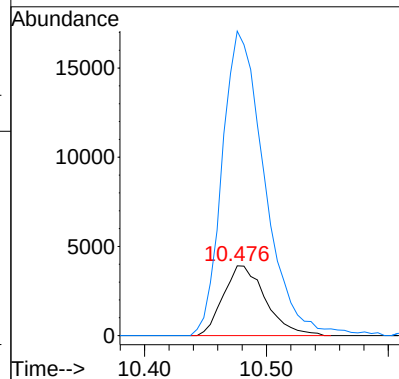
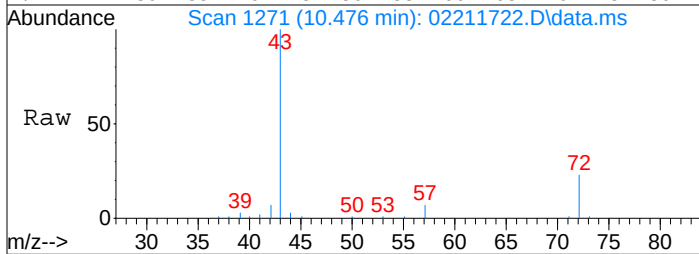
Tgt Ion	86	43	Resp	2644	Lower	Upper
Ion Ratio	100	1361.7			1134.8	1174.8#





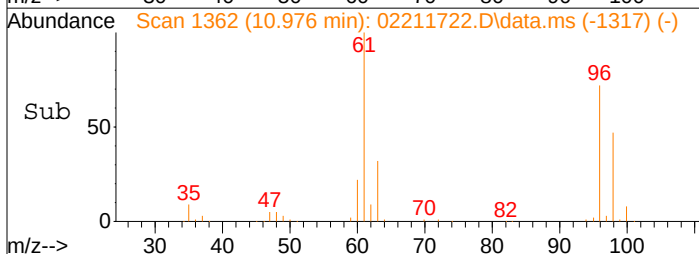
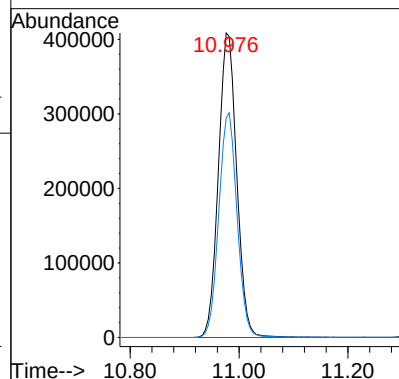
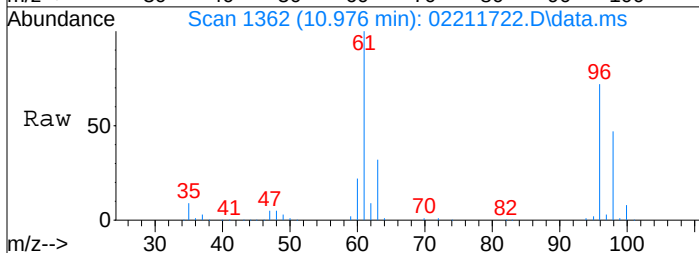
#27
2-Butanone (MEK)
Concen: 1.76 ng
RT: 10.48 min Scan# 1271
Delta R.T. -0.022 min
Lab File: 02211722.D
Acq: 21 Feb 2017 23:57

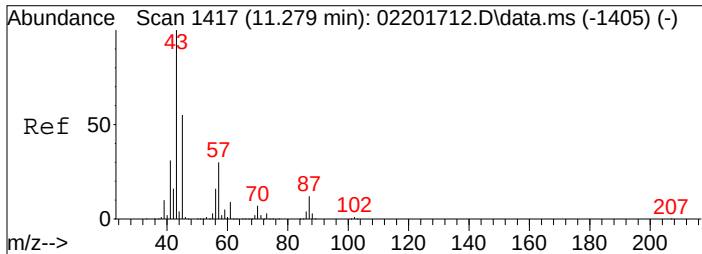
Tgt Ion: 72 Resp: 9440
Ion Ratio Lower Upper
72 100
43 440.3 402.0 442.0



#28
cis-1,2-Dichloroethene
Concen: 89.29 ng
RT: 10.98 min Scan# 1362
Delta R.T. -0.000 min
Lab File: 02211722.D
Acq: 21 Feb 2017 23:57

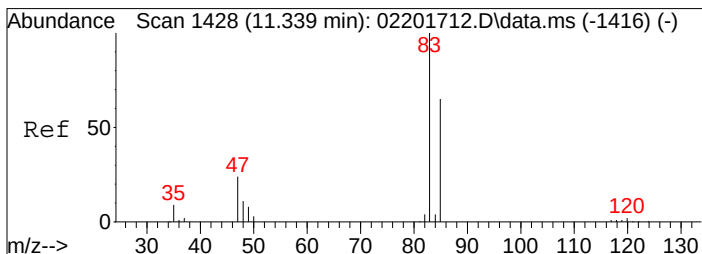
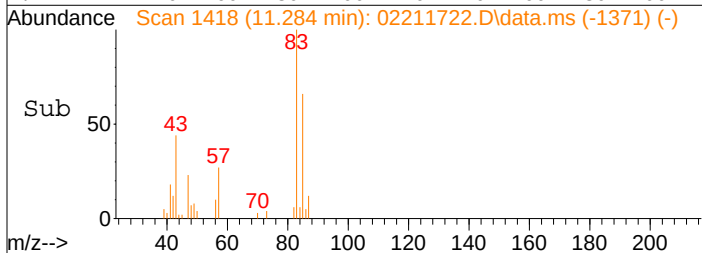
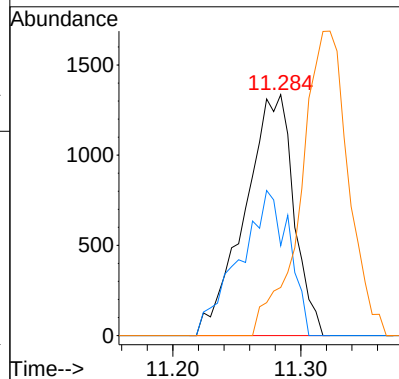
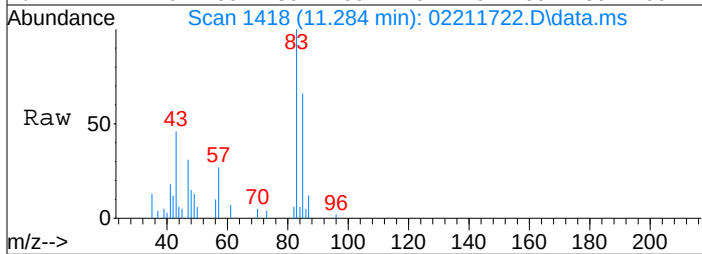
Tgt Ion: 61 Resp: 956896
Ion Ratio Lower Upper
61 100
96 73.8 55.0 95.0





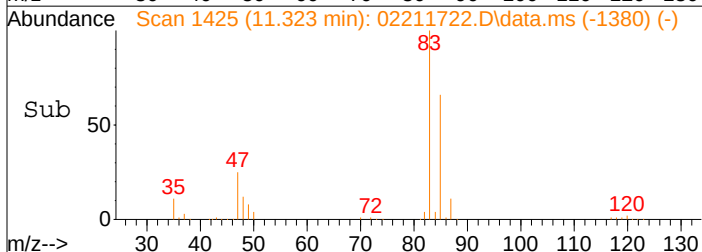
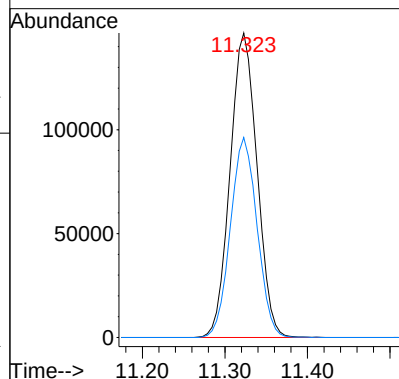
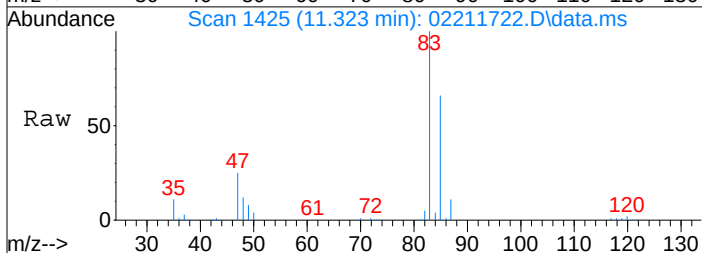
#31
n-Hexane
Concen: 0.27 ng
RT: 11.28 min Scan# 1418
Delta R.T. 0.011 min
Lab File: 02211722.D
Acq: 21 Feb 2017 23:57

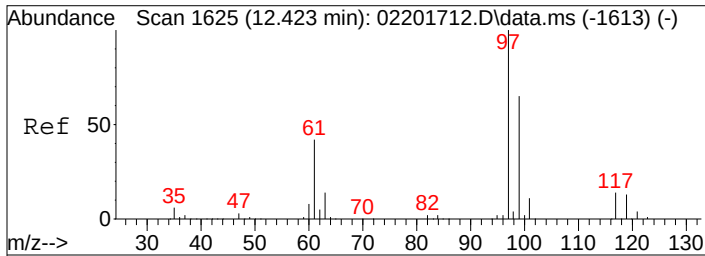
Tgt Ion: 57 Resp: 3562
Ion Ratio Lower Upper
57 100
56 60.7 41.4 62.2
86 121.6 13.1 19.7#



#32
Chloroform
Concen: 24.28 ng
RT: 11.32 min Scan# 1425
Delta R.T. -0.000 min
Lab File: 02211722.D
Acq: 21 Feb 2017 23:57

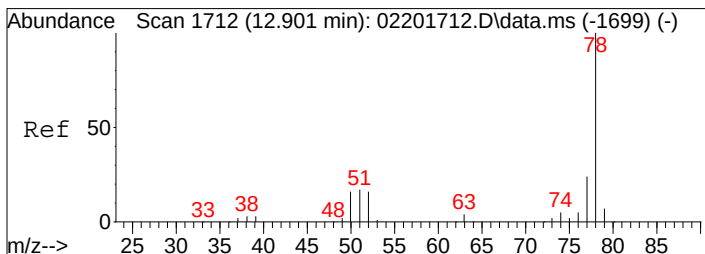
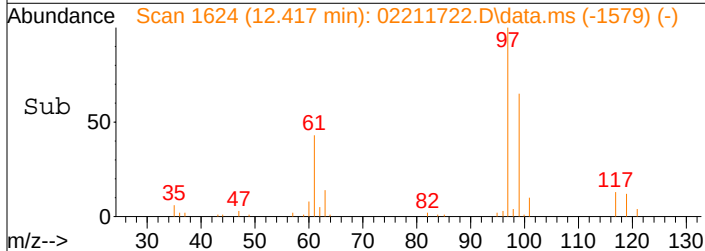
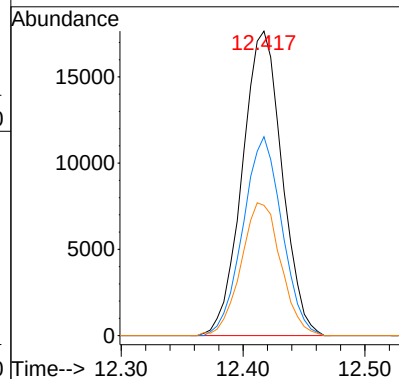
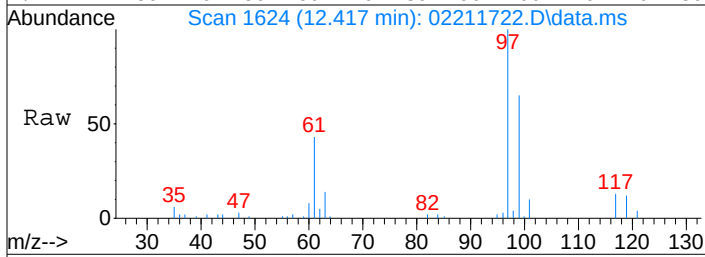
Tgt Ion: 83 Resp: 332517
Ion Ratio Lower Upper
83 100
85 65.1 45.6 85.6





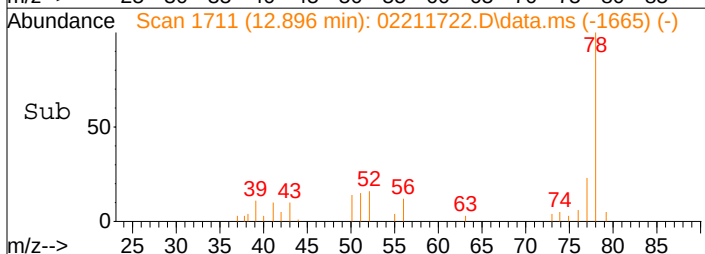
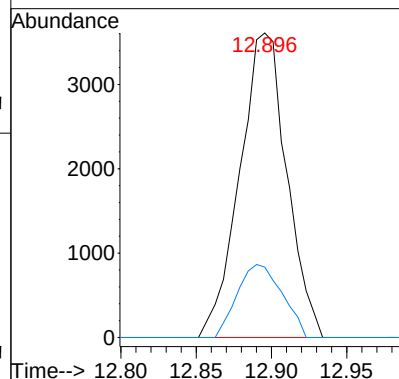
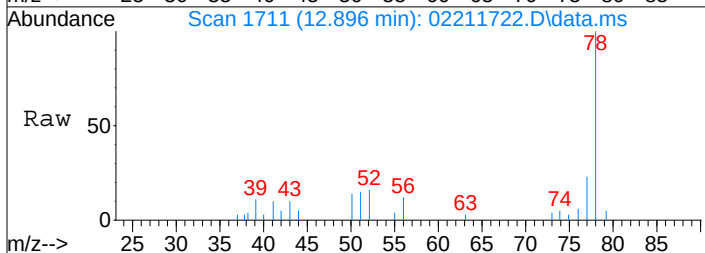
#38
 1,1,1-Trichloroethane
 Concen: 3.17 ng
 RT: 12.42 min Scan# 1624
 Delta R.T. -0.000 min
 Lab File: 02211722.D
 Acq: 21 Feb 2017 23:57

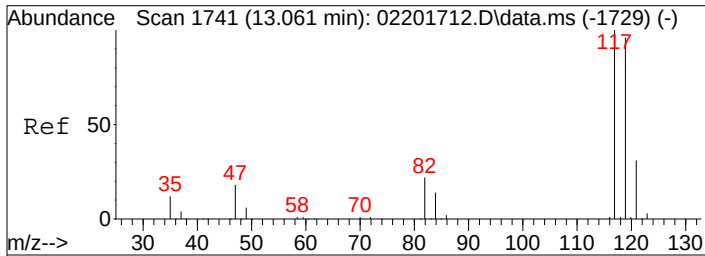
Tgt Ion: 97 Resp: 40085
 Ion Ratio Lower Upper
 97 100
 99 64.0 45.1 85.1
 61 43.7 23.0 63.0



#41
 Benzene
 Concen: 0.25 ng
 RT: 12.90 min Scan# 1711
 Delta R.T. 0.005 min
 Lab File: 02211722.D
 Acq: 21 Feb 2017 23:57

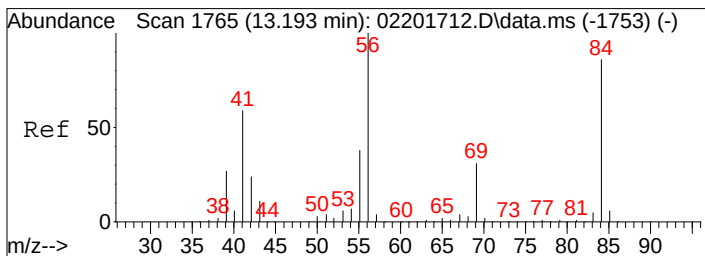
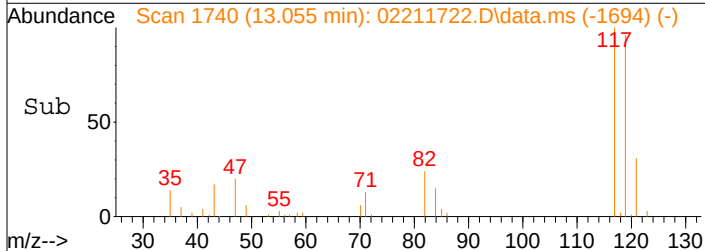
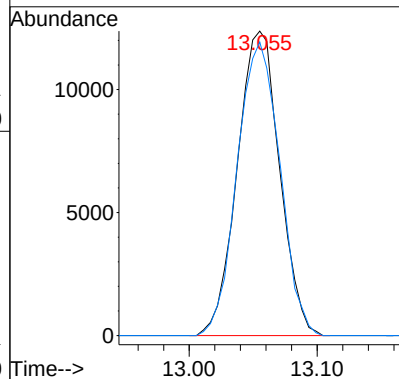
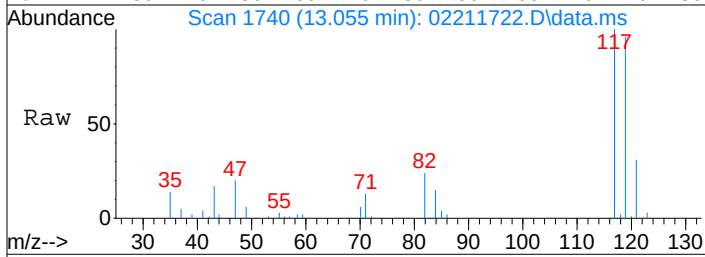
Tgt Ion: 78 Resp: 7848
 Ion Ratio Lower Upper
 78 100
 77 22.9 3.5 43.5





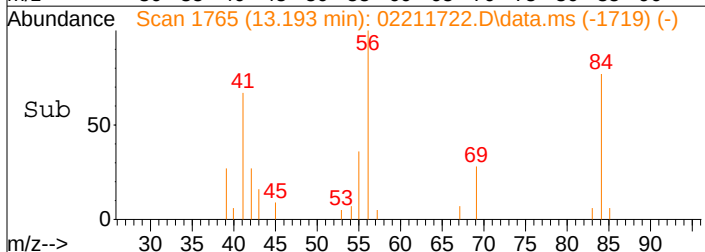
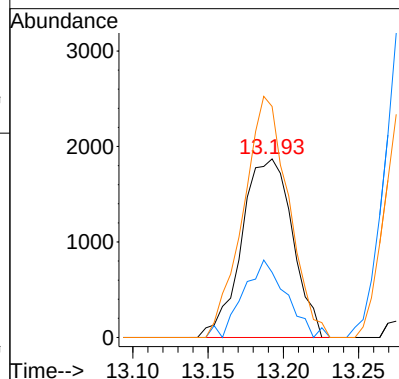
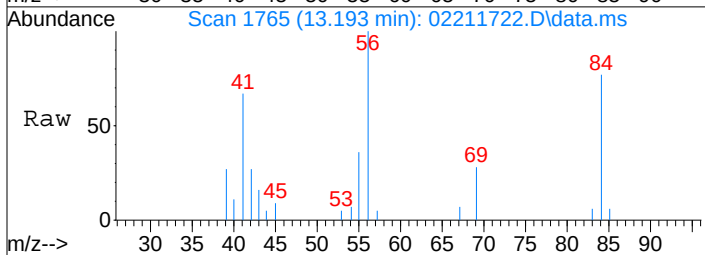
#42
Carbon Tetrachloride
Concen: 2.55 ng
RT: 13.06 min Scan# 1740
Delta R.T. 0.005 min
Lab File: 02211722.D
Acq: 21 Feb 2017 23:57

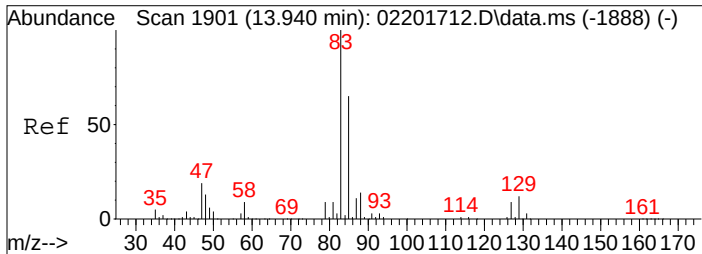
Tgt Ion: 117 Resp: 28527
Ion Ratio Lower Upper
117 100
119 97.2 75.9 115.9



#43
Cyclohexane
Concen: 0.37 ng
RT: 13.19 min Scan# 1765
Delta R.T. 0.005 min
Lab File: 02211722.D
Acq: 21 Feb 2017 23:57

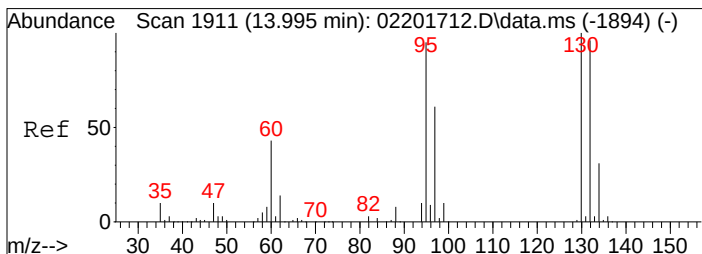
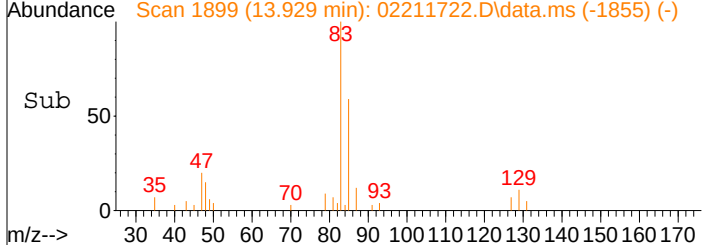
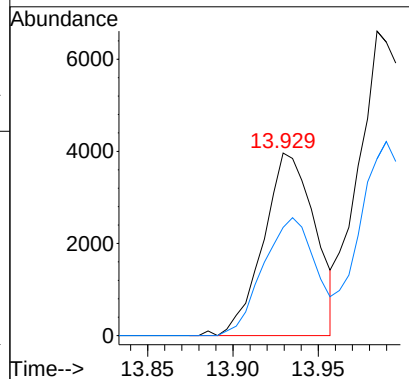
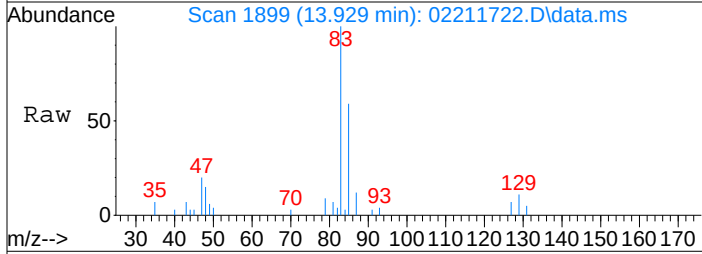
Tgt Ion: 84 Resp: 4385
Ion Ratio Lower Upper
84 100
69 36.9 16.3 56.3
56 120.8 97.4 137.4





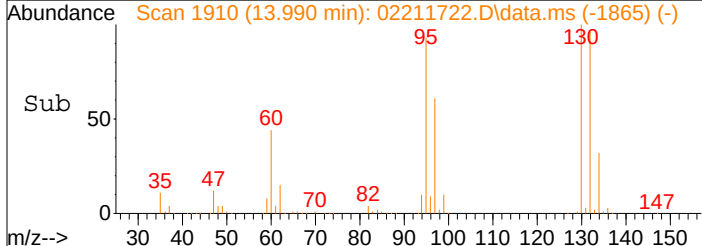
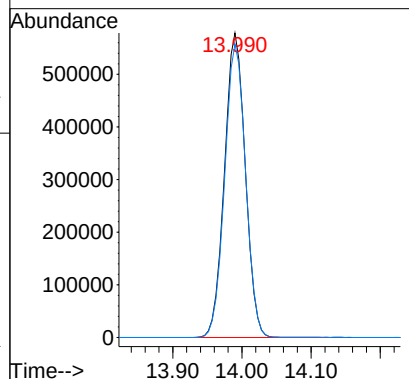
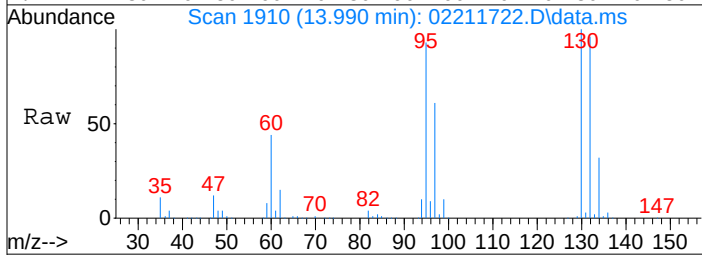
#46
Bromodichloromethane
Concen: 0.77 ng
RT: 13.93 min Scan# 1899
Delta R.T. -0.006 min
Lab File: 02211722.D
Acq: 21 Feb 2017 23:57

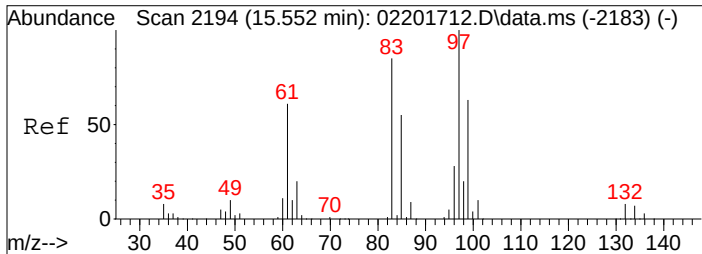
Tgt Ion	83	85	Resp	8335	Lower	Upper
Ion Ratio	100	65.8			44.7	84.7



#47
Trichloroethene
Concen: 137.84 ng
RT: 13.99 min Scan# 1910
Delta R.T. -0.000 min
Lab File: 02211722.D
Acq: 21 Feb 2017 23:57

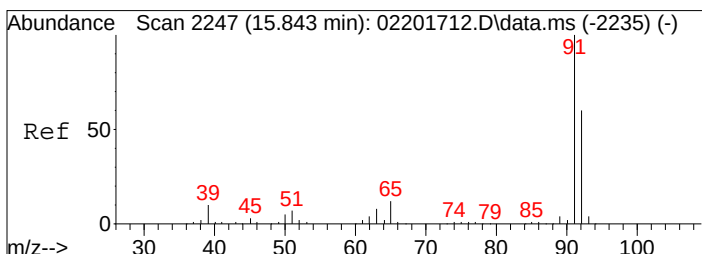
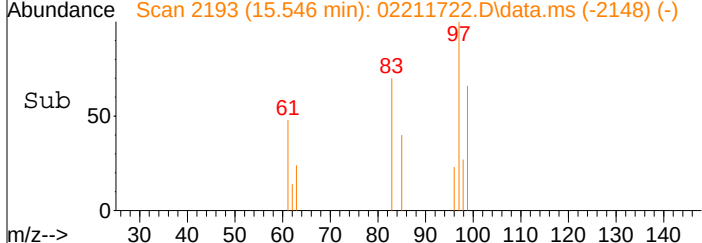
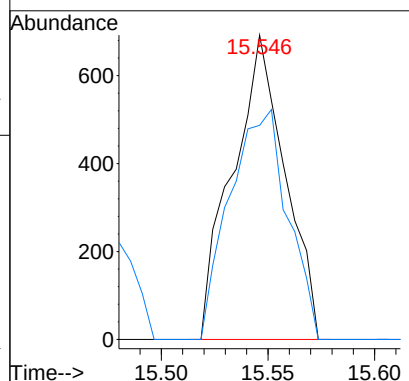
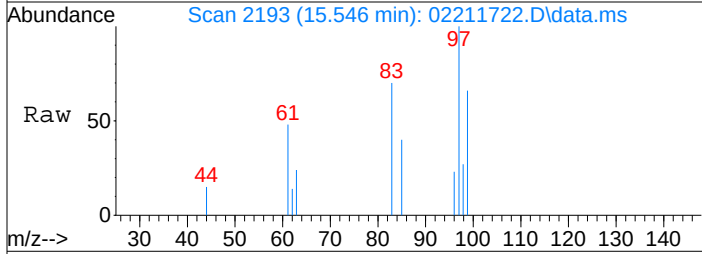
Tgt Ion	130	132	Resp	1208862	Lower	Upper
Ion Ratio	100	97.0			75.7	115.7





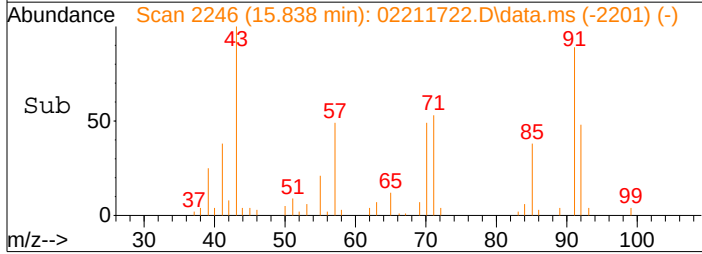
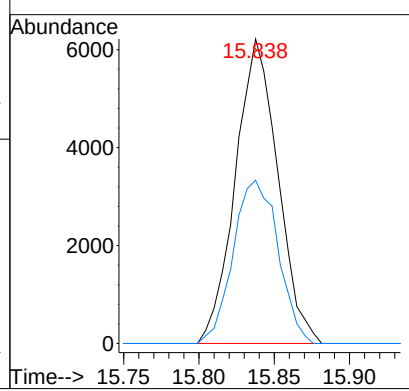
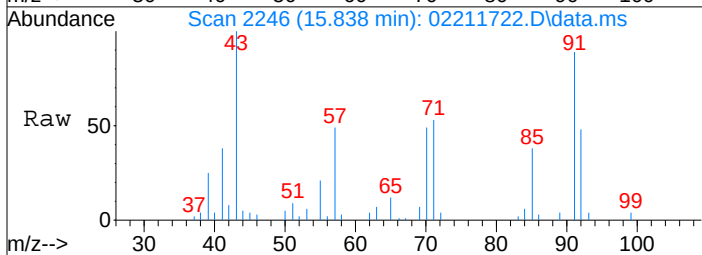
#55
1,1,2-Trichloroethane
Concen: 0.16 ng
RT: 15.55 min Scan# 2193
Delta R.T. -0.000 min
Lab File: 02211722.D
Acq: 21 Feb 2017 23:57

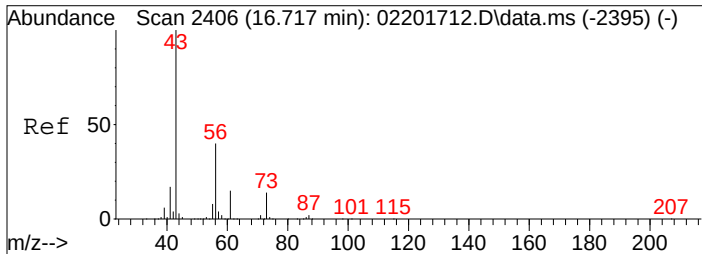
Tgt Ion: 97	Resp: 1188
Ion Ratio	Lower Upper
97	100
83	83.2 65.3 105.3



#58
Toluene
Concen: 0.37 ng
RT: 15.84 min Scan# 2246
Delta R.T. -0.000 min
Lab File: 02211722.D
Acq: 21 Feb 2017 23:57

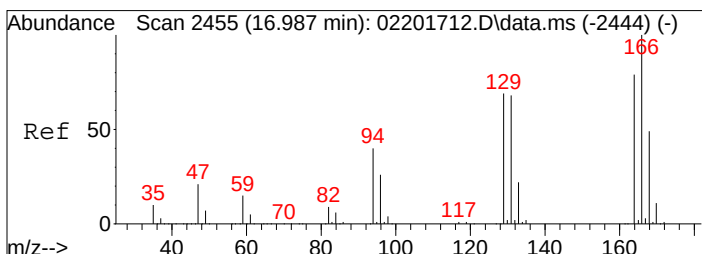
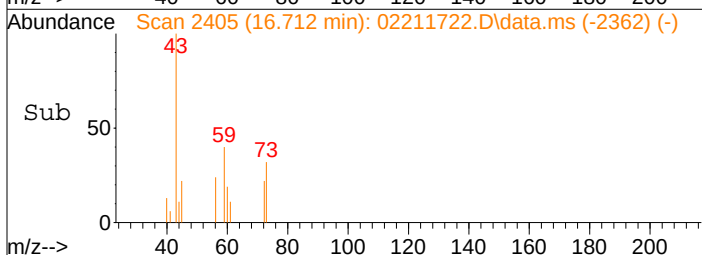
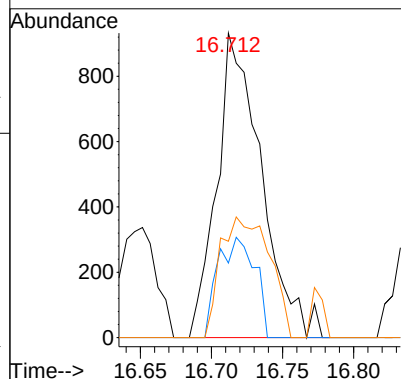
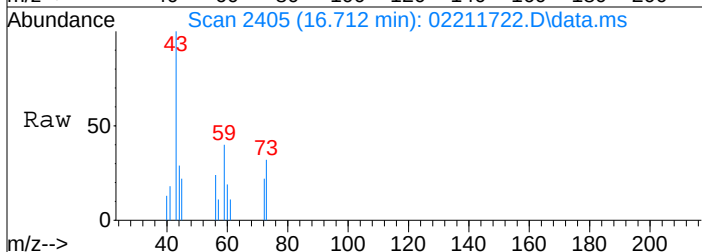
Tgt Ion: 91	Resp: 12175
Ion Ratio	Lower Upper
91	100
92	56.7 39.8 79.8





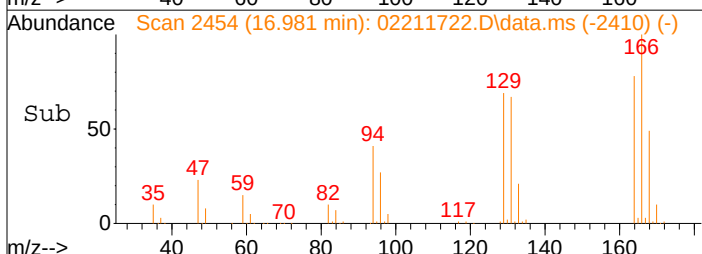
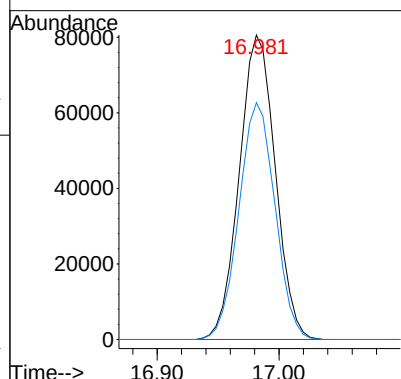
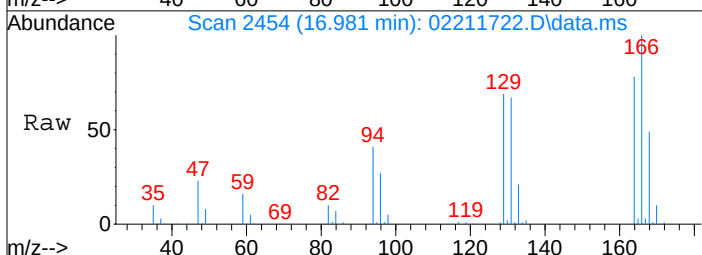
#62
 n-Butyl Acetate
 Concen: 0.10 ng
 RT: 16.71 min Scan# 2405
 Delta R.T. -0.011 min
 Lab File: 02211722.D
 Acq: 21 Feb 2017 23:57

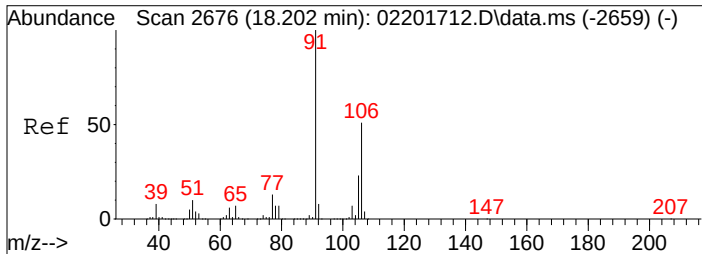
Tgt Ion: 43	Resp: 2031
Ion Ratio	Lower Upper
43	100
56	27.3 19.9 59.9
73	43.7 0.0 34.5#



#64
 Tetrachloroethene
 Concen: 16.58 ng
 RT: 16.98 min Scan# 2454
 Delta R.T. -0.006 min
 Lab File: 02211722.D
 Acq: 21 Feb 2017 23:57

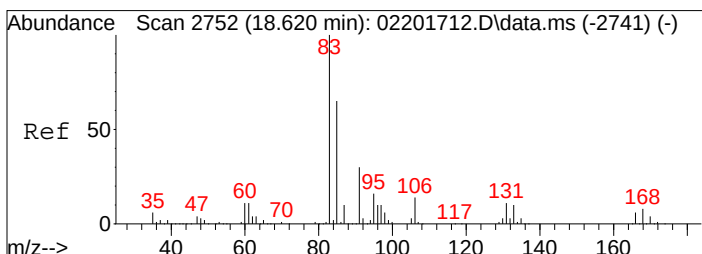
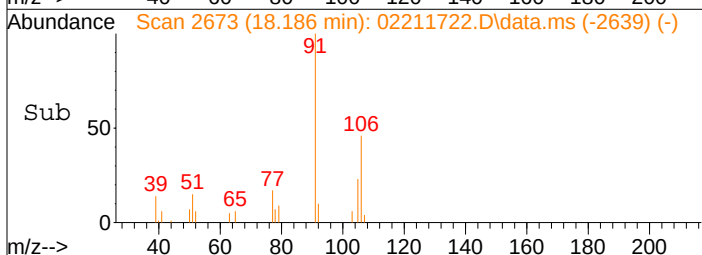
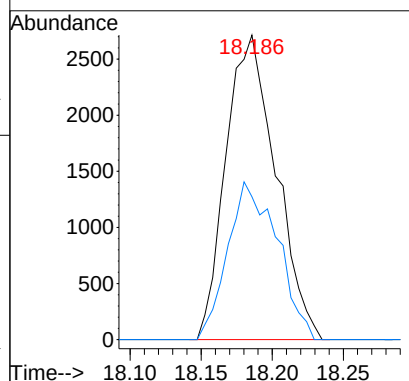
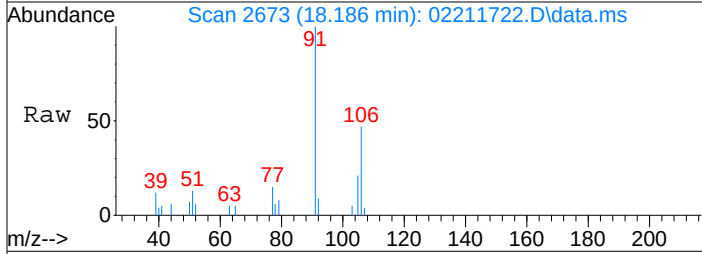
Tgt Ion: 166	Resp: 165737
Ion Ratio	Lower Upper
166	100
164	77.8 58.2 98.2





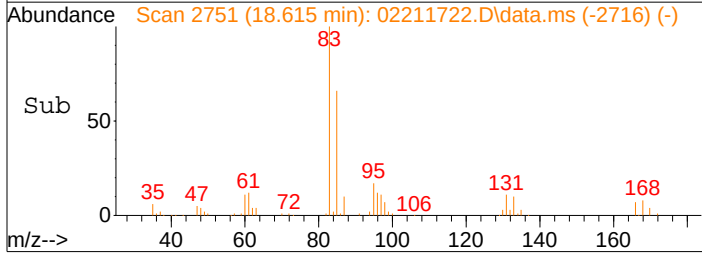
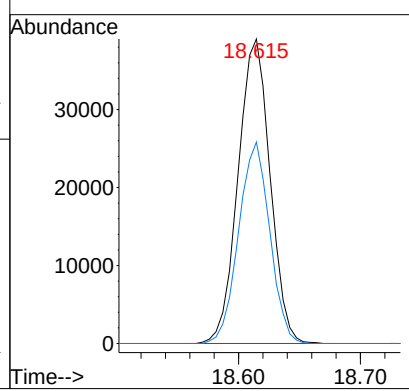
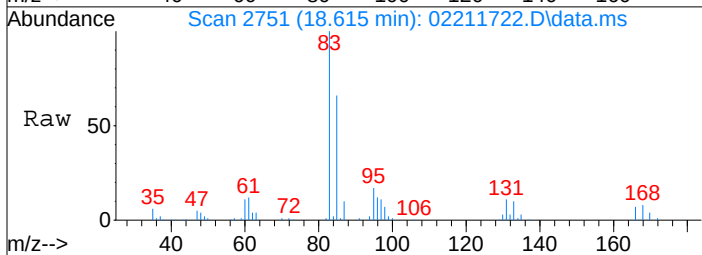
#67
 m- & p-Xylenes
 Concen: 0.23 ng
 RT: 18.19 min Scan# 2673
 Delta R.T. -0.011 min
 Lab File: 02211722.D
 Acq: 21 Feb 2017 23:57

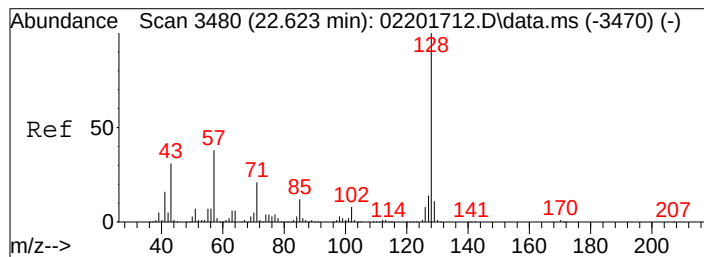
Tgt Ion:	91	Resp:	6634
Ion Ratio	Lower	Upper	
91	100		
106	51.4	30.7	70.7



#72
 1,1,2,2-Tetrachloroethane
 Concen: 5.18 ng
 RT: 18.61 min Scan# 2751
 Delta R.T. -0.006 min
 Lab File: 02211722.D
 Acq: 21 Feb 2017 23:57

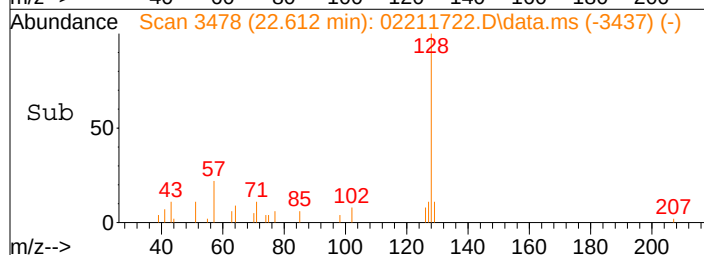
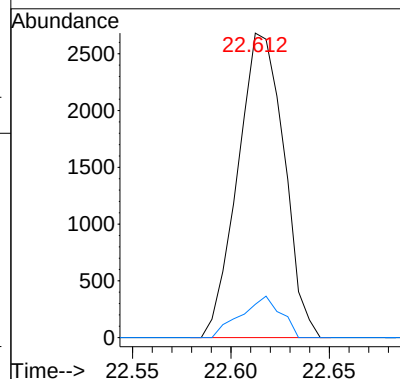
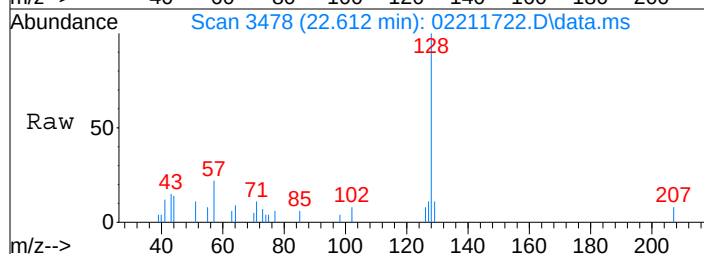
Tgt Ion:	83	Resp:	71365
Ion Ratio	Lower	Upper	
83	100		
85	64.3	44.9	84.9





#95
Naphthalene
Concen: 0.12 ng
RT: 22.61 min Scan# 3478
Delta R.T. -0.023 min
Lab File: 02211722.D
Acq: 21 Feb 2017 23:57

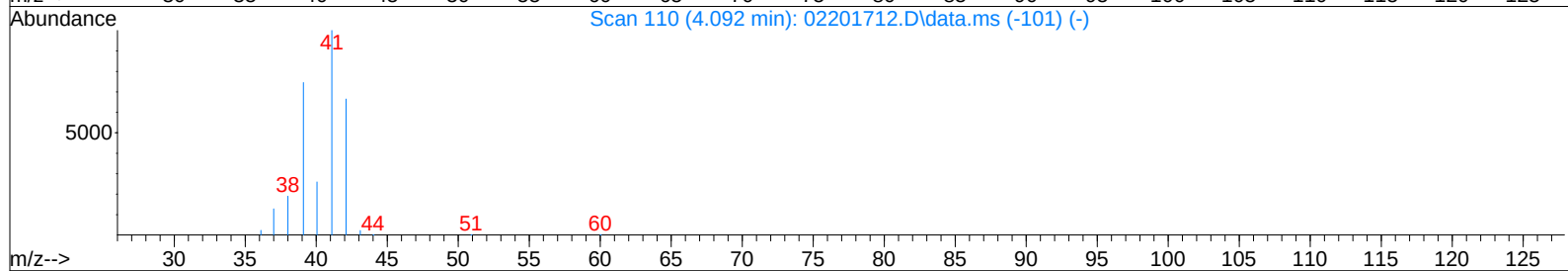
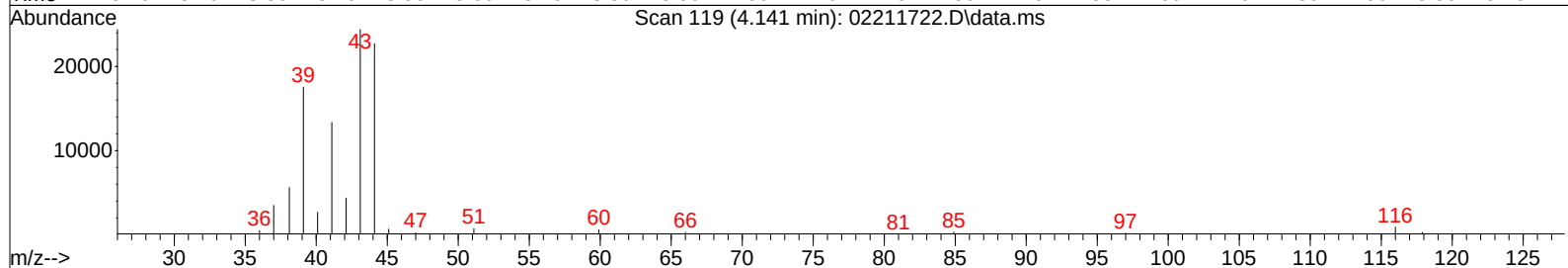
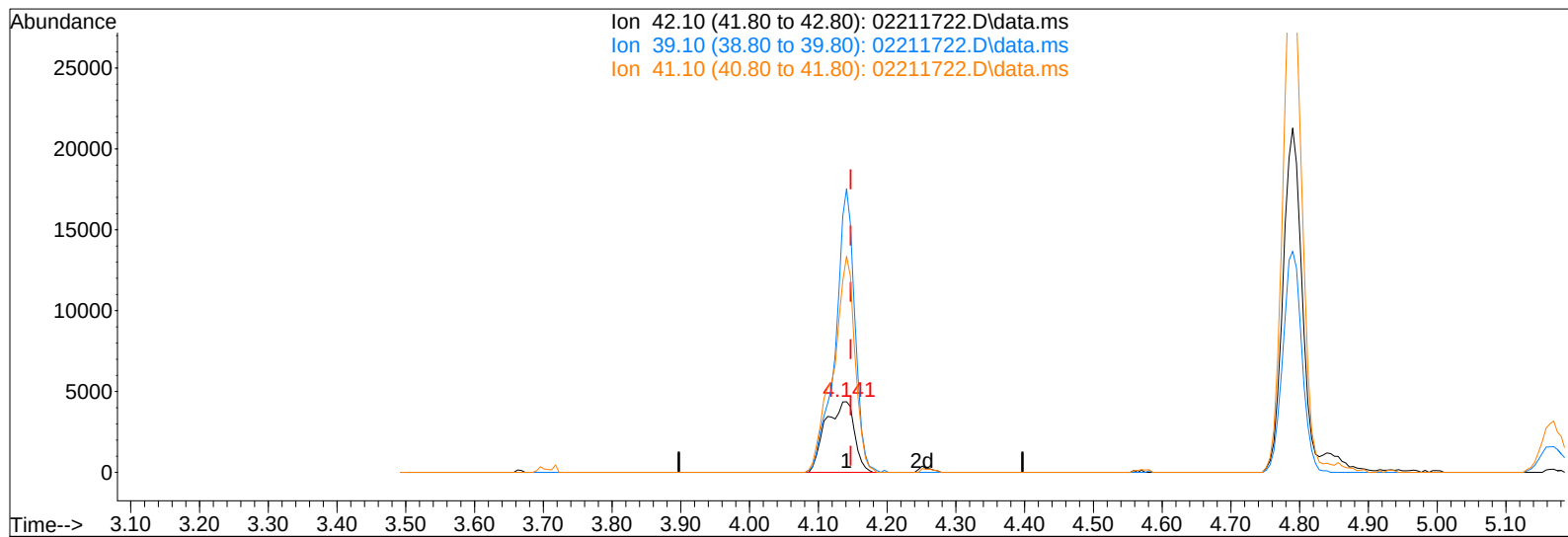
Tgt Ion:128 Resp: 4380
Ion Ratio Lower Upper
128 100
129 11.8 0.0 31.1



Data File : I:\MS13\DATA\2017 02\21\02211722.D
Acq On : 21 Feb 2017 23:57
Sample : P1700718-001 (1000ml)
Misc : S29-01311701

Vial: 14
Operator: LH/AMF
Inst : MS13

Quant Time: Feb 24 10:42:23 2017
Quant Method : I:\MS13\METHODS\R13022017.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Feb 21 11:57:41 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 02211722.D\data.ms

(2) Propene (T)

4.141min (-0.006) 1.35ng

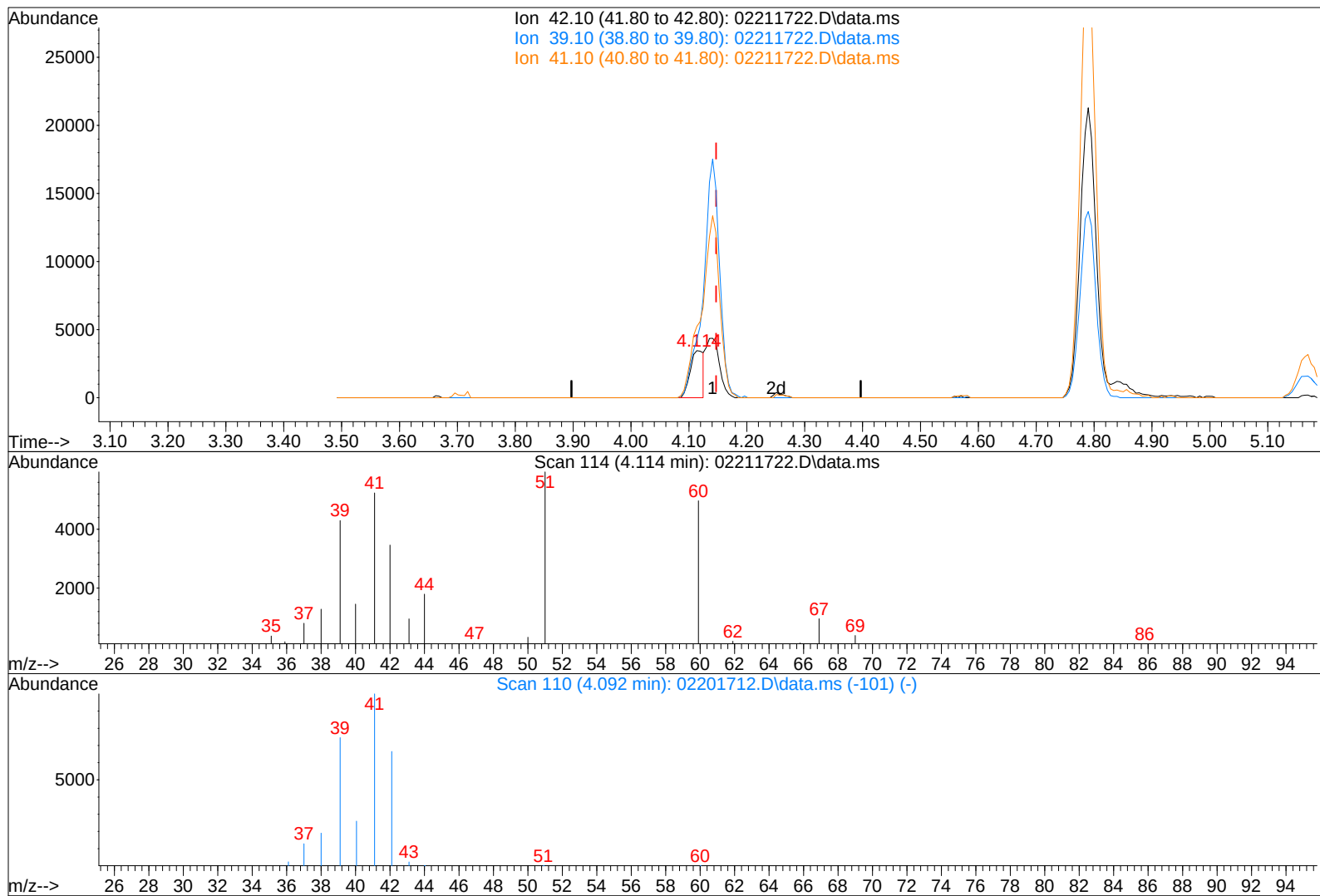
response 12652

Ion	Exp%	Act%
42.10	100	100
39.10	111.80	274.66#
41.10	149.80	235.99#
0.00	0.00	0.00

Data File : I:\MS13\DATA\2017 02\21\02211722.D
Acq On : 21 Feb 2017 23:57
Sample : P1700718-001 (1000ml)
Misc : S29-01311701

Vial: 14
Operator: LH/AMF
Inst : MS13

Quant Time: Feb 24 10:42:23 2017
Quant Method : I:\MS13\METHODS\R13022017.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Feb 21 11:57:41 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 02211722.D\data.ms

(2) Propene (T)

4.114min (-0.033) 0.59ng m

response 5537

IPC

Ion	Exp%	Act%

42.10	100	100

CL 2/24/17

39.10	111.80	627.60#

41.10	149.80	539.25#

0.00	0.00	0.00

Data File : I:\MS13\DATA\2017 02\23\02231726.D
 Acq On : 23 Feb 2017 21:04
 Sample : P1700718-001d1l (250ml)
 Misc : S29-02221710

Vial: 12
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 24 10:43:37 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 11:57:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

CL 2/24/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.15	130	147724	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.28	114	712714	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.61	82	281485	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.00	65	205263	10.715	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	85.68%
57) Toluene-d8 (SS2)	15.73	98	716766	13.219	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	105.76%
73) Bromofluorobenzene (SS3)	19.06	174	254863	12.138	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.12%

Target Compounds

						Qvalue
2) Propene	0.00	42	0	N.D.	d	
3) Dichlorodifluoromethan...	4.26	85	47010	1.493	ng	100
4) Chloromethane	4.56	50	294	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	244	N.D.		
6) Vinyl Chloride	4.98	62	468	N.D.		
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.35	45	17462	1.562	ng	98
11) Acetonitrile	6.65	41	1182	N.D.		
12) Acrolein	6.82	56	521	N.D.		
13) Acetone	7.04	58	16021	1.438	ng	# 54
14) Trichlorofluoromethane	7.26	101	8074	0.283	ng	99
15) 2-Propanol (Isopropanol)	7.53	45	3450	0.090	ng	92
16) Acrylonitrile	7.85	53	269	N.D.		
17) 1,1-Dichloroethene	8.22	96	11530	0.798	ng	87
18) 2-Methyl-2-Propanol (t...	8.45	59	870	N.D.		
19) Methylene Chloride	8.44	84	871	N.D.		
20) 3-Chloro-1-propene (Al...	8.53	41	546	N.D.		
21) Trichlorotrifluoroethane	8.86	151	71161	4.774	ng	98
22) Carbon Disulfide	8.72	76	58429	1.067	ng	98
23) trans-1,2-Dichloroethene	9.71	61	4842	0.225	ng	96
24) 1,1-Dichloroethane	9.95	63	10945	0.383	ng	100
25) Methyl tert-Butyl Ether	10.12	73	681	N.D.		
26) Vinyl Acetate	10.20	86	908	0.291	ng	# 43
27) 2-Butanone (MEK)	10.48	72	3580	0.328	ng	99
28) cis-1,2-Dichloroethene	10.97	61	323081	14.847	ng	95
29) Diisopropyl Ether	0.00	87	0	N.D.	d	
30) Ethyl Acetate	0.00	61	0	N.D.	d	
31) n-Hexane	11.27	57	1305	N.D.		
32) Chloroform	11.32	83	109066	3.923	ng	99
34) Tetrahydrofuran (THF)	11.77	72	413	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	0.00	62	0	N.D.		
38) 1,1,1-Trichloroethane	12.41	97	12104	0.484	ng	98
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	12.89	78	4019	N.D.		
42) Carbon Tetrachloride	13.05	117	8267	0.374	ng	97
43) Cyclohexane	13.18	84	1545	N.D.		
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	13.92	83	2601	0.122	ng	93
47) Trichloroethene	13.98	130	423428	24.412	ng	99
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d	
50) Methyl Methacrylate	14.06	100	283	N.D.		

Data File : I:\MS13\DATA\2017 02\23\02231726.D
 Acq On : 23 Feb 2017 21:04
 Sample : P1700718-001dil (250ml)
 Misc : S29-02221710

Vial: 12
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 24 10:43:37 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 11:57:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

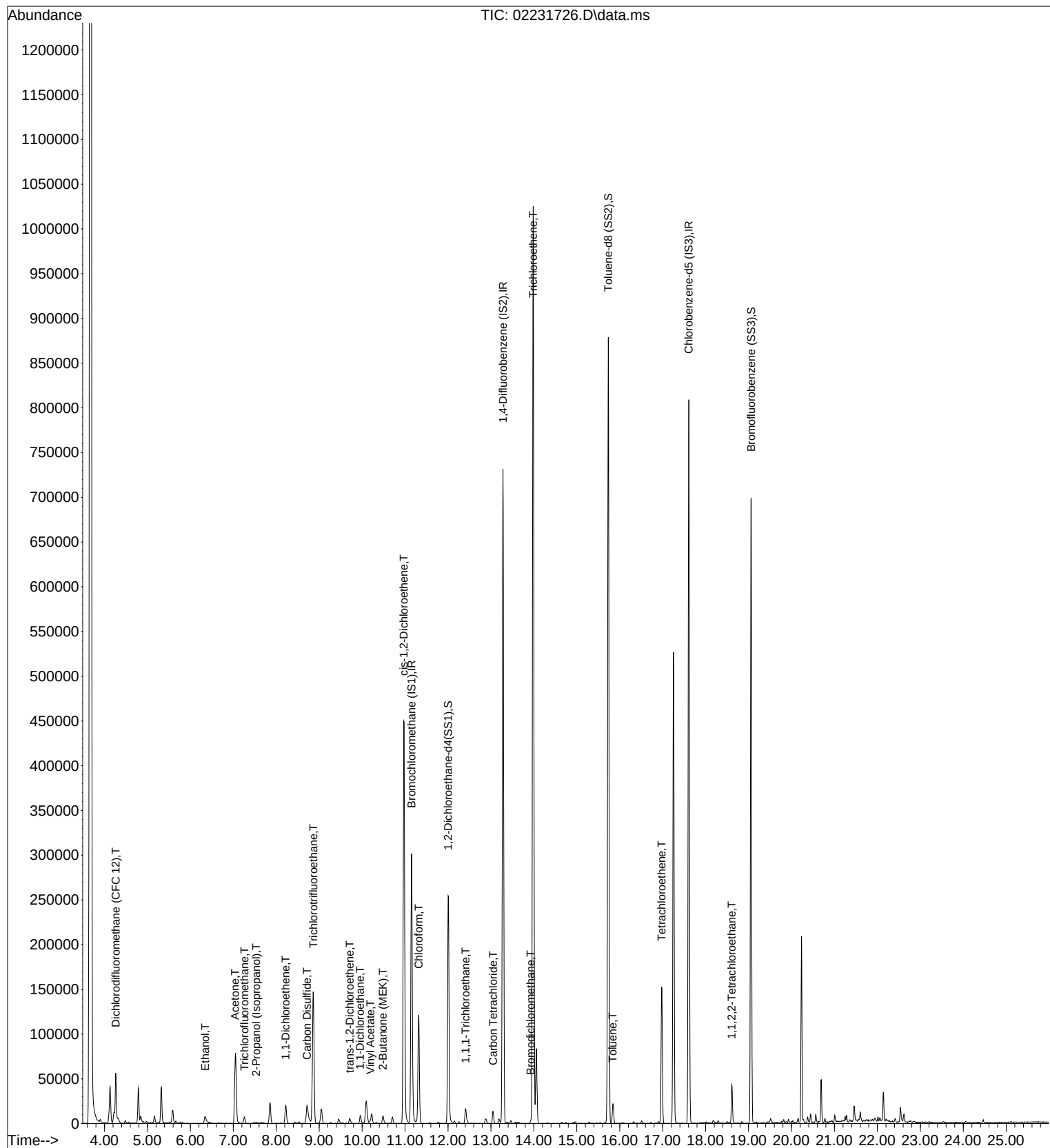
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	0.00	71	0	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	15.55	97	443	N.D.		
58) Toluene	15.83	91	7381	0.126	ng	97
59) 2-Hexanone	16.10	43	499	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.72	43	712	N.D.		
63) n-Octane	16.84	57	176	N.D.		
64) Tetrachloroethene	16.98	166	59005	3.348	ng	99
65) Chlorobenzene	17.65	112	278	N.D.		
66) Ethylbenzene	18.02	91	1447	N.D.		
67) m- & p-Xylenes	18.18	91	3214	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.53	104	415	N.D.		
70) o-Xylene	18.64	91	1055	N.D.		
71) n-Nonane	18.84	43	877	N.D.		
72) 1,1,2,2-Tetrachloroethane	18.61	83	24178	0.995	ng	98
74) Cumene	19.19	105	684	N.D.		
75) alpha-Pinene	19.57	93	133	N.D.		
76) n-Propylbenzene	19.67	91	541	N.D.		
77) 3-Ethyltoluene	19.77	105	1066	N.D.		
78) 4-Ethyltoluene	19.81	105	662	N.D.		
79) 1,3,5-Trimethylbenzene	19.88	105	438	N.D.		
80) alpha-Methylstyrene	20.03	118	848	N.D.		
81) 2-Ethyltoluene	20.06	105	603	N.D.		
82) 1,2,4-Trimethylbenzene	20.28	105	1937	N.D.		
83) n-Decane	20.37	57	2572	N.D.		
84) Benzyl Chloride	20.28	91	251	N.D.		
85) 1,3-Dichlorobenzene	20.49	146	480	N.D.		
86) 1,4-Dichlorobenzene	20.49	146	480	N.D.		
87) sec-Butylbenzene	20.69	105	1568	N.D.		
88) 4-Isopropyltoluene (p-...	0.00	119	0	N.D.	d	
89) 1,2,3-Trimethylbenzene	20.69	105	1568	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	20.84	68	322	N.D.		
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	0.00	57	0	N.D.	d	
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	22.61	128	1781	N.D.		
96) n-Dodecane	0.00	57	0	N.D.	d	
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	18.32	55	336	N.D.		
99) tert-Butylbenzene	20.28	119	233	N.D.		
100) n-Butylbenzene	21.10	91	782	N.D.		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2017 02\23\02231726.D
Acq On : 23 Feb 2017 21:04
Sample : P1700718-001dil (250ml)
Misc : S29-02221710

Vial: 12
Operator: LH/AMF
Inst : MS13

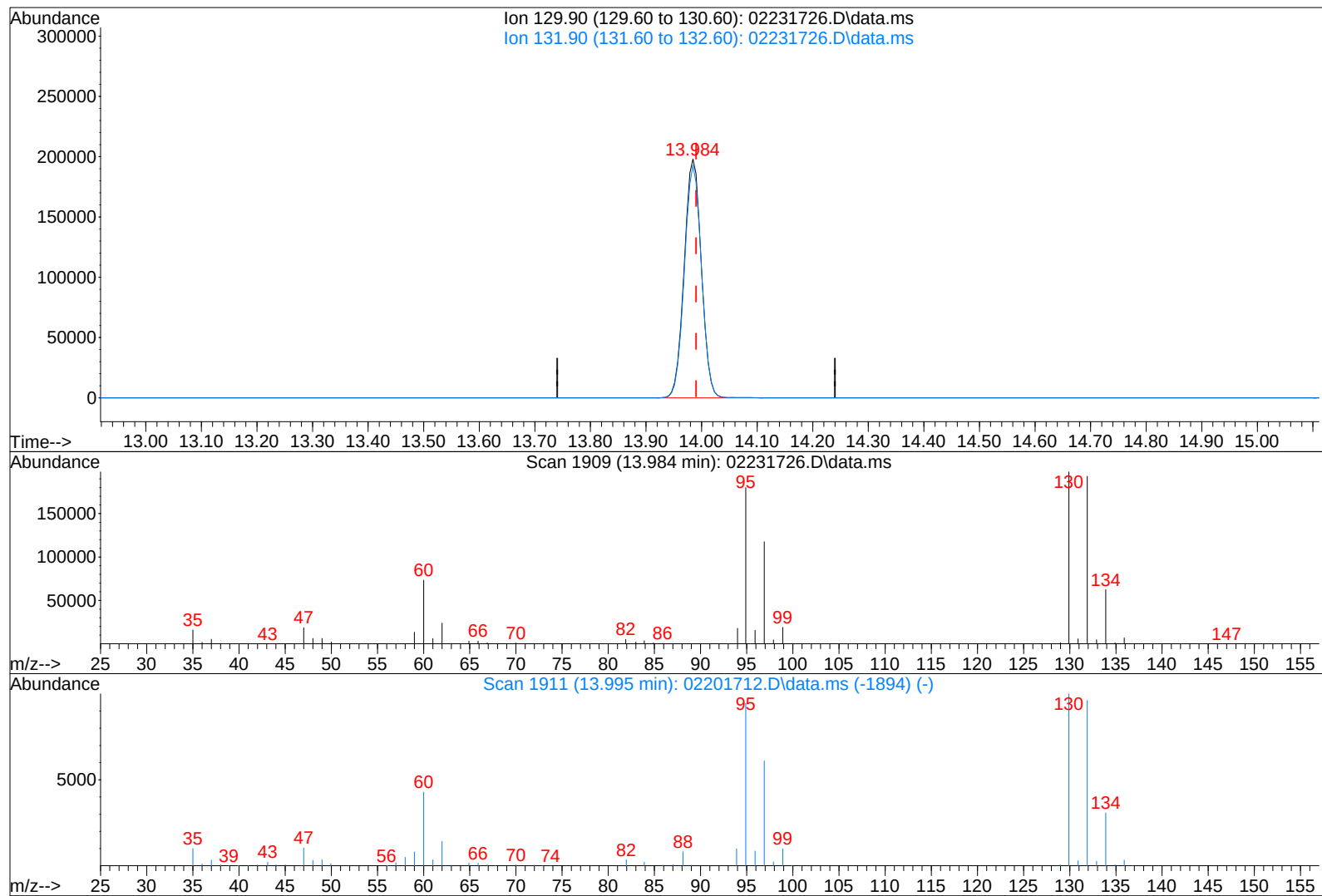
Quant Time: Feb 24 10:43:37 2017
Quant Method : I:\MS13\METHODS\R13022017.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Feb 21 11:57:41 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2017 02\23\02231726.D
Acq On : 23 Feb 2017 21:04
Sample : P1700718-001dil (250ml)
Misc : S29-02221710

Vial: 12
Operator: LH/AMF
Inst : MS13

Quant Time: Feb 24 07:36:22 2017
Quant Method : I:\MS13\METHODS\R13022017.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Feb 21 11:57:41 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 02231726.D\data.ms

(47) Trichloroethene (T)

13.984min (-0.006) 24.41ng

response 423428

Ion	Exp%	Act%
129.90	100	100
131.90	95.70	96.66
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2017 02\21\02211707.D
 Acq On : 21 Feb 2017 13:43
 Sample : LCS R13022117_25ng
 Misc : S29-01311701

Vial: 4
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 21 14:06:06 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 11:57:41 2017

Response via : Initial Calibration

2/21/17

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.17	130	122897	12.500	ng	0.02
37) 1,4-Difluorobenzene (IS2)	13.30	114	593776	12.500	ng	0.01
56) Chlorobenzene-d5 (IS3)	17.61	82	253936	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.03	65	185543	11.642	ng	0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	93.12%
57) Toluene-d8 (SS2)	15.74	98	611512	12.501	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.00%
73) Bromofluorobenzene (SS3)	19.07	174	252007	13.304	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	106.40%

Target Compounds

						Qvalue
2) Propene	4.09	42	418044	26.380	ng	99
3) Dichlorodifluoromethan...	4.25	85	741245	28.304	ng	100
4) Chloromethane	4.54	50	564383	30.204	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	402281	27.427	ng	99
6) Vinyl Chloride	4.95	62	555029	30.074	ng	100
7) 1,3-Butadiene	5.22	54	388684	32.464	ng	99
8) Bromomethane	5.66	94	343583	31.922	ng	100
9) Chloroethane	5.99	64	272399	29.230	ng	99
10) Ethanol	6.38	45	1318727	141.754	ng	99
11) Acetonitrile	6.63	41	727608	28.492	ng	99
12) Acrolein	6.81	56	220966	30.249	ng	98
13) Acetone	7.02	58	1338492	144.415	ng	91
14) Trichlorofluoromethane	7.26	101	655631	27.597	ng	100
15) 2-Propanol (Isopropanol)	7.52	45	1962233	61.618	ng	99
16) Acrylonitrile	7.78	53	518630	30.675	ng	100
17) 1,1-Dichloroethene	8.22	96	360081	29.945	ng	95
18) 2-Methyl-2-Propanol (t...	8.39	59	1952244	64.222	ng	99
19) Methylene Chloride	8.45	84	370848	28.523	ng	97
20) 3-Chloro-1-propene (Al...	8.61	41	608971	32.115	ng	99
21) Trichlorotrifluoroethane	8.86	151	367036	29.600	ng	99
22) Carbon Disulfide	8.71	76	1365402	29.976	ng	100
23) trans-1,2-Dichloroethene	9.72	61	546277	30.557	ng	97
24) 1,1-Dichloroethane	9.98	63	669157	28.112	ng	100
25) Methyl tert-Butyl Ether	10.07	73	1163489	28.472	ng	100
26) Vinyl Acetate	10.23	86	462010	178.017	ng	# 84
27) 2-Butanone (MEK)	10.47	72	259859	28.630	ng	94
28) cis-1,2-Dichloroethene	10.99	61	512436	28.306	ng	98
29) Diisopropyl Ether	11.29	87	317650	25.255	ng	# 74
30) Ethyl Acetate	11.29	61	275083	59.887	ng	99
31) n-Hexane	11.28	57	602872	26.840	ng	100
32) Chloroform	11.34	83	643745	27.829	ng	99
34) Tetrahydrofuran (THF)	11.74	72	261844	27.812	ng	97
35) Ethyl tert-Butyl Ether	11.88	87	455780	29.607	ng	98
36) 1,2-Dichloroethane	12.14	62	504963	27.137	ng	100
38) 1,1,1-Trichloroethane	12.42	97	584563	28.040	ng	99
39) Isopropyl Acetate	12.85	61	468741	57.575	ng	99
40) 1-Butanol	12.86	56	776843	67.923	ng	88
41) Benzene	12.90	78	1459729	27.915	ng	100
42) Carbon Tetrachloride	13.06	117	540981	29.401	ng	99
43) Cyclohexane	13.19	84	1141690	58.046	ng	98
44) tert-Amyl Methyl Ether	13.53	73	1077971	28.023	ng	99
45) 1,2-Dichloropropane	13.75	63	375936	28.659	ng	99
46) Bromodichloromethane	13.94	83	521351	29.397	ng	100
47) Trichloroethene	14.00	130	431169	29.837	ng	100
48) 1,4-Dioxane	13.96	88	323718	30.033	ng	98
49) 2,2,4-Trimethylpentane...	14.07	57	1560723	28.175	ng	98
50) Methyl Methacrylate	14.20	100	325246	62.448	ng	97

Data File : I:\MS13\DATA\2017 02\21\02211707.D
 Acq On : 21 Feb 2017 13:43
 Sample : LCS R13022117_25ng
 Misc : S29-01311701

Vial: 4
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 21 14:06:06 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 11:57:41 2017

Response via : Initial Calibration

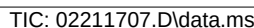
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.33	71	378854	28.599	ng	99
52) cis-1,3-Dichloropropene	14.86	75	634362	30.166	ng	100
53) 4-Methyl-2-pentanone	14.89	58	361226	30.436	ng	97
54) trans-1,3-Dichloropropene	15.38	75	593720	32.002	ng	100
55) 1,1,2-Trichloroethane	15.55	97	365176	29.183	ng	100
58) Toluene	15.84	91	1516689	28.653	ng	100
59) 2-Hexanone	16.08	43	887945	30.217	ng	98
60) Dibromochloromethane	16.25	129	464598	30.760	ng	100
61) 1,2-Dibromoethane	16.50	107	421924	29.981	ng	100
62) n-Butyl Acetate	16.72	43	998651	32.015	ng	98
63) n-Octane	16.85	57	321413	28.213	ng	98
64) Tetrachloroethene	16.99	166	465541	29.285	ng	100
65) Chlorobenzene	17.66	112	1040746	29.108	ng	100
66) Ethylbenzene	18.03	91	1729414	28.801	ng	99
67) m- & p-Xylenes	18.20	91	2680458	57.848	ng	99
68) Bromoform	18.26	173	415270	31.978	ng	100
69) Styrene	18.53	104	1107348	31.041	ng	99
70) o-Xylene	18.64	91	1363859	28.976	ng	99
71) n-Nonane	18.85	43	751202	27.219	ng	98
72) 1,1,2,2-Tetrachloroethane	18.61	83	636687	29.058	ng	100
74) Cumene	19.20	105	1776900	29.226	ng	100
75) alpha-Pinene	19.57	93	924556	30.608	ng	99
76) n-Propylbenzene	19.68	91	2086802	29.299	ng	99
77) 3-Ethyltoluene	19.77	105	1745323	29.207	ng	96
78) 4-Ethyltoluene	19.82	105	1712095	29.845	ng	95
79) 1,3,5-Trimethylbenzene	19.89	105	1447338	29.097	ng	99
80) alpha-Methylstyrene	20.03	118	832834	34.952	ng	99
81) 2-Ethyltoluene	20.07	105	1720763	29.468	ng	100
82) 1,2,4-Trimethylbenzene	20.29	105	1481487	29.581	ng	99
83) n-Decane	20.38	57	773539	26.053	ng	99
84) Benzyl Chloride	20.41	91	1337899	34.303	ng	99
85) 1,3-Dichlorobenzene	20.43	146	898883	30.286	ng	100
86) 1,4-Dichlorobenzene	20.50	146	910902	30.555	ng	100
87) sec-Butylbenzene	20.54	105	1967939	29.393	ng	99
88) 4-Isopropyltoluene (p-...	20.70	119	1888704	29.714	ng	99
89) 1,2,3-Trimethylbenzene	20.69	105	1522975	30.049	ng	100
90) 1,2-Dichlorobenzene	20.83	146	863124	29.778	ng	100
91) d-Limonene	20.84	68	598866	31.456	ng	99
92) 1,2-Dibromo-3-Chloropr...	21.25	157	330402	31.535	ng	96
93) n-Undecane	21.61	57	810490	31.080	ng	99
94) 1,2,4-Trichlorobenzene	22.51	180	669250	30.917	ng	100
95) Naphthalene	22.62	128	1906880	33.183	ng	100
96) n-Dodecane	22.62	57	756245	33.935	ng	99
97) Hexachlorobutadiene	22.96	225	452585	31.328	ng	100
98) Cyclohexanone	18.33	55	573653	36.665	ng	98
99) tert-Butylbenzene	20.29	119	1475579	29.571	ng	99
100) n-Butylbenzene	21.11	91	1573396	30.230	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Vial: 4
Operator: LH/AMF
Inst : MS13

Quant Time: Feb 21 14:06:06 2017



Data File : I:\MS13\DATA\2017 02\23\02231705.D
 Acq On : 23 Feb 2017 7:29
 Sample : LCS R13022317 25ng
 Misc : S29-02221710/S29-02091701 (3/10)

Vial: 4
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 23 08:33:47 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 11:57:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

2/23/17

2/24/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.17	130	149889	12.500	ng	0.01
37) 1,4-Difluorobenzene (IS2)	13.29	114	727238	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.61	82	287651	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.02	65	217141	11.171	ng	0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	89.36%
57) Toluene-d8 (SS2)	15.74	98	734093	13.248	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	106.00%
73) Bromofluorobenzene (SS3)	19.06	174	259608	12.099	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	96.80%

Target Compounds

						Qvalue
2) Propene	4.10	42	361137	18.685	ng	99
3) Dichlorodifluoromethan...	4.26	85	645482	20.209	ng	100
4) Chloromethane	4.54	50	455467	19.986	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	358717	20.053	ng	99
6) Vinyl Chloride	4.96	62	473183	21.022	ng	100
7) 1,3-Butadiene	5.23	54	359333	24.608	ng	97
8) Bromomethane	5.67	94	303538	23.123	ng	100
9) Chloroethane	6.00	64	243910	21.460	ng	99
10) Ethanol	6.37	45	1153333	101.650	ng	99
11) Acetonitrile	6.63	41	631428	20.273	ng	99
12) Acrolein	6.81	56	196263	22.029	ng	99
13) Acetone	7.02	58	1175465	103.986	ng	89
14) Trichlorofluoromethane	7.27	101	574337	19.822	ng	100
15) 2-Propanol (Isopropanol)	7.51	45	1677819	43.199	ng	98
16) Acrylonitrile	7.78	53	454304	22.031	ng	99
17) 1,1-Dichloroethene	8.23	96	322584	21.996	ng	92
18) 2-Methyl-2-Propanol (t...	8.38	59	1697751	45.793	ng	98
19) Methylene Chloride	8.45	84	330636	20.851	ng	95
20) 3-Chloro-1-propene (Al...	8.61	41	515299	22.281	ng	96
21) Trichlorotrifluoroethane	8.87	151	332746	22.002	ng	98
22) Carbon Disulfide	8.72	76	1213820	21.849	ng	100
23) trans-1,2-Dichloroethene	9.72	61	479237	21.980	ng	96
24) 1,1-Dichloroethane	9.98	63	589794	20.316	ng	99
25) Methyl tert-Butyl Ether	10.07	73	1029501	20.656	ng	100
26) Vinyl Acetate	10.23	86	409385	129.334	ng	# 81
27) 2-Butanone (MEK)	10.47	72	230151	20.791	ng	# 90
28) cis-1,2-Dichloroethene	10.99	61	452253	20.483	ng	96
29) Diisopropyl Ether	11.28	87	287684	18.754	ng	# 83
30) Ethyl Acetate	11.29	61	241641	43.133	ng	99
31) n-Hexane	11.28	57	533480	19.474	ng	100
32) Chloroform	11.34	83	568311	20.144	ng	100
34) Tetrahydrofuran (THF)	11.74	72	224892	19.585	ng	95
35) Ethyl tert-Butyl Ether	11.88	87	405995	21.624	ng	96
36) 1,2-Dichloroethane	12.14	62	439887	19.383	ng	100
38) 1,1,1-Trichloroethane	12.42	97	516961	20.246	ng	99
39) Isopropyl Acetate	12.84	61	414662	41.585	ng	95
40) 1-Butanol	12.86	56	667010	47.617	ng	88
41) Benzene	12.90	78	1306066	20.393	ng	100
42) Carbon Tetrachloride	13.06	117	478148	21.217	ng	99
43) Cyclohexane	13.19	84	1020981	42.383	ng	98
44) tert-Amyl Methyl Ether	13.53	73	953442	20.237	ng	98
45) 1,2-Dichloropropane	13.75	63	329974	20.538	ng	100
46) Bromodichloromethane	13.93	83	457374	21.057	ng	100
47) Trichloroethene	14.00	130	388176	21.932	ng	100
48) 1,4-Dioxane	13.96	88	286008	21.665	ng	97
49) 2,2,4-Trimethylpentane...	14.06	57	1383480	20.392	ng	97
50) Methyl Methacrylate	14.19	100	293000	45.933	ng	95

Data File : I:\MS13\DATA\2017 02\23\02231705.D
 Acq On : 23 Feb 2017 7:29
 Sample : LCS R13022317 25ng
 Misc : S29-02221710/S29-02091701 (3/10)

Vial: 4
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 23 08:33:47 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 11:57:41 2017

Response via : Initial Calibration

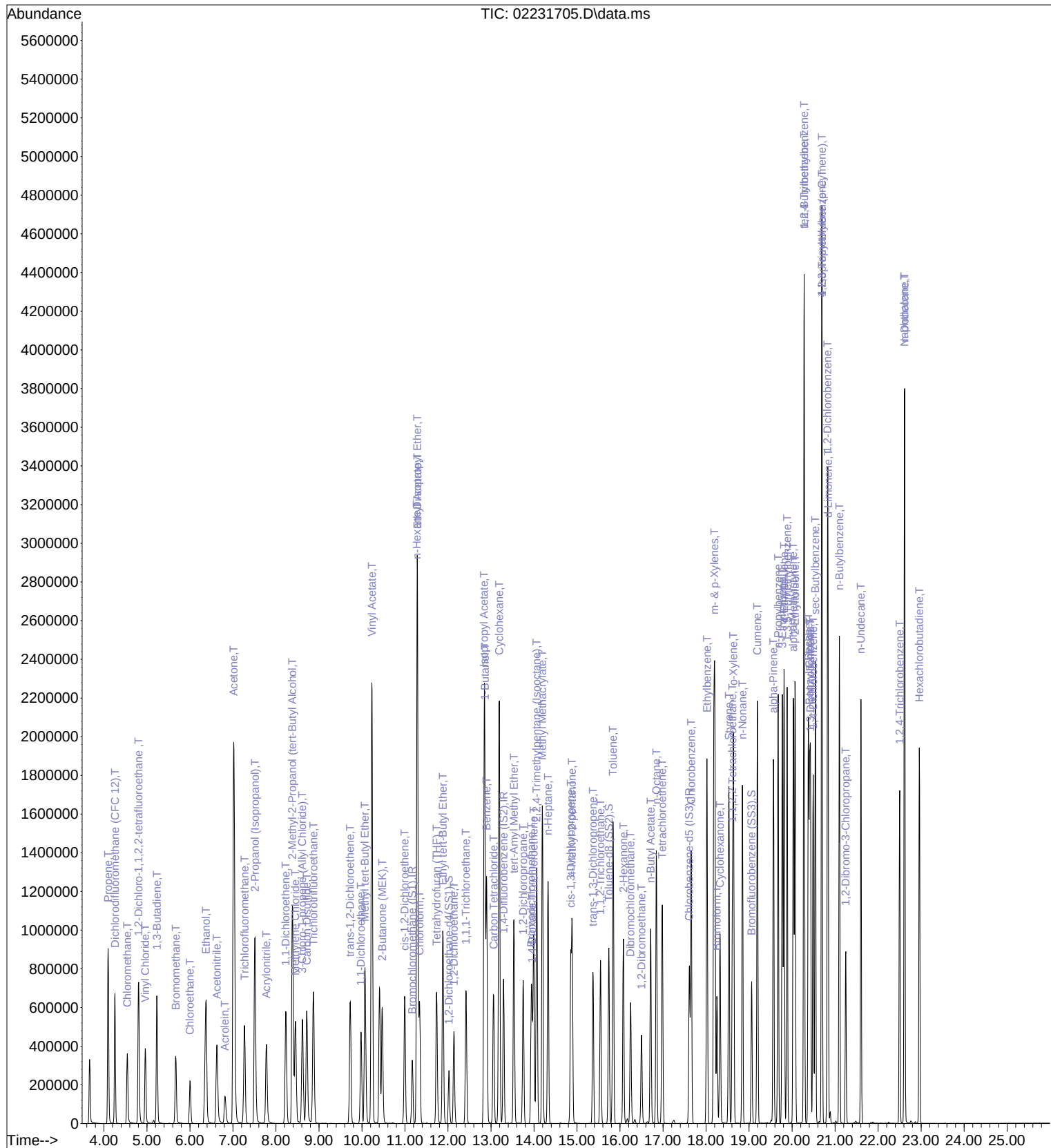
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.33	71	338430	20.859	ng	98
52) cis-1,3-Dichloropropene	14.85	75	557345	21.640	ng	100
53) 4-Methyl-2-pentanone	14.89	58	313726	21.582	ng	95
54) trans-1,3-Dichloropropene	15.37	75	523978	23.060	ng	100
55) 1,1,2-Trichloroethane	15.55	97	328281	21.420	ng	100
58) Toluene	15.84	91	1361547	22.707	ng	100
59) 2-Hexanone	16.08	43	751808	22.586	ng	97
60) Dibromochloromethane	16.24	129	415809	24.303	ng	100
61) 1,2-Dibromoethane	16.50	107	380296	23.855	ng	100
62) n-Butyl Acetate	16.71	43	851349	24.094	ng	98
63) n-Octane	16.84	57	286903	22.232	ng	97
64) Tetrachloroethene	16.98	166	425533	23.631	ng	100
65) Chlorobenzene	17.65	112	939265	23.191	ng	100
66) Ethylbenzene	18.02	91	1546123	22.731	ng	99
67) m- & p-Xylenes	18.20	91	2395827	45.645	ng	99
68) Bromoform	18.25	173	372841	25.346	ng	99
69) Styrene	18.53	104	992420	24.558	ng	99
70) o-Xylene	18.64	91	1220020	22.882	ng	99
71) n-Nonane	18.85	43	657745	21.039	ng	97
72) 1,1,2,2-Tetrachloroethane	18.61	83	569289	22.937	ng	100
74) Cumene	19.19	105	1591422	23.108	ng	99
75) alpha-Pinene	19.57	93	827943	24.197	ng	98
76) n-Propylbenzene	19.68	91	1870403	23.183	ng	99
77) 3-Ethyltoluene	19.77	105	1532484	22.639	ng	97
78) 4-Ethyltoluene	19.81	105	1571531	24.184	ng	95
79) 1,3,5-Trimethylbenzene	19.88	105	1301424	23.097	ng	100
80) alpha-Methylstyrene	20.03	118	750451	27.803	ng	99
81) 2-Ethyltoluene	20.07	105	1540559	23.290	ng	100
82) 1,2,4-Trimethylbenzene	20.28	105	1317562	23.225	ng	99
83) n-Decane	20.38	57	682120	20.281	ng	98
84) Benzyl Chloride	20.41	91	1181052	26.732	ng	99
85) 1,3-Dichlorobenzene	20.43	146	807483	24.018	ng	100
86) 1,4-Dichlorobenzene	20.49	146	824158	24.405	ng	100
87) sec-Butylbenzene	20.54	105	1758450	23.186	ng	99
88) 4-Isopropyltoluene (p-...	20.69	119	1690237	23.475	ng	99
89) 1,2,3-Trimethylbenzene	20.69	105	1357017	23.636	ng	100
90) 1,2-Dichlorobenzene	20.83	146	774865	23.600	ng	100
91) d-Limonene	20.84	68	527183	24.445	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.25	157	294241	24.792	ng	93
93) n-Undecane	21.60	57	707114	23.938	ng	99
94) 1,2,4-Trichlorobenzene	22.50	180	596603	24.331	ng	100
95) Naphthalene	22.61	128	1662261	25.536	ng	100
96) n-Dodecane	22.62	57	640275	25.364	ng	99
97) Hexachlorobutadiene	22.96	225	407260	24.886	ng	100
98) Cyclohexanone	18.32	55	466741	26.335	ng	97
99) tert-Butylbenzene	20.28	119	1316128	23.284	ng	99
100) n-Butylbenzene	21.10	91	1393939	23.643	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Vial: 4
Operator: LH/AMF
Inst : MS13

Quant Time: Feb 23 08:33:47 2017
Quant Method : I:\MS13\METHODS\R13022017.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Feb 21 11:57:41 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



Method Path : I:\MS13\METHODS\
 Method File : R13022017.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Tue Feb 21 11:57:41 2017
 Response Via : Initial Calibration

2/21/17 2/28/17

Calibration Files

0.08=02201706.D 0.10=02201707.D 0.20=02201708.D 0.40=02201709.D 1.0 =02201710.D 5.0 =02201711.D 25 =02201712.D
 50 =02201713.D 100 =02201714.D

Compound	0.08	0.10	0.20	0.40	1.0	5.0	25	50	100	Avg	%RSD
1) IR Bromochloromethane...				ISTD							
2) T Propene			1.704	1.572	1.508	1.620	1.468	1.572	1.838	1.612	7.78
3) T Dichlorodifluo...			2.852	2.834	2.662	2.810	2.625	2.484	2.378	2.664	6.88
4) T Chloromethane	2.267	2.036	2.021	1.994	1.957	2.050	2.067	1.639	1.072	1.901	18.45
5) T 1,2-Dichloro-1...	1.678	1.635	1.512	1.504	1.417	1.481	1.437	1.412	1.351	1.492	7.13
6) T Vinyl Chloride	1.840	1.814	1.844	1.840	1.890	2.043	1.947	1.908	1.768	1.877	4.35
7) T 1,3-Butadiene	1.199	1.150	1.184	1.138	1.156	1.309	1.321	1.275	1.227	1.218	5.71
8) T Bromomethane	1.069	1.063	1.028	1.104	1.099	1.115	1.125	1.125	1.126	1.095	3.14
9) T Chloroethane	1.014	0.927	0.999	0.957	0.911	0.971	0.916	0.923	0.913	0.948	4.14
10) T Ethanol			1.072	1.050	0.988	0.951	0.884	0.854	0.824	0.946	10.19
11) T Acetonitrile			2.845	2.627	2.624	2.648	2.481	2.489	2.467	2.597	5.16
12) T Acrolein	0.700	0.737	0.701	0.846	0.790	0.839	0.692	0.691	0.692	0.743	8.74
13) T Acetone			1.146	1.063	0.954	0.980	0.882	0.818	0.756	0.943	14.45
14) T Trichlorofluor...	2.752	2.544	2.432	2.478	2.360	2.472	2.312	2.227	2.169	2.416	7.28
15) T 2-Propanol (Is...	3.790	3.709	3.583	3.395	3.463	3.208	2.794	1.970	3.239		18.56
16) T Acrylonitrile	1.788	1.449	1.755	1.773	1.740	1.789	1.725	1.731	1.726	1.720	6.07
17) T 1,1-Dichloroet...	1.386	1.198	1.220	1.220	1.175	1.218	1.185	1.198	1.206	1.223	5.17
18) T 2-Methyl-2-Pro...	3.671	3.453	3.414	3.280	3.465	3.066	2.699	1.686	3.092		20.72
19) T Methylene Chlo...	1.682	1.403	1.340	1.218	1.265	1.214	1.224	1.234	1.322		12.11
20) T 3-Chloro-1-pro...	2.049	1.991	1.815	1.867	1.862	1.953	1.970	1.948	1.904	1.929	3.79
21) T Trichlorotrifl...	1.420	1.319	1.234	1.318	1.187	1.246	1.212	1.221	1.195	1.261	6.05
22) T Carbon Disulfide			4.996	4.659	4.643	4.531	4.522	4.446	4.633		4.21
23) T trans-1,2-Dich...	1.834	1.847	1.712	1.813	1.762	1.898	1.843	1.837	1.820	1.818	2.94
24) T 1,1-Dichloroet...	2.825	2.661	2.402	2.405	2.329	2.433	2.273	2.247	2.216	2.421	8.31
25) T Methyl tert-Bu...	4.756	4.451	4.197	4.021	4.137	3.949	3.912	3.829	4.156		7.48
26) T Vinyl Acetate	0.274	0.249	0.264	0.280	0.276	0.306	0.243	0.244	0.238	0.264	8.42
27) T 2-Butanone (MEK)	1.173	0.914	1.006	0.896	0.857	0.897	0.858	0.856	0.852	0.923	11.43
28) T cis-1,2-Dichlo...	2.168	1.923	1.877	1.726	1.820	1.832	1.767	1.745	1.713	1.841	7.68
29) T Diisopropyl Ether	1.528	1.416	1.411	1.328	1.276	1.297	1.239	1.037	0.982	1.279	13.79
30) T Ethyl Acetate	0.523	0.520	0.460	0.482	0.462	0.476	0.446	0.433	0.402	0.467	8.34
31) T n-Hexane	2.858	2.625	2.425	2.361	2.213	2.246	2.052	1.964	1.819	2.285	14.27
32) T Chloroform	2.561	2.631	2.447	2.454	2.230	2.306	2.227	2.178	2.141	2.353	7.49
33) S 1,2-Dichloroet...	1.606	1.616	1.652	1.647	1.687	1.688	1.642	1.546	1.506	1.621	3.78
34) T Tetrahydrofura...	1.372	1.055	0.943	0.891	0.880	0.843	0.841	0.835	0.958		19.07
35) T Ethyl tert-But...	1.694	1.538	1.608	1.562	1.506	1.588	1.544	1.533	1.519	1.566	3.70
36) T 1,2-Dichloroet...	2.117	2.112	1.896	1.891	1.856	1.932	1.822	1.733	1.674	1.893	7.91
37) IR 1,4-Difluorobenzen...				ISTD							
38) T 1,1,1-Trichlor...	0.500	0.457	0.442	0.443	0.430	0.442	0.422	0.412	0.403	0.439	6.46
39) T Isopropyl Acetate	0.199	0.192	0.175	0.175	0.166	0.171	0.160	0.157	0.149	0.171	9.51
40) T 1-Butanol	0.274	0.252	0.245	0.253	0.243	0.265	0.217	0.215	0.203	0.241	10.03
41) T Benzene	1.400	1.324	1.118	1.095	1.010	1.046	1.001	0.984	0.929	1.101	14.51
42) T Carbon Tetrach...	0.414	0.381	0.383	0.394	0.369	0.401	0.392	0.380	0.374	0.387	3.62

[illegible]

Method Path : I:\MS13\METHODS\

Method File : R13022017.M

Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

95) T	Naphthalene	2.480	2.731	3.161	3.032	2.950	2.618	2.829	9.25
96) T	n-Dodecane	1.273	1.037	0.941	1.076	1.066	1.152	1.179	9.18
97) T	Hexachlorobuta...	0.642	0.750	0.645	0.658	0.674	0.754	0.747	7.67
98) T	Cyclohexanone	0.833	0.806	0.877	0.706	0.711	0.687	0.770	10.26
99) T	tert-Butylbenzene	2.739	2.570	2.478	2.446	2.371	2.495	2.457	6.26
100) T	n-Butylbenzene	2.640	2.524	2.516	2.601	2.569	2.764	2.628	4.98

(#) = Out of Range

1ng/L Std. ID: S29-02171710
4ng/L Std. ID: S29-02061708
20ng/L Std. ID: S29-02061708
200ng/L Std. ID: S29-02147105

Dilution Factors:

Compounds	Source Std. mg/m ³	Primary Working Standards				
		200ng/L	20ng/L	4ng/L	1ng/L	
Propene	1.036	207.2	20.72	4.144	1.036	
Dichlorodifluoromethane	1.047	209.4	20.94	4.188	1.047	
Chloromethane	1.005	201.0	20.10	4.020	1.005	
Freon-114	1.005	201.0	20.10	4.020	1.005	
Vinyl Chloride	1.023	204.6	20.46	4.092	1.023	
1,3-Butadiene	1.057	211.4	21.14	4.228	1.057	
Bromomethane	0.993	198.6	19.86	3.972	0.993	
Chloroethane	1.009	201.8	20.18	4.036	1.009	
Ethanol	5.207	1041.4	104.14	20.828	5.207	
Acetonitrile	1.046	209.2	20.92	4.184	1.046	
Acrolein	1.041	208.2	20.82	4.164	1.041	
Acetone	5.313	1062.6	106.26	21.252	5.313	
Trichlorofluoromethane	1.049	209.8	20.98	4.196	1.049	
Isopropanol	2.105	421.0	42.10	8.420	2.105	
Acrylonitrile	1.055	211.0	21.10	4.220	1.055	
1,1-Dichloroethene	1.059	211.8	21.18	4.236	1.059	
tert-Butanol	2.114	422.8	42.28	8.456	2.114	
Methylene Chloride	1.057	211.4	21.14	4.228	1.057	
Trichlorofluoroethane	1.052	210.4	21.04	4.208	1.052	
Carbon Disulfide	1.049	209.8	20.98	4.196	1.049	
trans-1,2-Dichloroethene	1.061	212.2	21.22	4.244	1.061	
trans-1,2-Dichloroethene	1.067	213.4	21.34	4.268	1.067	
1,1-Dichloroethane	1.020	204.0	20.40	4.080	1.020	
Methyl tert-Butyl Ether	1.066	213.2	21.32	4.264	1.066	
Vinyl Acetate	5.265	1053.0	105.30	21.060	5.265	
2-Butanone	1.049	209.8	20.98	4.196	1.049	
cis-1,2-Dichloroethene	1.064	212.8	21.28	4.256	1.064	
Diisopropyl Ether	1.062	212.4	21.24	4.248	1.062	
Ethyl Acetate	2.129	425.8	42.58	8.516	2.129	
n-Hexane	1.063	212.6	21.26	4.252	1.063	
Chloroform	1.058	211.6	21.16	4.232	1.058	
Tetrahydrofuran	1.062	212.4	21.24	4.248	1.062	
Ethyl tert-Butyl Ether	1.057	211.4	21.14	4.228	1.057	
1,2-Dichloroethane	1.052	210.4	21.04	4.208	1.052	
1,1,1-Trichloroethane	1.074	214.8	21.48	4.296	1.074	
Isopropyl Acetate	2.104	420.8	42.08	8.416	2.104	
1-Butanol	2.105	421.0	42.10	8.420	2.105	
Benzene	1.052	210.4	21.04	4.208	1.052	
Carbon Tetrachloride	1.055	211.0	21.10	4.220	1.055	
Cyclohexane	2.130	426.0	42.60	8.520	2.130	
tert-Amyl Methyl Ether	1.054	210.8	21.08	4.216	1.054	
1,2-Dichloropropane	1.062	212.4	21.24	4.248	1.062	
Bromodichloromethane	1.066	213.2	21.32	4.264	1.066	
Trichloroethene	1.060	212.0	21.20	4.240	1.060	
1,4-Dioxane	1.062	212.4	21.24	4.248	1.062	
Isocutane	1.059	211.8	21.18	4.236	1.059	
Methyl Methacrylate	2.110	422.0	42.20	8.440	2.110	
n-Heptane	1.062	212.4	21.24	4.248	1.062	
cis-1,3-Dichloropropene	1.116	223.2	22.32	4.464	1.116	
4-Methyl-2-pentanone	1.058	211.6	21.16	4.232	1.058	
trans-1,3-Dichloropropene	1.064	212.8	21.28	4.256	1.064	
trans-1,3-Dichloropropene	1.061	212.2	21.22	4.244	1.061	
Toluene	1.053	210.6	21.06	4.212	1.053	
2-Hexanone	1.061	212.2	21.22	4.244	1.061	

Primary Source Standards Concentrations (Working & Initial Calibration)

Working STD Conc.(ng/L):	4		4		4		4		20		200		200		200	
	0.020	0.025	0.050	0.100	0.050	0.100	0.025	0.125	0.25	0.125	0.25	0.25	0.50	100ng	100ng	100ng
Injection (L):	0.08ng	0.1ng	0.2ng	0.4ng	0.2ng	0.4ng	1ng	1ng	5ng	5ng	25ng	50ng	50ng	50ng	100ng	100ng
ICAL Points:	0.08288	0.1036	0.2072	0.4144	0.1036	0.2072	0.4144	1.036	1.036	5.180	25.900	51.80	51.80	103.6	103.6	103.6
	0.08376	0.1047	0.2094	0.4188	0.1047	0.2094	0.4188	1.047	1.047	5.235	26.175	52.35	52.35	104.7	104.7	104.7
	0.08040	0.1005	0.2010	0.4020	0.1005	0.2010	0.4020	1.005	1.005	5.025	25.125	50.25	50.25	100.5	100.5	100.5
	0.08040	0.1005	0.2010	0.4020	0.1005	0.2010	0.4020	1.005	1.005	5.025	25.125	50.25	50.25	100.5	100.5	100.5
	0.08184	0.1023	0.2046	0.4092	0.1023	0.2046	0.4092	1.023	1.023	5.115	25.575	51.15	51.15	102.3	102.3	102.3
	0.08456	0.1057	0.2114	0.4228	0.1057	0.2114	0.4228	1.057	1.057	5.285	26.425	52.85	52.85	105.7	105.7	105.7
	0.07944	0.0993	0.1986	0.3972	0.0993	0.1986	0.3972	0.993	0.993	4.965	24.825	49.65	49.65	99.3	99.3	99.3
	0.08072	0.1009	0.2018	0.4036	0.1009	0.2018	0.4036	1.009	1.009	5.045	25.225	50.45	50.45	100.9	100.9	100.9
	0.41656	0.5207	1.0414	2.0828	0.5207	1.0414	2.0828	5.207	26.035	130.175	260.35	260.35	260.35	520.7	520.7	520.7
	0.08368	0.1046	0.2092	0.4184	0.1046	0.2092	0.4184	1.046	5.230	26.150	52.30	52.30	52.30	104.6	104.6	104.6
	0.08328	0.1041	0.2082	0.4164	0.1041	0.2082	0.4164	1.041	5.205	26.025	52.05	52.05	52.05	104.1	104.1	104.1
	0.42504	0.5313	1.0626	2.1252	0.5313	1.0626	2.1252	5.313	26.565	132.825	265.65	265.65	265.65	531.3	531.3	531.3
	0.08392	0.1049	0.2098	0.4196	0.1049	0.2098	0.4196	1.049	5.245	26.225	52.45	52.45	52.45	104.9	104.9	104.9
	0.16840	0.2105	0.4210	0.8420	0.2105	0.4210	0.8420	2.105	10.525	52.625	105.25	105.25	105.25	210.5	210.5	210.5
	0.08440	0.1055	0.2110	0.4220	0.1055	0.2110	0.4220	1.055	5.275	26.375	52.75	52.75	52.75	105.5	105.5	105.5
	0.08472	0.1059	0.2118	0.4236	0.1059	0.2118	0.4236	1.059	5.295	26.475	52.95	52.95	52.95	105.9	105.9	105.9
	0.16912	0.2114	0.4228	0.8456	0.2114	0.4228	0.8456	2.114	10.570	52.850	105.70	105.70	105.70	211.4	211.4	211.4
	0.08456	0.1057	0.2114	0.4228	0.1057	0.2114	0.4228	1.057	5.285	26.425	52.85	52.85	52.85	105.7	105.7	105.7
	0.08416	0.1052	0.2104	0.4208	0.1052	0.2104	0.4208	1.052	5.260	26.300	52.60	52.60	52.60	105.2	105.2	105.2
	0.08392	0.1049	0.2098	0.4196	0.1049	0.2098	0.4196	1.049	5.245	26.225	52.45	52.45	52.45	104.9	104.9	104.9
	0.08488	0.1061	0.2122	0.4244	0.1061	0.2122	0.4244	1.061	5.305	26.525	53.05	53.05	53.05	106.1	106.1	106.1
	0.08536	0.1067	0.2134	0.4268	0.1067	0.2134	0.4268	1.067	5.335	26.675	53.35	53.35	53.35	106.7	106.7	106.7
	0.08160	0.1020	0.2040	0.4080	0.1020	0.2040	0.4080	1.020	5.100	25.500	51.00	51.00	51.00	102.0	102.0	102.0
	0.08528	0.1066	0.2132	0.4264	0.1066	0.2132	0.4264	1.066	5.330	26.650	53.30	53.30	53.30	106.6	106.6	106.6
	0.42120	0.5265	1.0530	2.1060	0.5265	1.0530	2.1060	5.265	26.325	131.625	263.25	263.25	263.25	526.5	526.5	526.5
	0.08392	0.1049	0.2098	0.4196	0.1049	0.2098	0.4196	1.049	5.245	26.225	52.45	52.45	52.45	104.9	104.9	104.9
	0.08512	0.1064	0.2128	0.4256	0.1064	0.2128	0.4256	1.064	5.320	26.600	53.20	53.20	53.20	106.4	106.4	106.4
	0.08496	0.1062	0.2124	0.4248	0.1062	0.2124	0.4248	1.062	5.310	26.550	53.10	53.10	53.10	106.2	106.2	106.2
	0.17032	0.2129	0.4258	0.8516	0.2129	0.4258	0.8516	2.129	10.645	53.225	106.45	106.45	106.45	212.9	212.9	212.9
	0.08504	0.1063	0.2126	0.4252	0.1063	0.2126	0.4252	1.063	5.315	26.575	53.15	53.15	53.15	106.3	106.3	106.3
	0.08464	0.1058	0.2116	0.4232	0.1058	0.2116	0.4232	1.058	5.290	26.450	52.90	52.90	52.90	105.8	105.8	105.8
	0.08496	0.1062	0.2124	0.4248	0.1062	0.2124	0.4248	1.062	5.310	26.550	53.10	53.10	53.10	106.2	106.2	106.2
	0.08456	0.1057	0.2114	0.4228	0.1057	0.2114	0.4228	1.057	5.285	26.425	52.85	52.85	52.85	105.7	105.7	105.7
	0.08416	0.1052	0.2104	0.4208	0.1052	0.2104	0.4208	1.052	5.260	26.300	52.60	52.60	52.60	105.2	105.2	105.2
	0.08592	0.1074	0.2148	0.4296	0.1074	0.2148	0.4296	1.074	5.370	26.850	53.70	53.70	53.70	107.4	107.4	107.4
	0.16832	0.2104	0.4208	0.8416	0.2104	0.4208	0.8416	2.104	10.520	52.600	105.20	105.20	105.20	210.4	210.4	210.4
	0.16840	0.2105	0.4210	0.8420	0.2105	0.4210	0.8420	2.105	10.525	52.625	105.25	105.25	105.25	210.5	210.5	210.5
	0.08416	0.1052	0.2104	0.4208	0.1052	0.2104	0.4208	1.052	5.260	26.300	52.60	52.60	52.60	105.2	105.2	105.2
	0.08440	0.1055	0.2110	0.4220	0.1055	0.2110	0.4220	1.055	5.275	26.375	52.75	52.75	52.75	105.5	105.5	105.5
	0.17040	0.2130	0.4260	0.8520	0.2130	0.4260	0.8520	2.130	10.650	53.250	106.50	106.50	106.50	213.0	213.0	213.0
	0.08432	0.1054	0.2108	0.4216	0.1054	0.2108	0.4216	1.054	5.270	26.350	52.70	52.70	52.70	105.4	105.4	105.4
	0.08496	0.1062	0.2124	0.4248	0.1062	0.2124	0.4248	1.062	5.310	26.550	53.10	53.10	53.10	106.2	106.2	106.2
	0.08528	0.1066	0.2132	0.4264	0.1066	0.2132	0.4264	1.066	5.330	26.650	53.30	53.30	53.30	106.6	106.6	106.6
	0.08480	0.1060	0.2120	0.4240	0.1060	0.2120	0.4240	1.060	5.300	26.500	53.00	53.00	53.00	106.0	106.0	106.0
	0.08496	0.1062	0.2124	0.4248	0.1062	0.2124	0.4248	1.062	5.310	26.550	53.10	53.10	53.10	106.2	106.2	106.2
	0.08472	0.1059	0.2118	0.4236	0.1059	0.2118	0.4236	1.059	5.295	26.475	52.95	52.95	52.95	105.9	105.9	105.9
	0.16880	0.2110	0.4220	0.8440	0.2110	0.4220	0.8440	2.110	10.550	52.750	105.50	105.50	105.50	211.0	211.0	211.0
	0.08496	0.1062	0.2124	0.4248	0.1062	0.2124	0.4248	1.062	5.310	26.550	53.10	53.10	53.10	106.2	106.2	106.2
	0.08928	0.1116	0.2232	0.4464	0.1116	0.2232	0.4464	1.116	5.580	27.900	55.80	55.80	55.80	111.6	111.6	111.6
	0.08464	0.1058	0.2116	0.4232	0.1058	0.2116	0.4232	1.058	5.290	26.450	52.90	52.90	52.90	105.8	105.8	105.8
	0.08512	0.1064	0.2128	0.4256	0.1064	0.2128	0.4256	1.064	5.320	26.600	53.20	53.20	53.20	106.4	106.4	106.4
	0.08488	0.1061	0.2122	0.4244	0.1061	0.2122	0.4244	1.061	5.305	26.525	53.05	53.05	53.05	106.1	106.1	106.1
	0.08424	0.1053	0.2106	0.4212	0.1053	0.2106	0.4212	1.053	5.265	26.325	52.65	52.65	52.65	105.3	105.3	105.3
	0.08488	0.1061	0.2122	0.4244	0.1061	0.2122	0.4244	1.061	5.305	26.525	53.05	53.05	53.05	106.1	106.1	106.1

1ng/L Std. ID: S29-02171710
4ng/L Std. ID: S29-02061708
20ng/L Std. ID: S29-01241705

Primary Source Standards Concentrations (Working & Initial Calibration)

Compounds	Source Std. mg/m ³	Primary Working Standards					Working STD Conc.(ng/L):									
		200ng/L	200ng/L	4ng/L	4ng/L	1000	4	4	4	4	4	20	200	200	200	200
Dibromochloromethane	1.062	212.4	21.24	4.248	1.062		0.020	0.025	0.050	0.100	0.050	0.025	0.125	0.25	0.50	100ng
1,2-Dibromoethane	1.056	211.2	21.12	4.224	1.056		0.08496	0.1062	0.2124	0.4248	1.062	5.310	26.550	53.10	106.2	106.2
n-Butyl Acetate	1.064	212.8	21.28	4.256	1.064		0.08448	0.1056	0.2112	0.4224	1.056	5.280	26.400	52.80	105.6	105.6
n-Octane	1.057	211.4	21.14	4.228	1.057		0.08512	0.1064	0.2128	0.4256	1.064	5.320	26.600	53.20	106.4	106.4
Tetrachloroethene	1.061	212.2	21.22	4.244	1.061		0.08456	0.1057	0.2114	0.4228	1.057	5.285	26.425	52.85	105.7	105.7
Chlorobenzene	1.061	212.2	21.22	4.244	1.061		0.08488	0.1061	0.2122	0.4244	1.061	5.305	26.525	53.05	106.1	106.1
n-Butylbenzene	1.055	211.0	21.10	4.220	1.055		0.08440	0.1055	0.2110	0.4220	1.055	5.275	26.375	52.75	105.5	105.5
m- & p-Xylene	1.063	212.6	21.26	4.252	1.063		0.16984	0.2123	0.4246	0.8492	2.123	10.615	53.075	106.15	212.3	212.3
Bromodorm	1.063	212.6	21.26	4.252	1.063		0.08504	0.1063	0.2126	0.4252	1.063	5.315	26.575	53.15	106.3	106.3
Styrene	1.061	212.2	21.22	4.244	1.061		0.08488	0.1061	0.2122	0.4244	1.061	5.305	26.525	53.05	106.1	106.1
o-Xylene	1.054	210.8	21.08	4.216	1.054		0.08432	0.1054	0.2108	0.4216	1.054	5.270	26.350	52.70	105.4	105.4
n-Nonane	1.054	210.8	21.08	4.216	1.054		0.08432	0.1054	0.2108	0.4216	1.054	5.270	26.350	52.70	105.4	105.4
1,1,2,2-Tetrachloroethane	1.056	211.2	21.12	4.224	1.056		0.08448	0.1056	0.2112	0.4224	1.056	5.280	26.400	52.80	105.6	105.6
Cumene	1.050	210.0	21.00	4.200	1.050		0.08400	0.1050	0.2100	0.4200	1.050	5.250	26.250	52.50	105.0	105.0
alpha-Phene	1.044	208.8	20.88	4.176	1.044		0.08352	0.1044	0.2088	0.4176	1.044	5.220	26.100	52.20	104.4	104.4
n-Propylbenzene	1.063	212.6	21.26	4.252	1.063		0.08504	0.1063	0.2126	0.4252	1.063	5.315	26.575	53.15	106.3	106.3
3-Ethyltoluene	1.050	210.0	21.00	4.200	1.050		0.08400	0.1050	0.2100	0.4200	1.050	5.250	26.250	52.50	105.0	105.0
4-Ethyltoluene	1.049	209.8	20.98	4.196	1.049		0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	52.45	104.9	104.9
1,3,5-Trimethylbenzene	1.049	209.8	20.98	4.196	1.049		0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	52.45	104.9	104.9
alpha-Methylstyrene	1.050	210.0	21.00	4.200	1.050		0.08400	0.1050	0.2100	0.4200	1.050	5.250	26.250	52.50	105.0	105.0
2-Ethyltoluene	1.062	212.4	21.24	4.248	1.062		0.08496	0.1062	0.2124	0.4248	1.062	5.310	26.550	53.10	106.2	106.2
1,2,4-Trimethylbenzene	1.052	210.4	21.04	4.208	1.052		0.08416	0.1052	0.2104	0.4208	1.052	5.260	26.300	52.60	105.2	105.2
n-Decane	1.053	210.6	21.06	4.212	1.053		0.08424	0.1053	0.2106	0.4212	1.053	5.265	26.325	52.65	105.3	105.3
Benzyl Chloride	1.061	212.2	21.22	4.244	1.061		0.08488	0.1061	0.2122	0.4244	1.061	5.305	26.525	53.05	106.1	106.1
1,3-Dichlorobenzene	1.058	211.6	21.16	4.232	1.058		0.08464	0.1058	0.2116	0.4232	1.058	5.290	26.450	52.90	105.8	105.8
1,4-Dichlorobenzene	1.058	211.6	21.16	4.232	1.058		0.08464	0.1058	0.2116	0.4232	1.058	5.290	26.450	52.90	105.8	105.8
sec-Butylbenzene	1.054	210.8	21.08	4.216	1.054		0.08432	0.1054	0.2108	0.4216	1.054	5.270	26.350	52.70	105.4	105.4
p-Isopropyltoluene	1.027	205.4	20.54	4.108	1.027		0.08216	0.1027	0.2054	0.4108	1.027	5.135	25.675	51.35	102.7	102.7
1,2,3-Trimethylbenzene	1.027	205.4	20.54	4.108	1.027		0.08216	0.1027	0.2054	0.4108	1.027	5.135	25.675	51.35	102.7	102.7
1,2-Dichlorobenzene	1.058	211.6	21.16	4.232	1.058		0.08464	0.1058	0.2116	0.4232	1.058	5.290	26.450	52.90	105.8	105.8
d-Limonene	1.005	201.0	20.10	4.020	1.005		0.08040	0.1005	0.2010	0.4020	1.005	5.025	25.125	50.25	100.5	100.5
1,2-Dibromo-3-chloropropane	1.053	210.6	21.06	4.212	1.053		0.08424	0.1053	0.2106	0.4212	1.053	5.265	26.325	52.65	105.3	105.3
n-Undecane	1.054	210.8	21.08	4.216	1.054		0.08432	0.1054	0.2108	0.4216	1.054	5.270	26.350	52.70	105.4	105.4
1,2,2-Trichlorobenzene	1.043	208.6	20.86	4.172	1.043		0.08344	0.1043	0.2086	0.4172	1.043	5.215	26.075	52.15	104.3	104.3
Naphthalene	1.083	216.6	21.66	4.332	1.083		0.08664	0.1083	0.2166	0.4332	1.083	5.415	27.075	54.15	108.3	108.3
n-Dodecane	1.045	209.0	20.90	4.180	1.045		0.08360	0.1045	0.2090	0.4180	1.045	5.225	26.125	52.25	104.5	104.5
Hexachloro-1,3-butadiene	1.059	211.8	21.18	4.236	1.059		0.08472	0.1059	0.2118	0.4236	1.059	5.295	26.475	52.95	105.9	105.9
Methacrylonitrile	1.065	213.0	21.30	4.260	1.065		0.08520	0.1065	0.2130	0.4260	1.065	5.325	26.625	53.25	106.5	106.5
Cyclohexanone	1.056	211.2	21.12	4.224	1.056		0.08448	0.1056	0.2112	0.4224	1.056	5.280	26.400	52.80	105.6	105.6
tert-Butylbenzene	1.051	210.2	21.02	4.204	1.051		0.08408	0.1051	0.2102	0.4204	1.051	5.255	26.275	52.55	105.1	105.1
n-Butylbenzene	1.056	211.2	21.12	4.224	1.056		0.08448	0.1056	0.2112	0.4224	1.056	5.280	26.400	52.80	105.6	105.6

Method : I:\MS13\METHODS\R13022017.M (RTE Integrator)
 Title : EPA T0-15 per SOP VOA-T015 (CASS T0-15/GC-MS)
 Last Update : Tue Feb 21 11:57:41 2017
 Response via : Initial Calibration

 2/21/17

#	ID	Conc	ISTD Conc	Path\File
1	0.08	0	13	I:\MS13\DATA\2017_02\20\02201706.D
2	0.10	0	13	I:\MS13\DATA\2017_02\20\02201707.D
3	0.20	0	13	I:\MS13\DATA\2017_02\20\02201708.D
4	0.40	0	13	I:\MS13\DATA\2017_02\20\02201709.D
5	1.0	1	13	I:\MS13\DATA\2017_02\20\02201710.D
6	5.0	5	13	I:\MS13\DATA\2017_02\20\02201711.D
7	25	26	13	I:\MS13\DATA\2017_02\20\02201712.D
8	50	52	13	I:\MS13\DATA\2017_02\20\02201713.D
9	100	104	13	I:\MS13\DATA\2017_02\20\02201714.D

 2/28/17

#	ID	Update Time	Quant Time	Acquisition Time
1	0.08	Feb 21 11:57 2017	Feb 21 10:25 2017	20 Feb 2017 12:20
2	0.10	Feb 21 11:57 2017	Feb 21 10:25 2017	20 Feb 2017 12:56
3	0.20	Feb 21 11:57 2017	Feb 21 10:25 2017	20 Feb 2017 13:30
4	0.40	Feb 21 11:37 2017	Feb 21 10:25 2017	20 Feb 2017 14:05
5	1.0	Feb 21 11:17 2017	Feb 21 10:25 2017	20 Feb 2017 14:40
6	5.0	Feb 21 11:17 2017	Feb 21 10:25 2017	20 Feb 2017 15:15
7	25	Feb 21 11:36 2017	Feb 21 10:25 2017	20 Feb 2017 15:50
8	50	Feb 21 11:18 2017	Feb 21 10:25 2017	20 Feb 2017 16:25
9	100	Feb 21 11:18 2017	Feb 21 10:25 2017	20 Feb 2017 17:00

R13022017.M

Tue Feb 21 12:33:15 2017

Data File : I:\MS13\DATA\2017 02\20\02201707.D
 Acq On : 20 Feb 2017 12:56
 Sample : 0.1ng S29-02171710
 Misc : S29-01311701/S29-02171710 (3/18)

Vial: 10
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 21 10:25:18 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 10:20:40 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

AM 2/21/17 *LS* 2/28/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.16	130	127771	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.29	114	621366	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.61	82	263566	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.02	65	206454	14.283	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	114.24%	
57) Toluene-d8 (SS2)	15.74	98	638401	11.993	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	95.92%	
73) Bromofluorobenzene (SS3)	19.07	174	238469	10.652	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	85.20%	

Target Compounds

						Qvalue
2) Propene	4.16	42	1960	0.207	ng	94
3) Dichlorodifluoromethan...	4.31	85	3333	0.149	ng	# 96
4) Chloromethane	4.61	50	2092	0.157	ng	90
5) 1,2-Dichloro-1,1,2,2-t...	4.85	135	1680	0.127	ng	96
6) Vinyl Chloride	5.03	62	1897	0.142	ng	95
7) 1,3-Butadiene	5.30	54	1243	0.151	ng	98
8) Bromomethane	5.72	94	1079	0.125	ng	82
9) Chloroethane	6.04	64	956	0.145	ng	87
10) Ethanol	6.36	45	5976	1.081	ng	91
11) Acetonitrile	6.67	41	3298	0.228	ng	# 1
12) Acrolein	6.85	56	784	0.150	ng	84
13) Acetone	7.06	58	6993	1.130	ng	97
14) Trichlorofluoromethane	7.29	101	2728	0.142	ng	98
15) 2-Propanol (Isopropanol)	7.54	45	8154	0.435	ng	94
16) Acrylonitrile	7.80	53	1563	0.148	ng	89
17) 1,1-Dichloroethene	8.25	96	1297	0.142	ng	91
18) 2-Methyl-2-Propanol (t...	8.43	59	7932	0.362	ng	96
19) Methylene Chloride	8.46	84	1817	0.180	ng	99
20) 3-Chloro-1-propene (Al...	8.62	41	2141	0.187	ng	88
21) Trichlorotrifluoroethane	8.88	151	1414	0.128	ng	95
22) Carbon Disulfide	8.76	76	7501	0.209	ng	89
23) trans-1,2-Dichloroethene	9.72	61	2014	0.166	ng	97
24) 1,1-Dichloroethane	9.96	63	2774	0.171	ng	97
25) Methyl tert-Butyl Ether	10.12	73	5182	0.178	ng	92
26) Vinyl Acetate	10.23	86	1342	0.618	ng	# 35
27) 2-Butanone (MEK)	10.50	72	980	0.163	ng	# 80
28) cis-1,2-Dichloroethene	10.98	61	2091	0.170	ng	97
29) Diisopropyl Ether	11.31	87	1537	0.165	ng	# 77
30) Ethyl Acetate	11.30	61	1132	0.382	ng	95
31) n-Hexane	11.28	57	2852	0.199	ng	95
32) Chloroform	11.33	83	2845	0.165	ng	98
34) Tetrahydrofuran (THF)	11.77	72	1489	0.218	ng	# 90
35) Ethyl tert-Butyl Ether	11.91	87	1662	0.149	ng	# 81
36) 1,2-Dichloroethane	12.13	62	2271	0.171	ng	90
38) 1,1,1-Trichloroethane	12.42	97	2441	0.143	ng	99
39) Isopropyl Acetate	12.86	61	2005	0.357	ng	95
40) 1-Butanol	12.88	56	2636	0.319	ng	92
41) Benzene	12.90	78	6926	0.179	ng	95
42) Carbon Tetrachloride	13.06	117	1999	0.129	ng	90
43) Cyclohexane	13.19	84	4948	0.324	ng	98
44) tert-Amyl Methyl Ether	13.56	73	4457	0.163	ng	99
45) 1,2-Dichloropropane	13.75	63	1579	0.173	ng	96
46) Bromodichloromethane	13.93	83	2115	0.156	ng	97
47) Trichloroethene	14.00	130	1709	0.135	ng	97
48) 1,4-Dioxane	13.98	88	1281	0.164	ng	94
49) 2,2,4-Trimethylpentane...	14.06	57	7157	0.189	ng	95
50) Methyl Methacrylate	14.20	100	1056	0.253	ng	# 70

Data File : I:\MS13\DATA\2017 02\20\02201707.D
 Acq On : 20 Feb 2017 12:56
 Sample : 0.1ng S29-02171710
 Misc : S29-01311701/S29-02171710 (3/18)

Vial: 10
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 21 10:25:18 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 10:20:40 2017

Response via : Initial Calibration

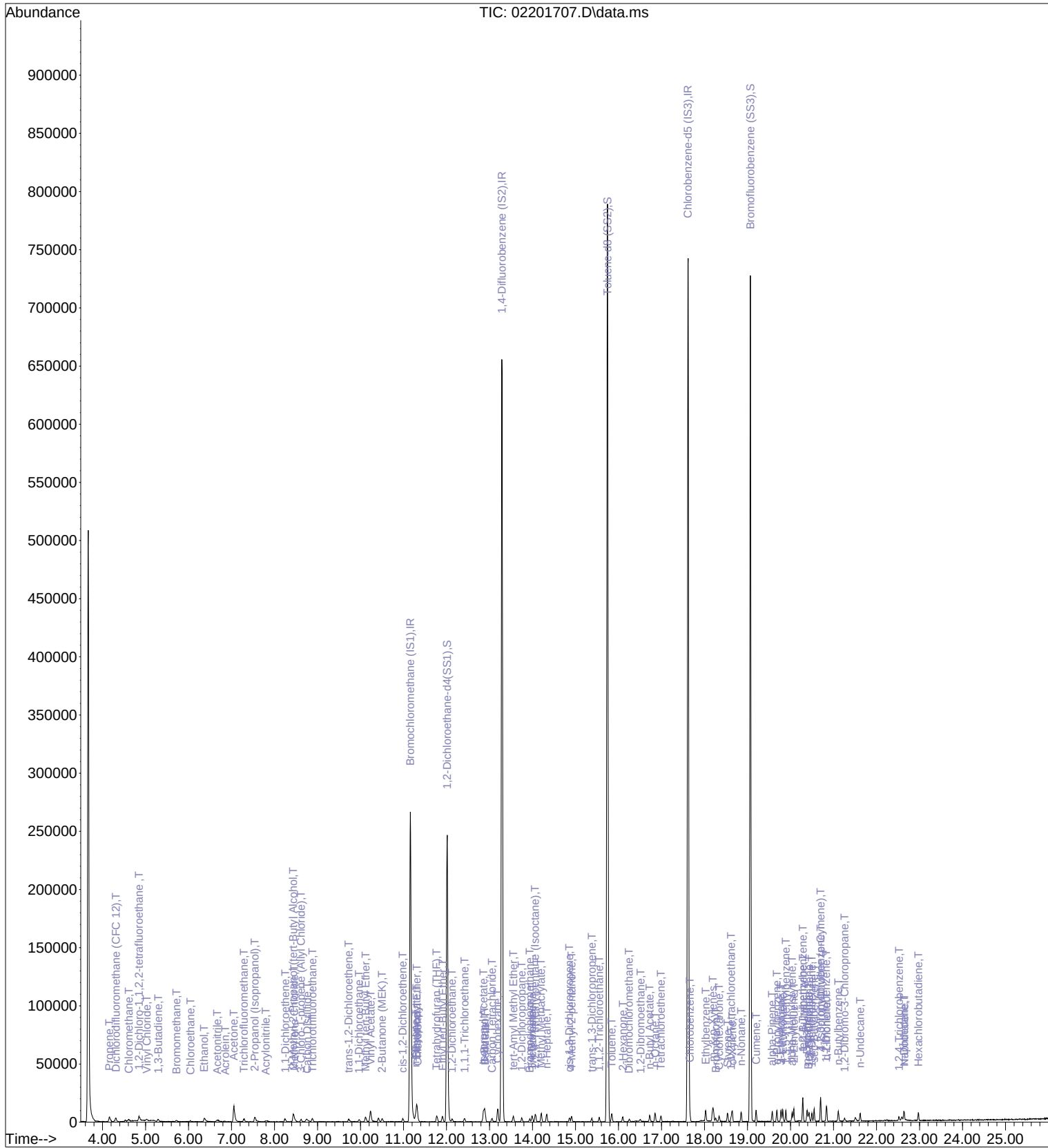
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.33	71	1630	0.172	ng	95
52) cis-1,3-Dichloropropene	14.85	75	2463	0.166	ng	98
53) 4-Methyl-2-pentanone	14.91	58	1387	0.169	ng	91
54) trans-1,3-Dichloropropene	15.38	75	1972	0.129	ng	100
55) 1,1,2-Trichloroethane	15.55	97	1454	0.146	ng	99
58) Toluene	15.84	91	6296	0.139	ng	98
59) 2-Hexanone	16.10	43	3590	0.180	ng	93
60) Dibromochloromethane	16.24	129	1548	0.113	ng	89
61) 1,2-Dibromoethane	16.51	107	1531	0.126	ng	99
62) n-Butyl Acetate	16.72	43	4097	0.195	ng	88
63) n-Octane	16.85	57	1935	0.231	ng	# 68
64) Tetrachloroethene	16.99	166	1929	0.121	ng	93
65) Chlorobenzene	17.66	112	4130	0.129	ng	97
66) Ethylbenzene	18.03	91	7278	0.144	ng	97
67) m- & p-Xylenes	18.20	91	11142	0.278	ng	99
68) Bromoform	18.26	173	1346	0.108	ng	98
69) Styrene	18.54	104	4041	0.124	ng	100
70) o-Xylene	18.65	91	5360	0.131	ng	94
71) n-Nonane	18.85	43	3262	0.184	ng	96
72) 1,1,2,2-Tetrachloroethane	18.62	83	2508	0.144	ng	98
74) Cumene	19.20	105	7059	0.131	ng	100
75) alpha-Pinene	19.57	93	3468	0.132	ng	85
76) n-Propylbenzene	19.68	91	8298	0.141	ng	99
77) 3-Ethyltoluene	19.77	105	6732	0.136	ng	100
78) 4-Ethyltoluene	19.82	105	6743	0.141	ng	100
79) 1,3,5-Trimethylbenzene	19.89	105	5575	0.123	ng	97
80) alpha-Methylstyrene	20.04	118	2644	0.106	ng	97
81) 2-Ethyltoluene	20.08	105	6838	0.132	ng	99
82) 1,2,4-Trimethylbenzene	20.29	105	5693	0.133	ng	99
83) n-Decane	20.39	57	3233	0.174	ng	96
84) Benzyl Chloride	20.41	91	2980	0.083	ng	94
85) 1,3-Dichlorobenzene	20.43	146	3355	0.110	ng	96
86) 1,4-Dichlorobenzene	20.50	146	3286	0.122	ng	99
87) sec-Butylbenzene	20.55	105	7668	0.131	ng	96
88) 4-Isopropyltoluene (p-...	20.70	119	7146	0.129	ng	98
89) 1,2,3-Trimethylbenzene	20.70	105	5543	0.128	ng	97
90) 1,2-Dichlorobenzene	20.83	146	3308	0.131	ng	96
91) d-Limonene	20.84	68	1889	0.141	ng	95
92) 1,2-Dibromo-3-Chloropr...	21.26	157	909	0.084	ng	# 73
93) n-Undecane	21.62	57	2697	0.127	ng	92
94) 1,2,4-Trichlorobenzene	22.52	180	1738	0.070	ng	# 94
95) Naphthalene	22.65	128	4099	0.066	ng	99
96) n-Dodecane	22.64	57	2284	0.121	ng	80
97) Hexachlorobutadiene	22.98	225	1674	0.105	ng	95
98) Cyclohexanone	18.34	55	2101	0.155	ng	98
99) tert-Butylbenzene	20.29	119	5695	0.127	ng	100
100) n-Butylbenzene	21.11	91	5619	0.116	ng	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Vial: 10
Operator: LH/AMF
Inst : MS13

Quant Time: Feb 21 10:25:18 2017



Data File : I:\MS13\DATA\2017 02\20\02201708.D
 Acq On : 20 Feb 2017 13:30
 Sample : 0.2ng S29-02171710
 Misc : S29-01311701/S29-02171710 (3/18)

Vial: 10
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 21 10:25:20 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 10:20:40 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

AM 2/21/17

AM 2/28/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.16	130	120895	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.29	114	589798	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.61	82	251362	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.01	65	199761	14.606	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	116.88%	
57) Toluene-d8 (SS2)	15.74	98	605153	11.920	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	95.36%	
73) Bromofluorobenzene (SS3)	19.07	174	227162	10.639	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	85.12%	

Target Compounds

						Qvalue
2) Propene	4.15	42	3415	0.381	ng	96
3) Dichlorodifluoromethan...	4.30	85	5776	0.273	ng	96
4) Chloromethane	4.59	50	3928	0.311	ng	97
5) 1,2-Dichloro-1,1,2,2-t...	4.84	135	2939	0.234	ng	99
6) Vinyl Chloride	5.01	62	3649	0.289	ng	99
7) 1,3-Butadiene	5.27	54	2421	0.311	ng	93
8) Bromomethane	5.70	94	1974	0.241	ng	99
9) Chloroethane	6.03	64	1949	0.312	ng	92
10) Ethanol	6.35	45	10801	2.065	ng	95
11) Acetonitrile	6.65	41	5757	0.421	ng	95
12) Acrolein	6.83	56	1411	0.286	ng	96
13) Acetone	7.03	58	11777	2.012	ng	96
14) Trichlorofluoromethane	7.29	101	4934	0.271	ng	99
15) 2-Propanol (Isopropanol)	7.52	45	15103	0.852	ng	99
16) Acrylonitrile	7.79	53	3582	0.358	ng	97
17) 1,1-Dichloroethene	8.24	96	2500	0.289	ng	100
18) 2-Methyl-2-Propanol (t...	8.42	59	14119	0.681	ng	96
19) Methylene Chloride	8.44	84	2869	0.301	ng	90
20) 3-Chloro-1-propene (Al...	8.61	41	3694	0.341	ng	70
21) Trichlorotrifluoroethane	8.87	151	2504	0.239	ng	91
22) Carbon Disulfide	8.74	76	11665	0.344	ng	95
23) trans-1,2-Dichloroethene	9.72	61	3533	0.308	ng	90
24) 1,1-Dichloroethane	9.96	63	4739	0.309	ng	96
25) Methyl tert-Butyl Ether	10.10	73	9177	0.334	ng	96
26) Vinyl Acetate	10.23	86	2690	1.309	ng	# 61
27) 2-Butanone (MEK)	10.50	72	2041	0.359	ng	97
28) cis-1,2-Dichloroethene	10.98	61	3863	0.333	ng	96
29) Diisopropyl Ether	11.31	87	2899	0.329	ng	# 93
30) Ethyl Acetate	11.31	61	1893	0.676	ng	93
31) n-Hexane	11.27	57	4986	0.367	ng	98
32) Chloroform	11.32	83	5008	0.307	ng	99
34) Tetrahydrofuran (THF)	11.77	72	2168	0.336	ng	# 86
35) Ethyl tert-Butyl Ether	11.89	87	3288	0.312	ng	98
36) 1,2-Dichloroethane	12.14	62	3858	0.307	ng	100
38) 1,1,1-Trichloroethane	12.42	97	4476	0.276	ng	98
39) Isopropyl Acetate	12.85	61	3466	0.649	ng	94
40) 1-Butanol	12.87	56	4872	0.620	ng	97
41) Benzene	12.89	78	11096	0.301	ng	97
42) Carbon Tetrachloride	13.05	117	3810	0.260	ng	99
43) Cyclohexane	13.19	84	8375	0.578	ng	97
44) tert-Amyl Methyl Ether	13.55	73	8276	0.319	ng	98
45) 1,2-Dichloropropane	13.75	63	2773	0.320	ng	100
46) Bromodichloromethane	13.94	83	3631	0.283	ng	99
47) Trichloroethene	13.99	130	2975	0.247	ng	96
48) 1,4-Dioxane	13.98	88	2181	0.294	ng	97
49) 2,2,4-Trimethylpentane...	14.07	57	11720	0.326	ng	100
50) Methyl Methacrylate	14.20	100	2118	0.535	ng	94

Data File : I:\MS13\DATA\2017 02\20\02201708.D
 Acq On : 20 Feb 2017 13:30
 Sample : 0.2ng S29-02171710
 Misc : S29-01311701/S29-02171710 (3/18)

Vial: 10
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 21 10:25:20 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 10:20:40 2017

Response via : Initial Calibration

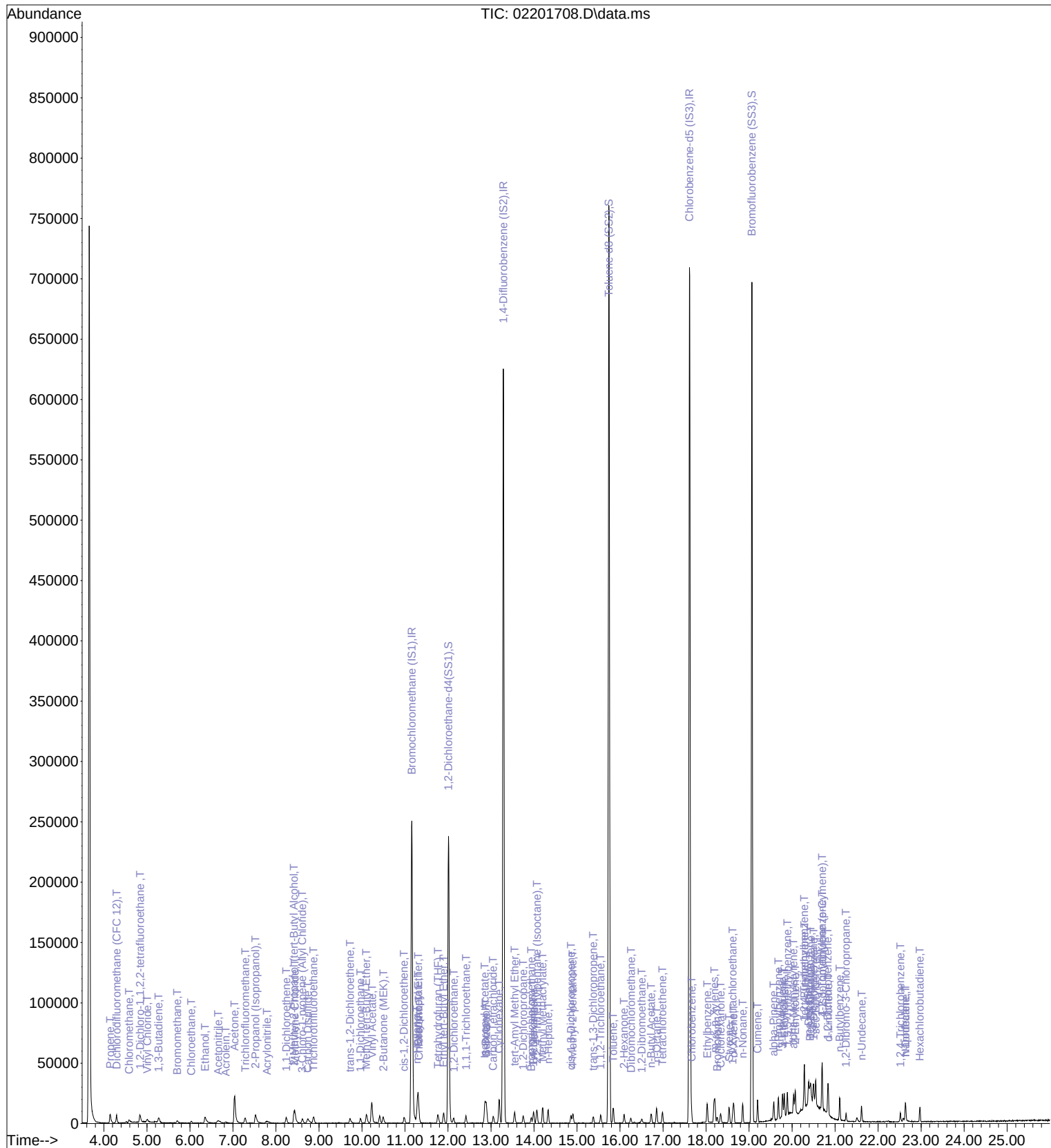
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.33	71	2913	0.324	ng	99
52) cis-1,3-Dichloropropene	14.86	75	4378	0.311	ng	99
53) 4-Methyl-2-pentanone	14.90	58	2344	0.302	ng	84
54) trans-1,3-Dichloropropene	15.38	75	3660	0.252	ng	98
55) 1,1,2-Trichloroethane	15.55	97	2686	0.283	ng	96
58) Toluene	15.84	91	11092	0.256	ng	99
59) 2-Hexanone	16.09	43	6246	0.328	ng	99
60) Dibromochloromethane	16.26	129	3116	0.238	ng	98
61) 1,2-Dibromoethane	16.50	107	2926	0.253	ng	99
62) n-Butyl Acetate	16.72	43	6871	0.343	ng	93
63) n-Octane	16.85	57	2724	0.341	ng	86
64) Tetrachloroethene	16.99	166	3263	0.215	ng	98
65) Chlorobenzene	17.66	112	7340	0.240	ng	95
66) Ethylbenzene	18.03	91	12487	0.259	ng	100
67) m- & p-Xylenes	18.20	91	19680	0.514	ng	96
68) Bromoform	18.26	173	2613	0.220	ng	100
69) Styrene	18.54	104	7419	0.239	ng	95
70) o-Xylene	18.64	91	9897	0.254	ng	99
71) n-Nonane	18.85	43	6341	0.375	ng	95
72) 1,1,2,2-Tetrachloroethane	18.62	83	4646	0.280	ng	97
74) Cumene	19.20	105	12708	0.246	ng	100
75) alpha-Pinene	19.57	93	6244	0.249	ng	94
76) n-Propylbenzene	19.68	91	14917	0.266	ng	99
77) 3-Ethyltoluene	19.78	105	12002	0.255	ng	98
78) 4-Ethyltoluene	19.82	105	11631	0.255	ng	97
79) 1,3,5-Trimethylbenzene	19.89	105	10335	0.239	ng	99
80) alpha-Methylstyrene	20.03	118	5065	0.214	ng	99
81) 2-Ethyltoluene	20.07	105	11873	0.240	ng	100
82) 1,2,4-Trimethylbenzene	20.28	105	10330	0.252	ng	98
83) n-Decane	20.39	57	9275	0.523	ng	86
84) Benzyl Chloride	20.41	91	6277	0.184	ng	98
85) 1,3-Dichlorobenzene	20.43	146	6126	0.210	ng	100
86) 1,4-Dichlorobenzene	20.50	146	5960	0.233	ng	99
87) sec-Butylbenzene	20.55	105	13672	0.244	ng	98
88) 4-Isopropyltoluene (p-...	20.70	119	12663	0.239	ng	97
89) 1,2,3-Trimethylbenzene	20.70	105	9766	0.237	ng	97
90) 1,2-Dichlorobenzene	20.83	146	5840	0.243	ng	99
91) d-Limonene	20.84	68	4182	0.326	ng	97
92) 1,2-Dibromo-3-Chloropr...	21.25	157	1699	0.165	ng	# 62
93) n-Undecane	21.62	57	4992	0.246	ng	96
94) 1,2,4-Trichlorobenzene	22.52	180	2901	0.122	ng	96
95) Naphthalene	22.63	128	7820	0.133	ng	96
96) n-Dodecane	22.63	57	3956	0.219	ng	85
97) Hexachlorobutadiene	22.97	225	2749	0.180	ng	97
98) Cyclohexanone	18.34	55	4019	0.311	ng	91
99) tert-Butylbenzene	20.29	119	10475	0.245	ng	98
100) n-Butylbenzene	21.11	91	10684	0.231	ng	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Vial: 10
Operator: LH/AMF
Inst : MS13

Quant Time: Feb 21 10:25:20 2017



Data File : I:\MS13\DATA\2017 02\20\02201709.D
 Acq On : 20 Feb 2017 14:05
 Sample : 0.4ng S29-02061708
 Misc : S29-01311701/S29-02061708 (3/7)

Vial: 11
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 21 10:25:22 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 10:20:40 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

AM 2/21/17

LS 2/28/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.16	130	119369	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.29	114	582171	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.61	82	247719	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.01	65	196548	14.555	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	116.40%	
57) Toluene-d8 (SS2)	15.74	98	597071	11.934	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	95.44%	
73) Bromofluorobenzene (SS3)	19.07	174	227247	10.800	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	86.40%	

Target Compounds

						Qvalue
2) Propene	4.14	42	6222	0.703	ng	94
3) Dichlorodifluoromethan...	4.29	85	11335	0.542	ng	98
4) Chloromethane	4.58	50	7653	0.614	ng	93
5) 1,2-Dichloro-1,1,2,2-t...	4.83	135	5774	0.466	ng	98
6) Vinyl Chloride	4.99	62	7189	0.577	ng	100
7) 1,3-Butadiene	5.26	54	4593	0.598	ng	96
8) Bromomethane	5.70	94	4186	0.518	ng	99
9) Chloroethane	6.02	64	3690	0.598	ng	93
10) Ethanol	6.34	45	20883	4.044	ng	97
11) Acetonitrile	6.65	41	10498	0.777	ng	# 63
12) Acrolein	6.82	56	3363	0.691	ng	79
13) Acetone	7.02	58	21565	3.731	ng	97
14) Trichlorofluoromethane	7.28	101	9931	0.552	ng	100
15) 2-Propanol (Isopropanol)	7.50	45	28812	1.646	ng	94
16) Acrylonitrile	7.77	53	7143	0.723	ng	96
17) 1,1-Dichloroethene	8.23	96	4936	0.578	ng	98
18) 2-Methyl-2-Propanol (t...	8.40	59	27571	1.347	ng	96
19) Methylene Chloride	8.44	84	5411	0.575	ng	99
20) 3-Chloro-1-propene (Al...	8.61	41	7501	0.702	ng	94
21) Trichlorotrifluoroethane	8.88	151	5280	0.510	ng	99
22) Carbon Disulfide	8.74	76	20247	0.605	ng	97
23) trans-1,2-Dichloroethene	9.72	61	7391	0.652	ng	100
24) 1,1-Dichloroethane	9.96	63	9370	0.619	ng	99
25) Methyl tert-Butyl Ether	10.09	73	17090	0.630	ng	99
26) Vinyl Acetate	10.23	86	5640	2.780	ng	# 82
27) 2-Butanone (MEK)	10.49	72	3590	0.639	ng	# 84
28) cis-1,2-Dichloroethene	10.98	61	7016	0.612	ng	94
29) Diisopropyl Ether	11.31	87	5387	0.620	ng	# 83
30) Ethyl Acetate	11.30	61	3921	1.418	ng	99
31) n-Hexane	11.28	57	9585	0.714	ng	98
32) Chloroform	11.33	83	9917	0.616	ng	97
34) Tetrahydrofuran (THF)	11.76	72	3827	0.600	ng	# 90
35) Ethyl tert-Butyl Ether	11.89	87	6307	0.607	ng	96
36) 1,2-Dichloroethane	12.13	62	7600	0.612	ng	98
38) 1,1,1-Trichloroethane	12.42	97	8857	0.553	ng	99
39) Isopropyl Acetate	12.85	61	6873	1.305	ng	96
40) 1-Butanol	12.87	56	9912	1.279	ng	99
41) Benzene	12.89	78	21469	0.591	ng	99
42) Carbon Tetrachloride	13.06	117	7737	0.534	ng	96
43) Cyclohexane	13.19	84	16488	1.153	ng	98
44) tert-Amyl Methyl Ether	13.54	73	15842	0.619	ng	98
45) 1,2-Dichloropropane	13.75	63	5574	0.652	ng	98
46) Bromodichloromethane	13.94	83	7187	0.567	ng	98
47) Trichloroethene	13.99	130	5762	0.485	ng	99
48) 1,4-Dioxane	13.98	88	4524	0.618	ng	99
49) 2,2,4-Trimethylpentane...	14.07	57	23125	0.651	ng	99
50) Methyl Methacrylate	14.20	100	4288	1.097	ng	96

Data File : I:\MS13\DATA\2017 02\20\02201709.D
 Acq On : 20 Feb 2017 14:05
 Sample : 0.4ng S29-02061708
 Misc : S29-01311701/S29-02061708 (3/7)

Vial: 11
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 21 10:25:22 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 10:20:40 2017

Response via : Initial Calibration

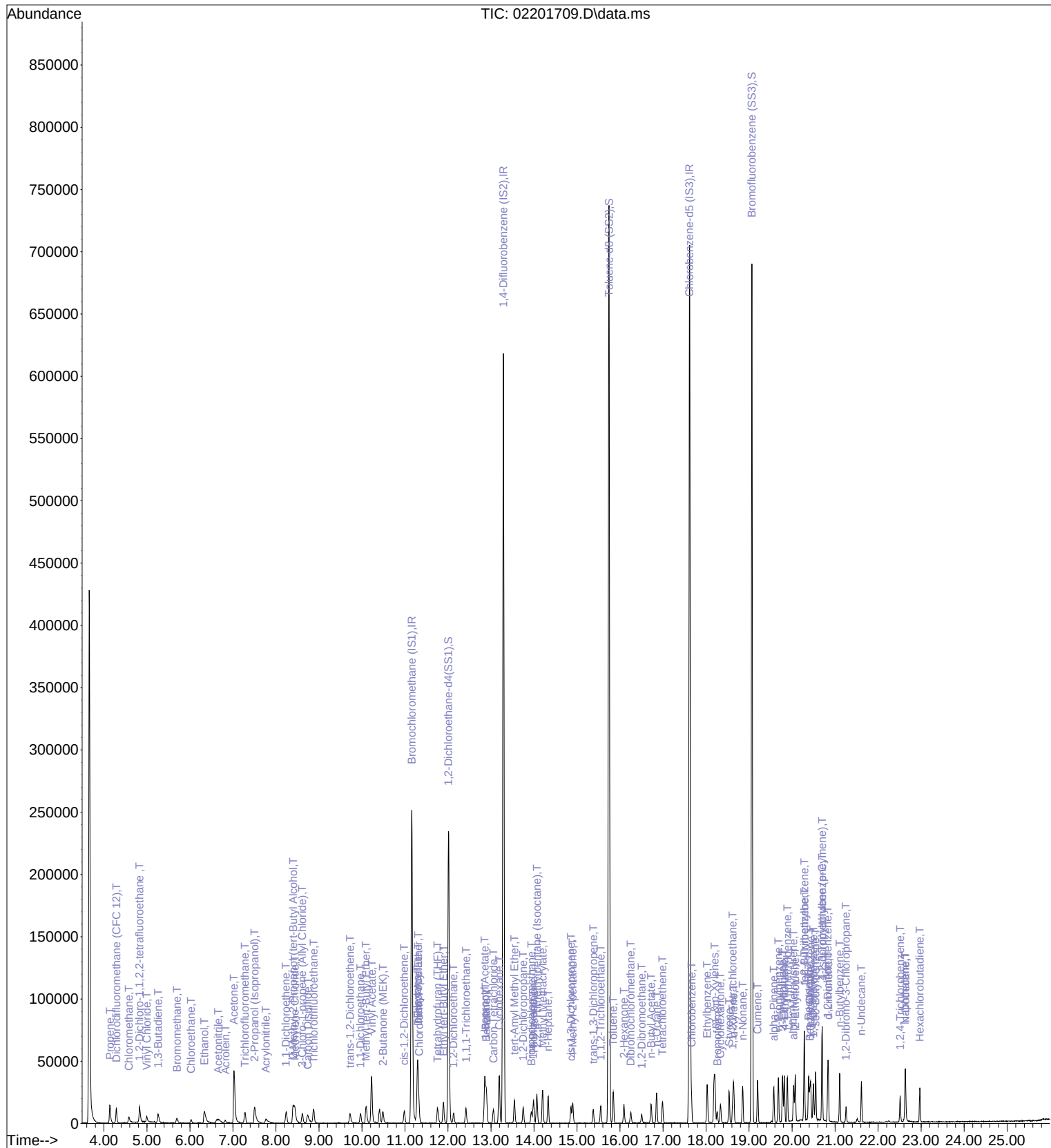
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.33	71	5561	0.627	ng	99
52) cis-1,3-Dichloropropene	14.86	75	9054	0.652	ng	98
53) 4-Methyl-2-pentanone	14.90	58	5031	0.656	ng	96
54) trans-1,3-Dichloropropene	15.38	75	7336	0.512	ng	100
55) 1,1,2-Trichloroethane	15.55	97	5282	0.565	ng	98
58) Toluene	15.84	91	21486	0.504	ng	99
59) 2-Hexanone	16.09	43	12283	0.654	ng	96
60) Dibromochloromethane	16.25	129	6213	0.481	ng	99
61) 1,2-Dibromoethane	16.50	107	5819	0.510	ng	99
62) n-Butyl Acetate	16.72	43	13366	0.678	ng	96
63) n-Octane	16.85	57	5142	0.653	ng	90
64) Tetrachloroethene	16.99	166	6474	0.432	ng	99
65) Chlorobenzene	17.66	112	14887	0.493	ng	100
66) Ethylbenzene	18.03	91	24613	0.518	ng	99
67) m- & p-Xylenes	18.20	91	38539	1.021	ng	97
68) Bromoform	18.26	173	4859	0.416	ng	98
69) Styrene	18.54	104	14288	0.467	ng	98
70) o-Xylene	18.64	91	18816	0.490	ng	99
71) n-Nonane	18.85	43	11262	0.675	ng	100
72) 1,1,2,2-Tetrachloroethane	18.62	83	8848	0.542	ng	95
74) Cumene	19.20	105	24668	0.485	ng	98
75) alpha-Pinene	19.58	93	11778	0.477	ng	98
76) n-Propylbenzene	19.68	91	29886	0.541	ng	99
77) 3-Ethyltoluene	19.78	105	24540	0.528	ng	94
78) 4-Ethyltoluene	19.82	105	23504	0.524	ng	96
79) 1,3,5-Trimethylbenzene	19.89	105	20113	0.471	ng	98
80) alpha-Methylstyrene	20.03	118	9328	0.399	ng	99
81) 2-Ethyltoluene	20.07	105	24378	0.499	ng	98
82) 1,2,4-Trimethylbenzene	20.29	105	20306	0.503	ng	99
83) n-Decane	20.39	57	11634	0.665	ng	98
84) Benzyl Chloride	20.41	91	13779	0.410	ng	100
85) 1,3-Dichlorobenzene	20.43	146	12013	0.418	ng	99
86) 1,4-Dichlorobenzene	20.50	146	12137	0.481	ng	100
87) sec-Butylbenzene	20.54	105	27463	0.498	ng	99
88) 4-Isopropyltoluene (p-...	20.70	119	25537	0.490	ng	99
89) 1,2,3-Trimethylbenzene	20.70	105	20458	0.504	ng	98
90) 1,2-Dichlorobenzene	20.83	146	11904	0.502	ng	97
91) d-Limonene	20.84	68	7186	0.569	ng	99
92) 1,2-Dibromo-3-Chloropr...	21.25	157	3855	0.380	ng	89
93) n-Undecane	21.61	57	11076	0.553	ng	97
94) 1,2,4-Trichlorobenzene	22.51	180	7529	0.322	ng	98
95) Naphthalene	22.63	128	21293	0.367	ng	97
96) n-Dodecane	22.63	57	8917	0.501	ng	95
97) Hexachlorobutadiene	22.97	225	5521	0.368	ng	94
98) Cyclohexanone	18.33	55	6970	0.547	ng	97
99) tert-Butylbenzene	20.29	119	20377	0.484	ng	99
100) n-Butylbenzene	21.11	91	21773	0.478	ng	98

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Vial: 11
Operator: LH/AMF
Inst : MS13

Quant Time: Feb 21 10:25:22 2017



Data File : I:\MS13\DATA\2017 02\20\02201706.D
 Acq On : 20 Feb 2017 12:20
 Sample : 0.08ng S29-02171710
 Misc : S29-01311701/S29-02171710 (3/18)

Vial: 10
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 21 10:25:16 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 10:20:40 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

AM 2/21/17

2/28/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.16	130	132812	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.29	114	649323	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.61	82	276128	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.02	65	213359	14.201	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	113.60%	
57) Toluene-d8 (SS2)	15.74	98	669841	12.011	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	96.08%	
73) Bromofluorobenzene (SS3)	19.07	174	252757	10.776	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	86.24%	

Target Compounds

						Qvalue
2) Propene	4.16	42	1753	0.178	ng	92
3) Dichlorodifluoromethan...	4.31	85	3009	0.129	ng	# 90
4) Chloromethane	4.61	50	1937	0.140	ng	97
5) 1,2-Dichloro-1,1,2,2-t...	4.85	135	1433	0.104	ng	93
6) Vinyl Chloride	5.03	62	1600	0.115	ng	95
7) 1,3-Butadiene	5.29	54	1077	0.126	ng	98
8) Bromomethane	5.72	94	902	0.100	ng	86
9) Chloroethane	6.04	64	870	0.127	ng	69
10) Ethanol	6.37	45	5562	0.968	ng	93
11) Acetonitrile	6.68	41	2933	0.195	ng	74
12) Acrolein	6.84	56	619	0.114	ng	89
13) Acetone	7.05	58	6314	0.982	ng	95
14) Trichlorofluoromethane	7.29	101	2454	0.123	ng	98
15) 2-Propanol (Isopropanol)	7.54	45	7576	0.389	ng	92
16) Acrylonitrile	7.80	53	1603	0.146	ng	84
17) 1,1-Dichloroethene	8.24	96	1248	0.131	ng	95
18) 2-Methyl-2-Propanol (t...	8.43	59	7395	0.325	ng	97
19) Methylene Chloride	8.44	84	1823	0.174	ng	94
20) 3-Chloro-1-propene (Al...	8.61	41	1832	0.154	ng	90
21) Trichlorotrifluoroethane	8.88	151	1266	0.110	ng	93
22) Carbon Disulfide	8.74	76	6856	0.184	ng	86
23) trans-1,2-Dichloroethene	9.73	61	1663	0.132	ng	83
24) 1,1-Dichloroethane	9.97	63	2449	0.145	ng	95
25) Methyl tert-Butyl Ether	10.12	73	4791	0.159	ng	89
26) Vinyl Acetate	10.23	86	1225	0.543	ng	# 38
27) 2-Butanone (MEK)	10.51	72	1046	0.167	ng	100
28) cis-1,2-Dichloroethene	10.98	61	1961	0.154	ng	96
29) Diisopropyl Ether	11.31	87	1379	0.143	ng	# 85
30) Ethyl Acetate	11.31	61	947	0.308	ng	96
31) n-Hexane	11.28	57	2582	0.173	ng	# 92
32) Chloroform	11.32	83	2303	0.128	ng	92
34) Tetrahydrofuran (THF)	11.77	72	1355	0.191	ng	95
35) Ethyl tert-Butyl Ether	11.91	87	1522	0.132	ng	# 88
36) 1,2-Dichloroethane	12.13	62	1893	0.137	ng	96
38) 1,1,1-Trichloroethane	12.42	97	2230	0.125	ng	97
39) Isopropyl Acetate	12.86	61	1743	0.297	ng	# 90
40) 1-Butanol	12.88	56	2399	0.278	ng	92
41) Benzene	12.89	78	6119	0.151	ng	97
42) Carbon Tetrachloride	13.06	117	1813	0.112	ng	95
43) Cyclohexane	13.20	84	4245	0.266	ng	93
44) tert-Amyl Methyl Ether	13.55	73	4546	0.159	ng	95
45) 1,2-Dichloropropane	13.75	63	1423	0.149	ng	91
46) Bromodichloromethane	13.94	83	1862	0.132	ng	97
47) Trichloroethene	13.99	130	1520	0.115	ng	99
48) 1,4-Dioxane	13.98	88	1176	0.144	ng	98
49) 2,2,4-Trimethylpentane...	14.07	57	6114	0.154	ng	99
50) Methyl Methacrylate	14.20	100	1117	0.256	ng	97

Data File : I:\MS13\DATA\2017 02\20\02201706.D
 Acq On : 20 Feb 2017 12:20
 Sample : 0.08ng S29-02171710
 Misc : S29-01311701/S29-02171710 (3/18)

Vial: 10
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 21 10:25:16 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 10:20:40 2017

Response via : Initial Calibration

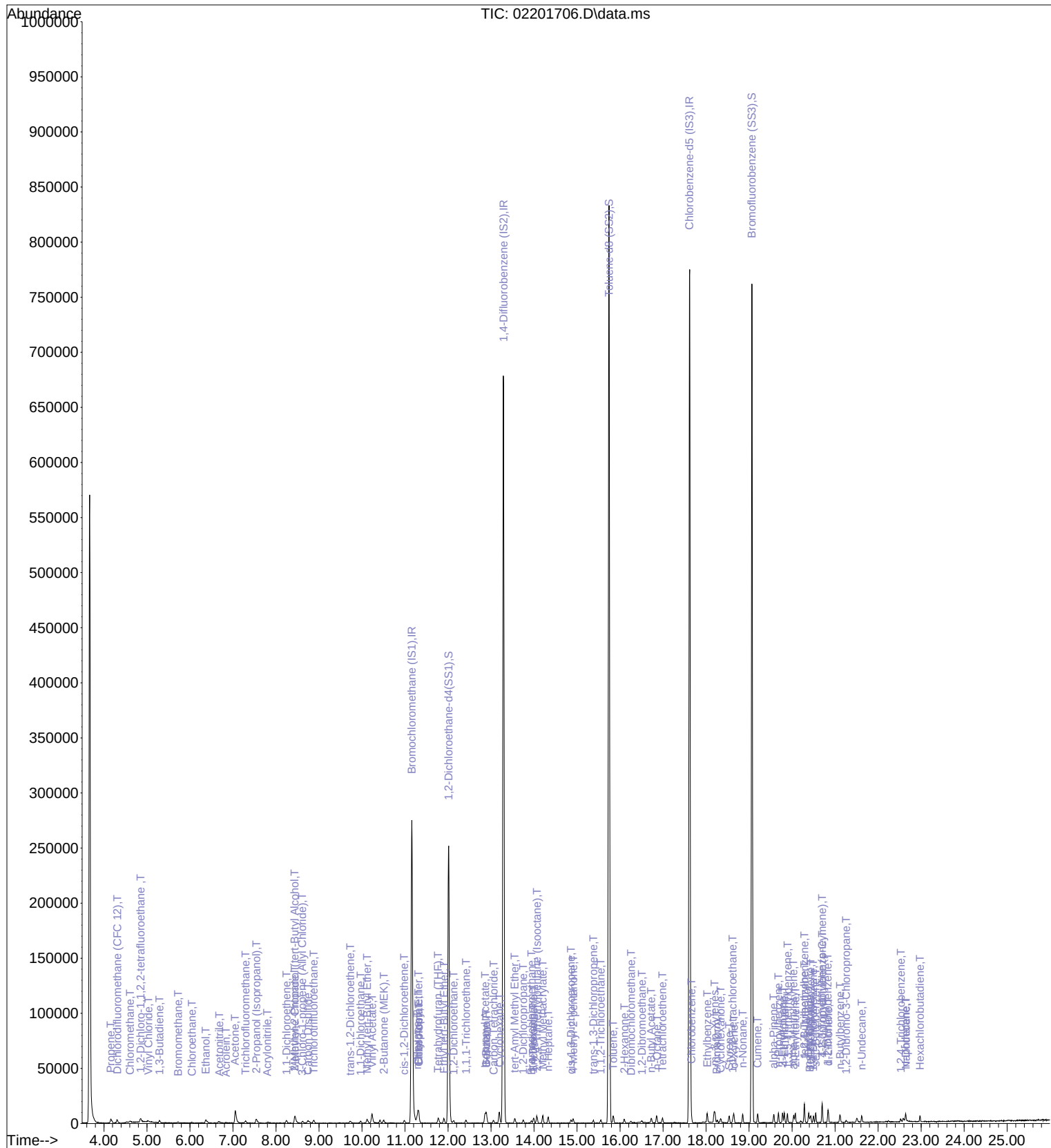
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.33	71	1352	0.137	ng	97
52) cis-1,3-Dichloropropene	14.86	75	2366	0.153	ng	93
53) 4-Methyl-2-pentanone	14.91	58	1261	0.147	ng	# 91
54) trans-1,3-Dichloropropene	15.38	75	1715	0.107	ng	92
55) 1,1,2-Trichloroethane	15.55	97	1245	0.119	ng	96
58) Toluene	15.84	91	5828	0.123	ng	99
59) 2-Hexanone	16.10	43	3247	0.155	ng	99
60) Dibromochloromethane	16.26	129	1496	0.104	ng	92
61) 1,2-Dibromoethane	16.51	107	1333	0.105	ng	92
62) n-Butyl Acetate	16.72	43	3589	0.163	ng	89
63) n-Octane	16.85	57	1841	0.210	ng	# 64
64) Tetrachloroethene	16.99	166	1651	0.099	ng	98
65) Chlorobenzene	17.66	112	3967	0.118	ng	92
66) Ethylbenzene	18.03	91	6440	0.122	ng	100
67) m- & p-Xylenes	18.20	91	9626	0.229	ng	97
68) Bromoform	18.25	173	1231	0.095	ng	93
69) Styrene	18.54	104	3708	0.109	ng	97
70) o-Xylene	18.65	91	5066	0.118	ng	95
71) n-Nonane	18.85	43	3034	0.163	ng	95
72) 1,1,2,2-Tetrachloroethane	18.62	83	2231	0.123	ng	99
74) Cumene	19.20	105	6435	0.114	ng	96
75) alpha-Pinene	19.57	93	3105	0.113	ng	75
76) n-Propylbenzene	19.68	91	7672	0.125	ng	98
77) 3-Ethyltoluene	19.78	105	6236	0.120	ng	99
78) 4-Ethyltoluene	19.82	105	5873	0.117	ng	99
79) 1,3,5-Trimethylbenzene	19.90	105	5135	0.108	ng	97
80) alpha-Methylstyrene	20.03	118	2179	0.084	ng	90
81) 2-Ethyltoluene	20.08	105	6169	0.113	ng	99
82) 1,2,4-Trimethylbenzene	20.29	105	5056	0.112	ng	97
83) n-Decane	20.39	57	3222	0.165	ng	89
84) Benzyl Chloride	20.41	91	2521	0.067	ng	94
85) 1,3-Dichlorobenzene	20.43	146	2764	0.086	ng	100
86) 1,4-Dichlorobenzene	20.49	146	2866	0.102	ng	99
87) sec-Butylbenzene	20.55	105	7116	0.116	ng	96
88) 4-Isopropyltoluene (p-...	20.70	119	6310	0.109	ng	96
89) 1,2,3-Trimethylbenzene	20.70	105	5034	0.111	ng	98
90) 1,2-Dichlorobenzene	20.83	146	2837	0.107	ng	98
91) d-Limonene	20.84	68	1848	0.131	ng	93
92) 1,2-Dibromo-3-Chloropr...	21.26	157	825	0.073	ng	# 85
93) n-Undecane	21.62	57	2426	0.109	ng	86
94) 1,2,4-Trichlorobenzene	22.53	180	1402	0.054	ng	92
95) Naphthalene	22.65	128	3525	0.055	ng	96
96) n-Dodecane	22.64	57	2351	0.119	ng	73
97) Hexachlorobutadiene	22.98	225	1202	0.072	ng	94
98) Cyclohexanone	18.34	55	1897	0.133	ng	93
99) tert-Butylbenzene	20.29	119	5087	0.108	ng	95
100) n-Butylbenzene	21.12	91	4926	0.097	ng	95

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Vial: 10
Operator: LH/AMF
Inst : MS13

Quant Time: Feb 21 10:25:16 2017
Quant Method : I:\MS13\METHODS\R13022017.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Feb 21 10:20:40 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2017 02\20\02201710.D
 Acq On : 20 Feb 2017 14:40
 Sample : 1.0ng S29-02061708
 Misc : S29-01311701/S29-02061708 (3/7)

Vial: 11
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 21 10:25:24 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 10:20:40 2017

Response via : Initial Calibration

AM 2/21/17

2/28/17

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.16	130	116507	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.29	114	567621	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.61	82	241854	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.02	65	196502	14.909	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	119.28%	
57) Toluene-d8 (SS2)	15.74	98	583650	11.948	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	95.60%	
73) Bromofluorobenzene (SS3)	19.07	174	225157	10.960	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	87.68%	

Target Compounds

						Qvalue
2) Propene	4.14	42	14558	1.686	ng	99
3) Dichlorodifluoromethan...	4.28	85	25976	1.272	ng	98
4) Chloromethane	4.58	50	18334	1.508	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.83	135	13271	1.097	ng	98
6) Vinyl Chloride	4.99	62	18022	1.483	ng	97
7) 1,3-Butadiene	5.26	54	11391	1.519	ng	99
8) Bromomethane	5.69	94	10170	1.290	ng	97
9) Chloroethane	6.02	64	8568	1.423	ng	99
10) Ethanol	6.33	45	47961	9.515	ng	100
11) Acetonitrile	6.62	41	25586	1.940	ng	88
12) Acrolein	6.82	56	7663	1.613	ng	98
13) Acetone	7.02	58	47238	8.374	ng	96
14) Trichlorofluoromethane	7.28	101	23078	1.315	ng	100
15) 2-Propanol (Isopropanol)	7.49	45	66618	3.900	ng	96
16) Acrylonitrile	7.76	53	17112	1.775	ng	97
17) 1,1-Dichloroethene	8.24	96	11602	1.392	ng	99
18) 2-Methyl-2-Propanol (t...	8.38	59	64629	3.235	ng	97
19) Methylene Chloride	8.45	84	11999	1.306	ng	97
20) 3-Chloro-1-propene (Al...	8.61	41	18262	1.751	ng	95
21) Trichlorotrifluoroethane	8.88	151	11604	1.149	ng	97
22) Carbon Disulfide	8.73	76	46070	1.410	ng	99
23) trans-1,2-Dichloroethene	9.72	61	17526	1.583	ng	98
24) 1,1-Dichloroethane	9.97	63	22138	1.498	ng	98
25) Methyl tert-Butyl Ether	10.09	73	39951	1.508	ng	99
26) Vinyl Acetate	10.23	86	13565	6.851	ng	# 85
27) 2-Butanone (MEK)	10.48	72	8375	1.528	ng	# 87
28) cis-1,2-Dichloroethene	10.98	61	18052	1.613	ng	96
29) Diisopropyl Ether	11.30	87	12629	1.488	ng	# 88
30) Ethyl Acetate	11.29	61	9162	3.395	ng	98
31) n-Hexane	11.28	57	21927	1.674	ng	98
32) Chloroform	11.33	83	21995	1.399	ng	100
34) Tetrahydrofuran (THF)	11.75	72	8823	1.417	ng	99
35) Ethyl tert-Butyl Ether	11.89	87	14834	1.462	ng	99
36) 1,2-Dichloroethane	12.13	62	18201	1.501	ng	98
38) 1,1,1-Trichloroethane	12.42	97	20950	1.340	ng	98
39) Isopropyl Acetate	12.85	61	15817	3.079	ng	# 92
40) 1-Butanol	12.87	56	23192	3.069	ng	98
41) Benzene	12.90	78	48257	1.362	ng	100
42) Carbon Tetrachloride	13.06	117	17674	1.252	ng	98
43) Cyclohexane	13.19	84	37946	2.722	ng	99
44) tert-Amyl Methyl Ether	13.54	73	36042	1.444	ng	98
45) 1,2-Dichloropropane	13.75	63	12653	1.517	ng	99
46) Bromodichloromethane	13.93	83	17280	1.398	ng	98
47) Trichloroethene	13.99	130	13970	1.207	ng	97
48) 1,4-Dioxane	13.97	88	10144	1.422	ng	94
49) 2,2,4-Trimethylpentane...	14.07	57	52716	1.523	ng	98
50) Methyl Methacrylate	14.20	100	9821	2.578	ng	91

Data File : I:\MS13\DATA\2017 02\20\02201710.D
 Acq On : 20 Feb 2017 14:40
 Sample : 1.0ng S29-02061708
 Misc : S29-01311701/S29-02061708 (3/7)

Vial: 11
 Operator: LH/AMF
 Inst : MS13

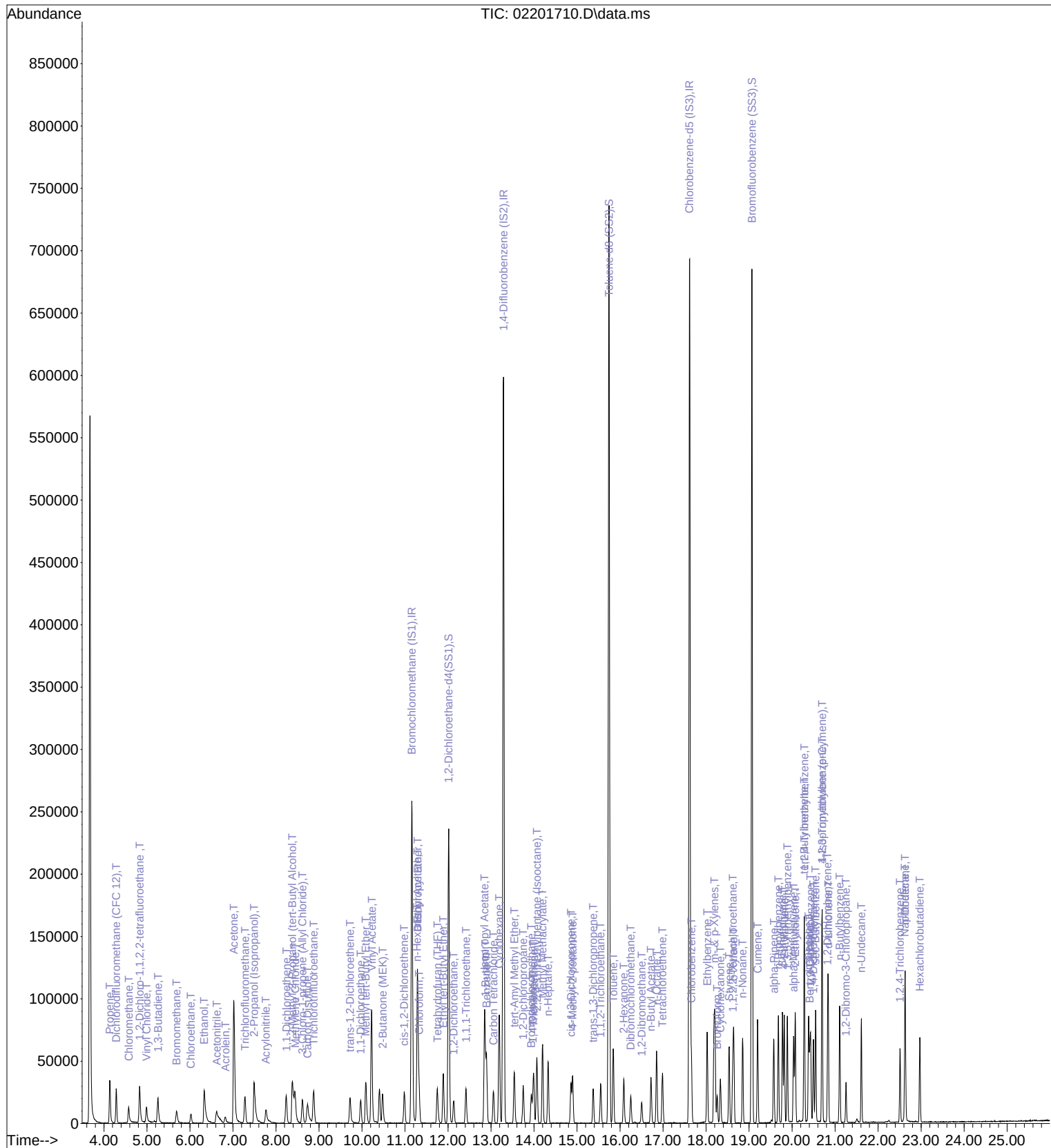
Quant Time: Feb 21 10:25:24 2017
 Quant Method : I:\MS13\METHODS\R13022017.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Tue Feb 21 10:20:40 2017
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.33	71	12991	1.503	ng	98
52) cis-1,3-Dichloropropene	14.86	75	21178	1.565	ng	99
53) 4-Methyl-2-pentanone	14.90	58	11967	1.600	ng	98
54) trans-1,3-Dichloropropene	15.38	75	17899	1.282	ng	98
55) 1,1,2-Trichloroethane	15.55	97	12189	1.336	ng	99
58) Toluene	15.84	91	50648	1.216	ng	98
59) 2-Hexanone	16.09	43	28974	1.580	ng	99
60) Dibromochloromethane	16.25	129	14336	1.136	ng	100
61) 1,2-Dibromoethane	16.50	107	14040	1.261	ng	95
62) n-Butyl Acetate	16.72	43	32256	1.675	ng	98
63) n-Octane	16.85	57	11603	1.508	ng	93
64) Tetrachloroethene	16.99	166	15134	1.035	ng	97
65) Chlorobenzene	17.66	112	34472	1.170	ng	100
66) Ethylbenzene	18.03	91	56818	1.225	ng	100
67) m- & p-Xylenes	18.20	91	89357	2.426	ng	99
68) Bromoform	18.26	173	12047	1.056	ng	98
69) Styrene	18.54	104	33723	1.128	ng	100
70) o-Xylene	18.64	91	44847	1.195	ng	100
71) n-Nonane	18.85	43	26956	1.655	ng	97
72) 1,1,2,2-Tetrachloroethane	18.62	83	20993	1.317	ng	99
74) Cumene	19.20	105	57773	1.164	ng	99
75) alpha-Pinene	19.58	93	28123	1.167	ng	100
76) n-Propylbenzene	19.68	91	69798	1.294	ng	99
77) 3-Ethyltoluene	19.77	105	58074	1.281	ng	96
78) 4-Ethyltoluene	19.82	105	54793	1.251	ng	97
79) 1,3,5-Trimethylbenzene	19.89	105	47069	1.130	ng	99
80) alpha-Methylstyrene	20.04	118	22570	0.990	ng	99
81) 2-Ethyltoluene	20.07	105	56243	1.180	ng	100
82) 1,2,4-Trimethylbenzene	20.29	105	47656	1.210	ng	100
83) n-Decane	20.39	57	26529	1.554	ng	98
84) Benzyl Chloride	20.41	91	35785	1.091	ng	98
85) 1,3-Dichlorobenzene	20.43	146	28362	1.012	ng	100
86) 1,4-Dichlorobenzene	20.50	146	29301	1.190	ng	98
87) sec-Butylbenzene	20.54	105	64501	1.197	ng	99
88) 4-Isopropyltoluene (p-...	20.70	119	59780	1.174	ng	99
89) 1,2,3-Trimethylbenzene	20.70	105	47085	1.189	ng	99
90) 1,2-Dichlorobenzene	20.83	146	27832	1.202	ng	100
91) d-Limonene	20.84	68	17452	1.416	ng	99
92) 1,2-Dibromo-3-Chloropr...	21.25	157	9608	0.971	ng	91
93) n-Undecane	21.61	57	26032	1.332	ng	98
94) 1,2,4-Trichlorobenzene	22.51	180	20028	0.878	ng	97
95) Naphthalene	22.62	128	57234	1.012	ng	99
96) n-Dodecane	22.63	57	21555	1.241	ng	96
97) Hexachlorobutadiene	22.97	225	13805	0.942	ng	99
98) Cyclohexanone	18.33	55	16478	1.324	ng	98
99) tert-Butylbenzene	20.28	119	48219	1.172	ng	100
100) n-Butylbenzene	21.11	91	52481	1.181	ng	98

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Vial: 11
Operator: LH/AMF
Inst : MS13

Quant Time: Feb 21 10:25:24 2017



Data File : I:\MS13\DATA\2017 02\20\02201711.D
 Acq On : 20 Feb 2017 15:15
 Sample : 5.0ng S29-02061708
 Misc : S29-01311701/S29-02061708 (3/7)

Vial: 11
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 21 10:25:26 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 10:20:40 2017

Response via : Initial Calibration

AM 2/21/17

2/28/17

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.16	130	105209	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.29	114	509916	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.61	82	220562	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.02	65	177582	14.920	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	119.36%	
57) Toluene-d8 (SS2)	15.74	98	524779	11.780	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	94.24%	
73) Bromofluorobenzene (SS3)	19.07	174	209127	11.163	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	89.28%	

Target Compounds

						Qvalue
2) Propene	4.11	42	70642	9.060	ng	99
3) Dichlorodifluoromethan...	4.27	85	123831	6.713	ng	99
4) Chloromethane	4.55	50	86715	7.896	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.82	135	62620	5.732	ng	100
6) Vinyl Chloride	4.97	62	87967	8.016	ng	98
7) 1,3-Butadiene	5.24	54	58248	8.603	ng	98
8) Bromomethane	5.67	94	46597	6.546	ng	99
9) Chloroethane	6.00	64	41233	7.586	ng	99
10) Ethanol	6.34	45	208388	45.782	ng	100
11) Acetonitrile	6.60	41	116557	9.788	ng	100
12) Acrolein	6.81	56	36777	8.573	ng	99
13) Acetone	7.01	58	219216	43.034	ng	99
14) Trichlorofluoromethane	7.27	101	109132	6.886	ng	99
15) 2-Propanol (Isopropanol)	7.49	45	306796	19.892	ng	98
16) Acrylonitrile	7.77	53	79436	9.126	ng	99
17) 1,1-Dichloroethene	8.23	96	54274	7.210	ng	98
18) 2-Methyl-2-Propanol (t...	8.37	59	308248	17.086	ng	99
19) Methylene Chloride	8.44	84	56249	6.782	ng	98
20) 3-Chloro-1-propene (Al...	8.61	41	86449	9.177	ng	99
21) Trichlorotrifluoroethane	8.87	151	55008	6.030	ng	99
22) Carbon Disulfide	8.72	76	207334	7.025	ng	100
23) trans-1,2-Dichloroethene	9.72	61	85210	8.523	ng	99
24) 1,1-Dichloroethane	9.97	63	104427	7.824	ng	98
25) Methyl tert-Butyl Ether	10.07	73	185582	7.756	ng	99
26) Vinyl Acetate	10.22	86	67727	37.879	ng	# 89
27) 2-Butanone (MEK)	10.47	72	39600	8.000	ng	94
28) cis-1,2-Dichloroethene	10.99	61	82047	8.118	ng	99
29) Diisopropyl Ether	11.29	87	57963	7.564	ng	# 89
30) Ethyl Acetate	11.29	61	42637	17.494	ng	99
31) n-Hexane	11.28	57	100453	8.494	ng	100
32) Chloroform	11.33	83	102680	7.232	ng	99
34) Tetrahydrofuran (THF)	11.74	72	39327	6.997	ng	97
35) Ethyl tert-Butyl Ether	11.88	87	70641	7.710	ng	99
36) 1,2-Dichloroethane	12.14	62	85518	7.808	ng	100
38) 1,1,1-Trichloroethane	12.42	97	96846	6.897	ng	100
39) Isopropyl Acetate	12.85	61	73357	15.897	ng	# 90
40) 1-Butanol	12.85	56	113839	16.769	ng	97
41) Benzene	12.90	78	224515	7.053	ng	99
42) Carbon Tetrachloride	13.06	117	86281	6.803	ng	99
43) Cyclohexane	13.19	84	175566	14.017	ng	98
44) tert-Amyl Methyl Ether	13.53	73	168004	7.495	ng	99
45) 1,2-Dichloropropane	13.75	63	59046	7.881	ng	99
46) Bromodichloromethane	13.94	83	83320	7.504	ng	99
47) Trichloroethene	14.00	130	64890	6.242	ng	100
48) 1,4-Dioxane	13.96	88	49376	7.707	ng	99
49) 2,2,4-Trimethylpentane...	14.06	57	246654	7.931	ng	100
50) Methyl Methacrylate	14.20	100	47567	13.900	ng	95

Data File : I:\MS13\DATA\2017 02\20\02201711.D
 Acq On : 20 Feb 2017 15:15
 Sample : 5.0ng S29-02061708
 Misc : S29-01311701/S29-02061708 (3/7)

Vial: 11
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 21 10:25:26 2017
 Quant Method : I:\MS13\METHODS\R13022017.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Tue Feb 21 10:20:40 2017
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

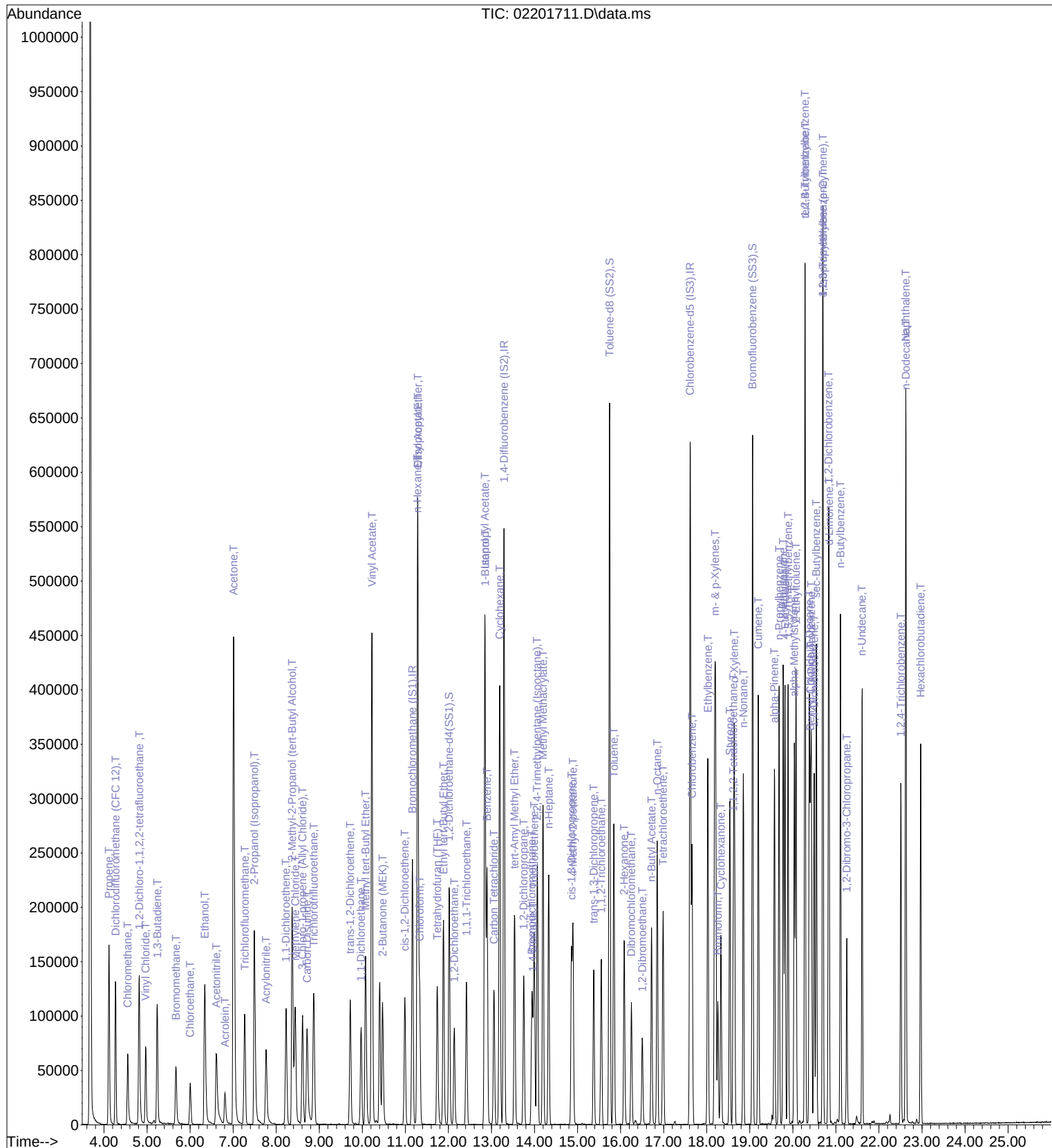
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.33	71	59527	7.664	ng	100
52) cis-1,3-Dichloropropene	14.86	75	102434	8.424	ng	100
53) 4-Methyl-2-pentanone	14.89	58	55663	8.285	ng	99
54) trans-1,3-Dichloropropene	15.38	75	91407	7.287	ng	100
55) 1,1,2-Trichloroethane	15.55	97	57262	6.988	ng	100
58) Toluene	15.84	91	235797	6.206	ng	99
59) 2-Hexanone	16.08	43	138870	8.303	ng	98
60) Dibromochloromethane	16.25	129	71066	6.177	ng	100
61) 1,2-Dibromoethane	16.50	107	65321	6.435	ng	99
62) n-Butyl Acetate	16.72	43	154498	8.798	ng	99
63) n-Octane	16.85	57	51655	7.362	ng	99
64) Tetrachloroethene	16.99	166	70189	5.264	ng	100
65) Chlorobenzene	17.66	112	160048	5.959	ng	99
66) Ethylbenzene	18.03	91	271879	6.429	ng	99
67) m- & p-Xylenes	18.20	91	421308	12.542	ng	99
68) Bromoform	18.26	173	60854	5.851	ng	99
69) Styrene	18.54	104	164824	6.045	ng	100
70) o-Xylene	18.64	91	215645	6.303	ng	98
71) n-Nonane	18.85	43	125804	8.468	ng	98
72) 1,1,2,2-Tetrachloroethane	18.62	83	99842	6.867	ng	100
74) Cumene	19.20	105	277925	6.141	ng	100
75) alpha-Pinene	19.57	93	139172	6.333	ng	100
76) n-Propylbenzene	19.68	91	335861	6.827	ng	99
77) 3-Ethyltoluene	19.77	105	276678	6.692	ng	96
78) 4-Ethyltoluene	19.82	105	263275	6.590	ng	97
79) 1,3,5-Trimethylbenzene	19.89	105	228444	6.012	ng	99
80) alpha-Methylstyrene	20.03	118	113150	5.442	ng	99
81) 2-Ethyltoluene	20.07	105	272196	6.260	ng	99
82) 1,2,4-Trimethylbenzene	20.28	105	233957	6.512	ng	100
83) n-Decane	20.39	57	127672	8.201	ng	100
84) Benzyl Chloride	20.41	91	200283	6.694	ng	98
85) 1,3-Dichlorobenzene	20.43	146	139984	5.476	ng	99
86) 1,4-Dichlorobenzene	20.50	146	140624	6.262	ng	100
87) sec-Butylbenzene	20.54	105	314462	6.400	ng	100
88) 4-Isopropyltoluene (p-...	20.70	119	294867	6.349	ng	100
89) 1,2,3-Trimethylbenzene	20.70	105	233671	6.468	ng	99
90) 1,2-Dichlorobenzene	20.83	146	135530	6.416	ng	99
91) d-Limonene	20.84	68	86511	7.696	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.25	157	50232	5.567	ng	94
93) n-Undecane	21.61	57	130595	7.329	ng	99
94) 1,2,4-Trichlorobenzene	22.51	180	104502	5.022	ng	99
95) Naphthalene	22.62	128	302056	5.854	ng	99
96) n-Dodecane	22.63	57	106226	6.706	ng	97
97) Hexachlorobutadiene	22.97	225	70403	5.266	ng	100
98) Cyclohexanone	18.33	55	81752	7.200	ng	99
99) tert-Butylbenzene	20.29	119	231332	6.166	ng	99
100) n-Butylbenzene	21.11	91	257476	6.351	ng	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2017 02\20\02201711.D
Acq On : 20 Feb 2017 15:15
Sample : 5.0ng S29-02061708
Misc : S29-01311701/S29-02061708 (3/7)

Vial: 11
Operator: LH/AMF
Inst : MS13

Quant Time: Feb 21 10:25:26 2017
Quant Method : I:\MS13\METHODS\R13022017.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Feb 21 10:20:40 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2017 02\20\02201712.D
 Acq On : 20 Feb 2017 15:50
 Sample : 25ng S29-01241705
 Misc : S29-01311701/S29-01241705 (2/22)

Vial: 3
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 21 10:25:28 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 10:20:40 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

AM 2/21/17

LH 2/28/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.17	130	118365	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.30	114	574999	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.62	82	251657	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.03	65	194381	14.516	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	116.16%
57) Toluene-d8 (SS2)	15.74	98	601185	11.828	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	94.64%
73) Bromofluorobenzene (SS3)	19.07	174	241241	11.286	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	90.32%

Target Compounds

						Qvalue
2) Propene	4.09	42	360121	41.051	ng	100
3) Dichlorodifluoromethan...	4.25	85	650638	31.352	ng	100
4) Chloromethane	4.54	50	491806	39.806	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	341816	27.810	ng	100
6) Vinyl Chloride	4.95	62	471449	38.187	ng	100
7) 1,3-Butadiene	5.22	54	330575	43.398	ng	100
8) Bromomethane	5.66	94	264522	33.029	ng	100
9) Chloroethane	6.00	64	218801	35.778	ng	100
10) Ethanol	6.37	45	1090129	212.878	ng	100
11) Acetonitrile	6.62	41	614357	45.856	ng	100
12) Acrolein	6.81	56	170573	35.343	ng	100
13) Acetone	7.02	58	1108981	193.506	ng	100
14) Trichlorofluoromethane	7.26	101	574209	32.204	ng	100
15) 2-Propanol (Isopropanol)	7.51	45	1598692	92.134	ng	100
16) Acrylonitrile	7.78	53	430825	43.993	ng	100
17) 1,1-Dichloroethene	8.23	96	297075	35.079	ng	100
18) 2-Methyl-2-Propanol (t...	8.38	59	1534365	75.594	ng	100
19) Methylene Chloride	8.45	84	303784	32.555	ng	100
20) 3-Chloro-1-propene (Al...	8.61	41	490576	46.288	ng	100
21) Trichlorotrifluoroethane	8.87	151	300897	29.319	ng	100
22) Carbon Disulfide	8.71	76	1138037	34.274	ng	100
23) trans-1,2-Dichloroethene	9.72	61	465423	41.378	ng	100
24) 1,1-Dichloroethane	9.98	63	548952	36.559	ng	100
25) Methyl tert-Butyl Ether	10.07	73	996645	37.025	ng	100
26) Vinyl Acetate	10.23	86	303095	150.678	ng	100
27) 2-Butanone (MEK)	10.47	72	213015	38.252	ng	100
28) cis-1,2-Dichloroethene	10.99	61	445081	39.144	ng	100
29) Diisopropyl Ether	11.29	87	311495	36.133	ng	100
30) Ethyl Acetate	11.30	61	224884	82.016	ng	100
31) n-Hexane	11.28	57	516349	38.809	ng	100
32) Chloroform	11.34	83	557760	34.918	ng	100
34) Tetrahydrofuran (THF)	11.74	72	211944	33.515	ng	100
35) Ethyl tert-Butyl Ether	11.88	87	386413	37.486	ng	100
36) 1,2-Dichloroethane	12.14	62	453849	36.833	ng	100
38) 1,1,1-Trichloroethane	12.42	97	521415	32.932	ng	100
39) Isopropyl Acetate	12.85	61	386833	74.342	ng	100
40) 1-Butanol	12.86	56	526207	68.741	ng	100
41) Benzene	12.90	78	1210534	33.725	ng	100
42) Carbon Tetrachloride	13.06	117	475190	33.226	ng	100
43) Cyclohexane	13.19	84	961536	68.079	ng	100
44) tert-Amyl Methyl Ether	13.53	73	917192	36.286	ng	100
45) 1,2-Dichloropropane	13.75	63	317667	37.601	ng	100
46) Bromodichloromethane	13.94	83	451717	36.080	ng	100
47) Trichloroethene	14.00	130	359740	30.689	ng	100
48) 1,4-Dioxane	13.96	88	265490	36.749	ng	100
49) 2,2,4-Trimethylpentane...	14.07	57	1337851	38.151	ng	100
50) Methyl Methacrylate	14.20	100	267634	69.354	ng	100

Data File : I:\MS13\DATA\2017 02\20\02201712.D
 Acq On : 20 Feb 2017 15:50
 Sample : 25ng S29-01241705
 Misc : S29-01311701/S29-01241705 (2/22)

Vial: 3
 Operator: LH/AMF
 Inst : MS13

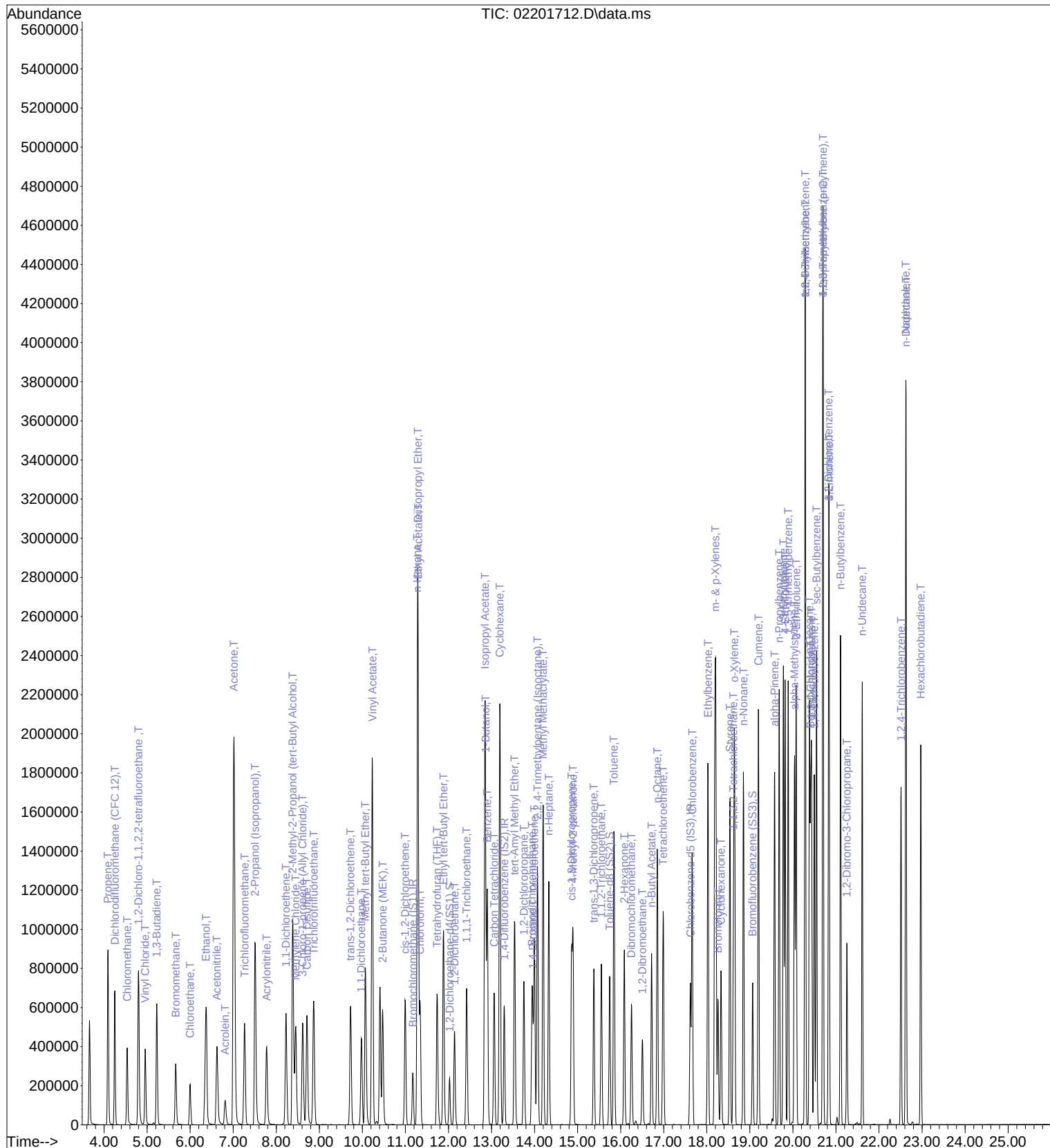
Quant Time: Feb 21 10:25:28 2017
 Quant Method : I:\MS13\METHODS\R13022017.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Tue Feb 21 10:20:40 2017
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.33	71	322959	36.876	ng	100
52) cis-1,3-Dichloropropene	14.86	75	571118	41.652	ng	100
53) 4-Methyl-2-pentanone	14.89	58	292336	38.587	ng	100
54) trans-1,3-Dichloropropene	15.38	75	512590	36.240	ng	100
55) 1,1,2-Trichloroethane	15.55	97	312009	33.765	ng	100
58) Toluene	15.84	91	1296681	29.913	ng	100
59) 2-Hexanone	16.09	43	708302	37.116	ng	100
60) Dibromochloromethane	16.25	129	403192	30.714	ng	100
61) 1,2-Dibromoethane	16.50	107	361187	31.183	ng	100
62) n-Butyl Acetate	16.72	43	744331	37.149	ng	100
63) n-Octane	16.85	57	280152	34.995	ng	100
64) Tetrachloroethene	16.99	166	396079	26.036	ng	100
65) Chlorobenzene	17.66	112	889713	29.031	ng	100
66) Ethylbenzene	18.03	91	1502733	31.146	ng	100
67) m- & p-Xylenes	18.20	91	2346036	61.209	ng	100
68) Bromoform	18.26	173	358940	30.245	ng	100
69) Styrene	18.54	104	926935	29.797	ng	100
70) o-Xylene	18.64	91	1191942	30.533	ng	100
71) n-Nonane	18.85	43	676962	39.936	ng	100
72) 1,1,2,2-Tetrachloroethane	18.62	83	561350	33.840	ng	100
74) Cumene	19.20	105	1543874	29.896	ng	100
75) alpha-Pinene	19.58	93	767387	30.605	ng	100
76) n-Propylbenzene	19.68	91	1837872	32.744	ng	100
77) 3-Ethyltoluene	19.78	105	1515607	32.127	ng	100
78) 4-Ethyltoluene	19.82	105	1499313	32.892	ng	100
79) 1,3,5-Trimethylbenzene	19.89	105	1278020	29.478	ng	100
80) alpha-Methylstyrene	20.04	118	625868	26.380	ng	100
81) 2-Ethyltoluene	20.08	105	1517552	30.591	ng	100
82) 1,2,4-Trimethylbenzene	20.29	105	1319219	32.183	ng	100
83) n-Decane	20.39	57	693899	39.067	ng	100
84) Benzyl Chloride	20.41	91	1088336	31.880	ng	100
85) 1,3-Dichlorobenzene	20.43	146	788633	27.041	ng	100
86) 1,4-Dichlorobenzene	20.50	146	785114	30.640	ng	100
87) sec-Butylbenzene	20.55	105	1736585	30.977	ng	100
88) 4-Isopropyltoluene (p-...	20.70	119	1644319	31.030	ng	100
89) 1,2,3-Trimethylbenzene	20.70	105	1311701	31.822	ng	100
90) 1,2-Dichlorobenzene	20.83	146	765037	31.744	ng	100
91) d-Limonene	20.84	68	474763	37.018	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.25	157	285045	27.686	ng	100
93) n-Undecane	21.61	57	729899	35.903	ng	100
94) 1,2,4-Trichlorobenzene	22.51	180	587285	24.737	ng	100
95) Naphthalene	22.62	128	1652954	28.077	ng	100
96) n-Dodecane	22.63	57	620306	34.321	ng	100
97) Hexachlorobutadiene	22.97	225	398214	26.105	ng	100
98) Cyclohexanone	18.33	55	375318	28.972	ng	100
99) tert-Butylbenzene	20.29	119	1299498	30.359	ng	100
100) n-Butylbenzene	21.11	91	1396704	30.194	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Vial: 3
Operator: LH/AMF
Inst : MS13

Quant Time: Feb 21 10:25:28 2017
Quant Method : I:\MS13\METHODS\R13022017.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Feb 21 10:20:40 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2017 02\20\02201713.D
 Acq On : 20 Feb 2017 16:25
 Sample : 50ng S29-01241705
 Misc : S29-01311701/S29-01241705 (2/22)

Vial: 3
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 21 10:25:30 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 10:20:40 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

AM 2/21/17

LH 2/28/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.18	130	134505	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.30	114	653789	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.62	82	280156	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.03	65	207889	13.662	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	109.28%
57) Toluene-d8 (SS2)	15.74	98	674044	11.912	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.28%
73) Bromofluorobenzene (SS3)	19.07	174	269319	11.318	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	90.56%

Target Compounds

						Qvalue
2) Propene	4.09	42	876316	87.906	ng	100
3) Dichlorodifluoromethan...	4.25	85	1399240	59.335	ng	100
4) Chloromethane	4.53	50	886492	63.142	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	763692	54.678	ng	99
6) Vinyl Chloride	4.96	62	1050255	74.861	ng	100
7) 1,3-Butadiene	5.22	54	725022	83.760	ng	99
8) Bromomethane	5.66	94	600958	66.033	ng	100
9) Chloroethane	6.00	64	500892	72.078	ng	100
10) Ethanol	6.40	45	2391147	410.907	ng	99
11) Acetonitrile	6.64	41	1400915	92.019	ng	99
12) Acrolein	6.82	56	386987	70.564	ng	99
13) Acetone	7.03	58	2338464	359.076	ng	93
14) Trichlorofluoromethane	7.26	101	1257127	62.045	ng	100
15) 2-Propanol (Isopropanol)	7.53	45	3163783	160.453	ng	99
16) Acrylonitrile	7.79	53	982801	88.315	ng	99
17) 1,1-Dichloroethene	8.23	96	682654	70.936	ng	97
18) 2-Methyl-2-Propanol (t...	8.40	59	3070309	133.115	ng	99
19) Methylene Chloride	8.46	84	696148	65.650	ng	98
20) 3-Chloro-1-propene (Al...	8.62	41	1102435	91.538	ng	99
21) Trichlorotrifluoroethane	8.87	151	689120	59.089	ng	100
22) Carbon Disulfide	8.72	76	2581572	68.420	ng	100
23) trans-1,2-Dichloroethene	9.73	61	1054731	82.518	ng	99
24) 1,1-Dichloroethane	9.98	63	1233100	72.268	ng	100
25) Methyl tert-Butyl Ether	10.07	73	2243693	73.350	ng	100
26) Vinyl Acetate	10.24	86	691917	302.699	ng	# 81
27) 2-Butanone (MEK)	10.48	72	483359	76.383	ng	95
28) cis-1,2-Dichloroethene	11.00	61	999137	77.328	ng	99
29) Diisopropyl Ether	11.29	87	592531	60.485	ng	# 81
30) Ethyl Acetate	11.30	61	496445	159.330	ng	98
31) n-Hexane	11.28	57	1123198	74.291	ng	100
32) Chloroform	11.34	83	1239793	68.302	ng	100
34) Tetrahydrofuran (THF)	11.74	72	480477	66.862	ng	98
35) Ethyl tert-Butyl Ether	11.88	87	871680	74.415	ng	98
36) 1,2-Dichloroethane	12.14	62	981077	70.068	ng	100
38) 1,1,1-Trichloroethane	12.42	97	1156481	64.240	ng	99
39) Isopropyl Acetate	12.85	61	861136	145.550	ng	# 93
40) 1-Butanol	12.87	56	1182279	135.834	ng	97
41) Benzene	12.90	78	2707681	66.344	ng	100
42) Carbon Tetrachloride	13.07	117	1048235	64.462	ng	100
43) Cyclohexane	13.20	84	2160369	134.525	ng	99
44) tert-Amyl Methyl Ether	13.54	73	2058091	71.610	ng	99
45) 1,2-Dichloropropane	13.75	63	715667	74.502	ng	100
46) Bromodichloromethane	13.95	83	999728	70.228	ng	100
47) Trichloroethene	14.00	130	819989	61.521	ng	100
48) 1,4-Dioxane	13.97	88	602348	73.328	ng	99
49) 2,2,4-Trimethylpentane...	14.07	57	2949902	73.983	ng	99
50) Methyl Methacrylate	14.20	100	608709	138.730	ng	97

Data File : I:\MS13\DATA\2017 02\20\02201713.D
 Acq On : 20 Feb 2017 16:25
 Sample : 50ng S29-01241705
 Misc : S29-01311701/S29-01241705 (2/22)

Vial: 3
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 21 10:25:30 2017
 Quant Method : I:\MS13\METHODS\R13022017.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Tue Feb 21 10:20:40 2017
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

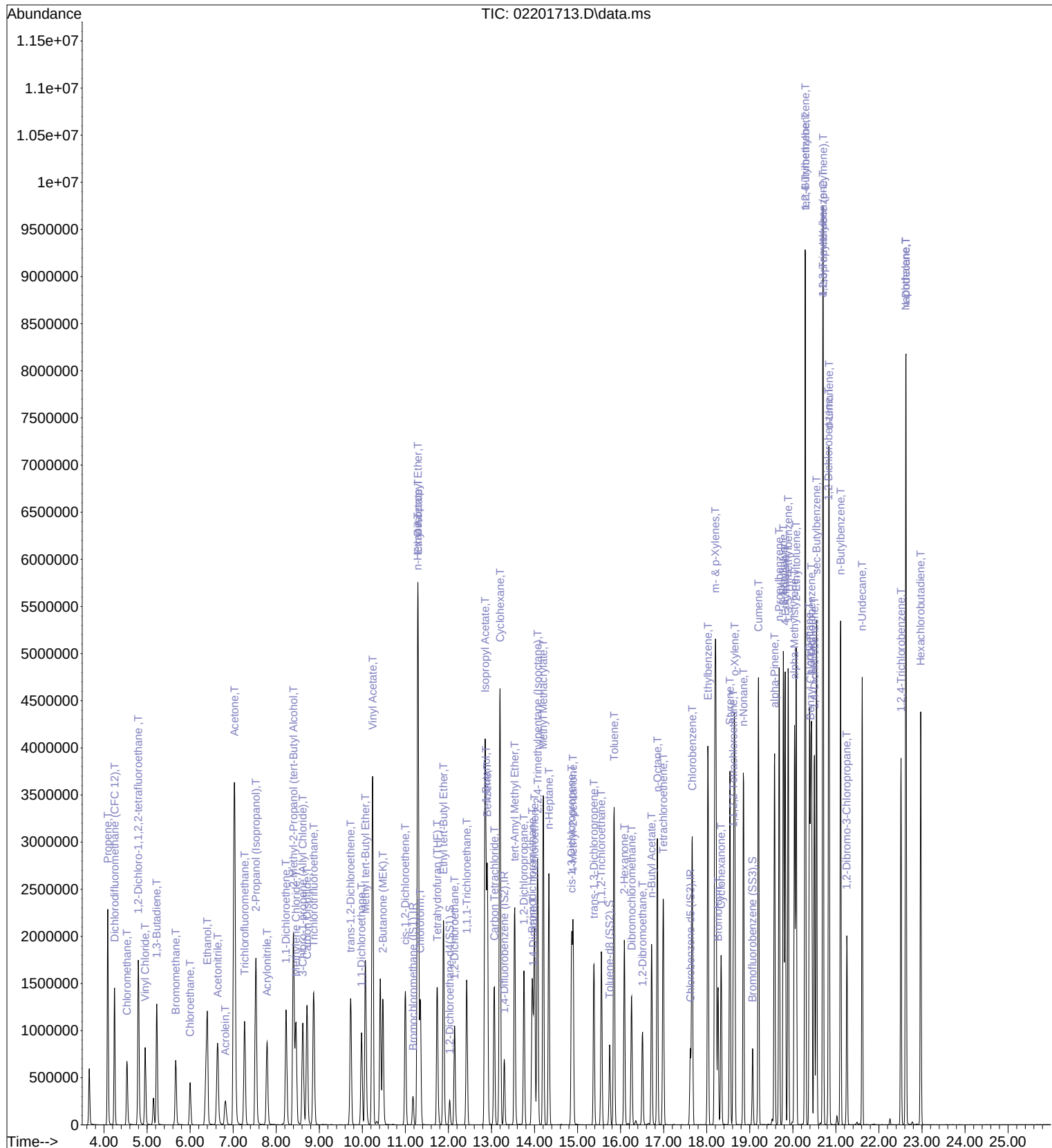
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.34	71	723511	72.656	ng	99
52) cis-1,3-Dichloropropene	14.86	75	1280011	82.101	ng	100
53) 4-Methyl-2-pentanone	14.89	58	648877	75.327	ng	97
54) trans-1,3-Dichloropropene	15.38	75	1139351	70.843	ng	100
55) 1,1,2-Trichloroethane	15.55	97	701443	66.761	ng	99
58) Toluene	15.85	91	2893285	59.956	ng	100
59) 2-Hexanone	16.09	43	1549705	72.946	ng	99
60) Dibromochloromethane	16.26	129	906021	61.996	ng	100
61) 1,2-Dibromoethane	16.51	107	816003	63.284	ng	100
62) n-Butyl Acetate	16.72	43	1635240	73.311	ng	99
63) n-Octane	16.86	57	617208	69.255	ng	98
64) Tetrachloroethene	16.99	166	903824	53.368	ng	100
65) Chlorobenzene	17.66	112	1998407	58.574	ng	100
66) Ethylbenzene	18.03	91	3311941	61.661	ng	99
67) m- & p-Xylenes	18.20	91	5167403	121.104	ng	99
68) Bromoform	18.26	173	828094	62.679	ng	100
69) Styrene	18.54	104	2075037	59.919	ng	99
70) o-Xylene	18.65	91	2637492	60.689	ng	99
71) n-Nonane	18.85	43	1439602	76.286	ng	98
72) 1,1,2,2-Tetrachloroethane	18.62	83	1249586	67.665	ng	100
74) Cumene	19.20	105	3381979	58.828	ng	99
75) alpha-Pinene	19.58	93	1699526	60.885	ng	100
76) n-Propylbenzene	19.68	91	3953319	63.268	ng	99
77) 3-Ethyltoluene	19.78	105	3466715	66.010	ng	97
78) 4-Ethyltoluene	19.82	105	3119217	61.468	ng	94
79) 1,3,5-Trimethylbenzene	19.89	105	2818118	58.389	ng	100
80) alpha-Methylstyrene	20.04	118	1400632	53.031	ng	98
81) 2-Ethyltoluene	20.08	105	3313002	59.989	ng	99
82) 1,2,4-Trimethylbenzene	20.29	105	2864171	62.765	ng	99
83) n-Decane	20.39	57	1476136	74.652	ng	98
84) Benzyl Chloride	20.41	91	2418101	63.626	ng	99
85) 1,3-Dichlorobenzene	20.43	146	1754610	54.042	ng	100
86) 1,4-Dichlorobenzene	20.50	146	1760541	61.717	ng	100
87) sec-Butylbenzene	20.55	105	3768260	60.381	ng	99
88) 4-Isopropyltoluene (p-...	20.70	119	3523315	59.724	ng	99
89) 1,2,3-Trimethylbenzene	20.70	105	2855901	62.236	ng	100
90) 1,2-Dichlorobenzene	20.83	146	1699223	63.334	ng	100
91) d-Limonene	20.84	68	1030073	72.145	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.25	157	643453	56.141	ng	96
93) n-Undecane	21.61	57	1539067	68.003	ng	99
94) 1,2,4-Trichlorobenzene	22.51	180	1319702	49.932	ng	100
95) Naphthalene	22.62	128	3579733	54.620	ng	99
96) n-Dodecane	22.63	57	1340459	66.622	ng	98
97) Hexachlorobutadiene	22.97	225	906428	53.376	ng	100
98) Cyclohexanone	18.33	55	841328	58.339	ng	99
99) tert-Butylbenzene	20.29	119	2802577	58.814	ng	99
100) n-Butylbenzene	21.11	91	2989303	58.050	ng	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2017 02\20\02201713.D
Acq On : 20 Feb 2017 16:25
Sample : 50ng S29-01241705
Misc : S29-01311701/S29-01241705 (2/22)

Vial: 3
Operator: LH/AMF
Inst : MS13

Quant Time: Feb 21 10:25:30 2017
Quant Method : I:\MS13\METHODS\R13022017.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Feb 21 10:20:40 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2017 02\20\02201714.D
 Acq On : 20 Feb 2017 17:00
 Sample : 100ng S29-01241706
 Misc : S29-01311701/S29-01241705 (2/22)

Vial: 3
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 21 10:25:32 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 10:20:40 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

AM 2/21/17

LS 2/28/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.19	130	144872	12.500	ng	0.01
37) 1,4-Difluorobenzene (IS2)	13.30	114	705007	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.62	82	299287	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.04	65	218143	13.310	ng	0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	106.48%
57) Toluene-d8 (SS2)	15.75	98	723599	11.971	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.76%
73) Bromofluorobenzene (SS3)	19.07	174	284853	11.205	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	89.68%

Target Compounds

						Qvalue
2) Propene	4.10	42	2206730	205.524	ng	99
3) Dichlorodifluoromethan...	4.26	85	2885723	113.612	ng	99
4) Chloromethane	4.55	50	1249161	82.607	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	1573731	104.612	ng	99
6) Vinyl Chloride	4.97	62	2095775	138.695	ng	100
7) 1,3-Butadiene	5.24	54	1503489	161.266	ng	98
8) Bromomethane	5.68	94	1295432	132.155	ng	100
9) Chloroethane	6.02	64	1067267	142.589	ng	99
10) Ethanol	6.45	45	4972987	793.429	ng	99
11) Acetonitrile	6.67	41	2990217	182.356	ng	100
12) Acrolein	6.84	56	834452	141.267	ng	99
13) Acetone	7.06	58	4656413	663.837	ng	# 84
14) Trichlorofluoromethane	7.28	101	2636404	120.807	ng	99
15) 2-Propanol (Isopropanol)	7.56	45	4804992	226.250	ng	99
16) Acrylonitrile	7.81	53	2110970	176.119	ng	99
17) 1,1-Dichloroethene	8.24	96	1479791	142.765	ng	94
18) 2-Methyl-2-Propanol (t...	8.42	59	4132004	166.326	ng	100
19) Methylene Chloride	8.47	84	1511248	132.319	ng	95
20) 3-Chloro-1-propene (Al...	8.63	41	2320908	178.920	ng	98
21) Trichlorotrifluoroethane	8.88	151	1452963	115.670	ng	99
22) Carbon Disulfide	8.73	76	5467364	134.533	ng	99
23) trans-1,2-Dichloroethene	9.74	61	2250180	163.448	ng	97
24) 1,1-Dichloroethane	9.99	63	2619346	142.526	ng	99
25) Methyl tert-Butyl Ether	10.08	73	4730274	143.575	ng	99
26) Vinyl Acetate	10.26	86	1454851	590.921	ng	# 54
27) 2-Butanone (MEK)	10.49	72	1035654	151.949	ng	# 89
28) cis-1,2-Dichloroethene	11.01	61	2111972	151.759	ng	97
29) Diisopropyl Ether	11.30	87	1208650	114.548	ng	96
30) Ethyl Acetate	11.31	61	992566	295.760	ng	94
31) n-Hexane	11.29	57	2240716	137.600	ng	99
32) Chloroform	11.36	83	2624854	134.259	ng	100
34) Tetrahydrofuran (THF)	11.75	72	1027883	132.802	ng	95
35) Ethyl tert-Butyl Ether	11.89	87	1860224	147.443	ng	95
36) 1,2-Dichloroethane	12.15	62	2041102	135.343	ng	100
38) 1,1,1-Trichloroethane	12.43	97	2442130	125.800	ng	99
39) Isopropyl Acetate	12.86	61	1764370	276.550	ng	# 84
40) 1-Butanol	12.89	56	2408099	256.571	ng	95
41) Benzene	12.91	78	5510830	125.218	ng	99
42) Carbon Tetrachloride	13.07	117	2223246	126.787	ng	100
43) Cyclohexane	13.20	84	4452653	257.121	ng	96
44) tert-Amyl Methyl Ether	13.54	73	4297963	138.680	ng	99
45) 1,2-Dichloropropane	13.76	63	1513208	146.084	ng	100
46) Bromodichloromethane	13.95	83	2107377	137.283	ng	100
47) Trichloroethene	14.01	130	1781799	123.971	ng	100
48) 1,4-Dioxane	13.97	88	1283224	144.866	ng	98
49) 2,2,4-Trimethylpentane...	14.08	57	5970198	138.854	ng	100
50) Methyl Methacrylate	14.21	100	1304497	275.707	ng	92

Data File : I:\MS13\DATA\2017 02\20\02201714.D
 Acq On : 20 Feb 2017 17:00
 Sample : 100ng S29-01241706
 Misc : S29-01311701/S29-01241705 (2/22)

Vial: 3
 Operator: LH/AMF
 Inst : MS13

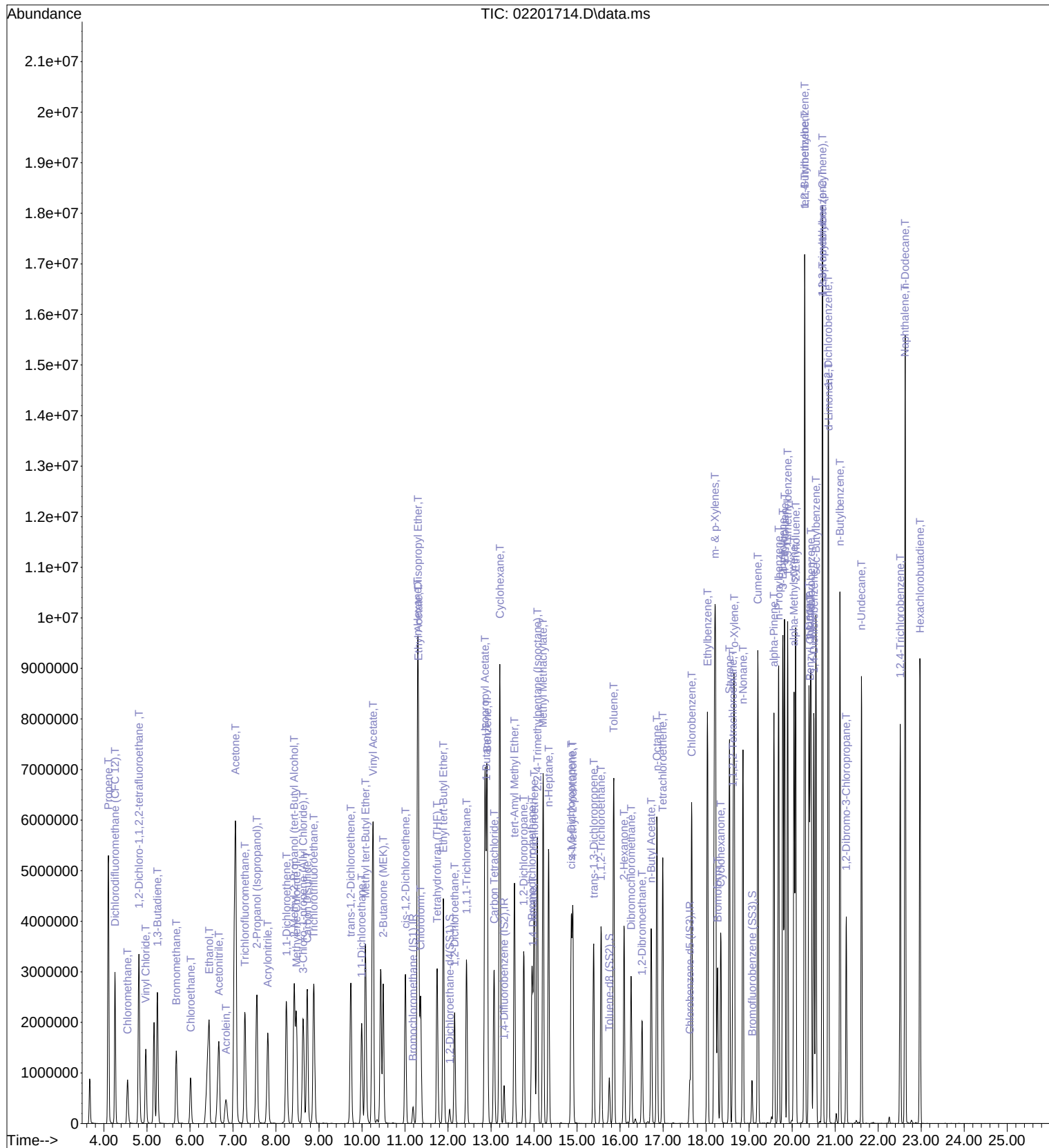
Quant Time: Feb 21 10:25:32 2017
 Quant Method : I:\MS13\METHODS\R13022017.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Tue Feb 21 10:20:40 2017
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.34	71	1520634	141.610	ng	98
52) cis-1,3-Dichloropropene	14.86	75	2690611	160.041	ng	99
53) 4-Methyl-2-pentanone	14.90	58	1350410	145.378	ng	93
54) trans-1,3-Dichloropropene	15.39	75	2398468	138.299	ng	99
55) 1,1,2-Trichloroethane	15.56	97	1503315	132.686	ng	100
58) Toluene	15.85	91	5968206	115.770	ng	98
59) 2-Hexanone	16.09	43	3132584	138.027	ng	97
60) Dibromochloromethane	16.26	129	1941928	124.386	ng	99
61) 1,2-Dibromoethane	16.51	107	1748155	126.909	ng	100
62) n-Butyl Acetate	16.72	43	3294562	138.261	ng	97
63) n-Octane	16.86	57	1270845	133.483	ng	96
64) Tetrachloroethene	16.99	166	1972949	109.050	ng	99
65) Chlorobenzene	17.66	112	4196909	115.150	ng	99
66) Ethylbenzene	18.03	91	6704934	116.852	ng	96
67) m- & p-Xylenes	18.21	91	10604313	232.638	ng	99
68) Bromoform	18.27	173	1804159	127.829	ng	99
69) Styrene	18.54	104	4315141	116.639	ng	99
70) o-Xylene	18.65	91	5390046	116.098	ng	97
71) n-Nonane	18.86	43	2818525	139.810	ng	95
72) 1,1,2,2-Tetrachloroethane	18.63	83	2586582	131.111	ng	99
74) Cumene	19.20	105	6702694	109.139	ng	96
75) alpha-Pinene	19.58	93	3492920	117.134	ng	100
76) n-Propylbenzene	19.69	91	7642527	114.491	ng	95
77) 3-Ethyltoluene	19.79	105	6593689	117.526	ng	96
78) 4-Ethyltoluene	19.82	105	6471541	119.378	ng	96
79) 1,3,5-Trimethylbenzene	19.90	105	5708150	110.709	ng	98
80) alpha-Methylstyrene	20.04	118	2918170	103.425	ng	99
81) 2-Ethyltoluene	20.08	105	6583163	111.583	ng	96
82) 1,2,4-Trimethylbenzene	20.29	105	5646525	115.828	ng	99
83) n-Decane	20.39	57	2889351	136.782	ng	96
84) Benzyl Chloride	20.42	91	4894183	120.546	ng	96
85) 1,3-Dichlorobenzene	20.44	146	3669057	105.784	ng	99
86) 1,4-Dichlorobenzene	20.51	146	3689028	121.056	ng	99
87) sec-Butylbenzene	20.56	105	7243890	108.653	ng	95
88) 4-Isopropyltoluene (p-...	20.70	119	6577661	104.372	ng	95
89) 1,2,3-Trimethylbenzene	20.70	105	5595626	114.145	ng	100
90) 1,2-Dichlorobenzene	20.84	146	3464064	120.861	ng	100
91) d-Limonene	20.85	68	2019827	132.424	ng	95
92) 1,2-Dibromo-3-Chloropr...	21.26	157	1354541	110.628	ng	93
93) n-Undecane	21.61	57	2962384	122.526	ng	96
94) 1,2,4-Trichlorobenzene	22.51	180	2763732	97.883	ng	99
95) Naphthalene	22.62	128	6787479	96.944	ng	97
96) n-Dodecane	22.63	57	2509981	116.774	ng	95
97) Hexachlorobutadiene	22.98	225	1944906	107.208	ng	99
98) Cyclohexanone	18.34	55	1737518	112.780	ng	97
99) tert-Butylbenzene	20.29	119	5464942	107.354	ng	97
100) n-Butylbenzene	21.11	91	5795071	105.342	ng	96

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Vial: 3
Operator: LH/AMF
Inst : MS13

Quant Time: Feb 21 10:25:32 2017
Quant Method : I:\MS13\METHODS\R13022017.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Feb 21 10:20:40 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File: I:\MS13\DATA\2017 02\20\02201717.D

Acq On : 20 Feb 2017 18:44

Operator: LH/AMF

Sample : 25ng ICV S29-02091701

Misc : S29-01311701/S29-02091701 (3/10)

2/28/17

ALS Vial : 3 Sample Multiplier: 1

Quant Time: Feb 28 17:35:52 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 11:57:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.17	130	141227	12.500	ng	0.02
37) 1,4-Difluorobenzene (IS2)	13.30	114	689700	12.500	ng	0.01
56) Chlorobenzene-d5 (IS3)	17.61	82	286513	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.02	65	207220	11.314	ng	0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	90.48%
57) Toluene-d8 (SS2)	15.74	98	708362	12.835	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.64%
73) Bromofluorobenzene (SS3)	19.07	174	274855	12.860	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.88%

Target Compounds

						Qvalue
2) Propene	4.08	42	462872	25.418	ng	98
3) Dichlorodifluoromethan...	4.24	85	805780	26.775	ng	100
4) Chloromethane	4.53	50	640975	29.851	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	448664	26.619	ng	99
6) Vinyl Chloride	4.95	62	605830	28.566	ng	100
7) 1,3-Butadiene	5.22	54	417087	30.315	ng	97
8) Bromomethane	5.66	94	384559	31.092	ng	100
9) Chloroethane	5.99	64	314511	29.368	ng	100
10) Ethanol	6.37	45	1551891	145.166	ng	100
11) Acetonitrile	6.62	41	839821	28.618	ng	99
12) Acrolein	6.81	56	259100	30.866	ng	97
13) Acetone	7.01	58	1546529	145.204	ng	88
14) Trichlorofluoromethane	7.26	101	715148	26.196	ng	99
15) 2-Propanol (Isopropanol)	7.51	45	2252201	61.544	ng	98
16) Acrylonitrile	7.78	53	597487	30.752	ng	99
17) 1,1-Dichloroethene	8.22	96	411621	29.789	ng	93
18) 2-Methyl-2-Propanol (t...	8.39	59	2225412	63.707	ng	99
19) Methylene Chloride	8.45	84	425838	28.501	ng	96
20) 3-Chloro-1-propene (Al...	8.61	41	690245	31.676	ng	98
21) Trichlorotrifluoroethane	8.86	151	415930	29.189	ng	99
22) Carbon Disulfide	8.71	76	1552443	29.659	ng	100
23) trans-1,2-Dichloroethene	9.72	61	620579	30.208	ng	97
24) 1,1-Dichloroethane	9.98	63	760742	27.811	ng	100
25) Methyl tert-Butyl Ether	10.07	73	1320679	28.124	ng	99
26) Vinyl Acetate	10.23	86	526104	176.403	ng	# 83
27) 2-Butanone (MEK)	10.47	72	299335	28.699	ng	93
28) cis-1,2-Dichloroethene	10.99	61	582174	27.984	ng	97
29) Diisopropyl Ether	11.29	87	364797	25.239	ng	# 75
30) Ethyl Acetate	11.29	61	318170	60.277	ng	98
31) n-Hexane	11.28	57	695668	26.952	ng	99
32) Chloroform	11.34	83	722756	27.190	ng	100
34) Tetrahydrofuran (THF)	11.74	72	291959	26.986	ng	97
35) Ethyl tert-Butyl Ether	11.88	87	518232	29.295	ng	98
36) 1,2-Dichloroethane	12.14	62	558128	26.101	ng	99
38) 1,1,1-Trichloroethane	12.42	97	648834	26.794	ng	99
39) Isopropyl Acetate	12.85	61	544526	57.581	ng	96
40) 1-Butanol	12.86	56	899023	67.673	ng	88
41) Benzene	12.90	78	1679888	27.658	ng	100
42) Carbon Tetrachloride	13.06	117	597132	27.939	ng	99
43) Cyclohexane	13.19	84	1303934	57.075	ng	99
44) tert-Amyl Methyl Ether	13.53	73	1236401	27.671	ng	98
45) 1,2-Dichloropropane	13.75	63	429347	28.178	ng	100
46) Bromodichloromethane	13.94	83	581338	28.221	ng	100
47) Trichloroethene	14.00	130	486694	28.995	ng	99
48) 1,4-Dioxane	13.96	88	370752	29.613	ng	99
49) 2,2,4-Trimethylpentane...	14.07	57	1789415	27.811	ng	97

Data File: I:\MS13\DATA\2017 02\20\02201717.D

Acq On : 20 Feb 2017 18:44

Operator: LH/AMF

Sample : 25ng ICV S29-02091701

Misc : S29-01311701/S29-02091701 (3/10)

ALS Vial : 3 Sample Multiplier: 1

Quant Time: Feb 28 17:35:52 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 11:57:41 2017

Response via : Initial Calibration

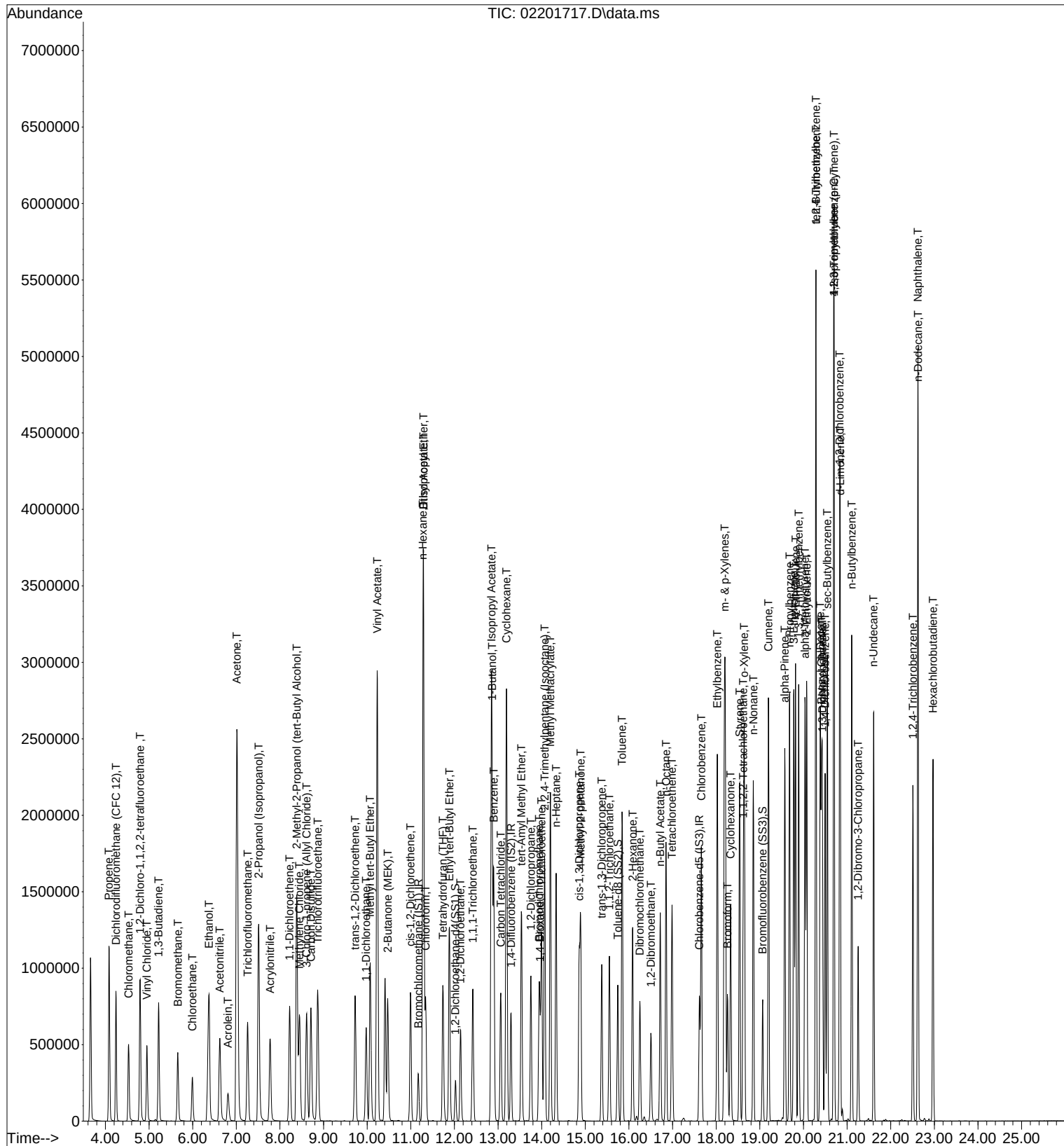
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.20	100	374780	61.951	ng	97
51) n-Heptane	14.33	71	434583	28.243	ng	99
52) cis-1,3-Dichloropropene	14.86	75	718802	29.427	ng	100
53) 4-Methyl-2-pentanone	14.89	58	415337	30.128	ng	95
54) trans-1,3-Dichloropropene	15.38	75	665846	30.898	ng	99
55) 1,1,2-Trichloroethane	15.55	97	417881	28.750	ng	100
58) Toluene	15.84	91	1732529	29.009	ng	100
59) 2-Hexanone	16.09	43	1011709	30.514	ng	97
60) Dibromochloromethane	16.25	129	517503	30.367	ng	99
61) 1,2-Dibromoethane	16.50	107	482760	30.403	ng	99
62) n-Butyl Acetate	16.72	43	1147621	32.608	ng	98
63) n-Octane	16.85	57	369630	28.756	ng	98
64) Tetrachloroethene	16.99	166	526707	29.365	ng	100
65) Chlorobenzene	17.66	112	1185158	29.379	ng	100
66) Ethylbenzene	18.03	91	1973641	29.131	ng	100
67) m- & p-Xylenes	18.20	91	3036470	58.080	ng	99
68) Bromoform	18.26	173	466787	31.858	ng	99
69) Styrene	18.54	104	1259486	31.291	ng	99
70) o-Xylene	18.64	91	1542032	29.037	ng	99
71) n-Nonane	18.85	43	859688	27.608	ng	98
72) 1,1,2,2-Tetrachloroethane	18.62	83	725323	29.339	ng	99
74) Cumene	19.20	105	2002970	29.199	ng	99
75) alpha-Pinene	19.57	93	1047522	30.735	ng	98
76) n-Propylbenzene	19.68	91	2361957	29.392	ng	99
77) 3-Ethyltoluene	19.78	105	1931393	28.646	ng	96
78) 4-Ethyltoluene	19.82	105	1975627	30.524	ng	95
79) 1,3,5-Trimethylbenzene	19.89	105	1640294	29.226	ng	99
80) alpha-Methylstyrene	20.04	118	944308	35.124	ng	99
81) 2-Ethyltoluene	20.07	105	1939148	29.432	ng	100
82) 1,2,4-Trimethylbenzene	20.29	105	1663779	29.444	ng	99
83) n-Decane	20.39	57	879489	26.253	ng	99
84) Benzyl Chloride	20.41	91	1500503	34.097	ng	99
85) 1,3-Dichlorobenzene	20.43	146	1004077	29.984	ng	100
86) 1,4-Dichlorobenzene	20.50	146	1020874	30.351	ng	100
87) sec-Butylbenzene	20.54	105	2211984	29.281	ng	99
88) 4-Isopropyltoluene (p-...	20.70	119	2109163	29.410	ng	99
89) 1,2,3-Trimethylbenzene	20.70	105	1709543	29.895	ng	100
90) 1,2-Dichlorobenzene	20.83	146	963542	29.463	ng	100
91) d-Limonene	20.84	68	679784	31.646	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.25	157	370046	31.303	ng	95
93) n-Undecane	21.61	57	913532	31.048	ng	99
94) 1,2,4-Trichlorobenzene	22.51	180	742401	30.397	ng	100
95) Naphthalene	22.62	128	2117283	32.655	ng	100
96) n-Dodecane	22.63	57	838737	33.357	ng	100
97) Hexachlorobutadiene	22.97	225	498626	30.590	ng	100
98) Cyclohexanone	18.33	55	669231	37.911	ng	97
99) tert-Butylbenzene	20.29	119	1651535	29.334	ng	99
100) n-Butylbenzene	21.11	91	1756383	29.909	ng	99

(#)=qualifier out of range (m)=manual integration (+)=signals summed

ALS Vial : 3 Sample Multiplier: 1

DataAcq Meth:T015.M



Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: 02201717.D

Data File Path: I:\MS13\DATA\2017_02\20\

Operator: LH/AMF

Date Acquired: 2/20/17

18:44

Acq. Method File: TO15.M

Sample Name: 25ng ICV S29-02091701

Misc Info: S29-01311701/S29-02091701 (

Instrument Name: MS13

2/28/17

#	Compound Name	Ret. Time	Amt. (ng)	Spike Amt.(ng)	% Rec.	Lower Limit	Upper Limit	* OR Fail	ICV/AZ 70-130%
2)	Propene	4.08	25.418	26.275	97	52	127	*	*
3)	Dichlorodifluoromethane (CFC 12)	4.24	26.775	26.250	102	68	109	*	*
4)	Chloromethane	4.53	29.851	26.225	114	51	130	*	*
5)	1,2-Dichloro-1,1,2,2-tetrafluoroethane	4.80	26.619	26.375	101	66	114	*	*
6)	Vinyl Chloride	4.95	28.566	26.250	109	61	125	*	*
7)	1,3-Butadiene	5.22	30.315	26.250	115	62	144	*	*
8)	Bromomethane	5.66	31.092	26.250	118	73	123	*	*
9)	Chloroethane	5.99	29.368	26.225	112	69	122	*	*
10)	Ethanol	6.37	145.166	132.650	109	62	124	*	*
11)	Acetonitrile	6.62	28.618	26.650	107	57	114	*	*
12)	Acrolein	6.81	30.866	26.525	116	62	116	*	*
13)	Acetone	7.01	145.204	133.050	109	57	117	*	*
14)	Trichlorofluoromethane	7.26	26.196	26.275	100	63	98	FAIL	*
15)	2-Propanol (Isopropanol)	7.51	61.544	53.025	116	66	121	*	*
16)	Acrylonitrile	7.78	30.752	26.575	116	68	123	*	*
17)	1,1-Dichloroethene	8.22	29.789	26.575	112	76	118	*	*
18)	2-Methyl-2-Propanol (tert-Butyl Alcohol)	8.39	63.707	53.275	120	74	126	*	*
19)	Methylene Chloride	8.45	28.501	26.550	107	60	118	*	*
20)	3-Chloro-1-propene (Allyl Chloride)	8.61	31.676	26.500	120	65	126	*	*
21)	Trichlorotrifluoroethane	8.86	29.189	26.450	110	73	114	*	*
22)	Carbon Disulfide	8.71	29.659	26.675	111	57	102	FAIL	*
23)	trans-1,2-Dichloroethene	9.72	30.208	26.675	113	74	123	*	*
24)	1,1-Dichloroethane	9.98	27.811	26.550	105	69	111	*	*
25)	Methyl tert-Butyl Ether	10.07	28.124	26.600	106	69	113	*	*
26)	Vinyl Acetate	10.23	176.403	132.550	133	76	128	FAIL	*
27)	2-Butanone (MEK)	10.47	28.699	26.550	108	63	127	*	*
28)	cis-1,2-Dichloroethene	10.99	27.984	26.475	106	72	117	*	*
29)	Diisopropyl Ether	11.29	25.239	26.575	95	64	118	*	*
30)	Ethyl Acetate	11.29	60.277	53.275	113	68	127	*	*
31)	n-Hexane	11.28	26.952	26.600	101	55	116	*	*
32)	Chloroform	11.34	27.190	26.475	103	70	109	*	*
34)	Tetrahydrofuran (THF)	11.74	26.986	26.575	102	72	113	*	*
35)	Ethyl tert-Butyl Ether	11.88	29.295	26.525	110	73	117	*	*
36)	1,2-Dichloroethane	12.14	26.101	26.500	98	69	113	*	*
38)	1,1,1-Trichloroethane	12.42	26.794	26.475	101	72	115	*	*
39)	Isopropyl Acetate	12.85	57.581	53.050	109	68	122	*	*
40)	1-Butanol	12.86	67.673	53.075	128	75	141	*	*
41)	Benzene	12.90	27.658	26.525	104	65	107	*	*
42)	Carbon Tetrachloride	13.06	27.939	26.600	105	71	113	*	*
43)	Cyclohexane	13.19	57.075	53.125	107	71	115	*	*
44)	tert-Amyl Methyl Ether	13.53	27.671	26.525	104	73	115	*	*
45)	1,2-Dichloropropane	13.75	28.178	26.525	106	71	115	*	*
46)	Bromodichloromethane	13.94	28.221	26.700	106	75	118	*	*
47)	Trichloroethene	14.00	28.995	26.550	109	68	114	*	*
48)	1,4-Dioxane	13.96	29.613	26.600	111	81	131	*	*
49)	2,2,4-Trimethylpentane (Isooctane)	14.07	27.811	26.525	105	68	112	*	*

Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: 02201717.D

TO15.M

Data File Path: I:\MS13\DATA\2017_02\20\

Sample Name: 25ng ICV S29-02091701

Operator: LH/AMF

Misc Info: S29-01311701/S29-02091701 (

Date Acquired: 2/20/17

18:44

Instrument Name: MS13

#	Compound Name	Ret. Time	Amt. (ng)	Spike Amt.(ng)	% Rec.	Lower Limit	Upper Limit	* OR Fail	ICV/AZ 70-130%
50)	Methyl Methacrylate	14.20	61.951	53.000	117	72	130	*	*
51)	n-Heptane	14.33	28.243	26.600	106	68	116	*	*
52)	cis-1,3-Dichloropropene	14.86	29.427	26.275	112	77	126	*	*
53)	4-Methyl-2-pentanone	14.89	30.128	26.575	113	69	126	*	*
54)	trans-1,3-Dichloropropene	15.38	30.898	26.675	116	79	125	*	*
55)	1,1,2-Trichloroethane	15.55	28.750	26.525	108	75	119	*	*
58)	Toluene	15.84	29.009	26.450	110	59	118	*	*
59)	2-Hexanone	16.09	30.514	26.575	115	69	129	*	*
60)	Dibromochloromethane	16.25	30.367	26.600	114	74	136	*	*
61)	1,2-Dibromoethane	16.50	30.403	26.450	115	73	131	*	*
62)	n-Butyl Acetate	16.72	32.608	26.950	121	69	130	*	*
63)	n-Octane	16.85	28.756	26.500	109	66	120	*	*
64)	Tetrachloroethene	16.99	29.365	26.575	110	65	130	*	*
65)	Chlorobenzene	17.66	29.379	26.500	111	68	120	*	*
66)	Ethylbenzene	18.03	29.131	26.450	110	68	122	*	*
67)	m- & p-Xylenes	18.20	58.080	53.025	110	68	123	*	*
68)	Bromoform	18.26	31.858	26.550	120	69	130	*	*
69)	Styrene	18.54	31.291	26.475	118	71	133	*	*
70)	o-Xylene	18.64	29.037	26.450	110	68	122	*	*
71)	n-Nonane	18.85	27.608	26.475	104	65	120	*	*
72)	1,1,2,2-Tetrachloroethane	18.62	29.339	26.500	111	69	130	*	*
74)	Cumene	19.20	29.199	26.525	110	70	123	*	*
75)	alpha-Pinene	19.57	30.735	26.575	116	70	128	*	*
76)	n-Propylbenzene	19.68	29.392	26.725	110	69	125	*	*
77)	3-Ethyltoluene	19.78	28.646	26.550	108	67	128	*	*
78)	4-Ethyltoluene	19.82	30.524	26.525	115	67	130	*	*
79)	1,3,5-Trimethylbenzene	19.89	29.226	26.525	110	67	124	*	*
80)	alpha-Methylstyrene	20.04	35.124	26.550	132	67	141	*	FAIL
81)	2-Ethyltoluene	20.07	29.432	26.550	111	67	124	*	*
82)	1,2,4-Trimethylbenzene	20.29	29.444	26.525	111	67	129	*	*
83)	n-Decane	20.39	26.253	26.525	99	66	124	*	*
84)	Benzyl Chloride	20.41	34.097	26.550	128	79	138	*	*
85)	1,3-Dichlorobenzene	20.43	29.984	26.475	113	65	136	*	*
86)	1,4-Dichlorobenzene	20.50	30.351	26.650	114	66	141	*	*
87)	sec-Butylbenzene	20.54	29.281	26.550	110	68	125	*	*
88)	4-Isopropyltoluene (p-Cymene)	20.70	29.410	26.550	111	68	131	*	*
89)	1,2,3-Trimethylbenzene	20.70	29.895	26.500	113	68	132	*	*
90)	1,2-Dichlorobenzene	20.83	29.463	26.550	111	67	136	*	*
91)	d-Limonene	20.84	31.646	26.550	119	71	134	*	*
92)	1,2-Dibromo-3-Chloropropane	21.25	31.303	26.475	118	73	136	*	*
93)	n-Undecane	21.61	31.048	26.600	117	68	132	*	*
94)	1,2,4-Trichlorobenzene	22.51	30.397	26.500	115	64	134	*	*
95)	Naphthalene	22.62	32.655	26.700	122	62	136	*	*
96)	n-Dodecane	22.63	33.357	26.550	126	61	137	*	*
97)	Hexachlorobutadiene	22.97	30.590	26.575	115	60	133	*	*
98)	Cyclohexanone	18.33	37.911	26.575	143	64	131	FAIL	FAIL
99)	tert-Butylbenzene	20.29	29.334	26.500	111	67	128	*	*
100)	n-Butylbenzene	21.11	29.909	26.500	113	68	128	*	*

Bold = 75 Compound List
*** = Pass**

Data File : I:\MS13\DATA\2017 02\21\02211701.D
 Acq On : 21 Feb 2017 5:12
 Sample : CCV R13022117_25ng
 Misc : S29-01311701

Vial: 3
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 21 13:23:55 2017
 Quant Method : I:\MS13\METHODS\R13022017.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Tue Feb 21 11:57:41 2017
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

2/21/17

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
 Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1 IR	Bromochloromethane (IS1)	1.000	1.000	0.0	99	0.02
2 T	Propene	1.612	1.493	7.4	101	-0.06
3 T	Dichlorodifluoromethane (CF	2.664	2.628	1.4	99	-0.05
4 T	Chloromethane	1.901	2.062	-8.5	99	-0.05
5 T	1,2-Dichloro-1,1,2,2-tetra	1.492	1.492	0.0	103	-0.04
6 T	Vinyl Chloride	1.877	2.013	-7.2	103	-0.06
7 T	1,3-Butadiene	1.218	1.345	-10.4	101	-0.05
8 T	Bromomethane	1.095	1.177	-7.5	104	-0.04
9 T	Chloroethane	0.948	0.952	-0.4	103	-0.04
10 T	Ethanol	0.946	0.884	6.6	99	0.02
11 T	Acetonitrile	2.597	2.524	2.8	101	-0.03
12 T	Acrolein	0.743	0.700	5.8	101	-0.02
13 T	Acetone	0.943	0.902	4.3	102	-0.02
14 T	Trichlorofluoromethane	2.416	2.272	6.0	98	-0.03
15 T	2-Propanol (Isopropanol)	3.239	3.174	2.0	98	-0.02
16 T	Acrylonitrile	1.720	1.759	-2.3	101	-0.02
17 T	1,1-Dichloroethene	1.223	1.211	1.0	102	-0.02
18 T	2-Methyl-2-Propanol (tert-B	3.092	3.042	1.6	99	-0.04
19 T	Methylene Chloride	1.322	1.246	5.7	102	0.02
20 T	3-Chloro-1-propene (Allyl C	1.929	1.973	-2.3	100	0.00
21 T	Trichlorotrifluoroethane	1.261	1.258	0.2	103	0.00
22 T	Carbon Disulfide	4.633	4.570	1.4	100	-0.03
23 T	trans-1,2-Dichloroethene	1.818	1.846	-1.5	100	0.00
24 T	1,1-Dichloroethane	2.421	2.280	5.8	100	0.01
25 T	Methyl tert-Butyl Ether	4.156	3.956	4.8	100	-0.03
26 T	Vinyl Acetate	0.264	0.246	6.8	100	0.00
27 T	2-Butanone (MEK)	0.923	0.864	6.4	100	-0.03
28 T	cis-1,2-Dichloroethene	1.841	1.754	4.7	99	0.02
29 T	Diisopropyl Ether	1.279	1.244	2.7	100	-0.02
30 T	Ethyl Acetate	0.467	0.451	3.4	100	-0.02
31 T	n-Hexane	2.285	2.053	10.2	99	0.00
32 T	Chloroform	2.353	2.211	6.0	99	0.02
33 S	1,2-Dichloroethane-d4 (SS1)	1.621	1.564	3.5	95	0.01
34 T	Tetrahydrofuran (THF)	0.958	0.853	11.0	100	-0.03
35 T	Ethyl tert-Butyl Ether	1.566	1.545	1.3	99	-0.01
36 T	1,2-Dichloroethane	1.893	1.760	7.0	96	0.00
37 IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	99	0.00
38 T	1,1,1-Trichloroethane	0.439	0.418	4.8	98	0.00
39 T	Isopropyl Acetate	0.171	0.160	6.4	99	0.00
40 T	1-Butanol	0.241	0.215	10.8	98	-0.02
41 T	Benzene	1.101	1.010	8.3	100	0.01
42 T	Carbon Tetrachloride	0.387	0.383	1.0	97	0.01
43 T	Cyclohexane	0.414	0.398	3.9	100	0.00
44 T	tert-Amyl Methyl Ether	0.810	0.755	6.8	99	-0.02
45 T	1,2-Dichloropropane	0.276	0.261	5.4	99	0.00
46 T	Bromodichloromethane	0.373	0.362	2.9	97	0.00
47 T	Trichloroethene	0.304	0.298	2.0	100	0.00
48 T	1,4-Dioxane	0.227	0.219	3.5	100	-0.02
49 T	2,2,4-Trimethylpentane (Iso	1.166	1.093	6.3	99	0.00
50 T	Methyl Methacrylate	0.110	0.111	-0.9	100	0.00
51 T	n-Heptane	0.279	0.265	5.0	99	0.00
52 T	cis-1,3-Dichloropropene	0.443	0.441	0.5	98	0.00
53 T	4-Methyl-2-pentanone	0.250	0.238	4.8	98	-0.01
54 T	trans-1,3-Dichloropropene	0.391	0.408	-4.3	96	0.00
55 T	1,1,2-Trichloroethane	0.263	0.255	3.0	99	0.00

Data File : I:\MS13\DATA\2017 02\21\02211701.D
 Acq On : 21 Feb 2017 5:12
 Sample : CCV R13022117_25ng
 Misc : S29-01311701

Vial: 3
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 21 13:23:55 2017
 Quant Method : I:\MS13\METHODS\R13022017.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Tue Feb 21 11:57:41 2017
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
 Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
56	IR Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	96	0.00
57	S Toluene-d8 (SS2)	2.408	2.426	-0.7	98	0.00
58	T Toluene	2.606	2.527	3.0	99	0.00
59	T 2-Hexanone	1.446	1.324	8.4	96	-0.01
60	T Dibromochloromethane	0.743	0.764	-2.8	97	0.00
61	T 1,2-Dibromoethane	0.693	0.695	-0.3	98	0.00
62	T n-Butyl Acetate	1.535	1.391	9.4	96	0.00
63	T n-Octane	0.561	0.536	4.5	98	0.00
64	T Tetrachloroethene	0.783	0.768	1.9	100	0.00
65	T Chlorobenzene	1.760	1.715	2.6	99	0.00
66	T Ethylbenzene	2.956	2.887	2.3	98	0.00
67	T m- & p-Xylenes	2.281	2.227	2.4	97	0.00
68	T Bromoform	0.639	0.686	-7.4	98	0.00
69	T Styrene	1.756	1.770	-0.8	98	0.00
70	T o-Xylene	2.317	2.272	1.9	97	0.00
71	T n-Nonane	1.359	1.268	6.7	95	0.00
72	T 1,1,2,2-Tetrachloroethane	1.079	1.061	1.7	96	0.00
73	S Bromofluorobenzene (SS3)	0.932	0.968	-3.9	97	0.00
74	T Cumene	2.993	2.981	0.4	98	0.00
75	T alpha-Pinene	1.487	1.490	-0.2	98	0.00
76	T n-Propylbenzene	3.506	3.469	1.1	97	0.00
77	T 3-Ethyltoluene	2.942	2.956	-0.5	99	0.00
78	T 4-Ethyltoluene	2.824	2.797	1.0	95	0.00
79	T 1,3,5-Trimethylbenzene	2.449	2.446	0.1	97	0.00
80	T alpha-Methylstyrene	1.173	1.195	-1.9	97	0.00
81	T 2-Ethyltoluene	2.874	2.862	0.4	97	0.00
82	T 1,2,4-Trimethylbenzene	2.465	2.490	-1.0	96	0.00
83	T n-Decane	1.462	1.307	10.6	96	0.00
84	T Benzyl Chloride	1.920	2.014	-4.9	95	0.00
85	T 1,3-Dichlorobenzene	1.461	1.481	-1.4	96	0.00
86	T 1,4-Dichlorobenzene	1.467	1.490	-1.6	97	0.00
87	T sec-Butylbenzene	3.296	3.298	-0.1	97	0.00
88	T 4-Isopropyltoluene (p-Cymen	3.129	3.196	-2.1	96	0.00
89	T 1,2,3-Trimethylbenzene	2.495	2.529	-1.4	96	0.00
90	T 1,2-Dichlorobenzene	1.427	1.441	-1.0	96	0.00
91	T d-Limonene	0.937	0.929	0.9	95	0.00
92	T 1,2-Dibromo-3-Chloropropane	0.516	0.533	-3.3	95	0.00
93	T n-Undecane	1.284	1.348	-5.0	94	-0.01
94	T 1,2,4-Trichlorobenzene	1.066	1.077	-1.0	92	-0.01
95	T Naphthalene	2.829	2.863	-1.2	91	-0.02
96	T n-Dodecane	1.097	1.130	-3.0	92	-0.01
97	T Hexachlorobutadiene	0.711	0.735	-3.4	94	0.00
98	T Cyclohexanone	0.770	0.701	9.0	95	-0.01
99	T tert-Butylbenzene	2.456	2.468	-0.5	96	0.00
100	T n-Butylbenzene	2.562	2.600	-1.5	95	0.00

(#) = Out of Range

SPCC's out = 0 CCC's out = 0

Data File : I:\MS13\DATA\2017 02\21\02211701.D
 Acq On : 21 Feb 2017 5:12
 Sample : CCV R13022117_25ng
 Misc : S29-01311701

Vial: 3
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 21 13:23:55 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 11:57:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

AM 2/21/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.17	130	117628	12.500	ng	0.02
37) 1,4-Difluorobenzene (IS2)	13.29	114	569838	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.61	82	241687	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.02	65	184026	12.064	ng	0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	96.48%
57) Toluene-d8 (SS2)	15.74	98	586347	12.594	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.72%
73) Bromofluorobenzene (SS3)	19.07	174	234003	12.979	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.84%

Target Compounds

						Qvalue
2) Propene	4.09	42	363808	23.986	ng	99
3) Dichlorodifluoromethan...	4.25	85	647359	25.826	ng	100
4) Chloromethane	4.53	50	487612	27.265	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	352658	25.121	ng	100
6) Vinyl Chloride	4.95	62	484562	27.432	ng	100
7) 1,3-Butadiene	5.22	54	334395	29.181	ng	99
8) Bromomethane	5.66	94	274895	26.684	ng	100
9) Chloroethane	5.99	64	226060	25.344	ng	100
10) Ethanol	6.37	45	1082953	121.624	ng	99
11) Acetonitrile	6.62	41	621131	25.412	ng	99
12) Acrolein	6.81	56	171443	24.521	ng	99
13) Acetone	7.01	58	1127192	127.064	ng	94
14) Trichlorofluoromethane	7.26	101	560609	24.655	ng	100
15) 2-Propanol (Isopropanol)	7.51	45	1571734	51.566	ng	99
16) Acrylonitrile	7.77	53	436522	26.975	ng	99
17) 1,1-Dichloroethene	8.22	96	301780	26.221	ng	96
18) 2-Methyl-2-Propanol (t...	8.38	59	1512809	51.996	ng	99
19) Methylene Chloride	8.45	84	309900	24.903	ng	98
20) 3-Chloro-1-propene (Al...	8.61	41	488384	26.909	ng	99
21) Trichlorotrifluoroethane	8.87	151	310514	26.163	ng	99
22) Carbon Disulfide	8.71	76	1140671	26.164	ng	100
23) trans-1,2-Dichloroethene	9.72	61	463440	27.085	ng	99
24) 1,1-Dichloroethane	9.98	63	547177	24.017	ng	100
25) Methyl tert-Butyl Ether	10.07	73	992012	25.363	ng	100
26) Vinyl Acetate	10.23	86	304340	122.518	ng	# 93
27) 2-Butanone (MEK)	10.47	72	213254	24.548	ng	96
28) cis-1,2-Dichloroethene	10.99	61	439130	25.343	ng	99
29) Diisopropyl Ether	11.28	87	310727	25.812	ng	97
30) Ethyl Acetate	11.29	61	225751	51.349	ng	98
31) n-Hexane	11.28	57	513295	23.876	ng	100
32) Chloroform	11.34	83	550403	24.860	ng	100
34) Tetrahydrofuran (THF)	11.74	72	212996	23.637	ng	97
35) Ethyl tert-Butyl Ether	11.88	87	384245	26.078	ng	98
36) 1,2-Dichloroethane	12.14	62	435551	24.455	ng	100
38) 1,1,1-Trichloroethane	12.42	97	511660	25.574	ng	99
39) Isopropyl Acetate	12.85	61	383181	49.043	ng	97
40) 1-Butanol	12.86	56	516247	47.034	ng	98
41) Benzene	12.90	78	1211134	24.134	ng	100
42) Carbon Tetrachloride	13.06	117	460589	26.083	ng	99
43) Cyclohexane	13.19	84	965940	51.174	ng	99
44) tert-Amyl Methyl Ether	13.53	73	906426	24.553	ng	99
45) 1,2-Dichloropropane	13.75	63	315915	25.095	ng	100
46) Bromodichloromethane	13.94	83	440358	25.874	ng	100
47) Trichloroethene	14.00	130	360427	25.990	ng	100
48) 1,4-Dioxane	13.96	88	265329	25.650	ng	99
49) 2,2,4-Trimethylpentane...	14.07	57	1319373	24.819	ng	98
50) Methyl Methacrylate	14.20	100	267467	53.512	ng	97

Data File : I:\MS13\DATA\2017 02\21\02211701.D
 Acq On : 21 Feb 2017 5:12
 Sample : CCV R13022117_25ng
 Misc : S29-01311701

Vial: 3
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 21 13:23:55 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 11:57:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

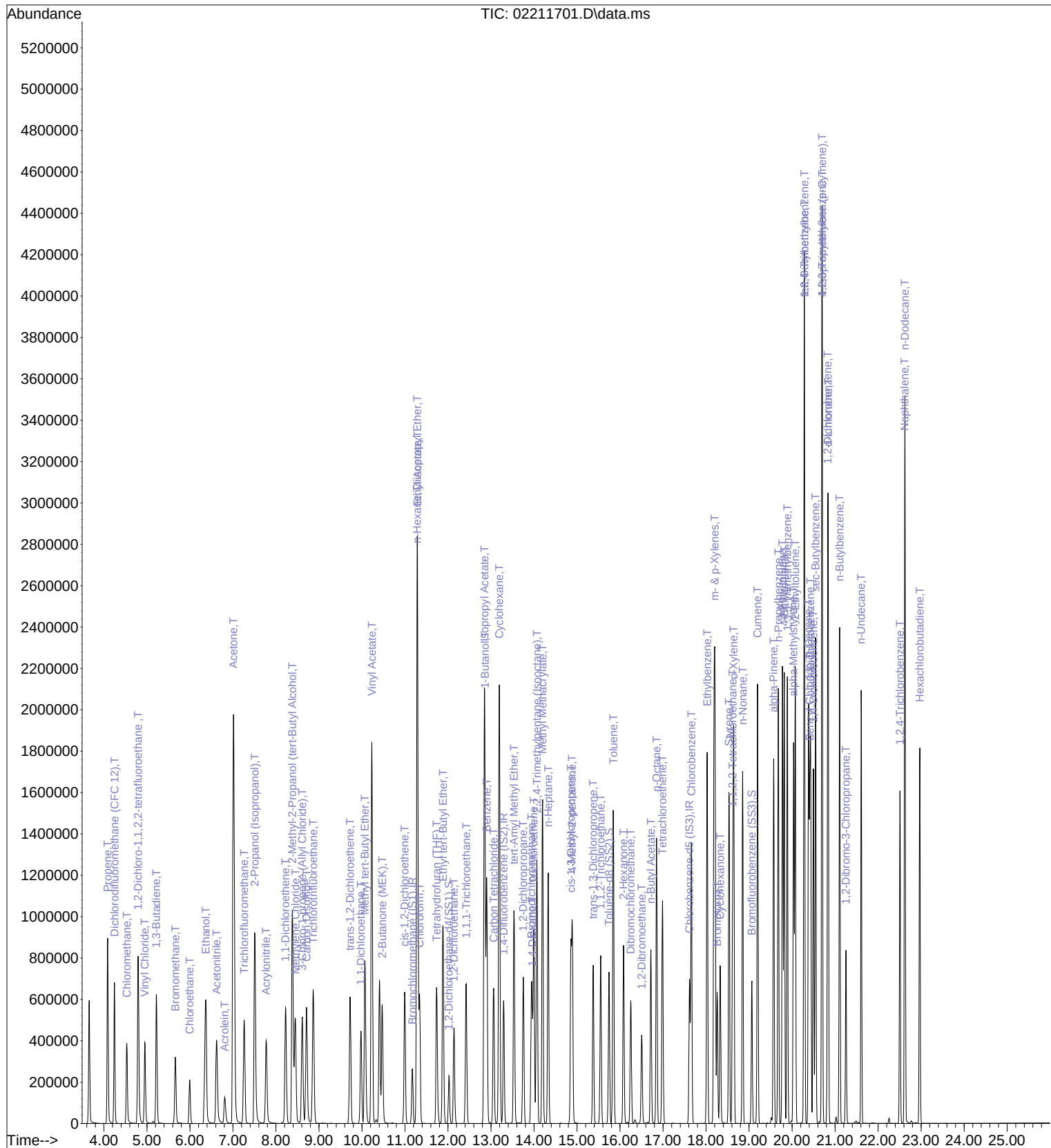
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.33	71	320319	25.196	ng	99
52) cis-1,3-Dichloropropene	14.86	75	560730	27.784	ng	100
53) 4-Methyl-2-pentanone	14.89	58	286415	25.146	ng	98
54) trans-1,3-Dichloropropene	15.38	75	494587	27.779	ng	99
55) 1,1,2-Trichloroethane	15.55	97	308899	25.722	ng	100
58) Toluene	15.84	91	1285998	25.526	ng	100
59) 2-Hexanone	16.08	43	679189	24.285	ng	99
60) Dibromochloromethane	16.25	129	392045	27.272	ng	99
61) 1,2-Dibromoethane	16.50	107	354997	26.503	ng	100
62) n-Butyl Acetate	16.72	43	715303	24.094	ng	99
63) n-Octane	16.85	57	274029	25.273	ng	99
64) Tetrachloroethene	16.99	166	394130	26.049	ng	100
65) Chlorobenzene	17.66	112	879317	25.840	ng	100
66) Ethylbenzene	18.03	91	1472142	25.759	ng	100
67) m- & p-Xylenes	18.20	91	2285765	51.830	ng	100
68) Bromoform	18.26	173	352286	28.503	ng	100
69) Styrene	18.53	104	907800	26.737	ng	99
70) o-Xylene	18.64	91	1157712	25.843	ng	99
71) n-Nonane	18.85	43	646204	24.601	ng	99
72) 1,1,2,2-Tetrachloroethane	18.62	83	541701	25.976	ng	100
74) Cumene	19.20	105	1513159	26.150	ng	100
75) alpha-Pinene	19.57	93	752100	26.160	ng	99
76) n-Propylbenzene	19.68	91	1782560	26.296	ng	99
77) 3-Ethyltoluene	19.78	105	1500395	26.381	ng	96
78) 4-Ethyltoluene	19.82	105	1418144	25.974	ng	95
79) 1,3,5-Trimethylbenzene	19.89	105	1240390	26.200	ng	100
80) alpha-Methylstyrene	20.03	118	606339	26.736	ng	99
81) 2-Ethyltoluene	20.07	105	1469394	26.438	ng	100
82) 1,2,4-Trimethylbenzene	20.29	105	1266239	26.565	ng	99
83) n-Decane	20.39	57	665378	23.545	ng	99
84) Benzyl Chloride	20.41	91	1032880	27.824	ng	100
85) 1,3-Dichlorobenzene	20.43	146	757618	26.820	ng	100
86) 1,4-Dichlorobenzene	20.50	146	761774	26.848	ng	100
87) sec-Butylbenzene	20.54	105	1680258	26.368	ng	100
88) 4-Isopropyltoluene (p-...	20.70	119	1586376	26.223	ng	99
89) 1,2,3-Trimethylbenzene	20.70	105	1255533	26.028	ng	100
90) 1,2-Dichlorobenzene	20.83	146	736761	26.707	ng	100
91) d-Limonene	20.84	68	451494	24.917	ng	99
92) 1,2-Dibromo-3-Chloropr...	21.25	157	271380	27.214	ng	97
93) n-Undecane	21.61	57	686740	27.669	ng	99
94) 1,2,4-Trichlorobenzene	22.51	180	542948	26.354	ng	100
95) Naphthalene	22.62	128	1498701	27.402	ng	100
96) n-Dodecane	22.62	57	570635	26.904	ng	100
97) Hexachlorobutadiene	22.97	225	376063	27.350	ng	99
98) Cyclohexanone	18.33	55	357895	24.034	ng	99
99) tert-Butylbenzene	20.29	119	1253890	26.402	ng	99
100) n-Butylbenzene	21.11	91	1327103	26.791	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2017 02\21\02211701.D
Acq On : 21 Feb 2017 5:12
Sample : CCV R13022117_25ng
Misc : S29-01311701

Vial: 3
Operator: LH/AMF
Inst : MS13

Quant Time: Feb 21 13:23:55 2017
Quant Method : I:\MS13\METHODS\R13022017.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Feb 21 11:57:41 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2017 02\23\02231701.D
 Acq On : 23 Feb 2017 5:10
 Sample : CCV R13022317 25ng
 Misc : S29-02221710/S29-02171703 (3/18)

Vial: 3
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 23 08:27:39 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 11:57:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

AM 2/23/17

AM 2/24/17

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
 Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1 IR	Bromochloromethane (IS1)	1.000	1.000	0.0	123	0.01
2 T	Propene	1.612	1.194	25.9	100	-0.06
3 T	Dichlorodifluoromethane (CF	2.664	2.167	18.7	101	-0.04
4 T	Chloromethane	1.901	1.590	16.4	94	-0.05
5 T	1,2-Dichloro-1,1,2,2-tetra	1.492	1.272	14.7	109	-0.04
6 T	Vinyl Chloride	1.877	1.681	10.4	106	-0.05
7 T	1,3-Butadiene	1.218	1.203	1.2	112	-0.04
8 T	Bromomethane	1.095	1.013	7.5	110	-0.04
9 T	Chloroethane	0.948	0.806	15.0	108	-0.03
10 T	Ethanol	0.946	0.790	16.5	110	0.03
11 T	Acetonitrile	2.597	2.146	17.4	106	-0.03
12 T	Acrolein	0.743	0.700	5.8	124	-0.02
13 T	Acetone	0.943	0.773	18.0	108	-0.01
14 T	Trichlorofluoromethane	2.416	1.938	19.8	103	-0.02
15 T	2-Propanol (Isopropanol)	3.239	2.848	12.1	109	-0.01
16 T	Acrylonitrile	1.720	1.499	12.8	107	-0.02
17 T	1,1-Dichloroethene	1.223	1.060	13.3	110	-0.01
18 T	2-Methyl-2-Propanol (tert-B	3.092	2.858	7.6	114	-0.03
19 T	Methylene Chloride	1.322	1.087	17.8	110	0.02
20 T	3-Chloro-1-propene (Allyl C	1.929	1.653	14.3	103	0.00
21 T	Trichlorotrifluoroethane	1.261	1.102	12.6	112	0.00
22 T	Carbon Disulfide	4.633	3.955	14.6	107	-0.02
23 T	trans-1,2-Dichloroethene	1.818	1.572	13.5	105	0.00
24 T	1,1-Dichloroethane	2.421	1.955	19.2	106	0.01
25 T	Methyl tert-Butyl Ether	4.156	3.394	18.3	105	-0.03
26 T	Vinyl Acetate	0.264	0.268	-1.5	135	0.00
27 T	2-Butanone (MEK)	0.923	0.759	17.8	109	-0.03
28 T	cis-1,2-Dichloroethene	1.841	1.500	18.5	104	0.02
29 T	Diisopropyl Ether	1.279	1.085	15.2	108	-0.02
30 T	Ethyl Acetate	0.467	0.392	16.1	108	-0.02
31 T	n-Hexane	2.285	1.745	23.6	104	0.00
32 T	Chloroform	2.353	1.895	19.5	104	0.02
33 S	1,2-Dichloroethane-d4 (SS1)	1.621	1.472	9.2	110	0.01
34 T	Tetrahydrofuran (THF)	0.958	0.742	22.5	108	-0.03
35 T	Ethyl tert-Butyl Ether	1.566	1.337	14.6	106	-0.02
36 T	1,2-Dichloroethane	1.893	1.466	22.6	99	0.00
37 IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	123	0.00
38 T	1,1,1-Trichloroethane	0.439	0.357	18.7	104	0.00
39 T	Isopropyl Acetate	0.171	0.142	17.0	109	-0.01
40 T	1-Butanol	0.241	0.235	2.5	133	-0.01
41 T	Benzene	1.101	0.877	20.3	107	0.00
42 T	Carbon Tetrachloride	0.387	0.331	14.5	104	0.00
43 T	Cyclohexane	0.414	0.344	16.9	107	0.00
44 T	tert-Amyl Methyl Ether	0.810	0.650	19.8	105	-0.02
45 T	1,2-Dichloropropane	0.276	0.223	19.2	105	0.00
46 T	Bromodichloromethane	0.373	0.312	16.4	104	0.00
47 T	Trichloroethene	0.304	0.262	13.8	109	0.00
48 T	1,4-Dioxane	0.227	0.197	13.2	111	-0.03
49 T	2,2,4-Trimethylpentane (Iso	1.166	0.934	19.9	104	0.00
50 T	Methyl Methacrylate	0.110	0.100	9.1	111	0.00
51 T	n-Heptane	0.279	0.229	17.9	106	0.00
52 T	cis-1,3-Dichloropropene	0.443	0.385	13.1	106	0.00
53 T	4-Methyl-2-pentanone	0.250	0.216	13.6	110	-0.01
54 T	trans-1,3-Dichloropropene	0.391	0.360	7.9	105	0.00
55 T	1,1,2-Trichloroethane	0.263	0.224	14.8	107	0.00

Data File : I:\MS13\DATA\2017 02\23\02231701.D
 Acq On : 23 Feb 2017 5:10
 Sample : CCV R13022317 25ng
 Misc : S29-02221710/S29-02171703 (3/18)

Vial: 3
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 23 08:27:39 2017
 Quant Method : I:\MS13\METHODS\R13022017.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Tue Feb 21 11:57:41 2017
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
 Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
56	IR Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	110	0.00
57	S Toluene-d8 (SS2)	2.408	2.572	-6.8	118	0.00
58	T Toluene	2.606	2.376	8.8	107	0.00
59	T 2-Hexanone	1.446	1.331	8.0	110	-0.01
60	T Dibromochloromethane	0.743	0.728	2.0	106	-0.01
61	T 1,2-Dibromoethane	0.693	0.670	3.3	108	0.00
62	T n-Butyl Acetate	1.535	1.484	3.3	117	-0.01
63	T n-Octane	0.561	0.494	11.9	103	0.00
64	T Tetrachloroethene	0.783	0.741	5.4	110	0.00
65	T Chlorobenzene	1.760	1.644	6.6	108	0.00
66	T Ethylbenzene	2.956	2.713	8.2	105	0.00
67	T m- & p-Xylenes	2.281	2.089	8.4	105	0.00
68	T Bromoform	0.639	0.665	-4.1	109	0.00
69	T Styrene	1.756	1.742	0.8	110	0.00
70	T o-Xylene	2.317	2.136	7.8	104	0.00
71	T n-Nonane	1.359	1.145	15.7	99	0.00
72	T 1,1,2,2-Tetrachloroethane	1.079	1.012	6.2	105	0.00
73	S Bromofluorobenzene (SS3)	0.932	0.884	5.2	101	0.00
74	T Cumene	2.993	2.789	6.8	105	0.00
75	T alpha-Pinene	1.487	1.429	3.9	107	0.00
76	T n-Propylbenzene	3.506	3.261	7.0	104	0.00
77	T 3-Ethyltoluene	2.942	2.754	6.4	105	0.00
78	T 4-Ethyltoluene	2.824	2.710	4.0	105	0.00
79	T 1,3,5-Trimethylbenzene	2.449	2.311	5.6	105	0.00
80	T alpha-Methylstyrene	1.173	1.295	-10.4	120	0.00
81	T 2-Ethyltoluene	2.874	2.705	5.9	105	0.00
82	T 1,2,4-Trimethylbenzene	2.465	2.353	4.5	104	0.00
83	T n-Decane	1.462	1.190	18.6	100	0.00
84	T Benzyl Chloride	1.920	2.171	-13.1	117	0.00
85	T 1,3-Dichlorobenzene	1.461	1.455	0.4	108	0.00
86	T 1,4-Dichlorobenzene	1.467	1.486	-1.3	111	-0.01
87	T sec-Butylbenzene	3.296	3.100	5.9	104	-0.01
88	T 4-Isopropyltoluene (p-Cymen	3.129	3.016	3.6	104	0.00
89	T 1,2,3-Trimethylbenzene	2.495	2.397	3.9	104	0.00
90	T 1,2-Dichlorobenzene	1.427	1.398	2.0	107	0.00
91	T d-Limonene	0.937	0.931	0.6	109	0.00
92	T 1,2-Dibromo-3-Chloropropane	0.516	0.549	-6.4	112	0.00
93	T n-Undecane	1.284	1.289	-0.4	103	-0.02
94	T 1,2,4-Trichlorobenzene	1.066	1.209	-13.4	119	-0.02
95	T Naphthalene	2.829	3.463	-22.4	125	-0.02
96	T n-Dodecane	1.097	1.269	-15.7	118	-0.02
97	T Hexachlorobutadiene	0.711	0.743	-4.5	109	-0.01
98	T Cyclohexanone	0.770	0.854	-10.9	133	-0.02
99	T tert-Butylbenzene	2.456	2.315	5.7	104	0.00
100	T n-Butylbenzene	2.562	2.508	2.1	105	0.00

(#) = Out of Range

SPCC's out = 0 CCC's out = 0

Data File : I:\MS13\DATA\2017 02\23\02231701.D
 Acq On : 23 Feb 2017 5:10
 Sample : CCV R13022317 25ng
 Misc : S29-02221710/S29-02171703 (3/18)

Vial: 3
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 23 08:27:39 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 11:57:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

2/23/17

2/24/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.17	130	145267	12.500	ng	0.01
37) 1,4-Difluorobenzene (IS2)	13.29	114	704460	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.61	82	276451	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.02	65	213904	11.355	ng	0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	90.80%
57) Toluene-d8 (SS2)	15.74	98	710928	13.350	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	106.80%
73) Bromofluorobenzene (SS3)	19.06	174	244480	11.855	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	94.88%

Target Compounds

						Qvalue
2) Propene	4.09	42	359343	19.184	ng	99
3) Dichlorodifluoromethan...	4.25	85	659137	21.293	ng	100
4) Chloromethane	4.54	50	464233	21.019	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	371436	21.425	ng	100
6) Vinyl Chloride	4.96	62	499663	22.905	ng	100
7) 1,3-Butadiene	5.23	54	369370	26.100	ng	98
8) Bromomethane	5.66	94	292196	22.967	ng	100
9) Chloroethane	6.00	64	236144	21.437	ng	100
10) Ethanol	6.38	45	1195133	108.685	ng	99
11) Acetonitrile	6.63	41	652089	21.603	ng	99
12) Acrolein	6.81	56	211730	24.522	ng	99
13) Acetone	7.02	58	1192491	108.849	ng	91
14) Trichlorofluoromethane	7.26	101	590690	21.035	ng	100
15) 2-Propanol (Isopropanol)	7.51	45	1741608	46.268	ng	99
16) Acrylonitrile	7.78	53	459465	22.991	ng	100
17) 1,1-Dichloroethene	8.23	96	326024	22.938	ng	93
18) 2-Methyl-2-Propanol (t...	8.39	59	1755078	48.845	ng	99
19) Methylene Chloride	8.45	84	333698	21.713	ng	94
20) 3-Chloro-1-propene (Al...	8.62	41	505298	22.544	ng	96
21) Trichlorotrifluoroethane	8.87	151	335988	22.923	ng	98
22) Carbon Disulfide	8.72	76	1219216	22.645	ng	100
23) trans-1,2-Dichloroethene	9.73	61	487297	23.060	ng	97
24) 1,1-Dichloroethane	9.98	63	579273	20.588	ng	100
25) Methyl tert-Butyl Ether	10.07	73	1051303	21.765	ng	100
26) Vinyl Acetate	10.23	86	410272	133.738	ng	# 82
27) 2-Butanone (MEK)	10.47	72	231453	21.574	ng	# 90
28) cis-1,2-Dichloroethene	10.99	61	463572	21.664	ng	97
29) Diisopropyl Ether	11.28	87	334884	22.525	ng	# 91
30) Ethyl Acetate	11.29	61	242713	44.703	ng	99
31) n-Hexane	11.28	57	539074	20.304	ng	99
32) Chloroform	11.34	83	582392	21.300	ng	100
34) Tetrahydrofuran (THF)	11.74	72	228856	20.565	ng	95
35) Ethyl tert-Butyl Ether	11.88	87	410539	22.562	ng	97
36) 1,2-Dichloroethane	12.14	62	448185	20.377	ng	100
38) 1,1,1-Trichloroethane	12.42	97	540312	21.845	ng	99
39) Isopropyl Acetate	12.84	61	421008	43.587	ng	97
40) 1-Butanol	12.86	56	698036	51.443	ng	88
41) Benzene	12.90	78	1299437	20.946	ng	100
42) Carbon Tetrachloride	13.06	117	492543	22.563	ng	99
43) Cyclohexane	13.19	84	1033471	44.288	ng	98
44) tert-Amyl Methyl Ether	13.53	73	965535	21.156	ng	98
45) 1,2-Dichloropropane	13.75	63	333935	21.457	ng	100
46) Bromodichloromethane	13.93	83	468743	22.278	ng	100
47) Trichloroethene	14.00	130	391974	22.863	ng	100
48) 1,4-Dioxane	13.96	88	295084	23.075	ng	98
49) 2,2,4-Trimethylpentane...	14.06	57	1394205	21.215	ng	97
50) Methyl Methacrylate	14.19	100	296681	48.014	ng	96

Data File : I:\MS13\DATA\2017 02\23\02231701.D
 Acq On : 23 Feb 2017 5:10
 Sample : CCV R13022317 25ng
 Misc : S29-02221710/S29-02171703 (3/18)

Vial: 3
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 23 08:27:39 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 11:57:41 2017

Response via : Initial Calibration

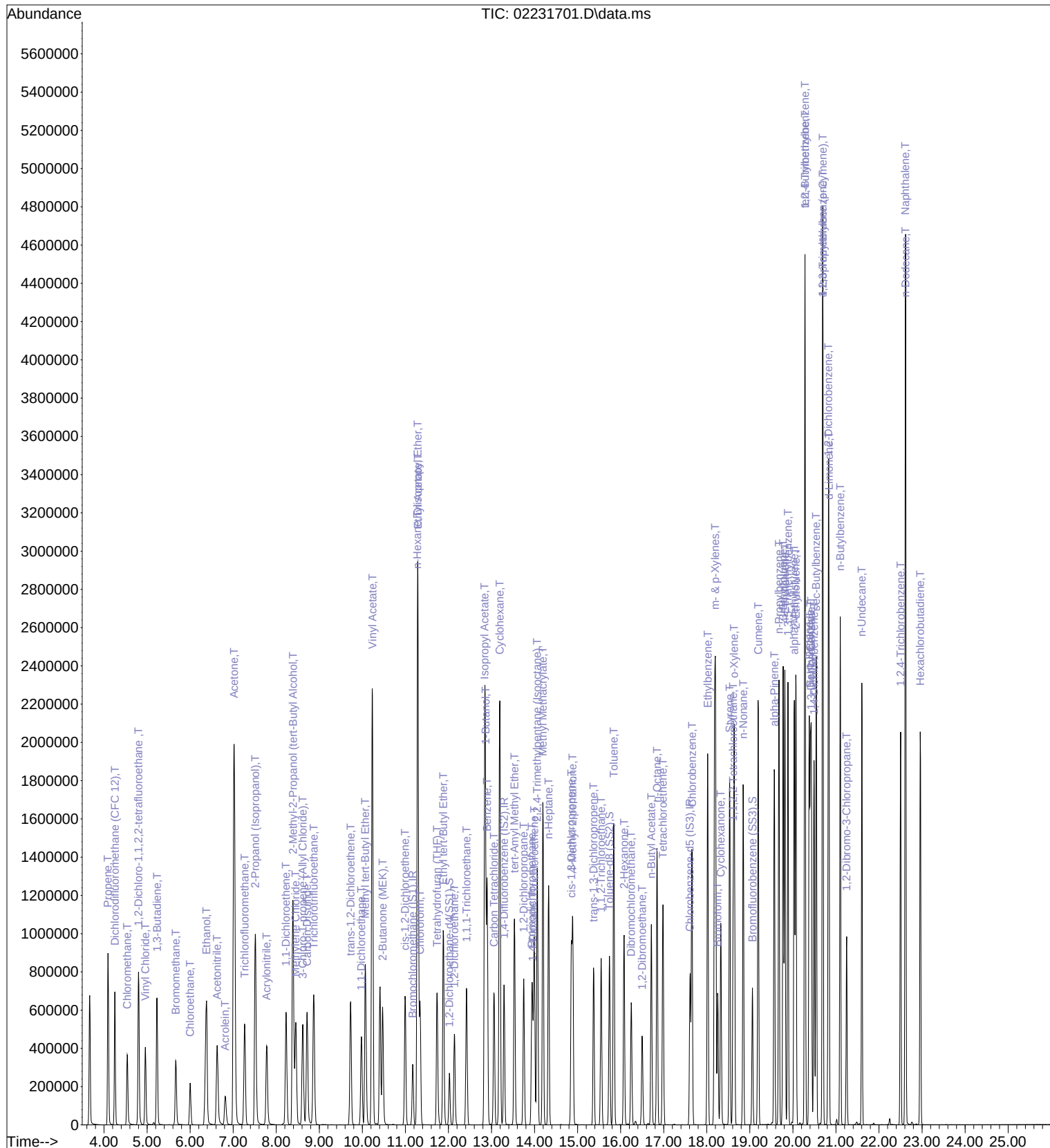
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.33	71	342395	21.786	ng	98
52) cis-1,3-Dichloropropene	14.85	75	605275	24.260	ng	99
53) 4-Methyl-2-pentanone	14.89	58	321584	22.838	ng	95
54) trans-1,3-Dichloropropene	15.37	75	539889	24.528	ng	100
55) 1,1,2-Trichloroethane	15.55	97	334198	22.511	ng	99
58) Toluene	15.84	91	1383534	24.009	ng	100
59) 2-Hexanone	16.08	43	781067	24.415	ng	98
60) Dibromochloromethane	16.24	129	427240	25.983	ng	100
61) 1,2-Dibromoethane	16.50	107	390938	25.516	ng	100
62) n-Butyl Acetate	16.71	43	873267	25.715	ng	98
63) n-Octane	16.84	57	288952	23.298	ng	97
64) Tetrachloroethene	16.98	166	434625	25.113	ng	100
65) Chlorobenzene	17.66	112	964644	24.783	ng	100
66) Ethylbenzene	18.02	91	1582441	24.207	ng	99
67) m- & p-Xylenes	18.20	91	2451791	48.603	ng	99
68) Bromoform	18.25	173	390854	27.646	ng	99
69) Styrene	18.53	104	1021694	26.307	ng	99
70) o-Xylene	18.64	91	1244886	24.295	ng	99
71) n-Nonane	18.85	43	667453	22.214	ng	97
72) 1,1,2,2-Tetrachloroethane	18.61	83	591023	24.777	ng	100
74) Cumene	19.19	105	1619126	24.462	ng	99
75) alpha-Pinene	19.57	93	824590	25.075	ng	98
76) n-Propylbenzene	19.68	91	1916841	24.721	ng	99
77) 3-Ethyltoluene	19.77	105	1598764	24.575	ng	96
78) 4-Ethyltoluene	19.81	105	1572036	25.172	ng	95
79) 1,3,5-Trimethylbenzene	19.88	105	1340117	24.747	ng	99
80) alpha-Methylstyrene	20.03	118	751536	28.971	ng	99
81) 2-Ethyltoluene	20.07	105	1588270	24.984	ng	100
82) 1,2,4-Trimethylbenzene	20.28	105	1368446	25.099	ng	99
83) n-Decane	20.38	57	693038	21.440	ng	98
84) Benzyl Chloride	20.41	91	1273307	29.988	ng	99
85) 1,3-Dichlorobenzene	20.43	146	850894	26.334	ng	100
86) 1,4-Dichlorobenzene	20.49	146	869425	26.789	ng	99
87) sec-Butylbenzene	20.54	105	1806418	24.783	ng	99
88) 4-Isopropyltoluene (p-...	20.69	119	1712397	24.746	ng	99
89) 1,2,3-Trimethylbenzene	20.69	105	1361007	24.666	ng	100
90) 1,2-Dichlorobenzene	20.83	146	817928	25.921	ng	100
91) d-Limonene	20.84	68	517421	24.965	ng	97
92) 1,2-Dibromo-3-Chloropr...	21.25	157	319517	28.012	ng	93
93) n-Undecane	21.60	57	751337	26.465	ng	99
94) 1,2,4-Trichlorobenzene	22.50	180	697062	29.579	ng	100
95) Naphthalene	22.61	128	2073777	33.148	ng	100
96) n-Dodecane	22.62	57	733034	30.215	ng	98
97) Hexachlorobutadiene	22.96	225	435186	27.670	ng	100
98) Cyclohexanone	18.32	55	498609	29.273	ng	97
99) tert-Butylbenzene	20.28	119	1345441	24.767	ng	99
100) n-Butylbenzene	21.10	91	1464575	25.848	ng	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Vial: 3
Operator: LH/AMF
Inst : MS13

Quant Time: Feb 23 08:27:39 2017
Quant Method : I:\MS13\METHODS\R13022017.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Feb 21 11:57:41 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2017 02\21\02211703.D
 Acq On : 21 Feb 2017 6:22
 Sample : MB R13022117_1000ml
 Misc : S29-01311701

Vial: 3
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 21 13:54:57 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 11:57:41 2017

Response via : Initial Calibration

AM 2/21/17

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.16	130	107219	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.29	114	522600	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.61	82	220315	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.02	65	168807	12.141	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.12%
57) Toluene-d8 (SS2)	15.74	98	537368	12.662	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.28%
73) Bromofluorobenzene (SS3)	19.07	174	207206	12.608	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.88%

Target Compounds

						Qvalue
2) Propene	4.19	42	450	N.D.		
3) Dichlorodifluoromethan...	0.00	85	0	N.D.		
4) Chloromethane	0.00	50	0	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.		
6) Vinyl Chloride	0.00	62	0	N.D.		
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.40	45	1382	0.170	ng	70
11) Acetonitrile	6.68	41	210	N.D.		
12) Acrolein	0.00	56	0	N.D.		
13) Acetone	7.08	58	2316	0.286	ng	87
14) Trichlorofluoromethane	0.00	101	0	N.D.		
15) 2-Propanol (Isopropanol)	7.58	45	297	N.D.		
16) Acrylonitrile	0.00	53	0	N.D.		
17) 1,1-Dichloroethene	0.00	96	0	N.D.		
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.		
19) Methylene Chloride	8.44	84	245	N.D.		
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.		
21) Trichlorotrifluoroethane	0.00	151	0	N.D.		
22) Carbon Disulfide	8.74	76	2069	N.D.		
23) trans-1,2-Dichloroethene	0.00	61	0	N.D.		
24) 1,1-Dichloroethane	0.00	63	0	N.D.		
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.		
27) 2-Butanone (MEK)	10.51	72	108	N.D.		
28) cis-1,2-Dichloroethene	0.00	61	0	N.D.		
29) Diisopropyl Ether	0.00	87	0	N.D.		
30) Ethyl Acetate	0.00	61	0	N.D.		
31) n-Hexane	0.00	57	0	N.D.		
32) Chloroform	0.00	83	0	N.D.		
34) Tetrahydrofuran (THF)	11.79	72	307	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	0.00	62	0	N.D.		
38) 1,1,1-Trichloroethane	0.00	97	0	N.D.		
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	12.89	56	896	0.089	ng	# 59
41) Benzene	12.90	78	803	N.D.		
42) Carbon Tetrachloride	0.00	117	0	N.D.		
43) Cyclohexane	13.28	84	261	N.D.		
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D.		
47) Trichloroethene	0.00	130	0	N.D.		
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.		
50) Methyl Methacrylate	0.00	100	0	N.D.		

Data File : I:\MS13\DATA\2017 02\21\02211703.D
 Acq On : 21 Feb 2017 6:22
 Sample : MB R13022117_1000ml
 Misc : S29-01311701

Vial: 3
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 21 13:54:57 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 11:57:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

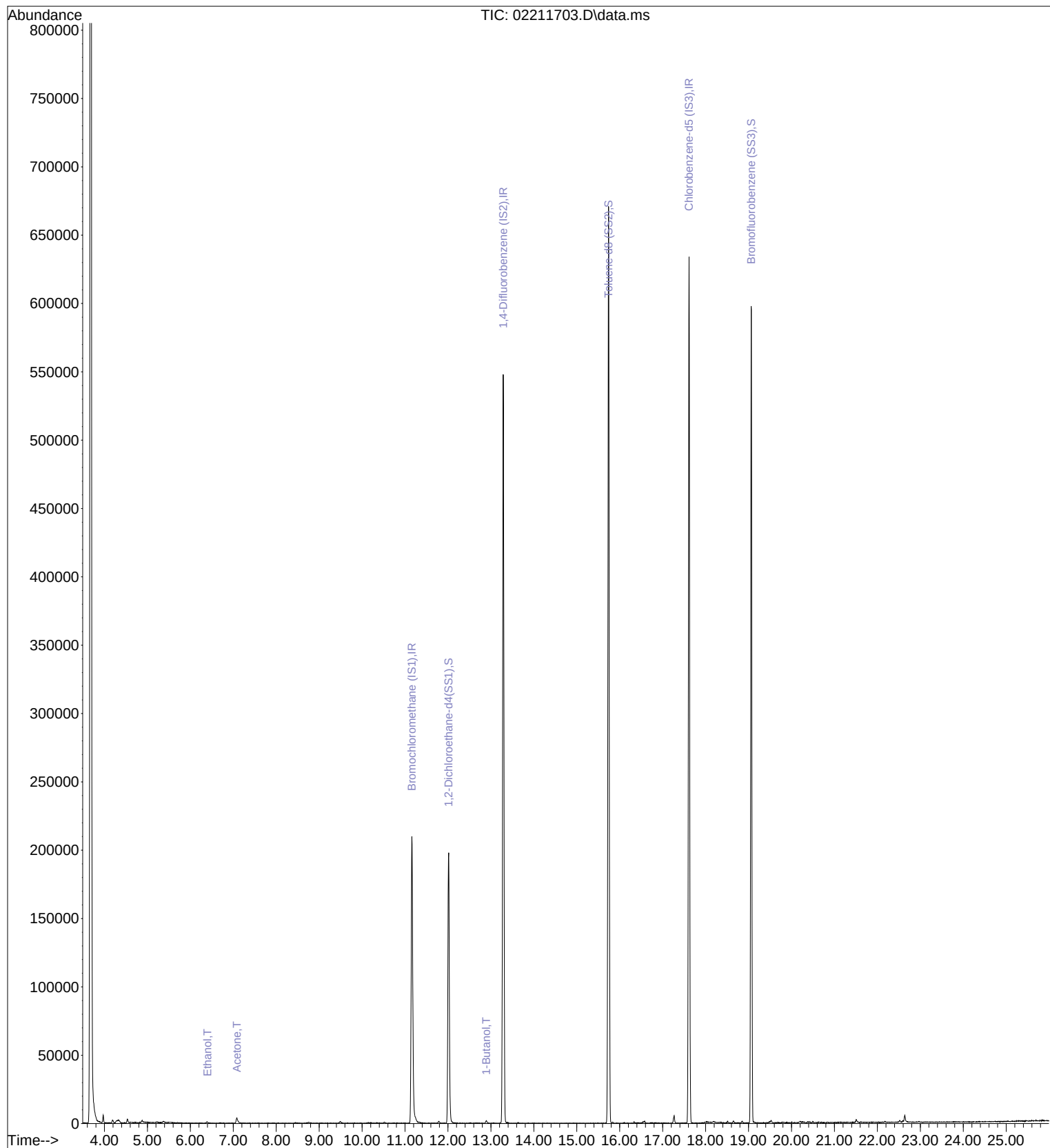
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	0.00	71	0	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	15.84	91	647	N.D.		
59) 2-Hexanone	16.11	43	538	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.73	43	265	N.D.		
63) n-Octane	0.00	57	0	N.D.		
64) Tetrachloroethene	0.00	166	0	N.D.		
65) Chlorobenzene	17.66	112	139	N.D.		
66) Ethylbenzene	18.03	91	578	N.D.		
67) m- & p-Xylenes	18.18	91	1116	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.53	104	298	N.D.		
70) o-Xylene	18.64	91	309	N.D.		
71) n-Nonane	18.85	43	525	N.D.		
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.		
74) Cumene	19.05	105	193	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	19.68	91	210	N.D.		
77) 3-Ethyltoluene	19.78	105	352	N.D.		
78) 4-Ethyltoluene	19.82	105	398	N.D.		
79) 1,3,5-Trimethylbenzene	19.82	105	398	N.D.		
80) alpha-Methylstyrene	0.00	118	0	N.D.		
81) 2-Ethyltoluene	20.08	105	172	N.D.		
82) 1,2,4-Trimethylbenzene	20.28	105	208	N.D.		
83) n-Decane	20.39	57	361	N.D.		
84) Benzyl Chloride	20.41	91	311	N.D.		
85) 1,3-Dichlorobenzene	20.43	146	226	N.D.		
86) 1,4-Dichlorobenzene	20.50	146	365	N.D.		
87) sec-Butylbenzene	0.00	105	0	N.D.		
88) 4-Isopropyltoluene (p-...	20.70	119	162	N.D.		
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D.		
90) 1,2-Dichlorobenzene	20.83	146	179	N.D.		
91) d-Limonene	0.00	68	0	N.D.		
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	21.62	57	148	N.D.		
94) 1,2,4-Trichlorobenzene	22.52	180	710	N.D.		
95) Naphthalene	22.64	128	3800	N.D.		
96) n-Dodecane	22.63	57	1099	N.D.		
97) Hexachlorobutadiene	22.98	225	224	N.D.		
98) Cyclohexanone	18.35	55	130	N.D.		
99) tert-Butylbenzene	0.00	119	0	N.D.		
100) n-Butylbenzene	21.11	91	276	N.D.		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2017 02\21\02211703.D
Acq On : 21 Feb 2017 6:22
Sample : MB R13022117_1000ml
Misc : S29-01311701

Vial: 3
Operator: LH/AMF
Inst : MS13

Quant Time: Feb 21 13:54:57 2017
Quant Method : I:\MS13\METHODS\R13022017.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Feb 21 11:57:41 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2017 02\23\02231703.D
 Acq On : 23 Feb 2017 6:20
 Sample : MB R13022317 1000ml
 Misc : S29-02221710/ AC00141

Vial: 3
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 23 08:32:55 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 11:57:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

2/23/17

2/24/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.15	130	140281	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.29	114	684295	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.61	82	269355	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.01	65	204609	11.247	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	90.00%
57) Toluene-d8 (SS2)	15.73	98	682333	13.151	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	105.20%
73) Bromofluorobenzene (SS3)	19.06	174	236282	11.760	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	94.08%

Target Compounds

					Qvalue
2) Propene	4.17	42	393	N.D.	
3) Dichlorodifluoromethan...	0.00	85	0	N.D.	
4) Chloromethane	0.00	50	0	N.D.	
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.	
6) Vinyl Chloride	0.00	62	0	N.D.	
7) 1,3-Butadiene	0.00	54	0	N.D.	
8) Bromomethane	0.00	94	0	N.D.	
9) Chloroethane	0.00	64	0	N.D.	
10) Ethanol	6.38	45	1214	N.D.	
11) Acetonitrile	6.69	41	362	N.D.	
12) Acrolein	0.00	56	0	N.D.	
13) Acetone	7.08	58	2648	N.D.	
14) Trichlorofluoromethane	0.00	101	0	N.D.	
15) 2-Propanol (Isopropanol)	7.57	45	156	N.D.	
16) Acrylonitrile	0.00	53	0	N.D.	
17) 1,1-Dichloroethene	0.00	96	0	N.D.	
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.	
19) Methylene Chloride	8.45	84	441	N.D.	
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.	
21) Trichlorotrifluoroethane	0.00	151	0	N.D.	
22) Carbon Disulfide	8.74	76	2038	N.D.	
23) trans-1,2-Dichloroethene	0.00	61	0	N.D.	
24) 1,1-Dichloroethane	0.00	63	0	N.D.	
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.	
26) Vinyl Acetate	0.00	86	0	N.D.	
27) 2-Butanone (MEK)	10.51	72	255	N.D.	
28) cis-1,2-Dichloroethene	0.00	61	0	N.D.	
29) Diisopropyl Ether	0.00	87	0	N.D.	
30) Ethyl Acetate	0.00	61	0	N.D.	
31) n-Hexane	0.00	57	0	N.D.	
32) Chloroform	0.00	83	0	N.D.	
34) Tetrahydrofuran (THF)	11.78	72	312	N.D.	
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.	
36) 1,2-Dichloroethane	0.00	62	0	N.D.	
38) 1,1,1-Trichloroethane	0.00	97	0	N.D.	
39) Isopropyl Acetate	0.00	61	0	N.D.	
40) 1-Butanol	12.89	56	778	N.D.	
41) Benzene	12.89	78	808	N.D.	
42) Carbon Tetrachloride	0.00	117	0	N.D.	
43) Cyclohexane	13.29	84	441	N.D.	
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.	
45) 1,2-Dichloropropane	0.00	63	0	N.D.	
46) Bromodichloromethane	0.00	83	0	N.D.	
47) Trichloroethene	0.00	130	0	N.D.	
48) 1,4-Dioxane	0.00	88	0	N.D.	
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	
50) Methyl Methacrylate	0.00	100	0	N.D.	

Data File : I:\MS13\DATA\2017 02\23\02231703.D
 Acq On : 23 Feb 2017 6:20
 Sample : MB R13022317 1000ml
 Misc : S29-02221710/ AC00141

Vial: 3
 Operator: LH/AMF
 Inst : MS13

Quant Time: Feb 23 08:32:55 2017

Quant Method : I:\MS13\METHODS\R13022017.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Feb 21 11:57:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

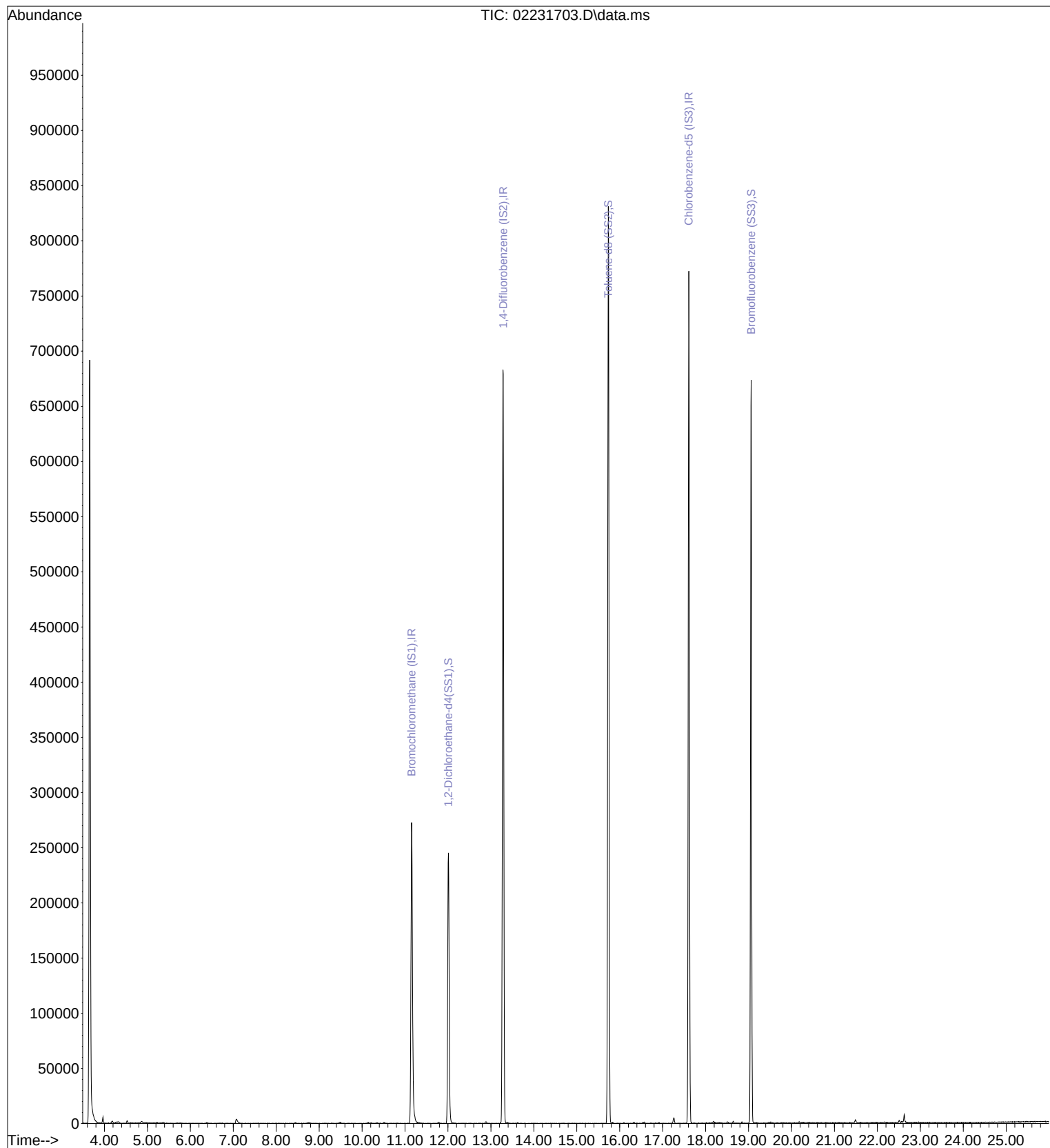
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	0.00	71	0	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	15.84	91	766	N.D.		
59) 2-Hexanone	16.10	43	528	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.71	43	287	N.D.		
63) n-Octane	0.00	57	0	N.D.		
64) Tetrachloroethene	0.00	166	0	N.D.		
65) Chlorobenzene	17.65	112	137	N.D.		
66) Ethylbenzene	18.02	91	725	N.D.		
67) m- & p-Xylenes	18.19	91	1147	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.53	104	394	N.D.		
70) o-Xylene	18.64	91	473	N.D.		
71) n-Nonane	18.84	43	577	N.D.		
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.		
74) Cumene	19.20	105	160	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	19.68	91	344	N.D.		
77) 3-Ethyltoluene	19.77	105	464	N.D.		
78) 4-Ethyltoluene	19.81	105	423	N.D.		
79) 1,3,5-Trimethylbenzene	19.88	105	119	N.D.		
80) alpha-Methylstyrene	0.00	118	0	N.D.		
81) 2-Ethyltoluene	20.07	105	282	N.D.		
82) 1,2,4-Trimethylbenzene	20.28	105	526	N.D.		
83) n-Decane	20.39	57	287	N.D.		
84) Benzyl Chloride	20.41	91	354	N.D.		
85) 1,3-Dichlorobenzene	20.42	146	338	N.D.		
86) 1,4-Dichlorobenzene	20.48	146	519	N.D.		
87) sec-Butylbenzene	20.69	105	243	N.D.		
88) 4-Isopropyltoluene (p-...	20.69	119	245	N.D.		
89) 1,2,3-Trimethylbenzene	20.69	105	243	N.D.		
90) 1,2-Dichlorobenzene	20.83	146	278	N.D.		
91) d-Limonene	0.00	68	0	N.D.		
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	21.49	57	1046	N.D.		
94) 1,2,4-Trichlorobenzene	22.51	180	1135	N.D.		
95) Naphthalene	22.62	128	5208	N.D.		
96) n-Dodecane	22.62	57	1342	N.D.		
97) Hexachlorobutadiene	22.96	225	293	N.D.		
98) Cyclohexanone	18.33	55	259	N.D.		
99) tert-Butylbenzene	0.00	119	0	N.D.		
100) n-Butylbenzene	21.10	91	221	N.D.		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2017 02\23\02231703.D
Acq On : 23 Feb 2017 6:20
Sample : MB R13022317 1000ml
Misc : S29-02221710/ AC00141

Vial: 3
Operator: LH/AMF
Inst : MS13

Quant Time: Feb 23 08:32:55 2017
Quant Method : I:\MS13\METHODS\R13022017.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Feb 21 11:57:41 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



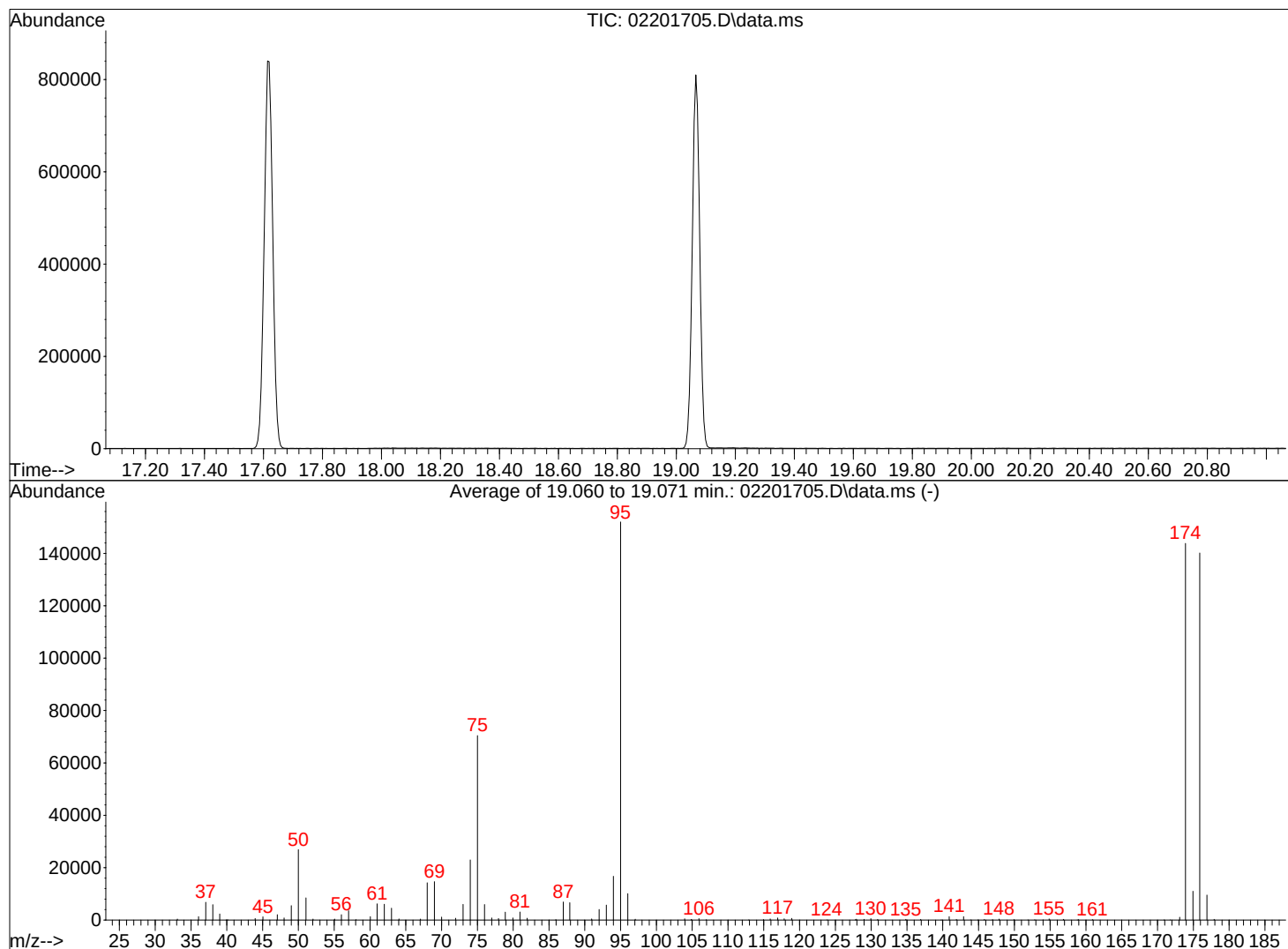
Data Path : I:\MS13\DATA\2017 02\20\
 Data File : 02201705.D
 Acq On : 20 Feb 2017 11:45
 Operator : LH/AMF
 Sample : 12.5ng BFB
 Misc : S29-01311701
 ALS Vial : 3 Sample Multiplier: 1

Integration File: LSCINT.P

2/28/17

2/21/17

Method : I:\MS13\METHODS\R13022017.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Tue Feb 21 10:20:40 2017



AutoFind: Scans 2832, 2833, 2834; Background Corrected with Scan 2824

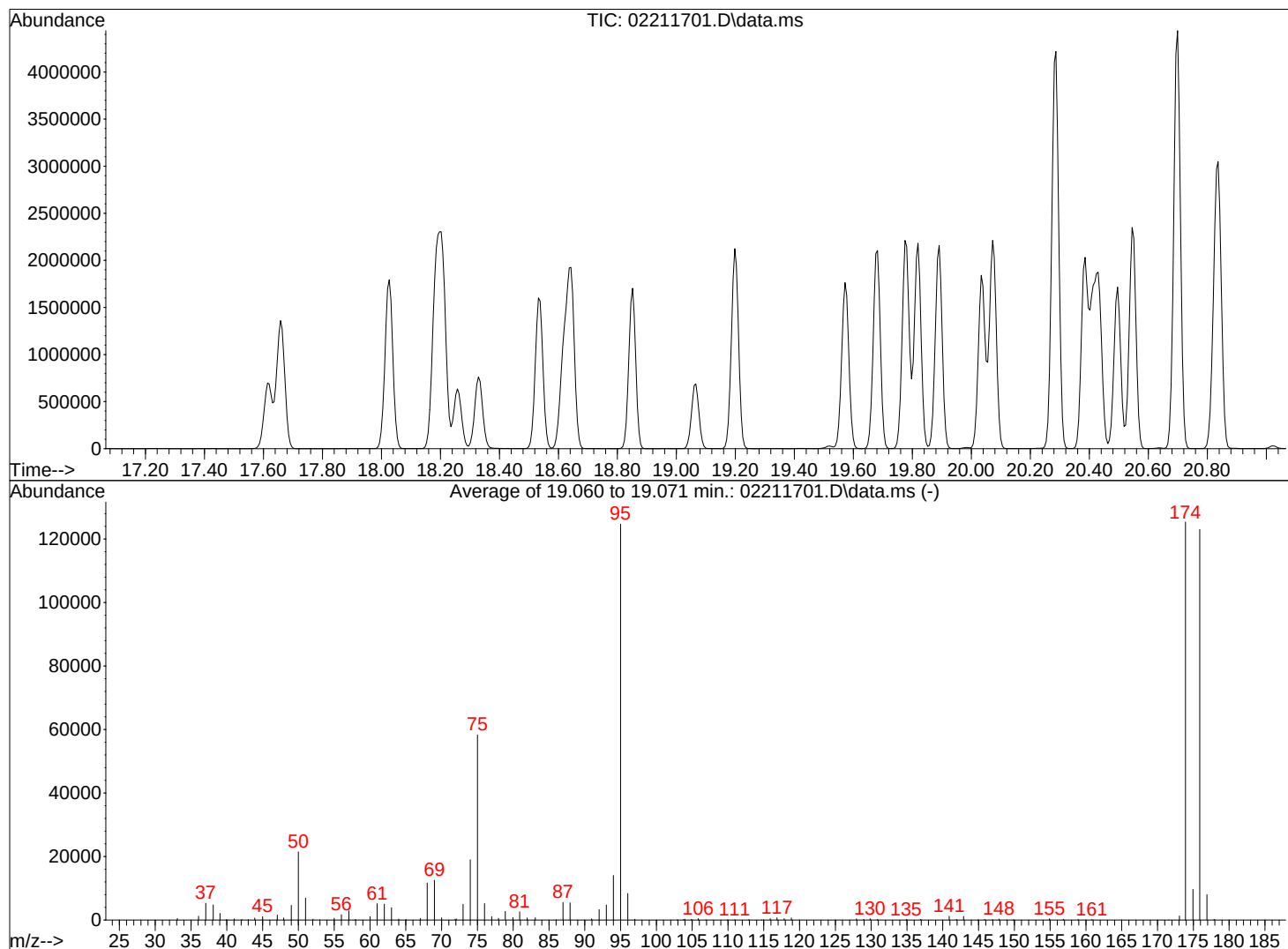
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	17.7	26893	PASS
75	95	30	66	46.3	70448	PASS
95	95	100	100	100.0	152021	PASS
96	95	5	9	6.6	10089	PASS
173	174	0.00	2	0.8	1089	PASS
174	95	50	120	94.6	143848	PASS
175	174	4	9	7.6	10972	PASS
176	174	93	101	97.4	140171	PASS
177	176	5	9	6.8	9526	PASS

Data Path : I:\MS13\DATA\2017 02\21\
Data File : 02211701.D
Acq On : 21 Feb 2017 5:12
Operator : LH/AMF
Sample : CCV R13022117_25ng
Misc : S29-01311701
ALS Vial : 3 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS13\METHODS\R13022017.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Tue Feb 21 11:57:41 2017

AM 2/21/17



AutoFind: Scans 2832, 2833, 2834; Background Corrected with Scan 2823

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	17.2	21456	PASS
75	95	30	66	46.8	58323	PASS
95	95	100	100	100.0	124739	PASS
96	95	5	9	6.7	8361	PASS
173	174	0.00	2	1.0	1279	PASS
174	95	50	120	100.5	125392	PASS
175	174	4	9	7.7	9650	PASS
176	174	93	101	98.1	123059	PASS
177	176	5	9	6.5	7989	PASS

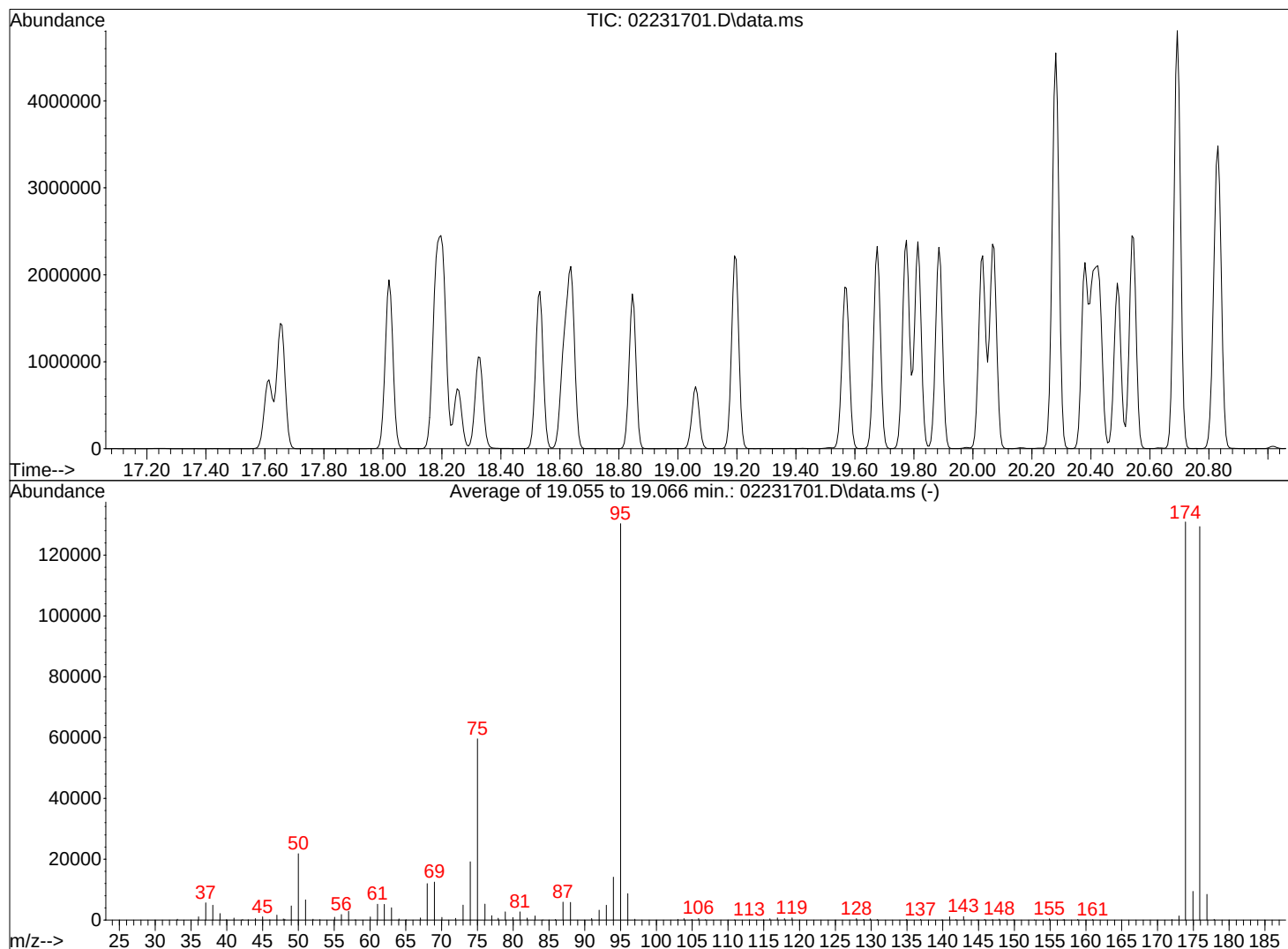
Data Path : I:\MS13\DATA\2017 02\23\
 Data File : 02231701.D
 Acq On : 23 Feb 2017 5:10
 Operator : LH/AMF
 Sample : CCV R13022317 25ng
 Misc : S29-02221710/S29-02171703 (3/18)
 ALS Vial : 3 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS13\METHODS\R13022017.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Tue Feb 21 11:57:41 2017

AM 2/23/17

DA 2/24/17



AutoFind: Scans 2831, 2832, 2833; Background Corrected with Scan 2823

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	16.7	21792	PASS
75	95	30	66	45.7	59592	PASS
95	95	100	100	100.0	130328	PASS
96	95	5	9	6.7	8688	PASS
173	174	0.00	2	1.0	1347	PASS
174	95	50	120	100.4	130896	PASS
175	174	4	9	7.2	9447	PASS
176	174	93	101	98.8	129365	PASS
177	176	5	9	6.5	8426	PASS

Injection Log

Directory: I:\MS13\DATA\2017_02\20\

[illegible]

Injection Log

Directory: I:\MS13\DATA\2017_02\21\

[illegible]

Injection Log

Directory: I:\MS13\DATA\2017_02\23\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	2/23/17 5:10	02231701.D	CCV R13022317_25ng	S29-02221710/S29-02171703 (3/18)	LH/AMF	3	Pass
2	2/23/17 5:45	02231702.D	lab air_1000ml	S29-02221710	LH/AMF	1	
3	2/23/17 6:20	02231703.D	MB R13022317_1000ml	S29-02221710/ AC00141	LH/AMF	3	Pass
4	2/23/17 6:55	02231704.D	system	S29-02221710	LH/AMF	16	
5	2/23/17 7:29	02231705.D	LCS R13022317_25ng	S29-02221710/S29-02091701 (3/10)	LH/AMF	4	Pass
6	2/23/17 8:04	02231706.D	LCSD R13022317_25ng	S29-02221710/S29-02091701 (3/10)	LH/AMF	4	Pass
7	2/23/17 9:04	02231707.D	P1700789-002 (5ml)	S29-02221710	LH/AMF	4	
8	2/23/17 9:39	02231708.D	P1700788-003 (0.1ml)	S29-02221710	LH/AMF	4	
9	2/23/17 10:13	02231709.D	P1700788-006 (0.1ml)	S29-02221710	LH/AMF	4	
10	2/23/17 11:06	02231710.D	P1700782-001 (1ml)	S29-02221710	LH/AMF	4	
11	2/23/17 11:48	02231711.D	P1700782-001 (14ml)	S29-02221710	LH/AMF	4	
12	2/23/17 12:23	02231712.D	P1700872-003 (100ml)	S29-02221710	LH/AMF	14	
13	2/23/17 12:58	02231713.D	P1700872-004 (100ml)	S29-02221710	LH/AMF	15	
14	2/23/17 13:33	02231714.D	P1700872-001 (100ml)	S29-02221710	LH/AMF	14	
15	2/23/17 14:08	02231715.D	P1700872-002 (100ml)	S29-02221710	LH/AMF	15	
16	2/23/17 14:43	02231716.D	P1700867-007 (1ml)	S29-02221710	LH/AMF	4	
17	2/23/17 15:18	02231717.D	P1700867-006 (5ml)	S29-02221710	LH/AMF	4	
18	2/23/17 16:22	02231718.D	P1700867-007 (540ml)	S29-02221710	LH/AMF	8	
19	2/23/17 16:57	02231719.D	P1700867-008 (31ml)	S29-02221710	LH/AMF	9	
20	2/23/17 17:33	02231720.D	P1700867-009 (515ml)	S29-02221710	LH/AMF	10	
21	2/23/17 18:08	02231721.D	P1700867-010 (21ml)	S29-02221710	LH/AMF	11	
22	2/23/17 18:43	02231722.D	P1700778-001 (1000ml)	S29-02221710	LH/AMF	1	
23	2/23/17 19:18	02231723.D	P1700778-002 (1000ml)	S29-02221710	LH/AMF	2	
24	2/23/17 19:54	02231724.D	P1700778-003 (1000ml)	S29-02221710	LH/AMF	5	
25	2/23/17 20:29	02231725.D	P1700778-004 (1000ml)	S29-02221710	LH/AMF	6	
26	2/23/17 21:04	02231726.D	P1700718-001dil(250ml)	S29-02221710	LH/AMF	12	

CL 2/24/17



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LABORATORY REPORT

May 3, 2017

Thomas Holmes
HDR Environmental, Operations & Construction, Inc.
9781 South Meridian Blvd., Suite 400
Englewood, CO 80112

RE: DDMT SVE / 10031560-282846-005

Dear Thomas:

Enclosed are the results of the sample submitted to our laboratory on April 14, 2017. For your reference, this analysis has been assigned our service request number P1701803.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

By Kate Kaneko at 11:34 am, 05/03/17

Kate Kaneko
Project Manager



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www.alsglobal.com

Client: HDR Environmental, Operations & Construction, Inc.
Project: DDMT SVE / 10031560-282846-005

Service Request No: P1701803

CASE NARRATIVE

The sample was received intact under chain of custody on April 14, 2017 and was stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the sample at the time of sample receipt.

Volatile Organic Compound Analysis

The sample was analyzed for volatile organic compounds in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. This procedure is described in laboratory SOP VOA-TO15. The analytical system was comprised of a gas chromatograph / mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the NELAP or DoD-ELAP accreditation.

The container was cleaned, prior to sampling, down to the method reporting limit (MRL) reported for this project. Please note, projects which require reporting below the MRL could have results between the MRL and method detection limit (MDL) that are biased high.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.



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ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2016036
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1177034
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-004
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413-16-7
Utah DOH (NELAP)	http://health.utah.gov/lab/environmental-lab-certification/	CA01627201 6-6
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: HDR Environmental, Operations & Construction, Inc.
Project ID: DDMT SVE / 10031560-282846-005

Service Request: P1701803

Date Received: 4/14/2017
Time Received: 09:30

TO-15 - VOC Cans

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)
ODSVE-EFF-Y6Q4	P1701803-001	Air	4/11/2017	10:00	SSC00299	-0.33	3.59

X



Air - Chain of Custody Record & Analytical Service Request

Page 1 of 1

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10-Day-Standard

ALS Project No
PT01803

Company Name & Address (Reporting Information) HDR 9781 S. Meridian Blvd Ste 400 Englewood, CO 80112				Project Name DDMT SVE				ALS Contact:		Analysis Method TO-15	Comments e.g. Actual Preservative or specific instructions
								Project Number 10031560-292846-005			
Project Manager Tom Holmes				P.O. # / Billing Information							
Phone 404-295-3279				Fax							
Email Address for Result Reporting Thomas.Holmes@hdrinc.com				Sampler (Print & Sign) Justin Bills							
Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Canister ID (Bar code # - AC, SC, etc.)	Flow Controller ID (Bar code # - FC #)	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	Sample Volume			
ODSVE-EFF-Y604	(1)	4/11/17	1000	SC00299	NA	-30	0	6L	X		
Report Tier Levels - please select										Project Requirements (MRLs, QAPP)	
Tier I - Results (Default in not specified)		Tier III (Results + QC & Calibration Summaries)		Tier II (Results + QC Summaries)		Tier IV (Date Validation Package) 10% Surcharge		EDD required YES / No Type: _____ Units: _____			
Relinquished by: (Signature) ASBS		Date: 4/11/17	Time: 1400	Received by: (Signature) [Signature]		Date: 4/11/17	Time: 0930	Chain of Custody Seal: (Circle) INTACT ☒ BROKEN ☐ ABSENT ☐			
Relinquished by: (Signature)		Date:	Time:	Received by: (Signature)		Date:	Time:	Cooler / Blank Temperature _____ °C			

Sample Acceptance Check Form

Client: HDR Environmental, Operations & Construction, Inc.

Work order: P1701803

Project: DDMT SVE / 10031560-282846-005

Sample(s) received on: 4/14/17

Date opened: 4/14/17

by: ADAVID

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were sample containers properly marked with client sample ID?	☒	☐	☐
2	Did sample containers arrive in good condition?	☒	☐	☐
3	Were chain-of-custody papers used and filled out?	☒	☐	☐
4	Did sample container labels and/or tags agree with custody papers?	☒	☐	☐
5	Was sample volume received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper temperature (thermal preservation) of cooler at receipt adhered to?	☐	☐	☒
8	Were custody seals on outside of cooler/Box/Container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
9	Do containers have appropriate preservation , according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are pH preserved?	☐	☐	☒
	Were VOA vials checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?	☐	☐	☒
10	Tubes: Are the tubes capped and intact?	☐	☐	☒
11	Badges: Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

[illegible]

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO₂, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: ODSVE-EFF-Y6Q4

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1701803

ALS Sample ID: P1701803-001

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Silonite Canister

Test Notes:

Container ID: SSC00299

Date Collected: 4/11/17

Date Received: 4/14/17

Date Analyzed: 4/22/17 & 4/25/17

Volume(s) Analyzed: 1.00 Liter(s)

0.50 Liter(s)

Initial Pressure (psig): -0.33 Final Pressure (psig): 3.59

Canister Dilution Factor: 1.27

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	0.22	0.64	0.18	0.13	0.37	0.10	J
75-71-8	Dichlorodifluoromethane (CFC 12)	12	0.64	0.22	2.3	0.13	0.044	
74-87-3	Chloromethane	ND	0.64	0.19	ND	0.31	0.092	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.64	0.24	ND	0.091	0.035	
75-01-4	Vinyl Chloride	0.27	0.64	0.22	0.11	0.25	0.084	J
106-99-0	1,3-Butadiene	ND	0.64	0.28	ND	0.29	0.13	
74-83-9	Bromomethane	ND	0.64	0.24	ND	0.16	0.062	
75-00-3	Chloroethane	ND	0.64	0.22	ND	0.24	0.082	
64-17-5	Ethanol	1.6	6.4	1.0	0.84	3.4	0.54	J
75-05-8	Acetonitrile	ND	0.64	0.23	ND	0.38	0.14	
107-02-8	Acrolein	ND	2.5	0.22	ND	1.1	0.094	
67-64-1	Acetone	1.3	6.4	0.98	0.57	2.7	0.41	J
75-69-4	Trichlorofluoromethane (CFC 11)	1.9	0.64	0.22	0.34	0.11	0.038	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	6.4	0.53	ND	2.6	0.22	
107-13-1	Acrylonitrile	ND	0.64	0.22	ND	0.29	0.10	
75-35-4	1,1-Dichloroethene	4.8	0.64	0.22	1.2	0.16	0.054	
75-09-2	Methylene Chloride	ND	0.64	0.22	ND	0.18	0.062	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.64	0.20	ND	0.20	0.065	
76-13-1	Trichlorotrifluoroethane (CFC 113)	31	0.64	0.22	4.1	0.083	0.028	
75-15-0	Carbon Disulfide	0.38	6.4	0.19	0.12	2.0	0.061	J
156-60-5	trans-1,2-Dichloroethene	1.5	0.64	0.24	0.37	0.16	0.061	
75-34-3	1,1-Dichloroethane	2.4	0.64	0.20	0.59	0.16	0.050	
1634-04-4	Methyl tert-Butyl Ether	ND	0.64	0.22	ND	0.18	0.060	
108-05-4	Vinyl Acetate	ND	6.4	0.83	ND	1.8	0.23	
78-93-3	2-Butanone (MEK)	0.43	6.4	0.27	0.15	2.2	0.090	J

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 2 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: ODSVE-EFF-Y6Q4

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1701803

ALS Sample ID: P1701803-001

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Silonite Canister

Test Notes:

Container ID: SSC00299

Date Collected: 4/11/17

Date Received: 4/14/17

Date Analyzed: 4/22/17 & 4/25/17

Volume(s) Analyzed: 1.00 Liter(s)

0.50 Liter(s)

Initial Pressure (psig): -0.33 Final Pressure (psig): 3.59

Canister Dilution Factor: 1.27

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	100	0.64	0.20	26	0.16	0.051	
141-78-6	Ethyl Acetate	ND	1.3	0.44	ND	0.35	0.12	
110-54-3	n-Hexane	2.0	0.64	0.19	0.56	0.18	0.054	
67-66-3	Chloroform	26	0.64	0.22	5.4	0.13	0.044	
109-99-9	Tetrahydrofuran (THF)	ND	0.64	0.25	ND	0.22	0.086	
107-06-2	1,2-Dichloroethane	ND	0.64	0.20	ND	0.16	0.050	
71-55-6	1,1,1-Trichloroethane	2.8	0.64	0.22	0.51	0.12	0.040	
71-43-2	Benzene	0.30	0.64	0.20	0.093	0.20	0.064	J
56-23-5	Carbon Tetrachloride	2.9	0.64	0.19	0.46	0.10	0.030	
110-82-7	Cyclohexane	1.4	1.3	0.37	0.40	0.37	0.11	
78-87-5	1,2-Dichloropropane	ND	0.64	0.20	ND	0.14	0.044	
75-27-4	Bromodichloromethane	1.4	0.64	0.19	0.20	0.095	0.028	
79-01-6	Trichloroethene	170	1.3	0.36	31	0.24	0.066	D
123-91-1	1,4-Dioxane	ND	0.64	0.20	ND	0.18	0.056	
80-62-6	Methyl Methacrylate	ND	1.3	0.39	ND	0.31	0.096	
142-82-5	n-Heptane	0.87	0.64	0.22	0.21	0.16	0.053	
10061-01-5	cis-1,3-Dichloropropene	ND	0.64	0.18	ND	0.14	0.039	
108-10-1	4-Methyl-2-pentanone	ND	0.64	0.20	ND	0.16	0.050	
10061-02-6	trans-1,3-Dichloropropene	ND	0.64	0.20	ND	0.14	0.045	
79-00-5	1,1,2-Trichloroethane	ND	0.64	0.20	ND	0.12	0.037	
108-88-3	Toluene	ND	0.64	0.22	ND	0.17	0.057	
591-78-6	2-Hexanone	ND	0.64	0.20	ND	0.16	0.050	
124-48-1	Dibromochloromethane	ND	0.64	0.20	ND	0.075	0.024	
106-93-4	1,2-Dibromoethane	ND	0.64	0.20	ND	0.083	0.026	
123-86-4	n-Butyl Acetate	ND	0.64	0.20	ND	0.13	0.043	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

D = The reported result is from a dilution.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: ODSVE-EFF-Y6Q4

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1701803

ALS Sample ID: P1701803-001

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Silonite Canister

Test Notes:

Container ID: SSC00299

Date Collected: 4/11/17

Date Received: 4/14/17

Date Analyzed: 4/22/17 & 4/25/17

Volume(s) Analyzed: 1.00 Liter(s)

0.50 Liter(s)

Initial Pressure (psig): -0.33 Final Pressure (psig): 3.59

Canister Dilution Factor: 1.27

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.64	0.23	ND	0.14	0.049	
127-18-4	Tetrachloroethene	22	0.64	0.18	3.3	0.094	0.026	
108-90-7	Chlorobenzene	ND	0.64	0.20	ND	0.14	0.044	
100-41-4	Ethylbenzene	ND	0.64	0.20	ND	0.15	0.047	
179601-23-1	m,p-Xylenes	ND	1.3	0.38	ND	0.29	0.088	
75-25-2	Bromoform	ND	0.64	0.19	ND	0.061	0.018	
100-42-5	Styrene	ND	0.64	0.19	ND	0.15	0.045	
95-47-6	o-Xylene	ND	0.64	0.19	ND	0.15	0.044	
111-84-2	n-Nonane	ND	0.64	0.19	ND	0.12	0.036	
79-34-5	1,1,2,2-Tetrachloroethane	3.6	0.64	0.19	0.53	0.093	0.028	
98-82-8	Cumene	ND	0.64	0.19	ND	0.13	0.039	
80-56-8	alpha-Pinene	ND	0.64	0.18	ND	0.11	0.032	
103-65-1	n-Propylbenzene	ND	0.64	0.20	ND	0.13	0.041	
622-96-8	4-Ethyltoluene	ND	0.64	0.20	ND	0.13	0.041	
108-67-8	1,3,5-Trimethylbenzene	ND	0.64	0.20	ND	0.13	0.041	
95-63-6	1,2,4-Trimethylbenzene	ND	0.64	0.19	ND	0.13	0.039	
100-44-7	Benzyl Chloride	ND	0.64	0.14	ND	0.12	0.027	
541-73-1	1,3-Dichlorobenzene	ND	0.64	0.19	ND	0.11	0.032	
106-46-7	1,4-Dichlorobenzene	ND	0.64	0.18	ND	0.11	0.030	
95-50-1	1,2-Dichlorobenzene	ND	0.64	0.19	ND	0.11	0.032	
5989-27-5	d-Limonene	ND	0.64	0.18	ND	0.11	0.032	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.64	0.13	ND	0.066	0.013	
120-82-1	1,2,4-Trichlorobenzene	ND	0.64	0.20	ND	0.086	0.027	
91-20-3	Naphthalene	ND	0.64	0.23	ND	0.12	0.044	
87-68-3	Hexachlorobutadiene	ND	0.64	0.18	ND	0.060	0.017	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client: HDR Environmental, Operations & Construction, Inc.
Client Sample ID: Method Blank
Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1701803
 ALS Sample ID: P170422-MB

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Lusine Hakobyan
Sample Type: 6.0 L Silonite Canister
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 4/22/17
Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	ND	0.50	0.14	ND	0.29	0.081	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.50	0.17	ND	0.10	0.034	
74-87-3	Chloromethane	ND	0.50	0.15	ND	0.24	0.073	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.50	0.19	ND	0.072	0.027	
75-01-4	Vinyl Chloride	ND	0.50	0.17	ND	0.20	0.067	
106-99-0	1,3-Butadiene	ND	0.50	0.22	ND	0.23	0.099	
74-83-9	Bromomethane	ND	0.50	0.19	ND	0.13	0.049	
75-00-3	Chloroethane	ND	0.50	0.17	ND	0.19	0.064	
64-17-5	Ethanol	ND	5.0	0.80	ND	2.7	0.42	
75-05-8	Acetonitrile	ND	0.50	0.18	ND	0.30	0.11	
107-02-8	Acrolein	ND	2.0	0.17	ND	0.87	0.074	
67-64-1	Acetone	ND	5.0	0.77	ND	2.1	0.32	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	0.50	0.17	ND	0.089	0.030	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	5.0	0.42	ND	2.0	0.17	
107-13-1	Acrylonitrile	ND	0.50	0.17	ND	0.23	0.078	
75-35-4	1,1-Dichloroethene	ND	0.50	0.17	ND	0.13	0.043	
75-09-2	Methylene Chloride	ND	0.50	0.17	ND	0.14	0.049	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.50	0.16	ND	0.16	0.051	
76-13-1	Trichlorotrifluoroethane (CFC 113)	ND	0.50	0.17	ND	0.065	0.022	
75-15-0	Carbon Disulfide	ND	5.0	0.15	ND	1.6	0.048	
156-60-5	trans-1,2-Dichloroethene	ND	0.50	0.19	ND	0.13	0.048	
75-34-3	1,1-Dichloroethane	ND	0.50	0.16	ND	0.12	0.040	
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	0.17	ND	0.14	0.047	
108-05-4	Vinyl Acetate	ND	5.0	0.65	ND	1.4	0.18	
78-93-3	2-Butanone (MEK)	ND	5.0	0.21	ND	1.7	0.071	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Method Blank

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1701803

ALS Sample ID: P170422-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Silonite Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 4/22/17

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.50	0.16	ND	0.13	0.040	
141-78-6	Ethyl Acetate	ND	1.0	0.35	ND	0.28	0.097	
110-54-3	n-Hexane	ND	0.50	0.15	ND	0.14	0.043	
67-66-3	Chloroform	ND	0.50	0.17	ND	0.10	0.035	
109-99-9	Tetrahydrofuran (THF)	ND	0.50	0.20	ND	0.17	0.068	
107-06-2	1,2-Dichloroethane	ND	0.50	0.16	ND	0.12	0.040	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.17	ND	0.092	0.031	
71-43-2	Benzene	ND	0.50	0.16	ND	0.16	0.050	
56-23-5	Carbon Tetrachloride	ND	0.50	0.15	ND	0.080	0.024	
110-82-7	Cyclohexane	ND	1.0	0.29	ND	0.29	0.084	
78-87-5	1,2-Dichloropropane	ND	0.50	0.16	ND	0.11	0.035	
75-27-4	Bromodichloromethane	ND	0.50	0.15	ND	0.075	0.022	
79-01-6	Trichloroethene	ND	0.50	0.14	ND	0.093	0.026	
123-91-1	1,4-Dioxane	ND	0.50	0.16	ND	0.14	0.044	
80-62-6	Methyl Methacrylate	ND	1.0	0.31	ND	0.24	0.076	
142-82-5	n-Heptane	ND	0.50	0.17	ND	0.12	0.041	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.14	ND	0.11	0.031	
108-10-1	4-Methyl-2-pentanone	ND	0.50	0.16	ND	0.12	0.039	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.16	ND	0.11	0.035	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.16	ND	0.092	0.029	
108-88-3	Toluene	ND	0.50	0.17	ND	0.13	0.045	
591-78-6	2-Hexanone	ND	0.50	0.16	ND	0.12	0.039	
124-48-1	Dibromochloromethane	ND	0.50	0.16	ND	0.059	0.019	
106-93-4	1,2-Dibromoethane	ND	0.50	0.16	ND	0.065	0.021	
123-86-4	n-Butyl Acetate	ND	0.50	0.16	ND	0.11	0.034	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client: HDR Environmental, Operations & Construction, Inc.
Client Sample ID: Method Blank
Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1701803
 ALS Sample ID: P170422-MB

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Lusine Hakobyan
Sample Type: 6.0 L Silonite Canister
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 4/22/17
Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.50	0.18	ND	0.11	0.039	
127-18-4	Tetrachloroethene	ND	0.50	0.14	ND	0.074	0.021	
108-90-7	Chlorobenzene	ND	0.50	0.16	ND	0.11	0.035	
100-41-4	Ethylbenzene	ND	0.50	0.16	ND	0.12	0.037	
179601-23-1	m,p-Xylenes	ND	1.0	0.30	ND	0.23	0.069	
75-25-2	Bromoform	ND	0.50	0.15	ND	0.048	0.015	
100-42-5	Styrene	ND	0.50	0.15	ND	0.12	0.035	
95-47-6	o-Xylene	ND	0.50	0.15	ND	0.12	0.035	
111-84-2	n-Nonane	ND	0.50	0.15	ND	0.095	0.029	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.15	ND	0.073	0.022	
98-82-8	Cumene	ND	0.50	0.15	ND	0.10	0.031	
80-56-8	alpha-Pinene	ND	0.50	0.14	ND	0.090	0.025	
103-65-1	n-Propylbenzene	ND	0.50	0.16	ND	0.10	0.033	
622-96-8	4-Ethyltoluene	ND	0.50	0.16	ND	0.10	0.033	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.16	ND	0.10	0.033	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.15	ND	0.10	0.031	
100-44-7	Benzyl Chloride	ND	0.50	0.11	ND	0.097	0.021	
541-73-1	1,3-Dichlorobenzene	ND	0.50	0.15	ND	0.083	0.025	
106-46-7	1,4-Dichlorobenzene	ND	0.50	0.14	ND	0.083	0.023	
95-50-1	1,2-Dichlorobenzene	ND	0.50	0.15	ND	0.083	0.025	
5989-27-5	d-Limonene	ND	0.50	0.14	ND	0.090	0.025	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.50	0.099	ND	0.052	0.010	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.16	ND	0.067	0.022	
91-20-3	Naphthalene	ND	0.50	0.18	ND	0.095	0.034	
87-68-3	Hexachlorobutadiene	ND	0.50	0.14	ND	0.047	0.013	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Method Blank

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1701803

ALS Sample ID: P170424-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Silonite Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 4/24/17

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	ND	0.50	0.14	ND	0.29	0.081	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.50	0.17	ND	0.10	0.034	
74-87-3	Chloromethane	ND	0.50	0.15	ND	0.24	0.073	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.50	0.19	ND	0.072	0.027	
75-01-4	Vinyl Chloride	ND	0.50	0.17	ND	0.20	0.067	
106-99-0	1,3-Butadiene	ND	0.50	0.22	ND	0.23	0.099	
74-83-9	Bromomethane	ND	0.50	0.19	ND	0.13	0.049	
75-00-3	Chloroethane	ND	0.50	0.17	ND	0.19	0.064	
64-17-5	Ethanol	ND	5.0	0.80	ND	2.7	0.42	
75-05-8	Acetonitrile	ND	0.50	0.18	ND	0.30	0.11	
107-02-8	Acrolein	ND	2.0	0.17	ND	0.87	0.074	
67-64-1	Acetone	ND	5.0	0.77	ND	2.1	0.32	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	0.50	0.17	ND	0.089	0.030	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	5.0	0.42	ND	2.0	0.17	
107-13-1	Acrylonitrile	ND	0.50	0.17	ND	0.23	0.078	
75-35-4	1,1-Dichloroethene	ND	0.50	0.17	ND	0.13	0.043	
75-09-2	Methylene Chloride	ND	0.50	0.17	ND	0.14	0.049	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.50	0.16	ND	0.16	0.051	
76-13-1	Trichlorotrifluoroethane (CFC 113)	ND	0.50	0.17	ND	0.065	0.022	
75-15-0	Carbon Disulfide	ND	5.0	0.15	ND	1.6	0.048	
156-60-5	trans-1,2-Dichloroethene	ND	0.50	0.19	ND	0.13	0.048	
75-34-3	1,1-Dichloroethane	ND	0.50	0.16	ND	0.12	0.040	
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	0.17	ND	0.14	0.047	
108-05-4	Vinyl Acetate	ND	5.0	0.65	ND	1.4	0.18	
78-93-3	2-Butanone (MEK)	ND	5.0	0.21	ND	1.7	0.071	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 2 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Method Blank

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1701803

ALS Sample ID: P170424-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Silonite Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 4/24/17

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.50	0.16	ND	0.13	0.040	
141-78-6	Ethyl Acetate	ND	1.0	0.35	ND	0.28	0.097	
110-54-3	n-Hexane	ND	0.50	0.15	ND	0.14	0.043	
67-66-3	Chloroform	ND	0.50	0.17	ND	0.10	0.035	
109-99-9	Tetrahydrofuran (THF)	ND	0.50	0.20	ND	0.17	0.068	
107-06-2	1,2-Dichloroethane	ND	0.50	0.16	ND	0.12	0.040	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.17	ND	0.092	0.031	
71-43-2	Benzene	ND	0.50	0.16	ND	0.16	0.050	
56-23-5	Carbon Tetrachloride	ND	0.50	0.15	ND	0.080	0.024	
110-82-7	Cyclohexane	ND	1.0	0.29	ND	0.29	0.084	
78-87-5	1,2-Dichloropropane	ND	0.50	0.16	ND	0.11	0.035	
75-27-4	Bromodichloromethane	ND	0.50	0.15	ND	0.075	0.022	
79-01-6	Trichloroethene	ND	0.50	0.14	ND	0.093	0.026	
123-91-1	1,4-Dioxane	ND	0.50	0.16	ND	0.14	0.044	
80-62-6	Methyl Methacrylate	ND	1.0	0.31	ND	0.24	0.076	
142-82-5	n-Heptane	ND	0.50	0.17	ND	0.12	0.041	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.14	ND	0.11	0.031	
108-10-1	4-Methyl-2-pentanone	ND	0.50	0.16	ND	0.12	0.039	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.16	ND	0.11	0.035	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.16	ND	0.092	0.029	
108-88-3	Toluene	ND	0.50	0.17	ND	0.13	0.045	
591-78-6	2-Hexanone	ND	0.50	0.16	ND	0.12	0.039	
124-48-1	Dibromochloromethane	ND	0.50	0.16	ND	0.059	0.019	
106-93-4	1,2-Dibromoethane	ND	0.50	0.16	ND	0.065	0.021	
123-86-4	n-Butyl Acetate	ND	0.50	0.16	ND	0.11	0.034	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 3 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Method Blank

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1701803

ALS Sample ID: P170424-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Silonite Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 4/24/17

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.50	0.18	ND	0.11	0.039	
127-18-4	Tetrachloroethene	ND	0.50	0.14	ND	0.074	0.021	
108-90-7	Chlorobenzene	ND	0.50	0.16	ND	0.11	0.035	
100-41-4	Ethylbenzene	ND	0.50	0.16	ND	0.12	0.037	
179601-23-1	m,p-Xylenes	ND	1.0	0.30	ND	0.23	0.069	
75-25-2	Bromoform	ND	0.50	0.15	ND	0.048	0.015	
100-42-5	Styrene	ND	0.50	0.15	ND	0.12	0.035	
95-47-6	o-Xylene	ND	0.50	0.15	ND	0.12	0.035	
111-84-2	n-Nonane	ND	0.50	0.15	ND	0.095	0.029	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.15	ND	0.073	0.022	
98-82-8	Cumene	ND	0.50	0.15	ND	0.10	0.031	
80-56-8	alpha-Pinene	ND	0.50	0.14	ND	0.090	0.025	
103-65-1	n-Propylbenzene	ND	0.50	0.16	ND	0.10	0.033	
622-96-8	4-Ethyltoluene	ND	0.50	0.16	ND	0.10	0.033	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.16	ND	0.10	0.033	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.15	ND	0.10	0.031	
100-44-7	Benzyl Chloride	ND	0.50	0.11	ND	0.097	0.021	
541-73-1	1,3-Dichlorobenzene	ND	0.50	0.15	ND	0.083	0.025	
106-46-7	1,4-Dichlorobenzene	ND	0.50	0.14	ND	0.083	0.023	
95-50-1	1,2-Dichlorobenzene	ND	0.50	0.15	ND	0.083	0.025	
5989-27-5	d-Limonene	ND	0.50	0.14	ND	0.090	0.025	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.50	0.099	ND	0.052	0.010	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.16	ND	0.067	0.022	
91-20-3	Naphthalene	ND	0.50	0.18	ND	0.095	0.034	
87-68-3	Hexachlorobutadiene	ND	0.50	0.14	ND	0.047	0.013	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

SURROGATE SPIKE RECOVERY RESULTS

Page 1 of 1

Client: HDR Environmental, Operations & Construction, Inc.
Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1701803

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Lusine Hakobyan
Sample Type: 6.0 L Silonite Canister(s)
Test Notes:

Date(s) Collected: 4/11/17
Date(s) Received: 4/14/17
Date(s) Analyzed: 4/22 - 4/24/17

Client Sample ID	ALS Sample ID	1,2-Dichloroethane-d4	Toluene-d8	Bromofluorobenzene	Acceptance Limits	Data Qualifier
		Percent Recovered	Percent Recovered	Percent Recovered		
Method Blank	P170422-MB	108	99	103	70-130	
Method Blank	P170424-MB	108	100	103	70-130	
Lab Control Sample	P170422-LCS	107	99	104	70-130	
Lab Control Sample	P170424-LCS	109	98	103	70-130	
ODSVE-EFF-Y6Q4	P1701803-001	110	98	104	70-130	

Surrogate percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly from the on-column percent recovery.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Lab Control Sample

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1701803

ALS Sample ID: P170422-LCS

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Silonite Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 4/22/17

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	ALS Acceptance Limits	Data Qualifier
115-07-1	Propene	122	96.3	79	52-127	
75-71-8	Dichlorodifluoromethane (CFC 12)	42.5	41.0	96	68-109	
74-87-3	Chloromethane	102	88.3	87	51-130	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	30.2	28.2	93	66-114	
75-01-4	Vinyl Chloride	82.2	71.3	87	61-125	
106-99-0	1,3-Butadiene	95.0	92.9	98	62-144	
74-83-9	Bromomethane	54.1	50.7	94	73-123	
75-00-3	Chloroethane	79.5	71.4	90	69-122	
64-17-5	Ethanol	563	496	88	62-124	
75-05-8	Acetonitrile	127	105	83	57-114	
107-02-8	Acrolein	92.6	77.0	83	62-116	
67-64-1	Acetone	448	360	80	57-117	
75-69-4	Trichlorofluoromethane (CFC 11)	37.4	36.1	97	63-98	
67-63-0	2-Propanol (Isopropyl Alcohol)	173	154	89	66-121	
107-13-1	Acrylonitrile	98.0	87.4	89	68-123	
75-35-4	1,1-Dichloroethene	53.6	48.5	90	76-118	
75-09-2	Methylene Chloride	61.2	48.4	79	60-118	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	67.8	64.4	95	65-126	
76-13-1	Trichlorotrifluoroethane (CFC 113)	27.6	25.6	93	73-114	
75-15-0	Carbon Disulfide	68.6	58.9	86	57-102	
156-60-5	trans-1,2-Dichloroethene	53.8	50.1	93	74-123	
75-34-3	1,1-Dichloroethane	52.5	47.0	90	69-111	
1634-04-4	Methyl tert-Butyl Ether	59.0	54.5	92	69-113	
108-05-4	Vinyl Acetate	301	278	92	76-128	
78-93-3	2-Butanone (MEK)	72.0	64.8	90	63-127	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 2 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Lab Control Sample

ALS Project ID: P1701803

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Sample ID: P170422-LCS

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: NA

Analyst: Lusine Hakobyan

Date Analyzed: 4/22/17

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 0.125 Liter(s)

Test Notes:

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	ALS Acceptance Limits	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	53.4	49.7	93	72-117	
141-78-6	Ethyl Acetate	118	101	86	68-127	
110-54-3	n-Hexane	60.4	50.2	83	55-116	
67-66-3	Chloroform	43.4	40.4	93	70-109	
109-99-9	Tetrahydrofuran (THF)	72.1	58.7	81	72-113	
107-06-2	1,2-Dichloroethane	52.4	51.3	98	69-113	
71-55-6	1,1,1-Trichloroethane	38.8	38.4	99	72-115	
71-43-2	Benzene	66.5	56.3	85	65-107	
56-23-5	Carbon Tetrachloride	33.8	35.3	104	71-113	
110-82-7	Cyclohexane	124	110	89	71-115	
78-87-5	1,2-Dichloropropane	45.9	41.4	90	71-115	
75-27-4	Bromodichloromethane	31.9	33.4	105	75-118	
79-01-6	Trichloroethene	39.5	37.5	95	68-114	
123-91-1	1,4-Dioxane	59.1	56.2	95	81-131	
80-62-6	Methyl Methacrylate	104	97.6	94	72-130	
142-82-5	n-Heptane	51.9	43.6	84	68-116	
10061-01-5	cis-1,3-Dichloropropene	46.3	45.1	97	77-126	
108-10-1	4-Methyl-2-pentanone	51.9	47.4	91	69-126	
10061-02-6	trans-1,3-Dichloropropene	47.0	47.9	102	79-125	
79-00-5	1,1,2-Trichloroethane	38.9	37.7	97	75-119	
108-88-3	Toluene	56.2	48.7	87	59-118	
591-78-6	2-Hexanone	51.9	45.7	88	69-129	
124-48-1	Dibromochloromethane	25.0	24.8	99	74-136	
106-93-4	1,2-Dibromoethane	27.5	26.2	95	73-131	
123-86-4	n-Butyl Acetate	45.4	39.7	87	69-130	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 3 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Lab Control Sample

ALS Project ID: P1701803

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Sample ID: P170422-LCS

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: NA

Analyst: Lusine Hakobyan

Date Analyzed: 4/22/17

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 0.125 Liter(s)

Test Notes:

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	ALS Acceptance Limits	Data Qualifier
111-65-9	n-Octane	45.4	37.1	82	66-120	
127-18-4	Tetrachloroethene	31.4	28.6	91	65-130	
108-90-7	Chlorobenzene	46.1	41.2	89	68-120	
100-41-4	Ethylbenzene	48.7	44.3	91	68-122	
179601-23-1	m,p-Xylenes	97.7	89.4	92	68-123	
75-25-2	Bromoform	20.6	20.9	101	69-130	
100-42-5	Styrene	49.8	46.2	93	71-133	
95-47-6	o-Xylene	48.7	45.3	93	68-122	
111-84-2	n-Nonane	40.4	33.6	83	65-120	
79-34-5	1,1,2,2-Tetrachloroethane	30.9	26.9	87	69-130	
98-82-8	Cumene	43.2	40.8	94	70-123	
80-56-8	alpha-Pinene	38.2	34.8	91	70-128	
103-65-1	n-Propylbenzene	43.5	40.9	94	69-125	
622-96-8	4-Ethyltoluene	43.2	41.2	95	67-130	
108-67-8	1,3,5-Trimethylbenzene	43.2	39.9	92	67-124	
95-63-6	1,2,4-Trimethylbenzene	43.2	40.2	93	67-129	
100-44-7	Benzyl Chloride	41.0	42.5	104	79-138	
541-73-1	1,3-Dichlorobenzene	35.2	34.3	97	65-136	
106-46-7	1,4-Dichlorobenzene	35.5	33.9	95	66-141	
95-50-1	1,2-Dichlorobenzene	35.3	33.7	95	67-136	
5989-27-5	d-Limonene	38.1	32.2	85	71-134	
96-12-8	1,2-Dibromo-3-chloropropane	21.9	21.4	98	73-136	
120-82-1	1,2,4-Trichlorobenzene	28.6	28.7	100	64-134	
91-20-3	Naphthalene	40.8	40.7	100	62-136	
87-68-3	Hexachlorobutadiene	19.9	20.0	101	60-133	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Lab Control Sample

ALS Project ID: P1701803

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Sample ID: P170424-LCS

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: NA

Analyst: Lusine Hakobyan

Date Analyzed: 4/24/17

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 0.125 Liter(s)

Test Notes:

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	ALS Acceptance Limits	Data Qualifier
115-07-1	Propene	122	98.9	81	52-127	
75-71-8	Dichlorodifluoromethane (CFC 12)	42.5	42.4	100	68-109	
74-87-3	Chloromethane	102	90.4	89	51-130	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	30.2	28.6	95	66-114	
75-01-4	Vinyl Chloride	82.2	73.4	89	61-125	
106-99-0	1,3-Butadiene	95.0	95.3	100	62-144	
74-83-9	Bromomethane	54.1	51.6	95	73-123	
75-00-3	Chloroethane	79.5	72.3	91	69-122	
64-17-5	Ethanol	563	513	91	62-124	
75-05-8	Acetonitrile	127	108	85	57-114	
107-02-8	Acrolein	92.6	77.0	83	62-116	
67-64-1	Acetone	448	366	82	57-117	
75-69-4	Trichlorofluoromethane (CFC 11)	37.4	36.8	98	63-98	
67-63-0	2-Propanol (Isopropyl Alcohol)	173	157	91	66-121	
107-13-1	Acrylonitrile	98.0	89.0	91	68-123	
75-35-4	1,1-Dichloroethene	53.6	49.1	92	76-118	
75-09-2	Methylene Chloride	61.2	48.8	80	60-118	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	67.8	65.7	97	65-126	
76-13-1	Trichlorotrifluoroethane (CFC 113)	27.6	25.7	93	73-114	
75-15-0	Carbon Disulfide	68.6	59.7	87	57-102	
156-60-5	trans-1,2-Dichloroethene	53.8	51.0	95	74-123	
75-34-3	1,1-Dichloroethane	52.5	47.6	91	69-111	
1634-04-4	Methyl tert-Butyl Ether	59.0	55.3	94	69-113	
108-05-4	Vinyl Acetate	301	285	95	76-128	
78-93-3	2-Butanone (MEK)	72.0	67.2	93	63-127	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 2 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Lab Control Sample

ALS Project ID: P1701803

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Sample ID: P170424-LCS

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: NA

Analyst: Lusine Hakobyan

Date Analyzed: 4/24/17

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 0.125 Liter(s)

Test Notes:

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	ALS Acceptance Limits	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	53.4	50.8	95	72-117	
141-78-6	Ethyl Acetate	118	103	87	68-127	
110-54-3	n-Hexane	60.4	51.2	85	55-116	
67-66-3	Chloroform	43.4	40.8	94	70-109	
109-99-9	Tetrahydrofuran (THF)	72.1	58.6	81	72-113	
107-06-2	1,2-Dichloroethane	52.4	51.8	99	69-113	
71-55-6	1,1,1-Trichloroethane	38.8	37.7	97	72-115	
71-43-2	Benzene	66.5	55.3	83	65-107	
56-23-5	Carbon Tetrachloride	33.8	34.9	103	71-113	
110-82-7	Cyclohexane	124	109	88	71-115	
78-87-5	1,2-Dichloropropane	45.9	41.2	90	71-115	
75-27-4	Bromodichloromethane	31.9	32.5	102	75-118	
79-01-6	Trichloroethene	39.5	36.8	93	68-114	
123-91-1	1,4-Dioxane	59.1	54.9	93	81-131	
80-62-6	Methyl Methacrylate	104	94.4	91	72-130	
142-82-5	n-Heptane	51.9	43.2	83	68-116	
10061-01-5	cis-1,3-Dichloropropene	46.3	44.8	97	77-126	
108-10-1	4-Methyl-2-pentanone	51.9	46.1	89	69-126	
10061-02-6	trans-1,3-Dichloropropene	47.0	47.1	100	79-125	
79-00-5	1,1,2-Trichloroethane	38.9	37.1	95	75-119	
108-88-3	Toluene	56.2	48.1	86	59-118	
591-78-6	2-Hexanone	51.9	45.3	87	69-129	
124-48-1	Dibromochloromethane	25.0	24.7	99	74-136	
106-93-4	1,2-Dibromoethane	27.5	25.6	93	73-131	
123-86-4	n-Butyl Acetate	45.4	39.1	86	69-130	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 3 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Lab Control Sample

Client Project ID: DDMT SVE / 10031560-282846-005

ALS Project ID: P1701803

ALS Sample ID: P170424-LCS

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Silonite Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 4/24/17

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	ALS Acceptance Limits	Data Qualifier
111-65-9	n-Octane	45.4	36.9	81	66-120	
127-18-4	Tetrachloroethene	31.4	28.6	91	65-130	
108-90-7	Chlorobenzene	46.1	40.9	89	68-120	
100-41-4	Ethylbenzene	48.7	43.7	90	68-122	
179601-23-1	m,p-Xylenes	97.7	88.7	91	68-123	
75-25-2	Bromoform	20.6	20.5	100	69-130	
100-42-5	Styrene	49.8	45.6	92	71-133	
95-47-6	o-Xylene	48.7	44.8	92	68-122	
111-84-2	n-Nonane	40.4	33.1	82	65-120	
79-34-5	1,1,2,2-Tetrachloroethane	30.9	26.5	86	69-130	
98-82-8	Cumene	43.2	40.1	93	70-123	
80-56-8	alpha-Pinene	38.2	34.0	89	70-128	
103-65-1	n-Propylbenzene	43.5	39.9	92	69-125	
622-96-8	4-Ethyltoluene	43.2	40.9	95	67-130	
108-67-8	1,3,5-Trimethylbenzene	43.2	39.3	91	67-124	
95-63-6	1,2,4-Trimethylbenzene	43.2	39.5	91	67-129	
100-44-7	Benzyl Chloride	41.0	41.4	101	79-138	
541-73-1	1,3-Dichlorobenzene	35.2	33.4	95	65-136	
106-46-7	1,4-Dichlorobenzene	35.5	33.2	94	66-141	
95-50-1	1,2-Dichlorobenzene	35.3	33.3	94	67-136	
5989-27-5	d-Limonene	38.1	31.8	83	71-134	
96-12-8	1,2-Dibromo-3-chloropropane	21.9	21.1	96	73-136	
120-82-1	1,2,4-Trichlorobenzene	28.6	27.8	97	64-134	
91-20-3	Naphthalene	40.8	39.6	97	62-136	
87-68-3	Hexachlorobutadiene	19.9	19.1	96	60-133	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: HDR Environmental, Operations & Construction, InALS Project ID: P1701803
Client Project ID: DDMT SVE / 10031560-282846-005

Internal Standard Area and RT Summary

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13 Lab File ID: 04221701.D
Analyst: Lusine Hakobyan Date Analyzed: 4/22/17
Sample Type: 6.0 L Silonite Canister(s) Time Analyzed: 04:17
Test Notes:

	IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
	AREA	#	RT	#	AREA	#
24 Hour Standard	76429	11.25	354084	13.33	150169	17.61
Upper Limit	107001	11.58	495718	13.66	210237	17.94
Lower Limit	45857	10.92	212450	13.00	90101	17.28

Client Sample ID						
01	Method Blank	69315	11.23	333481	13.32	139141
02	Lab Control Sample	74199	11.25	342545	13.33	144256
03	ODSVE-EFF-Y6Q4	68591	11.24	325009	13.32	140523
04						
05						
06						
07						
08						
09						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

IS1 (BCM) = Bromochloromethane

IS2 (DFB) = 1,4-Difluorobenzene

IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = 140% of internal standard area

AREA LOWER LIMIT = 60% of internal standard area

RT UPPER LIMIT = 0.33 minutes of internal standard RT

RT LOWER LIMIT = 0.33 minutes of internal standard RT

Column used to flag values outside QC limits with an I.

I = Internal standard not within the specified limits.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: HDR Environmental, Operations & Construction, InALS Project ID: P1701803
Client Project ID: DDMT SVE / 10031560-282846-005

Internal Standard Area and RT Summary

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13 Lab File ID: 04241702.D
Analyst: Lusine Hakobyan Date Analyzed: 4/24/17
Sample Type: 6.0 L Silonite Canister(s) Time Analyzed: 09:20
Test Notes:

	IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
	AREA	#	RT	#	AREA	#
24 Hour Standard	83544	11.25	391129	13.33	163996	17.61
Upper Limit	116962	11.58	547581	13.66	229594	17.94
Lower Limit	50126	10.92	234677	13.00	98398	17.28

Client Sample ID						
01	Method Blank	76138	11.23	366352	13.32	152224 17.61
02	Lab Control Sample	79424	11.25	377533	13.33	158484 17.61
03	ODSVE-EFF-Y6Q4 (Dilution)	63386	11.24	303521	13.32	129503 17.61
04						
05						
06						
07						
08						
09						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

IS1 (BCM) = Bromochloromethane

IS2 (DFB) = 1,4-Difluorobenzene

IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = 140% of internal standard area

AREA LOWER LIMIT = 60% of internal standard area

RT UPPER LIMIT = 0.33 minutes of internal standard RT

RT LOWER LIMIT = 0.33 minutes of internal standard RT

Column used to flag values outside QC limits with an I.

I = Internal standard not within the specified limits.

Data File : I:\MS13\DATA\2017 04\22\04221727.D
 Acq On : 22 Apr 2017 20:21
 Sample : P1701803-001 (1000mL)
 Misc : S29-04101701

Vial: 11
 Operator: AM/LH
 Inst : MS13

Quant Time: Apr 24 11:56:23 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

LH 4/25/17

QLast Update : Sat Apr 15 08:29:41 2017

Response via : Initial Calibration

AM 4/24/17

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.24	130	68591	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.32	114	325009	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.61	82	140523	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.07	65	140299	13.809	ng	-0.03
Spiked Amount	12.500	Range 70 - 130	Recovery	=	110.48%	
57) Toluene-d8 (SS2)	15.74	98	328589	12.195	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.52%	
73) Bromofluorobenzene (SS3)	19.06	174	146103	13.014	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	104.08%	

Target Compounds

						Qvalue
2) Propene	4.45	42	1062	0.170	ng	89
3) Dichlorodifluoromethan...	4.60	85	126189	9.122	ng	99
4) Chloromethane	0.00	50	0	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	5.12	135	502	N.D.		
6) Vinyl Chloride	5.27	62	1761	0.213	ng	98
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.55	45	5215m	1.249	ng	
11) Acetonitrile	6.84	41	430	N.D.		
12) Acrolein	7.05	56	283	N.D.		
13) Acetone	7.25	58	4881m	1.062	ng	
14) Trichlorofluoromethane	7.48	101	20600	1.484	ng	98
15) 2-Propanol (Isopropanol)	7.78	45	341	N.D.		
16) Acrylonitrile	8.05	53	404	N.D.		
17) 1,1-Dichloroethene	8.40	96	22706	3.782	ng	96
18) 2-Methyl-2-Propanol (t...	8.40	59	1033	N.D.		
19) Methylene Chloride	8.60	84	868	0.128	ng	92
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.	d	
21) Trichlorotrifluoroethane	9.02	151	170401	24.571	ng	99
22) Carbon Disulfide	8.87	76	6704	0.299	ng	92
23) trans-1,2-Dichloroethene	9.83	61	10570	1.160	ng	100
24) 1,1-Dichloroethane	10.08	63	21501	1.895	ng	97
25) Methyl tert-Butyl Ether	10.23	73	122	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.	d	
27) 2-Butanone (MEK)	10.58	72	1344	0.340	ng	# 55
28) cis-1,2-Dichloroethene	11.06	61	725400	82.572	ng	99
29) Diisopropyl Ether	0.00	87	0	N.D.	d	
30) Ethyl Acetate	0.00	61	0	N.D.	d	
31) n-Hexane	11.35	57	14217	1.544	ng	93
32) Chloroform	11.40	83	256367	20.681	ng	100
34) Tetrahydrofuran (THF)	0.00	72	0	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.19	62	432	N.D.		
38) 1,1,1-Trichloroethane	12.47	97	26975	2.201	ng	99
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	12.94	78	5826	0.234	ng	100
42) Carbon Tetrachloride	13.10	117	24864	2.257	ng	97
43) Cyclohexane	13.23	84	10109	1.089	ng	94
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	13.96	83	9905	1.077	ng	89
47) Trichloroethene	14.02	130	884175	120.583	ng	98
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d	
50) Methyl Methacrylate	0.00	100	0	N.D.	d	

Data File : I:\MS13\DATA\2017 04\22\04221727.D
 Acq On : 22 Apr 2017 20:21
 Sample : P1701803-001 (1000mL)
 Misc : S29-04101701

Vial: 11
 Operator: AM/LH
 Inst : MS13

Quant Time: Apr 24 11:56:23 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Sat Apr 15 08:29:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

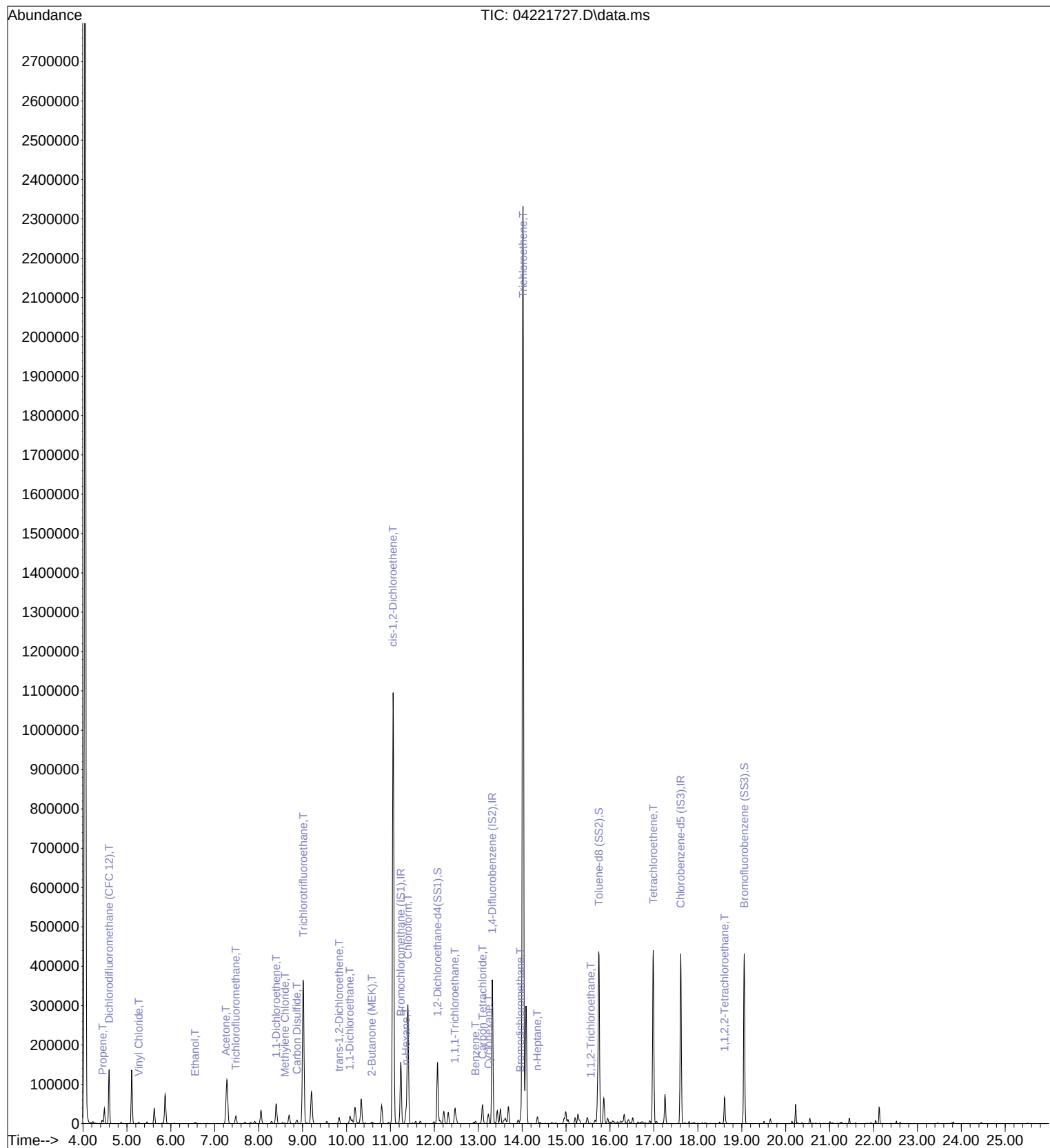
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.34	71	3997	0.682	ng	98
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	15.56	97	548	0.096	ng	# 64
58) Toluene	15.85	91	1227	N.D.		
59) 2-Hexanone	0.00	43	0	N.D.	d	
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.72	43	1008	N.D.		
63) n-Octane	0.00	57	0	N.D.		
64) Tetrachloroethene	16.99	166	158055	17.433	ng	100
65) Chlorobenzene	17.66	112	204	N.D.		
66) Ethylbenzene	18.02	91	311	N.D.		
67) m- & p-Xylenes	18.17	91	965	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	0.00	104	0	N.D.		
70) o-Xylene	18.64	91	341	N.D.		
71) n-Nonane	18.84	43	138	N.D.		
72) 1,1,2,2-Tetrachloroethane	18.61	83	31582	2.840	ng	98
74) Cumene	19.19	105	534	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	0.00	91	0	N.D.		
77) 3-Ethyltoluene	19.77	105	395	N.D.		
78) 4-Ethyltoluene	19.81	105	452	N.D.		
79) 1,3,5-Trimethylbenzene	19.88	105	322	N.D.		
80) alpha-Methylstyrene	20.22	118	519	N.D.		
81) 2-Ethyltoluene	20.06	105	214	N.D.		
82) 1,2,4-Trimethylbenzene	20.27	105	1680	N.D.		
83) n-Decane	20.37	57	869	N.D.		
84) Benzyl Chloride	0.00	91	0	N.D.		
85) 1,3-Dichlorobenzene	20.48	146	125	N.D.		
86) 1,4-Dichlorobenzene	20.48	146	125	N.D.		
87) sec-Butylbenzene	20.68	105	897	N.D.		
88) 4-Isopropyltoluene (p-...	20.68	119	389	N.D.		
89) 1,2,3-Trimethylbenzene	20.68	105	897	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	0.00	68	0	N.D.		
92) 1,2-Dibromo-3-Chloropr...	21.16	157	206	N.D.		
93) n-Undecane	21.60	57	792	N.D.		
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	22.60	128	2686	N.D.		
96) n-Dodecane	22.61	57	444	N.D.		
97) Hexachlorobutadiene	22.96	225	127	N.D.		
98) Cyclohexanone	18.35	55	124	N.D.		
99) tert-Butylbenzene	20.27	119	179	N.D.		
100) n-Butylbenzene	21.08	91	735	N.D.		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2017 04\22\04221727.D
Acq On : 22 Apr 2017 20:21
Sample : P1701803-001 (1000mL)
Misc : S29-04101701

Vial: 11
Operator: AM/LH
Inst : MS13

Quant Time: Apr 24 11:56:23 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Sat Apr 15 08:29:41 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2017 04\22\04221727.D
 Acq On : 22 Apr 2017 20:21
 Sample : P1701803-001 (1000mL)
 Misc : S29-04101701

Vial: 11
 Operator: AM/LH
 Inst : MS13

Quant Time: Apr 24 11:56:23 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Sat Apr 15 08:29:41 2017

Response via : Initial Calibration

AM 4/24/17

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.24	130	68591	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.32	114	325009	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.61	82	140523	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.07	65	140299	13.809	ng	-0.03
Spiked Amount	12.500	Range 70 - 130	Recovery	=	110.48%	
57) Toluene-d8 (SS2)	15.74	98	328589	12.195	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.52%	
73) Bromofluorobenzene (SS3)	19.06	174	146103	13.014	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	104.08%	

Target Compounds

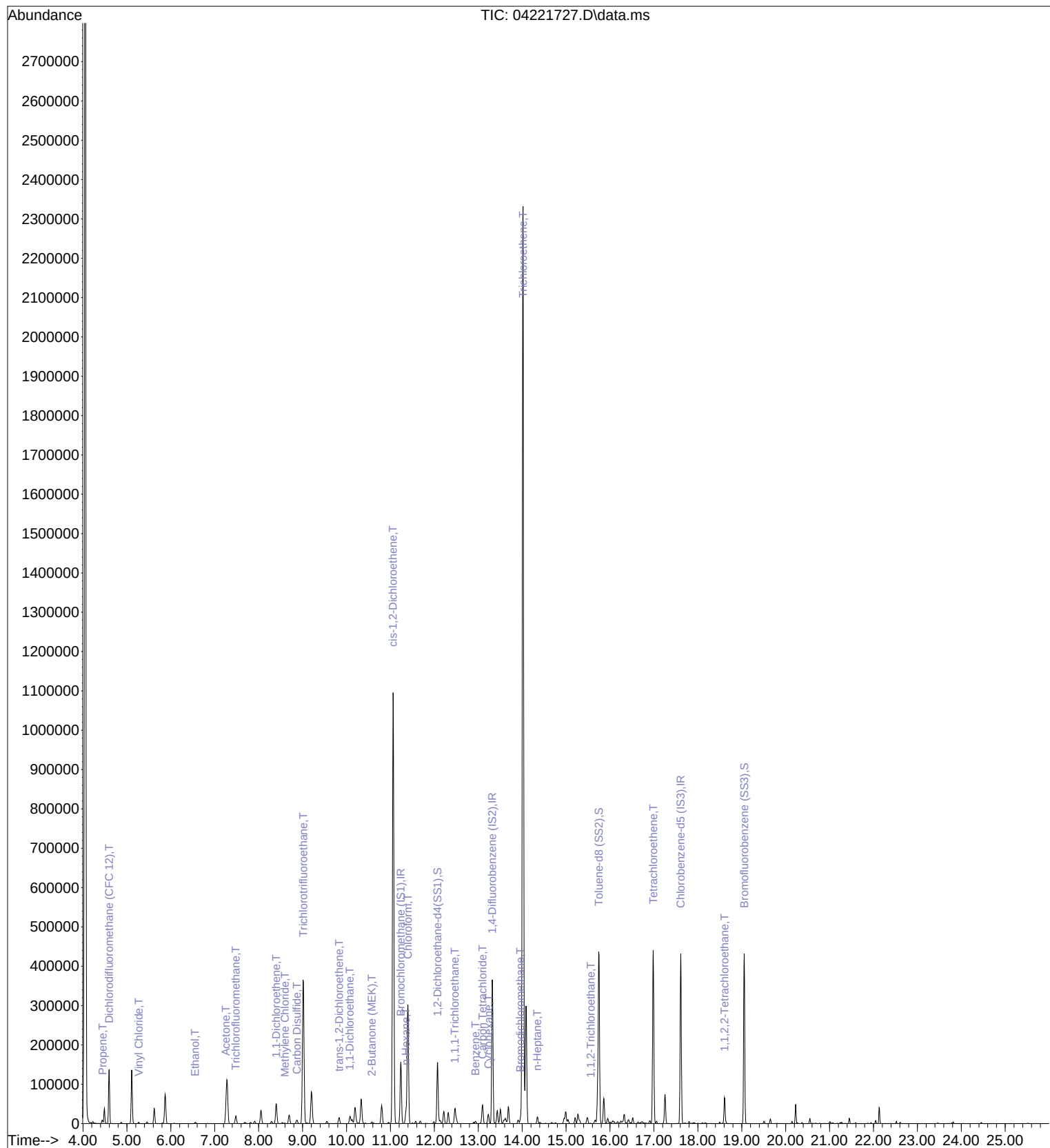
						Qvalue
2) Propene	4.45	42	1062	0.170	ng	89
3) Dichlorodifluoromethan...	4.60	85	126189	9.122	ng	99
6) Vinyl Chloride	5.27	62	1761	0.213	ng	98
10) Ethanol	6.55	45	5215m	1.249	ng	
13) Acetone	7.25	58	4881m	1.062	ng	
14) Trichlorofluoromethane	7.48	101	20600	1.484	ng	98
17) 1,1-Dichloroethene	8.40	96	22706	3.782	ng	96
19) Methylene Chloride	8.60	84	868	0.128	ng	92
21) Trichlorotrifluoroethane	9.02	151	170401	24.571	ng	99
22) Carbon Disulfide	8.87	76	6704	0.299	ng	92
23) trans-1,2-Dichloroethene	9.83	61	10570	1.160	ng	100
24) 1,1-Dichloroethane	10.08	63	21501	1.895	ng	97
27) 2-Butanone (MEK)	10.58	72	1344	0.340	ng	# 55
28) cis-1,2-Dichloroethene	11.06	61	725400	82.572	ng	99
31) n-Hexane	11.35	57	14217	1.544	ng	93
32) Chloroform	11.40	83	256367	20.681	ng	100
38) 1,1,1-Trichloroethane	12.47	97	26975	2.201	ng	99
41) Benzene	12.94	78	5826	0.234	ng	100
42) Carbon Tetrachloride	13.10	117	24864	2.257	ng	97
43) Cyclohexane	13.23	84	10109	1.089	ng	94
46) Bromodichloromethane	13.96	83	9905	1.077	ng	89
47) Trichloroethene	14.02	130	884175	120.583	ng	98
51) n-Heptane	14.34	71	3997	0.682	ng	98
55) 1,1,2-Trichloroethane	15.56	97	548	0.096	ng	# 64
64) Tetrachloroethene	16.99	166	158055	17.433	ng	100
72) 1,1,2,2-Tetrachloroethane	18.61	83	31582	2.840	ng	98

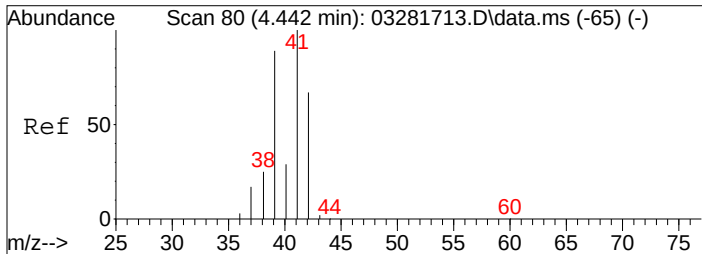
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2017 04\22\04221727.D
Acq On : 22 Apr 2017 20:21
Sample : P1701803-001 (1000mL)
Misc : S29-04101701

Vial: 11
Operator: AM/LH
Inst : MS13

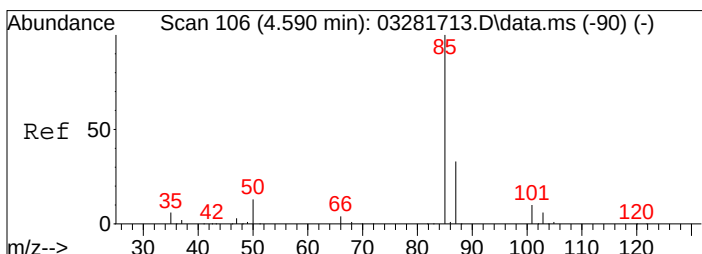
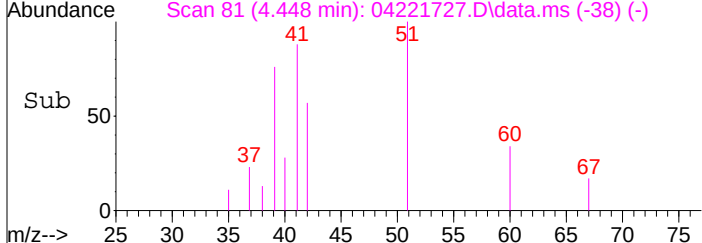
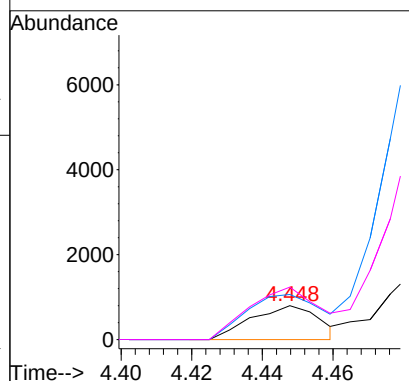
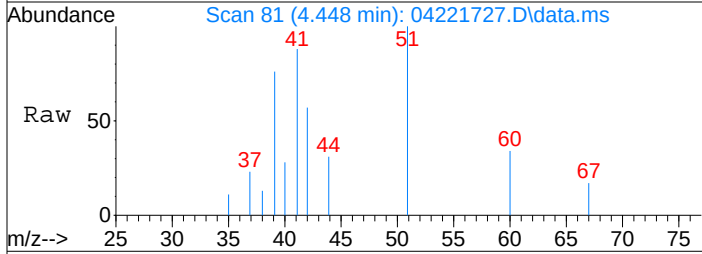
Quant Time: Apr 24 11:56:23 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Sat Apr 15 08:29:41 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M





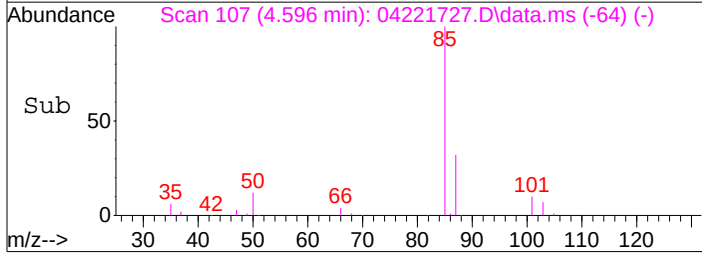
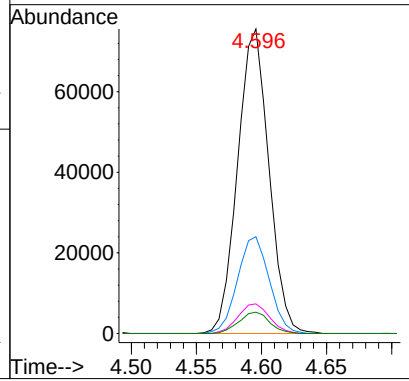
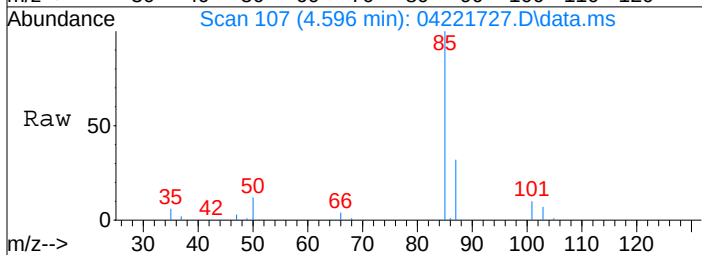
#2
 Propene
 Concen: 0.17 ng
 RT: 4.45 min Scan# 81
 Delta R.T. -0.005 min
 Lab File: 04221727.D
 Acq: 22 Apr 2017 20:21

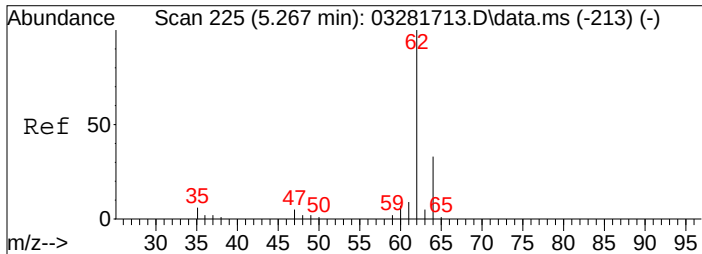
Tgt Ion: 42	Resp: 1062
Ion Ratio	Lower Upper
42	100
39	148.4 111.0 151.0
41	159.7 129.9 169.9



#3
 Dichlorodifluoromethane (CFC 12)
 Concen: 9.12 ng
 RT: 4.60 min Scan# 107
 Delta R.T. -0.006 min
 Lab File: 04221727.D
 Acq: 22 Apr 2017 20:21

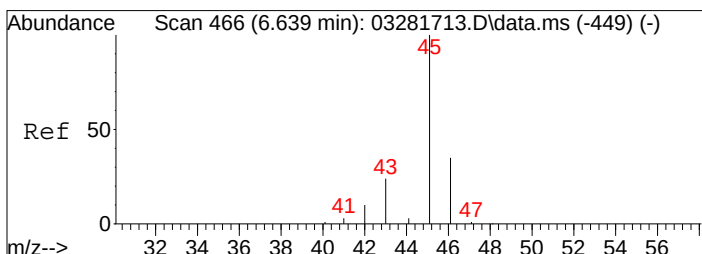
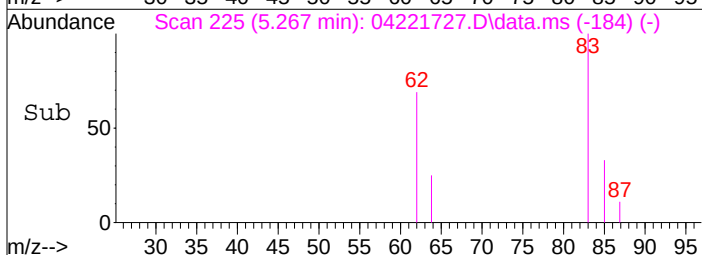
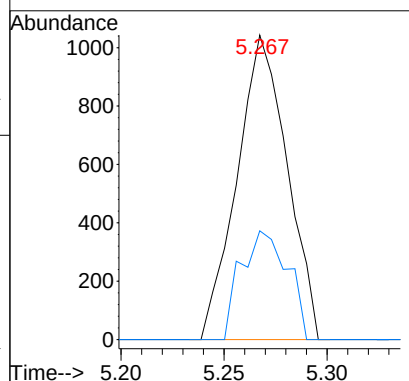
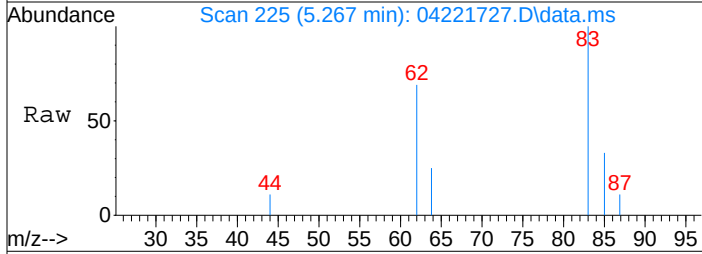
Tgt Ion: 85	Resp: 126189
Ion Ratio	Lower Upper
85	100
87	32.2 12.4 52.4
101	9.9 0.0 29.5
103	6.9 0.0 26.1





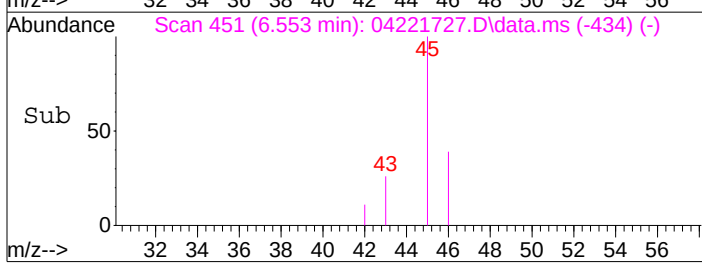
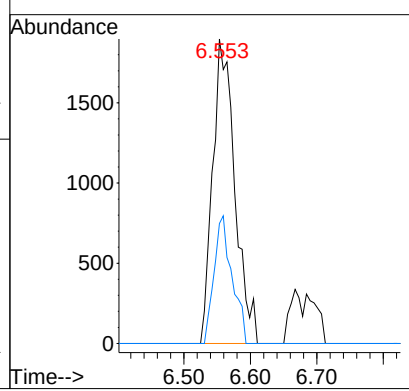
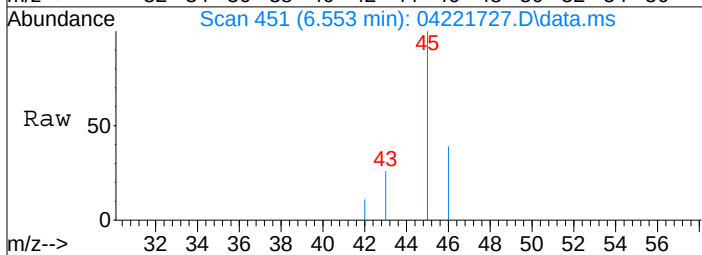
#6
 Vinyl Chloride
 Concen: 0.21 ng
 RT: 5.27 min Scan# 225
 Delta R.T. -0.017 min
 Lab File: 04221727.D
 Acq: 22 Apr 2017 20:21

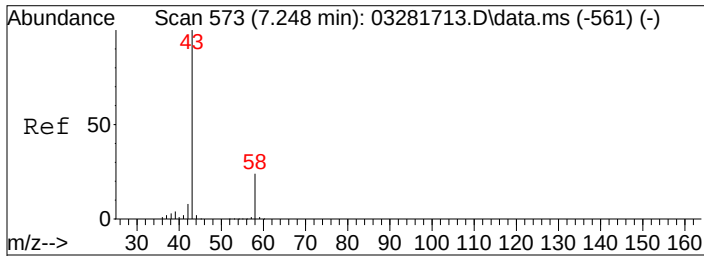
Tgt Ion: 62	Resp: 1761
Ion Ratio	Lower Upper
62	100
64	33.3 12.2 52.2



#10
 Ethanol
 Concen: 1.25 ng m
 RT: 6.55 min Scan# 451
 Delta R.T. -0.154 min
 Lab File: 04221727.D
 Acq: 22 Apr 2017 20:21

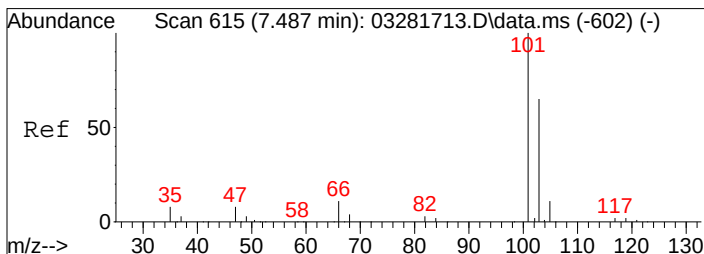
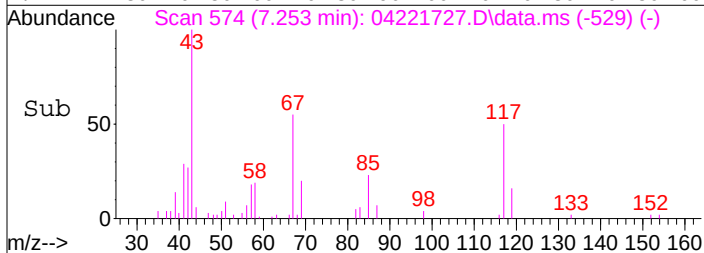
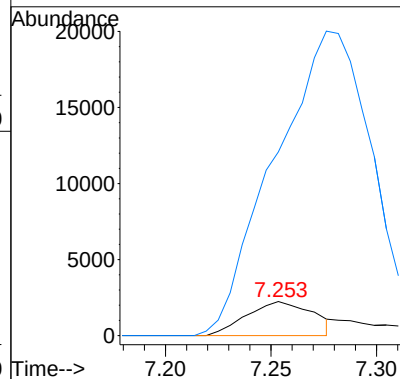
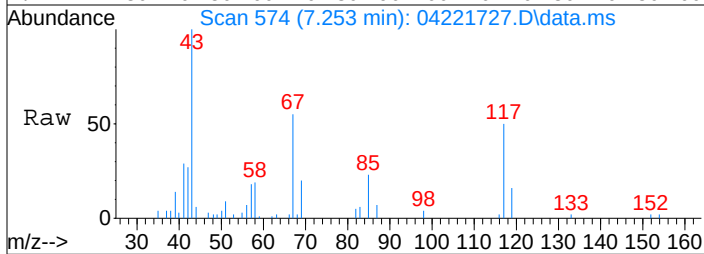
Tgt Ion: 45	Resp: 5215
Ion Ratio	Lower Upper
45	100
46	28.7 15.4 55.4





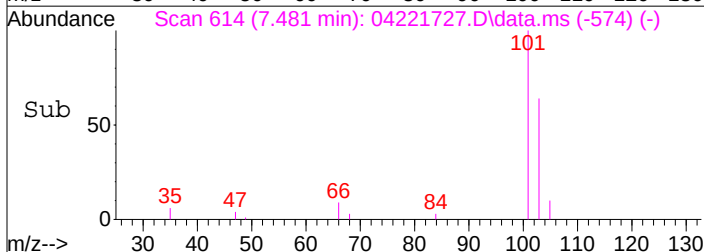
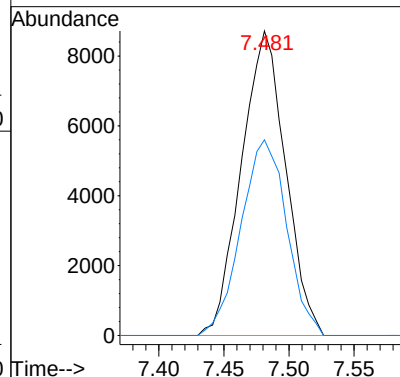
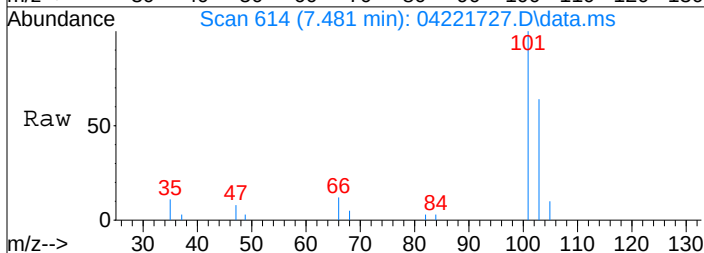
#13
Acetone
Concen: 1.06 ng m
RT: 7.25 min Scan# 574
Delta R.T. 0.006 min
Lab File: 04221727.D
Acq: 22 Apr 2017 20:21

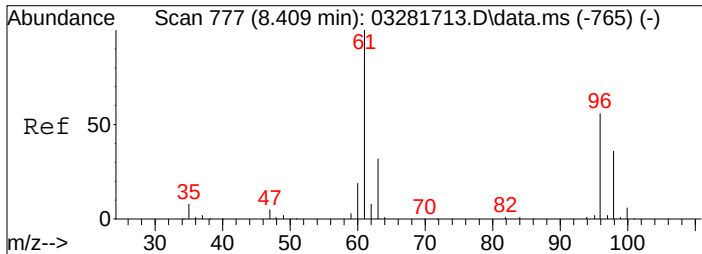
Tgt Ion: 58 Resp: 4881
Ion Ratio Lower Upper
58 100
43 761.6 328.9 388.9#



#14
Trichlorofluoromethane
Concen: 1.48 ng
RT: 7.48 min Scan# 614
Delta R.T. -0.023 min
Lab File: 04221727.D
Acq: 22 Apr 2017 20:21

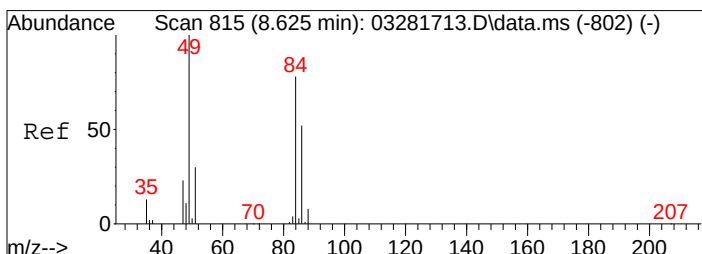
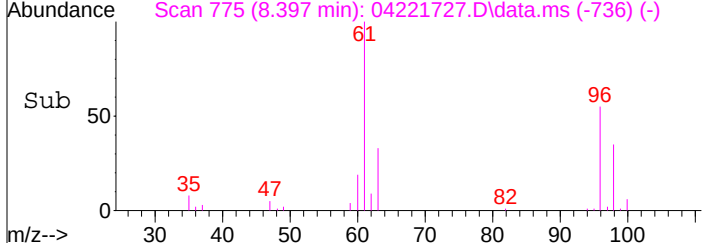
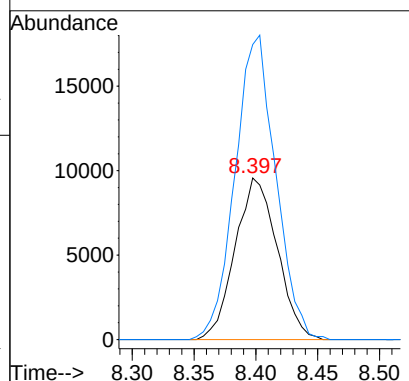
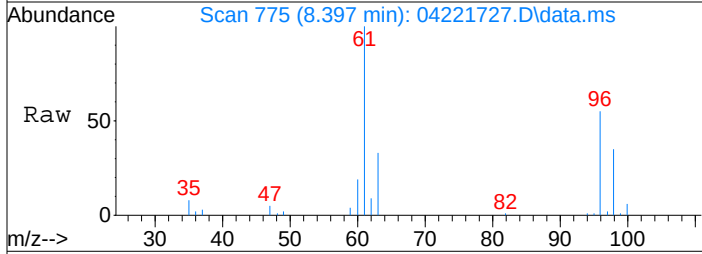
Tgt Ion: 101 Resp: 20600
Ion Ratio Lower Upper
101 100
103 66.5 45.3 85.3





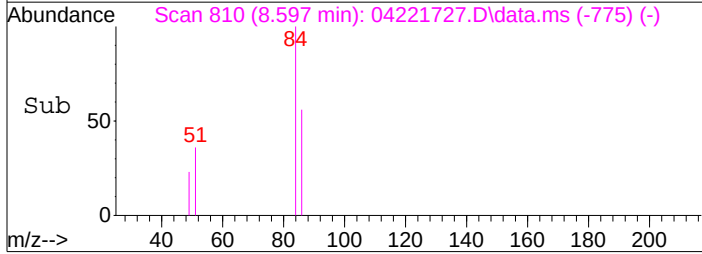
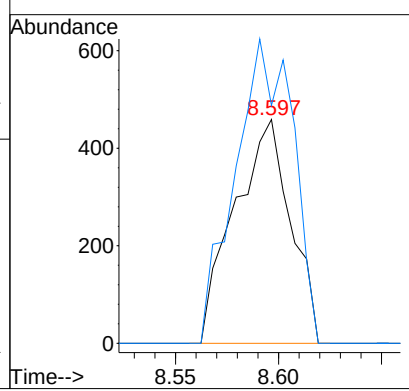
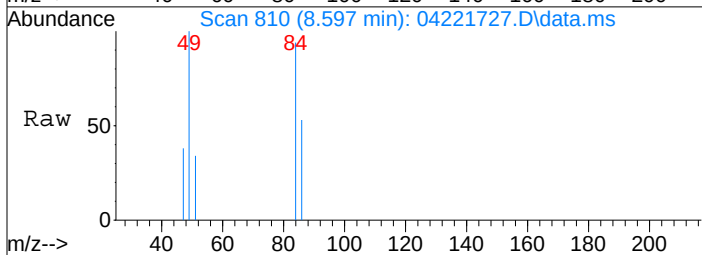
#17
 1,1-Dichloroethene
 Concen: 3.78 ng
 RT: 8.40 min Scan# 775
 Delta R.T. -0.028 min
 Lab File: 04221727.D
 Acq: 22 Apr 2017 20:21

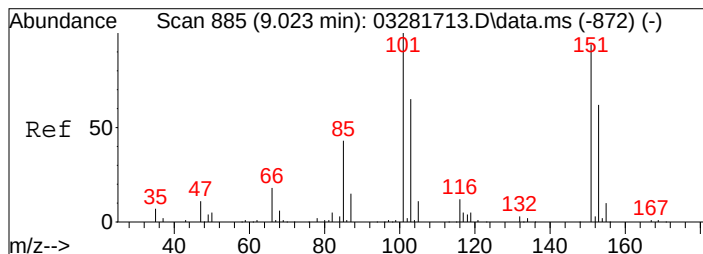
Tgt Ion:	96	Resp:	22706
Ion Ratio	Lower	Upper	
96	100		
61	182.1	156.8	196.8



#19
 Methylene Chloride
 Concen: 0.13 ng
 RT: 8.60 min Scan# 810
 Delta R.T. -0.051 min
 Lab File: 04221727.D
 Acq: 22 Apr 2017 20:21

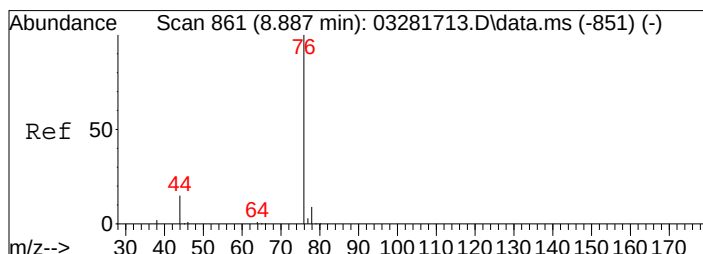
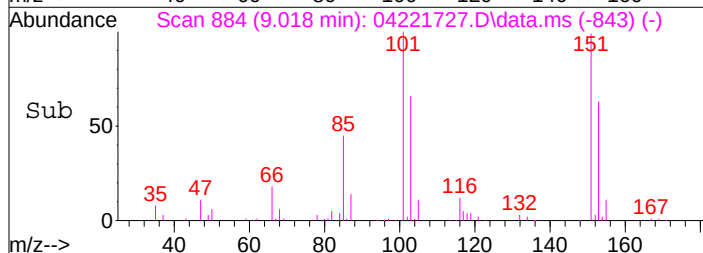
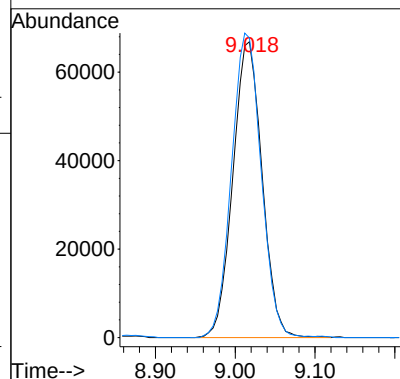
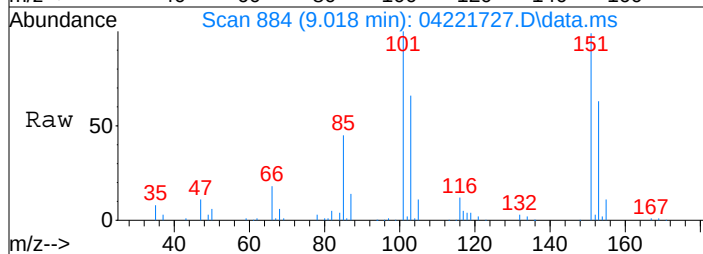
Tgt Ion:	84	Resp:	868
Ion Ratio	Lower	Upper	
84	100		
49	140.0	105.9	155.9





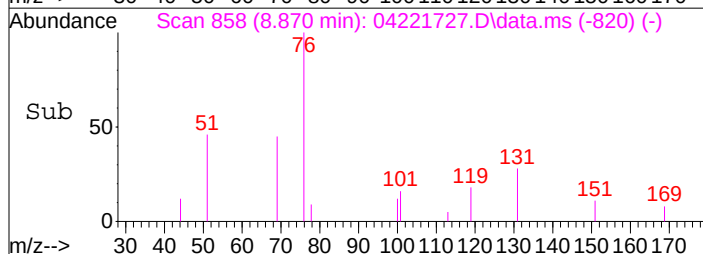
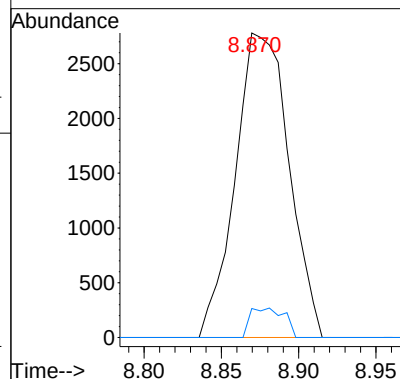
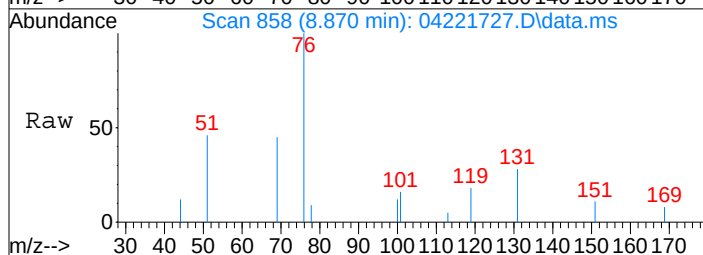
#21
Trichlorotrifluoroethane
Concen: 24.57 ng
RT: 9.02 min Scan# 884
Delta R.T. -0.017 min
Lab File: 04221727.D
Acq: 22 Apr 2017 20:21

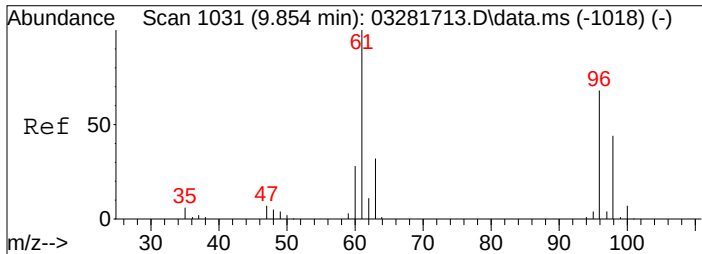
Tgt Ion: 151 Resp: 170401
Ion Ratio Lower Upper
151 100
101 104.5 85.9 125.9



#22
Carbon Disulfide
Concen: 0.30 ng
RT: 8.87 min Scan# 858
Delta R.T. -0.034 min
Lab File: 04221727.D
Acq: 22 Apr 2017 20:21

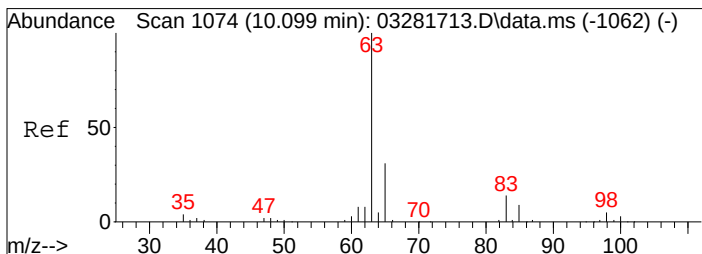
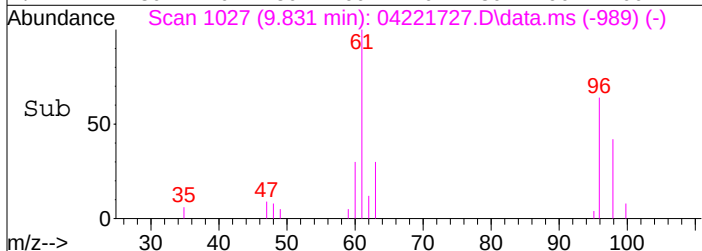
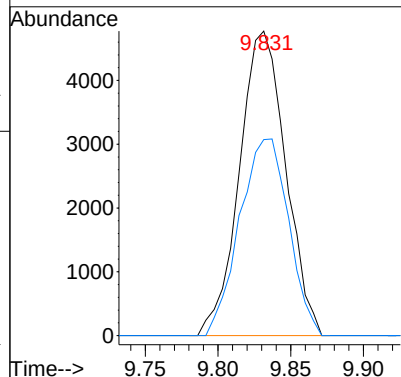
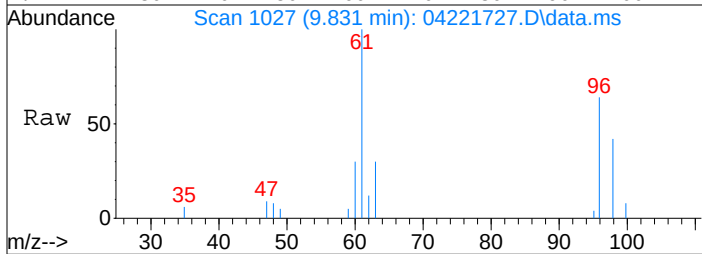
Tgt Ion: 76 Resp: 6704
Ion Ratio Lower Upper
76 100
78 6.1 0.0 29.2





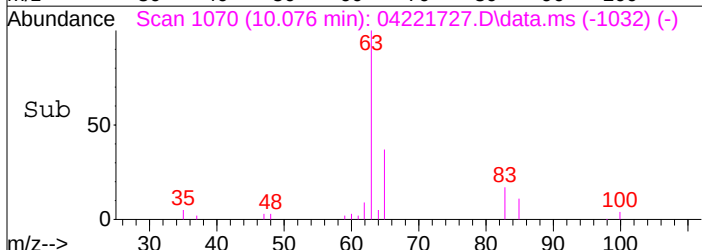
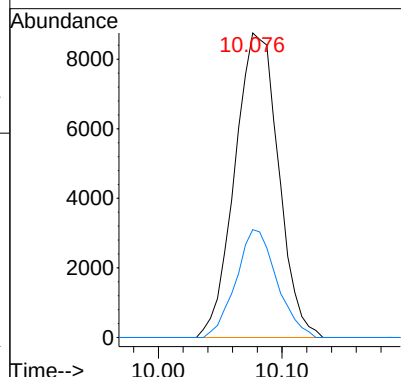
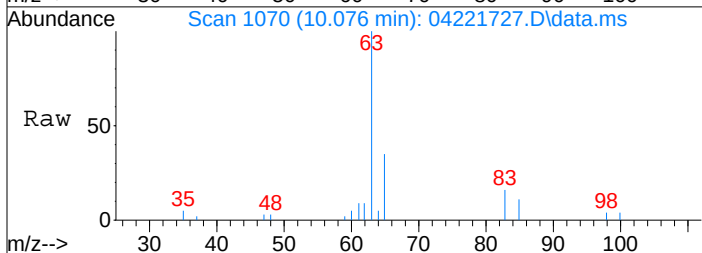
#23
trans-1,2-Dichloroethene
Concen: 1.16 ng
RT: 9.83 min Scan# 1027
Delta R.T. -0.034 min
Lab File: 04221727.D
Acq: 22 Apr 2017 20:21

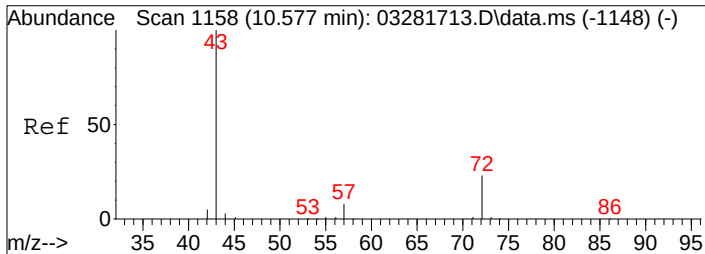
Tgt Ion	61	96	Resp	10570	Lower	Upper
Ion Ratio	100	68.3	48.4	88.4		



#24
1,1-Dichloroethane
Concen: 1.89 ng
RT: 10.08 min Scan# 1070
Delta R.T. -0.034 min
Lab File: 04221727.D
Acq: 22 Apr 2017 20:21

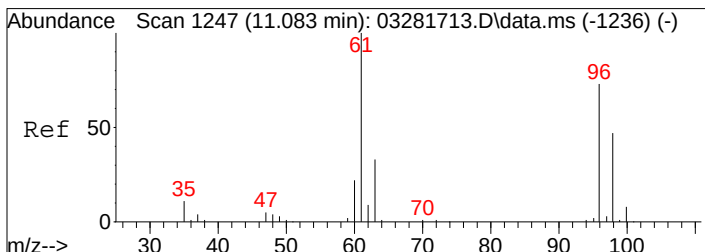
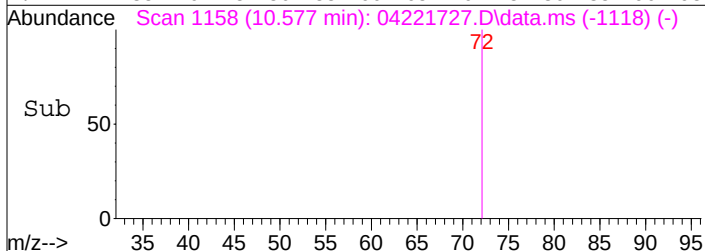
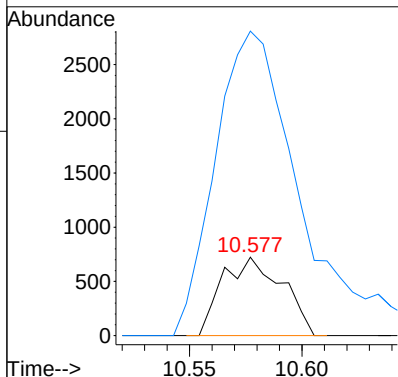
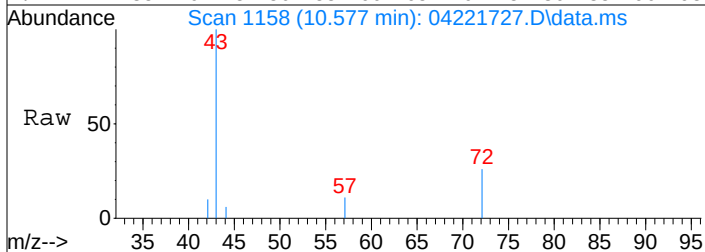
Tgt Ion	63	65	Resp	21501	Lower	Upper
Ion Ratio	100	33.1	11.4	51.4		





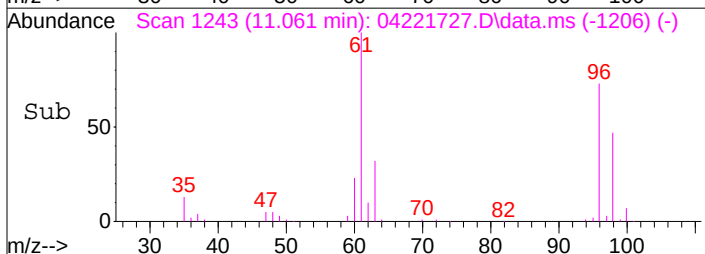
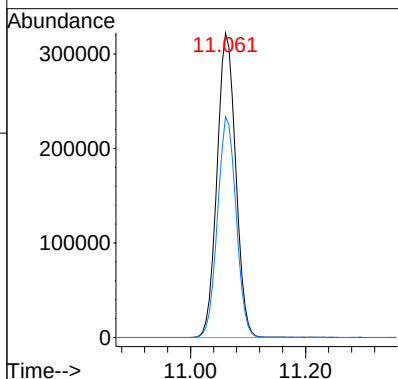
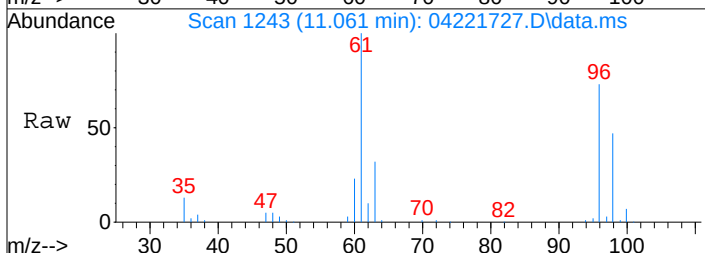
#27
2-Butanone (MEK)
Concen: 0.34 ng
RT: 10.58 min Scan# 1158
Delta R.T. -0.023 min
Lab File: 04221727.D
Acq: 22 Apr 2017 20:21

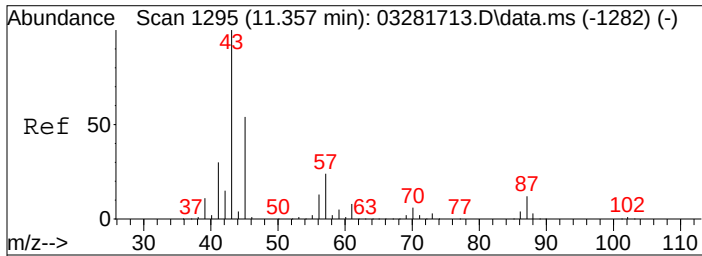
Tgt Ion: 72 Resp: 1344
Ion Ratio Lower Upper
72 100
43 549.8 415.9 455.9#



#28
cis-1,2-Dichloroethene
Concen: 82.57 ng
RT: 11.06 min Scan# 1243
Delta R.T. -0.040 min
Lab File: 04221727.D
Acq: 22 Apr 2017 20:21

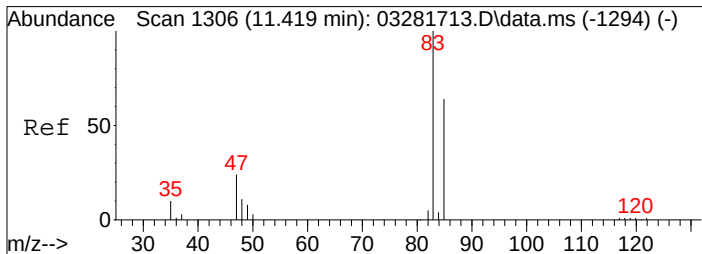
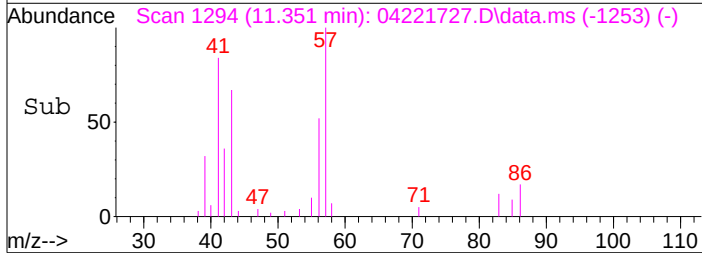
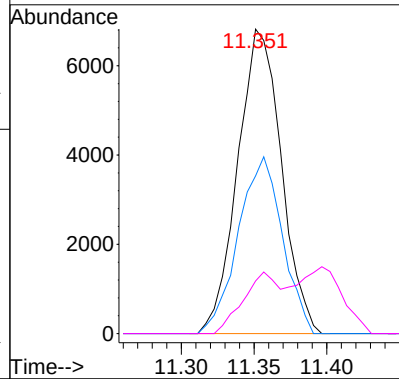
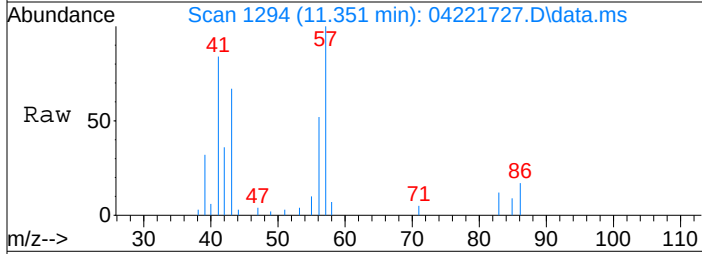
Tgt Ion: 61 Resp: 725400
Ion Ratio Lower Upper
61 100
96 72.3 53.3 93.3





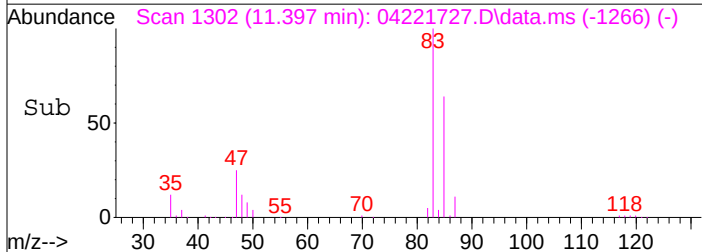
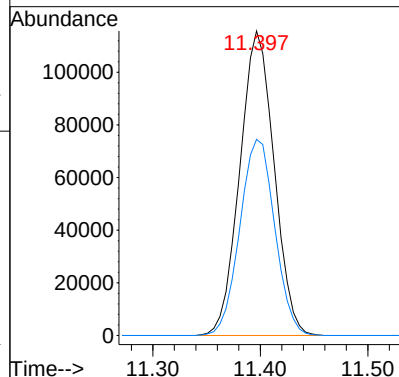
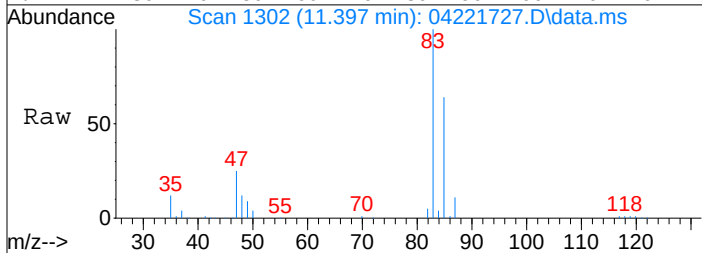
#31
n-Hexane
Concen: 1.54 ng
RT: 11.35 min Scan# 1294
Delta R.T. -0.017 min
Lab File: 04221727.D
Acq: 22 Apr 2017 20:21

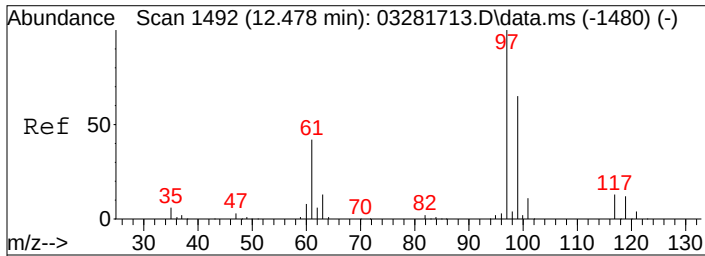
Tgt Ion: 57 Resp: 14217
Ion Ratio Lower Upper
57 100
56 58.7 42.6 64.0
86 18.9 12.9 19.3



#32
Chloroform
Concen: 20.68 ng
RT: 11.40 min Scan# 1302
Delta R.T. -0.046 min
Lab File: 04221727.D
Acq: 22 Apr 2017 20:21

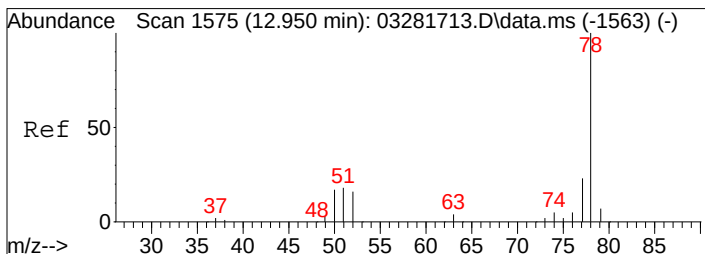
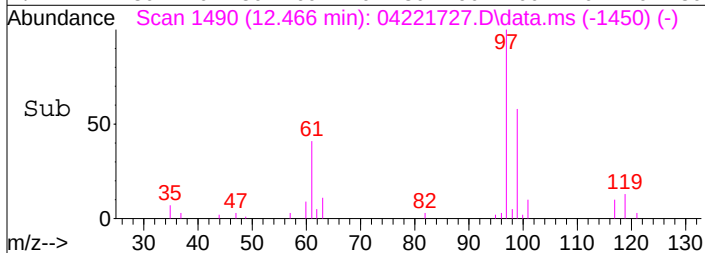
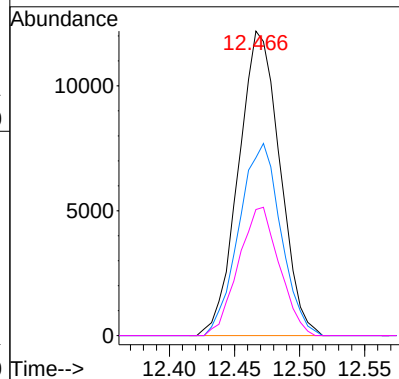
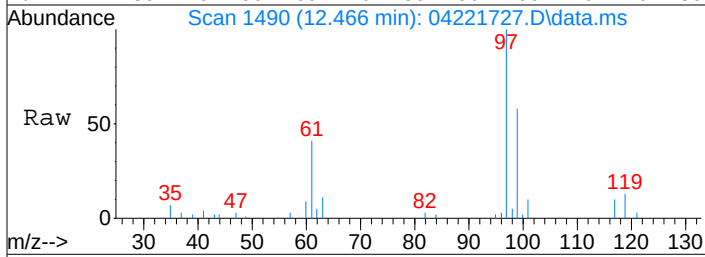
Tgt Ion: 83 Resp: 256367
Ion Ratio Lower Upper
83 100
85 65.6 45.2 85.2





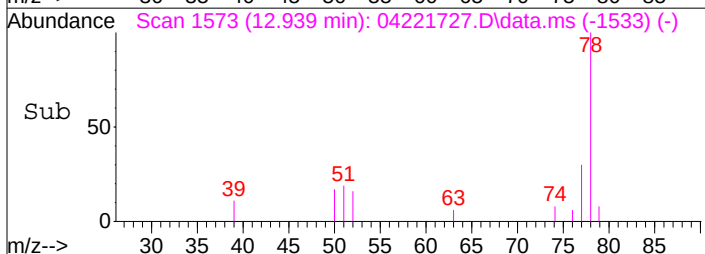
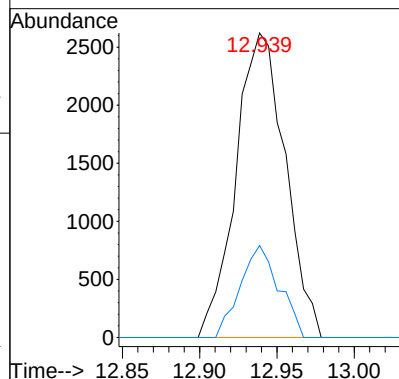
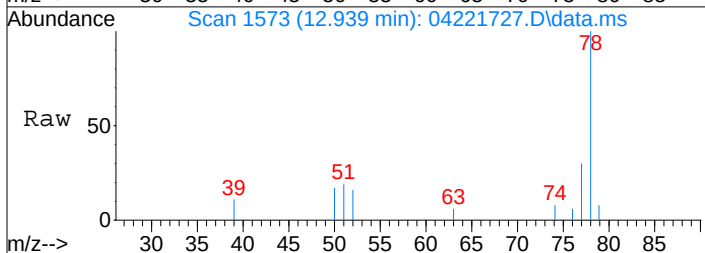
#38
 1,1,1-Trichloroethane
 Concen: 2.20 ng
 RT: 12.47 min Scan# 1490
 Delta R.T. -0.023 min
 Lab File: 04221727.D
 Acq: 22 Apr 2017 20:21

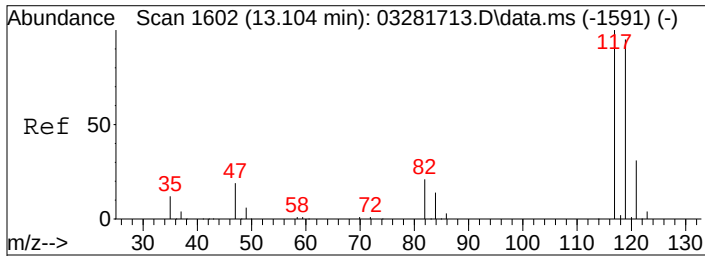
Tgt Ion: 97 Resp: 26975
 Ion Ratio Lower Upper
 97 100
 99 64.0 44.7 84.7
 61 41.6 21.2 61.2



#41
 Benzene
 Concen: 0.23 ng
 RT: 12.94 min Scan# 1573
 Delta R.T. -0.023 min
 Lab File: 04221727.D
 Acq: 22 Apr 2017 20:21

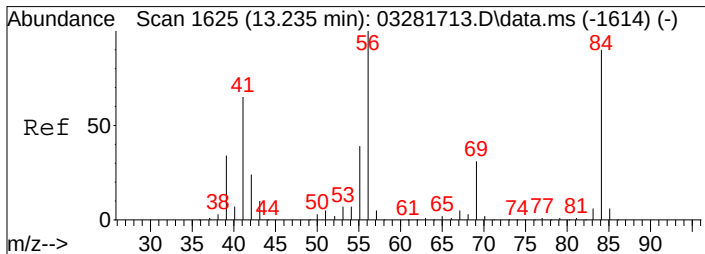
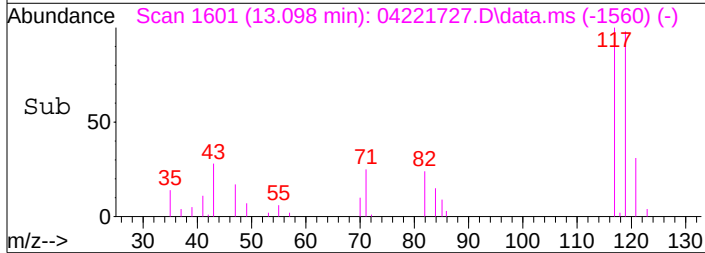
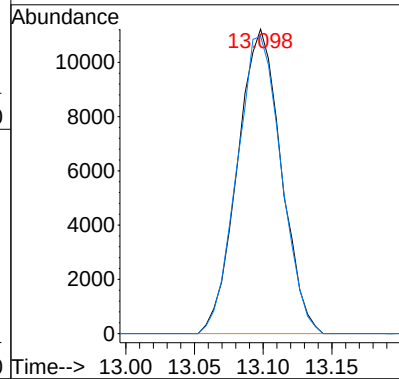
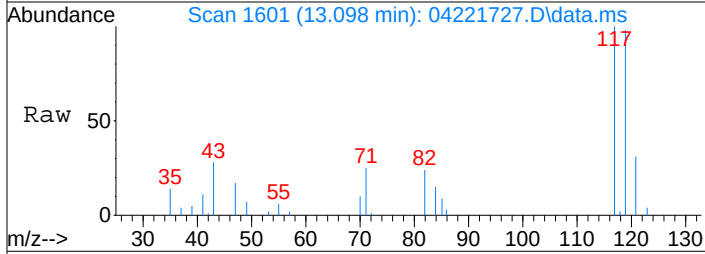
Tgt Ion: 78 Resp: 5826
 Ion Ratio Lower Upper
 78 100
 77 23.7 3.6 43.6





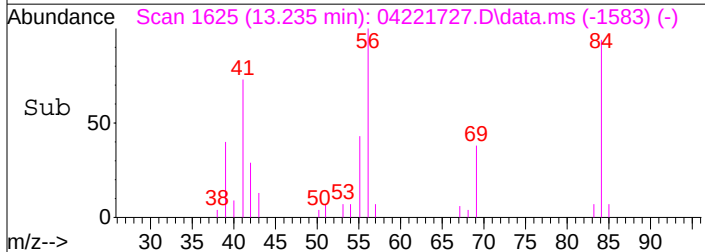
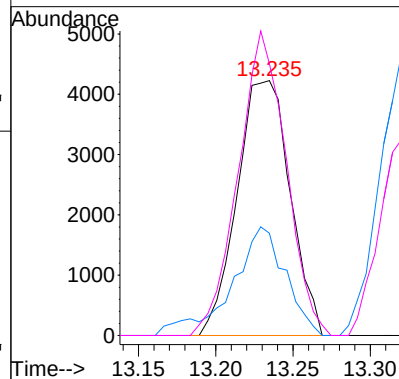
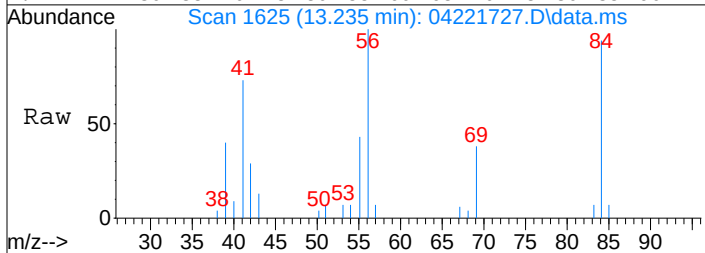
#42
Carbon Tetrachloride
Concen: 2.26 ng
RT: 13.10 min Scan# 1601
Delta R.T. -0.017 min
Lab File: 04221727.D
Acq: 22 Apr 2017 20:21

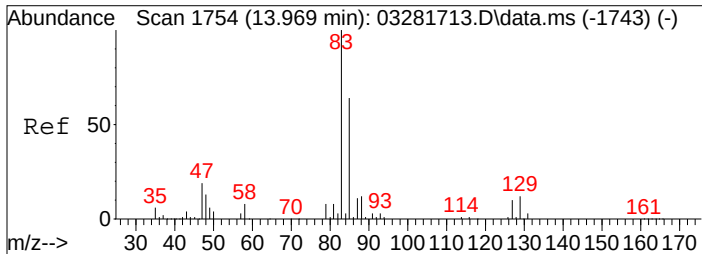
Tgt Ion: 117 Resp: 24864
Ion Ratio Lower Upper
117 100
119 99.0 76.1 116.1



#43
Cyclohexane
Concen: 1.09 ng
RT: 13.23 min Scan# 1625
Delta R.T. -0.011 min
Lab File: 04221727.D
Acq: 22 Apr 2017 20:21

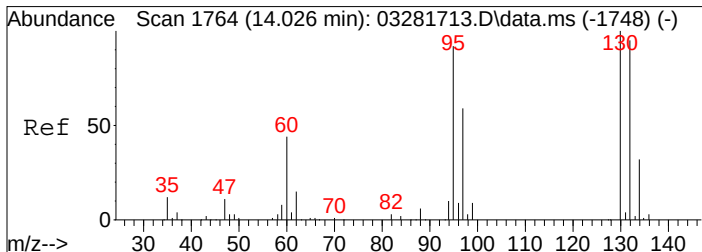
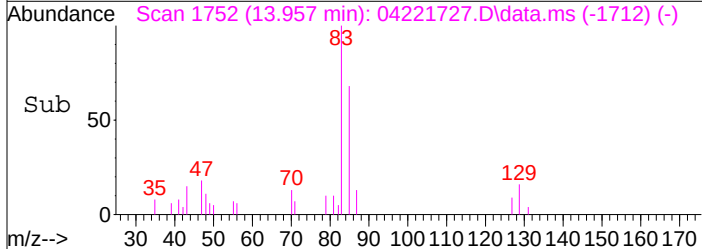
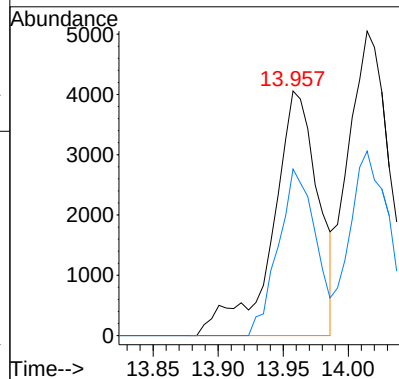
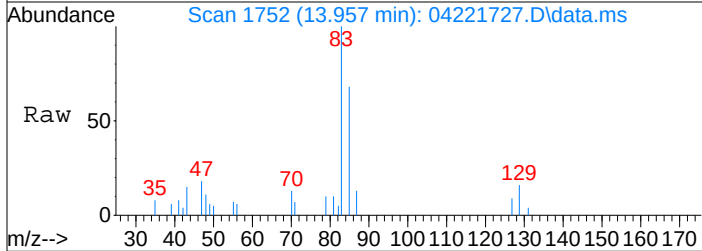
Tgt Ion: 84 Resp: 10109
Ion Ratio Lower Upper
84 100
69 43.2 15.7 55.7
56 107.7 91.4 131.4





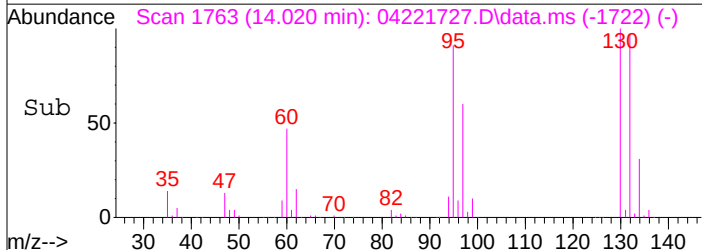
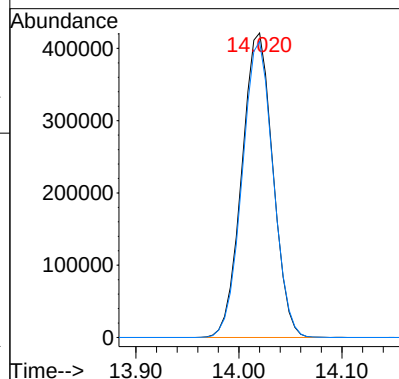
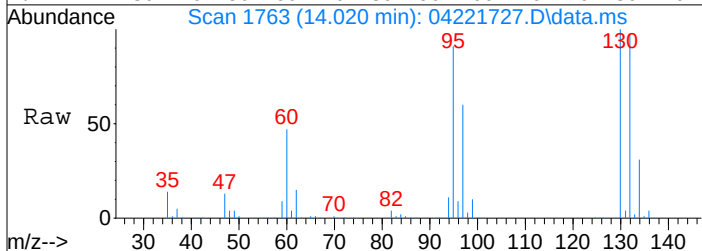
#46
Bromodichloromethane
Concen: 1.08 ng
RT: 13.96 min Scan# 1752
Delta R.T. -0.023 min
Lab File: 04221727.D
Acq: 22 Apr 2017 20:21

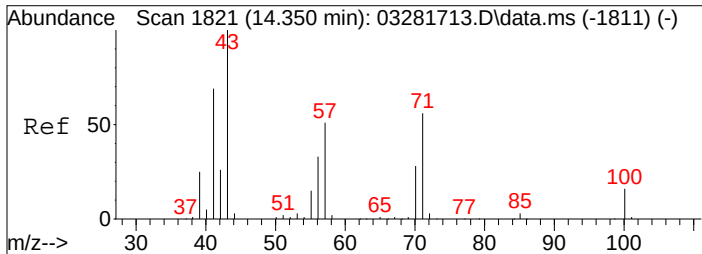
Tgt Ion	83	85	Resp	9905	Lower	Upper
Ion Ratio	100	56.0			44.7	84.7



#47
Trichloroethene
Concen: 120.58 ng
RT: 14.02 min Scan# 1763
Delta R.T. -0.017 min
Lab File: 04221727.D
Acq: 22 Apr 2017 20:21

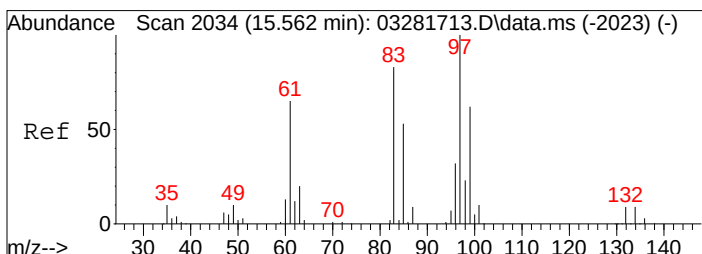
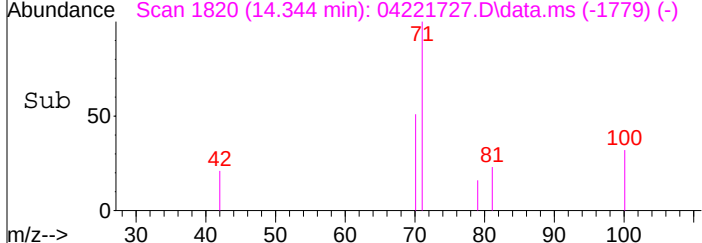
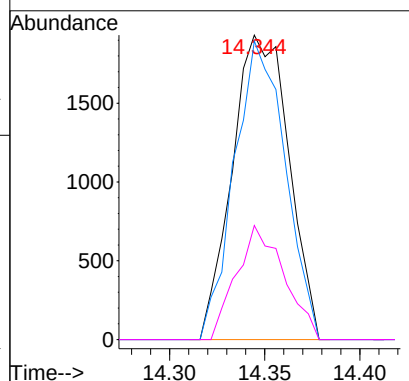
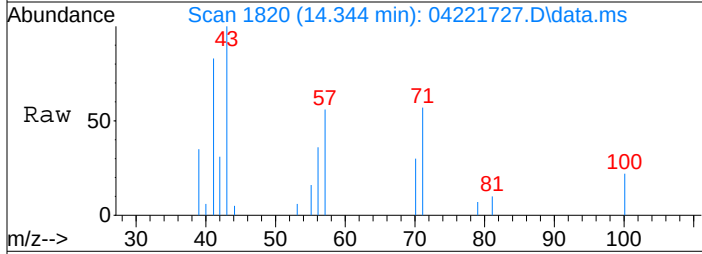
Tgt Ion	130	132	Resp	884175	Lower	Upper
Ion Ratio	100	96.7			75.1	115.1





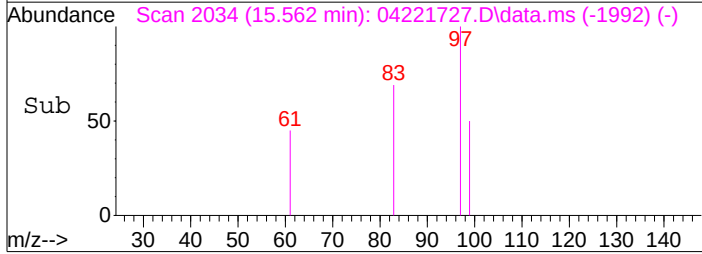
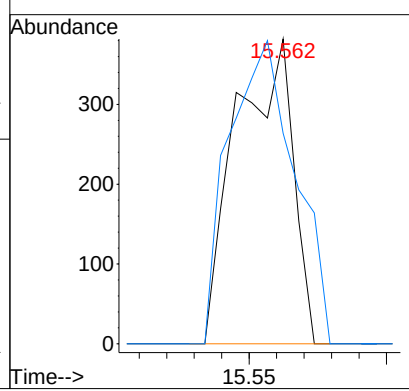
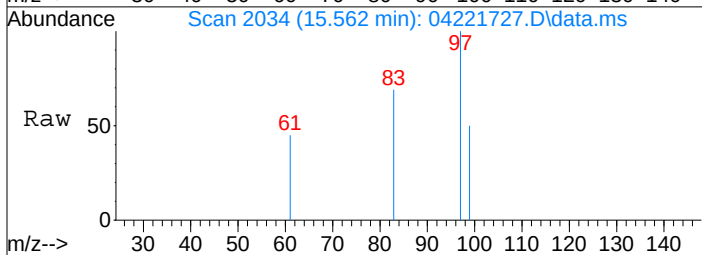
#51
 n-Heptane
 Concen: 0.68 ng
 RT: 14.34 min Scan# 1820
 Delta R.T. -0.017 min
 Lab File: 04221727.D
 Acq: 22 Apr 2017 20:21

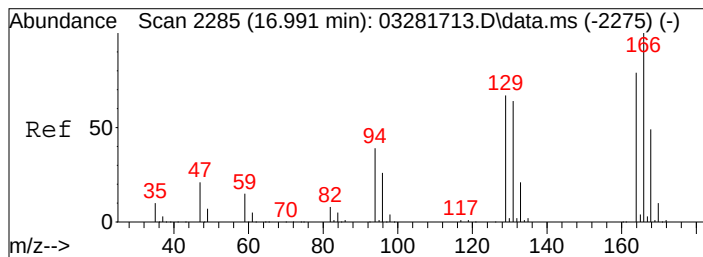
Tgt Ion: 71	Resp: 3997
Ion Ratio	Lower Upper
71	100
57	88.4 70.2 110.2
100	31.6 10.0 50.0



#55
 1,1,2-Trichloroethane
 Concen: 0.10 ng
 RT: 15.56 min Scan# 2034
 Delta R.T. -0.011 min
 Lab File: 04221727.D
 Acq: 22 Apr 2017 20:21

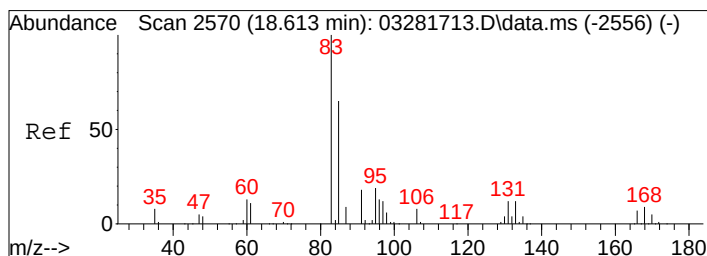
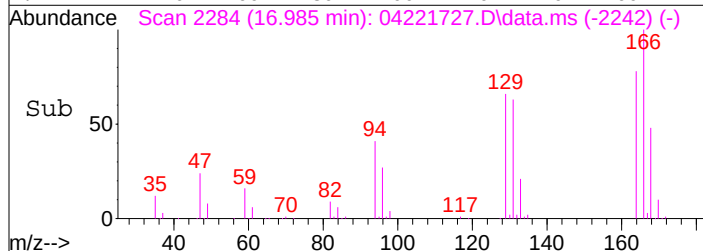
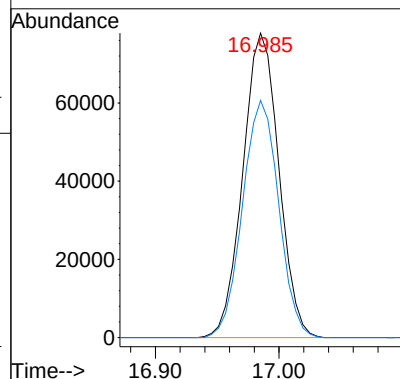
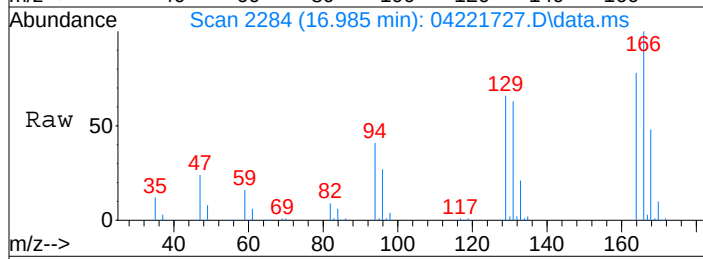
Tgt Ion: 97	Resp: 548
Ion Ratio	Lower Upper
97	100
83	115.5 62.9 102.9#





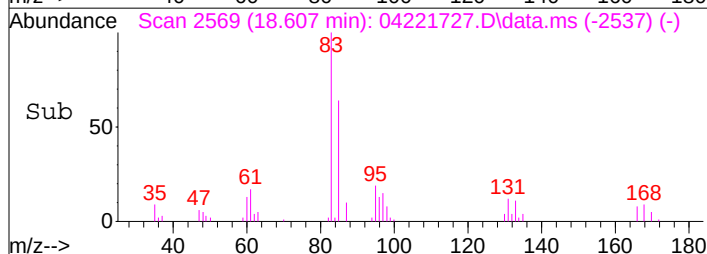
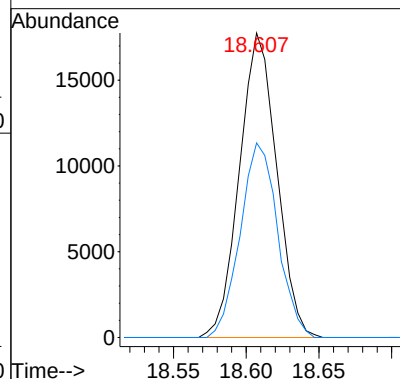
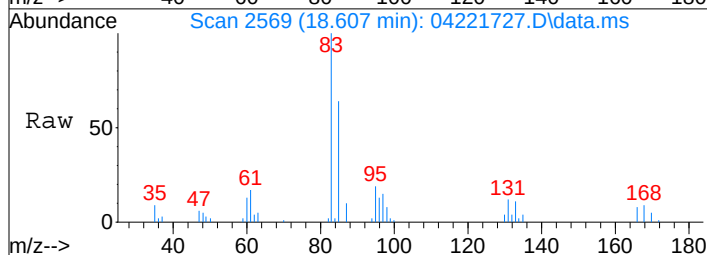
#64
Tetrachloroethene
Concen: 17.43 ng
RT: 16.99 min Scan# 2284
Delta R.T. -0.011 min
Lab File: 04221727.D
Acq: 22 Apr 2017 20:21

Tgt Ion: 166 Resp: 158055
Ion Ratio Lower Upper
166 100
164 78.1 58.0 98.0



#72
1,1,2,2-Tetrachloroethane
Concen: 2.84 ng
RT: 18.61 min Scan# 2569
Delta R.T. -0.017 min
Lab File: 04221727.D
Acq: 22 Apr 2017 20:21

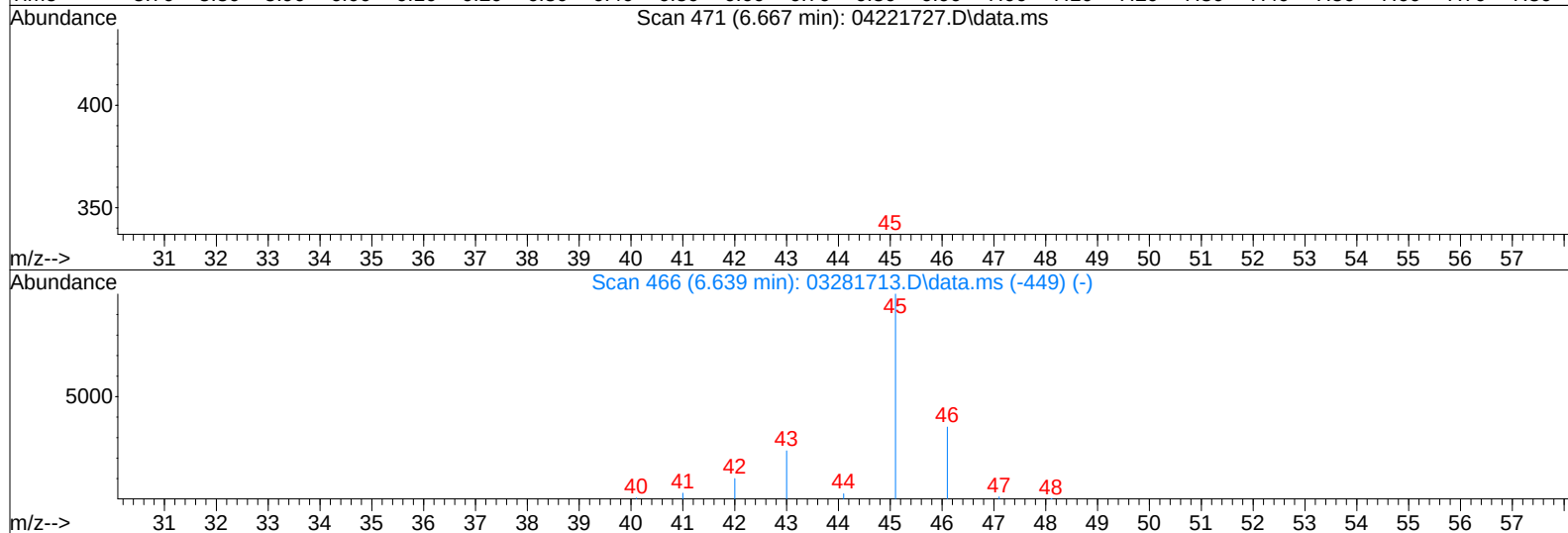
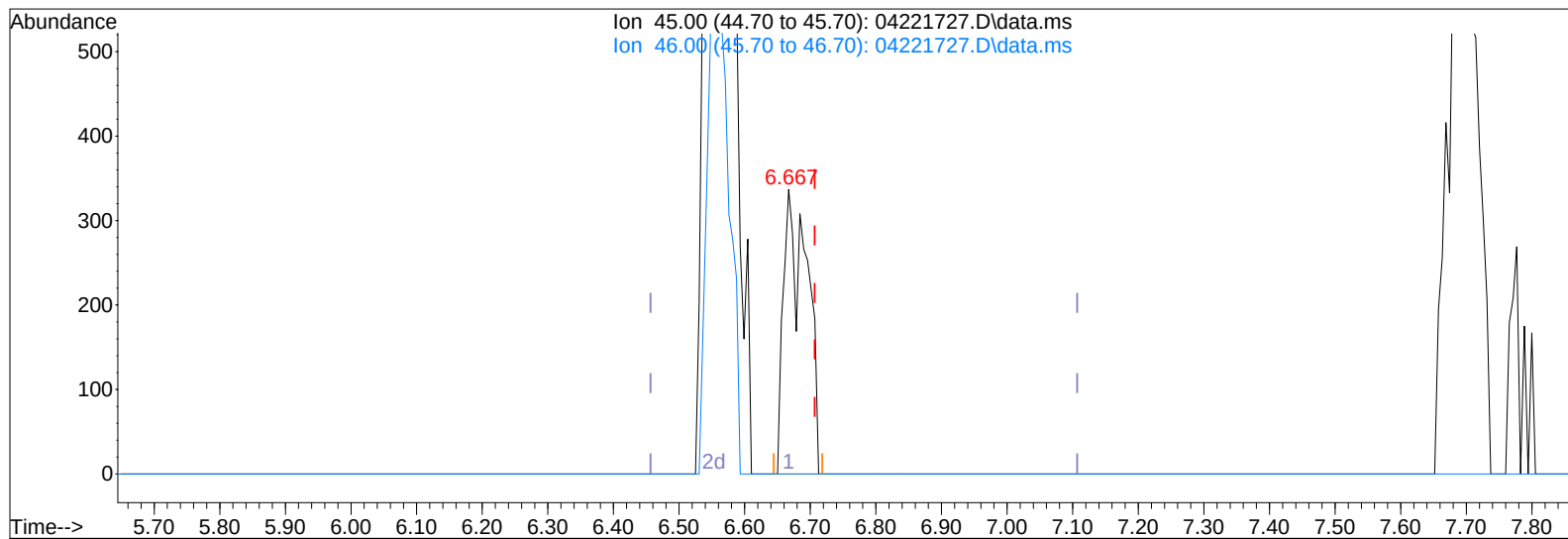
Tgt Ion: 83 Resp: 31582
Ion Ratio Lower Upper
83 100
85 64.3 45.9 85.9



Data File : I:\MS13\DATA\2017 04\22\04221727.D
Acq On : 22 Apr 2017 20:21
Sample : P1701803-001 (1000mL)
Misc : S29-04101701

Vial: 11
Operator: AM/LH
Inst : MS13

Quant Time: Apr 24 09:00:56 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Sat Apr 15 08:29:41 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 04221727.D\data.ms

(10) Ethanol (T)

6.667min (-0.040) 0.20ng

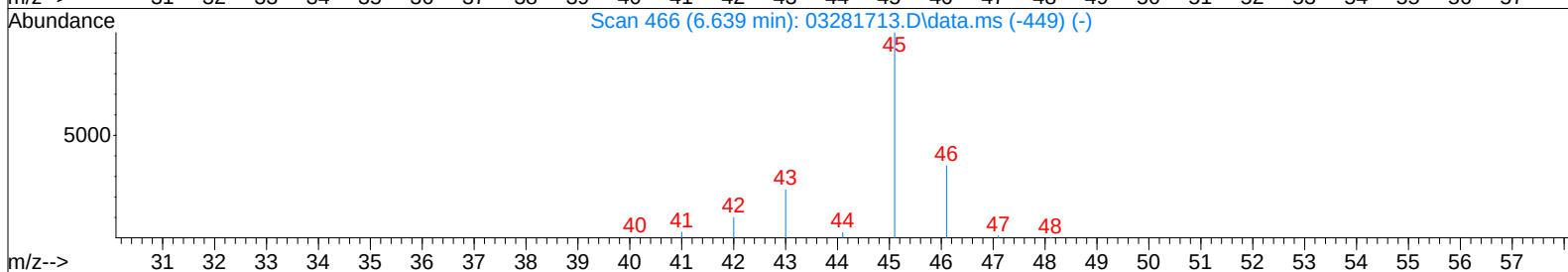
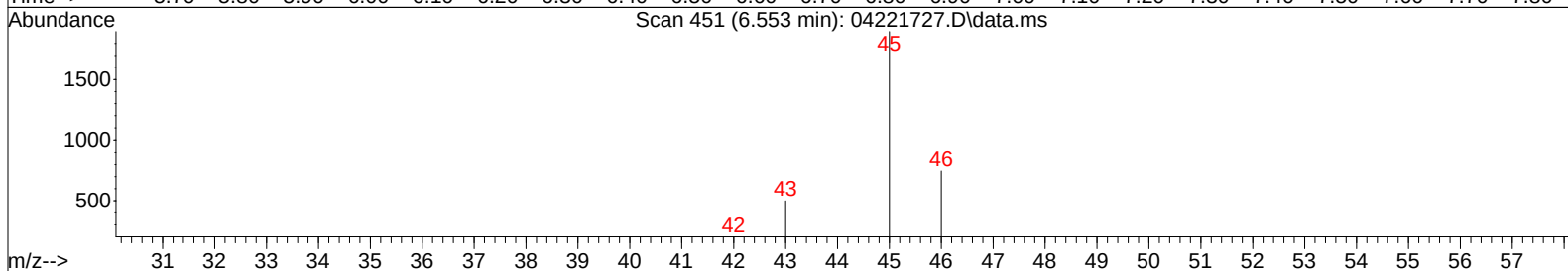
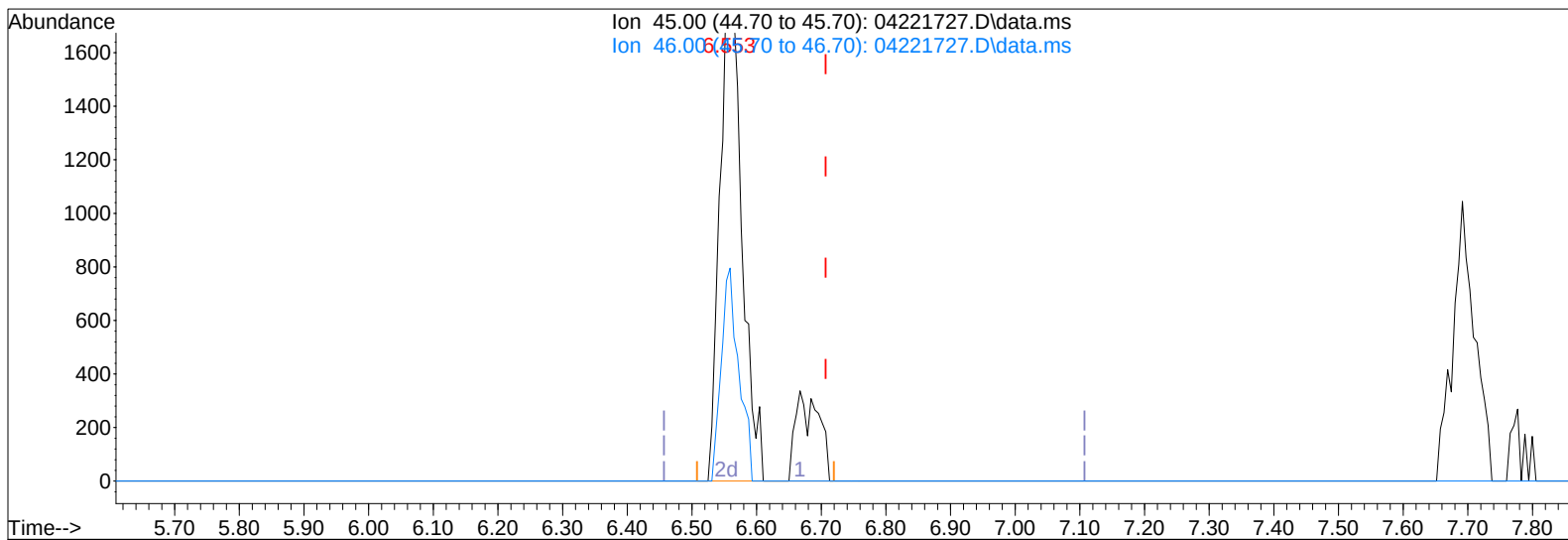
response 837

Ion	Exp%	Act%
45.00	100	100
46.00	35.40	0.00#
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2017 04\22\04221727.D
Acq On : 22 Apr 2017 20:21
Sample : P1701803-001 (1000mL)
Misc : S29-04101701

Vial: 11
Operator: AM/LH
Inst : MS13

Quant Time: Apr 24 09:00:56 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Sat Apr 15 08:29:41 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 04221727.D\data.ms

(10) Ethanol (T)

6.553min (-0.154) 1.25ng m

response 5215

Ion	Exp%	Act%

WP

45.00	100	100

46.00	35.40	28.69

4/24/17

0.00	0.00	0.00

LH 4/25/17

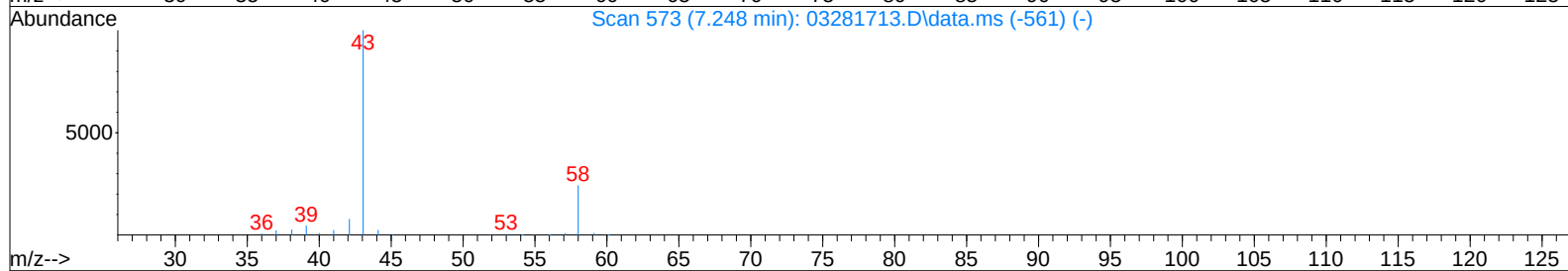
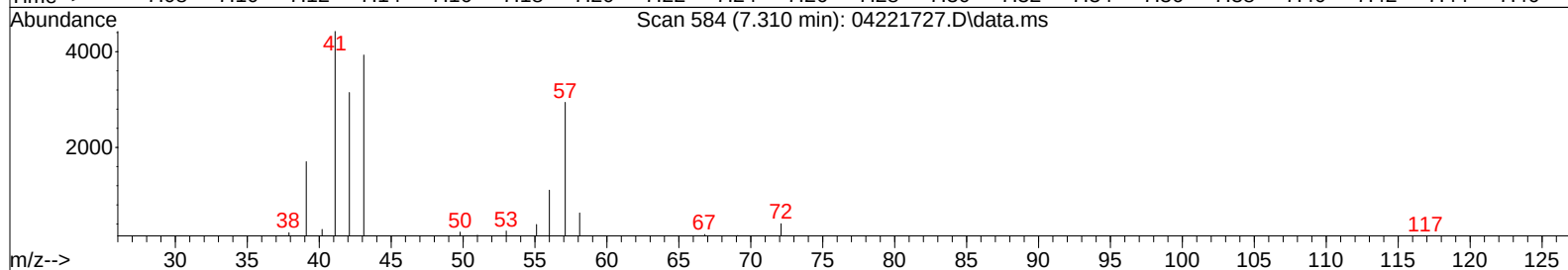
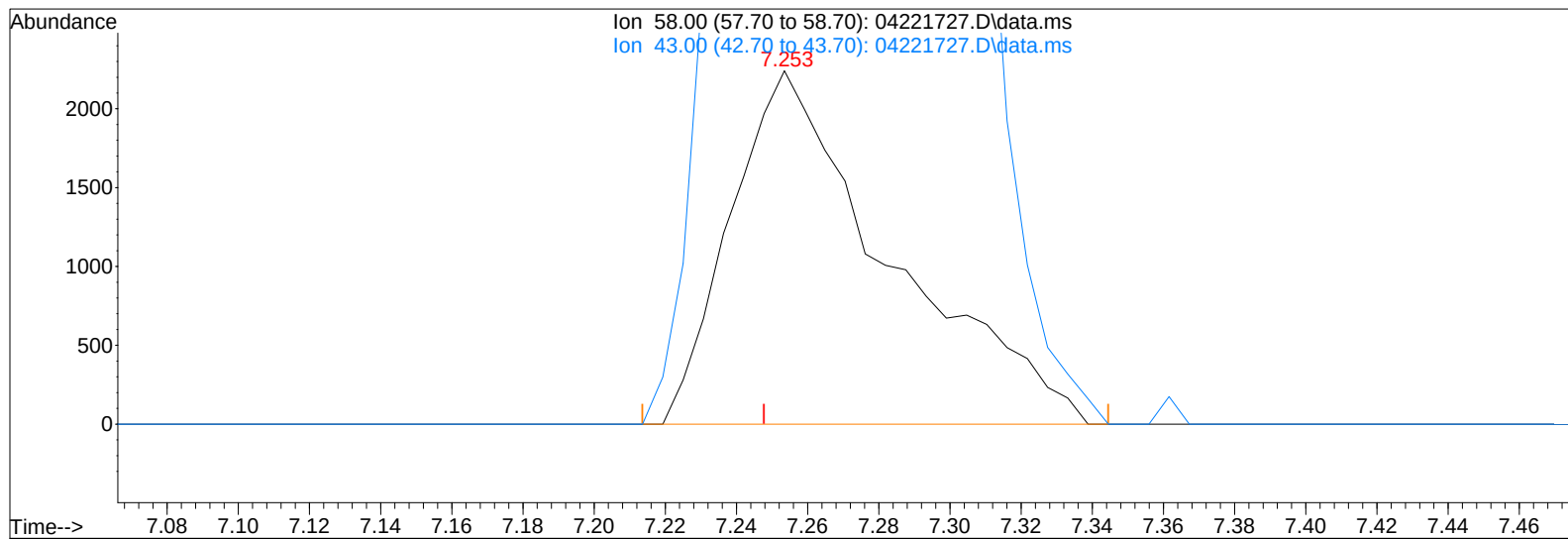
0.00	0.00	0.00

CL 4/25/17

Data File : I:\MS13\DATA\2017 04\22\04221727.D
Acq On : 22 Apr 2017 20:21
Sample : P1701803-001 (1000mL)
Misc : S29-04101701

Vial: 11
Operator: AM/LH
Inst : MS13

Quant Time: Apr 24 09:00:56 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Sat Apr 15 08:29:41 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 04221727.D\data.ms

(13) Acetone (T)

7.253min (+0.006) 1.51ng

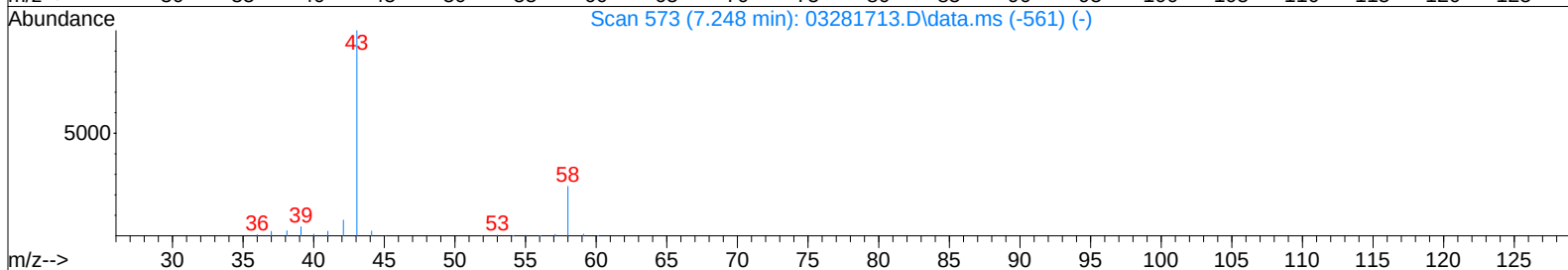
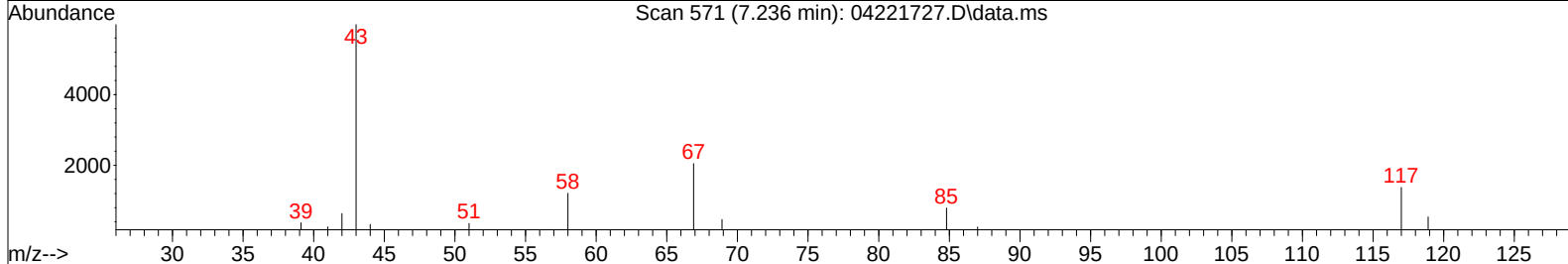
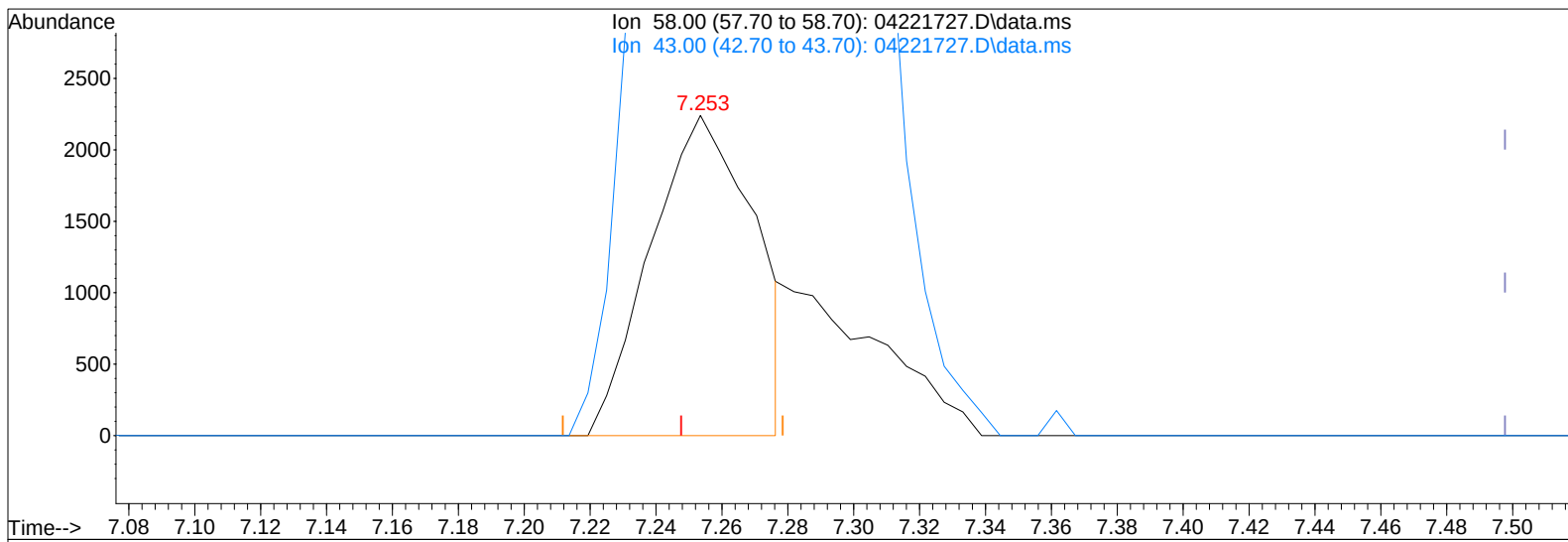
response 6962

Ion	Exp%	Act%
58.00	100	100
43.00	358.90	922.90#
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2017 04\22\04221727.D
Acq On : 22 Apr 2017 20:21
Sample : P1701803-001 (1000mL)
Misc : S29-04101701

Vial: 11
Operator: AM/LH
Inst : MS13

Quant Time: Apr 24 09:00:56 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Sat Apr 15 08:29:41 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 04221727.D\data.ms

(13) Acetone (T)

7.253min (+0.006) 1.06ng m

response 4881

Ion	Exp%	Act%

58.00	100	100

43.00	358.90	761.57#

0.00	0.00	0.00

0.00	0.00	0.00

IPC

4/24/17

LH 4/25/17

CL 4/25/17

Data File : I:\MS13\DATA\2017 04\24\04241730.D
 Acq On : 25 Apr 2017 2:09
 Sample : P1701803-001d1l (500ml)
 Misc : S31-04101701

Vial: 11
 Operator: AM/LH
 Inst : MS13

Quant Time: Apr 25 10:38:22 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Sat Apr 15 08:29:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 4/25/17

AM 4/25/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.24	130	63386	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.32	114	303521	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.61	82	129503	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.07	65	132425	14.104	ng	-0.03
Spiked Amount	12.500	Range 70	- 130	Recovery	=	112.80%
57) Toluene-d8 (SS2)	15.74	98	305847	12.316	ng	-0.02
Spiked Amount	12.500	Range 70	- 130	Recovery	=	98.56%
73) Bromofluorobenzene (SS3)	19.06	174	133790	12.931	ng	0.00
Spiked Amount	12.500	Range 70	- 130	Recovery	=	103.44%

Target Compounds

						Qvalue
2) Propene	4.45	42	668	0.116	ng	# 45
3) Dichlorodifluoromethan...	4.60	85	68545	5.362	ng	99
4) Chloromethane	0.00	50	0	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	5.13	135	179	N.D.		
6) Vinyl Chloride	5.27	62	773	0.101	ng	84
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.69	45	54	N.D.		
11) Acetonitrile	6.83	41	328	N.D.		
12) Acrolein	7.04	56	78	N.D.		
13) Acetone	7.25	58	4210	0.991	ng	# 1
14) Trichlorofluoromethane	7.48	101	11274	0.879	ng	94
15) 2-Propanol (Isopropanol)	7.76	45	56	N.D.		
16) Acrylonitrile	8.06	53	58	N.D.		
17) 1,1-Dichloroethene	8.40	96	11778	2.123	ng	94
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.		
19) Methylene Chloride	8.60	84	558	N.D.		
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.	d	
21) Trichlorotrifluoroethane	9.01	151	89711	13.998	ng	100
22) Carbon Disulfide	8.87	76	4376	0.211	ng	98
23) trans-1,2-Dichloroethene	9.83	61	5800	0.689	ng	100
24) 1,1-Dichloroethane	10.08	63	11246	1.072	ng	98
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.	d	
27) 2-Butanone (MEK)	10.57	72	717	0.196	ng	# 42
28) cis-1,2-Dichloroethene	11.06	61	376285	46.350	ng	98
29) Diisopropyl Ether	0.00	87	0	N.D.	d	
30) Ethyl Acetate	0.00	61	0	N.D.		
31) n-Hexane	11.35	57	7762	0.912	ng	96
32) Chloroform	11.40	83	133133	11.622	ng	100
34) Tetrahydrofuran (THF)	0.00	72	0	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	0.00	62	0	N.D.		
38) 1,1,1-Trichloroethane	12.47	97	13762	1.202	ng	96
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	12.94	78	3359	0.145	ng	96
42) Carbon Tetrachloride	13.09	117	12776	1.242	ng	98
43) Cyclohexane	13.23	84	5119	0.590	ng	99
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	13.96	83	5260	0.612	ng	90
47) Trichloroethene	14.01	130	448430	65.486	ng	97
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d	
50) Methyl Methacrylate	0.00	100	0	N.D.	d	

Data File : I:\MS13\DATA\2017 04\24\04241730.D
 Acq On : 25 Apr 2017 2:09
 Sample : P1701803-001dil (500ml)
 Misc : S31-04101701

Vial: 11
 Operator: AM/LH
 Inst : MS13

Quant Time: Apr 25 10:38:22 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Sat Apr 15 08:29:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

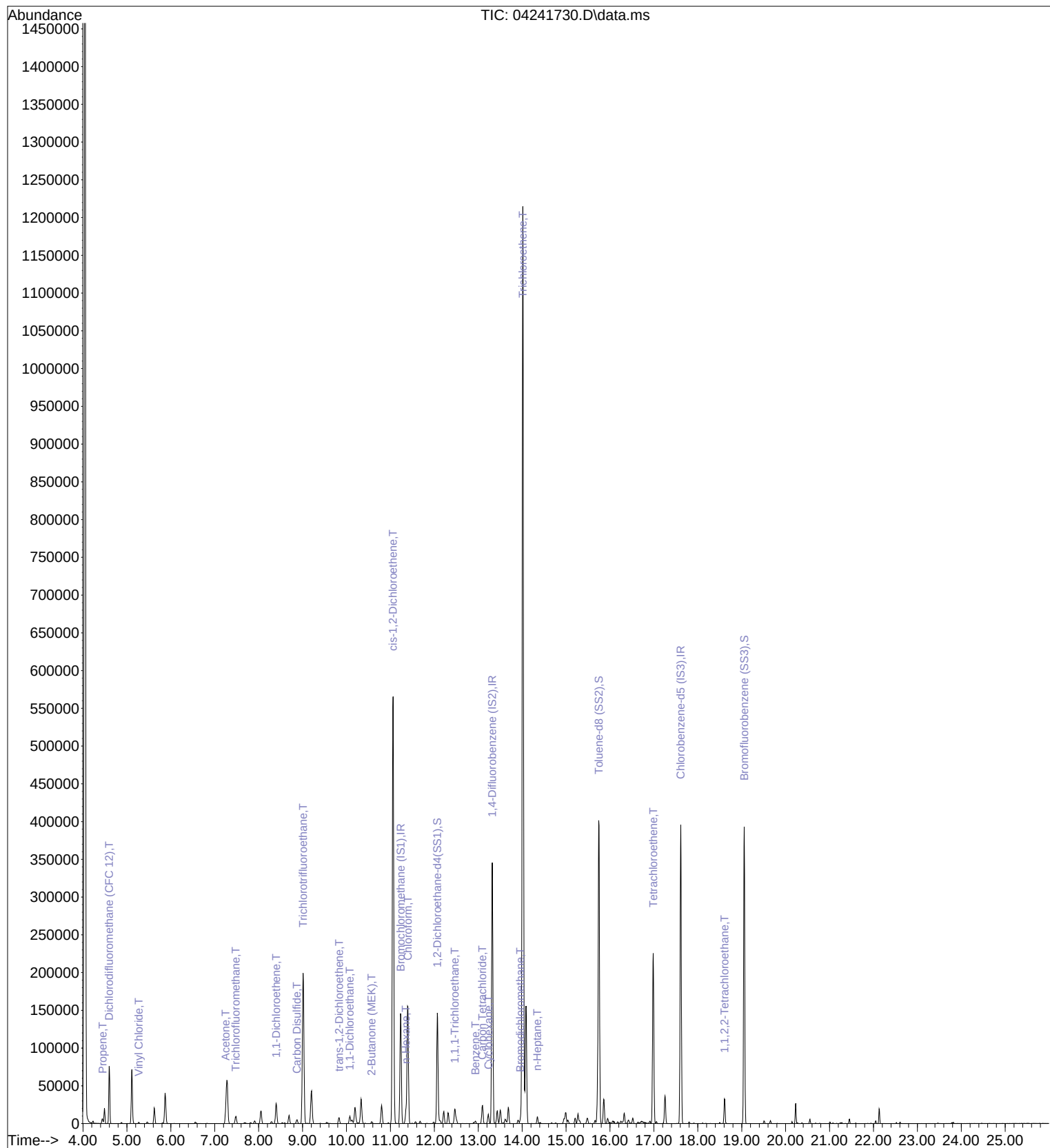
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.34	71	2057	0.376	ng	93
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	15.55	97	189	N.D.		
58) Toluene	15.85	91	566	N.D.		
59) 2-Hexanone	16.10	43	1122	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.72	43	465	N.D.		
63) n-Octane	0.00	57	0	N.D.		
64) Tetrachloroethene	16.99	166	82181	9.835	ng	99
65) Chlorobenzene	17.66	112	114	N.D.		
66) Ethylbenzene	18.17	91	439	N.D.		
67) m- & p-Xylenes	18.17	91	439	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	0.00	104	0	N.D.		
70) o-Xylene	0.00	91	0	N.D.		
71) n-Nonane	0.00	43	0	N.D.		
72) 1,1,2,2-Tetrachloroethane	18.61	83	16116	1.573	ng	98
74) Cumene	19.19	105	191	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	0.00	91	0	N.D.		
77) 3-Ethyltoluene	19.81	105	117	N.D.		
78) 4-Ethyltoluene	19.81	105	117	N.D.		
79) 1,3,5-Trimethylbenzene	19.88	105	105	N.D.		
80) alpha-Methylstyrene	20.22	118	254	N.D.		
81) 2-Ethyltoluene	19.88	105	105	N.D.		
82) 1,2,4-Trimethylbenzene	20.27	105	836	N.D.		
83) n-Decane	20.37	57	357	N.D.		
84) Benzyl Chloride	0.00	91	0	N.D.		
85) 1,3-Dichlorobenzene	0.00	146	0	N.D.		
86) 1,4-Dichlorobenzene	0.00	146	0	N.D.		
87) sec-Butylbenzene	20.68	105	368	N.D.		
88) 4-Isopropyltoluene (p-...	20.68	119	173	N.D.		
89) 1,2,3-Trimethylbenzene	20.68	105	368	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	0.00	68	0	N.D.		
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	21.60	57	321	N.D.		
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	22.60	128	2091	N.D.		
96) n-Dodecane	22.52	57	393	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	18.50	55	251	N.D.		
99) tert-Butylbenzene	20.22	119	460	N.D.		
100) n-Butylbenzene	21.08	91	194	N.D.		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2017 04\24\04241730.D
Acq On : 25 Apr 2017 2:09
Sample : P1701803-001dil (500ml)
Misc : S31-04101701

Vial: 11
Operator: AM/LH
Inst : MS13

Quant Time: Apr 25 10:38:22 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Sat Apr 15 08:29:41 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File: I:\MS13\DATA\2017 04\24\04241730.D

Acq On : 25 Apr 2017 2:09

Operator: AM/LH

Sample : P1701803-001dil (500ml)

Misc : S31-04101701

ALS Vial : 11 Sample Multiplier: 1

Quant Time: Apr 25 10:38:22 2017

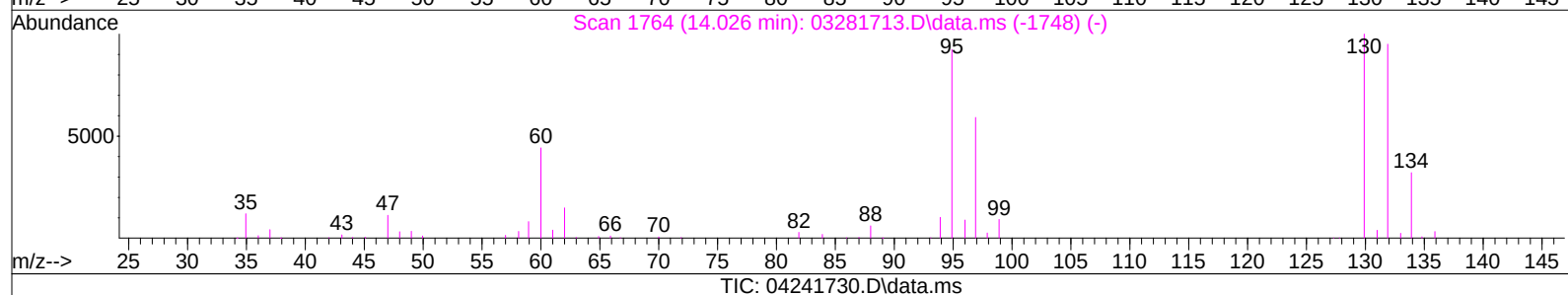
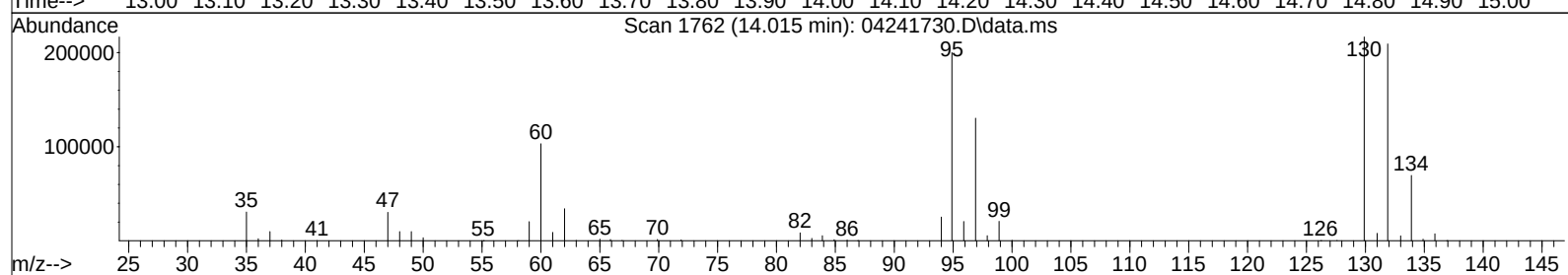
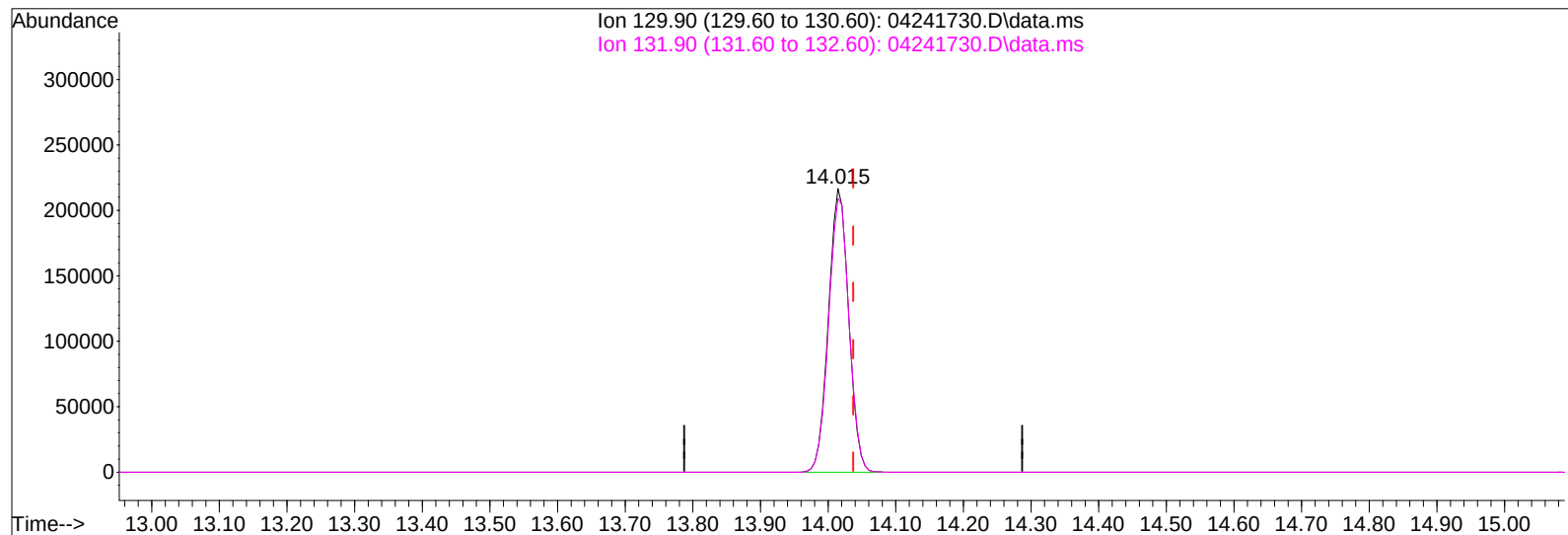
Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Sat Apr 15 08:29:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 04241730.D\data.ms

(47) Trichloroethene (T)

14.015min (-0.023) 65.49ng

response 448430

Ion	Exp%	Act%
129.90	100	100
131.90	95.10	97.59
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS13\DATA\2017 04\22\04221703.D

Acq On : 22 Apr 2017 5:28

Operator: AM/LH

Sample : MB R13042217 1000ml

Misc : S29-04101701/AC00880

ALS Vial : 3 Sample Multiplier: 1

Quant Time: Apr 22 09:10:16 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Sat Apr 15 08:29:41 2017

LH 4/22/17

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.23	130	69315	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.32	114	333481	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.61	82	139141	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.07	65	139657	13.602	ng	-0.03
Spiked Amount	12.500	Range	70 - 130	Recovery	=	108.80%
57) Toluene-d8 (SS2)	15.74	98	331603	12.429	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.44%
73) Bromofluorobenzene (SS3)	19.06	174	143109	12.874	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.96%

Target Compounds

						Qvalue
2) Propene	0.00	42	0	N.D.		
3) Dichlorodifluoromethan...	0.00	85	0	N.D.		
4) Chloromethane	0.00	50	0	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.		
6) Vinyl Chloride	0.00	62	0	N.D.		
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	0.00	45	0	N.D.	d	
11) Acetonitrile	6.83	41	121	N.D.		
12) Acrolein	0.00	56	0	N.D.		
13) Acetone	7.25	58	743	0.160	ng	# 37
14) Trichlorofluoromethane	0.00	101	0	N.D.		
15) 2-Propanol (Isopropanol)	0.00	45	0	N.D.		
16) Acrylonitrile	0.00	53	0	N.D.		
17) 1,1-Dichloroethene	0.00	96	0	N.D.		
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.		
19) Methylene Chloride	0.00	84	0	N.D.		
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.		
21) Trichlorotrifluoroethane	0.00	151	0	N.D.		
22) Carbon Disulfide	8.88	76	927	N.D.		
23) trans-1,2-Dichloroethene	0.00	61	0	N.D.		
24) 1,1-Dichloroethane	0.00	63	0	N.D.		
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.		
27) 2-Butanone (MEK)	0.00	72	0	N.D.		
28) cis-1,2-Dichloroethene	0.00	61	0	N.D.		
29) Diisopropyl Ether	0.00	87	0	N.D.		
30) Ethyl Acetate	0.00	61	0	N.D.		
31) n-Hexane	0.00	57	0	N.D.		
32) Chloroform	0.00	83	0	N.D.		
34) Tetrahydrofuran (THF)	0.00	72	0	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	0.00	62	0	N.D.		
38) 1,1,1-Trichloroethane	0.00	97	0	N.D.		
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	12.91	56	464	N.D.		
41) Benzene	12.93	78	109	N.D.		
42) Carbon Tetrachloride	0.00	117	0	N.D.		
43) Cyclohexane	0.00	84	0	N.D.		
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D.		
47) Trichloroethene	0.00	130	0	N.D.		
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.		

Data File: I:\MS13\DATA\2017 04\22\04221703.D

Acq On : 22 Apr 2017 5:28

Operator: AM/LH

Sample : MB R13042217 1000ml

Misc : S29-04101701/AC00880

ALS Vial : 3 Sample Multiplier: 1

Quant Time: Apr 22 09:10:16 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Sat Apr 15 08:29:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	0.00	100	0	N.D.		
51) n-Heptane	0.00	71	0	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	0.00	91	0	N.D.		
59) 2-Hexanone	0.00	43	0	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	0.00	43	0	N.D.		
63) n-Octane	0.00	57	0	N.D.		
64) Tetrachloroethene	0.00	166	0	N.D.		
65) Chlorobenzene	0.00	112	0	N.D.		
66) Ethylbenzene	0.00	91	0	N.D.		
67) m- & p-Xylenes	0.00	91	0	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	0.00	104	0	N.D.		
70) o-Xylene	0.00	91	0	N.D.		
71) n-Nonane	0.00	43	0	N.D.		
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.		
74) Cumene	0.00	105	0	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	0.00	91	0	N.D.		
77) 3-Ethyltoluene	0.00	105	0	N.D.		
78) 4-Ethyltoluene	0.00	105	0	N.D.		
79) 1,3,5-Trimethylbenzene	0.00	105	0	N.D.		
80) alpha-Methylstyrene	0.00	118	0	N.D.		
81) 2-Ethyltoluene	0.00	105	0	N.D.		
82) 1,2,4-Trimethylbenzene	0.00	105	0	N.D.		
83) n-Decane	20.55	57	289	N.D.		
84) Benzyl Chloride	20.40	91	122	N.D.		
85) 1,3-Dichlorobenzene	0.00	146	0	N.D.		
86) 1,4-Dichlorobenzene	0.00	146	0	N.D.		
87) sec-Butylbenzene	0.00	105	0	N.D.		
88) 4-Isopropyltoluene (p-...	0.00	119	0	N.D.		
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	0.00	68	0	N.D.		
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	0.00	57	0	N.D.		
94) 1,2,4-Trichlorobenzene	22.49	180	557	N.D.		
95) Naphthalene	22.61	128	2297	N.D.		
96) n-Dodecane	0.00	57	0	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.		
99) tert-Butylbenzene	0.00	119	0	N.D.		
100) n-Butylbenzene	0.00	91	0	N.D.		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File: I:\MS13\DATA\2017 04\22\04221703.D

Acq On : 22 Apr 2017 5:28

Operator: AM/LH

Sample : MB R13042217 1000ml

Misc : S29-04101701/AC00880

ALS Vial : 3 Sample Multiplier: 1

Quant Time: Apr 22 09:10:16 2017

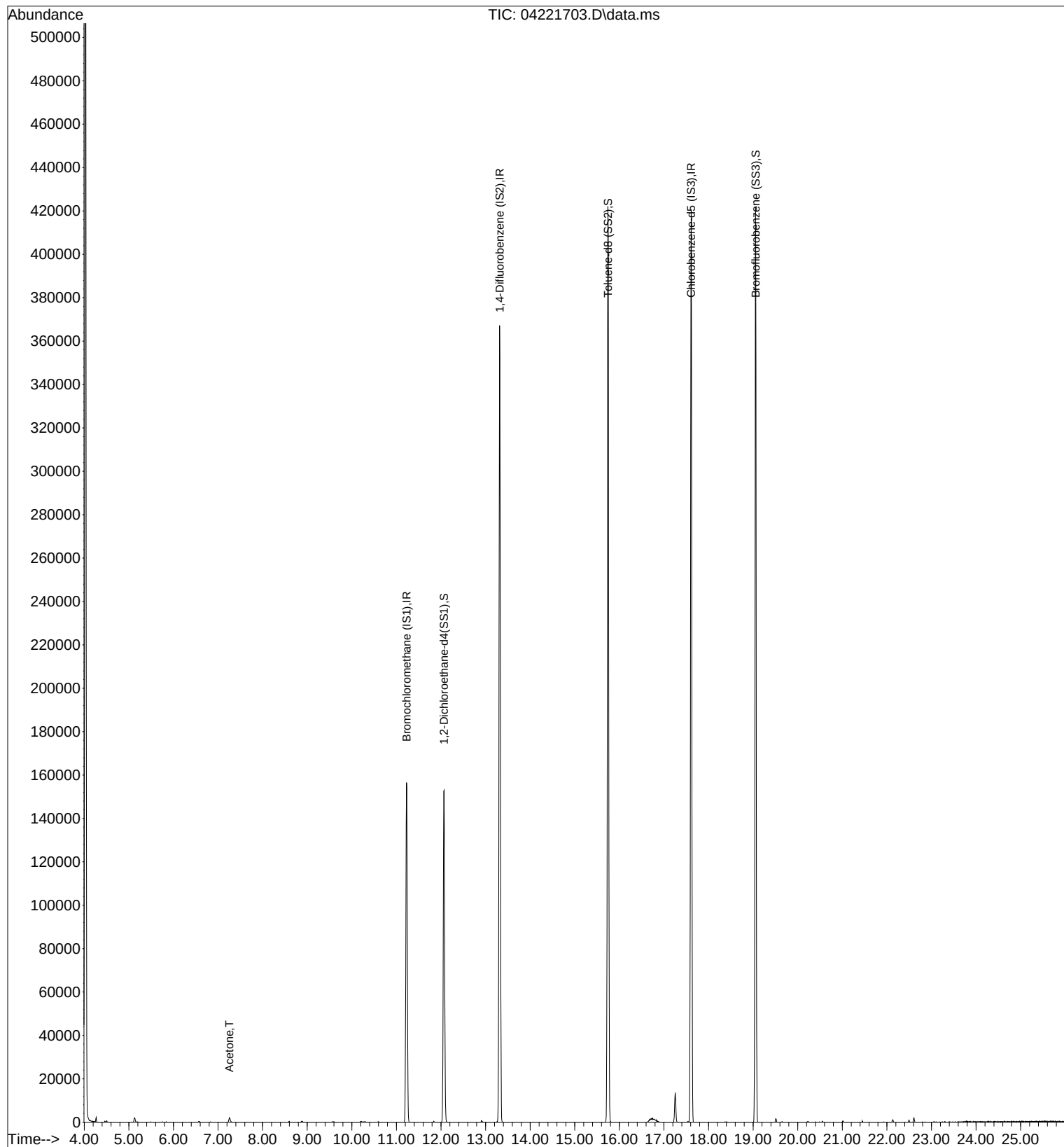
Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Sat Apr 15 08:29:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2017 04\24\04241704.D
 Acq On : 24 Apr 2017 10:30
 Sample : MB R13042417 1000ml
 Misc : S31-04101701/AC00880

Vial: 3
 Operator: AM/LH
 Inst : MS13

Quant Time: Apr 24 11:01:15 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Sat Apr 15 08:29:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 4/24/17

AM 4/24/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.23	130	76138	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.32	114	366352	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.61	82	152224	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.07	65	153526	13.613	ng	-0.03
Spiked Amount	12.500	Range 70 - 130	Recovery	=	108.88%	
57) Toluene-d8 (SS2)	15.74	98	363859	12.466	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	99.76%	
73) Bromofluorobenzene (SS3)	19.06	174	157259	12.931	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	103.44%	

Target Compounds

						Qvalue
2) Propene	4.46	42	123	N.D.		
3) Dichlorodifluoromethan...	0.00	85	0	N.D.		
4) Chloromethane	0.00	50	0	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.		
6) Vinyl Chloride	0.00	62	0	N.D.		
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.58	45	828	0.179	ng	# 65
11) Acetonitrile	6.83	41	64	N.D.		
12) Acrolein	7.05	56	79	N.D.		
13) Acetone	7.25	58	1213	0.238	ng	# 64
14) Trichlorofluoromethane	0.00	101	0	N.D.		
15) 2-Propanol (Isopropanol)	0.00	45	0	N.D.		
16) Acrylonitrile	0.00	53	0	N.D.		
17) 1,1-Dichloroethene	0.00	96	0	N.D.		
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.		
19) Methylene Chloride	0.00	84	0	N.D.		
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.		
21) Trichlorotrifluoroethane	0.00	151	0	N.D.		
22) Carbon Disulfide	8.89	76	945	N.D.		
23) trans-1,2-Dichloroethene	0.00	61	0	N.D.		
24) 1,1-Dichloroethane	0.00	63	0	N.D.		
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.		
27) 2-Butanone (MEK)	0.00	72	0	N.D.		
28) cis-1,2-Dichloroethene	0.00	61	0	N.D.		
29) Diisopropyl Ether	0.00	87	0	N.D.		
30) Ethyl Acetate	0.00	61	0	N.D.		
31) n-Hexane	0.00	57	0	N.D.		
32) Chloroform	0.00	83	0	N.D.		
34) Tetrahydrofuran (THF)	0.00	72	0	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	0.00	62	0	N.D.		
38) 1,1,1-Trichloroethane	0.00	97	0	N.D.		
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	12.93	78	296	N.D.		
42) Carbon Tetrachloride	0.00	117	0	N.D.		
43) Cyclohexane	0.00	84	0	N.D.		
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D.		
47) Trichloroethene	0.00	130	0	N.D.		
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.		
50) Methyl Methacrylate	0.00	100	0	N.D.		

Data File : I:\MS13\DATA\2017 04\24\04241704.D
 Acq On : 24 Apr 2017 10:30
 Sample : MB R13042417 1000ml
 Misc : S31-04101701/AC00880

Vial: 3
 Operator: AM/LH
 Inst : MS13

Quant Time: Apr 24 11:01:15 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Sat Apr 15 08:29:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

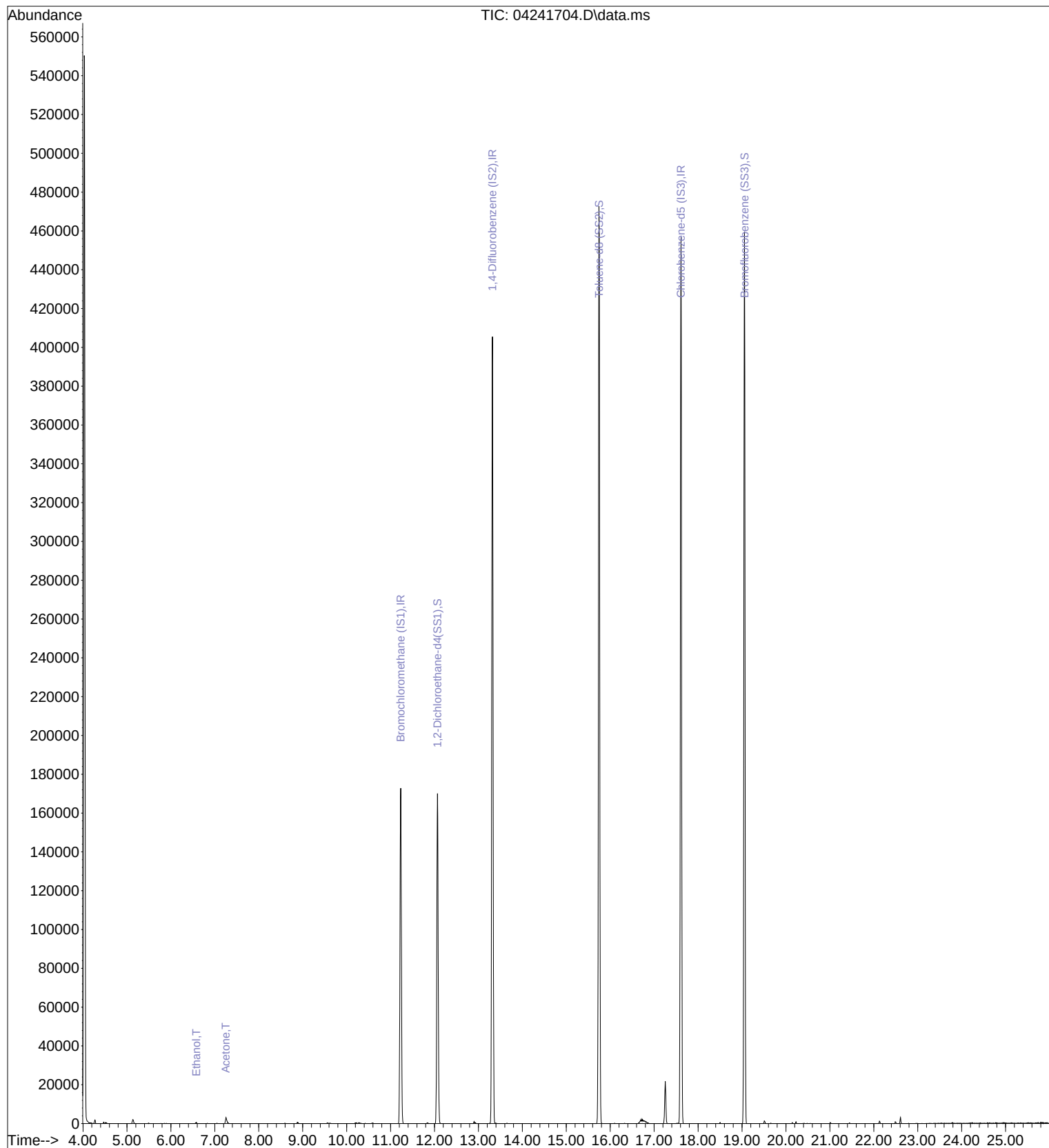
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	0.00	71	0	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	0.00	91	0	N.D.		
59) 2-Hexanone	16.10	43	112	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	0.00	43	0	N.D.		
63) n-Octane	0.00	57	0	N.D.		
64) Tetrachloroethene	0.00	166	0	N.D.		
65) Chlorobenzene	0.00	112	0	N.D.		
66) Ethylbenzene	0.00	91	0	N.D.		
67) m- & p-Xylenes	0.00	91	0	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	0.00	104	0	N.D.		
70) o-Xylene	0.00	91	0	N.D.		
71) n-Nonane	0.00	43	0	N.D.		
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.		
74) Cumene	19.06	105	184	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	0.00	91	0	N.D.		
77) 3-Ethyltoluene	0.00	105	0	N.D.		
78) 4-Ethyltoluene	0.00	105	0	N.D.		
79) 1,3,5-Trimethylbenzene	0.00	105	0	N.D.		
80) alpha-Methylstyrene	0.00	118	0	N.D.		
81) 2-Ethyltoluene	0.00	105	0	N.D.		
82) 1,2,4-Trimethylbenzene	0.00	105	0	N.D.		
83) n-Decane	20.55	57	106	N.D.		
84) Benzyl Chloride	0.00	91	0	N.D.		
85) 1,3-Dichlorobenzene	20.42	146	110	N.D.		
86) 1,4-Dichlorobenzene	20.42	146	110	N.D.		
87) sec-Butylbenzene	0.00	105	0	N.D.		
88) 4-Isopropyltoluene (p-...	0.00	119	0	N.D.		
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	0.00	68	0	N.D.		
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	21.45	57	118	N.D.		
94) 1,2,4-Trichlorobenzene	22.49	180	551	N.D.		
95) Naphthalene	22.61	128	2241	N.D.		
96) n-Dodecane	22.61	57	356	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.		
99) tert-Butylbenzene	0.00	119	0	N.D.		
100) n-Butylbenzene	0.00	91	0	N.D.		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2017 04\24\04241704.D
Acq On : 24 Apr 2017 10:30
Sample : MB R13042417 1000ml
Misc : S31-04101701/AC00880

Vial: 3
Operator: AM/LH
Inst : MS13

Quant Time: Apr 24 11:01:15 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Sat Apr 15 08:29:41 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File: I:\MS13\DATA\2017 04\22\04221705.D

Acq On : 22 Apr 2017 6:39

Operator: AM/LH

Sample : LCS R13042217 25ng

Misc : S29-04101701/S31-04181701 (5/17)

ALS Vial : 3 Sample Multiplier: 1

Quant Time: Apr 22 07:56:44 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Sat Apr 15 08:29:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 4/22/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.25	130	74199	12.500	ng	0.02
37) 1,4-Difluorobenzene (IS2)	13.33	114	342545	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.61	82	144256	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.08	65	146955	13.371	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	106.96%
57) Toluene-d8 (SS2)	15.75	98	341804	12.357	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.88%
73) Bromofluorobenzene (SS3)	19.06	174	150246	13.037	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	104.32%

Target Compounds

						Qvalue
2) Propene	4.44	42	139685	20.702	ng	96
3) Dichlorodifluoromethan...	4.59	85	379117	25.336	ng	100
4) Chloromethane	4.86	50	201731	22.790	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	5.12	135	192467	24.589	ng	98
6) Vinyl Chloride	5.27	62	203339	22.786	ng	100
7) 1,3-Butadiene	5.52	54	157232	25.690	ng	98
8) Bromomethane	5.94	94	144208	24.594	ng	99
9) Chloroethane	6.26	64	103801	23.529	ng	99
10) Ethanol	6.62	45	527299	116.769	ng	100
11) Acetonitrile	6.86	41	257324	22.108	ng	99
12) Acrolein	7.03	56	92690	22.052	ng	99
13) Acetone	7.24	58	531005	106.768	ng	# 62
14) Trichlorofluoromethane	7.48	101	380770	25.362	ng	99
15) 2-Propanol (Isopropanol)	7.71	45	871584	47.183	ng	98
16) Acrylonitrile	7.96	53	194587	23.697	ng	100
17) 1,1-Dichloroethene	8.40	96	156081	24.031	ng	96
18) 2-Methyl-2-Propanol (t...	8.55	59	990458	48.171	ng	99
19) Methylene Chloride	8.61	84	153641	21.009	ng	99
20) 3-Chloro-1-propene (Al...	8.77	41	244599	25.185	ng	99
21) Trichlorotrifluoroethane	9.02	151	184185	24.551	ng	99
22) Carbon Disulfide	8.88	76	556273	22.927	ng	100
23) trans-1,2-Dichloroethene	9.84	61	244633	24.824	ng	99
24) 1,1-Dichloroethane	10.09	63	291534	23.749	ng	99
25) Methyl tert-Butyl Ether	10.17	73	577206	24.555	ng	98
26) Vinyl Acetate	10.33	86	189530	122.406	ng	98
27) 2-Butanone (MEK)	10.57	72	102033	23.875	ng	96
28) cis-1,2-Dichloroethene	11.08	61	234220	24.646	ng	100
29) Diisopropyl Ether	11.36	87	131770	20.730	ng	98
30) Ethyl Acetate	11.36	61	102862	45.504	ng	99
31) n-Hexane	11.35	57	220050	22.092	ng	99
32) Chloroform	11.41	83	330729	24.663	ng	99
34) Tetrahydrofuran (THF)	11.80	72	98879	21.643	ng	97
35) Ethyl tert-Butyl Ether	11.94	87	216023	24.186	ng	98
36) 1,2-Dichloroethane	12.19	62	304653	25.948	ng	100
38) 1,1,1-Trichloroethane	12.47	97	338133	26.178	ng	100
39) Isopropyl Acetate	12.88	61	175278	47.048	ng	95
40) 1-Butanol	12.90	56	305023	45.751	ng	95
41) Benzene	12.94	78	588971	22.458	ng	100
42) Carbon Tetrachloride	13.10	117	322147	27.745	ng	100
43) Cyclohexane	13.23	84	463426	47.362	ng	97
44) tert-Amyl Methyl Ether	13.56	73	502789	23.911	ng	99
45) 1,2-Dichloropropane	13.78	63	136646	23.889	ng	99
46) Bromodichloromethane	13.96	83	270732	27.919	ng	100
47) Trichloroethene	14.02	130	194740	25.199	ng	99
48) 1,4-Dioxane	13.99	88	133616	25.305	ng	98
49) 2,2,4-Trimethylpentane...	14.09	57	588176	23.008	ng	96

Data File: I:\MS13\DATA\2017 04\22\04221705.D

Acq On : 22 Apr 2017 6:39

Operator: AM/LH

Sample : LCS R13042217 25ng

Misc : S29-04101701/S31-04181701 (5/17)

ALS Vial : 3 Sample Multiplier: 1

Quant Time: Apr 22 07:56:44 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Sat Apr 15 08:29:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.22	100	139348	49.920	ng	99
51) n-Heptane	14.35	71	138149	22.351	ng	99
52) cis-1,3-Dichloropropene	14.87	75	276100	25.598	ng	100
53) 4-Methyl-2-pentanone	14.90	58	139419	24.275	ng	99
54) trans-1,3-Dichloropropene	15.39	75	289626	27.160	ng	100
55) 1,1,2-Trichloroethane	15.56	97	155159	25.683	ng	99
58) Toluene	15.85	91	640414	22.916	ng	99
59) 2-Hexanone	16.09	43	372645	23.402	ng	99
60) Dibromochloromethane	16.25	129	239574	26.449	ng	99
61) 1,2-Dibromoethane	16.51	107	194202	25.206	ng	99
62) n-Butyl Acetate	16.71	43	403774	23.557	ng	99
63) n-Octane	16.85	57	119592	21.669	ng	96
64) Tetrachloroethene	16.99	166	225189	24.194	ng	100
65) Chlorobenzene	17.66	112	464376	23.687	ng	100
66) Ethylbenzene	18.02	91	787437	24.016	ng	99
67) m- & p-Xylenes	18.19	91	1263690	48.519	ng	99
68) Bromoform	18.25	173	226293	26.992	ng	99
69) Styrene	18.53	104	498108	24.581	ng	98
70) o-Xylene	18.64	91	644583	24.601	ng	98
71) n-Nonane	18.84	43	293305	22.039	ng	99
72) 1,1,2,2-Tetrachloroethane	18.61	83	263313	23.068	ng	100
74) Cumene	19.19	105	843401	25.042	ng	100
75) alpha-Pinene	19.56	93	423933	24.219	ng	99
76) n-Propylbenzene	19.67	91	964208	25.121	ng	99
77) 3-Ethyltoluene	19.77	105	851706	24.470	ng	99
78) 4-Ethyltoluene	19.81	105	795842	25.321	ng	99
79) 1,3,5-Trimethylbenzene	19.88	105	708699	24.493	ng	98
80) alpha-Methylstyrene	20.02	118	394845	25.709	ng	99
81) 2-Ethyltoluene	20.06	105	821018	24.815	ng	100
82) 1,2,4-Trimethylbenzene	20.27	105	731386	24.701	ng	98
83) n-Decane	20.37	57	302823	20.817	ng	99
84) Benzyl Chloride	20.40	91	675269	27.481	ng	100
85) 1,3-Dichlorobenzene	20.42	146	443903	25.760	ng	100
86) 1,4-Dichlorobenzene	20.49	146	450120	25.439	ng	100
87) sec-Butylbenzene	20.54	105	920163	24.684	ng	99
88) 4-Isopropyltoluene (p-...	20.69	119	937341	24.863	ng	99
89) 1,2,3-Trimethylbenzene	20.68	105	751804	25.454	ng	98
90) 1,2-Dichlorobenzene	20.82	146	424274	25.342	ng	100
91) d-Limonene	20.83	68	252857	22.431	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.24	157	166440	25.902	ng	96
93) n-Undecane	21.59	57	311281	21.645	ng	100
94) 1,2,4-Trichlorobenzene	22.49	180	362711	26.629	ng	100
95) Naphthalene	22.61	128	962815	26.655	ng	99
96) n-Dodecane	22.61	57	299346	21.228	ng	100
97) Hexachlorobutadiene	22.96	225	253766	26.639	ng	100
98) Cyclohexanone	18.32	55	222559	23.181	ng	98
99) tert-Butylbenzene	20.27	119	732525	25.144	ng	100
100) n-Butylbenzene	21.09	91	732641	24.496	ng	100

(#)=qualifier out of range (m)=manual integration (+)=signals summed

Data File: I:\MS13\DATA\2017 04\22\04221705.D

Acq On : 22 Apr 2017 6:39

Operator: AM/LH

Sample : LCS R13042217 25ng

Misc : S29-04101701/S31-04181701 (5/17)

ALS Vial : 3 Sample Multiplier: 1

Quant Time: Apr 22 07:56:44 2017

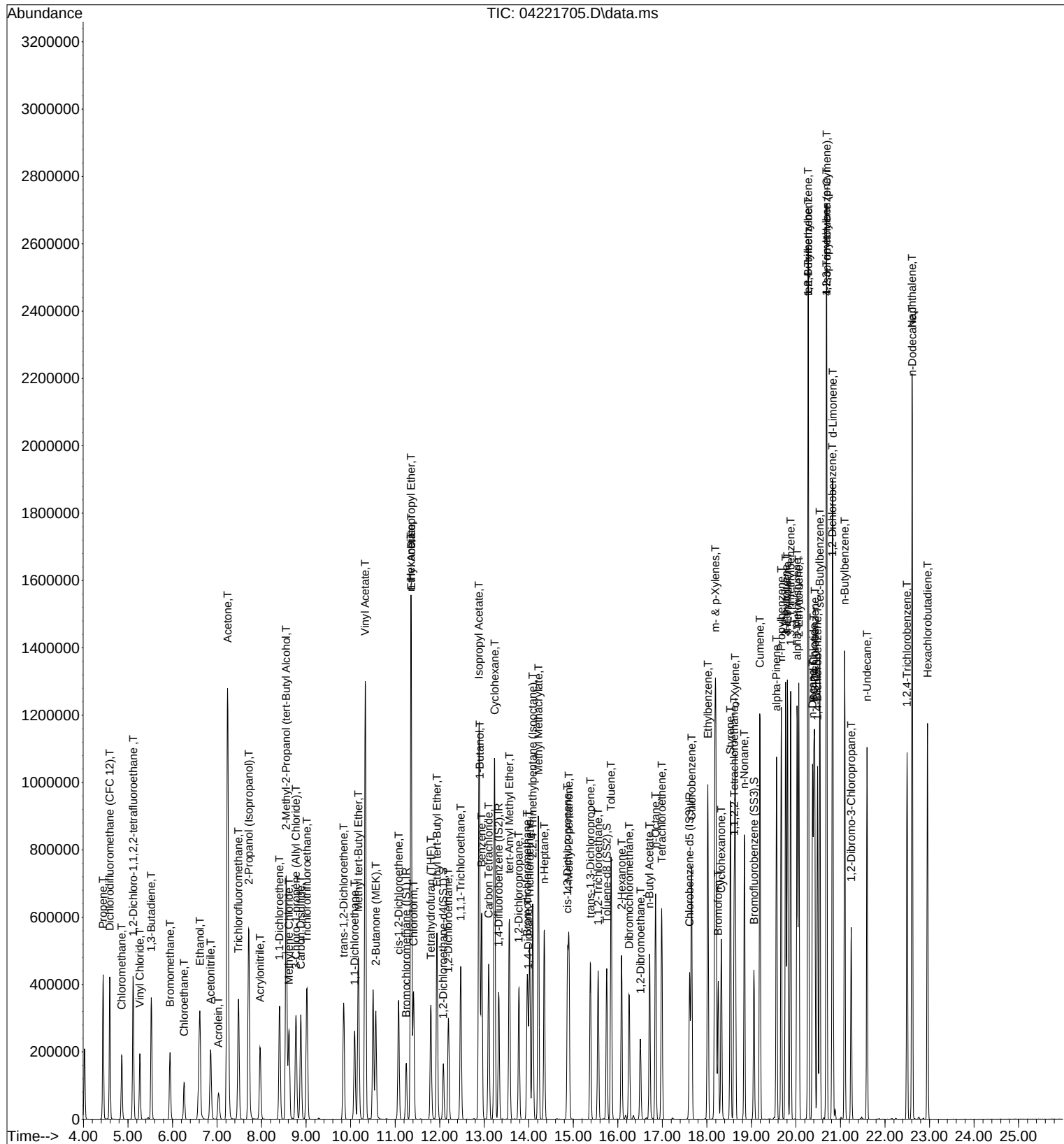
Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Sat Apr 15 08:29:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2017 04\24\04241706.D
 Acq On : 24 Apr 2017 11:40
 Sample : LCS R13042417 25ng
 Misc : S31-04101701/S31-04181701 (5/17)

Vial: 3
 Operator: AM/LH
 Inst : MS13

Quant Time: Apr 24 12:23:34 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Sat Apr 15 08:29:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 4/24/17

AM 4/24/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.25	130	79424	12.500	ng	0.02
37) 1,4-Difluorobenzene (IS2)	13.33	114	377533	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.61	82	158484	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.08	65	161137	13.696	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	109.60%	
57) Toluene-d8 (SS2)	15.75	98	372085	12.244	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.92%	
73) Bromofluorobenzene (SS3)	19.06	174	162328	12.821	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	102.56%	

Target Compounds

						Qvalue
2) Propene	4.44	42	153542	21.259	ng	95
3) Dichlorodifluoromethan...	4.59	85	420037	26.223	ng	100
4) Chloromethane	4.86	50	220929	23.316	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	5.11	135	209574	25.013	ng	98
6) Vinyl Chloride	5.26	62	223951	23.445	ng	100
7) 1,3-Butadiene	5.52	54	172599	26.345	ng	99
8) Bromomethane	5.94	94	157147	25.038	ng	100
9) Chloroethane	6.26	64	112623	23.850	ng	99
10) Ethanol	6.62	45	583904	120.798	ng	100
11) Acetonitrile	6.86	41	282957	22.711	ng	99
12) Acrolein	7.04	56	99259	22.062	ng	100
13) Acetone	7.24	58	578081	108.587	ng	# 62
14) Trichlorofluoromethane	7.48	101	415476	25.853	ng	99
15) 2-Propanol (Isopropanol)	7.71	45	955569	48.326	ng	97
16) Acrylonitrile	7.96	53	212229	24.145	ng	99
17) 1,1-Dichloroethene	8.40	96	169059	24.317	ng	95
18) 2-Methyl-2-Propanol (t...	8.55	59	1071639	48.691	ng	99
19) Methylene Chloride	8.61	84	165895	21.192	ng	99
20) 3-Chloro-1-propene (Al...	8.77	41	266954	25.679	ng	100
21) Trichlorotrifluoroethane	9.02	151	198005	24.657	ng	100
22) Carbon Disulfide	8.88	76	603237	23.227	ng	100
23) trans-1,2-Dichloroethene	9.84	61	266436	25.258	ng	98
24) 1,1-Dichloroethane	10.09	63	315989	24.048	ng	99
25) Methyl tert-Butyl Ether	10.17	73	627055	24.920	ng	98
26) Vinyl Acetate	10.33	86	207887	125.429	ng	100
27) 2-Butanone (MEK)	10.57	72	113223	24.751	ng	99
28) cis-1,2-Dichloroethene	11.08	61	255925	25.158	ng	99
29) Diisopropyl Ether	11.36	87	147851	21.729	ng	95
30) Ethyl Acetate	11.36	61	111951	46.266	ng	98
31) n-Hexane	11.36	57	240294	22.537	ng	98
32) Chloroform	11.41	83	357062	24.876	ng	99
34) Tetrahydrofuran (THF)	11.80	72	105563	21.586	ng	99
35) Ethyl tert-Butyl Ether	11.94	87	235547	24.637	ng	98
36) 1,2-Dichloroethane	12.19	62	329189	26.194	ng	100
38) 1,1,1-Trichloroethane	12.47	97	366255	25.728	ng	100
39) Isopropyl Acetate	12.88	61	193205	47.053	ng	95
40) 1-Butanol	12.90	56	333440	45.379	ng	95
41) Benzene	12.94	78	638142	22.078	ng	99
42) Carbon Tetrachloride	13.10	117	351240	27.447	ng	100
43) Cyclohexane	13.23	84	504295	46.762	ng	98
44) tert-Amyl Methyl Ether	13.56	73	542161	23.394	ng	99
45) 1,2-Dichloropropane	13.78	63	149817	23.764	ng	100
46) Bromodichloromethane	13.96	83	291189	27.246	ng	100
47) Trichloroethene	14.02	130	210547	24.719	ng	99
48) 1,4-Dioxane	13.99	88	143780	24.706	ng	99
49) 2,2,4-Trimethylpentane...	14.09	57	643354	22.834	ng	97
50) Methyl Methacrylate	14.22	100	148658	48.320	ng	99

Data File : I:\MS13\DATA\2017 04\24\04241706.D
 Acq On : 24 Apr 2017 11:40
 Sample : LCS R13042417 25ng
 Misc : S31-04101701/S31-04181701 (5/17)

Vial: 3
 Operator: AM/LH
 Inst : MS13

Quant Time: Apr 24 12:23:34 2017
 Quant Method : I:\MS13\METHODS\R13032817.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Apr 15 08:29:41 2017
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

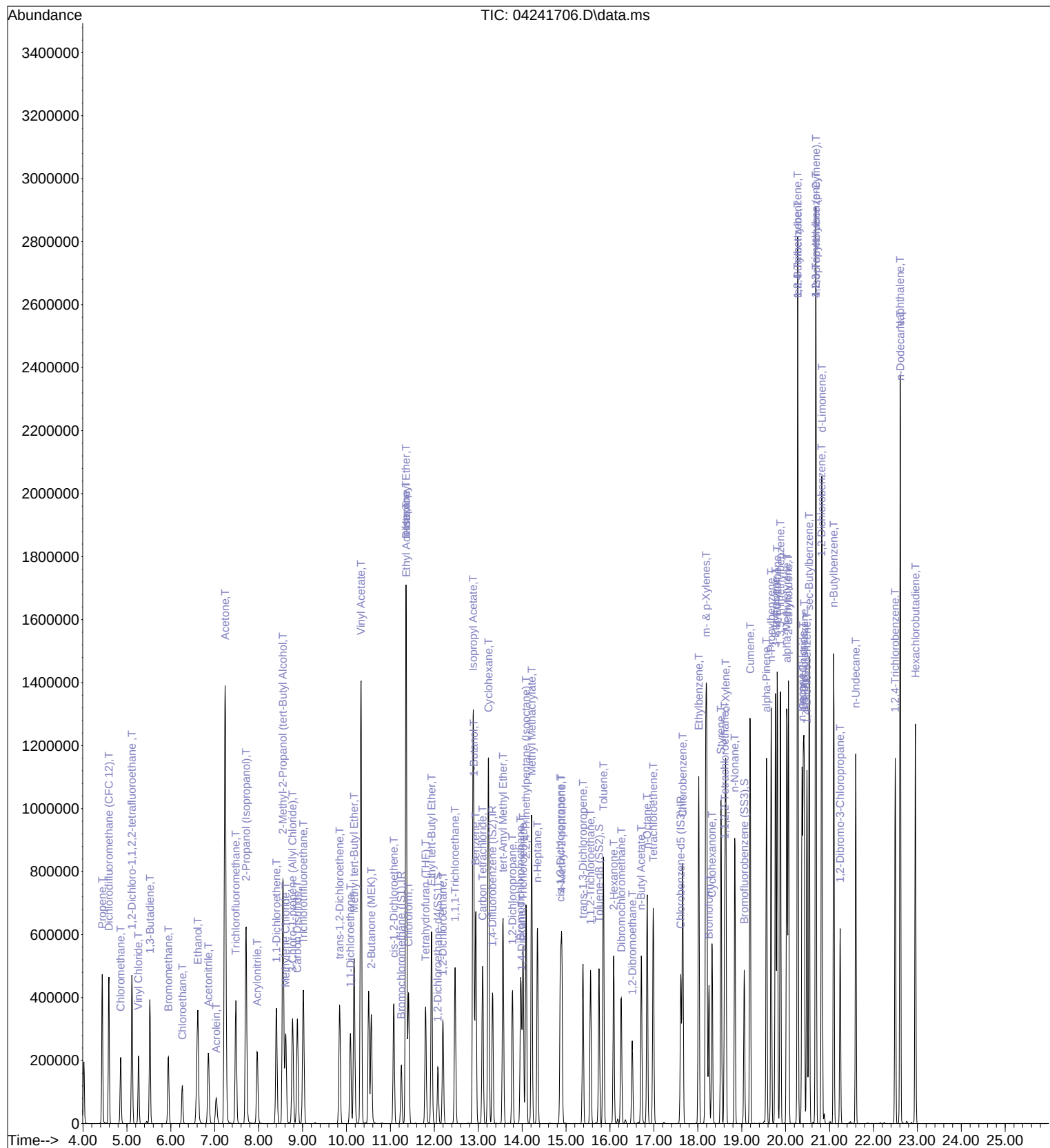
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.35	71	150696	22.121	ng	100
52) cis-1,3-Dichloropropene	14.87	75	302395	25.438	ng	100
53) 4-Methyl-2-pentanone	14.90	58	149522	23.622	ng	97
54) trans-1,3-Dichloropropene	15.39	75	313960	26.713	ng	100
55) 1,1,2-Trichloroethane	15.56	97	168573	25.317	ng	99
58) Toluene	15.85	91	695655	22.658	ng	99
59) 2-Hexanone	16.09	43	405224	23.164	ng	98
60) Dibromochloromethane	16.26	129	261758	26.303	ng	99
61) 1,2-Dibromoethane	16.51	107	207741	24.543	ng	100
62) n-Butyl Acetate	16.71	43	436621	23.186	ng	99
63) n-Octane	16.85	57	130532	21.528	ng	98
64) Tetrachloroethene	16.99	166	247427	24.197	ng	100
65) Chlorobenzene	17.66	112	506419	23.513	ng	99
66) Ethylbenzene	18.02	91	854148	23.712	ng	99
67) m- & p-Xylenes	18.19	91	1377043	48.125	ng	98
68) Bromoform	18.25	173	243724	26.461	ng	99
69) Styrene	18.53	104	539613	24.238	ng	99
70) o-Xylene	18.64	91	699128	24.288	ng	98
71) n-Nonane	18.84	43	317697	21.728	ng	99
72) 1,1,2,2-Tetrachloroethane	18.61	83	285016	22.727	ng	99
74) Cumene	19.19	105	911908	24.645	ng	99
75) alpha-Pinene	19.56	93	455523	23.688	ng	98
76) n-Propylbenzene	19.67	91	1034724	24.538	ng	99
77) 3-Ethyltoluene	19.77	105	914492	23.915	ng	99
78) 4-Ethyltoluene	19.81	105	867973	25.137	ng	98
79) 1,3,5-Trimethylbenzene	19.88	105	766706	24.119	ng	98
80) alpha-Methylstyrene	20.02	118	420267	24.908	ng	99
81) 2-Ethyltoluene	20.06	105	883246	24.299	ng	99
82) 1,2,4-Trimethylbenzene	20.27	105	789535	24.271	ng	98
83) n-Decane	20.37	57	326731	20.444	ng	98
84) Benzyl Chloride	20.40	91	723738	26.809	ng	99
85) 1,3-Dichlorobenzene	20.42	146	475534	25.118	ng	100
86) 1,4-Dichlorobenzene	20.49	146	485087	24.954	ng	99
87) sec-Butylbenzene	20.54	105	992401	24.232	ng	99
88) 4-Isopropyltoluene (p-...	20.69	119	1011795	24.429	ng	98
89) 1,2,3-Trimethylbenzene	20.68	105	807777	24.894	ng	98
90) 1,2-Dichlorobenzene	20.82	146	459557	24.985	ng	100
91) d-Limonene	20.83	68	274486	22.164	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.24	157	179642	25.447	ng	96
93) n-Undecane	21.60	57	334763	21.188	ng	100
94) 1,2,4-Trichlorobenzene	22.49	180	385551	25.765	ng	100
95) Naphthalene	22.61	128	1029766	25.949	ng	100
96) n-Dodecane	22.61	57	313625	20.244	ng	99
97) Hexachlorobutadiene	22.96	225	266869	25.500	ng	99
98) Cyclohexanone	18.32	55	239318	22.689	ng	98
99) tert-Butylbenzene	20.27	119	791897	24.741	ng	99
100) n-Butylbenzene	21.09	91	792439	24.117	ng	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2017 04\24\04241706.D
Acq On : 24 Apr 2017 11:40
Sample : LCS R13042417 25ng
Misc : S31-04101701/S31-04181701 (5/17)

Vial: 3
Operator: AM/LH
Inst : MS13

Quant Time: Apr 24 12:23:34 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Sat Apr 15 08:29:41 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



Method Path : I:\MS13\METHODS\
 Method File : R13032817.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Wed Mar 29 09:17:20 2017
 Response Via : Initial Calibration

LH 4/11/17
 3/29/17

Calibration Files

0.08=03281707.D 0.10=03281708.D 0.20=03281709.D 0.40=03281710.D 1.0 =03281711.D 5.0 =03281712.D 25 =03281713.D
 50 =03281714.D 100 =03281715.D

Compound	0.08	0.10	0.20	0.40	1.0	5.0	25	50	100	Avg	%RSD
-----ISTD-----											
1) IR Bromochloromethane...	1.458	1.356	1.298	1.399	1.122	0.987	1.000	0.830	0.782	1.137	22.16
2) T Propene											18.29
3) T Dichlorodifluo...	2.850	2.661	3.312	2.642	2.390	2.390	2.408	2.098	1.806	2.521	19.36
4) T Chloromethane	1.795	1.758	1.356	1.944	1.507	1.280	1.436	1.293	1.052	1.491	11.46
5) T 1,2-Dichloro-1...	1.324	1.432	1.364	1.621	1.357	1.226	1.252	1.179	1.112	1.319	13.80
6) T Vinyl Chloride	1.773	1.512	1.294	1.875	1.580	1.401	1.455	1.363	1.276	1.503	9.15
7) T 1,3-Butadiene	1.037	1.082	0.887	1.228	0.993	0.970	1.075	1.019	0.988	1.031	10.85
8) T Bromomethane	0.908	1.043	1.027	1.223	0.998	0.883	0.992	0.938	0.878	0.988	9.46
9) T Chloroethane			0.726	0.892	0.756	0.706	0.740	0.704	0.680	0.743	13.44
10) T Ethanol	0.876	0.798	0.702	0.956	0.784	0.671	0.724	0.677	0.659	0.761	10.03
11) T Acetonitrile	2.138	2.089	2.309	1.899	1.899	1.765	1.891	1.825	1.771	1.961	13.23
12) T Acrolein	0.680	0.844	0.763	0.850	0.722	0.637	0.662	0.614	0.601	0.708	18.99
13) T Acetone	1.116	0.982	0.854	0.990	0.796	0.700	0.743	0.697	0.662	0.838	12.91
14) T Trichlorofluor...	2.943	2.674	2.498	3.086	2.583	2.288	2.343	2.203	2.145	2.529	13.43
15) T 2-Propanol (Is...	3.284	3.541	3.107	3.842	3.113	2.788	3.050	2.861	2.421	3.112	10.45
16) T Acrylonitrile	1.513	1.175	1.400	1.669	1.419	1.269	1.383	1.332	1.291	1.383	9.70
17) T 1,1-Dichloroet...	1.077	1.143	1.131	1.339	1.083	0.998	1.064	1.021	0.992	1.094	12.67
18) T 2-Methyl-2-Pro...	4.145	3.625	3.406	4.135	3.368	3.126	3.349	3.168	2.853	3.464	24.57
19) T Methylene Chlo...	1.896	1.414	1.226	1.420	1.116	1.008	1.037	1.003	0.968	1.232	8.31
20) T 3-Chloro-1-pro...	1.773	1.530	1.545	1.923	1.572	1.515	1.683	1.626	1.559	1.636	14.03
21) T Trichlorotrifl...	1.578	1.300	1.112	1.533	1.248	1.124	1.204	1.154	1.121	1.264	15.30
22) T Carbon Disulfide	4.786	5.130	4.051	3.613	3.831	3.613	3.831	3.665	3.537	4.088	10.33
23) T trans-1,2-Dich...	1.683	1.784	1.502	2.054	1.607	1.529	1.653	1.584	1.545	1.660	10.42
24) T 1,1-Dichloroet...	2.223	2.243	1.904	2.494	2.102	1.881	1.989	1.911	1.864	2.068	11.19
25) T Methyl tert-Bu...	4.565	4.215	3.723	4.736	3.881	3.620	3.784	3.612	3.504	3.960	9.77
26) T Vinyl Acetate	0.258	0.243	0.247	0.326	0.258	0.242	0.263	0.256	0.255	0.261	10.84
27) T 2-Butanone (MEK)	0.607	0.735	0.750	0.890	0.743	0.668	0.719	0.689	0.678	0.720	9.92
28) T cis-1,2-Dichlo...	1.770	1.499	1.510	1.941	1.627	1.472	1.594	1.517	1.479	1.601	17.47
29) T Diisopropyl Ether	1.164	1.022	1.125	1.438	1.203	1.054	0.904	0.860	0.868	1.071	9.98
30) T Ethyl Acetate	0.462	0.364	0.377	0.421	0.375	0.343	0.363	0.353	0.359	0.381	13.73
31) T n-Hexane	1.779	2.137	1.730	1.730	1.517	1.542	1.497	1.544	1.544	1.678	11.50
32) T Chloroform	2.637	2.311	2.216	2.712	2.255	2.019	2.143	2.051	1.989	2.259	1.61
33) S 1,2-Dichloroet...	1.901	1.852	1.840	1.870	1.860	1.861	1.861	1.825	1.794	1.852	16.29
34) T Tetrahydrofura...	0.919	0.852	0.968	0.736	0.658	0.694	0.672	0.657	0.657	0.770	9.22
35) T Ethyl tert-But...	1.574	1.540	1.549	1.791	1.548	1.354	1.443	1.388	1.355	1.505	10.13
36) T 1,2-Dichloroet...	2.174	2.012	1.917	2.391	2.005	1.828	1.913	1.813	1.748	1.978	
-----ISTD-----											
37) IR 1,4-Difluorobenzen...											
38) T 1,1,1-Trichlor...	0.559	0.500	0.442	0.557	0.468	0.426	0.451	0.428	0.411	0.471	11.77
39) T Isopropyl Acetate	0.147	0.137	0.135	0.154	0.135	0.126	0.133	0.128	0.128	0.136	6.78
40) T 1-Butanol	0.291	0.260	0.222	0.284	0.233	0.213	0.235	0.227	0.225	0.243	11.60
41) T Benzene	1.213	1.124	0.957	1.111	0.908	0.820	0.855	0.821	0.805	0.957	16.11
42) T Carbon Tetrach...	0.482	0.392	0.413	0.499	0.412	0.394	0.426	0.405	0.391	0.424	9.39

Method Path : I:\MS13\METHODS\ Method File : R13032817.M	: EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)											
Title												
43) T Cyclohexane	0.392	0.402	0.326	0.436	0.347	0.323	0.340	0.326	0.320	0.357		11.83
44) T tert-Amyl Meth...	0.921	0.864	0.750	0.892	0.717	0.678	0.726	0.692	0.668	0.767		12.75
45) T 1,2-Dichloropr...	0.203	0.206	0.195	0.263	0.216	0.196	0.207	0.198	0.195	0.209		10.24
46) T Bromodichlorom...	0.352	0.357	0.317	0.418	0.355	0.340	0.364	0.346	0.336	0.354		7.82
47) T Trichloroethene	0.318	0.265	0.259	0.349	0.280	0.256	0.278	0.269	0.264	0.282		10.99
48) T 1,4-Dioxane	0.199	0.176	0.179	0.245	0.192	0.173	0.197	0.189	0.185	0.193		11.22
49) T 2,2,4-Trimethy...	1.047	1.007	0.871	1.120	0.930	0.843	0.889	0.855	0.834	0.933		10.93
50) T Methyl Methacr...	0.094	0.106	0.099	0.123	0.105	0.096	0.101	0.097	0.096	0.102		8.76
51) T n-Heptane	0.286	0.230	0.228	0.267	0.220	0.200	0.206	0.198	0.196	0.226		14.06
52) T cis-1,3-Dichlo...	0.406	0.365	0.372	0.472	0.391	0.371	0.401	0.387	0.377	0.394		8.21
53) T 4-Methyl-2-pen...	0.243	0.209	0.190	0.234	0.216	0.190	0.208	0.200	0.196	0.210		8.92
54) T trans-1,3-Dich...	0.387	0.362	0.366	0.454	0.391	0.368	0.406	0.388	0.379	0.389		7.23
55) T 1,1,2-Trichlor...	0.221	0.204	0.205	0.261	0.228	0.212	0.225	0.215	0.213	0.220		7.89

IR	Chlorobenzene-d5	(...)	ISTD	2.406	2.399	2.408	2.397	2.394	2.389	2.387	2.384	2.408	2.397	0.33
56) S	Toluene-d8 (SS2)	2.959	2.601	2.307	2.903	2.347	2.111	2.239	2.167	2.159	2.422	13.33		
57) T	Toluene	1.625	1.485	1.298	1.583	1.326	1.221	1.340	1.281	1.259	1.380	10.66		
58) T	2-Hexanone	0.748	0.825	0.725	0.949	0.766	0.725	0.794	0.770	0.761	0.785	8.79		
59) T	Dibromochlorom...	1.709	0.695	0.602	0.770	0.675	0.617	0.662	0.643	0.637	0.668	7.75		
60) T	1,2-Dibromoethane	1.615	1.603	1.422	1.749	1.446	1.346	1.451	1.382	1.352	1.485	9.36		
61) T	n-Butyl Acetate	0.561	0.565	0.492	0.556	0.440	0.411	0.435	0.422	0.423	0.478	13.78		
62) T	n-Octane	0.922	0.892	0.752	0.955	0.772	0.718	0.763	0.742	0.744	0.807	11.14		
63) T	Tetrachloroethene	1.978	1.785	1.595	2.040	1.691	1.499	1.606	1.559	1.536	1.699	11.54		
64) T	Chlorobenzene	3.234	2.947	2.755	3.476	2.768	2.514	2.709	2.612	2.555	2.841	11.41		
65) T	Ethylbenzene	2.576	2.458	2.113	2.745	2.162	2.004	2.137	2.076	2.042	2.257	11.80		
66) T	m- & p-Xylenes	0.784	0.669	0.674	0.826	0.705	0.675	0.750	0.734	0.722	0.726	7.40		
67) T	Bromoform	2.024	1.779	1.520	2.134	1.722	1.592	1.719	1.664	1.648	1.756	11.40		
68) T	Styrene	2.545	2.564	2.084	2.709	2.216	2.002	2.166	2.088	2.061	2.270	11.56		
69) T	o-Xylene	1.446	1.147	1.470	1.408	1.109	1.011	1.062	1.025	1.018	1.153	15.22		
70) T	n-Nonane	1.191	1.119	0.968	1.135	0.905	0.867	0.925	0.897	0.896	0.989	12.53		
71) T	1,1,2,2-Tetrac...	1.008	1.009	1.004	1.016	0.998	0.979	0.991	1.001	0.982	0.999	1.27		
72) T	Bromofluoroben...	3.136	2.917	3.514	2.951	2.622	2.831	2.723	2.653	2.918	10.09			
73) S	Cumene	1.784	1.648	1.408	1.773	1.481	1.340	1.435	1.397	1.385	1.517	11.35		
74) T	alpha-Pinene	3.635	3.307	4.074	3.366	2.963	3.209	3.078	2.976	3.326	11.28			
75) T	n-Propylbenzene	3.427	3.342	2.812	3.615	2.842	2.605	2.950	2.779	2.772	3.016	11.69		
76) T	3-Ethyltoluene	3.129	2.823	2.570	3.352	2.763	2.450	2.516	2.518	2.389	2.723	12.09		
77) T	4-Ethyltoluene	2.958	2.679	3.327	3.034	2.492	2.178	2.362	2.288	2.247	2.507	12.51		
78) T	1,3,5-Trimethy...	1.473	1.336	1.236	1.580	1.308	1.202	1.306	1.272	1.264	1.331	9.08		
79) T	alpha-Methylst...	3.572	3.052	2.657	3.357	2.799	2.492	2.705	2.616	2.553	2.867	13.22		
80) T	2-Ethyltoluene	3.024	2.855	2.357	3.033	2.496	2.212	2.407	2.358	2.349	2.566	12.33		
81) T	1,2,4-Trimethy...	1.582	1.665	1.316	1.428	1.209	0.997	1.080	1.035	1.034	1.261	19.93		
82) T	n-Decane	2.049	2.192	1.755	2.428	2.094	2.013	2.251	2.203	2.178	2.129	8.74		
83) T	Benzyl Chloride	1.613	1.560	1.349	1.785	1.499	1.333	1.465	1.425	1.411	1.493	9.54		
84) T	1,3-Dichlorobe...	1.693	1.602	1.435	1.828	1.527	1.342	1.496	1.445	1.431	1.533	9.86		
85) T	1,4-Dichlorobe...	3.691	3.642	3.044	3.832	3.155	2.832	3.071	2.944	2.860	3.230	11.93		
86) T	sec-Butylbenzene	3.813	3.394	3.139	3.916	3.178	2.870	3.117	3.006	2.968	3.267	11.33		
87) T	4-Isopropyltol...	2.926	2.625	2.504	3.018	2.535	2.216	2.438	2.386	2.386	2.559	10.20		
88) T	1,2,3-Trimethy...	1.554	1.625	1.333	1.695	1.444	1.282	1.404	1.360	1.359	1.451	9.82		
89) T	1,2-Dichlorobe...	1.225	1.147	0.926	1.113	0.912	0.817	0.883	0.870	0.898	0.977	14.81		
90) T	d-Limonene	0.630	0.509	0.504	0.649	0.575	0.509	0.560	0.542	0.532	0.557	9.49		
91) T	1,2-Dibromo-3-...	1.463	1.530	1.336	1.366	1.184	1.065	1.114	1.081	1.077	1.246	14.47		
92) T	n-Undecane	1.232	1.180	1.003	1.386	1.203	1.118	1.201	1.169	1.111	1.180	8.67		
93) T	1,2,4-Trichlor...													
94) T														

Method Path : I:\MS13\METHODS\
 Method File : R13032817.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

95) T	Naphthalene	3.234	2.974	2.555	3.584	3.271	3.098	3.258	3.163	3.033	3.130	8.90
96) T	n-Dodecane	1.399	1.363	1.211	1.452	1.200	1.081	1.093	1.082	1.116	1.222	11.99
97) T	Hexachlorobuta...	0.837	0.826	0.829	0.955	0.824	0.767	0.822	0.790	0.778	0.825	6.63
98) T	Cyclohexanone	0.990	0.912	0.819	0.918	0.745	0.700	0.825	0.795	0.782	0.832	11.07
99) T	tert-Butylbenzene	2.838	2.693	2.422	3.048	2.487	2.196	2.392	2.330	2.314	2.524	11.02
100) T	n-Butylbenzene	3.021	2.779	2.450	3.143	2.524	2.293	2.464	2.357	2.293	2.592	12.19

(#) = Out of Range

1ng/L Std. ID: S29-03141705
4ng/L Std. ID: S31-03271704
20ng/L Std. ID: S31-03271704
200ng/L Std. ID: S31-03271701

Dilution Factors:

Compounds	Source Std. mg/m ³	Primary Working Standards				
		200ng/L	20ng/L	4ng/L	1ng/L	1000
Propene	1.036	207.2	20.72	4.144	1.036	
Dichlorodifluoromethane	1.047	209.4	20.94	4.188	1.047	
Chloromethane	1.005	201.0	20.10	4.020	1.005	
Freon-114	1.005	201.0	20.10	4.020	1.005	
Vinyl Chloride	1.023	204.6	20.46	4.092	1.023	
1,3-Butadiene	1.057	211.4	21.14	4.228	1.057	
Bromomethane	0.993	198.6	19.86	3.972	0.993	
Chloroethane	1.009	201.8	20.18	4.036	1.009	
Ethanol	5.207	1041.4	104.14	20.828	5.207	
Acetonitrile	1.046	209.2	20.92	4.184	1.046	
Acrolein	1.041	208.2	20.82	4.164	1.041	
Acetone	5.313	1062.6	106.26	21.252	5.313	
Trichlorofluoromethane	1.049	209.8	20.98	4.196	1.049	
Isopropanol	2.105	421.0	42.10	8.420	2.105	
Acrylonitrile	1.055	211.0	21.10	4.220	1.055	
1,1-Dichloroethene	1.059	211.8	21.18	4.236	1.059	
tert-Butanol	2.114	422.8	42.28	8.456	2.114	
Methylene Chloride	1.057	211.4	21.14	4.228	1.057	
Trichlorofluoroethane	1.052	210.4	21.04	4.208	1.052	
Carbon Disulfide	1.049	209.8	20.98	4.196	1.049	
trans-1,2-Dichloroethene	1.061	212.2	21.22	4.244	1.061	
trans-1,2-Dichloroethene	1.067	213.4	21.34	4.268	1.067	
1,1-Dichloroethane	1.020	204.0	20.40	4.080	1.020	
Methyl tert-Butyl Ether	1.066	213.2	21.32	4.264	1.066	
Vinyl Acetate	5.265	1053.0	105.30	21.060	5.265	
2-Butanone	1.049	209.8	20.98	4.196	1.049	
cis-1,2-Dichloroethene	1.064	212.8	21.28	4.256	1.064	
Diisopropyl Ether	1.062	212.4	21.24	4.248	1.062	
Ethyl Acetate	2.129	425.8	42.58	8.516	2.129	
n-Hexane	1.063	212.6	21.26	4.252	1.063	
Chloroform	1.058	211.6	21.16	4.232	1.058	
Tetrahydrofuran	1.062	212.4	21.24	4.248	1.062	
Ethyl tert-Butyl Ether	1.057	211.4	21.14	4.228	1.057	
1,2-Dichloroethane	1.052	210.4	21.04	4.208	1.052	
1,1,1-Trichloroethane	1.074	214.8	21.48	4.296	1.074	
Isopropyl Acetate	2.104	420.8	42.08	8.416	2.104	
1-Butanol	2.105	421.0	42.10	8.420	2.105	
Benzene	1.052	210.4	21.04	4.208	1.052	
Carbon Tetrachloride	1.055	211.0	21.10	4.220	1.055	
Cyclohexane	2.130	426.0	42.60	8.520	2.130	
tert-Amyl Methyl Ether	1.054	210.8	21.08	4.216	1.054	
1,2-Dichloropropane	1.062	212.4	21.24	4.248	1.062	
Bromodichloromethane	1.066	213.2	21.32	4.264	1.066	
Trichloroethene	1.060	212.0	21.20	4.240	1.060	
1,4-Dioxane	1.062	212.4	21.24	4.248	1.062	
Isocetane	1.059	211.8	21.18	4.236	1.059	
Methyl Methacrylate	2.110	422.0	42.20	8.440	2.110	
n-Heptane	1.062	212.4	21.24	4.248	1.062	
cis-1,3-Dichloropropene	1.116	223.2	22.32	4.464	1.116	
4-Methyl-2-pentanone	1.058	211.6	21.16	4.232	1.058	
trans-1,3-Dichloropropene	1.064	212.8	21.28	4.256	1.064	
1,1,2,2-Trichloroethane	1.061	212.2	21.22	4.244	1.061	
Toluene	1.053	210.6	21.06	4.212	1.053	
2-Hexanone	1.061	212.2	21.22	4.244	1.061	

Primary Source Standards Concentrations (Working & Initial Calibration)

Working STD Conc.(ng/L):	4												
	0.020	0.025	0.050	0.050	0.100	0.100	0.20	0.25	0.125	200	200	200	200
Injection (L):	0.08ng	0.1ng	0.2ng	0.2ng	0.4ng	0.4ng	1ng	5ng	25ng	50ng	50ng	50ng	100ng
ICAL Points:	0.08288	0.1036	0.2072	0.2072	0.4144	0.4144	1.036	5.180	25.900	51.80	51.80	103.6	103.6
	0.08376	0.1047	0.2094	0.2094	0.4188	0.4188	1.047	5.235	26.175	52.35	52.35	104.7	104.7
	0.08040	0.1005	0.2010	0.2010	0.4020	0.4020	1.005	5.025	25.125	50.25	50.25	100.5	100.5
	0.08040	0.1005	0.2010	0.2010	0.4020	0.4020	1.005	5.025	25.125	50.25	50.25	100.5	100.5
	0.08184	0.1023	0.2046	0.2046	0.4092	0.4092	1.023	5.115	25.575	51.15	51.15	102.3	102.3
	0.08456	0.1057	0.2114	0.2114	0.4228	0.4228	1.057	5.285	26.425	52.85	52.85	105.7	105.7
	0.07944	0.0993	0.1986	0.1986	0.3972	0.3972	0.993	4.965	24.825	49.65	49.65	99.3	99.3
	0.08072	0.1009	0.2018	0.2018	0.4036	0.4036	1.009	5.045	25.225	50.45	50.45	100.9	100.9
	0.41656	0.5207	1.0414	1.0414	2.0828	2.0828	5.207	26.035	130.175	260.35	260.35	520.7	520.7
	0.08368	0.1046	0.2092	0.2092	0.4184	0.4184	1.046	5.230	26.150	52.30	52.30	104.6	104.6
	0.08328	0.1041	0.2082	0.2082	0.4164	0.4164	1.041	5.205	26.025	52.05	52.05	104.1	104.1
	0.42504	0.5313	1.0626	1.0626	2.1252	2.1252	5.313	26.565	132.825	265.65	265.65	531.3	531.3
	0.08392	0.1049	0.2098	0.2098	0.4196	0.4196	1.049	5.245	26.225	52.45	52.45	104.9	104.9
	0.16840	0.2105	0.4210	0.4210	0.8420	0.8420	2.105	10.525	52.625	105.25	105.25	210.5	210.5
	0.08440	0.1055	0.2110	0.2110	0.4220	0.4220	1.055	5.275	26.375	52.75	52.75	105.5	105.5
	0.08472	0.1059	0.2118	0.2118	0.4236	0.4236	1.059	5.295	26.475	52.95	52.95	105.9	105.9
	0.16912	0.2114	0.4228	0.4228	0.8456	0.8456	2.114	10.570	52.850	105.70	105.70	211.4	211.4
	0.08456	0.1057	0.2114	0.2114	0.4228	0.4228	1.057	5.285	26.425	52.85	52.85	105.7	105.7
	0.08416	0.1052	0.2104	0.2104	0.4208	0.4208	1.052	5.260	26.300	52.60	52.60	105.2	105.2
	0.08392	0.1049	0.2098	0.2098	0.4196	0.4196	1.049	5.245	26.225	52.45	52.45	104.9	104.9
	0.08512	0.1064	0.2128	0.2128	0.4256	0.4256	1.064	5.320	26.600	53.20	53.20	106.4	106.4
	0.08496	0.1062	0.2124	0.2124	0.4248	0.4248	1.062	5.310	26.550	53.10	53.10	106.2	106.2
	0.17032	0.2129	0.4258	0.4258	0.8516	0.8516	2.129	10.645	53.225	106.45	106.45	212.9	212.9
	0.08504	0.1063	0.2126	0.2126	0.4252	0.4252	1.063	5.315	26.575	53.15	53.15	106.3	106.3
	0.08464	0.1058	0.2116	0.2116	0.4232	0.4232	1.058	5.290	26.450	52.90	52.90	105.8	105.8
	0.08496	0.1062	0.2124	0.2124	0.4248	0.4248	1.062	5.310	26.550	53.10	53.10	106.2	106.2
	0.08456	0.1057	0.2114	0.2114	0.4228	0.4228	1.057	5.285	26.425	52.85	52.85	105.7	105.7
	0.08416	0.1052	0.2104	0.2104	0.4208	0.4208	1.052	5.260	26.300	52.60	52.60	105.2	105.2
	0.08592	0.1074	0.2148	0.2148	0.4296	0.4296	1.074	5.370	26.850	53.70	53.70	107.4	107.4
	0.16832	0.2104	0.4208	0.4208	0.8416	0.8416	2.104	10.520	52.600	105.20	105.20	210.4	210.4
	0.16840	0.2105	0.4210	0.4210	0.8420	0.8420	2.105	10.525	52.625	105.25	105.25	210.5	210.5
	0.08416	0.1052	0.2104	0.2104	0.4208	0.4208	1.052	5.260	26.300	52.60	52.60	105.2	105.2
	0.08440	0.1055	0.2110	0.2110	0.4220	0.4220	1.055	5.275	26.375	52.75	52.75	105.5	105.5
	0.17040	0.2130	0.4260	0.4260	0.8520	0.8520	2.130	10.650	53.250	106.50	106.50	213.0	213.0
	0.08432	0.1054	0.2108	0.2108	0.4216	0.4216	1.054	5.270	26.350	52.70	52.70	105.4	105.4
	0.08496	0.1062	0.2124	0.2124	0.4248	0.4248	1.062	5.310	26.550	53.10	53.10	106.2	106.2
	0.08528	0.1066	0.2132	0.2132	0.4264	0.4264	1.066	5.330	26.650	53.30	53.30	106.6	106.6
	0.08480	0.1060	0.2120	0.2120	0.4240	0.4240	1.060	5.300	26.500	53.00	53.00	106.0	106.0
	0.08496	0.1062	0.2124	0.2124	0.4248	0.4248	1.062	5.310	26.550	53.10	53.10	106.2	106.2
	0.08472	0.1059	0.2118	0.2118	0.4236	0.4236	1.059	5.295	26.475	52.95	52.95	105.9	105.9
	0.16880	0.2110	0.4220	0.4220	0.8440	0.8440	2.110	10.550	52.750	105.50	105.50	211.0	211.0
	0.08496	0.1062	0.2124	0.2124	0.4248	0.4248	1.062	5.310	26.550	53.10	53.10	106.2	106.2
	0.08928	0.1116	0.2232	0.2232	0.4464	0.4464	1.116	5.580	27.900	55.80	55.80	111.6	111.6
	0.08464	0.1058	0.2116	0.2116	0.4232	0.4232	1.058	5.290	26.450	52.90	52.90	105.8	105.8
	0.08512	0.1064	0.2128	0.2128	0.4256	0.4256	1.064	5.320	26.600	53.20	53.20	106.4	106.4
	0.08488	0.1061	0.2122	0.2122	0.4244	0.4244	1.061	5.305	26.525	53.05	53.05	106.1	106.1
	0.08424	0.1053	0.2106	0.2106	0.4212	0.4212	1.053	5.265	26.325	52.65	52.65	105.3	105.3
	0.08488	0.1061	0.2122	0.2122	0.4244	0.4244	1.061	5.305	26.525	53.05	53.05	106.1	106.1

LH 4/11/17

20ng/L_0.02L

1ng/L Std. ID: S29-03141705
4ng/L Std. ID: S31-03271704
20ng/L Std. ID: S31-03271704
200ng/L Std. ID: S31-03271701

Dilution Factors:

Compounds	Source Std. mg/m ³	Primary Working Standards				
		200ng/L	20ng/L	4ng/L	1ng/L	1000
Dibromochloromethane	1.062	212.4	21.24	4.248	1.062	
1,2-Dibromoethane	1.056	211.2	21.12	4.224	1.056	
n-Butyl Acetate	1.064	212.8	21.28	4.256	1.064	
n-Octane	1.057	211.4	21.14	4.228	1.057	
Tetrachloroethene	1.061	212.2	21.22	4.244	1.061	
Chlorobenzene	1.061	212.2	21.22	4.244	1.061	
Ethylbenzene	1.055	211.0	21.10	4.220	1.055	
m- & p-Xylene	2.123	424.6	42.46	8.492	2.123	
Bromodorm	1.063	212.6	21.26	4.252	1.063	
Styrene	1.061	212.2	21.22	4.244	1.061	
o-Xylene	1.054	210.8	21.08	4.216	1.054	
n-Nonane	1.054	210.8	21.08	4.216	1.054	
1,1,2,2-Tetrachloroethane	1.056	211.2	21.12	4.224	1.056	
Cumene	1.050	210.0	21.00	4.200	1.050	
alpha-Phene	1.044	208.8	20.88	4.176	1.044	
n-Propylbenzene	1.063	212.6	21.26	4.252	1.063	
3-Ethyltoluene	1.050	210.0	21.00	4.200	1.050	
4-Ethyltoluene	1.049	209.8	20.98	4.196	1.049	
1,3,5-Trimethylbenzene	1.049	209.8	20.98	4.196	1.049	
alpha-Methylstyrene	1.050	210.0	21.00	4.200	1.050	
2-Ethyltoluene	1.062	212.4	21.24	4.248	1.062	
1,2,4-Trimethylbenzene	1.052	210.4	21.04	4.208	1.052	
n-Decane	1.053	210.6	21.06	4.212	1.053	
Benzyl Chloride	1.061	212.2	21.22	4.244	1.061	
1,3-Dichlorobenzene	1.058	211.6	21.16	4.232	1.058	
1,4-Dichlorobenzene	1.058	211.6	21.16	4.232	1.058	
sec-Butylbenzene	1.054	210.8	21.08	4.216	1.054	
p-Isopropyltoluene	1.027	205.4	20.54	4.108	1.027	
1,2,3-Trimethylbenzene	1.027	205.4	20.54	4.108	1.027	
1,2-Dichlorobenzene	1.058	211.6	21.16	4.232	1.058	
d-Limonene	1.005	201.0	20.10	4.020	1.005	
1,2-Dibromo-3-chloropropane	1.053	210.6	21.06	4.212	1.053	
n-Undecane	1.054	210.8	21.08	4.216	1.054	
1,2,4-Trichlorobenzene	1.043	208.6	20.86	4.172	1.043	
Naphthalene	1.083	216.6	21.66	4.332	1.083	
n-Dodecane	1.045	209.0	20.90	4.180	1.045	
Hexachloro-1,3-butadiene	1.059	211.8	21.18	4.236	1.059	
Methacrylonitrile	1.065	213.0	21.30	4.260	1.065	
Cyclohexanone	1.056	211.2	21.12	4.224	1.056	
tert-Butylbenzene	1.051	210.2	21.02	4.204	1.051	
	1.056	211.2	21.12	4.224	1.056	

Primary Source Standards Concentrations (Working & Initial Calibration)

Working STD Conc.(ng/L):	4		4		4		20		20		200		200		200	
	0.020	0.025	0.050	0.100	0.050	0.100	0.050	0.100	0.050	0.100	0.125	0.25	0.125	0.25	0.25	0.50
Injection (L):	0.08ng	0.10g	0.212g	0.424g	0.212g	0.424g	0.212g	0.424g	0.212g	0.424g	0.25ng	50ng	0.25ng	50ng	100ng	100ng
ICAL Points:	0.08496	0.1062	0.2124	0.4248	0.2124	0.4248	0.2124	0.4248	0.2124	0.4248	0.26550	53.10	0.26550	53.10	106.2	106.2
	0.08448	0.1056	0.2112	0.4224	0.2112	0.4224	0.2112	0.4224	0.2112	0.4224	0.26400	52.80	0.26400	52.80	105.6	105.6
	0.08512	0.1064	0.2128	0.4256	0.2128	0.4256	0.2128	0.4256	0.2128	0.4256	0.26600	53.20	0.26600	53.20	106.4	106.4
	0.08456	0.1057	0.2114	0.4228	0.2114	0.4228	0.2114	0.4228	0.2114	0.4228	0.26525	53.05	0.26525	53.05	106.1	106.1
	0.08488	0.1061	0.2122	0.4244	0.2122	0.4244	0.2122	0.4244	0.2122	0.4244	0.26525	53.05	0.26525	53.05	106.1	106.1
	0.08440	0.1055	0.2110	0.4220	0.2110	0.4220	0.2110	0.4220	0.2110	0.4220	0.26375	52.75	0.26375	52.75	105.5	105.5
	0.16984	0.2123	0.4246	0.8492	0.4246	0.8492	0.4246	0.8492	0.4246	0.8492	0.53075	106.15	0.53075	106.15	212.3	212.3
	0.08504	0.1063	0.2126	0.4252	0.2126	0.4252	0.2126	0.4252	0.2126	0.4252	0.26575	53.15	0.26575	53.15	106.3	106.3
	0.08488	0.1061	0.2122	0.4244	0.2122	0.4244	0.2122	0.4244	0.2122	0.4244	0.26525	53.05	0.26525	53.05	106.1	106.1
	0.08432	0.1054	0.2108	0.4216	0.2108	0.4216	0.2108	0.4216	0.2108	0.4216	0.26350	52.70	0.26350	52.70	105.4	105.4
	0.08432	0.1054	0.2108	0.4216	0.2108	0.4216	0.2108	0.4216	0.2108	0.4216	0.26350	52.70	0.26350	52.70	105.4	105.4
	0.08448	0.1056	0.2112	0.4224	0.2112	0.4224	0.2112	0.4224	0.2112	0.4224	0.26400	52.80	0.26400	52.80	105.6	105.6
	0.08400	0.1050	0.2100	0.4200	0.2100	0.4200	0.2100	0.4200	0.2100	0.4200	0.26250	52.50	0.26250	52.50	105.0	105.0
	0.08352	0.1044	0.2088	0.4176	0.2088	0.4176	0.2088	0.4176	0.2088	0.4176	0.26100	52.20	0.26100	52.20	104.4	104.4
	0.08504	0.1063	0.2126	0.4252	0.2126	0.4252	0.2126	0.4252	0.2126	0.4252	0.26575	53.15	0.26575	53.15	106.3	106.3
	0.08400	0.1050	0.2100	0.4200	0.2100	0.4200	0.2100	0.4200	0.2100	0.4200	0.26250	52.50	0.26250	52.50	105.0	105.0
	0.08392	0.1049	0.2098	0.4196	0.2098	0.4196	0.2098	0.4196	0.2098	0.4196	0.26225	52.45	0.26225	52.45	104.9	104.9
	0.08392	0.1049	0.2098	0.4196	0.2098	0.4196	0.2098	0.4196	0.2098	0.4196	0.26225	52.45	0.26225	52.45	104.9	104.9
	0.08400	0.1050	0.2100	0.4200	0.2100	0.4200	0.2100	0.4200	0.2100	0.4200	0.26250	52.50	0.26250	52.50	105.0	105.0
	0.08496	0.1062	0.2124	0.4248	0.2124	0.4248	0.2124	0.4248	0.2124	0.4248	0.26550	53.10	0.26550	53.10	106.2	106.2
	0.08416	0.1052	0.2104	0.4208	0.2104	0.4208	0.2104	0.4208	0.2104	0.4208	0.26300	52.60	0.26300	52.60	105.2	105.2
	0.08424	0.1053	0.2106	0.4212	0.2106	0.4212	0.2106	0.4212	0.2106	0.4212	0.26325	52.65	0.26325	52.65	105.3	105.3
	0.08488	0.1061	0.2122	0.4244	0.2122	0.4244	0.2122	0.4244	0.2122	0.4244	0.26525	53.05	0.26525	53.05	106.1	106.1
	0.08464	0.1058	0.2116	0.4232	0.2116	0.4232	0.2116	0.4232	0.2116	0.4232	0.26450	52.90	0.26450	52.90	105.8	105.8
	0.08432	0.1054	0.2108	0.4216	0.2108	0.4216	0.2108	0.4216	0.2108	0.4216	0.26350	52.70	0.26350	52.70	105.4	105.4
	0.08216	0.1027	0.2054	0.4108	0.2054	0.4108	0.2054	0.4108	0.2054	0.4108	0.25675	51.35	0.25675	51.35	102.7	102.7
	0.08216	0.1027	0.2054	0.4108	0.2054	0.4108	0.2054	0.4108	0.2054	0.4108	0.25675	51.35	0.25675	51.35	102.7	102.7
	0.08464	0.1058	0.2116	0.4232	0.2116	0.4232	0.2116	0.4232	0.2116	0.4232	0.26450	52.90	0.26450	52.90	105.8	105.8
	0.08040	0.1005	0.2010	0.4020	0.2010	0.4020	0.2010	0.4020	0.2010	0.4020	0.25125	50.25	0.25125	50.25	100.5	100.5
	0.08424	0.1053	0.2106	0.4212	0.2106	0.4212	0.2106	0.4212	0.2106	0.4212	0.26325	52.65	0.26325	52.65	105.3	105.3
	0.08432	0.1054	0.2108	0.4216	0.2108	0.4216	0.2108	0.4216	0.2108	0.4216	0.26350	52.70	0.26350	52.70	105.4	105.4
	0.08344	0.1043	0.2086	0.4172	0.2086	0.4172	0.2086	0.4172	0.2086	0.4172	0.26075	52.15	0.26075	52.15	104.3	104.3
	0.08664	0.1083	0.2166	0.4332	0.2166	0.4332	0.2166	0.4332	0.2166	0.4332	0.27075	54.15	0.27075	54.15	108.3	108.3
	0.08360	0.1045	0.2090	0.4180	0.2090	0.4180	0.2090	0.4180	0.2090	0.4180	0.26125	52.25	0.26125	52.25	104.5	104.5
	0.08472	0.1059	0.2118	0.4236	0.2118	0.4236	0.2118	0.4236	0.2118	0.4236	0.26475	52.95	0.26475	52.95	105.9	105.9
	0.08520	0.1065	0.2130	0.4260	0.2130	0.4260	0.2130	0.4260	0.2130	0.4260	0.26625	53.25	0.26625	53.25	106.5	106.5
	0.08448	0.1056	0.2112	0.4224	0.2112	0.4224	0.2112	0.4224	0.2112	0.4224	0.26400	52.80	0.26400	52.80	105.6	105.6
	0.08408	0.1051	0.2102	0.4204	0.2102	0.4204	0.2102	0.4204	0.2102	0.4204	0.26275	52.55	0.26275	52.55	105.1	105.1
	0.08448	0.1056	0.2112	0.4224	0.2112	0.4224	0.2112	0.4224	0.2112	0.4224	0.26400	52.80	0.26400	52.80	105.6	105.6

Method : I:\MS13\METHODS\R13032817.M (RTE Integrator)
 Title : EPA T0-15 per SOP VOA-T015 (CASS T0-15/GC-MS)
 Last Update : Wed Mar 29 09:17:20 2017
 Response via : Initial Calibration

AM 3/29/17

LH 4/11/17

#	ID	Conc	ISTD Conc	Path\File

1	0.08	0	13	I:\MS13\DATA\2017_03\28\03281707.D
2	0.10	0	13	I:\MS13\DATA\2017_03\28\03281708.D
3	0.20	0	13	I:\MS13\DATA\2017_03\28\03281709.D
4	0.40	0	13	I:\MS13\DATA\2017_03\28\03281710.D
5	1.0	1	13	I:\MS13\DATA\2017_03\28\03281711.D
6	5.0	5	13	I:\MS13\DATA\2017_03\28\03281712.D
7	25	26	13	I:\MS13\DATA\2017_03\28\03281713.D
8	50	52	13	I:\MS13\DATA\2017_03\28\03281714.D
9	100	104	13	I:\MS13\DATA\2017_03\28\03281715.D

#	ID	Update Time				Quant Time				Acquisition Time			

1	0.08	Mar	29	08:40	2017	Mar	29	08:36	2017	28	Mar	2017	13:38
2	0.10	Mar	29	08:54	2017	Mar	29	08:53	2017	28	Mar	2017	14:13
3	0.20	Mar	29	08:59	2017	Mar	29	08:25	2017	28	Mar	2017	14:48
4	0.40	Mar	29	09:03	2017	Mar	29	08:25	2017	28	Mar	2017	15:23
5	1.0	Mar	29	09:07	2017	Mar	29	08:25	2017	28	Mar	2017	15:58
6	5.0	Mar	29	09:10	2017	Mar	29	08:25	2017	28	Mar	2017	16:33
7	25	Mar	29	09:10	2017	Mar	29	08:25	2017	28	Mar	2017	17:07
8	50	Mar	29	09:13	2017	Mar	29	08:25	2017	28	Mar	2017	17:42
9	100	Mar	29	09:16	2017	Mar	29	08:25	2017	28	Mar	2017	18:17

R13032817.M

Wed Mar 29 09:49:44 2017

Data File : I:\MS13\DATA\2017 03\28\03281708.D
 Acq On : 28 Mar 2017 14:13
 Sample : 0.1ng TO15 ICAL STD
 Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
 Operator: AM
 Inst : MS13

Quant Time: Mar 29 08:53:48 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Wed Mar 29 08:24:17 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 4/11/17

AM 3/29/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.23	130	102720	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.32	114	485914	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.61	82	199239	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.07	65	190228	15.096	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	120.80%	
57) Toluene-d8 (SS2)	15.75	98	477945	12.137	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.12%	
73) Bromofluorobenzene (SS3)	19.06	174	201094	12.598	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	100.80%	

Target Compounds

						Qvalue
2) Propene	4.47	42	1154	0.123	ng	89
3) Dichlorodifluoromethan...	4.62	85	2452m	0.128	ng	
4) Chloromethane	4.89	50	1452	0.133	ng	75
5) 1,2-Dichloro-1,1,2,2-t...	5.14	135	1183	0.112	ng	83
6) Vinyl Chloride	5.29	62	1271	0.114	ng	97
7) 1,3-Butadiene	5.54	54	940	0.141	ng	93
8) Bromomethane	5.96	94	851	0.117	ng	92
9) Chloroethane	0.00	64	0	N.D.	d	
10) Ethanol	6.55	45	3416m	0.650	ng	
11) Acetonitrile	6.83	41	1838	0.128	ng	81
12) Acrolein	7.03	56	722	0.146	ng	83
13) Acetone	7.24	58	4288	0.765	ng	97
14) Trichlorofluoromethane	7.49	101	2305	0.135	ng	99
15) 2-Propanol (Isopropanol)	7.69	45	6125	0.284	ng	95
16) Acrylonitrile	7.94	53	1019	0.100	ng	93
17) 1,1-Dichloroethene	8.40	96	995	0.117	ng	96
18) 2-Methyl-2-Propanol (t...	8.55	59	6298	0.275	ng	91
19) Methylene Chloride	8.60	84	1228	0.144	ng	93
20) 3-Chloro-1-propene (Al...	8.77	41	1323	0.112	ng	82
21) Trichlorotrifluoroethane	9.02	151	1121	0.117	ng	99
22) Carbon Disulfide	8.89	76	5433	0.179	ng	89
23) trans-1,2-Dichloroethene	9.83	61	1564	0.129	ng	99
24) 1,1-Dichloroethane	10.07	63	1880	0.120	ng	72
25) Methyl tert-Butyl Ether	10.18	73	3692	0.127	ng	85
26) Vinyl Acetate	10.32	86	1052	0.523	ng	# 72
27) 2-Butanone (MEK)	10.57	72	634	0.110	ng	# 71
28) cis-1,2-Dichloroethene	11.06	61	1311	0.112	ng	89
29) Diisopropyl Ether	11.36	87	892	0.105	ng	# 91
30) Ethyl Acetate	11.37	61	637	0.207	ng	92
31) n-Hexane	0.00	57	0	N.D.	d	
32) Chloroform	11.39	83	2009	0.124	ng	95
34) Tetrahydrofuran (THF)	11.81	72	802	0.132	ng	# 73
35) Ethyl tert-Butyl Ether	11.94	87	1338	0.119	ng	# 87
36) 1,2-Dichloroethane	12.18	62	1739	0.130	ng	94
38) 1,1,1-Trichloroethane	12.48	97	2087	0.134	ng	93
39) Isopropyl Acetate	12.89	61	1124	0.211	ng	# 82
40) 1-Butanol	12.89	56	2128	0.259	ng	93
41) Benzene	12.94	78	4595	0.125	ng	91
42) Carbon Tetrachloride	13.09	117	1607	0.115	ng	99
43) Cyclohexane	13.23	84	3330	0.238	ng	95
44) tert-Amyl Methyl Ether	13.56	73	3538	0.136	ng	99
45) 1,2-Dichloropropane	13.78	63	850	0.098	ng	82
46) Bromodichloromethane	13.95	83	1479	0.118	ng	97
47) Trichloroethene	14.01	130	1093	0.098	ng	88
48) 1,4-Dioxane	13.99	88	727	0.092	ng	95
49) 2,2,4-Trimethylpentane...	14.09	57	4146	0.120	ng	95
50) Methyl Methacrylate	14.22	100	870	0.217	ng	90

Data File : I:\MS13\DATA\2017 03\28\03281708.D
 Acq On : 28 Mar 2017 14:13
 Sample : 0.1ng TO15 ICAL STD
 Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
 Operator: AM
 Inst : MS13

Quant Time: Mar 29 08:53:48 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Wed Mar 29 08:24:17 2017

Response via : Initial Calibration

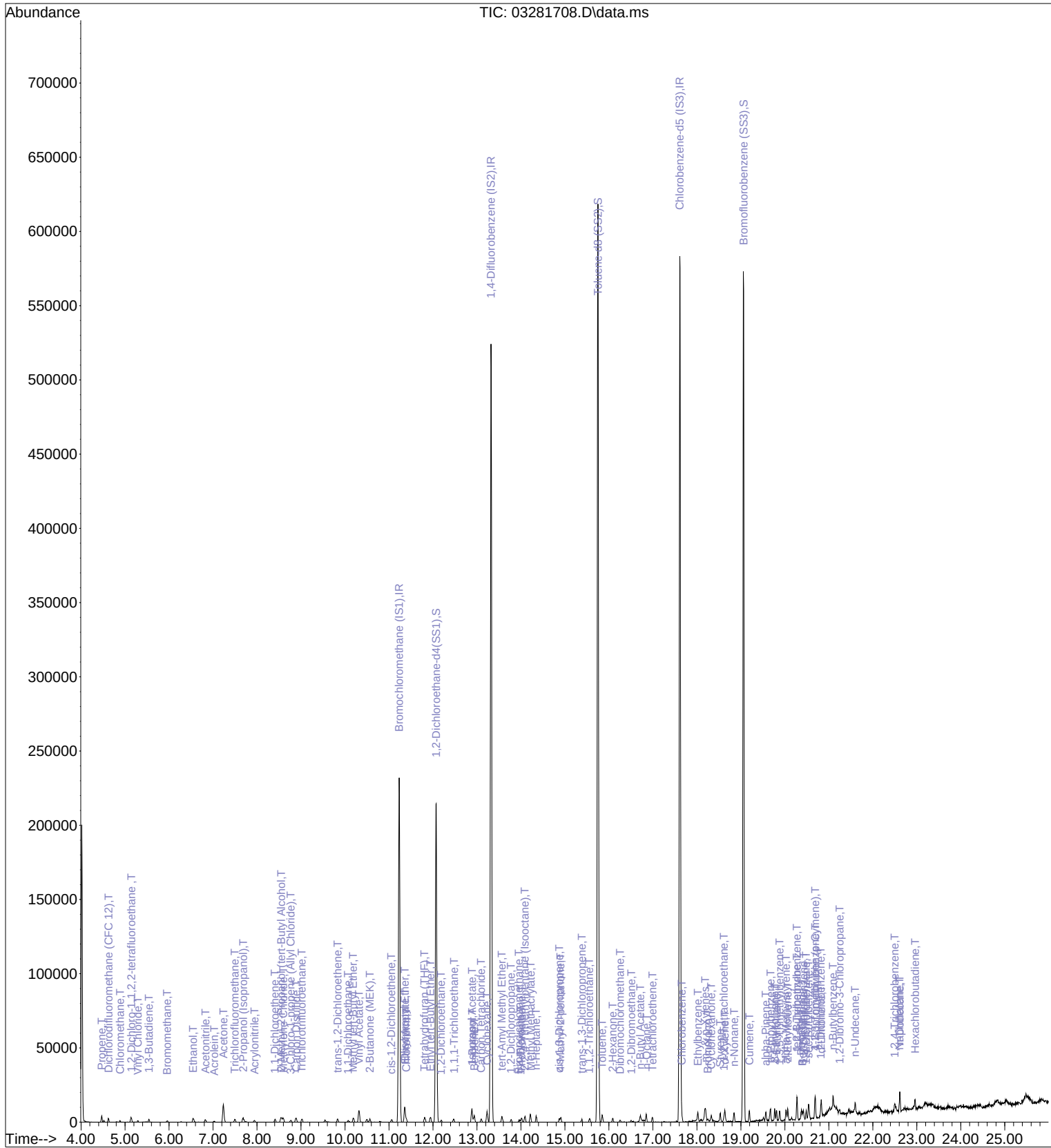
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.34	71	948	0.104	ng	96
52) cis-1,3-Dichloropropene	14.87	75	1585	0.104	ng	89
53) 4-Methyl-2-pentanone	14.90	58	858	0.105	ng	84
54) trans-1,3-Dichloropropene	15.39	75	1499	0.108	ng	93
55) 1,1,2-Trichloroethane	15.55	97	841	0.092	ng	96
58) Toluene	15.85	91	4366	0.113	ng	100
59) 2-Hexanone	16.09	43	2511	0.129	ng	97
60) Dibromochloromethane	16.25	129	1397	0.119	ng	98
61) 1,2-Dibromoethane	16.51	107	1170	0.110	ng	88
62) n-Butyl Acetate	16.72	43	2718	0.127	ng	88
63) n-Octane	16.85	57	952	0.123	ng	# 83
64) Tetrachloroethene	16.99	166	1508	0.118	ng	98
65) Chlorobenzene	17.66	112	3018	0.110	ng	87
66) Ethylbenzene	18.02	91	4955	0.111	ng	99
67) m- & p-Xylenes	18.19	91	8317	0.240	ng	97
68) Bromoform	18.25	173	1134	0.108	ng	88
69) Styrene	18.53	104	3008	0.108	ng	87
70) o-Xylene	18.64	91	4307	0.121	ng	92
71) n-Nonane	18.85	43	2429	0.140	ng	94
72) 1,1,2,2-Tetrachloroethane	18.61	83	1884	0.121	ng	82
74) Cumene	19.19	105	5249	0.113	ng	100
75) alpha-Pinene	19.57	93	2742	0.115	ng	91
76) n-Propylbenzene	19.68	91	6159	0.117	ng	89
77) 3-Ethyltoluene	19.77	105	5594	0.115	ng	96
78) 4-Ethyltoluene	19.81	105	4720	0.109	ng	93
79) 1,3,5-Trimethylbenzene	19.88	105	4479	0.115	ng	95
80) alpha-Methylstyrene	20.02	118	2236	0.106	ng	99
81) 2-Ethyltoluene	20.06	105	5166	0.111	ng	98
82) 1,2,4-Trimethylbenzene	20.27	105	4788	0.119	ng	95
83) n-Decane	20.37	57	2794	0.150	ng	93
84) Benzyl Chloride	20.40	91	3707	0.112	ng	96
85) 1,3-Dichlorobenzene	20.42	146	2631	0.104	ng	98
86) 1,4-Dichlorobenzene	20.49	146	2702	0.104	ng	100
87) sec-Butylbenzene	20.54	105	6119	0.116	ng	99
88) 4-Isopropyltoluene (p-...	20.69	119	5555	0.108	ng	92
89) 1,2,3-Trimethylbenzene	20.69	105	4297	0.105	ng	99
90) 1,2-Dichlorobenzene	20.82	146	2741	0.112	ng	97
91) d-Limonene	20.83	68	1837	0.129	ng	77
92) 1,2-Dibromo-3-Chloropr...	21.25	157	855	0.099	ng	# 63
93) n-Undecane	21.59	57	2571	0.141	ng	# 49
94) 1,2,4-Trichlorobenzene	22.50	180	1961	0.103	ng	93
95) Naphthalene	22.61	128	5134m	0.098	ng	
96) n-Dodecane	22.61	57	2271	0.135	ng	# 72
97) Hexachlorobutadiene	22.96	225	1394	0.101	ng	100
98) Cyclohexanone	18.33	55	1535	0.123	ng	# 69
99) tert-Butylbenzene	20.27	119	4511	0.111	ng	97
100) n-Butylbenzene	21.09	91	4678	0.115	ng	94

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Vial: 8
Operator: AM
Inst : MS13

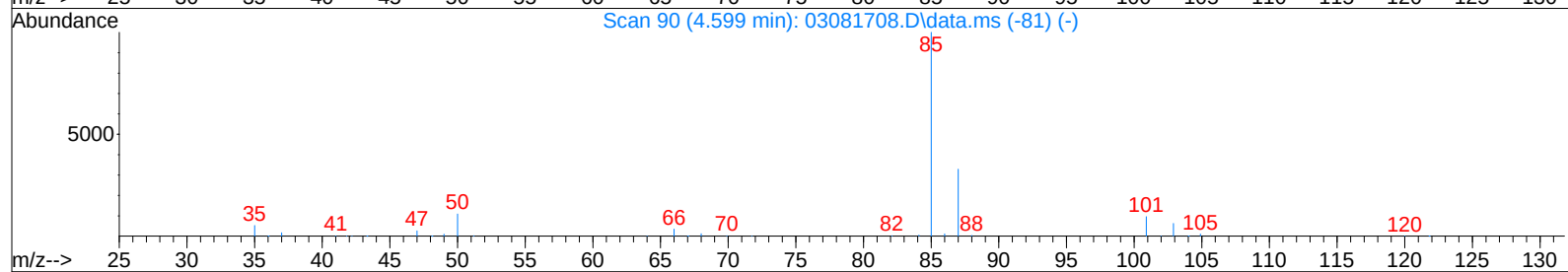
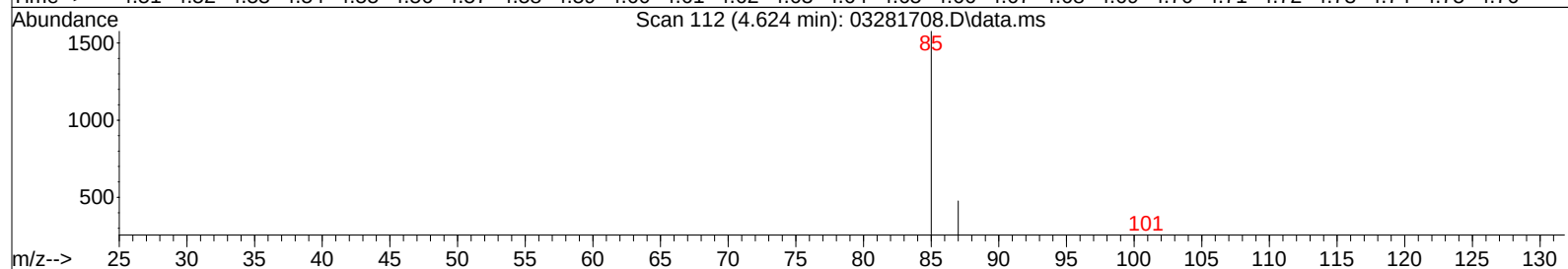
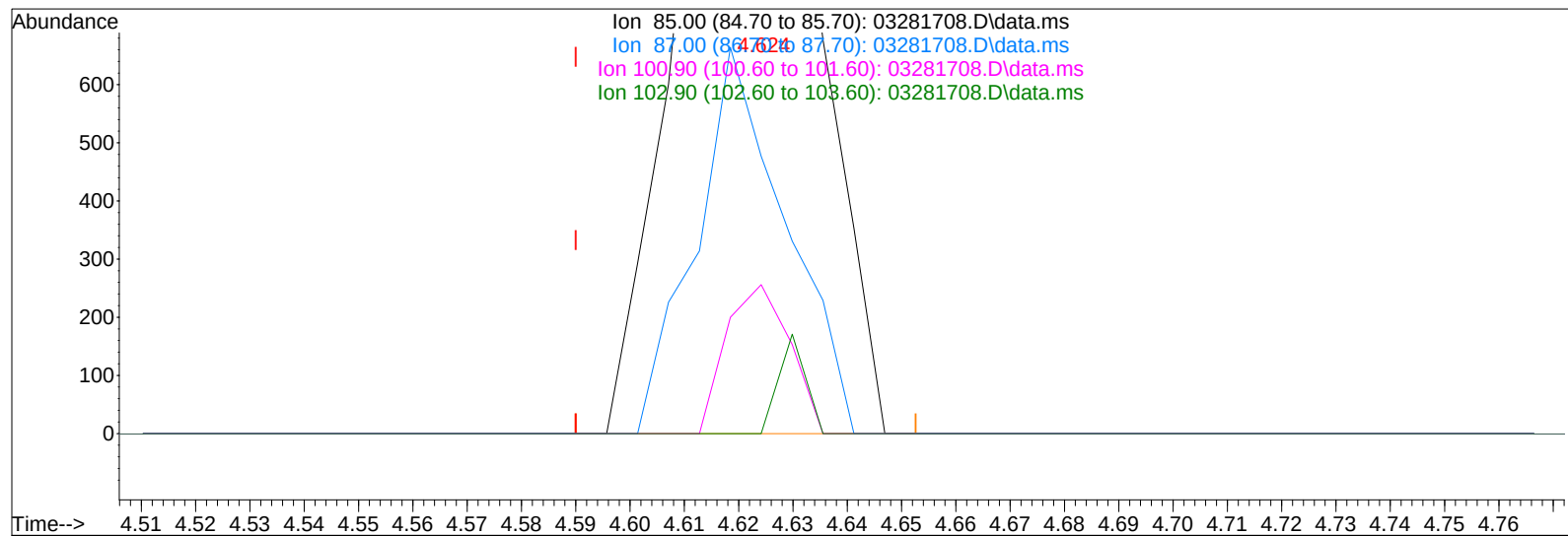
Quant Time: Mar 29 08:53:48 2017



Data File : I:\MS13\DATA\2017 03\28\03281708.D
 Acq On : 28 Mar 2017 14:13
 Sample : 0.1ng TO15 ICAL STD
 Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
 Operator: AM
 Inst : MS13

Quant Time: Mar 29 08:25:27 2017
 Quant Method : I:\MS13\METHODS\R13032817.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Wed Mar 29 08:24:17 2017
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



TIC: 03281708.D\data.ms

(3) Dichlorodifluoromethane (CFC 12) (T)

4.624min (+0.034) 0.13ng

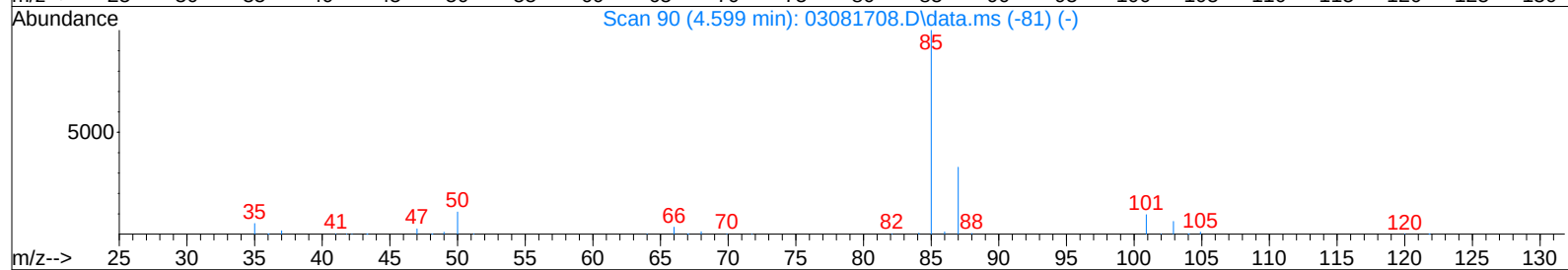
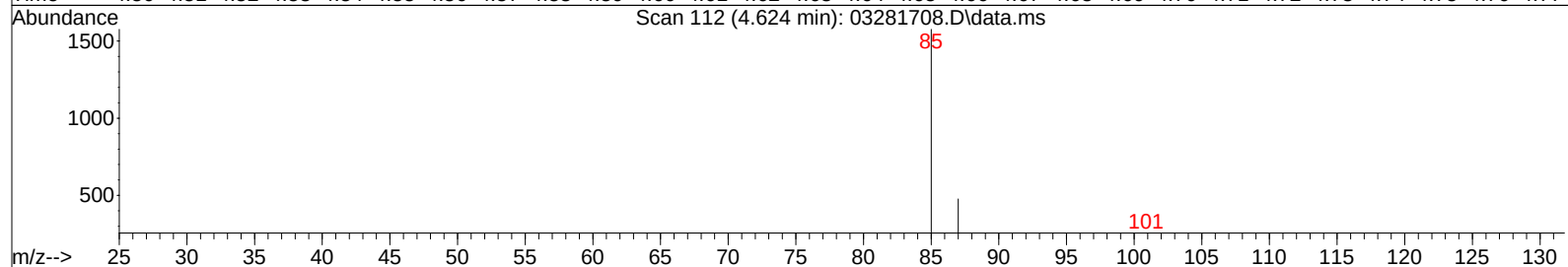
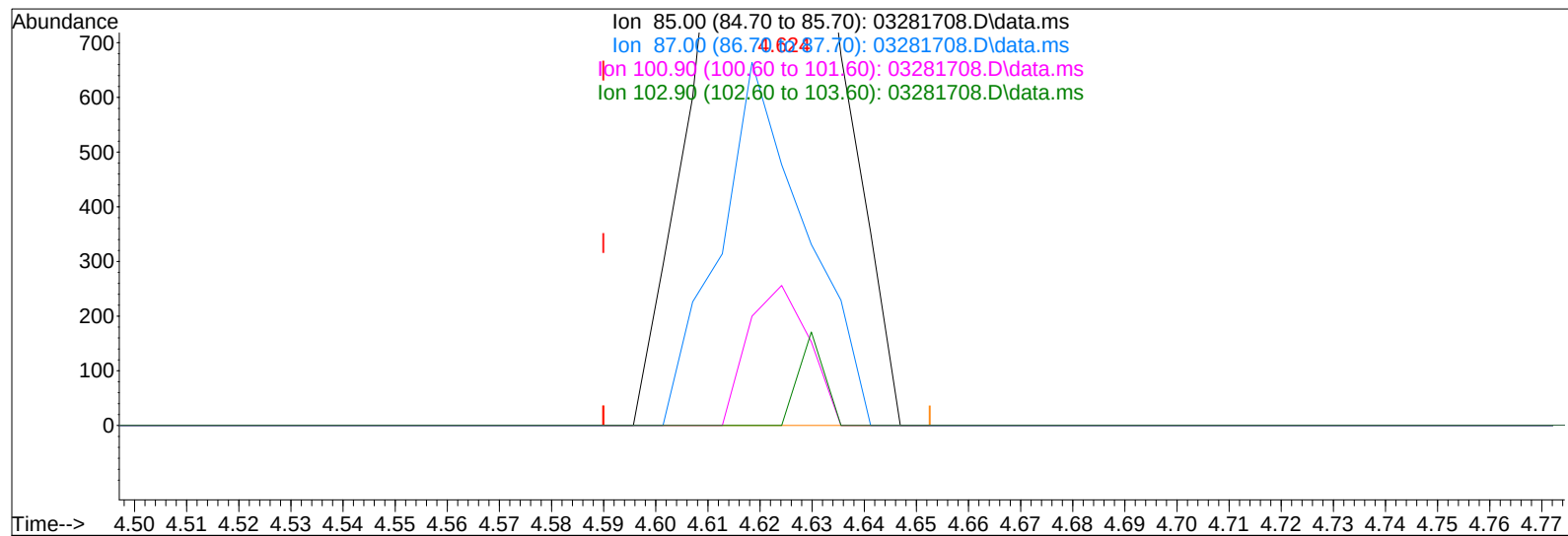
response 2452

Ion	Exp%	Act%
85.00	100	100
87.00	32.40	31.20
100.90	9.50	8.48
102.90	6.10	0.00

Data File : I:\MS13\DATA\2017 03\28\03281708.D
Acq On : 28 Mar 2017 14:13
Sample : 0.1ng TO15 ICAL STD
Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
Operator: AM
Inst : MS13

Quant Time: Mar 29 08:25:27 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Wed Mar 29 08:24:17 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 03281708.D\data.ms

(3) Dichlorodifluoromethane (CFC 12) (T)

4.624min (+0.034) 0.13ng m

response 2452

Ion	Exp%	Act%
85.00	100	100
87.00	32.40	31.20
100.90	9.50	8.48
102.90	6.10	2.37

MP

AM **3/29/17**

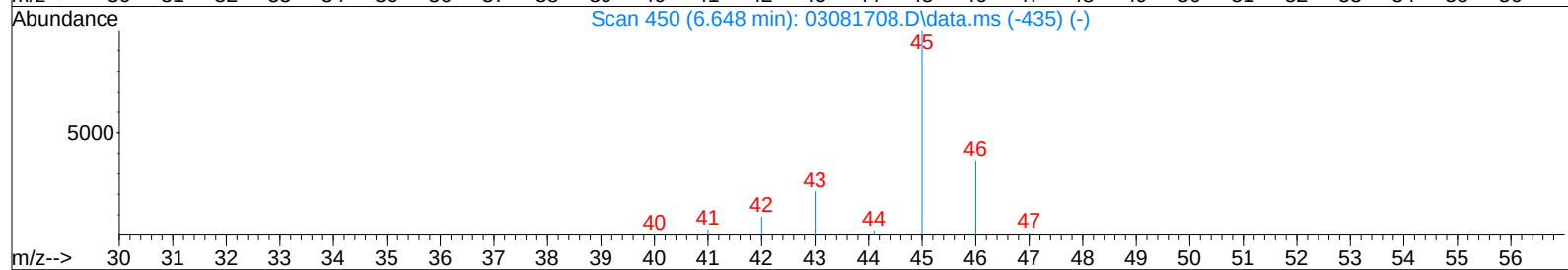
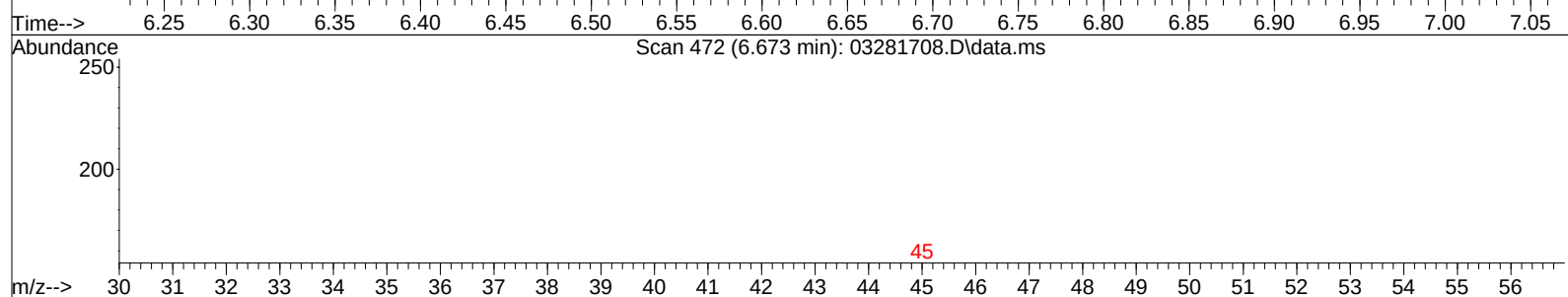
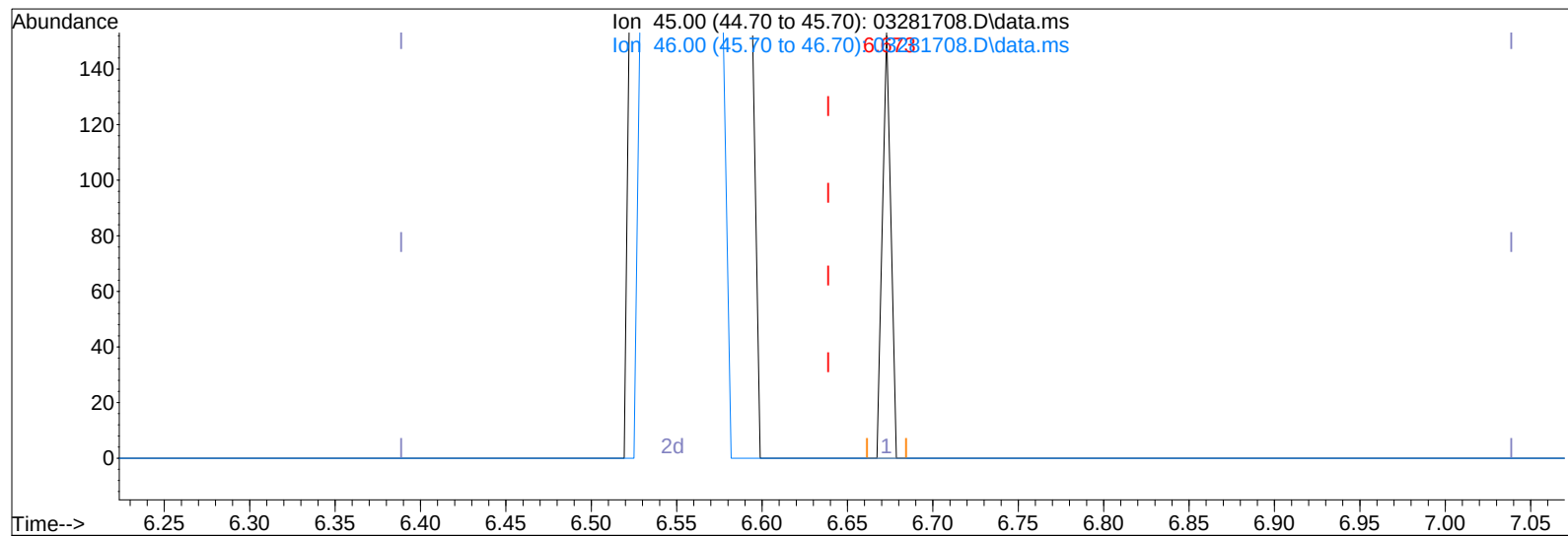
LH 4/11/17

CL 4/11/17

Data File : I:\MS13\DATA\2017 03\28\03281708.D
 Acq On : 28 Mar 2017 14:13
 Sample : 0.1ng TO15 ICAL STD
 Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
 Operator: AM
 Inst : MS13

Quant Time: Mar 29 08:25:27 2017
 Quant Method : I:\MS13\METHODS\R13032817.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Wed Mar 29 08:24:17 2017
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



TIC: 03281708.D\data.ms

(10) Ethanol (T)

6.673min (+0.034) 0.01ng

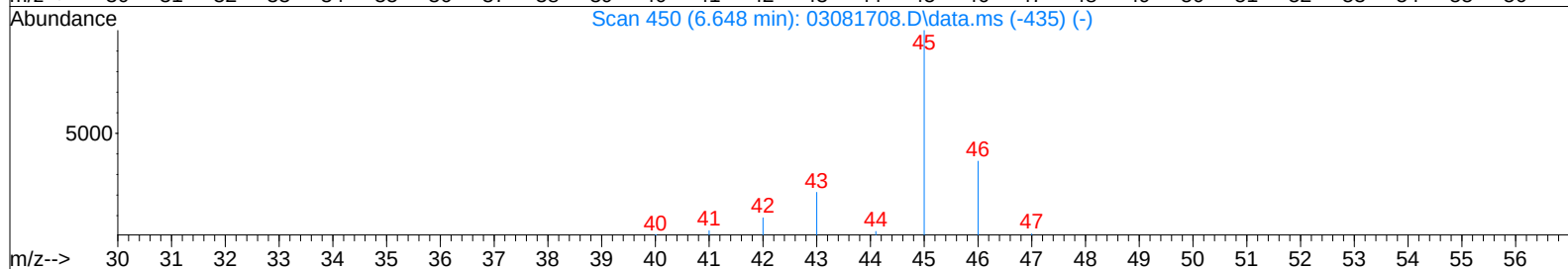
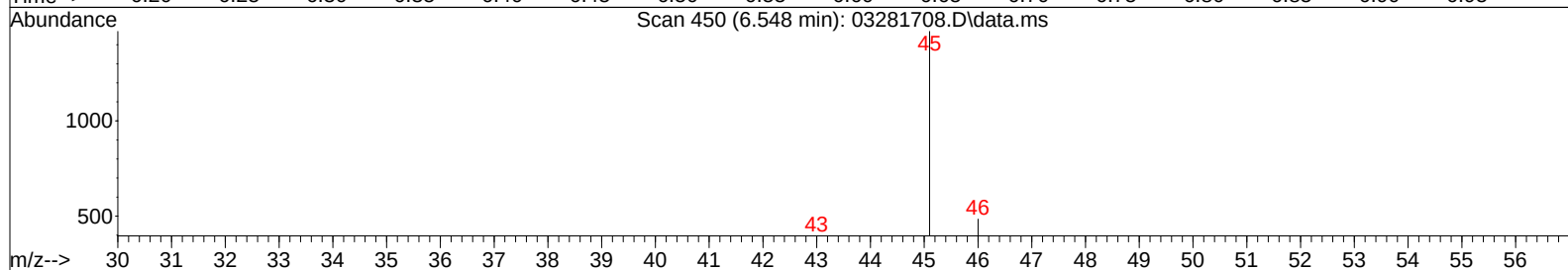
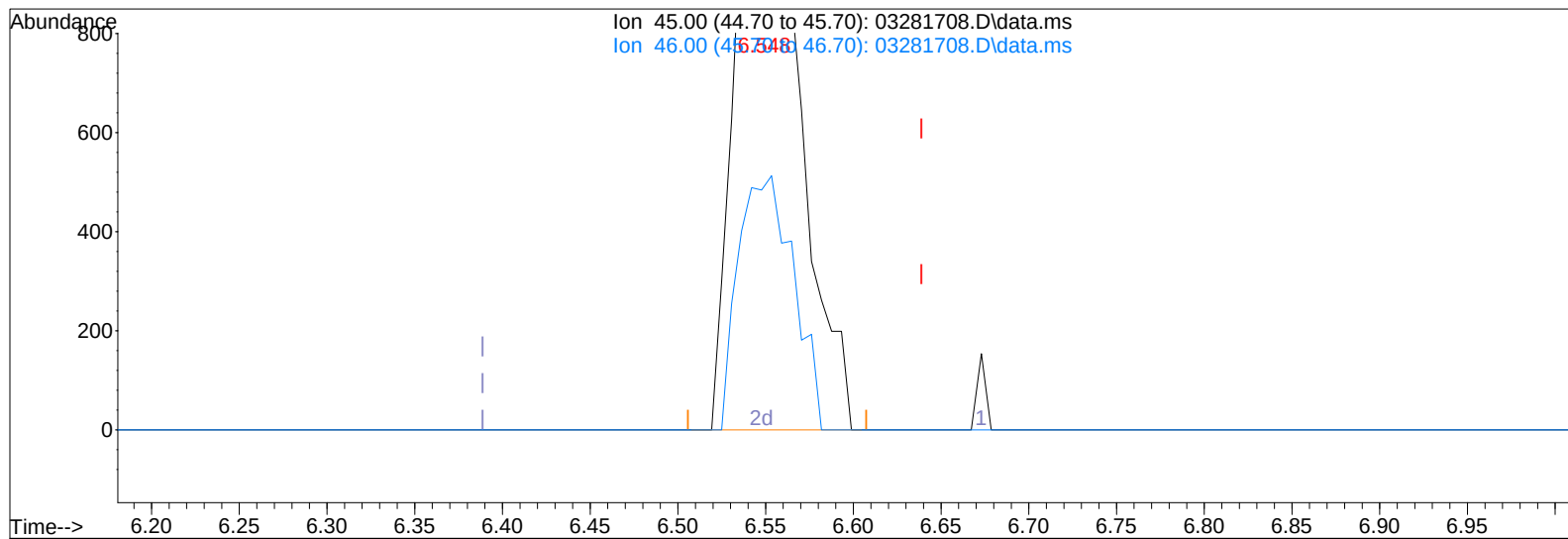
response 53

Ion	Exp%	Act%
45.00	100	100
46.00	35.40	0.00#
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2017 03\28\03281708.D
Acq On : 28 Mar 2017 14:13
Sample : 0.1ng TO15 ICAL STD
Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
Operator: AM
Inst : MS13

Quant Time: Mar 29 08:25:27 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Wed Mar 29 08:24:17 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 03281708.D\data.ms

(10) Ethanol (T)

6.548min (-0.091) 0.65ng m

response 3416

Ion	Exp%	Act%
45.00	100	100
46.00	35.40	32.73
0.00	0.00	0.00
0.00	0.00	0.00

WP

3/29/17

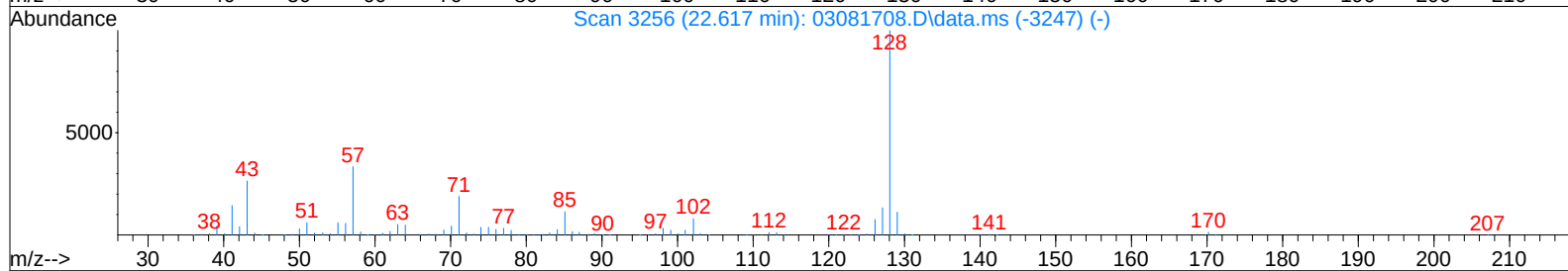
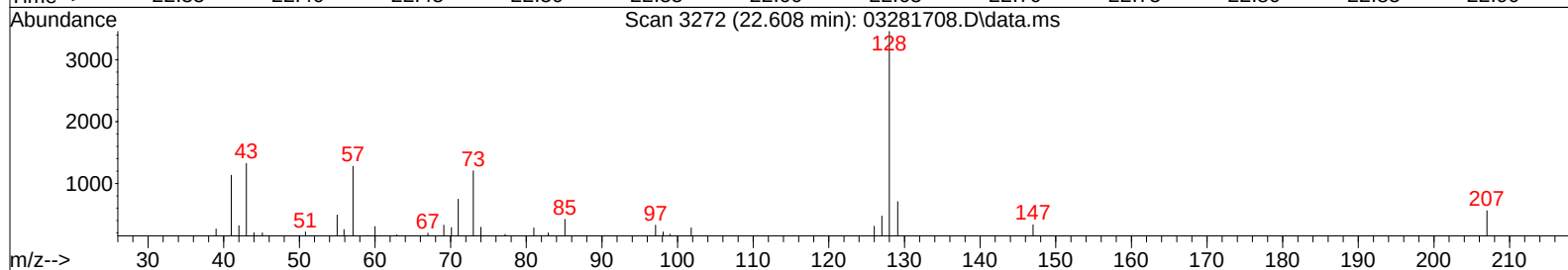
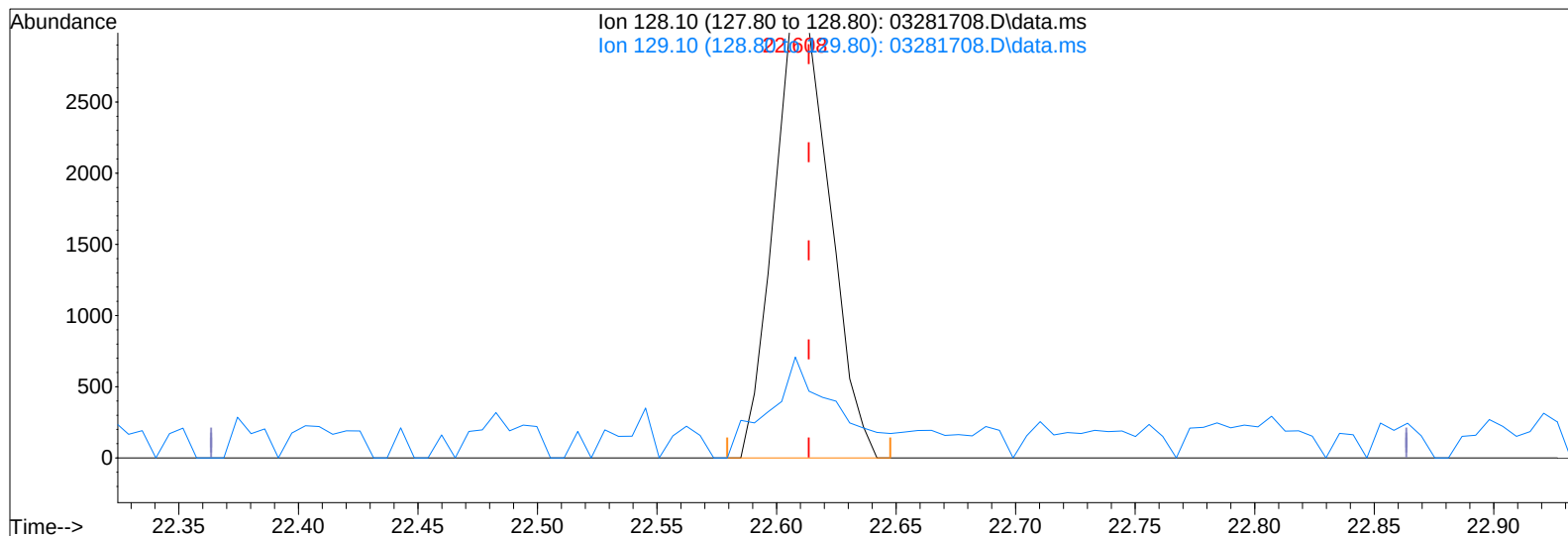
LH 4/11/17

CL 4/11/17

Data File : I:\MS13\DATA\2017 03\28\03281708.D
Acq On : 28 Mar 2017 14:13
Sample : 0.1ng TO15 ICAL STD
Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
Operator: AM
Inst : MS13

Quant Time: Mar 29 08:25:27 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Wed Mar 29 08:24:17 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 03281708.D\data.ms

(95) Naphthalene (T)

22.608min (-0.006) 0.10ng

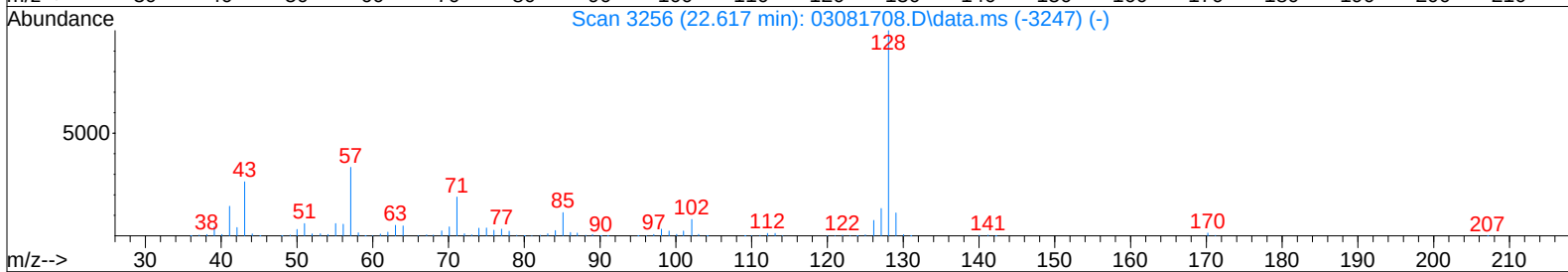
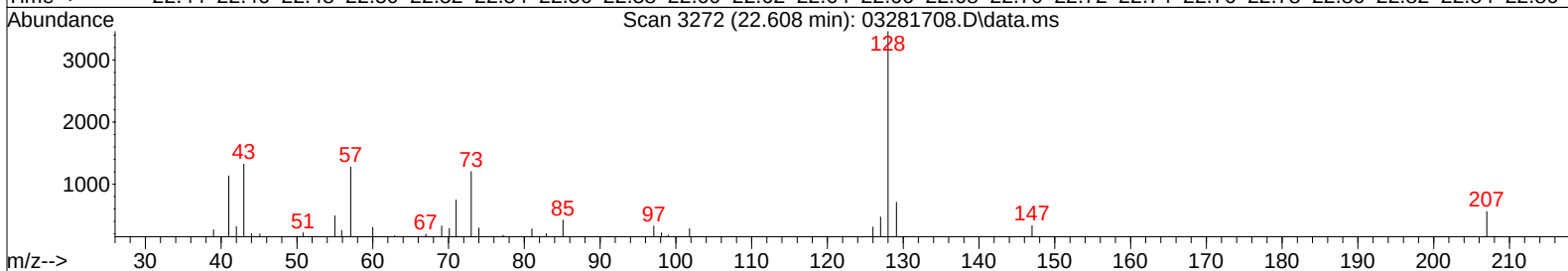
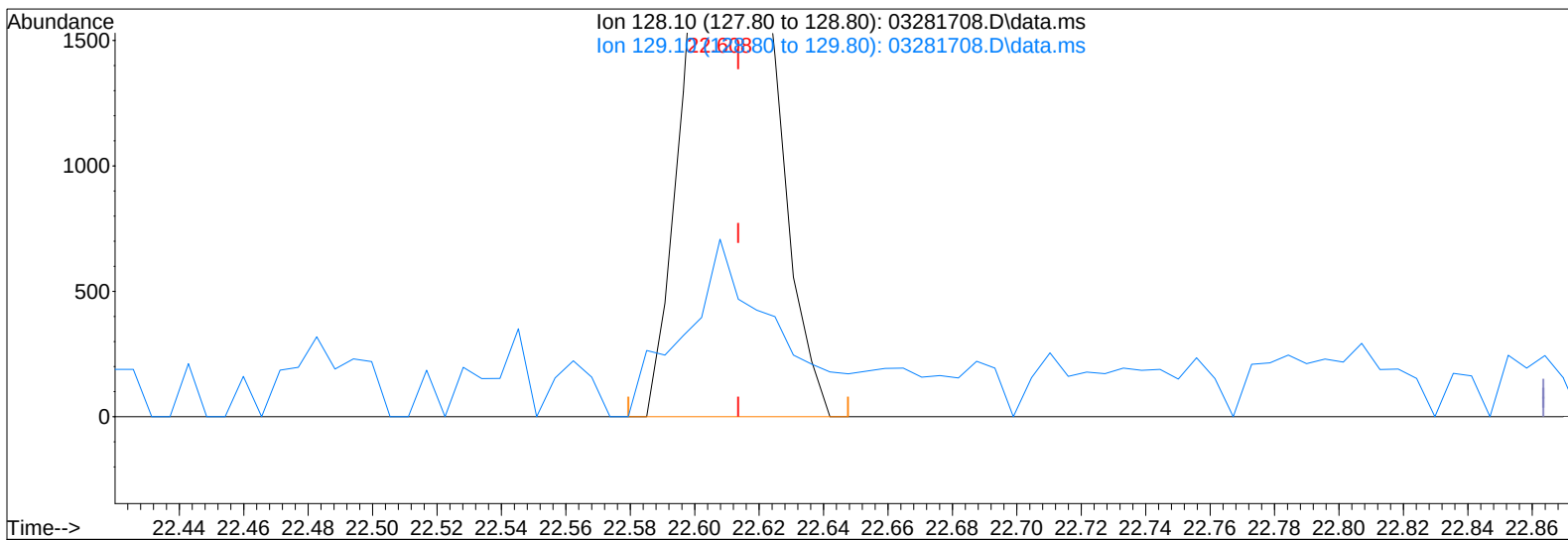
response 5134

Ion	Exp%	Act%
128.10	100	100
129.10	11.20	33.81#
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2017 03\28\03281708.D
Acq On : 28 Mar 2017 14:13
Sample : 0.1ng TO15 ICAL STD
Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
Operator: AM
Inst : MS13

Quant Time: Mar 29 08:25:27 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Wed Mar 29 08:24:17 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 03281708.D\data.ms

(95) Naphthalene (T)

22.608min (-0.006) 0.10ng m

response 5134

Ion	Exp%	Act%

BLC

128.10	100	100

129.10	11.20	25.71

AM 3/29/17

0.00	0.00	0.00

LH 4/11/17

0.00	0.00	0.00

CL 4/11/17

Data File : I:\MS13\DATA\2017 03\28\03281709.D
 Acq On : 28 Mar 2017 14:48
 Sample : 0.2ng TO15 ICAL STD
 Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
 Operator: AM
 Inst : MS13

Quant Time: Mar 29 08:25:29 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Wed Mar 29 08:24:17 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 4/11/17

3/29/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.24	130	104147	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.33	114	494278	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.62	82	202515	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.07	65	191585	14.995	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	120.00%	
57) Toluene-d8 (SS2)	15.75	98	487744	12.186	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.52%	
73) Bromofluorobenzene (SS3)	19.06	174	203239	12.526	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	100.24%	

Target Compounds

						Qvalue
2) Propene	4.48	42	2241	0.235	ng	97
3) Dichlorodifluoromethan...	4.63	85	4643	0.240	ng	97
4) Chloromethane	4.89	50	2271	0.205	ng	97
5) 1,2-Dichloro-1,1,2,2-t...	5.15	135	2284	0.213	ng	89
6) Vinyl Chloride	5.30	62	2206	0.196	ng	94
7) 1,3-Butadiene	5.55	54	1563	0.231	ng	# 86
8) Bromomethane	5.96	94	1699	0.231	ng	94
9) Chloroethane	6.27	64	1220	0.209	ng	91
10) Ethanol	6.56	45	6092	1.143	ng	96
11) Acetonitrile	6.83	41	3641	0.250	ng	96
12) Acrolein	7.03	56	1324	0.264	ng	95
13) Acetone	7.24	58	7563	1.330	ng	100
14) Trichlorofluoromethane	7.50	101	4366	0.251	ng	98
15) 2-Propanol (Isopropanol)	7.69	45	10900	0.498	ng	98
16) Acrylonitrile	7.94	53	2461	0.239	ng	92
17) 1,1-Dichloroethene	8.41	96	1996	0.231	ng	93
18) 2-Methyl-2-Propanol (t...	8.56	59	11997	0.516	ng	96
19) Methylene Chloride	8.60	84	2159	0.249	ng	99
20) 3-Chloro-1-propene (Al...	8.77	41	2708	0.226	ng	100
21) Trichlorotrifluoroethane	9.03	151	1944	0.200	ng	99
22) Carbon Disulfide	8.89	76	8461	0.274	ng	93
23) trans-1,2-Dichloroethene	9.84	61	2671	0.218	ng	99
24) 1,1-Dichloroethane	10.08	63	3236	0.204	ng	100
25) Methyl tert-Butyl Ether	10.19	73	6614	0.224	ng	99
26) Vinyl Acetate	10.32	86	2164	1.062	ng	99
27) 2-Butanone (MEK)	10.57	72	1311	0.224	ng	# 91
28) cis-1,2-Dichloroethene	11.07	61	2677	0.226	ng	100
29) Diisopropyl Ether	11.36	87	1990	0.231	ng	# 65
30) Ethyl Acetate	11.36	61	1373	0.439	ng	94
31) n-Hexane	11.36	57	3152	0.230	ng	# 97
32) Chloroform	11.40	83	3906	0.238	ng	91
34) Tetrahydrofuran (THF)	11.81	72	1508	0.245	ng	94
35) Ethyl tert-Butyl Ether	11.94	87	2728	0.239	ng	90
36) 1,2-Dichloroethane	12.19	62	3361	0.249	ng	100
38) 1,1,1-Trichloroethane	12.47	97	3758	0.236	ng	96
39) Isopropyl Acetate	12.88	61	2254	0.415	ng	97
40) 1-Butanol	12.89	56	3695	0.442	ng	96
41) Benzene	12.94	78	7965	0.214	ng	100
42) Carbon Tetrachloride	13.10	117	3444	0.243	ng	94
43) Cyclohexane	13.23	84	5497	0.387	ng	95
44) tert-Amyl Methyl Ether	13.57	73	6249	0.236	ng	98
45) 1,2-Dichloropropane	13.78	63	1637	0.185	ng	99
46) Bromodichloromethane	13.96	83	2669	0.209	ng	96
47) Trichloroethene	14.02	130	2173	0.191	ng	94
48) 1,4-Dioxane	14.00	88	1507	0.187	ng	97
49) 2,2,4-Trimethylpentane...	14.09	57	7292	0.207	ng	98
50) Methyl Methacrylate	14.22	100	1648	0.404	ng	93

Data File : I:\MS13\DATA\2017 03\28\03281709.D
 Acq On : 28 Mar 2017 14:48
 Sample : 0.2ng TO15 ICAL STD
 Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
 Operator: AM
 Inst : MS13

Quant Time: Mar 29 08:25:29 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Wed Mar 29 08:24:17 2017

Response via : Initial Calibration

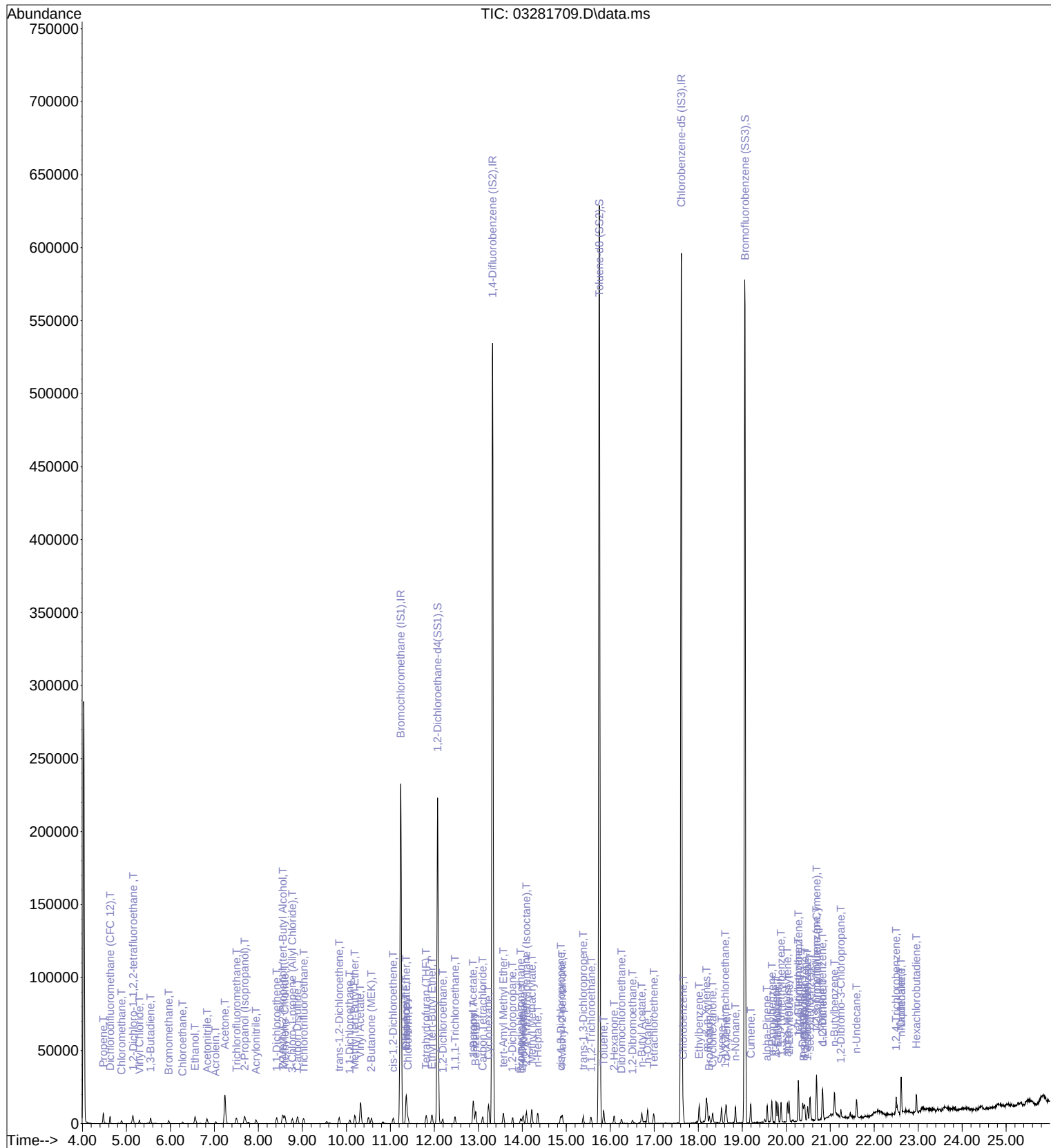
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.35	71	1916	0.207	ng	99
52) cis-1,3-Dichloropropene	14.88	75	3285	0.212	ng	93
53) 4-Methyl-2-pentanone	14.91	58	1592	0.191	ng	85
54) trans-1,3-Dichloropropene	15.39	75	3079	0.219	ng	98
55) 1,1,2-Trichloroethane	15.57	97	1721	0.186	ng	86
58) Toluene	15.85	91	7873	0.200	ng	99
59) 2-Hexanone	16.09	43	4462	0.225	ng	99
60) Dibromochloromethane	16.26	129	2495	0.209	ng	99
61) 1,2-Dibromoethane	16.51	107	2059	0.191	ng	96
62) n-Butyl Acetate	16.72	43	4904	0.225	ng	97
63) n-Octane	16.85	57	1685	0.215	ng	85
64) Tetrachloroethene	16.99	166	2584	0.200	ng	98
65) Chlorobenzene	17.66	112	5483	0.196	ng	86
66) Ethylbenzene	18.02	91	9419	0.208	ng	100
67) m- & p-Xylenes	18.19	91	14532	0.412	ng	99
68) Bromoform	18.25	173	2320	0.217	ng	94
69) Styrene	18.53	104	5224	0.184	ng	91
70) o-Xylene	18.64	91	7116	0.196	ng	97
71) n-Nonane	18.85	43	3917	0.222	ng	99
72) 1,1,2,2-Tetrachloroethane	18.61	83	3313	0.209	ng	98
74) Cumene	19.19	105	9924	0.210	ng	96
75) alpha-Pinene	19.56	93	4764	0.197	ng	95
76) n-Propylbenzene	19.68	91	11389	0.212	ng	95
77) 3-Ethyltoluene	19.77	105	9566	0.193	ng	98
78) 4-Ethyltoluene	19.81	105	8736	0.198	ng	94
79) 1,3,5-Trimethylbenzene	19.88	105	7908	0.199	ng	100
80) alpha-Methylstyrene	20.03	118	4204	0.196	ng	97
81) 2-Ethyltoluene	20.06	105	9144	0.193	ng	96
82) 1,2,4-Trimethylbenzene	20.28	105	8033	0.197	ng	99
83) n-Decane	20.37	57	4491	0.237	ng	92
84) Benzyl Chloride	20.40	91	6033	0.179	ng	99
85) 1,3-Dichlorobenzene	20.42	146	4626	0.180	ng	95
86) 1,4-Dichlorobenzene	20.49	146	4919	0.187	ng	96
87) sec-Butylbenzene	20.54	105	10395	0.194	ng	98
88) 4-Isopropyltoluene (p-...	20.69	119	10447	0.199	ng	97
89) 1,2,3-Trimethylbenzene	20.68	105	8332	0.201	ng	96
90) 1,2-Dichlorobenzene	20.82	146	4569	0.184	ng	92
91) d-Limonene	20.83	68	3017	0.208	ng	81
92) 1,2-Dibromo-3-Chloropr...	21.24	157	1721	0.197	ng	# 81
93) n-Undecane	21.60	57	4563	0.247	ng	# 73
94) 1,2,4-Trichlorobenzene	22.50	180	3389	0.175	ng	93
95) Naphthalene	22.61	128	8965	0.168	ng	80
96) n-Dodecane	22.62	57	4101	0.239	ng	89
97) Hexachlorobutadiene	22.96	225	2846	0.202	ng	93
98) Cyclohexanone	18.33	55	2803	0.220	ng	# 85
99) tert-Butylbenzene	20.27	119	8247	0.200	ng	94
100) n-Butylbenzene	21.09	91	8382	0.203	ng	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Vial: 8
Operator: AM
Inst : MS13

Quant Time: Mar 29 08:25:29 2017



Data File : I:\MS13\DATA\2017 03\28\03281710.D
 Acq On : 28 Mar 2017 15:23
 Sample : 0.4ng TO15 ICAL STD
 Misc : S29-03211702/S31-03271704 (4/25)

Vial: 12
 Operator: AM
 Inst : MS13

Quant Time: Mar 29 08:25:31 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Wed Mar 29 08:24:17 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 4/11/17

AM 3/29/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.24	130	104230	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.33	114	495607	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.61	82	204927	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.07	65	194913	15.243	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	121.92%	
57) Toluene-d8 (SS2)	15.75	98	491262	12.129	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.04%	
73) Bromofluorobenzene (SS3)	19.06	174	208254	12.684	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	101.44%	

Target Compounds

						Qvalue
2) Propene	4.47	42	4833	0.506	ng	94
3) Dichlorodifluoromethan...	4.62	85	11565	0.597	ng	97
4) Chloromethane	4.88	50	6515	0.589	ng	96
5) 1,2-Dichloro-1,1,2,2-t...	5.14	135	5433	0.506	ng	98
6) Vinyl Chloride	5.29	62	6397	0.568	ng	97
7) 1,3-Butadiene	5.54	54	4329	0.639	ng	99
8) Bromomethane	5.96	94	4051	0.550	ng	99
9) Chloroethane	6.27	64	3002	0.513	ng	96
10) Ethanol	6.56	45	16595	3.111	ng	96
11) Acetonitrile	6.83	41	8055	0.552	ng	96
12) Acrolein	7.02	56	2951	0.589	ng	97
13) Acetone	7.23	58	17550	3.085	ng	97
14) Trichlorofluoromethane	7.50	101	10797	0.621	ng	100
15) 2-Propanol (Isopropanol)	7.68	45	26976	1.231	ng	99
16) Acrylonitrile	7.95	53	5872	0.570	ng	100
17) 1,1-Dichloroethene	8.41	96	4729	0.548	ng	96
18) 2-Methyl-2-Propanol (t...	8.54	59	29155	1.254	ng	98
19) Methylene Chloride	8.61	84	5007	0.578	ng	93
20) 3-Chloro-1-propene (Al...	8.77	41	6748	0.564	ng	99
21) Trichlorotrifluoroethane	9.02	151	5362	0.552	ng	94
22) Carbon Disulfide	8.89	76	18153	0.588	ng	99
23) trans-1,2-Dichloroethene	9.83	61	7311	0.596	ng	95
24) 1,1-Dichloroethane	10.08	63	8484	0.536	ng	97
25) Methyl tert-Butyl Ether	10.19	73	16840	0.569	ng	100
26) Vinyl Acetate	10.32	86	5724	2.806	ng	# 95
27) 2-Butanone (MEK)	10.57	72	3114	0.532	ng	94
28) cis-1,2-Dichloroethene	11.07	61	6887	0.580	ng	98
29) Diisopropyl Ether	11.36	87	5094	0.590	ng	# 64
30) Ethyl Acetate	11.36	61	2988	0.955	ng	93
31) n-Hexane	11.36	57	7575	0.552	ng	99
32) Chloroform	11.40	83	9571	0.584	ng	98
34) Tetrahydrofuran (THF)	11.81	72	3430	0.556	ng	100
35) Ethyl tert-Butyl Ether	11.94	87	6313	0.553	ng	99
36) 1,2-Dichloroethane	12.19	62	8389	0.620	ng	97
38) 1,1,1-Trichloroethane	12.47	97	9486	0.595	ng	98
39) Isopropyl Acetate	12.88	61	5138	0.944	ng	# 84
40) 1-Butanol	12.89	56	9473	1.130	ng	97
41) Benzene	12.94	78	18535	0.496	ng	99
42) Carbon Tetrachloride	13.10	117	8350	0.588	ng	98
43) Cyclohexane	13.23	84	14728	1.034	ng	96
44) tert-Amyl Methyl Ether	13.56	73	14909	0.563	ng	99
45) 1,2-Dichloropropane	13.78	63	4426	0.500	ng	98
46) Bromodichloromethane	13.96	83	7061	0.551	ng	96
47) Trichloroethene	14.02	130	5860	0.513	ng	99
48) 1,4-Dioxane	13.99	88	4132	0.511	ng	98
49) 2,2,4-Trimethylpentane...	14.09	57	18812	0.534	ng	99
50) Methyl Methacrylate	14.21	100	4114	1.006	ng	94

Data File : I:\MS13\DATA\2017 03\28\03281710.D
 Acq On : 28 Mar 2017 15:23
 Sample : 0.4ng TO15 ICAL STD
 Misc : S29-03211702/S31-03271704 (4/25)

Vial: 12
 Operator: AM
 Inst : MS13

Quant Time: Mar 29 08:25:31 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Wed Mar 29 08:24:17 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.34	71	4495	0.483	ng	98
52) cis-1,3-Dichloropropene	14.87	75	8348	0.538	ng	99
53) 4-Methyl-2-pentanone	14.90	58	3930	0.470	ng	86
54) trans-1,3-Dichloropropene	15.38	75	7669	0.543	ng	98
55) 1,1,2-Trichloroethane	15.56	97	4397	0.473	ng	93
58) Toluene	15.85	91	20043	0.503	ng	99
59) 2-Hexanone	16.09	43	11015	0.549	ng	99
60) Dibromochloromethane	16.25	129	6607	0.548	ng	97
61) 1,2-Dibromoethane	16.51	107	5330	0.488	ng	99
62) n-Butyl Acetate	16.72	43	12205	0.554	ng	96
63) n-Octane	16.85	57	3855	0.485	ng	99
64) Tetrachloroethene	16.99	166	6643	0.507	ng	100
65) Chlorobenzene	17.66	112	14192	0.502	ng	93
66) Ethylbenzene	18.02	91	24051	0.525	ng	97
67) m- & p-Xylenes	18.19	91	38217	1.070	ng	98
68) Bromoform	18.25	173	5761	0.532	ng	97
69) Styrene	18.53	104	14851	0.518	ng	99
70) o-Xylene	18.64	91	18723	0.510	ng	99
71) n-Nonane	18.85	43	9731	0.546	ng	98
72) 1,1,2,2-Tetrachloroethane	18.61	83	7858	0.489	ng	97
74) Cumene	19.19	105	24195	0.507	ng	99
75) alpha-Pinene	19.57	93	12140	0.496	ng	99
76) n-Propylbenzene	19.67	91	28398	0.523	ng	96
77) 3-Ethyltoluene	19.77	105	24890	0.496	ng	99
78) 4-Ethyltoluene	19.81	105	23060	0.517	ng	99
79) 1,3,5-Trimethylbenzene	19.88	105	20871	0.520	ng	98
80) alpha-Methylstyrene	20.03	118	10880	0.502	ng	99
81) 2-Ethyltoluene	20.06	105	23377	0.489	ng	98
82) 1,2,4-Trimethylbenzene	20.27	105	20925	0.506	ng	99
83) n-Decane	20.38	57	9861	0.514	ng	96
84) Benzyl Chloride	20.40	91	16894	0.496	ng	100
85) 1,3-Dichlorobenzene	20.42	146	12383	0.476	ng	96
86) 1,4-Dichlorobenzene	20.49	146	12680	0.476	ng	100
87) sec-Butylbenzene	20.54	105	26489	0.488	ng	99
88) 4-Isopropyltoluene (p-...	20.69	119	26370	0.496	ng	98
89) 1,2,3-Trimethylbenzene	20.69	105	20326	0.485	ng	98
90) 1,2-Dichlorobenzene	20.82	146	11762	0.467	ng	99
91) d-Limonene	20.83	68	7333	0.499	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.24	157	4483	0.507	ng	92
93) n-Undecane	21.60	57	9440	0.505	ng	88
94) 1,2,4-Trichlorobenzene	22.50	180	9478	0.484	ng	98
95) Naphthalene	22.61	128	25454	0.471	ng	93
96) n-Dodecane	22.62	57	9947	0.574	ng	99
97) Hexachlorobutadiene	22.96	225	6635	0.466	ng	96
98) Cyclohexanone	18.32	55	6358	0.493	ng	93
99) tert-Butylbenzene	20.27	119	21004	0.504	ng	98
100) n-Butylbenzene	21.09	91	21763	0.522	ng	96

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2017 03\28\03281710.D
Acq On : 28 Mar 2017 15:23
Sample : 0.4ng TO15 ICAL STD
Misc : S29-03211702/S31-03271704 (4/25)

Vial: 12
Operator: AM
Inst : MS13

Quant Time: Mar 29 08:25:31 2017

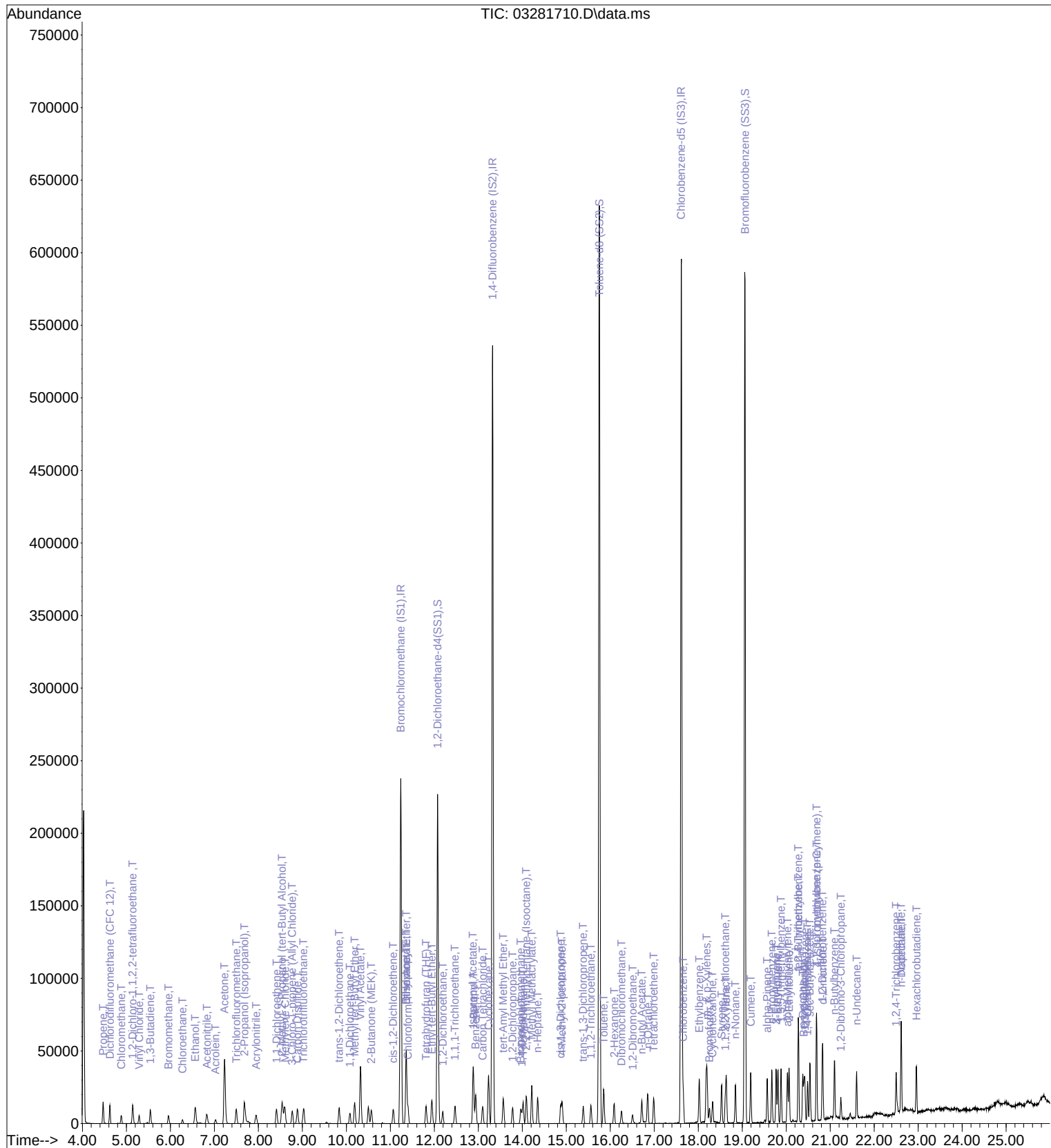
Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Wed Mar 29 08:24:17 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2017 03\28\03281707.D
 Acq On : 28 Mar 2017 13:38
 Sample : 0.08ng TO15 ICAL STD
 Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
 Operator: AM
 Inst : MS13

Quant Time: Mar 29 08:36:38 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Wed Mar 29 08:24:17 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 4/11/17

3/29/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.23	130	99085	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.33	114	468748	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.61	82	191677	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.07	65	188368	15.497	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	124.00%	
57) Toluene-d8 (SS2)	15.75	98	461158	12.173	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.36%	
73) Bromofluorobenzene (SS3)	19.06	174	193280	12.586	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	100.72%	

Target Compounds

						Qvalue
2) Propene	4.47	42	958	0.105	ng	92
3) Dichlorodifluoromethan...	0.00	85	0	N.D.	d	
4) Chloromethane	4.89	50	1144	0.109	ng	76
5) 1,2-Dichloro-1,1,2,2-t...	5.15	135	844	0.083	ng	70
6) Vinyl Chloride	5.30	62	1150m	0.107	ng	
7) 1,3-Butadiene	5.55	54	695	0.108	ng	# 67
8) Bromomethane	5.97	94	572	0.082	ng	# 78
9) Chloroethane	0.00	64	0	N.D.	d	
10) Ethanol	6.55	45	2893	0.571	ng	99
11) Acetonitrile	6.83	41	1744	0.126	ng	97
12) Acrolein	7.04	56	449	0.094	ng	81
13) Acetone	7.24	58	3761	0.695	ng	92
14) Trichlorofluoromethane	7.50	101	1958	0.119	ng	99
15) 2-Propanol (Isopropanol)	7.69	45	4384	0.210	ng	98
16) Acrylonitrile	7.94	53	1012	0.103	ng	# 77
17) 1,1-Dichloroethene	8.41	96	723	0.088	ng	92
18) 2-Methyl-2-Propanol (t...	8.55	59	5557	0.251	ng	89
19) Methylene Chloride	8.60	84	1271	0.154	ng	95
20) 3-Chloro-1-propene (Al...	8.77	41	1183	0.104	ng	74
21) Trichlorotrifluoroethane	9.03	151	1050	0.114	ng	# 80
22) Carbon Disulfide	8.89	76	4758m	0.162	ng	
23) trans-1,2-Dichloroethene	9.83	61	1139	0.098	ng	86
24) 1,1-Dichloroethane	10.08	63	1438	0.095	ng	99
25) Methyl tert-Butyl Ether	10.20	73	3086	0.110	ng	90
26) Vinyl Acetate	10.32	86	860	0.444	ng	# 72
27) 2-Butanone (MEK)	10.57	72	404	0.073	ng	# 16
28) cis-1,2-Dichloroethene	11.07	61	1194	0.106	ng	100
29) Diisopropyl Ether	11.36	87	784m	0.095	ng	
30) Ethyl Acetate	11.37	61	624m	0.210	ng	
31) n-Hexane	11.36	57	1497m	0.115	ng	
32) Chloroform	11.40	83	1769	0.114	ng	96
34) Tetrahydrofuran (THF)	11.82	72	739	0.126	ng	# 85
35) Ethyl tert-Butyl Ether	11.94	87	1055	0.097	ng	# 86
36) 1,2-Dichloroethane	12.18	62	1450	0.113	ng	94
38) 1,1,1-Trichloroethane	12.47	97	1801	0.119	ng	91
39) Isopropyl Acetate	12.88	61	925	0.180	ng	# 75
40) 1-Butanol	12.89	56	1839	0.232	ng	99
41) Benzene	12.94	78	3827	0.108	ng	100
42) Carbon Tetrachloride	13.10	117	1525	0.114	ng	96
43) Cyclohexane	13.23	84	2505	0.186	ng	92
44) tert-Amyl Methyl Ether	13.58	73	2912	0.116	ng	95
45) 1,2-Dichloropropane	13.78	63	646m	0.077	ng	
46) Bromodichloromethane	13.96	83	1127	0.093	ng	100
47) Trichloroethene	14.01	130	1010	0.094	ng	90
48) 1,4-Dioxane	14.00	88	633m	0.083	ng	
49) 2,2,4-Trimethylpentane...	14.09	57	3325	0.100	ng	98
50) Methyl Methacrylate	14.21	100	595	0.154	ng	# 68

Data File : I:\MS13\DATA\2017 03\28\03281707.D
 Acq On : 28 Mar 2017 13:38
 Sample : 0.08ng TO15 ICAL STD
 Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
 Operator: AM
 Inst : MS13

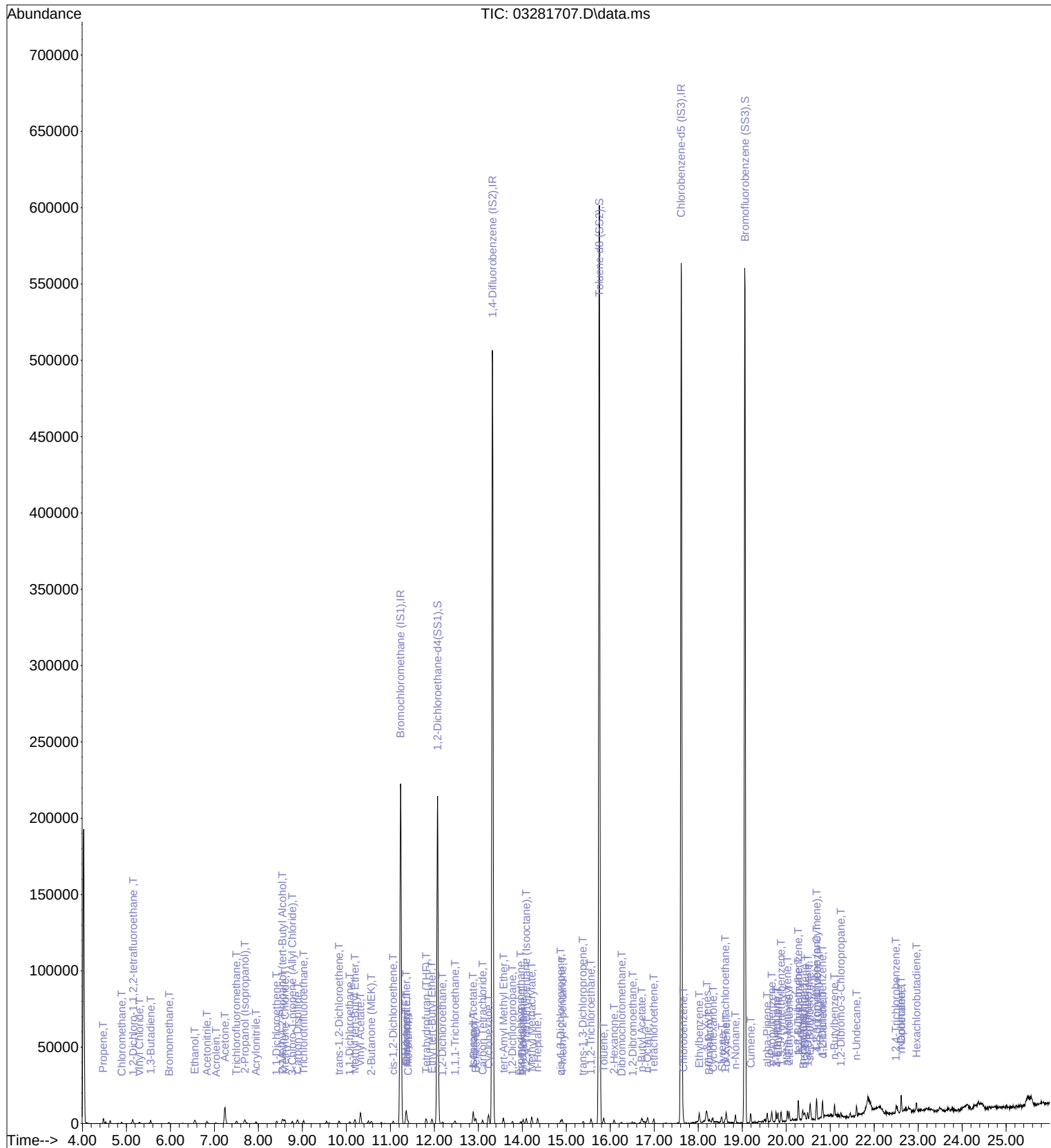
Quant Time: Mar 29 08:36:38 2017
 Quant Method : I:\MS13\METHODS\R13032817.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Wed Mar 29 08:24:17 2017
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
51) n-Heptane	14.34	71	910m	0.103	ng	
52) cis-1,3-Dichloropropene	14.87	75	1358	0.093	ng	96
53) 4-Methyl-2-pentanone	14.91	58	771	0.098	ng	# 86
54) trans-1,3-Dichloropropene	15.37	75	1236	0.093	ng	93
55) 1,1,2-Trichloroethane	15.56	97	703	0.080	ng	# 77
58) Toluene	15.85	91	3822	0.103	ng	96
59) 2-Hexanone	16.09	43	2115	0.113	ng	99
60) Dibromochloromethane	16.26	129	975	0.086	ng	94
61) 1,2-Dibromoethane	16.51	107	918	0.090	ng	89
62) n-Butyl Acetate	16.72	43	2108	0.102	ng	97
63) n-Octane	16.84	57	727	0.098	ng	# 82
64) Tetrachloroethene	16.99	166	1200	0.098	ng	94
65) Chlorobenzene	17.66	112	2575	0.097	ng	93
66) Ethylbenzene	18.03	91	4185	0.098	ng	99
67) m- & p-Xylenes	18.20	91	6708	0.201	ng	100
68) Bromoform	18.25	173	1022	0.101	ng	71
69) Styrene	18.54	104	2634	0.098	ng	85
70) o-Xylene	18.64	91	3290	0.096	ng	98
71) n-Nonane	18.85	43	2248	0.135	ng	83
72) 1,1,2,2-Tetrachloroethane	18.61	83	1543	0.103	ng	92
74) Cumene	19.19	105	4780	0.107	ng	97
75) alpha-Pinene	19.57	93	2285	0.100	ng	92
76) n-Propylbenzene	19.67	91	5260	0.104	ng	95
77) 3-Ethyltoluene	19.77	105	4414	0.094	ng	98
78) 4-Ethyltoluene	19.81	105	4027	0.096	ng	96
79) 1,3,5-Trimethylbenzene	19.88	105	3806	0.101	ng	98
80) alpha-Methylstyrene	20.03	118	1897	0.094	ng	96
81) 2-Ethyltoluene	20.06	105	4654	0.104	ng	95
82) 1,2,4-Trimethylbenzene	20.27	105	3902	0.101	ng	95
83) n-Decane	20.37	57	2043	0.114	ng	90
84) Benzyl Chloride	20.39	91	2667	0.084	ng	96
85) 1,3-Dichlorobenzene	20.42	146	2093	0.086	ng	90
86) 1,4-Dichlorobenzene	20.49	146	2197	0.088	ng	92
87) sec-Butylbenzene	20.54	105	4772	0.094	ng	99
88) 4-Isopropyltoluene (p-...	20.69	119	4804	0.097	ng	99
89) 1,2,3-Trimethylbenzene	20.69	105	3686	0.094	ng	93
90) 1,2-Dichlorobenzene	20.82	146	2017	0.086	ng	96
91) d-Limonene	20.83	68	1510	0.110	ng	# 75
92) 1,2-Dibromo-3-Chloropr...	21.24	157	814	0.098	ng	# 60
93) n-Undecane	21.59	57	1891	0.108	ng	# 56
94) 1,2,4-Trichlorobenzene	22.49	180	1576	0.086	ng	97
95) Naphthalene	22.61	128	4297	0.085	ng	48
96) n-Dodecane	22.62	57	1793	0.111	ng	# 64
97) Hexachlorobutadiene	22.96	225	1088	0.082	ng	93
98) Cyclohexanone	18.33	55	1283	0.106	ng	# 24
99) tert-Butylbenzene	20.27	119	3659	0.094	ng	98
100) n-Butylbenzene	21.09	91	3914	0.100	ng	94

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Vial: 8
Operator: AM
Inst : MS13

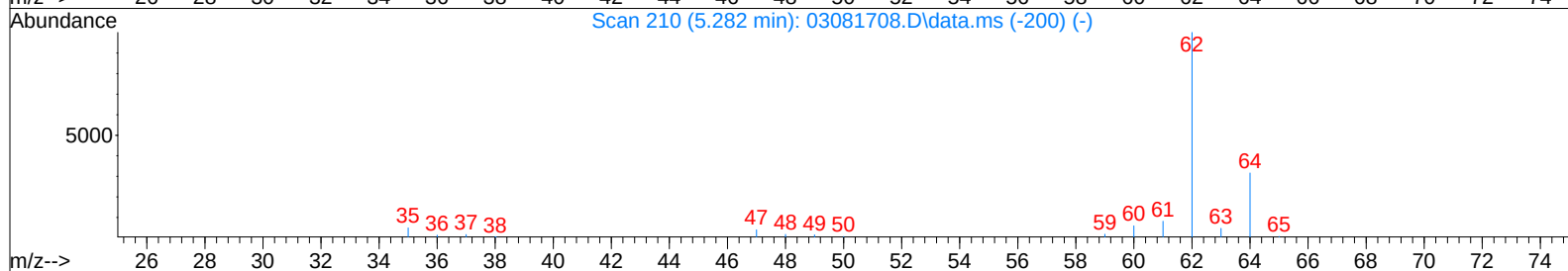
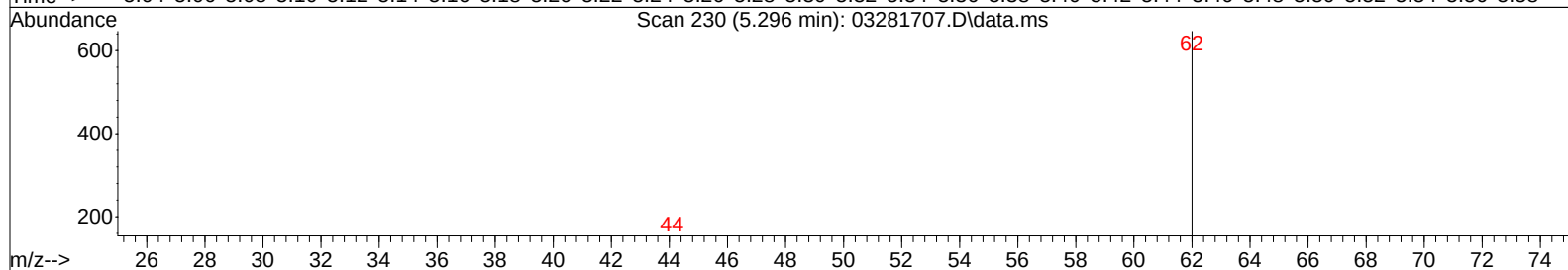
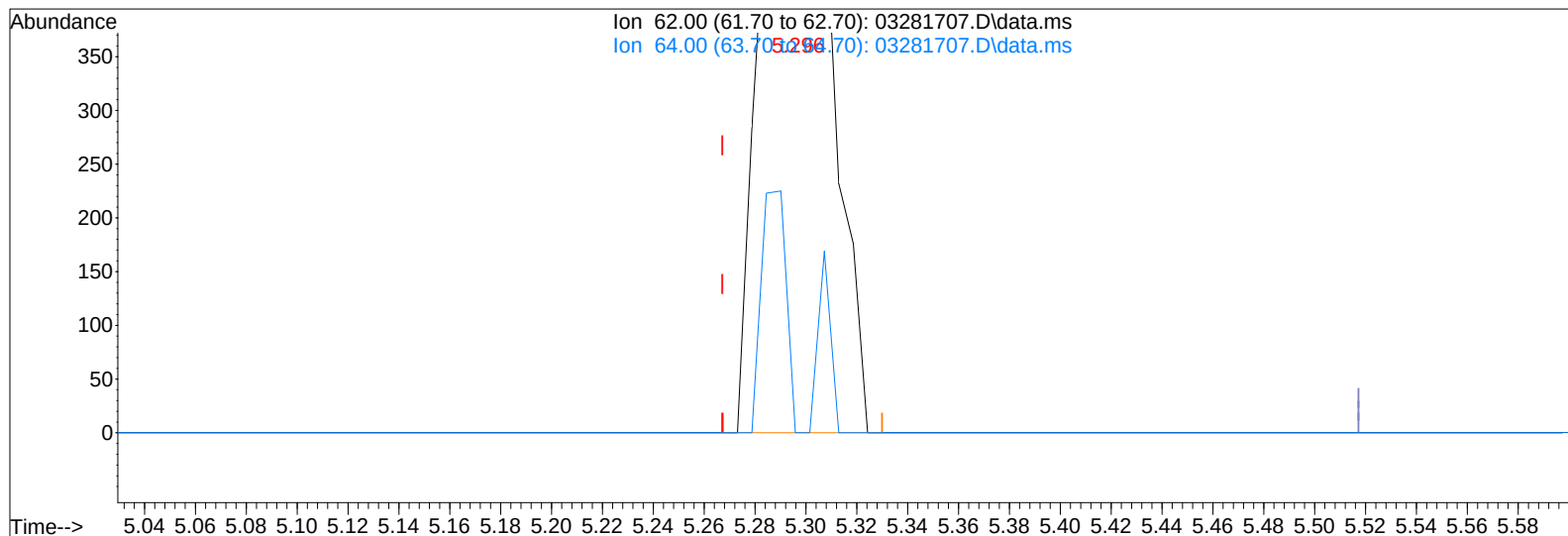
Quant Time: Mar 29 08:36:38 2017



Data File : I:\MS13\DATA\2017 03\28\03281707.D
Acq On : 28 Mar 2017 13:38
Sample : 0.08ng TO15 ICAL STD
Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
Operator: AM
Inst : MS13

Quant Time: Mar 29 08:25:25 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Wed Mar 29 08:24:17 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 03281707.D\data.ms

(6) Vinyl Chloride (T)

5.296min (+0.029) 0.11ng

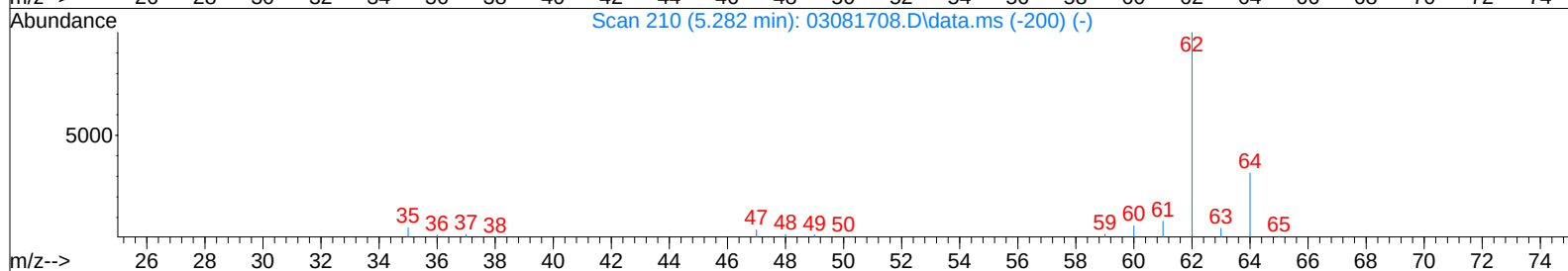
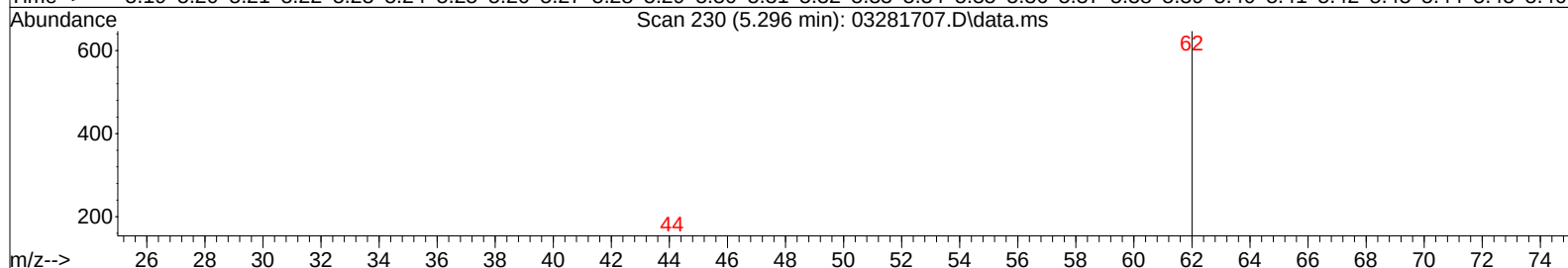
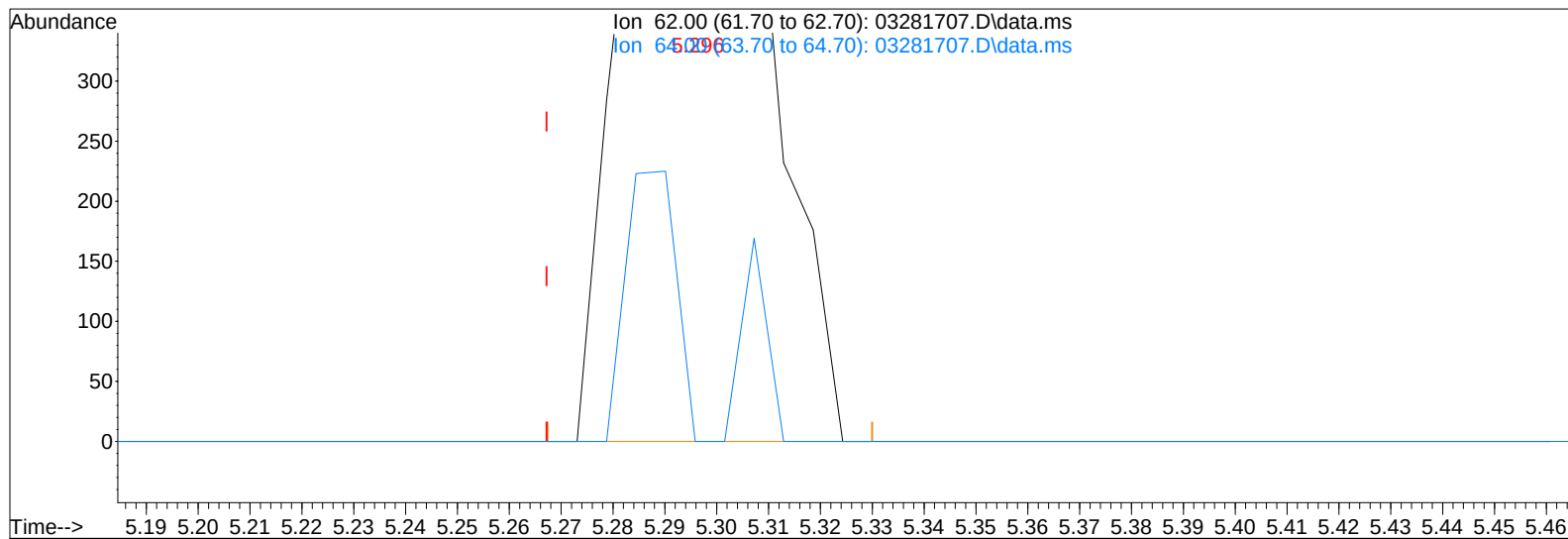
response 1150

Ion	Exp%	Act%
62.00	100	100
64.00	32.20	13.30
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2017 03\28\03281707.D
Acq On : 28 Mar 2017 13:38
Sample : 0.08ng TO15 ICAL STD
Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
Operator: AM
Inst : MS13

Quant Time: Mar 29 08:25:25 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Wed Mar 29 08:24:17 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 03281707.D\data.ms

(6) Vinyl Chloride (T)

5.296min (+0.029) 0.11ng m

response 1150

Ion	Exp%	Act%
62.00	100	100
64.00	32.20	18.35
0.00	0.00	0.00
0.00	0.00	0.00

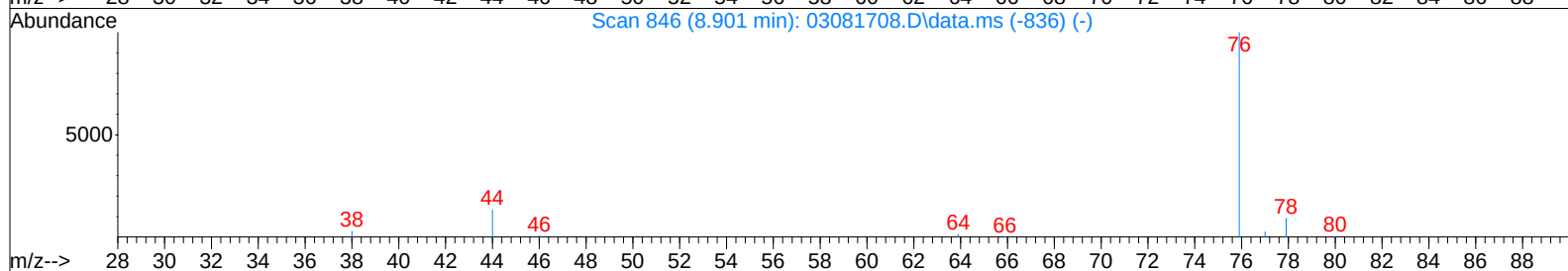
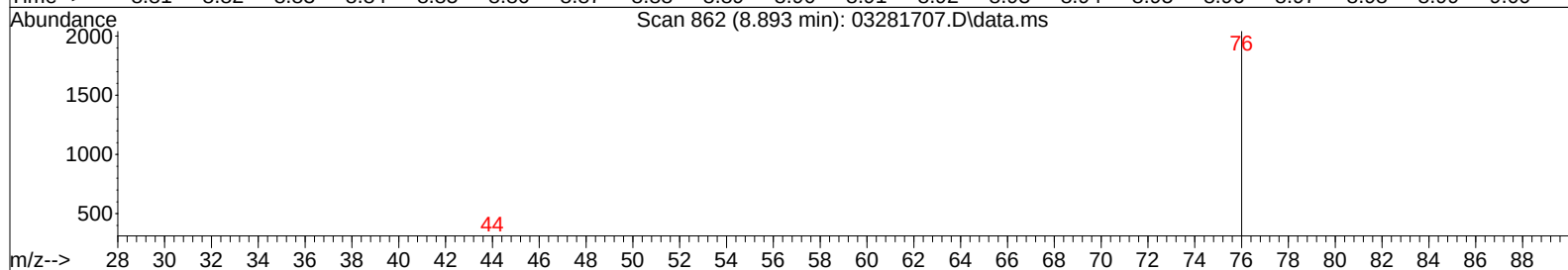
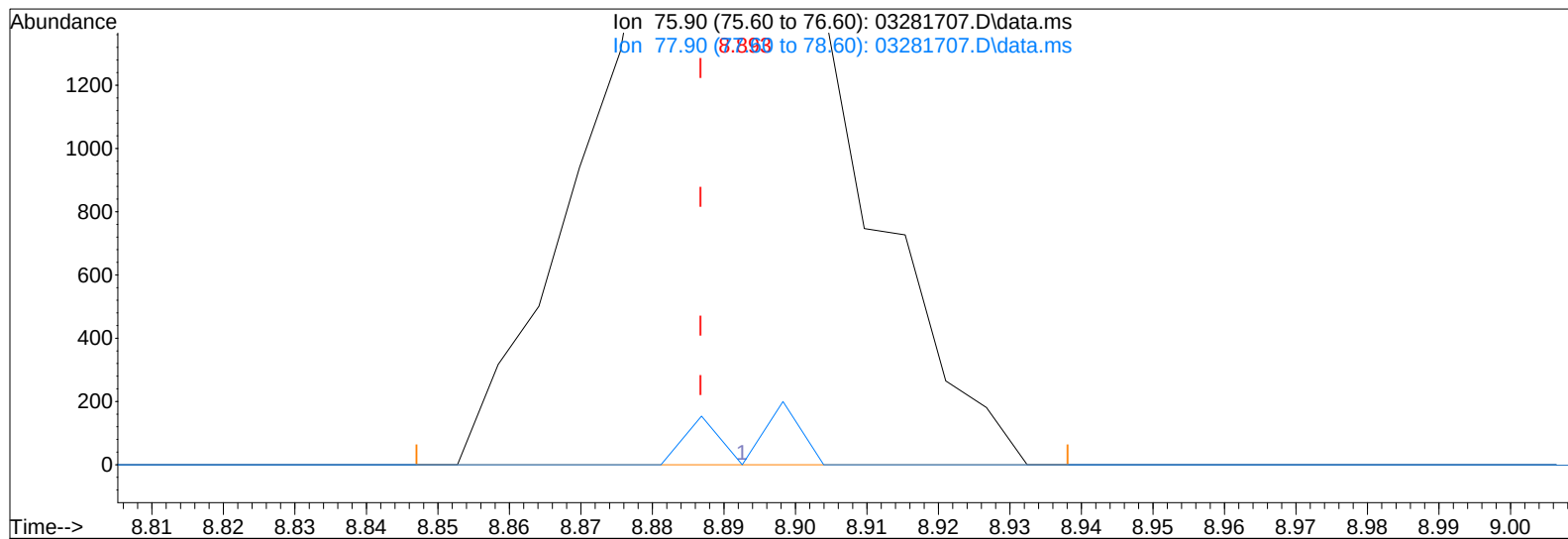
BLC

AM 3/29/17
LH 4/11/17
CL 4/11/17

Data File : I:\MS13\DATA\2017 03\28\03281707.D
Acq On : 28 Mar 2017 13:38
Sample : 0.08ng TO15 ICAL STD
Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
Operator: AM
Inst : MS13

Quant Time: Mar 29 08:25:25 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Wed Mar 29 08:24:17 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 03281707.D\data.ms

(22) Carbon Disulfide (T)

8.893min (+0.006) 0.16ng

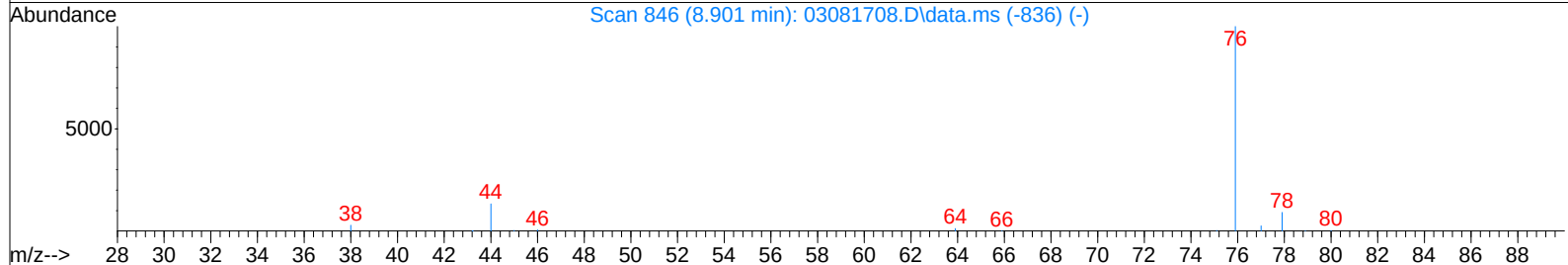
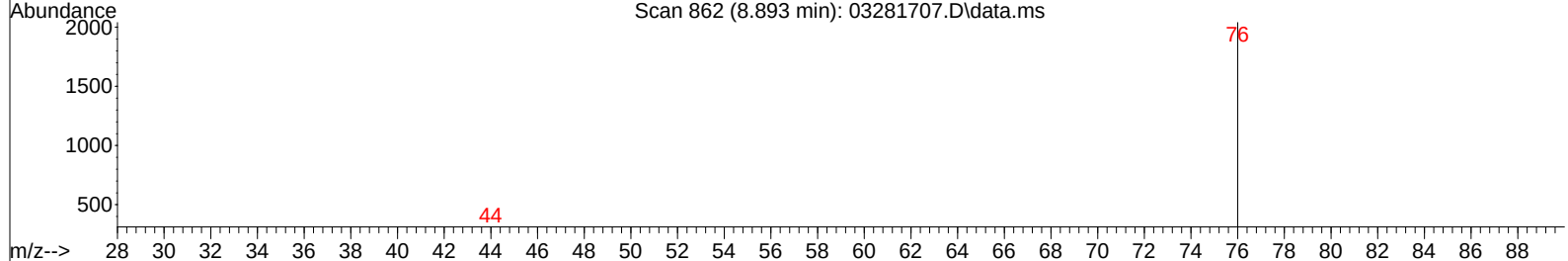
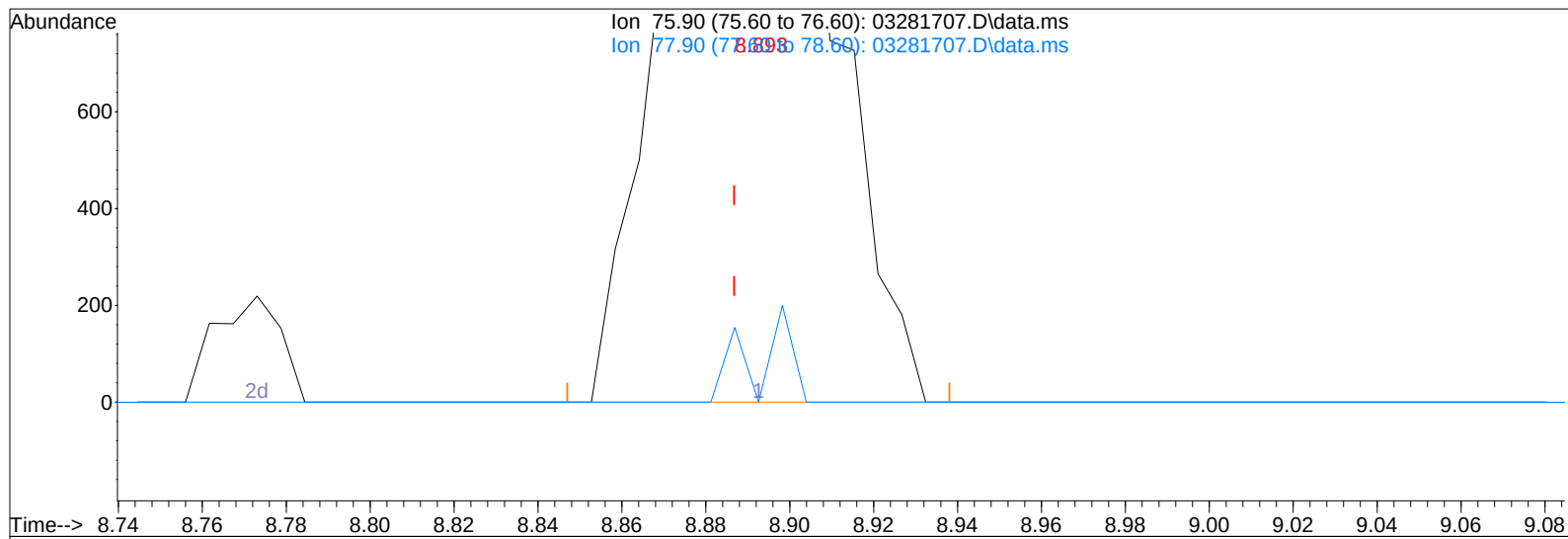
response 4758

Ion	Exp%	Act%
75.90	100	100
77.90	9.20	0.00
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2017 03\28\03281707.D
Acq On : 28 Mar 2017 13:38
Sample : 0.08ng TO15 ICAL STD
Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
Operator: AM
Inst : MS13

Quant Time: Mar 29 08:25:25 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Wed Mar 29 08:24:17 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 03281707.D\data.ms

(22) Carbon Disulfide (T)

8.893min (+0.006) 0.16ng m

response 4758

Ion	Exp%	Act%
75.90	100	100
77.90	9.20	2.54
0.00	0.00	0.00
0.00	0.00	0.00

BLC

AM 3/29/17

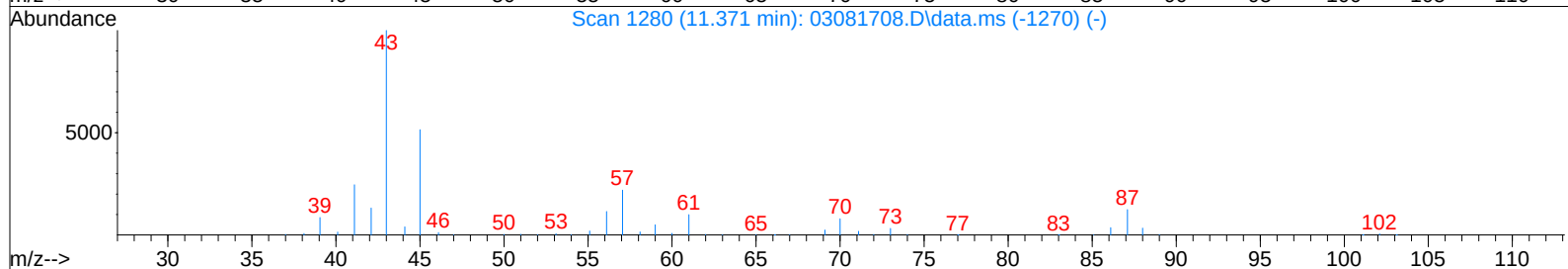
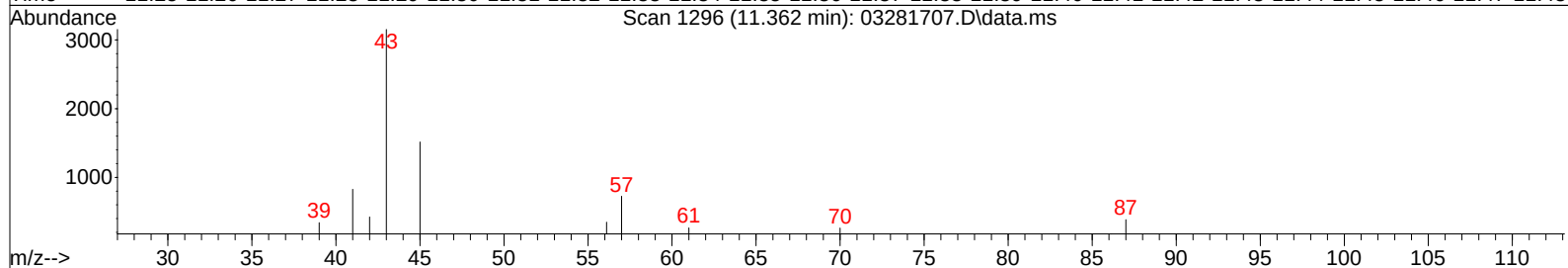
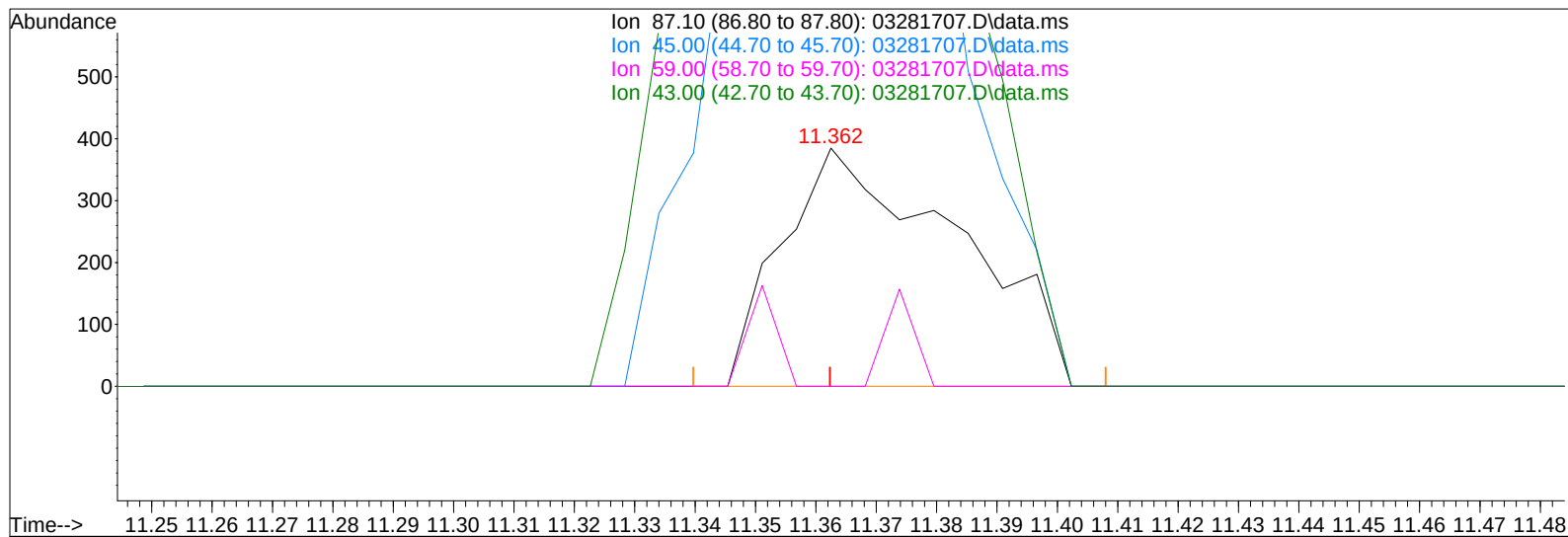
LH 4/11/17

CL 4/11/17

Data File : I:\MS13\DATA\2017 03\28\03281707.D
Acq On : 28 Mar 2017 13:38
Sample : 0.08ng TO15 ICAL STD
Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
Operator: AM
Inst : MS13

Quant Time: Mar 29 08:25:25 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Wed Mar 29 08:24:17 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 03281707.D\data.ms

(29) Diisopropyl Ether (T)

11.362min (+0.000) 0.10ng

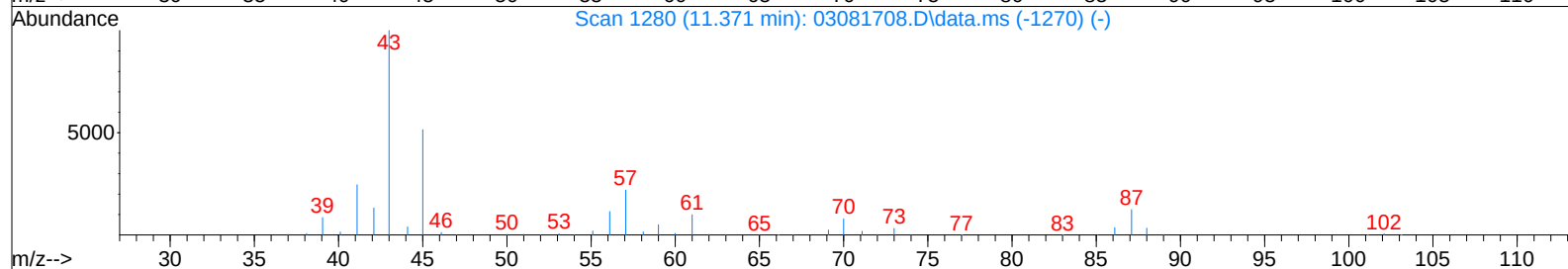
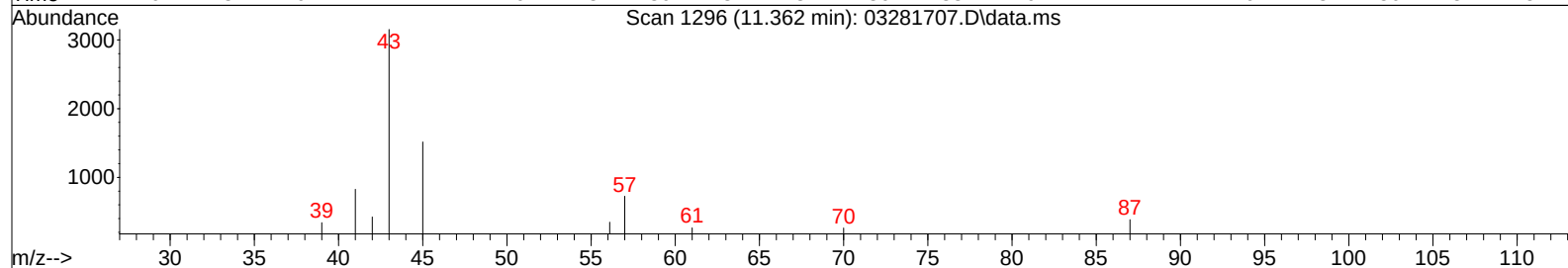
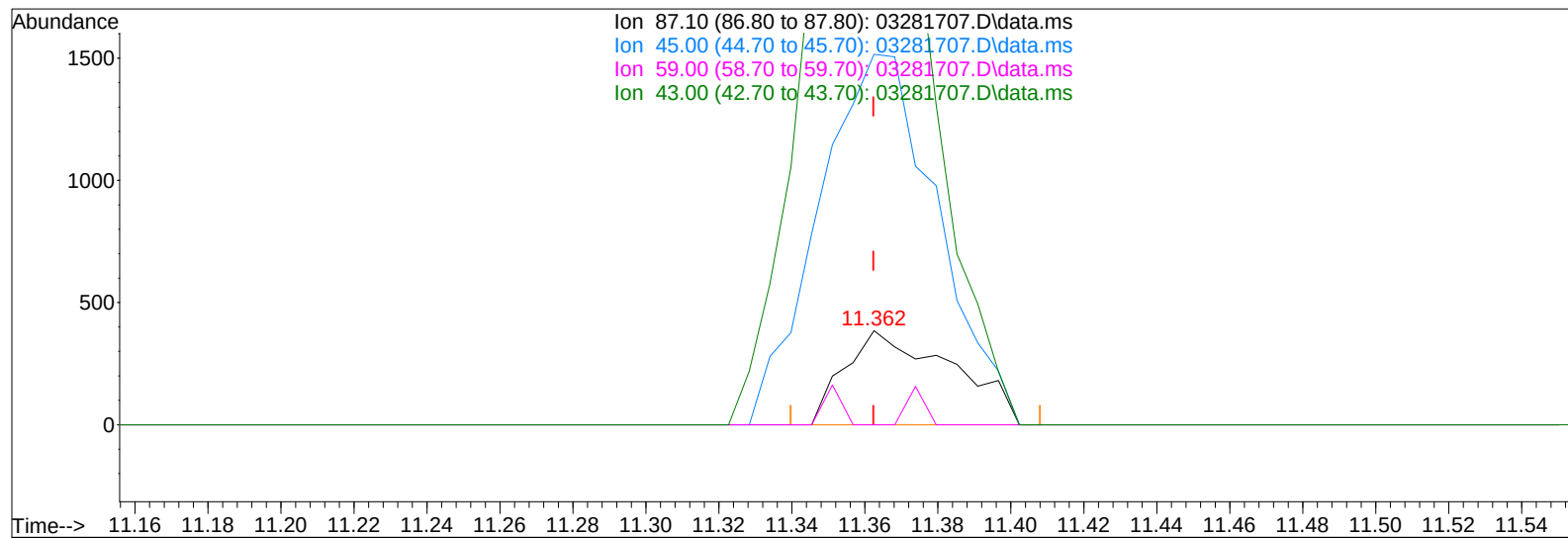
response 784

Ion	Exp%	Act%
87.10	100	100
45.00	442.60	436.35
59.00	39.90	0.00#
43.00	888.40	869.39

Data File : I:\MS13\DATA\2017 03\28\03281707.D
Acq On : 28 Mar 2017 13:38
Sample : 0.08ng TO15 ICAL STD
Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
Operator: AM
Inst : MS13

Quant Time: Mar 29 08:25:25 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Wed Mar 29 08:24:17 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 03281707.D\data.ms

(29) Diisopropyl Ether (T)

11.362min (+0.000) 0.10ng m

response 784

Ion	Exp%	Act%
87.10	100	100
45.00	442.60	436.35
59.00	39.90	13.90#
43.00	888.40	869.39

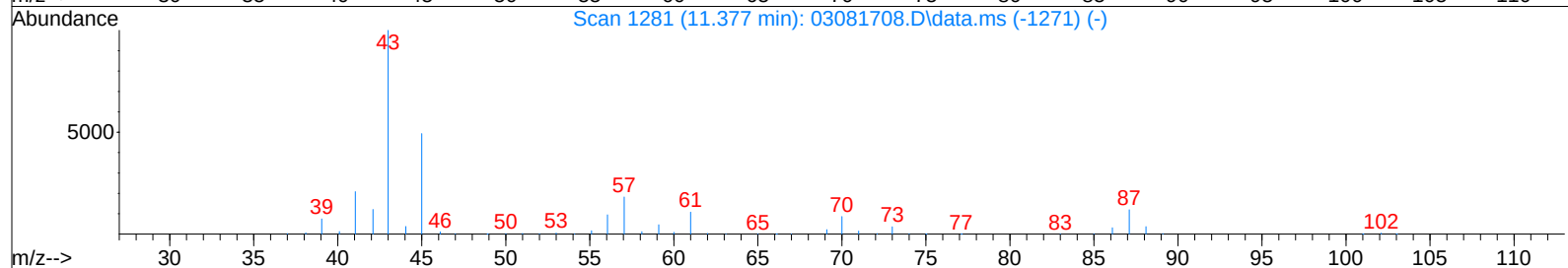
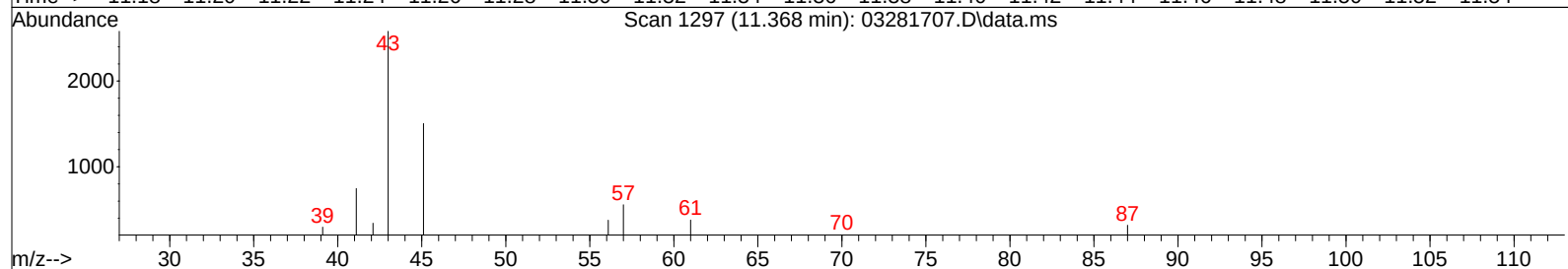
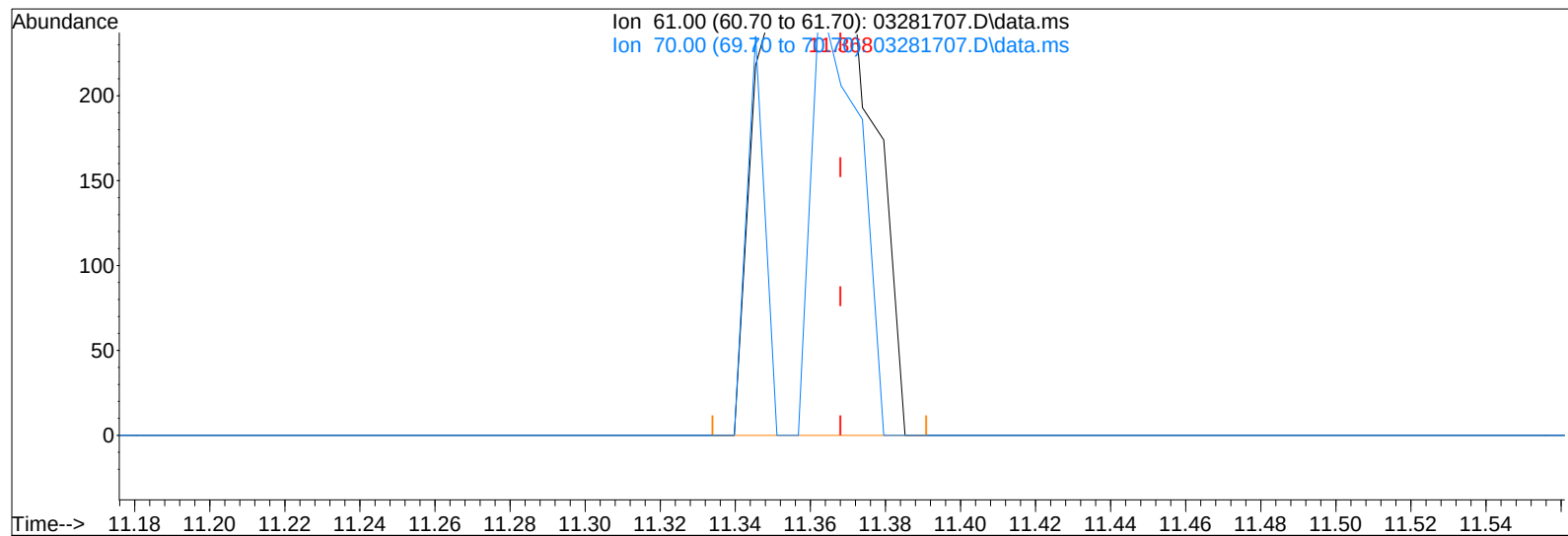
BLC

AM 3/29/17
LH 4/11/17
CL 4/11/17

Data File : I:\MS13\DATA\2017 03\28\03281707.D
Acq On : 28 Mar 2017 13:38
Sample : 0.08ng TO15 ICAL STD
Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
Operator: AM
Inst : MS13

Quant Time: Mar 29 08:25:25 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Wed Mar 29 08:24:17 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 03281707.D\data.ms

(30) Ethyl Acetate (T)

11.368min (+0.000) 0.21ng

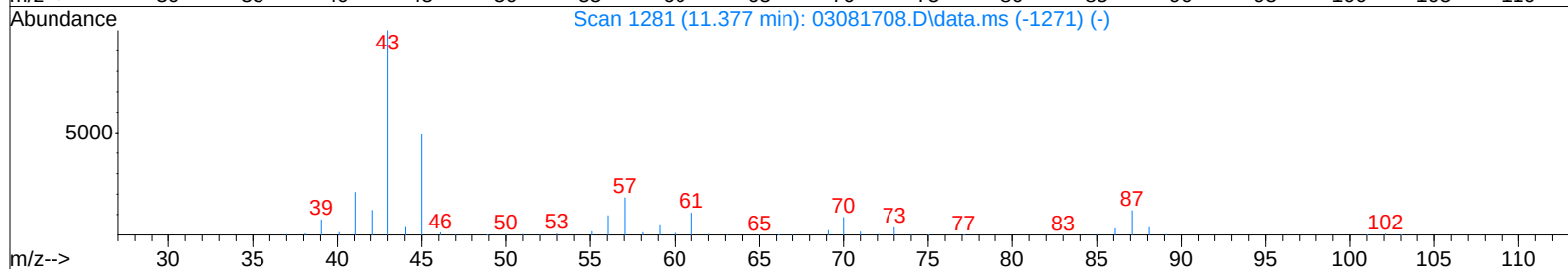
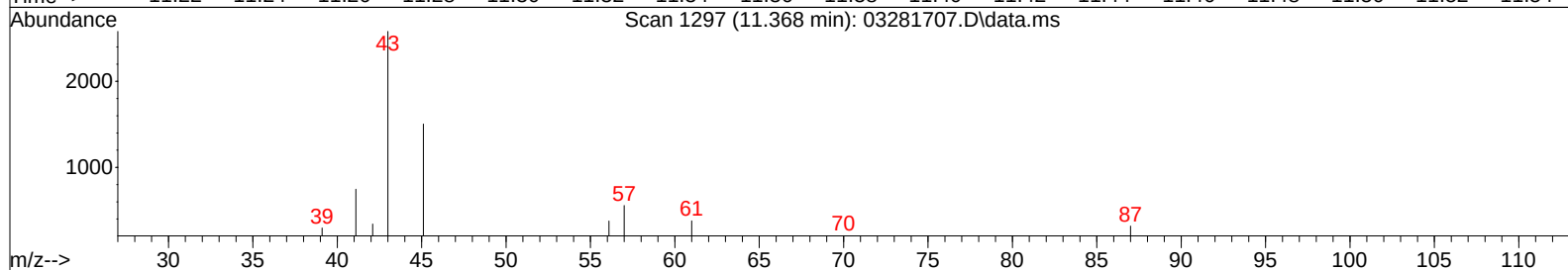
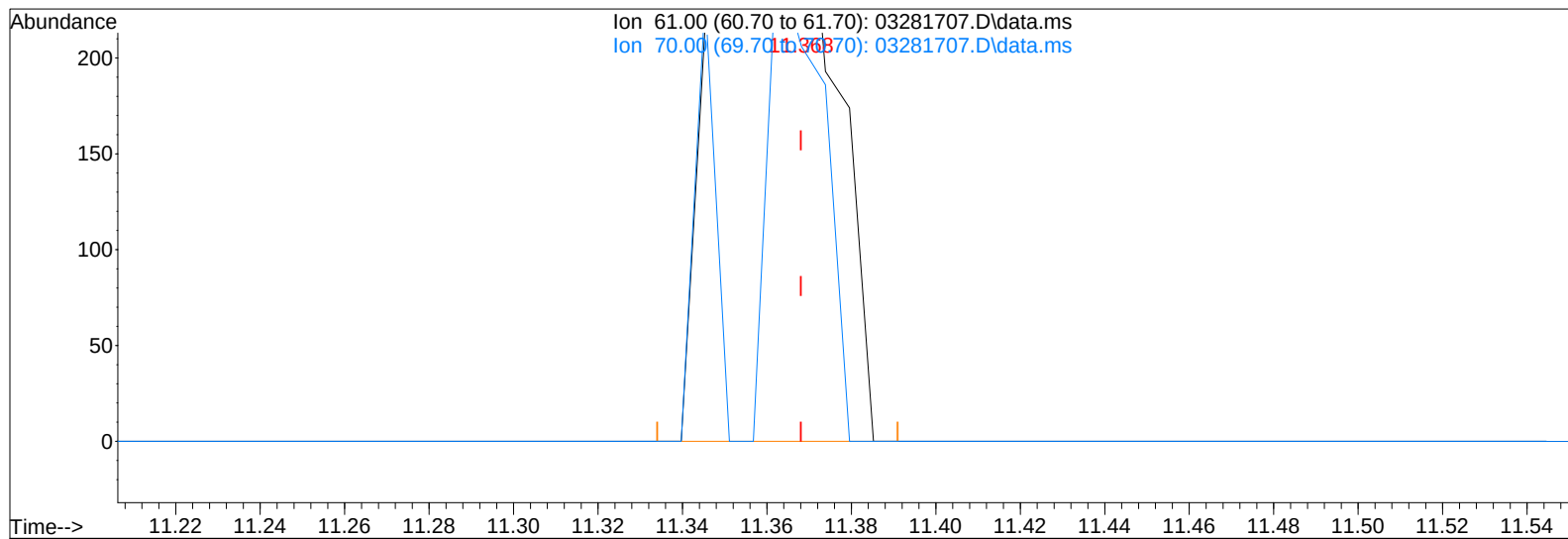
response 624

Ion	Exp%	Act%
61.00	100	100
70.00	80.60	35.74#
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2017 03\28\03281707.D
Acq On : 28 Mar 2017 13:38
Sample : 0.08ng TO15 ICAL STD
Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
Operator: AM
Inst : MS13

Quant Time: Mar 29 08:25:25 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Wed Mar 29 08:24:17 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 03281707.D\data.ms

(30) Ethyl Acetate (T)

11.368min (+0.000) 0.21ng m

response 624

Ion	Exp%	Act%
61.00	100	100
70.00	80.60	48.56#
0.00	0.00	0.00
0.00	0.00	0.00

BLC

AM 3/29/17

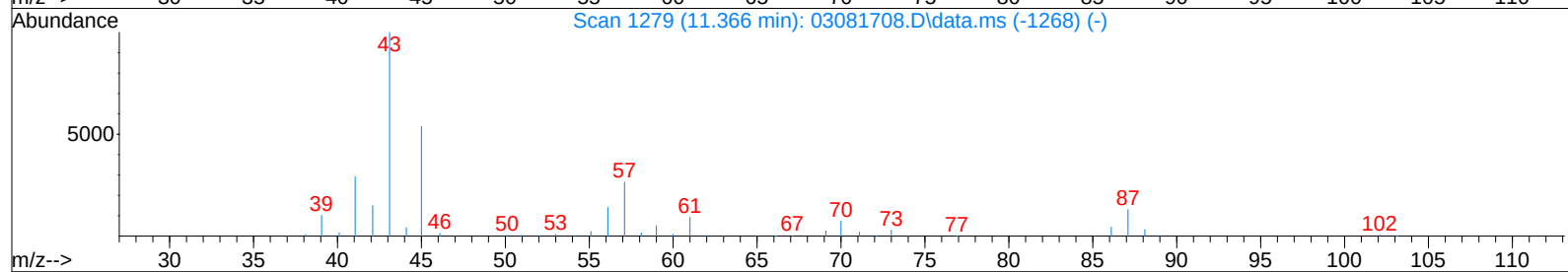
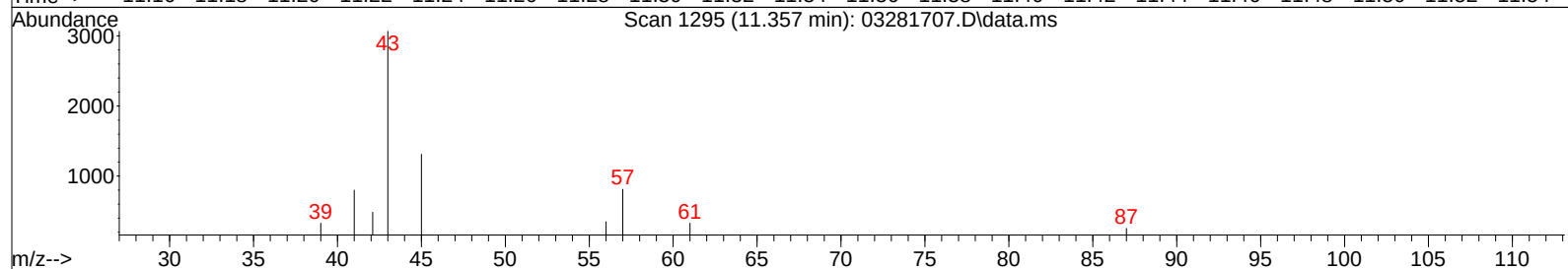
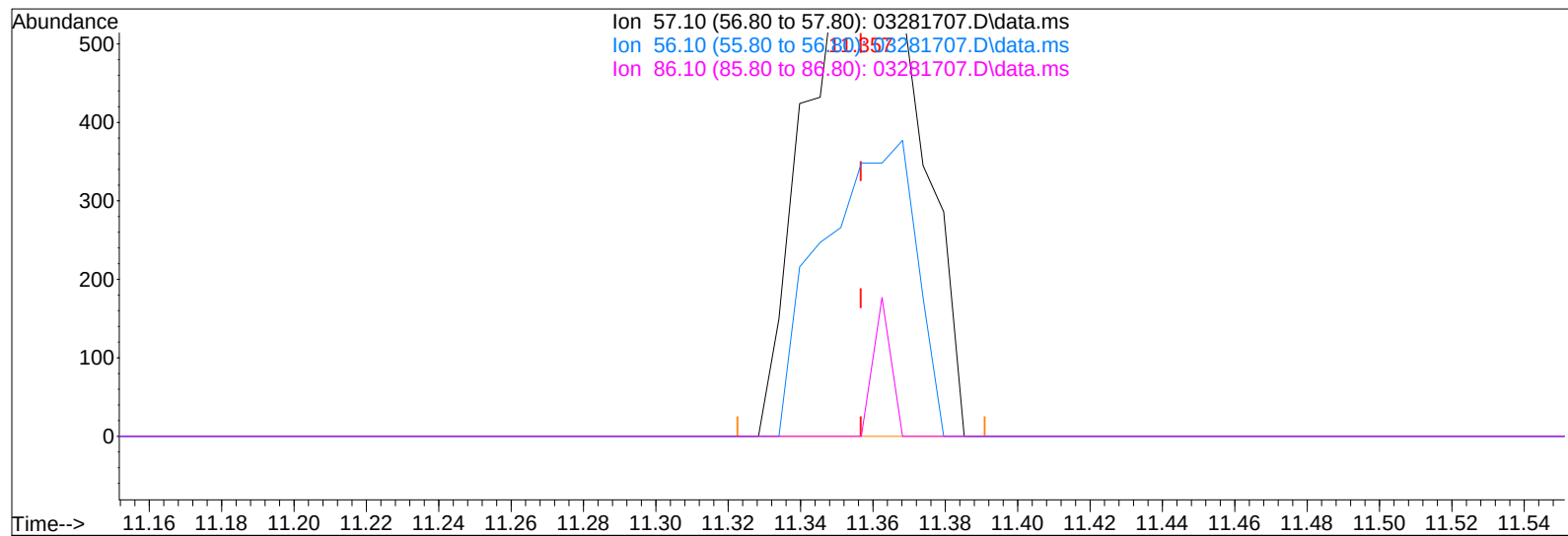
LH 4/11/17

CL 4/11/17

Data File : I:\MS13\DATA\2017 03\28\03281707.D
Acq On : 28 Mar 2017 13:38
Sample : 0.08ng TO15 ICAL STD
Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
Operator: AM
Inst : MS13

Quant Time: Mar 29 08:25:25 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Wed Mar 29 08:24:17 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 03281707.D\data.ms

(31) n-Hexane (T)

11.357min (+0.000) 0.11ng

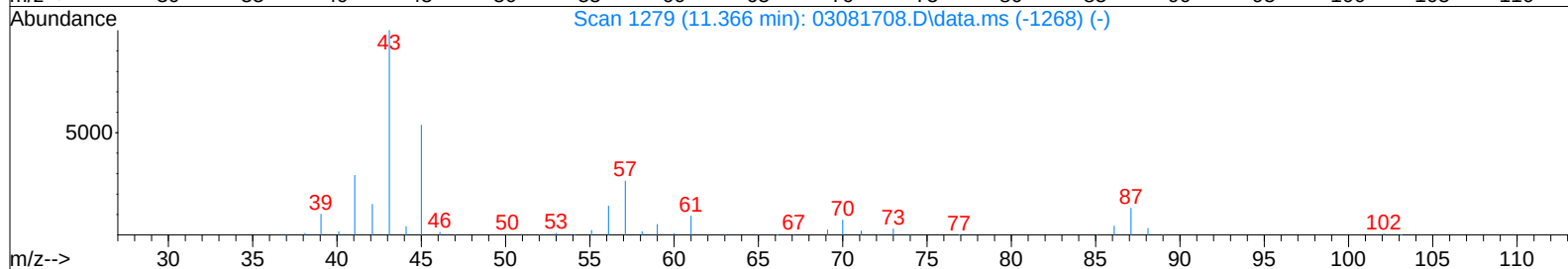
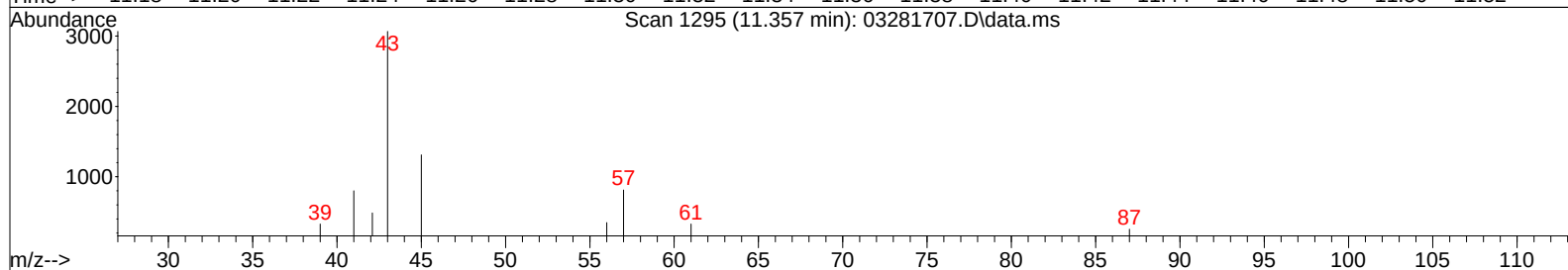
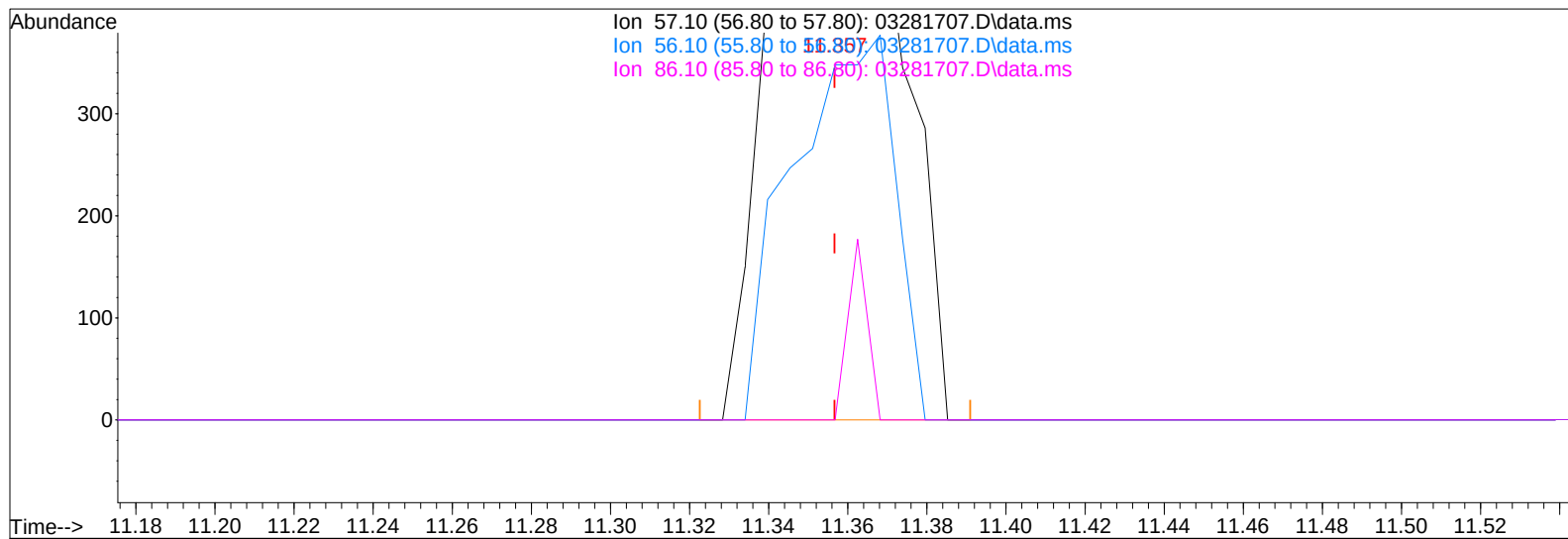
response 1497

Ion	Exp%	Act%
57.10	100	100
56.10	53.30	45.16
86.10	16.10	0.00#
0.00	0.00	0.00

Data File : I:\MS13\DATA\2017 03\28\03281707.D
Acq On : 28 Mar 2017 13:38
Sample : 0.08ng TO15 ICAL STD
Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
Operator: AM
Inst : MS13

Quant Time: Mar 29 08:25:25 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Wed Mar 29 08:24:17 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 03281707.D\data.ms

(31) n-Hexane (T)

11.357min (+0.000) 0.11ng m

response 1497

Ion	Exp%	Act%

57.10	100	100

56.10	53.30	45.16

86.10	16.10	4.01#

0.00	0.00	0.00

MP

AM 3/29/17

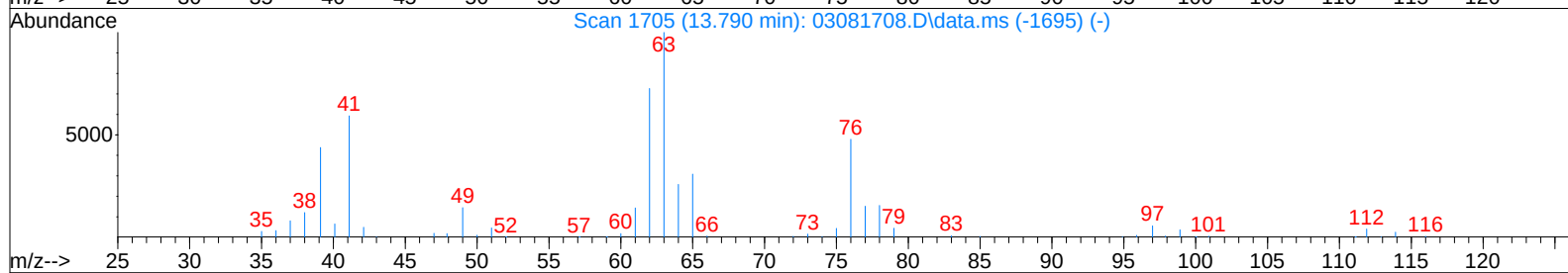
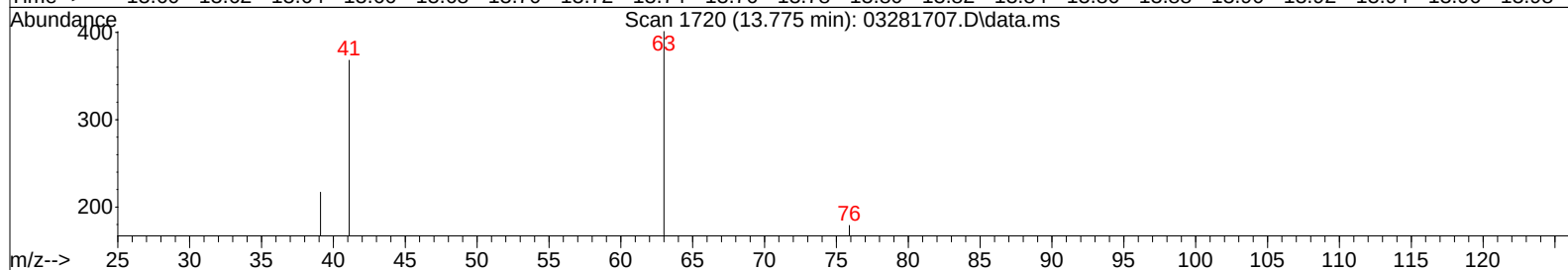
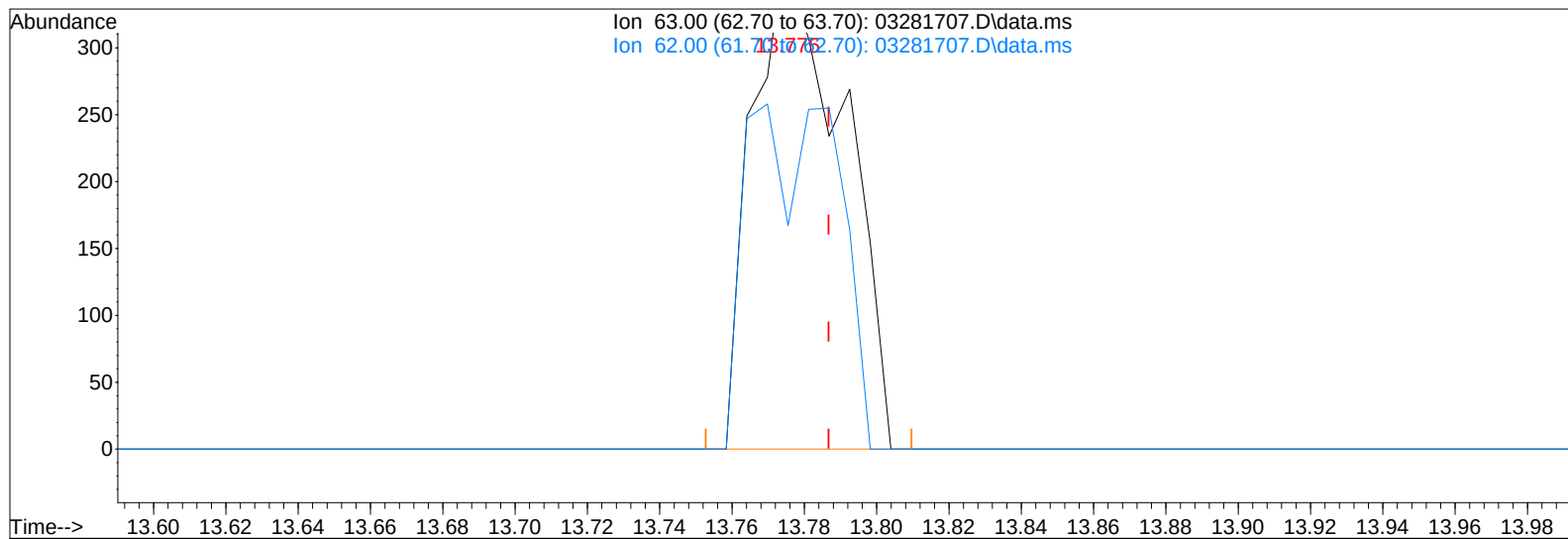
LH 4/11/17

CL 4/11/17

Data File : I:\MS13\DATA\2017 03\28\03281707.D
Acq On : 28 Mar 2017 13:38
Sample : 0.08ng TO15 ICAL STD
Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
Operator: AM
Inst : MS13

Quant Time: Mar 29 08:25:25 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Wed Mar 29 08:24:17 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 03281707.D\data.ms

(45) 1,2-Dichloropropane (T)

13.775min (-0.011) 0.08ng

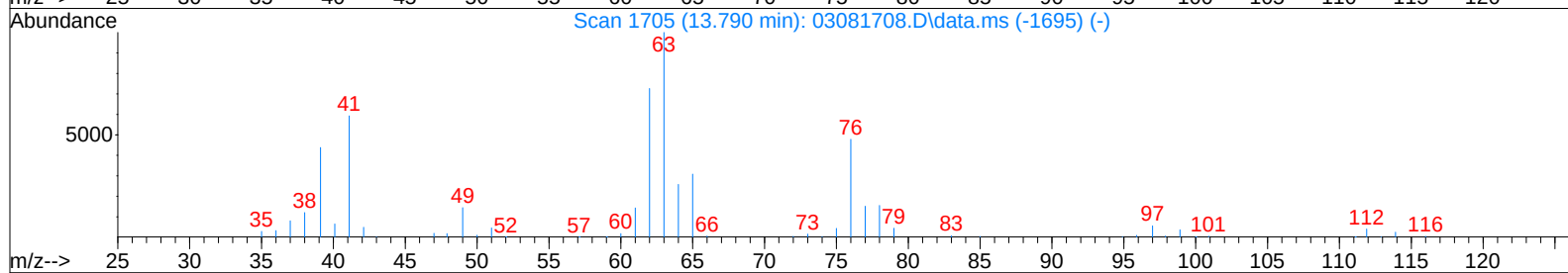
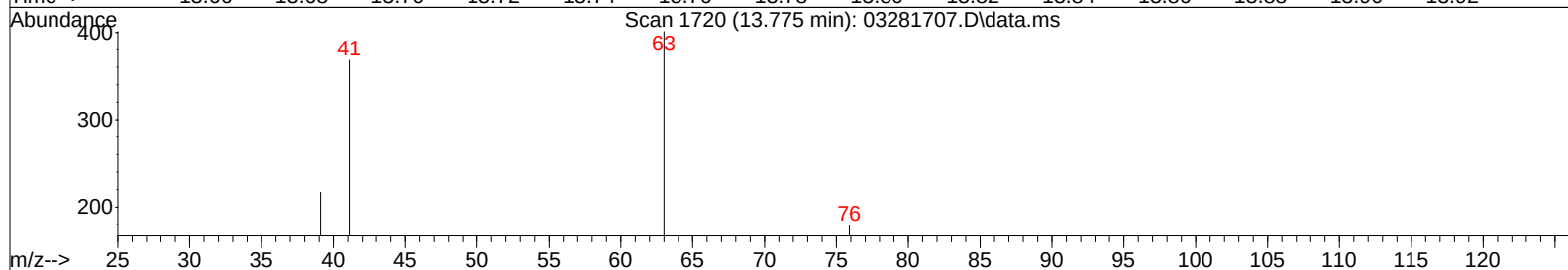
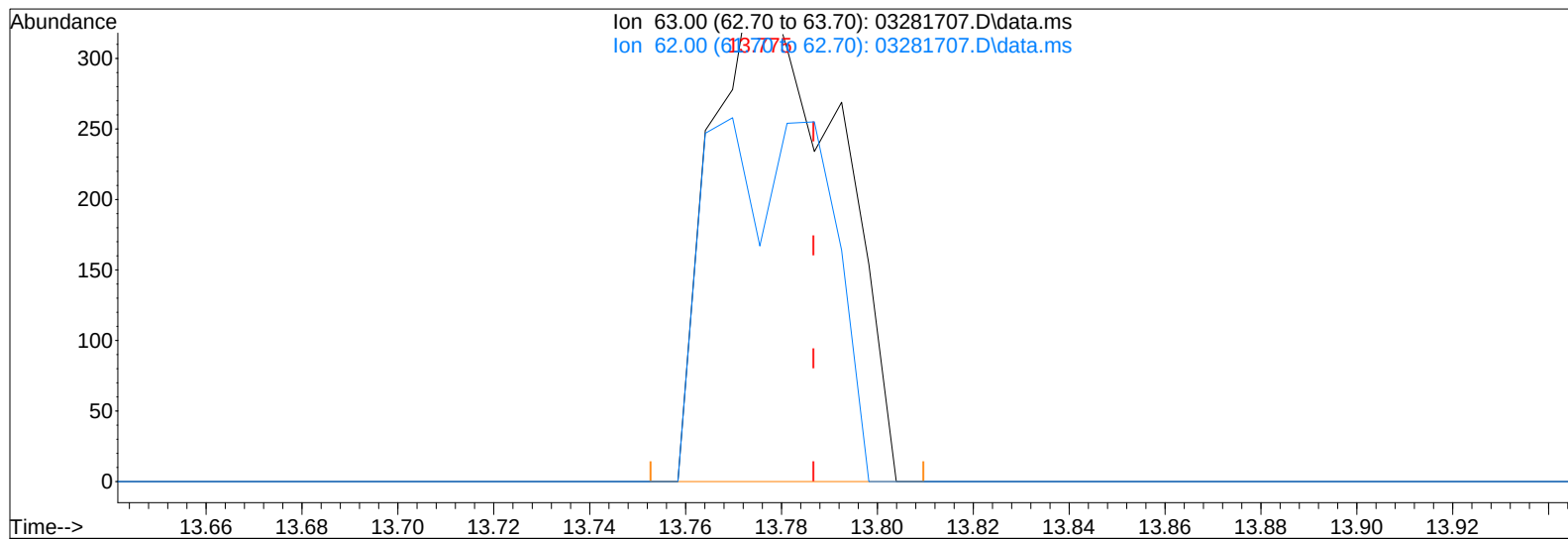
response 646

Ion	Exp%	Act%
63.00	100	100
62.00	71.10	35.45#
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2017 03\28\03281707.D
 Acq On : 28 Mar 2017 13:38
 Sample : 0.08ng TO15 ICAL STD
 Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
 Operator: AM
 Inst : MS13

Quant Time: Mar 29 08:25:25 2017
 Quant Method : I:\MS13\METHODS\R13032817.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Wed Mar 29 08:24:17 2017
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



TIC: 03281707.D\data.ms

(45) 1,2-Dichloropropane (T)

13.775min (-0.011) 0.08ng m

response 646

Ion	Exp%	Act%
63.00	100	100
62.00	71.10	71.05
0.00	0.00	0.00
0.00	0.00	0.00

BLC

AM 3/29/17

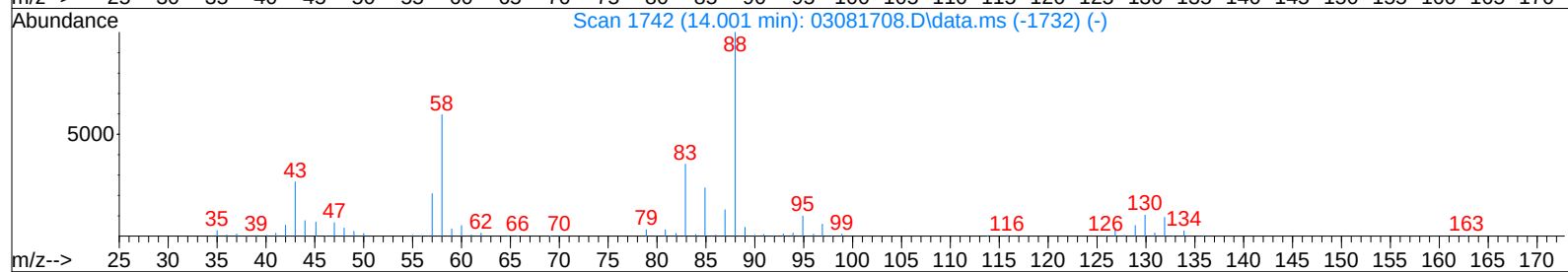
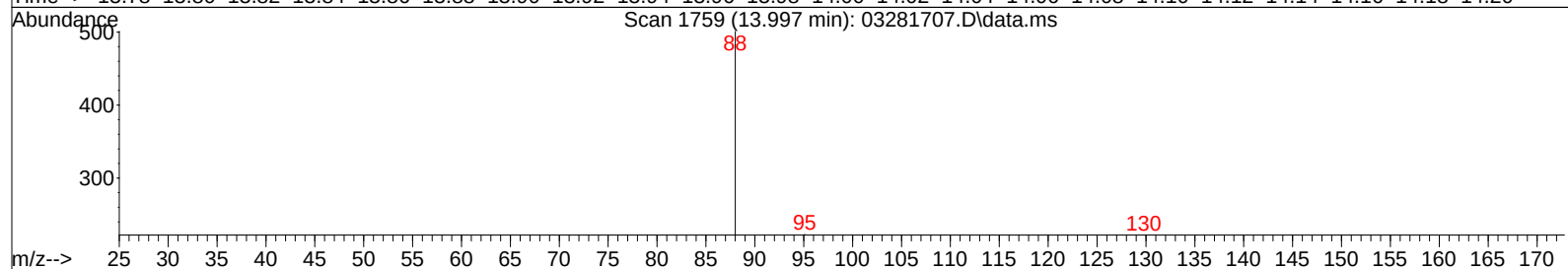
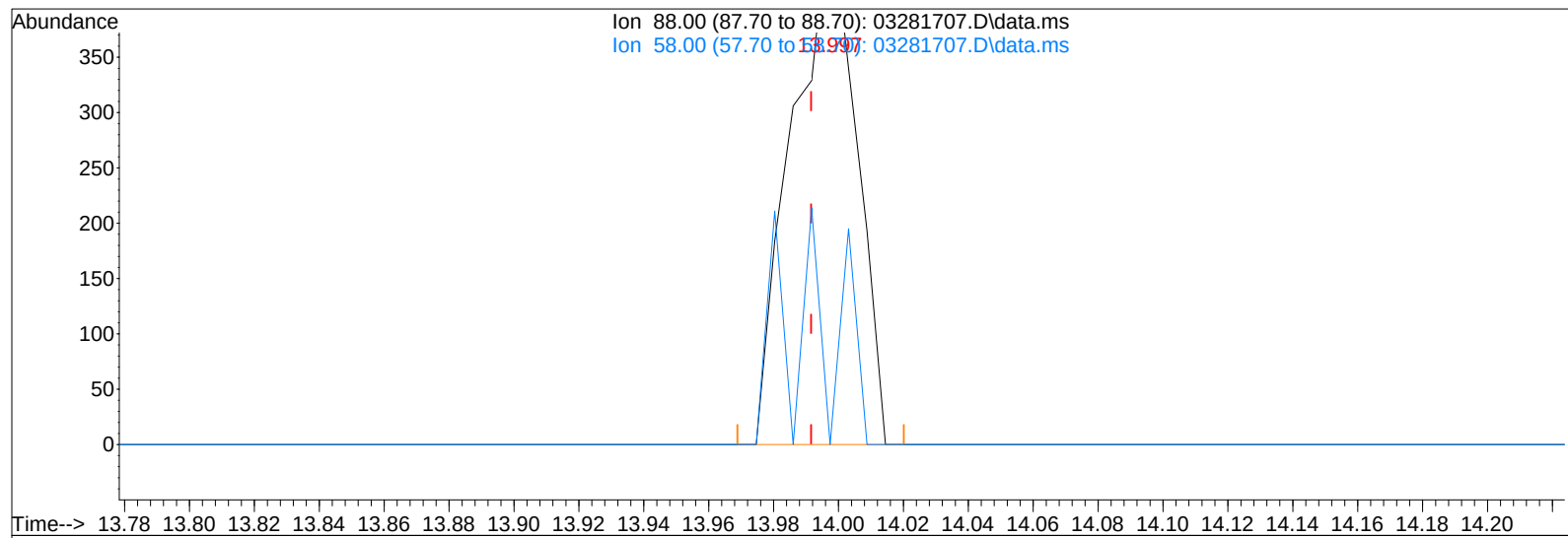
LH 4/11/17

CL 4/11/17

Data File : I:\MS13\DATA\2017 03\28\03281707.D
Acq On : 28 Mar 2017 13:38
Sample : 0.08ng TO15 ICAL STD
Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
Operator: AM
Inst : MS13

Quant Time: Mar 29 08:25:25 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Wed Mar 29 08:24:17 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 03281707.D\data.ms

(48) 1,4-Dioxane (T)

13.997min (+0.006) 0.08ng

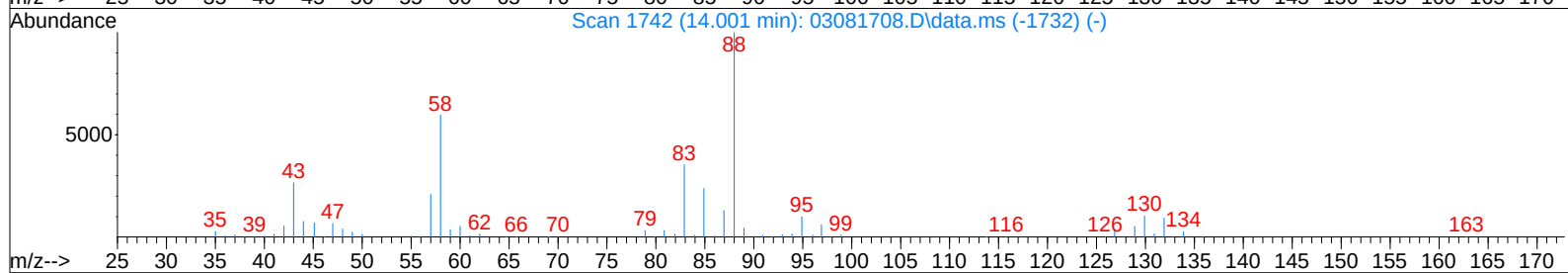
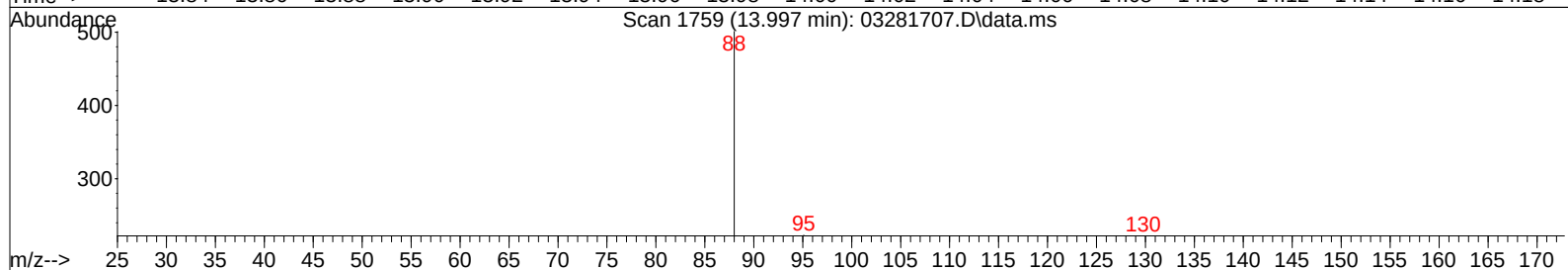
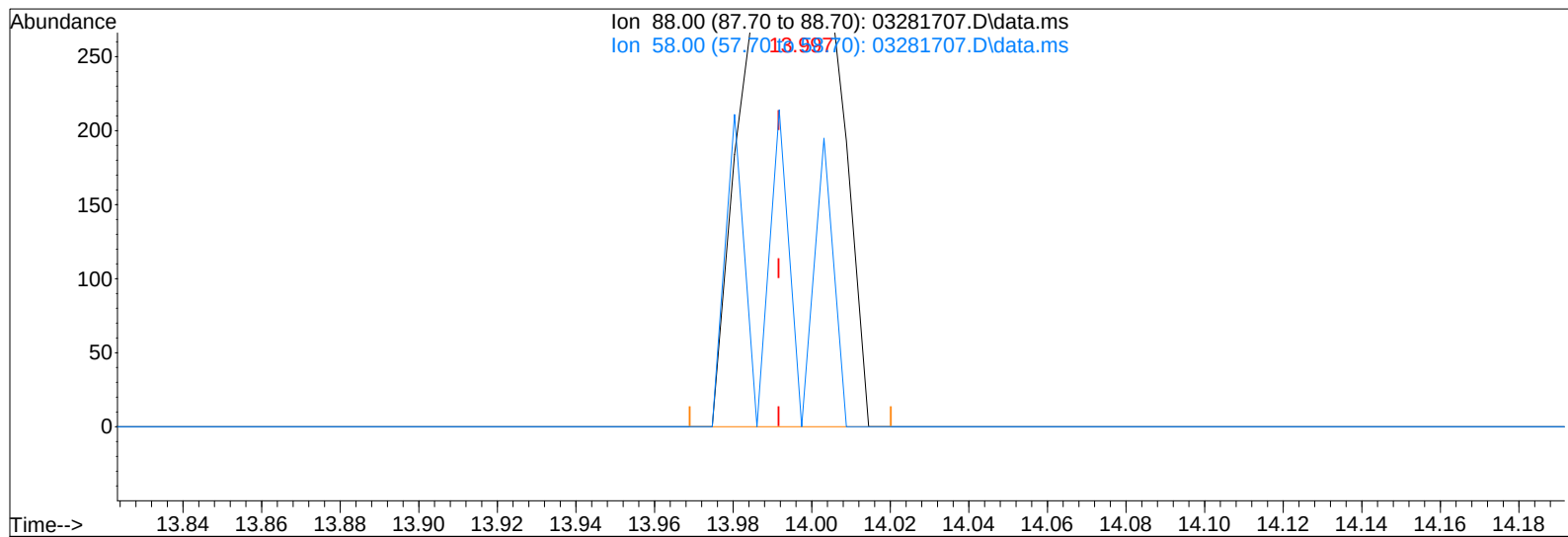
response 633

Ion	Exp%	Act%
88.00	100	100
58.00	60.10	22.12#
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2017 03\28\03281707.D
Acq On : 28 Mar 2017 13:38
Sample : 0.08ng TO15 ICAL STD
Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
Operator: AM
Inst : MS13

Quant Time: Mar 29 08:25:25 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Wed Mar 29 08:24:17 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 03281707.D\data.ms

(48) 1,4-Dioxane (T)

13.997min (+0.006) 0.08ng m

response 633

Ion	Exp%	Act%

88.00	100	100

BLC

58.00	60.10	33.49#

AM **3/29/17**

0.00	0.00	0.00

LH 4/11/17

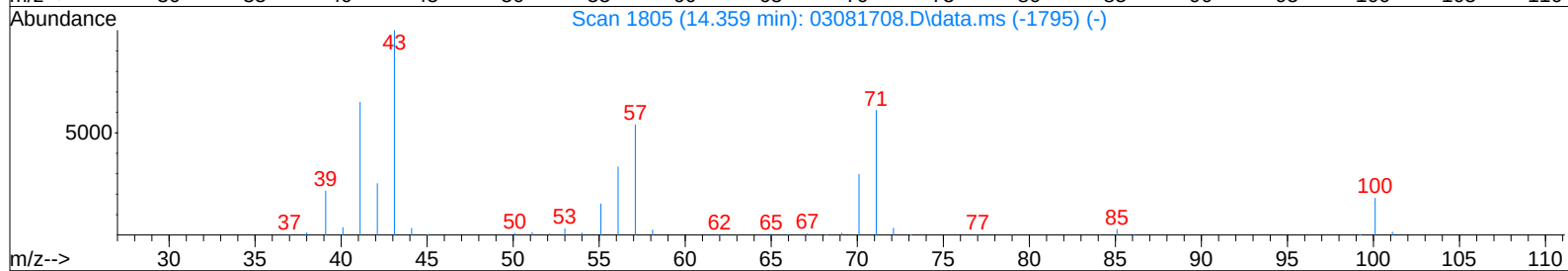
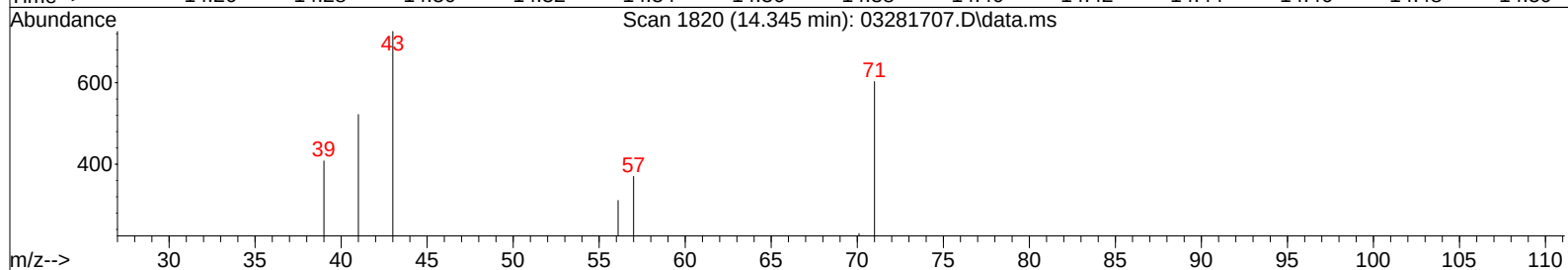
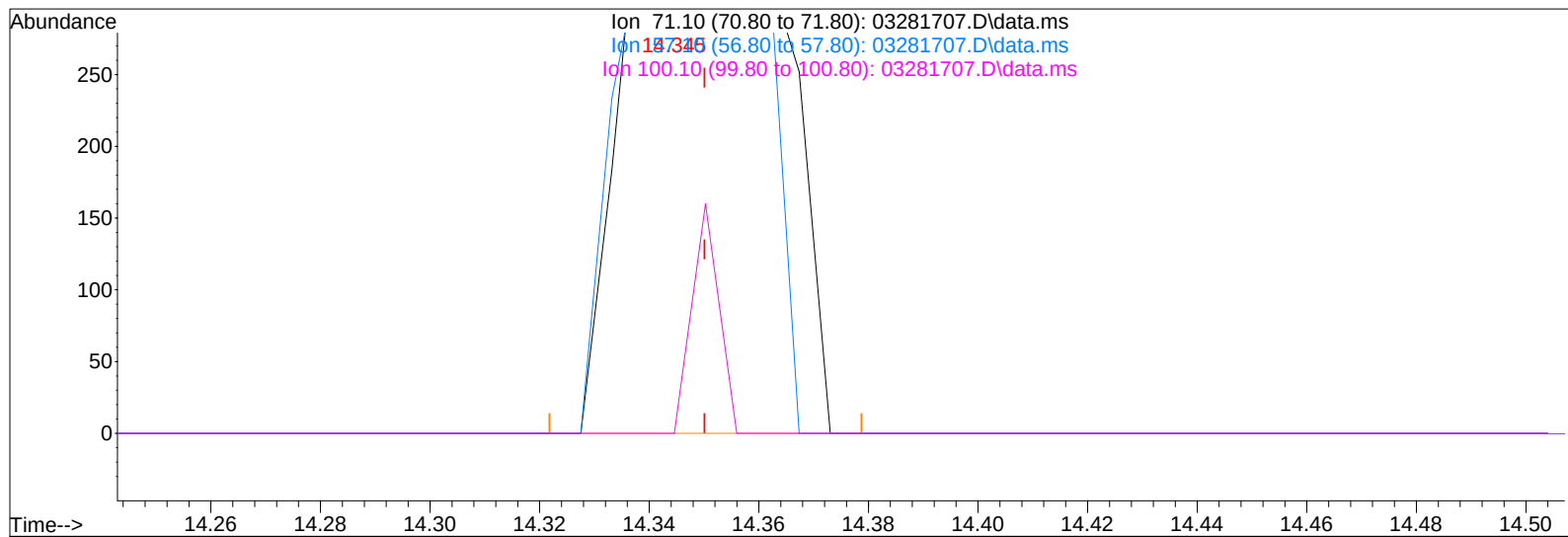
0.00	0.00	0.00

CL 4/11/17

Data File : I:\MS13\DATA\2017 03\28\03281707.D
Acq On : 28 Mar 2017 13:38
Sample : 0.08ng TO15 ICAL STD
Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
Operator: AM
Inst : MS13

Quant Time: Mar 29 08:25:25 2017
Quant Method : I:\MS13\METHODS\R13032817.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Wed Mar 29 08:24:17 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 03281707.D\data.ms

(51) n-Heptane (T)

14.345min (-0.006) 0.10ng

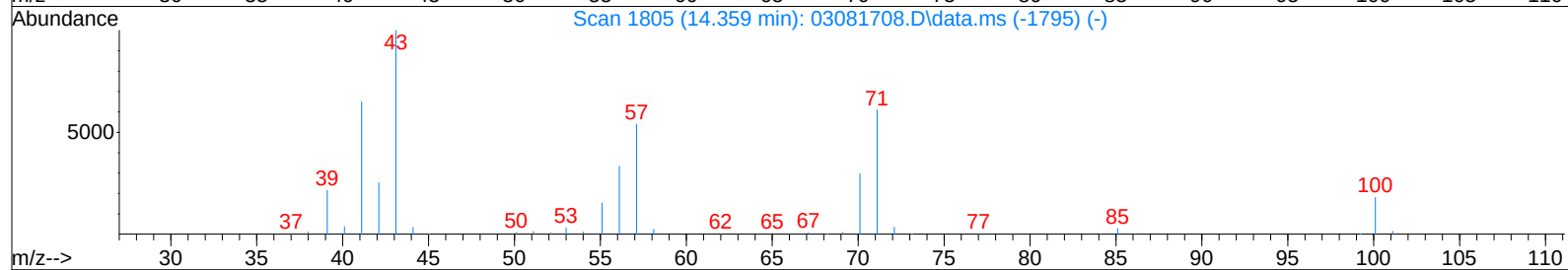
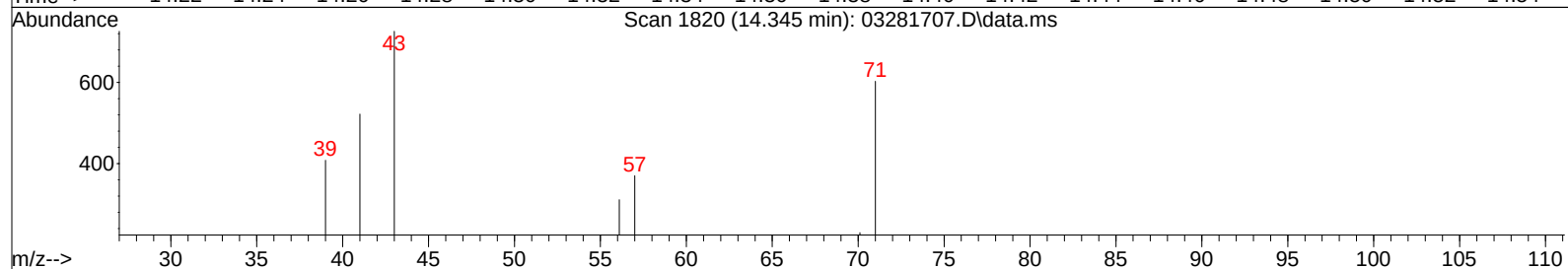
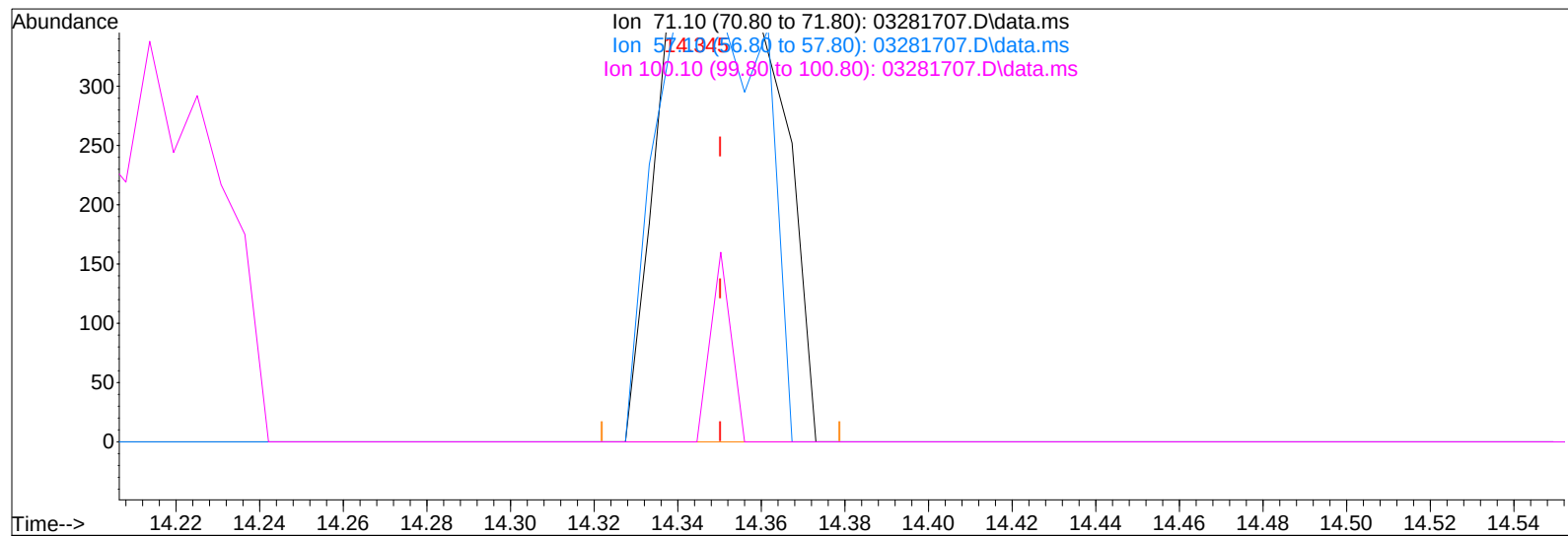
response 910

Ion	Exp%	Act%
71.10	100	100
57.10	90.20	73.63
100.10	30.00	0.00#
0.00	0.00	0.00

Data File : I:\MS13\DATA\2017 03\28\03281707.D
 Acq On : 28 Mar 2017 13:38
 Sample : 0.08ng TO15 ICAL STD
 Misc : S29-03211702/S29-03141705 (4/2)

Vial: 8
 Operator: AM
 Inst : MS13

Quant Time: Mar 29 08:25:25 2017
 Quant Method : I:\MS13\METHODS\R13032817.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Wed Mar 29 08:24:17 2017
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



TIC: 03281707.D\data.ms

(51) n-Heptane (T)

14.345min (-0.006) 0.10ng m

response 910

Ion	Exp%	Act%
71.10	100	100
57.10	90.20	73.63
100.10	30.00	6.04#
0.00	0.00	0.00

MP

AM 3/29/17

LH 4/11/17

CL 4/11/17

Data File : I:\MS13\DATA\2017 03\28\03281711.D
 Acq On : 28 Mar 2017 15:58
 Sample : 1.0ng TO15 ICAL STD
 Misc : S29-03211702/S31-03271704 (4/25)

Vial: 12
 Operator: AM
 Inst : MS13

Quant Time: Mar 29 08:25:33 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Wed Mar 29 08:24:17 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 4/11/17

AM 3/29/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.25	130	104085	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.33	114	494538	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.62	82	204441	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	193626	15.164	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	121.28%	
57) Toluene-d8 (SS2)	15.76	98	489447	12.113	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	96.88%	
73) Bromofluorobenzene (SS3)	19.06	174	203951	12.452	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	99.60%	

Target Compounds

						Qvalue
2) Propene	4.48	42	9675	1.014	ng	99
3) Dichlorodifluoromethan...	4.63	85	23036	1.191	ng	100
4) Chloromethane	4.89	50	12615	1.142	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	5.16	135	11356	1.060	ng	99
6) Vinyl Chloride	5.30	62	13461	1.196	ng	99
7) 1,3-Butadiene	5.56	54	8743	1.293	ng	94
8) Bromomethane	5.96	94	8253	1.121	ng	98
9) Chloroethane	6.29	64	6348	1.087	ng	94
10) Ethanol	6.60	45	34013	6.386	ng	95
11) Acetonitrile	6.86	41	16540	1.135	ng	95
12) Acrolein	7.05	56	6262	1.251	ng	97
13) Acetone	7.25	58	35201	6.196	ng	100
14) Trichlorofluoromethane	7.51	101	22559	1.300	ng	96
15) 2-Propanol (Isopropanol)	7.71	45	54570	2.494	ng	98
16) Acrylonitrile	7.97	53	12464	1.211	ng	96
17) 1,1-Dichloroethene	8.43	96	9552	1.108	ng	97
18) 2-Methyl-2-Propanol (t...	8.56	59	59284	2.553	ng	100
19) Methylene Chloride	8.62	84	9821	1.135	ng	96
20) 3-Chloro-1-propene (Al...	8.78	41	13767	1.152	ng	99
21) Trichlorotrifluoroethane	9.05	151	10902	1.124	ng	98
22) Carbon Disulfide	8.90	76	35790	1.161	ng	100
23) trans-1,2-Dichloroethene	9.84	61	14274	1.164	ng	95
24) 1,1-Dichloroethane	10.10	63	17853	1.129	ng	100
25) Methyl tert-Butyl Ether	10.20	73	34452	1.166	ng	100
26) Vinyl Acetate	10.34	86	11331	5.563	ng	# 92
27) 2-Butanone (MEK)	10.59	72	6494	1.111	ng	100
28) cis-1,2-Dichloroethene	11.07	61	14416	1.217	ng	98
29) Diisopropyl Ether	11.37	87	10640	1.233	ng	# 58
30) Ethyl Acetate	11.37	61	6654	2.130	ng	100
31) n-Hexane	11.37	57	15311	1.117	ng	99
32) Chloroform	11.41	83	19865	1.213	ng	99
34) Tetrahydrofuran (THF)	11.81	72	6508	1.057	ng	98
35) Ethyl tert-Butyl Ether	11.95	87	13626	1.195	ng	96
36) 1,2-Dichloroethane	12.20	62	17567	1.300	ng	98
38) 1,1,1-Trichloroethane	12.48	97	19876	1.250	ng	97
39) Isopropyl Acetate	12.89	61	11252	2.072	ng	96
40) 1-Butanol	12.89	56	19419	2.322	ng	98
41) Benzene	12.95	78	37794	1.014	ng	100
42) Carbon Tetrachloride	13.10	117	17193	1.214	ng	98
43) Cyclohexane	13.24	84	29257	2.058	ng	100
44) tert-Amyl Methyl Ether	13.58	73	29886	1.130	ng	98
45) 1,2-Dichloropropane	13.79	63	9062	1.025	ng	98
46) Bromodichloromethane	13.97	83	14981	1.173	ng	97
47) Trichloroethene	14.02	130	11761	1.032	ng	99
48) 1,4-Dioxane	13.99	88	8048	0.998	ng	96
49) 2,2,4-Trimethylpentane...	14.10	57	38967	1.108	ng	99
50) Methyl Methacrylate	14.22	100	8765	2.147	ng	98

Data File : I:\MS13\DATA\2017 03\28\03281711.D
 Acq On : 28 Mar 2017 15:58
 Sample : 1.0ng TO15 ICAL STD
 Misc : S29-03211702/S31-03271704 (4/25)

Vial: 12
 Operator: AM
 Inst : MS13

Quant Time: Mar 29 08:25:33 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Wed Mar 29 08:24:17 2017

Response via : Initial Calibration

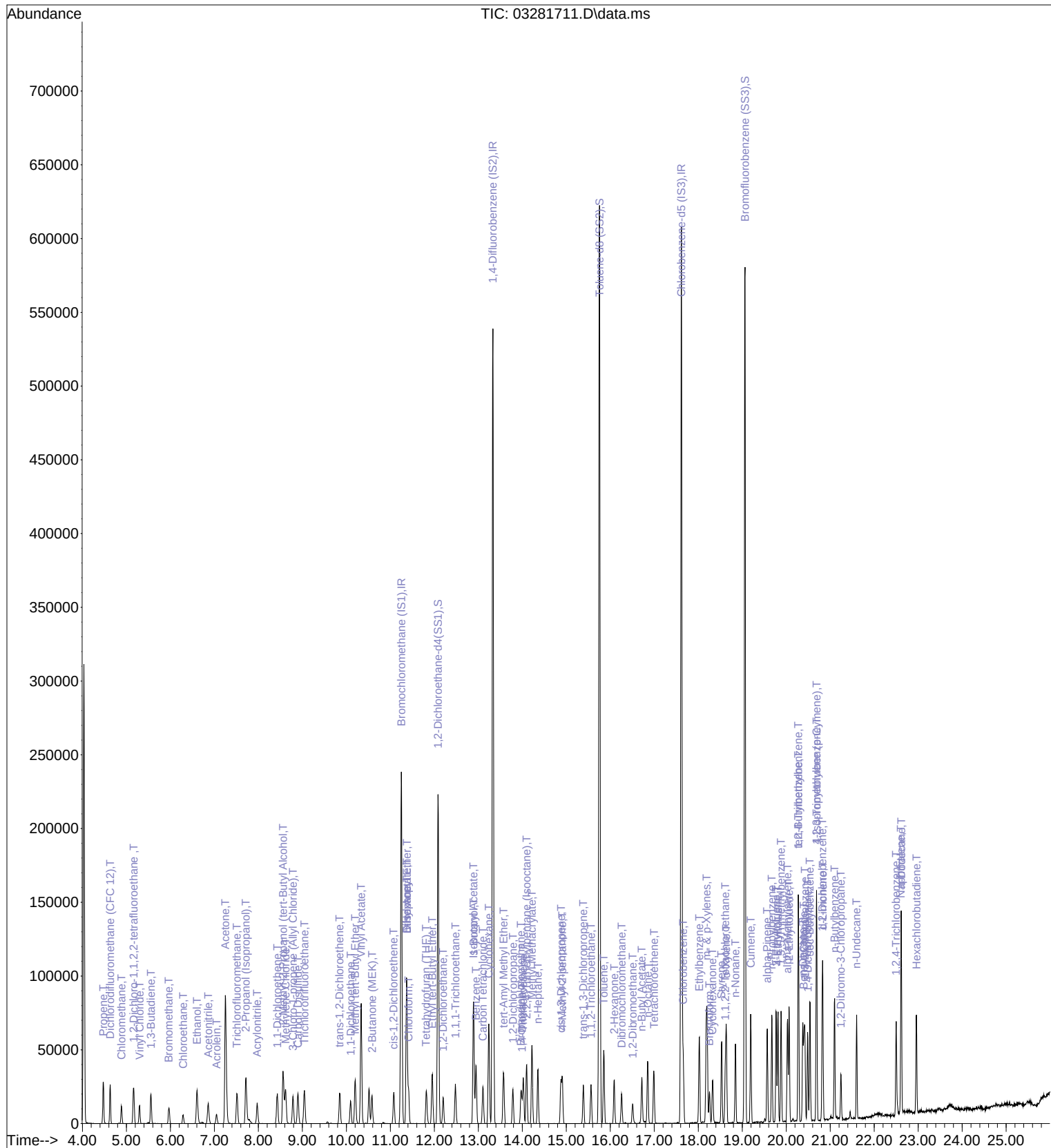
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.36	71	9237	0.995	ng	97
52) cis-1,3-Dichloropropene	14.88	75	17246	1.115	ng	98
53) 4-Methyl-2-pentanone	14.91	58	9031	1.083	ng	97
54) trans-1,3-Dichloropropene	15.39	75	16455	1.168	ng	99
55) 1,1,2-Trichloroethane	15.56	97	9582	1.034	ng	99
58) Toluene	15.85	91	40416	1.017	ng	99
59) 2-Hexanone	16.09	43	23007	1.150	ng	99
60) Dibromochloromethane	16.26	129	13312	1.107	ng	97
61) 1,2-Dibromoethane	16.51	107	11652	1.068	ng	97
62) n-Butyl Acetate	16.72	43	25169	1.144	ng	98
63) n-Octane	16.85	57	7598	0.959	ng	97
64) Tetrachloroethene	17.00	166	13392	1.025	ng	96
65) Chlorobenzene	17.66	112	29344	1.040	ng	98
66) Ethylbenzene	18.03	91	47755	1.045	ng	99
67) m- & p-Xylenes	18.19	91	75070	2.107	ng	97
68) Bromoform	18.25	173	12250	1.133	ng	98
69) Styrene	18.53	104	29888	1.044	ng	98
70) o-Xylene	18.64	91	38196	1.044	ng	99
71) n-Nonane	18.85	43	19111	1.074	ng	99
72) 1,1,2,2-Tetrachloroethane	18.61	83	15626	0.974	ng	95
74) Cumene	19.19	105	50676	1.064	ng	100
75) alpha-Pinene	19.57	93	25284	1.035	ng	98
76) n-Propylbenzene	19.67	91	58520	1.080	ng	97
77) 3-Ethyltoluene	19.77	105	48809	0.975	ng	100
78) 4-Ethyltoluene	19.81	105	47402	1.064	ng	99
79) 1,3,5-Trimethylbenzene	19.88	105	42761	1.068	ng	98
80) alpha-Methylstyrene	20.03	118	22455	1.038	ng	99
81) 2-Ethyltoluene	20.06	105	48609	1.019	ng	99
82) 1,2,4-Trimethylbenzene	20.27	105	42953	1.042	ng	99
83) n-Decane	20.38	57	20818	1.088	ng	98
84) Benzyl Chloride	20.40	91	36333	1.069	ng	100
85) 1,3-Dichlorobenzene	20.42	146	25932	1.000	ng	99
86) 1,4-Dichlorobenzene	20.49	146	26426	0.994	ng	98
87) sec-Butylbenzene	20.54	105	54386	1.005	ng	99
88) 4-Isopropyltoluene (p-...	20.69	119	53381	1.007	ng	98
89) 1,2,3-Trimethylbenzene	20.69	105	42580	1.018	ng	99
90) 1,2-Dichlorobenzene	20.82	146	24986	0.995	ng	100
91) d-Limonene	20.83	68	14994	1.022	ng	99
92) 1,2-Dibromo-3-Chloropr...	21.24	157	9900	1.122	ng	95
93) n-Undecane	21.60	57	20416	1.094	ng	98
94) 1,2,4-Trichlorobenzene	22.50	180	20528	1.051	ng	99
95) Naphthalene	22.61	128	57940	1.074	ng	99
96) n-Dodecane	22.62	57	20517	1.187	ng	97
97) Hexachlorobutadiene	22.96	225	14279	1.005	ng	100
98) Cyclohexanone	18.32	55	12863	1.001	ng	98
99) tert-Butylbenzene	20.27	119	42758	1.028	ng	100
100) n-Butylbenzene	21.10	91	43596	1.048	ng	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Vial: 12
Operator: AM
Inst : MS13

Quant Time: Mar 29 08:25:33 2017



Data File : I:\MS13\DATA\2017 03\28\03281712.D
 Acq On : 28 Mar 2017 16:33
 Sample : 5.0ng TO15 ICAL STD
 Misc : S29-03211702/S31-03271704 (4/25)

Vial: 12
 Operator: AM
 Inst : MS13

Quant Time: Mar 29 08:25:35 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Wed Mar 29 08:24:17 2017

Response via : Initial Calibration

MM 3/29/17

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.25	130	102892	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.33	114	482930	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.62	82	200495	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.08	65	191474	15.169	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	121.36%	
57) Toluene-d8 (SS2)	15.75	98	479046	12.089	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	96.72%	
73) Bromofluorobenzene (SS3)	19.06	174	196198	12.214	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.68%	

Target Compounds

						Qvalue
2) Propene	4.45	42	42086	4.462	ng	96
3) Dichlorodifluoromethan...	4.61	85	102984	5.384	ng	99
4) Chloromethane	4.86	50	52930	4.846	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	5.13	135	50694	4.785	ng	99
6) Vinyl Chloride	5.27	62	58994	5.303	ng	100
7) 1,3-Butadiene	5.53	54	42182	6.310	ng	98
8) Bromomethane	5.94	94	36071	4.958	ng	99
9) Chloroethane	6.26	64	29306	5.077	ng	99
10) Ethanol	6.59	45	143697	27.291	ng	100
11) Acetonitrile	6.84	41	75988	5.277	ng	98
12) Acrolein	7.03	56	27281	5.513	ng	99
13) Acetone	7.23	58	153152	27.268	ng	98
14) Trichlorofluoromethane	7.49	101	98789	5.759	ng	99
15) 2-Propanol (Isopropanol)	7.71	45	241525	11.166	ng	100
16) Acrylonitrile	7.96	53	55110	5.419	ng	99
17) 1,1-Dichloroethene	8.41	96	43478	5.100	ng	99
18) 2-Methyl-2-Propanol (t...	8.56	59	271958	11.846	ng	99
19) Methylene Chloride	8.61	84	43837	5.123	ng	96
20) 3-Chloro-1-propene (Al...	8.77	41	65583	5.549	ng	100
21) Trichlorotrifluoroethane	9.02	151	48535	5.064	ng	99
22) Carbon Disulfide	8.88	76	157775	5.175	ng	100
23) trans-1,2-Dichloroethene	9.84	61	67159	5.542	ng	100
24) 1,1-Dichloroethane	10.09	63	78982	5.051	ng	100
25) Methyl tert-Butyl Ether	10.18	73	158835	5.437	ng	100
26) Vinyl Acetate	10.33	86	52394	26.021	ng	# 95
27) 2-Butanone (MEK)	10.57	72	28823	4.990	ng	98
28) cis-1,2-Dichloroethene	11.07	61	64464	5.504	ng	100
29) Diisopropyl Ether	11.36	87	46058	5.400	ng	# 64
30) Ethyl Acetate	11.36	61	30063	9.733	ng	98
31) n-Hexane	11.36	57	66379	4.900	ng	99
32) Chloroform	11.41	83	87895	5.431	ng	99
34) Tetrahydrofuran (THF)	11.81	72	28761	4.726	ng	99
35) Ethyl tert-Butyl Ether	11.94	87	58893	5.227	ng	99
36) 1,2-Dichloroethane	12.19	62	79165	5.926	ng	99
38) 1,1,1-Trichloroethane	12.47	97	88366	5.690	ng	99
39) Isopropyl Acetate	12.88	61	51147	9.645	ng	99
40) 1-Butanol	12.89	56	86712	10.616	ng	98
41) Benzene	12.94	78	166582	4.576	ng	100
42) Carbon Tetrachloride	13.10	117	80356	5.810	ng	99
43) Cyclohexane	13.23	84	132954	9.578	ng	99
44) tert-Amyl Methyl Ether	13.57	73	137947	5.343	ng	99
45) 1,2-Dichloropropane	13.78	63	40284	4.667	ng	99
46) Bromodichloromethane	13.97	83	69995	5.610	ng	99
47) Trichloroethene	14.02	130	52437	4.714	ng	98
48) 1,4-Dioxane	13.99	88	35505	4.507	ng	99
49) 2,2,4-Trimethylpentane...	14.09	57	172496	5.024	ng	100
50) Methyl Methacrylate	14.21	100	39198	9.832	ng	98

Data File : I:\MS13\DATA\2017 03\28\03281712.D
 Acq On : 28 Mar 2017 16:33
 Sample : 5.0ng TO15 ICAL STD
 Misc : S29-03211702/S31-03271704 (4/25)

Vial: 12
 Operator: AM
 Inst : MS13

Quant Time: Mar 29 08:25:35 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Wed Mar 29 08:24:17 2017

Response via : Initial Calibration

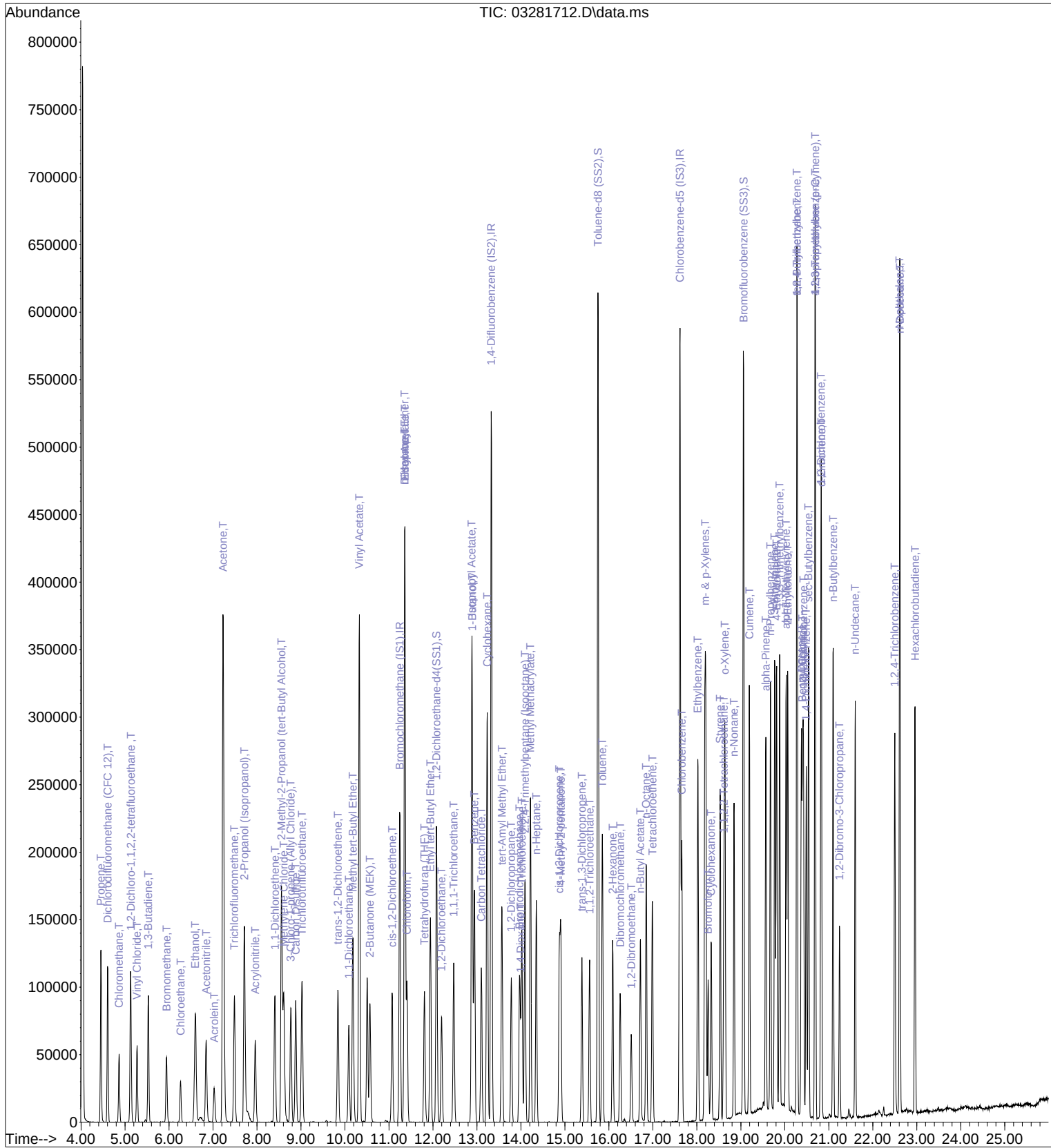
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.35	71	41072	4.532	ng	98
52) cis-1,3-Dichloropropene	14.87	75	80058	5.299	ng	100
53) 4-Methyl-2-pentanone	14.91	58	38807	4.766	ng	100
54) trans-1,3-Dichloropropene	15.39	75	75660	5.498	ng	100
55) 1,1,2-Trichloroethane	15.56	97	43486	4.804	ng	99
58) Toluene	15.85	91	178268	4.576	ng	100
59) 2-Hexanone	16.09	43	103900	5.297	ng	98
60) Dibromochloromethane	16.26	129	61791	5.238	ng	99
61) 1,2-Dibromoethane	16.51	107	52230	4.884	ng	100
62) n-Butyl Acetate	16.72	43	114893	5.326	ng	99
63) n-Octane	16.85	57	34814	4.481	ng	99
64) Tetrachloroethene	16.99	166	61135	4.772	ng	100
65) Chlorobenzene	17.66	112	127552	4.608	ng	100
66) Ethylbenzene	18.02	91	212736	4.746	ng	100
67) m- & p-Xylenes	18.19	91	341144	9.763	ng	99
68) Bromoform	18.25	173	57513	5.425	ng	99
69) Styrene	18.53	104	135503	4.827	ng	100
70) o-Xylene	18.64	91	169192	4.714	ng	99
71) n-Nonane	18.85	43	85420	4.896	ng	100
72) 1,1,2,2-Tetrachloroethane	18.61	83	73428	4.669	ng	99
74) Cumene	19.19	105	220819	4.727	ng	100
75) alpha-Pinene	19.57	93	112182	4.684	ng	100
76) n-Propylbenzene	19.67	91	252634	4.755	ng	99
77) 3-Ethyltoluene	19.77	105	219344	4.470	ng	99
78) 4-Ethyltoluene	19.81	105	206146	4.720	ng	100
79) 1,3,5-Trimethylbenzene	19.88	105	183239	4.666	ng	99
80) alpha-Methylstyrene	20.03	118	101257	4.774	ng	99
81) 2-Ethyltoluene	20.06	105	212252	4.536	ng	100
82) 1,2,4-Trimethylbenzene	20.27	105	186609	4.615	ng	99
83) n-Decane	20.38	57	84168	4.484	ng	99
84) Benzyl Chloride	20.40	91	171325	5.140	ng	99
85) 1,3-Dichlorobenzene	20.42	146	113084	4.448	ng	99
86) 1,4-Dichlorobenzene	20.49	146	113902	4.367	ng	99
87) sec-Butylbenzene	20.54	105	239403	4.512	ng	100
88) 4-Isopropyltoluene (p-...	20.69	119	236391	4.547	ng	99
89) 1,2,3-Trimethylbenzene	20.69	105	182513	4.451	ng	100
90) 1,2-Dichlorobenzene	20.82	146	108795	4.416	ng	98
91) d-Limonene	20.83	68	65878	4.580	ng	99
92) 1,2-Dibromo-3-Chloropr...	21.24	157	43009	4.972	ng	96
93) n-Undecane	21.60	57	90024	4.919	ng	99
94) 1,2,4-Trichlorobenzene	22.50	180	93490	4.879	ng	99
95) Naphthalene	22.61	128	269033	5.086	ng	100
96) n-Dodecane	22.62	57	90619	5.345	ng	98
97) Hexachlorobutadiene	22.96	225	65179	4.677	ng	98
98) Cyclohexanone	18.32	55	59303	4.704	ng	99
99) tert-Butylbenzene	20.27	119	185097	4.537	ng	100
100) n-Butylbenzene	21.10	91	194171	4.760	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Vial: 12
Operator: AM
Inst : MS13

Quant Time: Mar 29 08:25:35 2017



Data File : I:\MS13\DATA\2017 03\28\03281713.D
 Acq On : 28 Mar 2017 17:07
 Sample : 25ng TO15 ICAL STD
 Misc : S29-03211702/S31-03271701 (4/25)

Vial: 3
 Operator: AM
 Inst : MS13

Quant Time: Mar 29 08:25:37 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Wed Mar 29 08:24:17 2017

Response via : Initial Calibration

AM 4/11/17

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.26	130	110547	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.33	114	517981	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.62	82	215737	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	205717	15.169	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	121.36%
57) Toluene-d8 (SS2)	15.76	98	514891	12.075	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	96.64%
73) Bromofluorobenzene (SS3)	19.06	174	213753	12.367	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.96%

Target Compounds

						Qvalue
2) Propene	4.44	42	229093	22.608	ng	100
3) Dichlorodifluoromethan...	4.59	85	557383	27.123	ng	100
4) Chloromethane	4.86	50	319103	27.191	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	5.12	135	278211	24.440	ng	100
6) Vinyl Chloride	5.27	62	329175	27.543	ng	100
7) 1,3-Butadiene	5.53	54	251319	34.990	ng	100
8) Bromomethane	5.95	94	217771	27.862	ng	100
9) Chloroethane	6.26	64	165146	26.626	ng	100
10) Ethanol	6.64	45	833338	147.306	ng	100
11) Acetonitrile	6.87	41	437246	28.262	ng	100
12) Acrolein	7.04	56	152263	28.641	ng	100
13) Acetone	7.25	58	872557	144.596	ng	100
14) Trichlorofluoromethane	7.49	101	543452	29.486	ng	100
15) 2-Propanol (Isopropanol)	7.74	45	1419558	61.084	ng	100
16) Acrylonitrile	7.98	53	322493	29.514	ng	100
17) 1,1-Dichloroethene	8.41	96	249135	27.200	ng	100
18) 2-Methyl-2-Propanol (t...	8.57	59	1565487	63.470	ng	100
19) Methylene Chloride	8.62	84	242414	26.368	ng	100
20) 3-Chloro-1-propene (Al...	8.78	41	391486	30.832	ng	100
21) Trichlorotrifluoroethane	9.02	151	279320	27.123	ng	100
22) Carbon Disulfide	8.89	76	898788	27.441	ng	100
23) trans-1,2-Dichloroethene	9.85	61	389947	29.948	ng	100
24) 1,1-Dichloroethane	10.10	63	448614	26.701	ng	100
25) Methyl tert-Butyl Ether	10.18	73	891798	28.415	ng	100
26) Vinyl Acetate	10.34	86	306477	141.669	ng	100
27) 2-Butanone (MEK)	10.58	72	166696	26.863	ng	100
28) cis-1,2-Dichloroethene	11.08	61	374999	29.801	ng	100
29) Diisopropyl Ether	11.36	87	212222	23.160	ng	100
30) Ethyl Acetate	11.37	61	170722	51.446	ng	100
31) n-Hexane	11.36	57	362434	24.900	ng	100
32) Chloroform	11.42	83	501350	28.832	ng	100
34) Tetrahydrofuran (THF)	11.81	72	163026	24.934	ng	100
35) Ethyl tert-Butyl Ether	11.94	87	337164	27.851	ng	100
36) 1,2-Dichloroethane	12.20	62	444959	31.002	ng	100
38) 1,1,1-Trichloroethane	12.48	97	501617	30.116	ng	100
39) Isopropyl Acetate	12.89	61	290668	51.101	ng	100
40) 1-Butanol	12.90	56	511826	58.419	ng	100
41) Benzene	12.95	78	932292	23.877	ng	100
42) Carbon Tetrachloride	13.10	117	465903	31.408	ng	100
43) Cyclohexane	13.23	84	751095	50.445	ng	100
44) tert-Amyl Methyl Ether	13.57	73	792249	28.607	ng	100
45) 1,2-Dichloropropane	13.79	63	227355	24.558	ng	100
46) Bromodichloromethane	13.97	83	401638	30.014	ng	100
47) Trichloroethene	14.03	130	305122	25.572	ng	100
48) 1,4-Dioxane	13.99	88	216289	25.600	ng	100
49) 2,2,4-Trimethylpentane...	14.09	57	975355	26.483	ng	100
50) Methyl Methacrylate	14.22	100	220682	51.608	ng	100

Data File : I:\MS13\DATA\2017 03\28\03281713.D
 Acq On : 28 Mar 2017 17:07
 Sample : 25ng TO15 ICAL STD
 Misc : S29-03211702/S31-03271701 (4/25)

Vial: 3
 Operator: AM
 Inst : MS13

Quant Time: Mar 29 08:25:37 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Wed Mar 29 08:24:17 2017

Response via : Initial Calibration

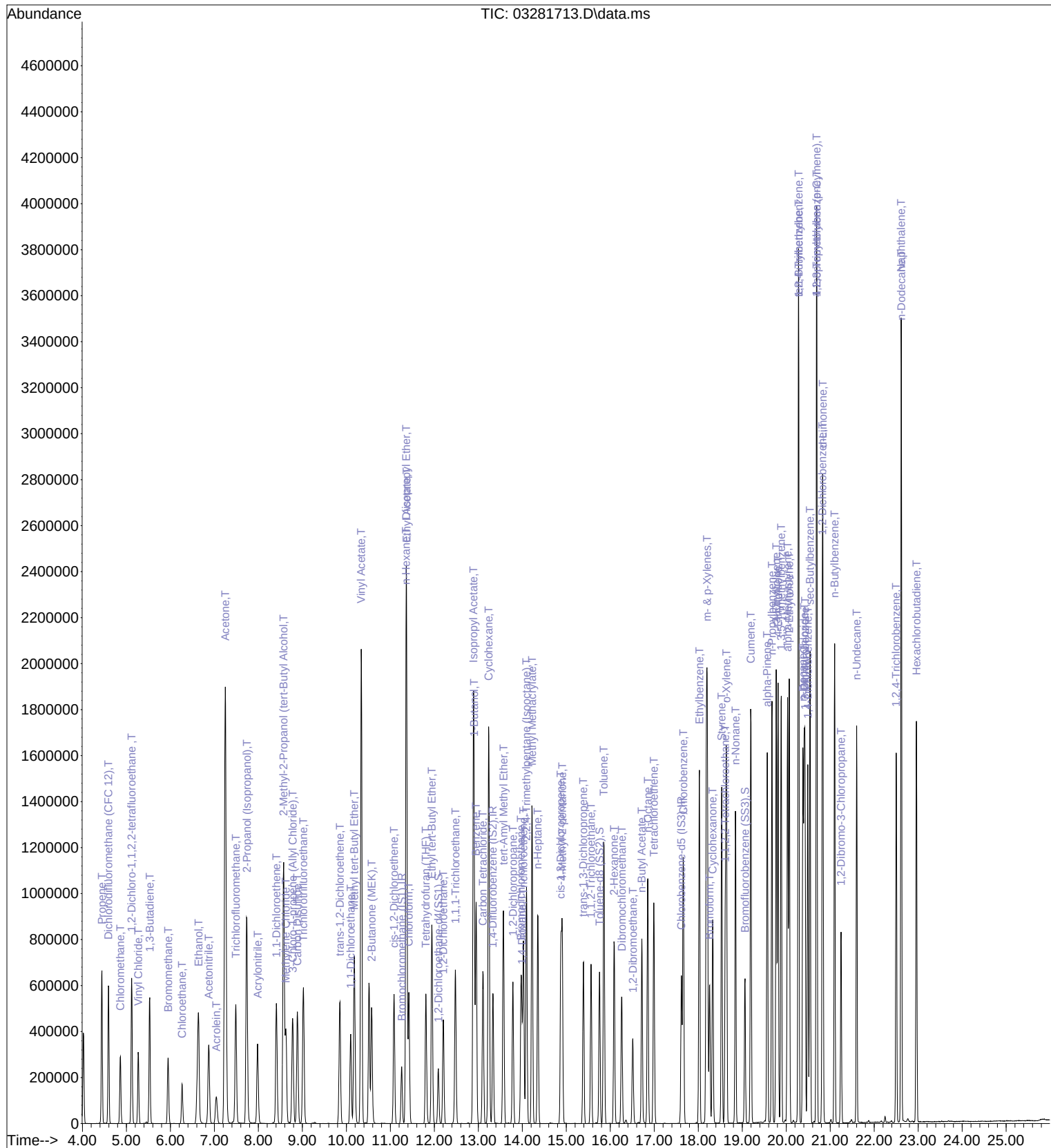
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.35	71	226697	23.322	ng	100
52) cis-1,3-Dichloropropene	14.87	75	463730	28.616	ng	100
53) 4-Methyl-2-pentanone	14.91	58	228505	26.164	ng	100
54) trans-1,3-Dichloropropene	15.39	75	446997	30.284	ng	100
55) 1,1,2-Trichloroethane	15.56	97	247113	25.451	ng	100
58) Toluene	15.85	91	1017371	24.272	ng	100
59) 2-Hexanone	16.09	43	613428	29.064	ng	100
60) Dibromochloromethane	16.26	129	363701	28.652	ng	100
61) 1,2-Dibromoethane	16.51	107	301695	26.216	ng	100
62) n-Butyl Acetate	16.72	43	666230	28.704	ng	100
63) n-Octane	16.85	57	198430	23.734	ng	100
64) Tetrachloroethene	16.99	166	349300	25.342	ng	100
65) Chlorobenzene	17.66	112	735258	24.685	ng	100
66) Ethylbenzene	18.03	91	1233029	25.567	ng	100
67) m- & p-Xylenes	18.20	91	1957294	52.057	ng	100
68) Bromoform	18.26	173	343858	30.141	ng	100
69) Styrene	18.53	104	787158	26.057	ng	100
70) o-Xylene	18.64	91	984970	25.502	ng	100
71) n-Nonane	18.85	43	483163	25.735	ng	100
72) 1,1,2,2-Tetrachloroethane	18.61	83	421244	24.892	ng	100
74) Cumene	19.19	105	1282447	25.512	ng	100
75) alpha-Pinene	19.57	93	646281	25.079	ng	100
76) n-Propylbenzene	19.68	91	1471657	25.743	ng	100
77) 3-Ethyltoluene	19.77	105	1336624	25.312	ng	100
78) 4-Ethyltoluene	19.81	105	1138843	24.232	ng	100
79) 1,3,5-Trimethylbenzene	19.89	105	1069031	25.300	ng	100
80) alpha-Methylstyrene	20.03	118	591765	25.927	ng	100
81) 2-Ethyltoluene	20.07	105	1239634	24.618	ng	100
82) 1,2,4-Trimethylbenzene	20.28	105	1092556	25.109	ng	100
83) n-Decane	20.38	57	490539	24.288	ng	100
84) Benzyl Chloride	20.41	91	1030316	28.728	ng	100
85) 1,3-Dichlorobenzene	20.43	146	668583	24.438	ng	100
86) 1,4-Dichlorobenzene	20.49	146	683082	24.338	ng	100
87) sec-Butylbenzene	20.54	105	1396616	24.462	ng	100
88) 4-Isopropyltoluene (p-...	20.69	119	1381242	24.690	ng	100
89) 1,2,3-Trimethylbenzene	20.69	105	1080218	24.483	ng	100
90) 1,2-Dichlorobenzene	20.82	146	640857	24.177	ng	100
91) d-Limonene	20.83	68	382917	24.741	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.25	157	254381	27.331	ng	100
93) n-Undecane	21.60	57	506398	25.715	ng	100
94) 1,2,4-Trichlorobenzene	22.50	180	540667	26.220	ng	100
95) Naphthalene	22.61	128	1522319	26.745	ng	100
96) n-Dodecane	22.62	57	492891	27.018	ng	100
97) Hexachlorobutadiene	22.96	225	375372	25.030	ng	100
98) Cyclohexanone	18.33	55	376054	27.724	ng	100
99) tert-Butylbenzene	20.28	119	1084771	24.709	ng	100
100) n-Butylbenzene	21.10	91	1122516	25.576	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Vial: 3
Operator: AM
Inst : MS13

Quant Time: Mar 29 08:25:37 2017



Data File : I:\MS13\DATA\2017 03\28\03281714.D
 Acq On : 28 Mar 2017 17:42
 Sample : 50ng TO15 ICAL STD
 Misc : S29-03211702/S31-03271701 (4/25)

Vial: 3
 Operator: AM
 Inst : MS13

Quant Time: Mar 29 08:25:39 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Wed Mar 29 08:24:17 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 4/11/17

3/29/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.27	130	114810	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.34	114	540104	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.62	82	223072	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.10	65	209585	14.880	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	119.04%
57) Toluene-d8 (SS2)	15.76	98	531720	12.060	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	96.48%
73) Bromofluorobenzene (SS3)	19.06	174	223292	12.494	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.92%

Target Compounds

						Qvalue
2) Propene	4.44	42	394666	37.501	ng	99
3) Dichlorodifluoromethan...	4.60	85	1008739	47.264	ng	100
4) Chloromethane	4.87	50	596964	48.979	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	5.13	135	544324	46.041	ng	99
6) Vinyl Chloride	5.27	62	640559	51.607	ng	100
7) 1,3-Butadiene	5.53	54	494722	66.321	ng	99
8) Bromomethane	5.96	94	427928	52.716	ng	100
9) Chloroethane	6.27	64	326012	50.611	ng	100
10) Ethanol	6.66	45	1618400	275.456	ng	99
11) Acetonitrile	6.89	41	876663	54.560	ng	100
12) Acrolein	7.05	56	293313	53.124	ng	98
13) Acetone	7.26	58	1701193	271.446	ng	98
14) Trichlorofluoromethane	7.49	101	1061190	55.438	ng	99
15) 2-Propanol (Isopropanol)	7.75	45	2765756	114.593	ng	99
16) Acrylonitrile	7.99	53	645431	56.875	ng	100
17) 1,1-Dichloroethene	8.41	96	496724	52.217	ng	100
18) 2-Methyl-2-Propanol (t...	8.59	59	3075257	120.051	ng	100
19) Methylene Chloride	8.63	84	486968	51.002	ng	98
20) 3-Chloro-1-propene (Al...	8.78	41	785351	59.555	ng	99
21) Trichlorotrifluoroethane	9.02	151	555842	51.970	ng	100
22) Carbon Disulfide	8.89	76	1785658	52.494	ng	100
23) trans-1,2-Dichloroethene	9.85	61	776307	57.407	ng	100
24) 1,1-Dichloroethane	10.10	63	895294	51.309	ng	99
25) Methyl tert-Butyl Ether	10.18	73	1768217	54.248	ng	100
26) Vinyl Acetate	10.35	86	618961	275.491	ng	# 95
27) 2-Butanone (MEK)	10.58	72	331756	51.478	ng	100
28) cis-1,2-Dichloroethene	11.09	61	741136	56.711	ng	98
29) Diisopropyl Ether	11.37	87	419394	44.069	ng	97
30) Ethyl Acetate	11.37	61	345166	100.152	ng	99
31) n-Hexane	11.36	57	730716	48.337	ng	99
32) Chloroform	11.43	83	996332	55.170	ng	100
34) Tetrahydrofuran (THF)	11.81	72	327825	48.278	ng	99
35) Ethyl tert-Butyl Ether	11.95	87	673913	53.600	ng	100
36) 1,2-Dichloroethane	12.20	62	876043	58.770	ng	100
38) 1,1,1-Trichloroethane	12.48	97	993254	57.190	ng	100
39) Isopropyl Acetate	12.89	61	582601	98.230	ng	98
40) 1-Butanol	12.92	56	1030459	112.798	ng	99
41) Benzene	12.95	78	1864858	45.804	ng	100
42) Carbon Tetrachloride	13.11	117	922676	59.653	ng	100
43) Cyclohexane	13.24	84	1501815	96.734	ng	100
44) tert-Amyl Methyl Ether	13.57	73	1575381	54.554	ng	99
45) 1,2-Dichloropropane	13.79	63	454940	47.129	ng	99
46) Bromodichloromethane	13.97	83	796652	57.095	ng	100
47) Trichloroethene	14.03	130	615307	49.456	ng	99
48) 1,4-Dioxane	14.00	88	432889	49.138	ng	98
49) 2,2,4-Trimethylpentane...	14.09	57	1956498	50.947	ng	99
50) Methyl Methacrylate	14.22	100	442992	99.353	ng	100

Data File : I:\MS13\DATA\2017 03\28\03281714.D
 Acq On : 28 Mar 2017 17:42
 Sample : 50ng TO15 ICAL STD
 Misc : S29-03211702/S31-03271701 (4/25)

Vial: 3
 Operator: AM
 Inst : MS13

Quant Time: Mar 29 08:25:39 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Wed Mar 29 08:24:17 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.36	71	453629	44.757	ng	100
52) cis-1,3-Dichloropropene	14.88	75	933242	55.230	ng	100
53) 4-Methyl-2-pentanone	14.91	58	457025	50.186	ng	98
54) trans-1,3-Dichloropropene	15.39	75	892930	58.018	ng	100
55) 1,1,2-Trichloroethane	15.56	97	492903	48.687	ng	100
58) Toluene	15.86	91	2036530	46.988	ng	100
59) 2-Hexanone	16.09	43	1212790	55.572	ng	100
60) Dibromochloromethane	16.26	129	729645	55.590	ng	100
61) 1,2-Dibromoethane	16.51	107	605693	50.902	ng	100
62) n-Butyl Acetate	16.72	43	1312226	54.678	ng	100
63) n-Octane	16.85	57	398281	46.072	ng	100
64) Tetrachloroethene	16.99	166	702142	49.265	ng	100
65) Chlorobenzene	17.66	112	1475836	47.919	ng	100
66) Ethylbenzene	18.03	91	2458567	49.303	ng	100
67) m- & p-Xylenes	18.20	91	3933549	101.178	ng	99
68) Bromoform	18.26	173	696409	59.038	ng	99
69) Styrene	18.53	104	1575713	50.446	ng	100
70) o-Xylene	18.64	91	1964083	49.180	ng	100
71) n-Nonane	18.85	43	964275	49.671	ng	100
72) 1,1,2,2-Tetrachloroethane	18.62	83	845031	48.292	ng	100
74) Cumene	19.20	105	2551531	49.089	ng	99
75) alpha-Pinene	19.57	93	1301189	48.832	ng	100
76) n-Propylbenzene	19.68	91	2919078	49.382	ng	100
77) 3-Ethyltoluene	19.77	105	2604053	47.692	ng	100
78) 4-Ethyltoluene	19.81	105	2356633	48.496	ng	100
79) 1,3,5-Trimethylbenzene	19.89	105	2141690	49.020	ng	100
80) alpha-Methylstyrene	20.04	118	1191869	50.502	ng	99
81) 2-Ethyltoluene	20.07	105	2478612	47.604	ng	100
82) 1,2,4-Trimethylbenzene	20.29	105	2213350	49.195	ng	100
83) n-Decane	20.38	57	972318	46.559	ng	99
84) Benzyl Chloride	20.41	91	2085591	56.240	ng	100
85) 1,3-Dichlorobenzene	20.43	146	1345627	47.568	ng	100
86) 1,4-Dichlorobenzene	20.49	146	1363999	47.001	ng	100
87) sec-Butylbenzene	20.54	105	2769062	46.906	ng	100
88) 4-Isopropyltoluene (p-...	20.70	119	2754861	47.625	ng	100
89) 1,2,3-Trimethylbenzene	20.70	105	2186808	47.933	ng	100
90) 1,2-Dichlorobenzene	20.83	146	1284152	46.852	ng	100
91) d-Limonene	20.83	68	779726	48.723	ng	99
92) 1,2-Dibromo-3-Chloropr...	21.25	157	509317	52.921	ng	99
93) n-Undecane	21.60	57	1016860	49.938	ng	100
94) 1,2,4-Trichlorobenzene	22.51	180	1087600	51.010	ng	100
95) Naphthalene	22.61	128	3056779	51.938	ng	100
96) n-Dodecane	22.62	57	1009070	53.494	ng	100
97) Hexachlorobutadiene	22.96	225	746145	48.118	ng	99
98) Cyclohexanone	18.33	55	749174	53.415	ng	99
99) tert-Butylbenzene	20.28	119	2185364	48.141	ng	100
100) n-Butylbenzene	21.10	91	2221114	48.942	ng	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2017 03\28\03281715.D
 Acq On : 28 Mar 2017 18:17
 Sample : 100ng TO15 ICAL STD
 Misc : S29-03211702/S31-03271701 (4/25)

Vial: 3
 Operator: AM
 Inst : MS13

Quant Time: Mar 29 08:25:41 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Wed Mar 29 08:24:17 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 4/11/17

3/29/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.27	130	118738	12.500	ng	0.01
37) 1,4-Difluorobenzene (IS2)	13.34	114	562102	12.500	ng	0.01
56) Chlorobenzene-d5 (IS3)	17.62	82	228762	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.10	65	213046	14.626	ng	0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	117.04%
57) Toluene-d8 (SS2)	15.76	98	550834	12.183	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.44%
73) Bromofluorobenzene (SS3)	19.06	174	224729	12.261	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.08%

Target Compounds

						Qvalue
2) Propene	4.45	42	769240	70.675	ng	99
3) Dichlorodifluoromethan...	4.60	85	1796451	81.388	ng	100
4) Chloromethane	4.88	50	1003989	79.649	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	5.14	135	1061960	86.854	ng	99
6) Vinyl Chloride	5.28	62	1240320	96.622	ng	100
7) 1,3-Butadiene	5.55	54	991812	128.561	ng	99
8) Bromomethane	5.97	94	828268	98.659	ng	99
9) Chloroethane	6.29	64	651421	97.783	ng	100
10) Ethanol	6.71	45	3259147	536.366	ng	99
11) Acetonitrile	6.92	41	1759743	105.896	ng	100
12) Acrolein	7.08	56	594556	104.122	ng	99
13) Acetone	7.29	58	3338804	515.124	ng	90
14) Trichlorofluoromethane	7.50	101	2137636	107.980	ng	100
15) 2-Propanol (Isopropanol)	7.79	45	4840193	193.908	ng	100
16) Acrylonitrile	8.02	53	1293740	110.232	ng	100
17) 1,1-Dichloroethene	8.43	96	997501	101.391	ng	99
18) 2-Methyl-2-Propanol (t...	8.62	59	5728721	216.238	ng	99
19) Methylene Chloride	8.65	84	972139	98.448	ng	99
20) 3-Chloro-1-propene (Al...	8.80	41	1557463	114.200	ng	100
21) Trichlorotrifluoroethane	9.03	151	1116665	100.952	ng	100
22) Carbon Disulfide	8.90	76	3564761	101.329	ng	100
23) trans-1,2-Dichloroethene	9.87	61	1565521	111.939	ng	100
24) 1,1-Dichloroethane	10.11	63	1806212	100.088	ng	99
25) Methyl tert-Butyl Ether	10.20	73	3548402	105.262	ng	99
26) Vinyl Acetate	10.37	86	1273495	548.064	ng	# 80
27) 2-Butanone (MEK)	10.60	72	675907	101.410	ng	97
28) cis-1,2-Dichloroethene	11.10	61	1495099	110.620	ng	99
29) Diisopropyl Ether	11.38	87	875890	88.993	ng	98
30) Ethyl Acetate	11.39	61	726313	203.773	ng	98
31) n-Hexane	11.37	57	1559200	99.729	ng	100
32) Chloroform	11.44	83	1999116	107.035	ng	100
34) Tetrahydrofuran (THF)	11.82	72	663040	94.415	ng	99
35) Ethyl tert-Butyl Ether	11.95	87	1360927	104.661	ng	100
36) 1,2-Dichloroethane	12.22	62	1746651	113.299	ng	100
38) 1,1,1-Trichloroethane	12.49	97	1986325	109.894	ng	100
39) Isopropyl Acetate	12.90	61	1207294	195.590	ng	# 94
40) 1-Butanol	12.94	56	2128734	223.900	ng	99
41) Benzene	12.96	78	3806449	89.833	ng	100
42) Carbon Tetrachloride	13.12	117	1852751	115.097	ng	100
43) Cyclohexane	13.25	84	3064993	189.694	ng	99
44) tert-Amyl Methyl Ether	13.58	73	3167785	105.405	ng	100
45) 1,2-Dichloropropane	13.79	63	932510	92.821	ng	99
46) Bromodichloromethane	13.98	83	1612780	111.062	ng	99
47) Trichloroethene	14.04	130	1260106	97.319	ng	99
48) 1,4-Dioxane	14.01	88	882160	96.217	ng	99
49) 2,2,4-Trimethylpentane...	14.11	57	3970900	99.355	ng	99
50) Methyl Methacrylate	14.24	100	908004	195.674	ng	100

Data File : I:\MS13\DATA\2017 03\28\03281715.D
 Acq On : 28 Mar 2017 18:17
 Sample : 100ng TO15 ICAL STD
 Misc : S29-03211702/S31-03271701 (4/25)

Vial: 3
 Operator: AM
 Inst : MS13

Quant Time: Mar 29 08:25:41 2017
 Quant Method : I:\MS13\METHODS\R13032817.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Wed Mar 29 08:24:17 2017
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.36	71	935473	88.685	ng	99
52) cis-1,3-Dichloropropene	14.89	75	1894075	107.706	ng	100
53) 4-Methyl-2-pentanone	14.92	58	933115	98.456	ng	97
54) trans-1,3-Dichloropropene	15.40	75	1814358	113.273	ng	100
55) 1,1,2-Trichloroethane	15.57	97	1014548	96.291	ng	100
58) Toluene	15.86	91	4161422	93.627	ng	99
59) 2-Hexanone	16.10	43	2445315	109.262	ng	99
60) Dibromochloromethane	16.26	129	1479140	109.889	ng	99
61) 1,2-Dibromoethane	16.52	107	1230843	100.867	ng	100
62) n-Butyl Acetate	16.72	43	2632133	106.948	ng	99
63) n-Octane	16.86	57	817517	92.217	ng	100
64) Tetrachloroethene	17.00	166	1443852	98.787	ng	100
65) Chlorobenzene	17.66	112	2982627	94.435	ng	100
66) Ethylbenzene	18.03	91	4933835	96.479	ng	99
67) m- & p-Xylenes	18.21	91	7932701	198.969	ng	98
68) Bromoform	18.27	173	1404700	116.121	ng	100
69) Styrene	18.54	104	3200563	99.916	ng	100
70) o-Xylene	18.65	91	3975491	97.069	ng	99
71) n-Nonane	18.85	43	1964059	98.655	ng	100
72) 1,1,2,2-Tetrachloroethane	18.62	83	1730697	96.446	ng	100
74) Cumene	19.20	105	5097313	95.628	ng	98
75) alpha-Pinene	19.57	93	2646342	96.844	ng	99
76) n-Propylbenzene	19.68	91	5790112	95.516	ng	99
77) 3-Ethyltoluene	19.78	105	5326343	95.123	ng	99
78) 4-Ethyltoluene	19.82	105	4586418	92.033	ng	99
79) 1,3,5-Trimethylbenzene	19.89	105	4314649	96.300	ng	99
80) alpha-Methylstyrene	20.04	118	2429770	100.394	ng	99
81) 2-Ethyltoluene	20.08	105	4961635	92.922	ng	98
82) 1,2,4-Trimethylbenzene	20.29	105	4523343	98.037	ng	98
83) n-Decane	20.38	57	1992897	93.056	ng	100
84) Benzyl Chloride	20.42	91	4229164	111.207	ng	99
85) 1,3-Dichlorobenzene	20.43	146	2731231	94.148	ng	100
86) 1,4-Dichlorobenzene	20.50	146	2770259	93.084	ng	100
87) sec-Butylbenzene	20.55	105	5517031	91.131	ng	99
88) 4-Isopropyltoluene (p-...	20.70	119	5577630	94.025	ng	99
89) 1,2,3-Trimethylbenzene	20.70	105	4484394	95.850	ng	99
90) 1,2-Dichlorobenzene	20.83	146	2630415	93.583	ng	100
91) d-Limonene	20.84	68	1651966	100.659	ng	97
92) 1,2-Dibromo-3-Chloropr...	21.25	157	1025130	103.868	ng	98
93) n-Undecane	21.61	57	2076799	99.454	ng	99
94) 1,2,4-Trichlorobenzene	22.51	180	2159795	98.778	ng	100
95) Naphthalene	22.62	128	6010633	99.586	ng	99
96) n-Dodecane	22.62	57	2133348	110.283	ng	99
97) Hexachlorobutadiene	22.96	225	1507545	94.802	ng	99
98) Cyclohexanone	18.34	55	1511946	105.118	ng	99
99) tert-Butylbenzene	20.29	119	4451303	95.618	ng	99
100) n-Butylbenzene	21.11	91	4432143	95.233	ng	98

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2017 03\28\03281715.D
Acq On : 28 Mar 2017 18:17
Sample : 100ng TO15 ICAL STD
Misc : S29-03211702/S31-03271701 (4/25)

Vial: 3
Operator: AM
Inst : MS13

Quant Time: Mar 29 08:25:41 2017

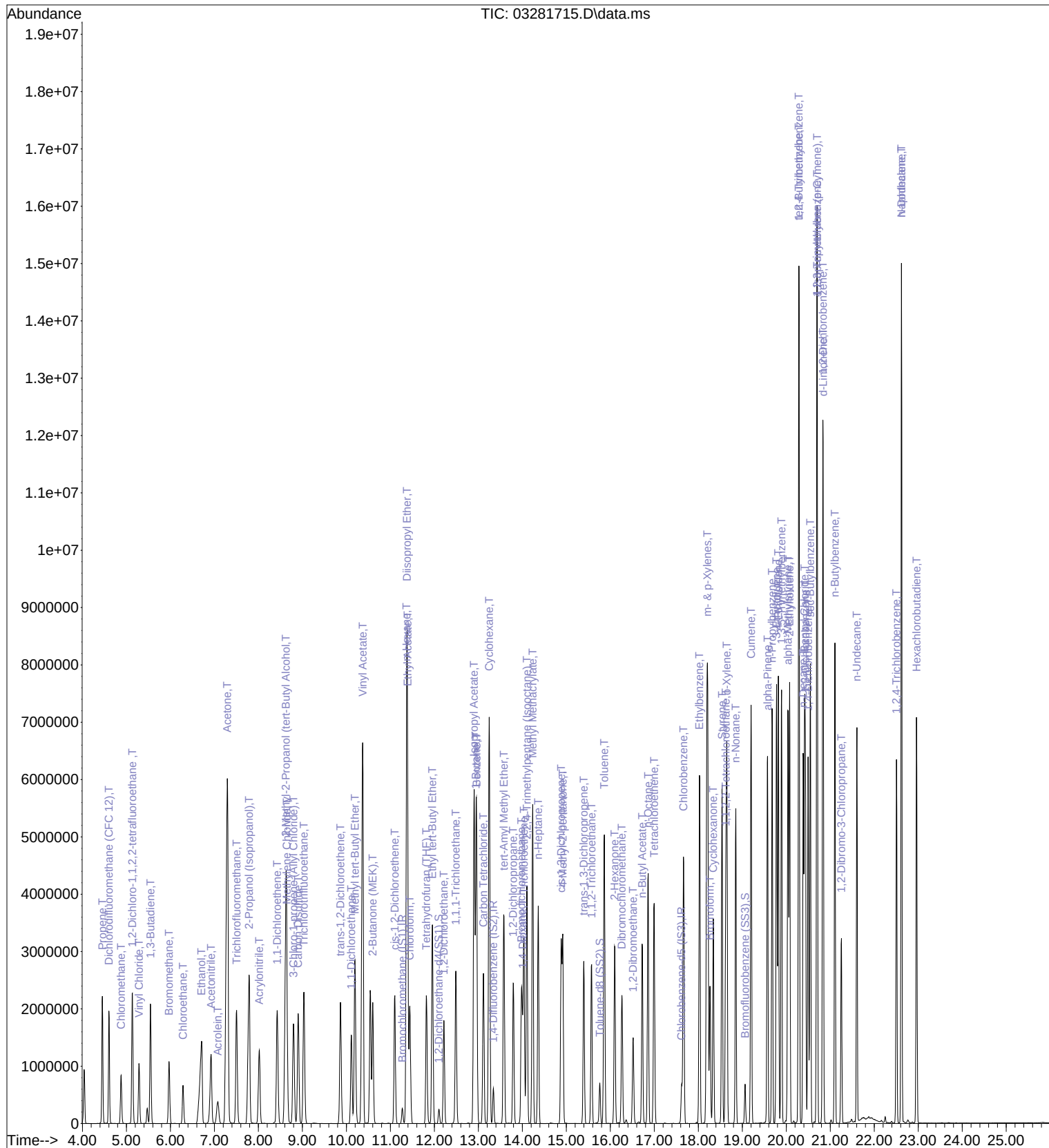
Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Wed Mar 29 08:24:17 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2017 03\28\03281718.D
 Acq On : 28 Mar 2017 20:02
 Sample : 25ng TO15 ICV STD
 Misc : S29-061416/S31-03271708 (4/25)

Vial: 3
 Operator: AM
 Inst : MS13

Quant Time: Mar 29 10:22:28 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Wed Mar 29 09:17:20 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 4/11/17

3/29/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.25	130	113118	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.33	114	551025	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.62	82	231878	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	203811	12.163	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.28%
57) Toluene-d8 (SS2)	15.76	98	546907	12.300	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.40%
73) Bromofluorobenzene (SS3)	19.06	174	221409	11.952	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.60%

Target Compounds

						Qvalue
2) Propene	4.44	42	283980	27.607	ng	98
3) Dichlorodifluoromethan...	4.60	85	606531	26.587	ng	99
4) Chloromethane	4.86	50	365940	27.117	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	5.13	135	305053	25.564	ng	99
6) Vinyl Chloride	5.27	62	374491	27.527	ng	100
7) 1,3-Butadiene	5.53	54	284318	30.471	ng	99
8) Bromomethane	5.95	94	246630	27.590	ng	100
9) Chloroethane	6.27	64	192249	28.585	ng	100
10) Ethanol	6.64	45	1007109	146.290	ng	99
11) Acetonitrile	6.87	41	483709	27.259	ng	100
12) Acrolein	7.04	56	166881	26.043	ng	99
13) Acetone	7.25	58	937551	123.653	ng	98
14) Trichlorofluoromethane	7.49	101	579776	25.331	ng	99
15) 2-Propanol (Isopropanol)	7.73	45	1533499	54.453	ng	100
16) Acrylonitrile	7.98	53	368651	29.448	ng	99
17) 1,1-Dichloroethene	8.41	96	269042	27.171	ng	100
18) 2-Methyl-2-Propanol (t...	8.57	59	1683617	53.711	ng	99
19) Methylene Chloride	8.63	84	270979	24.305	ng	99
20) 3-Chloro-1-propene (Al...	8.78	41	426962	28.837	ng	100
21) Trichlorotrifluoroethane	9.02	151	290314	25.384	ng	100
22) Carbon Disulfide	8.89	76	942888	25.490	ng	100
23) trans-1,2-Dichloroethene	9.85	61	405863	27.015	ng	100
24) 1,1-Dichloroethane	10.10	63	492124	26.297	ng	100
25) Methyl tert-Butyl Ether	10.18	73	928175	25.900	ng	99
26) Vinyl Acetate	10.34	86	323831	137.186	ng	99
27) 2-Butanone (MEK)	10.58	72	178586	27.411	ng	100
28) cis-1,2-Dichloroethene	11.08	61	387277	26.731	ng	99
29) Diisopropyl Ether	11.36	87	224069	23.122	ng	100
30) Ethyl Acetate	11.37	61	181865	52.772	ng	98
31) n-Hexane	11.36	57	382075	25.161	ng	100
32) Chloroform	11.42	83	514965	25.190	ng	99
34) Tetrahydrofuran (THF)	11.81	72	171595	24.637	ng	99
35) Ethyl tert-Butyl Ether	11.94	87	353347	25.950	ng	99
36) 1,2-Dichloroethane	12.20	62	455664	25.457	ng	100
38) 1,1,1-Trichloroethane	12.48	97	509564	24.524	ng	100
39) Isopropyl Acetate	12.89	61	315076	52.574	ng	97
40) 1-Butanol	12.90	56	575923	53.701	ng	99
41) Benzene	12.95	78	1030945	24.438	ng	100
42) Carbon Tetrachloride	13.10	117	491807	26.331	ng	100
43) Cyclohexane	13.23	84	811101	51.531	ng	98
44) tert-Amyl Methyl Ether	13.57	73	864145	25.547	ng	100
45) 1,2-Dichloropropane	13.79	63	249121	27.074	ng	98
46) Bromodichloromethane	13.97	83	441025	28.273	ng	99
47) Trichloroethene	14.03	130	329039	26.468	ng	99
48) 1,4-Dioxane	13.99	88	236421	27.834	ng	97
49) 2,2,4-Trimethylpentane...	14.09	57	1089012	26.482	ng	99
50) Methyl Methacrylate	14.23	100	238007	53.004	ng	94

Data File : I:\MS13\DATA\2017 03\28\03281718.D
 Acq On : 28 Mar 2017 20:02
 Sample : 25ng TO15 ICV STD
 Misc : S29-061416/S31-03271708 (4/25)

Vial: 3
 Operator: AM
 Inst : MS13

Quant Time: Mar 29 10:22:28 2017
 Quant Method : I:\MS13\METHODS\R13032817.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Wed Mar 29 09:17:20 2017
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.36	71	243817	24.522	ng	99
52) cis-1,3-Dichloropropene	14.87	75	478029	27.551	ng	100
53) 4-Methyl-2-pentanone	14.91	58	255454	27.651	ng	99
54) trans-1,3-Dichloropropene	15.39	75	491478	28.651	ng	99
55) 1,1,2-Trichloroethane	15.56	97	268345	27.613	ng	100
58) Toluene	15.85	91	1121710	24.971	ng	99
59) 2-Hexanone	16.09	43	680228	26.576	ng	99
60) Dibromochloromethane	16.26	129	385595	26.483	ng	100
61) 1,2-Dibromoethane	16.51	107	330710	26.704	ng	99
62) n-Butyl Acetate	16.72	43	761721	27.647	ng	99
63) n-Octane	16.85	57	226357	25.516	ng	98
64) Tetrachloroethene	16.99	166	374953	25.062	ng	99
65) Chlorobenzene	17.66	112	801756	25.443	ng	99
66) Ethylbenzene	18.03	91	1354561	25.702	ng	100
67) m- & p-Xylenes	18.20	91	2141808	51.159	ng	99
68) Bromoform	18.25	173	361809	26.848	ng	100
69) Styrene	18.53	104	839611	25.776	ng	100
70) o-Xylene	18.64	91	1067533	25.348	ng	100
71) n-Nonane	18.85	43	519538	24.286	ng	99
72) 1,1,2,2-Tetrachloroethane	18.61	83	458120	24.968	ng	100
74) Cumene	19.19	105	1396003	25.787	ng	100
75) alpha-Pinene	19.57	93	719408	25.569	ng	100
76) n-Propylbenzene	19.68	91	1627057	26.372	ng	99
77) 3-Ethyltoluene	19.77	105	1354162	24.204	ng	99
78) 4-Ethyltoluene	19.81	105	1397339	27.659	ng	99
79) 1,3,5-Trimethylbenzene	19.89	105	1169705	25.150	ng	99
80) alpha-Methylstyrene	20.03	118	652362	26.425	ng	100
81) 2-Ethyltoluene	20.07	105	1356821	25.512	ng	99
82) 1,2,4-Trimethylbenzene	20.28	105	1139482	23.941	ng	100
83) n-Decane	20.38	57	520625	22.265	ng	100
84) Benzyl Chloride	20.41	91	1095352	27.732	ng	100
85) 1,3-Dichlorobenzene	20.43	146	697847	25.193	ng	100
86) 1,4-Dichlorobenzene	20.49	146	728204	25.603	ng	100
87) sec-Butylbenzene	20.54	105	1506315	25.138	ng	100
88) 4-Isopropyltoluene (p-...	20.69	119	1508111	24.887	ng	99
89) 1,2,3-Trimethylbenzene	20.69	105	1211776	25.524	ng	99
90) 1,2-Dichlorobenzene	20.82	146	687456	25.546	ng	100
91) d-Limonene	20.83	68	433811	23.942	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.25	157	276374	26.757	ng	97
93) n-Undecane	21.60	57	535591	23.169	ng	99
94) 1,2,4-Trichlorobenzene	22.50	180	573140	26.177	ng	99
95) Naphthalene	22.61	128	1595163	27.474	ng	100
96) n-Dodecane	22.62	57	527118	23.255	ng	100
97) Hexachlorobutadiene	22.96	225	384336	25.100	ng	99
98) Cyclohexanone	18.33	55	408683	26.482	ng	99
99) tert-Butylbenzene	20.28	119	1132939	24.193	ng	100
100) n-Butylbenzene	21.10	91	1199652	24.954	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2017 03\28\03281718.D
Acq On : 28 Mar 2017 20:02
Sample : 25ng TO15 ICV STD
Misc : S29-061416/S31-03271708 (4/25)

Vial: 3
Operator: AM
Inst : MS13

Quant Time: Mar 29 10:22:28 2017

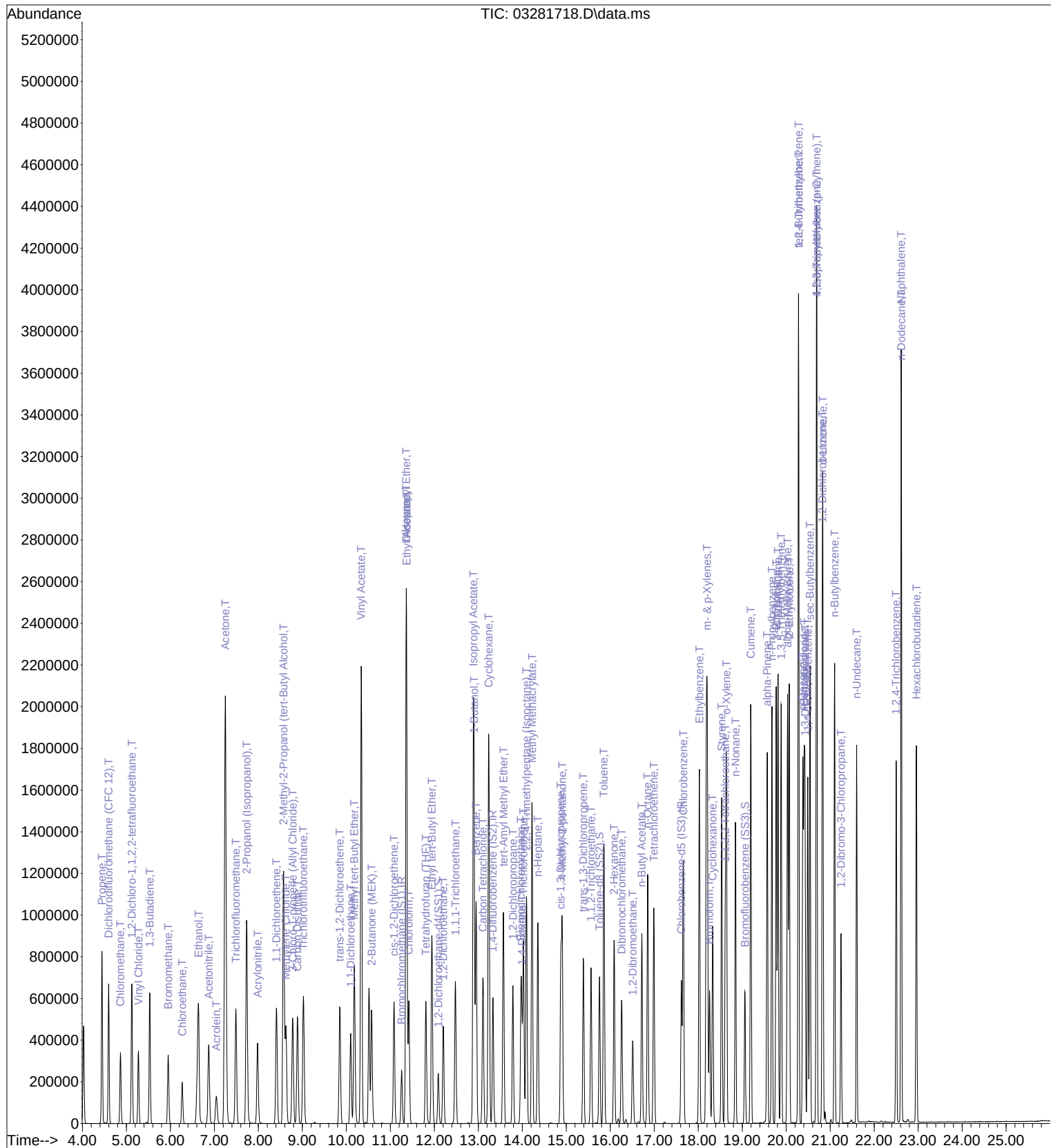
Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Wed Mar 29 09:17:20 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: 03281718.D

Acq. Method File: TO15.M

Data File Path: I:\MS13\DATA\2017_03\28\

Sample Name: 25ng TO15 ICV STD

Operator: AM

Misc Info: S29-061416/S31-03271708 (4/

Date Acquired: 3/28/2017

20:02

Instrument Name: MS13

#	Compound Name	Ret. Time	Amt. (ng)	Spike Amt.(ng)	% Rec.	Lower Limit	Upper Limit	* OR Fail	ICV/AZ 70-130%
2)	Propene	4.44	27.607	26.275	105	52	127	*	*
3)	Dichlorodifluoromethane (CFC 12)	4.60	26.587	26.250	101	68	109	*	*
4)	Chloromethane	4.86	27.117	26.225	103	51	130	*	*
5)	1,2-Dichloro-1,1,2,2-tetrafluoroethane	5.13	25.564	26.375	97	66	114	*	*
6)	Vinyl Chloride	5.27	27.527	26.250	105	61	125	*	*
7)	1,3-Butadiene	5.53	30.471	26.250	116	62	144	*	*
8)	Bromomethane	5.95	27.590	26.250	105	73	123	*	*
9)	Chloroethane	6.27	28.585	26.225	109	69	122	*	*
10)	Ethanol	6.64	146.290	132.650	110	62	124	*	*
11)	Acetonitrile	6.87	27.259	26.650	102	57	114	*	*
12)	Acrolein	7.04	26.043	26.525	98	62	116	*	*
13)	Acetone	7.25	123.653	133.050	93	57	117	*	*
14)	Trichlorofluoromethane	7.49	25.331	26.275	96	63	98	*	*
15)	2-Propanol (Isopropanol)	7.73	54.453	53.025	103	66	121	*	*
16)	Acrylonitrile	7.98	29.448	26.575	111	68	123	*	*
17)	1,1-Dichloroethene	8.41	27.171	26.575	102	76	118	*	*
18)	2-Methyl-2-Propanol (tert-Butyl Alcohol)	8.57	53.711	53.275	101	74	126	*	*
19)	Methylene Chloride	8.63	24.305	26.550	92	60	118	*	*
20)	3-Chloro-1-propene (Allyl Chloride)	8.78	28.837	26.500	109	65	126	*	*
21)	Trichlorotrifluoroethane	9.02	25.384	26.450	96	73	114	*	*
22)	Carbon Disulfide	8.89	25.490	26.675	96	57	102	*	*
23)	trans-1,2-Dichloroethene	9.85	27.015	26.675	101	74	123	*	*
24)	1,1-Dichloroethane	10.10	26.297	26.550	99	69	111	*	*
25)	Methyl tert-Butyl Ether	10.18	25.900	26.600	97	69	113	*	*
26)	Vinyl Acetate	10.34	137.186	132.550	103	76	128	*	*
27)	2-Butanone (MEK)	10.58	27.411	26.550	103	63	127	*	*
28)	cis-1,2-Dichloroethene	11.08	26.731	26.475	101	72	117	*	*
29)	Diisopropyl Ether	11.36	23.122	26.575	87	64	118	*	*
30)	Ethyl Acetate	11.37	52.772	53.275	99	68	127	*	*
31)	n-Hexane	11.36	25.161	26.600	95	55	116	*	*
32)	Chloroform	11.42	25.190	26.475	95	70	109	*	*
34)	Tetrahydrofuran (THF)	11.81	24.637	26.575	93	72	113	*	*
35)	Ethyl tert-Butyl Ether	11.94	25.950	26.525	98	73	117	*	*
36)	1,2-Dichloroethane	12.20	25.457	26.500	96	69	113	*	*
38)	1,1,1-Trichloroethane	12.48	24.524	26.475	93	72	115	*	*
39)	Isopropyl Acetate	12.89	52.574	53.050	99	68	122	*	*
40)	1-Butanol	12.90	53.701	53.075	101	75	141	*	*
41)	Benzene	12.95	24.438	26.525	92	65	107	*	*
42)	Carbon Tetrachloride	13.10	26.331	26.600	99	71	113	*	*
43)	Cyclohexane	13.23	51.531	53.125	97	71	115	*	*
44)	tert-Amyl Methyl Ether	13.57	25.547	26.525	96	73	115	*	*
45)	1,2-Dichloropropane	13.79	27.074	26.525	102	71	115	*	*
46)	Bromodichloromethane	13.97	28.273	26.700	106	75	118	*	*
47)	Trichloroethene	14.03	26.468	26.550	100	68	114	*	*
48)	1,4-Dioxane	13.99	27.834	26.600	105	81	131	*	*
49)	2,2,4-Trimethylpentane (Isooctane)	14.09	26.482	26.525	100	68	112	*	*

Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: 03281718.D

TO15.M

Data File Path: I:\MS13\DATA\2017_03\28\

Sample Name: 25ng TO15 ICV STD

Operator: AM

Misc Info: S29-061416/S31-03271708 (4/

Date Acquired: 3/28/2017

20:02

Instrument Name: MS13

#	Compound Name	Ret. Time	Amt. (ng)	Spike Amt.(ng)	% Rec.	Lower Limit	Upper Limit	* OR Fail	ICV/AZ 70-130%
50)	Methyl Methacrylate	14.23	53.004	53.000	100	72	130	*	*
51)	n-Heptane	14.36	24.522	26.600	92	68	116	*	*
52)	cis-1,3-Dichloropropene	14.87	27.551	26.275	105	77	126	*	*
53)	4-Methyl-2-pentanone	14.91	27.651	26.575	104	69	126	*	*
54)	trans-1,3-Dichloropropene	15.39	28.651	26.675	107	79	125	*	*
55)	1,1,2-Trichloroethane	15.56	27.613	26.525	104	75	119	*	*
58)	Toluene	15.85	24.971	26.450	94	59	118	*	*
59)	2-Hexanone	16.09	26.576	26.575	100	69	129	*	*
60)	Dibromochloromethane	16.26	26.483	26.600	100	74	136	*	*
61)	1,2-Dibromoethane	16.51	26.704	26.450	101	73	131	*	*
62)	n-Butyl Acetate	16.72	27.647	26.950	103	69	130	*	*
63)	n-Octane	16.85	25.516	26.500	96	66	120	*	*
64)	Tetrachloroethene	16.99	25.062	26.575	94	65	130	*	*
65)	Chlorobenzene	17.66	25.443	26.500	96	68	120	*	*
66)	Ethylbenzene	18.03	25.702	26.450	97	68	122	*	*
67)	m- & p-Xylenes	18.20	51.159	53.025	96	68	123	*	*
68)	Bromoform	18.25	26.848	26.550	101	69	130	*	*
69)	Styrene	18.53	25.776	26.475	97	71	133	*	*
70)	o-Xylene	18.64	25.348	26.450	96	68	122	*	*
71)	n-Nonane	18.85	24.286	26.475	92	65	120	*	*
72)	1,1,2,2-Tetrachloroethane	18.61	24.968	26.500	94	69	130	*	*
74)	Cumene	19.19	25.787	26.525	97	70	123	*	*
75)	alpha-Pinene	19.57	25.569	26.575	96	70	128	*	*
76)	n-Propylbenzene	19.68	26.372	26.725	99	69	125	*	*
77)	3-Ethyltoluene	19.77	24.204	26.550	91	67	128	*	*
78)	4-Ethyltoluene	19.81	27.659	26.525	104	67	130	*	*
79)	1,3,5-Trimethylbenzene	19.89	25.150	26.525	95	67	124	*	*
80)	alpha-Methylstyrene	20.03	26.425	26.550	100	67	141	*	*
81)	2-Ethyltoluene	20.07	25.512	26.550	96	67	124	*	*
82)	1,2,4-Trimethylbenzene	20.28	23.941	26.525	90	67	129	*	*
83)	n-Decane	20.38	22.265	26.525	84	66	124	*	*
84)	Benzyl Chloride	20.41	27.732	26.550	104	79	138	*	*
85)	1,3-Dichlorobenzene	20.43	25.193	26.475	95	65	136	*	*
86)	1,4-Dichlorobenzene	20.49	25.603	26.650	96	66	141	*	*
87)	sec-Butylbenzene	20.54	25.138	26.550	95	68	125	*	*
88)	4-Isopropyltoluene (p-Cymene)	20.69	24.887	26.550	94	68	131	*	*
89)	1,2,3-Trimethylbenzene	20.69	25.524	26.500	96	68	132	*	*
90)	1,2-Dichlorobenzene	20.82	25.546	26.550	96	67	136	*	*
91)	d-Limonene	20.83	23.942	26.550	90	71	134	*	*
92)	1,2-Dibromo-3-Chloropropane	21.25	26.757	26.475	101	73	136	*	*
93)	n-Undecane	21.60	23.169	26.600	87	68	132	*	*
94)	1,2,4-Trichlorobenzene	22.50	26.177	26.500	99	64	134	*	*
95)	Naphthalene	22.61	27.474	26.700	103	62	136	*	*
96)	n-Dodecane	22.62	23.255	26.550	88	61	137	*	*
97)	Hexachlorobutadiene	22.96	25.100	26.575	94	60	133	*	*
98)	Cyclohexanone	18.33	26.482	26.575	100	64	131	*	*
99)	tert-Butylbenzene	20.28	24.193	26.500	91	67	128	*	*
100)	n-Butylbenzene	21.10	24.954	26.500	94	68	128	*	*

Bold = 75 Compound List
*** = Pass**

Data File: I:\MS13\DATA\2017 04\22\04221701.D

Acq On : 22 Apr 2017 4:17

Operator: AM/LH

Sample : CCV R13042217 25ng

Misc : S29-04101701/S31-04111704 (5/10)

ALS Vial : 3 Sample Multiplier: 1

Quant Time: Apr 22 07:55:46 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Sat Apr 15 08:29:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 4/22/17

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min

Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1 IR	Bromochloromethane (IS1)	1.000	1.000	0.0	69	0.02
2 T	Propene	1.137	0.888	21.9	61	-0.02
3 T	Dichlorodifluoromethane (CF	2.521	2.368	6.1	68	-0.01
4 T	Chloromethane	1.491	1.271	14.8	61	-0.02
5 T	1,2-Dichloro-1,1,2,2-tetra	1.319	1.224	7.2	68	-0.02
6 T	Vinyl Chloride	1.503	1.275	15.2	61	-0.02
7 T	1,3-Butadiene	1.031	1.002	2.8	64	-0.02
8 T	Bromomethane	0.988	0.900	8.9	63	-0.02
9 T	Chloroethane	0.743	0.644	13.3	60	-0.03
10 T	Ethanol	0.761	0.672	11.7	64	-0.10
11 T	Acetonitrile	1.961	1.648	16.0	60	-0.07
12 T	Acrolein	0.708	0.586	17.2	61	-0.05
13 T	Acetone	0.838	0.666	20.5	62	-0.02
14 T	Trichlorofluoromethane	2.529	2.360	6.7	70	-0.02
15 T	2-Propanol (Isopropanol)	3.112	2.738	12.0	62	-0.08
16 T	Acrylonitrile	1.383	1.222	11.6	61	-0.06
17 T	1,1-Dichloroethene	1.094	0.972	11.2	63	-0.02
18 T	2-Methyl-2-Propanol (tert-B	3.464	3.164	8.7	65	-0.07
19 T	Methylene Chloride	1.232	0.949	23.0	63	-0.03
20 T	3-Chloro-1-propene (Allyl C	1.636	1.463	10.6	60	-0.02
21 T	Trichlorotrifluoroethane	1.264	1.137	10.0	65	-0.02
22 T	Carbon Disulfide	4.088	3.444	15.8	62	-0.02
23 T	trans-1,2-Dichloroethene	1.660	1.518	8.6	64	-0.02
24 T	1,1-Dichloroethane	2.068	1.814	12.3	63	-0.02
25 T	Methyl tert-Butyl Ether	3.960	3.555	10.2	65	-0.02
26 T	Vinyl Acetate	0.261	0.240	8.0	63	-0.04
27 T	2-Butanone (MEK)	0.720	0.642	10.8	62	-0.04
28 T	cis-1,2-Dichloroethene	1.601	1.454	9.2	63	-0.03
29 T	Diisopropyl Ether	1.071	0.829	22.6	63	-0.02
30 T	Ethyl Acetate	0.381	0.321	15.7	61	-0.03
31 T	n-Hexane	1.678	1.345	19.8	60	-0.02
32 T	Chloroform	2.259	2.064	8.6	67	-0.03
33 S	1,2-Dichloroethane-d4 (SS1)	1.852	1.975	-6.6	73	-0.02
34 T	Tetrahydrofuran (THF)	0.770	0.615	20.1	61	-0.02
35 T	Ethyl tert-Butyl Ether	1.505	1.343	10.8	64	-0.02
36 T	1,2-Dichloroethane	1.978	1.887	4.6	68	-0.02
37 IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	68	-0.02
38 T	1,1,1-Trichloroethane	0.471	0.452	4.0	69	-0.02
39 T	Isopropyl Acetate	0.136	0.121	11.0	62	-0.02
40 T	1-Butanol	0.243	0.218	10.3	63	-0.05
41 T	Benzene	0.957	0.786	17.9	63	-0.02
42 T	Carbon Tetrachloride	0.424	0.433	-2.1	69	-0.02
43 T	Cyclohexane	0.357	0.311	12.9	62	-0.01
44 T	tert-Amyl Methyl Ether	0.767	0.680	11.3	64	-0.02
45 T	1,2-Dichloropropane	0.209	0.185	11.5	61	-0.01
46 T	Bromodichloromethane	0.354	0.356	-0.6	67	-0.02
47 T	Trichloroethene	0.282	0.258	8.5	64	-0.02
48 T	1,4-Dioxane	0.193	0.180	6.7	63	-0.02
49 T	2,2,4-Trimethylpentane (Iso	0.933	0.796	14.7	61	-0.02
50 T	Methyl Methacrylate	0.102	0.093	8.8	63	-0.02
51 T	n-Heptane	0.226	0.184	18.6	61	-0.01
52 T	cis-1,3-Dichloropropene	0.394	0.376	4.6	64	-0.01
53 T	4-Methyl-2-pentanone	0.210	0.187	11.0	61	-0.02
54 T	trans-1,3-Dichloropropene	0.389	0.386	0.8	65	-0.01

Data File: I:\MS13\DATA\2017 04\22\04221701.D

Acq On : 22 Apr 2017 4:17

Operator: AM/LH

Sample : CCV R13042217 25ng

Misc : S29-04101701/S31-04111704 (5/10)

ALS Vial : 3 Sample Multiplier: 1

Quant Time: Apr 22 07:55:46 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Sat Apr 15 08:29:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min

Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
55 T	1,1,2-Trichloroethane	0.220	0.211	4.1	64	-0.02
56 IR	Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	70	0.00
57 S	Toluene-d8 (SS2)	2.397	2.354	1.8	69	-0.01
58 T	Toluene	2.422	2.044	15.6	64	-0.01
59 T	2-Hexanone	1.380	1.201	13.0	62	-0.01
60 T	Dibromochloromethane	0.785	0.763	2.8	67	0.00
61 T	1,2-Dibromoethane	0.668	0.617	7.6	65	-0.01
62 T	n-Butyl Acetate	1.485	1.272	14.3	61	-0.01
63 T	n-Octane	0.478	0.384	19.7	61	-0.01
64 T	Tetrachloroethene	0.807	0.719	10.9	66	-0.01
65 T	Chlorobenzene	1.699	1.469	13.5	64	0.00
66 T	Ethylbenzene	2.841	2.511	11.6	65	0.00
67 T	m- & p-Xylenes	2.257	2.022	10.4	66	-0.01
68 T	Bromoform	0.726	0.723	0.4	67	-0.01
69 T	Styrene	1.756	1.578	10.1	64	-0.01
70 T	o-Xylene	2.270	2.051	9.6	66	-0.01
71 T	n-Nonane	1.153	0.928	19.5	61	-0.01
72 T	1,1,2,2-Tetrachloroethane	0.989	0.850	14.1	64	-0.01
73 S	Bromofluorobenzene (SS3)	0.999	1.051	-5.2	74	0.00
74 T	Cumene	2.918	2.671	8.5	66	0.00
75 T	alpha-Pinene	1.517	1.326	12.6	64	-0.01
76 T	n-Propylbenzene	3.326	3.035	8.7	66	0.00
77 T	3-Ethyltoluene	3.016	2.753	8.7	65	-0.01
78 T	4-Ethyltoluene	2.723	2.467	9.4	68	-0.01
79 T	1,3,5-Trimethylbenzene	2.507	2.262	9.8	67	-0.01
80 T	alpha-Methylstyrene	1.331	1.196	10.1	64	-0.01
81 T	2-Ethyltoluene	2.867	2.581	10.0	66	-0.01
82 T	1,2,4-Trimethylbenzene	2.566	2.330	9.2	67	-0.01
83 T	n-Decane	1.261	0.962	23.7	62	-0.01
84 T	Benzyl Chloride	2.129	2.143	-0.7	66	-0.02
85 T	1,3-Dichlorobenzene	1.493	1.402	6.1	67	-0.01
86 T	1,4-Dichlorobenzene	1.533	1.423	7.2	66	-0.01
87 T	sec-Butylbenzene	3.230	2.900	10.2	66	-0.01
88 T	4-Isopropyltoluene (p-Cymen	3.267	3.013	7.8	67	-0.01
89 T	1,2,3-Trimethylbenzene	2.559	2.360	7.8	67	-0.02
90 T	1,2-Dichlorobenzene	1.451	1.345	7.3	67	-0.01
91 T	d-Limonene	0.977	0.798	18.3	63	-0.01
92 T	1,2-Dibromo-3-Chloropropane	0.557	0.538	3.4	67	-0.01
93 T	n-Undecane	1.246	1.002	19.6	63	-0.01
94 T	1,2,4-Trichlorobenzene	1.180	1.175	0.4	68	-0.01
95 T	Naphthalene	3.130	3.151	-0.7	67	-0.01
96 T	n-Dodecane	1.222	0.999	18.2	64	0.00
97 T	Hexachlorobutadiene	0.825	0.820	0.6	69	0.00
98 T	Cyclohexanone	0.832	0.728	12.5	61	-0.02
99 T	tert-Butylbenzene	2.524	2.316	8.2	67	-0.01
100 T	n-Butylbenzene	2.592	2.331	10.1	66	-0.01

(#)= Out of Range

SPCC's out = 0 CCC's out = 0

Data File: I:\MS13\DATA\2017 04\22\04221701.D

Acq On : 22 Apr 2017 4:17

Operator: AM/LH

Sample : CCV R13042217 25ng

Misc : S29-04101701/S31-04111704 (5/10)

ALS Vial : 3 Sample Multiplier: 1

Quant Time: Apr 22 07:55:46 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Sat Apr 15 08:29:41 2017

LH 4/22/17

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.25	130	76429	12.500	ng	0.02
37) 1,4-Difluorobenzene (IS2)	13.33	114	354084	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.61	82	150169	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.08	65	150940	13.332	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	106.64%
57) Toluene-d8 (SS2)	15.75	98	353432	12.274	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.16%
73) Bromofluorobenzene (SS3)	19.06	174	157854	13.158	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	105.28%

Target Compounds

						Qvalue
2) Propene	4.44	42	140571	20.225	ng	97
3) Dichlorodifluoromethan...	4.59	85	378950	24.585	ng	100
4) Chloromethane	4.86	50	195200	21.408	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	5.11	135	188074	23.327	ng	98
6) Vinyl Chloride	5.26	62	199363	21.689	ng	100
7) 1,3-Butadiene	5.52	54	161936	25.686	ng	98
8) Bromomethane	5.94	94	136618	22.620	ng	99
9) Chloroethane	6.26	64	99273	21.846	ng	100
10) Ethanol	6.61	45	535187	115.058	ng	100
11) Acetonitrile	6.86	41	263427	21.972	ng	99
12) Acrolein	7.03	56	93194	21.525	ng	100
13) Acetone	7.23	58	541225	105.648	ng	# 65
14) Trichlorofluoromethane	7.48	101	378437	24.471	ng	99
15) 2-Propanol (Isopropanol)	7.71	45	881078	46.305	ng	97
16) Acrylonitrile	7.96	53	197081	23.300	ng	100
17) 1,1-Dichloroethene	8.40	96	157299	23.512	ng	95
18) 2-Methyl-2-Propanol (t...	8.55	59	1022393	48.274	ng	99
19) Methylene Chloride	8.61	84	153322	20.353	ng	99
20) 3-Chloro-1-propene (Al...	8.77	41	235321	23.523	ng	99
21) Trichlorotrifluoroethane	9.02	151	182320	23.593	ng	100
22) Carbon Disulfide	8.88	76	558507	22.347	ng	100
23) trans-1,2-Dichloroethene	9.84	61	247653	24.398	ng	99
24) 1,1-Dichloroethane	10.09	63	282775	22.364	ng	100
25) Methyl tert-Butyl Ether	10.17	73	579258	23.923	ng	99
26) Vinyl Acetate	10.33	86	193065	121.051	ng	99
27) 2-Butanone (MEK)	10.56	72	102981	23.394	ng	100
28) cis-1,2-Dichloroethene	11.07	61	236506	24.161	ng	99
29) Diisopropyl Ether	11.36	87	134530	20.546	ng	95
30) Ethyl Acetate	11.36	61	104551	44.901	ng	98
31) n-Hexane	11.35	57	218519	21.298	ng	98
32) Chloroform	11.41	83	333864	24.171	ng	100
34) Tetrahydrofuran (THF)	11.80	72	99877	21.224	ng	98
35) Ethyl tert-Butyl Ether	11.94	87	217040	23.591	ng	98
36) 1,2-Dichloroethane	12.19	62	303420	25.089	ng	99
38) 1,1,1-Trichloroethane	12.47	97	344128	25.774	ng	100
39) Isopropyl Acetate	12.88	61	179605	46.638	ng	96
40) 1-Butanol	12.90	56	324564	47.096	ng	98
41) Benzene	12.94	78	585270	21.590	ng	99
42) Carbon Tetrachloride	13.10	117	323240	26.932	ng	100
43) Cyclohexane	13.23	84	469143	46.383	ng	98
44) tert-Amyl Methyl Ether	13.56	73	507427	23.345	ng	99
45) 1,2-Dichloropropane	13.78	63	139445	23.584	ng	98
46) Bromodichloromethane	13.96	83	268847	26.821	ng	99
47) Trichloroethene	14.02	130	193813	24.262	ng	99
48) 1,4-Dioxane	13.99	88	135285	24.786	ng	100
49) 2,2,4-Trimethylpentane...	14.09	57	596690	22.580	ng	97

Data File: I:\MS13\DATA\2017 04\22\04221701.D

Acq On : 22 Apr 2017 4:17

Operator: AM/LH

Sample : CCV R13042217 25ng

Misc : S29-04101701/S31-04111704 (5/10)

ALS Vial : 3 Sample Multiplier: 1

Quant Time: Apr 22 07:55:46 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Sat Apr 15 08:29:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.21	100	139160	48.228	ng	99
51) n-Heptane	14.35	71	138607	21.694	ng	99
52) cis-1,3-Dichloropropene	14.87	75	297496	26.683	ng	100
53) 4-Methyl-2-pentanone	14.90	58	140066	23.593	ng	98
54) trans-1,3-Dichloropropene	15.39	75	290981	26.398	ng	100
55) 1,1,2-Trichloroethane	15.56	97	158700	25.413	ng	97
58) Toluene	15.85	91	646342	22.218	ng	99
59) 2-Hexanone	16.09	43	382582	23.080	ng	99
60) Dibromochloromethane	16.26	129	243212	25.793	ng	99
61) 1,2-Dibromoethane	16.51	107	195656	24.395	ng	100
62) n-Butyl Acetate	16.71	43	406487	22.781	ng	99
63) n-Octane	16.85	57	121994	21.234	ng	99
64) Tetrachloroethene	16.99	166	229240	23.660	ng	100
65) Chlorobenzene	17.66	112	468026	22.934	ng	100
66) Ethylbenzene	18.02	91	795497	23.307	ng	99
67) m- & p-Xylenes	18.20	91	1289346	47.555	ng	98
68) Bromoform	18.25	173	230806	26.446	ng	100
69) Styrene	18.53	104	502786	23.834	ng	98
70) o-Xylene	18.64	91	649102	23.798	ng	98
71) n-Nonane	18.84	43	293842	21.209	ng	98
72) 1,1,2,2-Tetrachloroethane	18.61	83	269505	22.680	ng	99
74) Cumene	19.19	105	842391	24.027	ng	100
75) alpha-Pinene	19.56	93	415854	22.822	ng	99
76) n-Propylbenzene	19.67	91	968829	24.247	ng	99
77) 3-Ethyltoluene	19.77	105	868321	23.965	ng	99
78) 4-Ethyltoluene	19.81	105	777119	23.752	ng	99
79) 1,3,5-Trimethylbenzene	19.88	105	712497	23.655	ng	99
80) alpha-Methylstyrene	20.03	118	377300	23.599	ng	100
81) 2-Ethyltoluene	20.06	105	823233	23.902	ng	100
82) 1,2,4-Trimethylbenzene	20.27	105	736216	23.885	ng	99
83) n-Decane	20.37	57	304327	20.096	ng	98
84) Benzyl Chloride	20.40	91	682917	26.698	ng	100
85) 1,3-Dichlorobenzene	20.42	146	445540	24.837	ng	100
86) 1,4-Dichlorobenzene	20.49	146	452139	24.547	ng	99
87) sec-Butylbenzene	20.54	105	918064	23.658	ng	99
88) 4-Isopropyltoluene (p-...	20.69	119	929411	23.682	ng	99
89) 1,2,3-Trimethylbenzene	20.68	105	727879	23.674	ng	99
90) 1,2-Dichlorobenzene	20.82	146	427317	24.519	ng	99
91) d-Limonene	20.83	68	240757	20.517	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.24	157	170290	25.458	ng	98
93) n-Undecane	21.59	57	317062	21.179	ng	99
94) 1,2,4-Trichlorobenzene	22.49	180	368106	25.961	ng	100
95) Naphthalene	22.61	128	1025026	27.260	ng	99
96) n-Dodecane	22.61	57	313615	21.364	ng	99
97) Hexachlorobutadiene	22.95	225	260796	26.299	ng	100
98) Cyclohexanone	18.32	55	230975	23.110	ng	98
99) tert-Butylbenzene	20.27	119	731121	24.107	ng	99
100) n-Butylbenzene	21.09	91	739351	23.747	ng	99

(#)=qualifier out of range (m)=manual integration (+)=signals summed

Data File: I:\MS13\DATA\2017 04\22\04221701.D

Acq On : 22 Apr 2017 4:17

Operator: AM/LH

Sample : CCV R13042217 25ng

Misc : S29-04101701/S31-04111704 (5/10)

ALS Vial : 3 Sample Multiplier: 1

Quant Time: Apr 22 07:55:46 2017

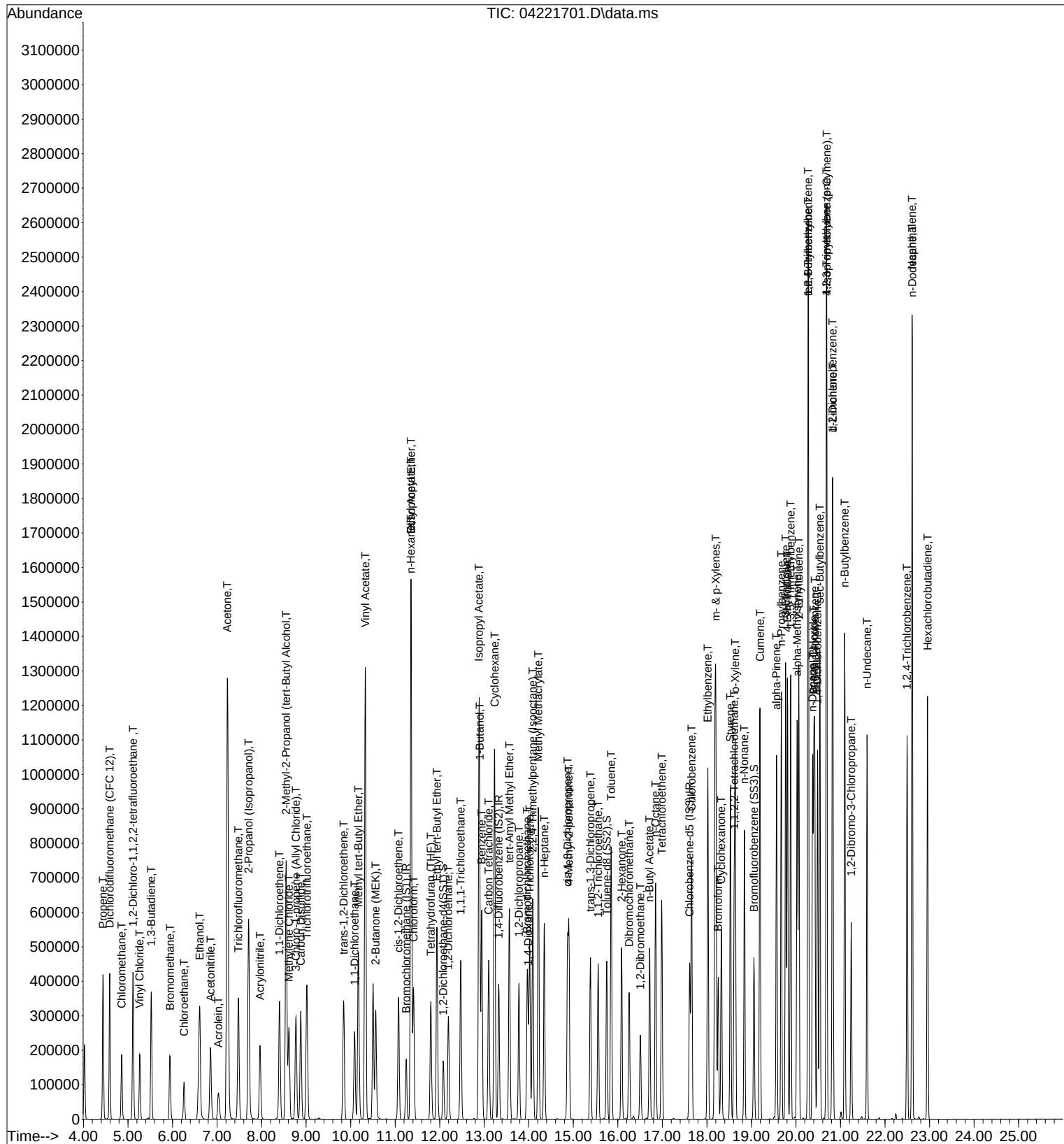
Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Sat Apr 15 08:29:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2017 04\24\04241702.D
 Acq On : 24 Apr 2017 9:20
 Sample : CCV R13042417 25ng
 Misc : S31-04101701/S31-04111704 (5/10)

Vial: 3
 Operator: AM/LH
 Inst : MS13

Quant Time: Apr 24 09:44:24 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

LH 4/24/17

QLast Update : Sat Apr 15 08:29:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

AM 4/24/17

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
 Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1 IR	Bromochloromethane (IS1)	1.000	1.000	0.0	76	0.02
2 T	Propene	1.137	0.888	21.9	67	-0.02
3 T	Dichlorodifluoromethane (CF	2.521	2.356	6.5	74	-0.02
4 T	Chloromethane	1.491	1.251	16.1	66	-0.03
5 T	1,2-Dichloro-1,1,2,2-tetra	1.319	1.223	7.3	74	-0.03
6 T	Vinyl Chloride	1.503	1.314	12.6	68	-0.02
7 T	1,3-Butadiene	1.031	0.997	3.3	70	-0.03
8 T	Bromomethane	0.988	0.898	9.1	68	-0.03
9 T	Chloroethane	0.743	0.653	12.1	67	-0.03
10 T	Ethanol	0.761	0.679	10.8	71	-0.09
11 T	Acetonitrile	1.961	1.650	15.9	66	-0.07
12 T	Acrolein	0.708	0.591	16.5	68	-0.05
13 T	Acetone	0.838	0.664	20.8	68	-0.01
14 T	Trichlorofluoromethane	2.529	2.371	6.2	76	-0.02
15 T	2-Propanol (Isopropanol)	3.112	2.759	11.3	68	-0.07
16 T	Acrylonitrile	1.383	1.221	11.7	67	-0.06
17 T	1,1-Dichloroethene	1.094	0.971	11.2	69	-0.02
18 T	2-Methyl-2-Propanol (tert-B	3.464	3.130	9.6	71	-0.07
19 T	Methylene Chloride	1.232	0.951	22.8	69	-0.03
20 T	3-Chloro-1-propene (Allyl C	1.636	1.466	10.4	66	-0.02
21 T	Trichlorotrifluoroethane	1.264	1.133	10.4	71	-0.02
22 T	Carbon Disulfide	4.088	3.411	16.6	67	-0.02
23 T	trans-1,2-Dichloroethene	1.660	1.508	9.2	69	-0.02
24 T	1,1-Dichloroethane	2.068	1.817	12.1	69	-0.02
25 T	Methyl tert-Butyl Ether	3.960	3.567	9.9	71	-0.02
26 T	Vinyl Acetate	0.261	0.239	8.4	69	-0.04
27 T	2-Butanone (MEK)	0.720	0.655	9.0	69	-0.03
28 T	cis-1,2-Dichloroethene	1.601	1.456	9.1	69	-0.03
29 T	Diisopropyl Ether	1.071	0.818	23.6	68	-0.02
30 T	Ethyl Acetate	0.381	0.319	16.3	66	-0.03
31 T	n-Hexane	1.678	1.365	18.7	67	-0.02
32 T	Chloroform	2.259	2.048	9.3	72	-0.03
33 S	1,2-Dichloroethane-d4 (SS1)	1.852	1.988	-7.3	81	-0.02
34 T	Tetrahydrofuran (THF)	0.770	0.614	20.3	67	-0.02
35 T	Ethyl tert-Butyl Ether	1.505	1.335	11.3	70	-0.02
36 T	1,2-Dichloroethane	1.978	1.891	4.4	75	-0.02
37 IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	76	-0.02
38 T	1,1,1-Trichloroethane	0.471	0.445	5.5	75	-0.02
39 T	Isopropyl Acetate	0.136	0.120	11.8	68	-0.02
40 T	1-Butanol	0.243	0.214	11.9	69	-0.05
41 T	Benzene	0.957	0.777	18.8	69	-0.02
42 T	Carbon Tetrachloride	0.424	0.424	0.0	75	-0.01
43 T	Cyclohexane	0.357	0.306	14.3	68	-0.01
44 T	tert-Amyl Methyl Ether	0.767	0.664	13.4	69	-0.02
45 T	1,2-Dichloropropane	0.209	0.183	12.4	67	-0.01
46 T	Bromodichloromethane	0.354	0.353	0.3	73	-0.02
47 T	Trichloroethene	0.282	0.256	9.2	70	-0.02
48 T	1,4-Dioxane	0.193	0.176	8.8	67	-0.02
49 T	2,2,4-Trimethylpentane (Iso	0.933	0.784	16.0	67	-0.02
50 T	Methyl Methacrylate	0.102	0.091	10.8	68	-0.02
51 T	n-Heptane	0.226	0.183	19.0	67	-0.01
52 T	cis-1,3-Dichloropropene	0.394	0.369	6.3	69	-0.01
53 T	4-Methyl-2-pentanone	0.210	0.186	11.4	67	-0.02
54 T	trans-1,3-Dichloropropene	0.389	0.382	1.8	71	-0.01
55 T	1,1,2-Trichloroethane	0.220	0.206	6.4	69	-0.02

Data File : I:\MS13\DATA\2017 04\24\04241702.D
 Acq On : 24 Apr 2017 9:20
 Sample : CCV R13042417 25ng
 Misc : S31-04101701/S31-04111704 (5/10)

Vial: 3
 Operator: AM/LH
 Inst : MS13

Quant Time: Apr 24 09:44:24 2017
 Quant Method : I:\MS13\METHODS\R13032817.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Apr 15 08:29:41 2017
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
 Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
56	IR Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	76	0.00
57	S Toluene-d8 (SS2)	2.397	2.364	1.4	75	-0.01
58	T Toluene	2.422	2.040	15.8	69	-0.01
59	T 2-Hexanone	1.380	1.198	13.2	68	-0.01
60	T Dibromochloromethane	0.785	0.759	3.3	73	0.00
61	T 1,2-Dibromoethane	0.668	0.609	8.8	70	-0.01
62	T n-Butyl Acetate	1.485	1.281	13.7	67	-0.01
63	T n-Octane	0.478	0.383	19.9	67	-0.01
64	T Tetrachloroethene	0.807	0.708	12.3	70	-0.01
65	T Chlorobenzene	1.699	1.453	14.5	69	0.00
66	T Ethylbenzene	2.841	2.501	12.0	70	0.00
67	T m- & p-Xylenes	2.257	2.002	11.3	71	-0.02
68	T Bromoform	0.726	0.714	1.7	72	-0.01
69	T Styrene	1.756	1.561	11.1	69	-0.01
70	T o-Xylene	2.270	2.022	10.9	71	-0.01
71	T n-Nonane	1.153	0.934	19.0	67	-0.01
72	T 1,1,2,2-Tetrachloroethane	0.989	0.838	15.3	69	-0.01
73	S Bromofluorobenzene (SS3)	0.999	1.039	-4.0	80	0.00
74	T Cumene	2.918	2.656	9.0	71	0.00
75	T alpha-Pinene	1.517	1.319	13.1	70	-0.01
76	T n-Propylbenzene	3.326	2.996	9.9	71	0.00
77	T 3-Ethyltoluene	3.016	2.713	10.0	70	-0.01
78	T 4-Ethyltoluene	2.723	2.435	10.6	74	-0.01
79	T 1,3,5-Trimethylbenzene	2.507	2.254	10.1	73	-0.01
80	T alpha-Methylstyrene	1.331	1.173	11.9	68	-0.01
81	T 2-Ethyltoluene	2.867	2.543	11.3	71	-0.01
82	T 1,2,4-Trimethylbenzene	2.566	2.321	9.5	73	-0.01
83	T n-Decane	1.261	0.947	24.9	67	-0.01
84	T Benzyl Chloride	2.129	2.125	0.2	72	-0.02
85	T 1,3-Dichlorobenzene	1.493	1.394	6.6	72	-0.01
86	T 1,4-Dichlorobenzene	1.533	1.398	8.8	71	-0.01
87	T sec-Butylbenzene	3.230	2.879	10.9	71	-0.01
88	T 4-Isopropyltoluene (p-Cymen	3.267	2.978	8.8	73	-0.01
89	T 1,2,3-Trimethylbenzene	2.559	2.340	8.6	73	-0.01
90	T 1,2-Dichlorobenzene	1.451	1.329	8.4	72	-0.01
91	T d-Limonene	0.977	0.791	19.0	68	-0.01
92	T 1,2-Dibromo-3-Chloropropane	0.557	0.530	4.8	72	-0.01
93	T n-Undecane	1.246	0.992	20.4	68	-0.01
94	T 1,2,4-Trichlorobenzene	1.180	1.161	1.6	73	-0.01
95	T Naphthalene	3.130	3.104	0.8	72	-0.01
96	T n-Dodecane	1.222	0.979	19.9	68	0.00
97	T Hexachlorobutadiene	0.825	0.802	2.8	74	0.00
98	T Cyclohexanone	0.832	0.725	12.9	67	-0.02
99	T tert-Butylbenzene	2.524	2.291	9.2	73	-0.01
100	T n-Butylbenzene	2.592	2.313	10.8	71	-0.01

(#) = Out of Range

SPCC's out = 0 CCC's out = 0

Data File : I:\MS13\DATA\2017 04\24\04241702.D
 Acq On : 24 Apr 2017 9:20
 Sample : CCV R13042417 25ng
 Misc : S31-04101701/S31-04111704 (5/10)

Vial: 3
 Operator: AM/LH
 Inst : MS13

Quant Time: Apr 24 09:44:24 2017

Quant Method : I:\MS13\METHODS\R13032817.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Sat Apr 15 08:29:41 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 4/24/17

4/24/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.25	130	83544	12.500	ng	0.02
37) 1,4-Difluorobenzene (IS2)	13.33	114	391129	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.61	82	163996	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	166087	13.421	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	107.36%
57) Toluene-d8 (SS2)	15.75	98	387697	12.329	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.64%
73) Bromofluorobenzene (SS3)	19.06	174	170397	13.006	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	104.08%

Target Compounds

						Qvalue
2) Propene	4.43	42	153758	20.239	ng	97
3) Dichlorodifluoromethan...	4.58	85	412148	24.462	ng	100
4) Chloromethane	4.85	50	210074	21.077	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	5.11	135	205367	23.302	ng	98
6) Vinyl Chloride	5.26	62	224608	22.354	ng	99
7) 1,3-Butadiene	5.52	54	176093	25.553	ng	97
8) Bromomethane	5.94	94	149012	22.571	ng	98
9) Chloroethane	6.26	64	110141	22.174	ng	100
10) Ethanol	6.62	45	590372	116.113	ng	99
11) Acetonitrile	6.85	41	288445	22.010	ng	98
12) Acrolein	7.03	56	102834	21.729	ng	100
13) Acetone	7.24	58	589861	105.336	ng	# 62
14) Trichlorofluoromethane	7.48	101	415545	24.582	ng	99
15) 2-Propanol (Isopropanol)	7.71	45	970475	46.660	ng	97
16) Acrylonitrile	7.96	53	215317	23.288	ng	99
17) 1,1-Dichloroethene	8.40	96	171821	23.495	ng	96
18) 2-Methyl-2-Propanol (t...	8.55	59	1105493	47.752	ng	99
19) Methylene Chloride	8.61	84	167892	20.389	ng	98
20) 3-Chloro-1-propene (Al...	8.77	41	257701	23.566	ng	99
21) Trichlorotrifluoroethane	9.01	151	198562	23.507	ng	99
22) Carbon Disulfide	8.88	76	604782	22.138	ng	100
23) trans-1,2-Dichloroethene	9.84	61	268894	24.234	ng	99
24) 1,1-Dichloroethane	10.09	63	309659	22.404	ng	99
25) Methyl tert-Butyl Ether	10.17	73	635258	24.001	ng	99
26) Vinyl Acetate	10.33	86	210524	120.756	ng	99
27) 2-Butanone (MEK)	10.57	72	114863	23.871	ng	97
28) cis-1,2-Dichloroethene	11.07	61	258781	24.185	ng	100
29) Diisopropyl Ether	11.36	87	145183	20.285	ng	99
30) Ethyl Acetate	11.36	61	113324	44.524	ng	99
31) n-Hexane	11.35	57	242425	21.616	ng	99
32) Chloroform	11.41	83	361969	23.974	ng	100
34) Tetrahydrofuran (THF)	11.80	72	108969	21.184	ng	98
35) Ethyl tert-Butyl Ether	11.94	87	235759	23.443	ng	99
36) 1,2-Dichloroethane	12.19	62	332362	25.142	ng	99
38) 1,1,1-Trichloroethane	12.47	97	374039	25.361	ng	99
39) Isopropyl Acetate	12.88	61	197070	46.326	ng	96
40) 1-Butanol	12.90	56	352603	46.319	ng	98
41) Benzene	12.94	78	639743	21.364	ng	100
42) Carbon Tetrachloride	13.10	117	349987	26.398	ng	99
43) Cyclohexane	13.23	84	510395	45.683	ng	98
44) tert-Amyl Methyl Ether	13.56	73	547689	22.811	ng	99
45) 1,2-Dichloropropane	13.78	63	151841	23.248	ng	100
46) Bromodichloromethane	13.96	83	293973	26.550	ng	100
47) Trichloroethene	14.02	130	212172	24.044	ng	99
48) 1,4-Dioxane	13.99	88	145988	24.214	ng	100
49) 2,2,4-Trimethylpentane...	14.09	57	649559	22.253	ng	96
50) Methyl Methacrylate	14.22	100	150817	47.318	ng	98

Data File : I:\MS13\DATA\2017 04\24\04241702.D
 Acq On : 24 Apr 2017 9:20
 Sample : CCV R13042417 25ng
 Misc : S31-04101701/S31-04111704 (5/10)

Vial: 3
 Operator: AM/LH
 Inst : MS13

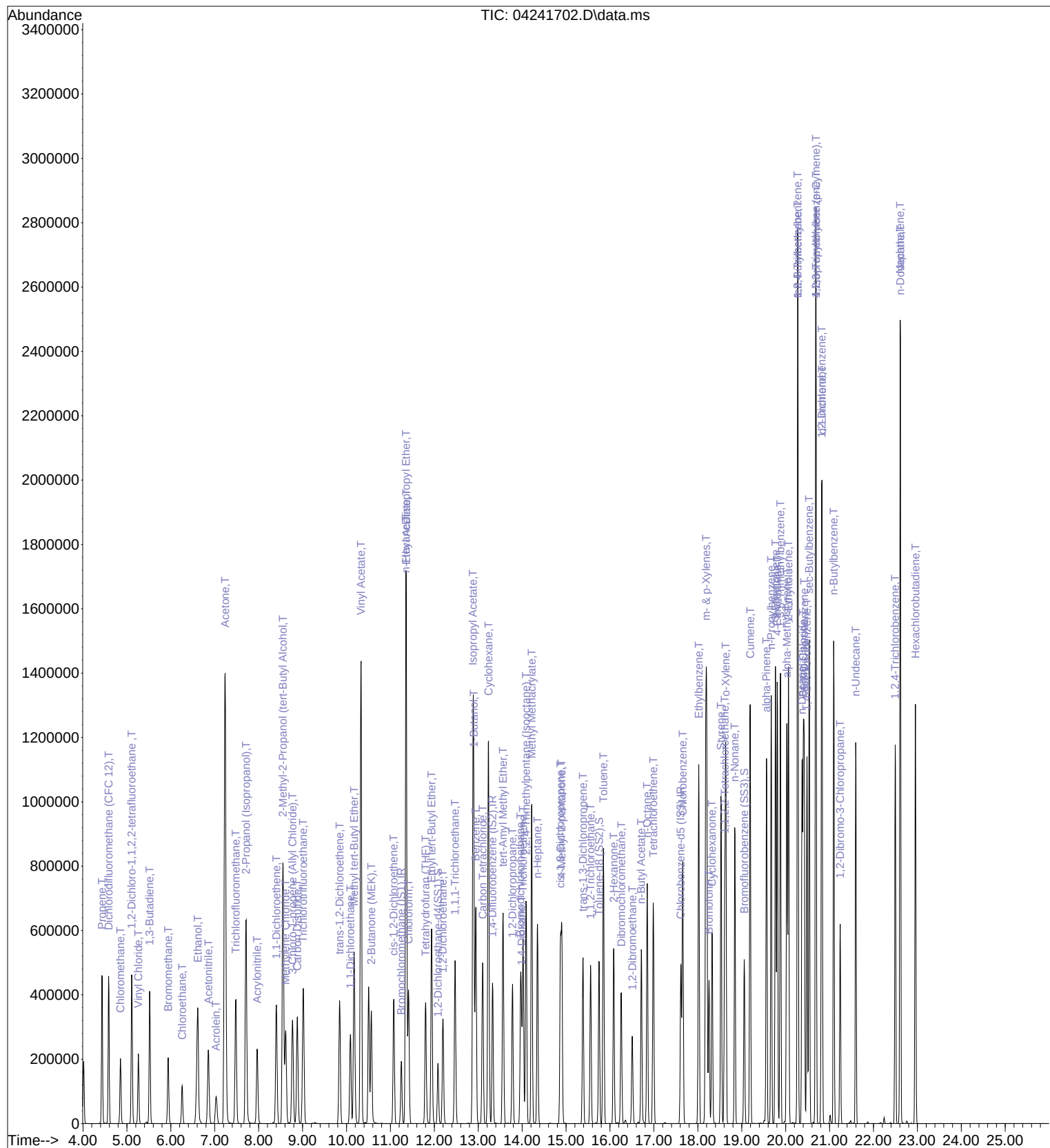
Quant Time: Apr 24 09:44:24 2017
 Quant Method : I:\MS13\METHODS\R13032817.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Apr 15 08:29:41 2017
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.35	71	152226	21.569	ng	99
52) cis-1,3-Dichloropropene	14.87	75	321784	26.128	ng	100
53) 4-Methyl-2-pentanone	14.90	58	153836	23.459	ng	98
54) trans-1,3-Dichloropropene	15.39	75	317959	26.113	ng	100
55) 1,1,2-Trichloroethane	15.56	97	170993	24.788	ng	98
58) Toluene	15.85	91	704440	22.173	ng	99
59) 2-Hexanone	16.09	43	416915	23.031	ng	98
60) Dibromochloromethane	16.26	129	264419	25.678	ng	100
61) 1,2-Dibromoethane	16.51	107	210883	24.077	ng	99
62) n-Butyl Acetate	16.71	43	446917	22.935	ng	99
63) n-Octane	16.85	57	132911	21.184	ng	99
64) Tetrachloroethene	16.99	166	246242	23.272	ng	100
65) Chlorobenzene	17.66	112	505659	22.689	ng	100
66) Ethylbenzene	18.02	91	865553	23.221	ng	99
67) m- & p-Xylenes	18.19	91	1394105	47.083	ng	98
68) Bromoform	18.25	173	249086	26.134	ng	100
69) Styrene	18.53	104	543186	23.579	ng	98
70) o-Xylene	18.64	91	699130	23.471	ng	98
71) n-Nonane	18.84	43	322984	21.347	ng	100
72) 1,1,2,2-Tetrachloroethane	18.61	83	290211	22.364	ng	99
74) Cumene	19.19	105	914789	23.892	ng	99
75) alpha-Pinene	19.56	93	451582	22.693	ng	98
76) n-Propylbenzene	19.67	91	1044584	23.939	ng	99
77) 3-Ethyltoluene	19.77	105	934393	23.614	ng	99
78) 4-Ethyltoluene	19.81	105	837637	23.443	ng	99
79) 1,3,5-Trimethylbenzene	19.88	105	775466	23.575	ng	98
80) alpha-Methylstyrene	20.03	118	403879	23.132	ng	99
81) 2-Ethyltoluene	20.06	105	885833	23.551	ng	99
82) 1,2,4-Trimethylbenzene	20.27	105	800973	23.795	ng	98
83) n-Decane	20.37	57	327001	19.773	ng	98
84) Benzyl Chloride	20.40	91	739337	26.467	ng	99
85) 1,3-Dichlorobenzene	20.42	146	483813	24.696	ng	100
86) 1,4-Dichlorobenzene	20.48	146	485013	24.112	ng	100
87) sec-Butylbenzene	20.54	105	995207	23.483	ng	99
88) 4-Isopropyltoluene (p-...	20.69	119	1003083	23.405	ng	98
89) 1,2,3-Trimethylbenzene	20.69	105	788316	23.478	ng	98
90) 1,2-Dichlorobenzene	20.82	146	461131	24.228	ng	100
91) d-Limonene	20.83	68	260744	20.347	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.24	157	183165	25.074	ng	96
93) n-Undecane	21.59	57	342850	20.970	ng	99
94) 1,2,4-Trichlorobenzene	22.49	180	397027	25.640	ng	100
95) Naphthalene	22.61	128	1102627	26.851	ng	99
96) n-Dodecane	22.61	57	335422	20.923	ng	99
97) Hexachlorobutadiene	22.95	225	278514	25.718	ng	99
98) Cyclohexanone	18.32	55	251161	23.011	ng	98
99) tert-Butylbenzene	20.27	119	789661	23.842	ng	99
100) n-Butylbenzene	21.09	91	801175	23.563	ng	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Vial: 3
Operator: AM/LH
Inst : MS13

Quant Time: Apr 24 09:44:24 2017



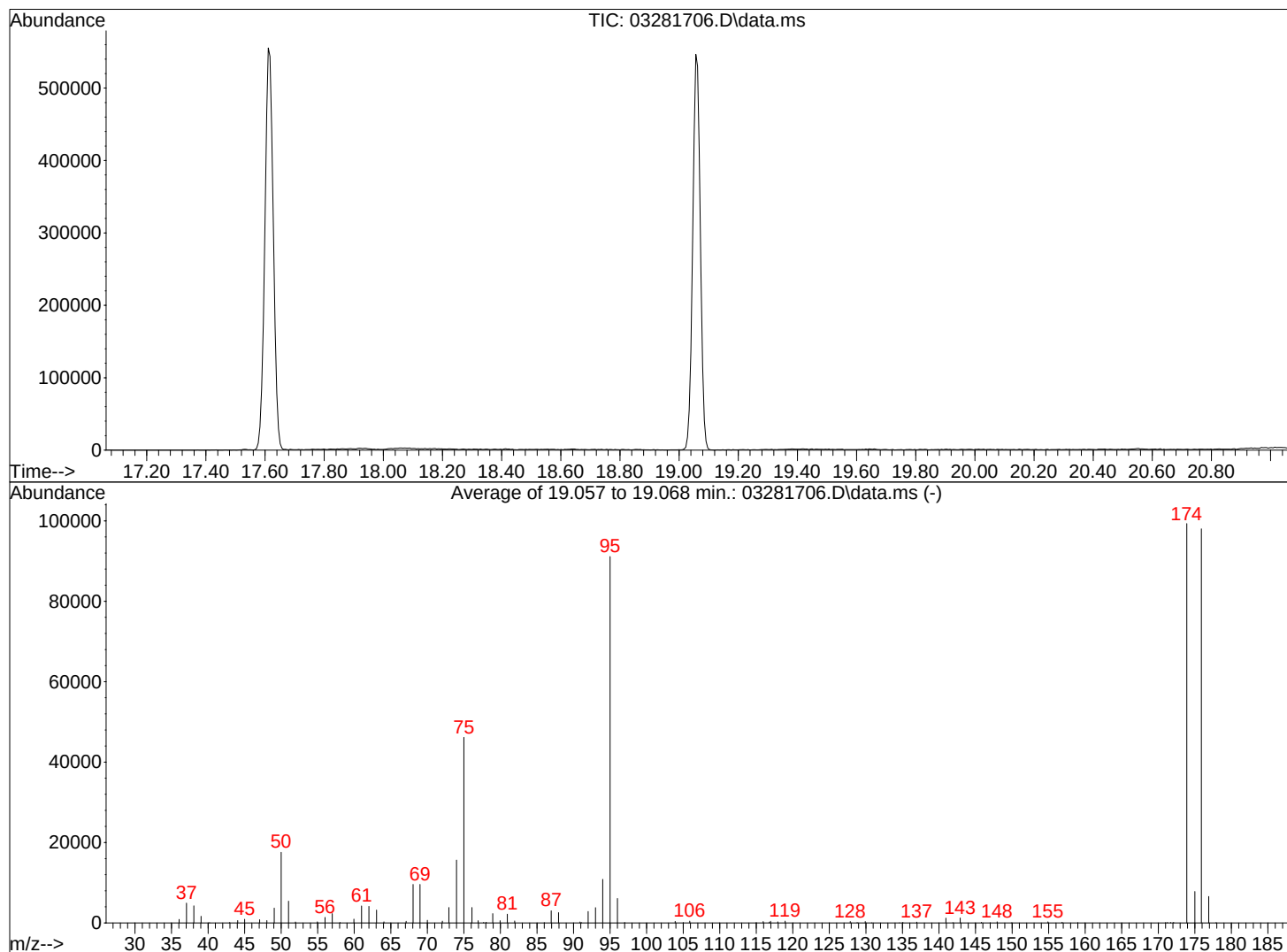
Data Path : I:\MS13\DATA\2017 03\28\
Data File : 03281706.D
Acq On : 28 Mar 2017 13:04
Operator : AM
Sample : 12.5ng TO15 BFB STD
Misc : S29-03211702
ALS Vial : 3 Sample Multiplier: 1

LH 4/11/17

Integration File: LSCINT.P

AM 3/29/17

Method : I:\MS13\METHODS\R13032817.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Wed Mar 29 08:24:17 2017



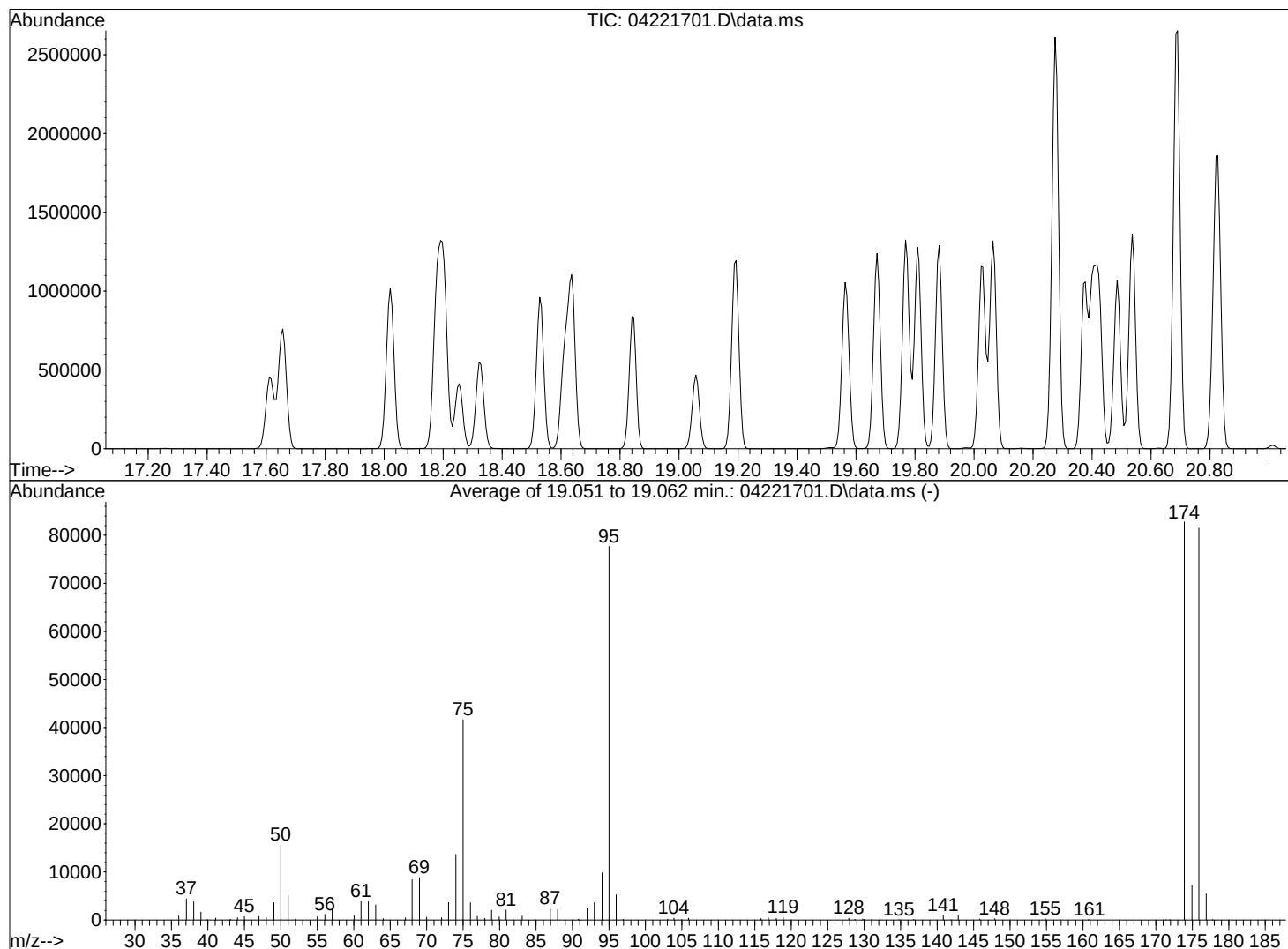
AutoFind: Scans 2648, 2649, 2650; Background Corrected with Scan 2639

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	19.3	17568	PASS
75	95	30	66	50.6	46141	PASS
95	95	100	100	100.0	91123	PASS
96	95	5	9	6.7	6085	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	109.0	99317	PASS
175	174	4	9	7.9	7835	PASS
176	174	93	101	98.7	98008	PASS
177	176	5	9	6.7	6568	PASS

Data Path : I:\MS13\DATA\2017 04\22\
Data File : 04221701.D
Acq On : 22 Apr 2017 4:17
Operator : AM/LH
Sample : CCV R13042217 25ng
Misc : S29-04101701/S31-04111704 (5/10)
ALS Vial : 3 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS13\METHODS\R13032817.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Sat Apr 15 08:29:41 2017



AutoFind: Scans 2647, 2648, 2649; Background Corrected with Scan 2639

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	20.2	15675	PASS
75	95	30	66	53.6	41645	PASS
95	95	100	100	100.0	77677	PASS
96	95	5	9	6.7	5243	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	106.5	82755	PASS
175	174	4	9	8.6	7149	PASS
176	174	93	101	98.5	81504	PASS
177	176	5	9	6.7	5422	PASS

LH 4/22/17

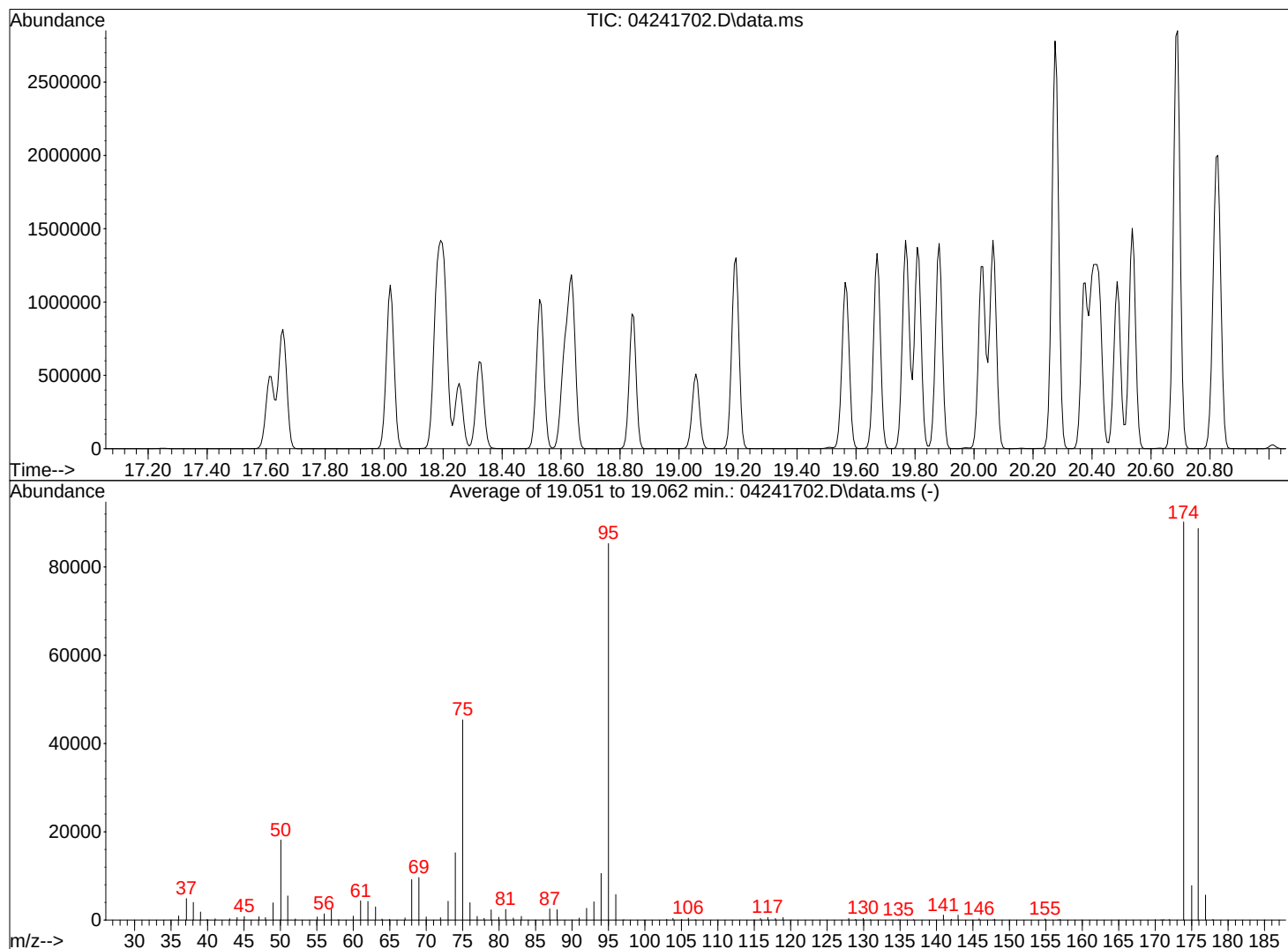
Data Path : I:\MS13\DATA\2017 04\24\
 Data File : 04241702.D
 Acq On : 24 Apr 2017 9:20
 Operator : AM/LH
 Sample : CCV R13042417 25ng
 Misc : S31-04101701/S31-04111704 (5/10)
 ALS Vial : 3 Sample Multiplier: 1

Integration File: LSCINT.P

LH 4/24/17

Method : I:\MS13\METHODS\R13032817.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Sat Apr 15 08:29:41 2017

4/24/17



AutoFind: Scans 2647, 2648, 2649; Background Corrected with Scan 2639

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	21.3	18131	PASS
75	95	30	66	53.2	45376	PASS
95	95	100	100	100.0	85301	PASS
96	95	5	9	6.8	5777	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	105.7	90203	PASS
175	174	4	9	8.6	7789	PASS
176	174	93	101	98.4	88725	PASS
177	176	5	9	6.4	5673	PASS

Injection Log

Directory: I:\MS13\DATA\2017_03\28\

[illegible]

Injection Log

Directory: I:\MS13\DATA\2017_04\22\

[illegible]

Injection Log

Directory: I:\MS13\DATA\2017_04\24\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	4/24/17 8:45	04241701.D	system	S31-04101701	AM/LH	16	
2	4/24/17 9:20	04241702.D	CCV R13042417_25ng	S31-04101701/S31-04111704 (5/10)	AM/LH	3	passed
3	4/24/17 9:55	04241703.D	blank	S29-04101701	AM/LH	3	
4	4/24/17 10:30	04241704.D	MB R13042417_1000ml	S31-04101701/AC00880	AM/LH	3	passed
5	4/24/17 11:05	04241705.D	system	S31-04101701	AM/LH	16	
6	4/24/17 11:40	04241706.D	LCS R13042417_25ng	S31-04101701/S31-04181701 (5/17)	AM/LH	3	passed
7	4/24/17 12:15	04241707.D	LCSD R13042417_25ng	S31-04101701/S31-04181701 (5/17)	AM/LH	3	passed
8	4/24/17 12:50	04241708.D	blank	S31-04101701	AM/LH	3	
9	4/24/17 13:26	04241709.D	P1701878-003 (1000ml)	S31-04101701	AM/LH	15	
10	4/24/17 14:01	04241710.D	P1701880-004 (2.5ml)	S31-04101701	AM/LH	4	
11	4/24/17 14:36	04241711.D	P1701880-001dil (5ml)	S31-04101701	AM/LH	4	
12	4/24/17 15:11	04241712.D	P1701880-002dil (4ml)	S31-04101701	AM/LH	4	
13	4/24/17 15:47	04241713.D	P1701880-003dil (0.4ml)	S31-04101701	AM/LH	4	
14	4/24/17 16:42	04241714.D	system	S31-04101701	AM/LH	16	
15	4/24/17 17:17	04241715.D	system	S31-04101701	AM/LH	16	
16	4/24/17 17:52	04241716.D	blank	S31-04101701	AM/LH	3	
17	4/24/17 18:27	04241717.D	P1701801-001 (400ml)	S31-04101701	AM/LH	1	
18	4/24/17 19:03	04241718.D	P1701802-001 (1000ml)	S31-04101701	AM/LH	2	
19	4/24/17 19:38	04241719.D	system	S31-04101701	AM/LH	16	
20	4/24/17 20:14	04241720.D	blank	S31-04101701	AM/LH	3	
21	4/24/17 20:50	04241721.D	P1701791-001 (1000ml)	S31-04101701	AM/LH	5	
22	4/24/17 21:25	04241722.D	P1701791-002 (200ml)	S31-04101701	AM/LH	6	
23	4/24/17 22:01	04241723.D	P1701791-002dil (100ml)	S31-04101701	AM/LH	6	
24	4/24/17 22:36	04241724.D	P1701789-002 (95ml)	S31-04101701	AM/LH	8	
25	4/24/17 23:12	04241725.D	P1701789-002dup (95ml)	S31-04101701	AM/LH	8	
26	4/24/17 23:47	04241726.D	P1701789-003dil (345ml)	S31-04101701	AM/LH	9	
27	4/25/17 0:22	04241727.D	system	S31-04101701	AM/LH	16	
28	4/25/17 0:58	04241728.D	blank	S31-04101701	AM/LH	3	
29	4/25/17 1:33	04241729.D	P1701792-001dil (395ml)	S31-04101701	AM/LH	10	
30	4/25/17 2:09	04241730.D	P1701803-001dil (500ml)	S31-04101701	AM/LH	11	
31	4/25/17 2:45	04241731.D	P1701808-001 (1000ml)	S31-04101701	AM/LH	12	
32	4/25/17 3:20	04241732.D	P1701808-002 (200ml)	S31-04101701	AM/LH	13	
33	4/25/17 3:55	04241733.D	P1701808-002dil (100ml)	S31-04101701	AM/LH	13	
				AM 4/25/17			
				LH 4/25/17			

A decorative graphic on the left side of the page consists of a large red rectangle, a smaller grey rectangle above it, a larger grey rectangle below it, and a black rectangle at the bottom right.

F

Appendix F. Data Quality Evaluation

DATA QUALITY EVALUATION

Vapor sampling of the Off Depot AS/SVE System effluent was conducted by HDR in July 2016, November 2016, February 2017 and April 2017. Samples were collected quarterly to evaluate performance and ensure compliance with discharge limits. System monitoring was performed in accordance with the *Dunn Field Off Depot Groundwater Remedial Action Work Plan, Revision 2* (HDR, 2009). The vapor samples were submitted to ALS Environmental in Simi Valley, California for analysis.

Field activities and laboratory analyses were performed in accordance with the *2017 Uniform Federal Policy-Quality Assurance Project Plan, Revision 0* (2017 QAPP) (HDR, 2017a).

The data quality evaluation (DQE) process involves assessment of all field and laboratory procedures for compliance with the QAPP. Data validation was completed by the HDR project chemist. This assessment is designed to evaluate problems with the quality assurance (QA)/quality control (QC) associated with the laboratory data and potential impact to the data quality objectives (DQOs). The DQE findings are summarized in the following sections.

FIELD ACTIVITIES AND FIELD QUALITY CONTROL

The field effort included the collection of soil gas from a single location during the sampling events in July 2016 and November 2016 and February and April 2017. The AS/SVE effluent sample location is on the north side of the SVE compound shown on [Figure 1](#) of the report.

One field QC sample (a field duplicate) was collected to evaluate sampling technique. Sample containers (6-liter Summa canisters) met U.S. Environmental Protection Agency (USEPA) requirements for environmentally clean containers. Sample labels were pre-printed to facilitate sample tracking from the field through the laboratory. Documentation of the sampling was performed in the field to ensure that the samples collected, sample labels, chain-of-custody (COC) records, and request for analysis were consistent. Where necessary, additional COC forms were filled out manually.

ANALYTICAL METHODS

The soil gas samples were analyzed for volatile organic compounds (VOCs) by Toxic Organics method TO-15.

LABORATORY QUALITY CONTROL

The laboratory QC program, including sample handling, laboratory control, and reporting, is documented in the QAPP. Sample handling includes documentation of sample receipt, placement in storage, lab personnel using the sample, and disposal. The laboratory control consists of instrument calibration and maintenance, laboratory control samples (LCS) and method blanks. Reporting of the laboratory control data was planned prior to the collection of the data, allowing the laboratory to place the appropriate information into the data package so that the DQE could be performed in a timely manner.

DQE SUMMARY

The objective of the DQE was to provide a review of the chemical data reports submitted by the laboratory and to assess the data in relation to the DQOs stated in the QAPP. The DQE consisted of review of laboratory QC data and field QC parameters, and flagging of the data as usable, usable with qualification, or unusable in accordance with the DQE standard operating procedures (SOPs) using the criteria stated in the QAPP for each analytical method performed. The following information was reviewed:

- Sample Integrity (Deliverables)
- Sample Completeness
- Sample Holding Times
- Laboratory Methods for Extraction and Analysis (Calibration, Internal Standards)
- Method Accuracy (bias) and Precision (Surrogates, LCS Recoveries)
- Laboratory Performance Criteria (Blanks, Instrument Performance Checks)

Field QC parameters were evaluated through field duplicates, field documentation, and shipping criteria.

The DQE was summarized by use of flags that indicate to the reviewer that the data being considered has been qualified using the established criteria. Sample delivery group (SDG) narratives detailing the evaluation of the laboratory data by HDR are included as attachments in this Appendix. The SDGs and associated groundwater samples are listed on [Table F-1](#).

The following sections provide summary discussions of the required data qualifications for each sampling event. A Level III DQE was performed and the data quality indicators (DQIs), expressed in terms of precision, accuracy, representativeness, comparability, completeness, and sensitivity, were assessed. This included the evaluation of sample integrity, holding times, trip blanks, rinsate blanks, method blanks, internal standards, surrogate recoveries, LCSs, and field duplicate precision. The results of the DQI assessment are provided below.

Precision

An annual field duplicate was collected to assess sampling precision. It consisted of a replicate grab sample collected concurrently with the associated field sample. Precision is best expressed in terms of relative percent difference (RPD).

July 2016: No duplicate sample pairs were collected during the sampling event.

November 2016: Although there were nine pairs of parent sample/field duplicate results outside control limits, all associated data are qualified J or UJ and as such are valid. Laboratory precision is discussed in more detail in the attached narratives.

February 2017: No duplicate sample pairs were collected during the sampling event.

April 2017: No duplicate sample pairs were collected during the sampling event.



Accuracy

Accuracy or bias was measured through the analyses of LCSs. Sample specific accuracy is measured through surrogate recovery. Accuracy is expressed as percent recovery (%R). Laboratory blanks are analyzed to assess potential bias in the reported sample results. Bias is expressed through qualification of analytical results.

Sample results were evaluated against blank results. Target analytes were not detected in the method blanks or canister blanks in any of the four sampling events.

July 2016: There were no samples analyzed for MS/MSD during this event. All LCS recoveries were within control limits. Further discussion of the LCS recoveries is provided in the attached DQE narratives.

November 2016: There were no samples analyzed for MS/MSD during this event. Although there was one high LCS recovery observed in the event, all associated data are qualified J+ or UJ and as such are valid. Further discussion of the LCS recoveries is provided in the attached DQE narratives.

February 2017: There were no samples analyzed for MS/MSD during this event. Although there were three high LCS recoveries observed in the event, all associated data are qualified J+ and as such are valid. Further discussion of the LCS recoveries is provided in the attached DQE narratives.

April 2017: There were no samples analyzed for MS/MSD during this event. All LCS recoveries were within control limits. Further discussion of the LCS recoveries is provided in the attached DQE narratives.

Representativeness

Representativeness refers to the degree sample data accurately and precisely describes the population of samples at a sampling point or under certain environmental conditions. Samples that are not properly preserved or are analyzed beyond holding times may not be considered representative. Review of sampling procedures, laboratory preparation and analysis holding times help in providing this assessment.

Sampling procedures followed the QAPP and were considered representative of the matrix collected. Laboratory preparation and analysis followed method guidelines.

Comparability

The selection of standardized methods and consistent laboratory practices facilitates the comparison of data between sampling events. Consistent methodology has been maintained throughout the SVE sampling events.

Past SVE data are comparable to recent events.

Completeness

Completeness is determined for both field and analytical objectives. Field completeness is calculated from the number of samples proposed versus the actual number of samples collected. Analytical completeness is expressed in terms of usable data. The project completeness goal for DDMT is 90% as stated in the QAPP.

Data from the SVE events was 100% complete and therefore met the completeness DQO.

Sensitivity

Analytical sensitivity is the concentration at which the measurement system can quantitate target analytes in the environmental matrices of concern. Analytical sensitivity is expressed in terms of the RL, which is provided by the respective laboratories as their reasonable and defensible quantitation limit for environmental samples above the method detection limit (MDL), which is established by each laboratory using clean matrix.

The analytical method RLs and MDLs were compared to the required RLs as listed in the QAPP and were determined to meet the overall project objectives.

The following sections discuss only those deficiencies encountered during the evaluation that resulted in qualified and/or unusable data.

AS/SVE Event – July 2016

A total of one soil gas sample, including one soil gas field sample and no QA/QC samples (duplicates), was collected from one AS/SVE location in July 2016. The sample was analyzed for TO-15 VOCs. The data are usable with qualifications as described below:

- Any result reported below the RL but above the method detection limit was qualified J and considered an estimated result (unless overridden by other QC flags).

AS/SVE Event – November 2016

A total of two soil gas samples, including one soil gas field sample and one QA/QC sample (a field duplicate), were collected from one AS/SVE location in November 2016. Samples were analyzed for TO-15 VOCs. The data are usable with qualifications as described below:

- The final qualifier for carbon disulfide in one sample was J+ and in one sample was UJ due to a high LCS recovery. Carbon disulfide is not a contaminant of concern (COC) at the site.
- The final qualifier for one parent sample result and one field duplicate sample result was UJ or J for nine analytes (chloromethane, bromomethane, acetonitrile, carbon disulfide, tetrahydrofuran, benzene, bromodichloromethane, dibromochloromethane and bromoform) due to field duplicate results outside control limits. These analytes are not COCs at the site.
- Any result reported below the RL but above the method detection limit was qualified J and considered an estimated result (unless overridden by other QC flags).

**AS/SVE Event – February 2017**

A total of one soil gas sample, including one soil gas field sample and no QA/QC samples (duplicates), was collected from one AS/SVE location in February 2017. The sample was analyzed for TO-15 VOCs. The data are usable with qualifications as described below:

- The final qualifier for carbon disulfide, trichlorofluoromethane and vinyl acetate in one sample was J+ due to high LCS recoveries. These analytes are not COCs at the site.
- Any result reported below the RL but above the method detection limit was qualified J and considered an estimated result (unless overridden by other QC flags).

AS/SVE Event – April 2017

A total of one soil gas sample, including one soil gas field sample and no QA/QC samples (duplicates), was collected from one AS/SVE location in April 2017. The sample was analyzed for TO-15 VOCs. The data are usable with qualifications as described below:

- Any result reported below the RL but above the method detection limit was qualified J and considered an estimated result (unless overridden by other QC flags).

SUMMARY

The sample data from the SVE events met the data quality objectives and are of sufficient quality to support the evaluation of the remedial action.

TABLE F-1
SAMPLE DATA GROUP SUMMARY TABLE
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SIX
Dunn Field - Defense Depot Memphis, Tennessee

Sample Data Group	Field Samples	Quality Control Samples
<u>SVE Sampling Event - July 2016</u>		
P1603665	ODSVE-EFF-Y6Q1	
<u>SVE Sampling Event - November 2016</u>		
P1605349	ODSVE-EFF-Y6Q2	ODSVE-DUP1-Y6Q2
<u>SVE Sampling Event - February 2017</u>		
P1700718	ODSVE-EFF-Y6Q3	
<u>SVE Sampling Event - April 2017</u>		
P1701803	ODSVE-EFF-Y6Q4	

DATA QUALITY REVIEW REPORT

VOLATILES IN AIR by USEPA Method TO-15

Project: DDMT Memphis ODSVE – Y6Q1
Project/Task Number: 10031560
Sample Data Package: P1603665
Laboratory: ALS Environmental, Simi Valley, California
Sample Matrix: Soil Gas
Sampling Dates: 19 July 2016
Validation Guidelines: Project Quality Assurance Project Plan (QAPP) (*Remedial Action Operations and Long Term Monitoring Quality Assurance Project Plan, Defense Depot Memphis, Tennessee, Revision 1* [HDR, November 2014]) United States Environmental Protection Agency (USEPA) *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air*, 2nd edition (1999) Method TO-15, and professional judgment
Validation Level: Stage 2BVM
Data Reviewer: Lynn K. Lutz, HDR

Sample ID	ALS ID	TO-15 VOCs
ODSVE-EFF-Y6Q1	P1603665-001	X

SUMMARY

All laboratory data were acceptable with qualification.

I. SAMPLE RECEIPT / CHAIN OF CUSTODY

The sample was collected in a 6-liter Summa canister. The sample was received in good condition. The chain of custody (COC) was filled out and signed. No qualification was required.

II. SAMPLES ANALYZED

All planned samples were collected and analyzed. No qualification was required.

III. HOLDING TIMES

The holding time criterion of 30 days was met. No qualification was required.

IV. GC/MS TUNING

GC/MS BFB tuning criteria were met. Sample analyses were begun within 24 hours of the BFB analysis. No qualification was required.

V. INSTRUMENT CALIBRATION

INITIAL CALIBRATIONS

Initial calibration criteria of relative standard deviation (RSD) less than 30% were met. No qualification was required.

SECOND SOURCE STANDARDS

Second source standard criteria of less than 30 percent difference (%D) were met. No qualification was required.

CONTINUING CALIBRATIONS

Continuing calibration standard criteria of less than 30%D were met. No qualification was required.

VI. BLANKS

METHOD BLANKS

Target analytes were not detected in the method blank. No qualification was required.

CANISTER BATCH CERTIFICATION BLANKS

Target analytes were not detected in the batch certification blanks above the MDL. No qualification was required.

VII. LABORATORY CONTROL SAMPLES (LCS)

All recoveries were within control limits. No qualification was required.

VIII. SURROGATES

All surrogate recoveries were within the control limits of 70-130%. No qualification was required.

IX. LABORATORY DUPLICATES

No lab duplicate sample was analyzed. No qualification was required.

X. FIELD DUPLICATES

No field duplicate sample was collected. No qualification was required.

XI. INTERNAL STANDARDS (ISTD)

The ISTD criterion of area responses within 40% of the CCV was met for all samples. No qualification was required.

XII. REPORTING LIMITS (RL) AND METHOD DETECTION LIMITS (MDL)

RLs and MDLs were appropriate for the project.

XIII. SAMPLE RESULTS / TRANSCRIPTION VERIFICATION

Transcription between the data packages and the EDDs was verified. Results between the MDL and RL have been qualified as estimated (J).

DATA QUALITY REVIEW REPORT

VOLATILES IN AIR by USEPA Method TO-15

Project: DDMT Memphis ODSVE – Y6Q2
Project/Task Number: 10031560-282846-005
Sample Data Package: P1605349
Laboratory: ALS Environmental, Simi Valley, California
Sample Matrix: Soil Gas
Sampling Dates: 09 November 2016
Validation Guidelines: Project Quality Assurance Project Plan (QAPP) (*Remedial Action Operations and Long Term Monitoring Quality Assurance Project Plan, Defense Depot Memphis, Tennessee, Revision 1* [HDR, November 2014]) United States Environmental Protection Agency (USEPA) *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air*, 2nd edition (1999) Method TO-15, and professional judgment
Validation Level: Stage 2BVM
Data Reviewer: Lynn K. Lutz, HDR

Sample ID	ALS ID	TO-15 VOCs
ODSVE-EFF-Y6Q2	P1605349-001	X
ODSVE-DUP1-Y6Q2	P1605349-002	X

SUMMARY

All laboratory data were acceptable with qualification.

I. SAMPLE RECEIPT / CHAIN OF CUSTODY

The samples were collected in 6-liter Summa canisters. The samples were received in good condition. The chain of custody (COC) was filled out and signed. No qualification was required.

II. SAMPLES ANALYZED

All planned samples were collected and analyzed. No qualification was required.

III. HOLDING TIMES

The holding time criterion of 30 days was met. No qualification was required.

IV. GC/MS TUNING

GC/MS BFB tuning criteria were met. Sample analyses were begun within 24 hours of the BFB analysis. No qualification was required.

V. INSTRUMENT CALIBRATION

INITIAL CALIBRATIONS

Initial calibration criteria of relative standard deviation (RSD) less than 30% were met. No qualification was required.

SECOND SOURCE STANDARDS

Second source standard criteria of less than 30 percent difference (%D) were met. No qualification was required.

CONTINUING CALIBRATIONS

Continuing calibration standard criteria of less than 30%D were met. No qualification was required.

VI. BLANKS

METHOD BLANKS

Target analytes were not detected in the method blanks. No qualification was required.

CANISTER BATCH CERTIFICATION BLANKS

Target analytes were not detected in the batch certification blanks above the MDL. No qualification was required.

VII. LABORATORY CONTROL SAMPLES (LCS)

The recovery of carbon disulfide in the LCS analyzed on 11/21/2016 at 108% was above the control limits of 57-102%. Carbon disulfide has been qualified in the samples as estimated with a possible high bias (J+) or non-detect estimated (UJ). Several analytes were recovered outside the control limits in the LCS analyzed on 11/22/2016, but none of these analytes were reported in the associated samples and no qualification was required.

VIII. SURROGATES

All surrogate recoveries were within the control limits of 70-130%. No qualification was required.

IX. LABORATORY DUPLICATES

No lab duplicate sample was analyzed. No qualification was required.

X. FIELD DUPLICATES

Sample ODSVE-DUP1-Y6Q2 was collected as a field duplicate of ODSVE-EFF-Y6Q2. Several analytes did not meet the required control limits and have been qualified as noted in the table below.

Analyte	Parent Concentration, ppbv	FD Concentration, ppbv	Qualifier
Chloromethane	0.33	U (RL 0.29)	J / UJ
Bromomethane	0.16	U (RL 0.16)	J / UJ
Acetonitrile	0.32 J	1.9	J / J
Carbon Disulfide	U (RL 1.9)	2.9	UJ / J
Tetrahydrofuran (THF)	0.54	U (RL 0.21)	J / UJ
Benzene	0.29	0.085 J	J / J
Bromodichloromethane	0.27	U (RL 0.09)	J / UJ
Dibromochloromethane	0.15	U (RL 0.071)	J / UJ
Bromoform	0.27	U (RL 0.059)	J / UJ

XI. INTERNAL STANDARDS (ISTD)

The ISTD criterion of area responses within 40% of the CCV was met for all samples. No qualification was required.

XII. REPORTING LIMITS (RL) AND METHOD DETECTION LIMITS (MDL)

RLs and MDLs were appropriate for the project.

XIII. SAMPLE RESULTS / TRANSCRIPTION VERIFICATION

Transcription between the data packages and the EDDs was verified. Results between the MDL and RL have been qualified as estimated (J).

DATA QUALITY REVIEW REPORT

VOLATILES IN AIR by USEPA Method TO-15

Project: DDMT Memphis ODSVE – Y6Q3
Project/Task Number: 10031560-282846-005
Sample Data Package: P1700718
Laboratory: ALS Environmental, Simi Valley, California
Sample Matrix: Soil Gas
Sampling Dates: 08 February 2017
Validation Guidelines: Project Quality Assurance Project Plan (QAPP) (*Remedial Action Operations and Long Term Monitoring Quality Assurance Project Plan, Defense Depot Memphis, Tennessee, Revision 1* [HDR, November 2014]) United States Environmental Protection Agency (USEPA) *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air*, 2nd edition (1999) Method TO-15, and professional judgment
Validation Level: Stage 2BVM
Data Reviewer: Lynn K. Lutz, HDR

Sample ID	ALS ID	TO-15 VOCs
ODSVE-EFF-Y6Q3	P1700718-001	X

SUMMARY

All laboratory data were acceptable with qualification.

I. SAMPLE RECEIPT / CHAIN OF CUSTODY

The sample was collected in a 6-liter Summa canister. The sample was received in good condition. The chain of custody (COC) was filled out and signed. No qualification was required.

II. SAMPLES ANALYZED

All planned samples were collected and analyzed. No qualification was required.

III. HOLDING TIMES

The holding time criterion of 30 days was met. No qualification was required.

IV. GC/MS TUNING

GC/MS BFB tuning criteria were met. Sample analyses were begun within 24 hours of the BFB analysis. No qualification was required.

V. INSTRUMENT CALIBRATION

INITIAL CALIBRATIONS

Initial calibration criteria of relative standard deviation (RSD) less than 30% were met. No qualification was required.

SECOND SOURCE STANDARDS

Second source standard criteria of less than 30 percent difference (%D) were met except for two analytes. The %D values for alpha-methyl styrene and cyclohexanone at +32% and +43% were outside the control limits, with higher responses than in the initial calibration. These two analytes were non-detect in the sample and no qualification was required.

CONTINUING CALIBRATIONS

Continuing calibration standard criteria of less than 30%D were met. No qualification was required.

VI. BLANKS

METHOD BLANKS

Target analytes were not detected in the method blanks. No qualification was required.

CANISTER BATCH CERTIFICATION BLANKS

Target analytes were not detected in the batch certification blanks above the reporting limit (RL). No qualification was required.

VII. LABORATORY CONTROL SAMPLES (LCS)

Several recoveries were above control limits and resulted in qualification as shown in the table below.

Analyte	Recovery	Control Limits	Qualification
Trichlorofluoromethane	105%	63-98%	J+
Carbon disulfide	112%	57-102%	J+
Vinyl acetate	135%	76-128%	J+

VIII. SURROGATES

All surrogate recoveries were within the control limits of 70-130%. No qualification was required.

IX. LABORATORY DUPLICATES

No lab duplicate sample was analyzed. No qualification was required.

X. FIELD DUPLICATES

No field duplicate sample was collected. No qualification was required.

XI. INTERNAL STANDARDS (ISTD)

The ISTD criterion of area responses within 40% of the CCV was met for all samples. No qualification was required.

XII. REPORTING LIMITS (RL) AND METHOD DETECTION LIMITS (MDL)

RLs and MDLs were appropriate for the project.

XIII. SAMPLE RESULTS / TRANSCRIPTION VERIFICATION

Transcription between the data packages and the EDDs was verified. Results between the MDL and RL have been qualified as estimated (J).

DATA QUALITY REVIEW REPORT

VOLATILES IN AIR by USEPA Method TO-15

Project: DDMT Memphis ODSVE – Y6Q4
Project/Task Number: 10031560-282846-005
Sample Data Package: P1701803
Laboratory: ALS Environmental, Simi Valley, California
Sample Matrix: Soil Gas
Sampling Dates: 11 April 2017
Validation Guidelines: Project Quality Assurance Project Plan (QAPP) (*Remedial Action Operations and Long Term Monitoring Quality Assurance Project Plan, Defense Depot Memphis, Tennessee, Revision 1* [HDR, November 2014]) United States Environmental Protection Agency (USEPA) *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air*, 2nd edition (1999) Method TO-15, and professional judgment
Validation Level: Stage 2BVM
Data Reviewer: Lynn K. Lutz, HDR

Sample ID	ALS ID	TO-15 VOCs
ODSVE-EFF-Y6Q4	P1701803-1	X

SUMMARY

All laboratory data were acceptable with qualification.

I. SAMPLE RECEIPT / CHAIN OF CUSTODY

The sample was collected in a 6-liter Summa canister. The sample was received in good condition. The chain of custody (COC) was filled out and signed. No qualification was required.

II. SAMPLES ANALYZED

All planned samples were collected and analyzed. No qualification was required.

III. HOLDING TIMES

The holding time criterion of 30 days was met. No qualification was required.

IV. GC/MS TUNING

GC/MS BFB tuning criteria were met. Sample analyses were begun within 24 hours of the BFB analysis. No qualification was required.

V. INSTRUMENT CALIBRATION

INITIAL CALIBRATIONS

Initial calibration criteria of relative standard deviation (RSD) less than 30% were met. No qualification was required.

SECOND SOURCE STANDARDS

Second source standard criteria of less than 30 percent difference (%D) were met. No qualification was required.

CONTINUING CALIBRATIONS

Continuing calibration standard criteria of less than 30%D were met. No qualification was required.

VI. BLANKS

METHOD BLANKS

Target analytes were not detected in the method blanks. No qualification was required.

CANISTER BATCH CERTIFICATION BLANKS

Target analytes were not detected in the batch certification blanks above the reporting limit (RL). No qualification was required.

VII. LABORATORY CONTROL SAMPLES (LCS)

All recoveries were within control limits. No qualification was required.

VIII. SURROGATES

Surrogate recoveries were within the control limits. No qualification was required.

IX. LABORATORY DUPLICATES

No lab duplicate sample was analyzed. No qualification was required.

X. FIELD DUPLICATES

No field duplicate sample was collected. No qualification was required.

XI. INTERNAL STANDARDS (ISTD)

The ISTD criterion of area responses within 40% of the CCV was met for all samples. No qualification was required.

XII. REPORTING LIMITS (RL) AND METHOD DETECTION LIMITS (MDL)

RLs and MDLs were appropriate for the project.

XIII. SAMPLE RESULTS / TRANSCRIPTION VERIFICATION

Transcription between the data packages and the EDDs was verified. Results between the MDL and RL have been qualified as estimated (J).