

Off Depot Air Sparge/ Soil Vapor Extraction System Annual Operations Report, Year Seven (May 2017 through April 2018)

Dunn Field - Defense Depot Memphis,
Tennessee

Revision 1
November 2018



**Off Depot Air Sparge/ Soil Vapor Extraction System
Annual Operations Report, Year Six (May 2017 through April
2018)**

Dunn Field - Defense Depot Memphis, Tennessee

Prepared for:



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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
CDCE	cis 1,2-Dichloroethene
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
LTM	long-term monitoring
MAQ	Memphis Aquifer
MCL	maximum contaminant level
MLGW	Memphis Light, Gas and Water
MW	monitoring well
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

Trinity Analysis & Development Corp. (Trinity) has prepared this Annual Operations Report for the Off Depot air sparging and soil vapor extraction (AS/SVE) system under Contract W91278-16-D-0054, Delivery Order 0001 to 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 Seven 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 May 2017 through 30 April 2018.

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:

- An AS/SVE system installed across the core of the plume near the down-gradient 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 ($\mu\text{g/L}$). 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 in 2007 for the fluvial soil vapor extraction system on Dunn Field. Permit conditions included 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 90 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.

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.

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.

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 Six, Revision 1* (HDR, 2018a) was approved by TDEC in March 2018 and by USEPA in June 2018.

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. Since that time, operations have been varied to restore the northerly groundwater flow in the treatment area so that the plume would pass through the AS wells.

Year Five operations began in January 2014 but were halted in February 2014 due to extensive equipment damage from a lightning-related power surge. System repairs were completed and operations resumed in March 2015. Year Five operations continued through December 2015. Starting in March 2015, the AS/SVE system was alternated between full and standby operation on a roughly 4-week interval.

Year Six operations took place from 1 January 2016 to 30 April 2017. The AS/SVE system was generally operated in stand-by mode until 6 May 2016 while a new task order was put in place. The system was alternated between full and standby operations, as in Year Five, from May 2016 through April 2017.

1.4.2 System Monitoring and Mass Removal

Total VOC concentrations in the system effluent decreased from 1240 parts per billion by volume (ppbv) at start-up in December 2009 to 31.8 ppbv in March 2012; total VOC concentrations have increased since and were 78 ppbv in April 2017 at the end of Year Six.

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. The AS/SVE emissions have never exceeded the de minimus standard of 0.1 lb/hr for the SCHD operating permit.

The AS/SVE system uptime percentage (%) and the mass removal in pounds (lbs) during the first 6 years of operations are shown below. The system uptime determination did not include the period required for equipment repair (February 2014 to March 2015) in Year Five or the period in standby mode (January to May 2016) in Year Six.

Period	System Uptime	VOC Removal (lbs)
Year One (2010)	97%	70.8
Year Two (2011)	94%	3.9
Year Three (2012)	97%	2.2
Year Four (2013)	91%	2.9
Year Five (Jan 2014-Dec 2015)	93%	2.0
Year Six (Jan 2016-April 2017)	93%	1.7

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 down-gradient of the AS/SVE barrier below 50 µg/L for individual CVOCs. The goal was met in the five performance monitoring wells (MW; MW-241, -243, -245, -245, -247) immediately down-gradient 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

O&M activities have been performed 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, photoionization detector (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 Seven AS/SVE operations included the following activities:

- Weekly system inspections with measurements of operating conditions, operational adjustments and equipment maintenance checks;
- Bi-weekly readings at AS wells, 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.

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2 System Operations

System operations in Year Seven followed the same schedule as in Year Six, alternating between full and standby operation roughly every four weeks. The AS wells were set to operate in three groups of 19 to 22 AS wells with 60 AS wells set for 4 hours per day (full-time), 6 AS wells set for 2 hours per day (half-time), and 24 AS wells closed ([Figure 1](#)).

During full operation, the AS well groups are operated for a total of 12 hours per day to remove VOCs from groundwater, and an SVE blower and the 12 SVE wells are operated 24 hours per day to remove soil vapor with VOCs from the vadose zone. The two blowers are alternated at 6-hour intervals. During standby 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 an SVE blower and the 12 wells are operated for two 6-hour periods each day; the blowers are alternated weekly. The AS/SVE system was in full operation during the following periods in Year Seven: 23 May to 20 June, 19 July to 22 August, 12 to 26 September, 5 to 16 October, 14 November to 5 December, 25 January to 9 March and 27 March to 1 May.

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. This continued in Year Seven until Blower #1 was replaced in June 2017 and began operation on 19 July 2017. When the AS manifold was open for 'full' operation in May and June 2017, the AS wells operated for approximately 5.5 hours in each 6-hour period.

2.1 System Performance

AS/SVE system uptime during periods of full operation in Year Seven was approximately 89%, which is slightly less than in previous years. System uptime in Years One to Six ranged from 91% to 97%. The periods of full operation in Year Seven totaled 185 days with 2,182 hours available for system operations. The AS/SVE system was down due to system alarms and other issues for a total of 248 hours. System maintenance and shutdowns are summarized in [Section 2.3](#).

2.2 System Flow Rates and Vacuums

Weekly measurements consist of pressure and air temperature at the AS compressor and air flow rates at the manifold, and vacuum and air temperature for each blower and the system effluent. Operating hours for each blower and the compressor were also recorded.

Flow rates and pressure/vacuum at the operating AS wells, SVE wells and the effluent were recorded at least biweekly during full operation. 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 were 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 118 to 201 standard cubic feet per minute (scfm) and averaged 148 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 Seven; average flow rates at individual SVE wells were 43 to 87 actual cubic feet per minute (acfm). Combined flow from all SVE wells during full operations averaged 574 scfm at 8.2 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 148 scfm and the average combined SVE flow rate of 574 scfm, the SVE system extracted approximately 3.9 times the injection rate during Year Seven.

2.3 System Maintenance

System inspections were performed weekly, as able, and semi-annual and annual equipment maintenance was conducted by the AS/SVE equipment manufacturer. 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 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 are included in [Appendix B](#).

Connections to AS wells have been damaged periodically due to pressure building up in the air lines and/or wells as discussed in the annual reports. Connections at eight AS wells were repaired in September 2013 (Year Four). Connections were damaged at two wells (AS-05 and AS-09) later in Year Four and at two wells (AS-17 and AS-32) in Year Seven, as noted below. Repairs to AS well heads are planned in Year Eight.

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

- The SVE system recorded a low voltage alarm on 11 May 2017. Blower #2 was operating properly during the inspection on 13 May, but the AS air dryer showed a high dew point alarm. The air dryer was reset and the AS manifold was briefly opened; the air dryer and compressor operated properly and the manifold was closed.
- Power and internet connectivity were lost on 27 May 2017 due to severe thunderstorms. The AS compressor was not operating during the inspection on 29 May, and the compressor showed main voltage low alarms on 27 and 29 May. The alarms were cleared and the air dryer was reset; the compressor and dryer operated properly.
- During system inspection on 7 June 2017, the AS compressor was operating but showed main voltage low alarms on 1 and 7 June.

- The AS compressor was not operating when checked remotely on 18 June 2017. The AS air dryer was reset and the compressor restarted during the inspection on 19 June. The compressor showed main voltage low alarms on 12, 18 and 19 June.
- Blower #1 was replaced on 26 June. The blower operated properly but would not start under automatic operation. System operations continued with Blower #2 operating for two 6-hour periods per day.
- On 19 July, a misaligned electrical contact for Blower #1 that connected the thermostat to the system logic control panel was identified and corrected. The alarm was reset and Blower #1 started. Sequential operation of the blowers was confirmed remotely.
- During system inspection on 25 July, the AS/SVE system was not operating due to a low vacuum alarm for Blower #1 on 21 July. On 27 July, a tripped breaker within the logic control panel was reset. Both blowers worked properly. Sequential operation of the blowers was confirmed remotely.
- During system inspection on 26 September, oil was observed on the floor at the AS compressor and the compressor temperature was above normal at 199°F. The compressor was shut down. An inspection identified a hole in the oil sump.
- The AS compressor sump was replaced on 4 October and semiannual maintenance performed for the compressor, except for air filter replacement because the filter was not delivered in time. Review of the damaged sump indicated the hole was at a weak weld point and that the high air pressure may have caused the failure.
- AS compressor air filter replaced on 5 October. The technician observed a broken filter canister bolt mount; he reinstalled the filter canister with temporary bolt mount, replaced the air filter and ordered a replacement filter canister. Air filter housing replaced on 31 October.
- During system inspection on 9 October, the AS compressor was operating but showed main voltage low alarms on 8 and 9 October.
- The internet connection to the system was not available for remote monitoring on 10 October. Service provider technical support was contacted and stated the problem was with the line into the building. A technician investigated the connection on 16 October; faulty wiring was replaced and the connection restored.
- The SVE system shut down for a few hours on 20 October due to a low voltage alarm.
- During system inspection on 31 October, the Ecodyer condensate gauge showed the pressure dew point was higher than normal. When the power switch and fan were reset per the system manual, the Ecodyer began operating properly and the condensate gauge showed a normal pressure dew point.
- The AS compressor was not operating during the system inspection on 15 December and showed alarms for low ambient temperature (<36 degrees) on 9 and 12 December. The compressor was re-started and operated properly during the remainder of the inspection.

- AS/SVE semiannual maintenance was conducted on 19 December. The blowers, condensate drains and the compressor air dryer were operating properly; AS compressor maintenance was performed on 4 October when the compressor oil sump was replaced.
- Pressure build-up at AS well #17 led to failure of the concrete well cap and the header during the inspection on 19 December; air flow to AS well #17 was closed through the system controls.
- Internet connectivity to the system controls was not available during remote monitoring on 22 December. The system was inspected that evening; the outside 500-gallon tank and the inside AWS tank were observed to be near capacity. Since the tanks could not be emptied prior to the Christmas holiday, the blowers were turned off to prevent overflow. The blowers remained off for the rest of December due to ice in the tanks and low ambient temperatures. The internet provider restored system connectivity on 28 December.
- The AS manifold was closed in December and remained closed with the AS compressor shut down until 25 January due to low temperatures and damage to condensate drains. The SVE blowers were shut down on 28 December due to frozen water lines and damage to the AWS transfer pump; the blowers remained off until 24 January except for brief periods during inspections. The SVE system recorded a low voltage alarm on 24 January prior to the blowers being re-started.
- The AWS transfer pump was replaced on 24 January.
- One AS condensate drain was replaced, and two others serviced, and sump pressure relieve valve, which was not working properly and causing a back pressure alarm was serviced on 24 January. This alarm resulted in shut downs of the AS compressor.
- The AS compressor shutdown due to a high temperature alarm on 25 January. Temporary fix made to the exhaust discharge vent louver which allowed AS/SVE system operations to continue.
- The AS manifold was closed on 14 February for preliminary repairs to the vent louver control; the AS manifold was opened on 15 February. The blowers were shut down due to rain during this period.
- The louver control motor repair was completed on 19 February.
- The AS-32 header was damaged by excess pressure on 23 March and the well was turned off via system controls.
- During system inspection on 18 April, the AS compressor was operating but showed main voltage low alarms on 14 and 15 April.
- From February to May 2018, the blowers were shut down during periods of heavy rain to reduce the volume of condensate generated by the SVE system. The periods of full operation were extended to recover the lost operating time.

- There were ten shutdowns in February: 4 February, 6 to 7 February, 9 to 12 February, 13 to 14 February, 14 to 15 February, 17 February, 21 to 22 February, 24 to 25 February, 27 to 28 February, 28 February to 1 March; the shutdowns lasted 5 to 71 hours and totaled 192 hours. The AS/SVE system was in full operation in February.
- There were four shutdowns in March: 5 March, 16 to 19 March, 24 to 25 March and 28 to 29 March; the shutdowns lasted 7 to 68 hours and totaled 131 hours. The system was in standby from 9 to 27 March; the blowers were shut down for 46 hours during the period of full operation.
- There were two shutdowns in April: 6 to 7 April and 14 to 15 April; the shutdowns lasted 24 and 29 hours and totaled 53 hours. The system was in full operation in April.

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

- Compressor shutdowns due to low voltage in May and June 2017 (28 hours)
- Blower shutdown due to low vacuum from 21 to 27 July 2017 (74 hours)
- Blower shutdowns during heavy rain in February, March and April (146 hours)

Operating hours in Year Seven were reduced by downtime of approximately 248 hours.

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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, 2017). System monitoring was performed during full operation in June, August, October and December 2017, and January and April 2018.

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 6.0 to 36.8 inches of water and the average at each VMP was 12 to 25 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; which 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 0.1 parts per million (ppm) and were 0 ppm for all six measurements at the system effluent. Water in the SVE air lines prevented some or all readings at SVE-6, SVE-9 and SVE-10.

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 measurements are shown on [Table 4](#). The estimated VOC concentrations were 0 ppm for approximately 75 percent of the measurements and were below 1 ppm in all but two measurements, 2.4 ppm at VMP-10A in August 2017 and 4.5 ppm at VMP-9A in April 2018. 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 7 June, 10 October, 5 December 2017 and 3 April 2018. An additional vapor sample was collected on 2 August 2017 to evaluate anomalous analytical results for the June 2017 sample, as discussed below. The samples were submitted for laboratory analysis of VOCs by USEPA Air 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 one or more samples. 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 53.8 to 74.4 ppbv. Trichloroethene (TCE) has generally been the CVOC detected at the highest concentration since 2009, but cis-1,2-Dichloroethene (cDCE) was at similar concentrations in Year Seven. TCE was 33 to 44% of the total primary CVOC concentration, and cDCE was 39 to 48%.

Total VOCs ranged from 63.8 to 89.4 ppbv; these concentrations are similar to sample results since operations resumed in March 2015. System effluent concentration trends from PID measurements and analytical results are shown on [Figure 2](#).

Elevated concentrations of 2-butanone, 2-propanol, acetone and propene reported in the June sample were not present in the August confirmation sample ([Table 5](#)); these analytes may represent laboratory contamination. Elevated concentrations of acetone and ethyl acetate were reported in the April 2018 sample. Ethyl acetate is a common indoor air contaminant due to its presence in cleaning agents and disinfectants but is not believed to have been used in the AS/SVE equipment buildings. These analytes are not considered to be present in soil vapor at the AS/SVE treatment area and were omitted from the total VOC concentrations for the vapor samples.

3.4 Data Quality Evaluation

Analytical results for AS/SVE effluent vapor samples collected in Year Seven were reviewed 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 Seven samples is provided in [Appendix F](#). The main findings from the DQE are summarized separately 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).

3.5 Mass Removal Estimate

The VOC mass removed by the AS/SVE system is estimated from the average total 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](#).

As noted in [Section 3.3](#), anomalous concentrations of some VOCs in the June 2017 and April 2018 sample results were omitted from the total VOC concentrations used for the mass emission calculations. In addition, an anomalous toluene concentration (170 ppbv) in the June 2012 sample (Year Three) was also omitted from the total VOC concentration used for the mass emission calculations on [Table 6](#). Toluene has been detected above the RL in only two other AS/SVE vapor samples, 5 ppbv in June 2010 and 1.9 ppbv in April 2018.

The estimated VOC emission rate in the effluent was 0.0009 lb/hr during Year Seven. The emissions remained well below the SCHD de minimus standard of 0.1 lb/hr. The AS/SVE system removed approximately 1.7 lbs of VOCs in Year Seven and 85.2 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 89% during periods of full operation in Year Seven (1 May 2017 to 30 April 2018). AS/SVE system is limited to full operations in alternate 4-week periods in order to maintain northerly groundwater flow in the treatment area.

The SVE system extracted approximately 3.9 times the AS injection rate during Year Seven. 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 Seven and were below 1 ppm for all but two readings. Total VOC concentrations in effluent vapor samples ranged from 64 to 89 ppbv. The estimated VOC emission rate in the effluent was 0.0009 lb/hr during Year Seven, well below the SCHD de minimus standard. Approximately 85 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) since September 2010. The total VOCs (and total CVOCs) in the effluent have had a slight increasing trend since 2012; total VOCs increased from 28 ppbv in February 2012 to 89 ppbv in October 2017 ([Figure 2](#)). The April 2018 total VOC concentration (77 ppbv) is approximately 6 percent of the concentration at startup in December 2009 (1240 ppbv).

Period	System Uptime	VOC Removal (lbs)
Year One (2010)	97%	70.8
Year Two (2011)	94%	3.9
Year Three (2012)	97%	2.2
Year Four (2013)	91%	2.9
Year Five (Jan 2014-Dec 2015)	93%	2.0
Year Six (Jan 2016-April 2017)	93%	1.7
Year Seven (May 2017-May 2018)	89%	1.7

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 up-gradient 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 the *April 2018 Long-Term Monitoring Summary Report, Revision 0* (HDR, 2018b). 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 106 µg/L in April 2018. Groundwater elevation contours and the April 2018 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](#)). Following damage to the AS/SVE system in 2014, CVOC concentrations at six of these wells increased above MCLs or the target concentrations (TCs) from the Dunn Field ROD. In April 2018, CVOC concentrations exceeded an MCL or TC in only two of these wells, MW-159 and MW-246. Concentrations for 1,1,2,2-tetrachloroethane (TeCA) and TCE, the CVOCs most commonly detected above the MCLs or TCs in the Off Depot area, in these six wells are shown on [Table 7](#) for October 2014 through April 2018. A time-trend plot for TeCA and TCE concentrations in MW-159 is provided on [Figure 4](#).

The recent concentration trends are summarized below:

- The TCE concentration at MW-159 decreased to 106 µg/L from 141 µg/L in April 2017 and 227 µg/L in October 2015; the concentration remains above the treatment goal for AS/SVE operations.
- TCE and TeCA concentrations at up-gradient well MW-150 increased above the MCL and TC in October 2017 but decreased in April 2018.
- TCE and TeCA concentrations at up-gradient well MW-54 have increased since 2016 but remain below the MCL and TC.
- Concentrations at the other three wells (MW-165, MW-243 and MW-246), which are located immediately down-gradient of the treatment area, decreased after AS/SVE operations resumed in March 2015 and concentrations appear to be stable. Only the TeCA concentration in MW-246, at 3.8 µg/L in April 2018, remains 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 and incorporated into system operations upon completion of an updated access agreement with MLGW. No date of completion of the Right of Entry can be projected at this time. Planning will resume once access is received.

Additional repair and maintenance activities to be conducted under future task order awards will include purging of all SVE lines due to water accumulation in many and inspection, troubleshooting, and repair of damaged AS wellheads and piping as necessary. No other

changes to AS/SVE operations are recommended. AS/SVE operations are currently planned to continue through July 2020.

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5 References

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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 SEVEN
Defense Depot Memphis, Tennessee

Date	Number of Blowers in Operation	AS	SVE Effluent		SVE-1		SVE-2		SVE-3		SVE-4	
		Compressor 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)	Flow rate (acfm)	Vacuum (in. H ₂ O)
5/17/2017	1	C	590	7.8	70	49.2	90	48.6	60	48.5	80	44.8
5/23/2017	1	125	590	7.8	60	50.1	80	51.6	60	49.9	70	46.1
6/7/2017	1	201	570	7.8	60	50.8	80	49.2	60	49.6	60	46.2
6/20/2017	1	156	570	7.8	60	50.0	NR	51.5	70	48.8	80	45.5
7/10/2017	1	C	590	7.2	60	45.7	80	39.3	60	45.1	70	41.2
7/27/2017	1	159	590	6.9	60	38.5	NR	32.6	60	37.4	70	34.9
8/2/2017	1	143	560	8.1	60	57.0	NR	50.7	60	55.1	60	52.4
8/15/2017	1	169	560	8.1	50	57.1	NR	51.0	60	54.3	80	51.8
9/5/2017	1	C	570	7.7	60	51.9	70	48.7	60	50.4	70	47.2
9/19/2017	1	170	550	8.0	60	55.7	NR	51.1	60	53.9	70	51.8
10/5/2017	1	136	570	8.2	60	54.4	NR	49.4	60	52.1	70	49.1
10/9/2017	1	126	550	8.3	60	55.5	NR	48.8	60	54.4	80	51.8
10/31/2017	1	C	580	8.6	60	55.3	70	43.7	60	54.9	70	51.5
11/15/2017	1	143	580	8.2	50	53.7	80	53.2	60	52.9	70	50.0
12/1/2017	1	186	570	8.6	70	56.7	80	59.7	60	55.7	70	53.2
12/5/2017	1	178	570	8.7	60	60.2	80	58.4	60	58.3	70	56.2
12/12/2017	1	C	580	8.8	70	54.7	80	55.8	60	55.1	70	52.8
1/25/2018	1	131	620	8.1	70	49.5	80	56.4	70	52.7	80	50.1
1/29/2018	1	154	580	8.6	80	57.7	80	60.2	70	58.3	80	57.6
2/15/2018	1	118	590	7.9	60	59.3	80	62.2	60	59.6	80	57.4
2/27/2018	1	145	580	8.5	70	62.3	80	65.8	60	59.5	70	58.6
3/9/2018	1	C	570	9.0	70	61.6	80	62.5	60	59.2	70	56.6
3/27/2018	1	120	580	8.6	60	61.3	80	60.9	60	59.0	80	57.5
4/3/2018	1	127	560	8.5	70	59.9	90	58.8	70	58.1	80	56.3
4/18/2018	1	129	560	8.9	60	60.1	80	62.8	60	58.4	70	60.4

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.

NR: No reading because of water in
line

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

Date	Number of Blowers in Operation	SVE-5		SVE-6		SVE-7		SVE-8		SVE-9		SVE-10	
		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)	Flow rate (acfm)	Vacuum (in. H ₂ O)
5/17/2017	1	50	60.1	80	43.6	60	66.5	80	51.4	90	69.2	NR	46.4
5/23/2017	1	50	61.0	80	44.8	50	70.8	80	54.4	80	70.4	NR	49.8
6/7/2017	1	50	61.4	80	45.6	50	71.3	70	55.3	70	71.8	NR	52.7
6/20/2017	1	50	60.8	80	44.4	50	70.9	80	54.6	80	70.7	NR	52.3
7/10/2017	1	50	56.5	80	39.1	50	66.3	80	50.9	70	66.2	NR	48.3
7/27/2017	1	50	50.3	80	32.7	50	60.7	80	44.9	80	60.6	NR	48.8
8/2/2017	1	50	66.2	70	51.1	50	75.7	80	59.8	80	75.5	NR	56.8
8/15/2017	1	50	65.8	70	51.4	NR	72.1	80	59.6	80	71.3	NR	52.1
9/5/2017	1	50	62.0	80	45.4	50	71.4	80	55.4	80	71.0	NR	52.2
9/19/2017	1	50	65.8	70	51.1	50	75.4	70	59.3	80	75.1	NR	57.6
10/5/2017	1	50	63.3	80	47.7	50	72.8	80	56.9	80	72.8	NR	54.8
10/9/2017	1	50	64.8	80	50.7	50	74.2	80	58.7	80	76.9	NR	57.2
10/31/2017	1	50	66.4	80	50.7	50	74.9	80	58.9	80	71.9	NR	53.4
11/15/2017	1	50	64.6	80	49.0	50	73.3	80	58.1	80	72.2	NR	53.5
12/1/2017	1	50	67.1	70	52.1	NR	73.5	80	61.5	90	72.7	NR	52.6
12/5/2017	1	50	69.5	80	55.8	NR	75.9	80	64.6	80	75.6	NR	56.1
12/12/2017	1	50	65.6	80	51.3	NR	71.9	80	58.3	NR	73.6	NR	53.3
1/25/2018	1	50	66.9	80	48.4	50	75.6	80	58.8	80	74.9	50	53.7
1/29/2018	1	50	68.9	80	53.6	NR	77.4	80	63.4	80	76.3	50	59.8
2/15/2018	1	50	72.7	80	55.5	NR	79.1	80	65.7	NR	77.3	50	59.2
2/27/2018	1	50	72.4	70	56.5	NR	80.2	80	67.9	NR	82.1	20	62.2
3/9/2018	1	50	72.7	80	61.0	NR	80.6	80	65.2	NR	78.5	NR	60.1
3/27/2018	1	50	71.7	90	56.4	NR	78.8	80	66.7	NR	77.6	NR	61.3
4/3/2018	1	50	68.9	80	55.5	NR	75.9	80	63.3	NR	77.5	NR	57.9
4/18/2018	1	50	71.9	70	59.9	NR	76.2	80	63.2	NR	80.2	NR	60.8

Notes

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acfm: actual cubic feet per minute

in. Hg: inches of mercury

in. H₂O: inches of water

C: AS manifold closed.

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line

TABLE 1
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OFF DEPOT AS-SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SEVEN
Defense Depot Memphis, Tennessee

Date	Number of Blowers in Operation	SVE-11		SVE-12	
		Flow rate (acfm)	Vacuum (in. H ₂ O)	Flow rate (acfm)	Vacuum (in. H ₂ O)
5/17/2017	1	80	29.9	NR	41.1
5/23/2017	1	80	31.2	NR	42.9
6/7/2017	1	60	33.4	NR	41.8
6/20/2017	1	70	31.5	NR	42.6
7/10/2017	1	80	27.5	NR	37.2
7/27/2017	1	70	21.4	NR	32.7
8/2/2017	1	70	37.6	NR	45.8
8/15/2017	1	70	37.9	NR	46.1
9/5/2017	1	70	31.1	NR	39.8
9/19/2017	1	60	37.0	NR	47.1
10/5/2017	1	80	33.7	NR	41.8
10/9/2017	1	80	39.5	NR	48.6
10/31/2017	1	80	34.4	80	51.1
11/15/2017	1	80	35.2	NR	50.6
12/1/2017	1	80	39.2	90	51.2
12/5/2017	1	70	42.7	NR	52.5
12/12/2017	1	80	35.7	80	48.4
1/25/2018	1	80	36.1	NR	46.6
1/29/2018	1	80	39.5	90	50.9
2/15/2018	1	80	44.6	90	52.4
2/27/2018	1	70	43.4	90	55.4
3/9/2018	1	80	45.8	90	54.2
3/27/2018	1	80	44.1	90	55.9
4/3/2018	1	80	42.6	90	57.7
4/18/2018	1	70	45.9	70	59.1

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.

NR: No reading because of water in
line

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

Date	6/6/2017	8/1/2017	10/9/2017	12/5/2017	1/29/2018	4/3/2018
Blowers	1	1	1	1	1	1
Sparge	Y	Y	Y	Y	Y	Y
VMP1A	7.2	14.2	10.7	13.8	14.1	12.2
VMP1B	7.1	14.4	11.8	13.2	13.8	12.0
VMP2A	7.2	16.1	16.0	14.8	16.2	15.4
VMP2B	7.9	16.6	16.3	14.4	16.3	16.1
VMP3A	8.8	19.7	19.5	18.3	11.1	18.3
VMP3B	6.0	18.8	18.0	18.6	19.5	18.3
VMP4A	12.4	25.0	25.1	29.2	22.9	26.0
VMP4B	9.6	23.1	22.9	20.2	22.1	22.7
VMP5A	NM	18.4	18.9	18.4	20.1	19.1
VMP5B	13.8	21.3	18.9	20.0	21.0	20.0
VMP6A	13.4	19.2	23.1	21.7	20.7	21.3
VMP6B	13.8	19.7	NM	21.7	20.6	21.1
VMP7A	14.4	21.4	23.8	21.5	17.5	19.8
VMP7B	14.4	21.0	22.1	20.8	21.8	22.2
VMP8A	7.1	21.4	20.9	21.7	19.8	32.6
VMP8B	7.3	21.7	21.7	22.0	19.7	32.8
VMP9A	17.7	22.7	22.8	24.9	22.1	36.8
VMP9B	17.7	23.6	22.8	24.8	22.0	36.8
VMP10A	13.8	22.7	24.5	21.8	21.1	24.4
VMP10B	13.8	22.5	23.1	NM	24.0	28.3

Notes:

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

NM: No measurement

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

Date	Blowers	Sparge	SVE-1	SVE-2	SVE-3	SVE-4	SVE-5	SVE-6	SVE-7	SVE-8	SVE-9	SVE-10	SVE-11	SVE-12	Effluent
6/7/2017	1	Y	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	NM	0.0	0.0	0.0
8/2/2017	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
10/10/2017	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
12/5/2017	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
1/29/2018	1	Y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NM	NM	0.0	0.0	0.0
4/3/2018	1	Y	0.0	0.0	0.0	0.0	0.0	NM	0.0	0.0	NM	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

Y: Sparge system was operating during measurements.

NM: No measurements at SVE-10 because of water in piping.

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

Date	6/6/2017	8/1/2017	10/9/2017	12/5/2017	1/29/2018	4/3/2018
Blowers	1	1	1	1	1	1
Sparge	Y	Y	Y	Y	Y	Y
VMP1A	0.1	0.0	0.0	0.2	0.0	0.0
VMP1B	0.2	0.0	0.1	0.0	0.0	0.0
VMP2A	0.4	0.0	0.0	0.0	0.0	0.0
VMP2B	0.4	0.0	0.0	0.3	0.1	0.0
VMP3A	0.0	0.0	0.0	0.0	0.0	0.0
VMP3B	0.0	0.0	0.0	0.0	0.0	0.0
VMP4A	0.0	0.0	0.0	0.0	0.0	0.0
VMP4B	0.0	0.0	0.0	0.0	0.0	0.0
VMP5A	0.0	0.0	0.2	0.0	0.0	NM
VMP5B	0.6	0.7	0.4	0.0	0.0	0.0
VMP6A	0.1	0.0	0.0	0.0	0.2	0.0
VMP6B	0.1	0.0	0.0	0.0	0.0	0.0
VMP7A	0.0	0.1	0.2	0.2	0.0	0.0
VMP7B	0.1	0.0	0.0	0.0	NM	0.0
VMP8A	0.1	0.0	0.1	0.0	0.0	0.0
VMP8B	0.1	0.0	0.0	0.0	0.0	0.0
VMP9A	0.3	0.0	0.0	0.0	0.0	4.5
VMP9B	0.3	0.0	0.0	0.0	0.0	0.7
VMP10A	0.0	2.4	0.0	0.0	0.0	0.6
VMP10B	0.0	0.6	0.0	NM	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

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

	SampleID	ODSVE-EFF-Y7Q1	ODSVE-EFF-Y7Q2	ODSVE-EFF-Y7Q2A	ODSVE-EFF-Y7Q3	ODSVE-EFF-Y7Q4
	Lab ID	P1702819-001	P1703804-001	P1705134-001	P1706191-001	P1801754-001
	Date	7-Jun-17	2-Aug-17	10-Oct-17	5-Dec-17	3-Apr-18
Primary CVOCs	Units					
1,1,2,2-Tetrachloroethane	ppbv	0.71	0.54	0.6	0.66	0.48
1,1,2-Trichloroethane	ppbv	0.13 U	0.12 U	0.12 U	0.11 U	0.12 U
1,1-Dichloroethene	ppbv	1.1	1.1	1.2	0.97	0.91
1,2-Dichloroethane	ppbv	0.17 U	0.16 U	0.16 U	0.15 U	0.4
Chloroform	ppbv	4.8	4.5	6.5	5	5.1
Carbon Tetrachloride	ppbv	0.34	0.36	0.49	0.39	0.4
cis-1,2-Dichloroethene	ppbv	24	22	35	26	25
Methylene Chloride	ppbv	0.20 U	0.19 U	0.32	0.081 J	0.38
Tetrachloroethene	ppbv	2.5	2.7	2.6	2.3	2.2
trans-1,2-Dichloroethene	ppbv	0.34	0.34	0.56	0.38	0.34
Trichloroethene	ppbv	26	25	27	18	23
Vinyl Chloride	ppbv	0.092 J	0.25 U	0.091 J	0.23 U	0.25 U
Total Primary CVOCs	ppbv	59.9	56.5	74.4	53.8	58.2
Other VOCs						
1,1,1-Trichloroethane	ppbv	0.35	0.37	0.41	0.39	0.34
1,1,2-Trichlorotrifluoroethane	ppbv	3.6	4.2	4.6	3.5	2.4
1,1-Dichloroethane	ppbv	0.52	0.48	0.56	0.4	0.44
1,2,4-Trimethylbenzene	ppbv	0.42	0.13 U	0.042 J	0.12 U	0.14
1,3,5-Trimethylbenzene	ppbv	0.2	0.13 U	0.13 U	0.12 U	0.06 J
2-Butanone (MEK) ¹	ppbv	42	0.2 J	0.59 J	0.77 J	0.89 J
2-Propanol (Isopropyl Alcohol) ¹	ppbv	60	2.6 U	0.26 J	2.4 U	1.3 J
Acetone ^{1,2}	ppbv	9.9	2.7 U	5.4	2.5 U	11
Benzene	ppbv	0.22 U	0.2 U	0.11 J	0.19 U	0.22
Bromodichloromethane	ppbv	0.14	0.16	0.17	0.21	0.067 J
Carbon Disulfide	ppbv	0.17 J	2.1 U	1.2 J	2.9	1.7 J
Cyclohexane	ppbv	0.15 J	0.15 J	0.37 U	1.7	2.3
Dichlorodifluoromethane (CFC 12)	ppbv	1.1	0.92	0.87	0.67	0.62
Ethanol	ppbv	1.3 J	3.4 U	3.1 J	0.62 J	6.2
Ethyl Acetate ²	ppbv	0.38 U	0.36 U	1.2	0.33 U	26
Ethylbenzene	ppbv	0.16 U	0.15 U	0.053 J	0.14 U	0.17
m,p-Xylenes	ppbv	0.46	0.3 U	0.2 J	0.28 U	0.61
n-Butyl Acetate	ppbv	0.15 U	0.14 U	0.054 J	0.13 U	0.92
n-Heptane	ppbv	0.17 U	0.17	0.16 U	0.12 J	0.38
n-Hexane	ppbv	0.065 J	0.71	0.1 J	0.98	0.55
o-Xylene	ppbv	0.16 U	0.15 U	0.079 J	0.14 U	0.22
Propene ¹	ppbv	19	0.37 U	0.33 J	0.36	1.2
Styrene	ppbv	0.16 U	0.15 U	0.046 J	0.14 U	0.18
Toluene	ppbv	0.18 U	0.17 U	0.36	0.16 U	1.9
Trichlorofluoromethane	ppbv	0.26	0.26	0.4	0.33	0.29
Vinyl Acetate	ppbv	2.9	1.8 U	1.1 J	1.7 U	1.8 U
Total VOCs		69.8	63.8	89.4	65.2	77.3

DQE Flags:

U: Analyte not detected above RL

J: Estimated

1) Anomalous concentrations of 2-butanone, 2-propanol, acetone and propene in the June 2017 sample were not included in the Total VOCs calculation.

2) Anomalous concentrations of acetone and ethyl acetate in the April 2018 sample were not included in the Total VOCs calculation.

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

Start Date	End Date	Hours Operating Between Dates	Average Flow Rate (scfm)	Laboratory Total VOC Effluent Concentration (ppbv)	Average Effluent VOC Concentration (ppbv)	Effluent 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	38.1	37.1	0.0006	0.6	75.8
6/30/2012	9/30/2012	1124	612	42.8	40.5	0.0005	0.6	76.4
9/30/2012	12/31/2012	1061	628	38.5	40.7	0.0005	0.6	76.9
12/31/2012	3/31/2013	1070	628	46.7	42.6	0.0006	0.6	77.5
3/31/2013	6/30/2013	1070	760	54.5	50.6	0.0008	0.9	78.4
6/30/2013	9/30/2013	730	662	49.2	51.9	0.0007	0.5	78.9
9/30/2013	12/31/2013	1104	763	53.2	51.2	0.0008	0.9	79.8
12/31/2013	3/30/2014	465	810	-	53.2	0.0009	0.4	80.2
3/6/2015	6/30/2015	525	615	86.2	86.2	0.0011	0.6	80.8
6/30/2015	9/30/2015	667	555	65.9	76.1	0.0009	0.6	81.4
9/30/2015	12/31/2015	507	566	72.2	69.1	0.0008	0.4	81.8
12/31/2015	7/31/2016	518	565	75.1	73.7	0.0009	0.4	82.3
7/31/2016	11/30/2016	540	574	82.4	78.8	0.0009	0.5	82.8
11/30/2016	2/28/2017	442	598	77.7	80.1	0.0010	0.4	83.2
2/28/2017	5/5/2017	292	595	78.3	78.0	0.0010	0.3	83.5
5/5/2017	7/31/2017	349	582	69.8	74.1	0.0009	0.3	83.8
7/31/2017	10/31/2017	555	558	89.4	79.6	0.0009	0.5	84.3
10/31/2017	1/31/2018	329	584	65.2	77.3	0.0009	0.3	84.6
1/31/2018	4/30/2018	715	574	77.3	71.3	0.0009	0.6	85.2

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 SEVEN
 Defense Depot Memphis, Tennessee

Date	TeCA Concentration (µg/L)					
	TC: 2.2 µg/L			MCL: NA		
	MW-54	MW-150	MW-159	MW-165	MW-243	MW-246
Oct 2014	2.5	0.8	13.7	0.7	2.6	9.6
Apr 2015	2.2	1.8	11.7	0.4	1.7	5.4
Oct 2015	1.1	3.1	15.7	0.5	1.3	3.3
Apr 2016	<0.5	<0.5	4.2	0.2 J	1.3	0.4 J
Oct 2016	<0.5	<0.5	9.9	<0.5	1.2	4.3
Apr 2017	0.4	0.2	10.1	<0.5	1.7	4.8
Oct 2017	-	2.6	8.4	<0.5	-	3.6
Apr 2018	0.5	1.0	6.4	<0.5	1.3	3.8

Date	TCE Concentration (µg/L)					
	TC: 5 µg/L			MCL: 5 µg/L		
	MW-54	MW-150	MW-159	MW-165	MW-243	MW-246
Oct 2014	10.0	2.3	216	6.3	5.0	28.5
Apr 2015	10.4	7.4	198	6.2	1.7	1.0
Oct 2015	5.3	9.5	227	3.6	1.5	0.7
Apr 2016	<1.0	<1.0	38.4	1.9	2.6	3.6
Oct 2016	<1.0	<1.0	171	1.1	2.4	0.4 J
Apr 2017	1.7	0.9	141	1.2	3.2	0.8
Oct 2017	-	7.7	146	1.0	-	0.6
Apr 2018	2.6	3.1	106	0.9 J	3.4	1.7

Notes:

MCL: Maximum Contaminant Level

TC: Target Concentration

NA: not applicable

µg/L: micrograms per liter

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



Figures



Figure 1

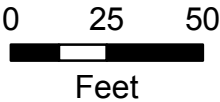
AS/SVE System

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

Defense Depot
Memphis, Tennessee

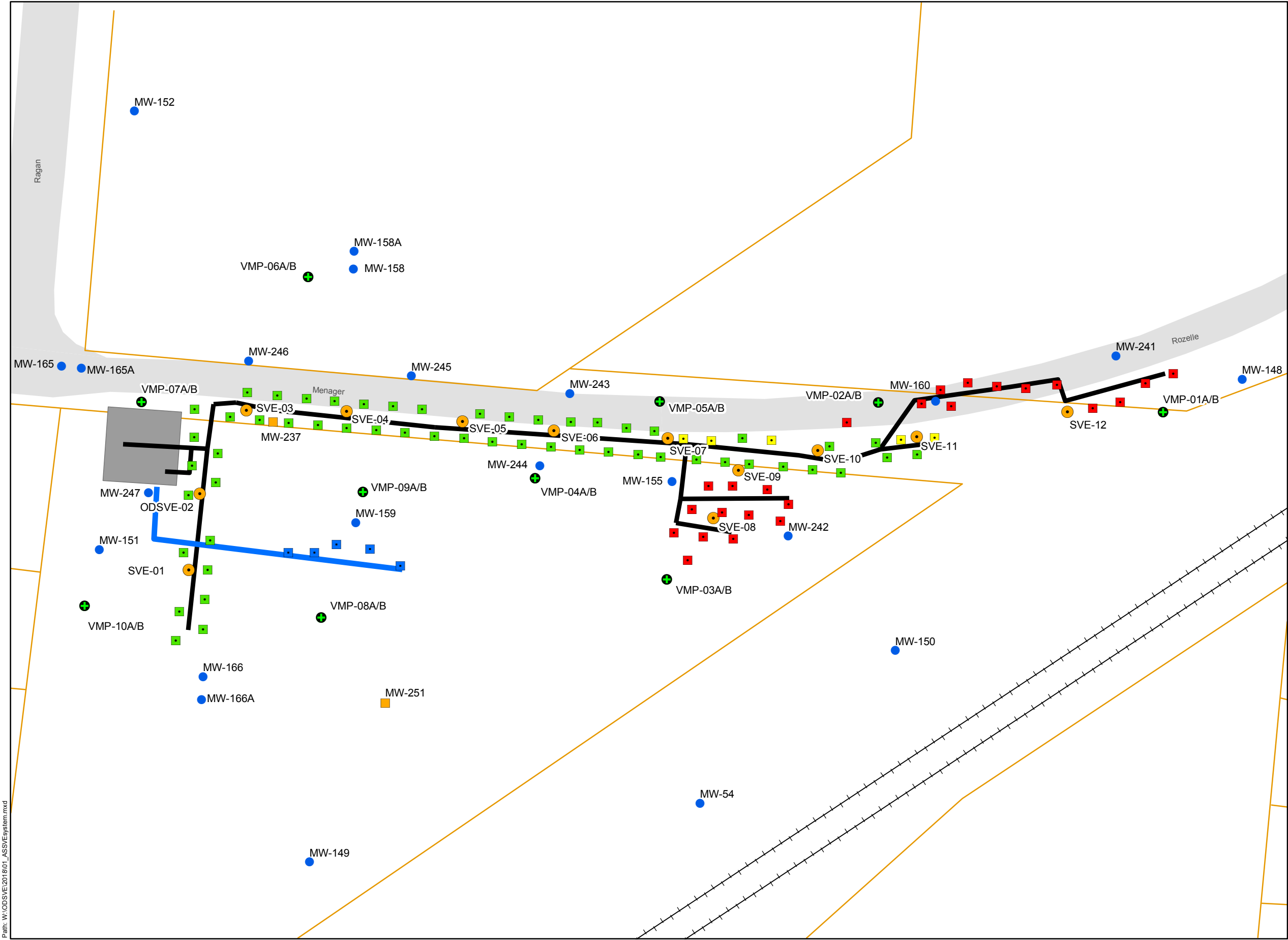
Legend

- 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: 10/29/2018
Edition: Rev 0



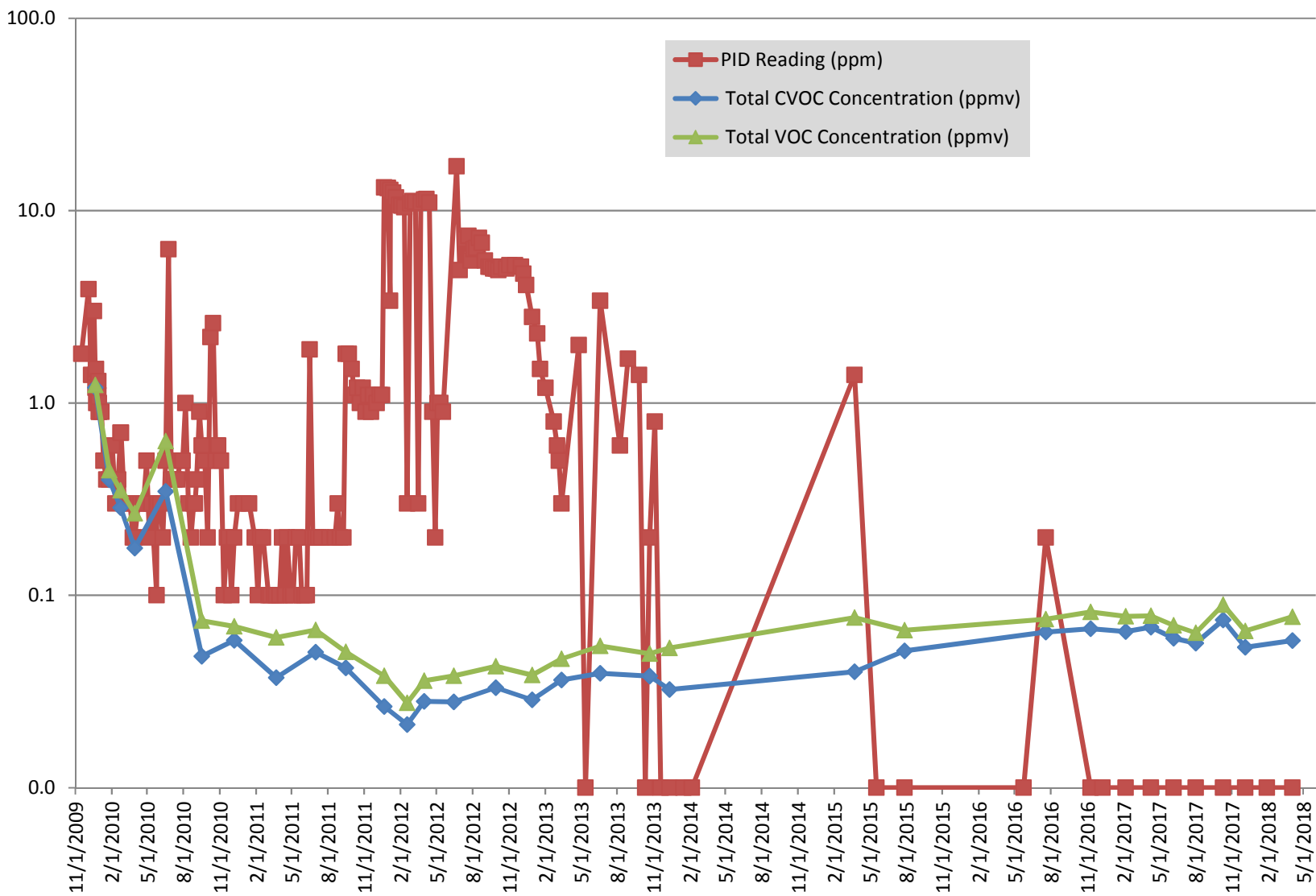


Figure 2
EFFLUENT CONCENTRATION TREND - ANALYTICAL RESULTS AND FIELD PID MEASUREMENTS
OFF DEPOT AS-SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SEVEN
Defense Depot Memphis, Tennessee

Path: W:\ODS\VE\2018\03_DE_TCE_Apr_2018.mxd

Notes:
1. Color-coded wells symbols are based on the most recent analytical result at each well. Results are from the April 2017 and April 2018 LTM events. Only TCE concentrations from the April 2018 LTM event are shown below the well ID.
2. Highest concentration at well pairs used for contour.
3. Groundwater contours are from the April 2018 LTM event.



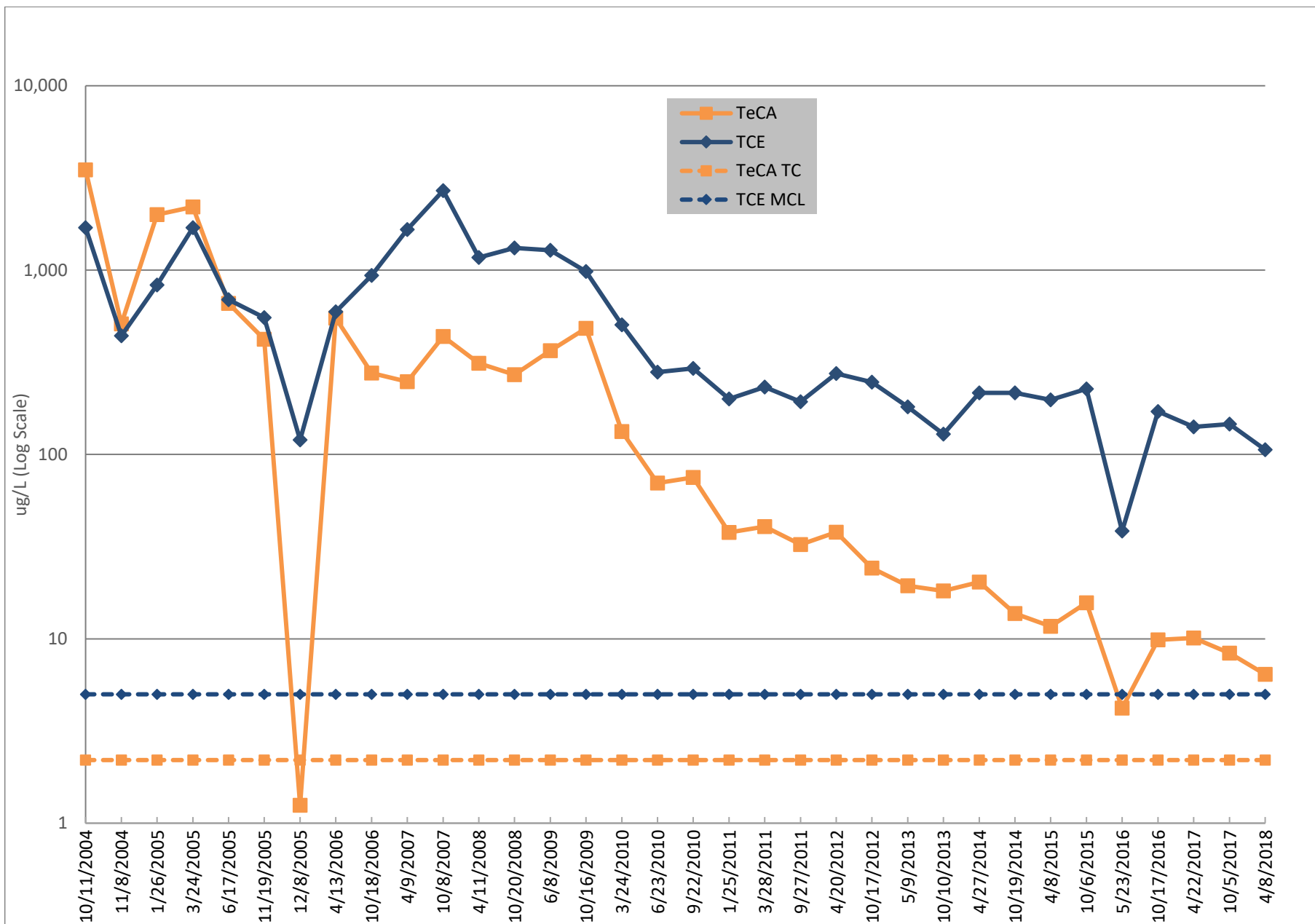
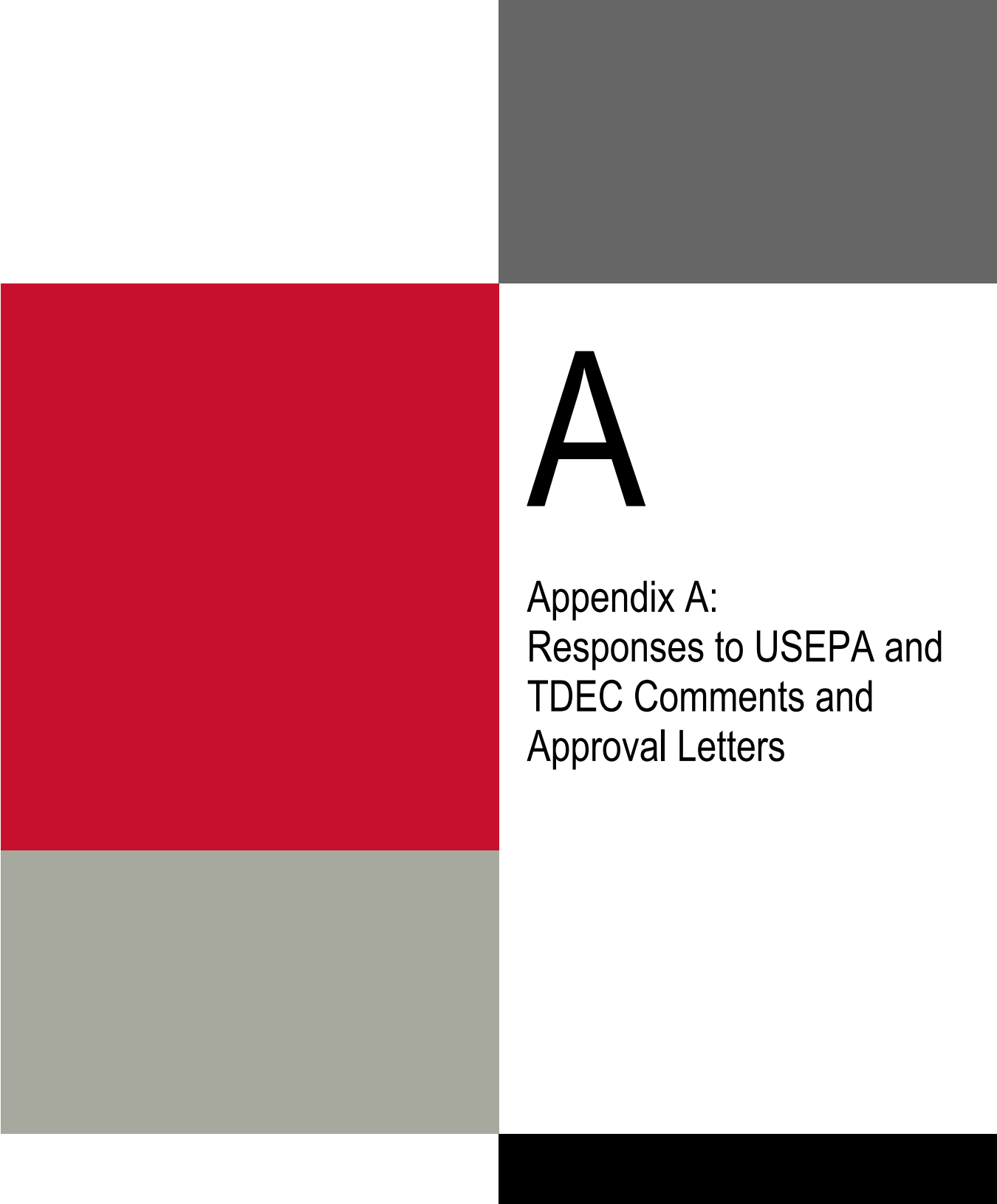


Figure 4
TeCA AND TCE CONCENTRATION TRENDS AT MW-159
OFF DEPOT AS-SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SEVEN
Defense Depot Memphis, Tennessee



A

Appendix A:
Responses to USEPA and
TDEC Comments and
Approval Letters



STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
Division of Remediation
Memphis Environmental Field Office
8383 Wolf Lake Drive
Bartlett, TN 38133-4119

October 19, 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: Off-Depot Air Sparge/Soil Vapor Extraction System Annual Operations
Report, Year Seven - Revision 0, September 2018
Dunn Field - Defense Depot Memphis, Tennessee
TDoR ID # 79-736**

Mr. Foster,

TDEC-DoR has reviewed the **Off-Depot Air Sparge/Soil Vapor Extraction System Annual Operations Y7 Report (Rev 0)**, as submitted by Trinity Analysis & Development, and approves the document. If there are questions or concerns, please contact me at (901) 371-3041 or at jamie.woods@tn.gov.

Regards,

A handwritten signature in blue ink, appearing to read "J A Woods".

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

cc: T. Calhoun (Trinity A&D)
D. Lloyd (EPA-PM)
Joan Hutton (CALIBRE)
TDoR NCO: file 79-736
TDoR MEFO: file 79-736



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

November 29, 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 Response to U.S. EPA Comments for the Defense Depot of Memphis, Tennessee Off Depot Air Sparge-Soil Vapor Extraction System Annual Operations Report, Year 7 Report for Dunn Field, Revision 0, dated September 2018.

US EPA approves the above mentioned report with the response to EPA comment revisions. 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 positioned above the typed name.

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 Extraction System Annual Operations Report
Year Seven (May 2017 to May 2018), Dunn Field, Revision 0
Defense Depot Memphis, Tennessee
Dated September 2018
Comments Received 28 October 2018**

EPA Comments:

1. **Section I, Introduction, Page 1-1:** In the last sentence in paragraph one, the text states that “The report covers operations from 1 May 2017 through 30 April 2018.” The text in Section 4.1, System Operations on Page 4-1 also indicates Year Seven occurred from 1 May 2017 through 30 April 2018. However, the monitoring period listed in the title of the report indicates the monitoring occurred May 2017 to May 2018, implying that monitoring may have occurred through May of 2018. Additionally, based on the information presented in Table 1, Flow Rate and Vacuum Readings at SVE Wells and Effluent, Off Depot AS-SVE System, Annual Operations Report, Year 7, the annual monitoring began on 4/25/2017. To ensure the Year Seven annual monitoring period is clearly presented, revise the Off Depot Air Sparge/Soil Vapor Extraction System Annual Operations Report, Year Seven (May 2017 to May 2018) Dunn Field, Revision 0, dated September 2018 (Annual Report) to address the above issues by providing consistent information about when the system was operated.

Response: The report title will be revised to list the period as “(May 2017 through April 2018)”. Table 1 will be revised to delete the readings outside the Year Seven monitoring period.

2. **Section 1.3, AS/SVE System Description, Page 1-3:** In the next to last paragraph in this section, the text states that “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 below ground surface (bgs) and the deep (‘A’) VMPs are screened at an average depth of 64 feet bgs.” The vapor monitoring points (VMPs) are depicted in Figure 1 AS/SVE System. However, only the “A” series MVPs are depicted in the figure. For clarity, revise the figure to depict the all the nested “A/B” MVPs.

Response: The VMP IDs on the figure will be revised from “A” to “A/B”. Each VMP pair was constructed using 1-inch diameter schedule 40 PVC in a single 6-inch diameter boring. There is a single survey point for each pair (center point of the well pad).

3. **Section 1.4.3 Groundwater Monitoring, Page 1-4:** The text in the first paragraph states, “Long-term monitoring (LTM) results are used to assess the overall effectiveness of the AS/SVE system. The chlorinated volatile organic compound (CVOC) concentrations in the Off Depot plume have met the treatment goal of 50 micrograms per liter (µg/L) for individual CVOCs [i.e., trichloroethylene (TCE)] in all but one LTM well in the AS/SVE area, MW-159, since October 2012.” The semiannual TCE groundwater results measured in MW-159 from April 2014 through April 2018 are presented in Table 7, Adjacent LTM Wells Exceeding MCLs or TC. Since the CVOC concentrations in groundwater, as provided in LTM reports, are considered the most useful measure of air sparge/soil vapor extraction (AS/SVE) remedy effectiveness as stated in Section 4.2, System Effectiveness, Page 4-1, it is recommended a time-series trend graph be prepared. The changes in TCE concentrations over time in MW-159 can be utilized as an additional line of evidence to assess the effectiveness of the AS/SVE system. Please revise the Annual Report to address this issue.

Response: A time trend plot for TeCA and TCE concentrations in MW-159 will be added as Figure 4 and will be referenced in Section 4.2.

4. **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 CVOCs from groundwater.” Additionally, the text states, “The new AS wells will be installed upon completion of an updated access agreement with 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.” The recommendation to install additional AS wells south

**Responses to Comments from:
U.S. Environmental Protection Agency (EPA) Region 4 on:
Off Depot Air Sparge/Soil Extraction System Annual Operations Report
Year Seven (May 2017 to May 2018), Dunn Field, Revision 0
Defense Depot Memphis, Tennessee
Dated September 2018
Comments Received 28 October 2018**

of MW-159 was first proposed in the Year Five Annual Report dated March 2016. For clarity, please revise the Year Seven Annual Report to include a schedule detailing when the additional AS wells will be installed during Year Eight and please include brief text in the report outlining the progress with respect to MLGW access.

Response: Right of Entry access with MLGW has made limited to no progress since July 2016 and no date of completion can be projected at this time. The Period of Performance for the task order supporting the AS well installation ends 31 December 2018. In discussions with the Army, that task will be allowed to expire while the ROE process continues. Upon receipt of ROE, a new task order will be issued to complete the scope of work, for those reasons, no schedule can be provided.

Text revised as follows:

'The new AS wells will be installed and incorporated into system operations upon completion of an updated access agreement with MLGW. No date for completion of the Right of Entry can be projected at this time. Planning will resume once access is received.'

A decorative graphic consisting of several overlapping rectangles. A large red rectangle is on the left. To its right is a dark gray rectangle. Below the red rectangle is a light gray rectangle. At the bottom right is a black rectangle.

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 901-268-2478	Order	1000300000756
Start (approx.)	Thursday, 10/5/17 / 12:00 AM	Service point	Memphis
Service techn.	Erric Crutcher	Pers.in charge	Sam Coats 877-882-8376

Attachments

Add attachment

Service Contract exist

PM Services (85695509)

CSD 100 - Pkg A

Scheduled with Denise Cooper 901-268-2478 for 10/5 at 11:30am - dlw
9/28/17

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		
11:00 AM	1:00 PM	0 Min	Thursday, 10/5/17	Erric Crutcher		

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%)

Work performed acc. to work plan.

Any outstanding deficiencies?

If yes, these discussed with customer?

☒ Yes ☐ No☒ Yes ☐ No

E-mail service manager(for confirmation)

sam.coats@kaeser.com

Work accepted.

Confirmed work and material of work plan.

Outstanding deficiencies acknowledged.

Customer e-mail(for confirmation)

denise.cooper@hdrinc.com

Service
technician's
signatureKaeser Field
Service:PNDigitally signed by
Kaeser Field Service:PN
Date: 2017.10.05
12:47:36 -05'00'Customer's
signat.Electronically signed by: denise cooper
I am signing this document
Location: Customer Site
Date: 2017.10.05 12:52:07 - UTC-06:00
Digital Signature created with: StepOver PDF Plugin 8.5-463

Remark:

☐ Signature unavailable

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. 4400 Maintain screw compressor**Type** CSD 100 125 psi 460/60 US**Material No.** 100818.1 **Year** 2009**Serial No.** 1234 **EMR** 3498678**Previous service hours**

38,869 h

Current service hours

38,890 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-airend power transmission	ok
☒ -Change filter mat(s) in compressor/control cabinet/SFC cabinet	changed
☒ -Change air filter	changed
☐ -Change oil filter	na
☒ -Maintain valves and proportional regulator	rebuilt
☒ -Check cooler and clean if necessary/check fan blades and guarding	Ok
☐ -Maintain condensate drain	na
☒ -Check hose lines and change as necessary	Need to replace filter adapter
☐ -Check electrical cables and cable inlets	na
☐ -Tighten mains terminals and check for oxidation	na
☐ -Check shutdown function when separator air outlet temp. too high	na
☐ -Check overcurrent relays and motor protection switches	na
☐ -Check door and guard interlocks and emergency stop function	na
☐ -Check oil and change if necessary	na
☐ Check fan motor bearings Re-greased	na
☐ Check compressor motor bearings Re-greased	na
☐ -Check oil sep. cartridge diff. pressure psi, change as needed	na
☐ -Check nominal press. shutdown function, shutdown at psi	na
☐ -Check shutdown function when airend discharge temp. too high	na
☐ -Check control voltage: L1 V	na
☐ -Check power consumption: Line U1 A V1 A W1 A	na
☐ -Check pressure relief valve(s)	na
☐ -Check airend discharge temperature °F	na
☒ -Test run, check conditions: start, idle, load and shut-down	tested
☒ -Check oil level, for leaks (compr.air./oil/water), idling press.	checked
☐ -Register service: stick label/service manual/controller	
Total h 38890 Load h 17362 Ambient temp. na °F	
Oil type M-460 Control mode duel	
Existing safety deficiencies? No X Yes:	Broken air filter canister
Cause(s):	unknown
Arising danger:	none

Work to be done		Comment
☐	Safety deficiency rectified? Yes ☒ No; reason:	need part.
☐	>>>> Equipment not released for use!	
☐	Rectified deficiencies:	
☐	Tasks fully completed	
☒	Follow-up assignment necessary for:	Replace air filter canister and adapter.
☐	Follow-up order issued for:	Next week.
☐	Supply spares:	
☐		
Additional comments:		

Consumed materialMateria No.PcSerial No.Part ID/batchStore

<u>Material delivered in advance</u>	<u>Material No.</u>	<u>Pc</u>	<u>Serial No.</u>	<u>Return</u>	<u>Returned by</u>
Filter mat 112x112x12	6.3572.0	2		0	☐ Tech. ☐ Customer
Air filter cartridge Ø420x130	6.4148.0	1		0	☐ Tech. ☐ Customer
Maintenance kit Com.aux.vi	400905.0	2		0	☐ Tech. ☐ Customer
Oil Analysis Kit (red)	ANKCPIND2BR	1		0	☐ Tech. ☐ Customer
					☐ Tech. ☐ Customer

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	Thomas Holmes
Start (approx.)	Tuesday, 12/19/17 / 12:00 AM	Service point	Memphis
Service techn.	Ryan Whitby	Pers.in charge	Sam Coats 877-882-8376

Attachments

Add attachment

Periodical maintenance

Contract No: Maintenance agreement-sign
Maintenance Contract

Major PM x2 EB 420 C Blower; Eco31 Service Unit on Refrig Dryer TE 141
Inclgd Inline Filtration; Minor CSD 100

Scheduled with Thomas Holmes 404-295-3279 for 12/19 - dlw 12/12/17

788938917885, 788938924718, 788940867957 Delv 12/18 @ 12:23 pm Signed

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
8:30 AM	12:00 PM	0 Min	Tuesday, 12/19/17	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: 2017.12.19
11:54:16 -06'00'Customer's
signature
Electronically signed by Thomas K. Cooper
Date: 2017/12/19 - 11:55:32 - UTC-06:00
Digital Signature created with: StepOver PDF Plugin 6-S-463☐ Signature unavailable

Remark:

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. 0040 **Maintain screw compressor - package A** 16.0
Type CSD 100 125 psi 460/60 US **1005559041**
Material No. 100818.1 **Year** **2009**
Serial No. 1234 **EMR** **3498678**

Previous service hours 39,158 h **Current service hours** 39,159 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-arend coupling	N/A
☐ -Change filter mat(s) in compressor/control cabinet/SFC cabinet	N/A
☐ -Change air filter	N/A
☐ -Check oil filter and change if necessary	N/A
☐ -Check cooler and clean if necessary/check fan blades and guarding	N/A
☐ -Maintain condensate drain	N/A
☐ -Check electrical cables and cable inlets	N/A
☐ -Tighten mains terminals and check for oxidation	N/A
☐ -Check shutdown function when separator air outlet temp. too high	N/A
☐ -Check overcurrent relays and motor protection switches	N/A
☐ -Check door and guard interlocks and emergency stop function	N/A
☐ -Check oil and change if necessary	N/A
☐ -Check oil separator cartridge difference pressure psi/bar,	N/A
change as needed	
☐ Check fan motor bearings ☐ Re-greased	N/A
☐ Check compressor motor bearings ☐ Re-greased	N/A
☐ -Check nominal pressure shutdown function,	N/A
shutdown at psi/bar	
☐ -Check shutdown function when arend discharge temp. too high	N/A
☐ -Check control voltage: L1 V	N/A
☐ -Check power consumption: Line U1 A V1 A W1 A	N/A
☐ -Check pressure relief valve(s)	N/A
☐ -Check arend discharge temperature °F/°C	N/A
☐ -Test run, check conditions: start, idle, load and shut-down	N/A
☐ -Check oil level, for leaks (compr.air./oil/water), idling press.	N/A
☐ -Register service: stick label/service manual/controller	N/A
Total h Load h Ambient temp. °F/°C	
Oil type Control mode	
Existing safety deficiencies? ☐ No ☐ Yes:	
Cause(s):	
Arising danger:	

Work to be done	Comment
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:	
No work was performed on this compressor.	

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

<u>Material delivered in advance</u>	<u>Material No.</u>	<u>Pc</u>	<u>Serial No.</u>	<u>Return</u>	<u>Returned by</u>
Filter mat 112x112x10	6.3572.0	2		2	☒ Tech. ☐ Customer
Oil filter 16bar	6.3465.0	1		1	☒ Tech. ☐ Customer
Air filter cartridge Ø420x130	6.4148.0	1		1	☒ Tech. ☐ Customer
Oil Separator cartridge cpl.	6.3623.0	1		1	☒ Tech. ☐ Customer
Oil Analysis Kit (red)	ANKCPIND2BR	1		1	☒ Tech. ☐ Customer ☐ Tech. ☐ Customer

Oper. 0070 **Maintain blower - package B** 4.0
Type EB 420 C VAC 40,0 hp 2.460 rpm **1005559293**
Material No. EBC **Year** 2009
Serial No. 2138 **EMR** 3605958

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 127.5 V	Ok
☐ -Check power consumption: Line U1 A V1 A W1 A	N/A
☐ -Check overheating shutdown function (option)	N/A
☒ -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: SB-220	
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 blower following LoTo procedures. Drained the oil and refilled with SB-220 blower oil. Replaced the air filter. Replaced the v-belts and ensured proper tension. Checked the blower for oil leaks. No leaks detected. Restarted the blower. Blower operating correctly with no problems at this time.		

Consumed materialMaterial No.PcSerial No.Part ID/batchStock

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
Narrow V-belt set (5pcs)XPZ 2C	893437.0	1		0	Tech. Customer

Oper. 0100 **Maintain blower - package B** 4.0
Type EB 420 C VAC 40,0 hp 2.460 rpm **1005559308**
Material No. EBC **Year** 2009
Serial No. 2140 **EMR** 3605982

Previous service hours

3 h

Current service hours

4 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 125.3 V	Ok
☐ -Check power consumption: Line U1 A V1 A W1 A	N/A
☐ -Check overheating shutdown function (option)	N/A
☒ -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: SB-220	
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 blower following LoTo procedures. Drained the oil and refilled with SB-220 blower oil. Replaced the air filter. Replaced the v-belts and ensured proper tension. Checked the blower for oil leaks. No leaks detected. Restarted the blower. Blower operating correctly with no problems at this time.		

Consumed materialMaterial No.PcSerial No.Part ID/batchStock

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

Oper. 0110 **Maintain refrigeration dryer** 2.0
Type Refrig. dryer TE 141 460/3/60 **1005558849**
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
☒ -Check 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 safety shutdown, switch-point °F/°C 230 psi/bar	Ok
☐ -Check compressed air temp.: Inlet °F/°C Outlet °F/°C	N/A
☒ -Check dew point: ☐ blue ☒ green ☐ red °F/°C	Ok
☒ -Check refrigerant circuit for leaks	Ok
Refilled/disposed refrigerant quantity: / kg/lb	
Refrigerant type and total quantity*: R-134a / kg/lb	
☒ -Check setting and function of the compressed air bypass/diversion	Ok
☒ -Test run	Ok
☒ -Register service: stick label/service manual/controller	Ok
Refrigerant type R-134a Ambient temperature 45 °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:

Isolated the ECO-drain from the compressed air network. Replaced the service unit for the ECO-drain. Reinstalled the ECO-drain and returned to the compressed air network. Tested the ECO-drain and checked for water/air leaks. No leaks detected. Monitored the dryer for proper operation. 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>	
Kaeser Eco-Drain 31 Service U	AN8247400370	1		0	☐ Tech. ☐ Customer ☐ Tech. ☐ Customer	

Oper. 0120 **Maintain oil-water sep. - package A** 0.5
Type KCF-100 Condensate Treatment System **1005558851**
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:	
Replaced the KCF-100 filter. Cleaned the KCF and charged the filter with water. Checked the KCF for leaks. No leaks detected. KCF-100 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-SET Aquamat KCF100 ANKCF100CAR` 1 0

☐ Tech.
☐ Customer
☐ Tech.
☐ Customer

Oper. 0130 **Maintain compr. air filter - package A** 1.0
Type Oil Removal KOR-485.2 **1005558852**
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)	Ok
☒ -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	N/A
☒ -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:	
Replaced the KOR element. Cleaned the filter housing. Reinstalled the KOR filter. Checked the filter for fluid/air leaks. No leaks detected. 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
Std 485 KOR Element (RED)	USOR-485	1		0	☐ Tech. ☐ Customer
Internal Automatic Drain	US4170-08	1		1	☒ 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.		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	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	
KFS-485		2009					+
AMD 1550						KFS	-
AMD 1550						KOR	+
AMS 1550						KPF	-

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 901-268-2478	Order	Thomas Holmes
Start (approx.)	Tuesday, 5/1/18 / 12:00 AM	Service point	Memphis
Service techn.	Ryan Whitby	Pers.in charge	Sam Coats 877-882-8376

Attachments

Add attachment

Periodical maintenance

Contract No: Maintenance agreement-sign
 Maintenance Contract

CSD 100 (Pkg A); EB 420 C VAC x2 (Pkg B)

Scheduled for Denise Cooper 901-268-2478 for 5/1 at 9AM - dlw 4/16/18

780570947087 Delv 04/20 @ 11:29 am Signed for by: ECRUTHER 04/20 ksh
 (1) 6.4148.0 shipped separately? 04/17 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
9:15 AM	11:30 AM	0 Min	Tuesday, 5/1/18	Ryan Whitby
9:15 AM	11:30 AM	0 Min	Tuesday, 5/1/18	Erric Crutcher

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

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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)

denise.cooper@hdrinc.com

Service
technician's
signatureKaeser Field
Service:PNDigitally signed by
Kaeser Field Service:PN
Date: 2018.05.01
11:33:01 -05'00'Customer's
signature
Electronically signed by Denise K. Cooper
Date: 2018/05/01 - 11:33:40 - UTC-06:00
Digital Signature created with: StepOver PDF Plugin 6-5-463☐ Signature unavailable

Remark:

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Oper. 0010 **Maintain screw compressor - package A** 1.5
Type CSD 100 125 psi 460/60 US **1005946304**
Material No. 100818.1 **Year** **2009**
Serial No. 1234 **EMR** **3498678**

Previous service hours 40,745 h **Current service hours** 41,515 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 fan motor bearings ☐ Re-greased	Ok
☒ Check compressor motor bearings ☒ Re-greased	Ok
☒ -Check nominal pressure shutdown function,	Ok
shutdown at 145 psi/bar	
☒ -Check shutdown function when airend discharge temp. too high	Ok
☒ -Check control voltage: L1 123.3 V	Ok
☒ -Check power consumption: Line U1 142.4 A V1 143.5 A W1 143.2 A	Ok
☒ -Check pressure relief valve(s)	Ok
☒ -Check airend discharge temperature 179 °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 41515 Load h 18160 Ambient temp. 80 °F/°C	
Oil type M-460 Control mode Dual	
Existing safety deficiencies? ☒ No ☐ Yes:	
Cause(s):	
Arising danger:	

Work to be done		Comment
☐	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. Shutdown the compressor following LoTo procedures. Replaced the air filter and the oil filter. Replaced the electrical cabinet air filters. Inspected the drive coupling. Greased the compressor motor bearings. Topped off the compressor with customer stock M-460 oil. Inspected the compressor for oil/air leaks. No leaks detected. Reset the maintenance timers on the controller. Compressor is 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>
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 (red)	ANKCPIND2BR	1		0	☐ Tech. ☐ Customer

Oper. 0020 **Maintain blower - package A** 1.0
Type EB 420 C VAC 40,0 hp 2.460 rpm **1005946608**
Material No. EBC **Year** 2009
Serial No. 2138 **EMR** 3605958

Previous service hours

2 h

Current service hours

3 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	N/A
☐ -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 blower following LoTo procedures. Drained the oil and refilled with SB-220 oil. Replaced the air filter. Inspected the belts for wear and ensured proper tension. Cleaned the blower and inspected for leaks. No leaks detected. Blower is 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 non-woven DN150	893606.0	1		0	Tech. Customer
Omega Blower 220 Synthetic C	ANSB-220	2		0	Tech. Customer
Oil Analysis Kit (red)	ANKCPIND2BR	1		0	Tech. Customer

Oper. 0030 **Maintain blower - package A** 1.0
Type EB 420 C VAC 40,0 hp 2.460 rpm **1005946607**
Material No. EBC **Year** 2009
Serial No. 2140 **EMR** 3605982

Previous service hours

4 h

Current service hours

5 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	N/A
☐ -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 blower following LoTo procedures. Drained the oil and refilled with SB-220 oil. Replaced the air filter. Inspected the belts for wear and ensured proper tension. Cleaned the blower and inspected for leaks. No leaks detected. Blower is 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 non-woven DN150	893606.0	1		0	☐ Tech. ☐ Customer
Omega Blower 220 Synthetic C	ANSB-220	2		0	☐ Tech. ☐ Customer
Oil Analysis Kit (red)	ANKCPIND2BR	1		0	☐ Tech. ☐ Customer
					☐ Tech. ☐ Customer

Oper. 0050 **Maintain refrigeration dryer** 2.0
Type Refrig. dryer TE 141 460/3/60 **1005946248**
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 260 psi/bar low 230 psi/bar	Ok
☒ -Check compressed air temp.: Inlet 84 °F/°C Outlet 77 °F/°C	Ok
☒ -Check dew point: ☐ blue ☒ green ☐ red °F/°C	Ok
Refilled/disposed refrigerant quantity: / kg/lb	
Refrigerant type and total quantity*: R-134a / 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 R-134a Ambient temperature 80 °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:	
Inspected the dryer. Dryer is 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 **1005946606**
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:	
Inspected the KCF-100. KCF-100 is 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	1005946249
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	N/A
☒ -Check pressure differential indicator (option)	Ok
☐ -Check optional shutdown function, only with user's permission	N/A
☒ -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:	
Inspected the KOR filter. KOR filter is 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. 0090 **Maintain filter - package A** 1.0
Type Separator - KFS-485.2 AMD 1550 **1005945971**
Material No. USKFS485.2 **Year**
Serial No. **** **EMR** **6348333**

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 filter element(s)	Ok
☒ -Check / maintain condensate drain	Ok
☐ -Check optional shutdown function, only with user's permission	N/A
☒ -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:	
Inspected the KFS air filter. KFS air filter is 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

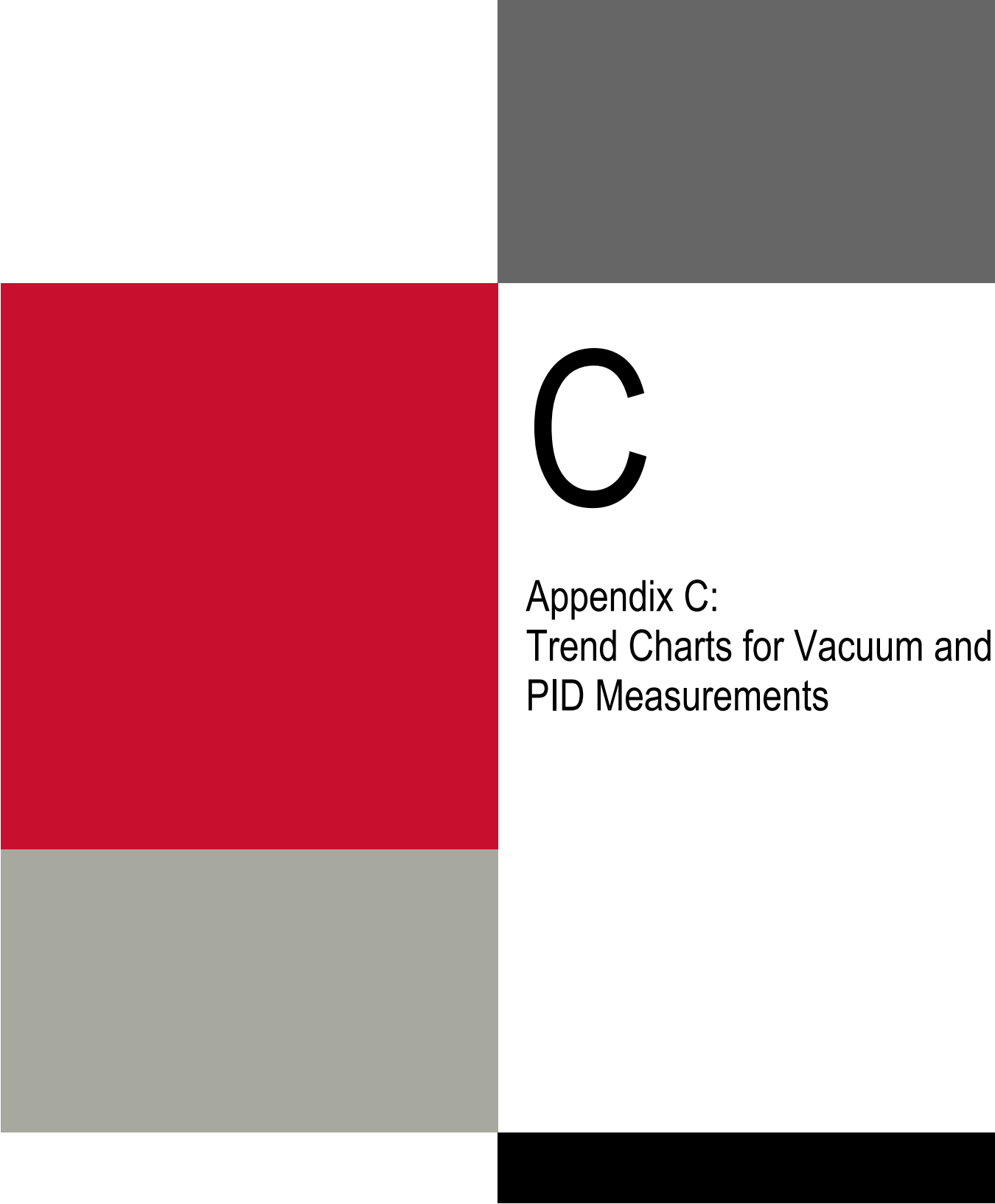
Registered machines

- 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 w/ AMD 6550		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.		-
Separator - KFS-485.2 AMD 1550		2018	USKFS485.2	20150824	-----		-
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	
							+
							-

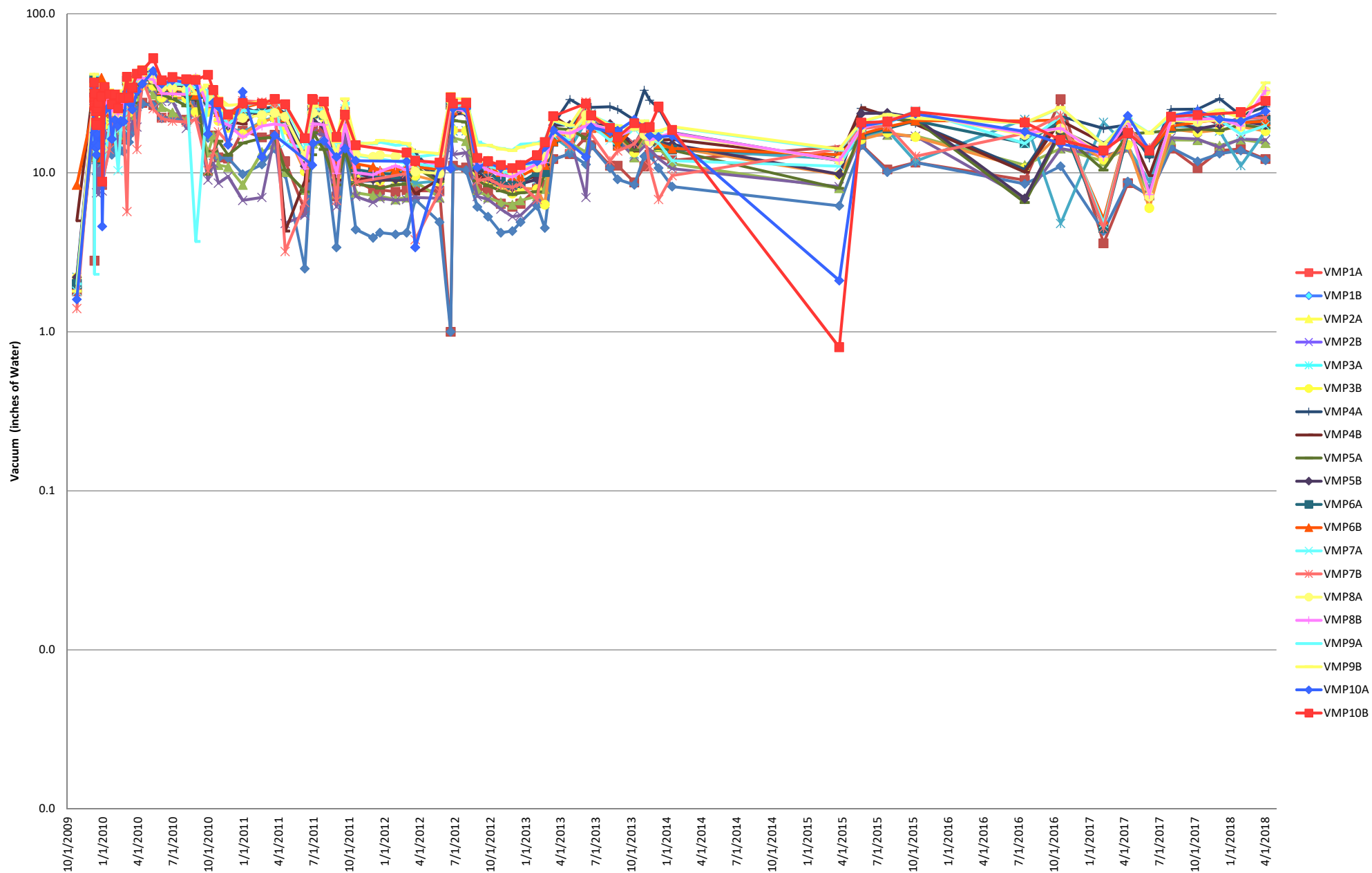
A decorative graphic on the left side of the page consists of four overlapping rectangles: a large red one in the middle, a grey one above it, a grey one below it, and a black one at the bottom right.

C

Appendix C:
Trend Charts for Vacuum and
PID Measurements

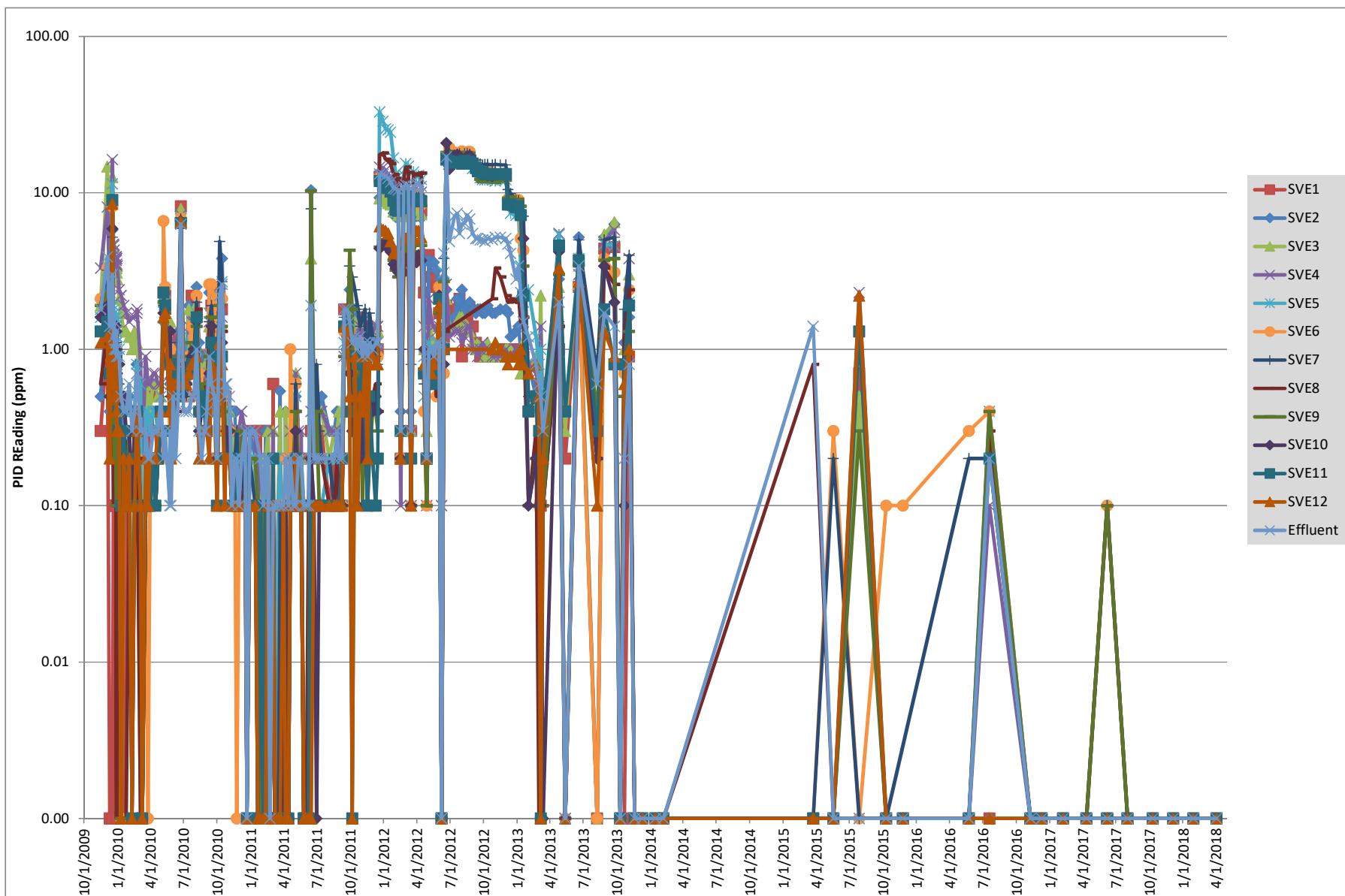


Appendix C-1: VMP Trends – Vacuum Readings

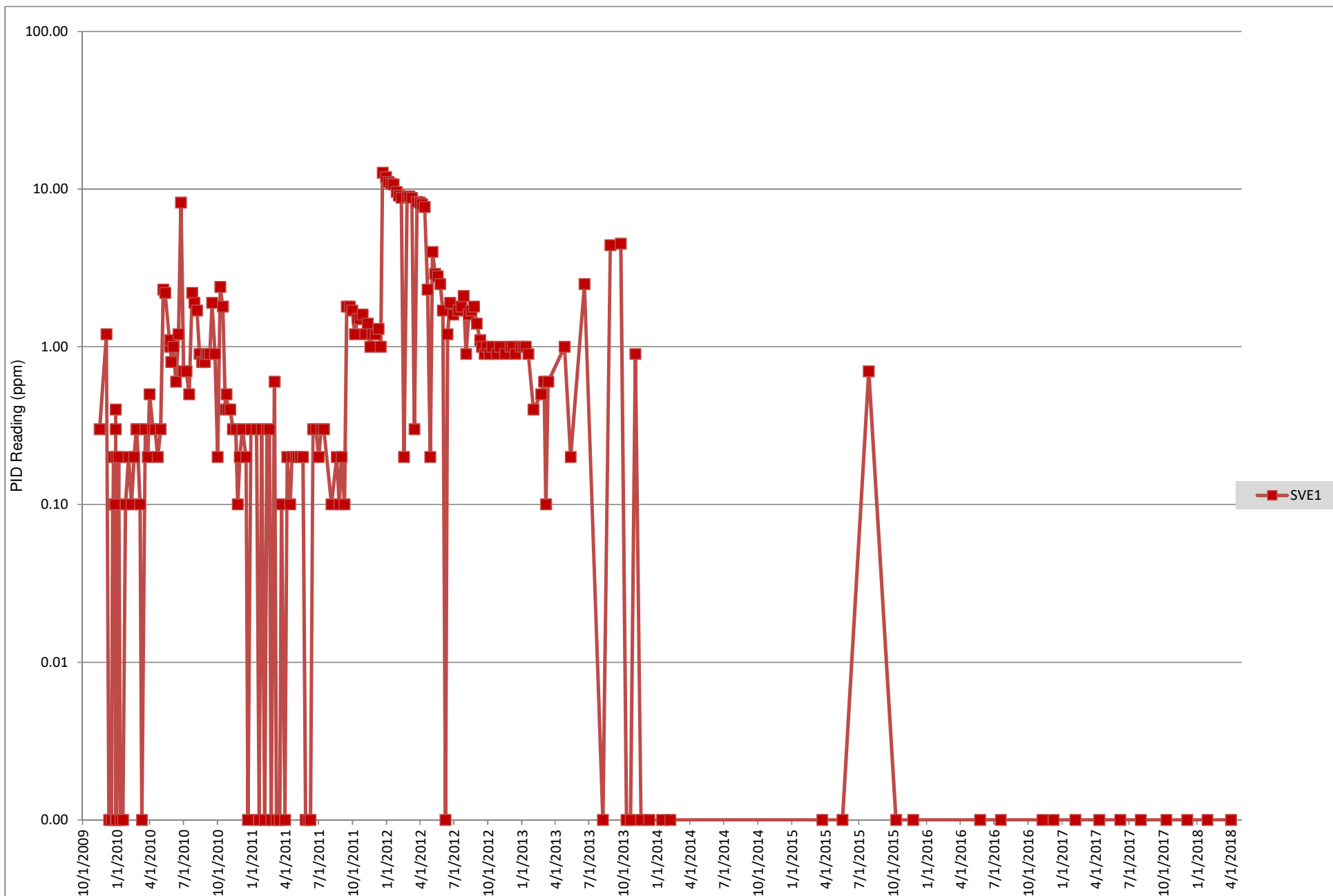


Appendix C-1
Figure 1
VMP TRENDS - VACUUM READINGS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SEVEN
Defense Depot Memphis, Tennessee

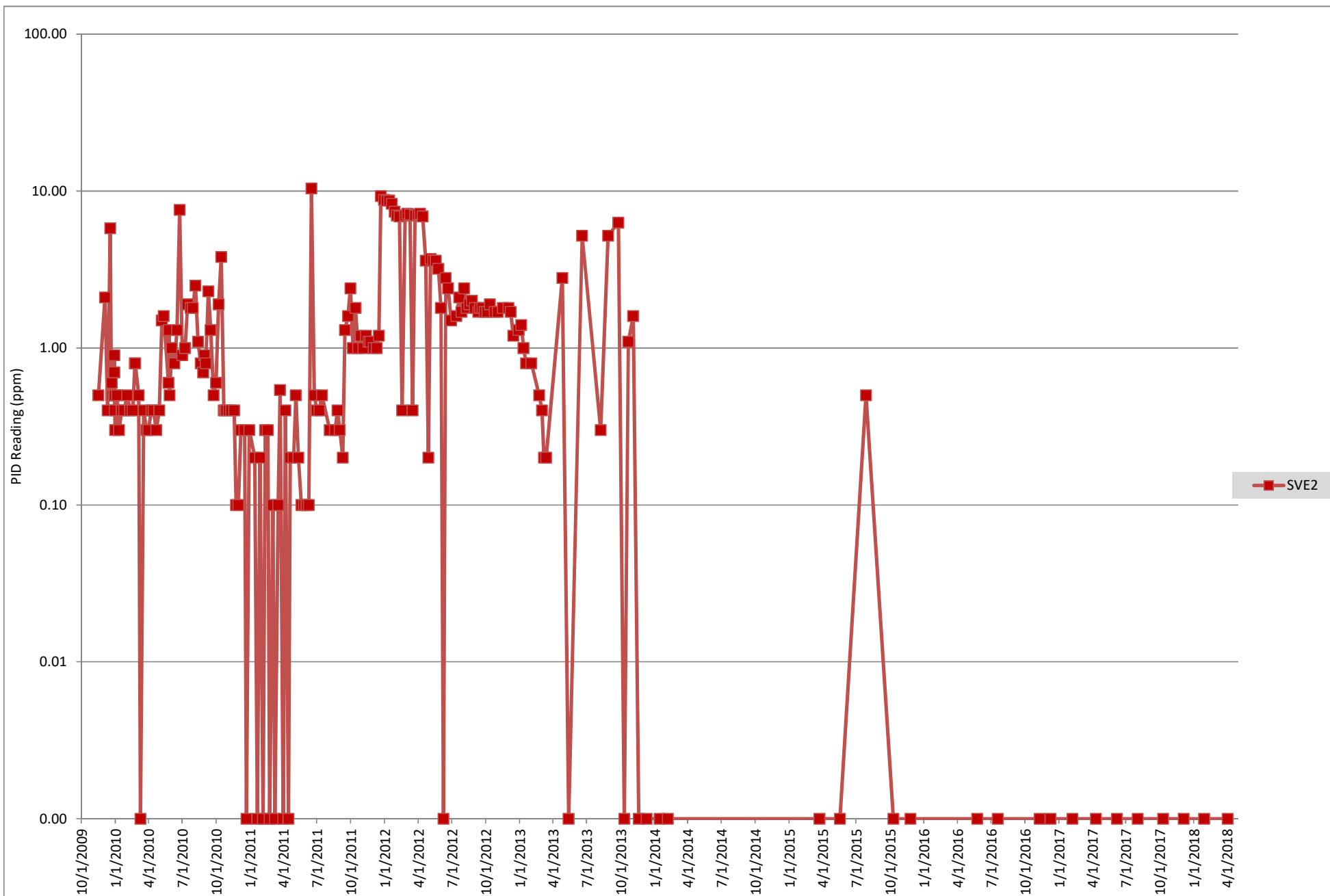
Appendix C-2:
SVE Wells and Effluent
Concentration Trends –
Field PID Measurements



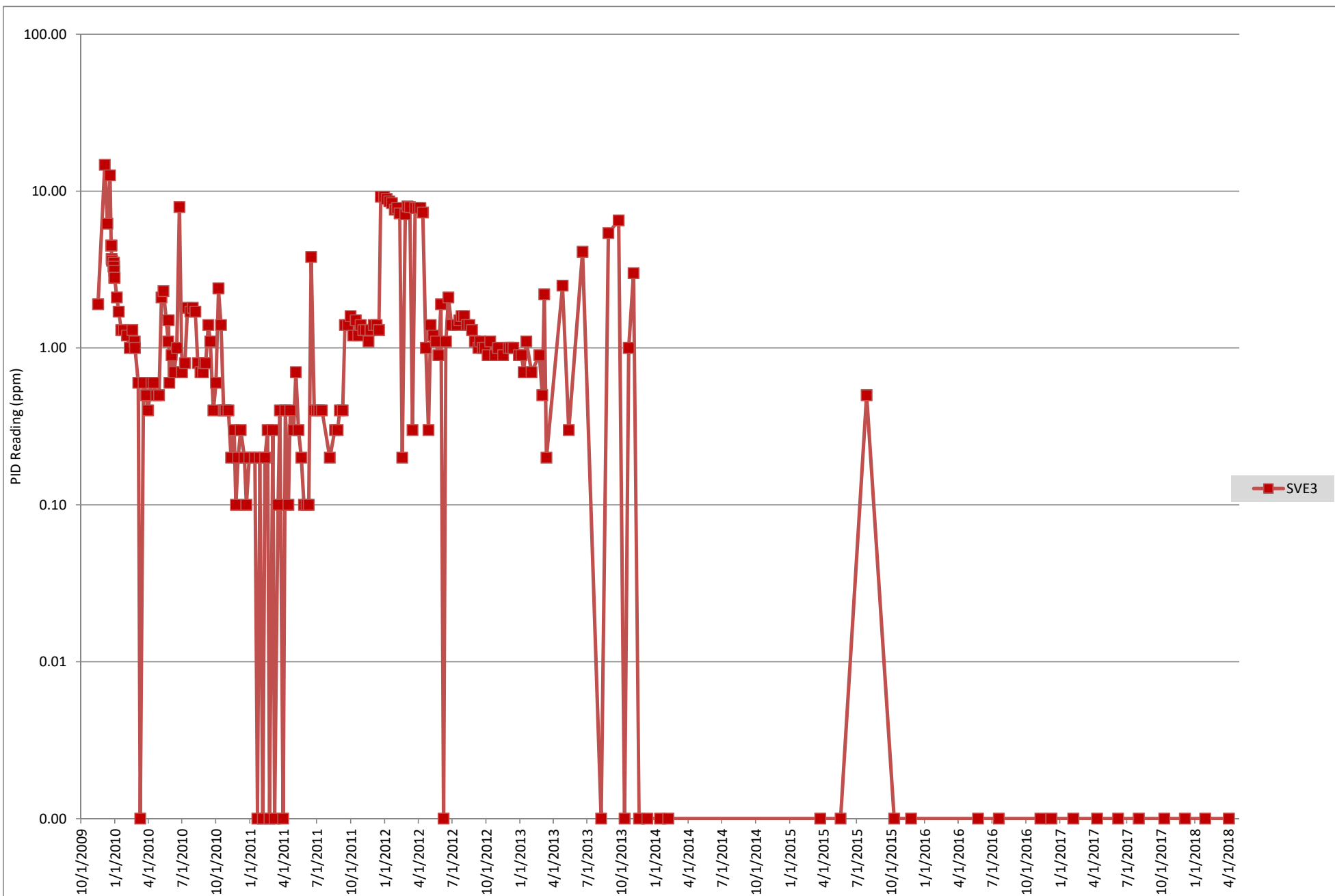
Appendix C-2
Figure 1
SVE WELLS AND EFFLUENT CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SEVEN
Defense Depot Memphis, Tennessee



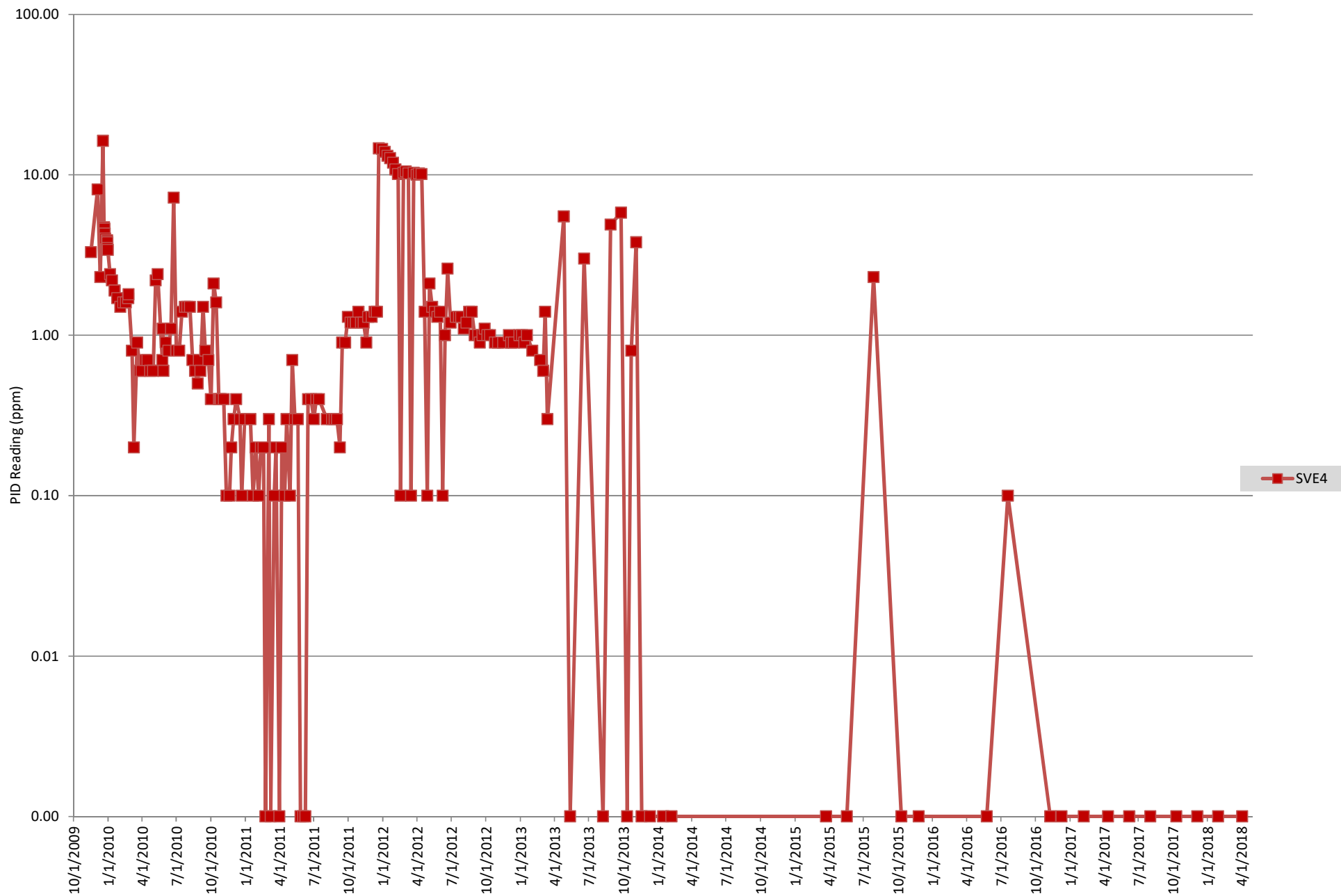
Appendix C-2
Figure 2
SVE WELL #1 CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SEVEN
Defense Depot Memphis, Tennessee



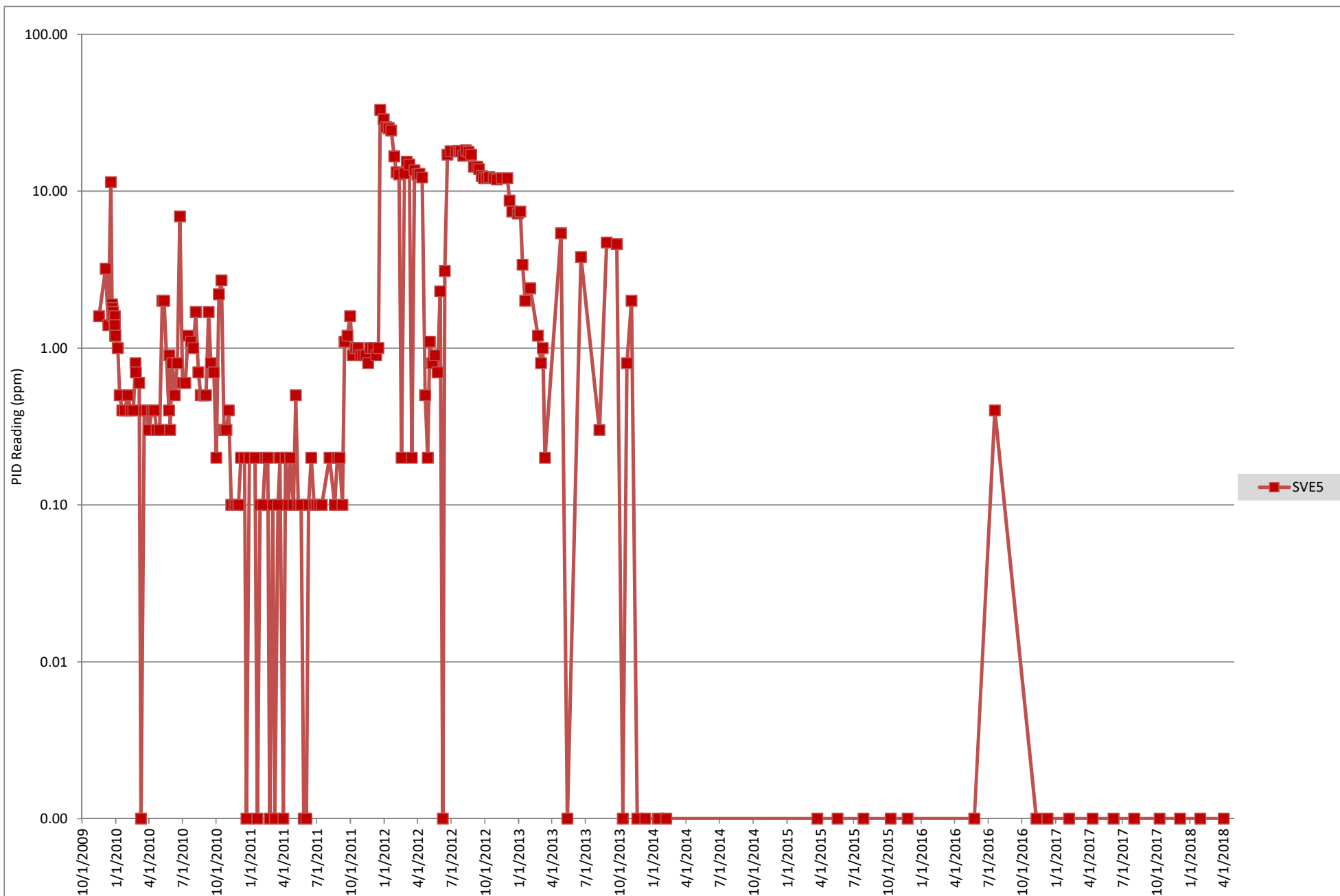
Appendix C-2
Figure 3
SVE WELL #2 CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SEVEN
Defense Depot Memphis, Tennessee



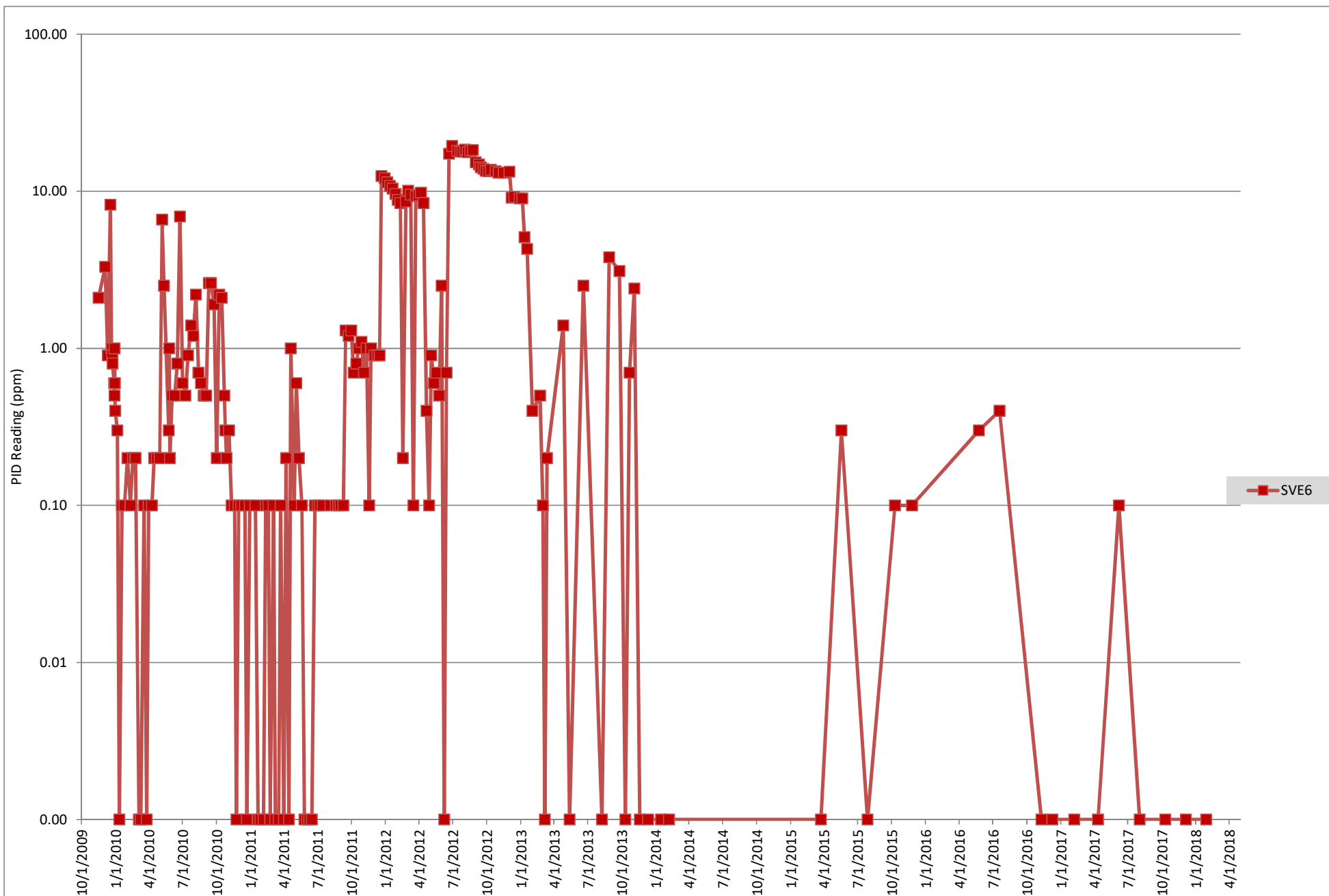
Appendix C-2
Figure 4
SVE WELL # 3 CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SEVEN
Defense Depot Memphis, Tennessee



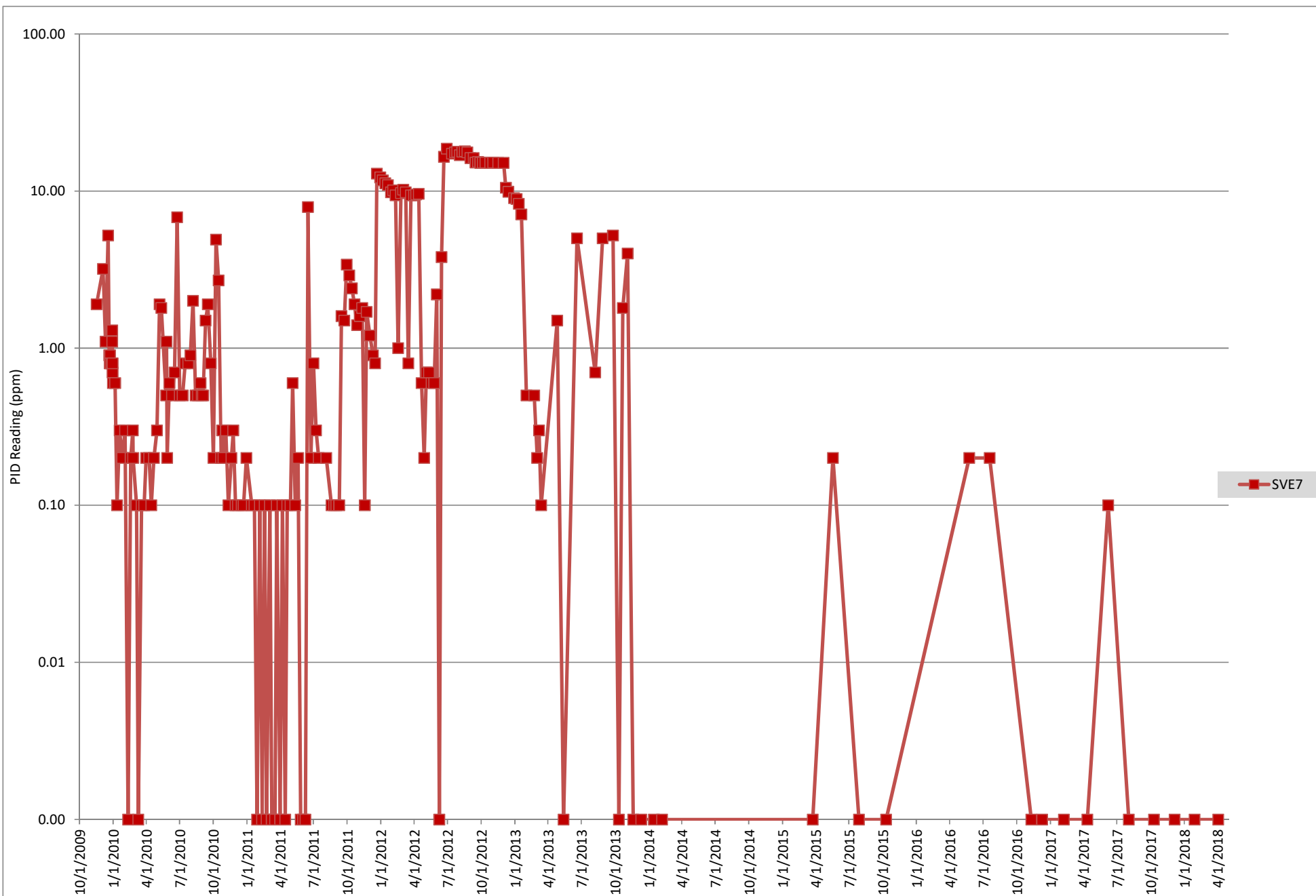
Appendix C-2
Figure 5
SVE WELL #4 CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SEVEN
Defense Depot Memphis, Tennessee



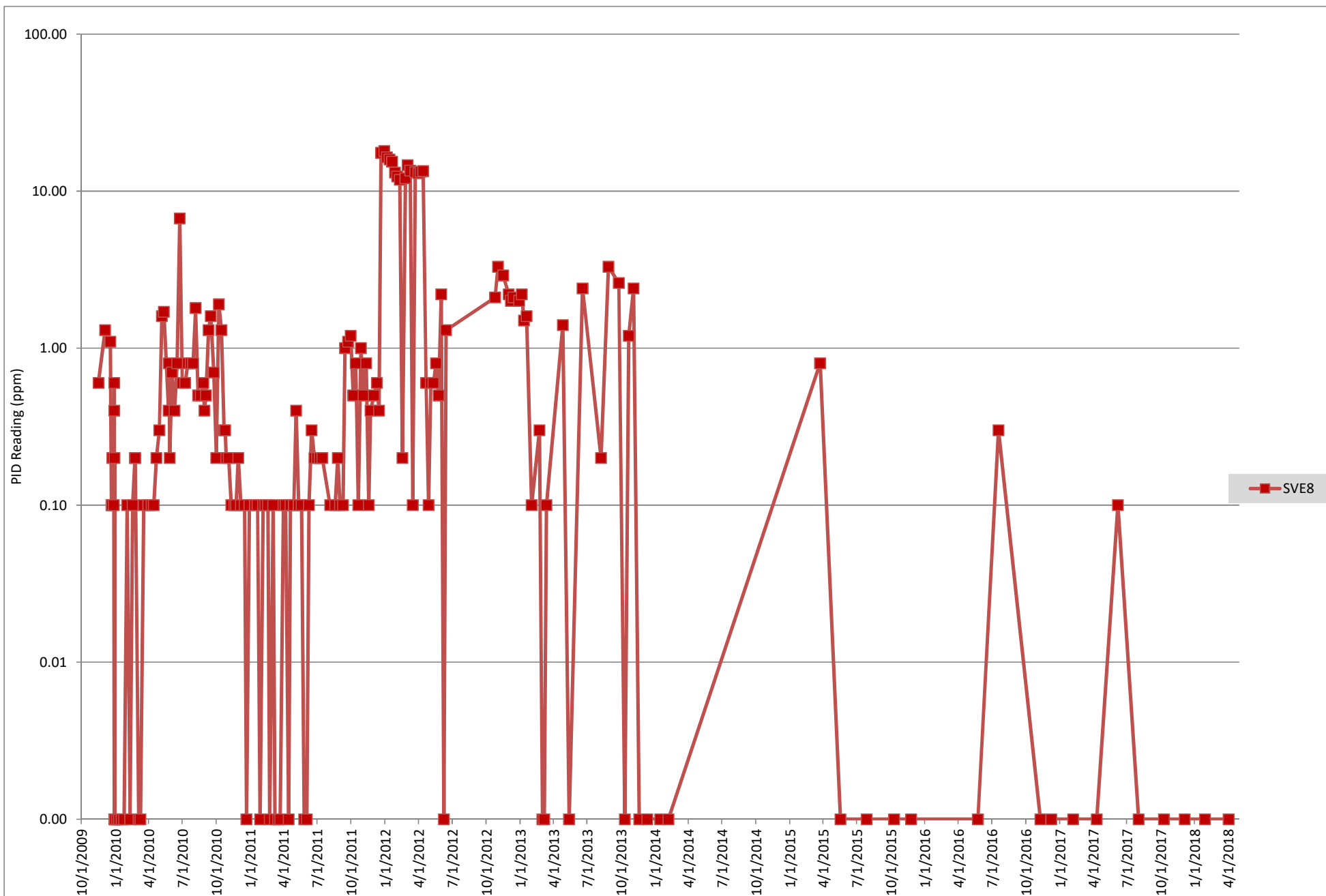
Appendix C-2
Figure 6
SVE WELL #5 CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SEVEN
Defense Depot Memphis, Tennessee



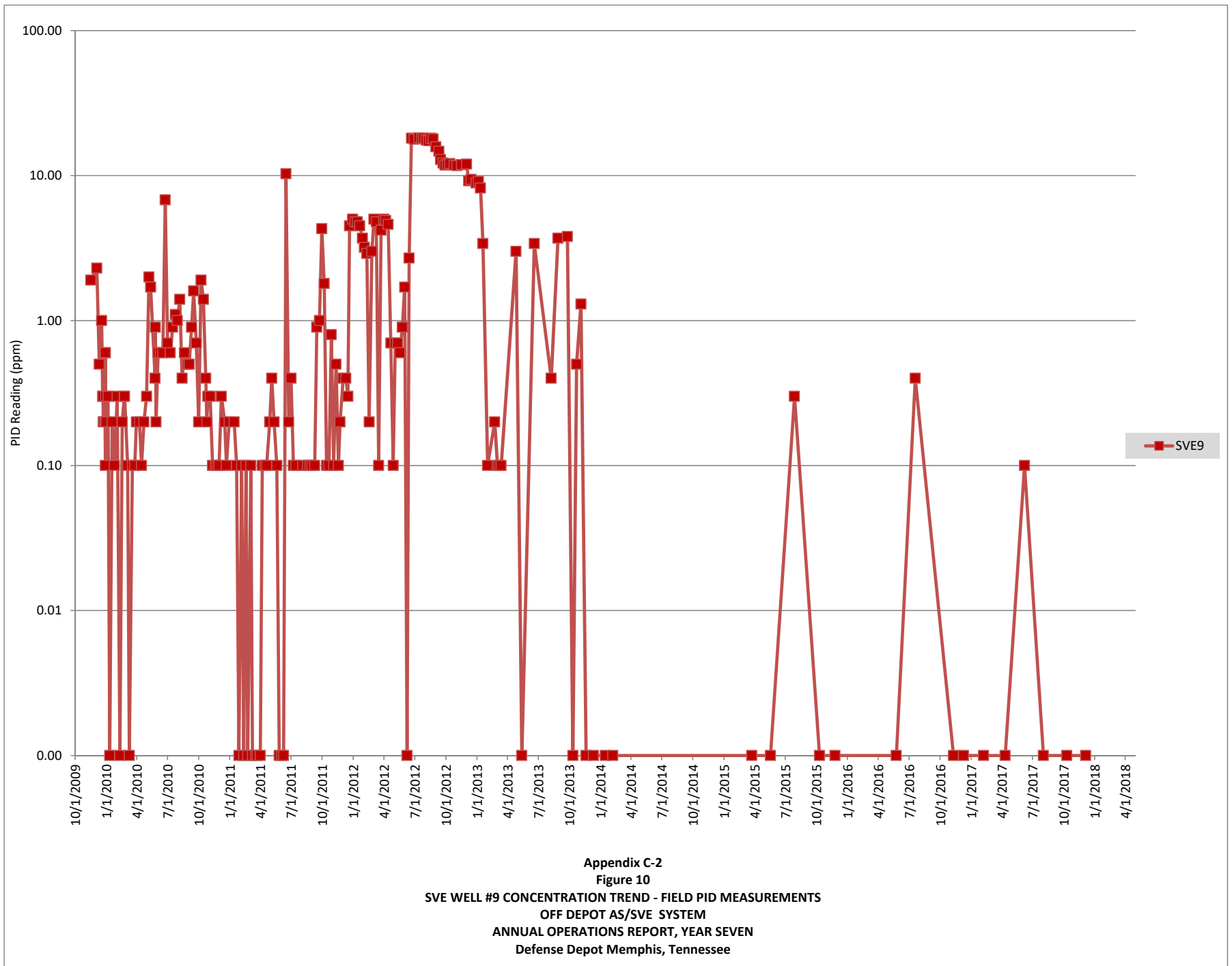
Appendix C-2
 Figure 7
 SVE WELL #6 CONCENTRATION TREND - FIELD PID MEASUREMENTS
 OFF DEPOT AS/SVE SYSTEM
 ANNUAL OPERATIONS REPORT, YEAR SEVEN
 Defense Depot Memphis, Tennessee

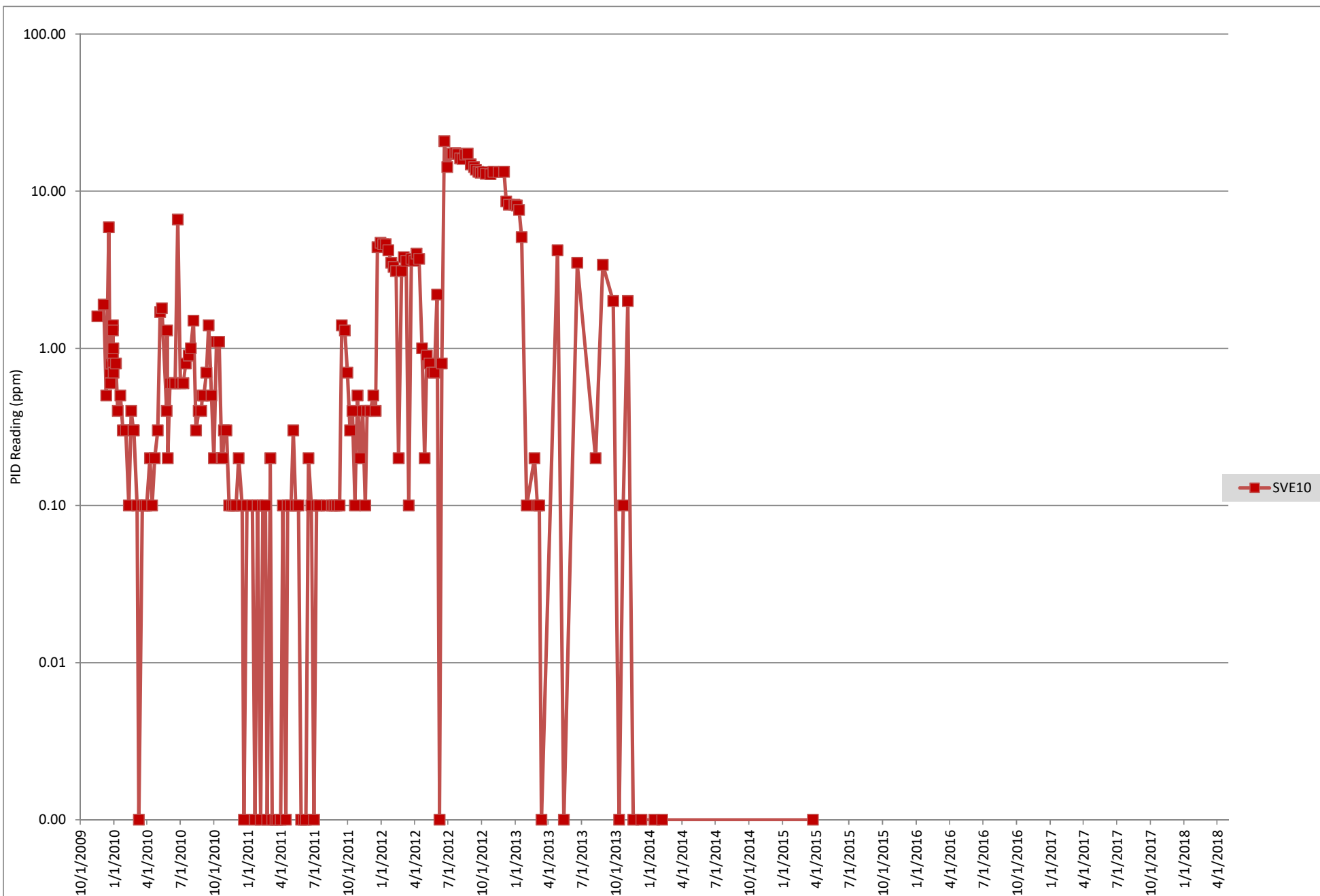


Appendix C-2
Figure 8
SVE WELL #7 CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SEVEN
Defense Depot Memphis, Tennessee

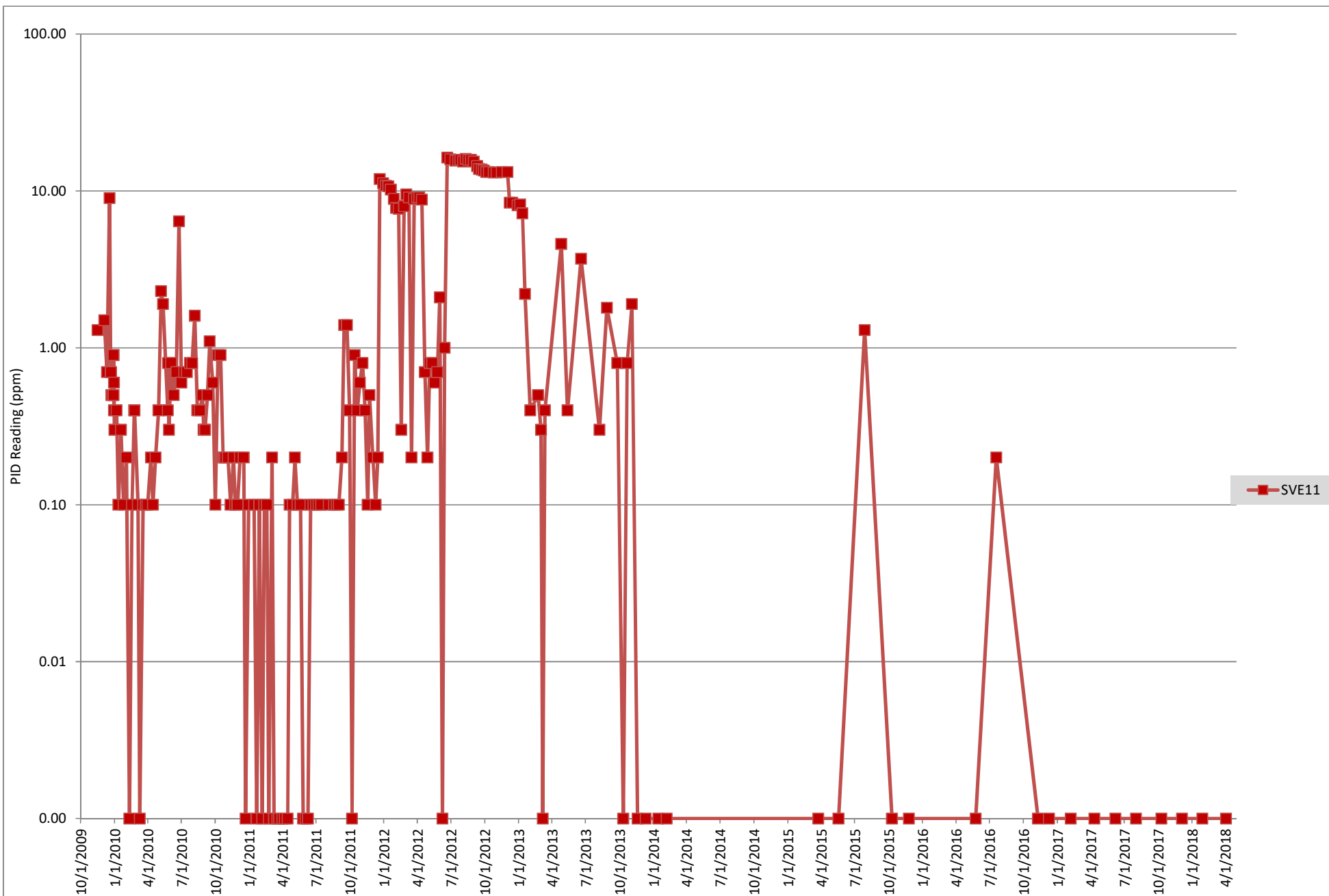


Appendix C-2
Figure 9
SVE WELL #8 CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SEVEN
Defense Depot Memphis, Tennessee

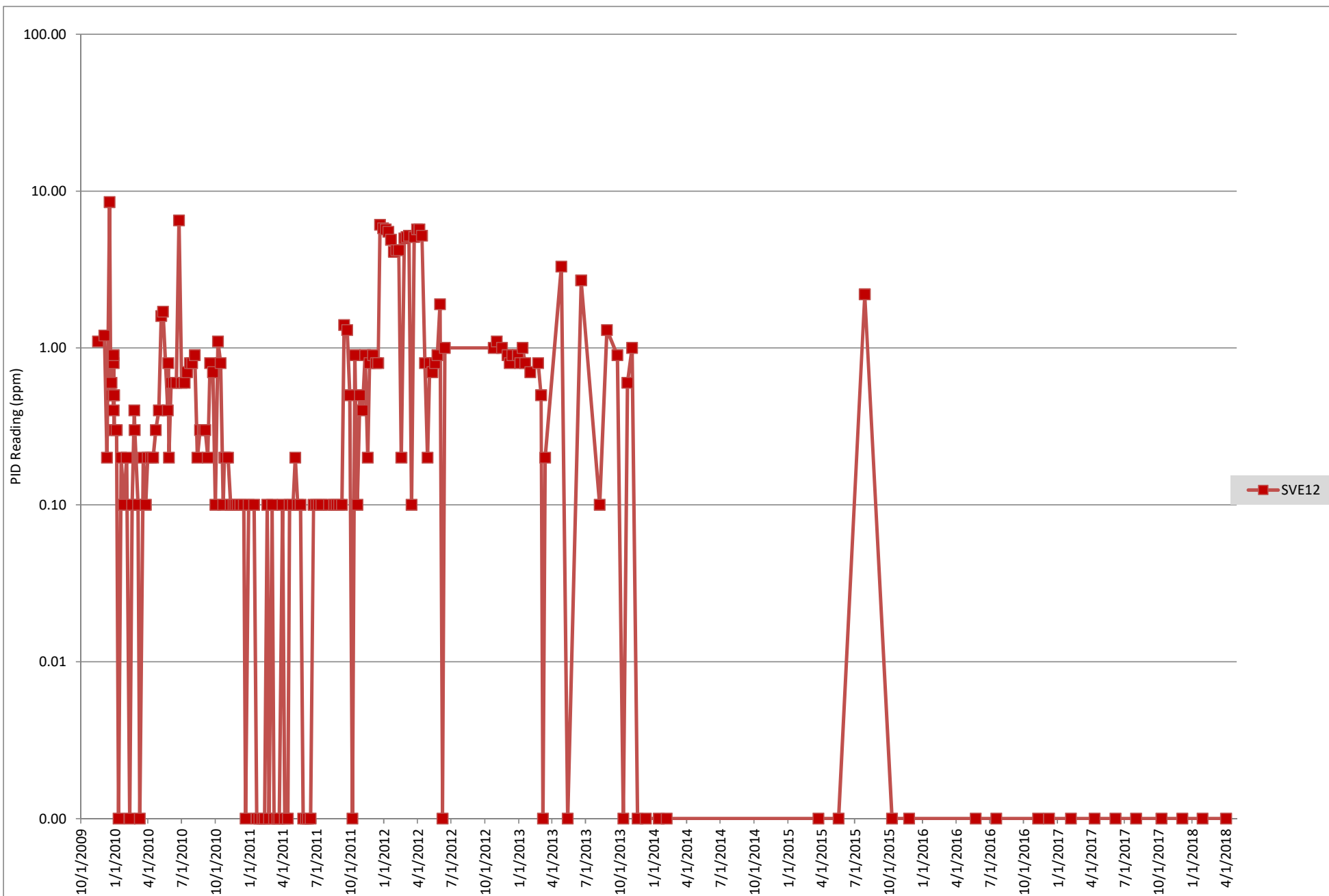




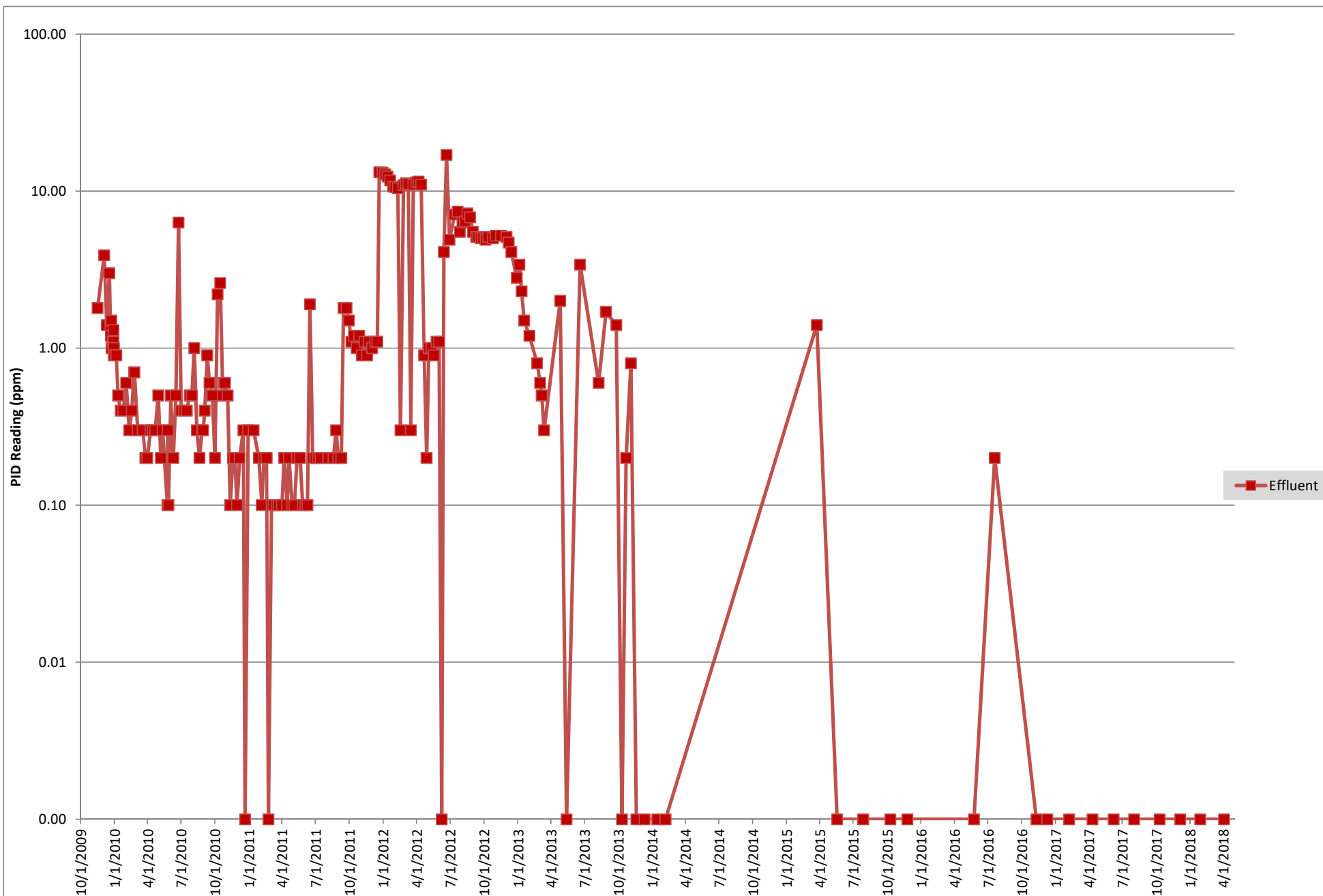
Appendix C-2
Figure 11
SVE WELL #10 CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SEVEN
Defense Depot Memphis, Tennessee



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



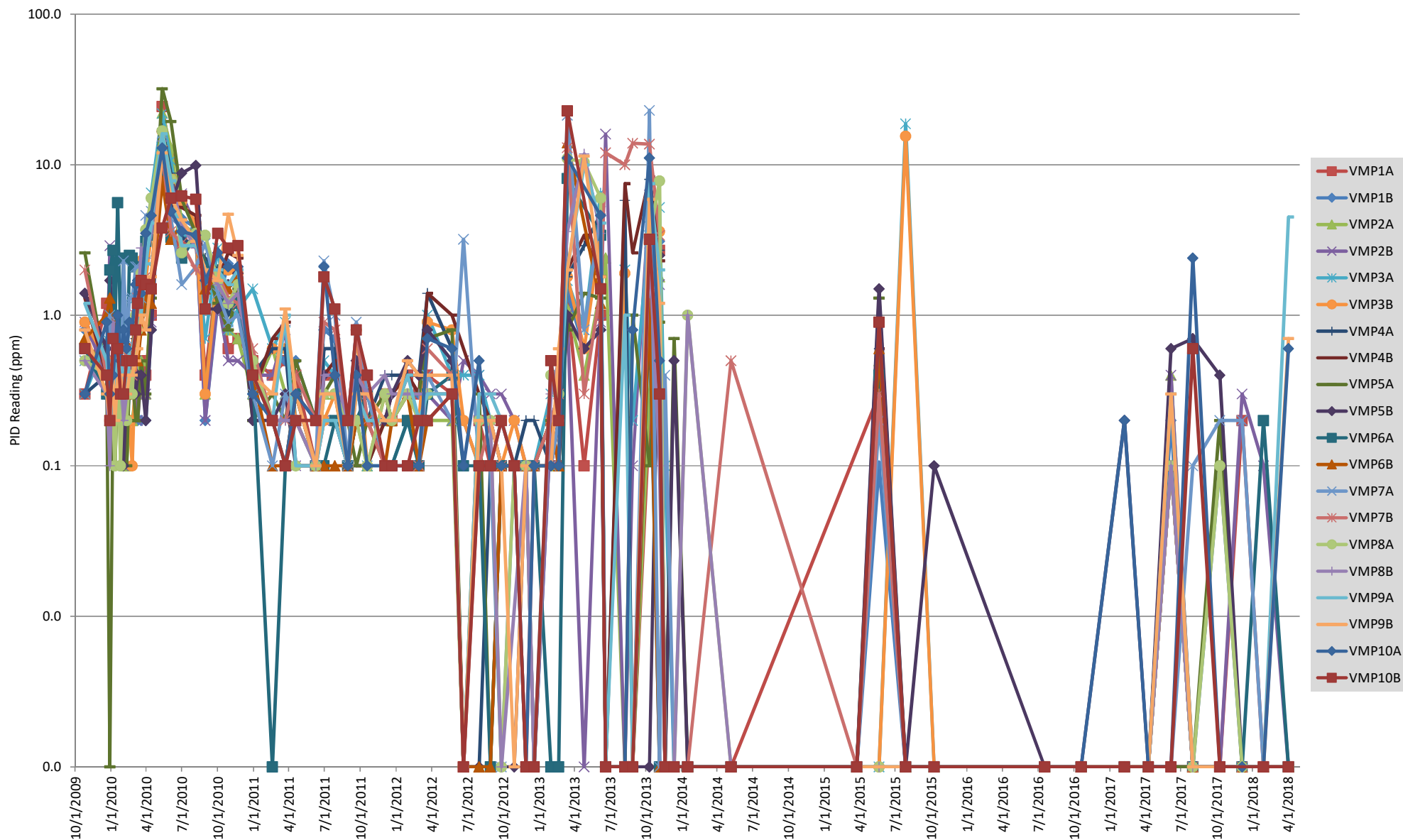
Appendix C-2
Figure 13
SVE WELL #12 CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SEVEN
Defense Depot Memphis, Tennessee



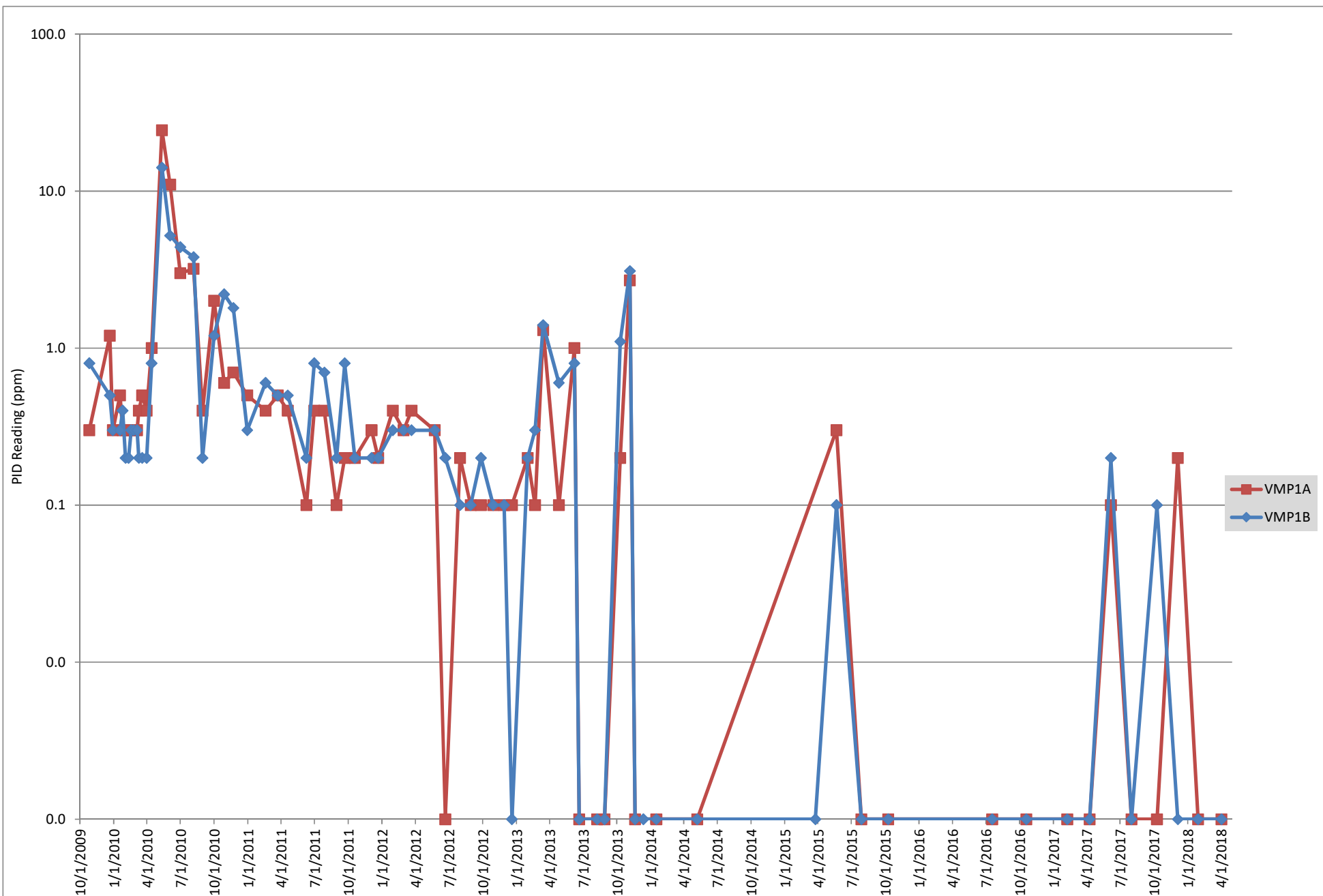
Appendix C-2
Figure 14
EFFLUENT CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SEVEN
Defense Depot Memphis, Tennessee



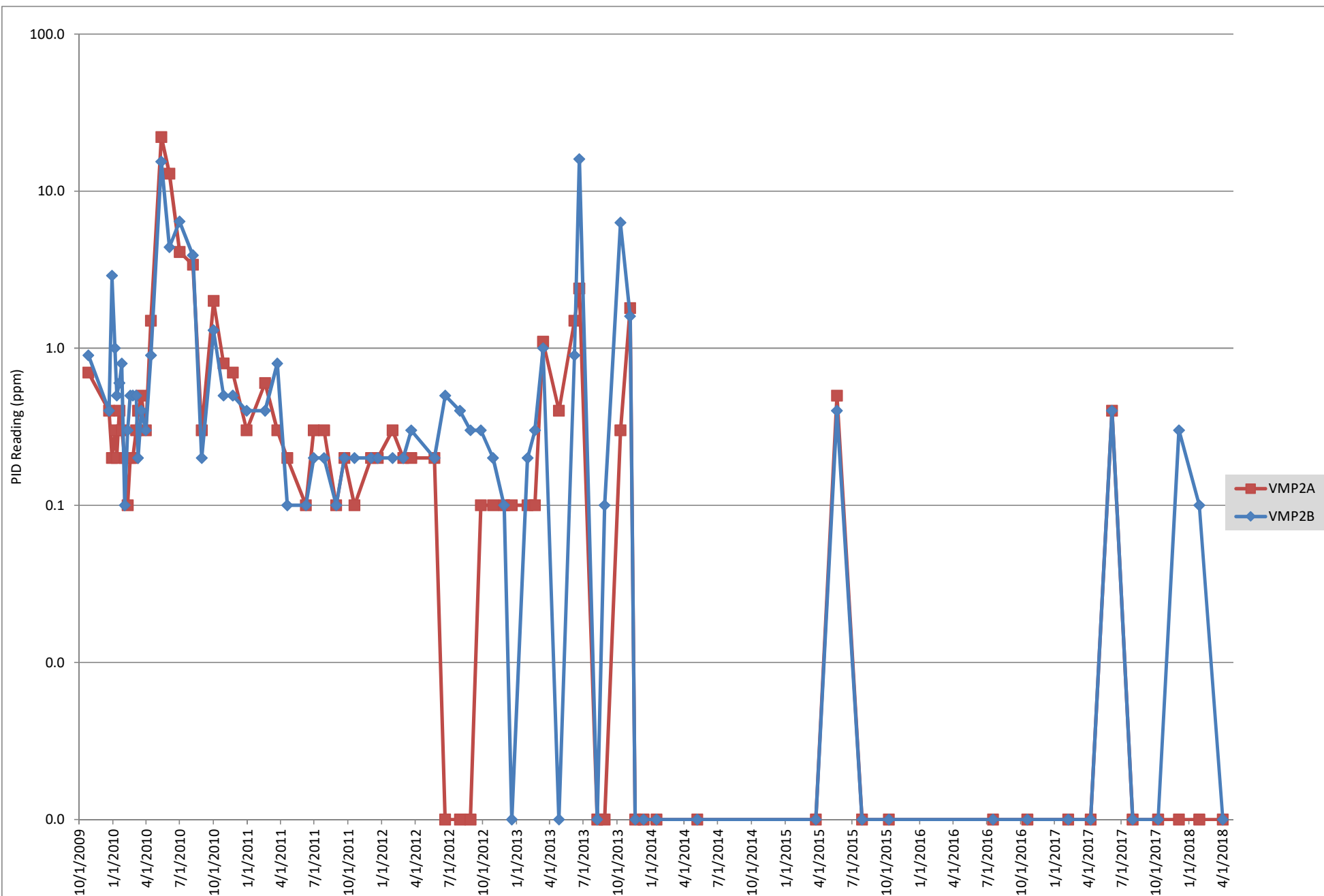
Appendix C-3: VMP Concentration Trends – Field PID Measurements



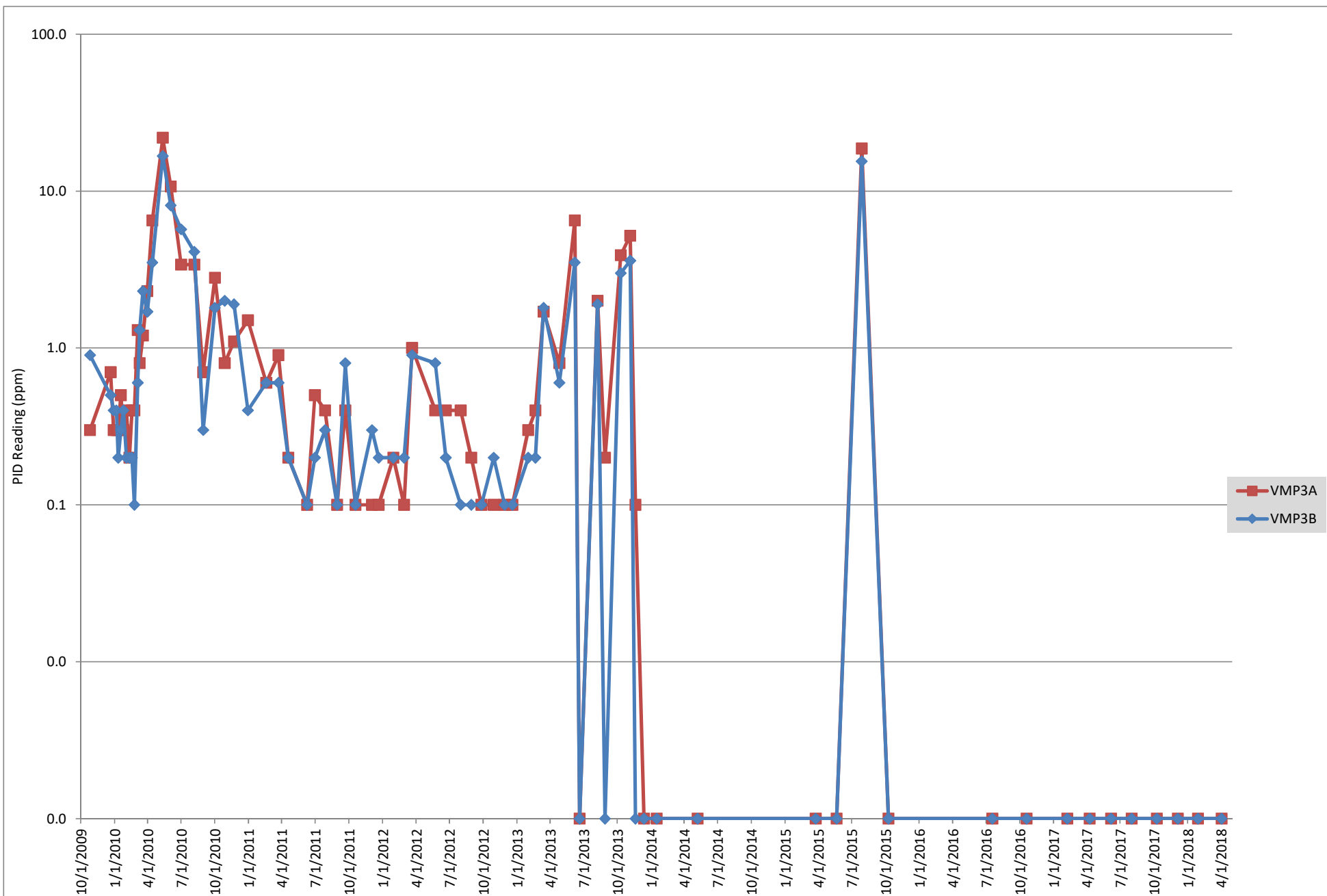
Appendix C-3
Figure 1
VMP CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SEVEN
Defense Depot Memphis, Tennessee



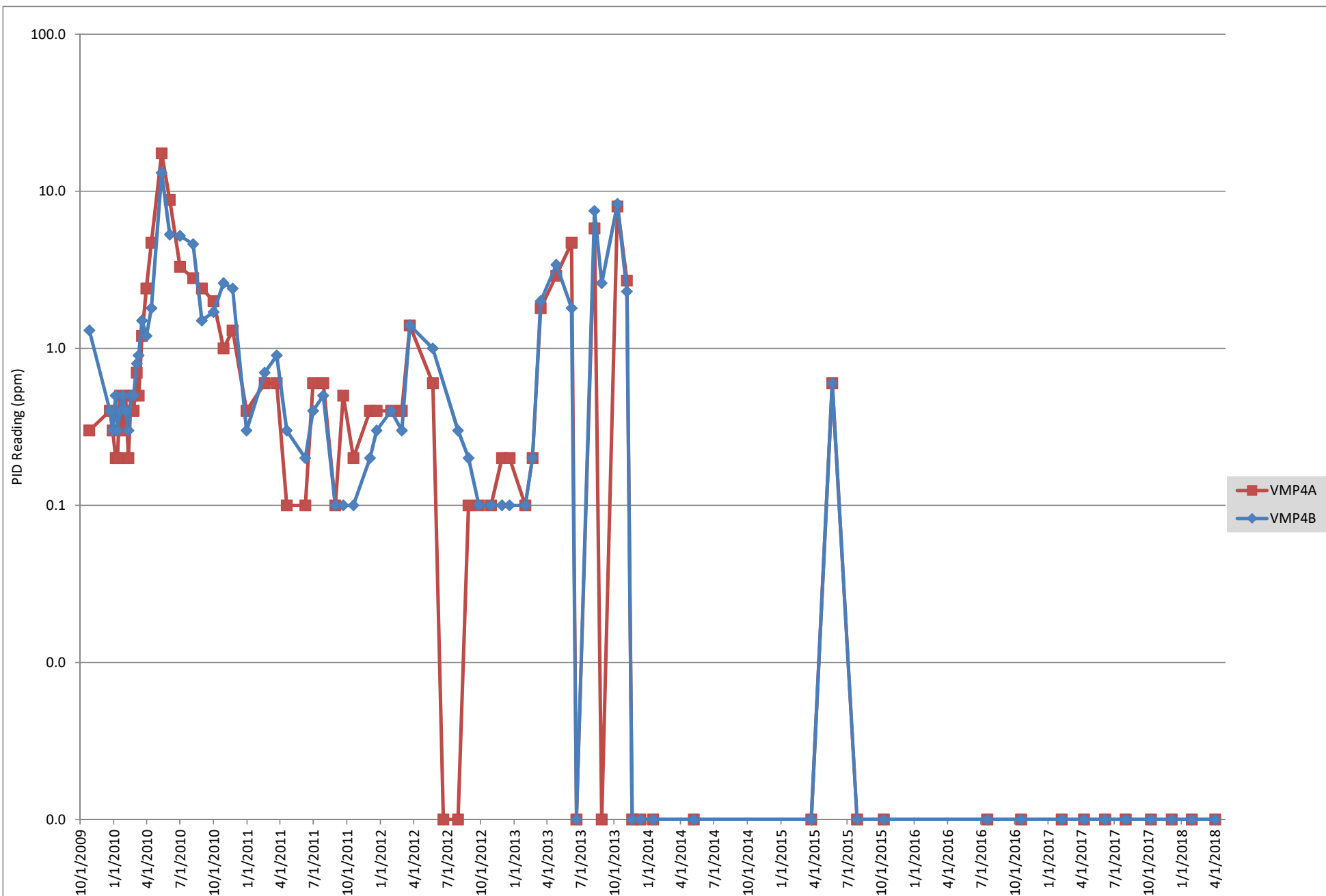
Appendix C-3
Figure 2
VMP 1A/B CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SEVEN
Defense Depot Memphis, Tennessee



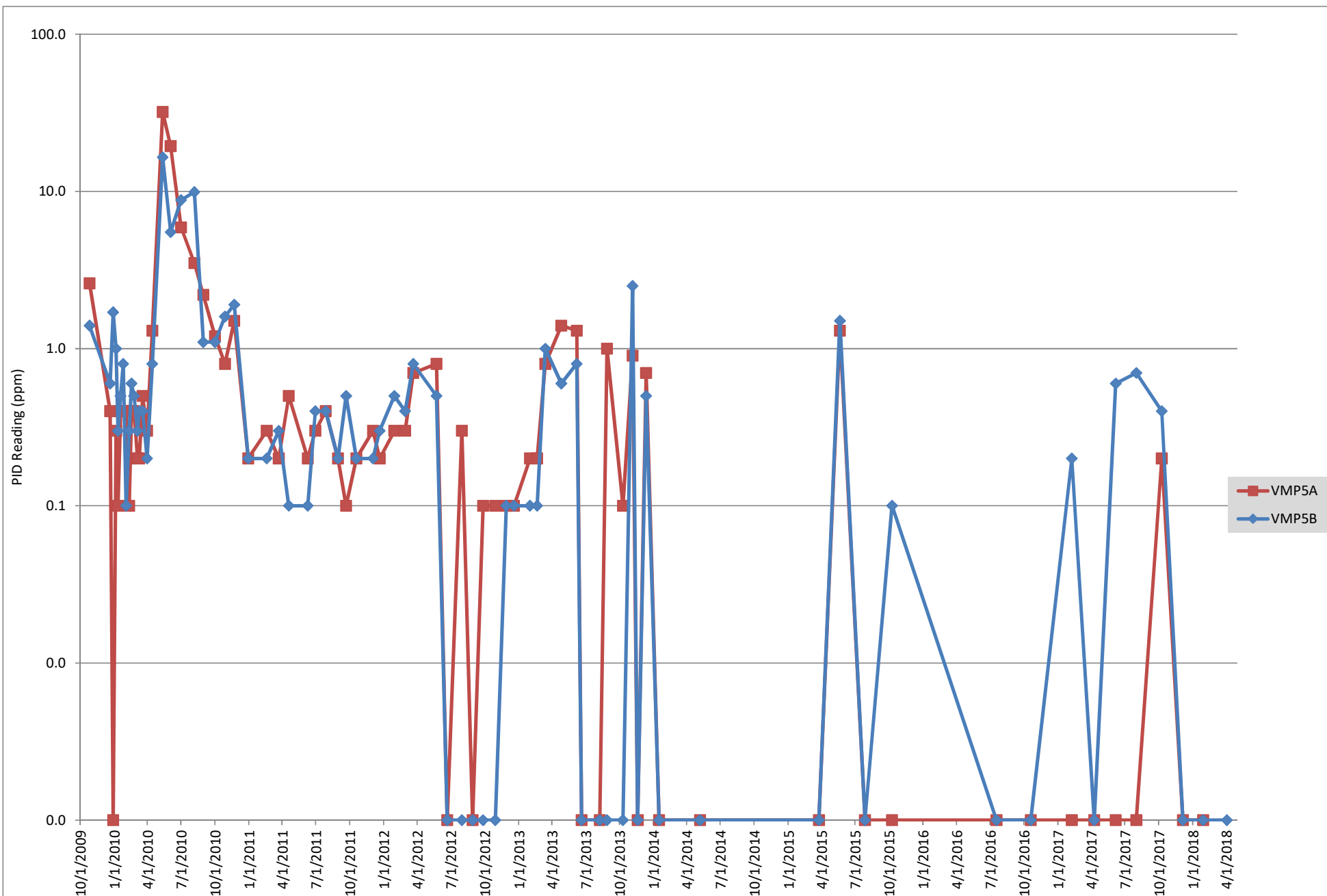
Appendix C-3
Figure 3
VMP 2A/B CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SEVEN
Defense Depot Memphis, Tennessee



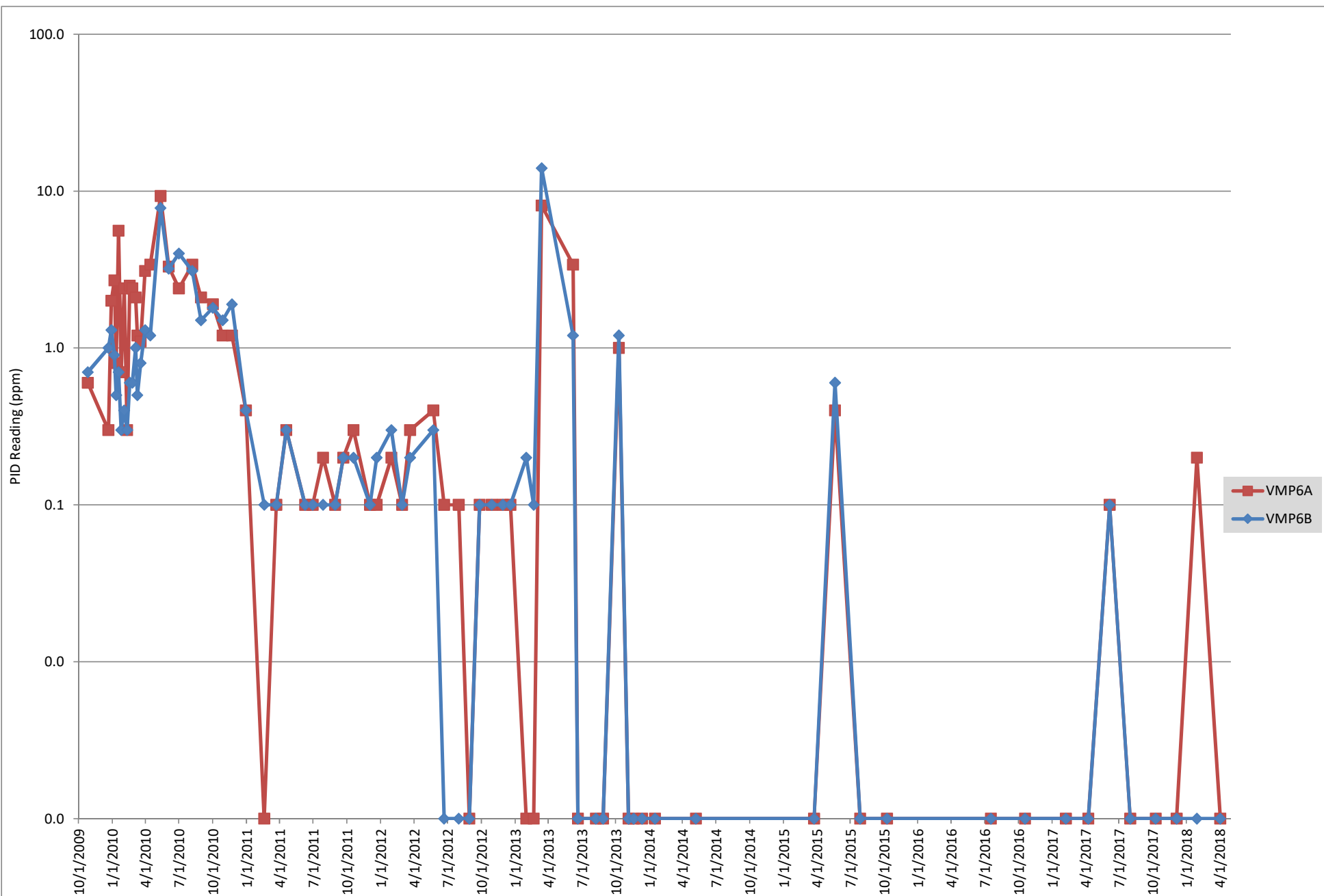
Appendix C-3
Figure 4
VMP 3A/B CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SEVEN
Defense Depot Memphis, Tennessee



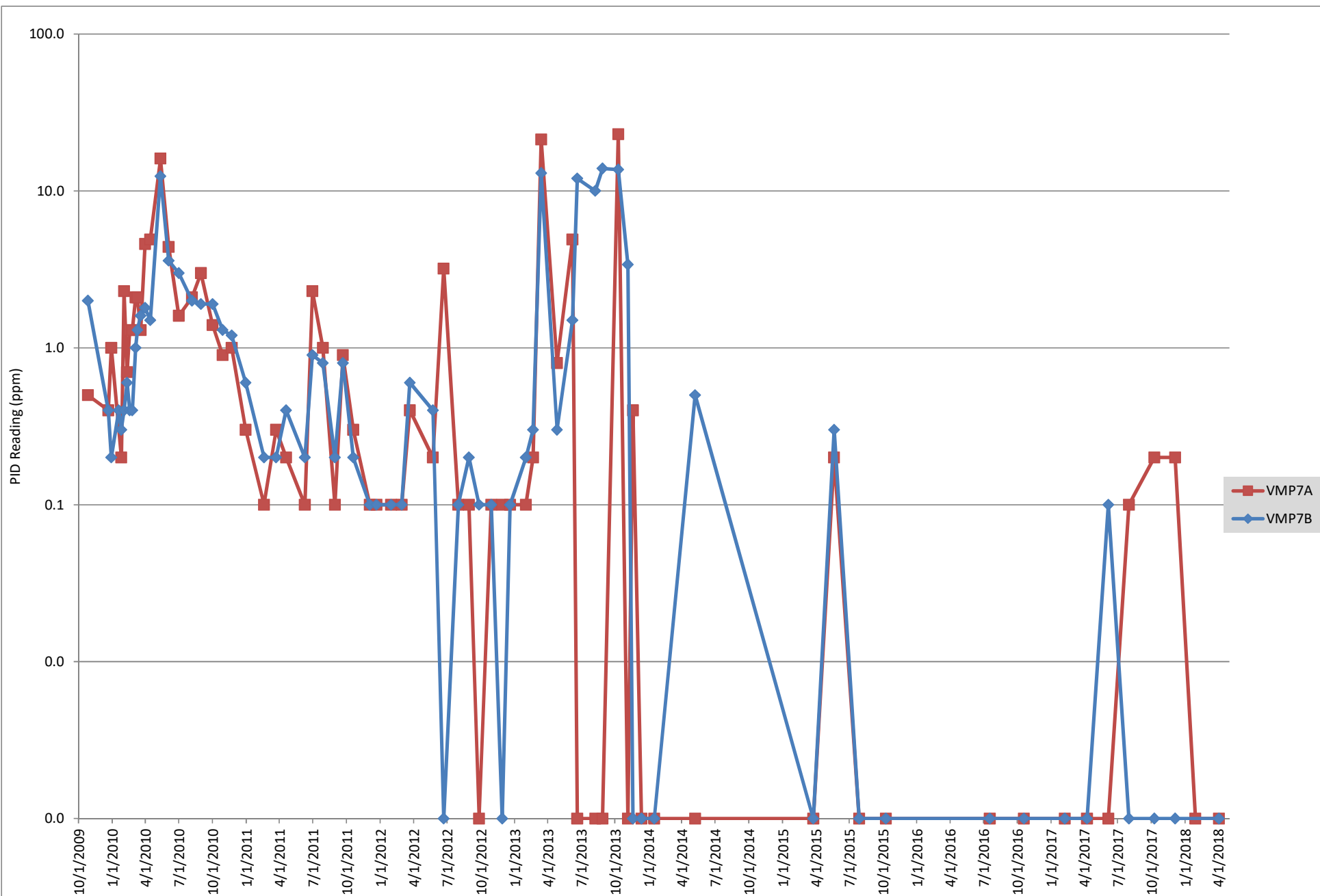
Appendix C-3
Figure 5
VMP 4A/B CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SEVEN
Defense Depot Memphis, Tennessee



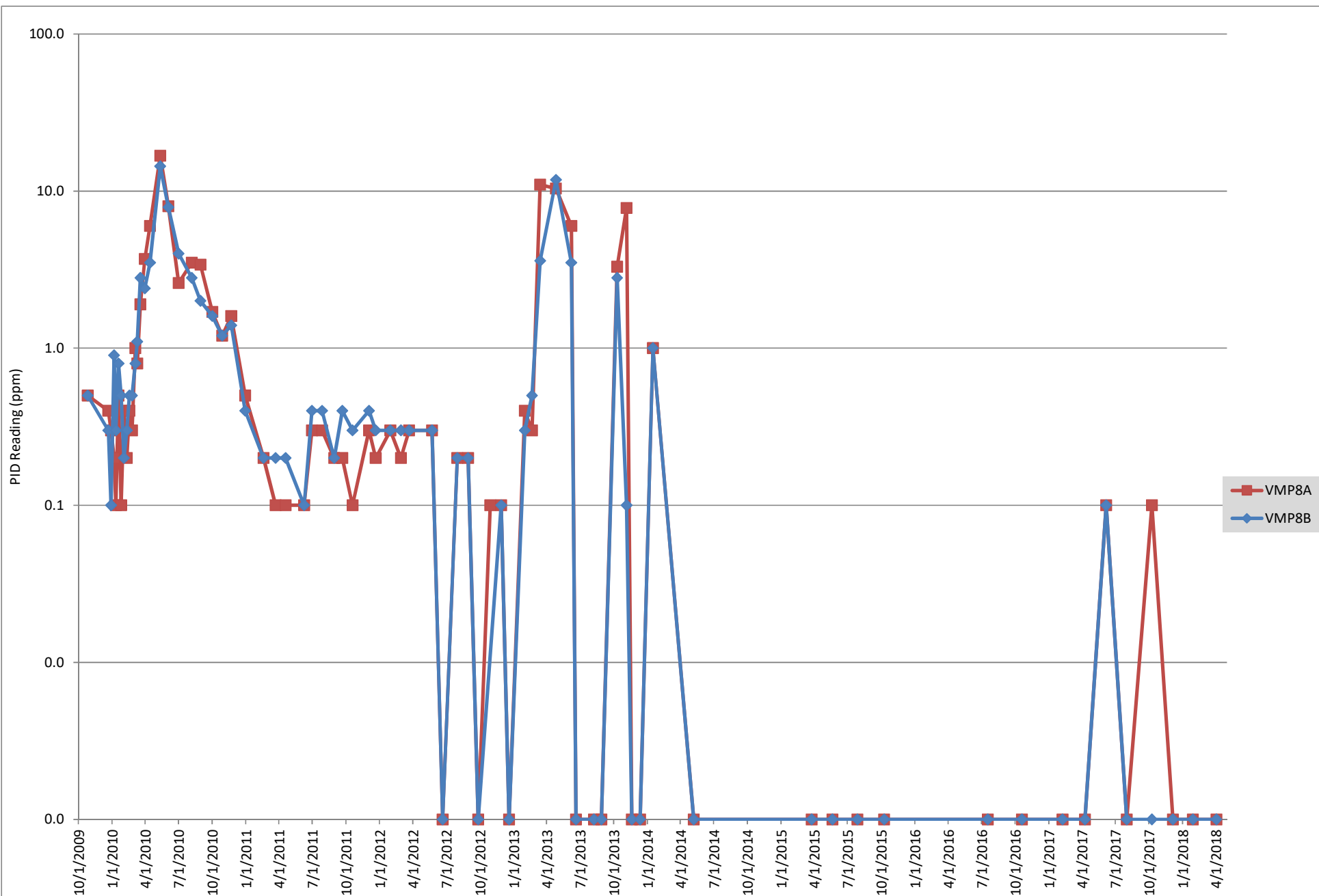
Appendix C-3
Figure 6
VMP 5A/B CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SEVEN
Defense Depot Memphis, Tennessee



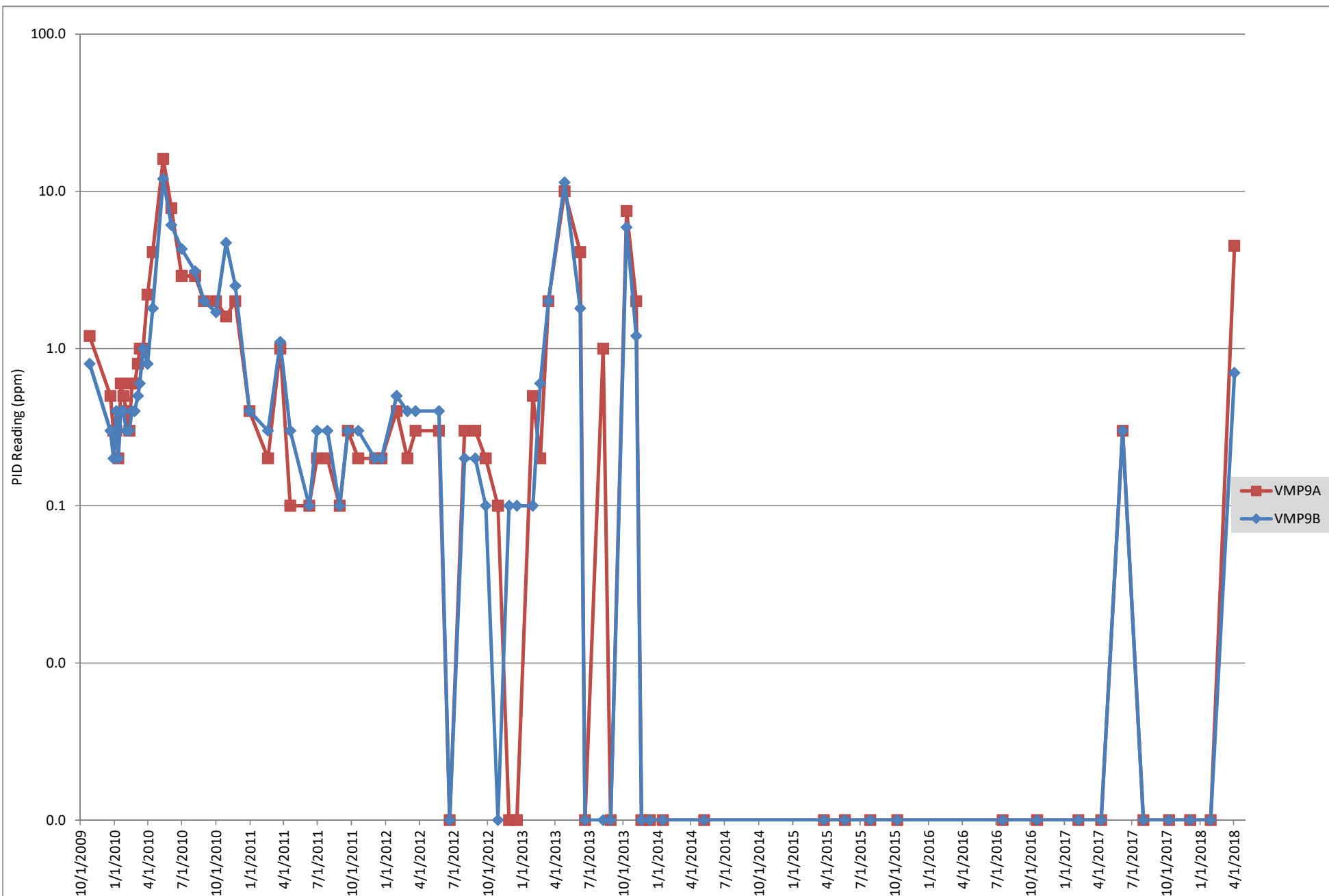
Appendix C-3
Figure 7
VMP 6A/B CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SEVEN
Defense Depot Memphis, Tennessee



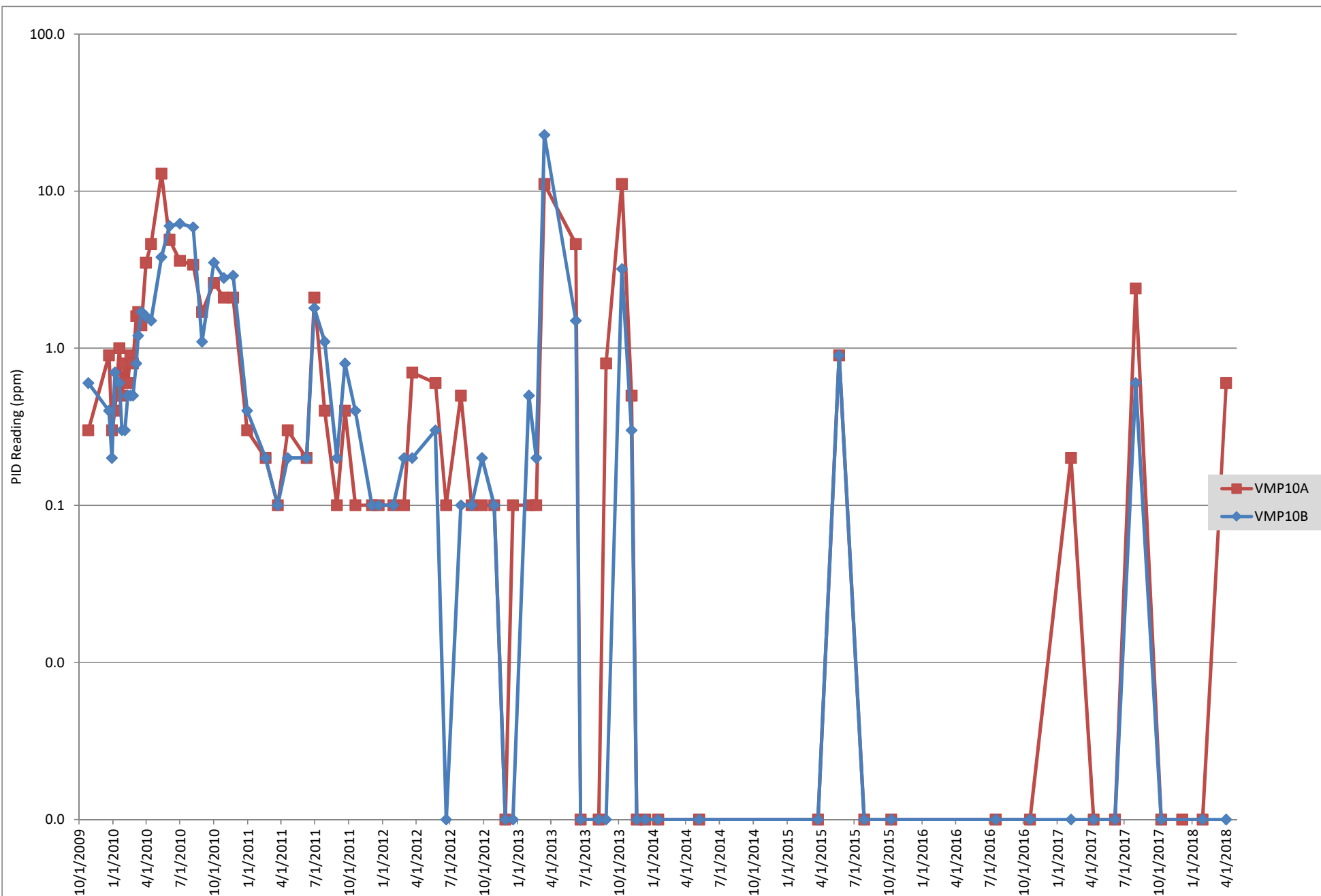
Appendix C-3
Figure 8
VMP 7A/B CONCENTRATION TREND - FIELD PID MEASUREMENTS
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SEVEN
Defense Depot Memphis, Tennessee



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

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.

D

Appendix D:
Results of Laboratory
Analyses

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

SampleID	ODSVE-EFF-Y7Q1	ODSVE-EFF-Y7Q2	ODSVE-EFF-Y7Q2A	ODSVE-EFF-Y7Q3	ODSVE-EFF-Y7Q4
Date	7-Jun-17	2-Aug-17	10-Oct-17	5-Dec-17	3-Apr-18
Event	Jun2017	Aug2017	Oct2017	Dec2017	Apr2018
Lab ID	P1702819-001	P1703804-001	P1705134-001	P1706191-001	P1801754-001
Analyte					
1,1,2,2-Tetrachloroethane	0.71	0.54	0.6	0.66	0.48
1,1,2-Trichloroethane	0.13 U	0.12 U	0.12 U	0.11 U	0.12 U
1,1-Dichloroethene	1.1	1.1	1.2	0.97	0.91
1,2-Dichloroethane	0.17 U	0.16 U	0.16 U	0.15 U	0.4
Carbon Tetrachloride	0.34	0.36	0.49	0.39	0.4
Chloroform	4.8	4.5	6.5	5	5.1
cis-1,2-Dichloroethene	24	22	35	26	25
Dibromochloromethane	0.081 U	0.076 U	0.075 U	0.07 U	0.074 U
Tetrachloroethene	2.5	2.7	2.6	2.3	2.2
trans-1,2-Dichloroethene	0.34	0.34	0.56	0.38	0.34
Trichloroethene	26	25	27	18	23
Vinyl Chloride	0.092 J	0.25 U	0.091 J	0.23 U	0.25 U
1,1,1-Trichloroethane	0.35	0.37	0.41	0.39	0.34
1,1,2-Trichlorotrifluoroethane	3.6	4.2	4.6	3.5	2.4
1,1-Dichloroethane	0.52	0.48	0.56	0.4	0.44
1,2,4-Trimethylbenzene	0.42	0.13 U	0.042 J	0.12 U	0.14
1,3,5-Trimethylbenzene	0.2	0.13 U	0.13 U	0.12 U	0.06 J
2-Butanone (MEK)	42	0.2 J	0.59 J	0.77 J	0.89 J
2-Hexanone	0.095 J	0.16 U	0.09 J	0.054 J	0.076 J
2-Propanol (Isopropyl Alcohol)	60	2.6 U	0.26 J	2.4 U	1.3 J
4-Ethyltoluene	0.046 J	0.13 U	0.13 U	0.12 U	0.13 U
4-Methyl-2-pentanone	0.17 U	0.16 U	0.084 J	0.15 U	0.15 U
Acetone	9.9	2.7 U	5.4	2.5 U	11
Acetonitrile	0.41 U	0.38 U	0.38 U	0.36 U	0.22 J
Acrolein	0.35 J	0.11 J	0.36 J	0.24 J	0.62 J
alpha-Pinene	0.12 U	0.12 U	0.11 U	0.11 U	0.042 J
Benzene	0.22 U	0.2 U	0.11 J	0.19 U	0.22
Bromodichloromethane	0.14	0.16	0.17	0.21	0.067 J
Carbon Disulfide	0.17 J	2.1 U	1.2 J	2.9	1.7 J
Cumene				0.12 U	0.13 U
Cyclohexane	0.15 J	0.15 J	0.37 U	1.7	2.3
Dichlorodifluoromethane (CFC 12)	1.1	0.92	0.87	0.67	0.62
Dichloromethane (Methylene Chloride)	0.20 U	0.19 U	0.32	0.081 J	0.38
d-Limonene	0.12 U	0.12 U	0.11 U	0.11 U	0.097 J
Ethanol	1.3 J	3.4 U	3.1 J	0.62 J	6.2
Ethyl Acetate	0.38 U	0.36 U	1.2	0.33 U	26
Ethylbenzene	0.16 U	0.15 U	0.053 J	0.14 U	0.17
Isopropylbenzene (Cumene)	0.14 U	0.13 U	0.13 U		
m,p-Xylenes	0.46	0.3 U	0.2 J	0.28 U	0.61
Naphthalene	0.062 J	0.12 U	0.12 U	0.11 U	0.075 J
n-Butyl Acetate	0.15 U	0.14 U	0.054 J	0.13 U	0.92
n-Heptane	0.17 U	0.17	0.16 U	0.12 J	0.38
n-Hexane	0.065 J	0.71	0.1 J	0.98	0.55
n-Nonane	0.13 U	0.12 U	0.12 U	0.11 U	0.073 J
n-Octane	0.15 U	0.14 U	0.14 U	0.13 U	0.11 J
o-Xylene	0.16 U	0.15 U	0.079 J	0.14 U	0.22
Propene	19	0.37 U	0.33 J	0.36	1.2
Styrene	0.16 U	0.15 U	0.046 J	0.14 U	0.18
Tetrahydrofuran (THF)	0.23 U	0.22 U	0.12 J	0.2 U	0.13 J
Toluene	0.18 U	0.17 U	0.36	0.16 U	1.9
Trichlorofluoromethane	0.26	0.26	0.4	0.33	0.29
Vinyl Acetate	2.9	1.8 U	1.1 J	1.7 U	1.8 U

DOE Flags:

U: Analyte not detected above reporting limit

J: Estimated

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 below it. At the bottom, a black rectangle is visible. The letter 'E' is placed to the right of the red rectangle.

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

June 29, 2017

Todd Calhoun
Trinity Analysis & Development Corp.
1002 N. Eglin Pkwy.
Shalimar, FL 32579

RE: DDMT SVE / 10060131 AC 2.0

Dear Todd:

Enclosed are the results of the sample submitted to our laboratory on June 12, 2017. For your reference, these analyses have been assigned our service request number P1702819.

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 7:55 am, 06/29/17

Kate Kaneko
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: Trinity Analysis & Development Corp.
Project: DDMT SVE / 10060131 AC 2.0

Service Request No: P1702819

CASE NARRATIVE

The sample was received intact under chain of custody on June 12, 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.



2655 Park Center Dr., Suite A
Simi Valley, CA 93065
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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/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: Trinity Analysis & Development Corp.
Project ID: DDMT SVE / 10060131 AC 2.0

Service Request: P1702819

Date Received: 6/12/2017
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-Y7Q1	P1702819-001	Air	6/7/2017	10:30	SC01885	-0.66	4.63

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 750 2819

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 10060131 AC 2.0											
Phone 404-295-3279				P.O. # / Billing Information											
Email Address for Result Reporting Thomas.Holmes@HDRinc.com				Sampler (Print & Sign)											
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-Y7Q1	①	6/7/17	1030	SC01985	0A00914	-29	0	6L	X						
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) [Signature]				Date: 6/7/17		Time: 1130		Received by: (Signature) [Signature]				Date: 6/7/17		Time: 0130	
Relinquished by: (Signature) _____				Date: _____		Time: _____		Received by: (Signature) _____				Date: _____		Time: _____	
Project Requirements (MRLs, QAPP)															
Cooler / Blank Temperature _____ °C															

Sample Acceptance Check Form

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: Trinity Analysis & Development Corp.

Client Sample ID: ODSVE-EFF-Y7Q1

Client Project ID: DDMT SVE / 10060131 AC 2.0

ALS Project ID: P1702819

ALS Sample ID: P1702819-001

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC01885

Date Collected: 6/7/17

Date Received: 6/12/17

Date Analyzed: 6/22/17

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.66

Final Pressure (psig): 4.63

Canister Dilution Factor: 1.38

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	19	0.40	0.33	0.11	
75-71-8	Dichlorodifluoromethane (CFC 12)	1.1	0.14	0.12	0.047	
74-87-3	Chloromethane	0.27	0.33	0.27	0.10	U
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	0.079	0.099	0.079	0.038	U
75-01-4	Vinyl Chloride	0.092	0.27	0.22	0.092	J
106-99-0	1,3-Butadiene	0.26	0.31	0.26	0.14	U
74-83-9	Bromomethane	0.14	0.18	0.14	0.068	U
75-00-3	Chloroethane	0.21	0.26	0.21	0.089	U
64-17-5	Ethanol	1.3	3.7	1.5	0.59	J
75-05-8	Acetonitrile	0.35	0.41	0.35	0.15	U
107-02-8	Acrolein	0.35	1.2	0.25	0.10	J
67-64-1	Acetone	9.9	2.9	1.2	0.45	
75-69-4	Trichlorofluoromethane	0.26	0.12	0.10	0.042	
67-63-0	2-Propanol (Isopropyl Alcohol)	60	2.8	0.47	0.24	
107-13-1	Acrylonitrile	0.27	0.32	0.27	0.11	U
75-35-4	1,1-Dichloroethene	1.1	0.17	0.15	0.059	
75-09-2	Methylene Chloride	0.17	0.20	0.17	0.068	U
107-05-1	3-Chloro-1-propene (Allyl Chloride)	0.19	0.22	0.19	0.071	U
76-13-1	Trichlorotrifluoroethane	3.6	0.090	0.076	0.031	
75-15-0	Carbon Disulfide	0.17	2.2	0.19	0.066	J
156-60-5	trans-1,2-Dichloroethene	0.34	0.17	0.15	0.066	
75-34-3	1,1-Dichloroethane	0.52	0.17	0.14	0.055	
1634-04-4	Methyl tert-Butyl Ether	0.16	0.19	0.16	0.065	U
108-05-4	Vinyl Acetate	2.9	2.0	0.82	0.25	
78-93-3	2-Butanone (MEK)	42	2.3	0.20	0.098	

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: Trinity Analysis & Development Corp.

Client Sample ID: ODSVE-EFF-Y7Q1

Client Project ID: DDMT SVE / 10060131 AC 2.0

ALS Project ID: P1702819

ALS Sample ID: P1702819-001

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC01885

Date Collected: 6/7/17

Date Received: 6/12/17

Date Analyzed: 6/22/17

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.66 Final Pressure (psig): 4.63

Canister Dilution Factor: 1.38

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	24	0.17	0.15	0.056	
141-78-6	Ethyl Acetate	0.33	0.38	0.33	0.13	U
110-54-3	n-Hexane	0.065	0.20	0.17	0.059	J
67-66-3	Chloroform	4.8	0.14	0.12	0.048	
109-99-9	Tetrahydrofuran (THF)	0.20	0.23	0.20	0.094	U
107-06-2	1,2-Dichloroethane	0.14	0.17	0.14	0.055	U
71-55-6	1,1,1-Trichloroethane	0.35	0.13	0.11	0.043	
71-43-2	Benzene	0.18	0.22	0.18	0.069	U
56-23-5	Carbon Tetrachloride	0.34	0.11	0.092	0.033	
110-82-7	Cyclohexane	0.15	0.40	0.34	0.12	J
78-87-5	1,2-Dichloropropane	0.13	0.15	0.13	0.048	U
75-27-4	Bromodichloromethane	0.14	0.10	0.089	0.031	
79-01-6	Trichloroethene	26	0.13	0.11	0.036	
123-91-1	1,4-Dioxane	0.16	0.19	0.16	0.061	U
80-62-6	Methyl Methacrylate	0.28	0.34	0.28	0.10	U
142-82-5	n-Heptane	0.14	0.17	0.14	0.057	U
10061-01-5	cis-1,3-Dichloropropene	0.14	0.15	0.14	0.043	U
108-10-1	4-Methyl-2-pentanone	0.14	0.17	0.14	0.054	U
10061-02-6	trans-1,3-Dichloropropene	0.13	0.15	0.13	0.049	U
79-00-5	1,1,2-Trichloroethane	0.11	0.13	0.11	0.040	U
108-88-3	Toluene	0.15	0.18	0.15	0.062	U
591-78-6	2-Hexanone	0.095	0.17	0.14	0.054	J
124-48-1	Dibromochloromethane	0.068	0.081	0.068	0.026	U
106-93-4	1,2-Dibromoethane	0.075	0.090	0.075	0.029	U
123-86-4	n-Butyl Acetate	0.12	0.15	0.12	0.046	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.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 3 of 3

Client: Trinity Analysis & Development Corp.
Client Sample ID: ODSVE-EFF-Y7Q1
Client Project ID: DDMT SVE / 10060131 AC 2.0

ALS Project ID: P1702819
 ALS Sample ID: P1702819-001

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16
Analyst: Lusine Hakobyan
Sampling Media: 6.0 L Summa Canister
Test Notes:
Container ID: SC01885

Date Collected: 6/7/17
Date Received: 6/12/17
Date Analyzed: 6/22/17
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.66 Final Pressure (psig): 4.63

Canister Dilution Factor: 1.38

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	0.12	0.15	0.12	0.053	U
127-18-4	Tetrachloroethene	2.5	0.10	0.086	0.029	
108-90-7	Chlorobenzene	0.13	0.15	0.13	0.048	U
100-41-4	Ethylbenzene	0.13	0.16	0.13	0.051	U
179601-23-1	m,p-Xylenes	0.46	0.32	0.27	0.095	
75-25-2	Bromoform	0.057	0.067	0.057	0.020	U
100-42-5	Styrene	0.14	0.16	0.14	0.049	U
95-47-6	o-Xylene	0.13	0.16	0.13	0.048	U
111-84-2	n-Nonane	0.11	0.13	0.11	0.039	U
79-34-5	1,1,2,2-Tetrachloroethane	0.71	0.10	0.084	0.030	
98-82-8	Cumene	0.12	0.14	0.12	0.042	U
80-56-8	alpha-Pinene	0.10	0.12	0.10	0.035	U
103-65-1	n-Propylbenzene	0.12	0.14	0.12	0.045	U
622-96-8	4-Ethyltoluene	0.046	0.14	0.12	0.045	J
108-67-8	1,3,5-Trimethylbenzene	0.20	0.14	0.12	0.045	
95-63-6	1,2,4-Trimethylbenzene	0.42	0.14	0.12	0.042	
100-44-7	Benzyl Chloride	0.11	0.13	0.11	0.029	U
541-73-1	1,3-Dichlorobenzene	0.096	0.11	0.096	0.034	U
106-46-7	1,4-Dichlorobenzene	0.096	0.11	0.096	0.032	U
95-50-1	1,2-Dichlorobenzene	0.096	0.11	0.096	0.034	U
5989-27-5	d-Limonene	0.099	0.12	0.099	0.035	U
96-12-8	1,2-Dibromo-3-chloropropane	0.060	0.071	0.060	0.014	U
120-82-1	1,2,4-Trichlorobenzene	0.078	0.093	0.078	0.030	U
91-20-3	Naphthalene	0.062	0.13	0.11	0.047	J
87-68-3	Hexachlorobutadiene	0.054	0.065	0.054	0.018	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.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: Trinity Analysis & Development Corp.

Client Sample ID: Method Blank

Client Project ID: DDMT SVE / 10060131 AC 2.0

ALS Project ID: P1702819

ALS Sample ID: P170622-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 6/22/17

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)	0.085	0.10	0.085	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)	0.057	0.072	0.057	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	0.25	0.30	0.25	0.11	U
107-02-8	Acrolein	0.18	0.87	0.18	0.074	U
67-64-1	Acetone	0.88	2.1	0.88	0.32	U
75-69-4	Trichlorofluoromethane	0.075	0.089	0.075	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)	0.13	0.16	0.13	0.051	U
76-13-1	Trichlorotrifluoroethane	0.055	0.065	0.055	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	0.60	1.4	0.60	0.18	U
78-93-3	2-Butanone (MEK)	0.14	1.7	0.14	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: Trinity Analysis & Development Corp.

Client Sample ID: Method Blank

Client Project ID: DDMT SVE / 10060131 AC 2.0

ALS Project ID: P1702819

ALS Sample ID: P170622-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 6/22/17

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	0.086	0.10	0.086	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	0.079	0.092	0.079	0.031	U
71-43-2	Benzene	0.13	0.16	0.13	0.050	U
56-23-5	Carbon Tetrachloride	0.067	0.080	0.067	0.024	U
110-82-7	Cyclohexane	0.25	0.29	0.25	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	0.078	0.093	0.078	0.026	U
123-91-1	1,4-Dioxane	0.12	0.14	0.12	0.044	U
80-62-6	Methyl Methacrylate	0.21	0.24	0.21	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	0.10	0.12	0.10	0.039	U
124-48-1	Dibromochloromethane	0.049	0.059	0.049	0.019	U
106-93-4	1,2-Dibromoethane	0.055	0.065	0.055	0.021	U
123-86-4	n-Butyl Acetate	0.091	0.11	0.091	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: Trinity Analysis & Development Corp.
Client Sample ID: Method Blank
Client Project ID: DDMT SVE / 10060131 AC 2.0

ALS Project ID: P1702819
 ALS Sample ID: P170622-MB

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16
Analyst: Lusine Hakobyan
Sampling Media: 6.0 L Summa Canister
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 6/22/17
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	0.090	0.11	0.090	0.039	U
127-18-4	Tetrachloroethene	0.062	0.074	0.062	0.021	U
108-90-7	Chlorobenzene	0.091	0.11	0.091	0.035	U
100-41-4	Ethylbenzene	0.097	0.12	0.097	0.037	U
179601-23-1	m,p-Xylenes	0.20	0.23	0.20	0.069	U
75-25-2	Bromoform	0.042	0.048	0.042	0.015	U
100-42-5	Styrene	0.099	0.12	0.099	0.035	U
95-47-6	o-Xylene	0.097	0.12	0.097	0.035	U
111-84-2	n-Nonane	0.080	0.095	0.080	0.029	U
79-34-5	1,1,2,2-Tetrachloroethane	0.061	0.073	0.061	0.022	U
98-82-8	Cumene	0.085	0.10	0.085	0.031	U
80-56-8	alpha-Pinene	0.075	0.090	0.075	0.025	U
103-65-1	n-Propylbenzene	0.088	0.10	0.088	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	0.081	0.097	0.081	0.021	U
541-73-1	1,3-Dichlorobenzene	0.070	0.083	0.070	0.025	U
106-46-7	1,4-Dichlorobenzene	0.070	0.083	0.070	0.023	U
95-50-1	1,2-Dichlorobenzene	0.070	0.083	0.070	0.025	U
5989-27-5	d-Limonene	0.072	0.090	0.072	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	0.082	0.095	0.082	0.034	U
87-68-3	Hexachlorobutadiene	0.039	0.047	0.039	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: Trinity Analysis & Development Corp.
Client Project ID: DDMT SVE / 10060131 AC 2.0

ALS Project ID: P1702819

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16
Analyst: Lusine Hakobyan
Sampling Media: 6.0 L Summa Canister(s)
Test Notes:

Date(s) Collected: 6/7/17
Date(s) Received: 6/12/17
Date(s) Analyzed: 6/22/17

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	P170622-MB	90	101	98	70-130	
Lab Control Sample	P170622-LCS	87	99	98	70-130	
ODSVE-EFF-Y7Q1	P1702819-001	90	99	99	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: Trinity Analysis & Development Corp.

Client Sample ID: Lab Control Sample

Client Project ID: DDMT SVE / 10060131 AC 2.0

ALS Project ID: P1702819

ALS Sample ID: P170622-LCS

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 6/22/17

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	DOD Acceptance Limits	Data Qualifier
115-07-1	Propene	122	111	91	57-136	
75-71-8	Dichlorodifluoromethane (CFC 12)	42.5	34.6	81	59-128	
74-87-3	Chloromethane	102	93.7	92	59-132	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	30.2	24.3	80	63-121	
75-01-4	Vinyl Chloride	82.2	75.1	91	64-127	
106-99-0	1,3-Butadiene	95.0	85.6	90	66-134	
74-83-9	Bromomethane	54.1	45.4	84	63-134	
75-00-3	Chloroethane	79.5	79.5	100	63-127	
64-17-5	Ethanol	563	522	93	59-125	
75-05-8	Acetonitrile	127	115	91	63-132	
107-02-8	Acrolein	92.6	84.2	91	62-126	
67-64-1	Acetone	448	420	94	58-128	
75-69-4	Trichlorofluoromethane	37.4	30.7	82	62-126	
67-63-0	2-Propanol (Isopropyl Alcohol)	173	156	90	52-125	
107-13-1	Acrylonitrile	98.0	95.6	98	71-137	
75-35-4	1,1-Dichloroethene	53.6	49.1	92	61-133	
75-09-2	Methylene Chloride	61.2	56.8	93	62-115	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	67.8	58.8	87	71-131	
76-13-1	Trichlorotrifluoroethane	27.6	23.8	86	66-126	
75-15-0	Carbon Disulfide	68.6	65.8	96	57-134	
156-60-5	trans-1,2-Dichloroethene	53.8	50.9	95	67-124	
75-34-3	1,1-Dichloroethane	52.5	48.8	93	68-126	
1634-04-4	Methyl tert-Butyl Ether	59.0	52.1	88	66-126	
108-05-4	Vinyl Acetate	301	313	104	56-139	
78-93-3	2-Butanone (MEK)	72.0	69.1	96	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: Trinity Analysis & Development Corp.

Client Sample ID: Lab Control Sample

Client Project ID: DDMT SVE / 10060131 AC 2.0

ALS Project ID: P1702819

ALS Sample ID: P170622-LCS

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 6/22/17

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	53.4	49.4	93	70-121	
141-78-6	Ethyl Acetate	118	118	100	65-128	
110-54-3	n-Hexane	60.4	57.8	96	63-120	
67-66-3	Chloroform	43.4	37.3	86	68-123	
109-99-9	Tetrahydrofuran (THF)	72.1	65.4	91	64-123	
107-06-2	1,2-Dichloroethane	52.4	41.5	79	65-128	
71-55-6	1,1,1-Trichloroethane	38.8	31.7	82	68-125	
71-43-2	Benzene	66.5	60.0	90	69-119	
56-23-5	Carbon Tetrachloride	33.8	27.5	81	68-132	
110-82-7	Cyclohexane	124	116	94	70-117	
78-87-5	1,2-Dichloropropane	45.9	45.4	99	69-123	
75-27-4	Bromodichloromethane	31.9	27.7	87	72-128	
79-01-6	Trichloroethene	39.5	34.9	88	71-123	
123-91-1	1,4-Dioxane	59.1	56.4	95	71-122	
80-62-6	Methyl Methacrylate	104	96.2	93	70-128	
142-82-5	n-Heptane	51.9	49.8	96	69-123	
10061-01-5	cis-1,3-Dichloropropene	46.3	44.6	96	70-128	
108-10-1	4-Methyl-2-pentanone	51.9	50.8	98	67-130	
10061-02-6	trans-1,3-Dichloropropene	47.0	44.4	94	75-133	
79-00-5	1,1,2-Trichloroethane	38.9	36.2	93	73-119	
108-88-3	Toluene	56.2	51.2	91	66-119	
591-78-6	2-Hexanone	51.9	44.5	86	62-128	
124-48-1	Dibromochloromethane	25.0	21.2	85	70-130	
106-93-4	1,2-Dibromoethane	27.5	24.8	90	74-122	
123-86-4	n-Butyl Acetate	45.4	39.7	87	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: Trinity Analysis & Development Corp.

Client Sample ID: Lab Control Sample

Client Project ID: DDMT SVE / 10060131 AC 2.0

ALS Project ID: P1702819

ALS Sample ID: P170622-LCS

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 6/22/17

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	45.4	40.6	89	69-121	
127-18-4	Tetrachloroethene	31.4	26.8	85	66-124	
108-90-7	Chlorobenzene	46.1	41.1	89	70-119	
100-41-4	Ethylbenzene	48.7	42.9	88	70-124	
179601-23-1	m,p-Xylenes	97.7	83.7	86	61-134	
75-25-2	Bromoform	20.6	17.2	83	66-139	
100-42-5	Styrene	49.8	46.1	93	73-127	
95-47-6	o-Xylene	48.7	41.7	86	67-125	
111-84-2	n-Nonane	40.4	35.5	88	63-128	
79-34-5	1,1,2,2-Tetrachloroethane	30.9	29.1	94	65-127	
98-82-8	Cumene	43.2	37.3	86	68-124	
80-56-8	alpha-Pinene	38.2	35.2	92	66-123	
103-65-1	n-Propylbenzene	43.5	38.9	89	69-123	
622-96-8	4-Ethyltoluene	43.2	38.7	90	67-129	
108-67-8	1,3,5-Trimethylbenzene	43.2	36.7	85	67-130	
95-63-6	1,2,4-Trimethylbenzene	43.2	36.7	85	66-132	
100-44-7	Benzyl Chloride	41.0	38.3	93	50-147	
541-73-1	1,3-Dichlorobenzene	35.2	31.0	88	65-130	
106-46-7	1,4-Dichlorobenzene	35.5	31.3	88	60-131	
95-50-1	1,2-Dichlorobenzene	35.3	31.2	88	63-129	
5989-27-5	d-Limonene	38.1	37.0	97	62-133	
96-12-8	1,2-Dibromo-3-chloropropane	21.9	20.8	95	62-155	
120-82-1	1,2,4-Trichlorobenzene	28.6	27.6	97	55-142	
91-20-3	Naphthalene	40.8	42.5	104	57-138	
87-68-3	Hexachlorobutadiene	19.9	17.2	86	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: Trinity Analysis & Development Corp.
Client Project ID: DDMT SVE / 10060131 AC 2.0

ALS Project ID: P1702819

Method Blank Summary

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16
Analyst: Lusine Hakobyan
Sampling Media: 6.0 L Summa Canister(s)
Test Notes:

Lab File ID: 06221704.D
Date Analyzed: 6/22/17
Time Analyzed: 06:46

Client Sample ID	ALS Sample ID	Lab File ID	Time Analyzed
Lab Control Sample	P170622-LCS	06221705.D	07:20
ODSVE-EFF-Y7Q1	P1702819-001	06221723.D	19:34

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Trinity Analysis & Development Corp.
Client Project ID: DDMT SVE / 10060131 AC 2.0

ALS Project ID: P1702819

Internal Standard Area and RT Summary

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16
Analyst: Lusine Hakobyan
Sampling Media: 6.0 L Summa Canister(s)
Test Notes:

Lab File ID: 06221702.D
Date Analyzed: 6/22/17
Time Analyzed: 05:37

	IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
	AREA	#	RT	#	AREA	#
24 Hour Standard	268809	11.35	1282217	13.45	513372	17.73
Upper Limit	376333	11.68	1795104	13.78	718721	18.06
Lower Limit	161285	11.02	769330	13.12	308023	17.40

Client Sample ID						
01	Method Blank	248619	11.33	1227239	13.44	477816
02	Lab Control Sample	262761	11.34	1246145	13.45	492683
03	ODSVE-EFF-Y7Q1	256520	11.33	1253889	13.45	500094
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:\MS16\DATA\2017 06\22\06221723.D

Acq On : 22 Jun 2017 19:34

Operator: LH

Sample : P1702819-001 (1000mL)

Misc : S31-06081702

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Jun 23 14:18:18 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 08:16:28 2017

Response via : Initial Calibration

LH 6/23/17

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.33	130	256520	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.45	114	1253889	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.73	82	500094	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.19	65	329547	11.253	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	90.00%
57) Toluene-d8 (SS2)	15.88	98	1263681	12.384	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.04%
73) Bromofluorobenzene (SS3)	19.09	174	482139	12.376	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.04%

Target Compounds

						Qvalue
2) Propene	4.05	42	573254	23.160	ng	97
3) Dichlorodifluoromethan...	4.22	85	227890	4.100	ng	99
4) Chloromethane	4.54	50	791	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	4.79	135	2053	N.D.		
6) Vinyl Chloride	4.98	62	6816	0.171	ng	96
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	6.46	45	30790	1.760	ng	98
11) Acetonitrile	6.74	41	3040	N.D.		
12) Acrolein	6.92	56	9307	0.585	ng	95
13) Acetone	7.13	58	310366	17.048	ng	90
14) Trichlorofluoromethane	7.36	101	51456	1.063	ng	99
15) 2-Propanol (Isopropanol)	7.64	45	6476815	107.387	ng	96
16) Acrylonitrile	8.13	53	1025	N.D.		
17) 1,1-Dichloroethene	8.35	96	81704	3.101	ng	99
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.	d	
19) Methylene Chloride	8.58	84	4235	0.160	ng	99
20) 3-Chloro-1-propene (Al...	8.57	41	1363	N.D.		
21) Trichlorotrifluoroethane	9.00	151	542499	20.111	ng	96
22) Carbon Disulfide	8.86	76	35198	0.385	ng	99
23) trans-1,2-Dichloroethene	9.87	61	33981	0.986	ng	98
24) 1,1-Dichloroethane	10.13	63	67094	1.525	ng	100
25) Methyl tert-Butyl Ether	10.25	73	4694	N.D.		
26) Vinyl Acetate	10.36	86	43904	7.379	ng	# 15
27) 2-Butanone (MEK)	10.64	72	1561878	89.235	ng	91
28) cis-1,2-Dichloroethene	11.15	61	2296659	68.031	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	11.42	57	6623	0.167	ng	96
32) Chloroform	11.50	83	794891	16.957	ng	99
34) Tetrahydrofuran (THF)	11.93	72	2267	0.126	ng	# 61
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.30	62	1400	N.D.		
38) 1,1,1-Trichloroethane	12.58	97	62099	1.381	ng	99
39) Isopropyl Acetate	0.00	61	0	N.D.	d	
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	13.06	78	12464	0.114	ng	97
42) Carbon Tetrachloride	13.21	117	65219	1.557	ng	99
43) Cyclohexane	13.34	84	15064	0.366	ng	98
44) tert-Amyl Methyl Ether	13.64	73	3768	N.D.		
45) 1,2-Dichloropropane	13.72	63	1406	N.D.		
46) Bromodichloromethane	14.09	83	26252	0.676	ng	95
47) Trichloroethene	14.14	130	3361842	101.696	ng	100
48) 1,4-Dioxane	14.14	88	773	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d	

Data File: I:\MS16\DATA\2017 06\22\06221723.D

Acq On : 22 Jun 2017 19:34

Operator: LH

Sample : P1702819-001 (1000mL)

Misc : S31-06081702

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Jun 23 14:18:18 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 08:16:28 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.	d	
51) n-Heptane	0.00	71	0	N.D.	d	
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	15.03	58	2363	0.099	ng	# 62
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	15.70	97	3483	0.127	ng	# 70
58) Toluene	15.98	91	14417m	0.128	ng	
59) 2-Hexanone	16.22	43	16253	0.282	ng	79
60) Dibromochloromethane	16.40	129	617	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.84	43	4054	N.D.		
63) n-Octane	16.97	57	3858	0.169	ng	82
64) Tetrachloroethene	17.12	166	453120	12.167	ng	99
65) Chlorobenzene	17.78	112	2305	N.D.		
66) Ethylbenzene	18.11	91	9561	N.D.		
67) m- & p-Xylenes	18.27	91	148435	1.435	ng	99
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.60	104	3561	N.D.		
70) o-Xylene	18.70	91	10213	0.097	ng	86
71) n-Nonane	18.88	43	5859	0.123	ng	94
72) 1,1,2,2-Tetrachloroethane	18.68	83	174562	3.542	ng	96
74) Cumene	19.21	105	2842	N.D.		
75) alpha-Pinene	19.55	93	1304	N.D.		
76) n-Propylbenzene	19.65	91	4103	N.D.		
77) 3-Ethyltoluene	0.00	105	0	N.D.	d	
78) 4-Ethyltoluene	19.78	105	20761	0.164	ng	96
79) 1,3,5-Trimethylbenzene	19.84	105	81823	0.722	ng	98
80) alpha-Methylstyrene	19.97	118	879	N.D.		
81) 2-Ethyltoluene	0.00	105	0	N.D.	d	
82) 1,2,4-Trimethylbenzene	20.19	105	174119	1.508	ng	88
83) n-Decane	0.00	57	0	N.D.	d	
84) Benzyl Chloride	20.32	91	2538	N.D.		
85) 1,3-Dichlorobenzene	20.34	146	598	N.D.		
86) 1,4-Dichlorobenzene	20.39	146	1393	N.D.		
87) sec-Butylbenzene	20.43	105	1380	N.D.		
88) 4-Isopropyltoluene (p-...	20.57	119	6235	N.D.		
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D.	d	
90) 1,2-Dichlorobenzene	20.69	146	515	N.D.		
91) d-Limonene	20.69	68	5234m	0.132	ng	
92) 1,2-Dibromo-3-Chloropr...	20.99	157	1105	N.D.		
93) n-Undecane	0.00	57	0	N.D.	d	
94) 1,2,4-Trichlorobenzene	22.17	180	755	N.D.		
95) Naphthalene	22.28	128	31542	0.234	ng	87
96) n-Dodecane	0.00	57	0	N.D.	d	
97) Hexachlorobutadiene	22.60	225	626	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.	d	

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

Data File: I:\MS16\DATA\2017 06\22\06221723.D

Acq On : 22 Jun 2017 19:34

Operator: LH

Sample : P1702819-001 (1000mL)

Misc : S31-06081702

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Jun 23 14:18:18 2017

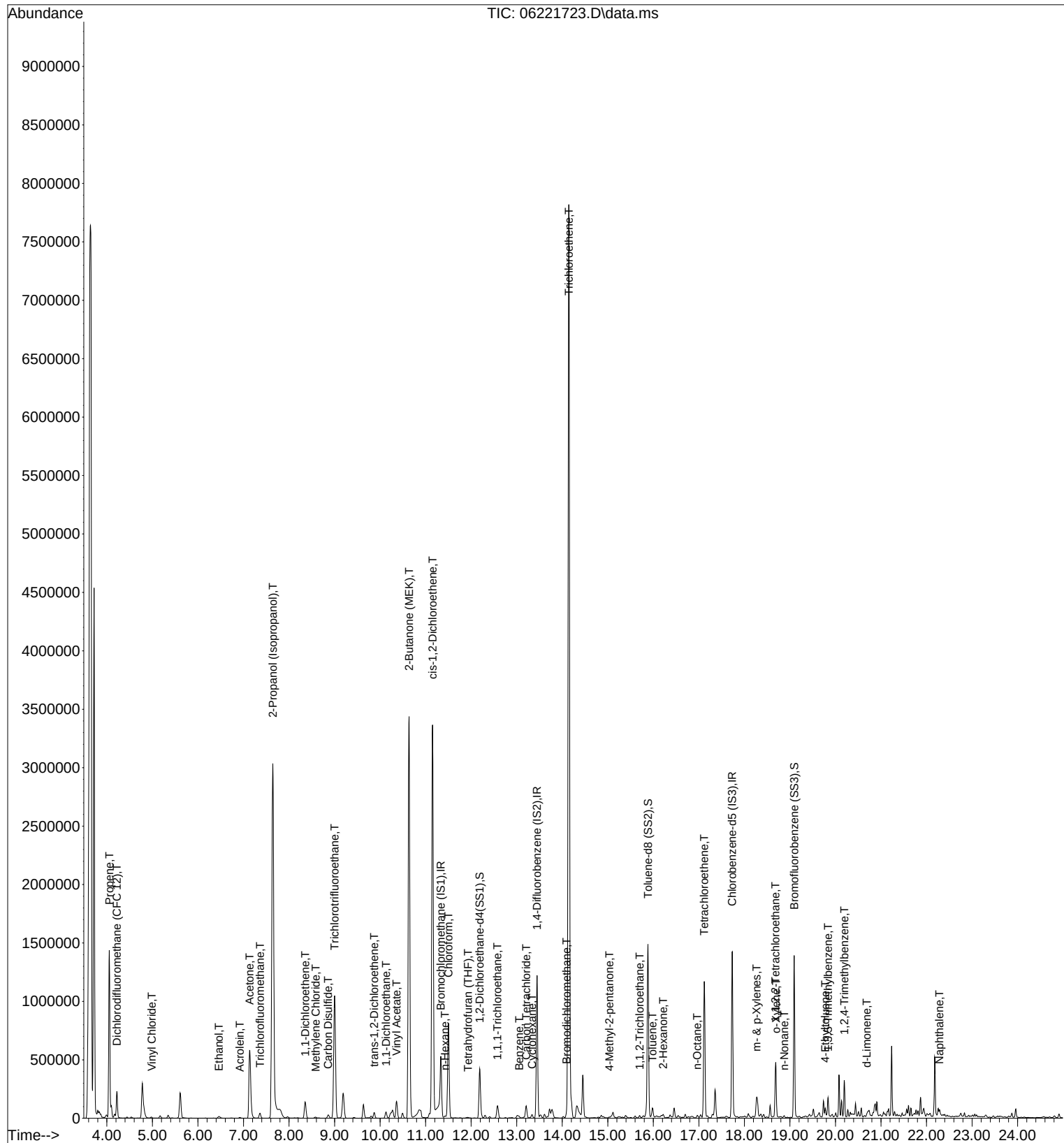
Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 08:16:28 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS16\DATA\2017 06\22\06221723.D

Acq On : 22 Jun 2017 19:34

Operator: LH

Sample : P1702819-001 (1000mL)

Misc : S31-06081702

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Jun 23 14:18:18 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 08:16:28 2017

LH 6/23/17

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.33	130	256520	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.45	114	1253889	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.73	82	500094	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.19	65	329547	11.253	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	90.00%
57) Toluene-d8 (SS2)	15.88	98	1263681	12.384	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.04%
73) Bromofluorobenzene (SS3)	19.09	174	482139	12.376	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.04%

Target Compounds

						Qvalue
2) Propene	4.05	42	573254	23.160	ng	97
3) Dichlorodifluoromethan...	4.22	85	227890	4.100	ng	99
6) Vinyl Chloride	4.98	62	6816	0.171	ng	96
10) Ethanol	6.46	45	30790	1.760	ng	98
12) Acrolein	6.92	56	9307	0.585	ng	95
13) Acetone	7.13	58	310366	17.048	ng	90
14) Trichlorofluoromethane	7.36	101	51456	1.063	ng	99
15) 2-Propanol (Isopropanol)	7.64	45	6476815	107.387	ng	96
17) 1,1-Dichloroethene	8.35	96	81704	3.101	ng	99
19) Methylene Chloride	8.58	84	4235	0.160	ng	99
21) Trichlorotrifluoroethane	9.00	151	542499	20.111	ng	96
22) Carbon Disulfide	8.86	76	35198	0.385	ng	99
23) trans-1,2-Dichloroethene	9.87	61	33981	0.986	ng	98
24) 1,1-Dichloroethane	10.13	63	67094	1.525	ng	100
26) Vinyl Acetate	10.36	86	43904	7.379	ng	# 15
27) 2-Butanone (MEK)	10.64	72	1561878	89.235	ng	91
28) cis-1,2-Dichloroethene	11.15	61	2296659	68.031	ng	99
31) n-Hexane	11.42	57	6623	0.167	ng	96
32) Chloroform	11.50	83	794891	16.957	ng	99
34) Tetrahydrofuran (THF)	11.93	72	2267	0.126	ng	# 61
38) 1,1,1-Trichloroethane	12.58	97	62099	1.381	ng	99
41) Benzene	13.06	78	12464	0.114	ng	97
42) Carbon Tetrachloride	13.21	117	65219	1.557	ng	99
43) Cyclohexane	13.34	84	15064	0.366	ng	98
46) Bromodichloromethane	14.09	83	26252	0.676	ng	95
47) Trichloroethene	14.14	130	3361842	101.696	ng	100
53) 4-Methyl-2-pentanone	15.03	58	2363	0.099	ng	# 62
55) 1,1,2-Trichloroethane	15.70	97	3483	0.127	ng	# 70
58) Toluene	15.98	91	14417m	0.128	ng	
59) 2-Hexanone	16.22	43	16253	0.282	ng	79
63) n-Octane	16.97	57	3858	0.169	ng	82
64) Tetrachloroethene	17.12	166	453120	12.167	ng	99
67) m- & p-Xylenes	18.27	91	148435	1.435	ng	99
70) o-Xylene	18.70	91	10213	0.097	ng	86
71) n-Nonane	18.88	43	5859	0.123	ng	94
72) 1,1,2,2-Tetrachloroethane	18.68	83	174562	3.542	ng	96
78) 4-Ethyltoluene	19.78	105	20761	0.164	ng	96
79) 1,3,5-Trimethylbenzene	19.84	105	81823	0.722	ng	98
82) 1,2,4-Trimethylbenzene	20.19	105	174119	1.508	ng	88
91) d-Limonene	20.69	68	5234m	0.132	ng	
95) Naphthalene	22.28	128	31542	0.234	ng	87

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

Data File: I:\MS16\DATA\2017 06\22\06221723.D

Acq On : 22 Jun 2017 19:34

Operator: LH

Sample : P1702819-001 (1000mL)

Misc : S31-06081702

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Jun 23 14:18:18 2017

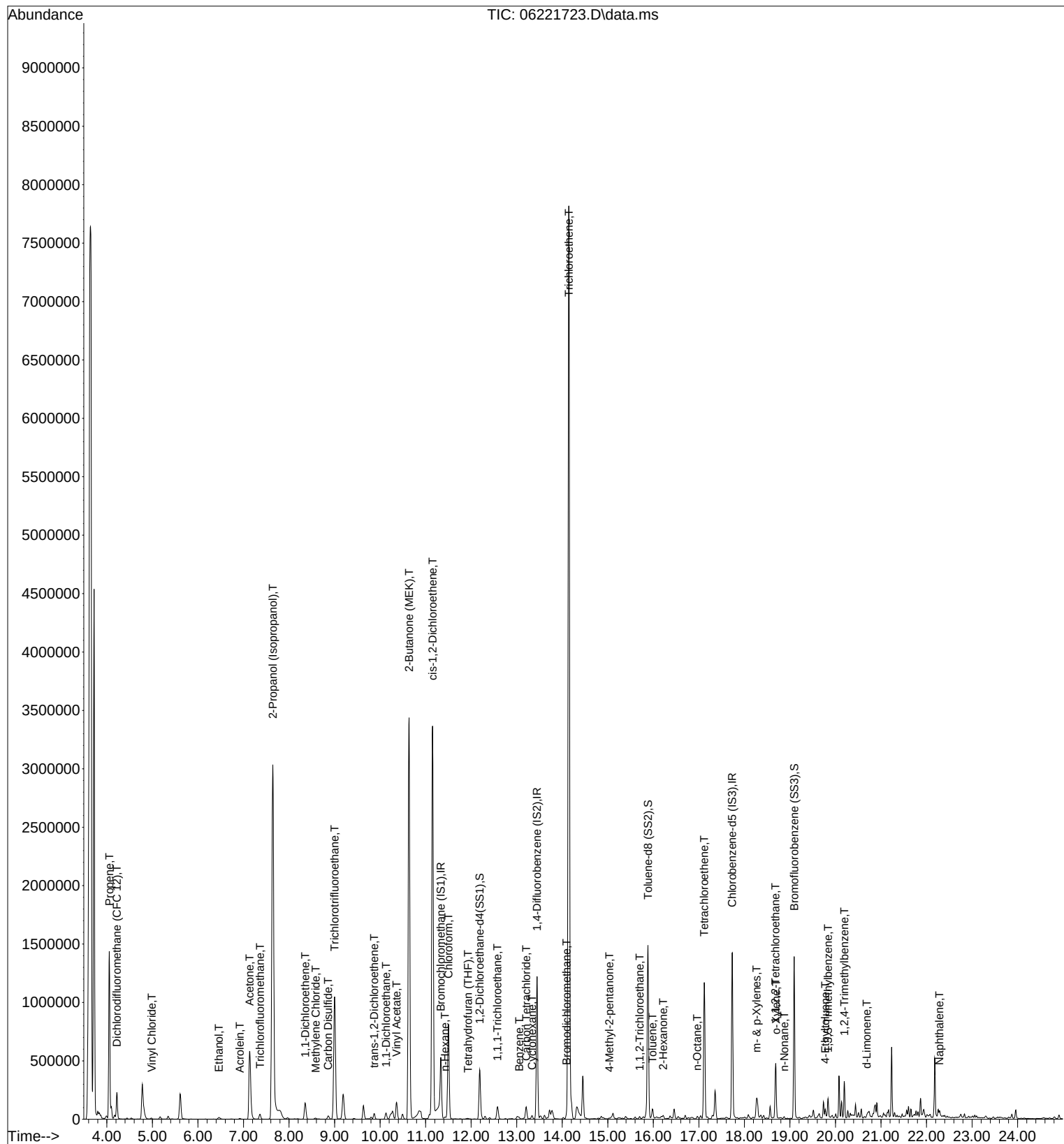
Quant Method : I:\MS16\METHODS\R16042417.M

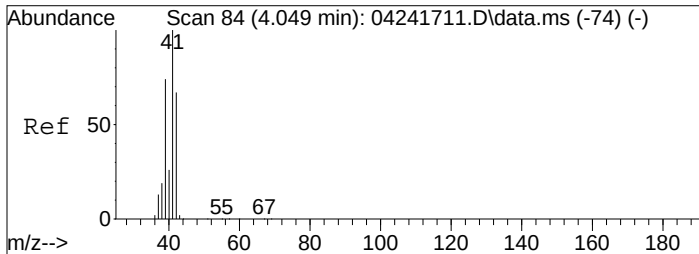
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Apr 25 08:16:28 2017

Response via : Initial Calibration

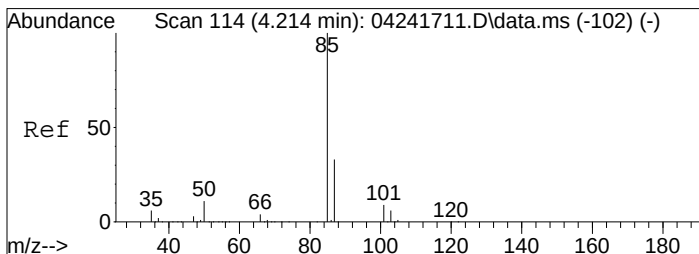
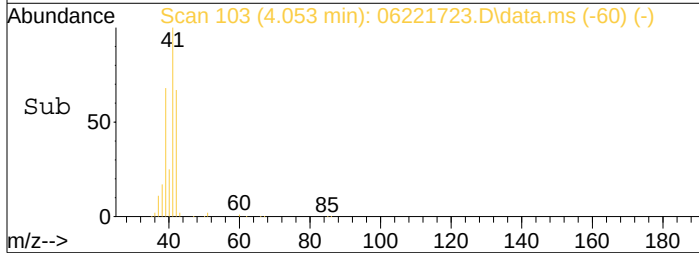
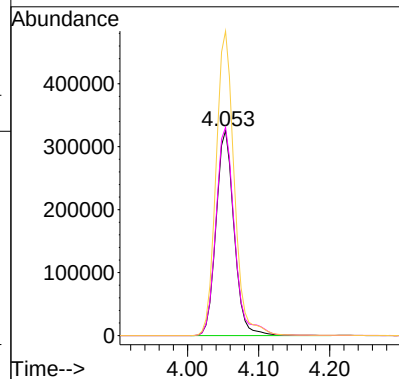
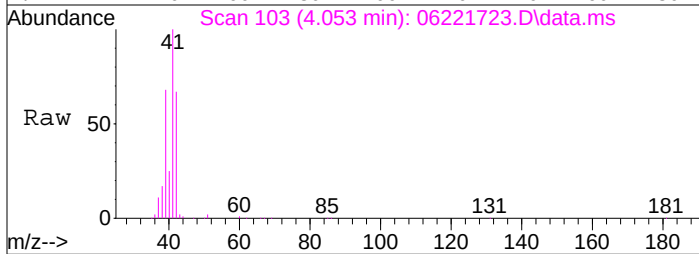
DataAcq Meth:TO15.M





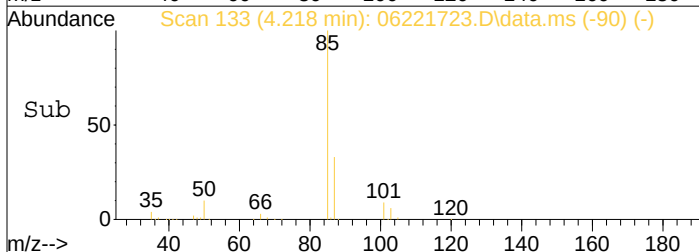
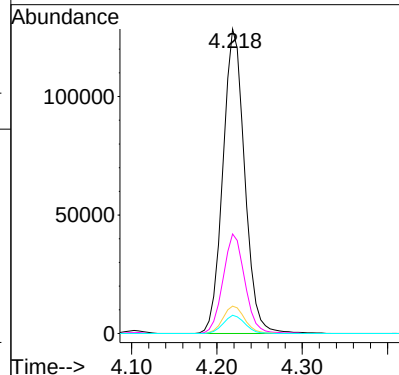
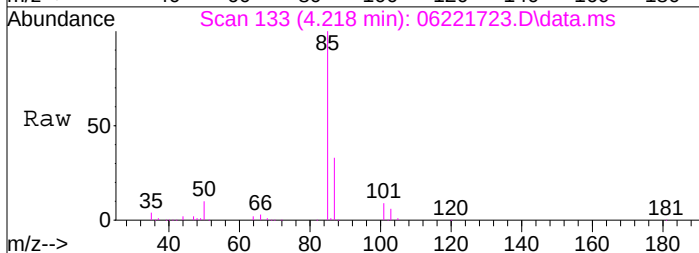
#2
Propene
Concen: 23.16 ng
RT: 4.05 min Scan# 103
Delta R.T. -0.012 min
Lab File: 06221723.D
Acq: 22 Jun 2017 19:34

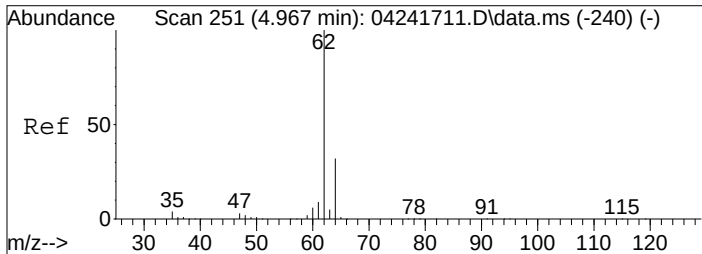
Tgt Ion: 42 Resp: 573254
Ion Ratio Lower Upper
42 100
39 105.9 93.2 133.2
41 151.0 130.6 170.6



#3
Dichlorodifluoromethane (CFC 12)
Concen: 4.10 ng
RT: 4.22 min Scan# 133
Delta R.T. -0.012 min
Lab File: 06221723.D
Acq: 22 Jun 2017 19:34

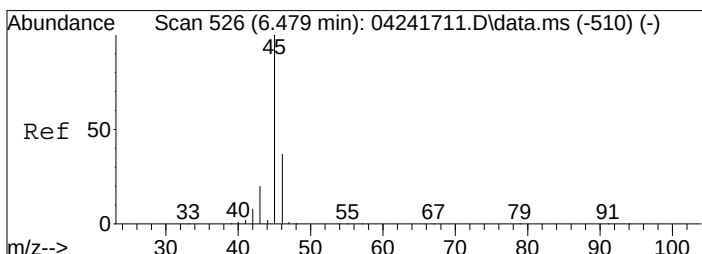
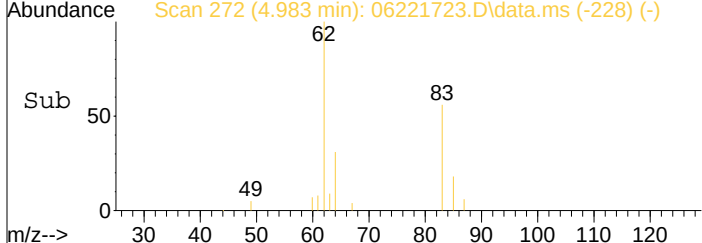
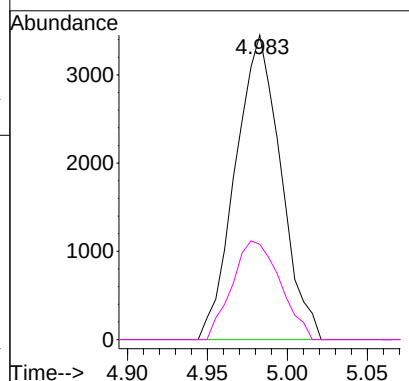
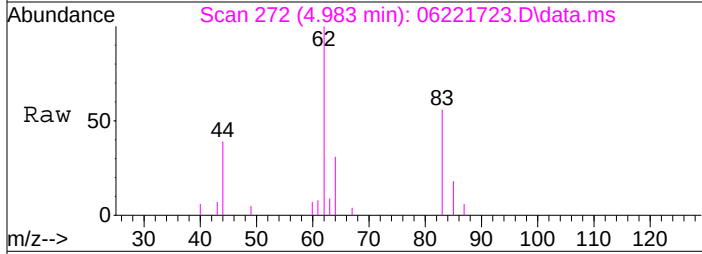
Tgt Ion: 85 Resp: 227890
Ion Ratio Lower Upper
85 100
87 32.6 12.8 52.8
101 9.0 0.0 29.5
103 5.9 0.0 26.1





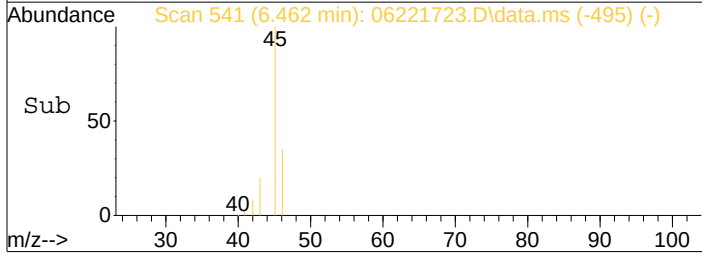
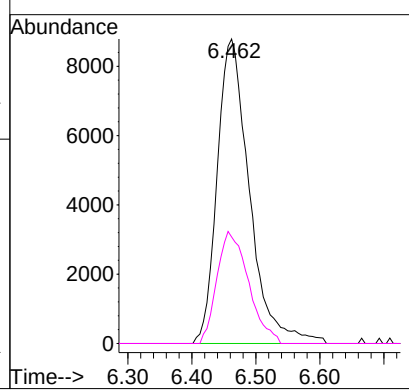
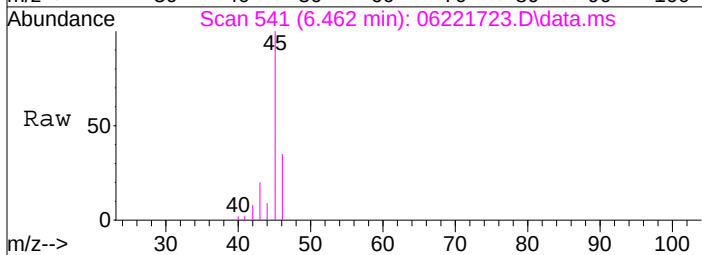
#6
 Vinyl Chloride
 Concen: 0.17 ng
 RT: 4.98 min Scan# 272
 Delta R.T. -0.006 min
 Lab File: 06221723.D
 Acq: 22 Jun 2017 19:34

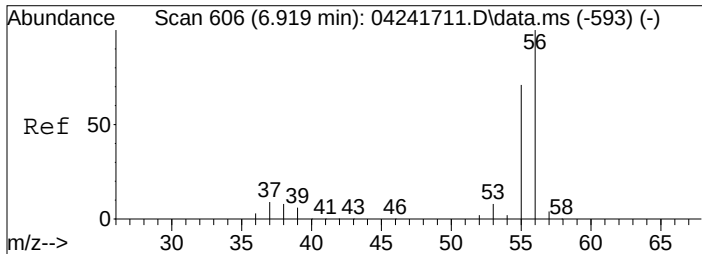
Tgt Ion: 62	Resp: 6816
Ion Ratio	Lower Upper
62	100
64	34.3 12.2 52.2



#10
 Ethanol
 Concen: 1.76 ng
 RT: 6.46 min Scan# 541
 Delta R.T. -0.094 min
 Lab File: 06221723.D
 Acq: 22 Jun 2017 19:34

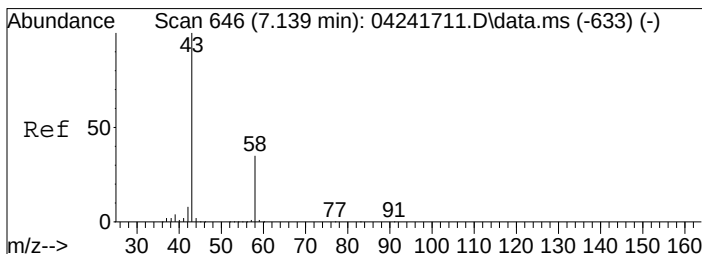
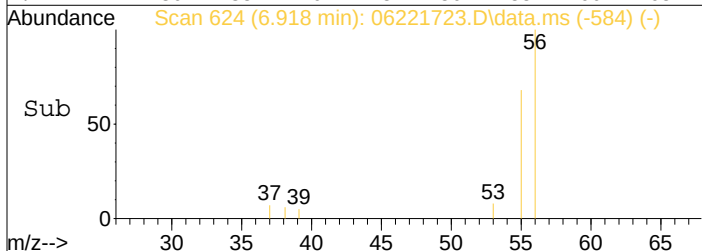
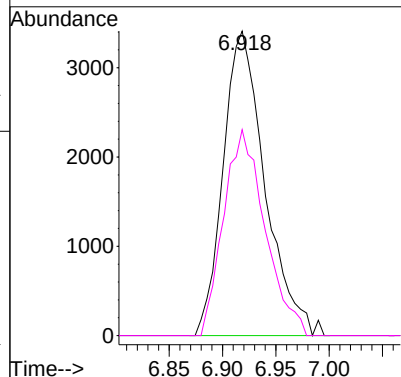
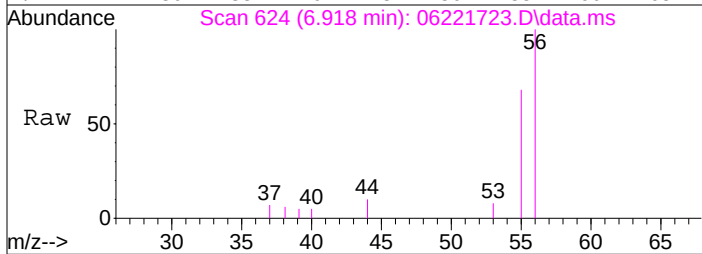
Tgt Ion: 45	Resp: 30790
Ion Ratio	Lower Upper
45	100
46	35.9 16.9 56.9





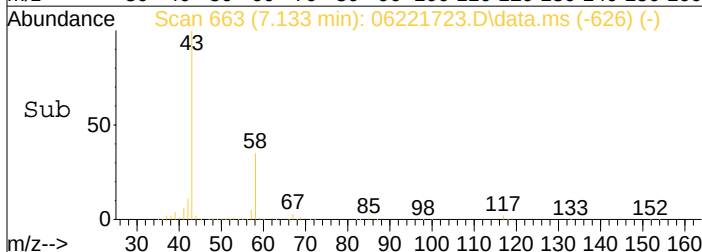
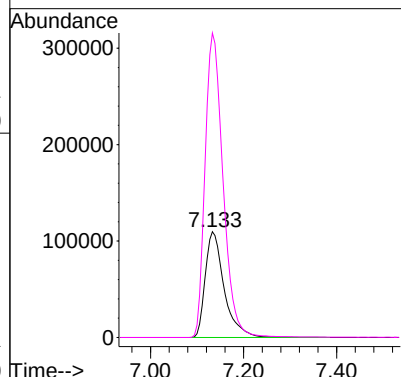
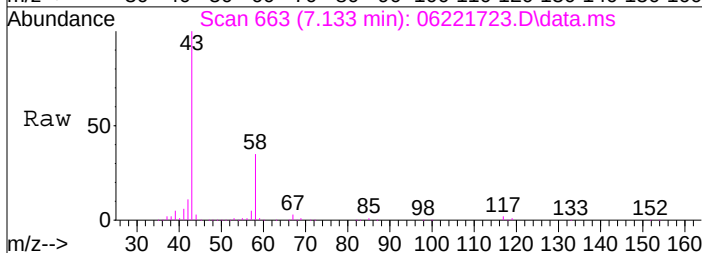
#12
Acrolein
Concen: 0.59 ng
RT: 6.92 min Scan# 624
Delta R.T. -0.028 min
Lab File: 06221723.D
Acq: 22 Jun 2017 19:34

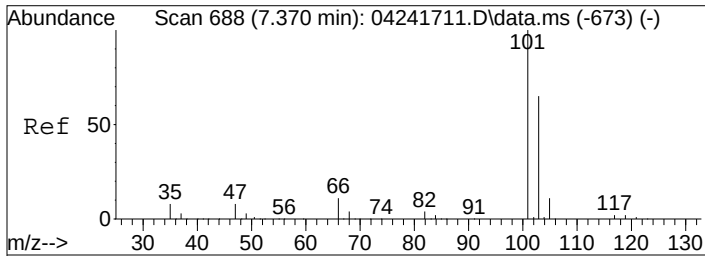
Tgt Ion: 56 Resp: 9307
Ion Ratio Lower Upper
56 100
55 66.8 50.6 90.6



#13
Acetone
Concen: 17.05 ng
RT: 7.13 min Scan# 663
Delta R.T. -0.045 min
Lab File: 06221723.D
Acq: 22 Jun 2017 19:34

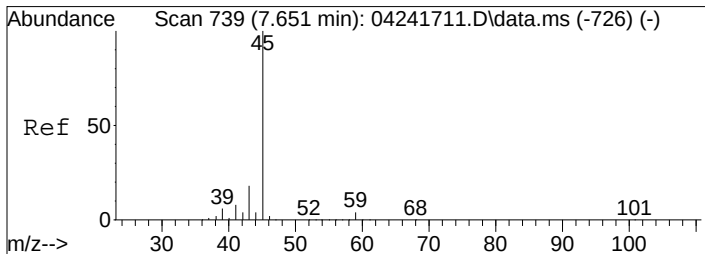
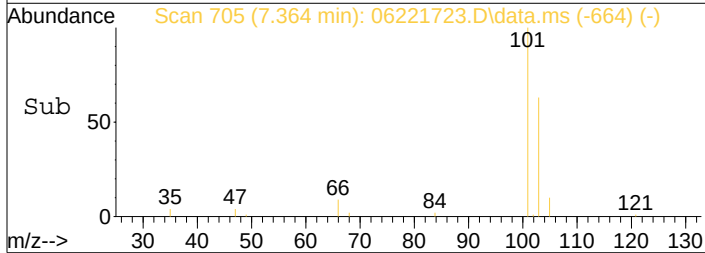
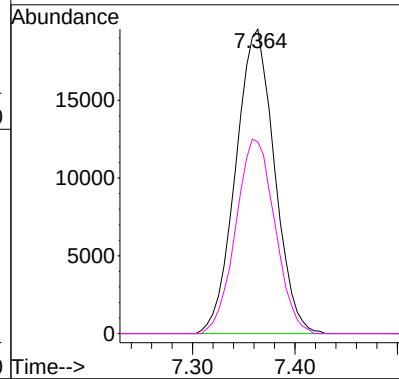
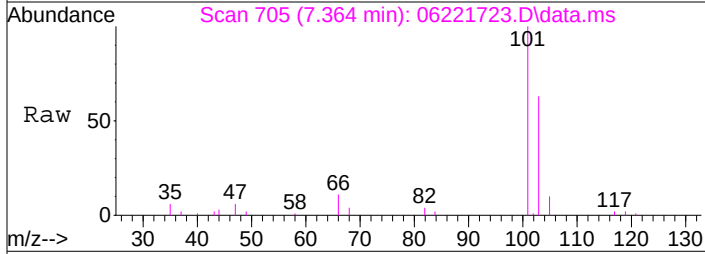
Tgt Ion: 58 Resp: 310366
Ion Ratio Lower Upper
58 100
43 274.0 264.1 324.1





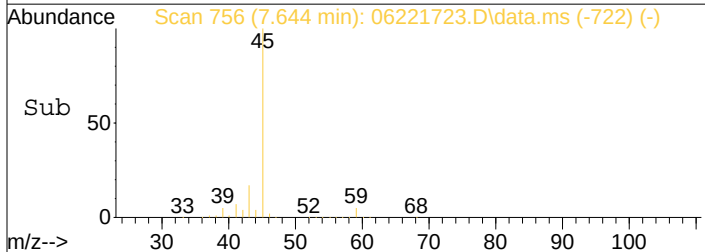
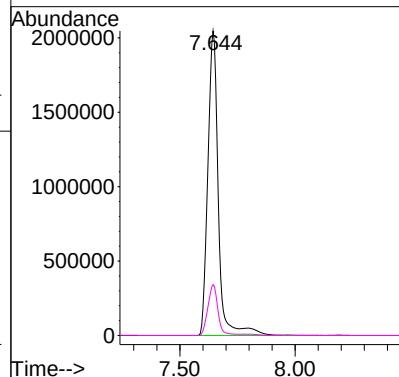
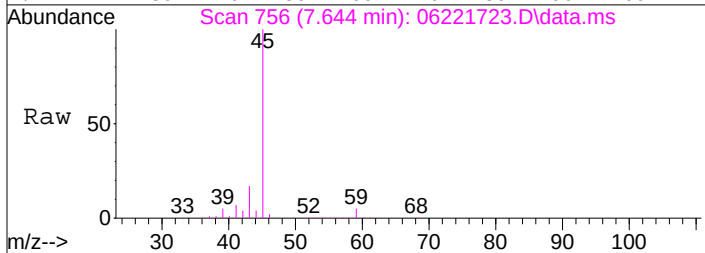
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 Trichlorofluoromethane
 Concen: 1.06 ng
 RT: 7.36 min Scan# 705
 Delta R.T. -0.023 min
 Lab File: 06221723.D
 Acq: 22 Jun 2017 19:34

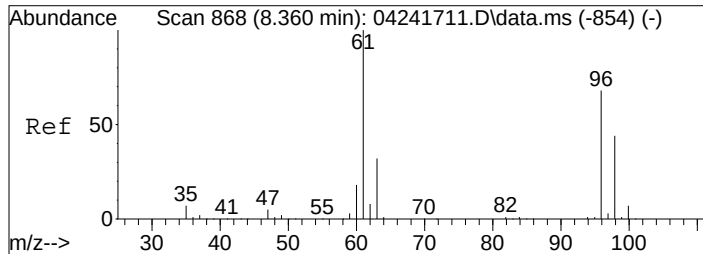
Tgt Ion: 101 Resp: 51456
 Ion Ratio Lower Upper
 101 100
 103 64.6 45.1 85.1



#15
 2-Propanol (Isopropanol)
 Concen: 107.39 ng
 RT: 7.64 min Scan# 756
 Delta R.T. -0.061 min
 Lab File: 06221723.D
 Acq: 22 Jun 2017 19:34

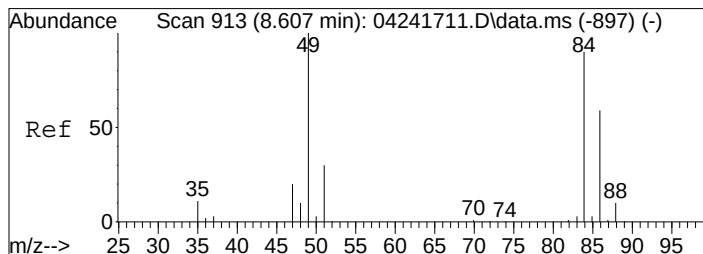
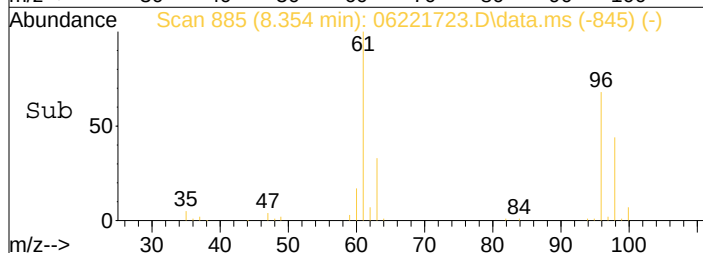
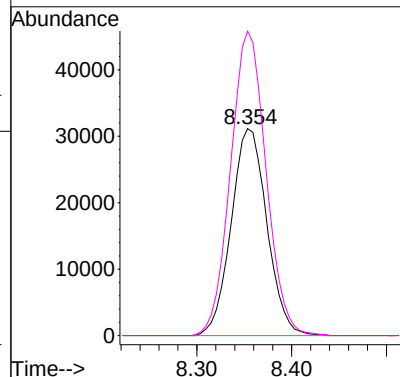
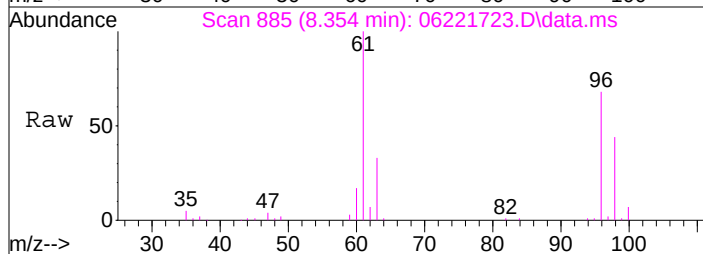
Tgt Ion: 45 Resp: 6476815
 Ion Ratio Lower Upper
 45 100
 43 16.8 0.0 38.7





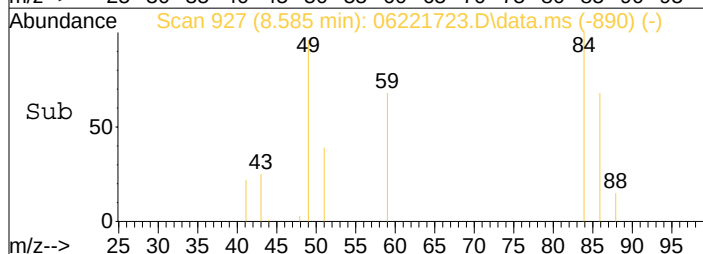
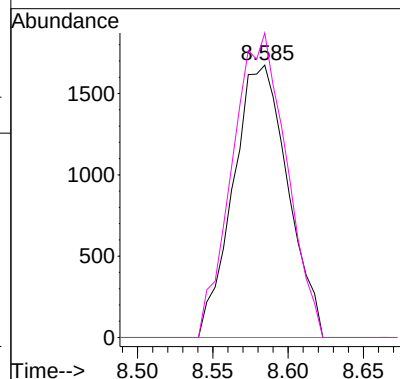
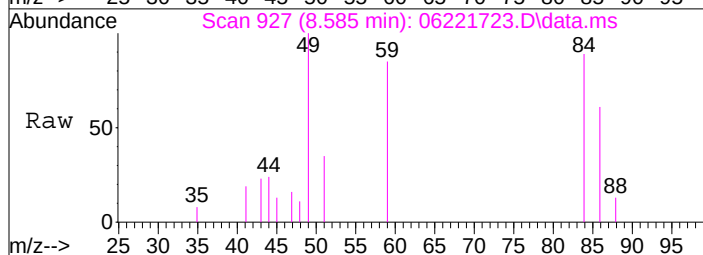
#17
1,1-Dichloroethene
Concen: 3.10 ng
RT: 8.35 min Scan# 885
Delta R.T. -0.028 min
Lab File: 06221723.D
Acq: 22 Jun 2017 19:34

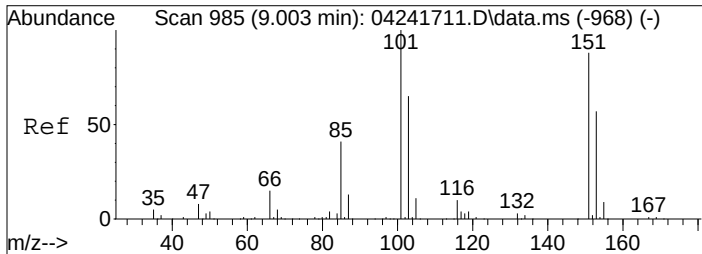
Tgt Ion: 96 Resp: 81704
Ion Ratio Lower Upper
96 100
61 146.0 127.3 167.3



#19
Methylene Chloride
Concen: 0.16 ng
RT: 8.58 min Scan# 927
Delta R.T. -0.044 min
Lab File: 06221723.D
Acq: 22 Jun 2017 19:34

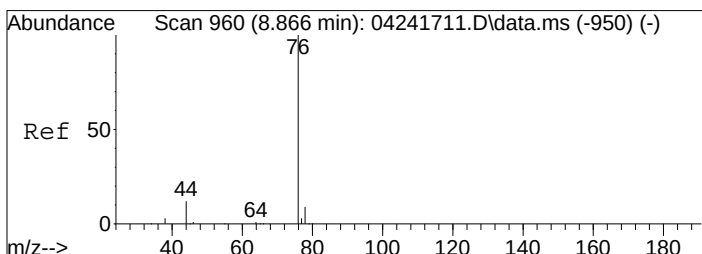
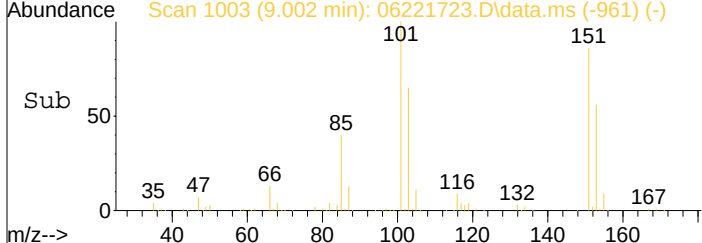
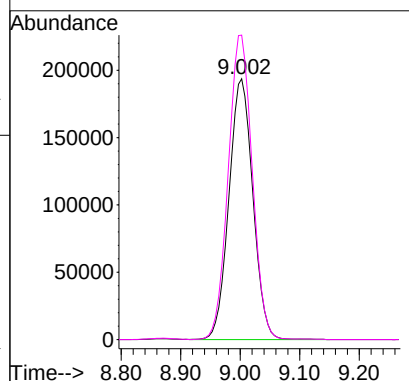
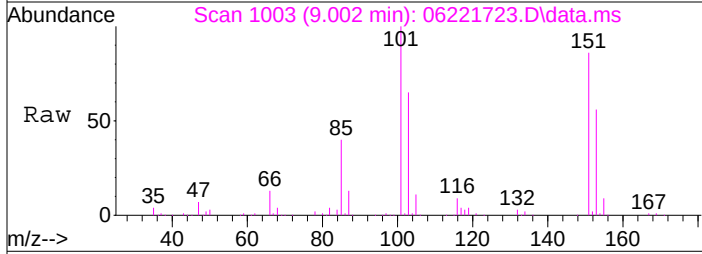
Tgt Ion: 84 Resp: 4235
Ion Ratio Lower Upper
84 100
49 110.4 87.0 137.0





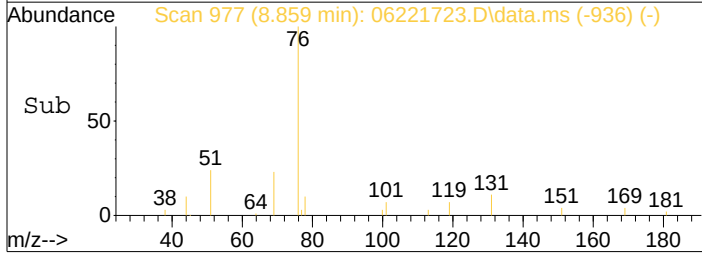
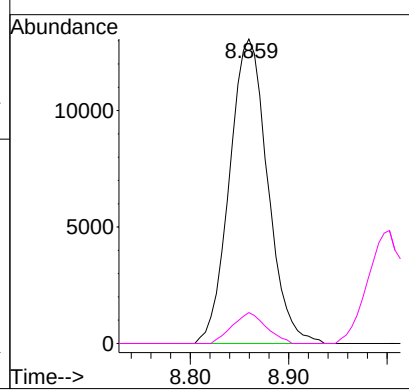
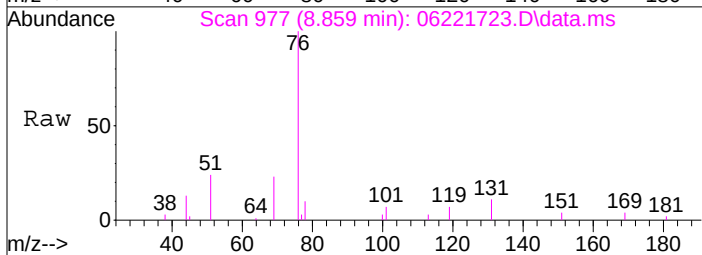
#21
 Trichlorotrifluoroethane
 Concen: 20.11 ng
 RT: 9.00 min Scan# 1003
 Delta R.T. -0.017 min
 Lab File: 06221723.D
 Acq: 22 Jun 2017 19:34

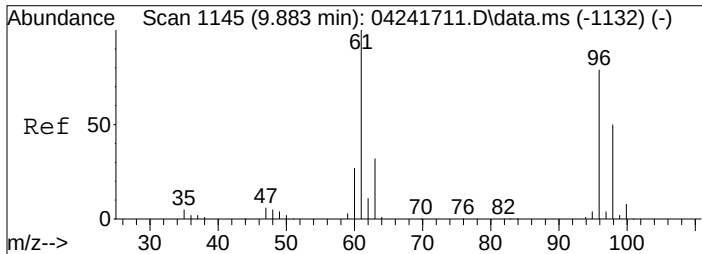
Tgt Ion: 151	Resp: 542499
Ion Ratio	Lower Upper
151	100
101	117.4 93.3 133.3



#22
 Carbon Disulfide
 Concen: 0.38 ng
 RT: 8.86 min Scan# 977
 Delta R.T. -0.023 min
 Lab File: 06221723.D
 Acq: 22 Jun 2017 19:34

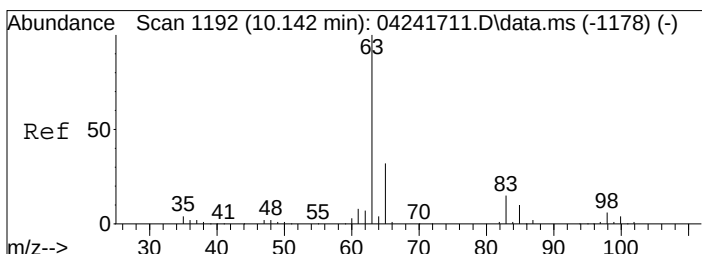
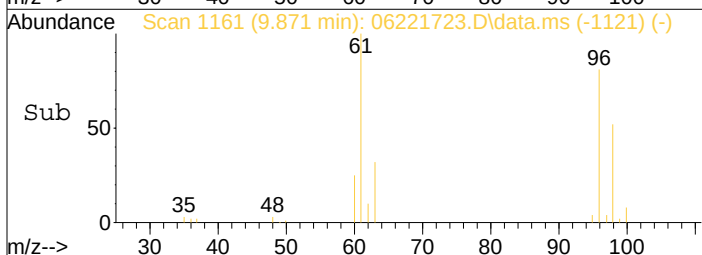
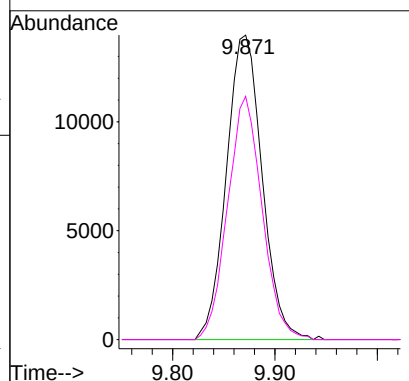
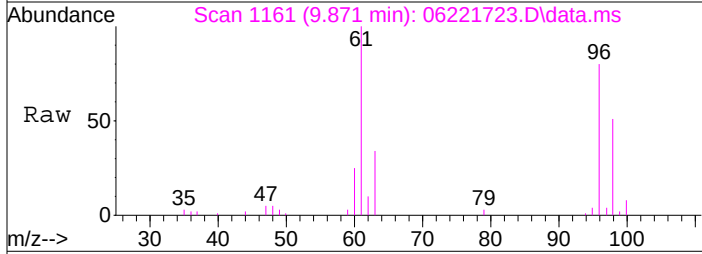
Tgt Ion: 76	Resp: 35198
Ion Ratio	Lower Upper
76	100
78	9.0 0.0 29.2





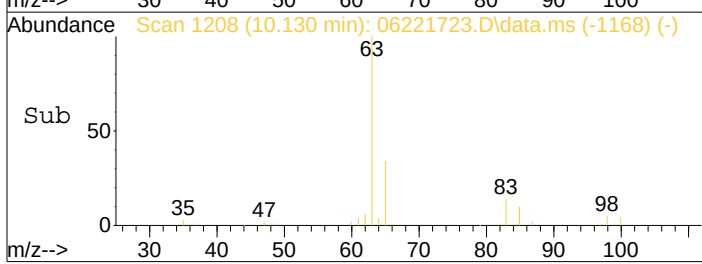
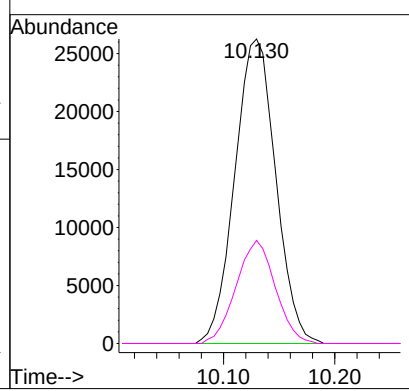
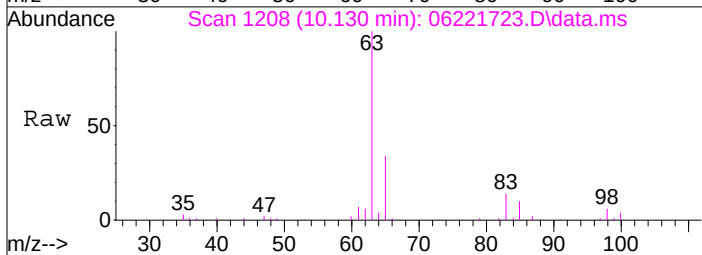
#23
trans-1,2-Dichloroethene
Concen: 0.99 ng
RT: 9.87 min Scan# 1161
Delta R.T. -0.028 min
Lab File: 06221723.D
Acq: 22 Jun 2017 19:34

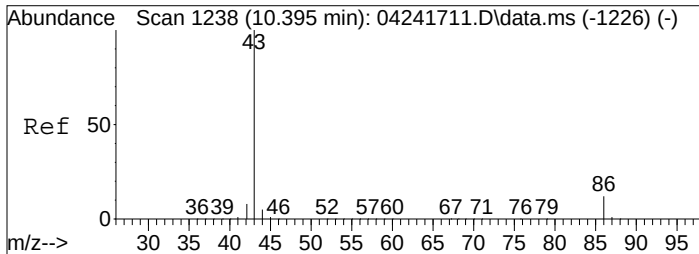
Tgt Ion:	61	Resp:	33981
Ion Ratio		Lower	Upper
61	100		
96	76.9	58.5	98.5



#24
1,1-Dichloroethane
Concen: 1.52 ng
RT: 10.13 min Scan# 1208
Delta R.T. -0.028 min
Lab File: 06221723.D
Acq: 22 Jun 2017 19:34

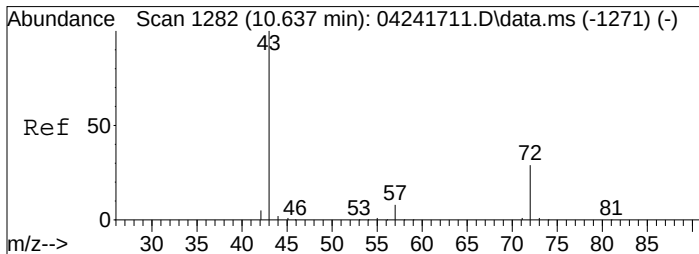
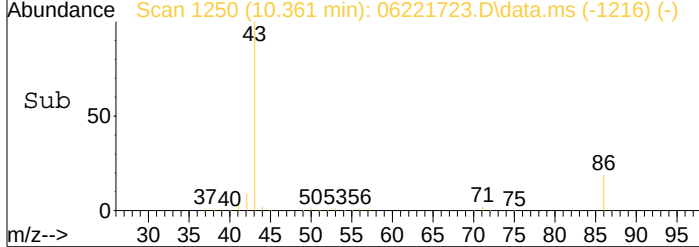
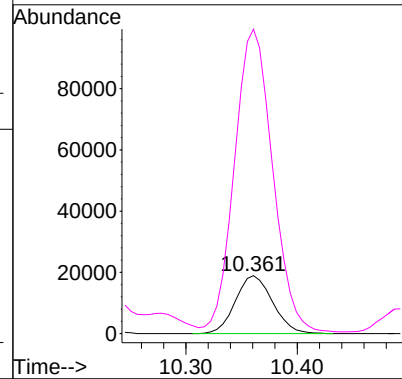
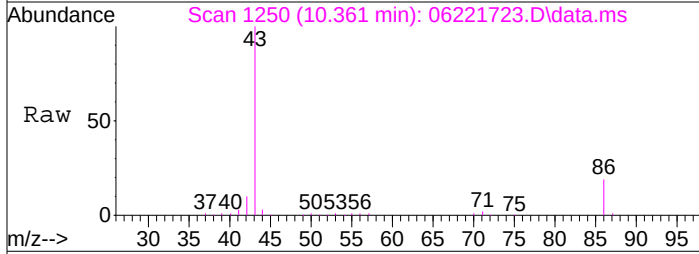
Tgt Ion:	63	Resp:	67094
Ion Ratio		Lower	Upper
63	100		
65	32.4	12.1	52.1





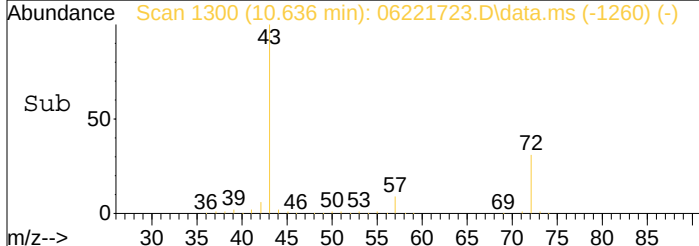
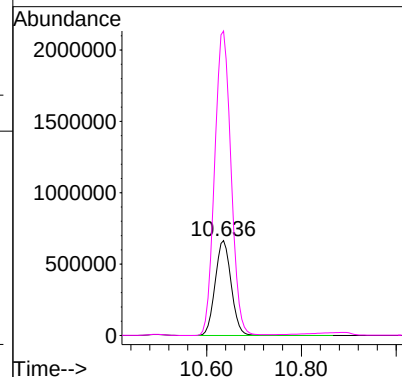
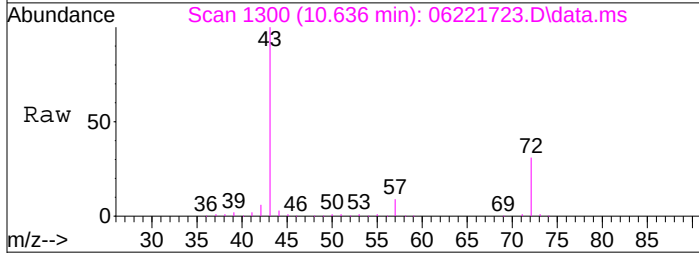
#26
 Vinyl Acetate
 Concen: 7.38 ng
 RT: 10.36 min Scan# 1250
 Delta R.T. -0.061 min
 Lab File: 06221723.D
 Acq: 22 Jun 2017 19:34

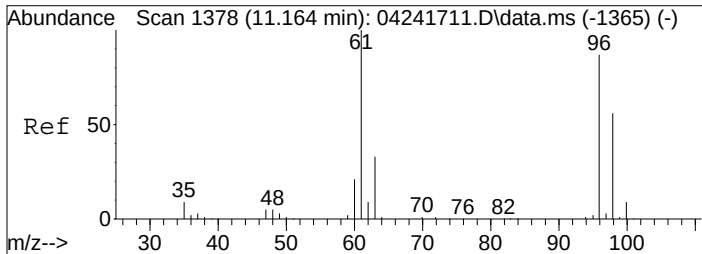
Tgt Ion: 86 Resp: 43904
 Ion Ratio Lower Upper
 86 100
 43 542.4 870.6 910.6#



#27
 2-Butanone (MEK)
 Concen: 89.24 ng
 RT: 10.64 min Scan# 1300
 Delta R.T. -0.028 min
 Lab File: 06221723.D
 Acq: 22 Jun 2017 19:34

Tgt Ion: 72 Resp: 1561878
 Ion Ratio Lower Upper
 72 100
 43 334.4 334.1 374.1

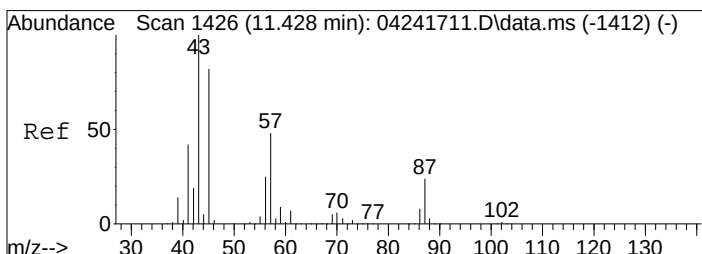
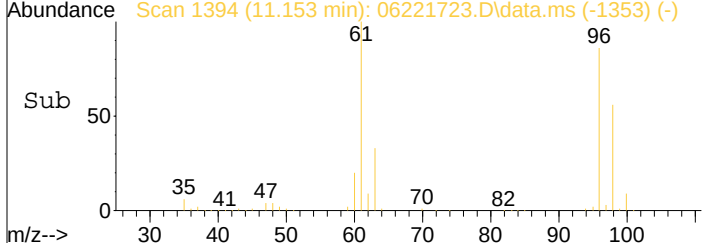
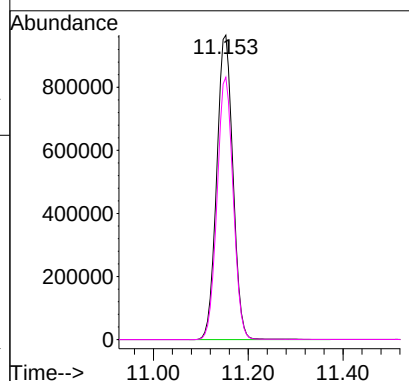
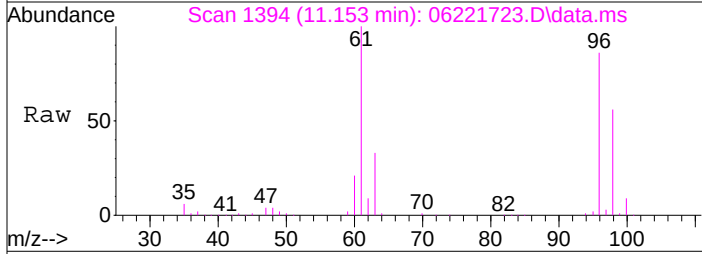




#28
 cis-1,2-Dichloroethene
 Concen: 68.03 ng
 RT: 11.15 min Scan# 1394
 Delta R.T. -0.023 min
 Lab File: 06221723.D
 Acq: 22 Jun 2017 19:34

Tgt Ion: 61 Resp: 2296659

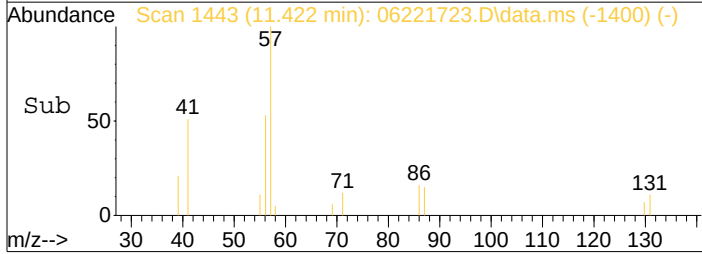
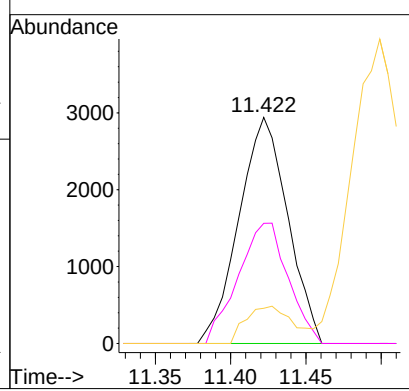
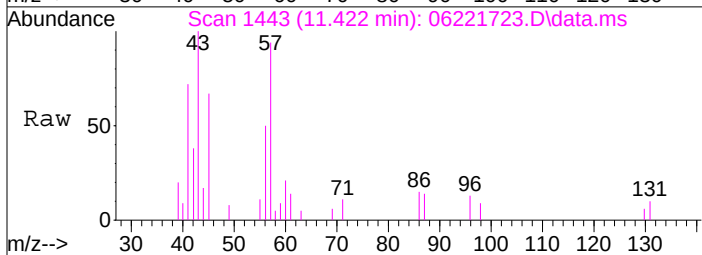
Ion	Ratio	Lower	Upper
61	100		
96	85.5	66.2	106.2

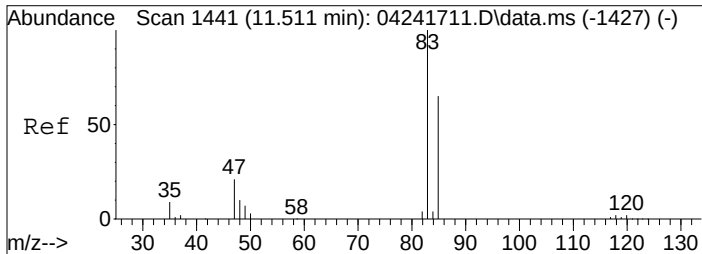


#31
 n-Hexane
 Concen: 0.17 ng
 RT: 11.42 min Scan# 1443
 Delta R.T. -0.012 min
 Lab File: 06221723.D
 Acq: 22 Jun 2017 19:34

Tgt Ion: 57 Resp: 6623

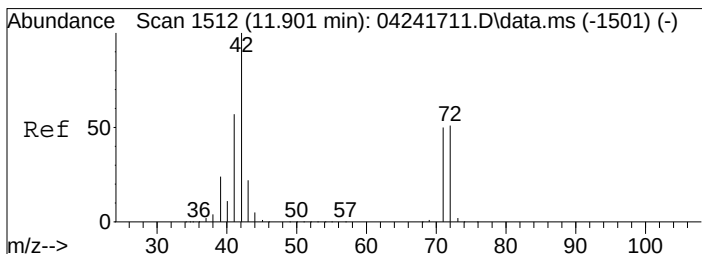
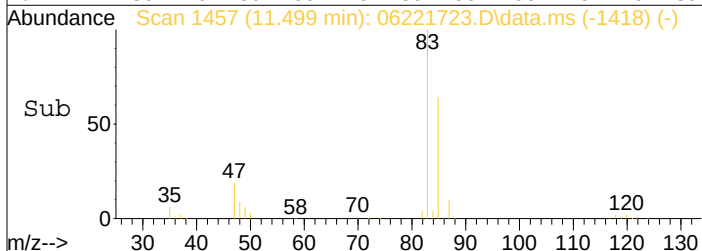
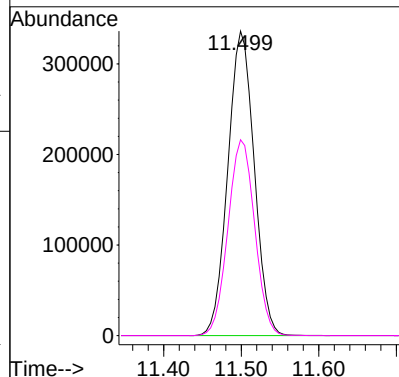
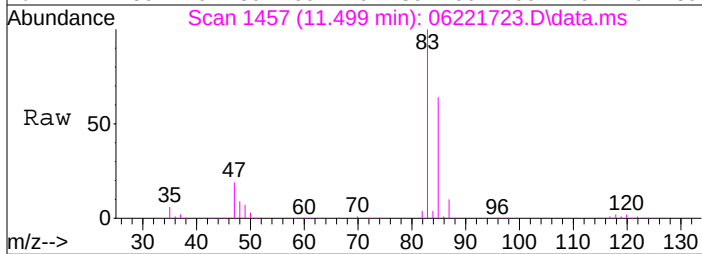
Ion	Ratio	Lower	Upper
57	100		
56	54.4	41.1	61.7
86	16.4	13.9	20.9





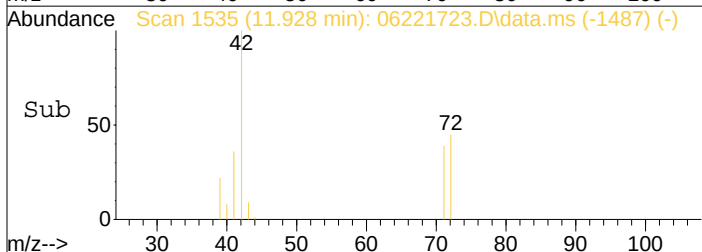
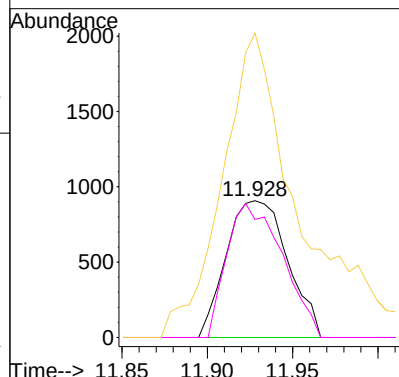
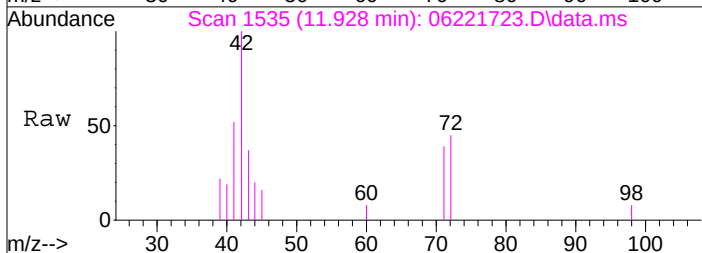
#32
Chloroform
Concen: 16.96 ng
RT: 11.50 min Scan# 1457
Delta R.T. -0.034 min
Lab File: 06221723.D
Acq: 22 Jun 2017 19:34

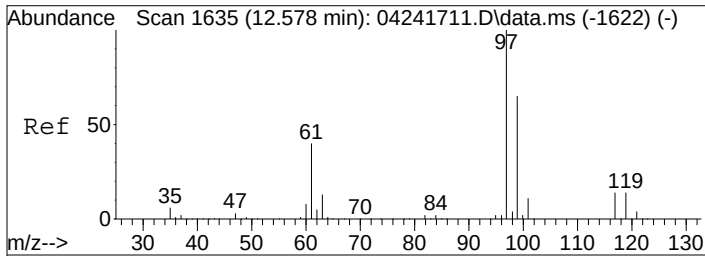
Tgt Ion: 83 Resp: 794891
Ion Ratio Lower Upper
83 100
85 65.1 45.7 85.7



#34
Tetrahydrofuran (THF)
Concen: 0.13 ng
RT: 11.93 min Scan# 1535
Delta R.T. 0.016 min
Lab File: 06221723.D
Acq: 22 Jun 2017 19:34

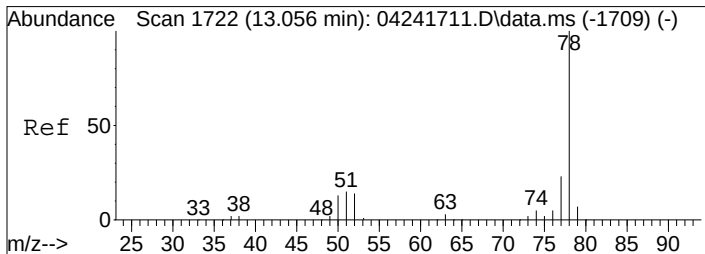
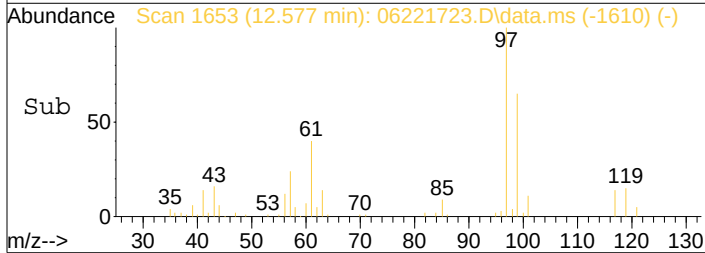
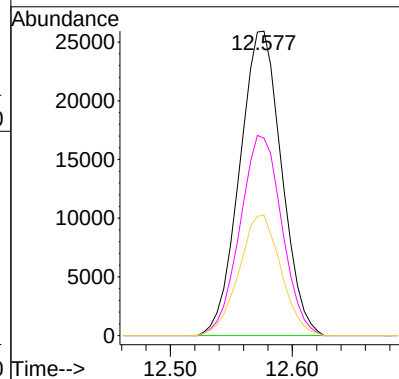
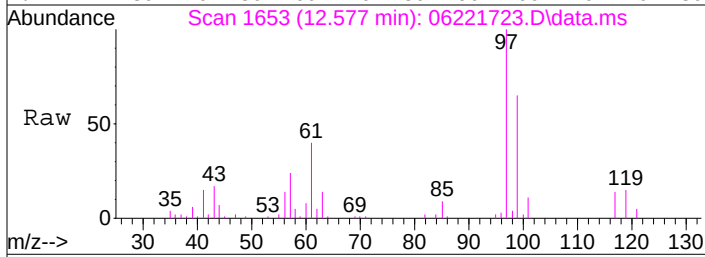
Tgt Ion: 72 Resp: 2267
Ion Ratio Lower Upper
72 100
71 88.7 77.2 117.2
42 277.4 176.9 216.9#





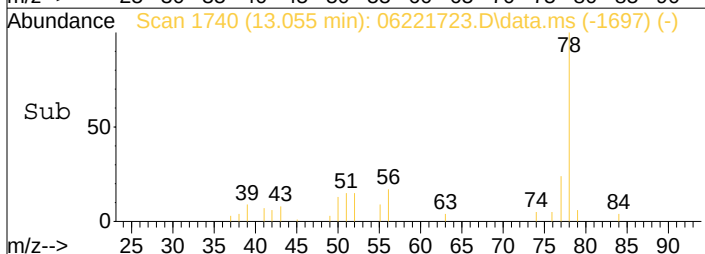
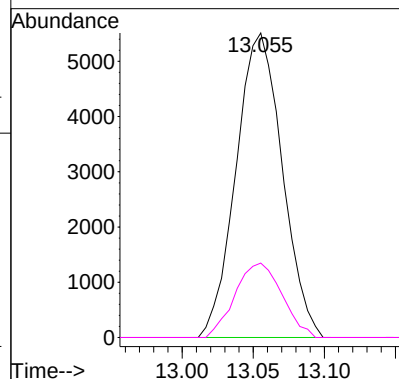
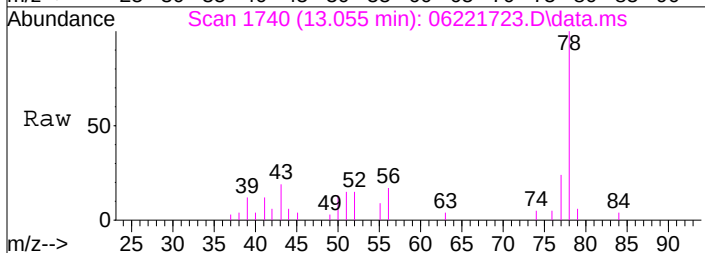
#38
1,1,1-Trichloroethane
Concen: 1.38 ng
RT: 12.58 min Scan# 1653
Delta R.T. -0.012 min
Lab File: 06221723.D
Acq: 22 Jun 2017 19:34

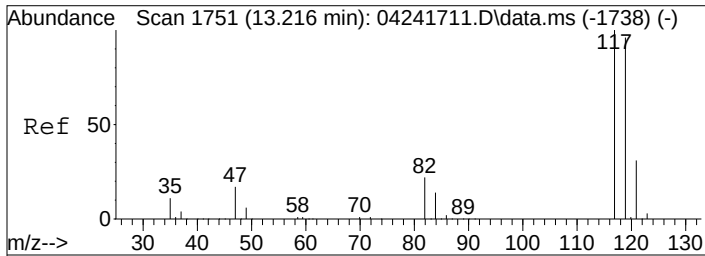
Tgt Ion: 97 Resp: 62099
Ion Ratio Lower Upper
97 100
99 65.6 45.1 85.1
61 39.5 19.8 59.8



#41
Benzene
Concen: 0.11 ng
RT: 13.06 min Scan# 1740
Delta R.T. -0.012 min
Lab File: 06221723.D
Acq: 22 Jun 2017 19:34

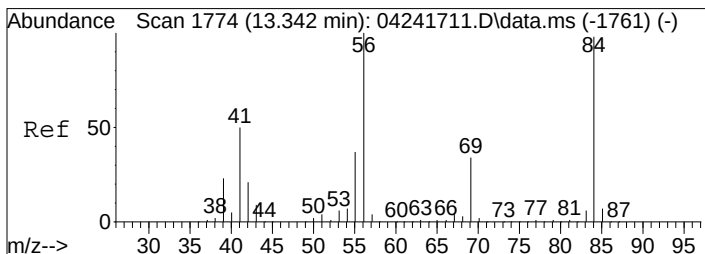
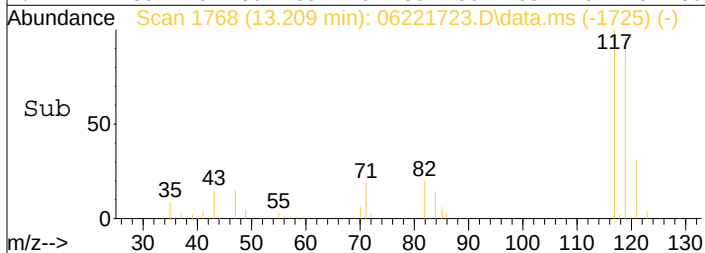
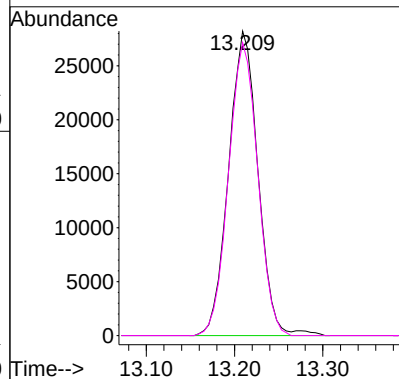
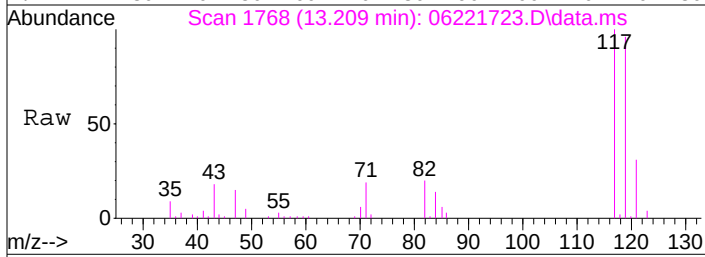
Tgt Ion: 78 Resp: 12464
Ion Ratio Lower Upper
78 100
77 24.8 3.4 43.4





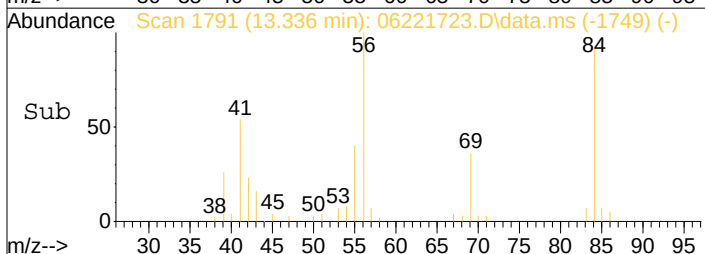
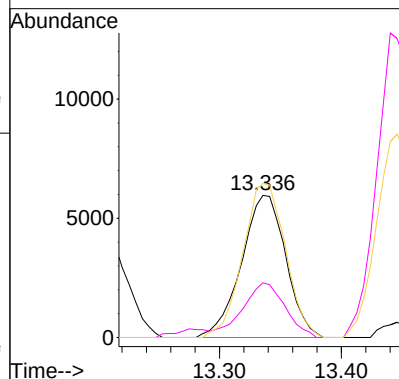
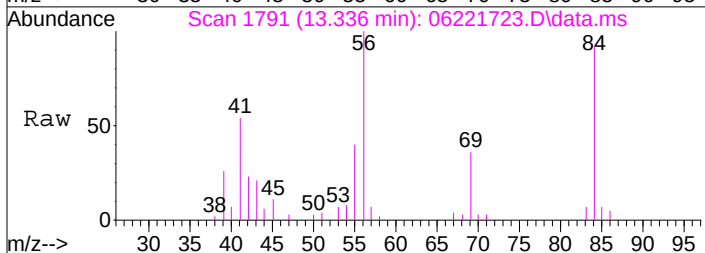
#42
Carbon Tetrachloride
Concen: 1.56 ng
RT: 13.21 min Scan# 1768
Delta R.T. -0.012 min
Lab File: 06221723.D
Acq: 22 Jun 2017 19:34

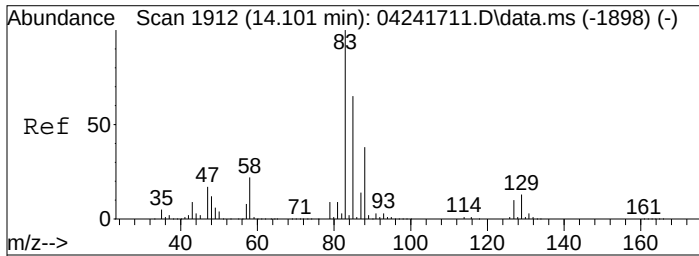
Tgt Ion: 117 Resp: 65219
Ion Ratio Lower Upper
117 100
119 95.4 76.2 116.2



#43
Cyclohexane
Concen: 0.37 ng
RT: 13.34 min Scan# 1791
Delta R.T. -0.017 min
Lab File: 06221723.D
Acq: 22 Jun 2017 19:34

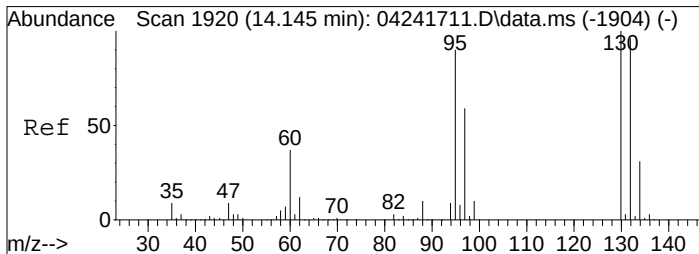
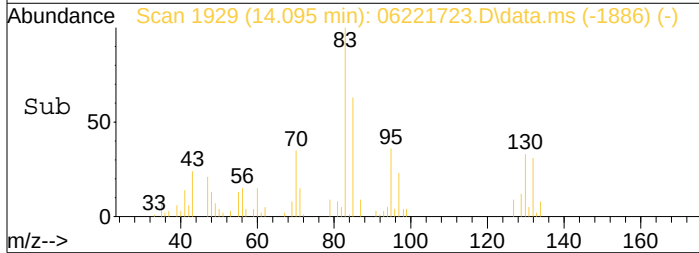
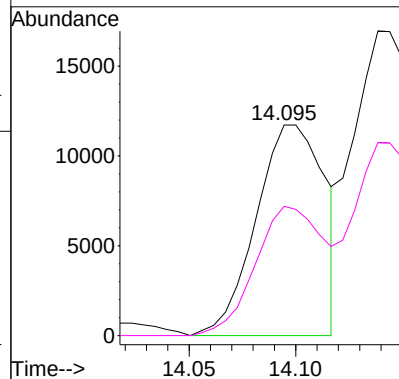
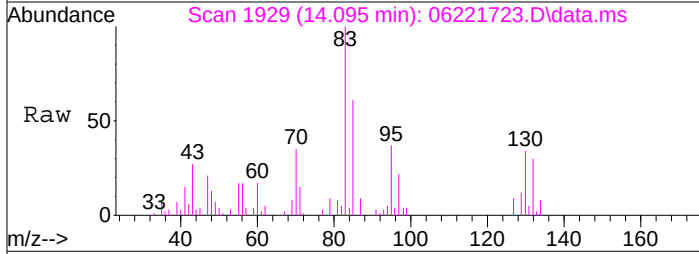
Tgt Ion: 84 Resp: 15064
Ion Ratio Lower Upper
84 100
69 37.0 14.6 54.6
56 104.3 82.7 122.7





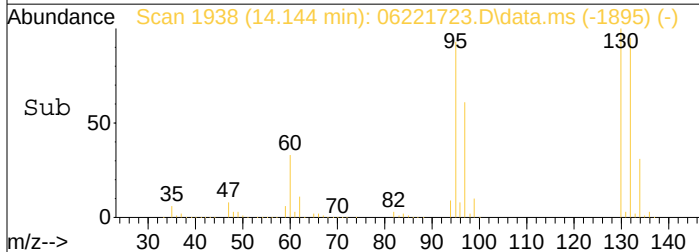
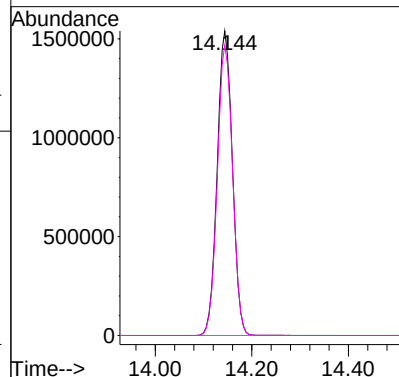
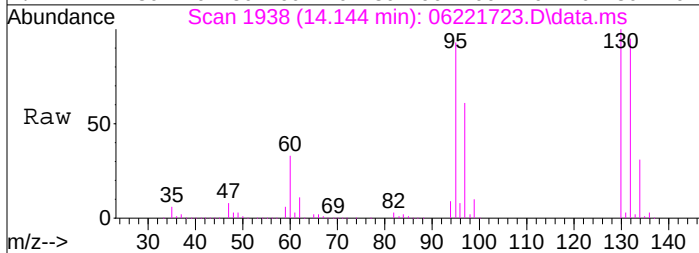
#46
Bromodichloromethane
Concen: 0.68 ng
RT: 14.09 min Scan# 1929
Delta R.T. -0.012 min
Lab File: 06221723.D
Acq: 22 Jun 2017 19:34

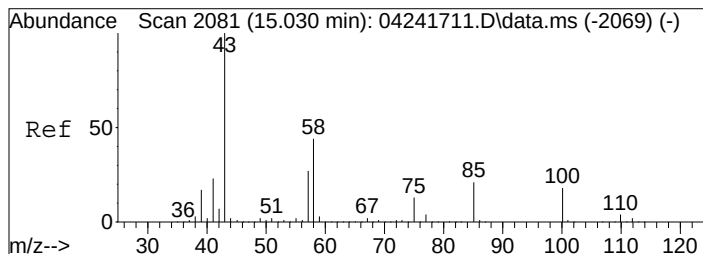
Tgt Ion: 83 Resp: 26252
Ion Ratio Lower Upper
83 100
85 60.9 44.6 84.6



#47
Trichloroethene
Concen: 101.70 ng
RT: 14.14 min Scan# 1938
Delta R.T. -0.012 min
Lab File: 06221723.D
Acq: 22 Jun 2017 19:34

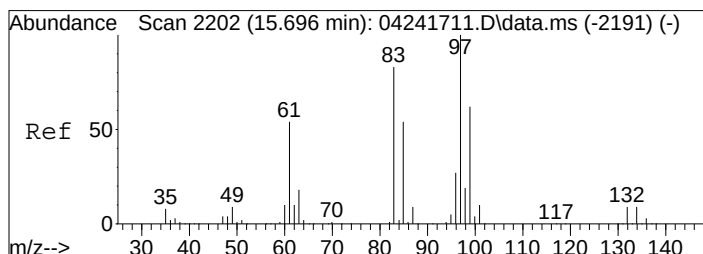
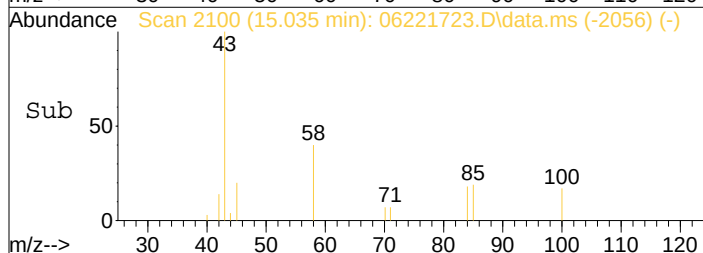
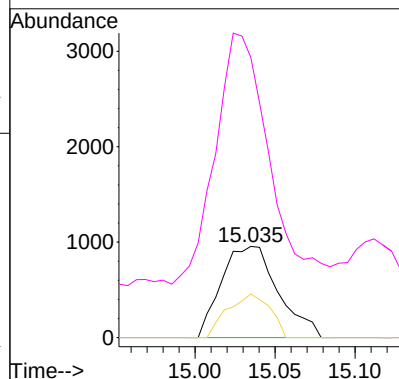
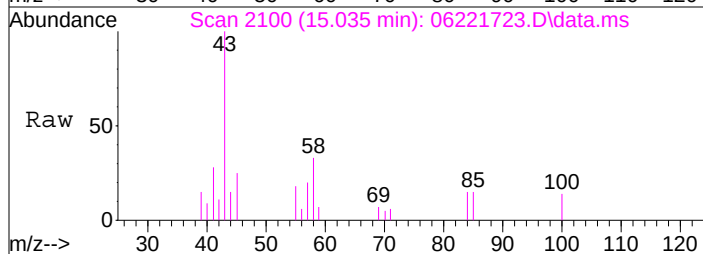
Tgt Ion: 130 Resp: 3361842
Ion Ratio Lower Upper
130 100
132 95.8 76.0 116.0





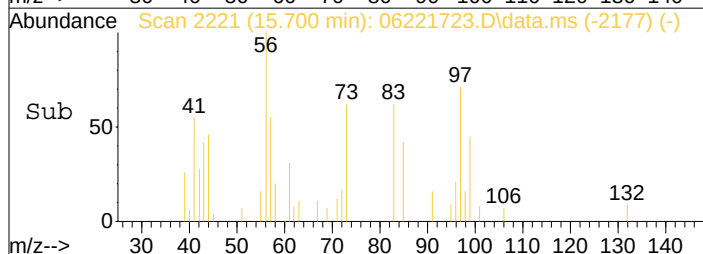
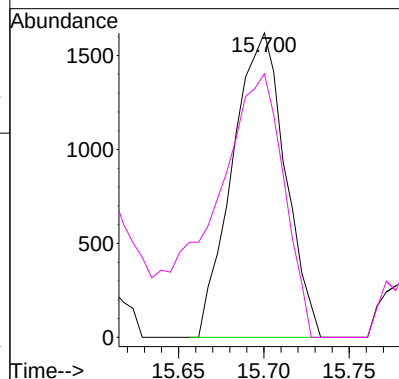
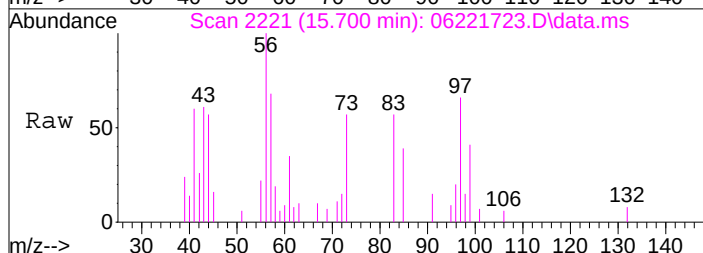
#53
 4-Methyl-2-pentanone
 Concen: 0.10 ng
 RT: 15.03 min Scan# 2100
 Delta R.T. -0.006 min
 Lab File: 06221723.D
 Acq: 22 Jun 2017 19:34

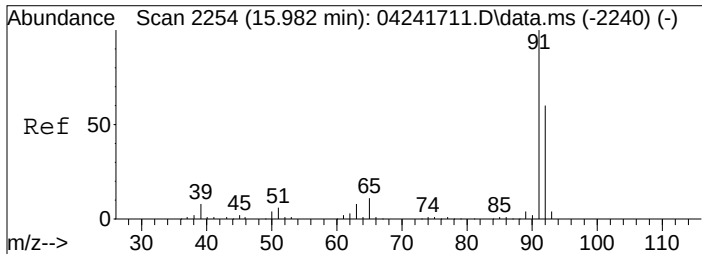
Tgt Ion	Ratio	Lower	Upper
58	100		
43	299.3	184.9	277.3#
85	35.6	40.5	60.7#



#55
 1,1,2-Trichloroethane
 Concen: 0.13 ng
 RT: 15.70 min Scan# 2221
 Delta R.T. -0.006 min
 Lab File: 06221723.D
 Acq: 22 Jun 2017 19:34

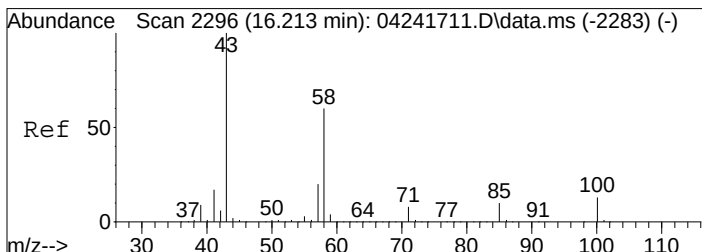
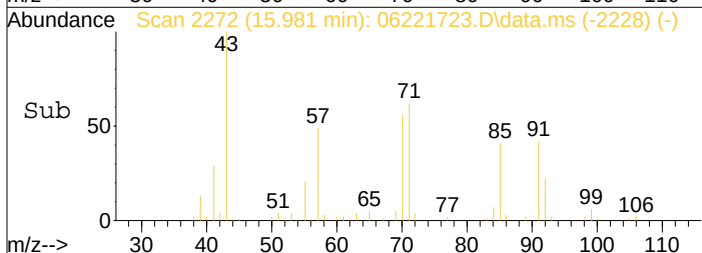
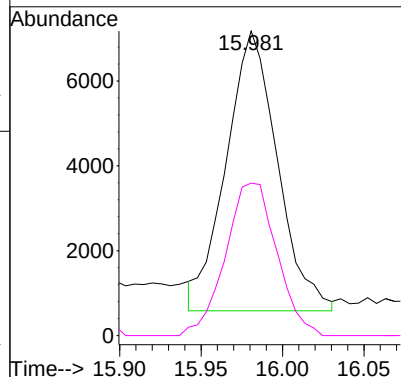
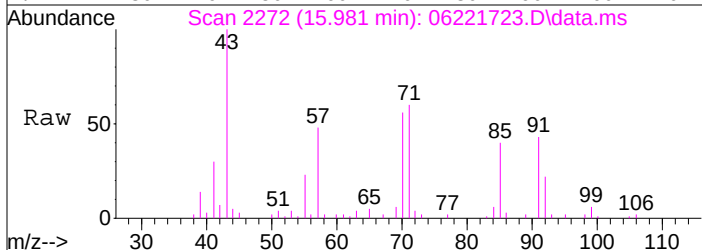
Tgt Ion	Ratio	Lower	Upper
97	100		
83	110.0	63.0	103.0#





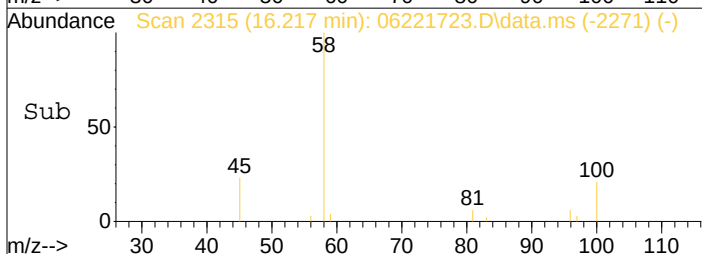
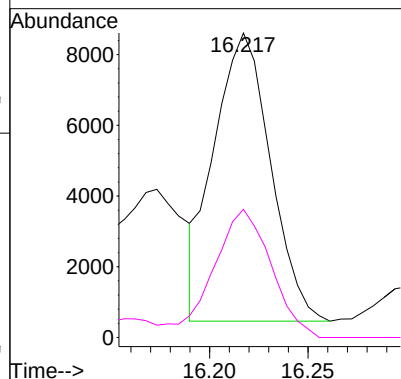
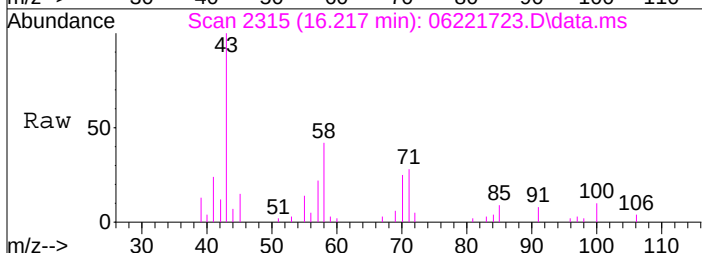
#58
Toluene
Concen: 0.13 ng m
RT: 15.98 min Scan# 2272
Delta R.T. -0.006 min
Lab File: 06221723.D
Acq: 22 Jun 2017 19:34

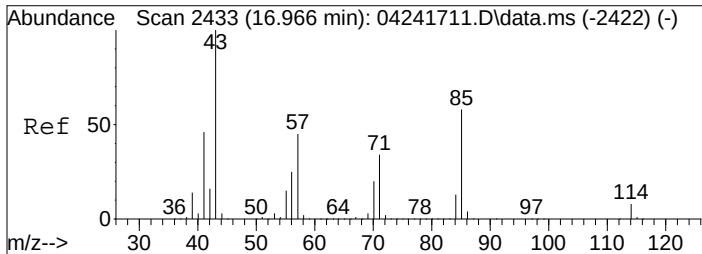
Tgt Ion: 91 Resp: 14417
Ion Ratio Lower Upper
91 100
92 54.6 39.8 79.8



#59
2-Hexanone
Concen: 0.28 ng
RT: 16.22 min Scan# 2315
Delta R.T. -0.006 min
Lab File: 06221723.D
Acq: 22 Jun 2017 19:34

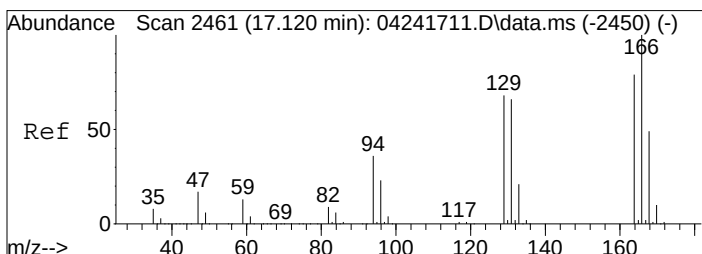
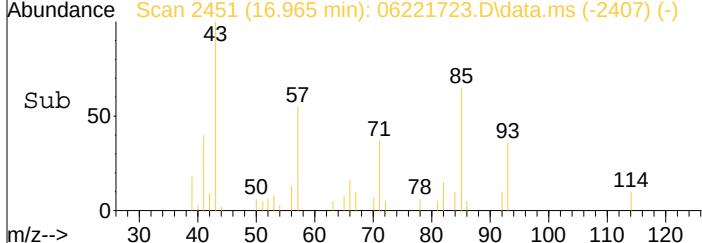
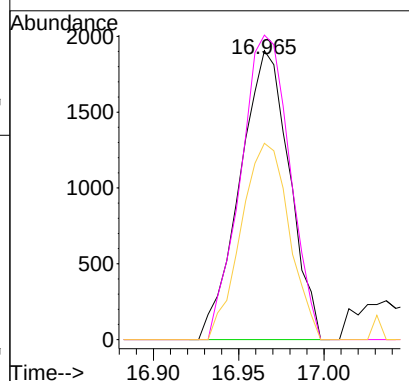
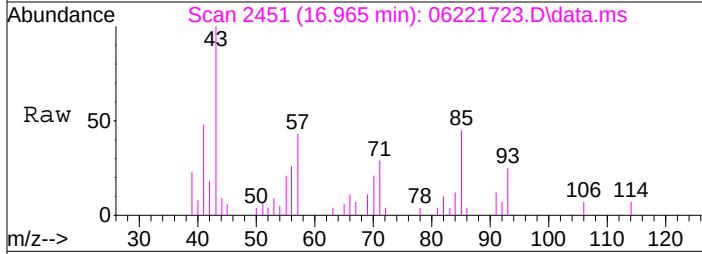
Tgt Ion: 43 Resp: 16253
Ion Ratio Lower Upper
43 100
58 44.3 39.8 79.8





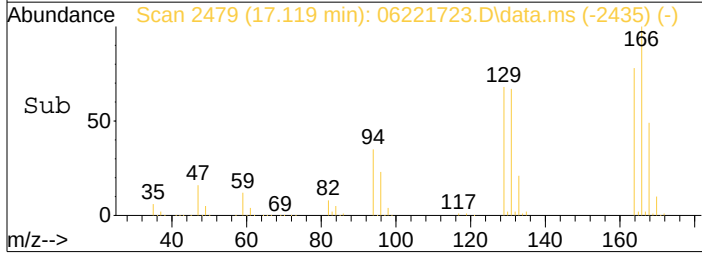
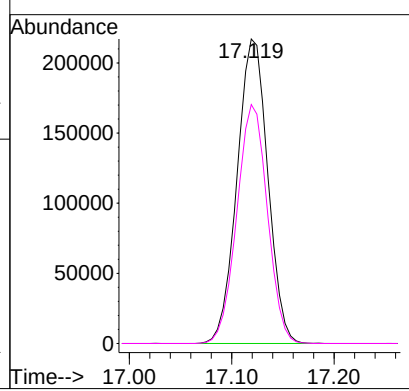
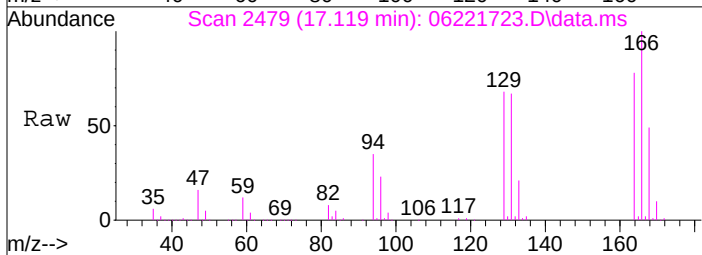
#63
n-Octane
Concen: 0.17 ng
RT: 16.97 min Scan# 2451
Delta R.T. -0.006 min
Lab File: 06221723.D
Acq: 22 Jun 2017 19:34

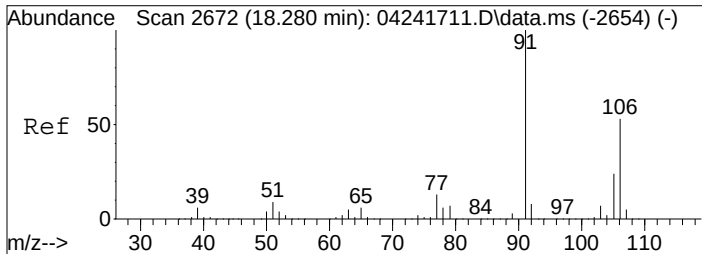
Tgt Ion: 57	Resp: 3858
Ion Ratio	Lower Upper
57	100
85	104.3 103.5 155.3
71	65.8 59.9 89.9



#64
Tetrachloroethene
Concen: 12.17 ng
RT: 17.12 min Scan# 2479
Delta R.T. -0.006 min
Lab File: 06221723.D
Acq: 22 Jun 2017 19:34

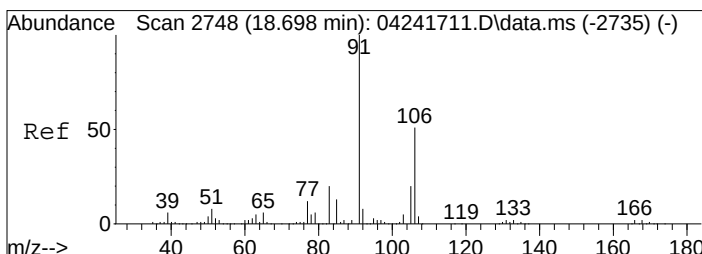
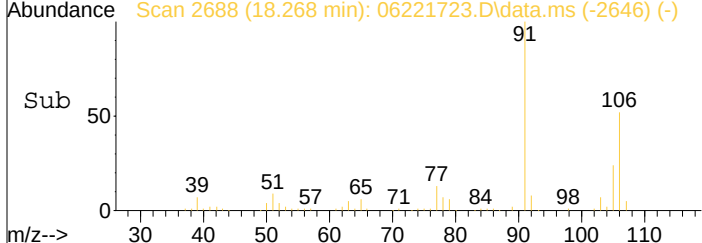
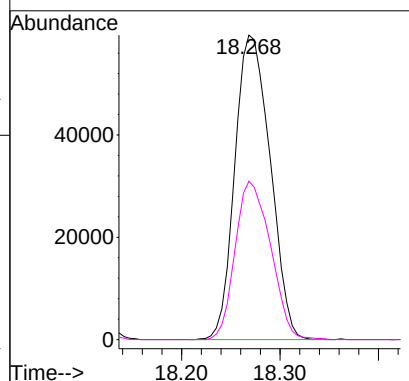
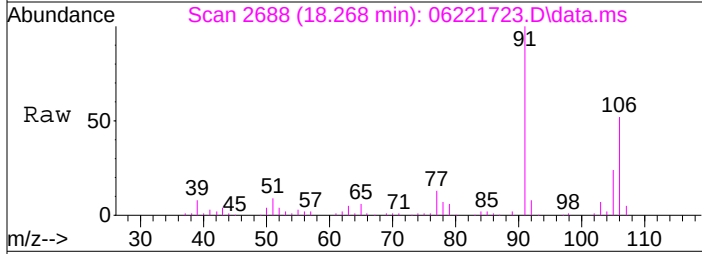
Tgt Ion: 166	Resp: 453120
Ion Ratio	Lower Upper
166	100
164	77.8 58.3 98.3





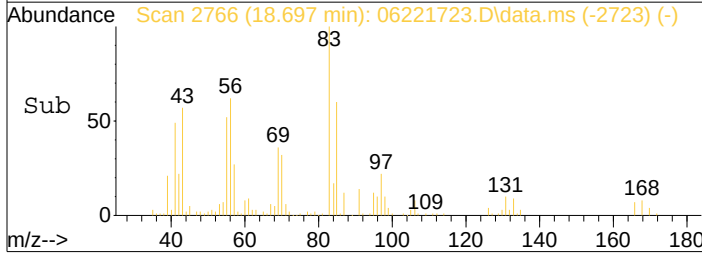
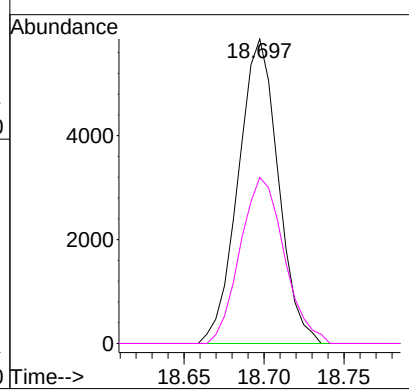
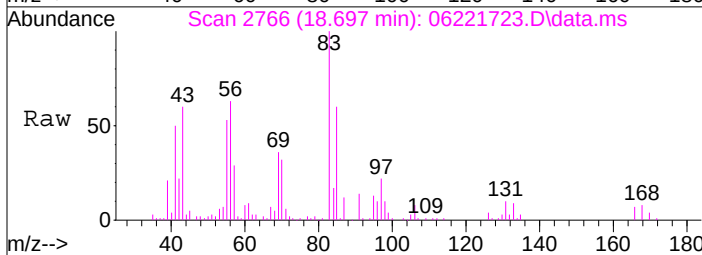
#67
 m- & p-Xylenes
 Concen: 1.44 ng
 RT: 18.27 min Scan# 2688
 Delta R.T. -0.017 min
 Lab File: 06221723.D
 Acq: 22 Jun 2017 19:34

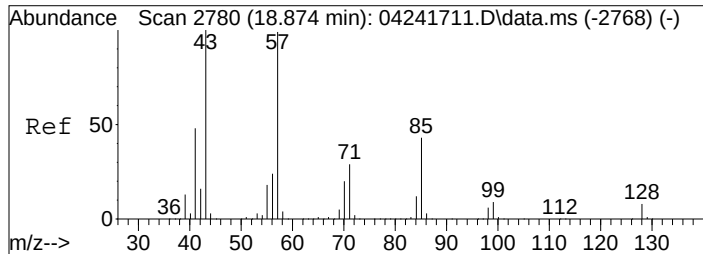
Tgt Ion:	91	Resp:	148435
Ion Ratio	Lower	Upper	
91	100		
106	52.1	33.1	73.1



#70
 o-Xylene
 Concen: 0.10 ng
 RT: 18.70 min Scan# 2766
 Delta R.T. -0.012 min
 Lab File: 06221723.D
 Acq: 22 Jun 2017 19:34

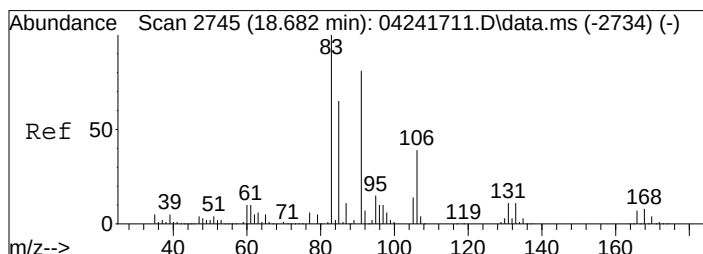
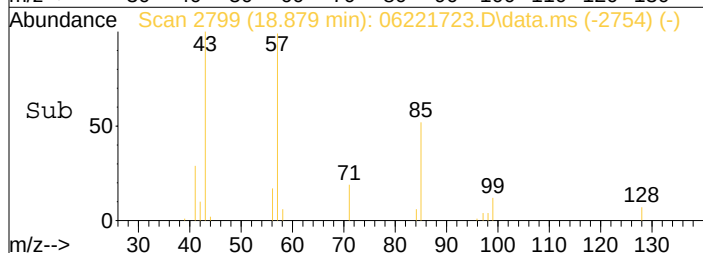
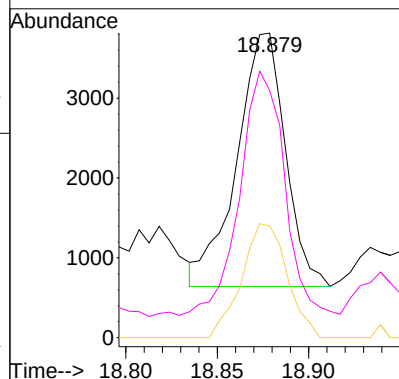
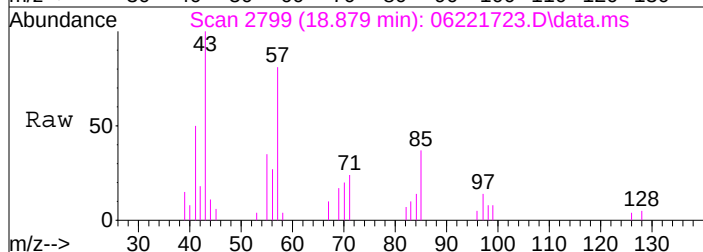
Tgt Ion:	91	Resp:	10213
Ion Ratio	Lower	Upper	
91	100		
106	60.1	30.5	70.5





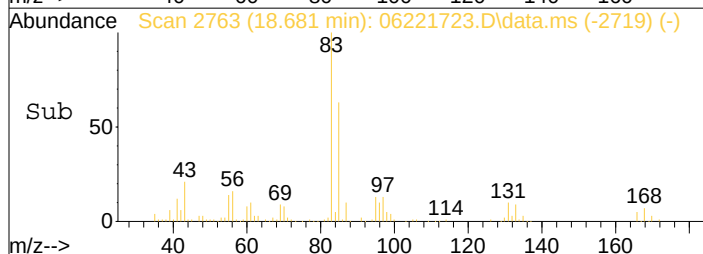
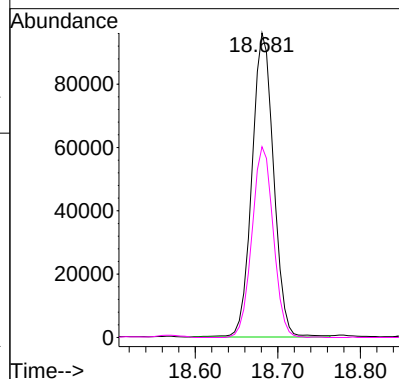
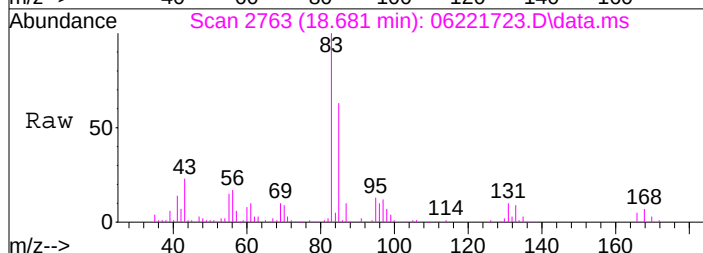
#71
n-Nonane
Concen: 0.12 ng
RT: 18.88 min Scan# 2799
Delta R.T. -0.001 min
Lab File: 06221723.D
Acq: 22 Jun 2017 19:34

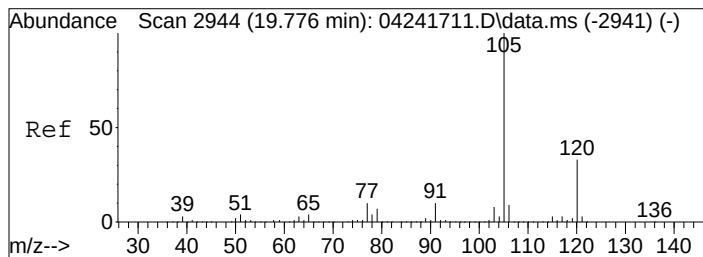
Tgt Ion: 43 Resp: 5859
Ion Ratio Lower Upper
43 100
57 90.3 78.3 118.3
85 42.1 22.9 62.9



#72
1,1,2,2-Tetrachloroethane
Concen: 3.54 ng
RT: 18.68 min Scan# 2763
Delta R.T. -0.006 min
Lab File: 06221723.D
Acq: 22 Jun 2017 19:34

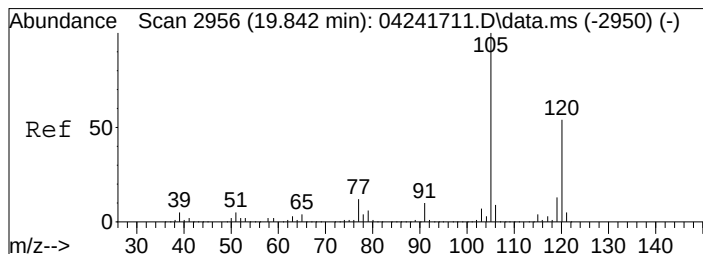
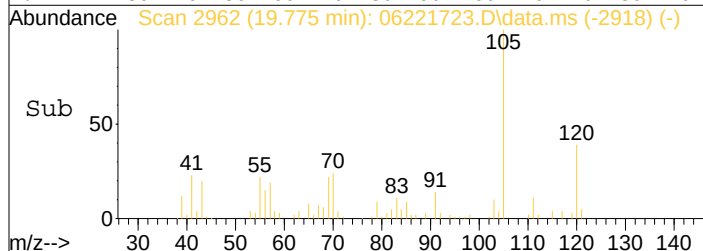
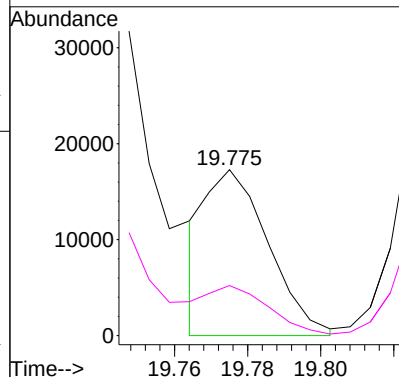
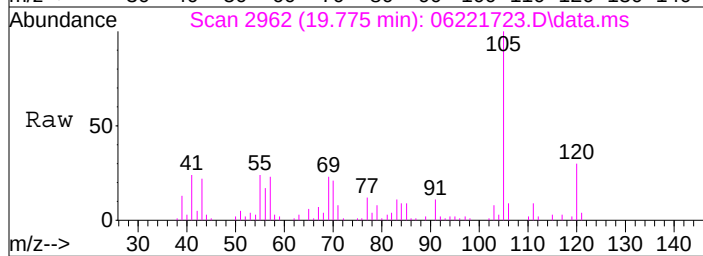
Tgt Ion: 83 Resp: 174562
Ion Ratio Lower Upper
83 100
85 61.8 45.3 85.3





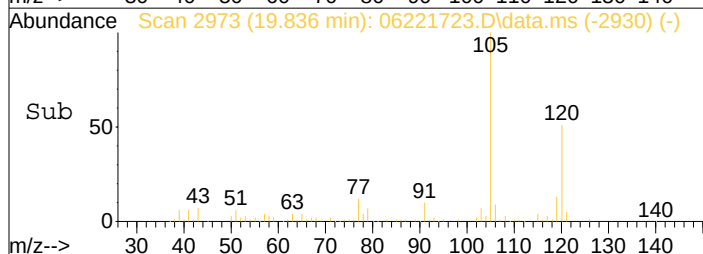
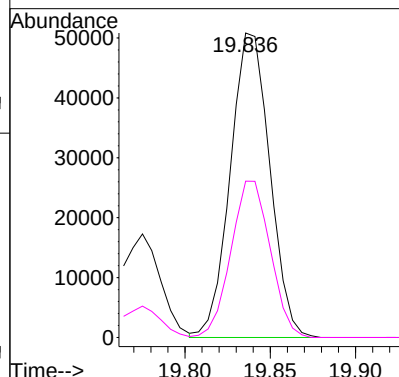
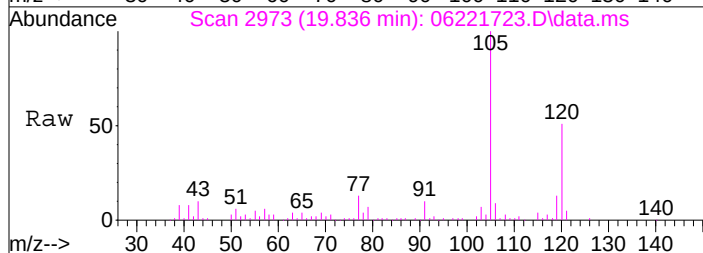
#78
4-Ethyltoluene
Concen: 0.16 ng
RT: 19.78 min Scan# 2962
Delta R.T. -0.006 min
Lab File: 06221723.D
Acq: 22 Jun 2017 19:34

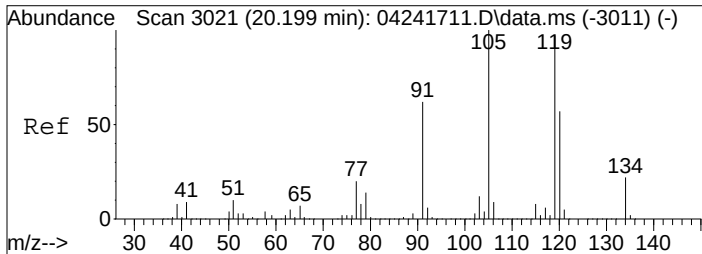
Tgt Ion:105 Resp: 20761
Ion Ratio Lower Upper
105 100
120 30.2 12.2 52.2



#79
1,3,5-Trimethylbenzene
Concen: 0.72 ng
RT: 19.84 min Scan# 2973
Delta R.T. -0.012 min
Lab File: 06221723.D
Acq: 22 Jun 2017 19:34

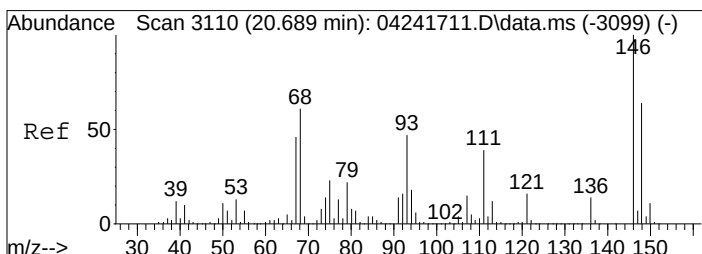
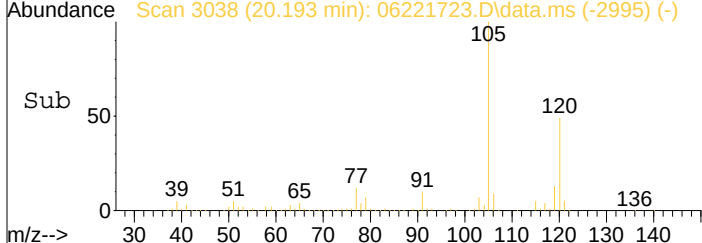
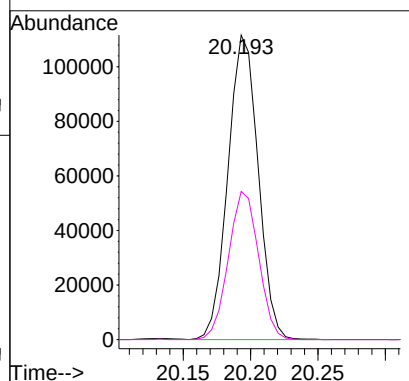
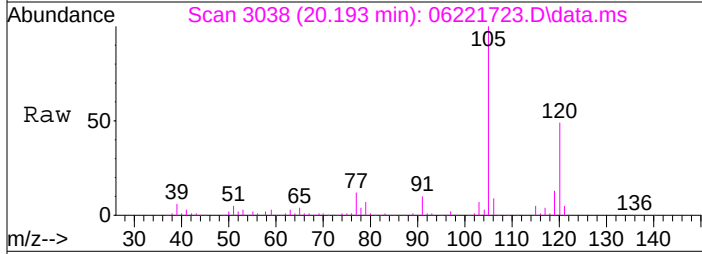
Tgt Ion:105 Resp: 81823
Ion Ratio Lower Upper
105 100
120 51.2 32.9 72.9





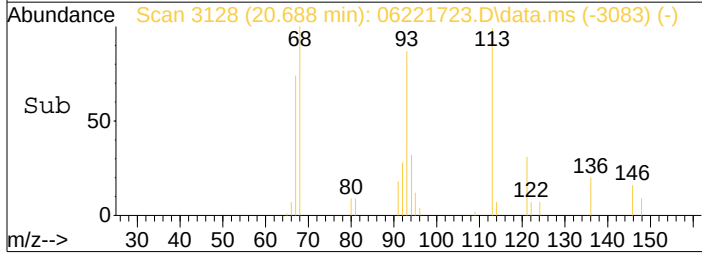
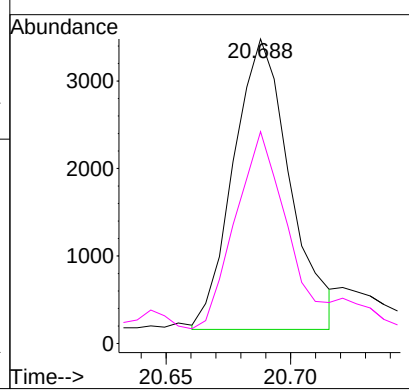
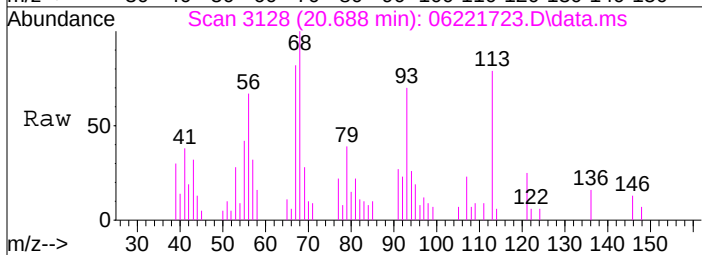
#82
 1,2,4-Trimethylbenzene
 Concen: 1.51 ng
 RT: 20.19 min Scan# 3038
 Delta R.T. -0.012 min
 Lab File: 06221723.D
 Acq: 22 Jun 2017 19:34

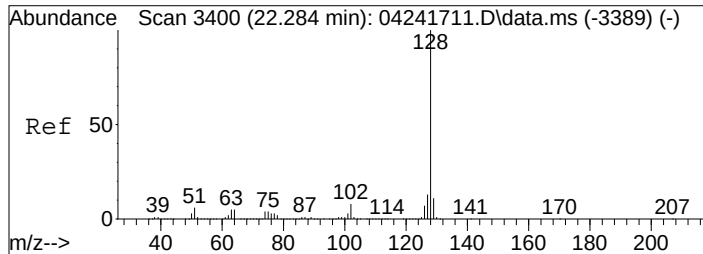
Tgt Ion:	105	Resp:	174119
Ion Ratio	Lower	Upper	
105	100		
120	48.6	37.3	77.3



#91
 d-Limonene
 Concen: 0.13 ng m
 RT: 20.69 min Scan# 3128
 Delta R.T. -0.001 min
 Lab File: 06221723.D
 Acq: 22 Jun 2017 19:34

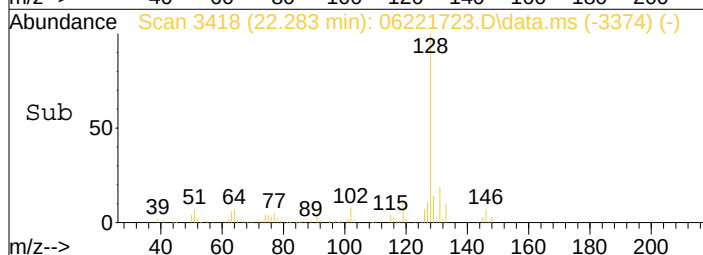
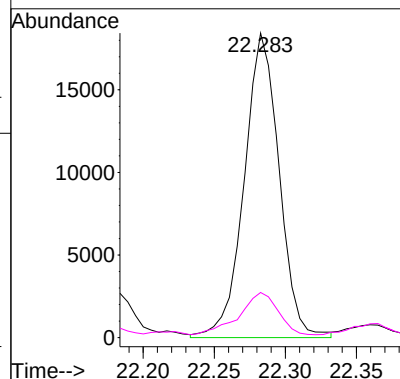
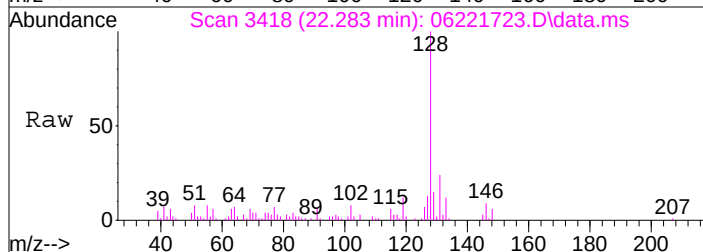
Tgt Ion:	68	Resp:	5234
Ion Ratio	Lower	Upper	
68	100		
93	84.6	57.2	97.2





#95
 Naphthalene
 Concen: 0.23 ng
 RT: 22.28 min Scan# 3418
 Delta R.T. -0.006 min
 Lab File: 06221723.D
 Acq: 22 Jun 2017 19:34

Tgt Ion:128 Resp: 31542
 Ion Ratio Lower Upper
 128 100
 129 16.0 0.0 31.2



Data File: I:\MS16\DATA\2017 06\22\06221723.D

Acq On : 22 Jun 2017 19:34

Operator: LH

Sample : P1702819-001 (1000mL)

Misc : S31-06081702

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Jun 23 08:35:56 2017

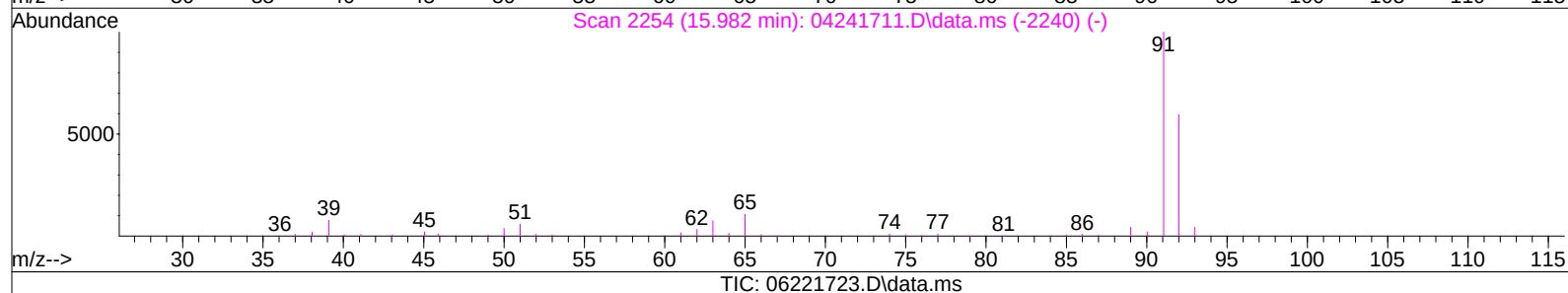
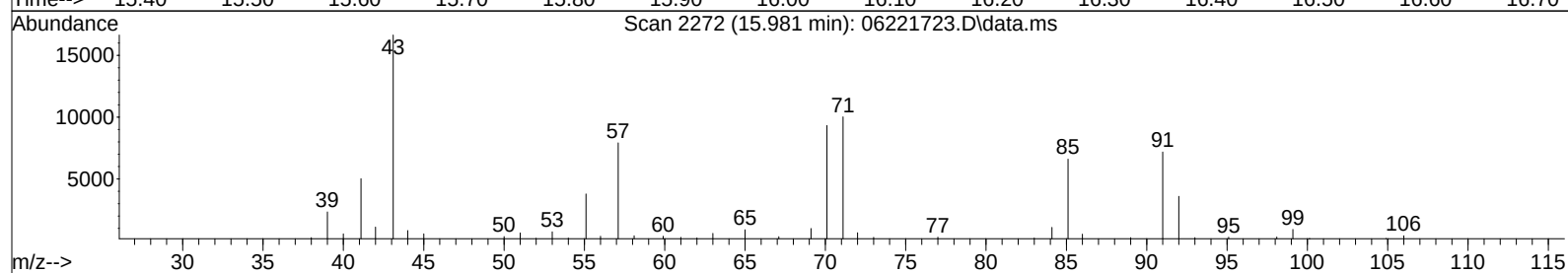
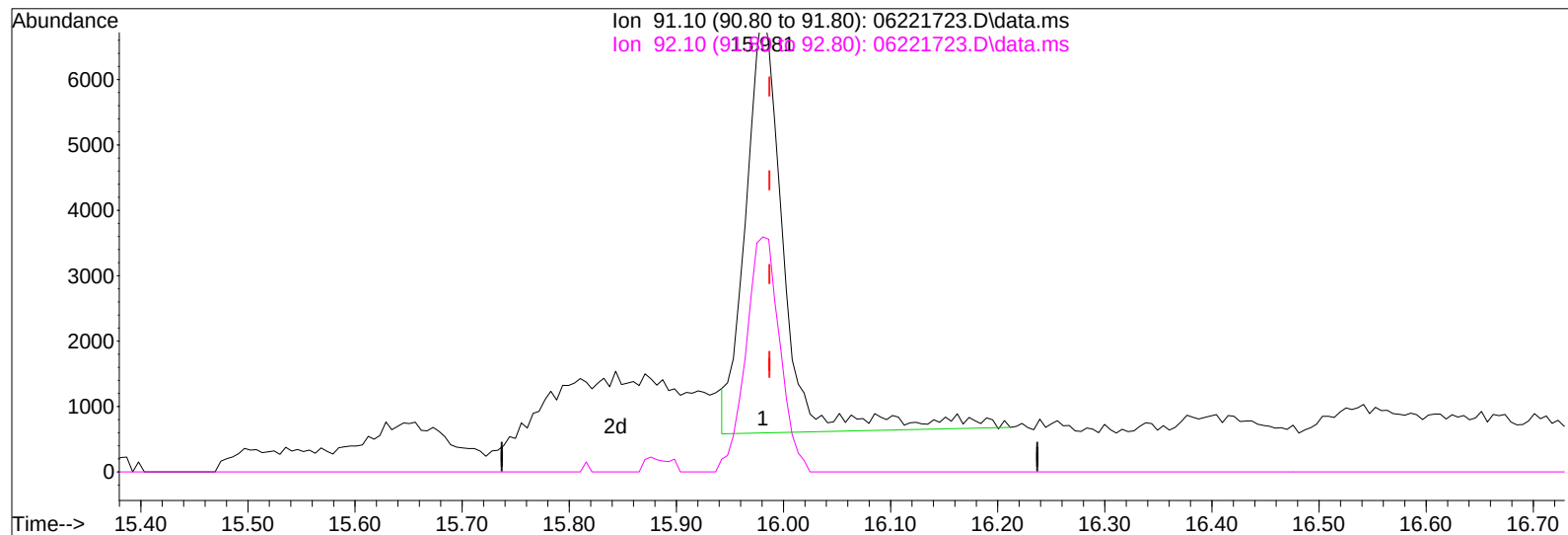
Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 08:16:28 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 06221723.D\data.ms

(58) Toluene (T)

15.981min (-0.006) 0.14ng

response 15886

Ion	Exp%	Act%
91.10	100	100
92.10	59.80	49.58
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS16\DATA\2017 06\22\06221723.D

Acq On : 22 Jun 2017 19:34

Operator: LH

Sample : P1702819-001 (1000mL)

Misc : S31-06081702

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Jun 23 08:35:56 2017

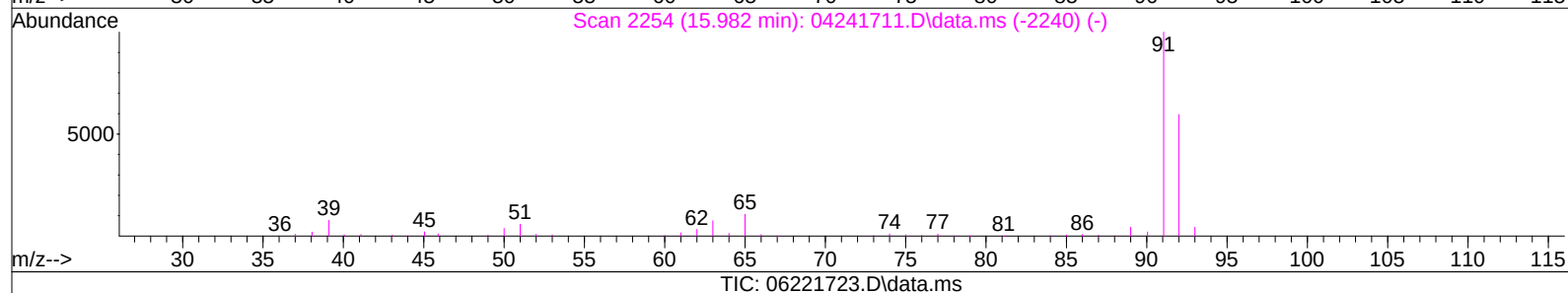
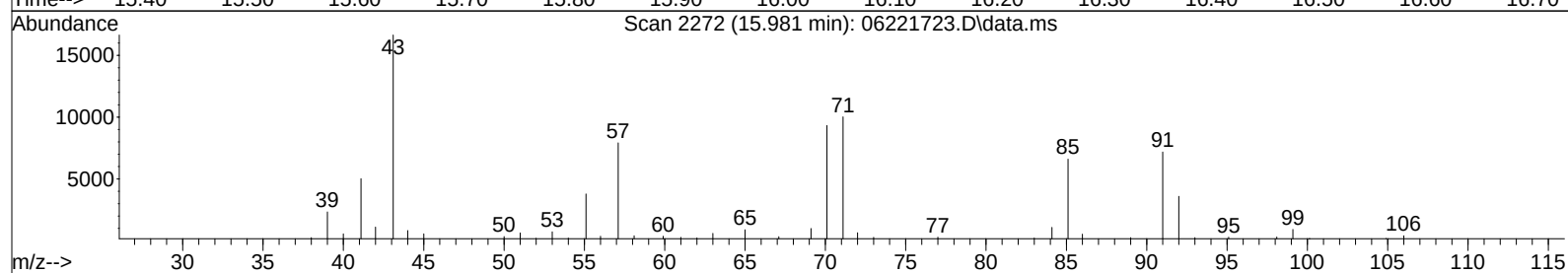
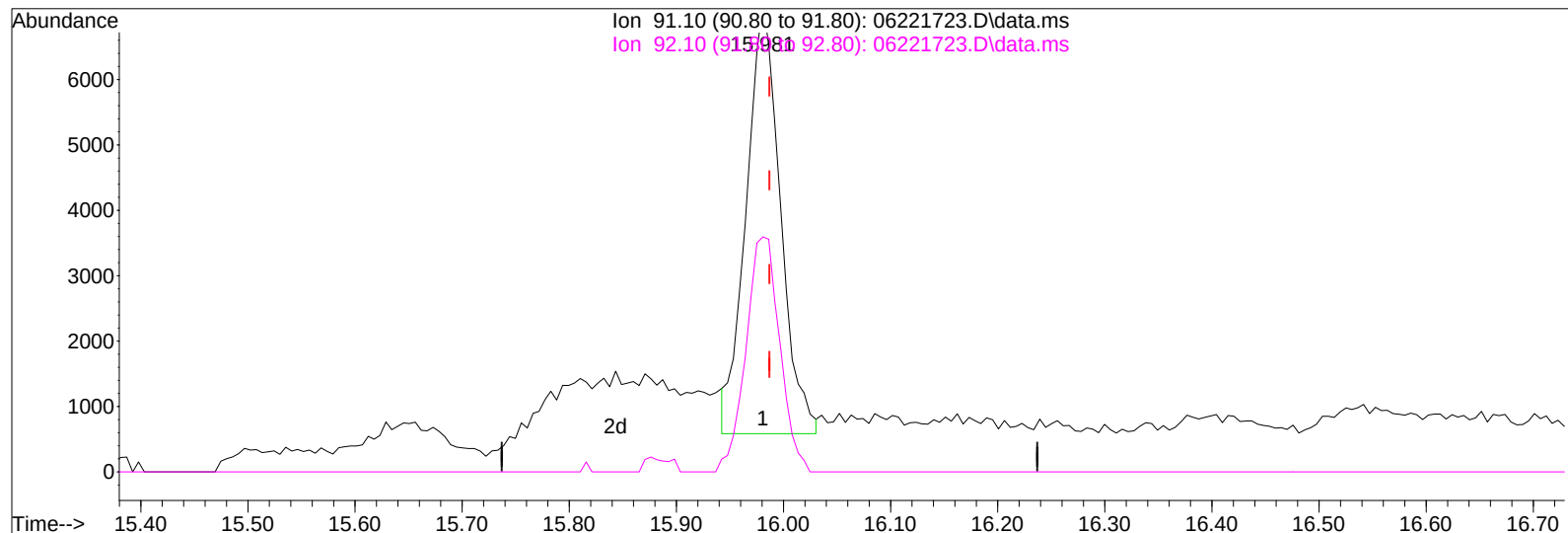
Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 08:16:28 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



(58) Toluene (T)

15.981min (-0.006) 0.13ng m

BLC

response 14417

LH 6/23/17

Ion	Exp%	Act%
91.10	100	100
92.10	59.80	54.64
0.00	0.00	0.00
0.00	0.00	0.00

6/23/17

Data File: I:\MS16\DATA\2017 06\22\06221723.D

Acq On : 22 Jun 2017 19:34

Operator: LH

Sample : P1702819-001 (1000mL)

Misc : S31-06081702

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Jun 23 08:35:56 2017

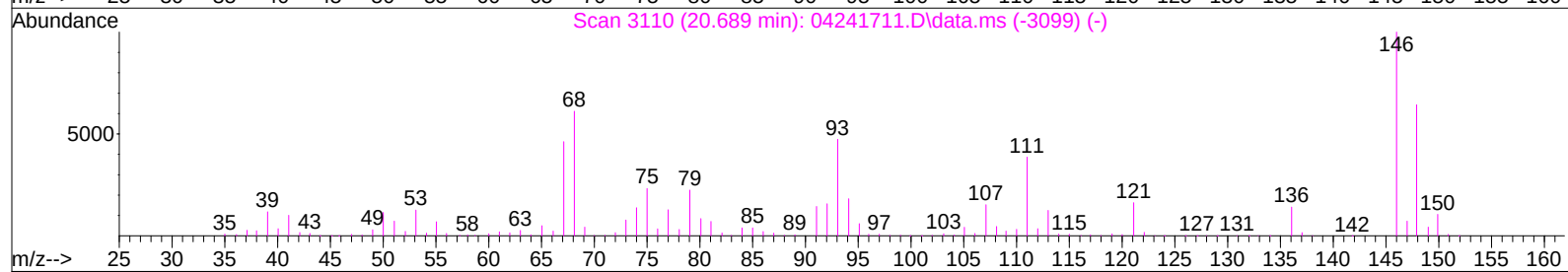
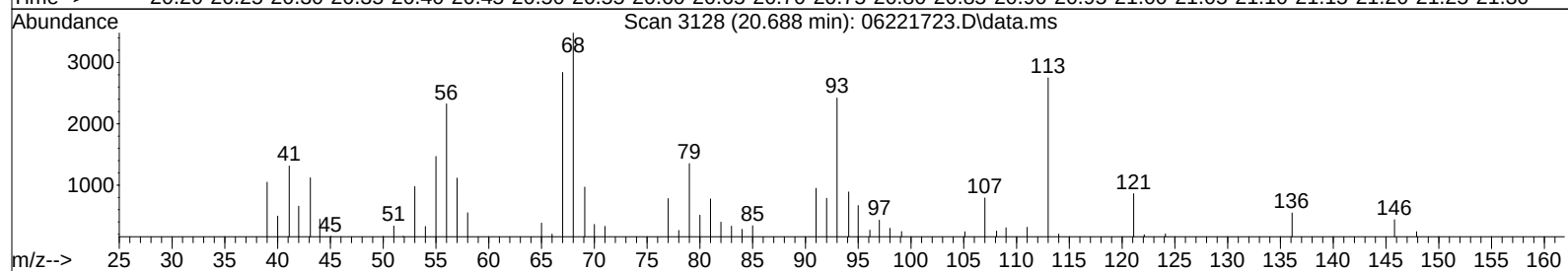
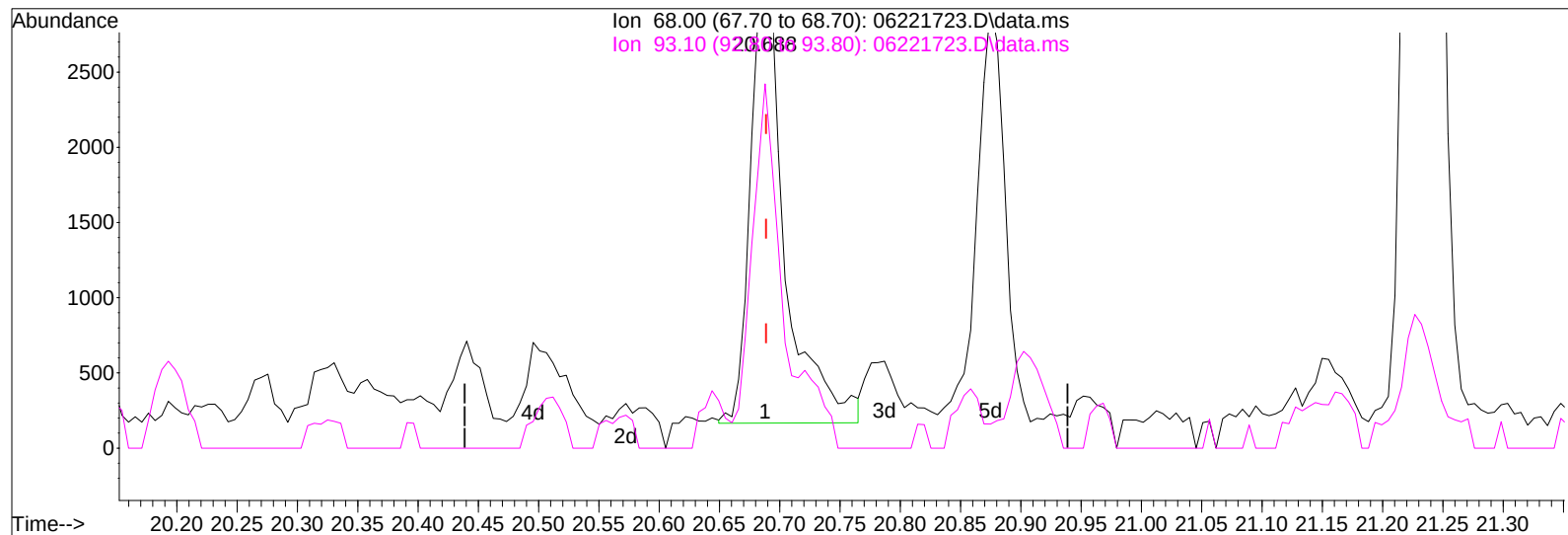
Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 08:16:28 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 06221723.D\data.ms

(91) d-Limonene (T)

20.688min (-0.001) 0.15ng

response 6033

Ion	Exp%	Act%
68.00	100	100
93.10	77.20	73.36
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS16\DATA\2017 06\22\06221723.D

Acq On : 22 Jun 2017 19:34

Operator: LH

Sample : P1702819-001 (1000mL)

Misc : S31-06081702

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Jun 23 08:35:56 2017

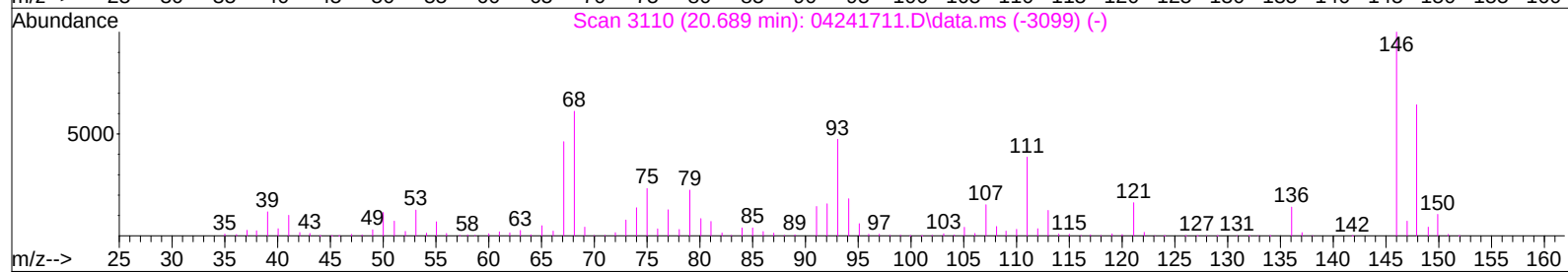
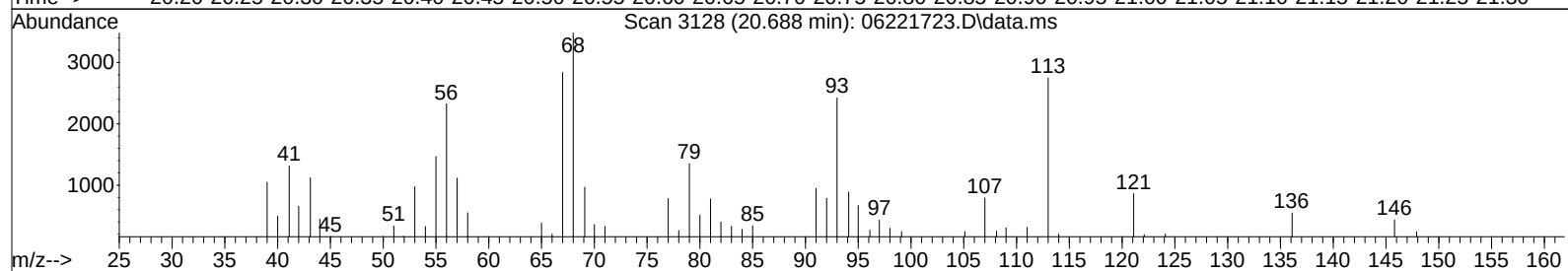
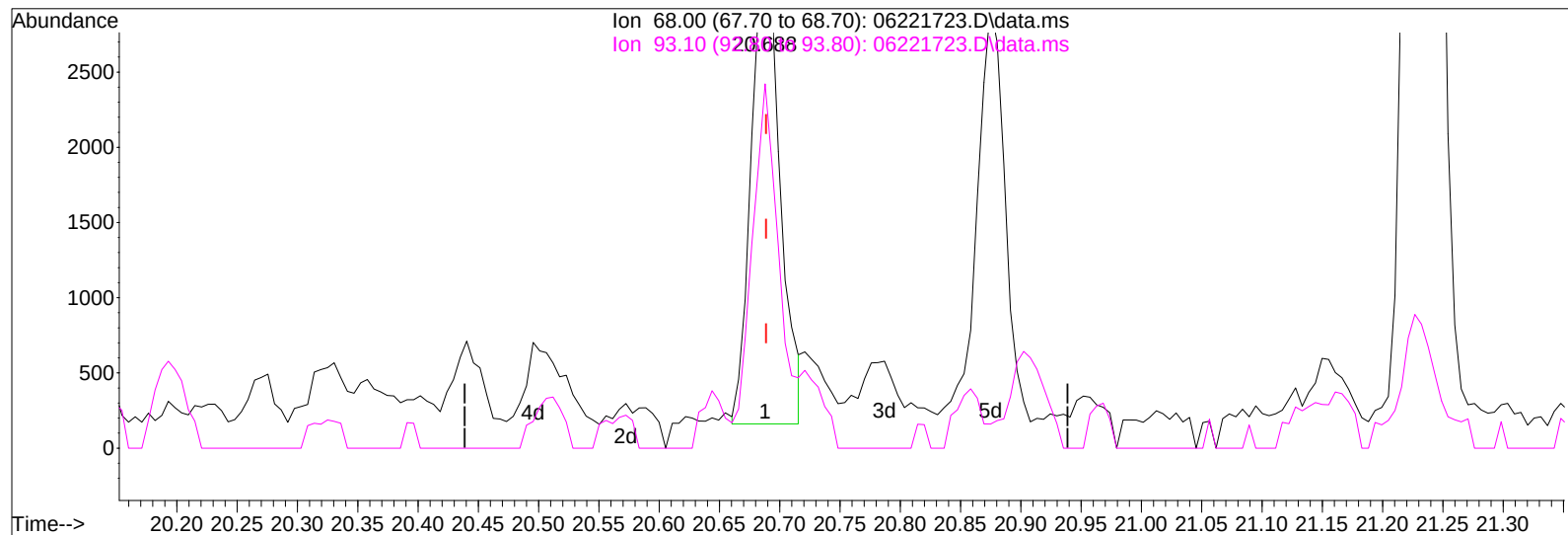
Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 08:16:28 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 06221723.D\data.ms

(91) d-Limonene (T)

20.688min (-0.001) 0.13ng m

response 5234

IPC

LH 6/23/17

Ion	Exp%	Act%
68.00	100	100
93.10	77.20	84.56
0.00	0.00	0.00
0.00	0.00	0.00

6/23/17

Data File: I:\MS16\DATA\2017 06\22\06221704.D

Acq On : 22 Jun 2017 6:46

Operator: LH

Sample : MB R16062217 1000mL

Misc : S31-06081702 AC00442

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 22 08:33:40 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 08:16:28 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 6/22/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.33	130	248619	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.44	114	1227239	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.73	82	477816	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.18	65	320009	11.274	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	90.16%
57) Toluene-d8 (SS2)	15.88	98	1226929	12.585	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.64%
73) Bromofluorobenzene (SS3)	19.09	174	456884	12.275	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.16%

Target Compounds

						Qvalue
2) Propene	4.10	42	545	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	6.48	45	2357	0.139	ng	83
11) Acetonitrile	6.77	41	1138	N.D.		
12) Acrolein	6.96	56	428	N.D.		
13) Acetone	7.18	58	5743	0.325	ng	# 72
14) Trichlorofluoromethane	0.00	101	0	N.D.		
15) 2-Propanol (Isopropanol)	7.72	45	236	N.D.		
16) Acrylonitrile	7.94	53	310	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	8.60	84	1532	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	8.87	76	2860	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	13.06	56	1207	N.D.		
41) Benzene	13.05	78	2241	N.D.		
42) Carbon Tetrachloride	0.00	117	0	N.D.		
43) Cyclohexane	13.43	84	533	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:\MS16\DATA\2017 06\22\06221704.D

Acq On : 22 Jun 2017 6:46

Operator: LH

Sample : MB R16062217 1000mL

Misc : S31-06081702 AC00442

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 22 08:33:40 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 08:16:28 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	15.98	91	1829	N.D.		
59) 2-Hexanone	16.23	43	736	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.85	43	631	N.D.		
63) n-Octane	16.94	57	1166	N.D.		
64) Tetrachloroethene	0.00	166	0	N.D.		
65) Chlorobenzene	17.78	112	785	N.D.		
66) Ethylbenzene	18.12	91	875	N.D.		
67) m- & p-Xylenes	18.27	91	2036	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.60	104	1044	N.D.		
70) o-Xylene	18.70	91	1028	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	19.21	105	1701	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	19.63	91	3230	N.D.		
77) 3-Ethyltoluene	19.74	105	4944	N.D.		
78) 4-Ethyltoluene	19.77	105	826	N.D.		
79) 1,3,5-Trimethylbenzene	19.84	105	3775	N.D.		
80) alpha-Methylstyrene	0.00	118	0	N.D.		
81) 2-Ethyltoluene	20.01	105	1541	N.D.		
82) 1,2,4-Trimethylbenzene	20.20	105	1067	N.D.		
83) n-Decane	20.28	57	578	N.D.		
84) Benzyl Chloride	20.31	91	1182	N.D.		
85) 1,3-Dichlorobenzene	20.34	146	1248	N.D.		
86) 1,4-Dichlorobenzene	20.39	146	1861	N.D.		
87) sec-Butylbenzene	20.57	105	3462	N.D.		
88) 4-Isopropyltoluene (p-...	20.57	119	2747	N.D.		
89) 1,2,3-Trimethylbenzene	20.57	105	3462	N.D.		
90) 1,2-Dichlorobenzene	20.69	146	1045	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	21.35	57	1234	N.D.		
94) 1,2,4-Trichlorobenzene	22.18	180	2006	N.D.		
95) Naphthalene	22.29	128	12557	0.097 ng	95	
96) n-Dodecane	22.26	57	2598	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.		
99) tert-Butylbenzene	20.19	119	596	N.D.		
100) n-Butylbenzene	20.93	91	955	N.D.		

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

Data File: I:\MS16\DATA\2017 06\22\06221704.D

Acq On : 22 Jun 2017 6:46

Operator: LH

Sample : MB R16062217 1000mL

Misc : S31-06081702 AC00442

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 22 08:33:40 2017

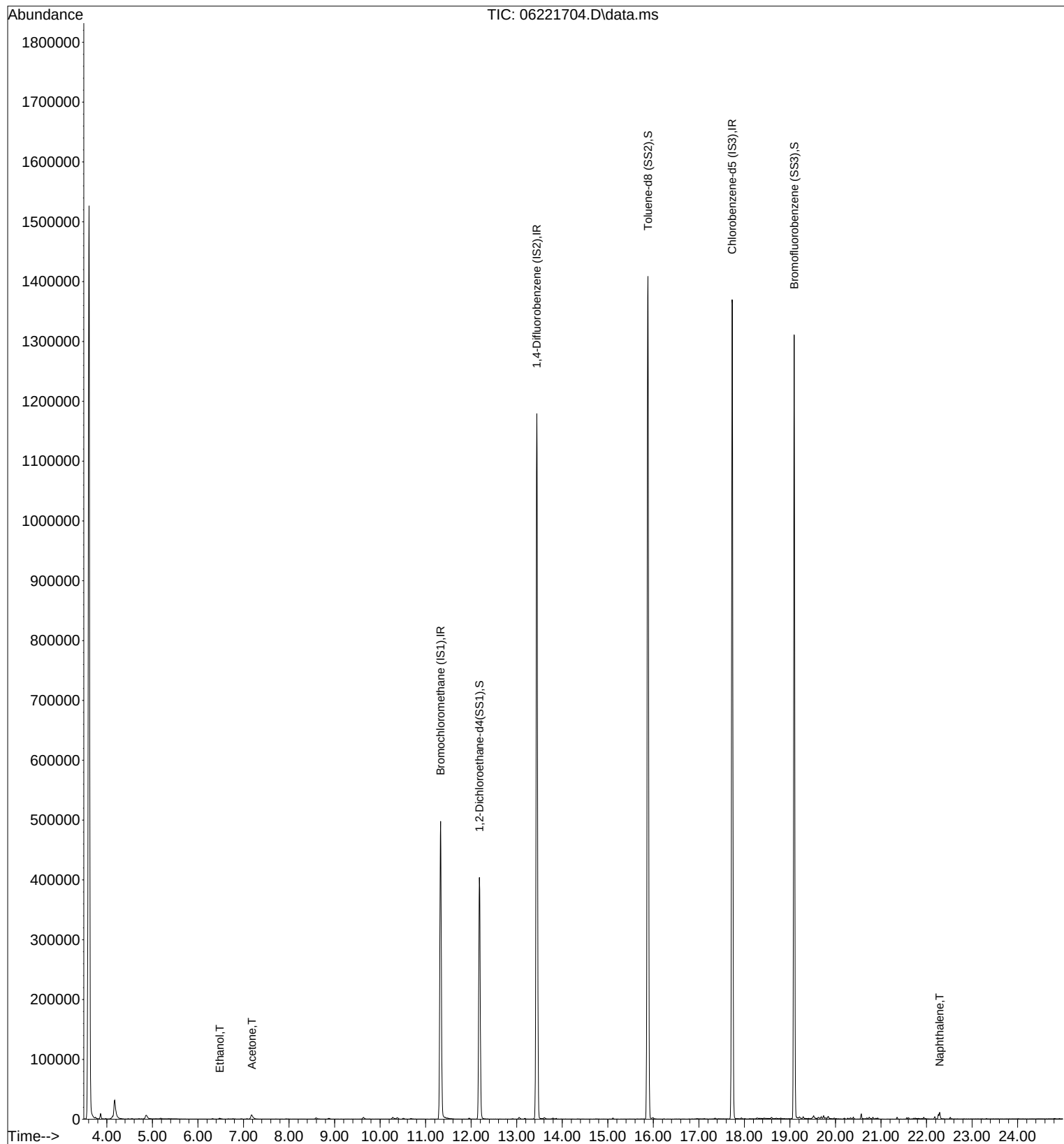
Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 08:16:28 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS16\DATA\2017 06\22\06221705.D

Acq On : 22 Jun 2017 7:20

Operator: LH

Sample : LCS R16062217 25ng

Misc : S31-06081702/S31-06161705 (7/15)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 22 08:33:57 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 08:16:28 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 6/22/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.34	130	262761	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.45	114	1246145	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.73	82	492683	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.20	65	327635	10.922	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	87.36%
57) Toluene-d8 (SS2)	15.88	98	1248744	12.422	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.36%
73) Bromofluorobenzene (SS3)	19.09	174	471752	12.292	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.32%

Target Compounds

						Qvalue
2) Propene	4.05	42	605660	23.888	ng	95
3) Dichlorodifluoromethan...	4.22	85	1217960	21.394	ng	99
4) Chloromethane	4.53	50	893188	24.182	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	720744	21.181	ng	100
6) Vinyl Chloride	4.97	62	977192	23.999	ng	100
7) 1,3-Butadiene	5.25	54	725078	23.654	ng	95
8) Bromomethane	5.72	94	629391	22.033	ng	100
9) Chloroethane	6.07	64	470222	26.206	ng	100
10) Ethanol	6.48	45	2200975	122.847	ng	99
11) Acetonitrile	6.75	41	1033952	24.078	ng	97
12) Acrolein	6.92	56	392890	24.110	ng	99
13) Acetone	7.14	58	2323176	124.577	ng	# 82
14) Trichlorofluoromethane	7.37	101	1068262	21.552	ng	100
15) 2-Propanol (Isopropanol)	7.66	45	2963416	47.967	ng	97
16) Acrylonitrile	7.94	53	818266	25.930	ng	99
17) 1,1-Dichloroethene	8.36	96	656880	24.337	ng	97
18) 2-Methyl-2-Propanol (t...	8.55	59	3221056	46.845	ng	97
19) Methylene Chloride	8.61	84	668411	24.665	ng	99
20) 3-Chloro-1-propene (Al...	8.77	41	818087	23.007	ng	98
21) Trichlorotrifluoroethane	9.01	151	630715	22.826	ng	97
22) Carbon Disulfide	8.87	76	2399221	25.612	ng	100
23) trans-1,2-Dichloroethene	9.89	61	890210	25.205	ng	99
24) 1,1-Dichloroethane	10.15	63	1111646	24.665	ng	100
25) Methyl tert-Butyl Ether	10.22	73	1921343	23.470	ng	98
26) Vinyl Acetate	10.40	86	840387	137.884	ng	100
27) 2-Butanone (MEK)	10.64	72	456328	25.452	ng	91
28) cis-1,2-Dichloroethene	11.16	61	846826	24.489	ng	100
29) Diisopropyl Ether	11.44	87	555152	22.776	ng	97
30) Ethyl Acetate	11.45	61	495939	53.329	ng	97
31) n-Hexane	11.43	57	1035519	25.439	ng	99
32) Chloroform	11.51	83	1092098	22.744	ng	100
34) Tetrahydrofuran (THF)	11.90	72	444589	24.094	ng	98
35) Ethyl tert-Butyl Ether	12.03	87	795180	24.174	ng	97
36) 1,2-Dichloroethane	12.31	62	755027	20.971	ng	100
38) 1,1,1-Trichloroethane	12.58	97	965134	21.603	ng	99
39) Isopropyl Acetate	12.99	61	861822	52.490	ng	# 89
40) 1-Butanol	13.02	56	1410020	50.054	ng	91
41) Benzene	13.06	78	2593655	23.939	ng	100
42) Carbon Tetrachloride	13.21	117	900137	21.622	ng	99
43) Cyclohexane	13.35	84	2047922	50.068	ng	96
44) tert-Amyl Methyl Ether	13.68	73	1866466	23.983	ng	97
45) 1,2-Dichloropropane	13.91	63	643453	26.222	ng	100
46) Bromodichloromethane	14.10	83	896318	23.213	ng	100
47) Trichloroethene	14.15	130	770222	23.444	ng	100
48) 1,4-Dioxane	14.12	88	582780	25.401	ng	98
49) 2,2,4-Trimethylpentane...	14.20	57	2563421	25.497	ng	92

Data File: I:\MS16\DATA\2017 06\22\06221705.D

Acq On : 22 Jun 2017 7:20

Operator: LH

Sample : LCS R16062217 25ng

Misc : S31-06081702/S31-06161705 (7/15)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 22 08:33:57 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 08:16:28 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.34	100	589795	49.235	ng	92
51) n-Heptane	14.46	71	643577	25.510	ng	98
52) cis-1,3-Dichloropropene	15.01	75	1104055	25.277	ng	100
53) 4-Methyl-2-pentanone	15.03	58	616303	25.997	ng	91
54) trans-1,3-Dichloropropene	15.52	75	991638	25.202	ng	100
55) 1,1,2-Trichloroethane	15.70	97	674271	24.703	ng	97
58) Toluene	15.99	91	2669020	24.116	ng	100
59) 2-Hexanone	16.22	43	1295850	22.801	ng	93
60) Dibromochloromethane	16.40	129	838526	22.592	ng	100
61) 1,2-Dibromoethane	16.65	107	790042	23.861	ng	100
62) n-Butyl Acetate	16.84	43	1488993	23.559	ng	96
63) n-Octane	16.97	57	534390	23.692	ng	96
64) Tetrachloroethene	17.12	166	832656	22.694	ng	100
65) Chlorobenzene	17.77	112	1891531	23.637	ng	100
66) Ethylbenzene	18.12	91	3068334	23.278	ng	99
67) m- & p-Xylenes	18.28	91	4628352	45.429	ng	100
68) Bromoform	18.35	173	749857	22.271	ng	100
69) Styrene	18.60	104	1984784	24.512	ng	99
70) o-Xylene	18.70	91	2359169	22.640	ng	100
71) n-Nonane	18.88	43	1094496	23.259	ng	97
72) 1,1,2,2-Tetrachloroethane	18.69	83	1210706	24.937	ng	99
74) Cumene	19.21	105	3115069	22.914	ng	99
75) alpha-Pinene	19.55	93	1642140	24.534	ng	98
76) n-Propylbenzene	19.65	91	3687399	23.889	ng	99
77) 3-Ethyltoluene	19.74	105	3097806	22.992	ng	99
78) 4-Ethyltoluene	19.77	105	2971315	23.755	ng	99
79) 1,3,5-Trimethylbenzene	19.84	105	2516478	22.542	ng	100
80) alpha-Methylstyrene	19.97	118	1473062	26.041	ng	99
81) 2-Ethyltoluene	20.01	105	3011770	22.937	ng	99
82) 1,2,4-Trimethylbenzene	20.20	105	2563384	22.531	ng	99
83) n-Decane	20.28	57	1282207	24.148	ng	98
84) Benzyl Chloride	20.31	91	2294331	24.757	ng	99
85) 1,3-Dichlorobenzene	20.34	146	1597161	23.276	ng	100
86) 1,4-Dichlorobenzene	20.39	146	1609942	23.476	ng	100
87) sec-Butylbenzene	20.43	105	3397101	23.037	ng	99
88) 4-Isopropyltoluene (p-...	20.57	119	3176123	22.940	ng	99
89) 1,2,3-Trimethylbenzene	20.57	105	2605716	23.613	ng	99
90) 1,2-Dichlorobenzene	20.69	146	1543884	23.428	ng	100
91) d-Limonene	20.69	68	1003475	25.748	ng	96
92) 1,2-Dibromo-3-Chloropr...	21.07	157	618610	25.166	ng	95
93) n-Undecane	21.35	57	1376027	26.043	ng	98
94) 1,2,4-Trichlorobenzene	22.18	180	1295645	25.612	ng	100
95) Naphthalene	22.29	128	3703003	27.827	ng	100
96) n-Dodecane	22.26	57	1383023	27.877	ng	97
97) Hexachlorobutadiene	22.60	225	825653	22.875	ng	100
98) Cyclohexanone	18.42	55	938000	22.425	ng	94
99) tert-Butylbenzene	20.20	119	2510835	22.661	ng	99
100) n-Butylbenzene	20.92	91	2729737	23.889	ng	99

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

Method Path : I:\MS16\METHODS\
 Method File : R16042417.M
 Title : EPA T0-15 per SOP VOA-T015 (CASS T0-15/GC-MS)
 Last Update : Tue Apr 25 08:34:49 2017
 Response Via : Initial Calibration

LH 4/25/17

Calibration Files

0.08=04241705.D 0.10=04241706.D 0.20=04241707.D 0.40=04241708.D 1.0 =04241709.D 5.0 =04241710.D
 50 =04241712.D 100 =04241713.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			1.228	1.454	1.151	1.068	1.091	1.134	1.317	1.206	11.47
3) T	Dichlorodifluo...	3.150	3.124	2.589	3.244	2.694	2.443	2.509	2.376	2.245	2.708	13.72
4) T	Chloromethane	2.119	2.046	1.785	2.203	1.805	1.483	1.641	1.514	1.218	1.757	18.61
5) T	1,2-Dichloro-1...	1.812	1.817	1.577	1.951	1.594	1.464	1.509	1.450	1.393	1.619	12.06
6) T	Vinyl Chloride	2.201	2.154	1.862	2.305	1.905	1.743	1.811	1.755	1.698	1.937	11.59
7) T	1,3-Butadiene	1.697	1.703	1.411	1.705	1.380	1.255	1.344	1.324	1.304	1.458	12.88
8) T	Bromomethane	1.855	1.600	1.456	1.593	1.266	1.116	1.156	1.111	1.077	1.359	20.46
9) T	Chloroethane	0.937	0.894	0.813	1.001	0.855	0.783	0.816	0.795	0.788	0.854	8.91
10) T	Ethanol	1.033	0.967	0.813	0.987	0.813	0.733	0.784	0.778	0.762	0.852	13.11
11) T	Acetonitrile			2.675	2.755	1.828	1.694	1.819	1.777	1.752	2.043	22.60
12) T	Acrolein	1.076	0.960	0.746	0.850	0.707	0.626	0.681	0.668	0.662	0.775	19.95
13) T	Acetone	1.059	0.989	0.844	1.026	0.859	0.791	0.828	0.811	0.778	0.887	12.11
14) T	Trichlorofluor...	2.617	2.616	2.258	2.835	2.341	2.186	2.236	2.130	2.003	2.358	11.56
15) T	2-Propanol (Is...	3.513	3.420	2.895	3.587	2.959	2.634	2.792	2.563	2.088	2.939	16.86
16) T	Acrylonitrile	1.878	1.660	1.389	1.694	1.407	1.301	1.436	1.389	1.356	1.501	12.97
17) T	1,1-Dichloroet...	1.477	1.379	1.210	1.515	1.268	1.161	1.220	1.180	1.146	1.284	10.82
18) T	2-Methyl-2-Pro...	3.860	3.763	3.230	4.027	3.341	3.044	3.162	2.959	2.054	3.271	18.12
19) T	Methylene Chlo...			1.455	1.602	1.282	1.153	1.213	1.162	1.157	1.289	13.55
20) T	3-Chloro-1-pro...		2.226	1.820	2.011	1.685	1.412	1.517	1.460	1.402	1.692	18.01
21) T	Trichlorotrifl...	1.454	1.429	1.229	1.599	1.309	1.195	1.255	1.204	1.155	1.314	11.28
22) T	Carbon Disulfide			4.704	5.587	4.553	4.162	4.255	4.062	3.872	4.456	12.87
23) T	trans-1,2-Dich...	1.878	1.814	1.561	1.974	1.671	1.539	1.628	1.555	1.501	1.680	10.04
24) T	1,1-Dichloroet...	2.418	2.395	2.078	2.542	2.126	1.940	2.025	1.924	1.849	2.144	11.57
25) T	Methyl tert-Bu...	4.533	4.250	3.729	4.658	3.805	3.530	3.666	3.513	3.366	3.894	12.05
26) T	Vinyl Acetate	0.282	0.266	0.242	0.318	0.273	0.275	0.329	0.330	0.295	0.290	10.45
27) T	2-Butanone (MEK)	0.914	0.920	0.754	1.011	0.837	0.786	0.835	0.811	0.809	0.853	9.43
28) T	cis-1,2-Dichlo...	1.888	1.773	1.538	1.946	1.633	1.496	1.579	1.510	1.444	1.645	11.02
29) T	Diisopropyl Ether	1.429	1.430	1.226	1.251	1.023	0.959	1.059	1.060	0.999	1.160	15.66
30) T	Ethyl Acetate	0.500	0.457	0.392	0.499	0.419	0.400	0.450	0.450	0.416	0.442	8.91
31) T	n-Hexane	2.310	2.157	1.799	2.230	1.795	1.704	1.863	1.837	1.732	1.936	11.89
32) T	Chloroform	2.630	2.504	2.220	2.717	2.271	2.090	2.162	2.043	1.921	2.284	12.01
33) S	1,2-Dichloroet...	1.427	1.458	1.438	1.445	1.444	1.452	1.413	1.403	1.366	1.427	2.04
34) T	Tetrahydrofura...	1.088	1.029	0.872	1.009	0.832	0.750	0.790	0.767	0.764	0.878	14.85
35) T	Ethyl tert-But...	1.664	1.670	1.434	1.861	1.538	1.434	1.529	1.488	1.465	1.565	9.07
36) T	1,2-Dichloroet...	1.935	1.946	1.619	2.059	1.707	1.570	1.631	1.536	1.412	1.713	12.75
37) IR	1,4-Difluorobenzen...	-----ISTD-----										
38) T	1,1,1-Trichlor...	0.521	0.487	0.427	0.541	0.445	0.402	0.425	0.401	0.383	0.448	12.46
39) T	Isopropyl Acetate	0.181	0.168	0.149	0.192	0.160	0.145	0.165	0.164	0.158	0.165	8.88
40) T	1-Butanol	0.355	0.306	0.264	0.314	0.263	0.242	0.273	0.271	0.255	0.283	12.61
41) T	Benzene	1.350	1.253	1.037	1.257	1.025	0.932	1.011	0.985	0.932	1.087	14.39
42) T	Carbon Tetrach...	0.474	0.446	0.396	0.502	0.413	0.376	0.404	0.385	0.363	0.418	11.24
43) T	Cyclohexane	0.467	0.437	0.382	0.474	0.399	0.364	0.403	0.395	0.371	0.410	9.75
44) T	tert-Amyl Meth...	0.882	0.841	0.742	0.914	0.764	0.699	0.755	0.728	0.701	0.781	10.13
45) T	1,2-Dichloropr...	0.280	0.264	0.232	0.290	0.242	0.219	0.236	0.228	0.224	0.246	10.40
46) T	Bromodichlorom...	0.446	0.431	0.367	0.450	0.379	0.348	0.373	0.356	0.337	0.387	11.17
47) T	Trichloroethene	0.376	0.363	0.302	0.391	0.317	0.292	0.317	0.308	0.300	0.330	11.21
48) T	1,4-Dioxane	0.252	0.243	0.202	0.268	0.228	0.207	0.227	0.222	0.222	0.230	9.22
49) T	2,2,4-Trimethy...	1.199	1.111	0.958	1.197	0.982	0.895	0.954	0.911	0.870	1.008	12.65
50) T	Methyl Methacr...	0.126	0.125	0.109	0.138	0.116	0.108	0.122	0.120	0.117	0.120	7.75
51) T	n-Heptane	0.293	0.263	0.241	0.291	0.240	0.221	0.244	0.242	0.242	0.253	9.68
52) T	cis-1,3-Dichlo...	0.477	0.462	0.398	0.503	0.424	0.394	0.440	0.429	0.417	0.438	8.28
53) T	4-Methyl-2-pen...	0.276	0.248	0.221	0.281	0.230	0.210	0.229	0.224	0.222	0.238	10.56
54) T	trans-1,3-Dich...	0.427	0.400	0.357	0.451	0.383	0.357	0.406	0.392	0.380	0.395	7.84

55)	T	1,1,2-Trichlor...	0.314	0.289	0.258	0.322	0.268	0.243	0.265	0.255	0.250	0.274	10.32
56)	IR	Chlorobenzene-d5 (...	-----ISTD-----										
57)	S	Toluene-d8 (SS2)	2.616	2.596	2.561	2.534	2.538	2.552	2.526	2.523	2.508	2.550	1.39
58)	T	Toluene			2.853	3.482	2.868	2.616	2.760	2.631	2.446	2.808	11.83
59)	T	2-Hexanone	1.810	1.659	1.351	1.669	1.420	1.258	1.351	1.273	1.186	1.442	15.09
60)	T	Dibromochlorom...	1.096	1.022	0.859	1.102	0.914	0.849	0.922	0.879	0.834	0.942	11.13
61)	T	1,2-Dibromoethane	0.982	0.908	0.785	0.958	0.817	0.754	0.826	0.786	0.745	0.840	10.45
62)	T	n-Butyl Acetate	2.081	1.822	1.529	1.819	1.574	1.407	1.488	1.403	1.309	1.604	15.71
63)	T	n-Octane	0.766	0.671	0.558	0.643	0.513	0.476	0.519	0.507	0.498	0.572	17.25
64)	T	Tetrachloroethene	1.033	1.029	0.872	1.093	0.916	0.847	0.900	0.862	0.826	0.931	10.31
65)	T	Chlorobenzene	2.403	2.225	1.892	2.352	1.947	1.777	1.982	1.905	1.790	2.030	11.62
66)	T	Ethylbenzene	4.049	3.740	3.109	3.911	3.267	2.982	3.232	3.078	2.730	3.344	13.49
67)	T	m- & p-Xylenes	3.206	2.953	2.415	2.987	2.497	2.294	2.525	2.393	1.994	2.585	14.95
68)	T	Bromoform	0.925	0.900	0.789	0.983	0.838	0.789	0.871	0.826	0.768	0.854	8.38
69)	T	Styrene	2.407	2.184	1.868	2.264	1.915	1.802	2.134	2.048	1.865	2.054	10.11
70)	T	o-Xylene	3.217	2.999	2.509	3.072	2.559	2.366	2.557	2.434	2.081	2.644	14.08
71)	T	n-Nonane	1.502	1.360	1.138	1.381	1.157	1.066	1.131	1.067	0.943	1.194	15.14
72)	T	1,1,2,2-Tetrac...	1.404	1.301	1.117	1.421	1.187	1.128	1.260	1.204	1.063	1.232	10.20
73)	S	Bromofluoroben...	0.937	0.954	0.979	0.978	0.993	0.997	0.992	0.979	0.955	0.974	2.11
74)	T	Cumene	3.948	4.057	3.246	4.039	3.379	3.121	3.377	3.188	2.689	3.449	13.65
75)	T	alpha-Pinene	1.933	1.788	1.588	1.868	1.613	1.521	1.754	1.697	1.519	1.698	8.78
76)	T	n-Propylbenzene	4.459	4.445	3.676	4.637	3.888	3.609	3.931	3.648	2.951	3.916	13.54
77)	T	3-Ethyltoluene	3.880	3.686	3.098	3.970	3.365	3.064	3.608	3.276	2.816	3.418	11.51
78)	T	4-Ethyltoluene	3.778	3.581	2.979	3.678	3.122	2.977	3.092	2.999	2.354	3.173	13.97
79)	T	1,3,5-Trimethy...	3.289	3.178	2.590	3.298	2.792	2.573	2.843	2.678	2.250	2.832	12.70
80)	T	alpha-Methylst...	1.703	1.535	1.320	1.453	1.238	1.181	1.603	1.534	1.350	1.435	12.17
81)	T	2-Ethyltoluene	3.916	3.683	3.139	3.880	3.286	3.043	3.344	3.117	2.573	3.331	13.04
82)	T	1,2,4-Trimethy...	3.892	3.216	2.608	3.292	2.788	2.630	2.984	2.655	1.913	2.887	19.17
83)	T	n-Decane	1.647	1.519	1.269	1.516	1.266	1.194	1.332	1.268	1.113	1.347	13.00
84)	T	Benzyl Chloride				2.452	2.162	2.144	2.685	2.546	2.119	2.351	10.28
85)	T	1,3-Dichlorobe...	2.078	1.844	1.510	1.953	1.652	1.573	1.835	1.740	1.482	1.741	11.74
86)	T	1,4-Dichlorobe...	2.093	1.887	1.451	1.962	1.652	1.532	1.813	1.736	1.534	1.740	12.49
87)	T	sec-Butylbenzene	4.375	4.153	3.513	4.434	3.753	3.491	3.757	3.451	2.745	3.741	14.15
88)	T	4-Isopropyltol...	4.045	3.867	3.295	4.253	3.598	3.405	3.741	3.191	2.220	3.513	16.99
89)	T	1,2,3-Trimethy...	3.240	3.037	2.600	3.321	2.812	2.661	2.995	2.640	1.891	2.800	15.31
90)	T	1,2-Dichlorobe...	1.956	1.756	1.511	1.914	1.636	1.549	1.804	1.668	1.253	1.672	13.07
91)	T	d-Limonene	1.191	1.125	0.958	1.058	0.894	0.852	1.055	1.013	0.755	0.989	13.98
92)	T	1,2-Dibromo-3-...	0.608	0.618	0.505	0.689	0.614	0.597	0.697	0.666	0.619	0.624	9.23
93)	T	n-Undecane	1.520	1.435	1.192	1.532	1.288	1.225	1.391	1.327	1.155	1.341	10.31
94)	T	1,2,4-Trichlor...				1.325	1.156	1.100	1.450	1.394	1.275	1.283	10.54
95)	T	Naphthalene	4.330	3.323	2.405	3.494	3.020	2.896	4.097	3.795	3.025	3.376	18.27
96)	T	n-Dodecane	1.375	1.251	1.139	1.381	1.202	1.160	1.354	1.311	1.155	1.259	7.86
97)	T	Hexachlorobuta...	0.981	0.974	0.818	1.066	0.891	0.837	0.943	0.901	0.830	0.916	9.05
98)	T	Cyclohexanone	1.624	1.307	1.043	1.145	0.960	0.856	0.920	0.867	0.828	1.061	24.70
99)	T	tert-Butylbenzene	3.380	3.132	2.679	3.341	2.800	2.634	2.924	2.556	1.855	2.811	16.63
100)	T	n-Butylbenzene	3.347	3.167	2.604	3.409	2.881	2.699	2.988	2.754	2.244	2.899	12.89

(#) = Out of Range

R16042417.M Tue Apr 25 09:00:55 2017

Primary Source Standards Concentrations (Working & Initial Calibration)

1ng/L Std. ID: S31-04111708
4ng/L Std. ID: S31-04111708
20ng/L Std. ID: S31-04111707
200ng/L Std. ID: S31-04111702

200ng/L Std. ID: S31-04111702										Working STD Conc.(ng/L):									
Dilution Factors:										ICAL Points:									
Compounds	Source Std. mg/m ³	Primary Working Standards					4	4	4	20	20	200	200	200	200				
		200ng/L	20ng/L	20ng/L	4ng/L	4ng/L										1ng/L			
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				
trans-1,2-Dichloroethene	1.067	213.4	21.34	4.268	1.067		0.08472	0.1059	0.2118	0.4236	1.059	5.295	26.475	52.95	105.9				
1,1-Dichloroethane	1.059	211.8	21.18	4.236	1.059		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				
Trichlorofluoroethane	1.049	209.8	20.98	4.196	1.049		0.08416	0.1052	0.2104	0.4208	1.052	5.260	26.300	52.60	105.2				
Carbon Disulfide	1.061	212.2	21.22	4.244	1.061		0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	52.45	104.9				
trans-1,2-Dichloroethene	1.067	213.4	21.34	4.268	1.067		0.08488	0.1061	0.2124	0.4248	1.061	5.305	26.525	53.05	106.1				
1,1-Dichloroethane	1.020	204.0	20.40	4.080	1.020		0.08536	0.1067	0.2134	0.4268	1.067	5.335	26.675	53.35	106.7				
Methyl tert-Butyl Ether	1.066	213.2	21.32	4.264	1.066		0.08160	0.1020	0.2040	0.4080	1.020	5.100	25.500	51.00	102.0				
Vinyl Acetate	5.265	1053.0	105.30	21.060	5.265		0.08528	0.1066	0.2132	0.4264	1.066	5.330	26.650	53.30	106.6				
2-Butanone	1.049	209.8	20.98	4.196	1.049		0.42120	0.5265	1.0530	2.1060	5.265	26.325	131.625	263.25	526.5				
cis-1,2-Dichloroethene	1.064	212.8	21.28	4.256	1.064		0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	52.45	104.9				
Diisopropyl Ether	1.062	212.4	21.24	4.248	1.062		0.08512	0.1064	0.2128	0.4256	1.064	5.320	26.600	53.20	106.4				
Ethyl Acetate	2.129	425.8	42.58	8.516	2.129		0.08496	0.1062	0.2124	0.4248	1.062	5.310	26.550	53.10	106.2				
n-Hexane	1.063	212.6	21.26	4.252	1.063		0.17032	0.2129	0.4258	0.8516	2.129	10.645	53.225	106.45	212.9				
Chloroform	1.058	211.6	21.16	4.232	1.058		0.08504	0.1063	0.2126	0.4252	1.063	5.315	26.575	53.15	106.3				
Tetrahydrofuran	1.062	212.4	21.24	4.248	1.062		0.08464	0.1058	0.2116	0.4232	1.058	5.290	26.450	52.90	105.8				
Ethyl tert-Butyl Ether	1.057	211.4	21.14	4.228	1.057		0.08496	0.1062	0.2124	0.4248	1.062	5.310	26.550	53.10	106.2				
1,2-Dichloroethane	1.052	210.4	21.04	4.208	1.052		0.08456	0.1057	0.2114	0.4228	1.057	5.285	26.425	52.85	105.7				
1,1,1-Trichloroethane	1.074	214.8	21.48	4.296	1.074		0.08416	0.1052	0.2104	0.4208	1.052	5.260	26.300	52.60	105.2				
Isopropyl Acetate	2.104	420.8	42.08	8.416	2.104		0.08592	0.1074	0.2148	0.4296	1.074	5.370	26.850	53.70	107.4				
1-Butanol	2.105	421.0	42.10	8.420	2.105		0.16832	0.2104	0.4208	0.8416	2.104	10.520	52.600	105.20	210.4				
Benzene	1.052	210.4	21.04	4.208	1.052		0.16840	0.2105	0.4210	0.8420	2.105	10.525	52.625	105.25	210.5				
Carbon Tetrachloride	1.055	211.0	21.10	4.220	1.055		0.08416	0.1052	0.2104	0.4208	1.052	5.260	26.300	52.60	105.2				
Cyclohexane	2.130	426.0	42.60	8.520	2.130		0.08440	0.1055	0.2110	0.4220	1.055	5.275	26.375	52.75	105.5				
tert-Amyl Methyl Ether	1.054	210.8	21.08	4.216	1.054		0.17040	0.2130	0.4260	0.8520	2.130	10.650	53.250	106.50	213.0				
1,2-Dichloropropane	1.062	212.4	21.24	4.248	1.062		0.08432	0.1054	0.2108	0.4216	1.054	5.270	26.350	52.70	105.4				
Bromodichloromethane	1.066	213.2	21.32	4.264	1.066		0.08496	0.1062	0.2124	0.4248	1.062	5.310	26.550	53.10	106.2				
Trichloroethene	1.060	212.0	21.20	4.240	1.060		0.08528	0.1066	0.2132	0.4264	1.066	5.330	26.650	53.30	106.6				
1,4-Dioxane	1.062	212.4	21.24	4.248	1.062		0.08480	0.1060	0.2120	0.4240	1.060	5.300	26.500	53.00	106.0				
Isocetane	1.059	211.8	21.18	4.236	1.059		0.08496	0.1062	0.2124	0.4248	1.062	5.310	26.550	53.10	106.2				
Methyl Methacrylate	2.110	422.0	42.20	8.440	2.110		0.08472	0.1059	0.2118	0.4236	1.059	5.295	26.475	52.95	105.9				
n-Heptane	1.062	212.4	21.24	4.248	1.062		0.16880	0.2110	0.4220	0.8440	2.110	10.550	52.750	105.50	211.0				
cis-1,3-Dichloropropene	1.116	223.2	22.32	4.464	1.116		0.08496	0.1062	0.2124	0.4248	1.062	5.310	26.550	53.10	106.2				
4-Methyl-2-pentanone	1.058	211.6	21.16	4.232	1.058		0.08432	0.1054	0.2108	0.4216	1.054	5.270	26.350	52.70	105.4				
trans-1,3-Dichloropropene	1.064	212.8	21.28	4.256	1.064		0.08528	0.1066	0.2132	0.4264	1.066	5.330	26.650	53.30	106.6				
1,1,2-Trichloroethane	1.061	212.2	21.22	4.244	1.061		0.08480	0.1060	0.2120	0.4240	1.060	5.300	26.500	53.00	106.0				
Toluene	1.053	210.6	21.06	4.212	1.053		0.08496	0.1062	0.2124	0.4248	1.062	5.310	26.550	53.10	106.2				
2-Hexanone	1.061	212.2	21.22	4.244	1.061		0.08472	0.1059	0.2118	0.4236	1.059	5.295	26.475	52.95	105.9				
							0.16880	0.2110	0.4220	0.8440	2.110	10.550	52.750	105.50	211.0				
							0.08496	0.1062	0.2124	0.4248	1.062	5.310	26.550	53.10	106.2				
							0.08928	0.1116	0.2232	0.4464	1.116	5.580	27.900	55.80	111.6				
							0.08464	0.1058	0.2116	0.4232	1.058	5.290	26.450	52.90	105.8				
							0.08512	0.1064	0.2128	0.4256	1.064	5.320	26.600	53.20	106.4				
							0.08488	0.1061	0.2122	0.4244	1.061	5.305	26.525	53.05	106.1				
							0.08424	0.1053	0.2106	0.4212	1.053	5.265	26.325	52.65	105.3				
							0.08488	0.1061	0.2122	0.4244	1.061	5.305	26.525	53.05	106.1				

LH 4/25/17

Primary Source Standards Concentrations (Working & Initial Calibration)

1ng/L Std. ID: S31-04111708
4ng/L Std. ID: S31-04111708
20ng/L Std. ID: S31-04111707
200ng/L Std. ID: S31-04111702

200ng/L Std. ID: S31-04111702											
Dilution Factors:			5		50		250		1000		
Compounds	Source Std. mg/m ³	200ng/L	20ng/L	Primary Working	4ng/L	1ng/L					
Dibromochloromethane	1.062	212.4	21.24	2.124	4.248	1.062					
1,2-Dibromomethane	1.056	211.2	21.12	2.112	4.224	1.056					
n-Butyl Acetate	1.064	212.8	21.28	2.128	4.256	1.064					
n-Octane	1.057	211.4	21.14	2.114	4.228	1.057					
Tetrachloroethene	1.061	212.2	21.22	2.122	4.244	1.061					
Chlorobenzene	1.061	212.2	21.22	2.122	4.244	1.061					
Ethylbenzene	1.055	211.0	21.10	2.110	4.220	1.055					
m-&p-Xylene	2.123	424.6	42.46	8.492	2.123						
Bromodorm	1.063	212.6	21.26	2.126	4.252	1.063					
Styrene	1.061	212.2	21.22	2.122	4.244	1.061					
o-Xylene	1.054	210.8	21.08	2.108	4.216	1.054					
n-Nonane	1.054	210.8	21.08	2.108	4.216	1.054					
1,1,2,2-Tetrachloroethane	1.056	211.2	21.12	2.112	4.224	1.056					
Cumene	1.050	210.0	21.00	2.100	4.200	1.050					
alpha-Phene	1.044	208.8	20.88	4.176	1.044						
n-Propylbenzene	1.063	212.6	21.26	2.126	4.252	1.063					
3-Ethyltoluene	1.050	210.0	21.00	2.100	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	2.100	4.200	1.050					
2-Ethyltoluene	1.062	212.4	21.24	2.124	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						
n-Butylbenzene	1.056	211.2	21.12	4.224	1.056						

Working STD Conc.(ng/L):																			
Injection (L):	ICAL Points:	4	4	4	20	20	20	20	20	20	20	20	20	20	20	200	200	200	200
		0.020	0.025	0.090	0.090	0.020	0.020	0.090	0.090	0.025	0.025	0.090	0.090	0.025	0.025	0.090	0.090	0.25	0.25
		0.08ng	0.1ng	0.2ng	0.4ng	0.4ng	0.4ng	0.4ng	0.4ng	5ng	5ng	5ng	5ng	25ng	25ng	25ng	50ng	50ng	100ng
		0.08496	0.1062	0.2124	0.4248	0.4248	1.062	1.062	5.310	26.550	53.10	106.2	106.2	53.10	26.550	53.10	106.2	106.2	106.2
		0.08448	0.1056	0.2112	0.4224	0.4224	1.056	1.056	5.280	26.400	52.80	105.6	105.6	52.80	26.400	52.80	105.6	105.6	105.6
		0.08512	0.1064	0.2128	0.4256	0.4256	1.064	1.064	5.320	26.600	53.20	106.4	106.4	53.20	26.600	53.20	106.4	106.4	106.4
		0.08456	0.1057	0.2114	0.4228	0.4228	1.057	1.057	5.285	26.425	52.85	105.7	105.7	52.85	26.425	52.85	105.7	105.7	105.7
		0.08488	0.1061	0.2122	0.4244	0.4244	1.061	1.061	5.305	26.525	53.05	106.1	106.1	53.05	26.525	53.05	106.1	106.1	106.1
		0.08488	0.1061	0.2122	0.4244	0.4244	1.061	1.061	5.305	26.525	53.05	106.1	106.1	53.05	26.525	53.05	106.1	106.1	106.1
		0.08440	0.1055	0.2110	0.4220	0.4220	1.055	1.055	5.275	26.375	52.75	105.5	105.5	52.75	26.375	52.75	105.5	105.5	105.5
		0.16984	0.2123	0.4246	0.8492	0.8492	2.123	2.123	10.615	53.075	106.15	212.3	212.3	53.075	106.15	106.15	212.3	212.3	212.3
		0.08504	0.1063	0.2126	0.4252	0.4252	1.063	1.063	5.315	26.575	53.15	106.3	106.3	53.15	26.575	53.15	106.3	106.3	106.3
		0.08488	0.1061	0.2122	0.4244	0.4244	1.061	1.061	5.305	26.525	53.05	106.1	106.1	53.05	26.525	53.05	106.1	106.1	106.1
		0.08432	0.1054	0.2108	0.4216	0.4216	1.054	1.054	5.270	26.350	52.70	105.4	105.4	52.70	26.350	52.70	105.4	105.4	105.4
		0.08432	0.1054	0.2108	0.4216	0.4216	1.054	1.054	5.270	26.350	52.70	105.4	105.4	52.70	26.350	52.70	105.4	105.4	105.4
		0.08448	0.1056	0.2112	0.4224	0.4224	1.056	1.056	5.280	26.400	52.80	105.6	105.6	52.80	26.400	52.80	105.6	105.6	105.6
		0.08400	0.1050	0.2100	0.4200	0.4200	1.050	1.050	5.250	26.250	52.50	105.0	105.0	52.50	26.250	52.50	105.0	105.0	105.0
		0.08352	0.1044	0.2088	0.4176	0.4176	1.044	1.044	5.220	26.100	52.20	104.4	104.4	52.20	26.100	52.20	104.4	104.4	104.4
		0.08504	0.1063	0.2126	0.4252	0.4252	1.063	1.063	5.315	26.575	53.15	106.3	106.3	53.15	26.575	53.15	106.3	106.3	106.3
		0.08400	0.1050	0.2100	0.4200	0.4200	1.050	1.050	5.250	26.250	52.50	105.0	105.0	52.50	26.250	52.50	105.0	105.0	105.0
		0.08392	0.1049	0.2098	0.4196	0.4196	1.049	1.049	5.245	26.225	52.45	104.9	104.9	52.45	26.225	52.45	104.9	104.9	104.9
		0.08392	0.1049	0.2098	0.4196	0.4196	1.049	1.049	5.245	26.225	52.45	104.9	104.9	52.45	26.225	52.45	104.9	104.9	104.9
		0.08400	0.1050	0.2100	0.4200	0.4200	1.050	1.050	5.250	26.250	52.50	105.0	105.0	52.50	26.250	52.50	105.0	105.0	105.0
		0.08496	0.1062	0.2124	0.4248	0.4248	1.062	1.062	5.310	26.550	53.10	106.2	106.2	53.10	26.550	53.10	106.2	106.2	106.2
		0.08416	0.1052	0.2104	0.4208	0.4208	1.052	1.052	5.260	26.300	52.60	105.2	105.2	52.60	26.300	52.60	105.2	105.2	105.2
		0.08424	0.1053	0.2106	0.4212	0.4212	1.053	1.053	5.265	26.325	52.65	105.3	105.3	52.65	26.325	52.65	105.3	105.3	105.3
		0.08488	0.1061	0.2122	0.4244	0.4244	1.061	1.061	5.305	26.525	53.05	106.1	106.1	53.05	26.525	53.05	106.1	106.1	106.1
		0.08464	0.1058	0.2116	0.4232	0.4232	1.058	1.058	5.290	26.450	52.90	105.8	105.8	52.90	26.450	52.90	105.8	105.8	105.8
		0.08464	0.1058	0.2116	0.4232	0.4232	1.058	1.058	5.290	26.450	52.90	105.8	105.8	52.90	26.450	52.90	105.8	105.8	105.8
		0.08432	0.1054	0.2108	0.4216	0.4216	1.054	1.054	5.270	26.350	52.70	105.4	105.4	52.70	26.350	52.70	105.4	105.4	105.4
		0.08216	0.1027	0.2054	0.4108	0.4108	1.027	1.027	5.135	25.675	51.35	102.7	102.7	51.35	25.675	51.35	102.7	102.7	102.7
		0.08216	0.1027	0.2054	0.4108	0.4108	1.027	1.027	5.135	25.675	51.35	102.7	102.7	51.35	25.675	51.35	102.7	102.7	102.7
		0.08464	0.1058	0.2116	0.4232	0.4232	1.058	1.058	5.290	26.450	52.90	105.8	105.8	52.90	26.450	52.90	105.8	105.8	105.8
		0.08040	0.1005	0.2010	0.4020	0.4020	1.005	1.005	5.025	25.125	50.25	100.5	100.5	50.25	25.125	50.25	100.5	100.5	100.5
		0.08424	0.1053	0.2106	0.4212	0.4212	1.053	1.053	5.265	26.325	52.65	105.3	105.3	52.65	26.325	52.65	105.3	105.3	105.3
		0.08432	0.1054	0.2108	0.4216	0.4216	1.054	1.054	5.270	26.350	52.70	105.4	105.4	52.70	26.350	52.70	105.4	105.4	105.4
		0.08344	0.1043	0.2086	0.4172	0.4172	1.043	1.043	5.215	26.075	52.15	104.3	104.3	52.15	26.075	52.15	104.3	104.3	104.3
		0.08664	0.1083	0.2166	0.4332	0.4332	1.083	1.083	5.415	27.075	54.15	108.3	108.3	54.15	27.075	54.15	108.3	108.3	108.3
		0.08360	0.1045	0.2090	0.4180	0.4180	1.045	1.045	5.225	26.125	52.25	104.5	104.5	52.25	26.125	52.25	104.5	104.5	104.5
		0.08472	0.1059	0.2118	0.4236	0.4236	1.059	1.059	5.295	26.475	52.95	105.9	105.9	52.95	26.475	52.95	105.9	105.9	105.9
		0.08520	0.1065	0.2130	0.4260	0.4260	1.065	1.065	5.325	26.625	53.25	106.5	106.5	53.25	26.625	53.25	106.5	106.5	106.5
		0.08448	0.1056	0.2112	0.4224	0.4224	1.056	1.056	5.280	26.400	52.80	105.6	105.6	52.80	26.400	52.80	105.6	105.6	105.6
		0.08408	0.1051	0.2102	0.4204	0.4204	1.051	1.051	5.255	26.275	52.55	105.1	105.1	52.55	26.275	52.55	105.1	105.1	105.1
		0.08448	0.1056	0.2112	0.4224	0.4224	1.056	1.056	5.280	26.400	52.80	105.6	105.6	52.80	26.400	52.80	105.6	105.6	105.6

Method : I:\MS16\METHODS\R16042417.M (RTE Integrator)
 Title : EPA T0-15 per SOP VOA-T015 (CASS T0-15/GC-MS)
 Last Update : Tue Apr 25 08:34:49 2017
 Response via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	0.08	0	13	I:\MS16\DATA\2017_04\24\04241705.D
2	0.10	0	13	I:\MS16\DATA\2017_04\24\04241706.D
3	0.20	0	13	I:\MS16\DATA\2017_04\24\04241707.D
4	0.40	0	13	I:\MS16\DATA\2017_04\24\04241708.D
5	1.0	1	13	I:\MS16\DATA\2017_04\24\04241709.D
6	5.0	5	13	I:\MS16\DATA\2017_04\24\04241710.D
7	25	26	13	I:\MS16\DATA\2017_04\24\04241711.D
8	50	52	13	I:\MS16\DATA\2017_04\24\04241712.D
9	100	104	13	I:\MS16\DATA\2017_04\24\04241713.D

#	ID	Update Time	Quant Time	Acquisition Time
1	0.08	Apr 25 08:15 2017	Apr 25 07:41 2017	24 Apr 2017 11:48
2	0.10	Apr 25 08:15 2017	Apr 25 07:42 2017	24 Apr 2017 12:22
3	0.20	Apr 25 08:15 2017	Apr 25 07:42 2017	24 Apr 2017 12:55
4	0.40	Apr 25 08:15 2017	Apr 25 07:42 2017	24 Apr 2017 13:29
5	1.0	Apr 25 08:16 2017	Apr 25 07:42 2017	24 Apr 2017 14:02
6	5.0	Apr 25 08:16 2017	Apr 25 07:42 2017	24 Apr 2017 14:35
7	25	Apr 25 08:16 2017	Apr 25 07:42 2017	24 Apr 2017 15:09
8	50	Apr 25 08:16 2017	Apr 25 07:42 2017	24 Apr 2017 15:43
9	100	Apr 25 08:16 2017	Apr 25 07:42 2017	24 Apr 2017 16:17

R16042417.M

Tue Apr 25 09:01:55 2017

LH 4/25/17

Data File: I:\MS16\DATA\2017 04\24\04241706.D

Acq On : 24 Apr 2017 12:22

Operator: LH

Sample : 0.1ng TO-15 ICAL STD

Misc : S31-04111710/S31-04111708 (5/10)

ALS Vial : 6 Sample Multiplier: 1

Quant Time: Apr 25 07:42:00 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 07:41:36 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 4/25/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.32	130	268598	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.44	114	1300609	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.73	82	489280	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.18	65	391484	12.506	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.08%
57) Toluene-d8 (SS2)	15.88	98	1270371	12.977	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.84%
73) Bromofluorobenzene (SS3)	19.09	174	466895	12.449	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.60%

Target Compounds

						Qvalue
2) Propene	4.09	42	3336	0.125	ng	# 87
3) Dichlorodifluoromethan...	4.24	85	7029	0.127	ng	# 94
4) Chloromethane	4.55	50	4418	0.113	ng	97
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	3924	0.114	ng	97
6) Vinyl Chloride	4.99	62	4736	0.112	ng	98
7) 1,3-Butadiene	5.26	54	3868	0.123	ng	95
8) Bromomethane	5.73	94	3414	0.125	ng	91
9) Chloroethane	6.07	64	1938	0.103	ng	88
10) Ethanol	6.45	45	10818	0.590	ng	87
11) Acetonitrile	6.75	41	8159	0.190	ng	92
12) Acrolein	6.94	56	2147	0.126	ng	# 61
13) Acetone	7.15	58	11286	0.583	ng	# 69
14) Trichlorofluoromethane	7.38	101	5897	0.117	ng	99
15) 2-Propanol (Isopropanol)	7.66	45	15469	0.241	ng	72
16) Acrylonitrile	7.91	53	3763	0.116	ng	93
17) 1,1-Dichloroethene	8.37	96	3138	0.112	ng	97
18) 2-Methyl-2-Propanol (t...	8.56	59	17094	0.239	ng	81
19) Methylene Chloride	8.59	84	4287	0.153	ng	100
20) 3-Chloro-1-propene (Al...	8.76	41	5032	0.129	ng	78
21) Trichlorotrifluoroethane	9.00	151	3220	0.115	ng	97
22) Carbon Disulfide	8.87	76	13799	0.148	ng	99
23) trans-1,2-Dichloroethene	9.87	61	4159	0.112	ng	100
24) 1,1-Dichloroethane	10.13	63	5249	0.112	ng	94
25) Methyl tert-Butyl Ether	10.24	73	9735	0.115	ng	94
26) Vinyl Acetate	10.39	86	3012	0.465	ng	# 37
27) 2-Butanone (MEK)	10.65	72	2074	0.112	ng	# 65
28) cis-1,2-Dichloroethene	11.15	61	4054	0.113	ng	99
29) Diisopropyl Ether	11.43	87	3264	0.135	ng	# 81
30) Ethyl Acetate	11.45	61	2089	0.217	ng	96
31) n-Hexane	11.42	57	4928	0.112	ng	94
32) Chloroform	11.49	83	5693	0.115	ng	100
34) Tetrahydrofuran (THF)	11.93	72	2348	0.121	ng	# 85
35) Ethyl tert-Butyl Ether	12.03	87	3794	0.111	ng	89
36) 1,2-Dichloroethane	12.30	62	4399	0.119	ng	99
38) 1,1,1-Trichloroethane	12.57	97	5446	0.118	ng	99
39) Isopropyl Acetate	13.00	61	3670	0.211	ng	# 63
40) 1-Butanol	13.03	56	6704	0.229	ng	# 65
41) Benzene	13.05	78	13710	0.120	ng	98
42) Carbon Tetrachloride	13.21	117	4899	0.114	ng	99
43) Cyclohexane	13.34	84	9688	0.225	ng	96
44) tert-Amyl Methyl Ether	13.68	73	9225	0.113	ng	88
45) 1,2-Dichloropropane	13.90	63	2917	0.112	ng	100
46) Bromodichloromethane	14.09	83	4775	0.118	ng	97
47) Trichloroethene	14.14	130	4002	0.119	ng	98
48) 1,4-Dioxane	14.13	88	2689	0.113	ng	97
49) 2,2,4-Trimethylpentane...	14.20	57	12244	0.114	ng	76

Data File: I:\MS16\DATA\2017 04\24\04241706.D

Acq On : 24 Apr 2017 12:22

Operator: LH

Sample : 0.1ng TO-15 ICAL STD

Misc : S31-04111710/S31-04111708 (5/10)

ALS Vial : 6 Sample Multiplier: 1

Quant Time: Apr 25 07:42:00 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 07:41:36 2017

Response via : Initial Calibration

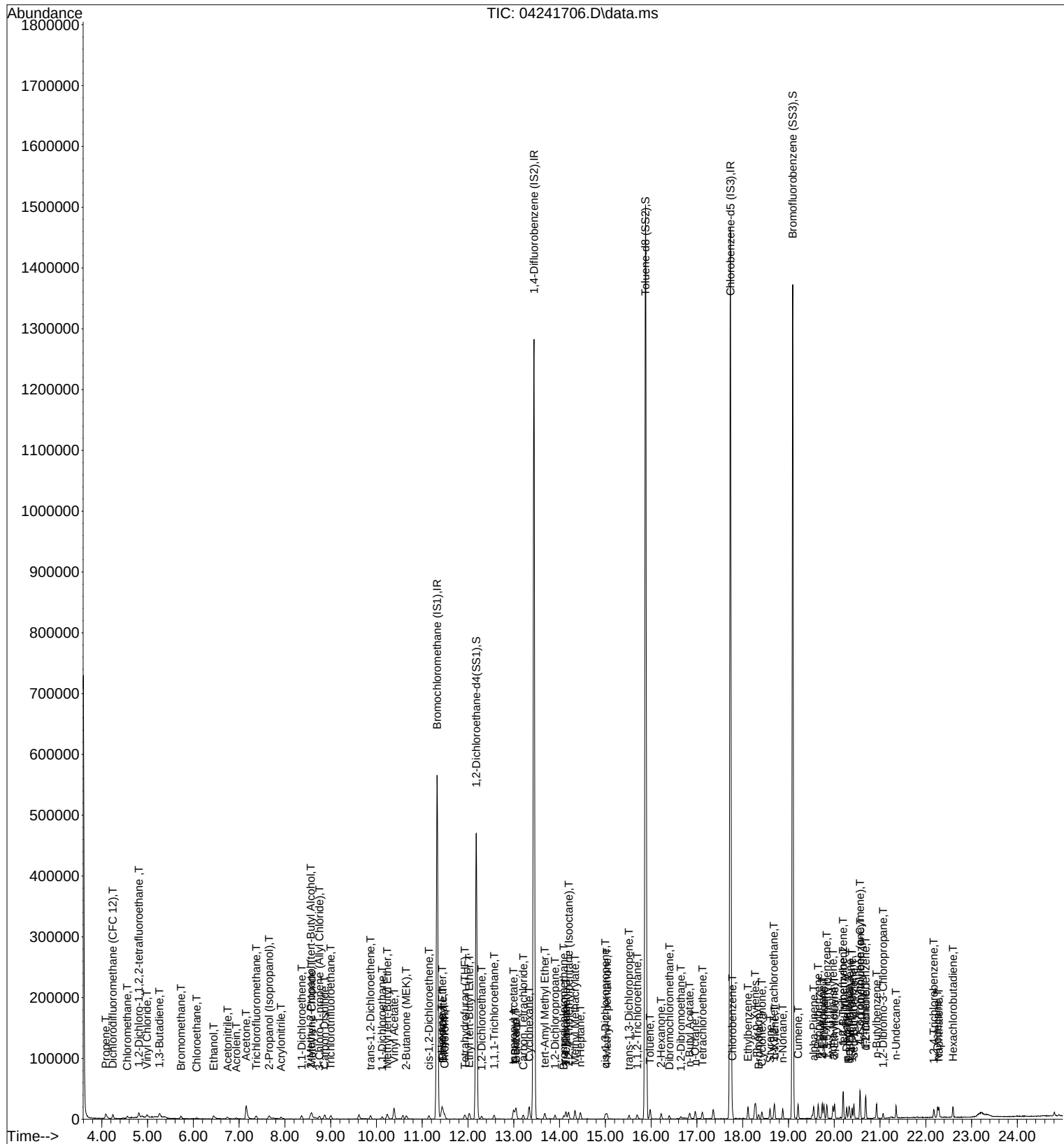
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.34	100	2736	0.218	ng	89
51) n-Heptane	14.46	71	2904	0.108	ng	90
52) cis-1,3-Dichloropropene	15.00	75	5361	0.117	ng	93
53) 4-Methyl-2-pentanone	15.04	58	2728	0.109	ng	80
54) trans-1,3-Dichloropropene	15.51	75	4429	0.108	ng	93
55) 1,1,2-Trichloroethane	15.70	97	3192	0.112	ng	96
58) Toluene	15.98	91	14579	0.130	ng	95
59) 2-Hexanone	16.22	43	6888	0.124	ng	90
60) Dibromochloromethane	16.40	129	4248	0.120	ng	96
61) 1,2-Dibromoethane	16.65	107	3752	0.119	ng	99
62) n-Butyl Acetate	16.84	43	7588	0.122	ng	98
63) n-Octane	16.96	57	2778	0.128	ng	86
64) Tetrachloroethene	17.12	166	4274	0.124	ng	95
65) Chlorobenzene	17.77	112	9242	0.122	ng	97
66) Ethylbenzene	18.12	91	15444	0.123	ng	98
67) m- & p-Xylenes	18.27	91	24539	0.256	ng	95
68) Bromoform	18.35	173	3744	0.119	ng	96
69) Styrene	18.60	104	9072	0.120	ng	98
70) o-Xylene	18.70	91	12372	0.126	ng	94
71) n-Nonane	18.87	43	5611	0.118	ng	93
72) 1,1,2,2-Tetrachloroethane	18.68	83	5378	0.115	ng	98
74) Cumene	19.21	105	16674	0.130	ng	96
75) alpha-Pinene	19.55	93	7307	0.111	ng	97
76) n-Propylbenzene	19.65	91	18494	0.126	ng	96
77) 3-Ethyltoluene	19.74	105	15150	0.119	ng	97
78) 4-Ethyltoluene	19.78	105	14704	0.126	ng	91
79) 1,3,5-Trimethylbenzene	19.84	105	13050	0.124	ng	96
80) alpha-Methylstyrene	19.97	118	6310	0.117	ng	94
81) 2-Ethyltoluene	20.01	105	15311	0.124	ng	97
82) 1,2,4-Trimethylbenzene	20.19	105	13242	0.127	ng	94
83) n-Decane	20.27	57	6261	0.124	ng	94
84) Benzyl Chloride	20.31	91	9977	0.114	ng	93
85) 1,3-Dichlorobenzene	20.34	146	7637	0.123	ng	99
86) 1,4-Dichlorobenzene	20.39	146	7813	0.128	ng	96
87) sec-Butylbenzene	20.43	105	17133	0.123	ng	95
88) 4-Isopropyltoluene (p-...	20.56	119	15544	0.119	ng	90
89) 1,2,3-Trimethylbenzene	20.57	105	12207	0.117	ng	100
90) 1,2-Dichlorobenzene	20.69	146	7274	0.121	ng	98
91) d-Limonene	20.69	68	4424	0.115	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.07	157	2546	0.110	ng	# 79
93) n-Undecane	21.35	57	5919	0.114	ng	97
94) 1,2,4-Trichlorobenzene	22.17	180	4779	0.113	ng	99
95) Naphthalene	22.28	128	14087	0.116	ng	96
96) n-Dodecane	22.26	57	5118	0.105	ng	90
97) Hexachlorobutadiene	22.60	225	4036	0.122	ng	98
98) Cyclohexanone	18.42	55	5404	0.134	ng	95
99) tert-Butylbenzene	20.19	119	12883	0.124	ng	98
100) n-Butylbenzene	20.93	91	13090	0.120	ng	94

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

ALS Vial : 6 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS16\DATA\2017 04\24\04241707.D

Acq On : 24 Apr 2017 12:55

Operator: LH

Sample : 0.2ng TO-15 ICAL STD

Misc : S31-04111710/S31-04111708 (5/10)

ALS Vial : 6 Sample Multiplier: 1

Quant Time: Apr 25 07:42:03 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 07:41:36 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 4/25/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.32	130	275220	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.44	114	1308698	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.73	82	501368	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.18	65	395630	12.335	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.64%
57) Toluene-d8 (SS2)	15.88	98	1284043	12.801	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.40%
73) Bromofluorobenzene (SS3)	19.09	174	490865	12.772	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.16%

Target Compounds

						Qvalue
2) Propene	4.08	42	5600	0.205	ng	94
3) Dichlorodifluoromethan...	4.23	85	11937	0.210	ng	98
4) Chloromethane	4.54	50	7900	0.197	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	6981	0.197	ng	99
6) Vinyl Chloride	4.98	62	8386	0.193	ng	100
7) 1,3-Butadiene	5.25	54	6567	0.204	ng	96
8) Bromomethane	5.71	94	6366	0.228	ng	84
9) Chloroethane	6.06	64	3613	0.188	ng	97
10) Ethanol	6.42	45	18647	0.992	ng	93
11) Acetonitrile	6.73	41	12320	0.279	ng	90
12) Acrolein	6.92	56	3419	0.195	ng	# 56
13) Acetone	7.14	58	19742	0.995	ng	# 78
14) Trichlorofluoromethane	7.36	101	10430	0.201	ng	99
15) 2-Propanol (Isopropanol)	7.63	45	26836	0.408	ng	82
16) Acrylonitrile	7.91	53	6455	0.194	ng	95
17) 1,1-Dichloroethene	8.35	96	5642	0.197	ng	100
18) 2-Methyl-2-Propanol (t...	8.54	59	30066	0.411	ng	86
19) Methylene Chloride	8.58	84	6772	0.237	ng	99
20) 3-Chloro-1-propene (Al...	8.74	41	8430	0.211	ng	85
21) Trichlorotrifluoroethane	9.00	151	5678	0.198	ng	99
22) Carbon Disulfide	8.86	76	21980	0.230	ng	99
23) trans-1,2-Dichloroethene	9.87	61	7336	0.193	ng	98
24) 1,1-Dichloroethane	10.12	63	9334	0.194	ng	100
25) Methyl tert-Butyl Ether	10.23	73	17504	0.202	ng	98
26) Vinyl Acetate	10.38	86	5617	0.847	ng	# 60
27) 2-Butanone (MEK)	10.64	72	3482	0.184	ng	# 65
28) cis-1,2-Dichloroethene	11.15	61	7204	0.196	ng	98
29) Diisopropyl Ether	11.43	87	5732	0.231	ng	# 80
30) Ethyl Acetate	11.46	61	3676	0.372	ng	93
31) n-Hexane	11.42	57	8422	0.187	ng	96
32) Chloroform	11.49	83	10341	0.203	ng	98
34) Tetrahydrofuran (THF)	11.92	72	4077	0.205	ng	95
35) Ethyl tert-Butyl Ether	12.02	87	6673	0.191	ng	92
36) 1,2-Dichloroethane	12.30	62	7502	0.198	ng	99
38) 1,1,1-Trichloroethane	12.57	97	9597	0.206	ng	99
39) Isopropyl Acetate	12.99	61	6584	0.376	ng	# 75
40) 1-Butanol	13.02	56	11629	0.395	ng	81
41) Benzene	13.05	78	22846	0.198	ng	99
42) Carbon Tetrachloride	13.20	117	8737	0.202	ng	99
43) Cyclohexane	13.34	84	17050	0.393	ng	96
44) tert-Amyl Methyl Ether	13.67	73	16378	0.199	ng	93
45) 1,2-Dichloropropane	13.90	63	5155	0.197	ng	99
46) Bromodichloromethane	14.09	83	8183	0.202	ng	98
47) Trichloroethene	14.14	130	6695	0.197	ng	96
48) 1,4-Dioxane	14.13	88	4487	0.188	ng	87
49) 2,2,4-Trimethylpentane...	14.19	57	21253	0.197	ng	87

Data File: I:\MS16\DATA\2017 04\24\04241707.D

Acq On : 24 Apr 2017 12:55

Operator: LH

Sample : 0.2ng TO-15 ICAL STD

Misc : S31-04111710/S31-04111708 (5/10)

ALS Vial : 6 Sample Multiplier: 1

Quant Time: Apr 25 07:42:03 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 07:41:36 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.34	100	4816	0.381	ng	94
51) n-Heptane	14.45	71	5360	0.199	ng	99
52) cis-1,3-Dichloropropene	15.00	75	9293	0.202	ng	95
53) 4-Methyl-2-pentanone	15.03	58	4891	0.194	ng	93
54) trans-1,3-Dichloropropene	15.51	75	7949	0.193	ng	97
55) 1,1,2-Trichloroethane	15.70	97	5739	0.201	ng	98
58) Toluene	15.98	91	24096	0.209	ng	99
59) 2-Hexanone	16.22	43	11502	0.202	ng	94
60) Dibromochloromethane	16.39	129	7319	0.203	ng	99
61) 1,2-Dibromoethane	16.65	107	6647	0.206	ng	98
62) n-Butyl Acetate	16.84	43	13053	0.205	ng	96
63) n-Octane	16.97	57	4734	0.213	ng	86
64) Tetrachloroethene	17.11	166	7422	0.211	ng	99
65) Chlorobenzene	17.77	112	16106	0.207	ng	98
66) Ethylbenzene	18.12	91	26313	0.204	ng	99
67) m- & p-Xylenes	18.27	91	41124	0.419	ng	97
68) Bromoform	18.35	173	6732	0.209	ng	96
69) Styrene	18.60	104	15902	0.205	ng	100
70) o-Xylene	18.70	91	21215	0.210	ng	94
71) n-Nonane	18.87	43	9624	0.197	ng	93
72) 1,1,2,2-Tetrachloroethane	18.68	83	9466	0.198	ng	99
74) Cumene	19.21	105	27338	0.208	ng	98
75) alpha-Pinene	19.55	93	13302	0.198	ng	94
76) n-Propylbenzene	19.65	91	31346	0.208	ng	96
77) 3-Ethyltoluene	19.74	105	26096	0.199	ng	99
78) 4-Ethyltoluene	19.78	105	25066	0.210	ng	97
79) 1,3,5-Trimethylbenzene	19.84	105	21792	0.203	ng	98
80) alpha-Methylstyrene	19.97	118	11116	0.201	ng	96
81) 2-Ethyltoluene	20.01	105	26745	0.212	ng	96
82) 1,2,4-Trimethylbenzene	20.19	105	22010	0.206	ng	97
83) n-Decane	20.27	57	10723	0.207	ng	95
84) Benzyl Chloride	20.31	91	15260	0.170	ng	97
85) 1,3-Dichlorobenzene	20.33	146	12818	0.202	ng	99
86) 1,4-Dichlorobenzene	20.39	146	12317	0.197	ng	99
87) sec-Butylbenzene	20.43	105	29700	0.207	ng	96
88) 4-Isopropyltoluene (p-...	20.56	119	27146	0.202	ng	95
89) 1,2,3-Trimethylbenzene	20.56	105	21419	0.200	ng	99
90) 1,2-Dichlorobenzene	20.69	146	12821	0.208	ng	97
91) d-Limonene	20.69	68	7720	0.196	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.07	157	4267	0.181	ng	# 79
93) n-Undecane	21.35	57	10079	0.189	ng	100
94) 1,2,4-Trichlorobenzene	22.18	180	7564	0.175	ng	98
95) Naphthalene	22.28	128	20896	0.168	ng	97
96) n-Dodecane	22.26	57	9552	0.192	ng	99
97) Hexachlorobutadiene	22.59	225	6949	0.205	ng	99
98) Cyclohexanone	18.42	55	8839	0.213	ng	96
99) tert-Butylbenzene	20.19	119	22586	0.213	ng	99
100) n-Butylbenzene	20.93	91	22056	0.198	ng	98

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

Data File: I:\MS16\DATA\2017 04\24\04241707.D

Acq On : 24 Apr 2017 12:55

Operator: LH

Sample : 0.2ng TO-15 ICAL STD

Misc : S31-04111710/S31-04111708 (5/10)

ALS Vial : 6 Sample Multiplier: 1

Quant Time: Apr 25 07:42:03 2017

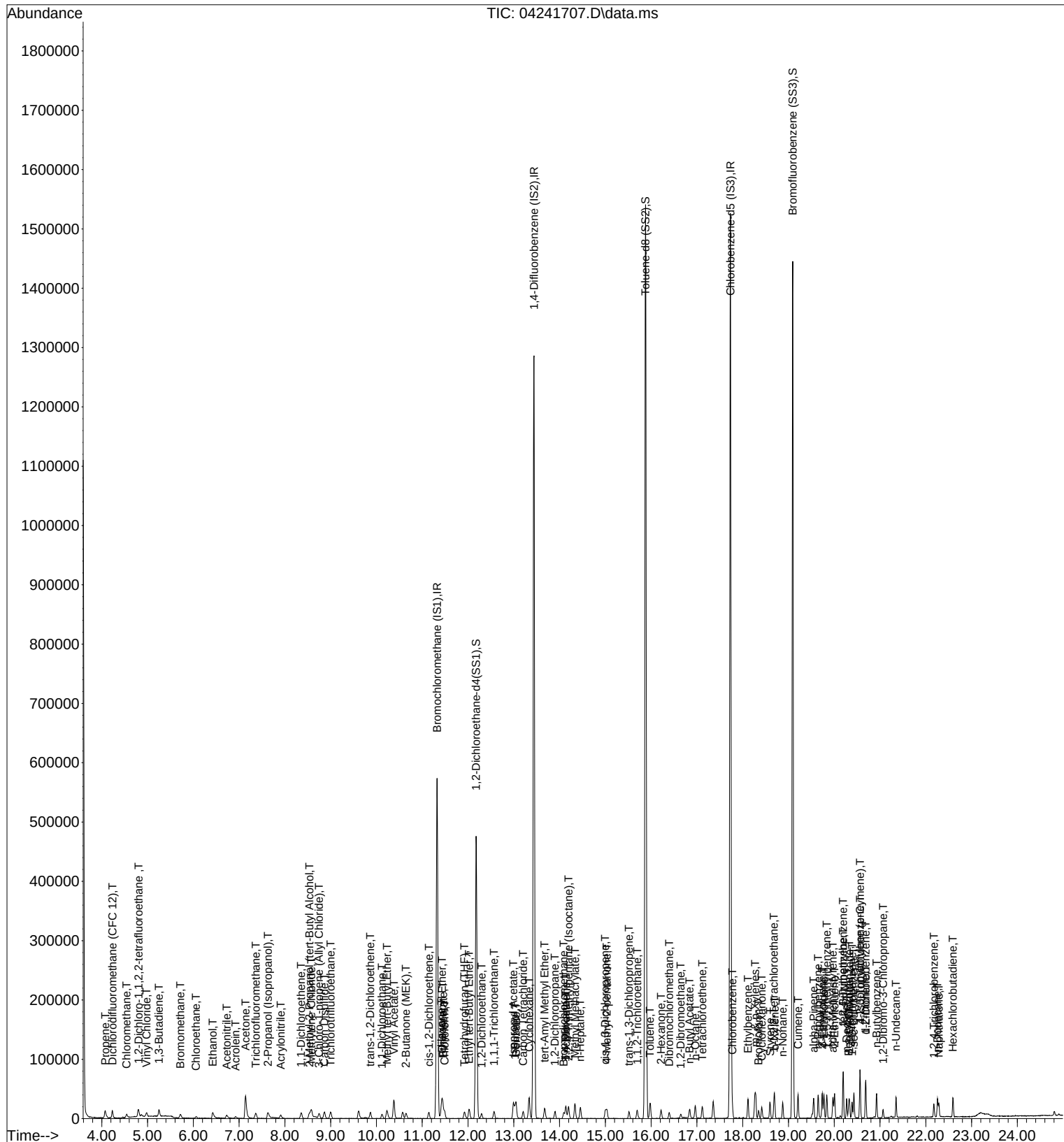
Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 07:41:36 2017

Response via : Initial Calibration

DataAcq Meth:T015.M



Data File: I:\MS16\DATA\2017 04\24\04241708.D

Acq On : 24 Apr 2017 13:29

Operator: LH

Sample : 0.4ng TO-15 ICAL STD

Misc : S31-04111710/S31-04111707 (5/10)

ALS Vial : 7 Sample Multiplier: 1

Quant Time: Apr 25 07:42:05 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 07:41:36 2017

LH 4/25/17

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.32	130	273025	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.44	114	1299937	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.73	82	505022	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.18	65	394386	12.395	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.12%
57) Toluene-d8 (SS2)	15.88	98	1279587	12.664	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.28%
73) Bromofluorobenzene (SS3)	19.09	174	493766	12.755	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.00%

Target Compounds

						Qvalue
2) Propene	4.06	42	13164	0.487	ng	96
3) Dichlorodifluoromethan...	4.22	85	29674	0.527	ng	98
4) Chloromethane	4.53	50	19346	0.486	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	17132	0.488	ng	98
6) Vinyl Chloride	4.97	62	20601	0.477	ng	100
7) 1,3-Butadiene	5.24	54	15747	0.493	ng	98
8) Bromomethane	5.71	94	13824	0.500	ng	94
9) Chloroethane	6.06	64	8828	0.462	ng	97
10) Ethanol	6.42	45	44921	2.410	ng	98
11) Acetonitrile	6.72	41	25173	0.576	ng	98
12) Acrolein	6.91	56	7733	0.445	ng	84
13) Acetone	7.12	58	47640	2.422	ng	# 78
14) Trichlorofluoromethane	7.36	101	25978	0.506	ng	99
15) 2-Propanol (Isopropanol)	7.62	45	65963	1.011	ng	90
16) Acrylonitrile	7.90	53	15610	0.474	ng	96
17) 1,1-Dichloroethene	8.35	96	14018	0.494	ng	99
18) 2-Methyl-2-Propanol (t...	8.51	59	74370	1.024	ng	93
19) Methylene Chloride	8.57	84	14791	0.521	ng	99
20) 3-Chloro-1-propene (Al...	8.74	41	18479	0.465	ng	94
21) Trichlorotrifluoroethane	9.00	151	14654	0.514	ng	99
22) Carbon Disulfide	8.85	76	51786	0.545	ng	100
23) trans-1,2-Dichloroethene	9.87	61	18402	0.489	ng	98
24) 1,1-Dichloroethane	10.12	63	22655	0.474	ng	99
25) Methyl tert-Butyl Ether	10.22	73	43383	0.505	ng	98
26) Vinyl Acetate	10.38	86	14622	2.223	ng	# 63
27) 2-Butanone (MEK)	10.64	72	9262	0.492	ng	# 84
28) cis-1,2-Dichloroethene	11.14	61	18086	0.496	ng	99
29) Diisopropyl Ether	11.43	87	11607	0.471	ng	# 87
30) Ethyl Acetate	11.45	61	9277	0.946	ng	95
31) n-Hexane	11.42	57	20712	0.464	ng	99
32) Chloroform	11.49	83	25115	0.497	ng	99
34) Tetrahydrofuran (THF)	11.91	72	9361	0.475	ng	95
35) Ethyl tert-Butyl Ether	12.02	87	17189	0.496	ng	97
36) 1,2-Dichloroethane	12.30	62	18921	0.503	ng	99
38) 1,1,1-Trichloroethane	12.57	97	24169	0.523	ng	99
39) Isopropyl Acetate	12.99	61	16805	0.965	ng	# 82
40) 1-Butanol	13.01	56	27492	0.941	ng	86
41) Benzene	13.05	78	55005	0.481	ng	99
42) Carbon Tetrachloride	13.20	117	22013	0.513	ng	98
43) Cyclohexane	13.33	84	42012	0.975	ng	97
44) tert-Amyl Methyl Ether	13.67	73	40084	0.490	ng	96
45) 1,2-Dichloropropane	13.90	63	12814	0.492	ng	99
46) Bromodichloromethane	14.09	83	19966	0.495	ng	100
47) Trichloroethene	14.14	130	17259	0.513	ng	100
48) 1,4-Dioxane	14.12	88	11848	0.499	ng	95
49) 2,2,4-Trimethylpentane...	14.19	57	52715	0.492	ng	95

Data File: I:\MS16\DATA\2017 04\24\04241708.D

Acq On : 24 Apr 2017 13:29

Operator: LH

Sample : 0.4ng TO-15 ICAL STD

Misc : S31-04111710/S31-04111707 (5/10)

ALS Vial : 7 Sample Multiplier: 1

Quant Time: Apr 25 07:42:05 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 07:41:36 2017

Response via : Initial Calibration

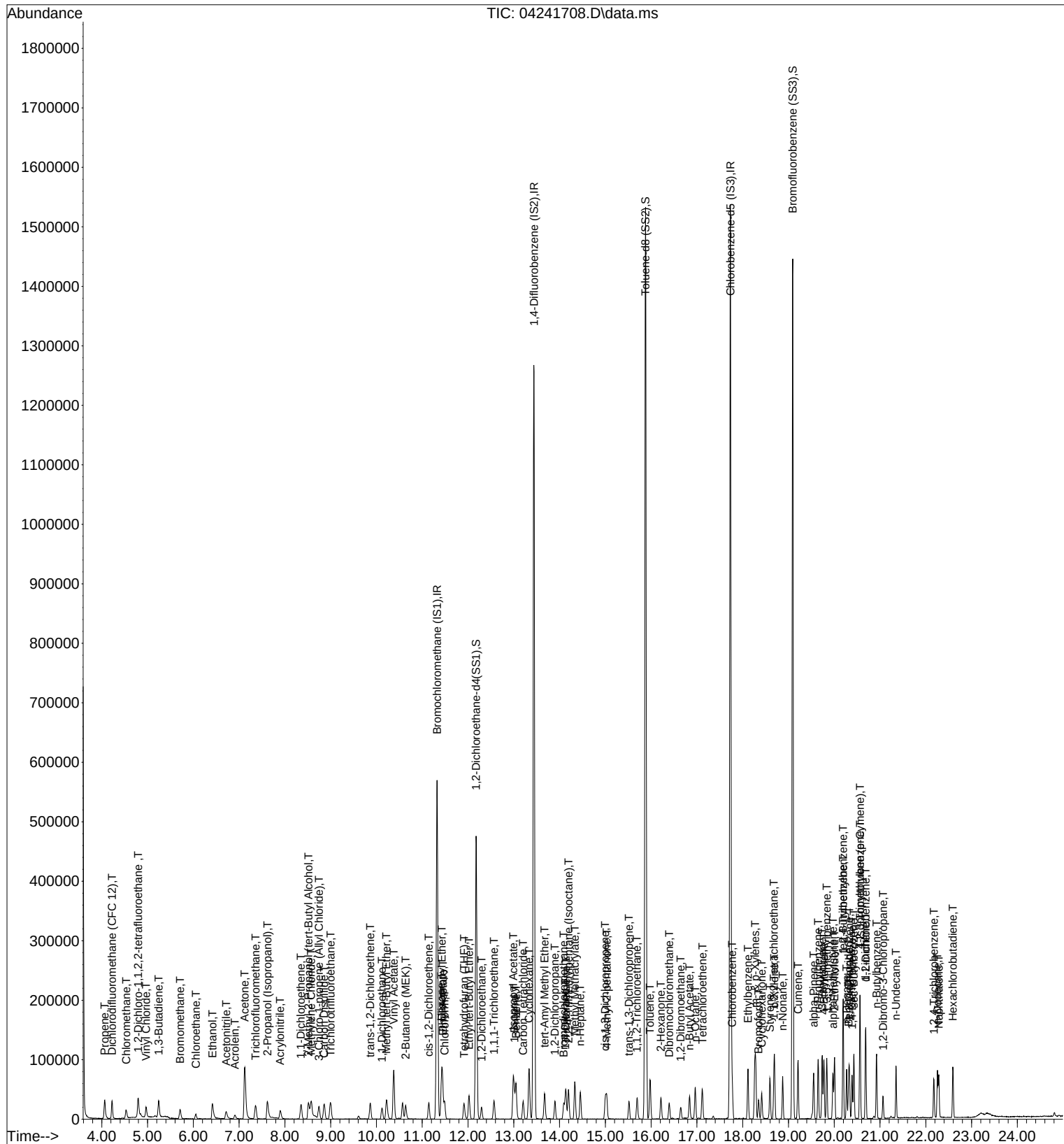
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.33	100	12155	0.968	ng	97
51) n-Heptane	14.45	71	12868	0.480	ng	96
52) cis-1,3-Dichloropropene	15.00	75	23328	0.511	ng	97
53) 4-Methyl-2-pentanone	15.03	58	12365	0.495	ng	95
54) trans-1,3-Dichloropropene	15.51	75	19970	0.489	ng	99
55) 1,1,2-Trichloroethane	15.69	97	14220	0.501	ng	99
58) Toluene	15.98	91	59261	0.511	ng	98
59) 2-Hexanone	16.21	43	28612	0.500	ng	96
60) Dibromochloromethane	16.39	129	18905	0.519	ng	98
61) 1,2-Dibromoethane	16.65	107	16348	0.504	ng	98
62) n-Butyl Acetate	16.84	43	31280	0.488	ng	100
63) n-Octane	16.97	57	10981	0.491	ng	94
64) Tetrachloroethene	17.12	166	18735	0.528	ng	99
65) Chlorobenzene	17.77	112	40322	0.514	ng	99
66) Ethylbenzene	18.12	91	66678	0.514	ng	98
67) m- & p-Xylenes	18.27	91	102498	1.036	ng	97
68) Bromoform	18.35	173	16889	0.519	ng	99
69) Styrene	18.59	104	38824	0.496	ng	100
70) o-Xylene	18.69	91	52332	0.515	ng	97
71) n-Nonane	18.87	43	23526	0.479	ng	96
72) 1,1,2,2-Tetrachloroethane	18.68	83	24255	0.504	ng	98
74) Cumene	19.21	105	68536	0.518	ng	98
75) alpha-Pinene	19.55	93	31511	0.465	ng	80
76) n-Propylbenzene	19.65	91	79653	0.526	ng	97
77) 3-Ethyltoluene	19.74	105	67372	0.511	ng	98
78) 4-Ethyltoluene	19.78	105	62353	0.518	ng	98
79) 1,3,5-Trimethylbenzene	19.84	105	55906	0.517	ng	97
80) alpha-Methylstyrene	19.97	118	24657	0.442	ng	96
81) 2-Ethyltoluene	20.01	105	66597	0.524	ng	97
82) 1,2,4-Trimethylbenzene	20.19	105	55973	0.521	ng	99
83) n-Decane	20.27	57	25797	0.494	ng	98
84) Benzyl Chloride	20.31	91	42036	0.464	ng	96
85) 1,3-Dichlorobenzene	20.33	146	33395	0.522	ng	99
86) 1,4-Dichlorobenzene	20.39	146	33544	0.533	ng	97
87) sec-Butylbenzene	20.43	105	75528	0.524	ng	98
88) 4-Isopropyltoluene (p-...	20.56	119	70579	0.522	ng	97
89) 1,2,3-Trimethylbenzene	20.56	105	55118	0.511	ng	100
90) 1,2-Dichlorobenzene	20.69	146	32723	0.527	ng	100
91) d-Limonene	20.69	68	17179	0.433	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.07	157	11718	0.493	ng	87
93) n-Undecane	21.35	57	26088	0.485	ng	99
94) 1,2,4-Trichlorobenzene	22.18	180	22338	0.512	ng	99
95) Naphthalene	22.28	128	61151	0.488	ng	100
96) n-Dodecane	22.26	57	23328	0.466	ng	98
97) Hexachlorobutadiene	22.59	225	18246	0.533	ng	100
98) Cyclohexanone	18.42	55	19548	0.468	ng	97
99) tert-Butylbenzene	20.19	119	56747	0.530	ng	98
100) n-Butylbenzene	20.93	91	58179	0.518	ng	97

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

ALS Vial : 7 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS16\DATA\2017 04\24\04241705.D

Acq On : 24 Apr 2017 11:48

Operator: LH

Sample : 0.08ng TO-15 ICAL STD

Misc : S31-04111710/S31-04111708 (5/10)

ALS Vial : 6 Sample Multiplier: 1

Quant Time: Apr 25 07:41:58 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

LH 4/25/17

QLast Update : Tue Apr 25 07:41:36 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.32	130	279436	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.44	114	1317113	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.73	82	493798	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.18	65	398697	12.243	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.92%
57) Toluene-d8 (SS2)	15.88	98	1291848	13.076	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	104.64%
73) Bromofluorobenzene (SS3)	19.09	174	462691	12.224	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.76%

Target Compounds

						Qvalue
2) Propene	4.09	42	3091	0.112	ng	# 89
3) Dichlorodifluoromethan...	4.25	85	5898	0.102	ng	# 89
4) Chloromethane	4.56	50	3809	0.094	ng	98
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	3257	0.091	ng	96
6) Vinyl Chloride	4.99	62	4026	0.091	ng	98
7) 1,3-Butadiene	5.26	54	3208	0.098	ng	95
8) Bromomethane	5.73	94	3294	0.116	ng	82
9) Chloroethane	6.08	64	1691	0.086	ng	# 43
10) Ethanol	6.45	45	9624	0.505	ng	92
11) Acetonitrile	6.75	41	7726	0.173	ng	99
12) Acrolein	6.94	56	2004	0.113	ng	# 57
13) Acetone	7.16	58	10064	0.500	ng	# 67
14) Trichlorofluoromethane	7.38	101	4910	0.093	ng	99
15) 2-Propanol (Isopropanol)	7.66	45	13226	0.198	ng	68
16) Acrylonitrile	7.92	53	3543	0.105	ng	94
17) 1,1-Dichloroethene	8.37	96	2797	0.096	ng	96
18) 2-Methyl-2-Propanol (t...	8.56	59	14594	0.196	ng	74
19) Methylene Chloride	8.59	84	3778	0.130	ng	98
20) 3-Chloro-1-propene (Al...	8.76	41	4466	0.110	ng	76
21) Trichlorotrifluoroethane	9.00	151	2728	0.094	ng	97
22) Carbon Disulfide	8.87	76	12448	0.128	ng	100
23) trans-1,2-Dichloroethene	9.87	61	3583	0.093	ng	98
24) 1,1-Dichloroethane	10.13	63	4411	0.090	ng	98
25) Methyl tert-Butyl Ether	10.24	73	8642	0.098	ng	93
26) Vinyl Acetate	10.39	86	2651	0.394	ng	# 49
27) 2-Butanone (MEK)	10.65	72	1715	0.089	ng	# 59
28) cis-1,2-Dichloroethene	11.15	61	3592	0.096	ng	98
29) Diisopropyl Ether	11.43	87	2715	0.108	ng	# 86
30) Ethyl Acetate	11.46	61	1904	0.190	ng	95
31) n-Hexane	11.42	57	4391	0.096	ng	# 96
32) Chloroform	11.49	83	4977	0.096	ng	99
34) Tetrahydrofuran (THF)	11.93	72	2067	0.103	ng	# 87
35) Ethyl tert-Butyl Ether	12.03	87	3146	0.089	ng	90
36) 1,2-Dichloroethane	12.29	62	3641	0.095	ng	99
38) 1,1,1-Trichloroethane	12.57	97	4717	0.101	ng	97
39) Isopropyl Acetate	12.99	61	3206	0.182	ng	# 64
40) 1-Butanol	13.03	56	6300	0.213	ng	# 70
41) Benzene	13.05	78	11968	0.103	ng	95
42) Carbon Tetrachloride	13.20	117	4219	0.097	ng	96
43) Cyclohexane	13.34	84	8380	0.192	ng	95
44) tert-Amyl Methyl Ether	13.68	73	7837	0.095	ng	# 68
45) 1,2-Dichloropropane	13.90	63	2507	0.095	ng	99
46) Bromodichloromethane	14.10	83	4004	0.098	ng	99
47) Trichloroethene	14.14	130	3359	0.098	ng	99
48) 1,4-Dioxane	14.14	88	2259	0.094	ng	93
49) 2,2,4-Trimethylpentane...	14.19	57	10704	0.099	ng	83

Data File: I:\MS16\DATA\2017 04\24\04241705.D

Acq On : 24 Apr 2017 11:48

Operator: LH

Sample : 0.08ng TO-15 ICAL STD

Misc : S31-04111710/S31-04111708 (5/10)

ALS Vial : 6 Sample Multiplier: 1

Quant Time: Apr 25 07:41:58 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 07:41:36 2017

Response via : Initial Calibration

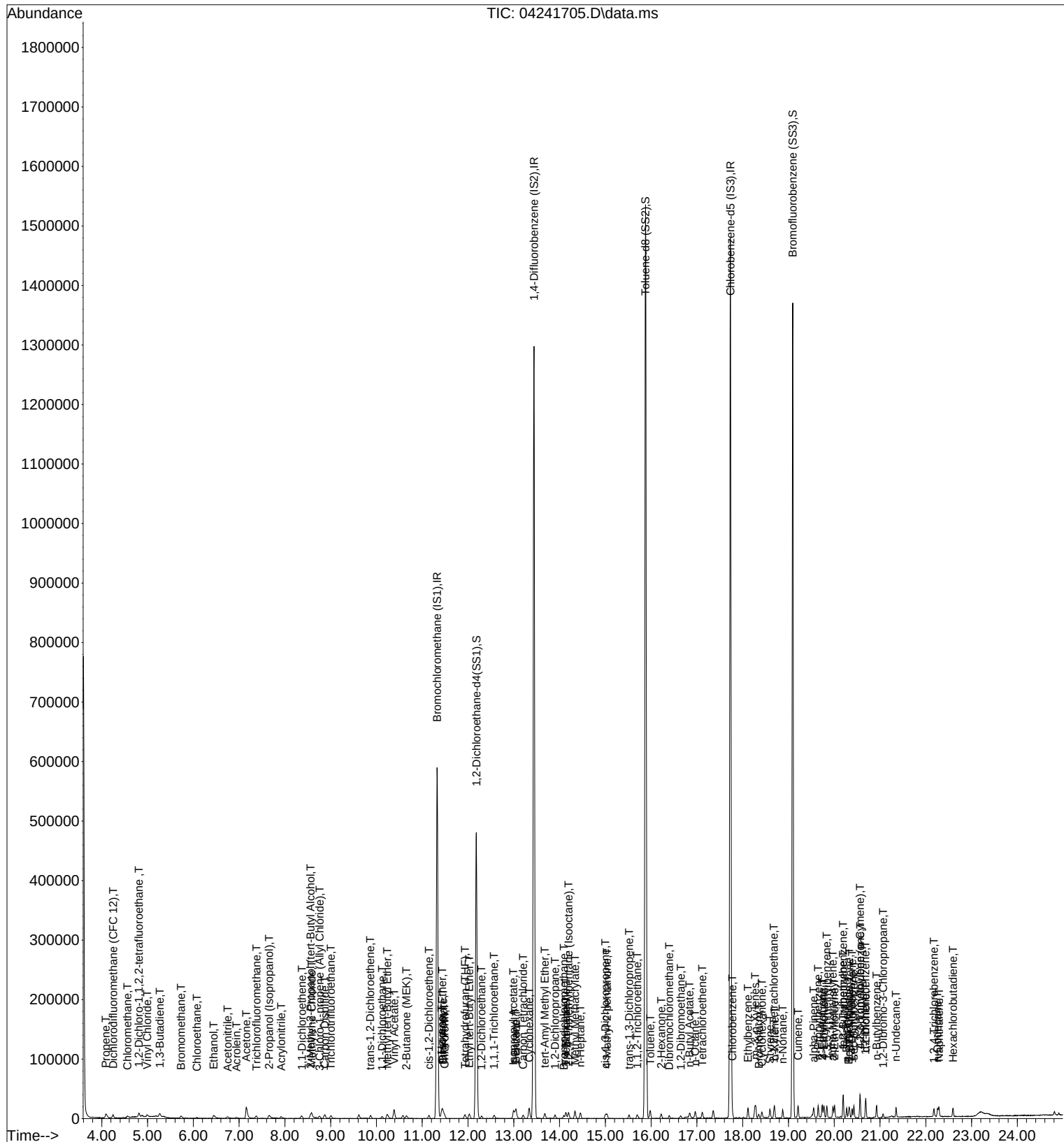
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.34	100	2246	0.177	ng	# 82
51) n-Heptane	14.46	71	2623	0.097	ng	97
52) cis-1,3-Dichloropropene	15.00	75	4488	0.097	ng	94
53) 4-Methyl-2-pentanone	15.04	58	2460	0.097	ng	78
54) trans-1,3-Dichloropropene	15.52	75	3830	0.093	ng	95
55) 1,1,2-Trichloroethane	15.70	97	2804	0.098	ng	99
58) Toluene	15.98	91	15237	0.134	ng	83
59) 2-Hexanone	16.22	43	6069	0.108	ng	90
60) Dibromochloromethane	16.39	129	3677	0.103	ng	96
61) 1,2-Dibromoethane	16.65	107	3276	0.103	ng	99
62) n-Butyl Acetate	16.84	43	6998	0.112	ng	100
63) n-Octane	16.96	57	2558	0.117	ng	# 79
64) Tetrachloroethene	17.11	166	3465	0.100	ng	99
65) Chlorobenzene	17.77	112	8056	0.105	ng	95
66) Ethylbenzene	18.12	91	13500	0.106	ng	96
67) m- & p-Xylenes	18.27	91	21510	0.222	ng	93
68) Bromoform	18.35	173	3106	0.098	ng	99
69) Styrene	18.59	104	8072	0.105	ng	98
70) o-Xylene	18.70	91	10716	0.108	ng	94
71) n-Nonane	18.87	43	5003	0.104	ng	90
72) 1,1,2,2-Tetrachloroethane	18.68	83	4687	0.100	ng	97
74) Cumene	19.21	105	13100	0.101	ng	92
75) alpha-Pinene	19.55	93	6379	0.096	ng	95
76) n-Propylbenzene	19.65	91	14980	0.101	ng	96
77) 3-Ethyltoluene	19.74	105	12876	0.100	ng	99
78) 4-Ethyltoluene	19.78	105	12524	0.106	ng	99
79) 1,3,5-Trimethylbenzene	19.84	105	10904	0.103	ng	99
80) alpha-Methylstyrene	19.97	118	5651	0.104	ng	95
81) 2-Ethyltoluene	20.01	105	13142	0.106	ng	100
82) 1,2,4-Trimethylbenzene	20.19	105	12939	0.123	ng	84
83) n-Decane	20.27	57	5481	0.107	ng	93
84) Benzyl Chloride	20.31	91	7914	0.089	ng	95
85) 1,3-Dichlorobenzene	20.33	146	6948	0.111	ng	99
86) 1,4-Dichlorobenzene	20.39	146	6999	0.114	ng	99
87) sec-Butylbenzene	20.43	105	14572	0.103	ng	98
88) 4-Isopropyltoluene (p-...	20.56	119	13129	0.099	ng	93
89) 1,2,3-Trimethylbenzene	20.57	105	10516	0.100	ng	99
90) 1,2-Dichlorobenzene	20.68	146	6541	0.108	ng	99
91) d-Limonene	20.69	68	3784	0.097	ng	99
92) 1,2-Dibromo-3-Chloropr...	21.07	157	2023	0.087	ng	# 75
93) n-Undecane	21.35	57	5063	0.096	ng	96
94) 1,2,4-Trichlorobenzene	22.18	180	4615	0.108	ng	100
95) Naphthalene	22.29	128	14821	0.121	ng	95
96) n-Dodecane	22.26	57	4542	0.093	ng	83
97) Hexachlorobutadiene	22.60	225	3284	0.098	ng	96
98) Cyclohexanone	18.42	55	5421	0.133	ng	89
99) tert-Butylbenzene	20.19	119	11225	0.107	ng	100
100) n-Butylbenzene	20.93	91	11170	0.102	ng	95

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

ALS Vial : 6 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS16\DATA\2017 04\24\04241709.D

Acq On : 24 Apr 2017 14:02

Operator: LH

Sample : 1.0ng TO-15 ICAL STD

Misc : S31-04111710/S31-04111707 (5/10)

ALS Vial : 7 Sample Multiplier: 1

Quant Time: Apr 25 07:42:07 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 07:41:36 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 4/25/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.32	130	271939	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.44	114	1288392	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.73	82	498192	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.18	65	392754	12.393	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.12%
57) Toluene-d8 (SS2)	15.88	98	1264549	12.687	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.52%
73) Bromofluorobenzene (SS3)	19.09	174	494674	12.954	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.60%

Target Compounds

						Qvalue
2) Propene	4.05	42	25942	0.963	ng	91
3) Dichlorodifluoromethan...	4.22	85	61358	1.095	ng	100
4) Chloromethane	4.52	50	39457	0.995	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.79	135	34852	0.997	ng	100
6) Vinyl Chloride	4.96	62	42398	0.986	ng	99
7) 1,3-Butadiene	5.24	54	31737	0.998	ng	99
8) Bromomethane	5.70	94	27355	0.993	ng	97
9) Chloroethane	6.05	64	18776	0.987	ng	99
10) Ethanol	6.41	45	92101	4.961	ng	98
11) Acetonitrile	6.71	41	41595	0.955	ng	86
12) Acrolein	6.90	56	16007	0.926	ng	91
13) Acetone	7.11	58	99233	5.064	ng	# 83
14) Trichlorofluoromethane	7.36	101	53425	1.044	ng	100
15) 2-Propanol (Isopropanol)	7.62	45	135525	2.085	ng	92
16) Acrylonitrile	7.90	53	32299	0.985	ng	99
17) 1,1-Dichloroethene	8.35	96	29218	1.034	ng	98
18) 2-Methyl-2-Propanol (t...	8.51	59	153661	2.124	ng	96
19) Methylene Chloride	8.57	84	29478	1.042	ng	97
20) 3-Chloro-1-propene (Al...	8.75	41	38557	0.975	ng	94
21) Trichlorotrifluoroethane	9.00	151	29869	1.052	ng	100
22) Carbon Disulfide	8.86	76	105099	1.111	ng	100
23) trans-1,2-Dichloroethene	9.87	61	38785	1.034	ng	99
24) 1,1-Dichloroethane	10.13	63	47174	0.990	ng	99
25) Methyl tert-Butyl Ether	10.21	73	88231	1.031	ng	99
26) Vinyl Acetate	10.38	86	31320	4.780	ng	# 71
27) 2-Butanone (MEK)	10.64	72	19093	1.019	ng	92
28) cis-1,2-Dichloroethene	11.14	61	37807	1.040	ng	98
29) Diisopropyl Ether	11.43	87	23635	0.963	ng	# 85
30) Ethyl Acetate	11.45	61	19413	1.988	ng	98
31) n-Hexane	11.42	57	41509	0.934	ng	100
32) Chloroform	11.49	83	52275	1.039	ng	99
34) Tetrahydrofuran (THF)	11.91	72	19216	0.979	ng	99
35) Ethyl tert-Butyl Ether	12.02	87	35360	1.024	ng	97
36) 1,2-Dichloroethane	12.30	62	39062	1.043	ng	99
38) 1,1,1-Trichloroethane	12.57	97	49249	1.075	ng	99
39) Isopropyl Acetate	12.98	61	34762	2.014	ng	# 85
40) 1-Butanol	13.01	56	57073	1.971	ng	86
41) Benzene	13.05	78	111123	0.980	ng	99
42) Carbon Tetrachloride	13.20	117	44917	1.055	ng	99
43) Cyclohexane	13.34	84	87598	2.052	ng	98
44) tert-Amyl Methyl Ether	13.67	73	82945	1.023	ng	97
45) 1,2-Dichloropropane	13.90	63	26448	1.025	ng	99
46) Bromodichloromethane	14.09	83	41636	1.042	ng	100
47) Trichloroethene	14.14	130	34678	1.039	ng	98
48) 1,4-Dioxane	14.12	88	24909	1.057	ng	98
49) 2,2,4-Trimethylpentane...	14.19	57	107138	1.009	ng	95

Data File: I:\MS16\DATA\2017 04\24\04241709.D

Acq On : 24 Apr 2017 14:02

Operator: LH

Sample : 1.0ng TO-15 ICAL STD

Misc : S31-04111710/S31-04111707 (5/10)

ALS Vial : 7 Sample Multiplier: 1

Quant Time: Apr 25 07:42:07 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 07:41:36 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.33	100	25274	2.032	ng	98
51) n-Heptane	14.45	71	26261	0.989	ng	100
52) cis-1,3-Dichloropropene	15.00	75	48800	1.078	ng	99
53) 4-Methyl-2-pentanone	15.02	58	25037	1.010	ng	91
54) trans-1,3-Dichloropropene	15.51	75	41979	1.037	ng	100
55) 1,1,2-Trichloroethane	15.70	97	29294	1.042	ng	100
58) Toluene	15.98	91	120381	1.053	ng	99
59) 2-Hexanone	16.21	43	60066	1.064	ng	95
60) Dibromochloromethane	16.39	129	38671	1.077	ng	99
61) 1,2-Dibromoethane	16.65	107	34401	1.075	ng	100
62) n-Butyl Acetate	16.84	43	66727	1.055	ng	98
63) n-Octane	16.97	57	21611	0.980	ng	98
64) Tetrachloroethene	17.12	166	38735	1.107	ng	99
65) Chlorobenzene	17.77	112	82311	1.063	ng	100
66) Ethylbenzene	18.12	91	137380	1.073	ng	98
67) m- & p-Xylenes	18.27	91	211253	2.165	ng	97
68) Bromoform	18.35	173	35508	1.107	ng	99
69) Styrene	18.59	104	80978	1.048	ng	99
70) o-Xylene	18.69	91	107483	1.072	ng	97
71) n-Nonane	18.87	43	48592	1.003	ng	95
72) 1,1,2,2-Tetrachloroethane	18.68	83	49970	1.053	ng	99
74) Cumene	19.21	105	141400	1.083	ng	98
75) alpha-Pinene	19.55	93	67135	1.005	ng	90
76) n-Propylbenzene	19.65	91	164730	1.102	ng	98
77) 3-Ethyltoluene	19.74	105	140828	1.083	ng	97
78) 4-Ethyltoluene	19.77	105	130544	1.099	ng	98
79) 1,3,5-Trimethylbenzene	19.84	105	116735	1.093	ng	97
80) alpha-Methylstyrene	19.97	118	51816	0.942	ng	96
81) 2-Ethyltoluene	20.01	105	139093	1.109	ng	98
82) 1,2,4-Trimethylbenzene	20.19	105	116896	1.103	ng	99
83) n-Decane	20.27	57	53137	1.031	ng	99
84) Benzyl Chloride	20.32	91	91434	1.023	ng	97
85) 1,3-Dichlorobenzene	20.33	146	69669	1.103	ng	99
86) 1,4-Dichlorobenzene	20.39	146	69645	1.122	ng	98
87) sec-Butylbenzene	20.43	105	157658	1.108	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	147253	1.104	ng	98
89) 1,2,3-Trimethylbenzene	20.56	105	115112	1.082	ng	100
90) 1,2-Dichlorobenzene	20.69	146	68987	1.127	ng	100
91) d-Limonene	20.69	68	35804	0.914	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.07	157	25783	1.099	ng	91
93) n-Undecane	21.35	57	54112	1.020	ng	99
94) 1,2,4-Trichlorobenzene	22.18	180	48068	1.117	ng	99
95) Naphthalene	22.28	128	130371	1.056	ng	100
96) n-Dodecane	22.26	57	50049	1.013	ng	99
97) Hexachlorobutadiene	22.60	225	37597	1.114	ng	99
98) Cyclohexanone	18.41	55	40402	0.980	ng	97
99) tert-Butylbenzene	20.19	119	117290	1.111	ng	98
100) n-Butylbenzene	20.93	91	121242	1.095	ng	98

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

Data File: I:\MS16\DATA\2017 04\24\04241709.D

Acq On : 24 Apr 2017 14:02

Operator: LH

Sample : 1.0ng TO-15 ICAL STD

Misc : S31-04111710/S31-04111707 (5/10)

ALS Vial : 7 Sample Multiplier: 1

Quant Time: Apr 25 07:42:07 2017

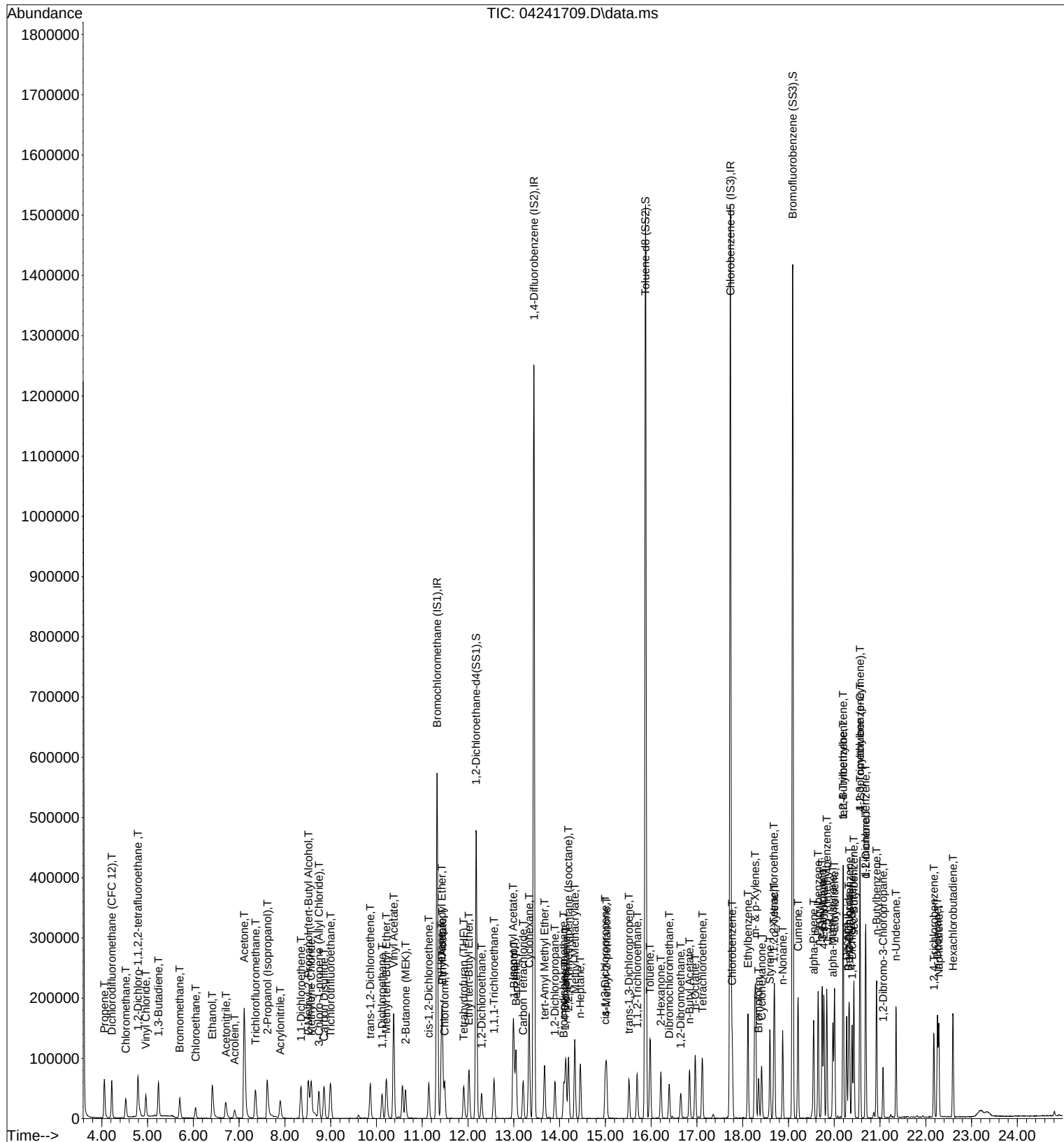
Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 07:41:36 2017

Response via : Initial Calibration

DataAcq Meth:T015.M



Data File: I:\MS16\DATA\2017 04\24\04241710.D

Acq On : 24 Apr 2017 14:35

Operator: LH

Sample : 5.0ng TO-15 ICAL STD

Misc : S31-04111710/S31-04111707 (5/10)

ALS Vial : 7 Sample Multiplier: 1

Quant Time: Apr 25 07:42:09 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

LH 4/25/17

QLast Update : Tue Apr 25 07:41:36 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.33	130	262292	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.44	114	1266528	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.73	82	486369	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.19	65	380750	12.456	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.68%
57) Toluene-d8 (SS2)	15.88	98	1240986	12.753	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.00%
73) Bromofluorobenzene (SS3)	19.09	174	484682	13.001	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	104.00%

Target Compounds

						Qvalue
2) Propene	4.05	42	116100	4.470	ng	99
3) Dichlorodifluoromethan...	4.22	85	268383	4.966	ng	99
4) Chloromethane	4.52	50	156355	4.089	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.79	135	154411	4.578	ng	99
6) Vinyl Chloride	4.96	62	187024	4.510	ng	100
7) 1,3-Butadiene	5.24	54	139155	4.539	ng	99
8) Bromomethane	5.70	94	116257	4.375	ng	99
9) Chloroethane	6.05	64	82861	4.515	ng	99
10) Ethanol	6.44	45	400270	22.355	ng	99
11) Acetonitrile	6.72	41	185955	4.426	ng	99
12) Acrolein	6.90	56	68411	4.101	ng	98
13) Acetone	7.12	58	441094	23.339	ng	87
14) Trichlorofluoromethane	7.36	101	240555	4.874	ng	100
15) 2-Propanol (Isopropanol)	7.62	45	581711	9.278	ng	98
16) Acrylonitrile	7.91	53	144018	4.552	ng	99
17) 1,1-Dichloroethene	8.35	96	128998	4.732	ng	98
18) 2-Methyl-2-Propanol (t...	8.52	59	675100	9.674	ng	99
19) Methylene Chloride	8.59	84	127841	4.686	ng	99
20) 3-Chloro-1-propene (Al...	8.75	41	155853	4.086	ng	99
21) Trichlorotrifluoroethane	9.00	151	131560	4.805	ng	100
22) Carbon Disulfide	8.86	76	463259	5.077	ng	100
23) trans-1,2-Dichloroethene	9.87	61	172340	4.765	ng	99
24) 1,1-Dichloroethane	10.13	63	207621	4.518	ng	100
25) Methyl tert-Butyl Ether	10.21	73	394826	4.781	ng	100
26) Vinyl Acetate	10.38	86	151646	23.995	ng	# 78
27) 2-Butanone (MEK)	10.63	72	86534	4.788	ng	96
28) cis-1,2-Dichloroethene	11.15	61	166972	4.764	ng	98
29) Diisopropyl Ether	11.43	87	106804	4.512	ng	# 88
30) Ethyl Acetate	11.44	61	89262	9.477	ng	99
31) n-Hexane	11.42	57	190072	4.435	ng	100
32) Chloroform	11.50	83	231999	4.780	ng	99
34) Tetrahydrofuran (THF)	11.90	72	83532	4.414	ng	98
35) Ethyl tert-Butyl Ether	12.02	87	158999	4.774	ng	98
36) 1,2-Dichloroethane	12.30	62	173338	4.799	ng	100
38) 1,1,1-Trichloroethane	12.57	97	218890	4.862	ng	100
39) Isopropyl Acetate	12.99	61	154279	9.094	ng	# 86
40) 1-Butanol	13.00	56	258010	9.063	ng	94
41) Benzene	13.05	78	496838	4.458	ng	100
42) Carbon Tetrachloride	13.21	117	200972	4.803	ng	99
43) Cyclohexane	13.34	84	393298	9.373	ng	99
44) tert-Amyl Methyl Ether	13.67	73	373300	4.683	ng	98
45) 1,2-Dichloropropane	13.90	63	118035	4.653	ng	100
46) Bromodichloromethane	14.10	83	187940	4.787	ng	100
47) Trichloroethene	14.14	130	156810	4.780	ng	99
48) 1,4-Dioxane	14.11	88	111288	4.806	ng	99
49) 2,2,4-Trimethylpentane...	14.19	57	480146	4.598	ng	98

Data File: I:\MS16\DATA\2017 04\24\04241710.D

Acq On : 24 Apr 2017 14:35

Operator: LH

Sample : 5.0ng TO-15 ICAL STD

Misc : S31-04111710/S31-04111707 (5/10)

ALS Vial : 7 Sample Multiplier: 1

Quant Time: Apr 25 07:42:09 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 07:41:36 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.34	100	115381	9.435	ng	98
51) n-Heptane	14.46	71	119062	4.563	ng	99
52) cis-1,3-Dichloropropene	15.00	75	222865	5.007	ng	100
53) 4-Methyl-2-pentanone	15.02	58	112667	4.625	ng	96
54) trans-1,3-Dichloropropene	15.52	75	192247	4.833	ng	100
55) 1,1,2-Trichloroethane	15.70	97	130379	4.717	ng	100
58) Toluene	15.98	91	535885	4.802	ng	99
59) 2-Hexanone	16.21	43	259626	4.709	ng	98
60) Dibromochloromethane	16.40	129	175482	5.006	ng	100
61) 1,2-Dibromoethane	16.65	107	154830	4.956	ng	100
62) n-Butyl Acetate	16.84	43	291245	4.715	ng	98
63) n-Octane	16.97	57	97802	4.541	ng	99
64) Tetrachloroethene	17.12	166	174851	5.117	ng	99
65) Chlorobenzene	17.77	112	366875	4.855	ng	100
66) Ethylbenzene	18.12	91	612041	4.898	ng	99
67) m- & p-Xylenes	18.28	91	947560	9.949	ng	98
68) Bromoform	18.35	173	163090	5.209	ng	100
69) Styrene	18.60	104	372023	4.932	ng	100
70) o-Xylene	18.69	91	485251	4.957	ng	98
71) n-Nonane	18.87	43	218644	4.624	ng	96
72) 1,1,2,2-Tetrachloroethane	18.68	83	231835	5.002	ng	100
74) Cumene	19.21	105	637537	5.003	ng	98
75) alpha-Pinene	19.55	93	308941	4.736	ng	96
76) n-Propylbenzene	19.65	91	746448	5.115	ng	98
77) 3-Ethyltoluene	19.74	105	625981	4.929	ng	97
78) 4-Ethyltoluene	19.78	105	607642	5.238	ng	92
79) 1,3,5-Trimethylbenzene	19.84	105	525037	5.037	ng	99
80) alpha-Methylstyrene	19.97	118	241214	4.492	ng	97
81) 2-Ethyltoluene	20.01	105	628787	5.136	ng	98
82) 1,2,4-Trimethylbenzene	20.19	105	538236	5.203	ng	99
83) n-Decane	20.27	57	244619	4.864	ng	99
84) Benzyl Chloride	20.31	91	442513	5.071	ng	98
85) 1,3-Dichlorobenzene	20.33	146	323812	5.251	ng	100
86) 1,4-Dichlorobenzene	20.39	146	315348	5.204	ng	100
87) sec-Butylbenzene	20.43	105	715880	5.155	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	680338	5.224	ng	99
89) 1,2,3-Trimethylbenzene	20.56	105	531625	5.116	ng	100
90) 1,2-Dichlorobenzene	20.69	146	318889	5.336	ng	99
91) d-Limonene	20.69	68	166508	4.353	ng	99
92) 1,2-Dibromo-3-Chloropr...	21.07	157	122324	5.341	ng	94
93) n-Undecane	21.35	57	251267	4.851	ng	99
94) 1,2,4-Trichlorobenzene	22.17	180	223248	5.312	ng	100
95) Naphthalene	22.28	128	610198	5.060	ng	99
96) n-Dodecane	22.26	57	235772	4.889	ng	99
97) Hexachlorobutadiene	22.59	225	172533	5.237	ng	100
98) Cyclohexanone	18.41	55	175767	4.369	ng	98
99) tert-Butylbenzene	20.19	119	538653	5.227	ng	99
100) n-Butylbenzene	20.93	91	554448	5.129	ng	99

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

Data File: I:\MS16\DATA\2017 04\24\04241710.D

Acq On : 24 Apr 2017 14:35

Operator: LH

Sample : 5.0ng TO-15 ICAL STD

Misc : S31-04111710/S31-04111707 (5/10)

ALS Vial : 7 Sample Multiplier: 1

Quant Time: Apr 25 07:42:09 2017

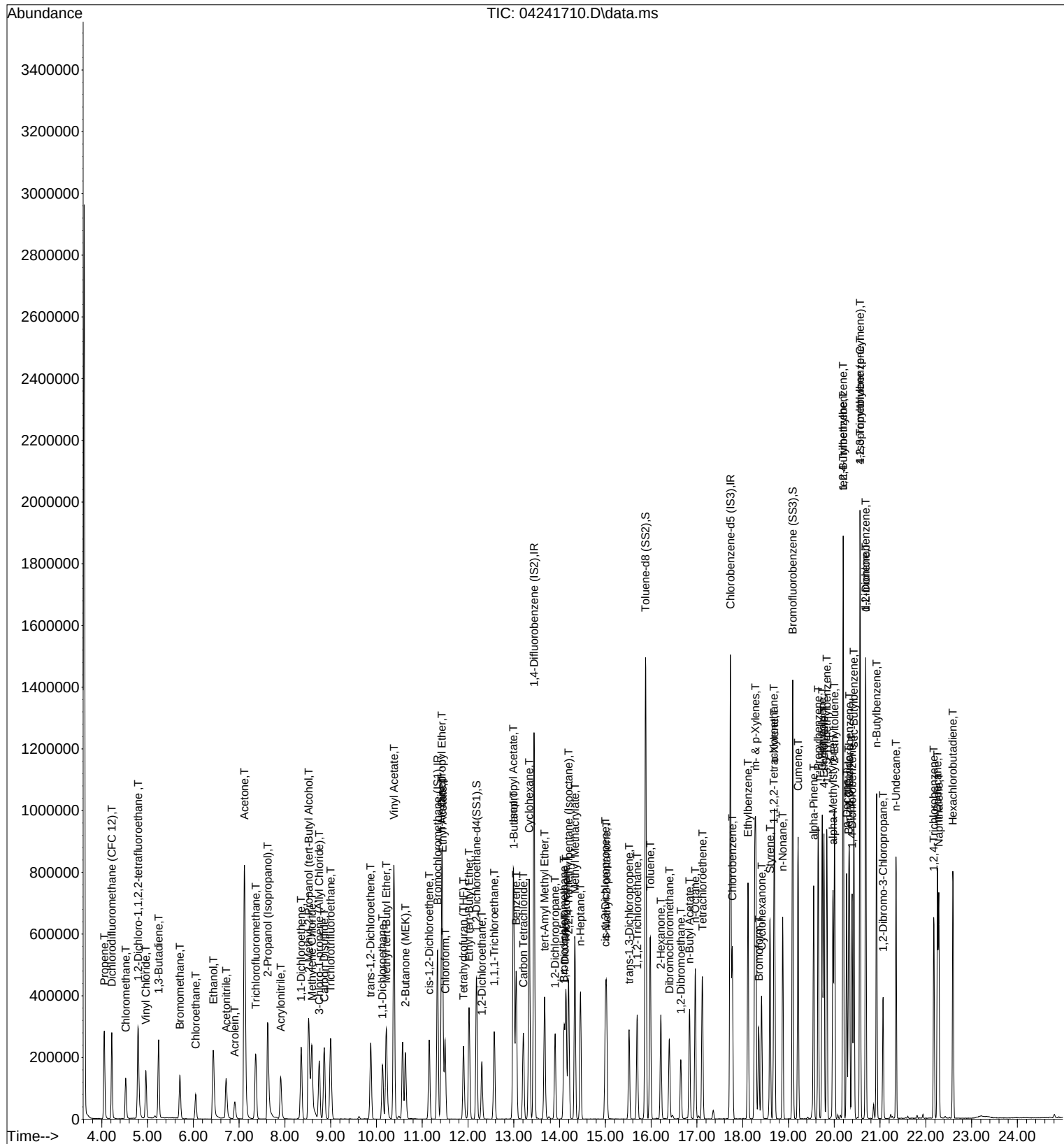
Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 07:41:36 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS16\DATA\2017 04\24\04241711.D

Acq On : 24 Apr 2017 15:09

Operator: LH

Sample : 25ng TO-15 ICAL STD

Misc : S31-04111710/S31-04111702 (5/10)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Apr 25 07:42:10 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

LH 4/25/17

QLast Update : Tue Apr 25 07:41:36 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.35	130	285559	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.45	114	1351644	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.73	82	527237	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.19	65	403413	12.122	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	96.96%
57) Toluene-d8 (SS2)	15.88	98	1331680	12.624	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.96%
73) Bromofluorobenzene (SS3)	19.09	174	522957	12.940	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.52%

Target Compounds

						Qvalue
2) Propene	4.05	42	645518	22.830	ng	100
3) Dichlorodifluoromethan...	4.21	85	1500526	25.501	ng	100
4) Chloromethane	4.52	50	941913	22.626	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	866205	23.588	ng	100
6) Vinyl Chloride	4.97	62	1058165	23.439	ng	100
7) 1,3-Butadiene	5.25	54	811580	24.316	ng	100
8) Bromomethane	5.71	94	655746	22.665	ng	100
9) Chloroethane	6.06	64	470092	23.528	ng	100
10) Ethanol	6.48	45	2331392	119.596	ng	100
11) Acetonitrile	6.74	41	1086906	23.760	ng	100
12) Acrolein	6.92	56	405162	22.311	ng	100
13) Acetone	7.14	58	2511334	122.049	ng	100
14) Trichlorofluoromethane	7.37	101	1339661	24.933	ng	100
15) 2-Propanol (Isopropanol)	7.65	45	3356113	49.169	ng	100
16) Acrylonitrile	7.93	53	865512	25.126	ng	100
17) 1,1-Dichloroethene	8.36	96	738092	24.871	ng	100
18) 2-Methyl-2-Propanol (t...	8.54	59	3818105	50.257	ng	100
19) Methylene Chloride	8.61	84	732447	24.662	ng	100
20) 3-Chloro-1-propene (Al...	8.76	41	911697	21.953	ng	100
21) Trichlorotrifluoroethane	9.00	151	752164	25.232	ng	100
22) Carbon Disulfide	8.87	76	2578182	25.951	ng	100
23) trans-1,2-Dichloroethene	9.88	61	992297	25.202	ng	100
24) 1,1-Dichloroethane	10.14	63	1179399	23.572	ng	100
25) Methyl tert-Butyl Ether	10.22	73	2231922	24.827	ng	100
26) Vinyl Acetate	10.39	86	990249	143.921	ng	100
27) 2-Butanone (MEK)	10.64	72	500313	25.426	ng	100
28) cis-1,2-Dichloroethene	11.16	61	959300	25.138	ng	100
29) Diisopropyl Ether	11.43	87	642117	24.914	ng	100
30) Ethyl Acetate	11.45	61	547100	53.354	ng	100
31) n-Hexane	11.43	57	1130806	24.237	ng	100
32) Chloroform	11.51	83	1306117	24.717	ng	100
34) Tetrahydrofuran (THF)	11.90	72	479356	23.266	ng	100
35) Ethyl tert-Butyl Ether	12.03	87	923013	25.456	ng	100
36) 1,2-Dichloroethane	12.31	62	979737	24.912	ng	100
38) 1,1,1-Trichloroethane	12.58	97	1234751	25.700	ng	100
39) Isopropyl Acetate	12.99	61	940589	51.950	ng	100
40) 1-Butanol	13.01	56	1555289	51.192	ng	100
41) Benzene	13.06	78	2874670	24.171	ng	100
42) Carbon Tetrachloride	13.22	117	1152259	25.805	ng	100
43) Cyclohexane	13.34	84	2319311	51.790	ng	100
44) tert-Amyl Methyl Ether	13.68	73	2150043	25.273	ng	100
45) 1,2-Dichloropropane	13.91	63	677337	25.021	ng	100
46) Bromodichloromethane	14.10	83	1074811	25.651	ng	100
47) Trichloroethene	14.14	130	907463	25.919	ng	100
48) 1,4-Dioxane	14.11	88	650678	26.330	ng	100
49) 2,2,4-Trimethylpentane...	14.20	57	2730662	24.502	ng	100

Data File: I:\MS16\DATA\2017 04\24\04241711.D

Acq On : 24 Apr 2017 15:09

Operator: LH

Sample : 25ng TO-15 ICAL STD

Misc : S31-04111710/S31-04111702 (5/10)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Apr 25 07:42:10 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 07:41:36 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.34	100	693306	53.121	ng	100
51) n-Heptane	14.46	71	701767	25.202	ng	100
52) cis-1,3-Dichloropropene	15.00	75	1328359	27.965	ng	100
53) 4-Methyl-2-pentanone	15.03	58	654921	25.192	ng	100
54) trans-1,3-Dichloropropene	15.52	75	1167860	27.511	ng	100
55) 1,1,2-Trichloroethane	15.70	97	761468	25.813	ng	100
58) Toluene	15.98	91	3064309	25.331	ng	100
59) 2-Hexanone	16.21	43	1511911	25.296	ng	100
60) Dibromochloromethane	16.40	129	1032306	27.164	ng	100
61) 1,2-Dibromoethane	16.65	107	919642	27.157	ng	100
62) n-Butyl Acetate	16.84	43	1669478	24.931	ng	100
63) n-Octane	16.97	57	578304	24.772	ng	100
64) Tetrachloroethene	17.12	166	1006570	27.171	ng	100
65) Chlorobenzene	17.77	112	2217491	27.070	ng	100
66) Ethylbenzene	18.12	91	3595725	26.544	ng	100
67) m- & p-Xylenes	18.28	91	5653306	54.757	ng	100
68) Bromoform	18.35	173	975866	28.751	ng	100
69) Styrene	18.60	104	2387883	29.206	ng	100
70) o-Xylene	18.70	91	2842073	26.784	ng	100
71) n-Nonane	18.87	43	1256566	24.514	ng	100
72) 1,1,2,2-Tetrachloroethane	18.68	83	1402848	27.920	ng	100
74) Cumene	19.21	105	3738851	27.067	ng	100
75) alpha-Pinene	19.55	93	1931467	27.312	ng	100
76) n-Propylbenzene	19.65	91	4406502	27.856	ng	100
77) 3-Ethyltoluene	19.74	105	3994286	29.016	ng	100
78) 4-Ethyltoluene	19.78	105	3420334	27.198	ng	100
79) 1,3,5-Trimethylbenzene	19.84	105	3144539	27.828	ng	100
80) alpha-Methylstyrene	19.97	118	1774411	30.482	ng	100
81) 2-Ethyltoluene	20.01	105	3744507	28.215	ng	100
82) 1,2,4-Trimethylbenzene	20.20	105	3310673	29.520	ng	100
83) n-Decane	20.27	57	1478500	27.120	ng	100
84) Benzyl Chloride	20.31	91	3003432	31.748	ng	100
85) 1,3-Dichlorobenzene	20.34	146	2046766	30.619	ng	100
86) 1,4-Dichlorobenzene	20.39	146	2022749	30.791	ng	100
87) sec-Butylbenzene	20.43	105	4175726	27.737	ng	100
88) 4-Isopropyltoluene (p-...	20.56	119	4050971	28.694	ng	100
89) 1,2,3-Trimethylbenzene	20.57	105	3243789	28.799	ng	100
90) 1,2-Dichlorobenzene	20.69	146	2012941	31.069	ng	100
91) d-Limonene	20.69	68	1162544	28.036	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.07	157	773851	31.168	ng	100
93) n-Undecane	21.35	57	1546043	27.536	ng	100
94) 1,2,4-Trichlorobenzene	22.18	180	1595194	35.014	ng	100
95) Naphthalene	22.28	128	4678751	35.793	ng	100
96) n-Dodecane	22.26	57	1491476	28.527	ng	100
97) Hexachlorobutadiene	22.60	225	1053574	29.500	ng	100
98) Cyclohexanone	18.41	55	1024269	23.487	ng	100
99) tert-Butylbenzene	20.20	119	3240456	29.006	ng	100
100) n-Butylbenzene	20.93	91	3327164	28.391	ng	100

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

Data File: I:\MS16\DATA\2017 04\24\04241711.D

Acq On : 24 Apr 2017 15:09

Operator: LH

Sample : 25ng TO-15 ICAL STD

Misc : S31-04111710/S31-04111702 (5/10)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Apr 25 07:42:10 2017

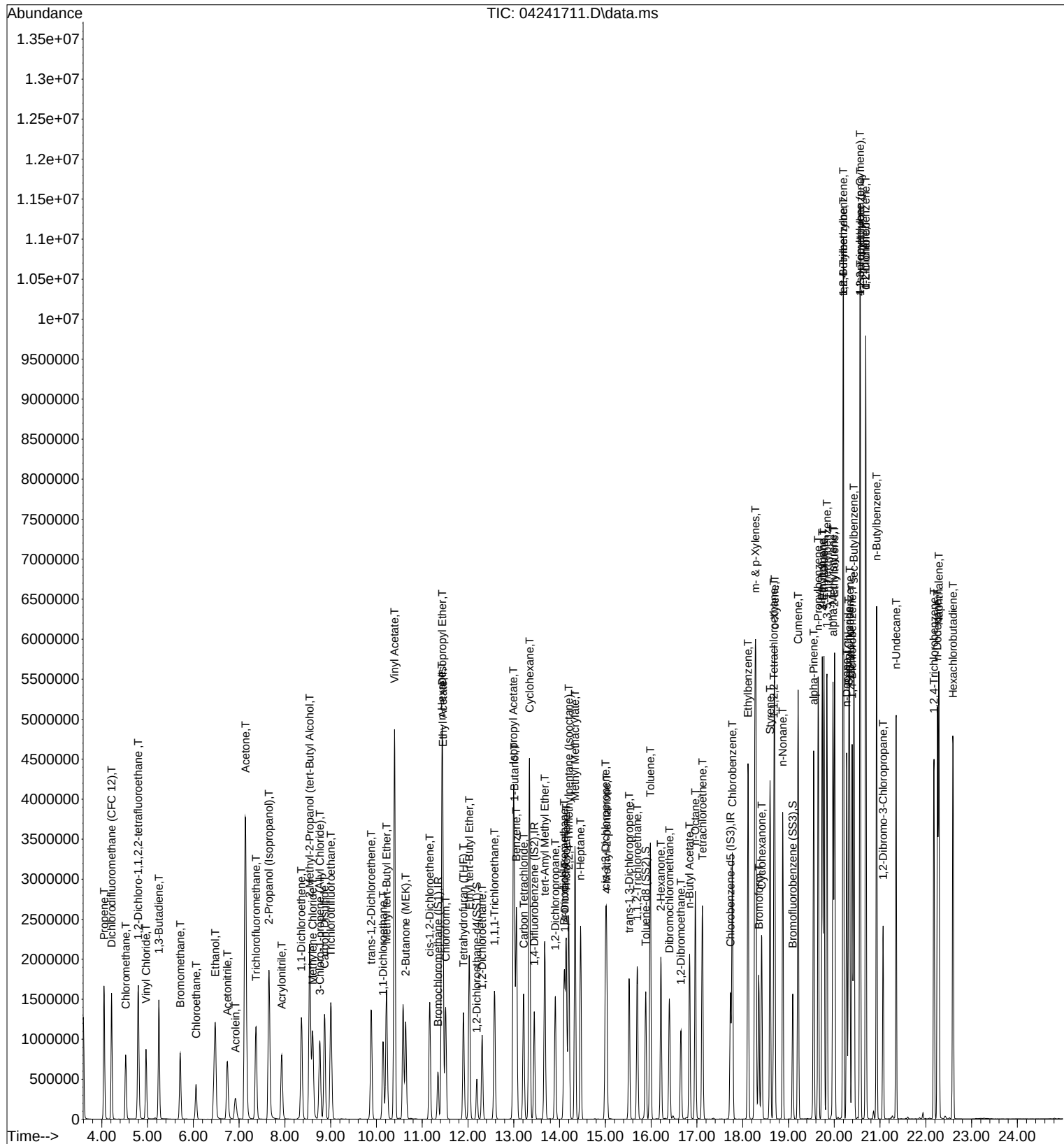
Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 07:41:36 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS16\DATA\2017 04\24\04241712.D

Acq On : 24 Apr 2017 15:43

Operator: LH

Sample : 50ng TO-15 ICAL STD

Misc : S31-04111710/S31-04111702 (5/10)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Apr 25 07:42:13 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 07:41:36 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 4/25/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.35	130	291557	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.45	114	1379690	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.73	82	540918	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.20	65	409182	12.042	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	96.32%
57) Toluene-d8 (SS2)	15.88	98	1364798	12.611	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.88%
73) Bromofluorobenzene (SS3)	19.09	174	529740	12.776	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.24%

Target Compounds

						Qvalue
2) Propene	4.05	42	1370705	47.481	ng	98
3) Dichlorodifluoromethan...	4.21	85	2901323	48.293	ng	100
4) Chloromethane	4.53	50	1774444	41.748	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	1699973	45.341	ng	100
6) Vinyl Chloride	4.97	62	2093258	45.414	ng	100
7) 1,3-Butadiene	5.25	54	1632233	47.897	ng	98
8) Bromomethane	5.72	94	1286748	43.561	ng	100
9) Chloroethane	6.07	64	935646	45.865	ng	99
10) Ethanol	6.51	45	4722870	237.290	ng	100
11) Acetonitrile	6.76	41	2167348	46.405	ng	99
12) Acrolein	6.93	56	810832	43.731	ng	99
13) Acetone	7.15	58	5024339	239.157	ng	89
14) Trichlorofluoromethane	7.38	101	2605622	47.497	ng	100
15) 2-Propanol (Isopropanol)	7.67	45	6292457	90.292	ng	99
16) Acrylonitrile	7.94	53	1709255	48.599	ng	100
17) 1,1-Dichloroethene	8.37	96	1456934	48.083	ng	99
18) 2-Methyl-2-Propanol (t...	8.56	59	7294243	94.038	ng	99
19) Methylene Chloride	8.61	84	1432944	47.255	ng	99
20) 3-Chloro-1-propene (Al...	8.77	41	1790987	42.238	ng	99
21) Trichlorotrifluoroethane	9.01	151	1473276	48.405	ng	99
22) Carbon Disulfide	8.87	76	5025714	49.546	ng	100
23) trans-1,2-Dichloroethene	9.89	61	1934534	48.122	ng	100
24) 1,1-Dichloroethane	10.15	63	2288380	44.795	ng	100
25) Methyl tert-Butyl Ether	10.22	73	4366805	47.575	ng	100
26) Vinyl Acetate	10.41	86	2024541	288.189	ng	# 77
27) 2-Butanone (MEK)	10.65	72	991847	49.370	ng	96
28) cis-1,2-Dichloroethene	11.17	61	1873198	48.076	ng	99
29) Diisopropyl Ether	11.44	87	1313336	49.909	ng	# 88
30) Ethyl Acetate	11.46	61	1116602	106.652	ng	99
31) n-Hexane	11.43	57	2277930	47.819	ng	100
32) Chloroform	11.52	83	2520953	46.726	ng	100
34) Tetrahydrofuran (THF)	11.90	72	949613	45.142	ng	99
35) Ethyl tert-Butyl Ether	12.03	87	1834197	49.546	ng	98
36) 1,2-Dichloroethane	12.31	62	1884152	46.924	ng	100
38) 1,1,1-Trichloroethane	12.58	97	2379723	48.524	ng	100
39) Isopropyl Acetate	13.00	61	1905546	103.105	ng	# 91
40) 1-Butanol	13.03	56	3148259	101.518	ng	94
41) Benzene	13.06	78	5718459	47.104	ng	100
42) Carbon Tetrachloride	13.22	117	2238945	49.123	ng	100
43) Cyclohexane	13.35	84	4640322	101.512	ng	99
44) tert-Amyl Methyl Ether	13.68	73	4234385	48.761	ng	99
45) 1,2-Dichloropropane	13.91	63	1337015	48.386	ng	100
46) Bromodichloromethane	14.10	83	2093979	48.957	ng	100
47) Trichloroethene	14.15	130	1802433	50.434	ng	100
48) 1,4-Dioxane	14.12	88	1303733	51.684	ng	99
49) 2,2,4-Trimethylpentane...	14.21	57	5325383	46.813	ng	98

Data File: I:\MS16\DATA\2017 04\24\04241712.D

Acq On : 24 Apr 2017 15:43

Operator: LH

Sample : 50ng TO-15 ICAL STD

Misc : S31-04111710/S31-04111702 (5/10)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Apr 25 07:42:13 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 07:41:36 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.34	100	1401716	105.215	ng	98
51) n-Heptane	14.46	71	1415879	49.813	ng	100
52) cis-1,3-Dichloropropene	15.01	75	2641713	54.484	ng	100
53) 4-Methyl-2-pentanone	15.03	58	1305815	49.207	ng	96
54) trans-1,3-Dichloropropene	15.53	75	2302131	53.128	ng	99
55) 1,1,2-Trichloroethane	15.70	97	1492090	49.553	ng	100
58) Toluene	15.98	91	5994112	48.298	ng	99
59) 2-Hexanone	16.22	43	2922281	47.656	ng	97
60) Dibromochloromethane	16.40	129	2018660	51.776	ng	100
61) 1,2-Dibromoethane	16.65	107	1796233	51.701	ng	100
62) n-Butyl Acetate	16.84	43	3228928	46.999	ng	98
63) n-Octane	16.97	57	1159263	48.401	ng	99
64) Tetrachloroethene	17.12	166	1978528	52.058	ng	100
65) Chlorobenzene	17.77	112	4373102	52.035	ng	99
66) Ethylbenzene	18.12	91	7027011	50.563	ng	98
67) m- & p-Xylenes	18.29	91	10991821	103.771	ng	99
68) Bromoform	18.36	173	1900319	54.572	ng	100
69) Styrene	18.60	104	4701440	56.048	ng	100
70) o-Xylene	18.70	91	5550686	50.987	ng	99
71) n-Nonane	18.88	43	2432235	46.250	ng	97
72) 1,1,2,2-Tetrachloroethane	18.69	83	2750033	53.349	ng	100
74) Cumene	19.21	105	7241694	51.100	ng	99
75) alpha-Pinene	19.55	93	3834203	52.846	ng	99
76) n-Propylbenzene	19.65	91	8391372	51.706	ng	98
77) 3-Ethyltoluene	19.74	105	7443652	52.706	ng	98
78) 4-Ethyltoluene	19.78	105	6806887	52.759	ng	98
79) 1,3,5-Trimethylbenzene	19.84	105	6077872	52.427	ng	99
80) alpha-Methylstyrene	19.97	118	3484542	58.346	ng	100
81) 2-Ethyltoluene	20.01	105	7162778	52.607	ng	98
82) 1,2,4-Trimethylbenzene	20.20	105	6044391	52.532	ng	99
83) n-Decane	20.28	57	2889094	51.653	ng	99
84) Benzyl Chloride	20.32	91	5845464	60.227	ng	99
85) 1,3-Dichlorobenzene	20.34	146	3984278	58.096	ng	100
86) 1,4-Dichlorobenzene	20.40	146	3973388	58.955	ng	100
87) sec-Butylbenzene	20.43	105	7870972	50.961	ng	98
88) 4-Isopropyltoluene (p-...	20.57	119	7091514	48.960	ng	98
89) 1,2,3-Trimethylbenzene	20.57	105	5867079	50.771	ng	99
90) 1,2-Dichlorobenzene	20.69	146	3818491	57.447	ng	100
91) d-Limonene	20.69	68	2202157	51.764	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.07	157	1516938	59.552	ng	97
93) n-Undecane	21.35	57	3026165	52.535	ng	99
94) 1,2,4-Trichlorobenzene	22.18	180	3145146	67.289	ng	100
95) Naphthalene	22.29	128	8892174	66.306	ng	99
96) n-Dodecane	22.26	57	2963611	55.251	ng	99
97) Hexachlorobutadiene	22.60	225	2064632	56.347	ng	100
98) Cyclohexanone	18.42	55	1981143	44.279	ng	99
99) tert-Butylbenzene	20.20	119	5812861	50.715	ng	99
100) n-Butylbenzene	20.93	91	6291849	52.331	ng	98

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

Operator: LH

Sample : 50ng TO-15 ICAL STD

Misc : S31-04111710/S31-04111702 (5/10)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Apr 25 07:42:13 2017

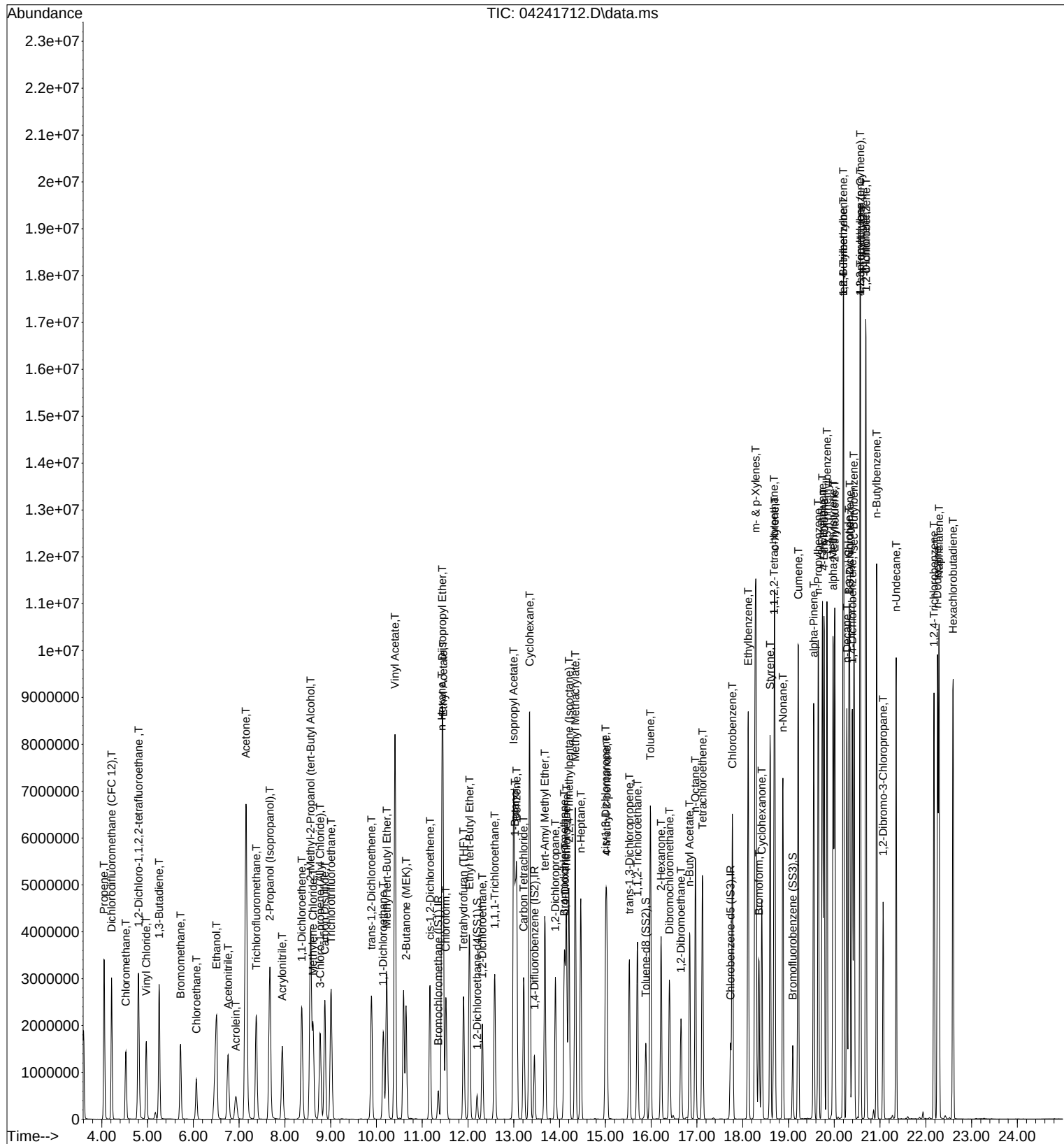
Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 07:41:36 2017

Response via : Initial Calibration

DataAcq Meth:T015.M



Data File: I:\MS16\DATA\2017 04\24\04241713.D

Acq On : 24 Apr 2017 16:17

Operator: LH

Sample : 100ng TO-15 ICAL STD

Misc : S31-04111710/S31-04111702 (5/10)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Apr 25 07:42:15 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 07:41:36 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 4/25/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.36	130	302128	12.500	ng	0.02
37) 1,4-Difluorobenzene (IS2)	13.46	114	1424382	12.500	ng	0.01
56) Chlorobenzene-d5 (IS3)	17.74	82	563729	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.20	65	412558	11.717	ng	0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	93.76%
57) Toluene-d8 (SS2)	15.89	98	1413942	12.537	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.32%
73) Bromofluorobenzene (SS3)	19.09	174	538391	12.459	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.68%

Target Compounds

						Qvalue
2) Propene	4.07	42	3296839	110.206	ng	95
3) Dichlorodifluoromethan...	4.23	85	5680640	91.247	ng	99
4) Chloromethane	4.54	50	2958694	67.174	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.82	135	3383749	87.092	ng	100
6) Vinyl Chloride	4.99	62	4198820	87.907	ng	99
7) 1,3-Butadiene	5.27	54	3332375	94.365	ng	96
8) Bromomethane	5.74	94	2584530	84.433	ng	99
9) Chloroethane	6.08	64	1921395	90.891	ng	99
10) Ethanol	6.56	45	9594124	465.170	ng	99
11) Acetonitrile	6.79	41	4429309	91.517	ng	99
12) Acrolein	6.95	56	1665764	86.696	ng	99
13) Acetone	7.18	58	9991761	458.963	ng	# 76
14) Trichlorofluoromethane	7.39	101	5078162	89.329	ng	99
15) 2-Propanol (Isopropanol)	7.71	45	10622254	147.088	ng	98
16) Acrylonitrile	7.97	53	3458458	94.892	ng	100
17) 1,1-Dichloroethene	8.38	96	2933908	93.439	ng	97
18) 2-Methyl-2-Propanol (t...	8.59	59	10494411	130.561	ng	98
19) Methylene Chloride	8.63	84	2956067	94.073	ng	95
20) 3-Chloro-1-propene (Al...	8.78	41	3565024	81.134	ng	98
21) Trichlorotrifluoroethane	9.02	151	2929345	92.878	ng	98
22) Carbon Disulfide	8.88	76	9930408	94.474	ng	99
23) trans-1,2-Dichloroethene	9.90	61	3871112	92.926	ng	99
24) 1,1-Dichloroethane	10.16	63	4558358	86.108	ng	99
25) Methyl tert-Butyl Ether	10.24	73	8673318	91.188	ng	99
26) Vinyl Acetate	10.42	86	3748555	514.929	ng	# 51
27) 2-Butanone (MEK)	10.66	72	2050435	98.490	ng	# 87
28) cis-1,2-Dichloroethene	11.18	61	3714043	91.987	ng	98
29) Diisopropyl Ether	11.44	87	2563450	94.007	ng	# 75
30) Ethyl Acetate	11.47	61	2138542	197.115	ng	97
31) n-Hexane	11.43	57	4450576	90.159	ng	100
32) Chloroform	11.53	83	4912765	87.872	ng	100
34) Tetrahydrofuran (THF)	11.91	72	1960466	89.935	ng	96
35) Ethyl tert-Butyl Ether	12.04	87	3743674	97.587	ng	94
36) 1,2-Dichloroethane	12.32	62	3589149	86.258	ng	99
38) 1,1,1-Trichloroethane	12.59	97	4689649	92.624	ng	99
39) Isopropyl Acetate	13.00	61	3785354	198.392	ng	# 80
40) 1-Butanol	13.05	56	6114284	190.974	ng	89
41) Benzene	13.07	78	11174376	89.158	ng	99
42) Carbon Tetrachloride	13.22	117	4362644	92.714	ng	100
43) Cyclohexane	13.35	84	9012762	190.978	ng	98
44) tert-Amyl Methyl Ether	13.69	73	8421121	93.931	ng	98
45) 1,2-Dichloropropane	13.91	63	2714906	95.169	ng	100
46) Bromodichloromethane	14.11	83	4095237	92.743	ng	100
47) Trichloroethene	14.16	130	3622748	98.188	ng	100
48) 1,4-Dioxane	14.13	88	2688345	103.231	ng	99
49) 2,2,4-Trimethylpentane...	14.21	57	10493546	89.349	ng	95

Data File: I:\MS16\DATA\2017 04\24\04241713.D

Acq On : 24 Apr 2017 16:17

Operator: LH

Sample : 100ng TO-15 ICAL STD

Misc : S31-04111710/S31-04111702 (5/10)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Apr 25 07:42:15 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 07:41:36 2017

Response via : Initial Calibration

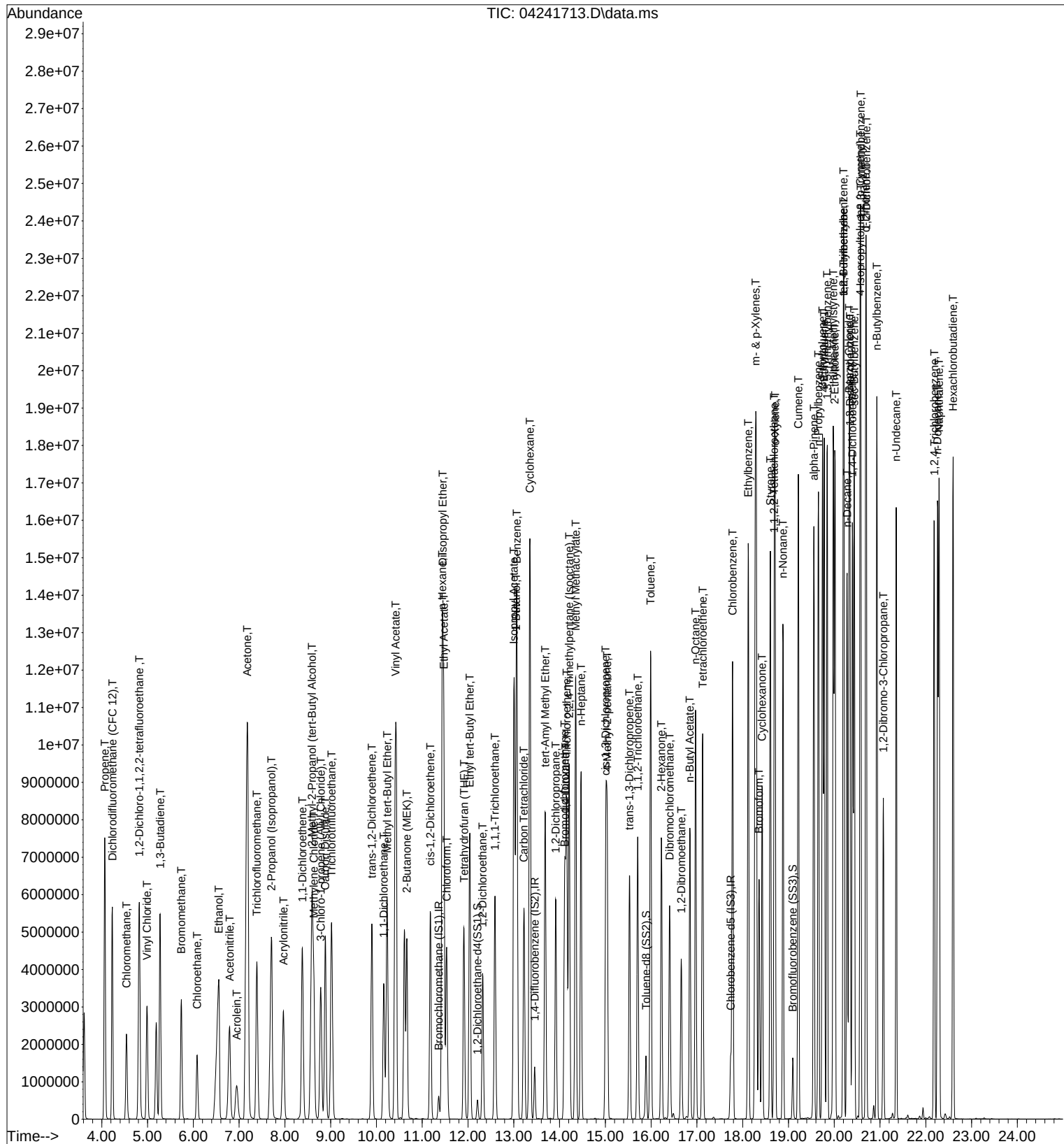
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.35	100	2813263	204.543	ng	97
51) n-Heptane	14.47	71	2931482	99.899	ng	99
52) cis-1,3-Dichloropropene	15.01	75	5296847	105.817	ng	99
53) 4-Methyl-2-pentanone	15.04	58	2681767	97.887	ng	89
54) trans-1,3-Dichloropropene	15.53	75	4603066	102.894	ng	99
55) 1,1,2-Trichloroethane	15.71	97	3025739	97.333	ng	99
58) Toluene	15.99	91	11615585	89.806	ng	97
59) 2-Hexanone	16.22	43	5674886	88.800	ng	93
60) Dibromochloromethane	16.41	129	3992368	98.255	ng	99
61) 1,2-Dibromoethane	16.66	107	3549804	98.040	ng	100
62) n-Butyl Acetate	16.84	43	6281771	87.736	ng	95
63) n-Octane	16.97	57	2372896	95.063	ng	98
64) Tetrachloroethene	17.13	166	3952202	99.780	ng	99
65) Chlorobenzene	17.78	112	8566302	97.805	ng	98
66) Ethylbenzene	18.12	91	12987733	89.672	ng	95
67) m- & p-Xylenes	18.29	91	19087522	172.909	ng	97
68) Bromoform	18.36	173	3679562	101.391	ng	99
69) Styrene	18.60	104	8924603	102.090	ng	99
70) o-Xylene	18.71	91	9890026	87.171	ng	97
71) n-Nonane	18.88	43	4484215	81.818	ng	92
72) 1,1,2,2-Tetrachloroethane	18.69	83	5061188	94.211	ng	100
74) Cumene	19.22	105	12731132	86.200	ng	95
75) alpha-Pinene	19.56	93	7153850	94.610	ng	100
76) n-Propylbenzene	19.65	91	14147831	83.648	ng	92
77) 3-Ethyltoluene	19.74	105	13336151	90.607	ng	95
78) 4-Ethyltoluene	19.78	105	11136924	82.827	ng	94
79) 1,3,5-Trimethylbenzene	19.85	105	10646158	88.117	ng	97
80) alpha-Methylstyrene	19.98	118	6393662	102.726	ng	99
81) 2-Ethyltoluene	20.01	105	12324775	86.856	ng	95
82) 1,2,4-Trimethylbenzene	20.20	105	9074173	75.673	ng	99
83) n-Decane	20.28	57	5285065	90.666	ng	98
84) Benzyl Chloride	20.33	91	10138382	100.231	ng	96
85) 1,3-Dichlorobenzene	20.34	146	7072895	98.959	ng	100
86) 1,4-Dichlorobenzene	20.40	146	7318231	104.190	ng	100
87) sec-Butylbenzene	20.44	105	13049037	81.068	ng	94
88) 4-Isopropyltoluene (p-...	20.57	119	10281786	68.114	ng	95
89) 1,2,3-Trimethylbenzene	20.58	105	8760468	72.741	ng	98
90) 1,2-Dichlorobenzene	20.70	146	5977907	86.295	ng	100
91) d-Limonene	20.69	68	3420198	77.142	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.07	157	2941305	110.797	ng	94
93) n-Undecane	21.35	57	5489816	91.449	ng	97
94) 1,2,4-Trichlorobenzene	22.18	180	5997412	123.119	ng	99
95) Naphthalene	22.29	128	14774832	105.713	ng	96
96) n-Dodecane	22.26	57	5445107	97.407	ng	97
97) Hexachlorobutadiene	22.60	225	3964584	103.821	ng	100
98) Cyclohexanone	18.42	55	3944119	84.585	ng	95
99) tert-Butylbenzene	20.20	119	8791205	73.597	ng	98
100) n-Butylbenzene	20.93	91	10687939	85.297	ng	95

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

ALS Vial : 2 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS16\DATA\2017 04\24\04241714.D

Acq On : 24 Apr 2017 16:50

Operator: LH

Sample : 25ng TO-15 ICV STD

Misc : S31-04111710/S31-03271706 (4/25)

ALS Vial : 16 Sample Multiplier: 1

Quant Time: Apr 25 08:34:56 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 08:34:49 2017

LH 4/25/17

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.35	130	291704	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.45	114	1388232	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.73	82	530597	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.19	65	399562	11.998	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	96.00%
57) Toluene-d8 (SS2)	15.88	98	1360105	12.563	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.48%
73) Bromofluorobenzene (SS3)	19.09	174	512785	12.406	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.28%

Target Compounds

						Qvalue
2) Propene	4.05	42	710682	25.249	ng	98
3) Dichlorodifluoromethan...	4.22	85	1487815	23.541	ng	100
4) Chloromethane	4.53	50	921659	22.477	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	889778	23.554	ng	100
6) Vinyl Chloride	4.97	62	1104966	24.445	ng	99
7) 1,3-Butadiene	5.25	54	804643	23.645	ng	99
8) Bromomethane	5.71	94	715689	22.568	ng	100
9) Chloroethane	6.06	64	506371	25.420	ng	100
10) Ethanol	6.48	45	2403613	120.846	ng	100
11) Acetonitrile	6.74	41	1114578	23.380	ng	99
12) Acrolein	6.92	56	425473	23.519	ng	99
13) Acetone	7.14	58	2530357	122.223	ng	96
14) Trichlorofluoromethane	7.37	101	1330612	24.182	ng	100
15) 2-Propanol (Isopropanol)	7.65	45	3243278	47.288	ng	99
16) Acrylonitrile	7.93	53	875259	24.984	ng	100
17) 1,1-Dichloroethene	8.37	96	741637	24.750	ng	98
18) 2-Methyl-2-Propanol (t...	8.54	59	3705607	48.544	ng	99
19) Methylene Chloride	8.61	84	740123	24.602	ng	99
20) 3-Chloro-1-propene (Al...	8.76	41	942356	23.873	ng	99
21) Trichlorotrifluoroethane	9.01	151	749718	24.441	ng	100
22) Carbon Disulfide	8.87	76	2604793	25.047	ng	100
23) trans-1,2-Dichloroethene	9.89	61	985260	25.129	ng	100
24) 1,1-Dichloroethane	10.15	63	1222543	24.434	ng	100
25) Methyl tert-Butyl Ether	10.22	73	2220969	24.438	ng	100
26) Vinyl Acetate	10.39	86	973722	143.909	ng	100
27) 2-Butanone (MEK)	10.64	72	496018	24.921	ng	99
28) cis-1,2-Dichloroethene	11.16	61	938681	24.451	ng	100
29) Diisopropyl Ether	11.43	87	637676	23.566	ng	98
30) Ethyl Acetate	11.45	61	538768	52.187	ng	100
31) n-Hexane	11.43	57	1126335	24.924	ng	100
32) Chloroform	11.51	83	1277833	23.972	ng	100
34) Tetrahydrofuran (THF)	11.90	72	477930	23.331	ng	99
35) Ethyl tert-Butyl Ether	12.03	87	917333	25.120	ng	100
36) 1,2-Dichloroethane	12.31	62	940927	23.542	ng	100
38) 1,1,1-Trichloroethane	12.58	97	1186407	23.838	ng	100
39) Isopropyl Acetate	12.99	61	921176	50.363	ng	100
40) 1-Butanol	13.01	56	1542536	49.153	ng	99
41) Benzene	13.06	78	2872662	23.800	ng	100
42) Carbon Tetrachloride	13.22	117	1123400	24.223	ng	100
43) Cyclohexane	13.34	84	2289103	50.236	ng	100
44) tert-Amyl Methyl Ether	13.68	73	2123355	24.491	ng	100
45) 1,2-Dichloropropane	13.91	63	672998	24.619	ng	100
46) Bromodichloromethane	14.10	83	1057526	24.584	ng	100
47) Trichloroethene	14.15	130	883862	24.149	ng	100
48) 1,4-Dioxane	14.12	88	645696	25.262	ng	100
49) 2,2,4-Trimethylpentane...	14.20	57	2709284	24.190	ng	98

Data File: I:\MS16\DATA\2017 04\24\04241714.D

Acq On : 24 Apr 2017 16:50

Operator: LH

Sample : 25ng TO-15 ICV STD

Misc : S31-04111710/S31-03271706 (4/25)

ALS Vial : 16 Sample Multiplier: 1

Quant Time: Apr 25 08:34:56 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 08:34:49 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.34	100	689133	51.639	ng	100
51) n-Heptane	14.46	71	703397	25.027	ng	100
52) cis-1,3-Dichloropropene	15.00	75	1240070	25.486	ng	100
53) 4-Methyl-2-pentanone	15.03	58	655728	24.829	ng	98
54) trans-1,3-Dichloropropene	15.52	75	1151368	26.266	ng	100
55) 1,1,2-Trichloroethane	15.70	97	751681	24.720	ng	100
58) Toluene	15.98	91	3011439	25.265	ng	100
59) 2-Hexanone	16.21	43	1471921	24.049	ng	99
60) Dibromochloromethane	16.40	129	999840	25.014	ng	100
61) 1,2-Dibromoethane	16.65	107	901669	25.287	ng	100
62) n-Butyl Acetate	16.84	43	1641608	24.118	ng	99
63) n-Octane	16.97	57	570601	23.489	ng	100
64) Tetrachloroethene	17.12	166	987439	24.989	ng	100
65) Chlorobenzene	17.77	112	2157798	25.037	ng	100
66) Ethylbenzene	18.12	91	3497851	24.640	ng	100
67) m- & p-Xylenes	18.28	91	5430618	49.494	ng	100
68) Bromoform	18.35	173	927543	25.580	ng	100
69) Styrene	18.60	104	2294014	26.307	ng	100
70) o-Xylene	18.70	91	2755543	24.554	ng	100
71) n-Nonane	18.87	43	1218973	24.053	ng	100
72) 1,1,2,2-Tetrachloroethane	18.68	83	1341970	25.665	ng	100
74) Cumene	19.21	105	3635773	24.833	ng	100
75) alpha-Pinene	19.55	93	1891179	26.236	ng	100
76) n-Propylbenzene	19.65	91	4249983	25.567	ng	100
77) 3-Ethyltoluene	19.74	105	3735651	25.745	ng	100
78) 4-Ethyltoluene	19.78	105	3445361	25.577	ng	100
79) 1,3,5-Trimethylbenzene	19.84	105	3011917	25.052	ng	100
80) alpha-Methylstyrene	19.97	118	1735377	28.486	ng	100
81) 2-Ethyltoluene	20.01	105	3594298	25.418	ng	100
82) 1,2,4-Trimethylbenzene	20.20	105	3175043	25.913	ng	100
83) n-Decane	20.27	57	1431448	25.033	ng	100
84) Benzyl Chloride	20.31	91	2851090	28.567	ng	100
85) 1,3-Dichlorobenzene	20.34	146	1947302	26.351	ng	100
86) 1,4-Dichlorobenzene	20.39	146	1934649	26.195	ng	100
87) sec-Butylbenzene	20.43	105	4023952	25.338	ng	100
88) 4-Isopropyltoluene (p-...	20.57	119	3949649	26.489	ng	100
89) 1,2,3-Trimethylbenzene	20.57	105	3216600	27.066	ng	100
90) 1,2-Dichlorobenzene	20.69	146	1921110	27.069	ng	100
91) d-Limonene	20.69	68	1152300	27.454	ng	99
92) 1,2-Dibromo-3-Chloropr...	21.07	157	747980	28.254	ng	99
93) n-Undecane	21.35	57	1496185	26.294	ng	100
94) 1,2,4-Trichlorobenzene	22.18	180	1532880	28.136	ng	100
95) Naphthalene	22.28	128	4351019	30.360	ng	100
96) n-Dodecane	22.26	57	1508653	28.236	ng	100
97) Hexachlorobutadiene	22.60	225	1011324	26.017	ng	100
98) Cyclohexanone	18.41	55	1012130	22.468	ng	100
99) tert-Butylbenzene	20.20	119	3125818	26.195	ng	100
100) n-Butylbenzene	20.93	91	3182078	25.858	ng	100

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

Data File: I:\MS16\DATA\2017 04\24\04241714.D

Acq On : 24 Apr 2017 16:50

Operator: LH

Sample : 25ng TO-15 ICV STD

Misc : S31-04111710/S31-03271706 (4/25)

ALS Vial : 16 Sample Multiplier: 1

Quant Time: Apr 25 08:34:56 2017

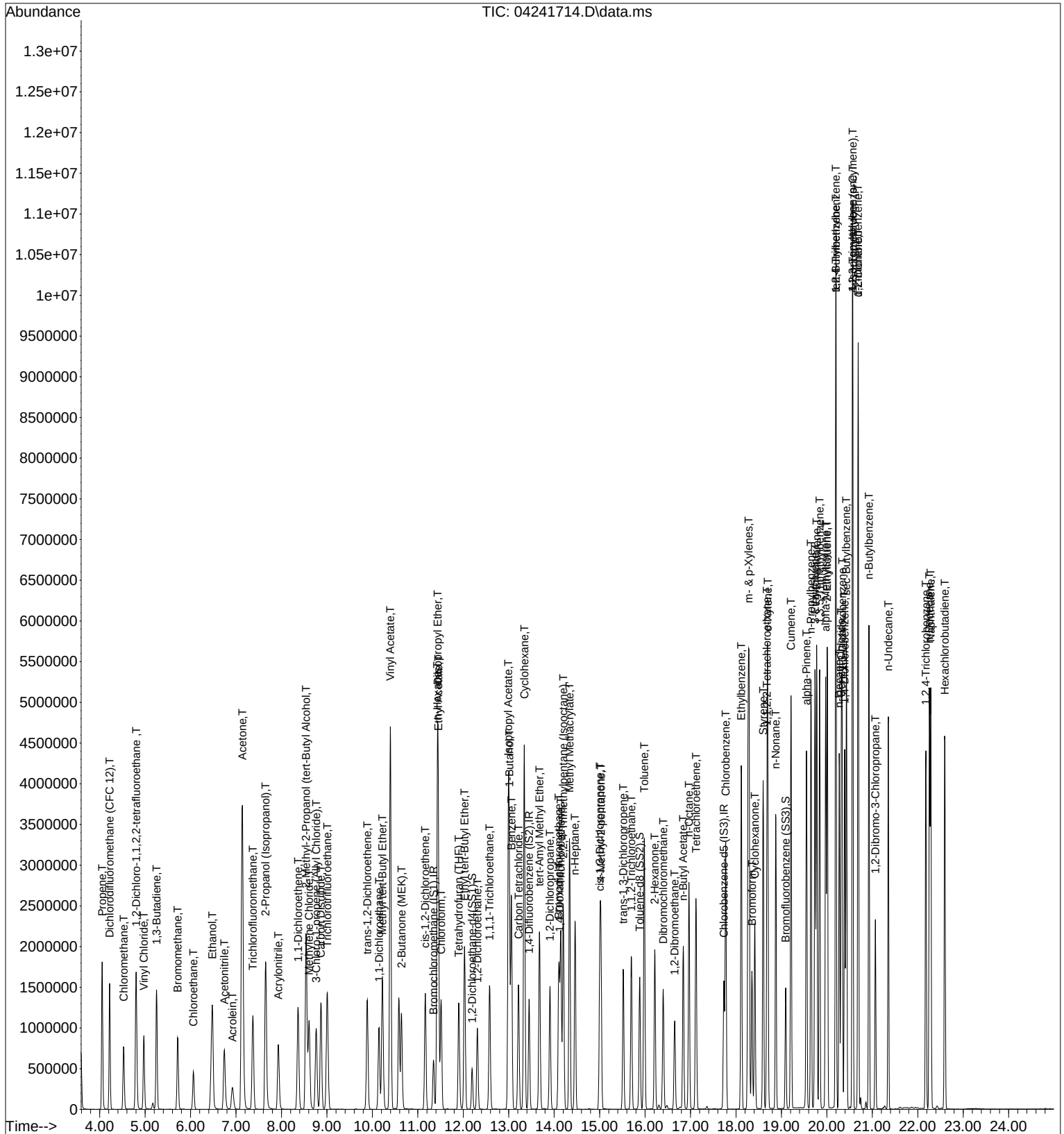
Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 08:34:49 2017

Response via : Initial Calibration

DataAcq Meth:T015.M



Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: 04241714.D

Acq. Method File: TO15.M

Data File Path: I:\MS16\DATA\2017_04\24\

Sample Name: 25ng TO-15 ICV STD

Operator: LH

Misc Info: S31-04111710/S31-03271706 (

Date Acquired: 4/24/17

16:50

Instrument Name: GCMS-16

#	Compound Name	Ret. Time	Amt. (ng)	Spike Amt.(ng)	% Rec.	Lower Limit	Upper Limit	* OR Fail	ICV/AZ 70-130%
2)	Propene	4.05	25.249	26.275	96	52	127	*	*
3)	Dichlorodifluoromethane (CFC 1	4.22	23.541	26.250	90	68	109	*	*
4)	Chloromethane	4.53	22.477	26.225	86	51	130	*	*
5)	1,2-Dichloro-1,1,2,2-tetrafluoroet	4.80	23.554	26.375	89	66	114	*	*
6)	Vinyl Chloride	4.97	24.445	26.250	93	61	125	*	*
7)	1,3-Butadiene	5.25	23.645	26.250	90	62	144	*	*
8)	Bromomethane	5.71	22.568	26.250	86	73	123	*	*
9)	Chloroethane	6.06	25.420	26.225	97	69	122	*	*
10)	Ethanol	6.48	120.846	132.650	91	62	124	*	*
11)	Acetonitrile	6.74	23.380	26.650	88	57	114	*	*
12)	Acrolein	6.92	23.519	26.525	89	62	116	*	*
13)	Acetone	7.14	122.223	133.050	92	57	117	*	*
14)	Trichlorofluoromethane	7.37	24.182	26.275	92	63	98	*	*
15)	2-Propanol (Isopropanol)	7.65	47.288	53.025	89	66	121	*	*
16)	Acrylonitrile	7.93	24.984	26.575	94	68	123	*	*
17)	1,1-Dichloroethene	8.37	24.750	26.575	93	76	118	*	*
18)	2-Methyl-2-Propanol (tert-Butyl Alc	8.54	48.544	53.275	91	74	126	*	*
19)	Methylene Chloride	8.61	24.602	26.550	110	60	118	*	*
20)	3-Chloro-1-propene (Allyl Chloride	8.76	23.873	26.500	90	65	126	*	*
21)	Trichlorotrifluoroethane	9.01	24.441	26.450	92	73	114	*	*
22)	Carbon Disulfide	8.87	25.047	26.675	94	57	102	*	*
23)	trans-1,2-Dichloroethene	9.89	25.129	26.675	94	74	123	*	*
24)	1,1-Dichloroethane	10.15	24.434	26.550	92	69	111	*	*
25)	Methyl tert-Butyl Ether	10.22	24.438	26.600	92	69	113	*	*
26)	Vinyl Acetate	10.39	143.909	132.550	109	76	128	*	*
27)	2-Butanone (MEK)	10.64	24.921	26.550	94	63	127	*	*
28)	cis-1,2-Dichloroethene	11.16	24.451	26.475	92	72	117	*	*
29)	Diisopropyl Ether	11.43	23.566	26.575	89	64	118	*	*
30)	Ethyl Acetate	11.45	52.187	53.275	98	68	127	*	*
31)	n-Hexane	11.43	24.924	26.600	94	55	116	*	*
32)	Chloroform	11.51	23.972	26.475	91	70	109	*	*
34)	Tetrahydrofuran (THF)	11.90	23.331	26.575	88	72	113	*	*
35)	Ethyl tert-Butyl Ether	12.03	25.120	26.525	95	73	117	*	*
36)	1,2-Dichloroethane	12.31	23.542	26.500	89	69	113	*	*
38)	1,1,1-Trichloroethane	12.58	23.838	26.475	90	72	115	*	*
39)	Isopropyl Acetate	12.99	50.363	53.050	95	68	122	*	*
40)	1-Butanol	13.01	49.153	53.075	93	75	141	*	*
41)	Benzene	13.06	23.800	26.525	90	65	107	*	*
42)	Carbon Tetrachloride	13.22	24.223	26.600	91	71	113	*	*
43)	Cyclohexane	13.34	50.236	53.125	95	71	115	*	*
44)	tert-Amyl Methyl Ether	13.68	24.491	26.525	92	73	115	*	*
45)	1,2-Dichloropropane	13.91	24.619	26.525	93	71	115	*	*
46)	Bromodichloromethane	14.10	24.584	26.700	92	75	118	*	*
47)	Trichloroethene	14.15	24.149	26.550	91	68	114	*	*
48)	1,4-Dioxane	14.12	25.262	26.600	95	81	131	*	*
49)	2,2,4-Trimethylpentane (Isooctane)	14.20	24.190	26.525	91	68	112	*	*

Bold = 75 Compound List

* = Pass

Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: 04241714.D

Data File Path: I:\MS16\DATA\2017_04\24\

Operator: LH

Date Acquired: 4/24/17

16:50

TO15.M

Sample Name: 25ng TO-15 ICV STD

Misc Info: S31-04111710/S31-03271706

Instrument Name: GCMS-16

#	Compound Name	Ret. Time	Amt. (ng)	Spike Amt.(ng)	% Rec.	Lower Limit	Upper Limit	* OR Fail	ICV/AZ 70-130%
50)	Methyl Methacrylate	14.34	51.639	53.000	97	72	130	*	*
51)	n-Heptane	14.46	25.027	26.600	94	68	116	*	*
52)	cis-1,3-Dichloropropene	15.00	25.486	26.275	97	77	126	*	*
53)	4-Methyl-2-pentanone	15.03	24.829	26.575	93	69	126	*	*
54)	trans-1,3-Dichloropropene	15.52	26.266	26.675	98	79	125	*	*
55)	1,1,2-Trichloroethane	15.70	24.720	26.525	93	75	119	*	*
58)	Toluene	15.98	25.265	26.450	96	59	118	*	*
59)	2-Hexanone	16.21	24.049	26.575	90	69	129	*	*
60)	Dibromochloromethane	16.40	25.014	26.600	94	74	136	*	*
61)	1,2-Dibromoethane	16.65	25.287	26.450	96	73	131	*	*
62)	n-Butyl Acetate	16.84	24.118	26.950	89	69	130	*	*
63)	n-Octane	16.97	23.489	26.500	89	66	120	*	*
64)	Tetrachloroethene	17.12	24.989	26.575	94	65	130	*	*
65)	Chlorobenzene	17.77	25.037	26.500	94	68	120	*	*
66)	Ethylbenzene	18.12	24.640	26.450	93	68	122	*	*
67)	m- & p-Xylenes	18.28	49.494	53.025	93	68	123	*	*
68)	Bromoform	18.35	25.580	26.550	96	69	130	*	*
69)	Styrene	18.60	26.307	26.475	99	71	133	*	*
70)	o-Xylene	18.70	24.554	26.450	93	68	122	*	*
71)	n-Nonane	18.87	24.053	26.475	91	65	120	*	*
72)	1,1,2,2-Tetrachloroethane	18.68	25.665	26.500	97	69	130	*	*
74)	Cumene	19.21	24.833	26.525	94	70	123	*	*
75)	alpha-Pinene	19.55	26.236	26.575	99	70	128	*	*
76)	n-Propylbenzene	19.65	25.567	26.725	96	69	125	*	*
77)	3-Ethyltoluene	19.74	25.745	26.550	97	67	128	*	*
78)	4-Ethyltoluene	19.78	25.577	26.525	96	67	130	*	*
79)	1,3,5-Trimethylbenzene	19.84	25.052	26.525	94	67	124	*	*
80)	alpha-Methylstyrene	19.97	28.486	26.550	107	67	141	*	*
81)	2-Ethyltoluene	20.01	25.418	26.550	96	67	124	*	*
82)	1,2,4-Trimethylbenzene	20.20	25.913	26.525	98	67	129	*	*
83)	n-Decane	20.27	25.033	26.525	94	66	124	*	*
84)	Benzyl Chloride	20.31	28.567	26.550	108	79	138	*	*
85)	1,3-Dichlorobenzene	20.34	26.351	26.475	100	65	136	*	*
86)	1,4-Dichlorobenzene	20.39	26.195	26.650	98	66	141	*	*
87)	sec-Butylbenzene	20.43	25.338	26.550	95	68	125	*	*
88)	4-Isopropyltoluene (p-Cymene)	20.57	26.489	26.550	100	68	131	*	*
89)	1,2,3-Trimethylbenzene	20.57	27.066	26.500	102	68	132	*	*
90)	1,2-Dichlorobenzene	20.69	27.069	26.550	102	67	136	*	*
91)	d-Limonene	20.69	27.454	26.550	103	71	134	*	*
92)	1,2-Dibromo-3-Chloropropane	21.07	28.254	26.475	107	73	136	*	*
93)	n-Undecane	21.35	26.294	26.600	99	68	132	*	*
94)	1,2,4-Trichlorobenzene	22.18	28.136	26.500	106	64	134	*	*
95)	Naphthalene	22.28	30.360	26.700	114	62	136	*	*
96)	n-Dodecane	22.26	28.236	26.550	106	61	137	*	*
97)	Hexachlorobutadiene	22.60	26.017	26.575	98	60	133	*	*
98)	Cyclohexanone	18.42	22.468	26.575	85	64	131	*	*
99)	tert-Butylbenzene	20.20	26.195	26.500	99	67	128	*	*
100)	n-Butylbenzene	20.93	25.858	26.500	98	68	128	*	*

Data File: I:\MS16\DATA\2017 06\22\06221702.D

Acq On : 22 Jun 2017 5:37

Operator: LH

Sample : CCV R16062217 25ng

Misc : S31-06081702/S31-06011703 (6/30)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 22 08:33:15 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 08:16:28 2017

LH 6/22/17

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	94	-0.02
2 T	Propene	1.206	1.075	10.9	93	0.00
3 T	Dichlorodifluoromethane (CF	2.708	2.136	21.1	80	0.00
4 T	Chloromethane	1.757	1.562	11.1	90	0.00
5 T	1,2-Dichloro-1,1,2,2-tetra	1.619	1.284	20.7	80	-0.01
6 T	Vinyl Chloride	1.937	1.726	10.9	90	-0.01
7 T	1,3-Butadiene	1.458	1.265	13.2	89	-0.02
8 T	Bromomethane	1.359	1.102	18.9	90	-0.02
9 T	Chloroethane	0.854	0.828	3.0	96	-0.02
10 T	Ethanol	0.852	0.746	12.4	90	-0.08
11 T	Acetonitrile	2.043	1.779	12.9	92	-0.05
12 T	Acrolein	0.775	0.687	11.4	95	-0.02
13 T	Acetone	0.887	0.806	9.1	92	-0.04
14 T	Trichlorofluoromethane	2.358	1.888	19.9	79	-0.01
15 T	2-Propanol (Isopropanol)	2.939	2.556	13.0	86	-0.05
16 T	Acrylonitrile	1.501	1.424	5.1	93	-0.03
17 T	1,1-Dichloroethene	1.284	1.148	10.6	89	-0.01
18 T	2-Methyl-2-Propanol (tert-B	3.271	2.777	15.1	83	-0.04
19 T	Methylene Chloride	1.289	1.164	9.7	90	-0.02
20 T	3-Chloro-1-propene (Allyl C	1.692	1.379	18.5	86	-0.02
21 T	Trichlorotrifluoroethane	1.314	1.103	16.1	83	-0.01
22 T	Carbon Disulfide	4.456	4.194	5.9	93	-0.01
23 T	trans-1,2-Dichloroethene	1.680	1.539	8.4	89	-0.01
24 T	1,1-Dichloroethane	2.144	1.943	9.4	90	-0.01
25 T	Methyl tert-Butyl Ether	3.894	3.338	14.3	86	-0.01
26 T	Vinyl Acetate	0.290	0.291	-0.3	83	-0.02
27 T	2-Butanone (MEK)	0.853	0.787	7.7	89	-0.02
28 T	cis-1,2-Dichloroethene	1.645	1.474	10.4	88	-0.01
29 T	Diisopropyl Ether	1.160	0.970	16.4	86	0.00
30 T	Ethyl Acetate	0.442	0.431	2.5	90	-0.02
31 T	n-Hexane	1.936	1.843	4.8	93	0.00
32 T	Chloroform	2.284	1.910	16.4	83	-0.02
33 S	1,2-Dichloroethane-d4 (SS1)	1.427	1.257	11.9	84	0.00
34 T	Tetrahydrofuran (THF)	0.878	0.773	12.0	92	-0.01
35 T	Ethyl tert-Butyl Ether	1.565	1.387	11.4	85	0.00
36 T	1,2-Dichloroethane	1.713	1.323	22.8	76	0.00
37 IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	95	0.00
38 T	1,1,1-Trichloroethane	0.448	0.355	20.8	79	0.00
39 T	Isopropyl Acetate	0.165	0.159	3.6	91	0.00
40 T	1-Butanol	0.283	0.242	14.5	84	-0.03
41 T	Benzene	1.087	0.943	13.2	89	0.00
42 T	Carbon Tetrachloride	0.418	0.332	20.6	78	0.00
43 T	Cyclohexane	0.410	0.375	8.5	88	0.00
44 T	tert-Amyl Methyl Ether	0.781	0.691	11.5	87	-0.01
45 T	1,2-Dichloropropane	0.246	0.236	4.1	95	0.00
46 T	Bromodichloromethane	0.387	0.322	16.8	82	0.00
47 T	Trichloroethene	0.330	0.282	14.5	85	0.00
48 T	1,4-Dioxane	0.230	0.211	8.3	88	-0.01
49 T	2,2,4-Trimethylpentane (Iso	1.008	0.942	6.5	94	0.00
50 T	Methyl Methacrylate	0.120	0.108	10.0	84	-0.01
51 T	n-Heptane	0.253	0.239	5.5	93	0.00
52 T	cis-1,3-Dichloropropene	0.438	0.407	7.1	88	0.00
53 T	4-Methyl-2-pentanone	0.238	0.224	5.9	93	-0.01
54 T	trans-1,3-Dichloropropene	0.395	0.364	7.8	85	0.00

Data File: I:\MS16\DATA\2017 06\22\06221702.D

Acq On : 22 Jun 2017 5:37

Operator: LH

Sample : CCV R16062217 25ng

Misc : S31-06081702/S31-06011703 (6/30)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 22 08:33:15 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 08:16:28 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	0.274	0.246	10.2	88	0.00
56 IR	Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	97	0.00
57 S	Toluene-d8 (SS2)	2.550	2.526	0.9	97	0.00
58 T	Toluene	2.808	2.479	11.7	87	0.00
59 T	2-Hexanone	1.442	1.160	19.6	84	0.00
60 T	Dibromochloromethane	0.942	0.766	18.7	81	0.00
61 T	1,2-Dibromoethane	0.840	0.724	13.8	85	0.00
62 T	n-Butyl Acetate	1.604	1.312	18.2	86	0.00
63 T	n-Octane	0.572	0.497	13.1	93	0.00
64 T	Tetrachloroethene	0.931	0.758	18.6	82	0.00
65 T	Chlorobenzene	2.030	1.724	15.1	85	0.00
66 T	Ethylbenzene	3.344	2.819	15.7	85	0.00
67 T	m- & p-Xylenes	2.585	2.124	17.8	82	0.00
68 T	Bromoform	0.854	0.688	19.4	77	0.00
69 T	Styrene	2.054	1.812	11.8	83	0.00
70 T	o-Xylene	2.644	2.161	18.3	82	-0.01
71 T	n-Nonane	1.194	1.012	15.2	87	0.00
72 T	1,1,2,2-Tetrachloroethane	1.232	1.111	9.8	86	0.00
73 S	Bromofluorobenzene (SS3)	0.974	0.954	2.1	94	0.00
74 T	Cumene	3.449	2.867	16.9	83	0.00
75 T	alpha-Pinene	1.698	1.492	12.1	83	0.00
76 T	n-Propylbenzene	3.916	3.367	14.0	83	0.00
77 T	3-Ethyltoluene	3.418	2.942	13.9	79	0.00
78 T	4-Ethyltoluene	3.173	2.626	17.2	83	0.00
79 T	1,3,5-Trimethylbenzene	2.832	2.324	17.9	80	0.00
80 T	alpha-Methylstyrene	1.435	1.313	8.5	80	0.00
81 T	2-Ethyltoluene	3.331	2.746	17.6	80	0.00
82 T	1,2,4-Trimethylbenzene	2.887	2.356	18.4	77	0.00
83 T	n-Decane	1.347	1.180	12.4	86	0.00
84 T	Benzyl Chloride	2.351	2.106	10.4	76	-0.01
85 T	1,3-Dichlorobenzene	1.741	1.465	15.9	78	0.00
86 T	1,4-Dichlorobenzene	1.740	1.489	14.4	80	0.00
87 T	sec-Butylbenzene	3.741	3.112	16.8	81	0.00
88 T	4-Isopropyltoluene (p-Cymen	3.513	2.950	16.0	77	0.00
89 T	1,2,3-Trimethylbenzene	2.800	2.363	15.6	77	-0.01
90 T	1,2-Dichlorobenzene	1.672	1.417	15.3	76	-0.01
91 T	d-Limonene	0.989	0.884	10.6	82	0.00
92 T	1,2-Dibromo-3-Chloropropane	0.624	0.555	11.1	78	0.00
93 T	n-Undecane	1.341	1.269	5.4	89	0.00
94 T	1,2,4-Trichlorobenzene	1.283	1.180	8.0	79	0.00
95 T	Naphthalene	3.376	3.344	0.9	79	0.00
96 T	n-Dodecane	1.259	1.273	-1.1	92	0.00
97 T	Hexachlorobutadiene	0.916	0.747	18.4	77	0.00
98 T	Cyclohexanone	1.061	0.792	25.4	84	0.00
99 T	tert-Butylbenzene	2.811	2.298	18.2	77	0.00
100 T	n-Butylbenzene	2.899	2.512	13.3	82	0.00

(#)= Out of Range

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

Data File: I:\MS16\DATA\2017 06\22\06221702.D

Acq On : 22 Jun 2017 5:37

Operator: LH

Sample : CCV R16062217 25ng

Misc : S31-06081702/S31-06011703 (6/30)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 22 08:33:15 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 08:16:28 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 6/22/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.35	130	268809	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.45	114	1282217	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.73	82	513372	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.20	65	337912	11.011	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	88.08%
57) Toluene-d8 (SS2)	15.88	98	1296999	12.382	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.04%
73) Bromofluorobenzene (SS3)	19.09	174	489759	12.247	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.00%

Target Compounds

						Qvalue
2) Propene	4.06	42	598480	23.073	ng	95
3) Dichlorodifluoromethan...	4.22	85	1202550	20.648	ng	100
4) Chloromethane	4.53	50	844132	22.340	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	693876	19.933	ng	100
6) Vinyl Chloride	4.98	62	949411	22.793	ng	100
7) 1,3-Butadiene	5.26	54	719094	22.931	ng	95
8) Bromomethane	5.72	94	588538	20.139	ng	100
9) Chloroethane	6.07	64	449267	24.475	ng	100
10) Ethanol	6.48	45	2089211	113.986	ng	99
11) Acetonitrile	6.75	41	1000479	22.774	ng	98
12) Acrolein	6.92	56	384738	23.079	ng	98
13) Acetone	7.14	58	2301489	120.637	ng	# 83
14) Trichlorofluoromethane	7.37	101	1064885	21.001	ng	100
15) 2-Propanol (Isopropanol)	7.66	45	2892376	45.764	ng	96
16) Acrylonitrile	7.94	53	807441	25.011	ng	99
17) 1,1-Dichloroethene	8.37	96	653450	23.665	ng	97
18) 2-Methyl-2-Propanol (t...	8.55	59	3155988	44.866	ng	98
19) Methylene Chloride	8.61	84	661741	23.870	ng	98
20) 3-Chloro-1-propene (Al...	8.77	41	779956	21.441	ng	98
21) Trichlorotrifluoroethane	9.01	151	621791	21.997	ng	97
22) Carbon Disulfide	8.87	76	2392461	24.965	ng	100
23) trans-1,2-Dichloroethene	9.89	61	882751	24.432	ng	100
24) 1,1-Dichloroethane	10.15	63	1065242	23.103	ng	100
25) Methyl tert-Butyl Ether	10.22	73	1912774	22.840	ng	98
26) Vinyl Acetate	10.40	86	823180	132.022	ng	99
27) 2-Butanone (MEK)	10.64	72	443901	24.202	ng	94
28) cis-1,2-Dichloroethene	11.16	61	842912	23.827	ng	100
29) Diisopropyl Ether	11.44	87	554043	22.219	ng	98
30) Ethyl Acetate	11.45	61	492863	51.806	ng	96
31) n-Hexane	11.43	57	1053416	25.296	ng	98
32) Chloroform	11.52	83	1086125	22.111	ng	100
34) Tetrahydrofuran (THF)	11.90	72	441388	23.383	ng	98
35) Ethyl tert-Butyl Ether	12.03	87	788167	23.422	ng	96
36) 1,2-Dichloroethane	12.31	62	748536	20.323	ng	100
38) 1,1,1-Trichloroethane	12.58	97	978452	21.285	ng	99
39) Isopropyl Acetate	12.99	61	858846	50.837	ng	# 88
40) 1-Butanol	13.02	56	1307969	45.125	ng	94
41) Benzene	13.06	78	2545149	22.830	ng	100
42) Carbon Tetrachloride	13.21	117	896874	20.938	ng	100
43) Cyclohexane	13.35	84	2050856	48.729	ng	96
44) tert-Amyl Methyl Ether	13.68	73	1866691	23.311	ng	97
45) 1,2-Dichloropropane	13.91	63	643400	25.482	ng	100
46) Bromodichloromethane	14.10	83	881177	22.179	ng	100
47) Trichloroethene	14.15	130	767780	22.712	ng	100
48) 1,4-Dioxane	14.12	88	574113	24.319	ng	97
49) 2,2,4-Trimethylpentane...	14.20	57	2558730	24.734	ng	92

Data File: I:\MS16\DATA\2017 06\22\06221702.D

Acq On : 22 Jun 2017 5:37

Operator: LH

Sample : CCV R16062217 25ng

Misc : S31-06081702/S31-06011703 (6/30)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 22 08:33:15 2017

Quant Method : I:\MS16\METHODS\R16042417.M

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

QLast Update : Tue Apr 25 08:16:28 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

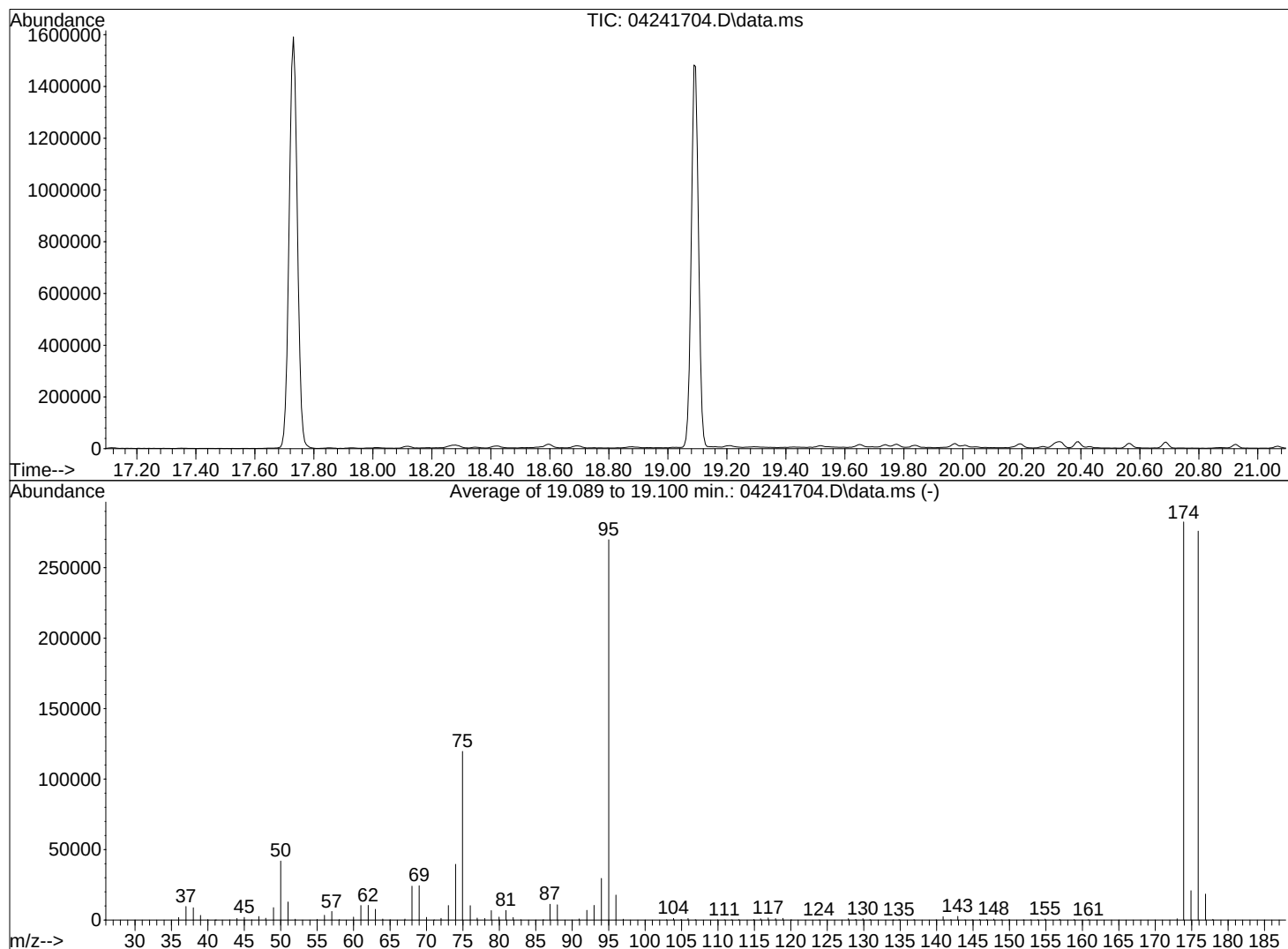
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.34	100	584411	47.413	ng	92
51) n-Heptane	14.46	71	650516	25.060	ng	97
52) cis-1,3-Dichloropropene	15.01	75	1165203	25.927	ng	100
53) 4-Methyl-2-pentanone	15.03	58	607766	24.915	ng	92
54) trans-1,3-Dichloropropene	15.52	75	992927	24.525	ng	100
55) 1,1,2-Trichloroethane	15.70	97	670121	23.860	ng	97
58) Toluene	15.98	91	2680420	23.243	ng	100
59) 2-Hexanone	16.22	43	1263246	21.332	ng	94
60) Dibromochloromethane	16.40	129	835453	21.602	ng	100
61) 1,2-Dibromoethane	16.65	107	784850	22.749	ng	100
62) n-Butyl Acetate	16.84	43	1432948	21.759	ng	96
63) n-Octane	16.97	57	538937	22.930	ng	95
64) Tetrachloroethene	17.12	166	825421	21.590	ng	100
65) Chlorobenzene	17.77	112	1878050	22.523	ng	100
66) Ethylbenzene	18.12	91	3053983	22.235	ng	100
67) m- & p-Xylenes	18.28	91	4629218	43.606	ng	100
68) Bromoform	18.35	173	750713	21.398	ng	100
69) Styrene	18.60	104	1974108	23.398	ng	99
70) o-Xylene	18.70	91	2338155	21.534	ng	100
71) n-Nonane	18.88	43	1094917	22.330	ng	98
72) 1,1,2,2-Tetrachloroethane	18.68	83	1205110	23.821	ng	100
74) Cumene	19.21	105	3090775	21.819	ng	99
75) alpha-Pinene	19.55	93	1598954	22.926	ng	98
76) n-Propylbenzene	19.65	91	3674938	22.849	ng	98
77) 3-Ethyltoluene	19.74	105	3172100	22.595	ng	99
78) 4-Ethyltoluene	19.78	105	2828373	21.701	ng	99
79) 1,3,5-Trimethylbenzene	19.84	105	2502812	21.516	ng	99
80) alpha-Methylstyrene	19.97	118	1415964	24.023	ng	99
81) 2-Ethyltoluene	20.01	105	2994011	21.883	ng	99
82) 1,2,4-Trimethylbenzene	20.20	105	2545165	21.469	ng	99
83) n-Decane	20.28	57	1276134	23.066	ng	98
84) Benzyl Chloride	20.31	91	2294697	23.764	ng	98
85) 1,3-Dichlorobenzene	20.34	146	1591795	22.263	ng	100
86) 1,4-Dichlorobenzene	20.39	146	1617447	22.635	ng	99
87) sec-Butylbenzene	20.43	105	3367638	21.917	ng	99
88) 4-Isopropyltoluene (p-...	20.57	119	3110178	21.559	ng	99
89) 1,2,3-Trimethylbenzene	20.57	105	2492184	21.674	ng	99
90) 1,2-Dichlorobenzene	20.69	146	1539625	22.421	ng	100
91) d-Limonene	20.69	68	948928	23.367	ng	96
92) 1,2-Dibromo-3-Chloropr...	21.07	157	600438	23.442	ng	96
93) n-Undecane	21.35	57	1373651	24.950	ng	97
94) 1,2,4-Trichlorobenzene	22.18	180	1264167	23.982	ng	100
95) Naphthalene	22.28	128	3717882	26.813	ng	100
96) n-Dodecane	22.26	57	1365628	26.417	ng	97
97) Hexachlorobutadiene	22.60	225	812099	21.592	ng	100
98) Cyclohexanone	18.42	55	858318	19.693	ng	95
99) tert-Butylbenzene	20.20	119	2480025	21.481	ng	99
100) n-Butylbenzene	20.92	91	2724075	22.879	ng	99

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

Data Path : I:\MS16\DATA\2017 04\24\
Data File : 04241704.D
Acq On : 24 Apr 2017 11:15
Operator : LH
Sample : 12.5ng TO-15 BFB
Misc : S31-04111710
ALS Vial : 2 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS16\METHODS\R16042417.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Tue Apr 25 07:41:36 2017



AutoFind: Scans 2819, 2820, 2821; Background Corrected with Scan 2810

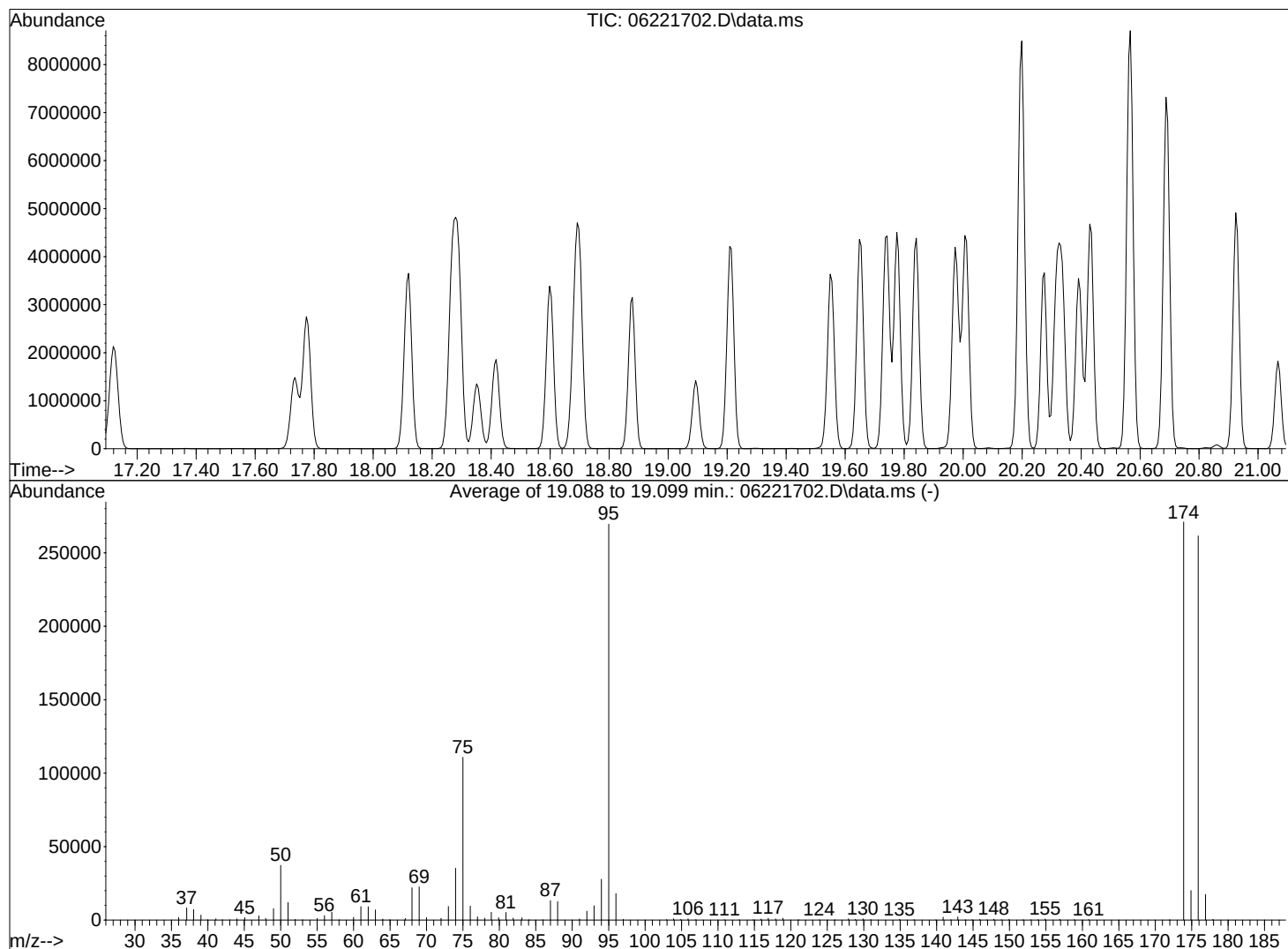
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	15.5	41821	PASS
75	95	30	66	44.3	119651	PASS
95	95	100	100	100.0	269824	PASS
96	95	5	9	6.6	17700	PASS
173	174	0.00	2	0.3	935	PASS
174	95	50	120	104.7	282453	PASS
175	174	4	9	7.4	20867	PASS
176	174	93	101	97.7	275925	PASS
177	176	5	9	6.7	18414	PASS

LH 4/25/17

Data Path : I:\MS16\DATA\2017 06\22\
Data File : 06221702.D
Acq On : 22 Jun 2017 5:37
Operator : LH
Sample : CCV R16062217 25ng
Misc : S31-06081702/S31-06011703 (6/30)
ALS Vial : 2 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS16\METHODS\R16042417.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Tue Apr 25 08:16:28 2017



AutoFind: Scans 2837, 2838, 2839; Background Corrected with Scan 2829

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	13.8	37248	PASS
75	95	30	66	41.1	110781	PASS
95	95	100	100	100.0	269525	PASS
96	95	5	9	6.7	18080	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	100.6	271019	PASS
175	174	4	9	7.4	20133	PASS
176	174	93	101	96.5	261483	PASS
177	176	5	9	6.7	17389	PASS

LH 6/22/17

Injection Log

Directory: J:\MS16\DATA\2017_04\24\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	4/24/17 8:15	04241701.D	Blank (100mL)	S31-04111710	LH	2	
2	4/24/17 8:48	04241702.D	CCV R16042417_25ng	S31-04111710/S31-04111702 (5/10)	LH	2	
3	4/24/17 10:08	04241703.D	25ng std check	S31-04111710/S31-03271706 (4/25)	LH	16	
4	4/24/17 11:15	04241704.D	12.5ng TO-15 BFB	S31-04111710	LH	2	passed
5	4/24/17 11:48	04241705.D	0.08ng TO-15 ICAL STD	S31-04111710/S31-04111708 (5/10)	LH	6	
6	4/24/17 12:22	04241706.D	0.1ng TO-15 ICAL STD	S31-04111710/S31-04111708 (5/10)	LH	6	
7	4/24/17 12:55	04241707.D	0.2ng TO-15 ICAL STD	S31-04111710/S31-04111708 (5/10)	LH	6	
8	4/24/17 13:29	04241708.D	0.4ng TO-15 ICAL STD	S31-04111710/S31-04111707 (5/10)	LH	7	
9	4/24/17 14:02	04241709.D	1.0ng TO-15 ICAL STD	S31-04111710/S31-04111707 (5/10)	LH	7	
10	4/24/17 14:35	04241710.D	5.0ng TO-15 ICAL STD	S31-04111710/S31-04111707 (5/10)	LH	7	
11	4/24/17 15:09	04241711.D	25ng TO-15 ICAL STD	S31-04111710/S31-04111702 (5/10)	LH	2	R16042417.M
12	4/24/17 15:43	04241712.D	50ng TO-15 ICAL STD	S31-04111710/S31-04111702 (5/10)	LH	2	
13	4/24/17 16:17	04241713.D	100ng TO-15 ICAL STD	S31-04111710/S31-04111702 (5/10)	LH	2	
14	4/24/17 16:50	04241714.D	25ng TO-15 ICV STD	S31-04111710/S31-03271706 (4/25)	LH	16	passed

ICAL R16042417.M passed for all compounds 0.08ng-100ng, except: propene, acetonitrile, methylene chloride, carbon disulfide, toluene 0.2ng-100ng,

##	allyl chloride 0.1ng-100ng, benzyl chloride, 1,2,4-trichlorobenzene 0.4ng-100ng.

4/25/17

Injection Log

Directory: I:\MS16\DATA\2017_06\22\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	6/22/17 5:03	06221701.D	CCV C16062217_25ng	S31-06081702/S31-06201702 (7/19)	LH	3	passed
2	6/22/17 5:37	06221702.D	CCV R16062217_25ng	S31-06081702/S31-06011703 (6/30)	LH	2	passed
3	6/22/17 6:12	06221703.D	CCV M16062217_25ng	S31-06081702/S31-04251701 (6/22)	LH	4	passed
4	6/22/17 6:46	06221704.D	MB R16062217_1000mL	S31-06081702 AC00442	LH	2	passed
5	6/22/17 7:20	06221705.D	LCS R16062217_25ng	S31-06081702/S31-06161705 (7/15)	LH	2	passed
6	6/22/17 7:54	06221706.D	LCSD R16062217_25ng	S31-06081702/S31-06161705 (7/15)	LH	2	passed
7	6/22/17 8:51	06221707.D	Blank (100mL)	S31-06081702	LH	1	
8	6/22/17 9:25	06221708.D	P1702939-004 (5.0mL)	S31-06081702	LH	1	
9	6/22/17 10:10	06221709.D	P1702909-002 (400mL)	S31-06081702	LH	13	
10	6/22/17 10:44	06221710.D	P1702909-004 (400mL)	S31-06081702	LH	14	
11	6/22/17 11:19	06221711.D	P1702939-004dil (2.0mL)	S31-06081702	LH	1	
12	6/22/17 12:12	06221712.D	P1703014-001 (400mL)	S31-06081702	LH	5	
13	6/22/17 12:46	06221713.D	P1703014-002 (400mL)	S31-06081702	LH	6	
14	6/22/17 13:35	06221714.D	P1703014-003 (1000mL)	S31-06081702	LH	7	
15	6/22/17 14:09	06221715.D	P1703014-004 (500mL)	S31-06081702	LH	8	
16	6/22/17 14:48	06221716.D	P1703014-004dil (100mL)	S31-06081702	LH	8	
17	6/22/17 15:22	06221717.D	P1703014-005 (600mL)	S31-06081702	LH	9	
18	6/22/17 16:07	06221718.D	P1703014-006 (1000mL)	S31-06081702	LH	10	
19	6/22/17 17:19	06221719.D	P1703014-007 (1000mL)	S31-06081702	LH	11	
20	6/22/17 17:53	06221720.D	P1703014-008 (1000mL)	S31-06081702	LH	12	
21	6/22/17 18:27	06221721.D	P1703014-009 (600mL)	S31-06081702	LH	13	
22	6/22/17 19:00	06221722.D	P1703014-009dil (60mL)	S31-06081702	LH	13	not needed
23	6/22/17 19:34	06221723.D	P1702819-001 (1000mL)	S31-06081702	LH	14	
24	6/22/17 20:08	06221724.D	P1702932-001 (400mL)	S31-06081702	LH	15	
25	6/22/17 20:42	06221725.D	P1702933-001 (400mL)	S31-06081702	LH	16	
26	6/22/17 21:15	06221726.D	P1702934-001 (400mL)	S31-06081702	LH	5	
27	6/22/17 21:49	06221727.D	P1702936-001 (400mL)	S31-06081702	LH	6	
28	6/22/17 22:23	06221728.D	Blank (100mL)	S31-06081702	LH	2	
29	6/22/17 22:57	06221729.D	CCVend R16062217_25ng	S31-06081702/S31-06011703 (6/30)	LH	2	passed
				LH 6/23/17			



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LABORATORY REPORT

August 25, 2017

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1002 N. Eglin Pkwy.
Shalimar, FL 32579

RE: DDMT SVE / 10060131 AC 2.0

Dear Todd:

Enclosed are the results of the sample submitted to our laboratory on August 7, 2017. For your reference, these analyses have been assigned our service request number P1703804.

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 10:20 am, 08/28/17

Kate Kaneko
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: Trinity Analysis & Development Corp.
Project: DDMT SVE / 10060131 AC 2.0

Service Request No: P1703804

CASE NARRATIVE

The sample was received intact under chain of custody on August 7, 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.



2655 Park Center Dr., Suite A
 Simi Valley, CA 93065
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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	T104704413-17-8
Utah DOH (NELAP)	http://health.utah.gov/lab/environmental-lab-certification/	CA01627201 7-8
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: Trinity Analysis & Development Corp.
Project ID: DDMT SVE / 10060131 AC 2.0

Service Request: P1703804

Date Received: 8/7/2017
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-Y7Q2	P1703804-001	Air	8/2/2017	10:10	SC01601	-0.57	3.58

X

Air - Chain of Custody Record & Analytical Service Request

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

[illegible]

ALS Environmental Sample Acceptance Check Form

Client: Trinity Analysis & Development Corp.

Work order: P1703804

Project: DDMT SVE / 10060131 AC 2.0

Sample(s) received on: 8/7/17

Date opened: 8/7/17

by: E.PEREZ

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)? <u>Box Seal</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): _____

RSK - MEEPP, HCL (pH<2); RSK - CO₂, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: Trinity Analysis & Development Corp.

Client Sample ID: ODSVE-EFF-Y7Q2

Client Project ID: DDMT SVE / 10060131 AC 2.0

ALS Project ID: P1703804

ALS Sample ID: P1703804-001

Test Code: EPA TO-15

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

Analyst: Anusha Bayyarapu/Wida Ang

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC01601

Date Collected: 8/2/17

Date Received: 8/7/17

Date Analyzed: 8/9/17

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.57

Final Pressure (psig): 3.58

Container Dilution Factor: 1.29

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	0.31	0.37	0.31	0.10	U
75-71-8	Dichlorodifluoromethane (CFC 12)	0.92	0.13	0.11	0.044	
74-87-3	Chloromethane	0.25	0.31	0.25	0.094	U
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	0.074	0.092	0.074	0.035	U
75-01-4	Vinyl Chloride	0.21	0.25	0.21	0.086	U
106-99-0	1,3-Butadiene	0.25	0.29	0.25	0.13	U
74-83-9	Bromomethane	0.13	0.17	0.13	0.063	U
75-00-3	Chloroethane	0.20	0.24	0.20	0.083	U
64-17-5	Ethanol	1.4	3.4	1.4	0.55	U
75-05-8	Acetonitrile	0.32	0.38	0.32	0.14	U
107-02-8	Acrolein	0.11	1.1	0.24	0.096	J
67-64-1	Acetone	1.1	2.7	1.1	0.42	U
75-69-4	Trichlorofluoromethane	0.26	0.11	0.096	0.039	
67-63-0	2-Propanol (Isopropyl Alcohol)	0.44	2.6	0.44	0.22	U
107-13-1	Acrylonitrile	0.25	0.30	0.25	0.10	U
75-35-4	1,1-Dichloroethene	1.1	0.16	0.14	0.055	
75-09-2	Methylene Chloride	0.16	0.19	0.16	0.063	U
107-05-1	3-Chloro-1-propene (Allyl Chloride)	0.17	0.21	0.17	0.066	U
76-13-1	Trichlorotrifluoroethane	4.2	0.084	0.071	0.029	
75-15-0	Carbon Disulfide	0.17	2.1	0.17	0.062	U
156-60-5	trans-1,2-Dichloroethene	0.34	0.16	0.14	0.062	
75-34-3	1,1-Dichloroethane	0.48	0.16	0.13	0.051	
1634-04-4	Methyl tert-Butyl Ether	0.15	0.18	0.15	0.061	U
108-05-4	Vinyl Acetate	0.77	1.8	0.77	0.24	U
78-93-3	2-Butanone (MEK)	0.20	2.2	0.18	0.092	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: Trinity Analysis & Development Corp.

Client Sample ID: ODSVE-EFF-Y7Q2

Client Project ID: DDMT SVE / 10060131 AC 2.0

ALS Project ID: P1703804

ALS Sample ID: P1703804-001

Test Code: EPA TO-15

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

Analyst: Anusha Bayyarapu/Wida Ang

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC01601

Date Collected: 8/2/17

Date Received: 8/7/17

Date Analyzed: 8/9/17

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.57 Final Pressure (psig): 3.58

Container Dilution Factor: 1.29

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	22	0.16	0.14	0.052	
141-78-6	Ethyl Acetate	0.30	0.36	0.30	0.13	U
110-54-3	n-Hexane	0.71	0.18	0.16	0.055	
67-66-3	Chloroform	4.5	0.13	0.11	0.045	
109-99-9	Tetrahydrofuran (THF)	0.18	0.22	0.18	0.088	U
107-06-2	1,2-Dichloroethane	0.13	0.16	0.13	0.051	U
71-55-6	1,1,1-Trichloroethane	0.37	0.12	0.10	0.040	
71-43-2	Benzene	0.17	0.20	0.17	0.065	U
56-23-5	Carbon Tetrachloride	0.36	0.10	0.086	0.031	
110-82-7	Cyclohexane	0.15	0.37	0.32	0.11	J
78-87-5	1,2-Dichloropropane	0.12	0.14	0.12	0.045	U
75-27-4	Bromodichloromethane	0.16	0.096	0.083	0.029	
79-01-6	Trichloroethene	25	0.12	0.10	0.034	
123-91-1	1,4-Dioxane	0.15	0.18	0.15	0.057	U
80-62-6	Methyl Methacrylate	0.26	0.32	0.26	0.098	U
142-82-5	n-Heptane	0.17	0.16	0.13	0.054	
10061-01-5	cis-1,3-Dichloropropene	0.13	0.14	0.13	0.040	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	0.099	0.12	0.099	0.038	U
108-88-3	Toluene	0.14	0.17	0.14	0.058	U
591-78-6	2-Hexanone	0.13	0.16	0.13	0.050	U
124-48-1	Dibromochloromethane	0.064	0.076	0.064	0.024	U
106-93-4	1,2-Dibromoethane	0.071	0.084	0.071	0.027	U
123-86-4	n-Butyl Acetate	0.12	0.14	0.12	0.043	U

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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 3 of 3

Client: Trinity Analysis & Development Corp.
Client Sample ID: ODSVE-EFF-Y7Q2
Client Project ID: DDMT SVE / 10060131 AC 2.0

ALS Project ID: P1703804
 ALS Sample ID: P1703804-001

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8
Analyst: Anusha Bayyarapu/Wida Ang
Sampling Media: 6.0 L Summa Canister
Test Notes:
Container ID: SC01601

Date Collected: 8/2/17
Date Received: 8/7/17
Date Analyzed: 8/9/17
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.57 **Final Pressure (psig):** 3.58

Container Dilution Factor: 1.29

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	0.12	0.14	0.12	0.050	U
127-18-4	Tetrachloroethene	2.7	0.095	0.080	0.027	
108-90-7	Chlorobenzene	0.12	0.14	0.12	0.045	U
100-41-4	Ethylbenzene	0.12	0.15	0.12	0.048	U
179601-23-1	m,p-Xylenes	0.25	0.30	0.25	0.089	U
75-25-2	Bromoform	0.054	0.062	0.054	0.019	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	0.045	U
111-84-2	n-Nonane	0.10	0.12	0.10	0.037	U
79-34-5	1,1,2,2-Tetrachloroethane	0.54	0.094	0.079	0.028	
98-82-8	Cumene	0.11	0.13	0.11	0.039	U
80-56-8	alpha-Pinene	0.097	0.12	0.097	0.032	U
103-65-1	n-Propylbenzene	0.11	0.13	0.11	0.042	U
622-96-8	4-Ethyltoluene	0.11	0.13	0.11	0.042	U
108-67-8	1,3,5-Trimethylbenzene	0.11	0.13	0.11	0.042	U
95-63-6	1,2,4-Trimethylbenzene	0.11	0.13	0.11	0.039	U
100-44-7	Benzyl Chloride	0.10	0.12	0.10	0.027	U
541-73-1	1,3-Dichlorobenzene	0.090	0.11	0.090	0.032	U
106-46-7	1,4-Dichlorobenzene	0.090	0.11	0.090	0.030	U
95-50-1	1,2-Dichlorobenzene	0.090	0.11	0.090	0.032	U
5989-27-5	d-Limonene	0.093	0.12	0.093	0.032	U
96-12-8	1,2-Dibromo-3-chloropropane	0.056	0.067	0.056	0.013	U
120-82-1	1,2,4-Trichlorobenzene	0.073	0.087	0.073	0.028	U
91-20-3	Naphthalene	0.11	0.12	0.11	0.044	U
87-68-3	Hexachlorobutadiene	0.051	0.060	0.051	0.017	U

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 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: Trinity Analysis & Development Corp.

Client Sample ID: Method Blank

Client Project ID: DDMT SVE / 10060131 AC 2.0

ALS Project ID: P1703804

ALS Sample ID: P170809-MB

Test Code: EPA TO-15

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

Analyst: Anusha Bayyarapu/Wida Ang

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 8/9/17

Volume(s) Analyzed: 1.00 Liter(s)

Container 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)	0.085	0.10	0.085	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)	0.057	0.072	0.057	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	0.25	0.30	0.25	0.11	U
107-02-8	Acrolein	0.18	0.87	0.18	0.074	U
67-64-1	Acetone	0.88	2.1	0.88	0.32	U
75-69-4	Trichlorofluoromethane	0.075	0.089	0.075	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)	0.13	0.16	0.13	0.051	U
76-13-1	Trichlorotrifluoroethane	0.055	0.065	0.055	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	0.60	1.4	0.60	0.18	U
78-93-3	2-Butanone (MEK)	0.14	1.7	0.14	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: Trinity Analysis & Development Corp.

Client Sample ID: Method Blank

Client Project ID: DDMT SVE / 10060131 AC 2.0

ALS Project ID: P1703804

ALS Sample ID: P170809-MB

Test Code: EPA TO-15

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

Analyst: Anusha Bayyarapu/Wida Ang

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 8/9/17

Volume(s) Analyzed: 1.00 Liter(s)

Container 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	0.086	0.10	0.086	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	0.079	0.092	0.079	0.031	U
71-43-2	Benzene	0.13	0.16	0.13	0.050	U
56-23-5	Carbon Tetrachloride	0.067	0.080	0.067	0.024	U
110-82-7	Cyclohexane	0.25	0.29	0.25	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	0.078	0.093	0.078	0.026	U
123-91-1	1,4-Dioxane	0.12	0.14	0.12	0.044	U
80-62-6	Methyl Methacrylate	0.21	0.24	0.21	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	0.10	0.12	0.10	0.039	U
124-48-1	Dibromochloromethane	0.049	0.059	0.049	0.019	U
106-93-4	1,2-Dibromoethane	0.055	0.065	0.055	0.021	U
123-86-4	n-Butyl Acetate	0.091	0.11	0.091	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: Trinity Analysis & Development Corp.
Client Sample ID: Method Blank
Client Project ID: DDMT SVE / 10060131 AC 2.0

ALS Project ID: P1703804
 ALS Sample ID: P170809-MB

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

Date Collected: NA
Date Received: NA
Date Analyzed: 8/9/17
Volume(s) Analyzed: 1.00 Liter(s)

Container Dilution Factor: 1.00

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	0.090	0.11	0.090	0.039	U
127-18-4	Tetrachloroethene	0.062	0.074	0.062	0.021	U
108-90-7	Chlorobenzene	0.091	0.11	0.091	0.035	U
100-41-4	Ethylbenzene	0.097	0.12	0.097	0.037	U
179601-23-1	m,p-Xylenes	0.20	0.23	0.20	0.069	U
75-25-2	Bromoform	0.042	0.048	0.042	0.015	U
100-42-5	Styrene	0.099	0.12	0.099	0.035	U
95-47-6	o-Xylene	0.097	0.12	0.097	0.035	U
111-84-2	n-Nonane	0.080	0.095	0.080	0.029	U
79-34-5	1,1,2,2-Tetrachloroethane	0.061	0.073	0.061	0.022	U
98-82-8	Cumene	0.085	0.10	0.085	0.031	U
80-56-8	alpha-Pinene	0.075	0.090	0.075	0.025	U
103-65-1	n-Propylbenzene	0.088	0.10	0.088	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	0.081	0.097	0.081	0.021	U
541-73-1	1,3-Dichlorobenzene	0.070	0.083	0.070	0.025	U
106-46-7	1,4-Dichlorobenzene	0.070	0.083	0.070	0.023	U
95-50-1	1,2-Dichlorobenzene	0.070	0.083	0.070	0.025	U
5989-27-5	d-Limonene	0.072	0.090	0.072	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	0.082	0.095	0.082	0.034	U
87-68-3	Hexachlorobutadiene	0.039	0.047	0.039	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: Trinity Analysis & Development Corp.
Client Project ID: DDMT SVE / 10060131 AC 2.0

ALS Project ID: P1703804

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

Date(s) Collected: 8/2/17
Date(s) Received: 8/7/17
Date(s) Analyzed: 8/9/17

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	P170809-MB	94	98	114	70-130	
Lab Control Sample	P170809-LCS	92	96	119	70-130	
ODSVE-EFF-Y7Q2	P1703804-001	95	97	113	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: Trinity Analysis & Development Corp.

Client Sample ID: Lab Control Sample

Client Project ID: DDMT SVE / 10060131 AC 2.0

ALS Project ID: P1703804

ALS Sample ID: P170809-LCS

Test Code: EPA TO-15

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

Analyst: Anusha Bayyarapu/Wida Ang

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 8/9/17

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	DOD Acceptance Limits	Data Qualifier
115-07-1	Propene	122	85.6	70	57-136	
75-71-8	Dichlorodifluoromethane (CFC 12)	42.5	31.7	75	59-128	
74-87-3	Chloromethane	102	86.2	85	59-132	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	30.2	24.7	82	63-121	
75-01-4	Vinyl Chloride	82.2	78.1	95	64-127	
106-99-0	1,3-Butadiene	95.0	92.0	97	66-134	
74-83-9	Bromomethane	54.1	51.1	94	63-134	
75-00-3	Chloroethane	79.5	64.4	81	63-127	
64-17-5	Ethanol	563	411	73	59-125	
75-05-8	Acetonitrile	127	86.4	68	63-132	
107-02-8	Acrolein	92.6	74.6	81	62-126	
67-64-1	Acetone	448	363	81	58-128	
75-69-4	Trichlorofluoromethane	37.4	27.8	74	62-126	
67-63-0	2-Propanol (Isopropyl Alcohol)	173	135	78	52-125	
107-13-1	Acrylonitrile	98.0	82.9	85	71-137	
75-35-4	1,1-Dichloroethene	53.6	43.0	80	61-133	
75-09-2	Methylene Chloride	61.2	51.3	84	62-115	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	67.8	56.1	83	71-131	
76-13-1	Trichlorotrifluoroethane	27.6	22.7	82	66-126	
75-15-0	Carbon Disulfide	68.6	55.7	81	57-134	
156-60-5	trans-1,2-Dichloroethene	53.8	43.5	81	67-124	
75-34-3	1,1-Dichloroethane	52.5	40.0	76	68-126	
1634-04-4	Methyl tert-Butyl Ether	59.0	48.0	81	66-126	
108-05-4	Vinyl Acetate	301	286	95	56-139	
78-93-3	2-Butanone (MEK)	72.0	62.3	87	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: Trinity Analysis & Development Corp.

Client Sample ID: Lab Control Sample

Client Project ID: DDMT SVE / 10060131 AC 2.0

ALS Project ID: P1703804

ALS Sample ID: P170809-LCS

Test Code: EPA TO-15

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

Analyst: Anusha Bayyarapu/Wida Ang

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 8/9/17

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	53.4	41.8	78	70-121	
141-78-6	Ethyl Acetate	118	101	86	65-128	
110-54-3	n-Hexane	60.4	44.0	73	63-120	
67-66-3	Chloroform	43.4	33.4	77	68-123	
109-99-9	Tetrahydrofuran (THF)	72.1	57.9	80	64-123	
107-06-2	1,2-Dichloroethane	52.4	39.7	76	65-128	
71-55-6	1,1,1-Trichloroethane	38.8	30.6	79	68-125	
71-43-2	Benzene	66.5	51.9	78	69-119	
56-23-5	Carbon Tetrachloride	33.8	27.2	80	68-132	
110-82-7	Cyclohexane	124	97.9	79	70-117	
78-87-5	1,2-Dichloropropane	45.9	35.8	78	69-123	
75-27-4	Bromodichloromethane	31.9	26.8	84	72-128	
79-01-6	Trichloroethene	39.5	33.3	84	71-123	
123-91-1	1,4-Dioxane	59.1	51.6	87	71-122	
80-62-6	Methyl Methacrylate	104	105	101	70-128	
142-82-5	n-Heptane	51.9	39.9	77	69-123	
10061-01-5	cis-1,3-Dichloropropene	46.3	42.2	91	70-128	
108-10-1	4-Methyl-2-pentanone	51.9	48.0	92	67-130	
10061-02-6	trans-1,3-Dichloropropene	47.0	45.7	97	75-133	
79-00-5	1,1,2-Trichloroethane	38.9	33.4	86	73-119	
108-88-3	Toluene	56.2	42.4	75	66-119	
591-78-6	2-Hexanone	51.9	44.3	85	62-128	
124-48-1	Dibromochloromethane	25.0	21.7	87	70-130	
106-93-4	1,2-Dibromoethane	27.5	24.5	89	74-122	
123-86-4	n-Butyl Acetate	45.4	39.9	88	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: Trinity Analysis & Development Corp.

Client Sample ID: Lab Control Sample

Client Project ID: DDMT SVE / 10060131 AC 2.0

ALS Project ID: P1703804

ALS Sample ID: P170809-LCS

Test Code: EPA TO-15

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

Analyst: Anusha Bayyarapu/Wida Ang

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 8/9/17

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	45.4	33.4	74	69-121	
127-18-4	Tetrachloroethene	31.4	26.6	85	66-124	
108-90-7	Chlorobenzene	46.1	36.6	79	70-119	
100-41-4	Ethylbenzene	48.7	38.9	80	70-124	
179601-23-1	m,p-Xylenes	97.7	77.2	79	61-134	
75-25-2	Bromoform	20.6	19.1	93	66-139	
100-42-5	Styrene	49.8	45.7	92	73-127	
95-47-6	o-Xylene	48.7	38.6	79	67-125	
111-84-2	n-Nonane	40.4	30.7	76	63-128	
79-34-5	1,1,2,2-Tetrachloroethane	30.9	25.6	83	65-127	
98-82-8	Cumene	43.2	34.7	80	68-124	
80-56-8	alpha-Pinene	38.2	31.7	83	66-123	
103-65-1	n-Propylbenzene	43.5	35.9	83	69-123	
622-96-8	4-Ethyltoluene	43.2	38.3	89	67-129	
108-67-8	1,3,5-Trimethylbenzene	43.2	34.8	81	67-130	
95-63-6	1,2,4-Trimethylbenzene	43.2	35.9	83	66-132	
100-44-7	Benzyl Chloride	41.0	42.4	103	50-147	
541-73-1	1,3-Dichlorobenzene	35.2	31.9	91	65-130	
106-46-7	1,4-Dichlorobenzene	35.5	31.9	90	60-131	
95-50-1	1,2-Dichlorobenzene	35.3	30.6	87	63-129	
5989-27-5	d-Limonene	38.1	33.7	88	62-133	
96-12-8	1,2-Dibromo-3-chloropropane	21.9	24.5	112	62-155	
120-82-1	1,2,4-Trichlorobenzene	28.6	28.8	101	55-142	
91-20-3	Naphthalene	40.8	42.3	104	57-138	
87-68-3	Hexachlorobutadiene	19.9	16.5	83	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: Trinity Analysis & Development Corp.
Client Project ID: DDMT SVE / 10060131 AC 2.0

ALS Project ID: P1703804

Method Blank Summary

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

Lab File ID: 08091704.D
Date Analyzed: 8/9/17
Time Analyzed: 05:08

Client Sample ID	ALS Sample ID	Lab File ID	Time Analyzed
Lab Control Sample	P170809-LCS	08091705.D	05:41
ODSVE-EFF-Y7Q2	P1703804-001	08091714.D	11:42

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Trinity Analysis & Development Corp.
Client Project ID: DDMT SVE / 10060131 AC 2.0

ALS Project ID: P1703804

Internal Standard Area and RT Summary

Test Code: EPA TO-15

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

Analyst: Anusha Bayyarapu/Wida Ang

Sampling Media: 6.0 L Summa Canister(s)

Test Notes:

Lab File ID: 08091702.D

Date Analyzed: 8/9/17

Time Analyzed: 04:03

	IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
	AREA	#	RT	#	AREA	#
24 Hour Standard	185740		8.80		833879	10.53
Upper Limit	260036		9.13		1167431	10.86
Lower Limit	111444		8.47		500327	10.20

Client Sample ID		IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
		AREA	#	RT	#	AREA	#
01	Method Blank	171342		8.78		810179	10.52
02	Lab Control Sample	193681		8.80		858925	10.53
03	ODSVE-EFF-Y7Q2	180812		8.78		841102	10.53
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:\MS08\Data\2017 08\09\08091714.D

Acq On : 9 Aug 2017 11:42

Operator: WA/AB

Sample : P1703804-001 (1000mL)

Misc : S31-07131701

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Aug 12 09:26:15 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 12:51:06 2017

Response via : Initial Calibration

8/12/17

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.78	130	180812	12.500	ng	-0.04
37) 1,4-Difluorobenzene (IS2)	10.53	114	841102	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	14.56	82	368428	12.500	ng	-0.01

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.48	65	296423	11.934	ng	-0.03
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.44%
57) Toluene-d8 (SS2)	12.75	98	889937	12.129	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.04%
73) Bromofluorobenzene (SS3)	16.06	174	351282	14.190	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	113.52%

Target Compounds

						Qvalue
2) Propene	0.00	42	0	N.D.	d	
3) Dichlorodifluoromethan...	3.99	85	136368	3.528	ng	99
4) Chloromethane	4.35	50	1593	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	4.37	135	1196	N.D.		
6) Vinyl Chloride	4.51	62	3109	0.168	ng	91
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	5.42	45	2008	0.170	ng	80
11) Acetonitrile	5.68	41	952	N.D.		
12) Acrolein	5.75	56	1922	0.194	ng	79
13) Acetone	0.00	58	0	N.D.	d	
14) Trichlorofluoromethane	6.01	101	42260	1.153	ng	100
15) 2-Propanol (Isopropanol)	0.00	45	0	N.D.	d	
16) Acrylonitrile	0.00	53	0	N.D.	d	
17) 1,1-Dichloroethene	6.65	96	57046	3.303	ng	97
18) 2-Methyl-2-Propanol (t...	6.78	59	4193	N.D.		
19) Methylene Chloride	6.79	84	2222	0.137	ng	99
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.	d	
21) Trichlorotrifluoroethane	7.06	151	452119	24.789	ng	94
22) Carbon Disulfide	0.00	76	0	N.D.	d	
23) trans-1,2-Dichloroethene	7.69	61	25472	1.034	ng	99
24) 1,1-Dichloroethane	7.88	63	45657	1.510	ng	99
25) Methyl tert-Butyl Ether	7.98	73	772	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.	d	
27) 2-Butanone (MEK)	8.27	72	4743	0.456	ng	# 79
28) cis-1,2-Dichloroethene	8.64	61	1627844	67.306	ng	100
29) Diisopropyl Ether	0.00	87	0	N.D.	d	
30) Ethyl Acetate	0.00	61	0	N.D.	d	
31) n-Hexane	8.85	57	45855	1.942	ng	96
32) Chloroform	8.90	83	573637	17.091	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	9.58	62	1415	N.D.		
38) 1,1,1-Trichloroethane	9.81	97	54566	1.570	ng	99
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	10.23	78	5065	N.D.		
42) Carbon Tetrachloride	10.36	117	56011	1.767	ng	99
43) Cyclohexane	10.48	84	11287	0.392	ng	87
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	10.82	63	708	N.D.		
46) Bromodichloromethane	11.11	83	21517	0.836	ng	90
47) Trichloroethene	11.16	130	2201460	105.921	ng	100
48) 1,4-Dioxane	11.16	88	401	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d	

Data File: I:\MS08\Data\2017 08\09\08091714.D

Acq On : 9 Aug 2017 11:42

Operator: WA/AB

Sample : P1703804-001 (1000mL)

Misc : S31-07131701

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Aug 12 09:26:15 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 12:51:06 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.	d	
51) n-Heptane	11.44	71	9195	0.553	ng	97
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	11.99	58	511	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	12.58	97	2062	0.121	ng	96
58) Toluene	12.86	91	2451	N.D.		
59) 2-Hexanone	0.00	43	0	N.D.	d	
60) Dibromochloromethane	13.24	129	618	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	13.60	43	468	N.D.		
63) n-Octane	13.78	57	811	N.D.		
64) Tetrachloroethene	13.93	166	343012	14.421	ng	100
65) Chlorobenzene	14.60	112	909	N.D.		
66) Ethylbenzene	14.99	91	702	N.D.		
67) m- & p-Xylenes	15.15	91	2468	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	0.00	104	0	N.D.		
70) o-Xylene	15.63	91	1939	N.D.		
71) n-Nonane	15.83	43	675	N.D.		
72) 1,1,2,2-Tetrachloroethane	15.60	83	82799	2.874	ng	99
74) Cumene	16.20	105	420	N.D.		
75) alpha-Pinene	16.70	93	406	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.	d	
81) 2-Ethyltoluene	17.25	105	1297	N.D.		
82) 1,2,4-Trimethylbenzene	17.30	105	761	N.D.		
83) n-Decane	17.40	57	735	N.D.		
84) Benzyl Chloride	0.00	91	0	N.D.		
85) 1,3-Dichlorobenzene	17.50	146	586	N.D.		
86) 1,4-Dichlorobenzene	17.50	146	586	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...	18.18	157	854	N.D.		
93) n-Undecane	18.59	57	593	N.D.		
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	19.58	128	1631	N.D.		
96) n-Dodecane	19.57	57	1357	N.D.		
97) Hexachlorobutadiene	19.90	225	628	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.	d	
99) tert-Butylbenzene	17.25	119	5704	N.D.		
100) n-Butylbenzene	18.11	91	1137	N.D.		

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

Data File: I:\MS08\Data\2017 08\09\08091714.D

Acq On : 9 Aug 2017 11:42

Operator: WA/AB

Sample : P1703804-001 (1000mL)

Misc : S31-07131701

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Aug 12 09:26:15 2017

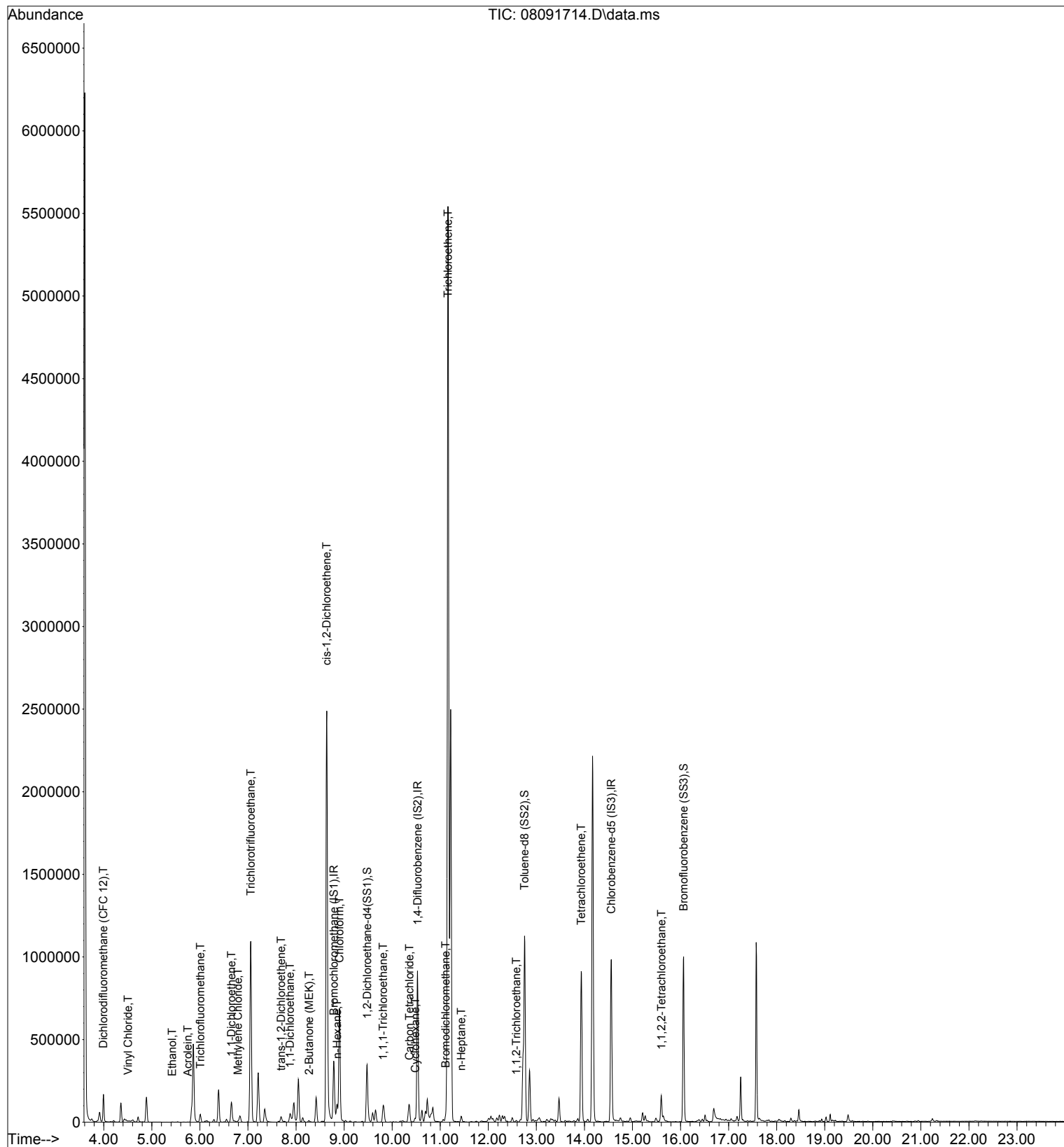
Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 12:51:06 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS08\Data\2017 08\09\08091714.D

Acq On : 9 Aug 2017 11:42

Operator: WA/AB

Sample : P1703804-001 (1000mL)

Misc : S31-07131701

ALS Vial : 2 Sample Multiplier: 1

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Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 12:51:06 2017

Response via : Initial Calibration

107 8/12/17

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.78	130	180812	12.500	ng	-0.04
37) 1,4-Difluorobenzene (IS2)	10.53	114	841102	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	14.56	82	368428	12.500	ng	-0.01

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	9.48	65	296423	11.934	ng	-0.03
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.44%
57) Toluene-d8 (SS2)	12.75	98	889937	12.129	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.04%
73) Bromofluorobenzene (SS3)	16.06	174	351282	14.190	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	113.52%

Target Compounds

						Qvalue
3) Dichlorodifluoromethan...	3.99	85	136368	3.528	ng	99
6) Vinyl Chloride	4.51	62	3109	0.168	ng	91
10) Ethanol	5.42	45	2008	0.170	ng	80
12) Acrolein	5.75	56	1922	0.194	ng	79
14) Trichlorofluoromethane	6.01	101	42260	1.153	ng	100
17) 1,1-Dichloroethene	6.65	96	57046	3.303	ng	97
19) Methylene Chloride	6.79	84	2222	0.137	ng	99
21) Trichlorotrifluoroethane	7.06	151	452119	24.789	ng	94
23) trans-1,2-Dichloroethene	7.69	61	25472	1.034	ng	99
24) 1,1-Dichloroethane	7.88	63	45657	1.510	ng	99
27) 2-Butanone (MEK)	8.27	72	4743	0.456	ng	# 79
28) cis-1,2-Dichloroethene	8.64	61	1627844	67.306	ng	100
31) n-Hexane	8.85	57	45855	1.942	ng	96
32) Chloroform	8.90	83	573637	17.091	ng	99
38) 1,1,1-Trichloroethane	9.81	97	54566	1.570	ng	99
42) Carbon Tetrachloride	10.36	117	56011	1.767	ng	99
43) Cyclohexane	10.48	84	11287	0.392	ng	87
46) Bromodichloromethane	11.11	83	21517	0.836	ng	90
47) Trichloroethene	11.16	130	2201460	105.921	ng	100
51) n-Heptane	11.44	71	9195	0.553	ng	97
55) 1,1,2-Trichloroethane	12.58	97	2062	0.121	ng	96
64) Tetrachloroethene	13.93	166	343012	14.421	ng	100
72) 1,1,2,2-Tetrachloroethane	15.60	83	82799	2.874	ng	99

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

Data File: I:\MS08\Data\2017 08\09\08091714.D

Acq On : 9 Aug 2017 11:42

Operator: WA/AB

Sample : P1703804-001 (1000mL)

Misc : S31-07131701

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Aug 12 09:26:15 2017

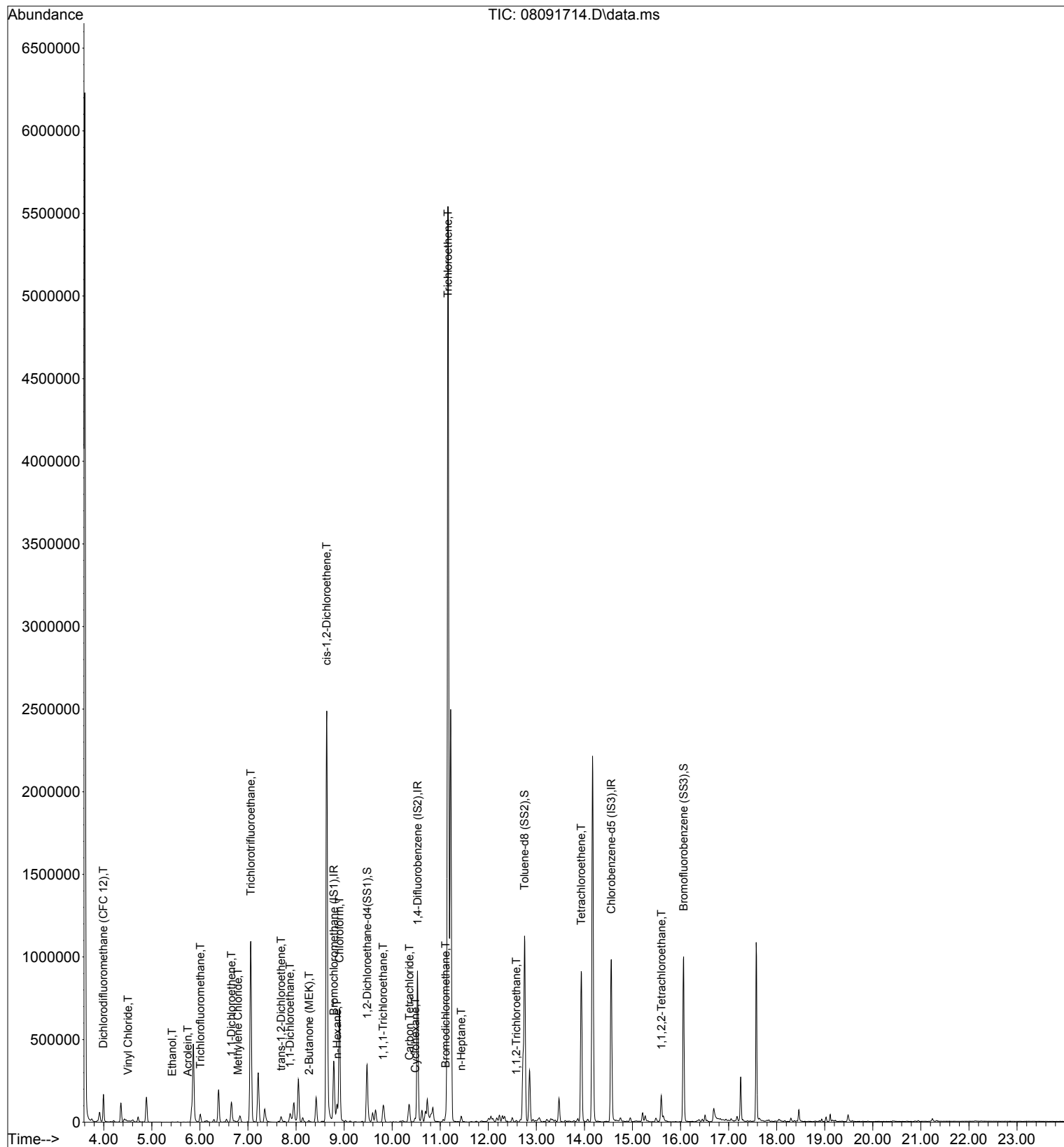
Quant Method : I:\MS08\Methods\R8071417.M

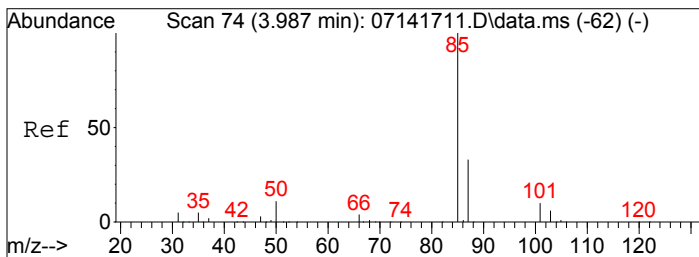
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 14 12:51:06 2017

Response via : Initial Calibration

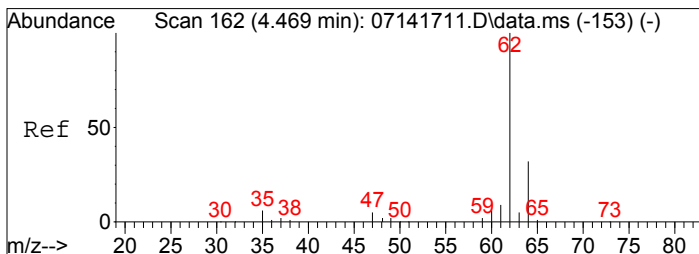
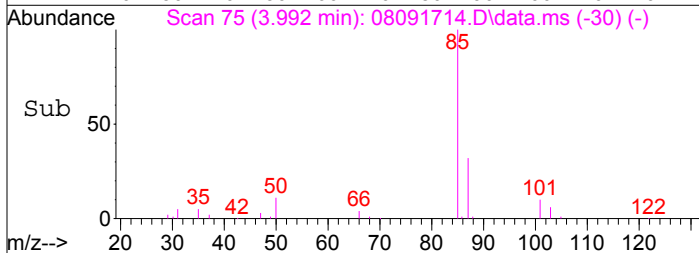
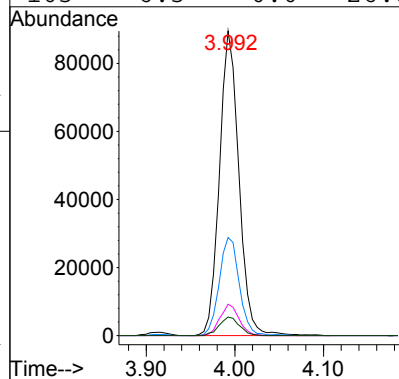
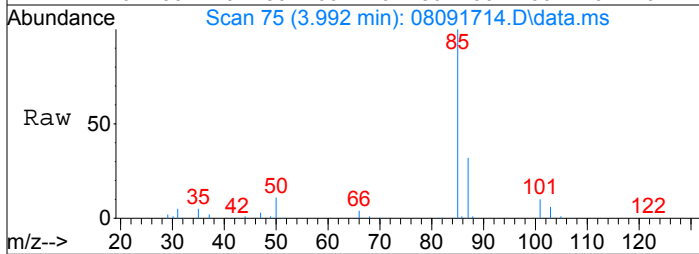
DataAcq Meth:TO15.M





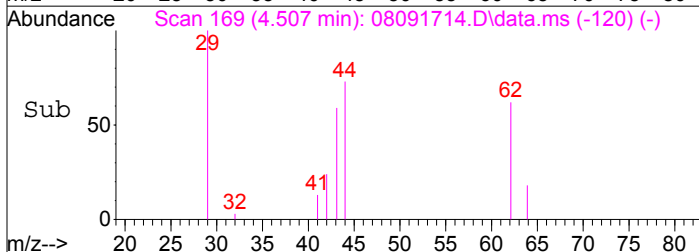
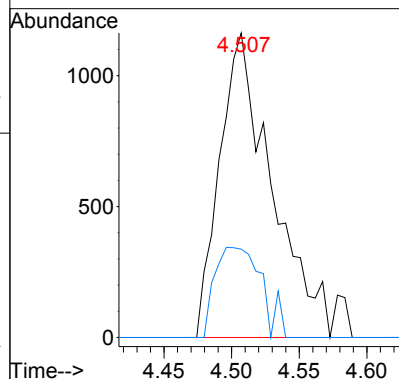
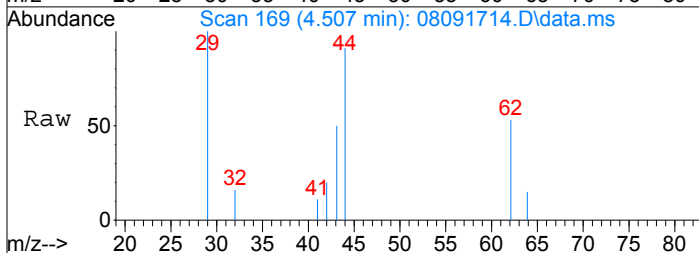
#3
 Dichlorodifluoromethane (CFC 12)
 Concen: 3.53 ng
 RT: 3.99 min Scan# 75
 Delta R.T. -0.006 min
 Lab File: 08091714.D
 Acq: 9 Aug 2017 11:42

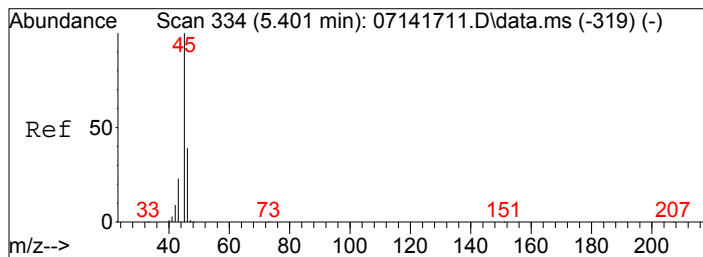
Tgt Ion: 85 Resp: 136368
 Ion Ratio Lower Upper
 85 100
 87 33.3 12.5 52.5
 101 10.1 0.0 30.5
 103 6.3 0.0 26.8



#6
 Vinyl Chloride
 Concen: 0.17 ng
 RT: 4.51 min Scan# 169
 Delta R.T. 0.016 min
 Lab File: 08091714.D
 Acq: 9 Aug 2017 11:42

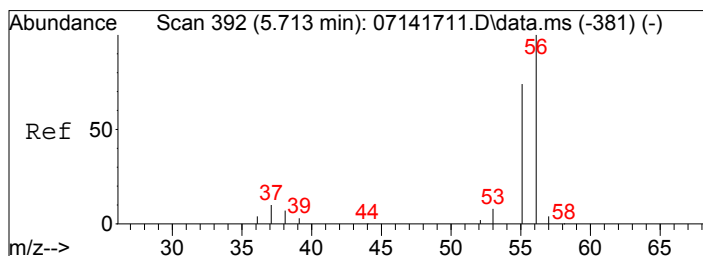
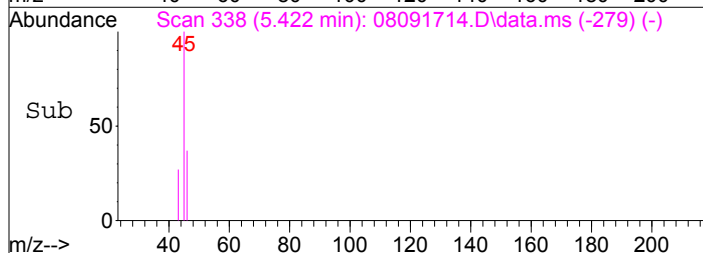
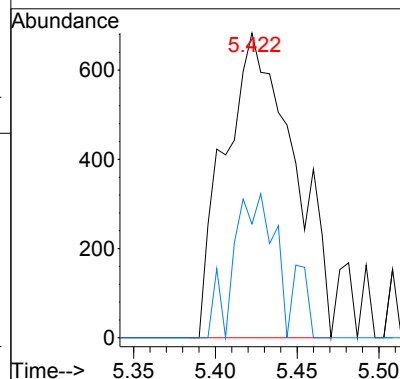
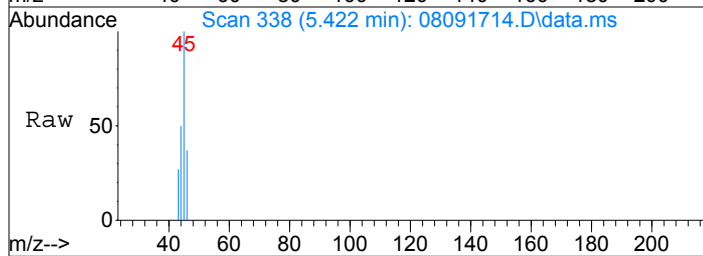
Tgt Ion: 62 Resp: 3109
 Ion Ratio Lower Upper
 62 100
 64 26.5 11.2 51.2





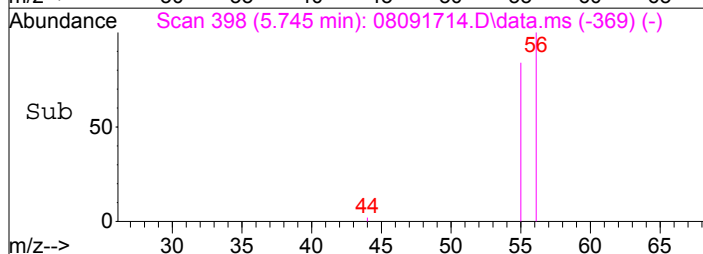
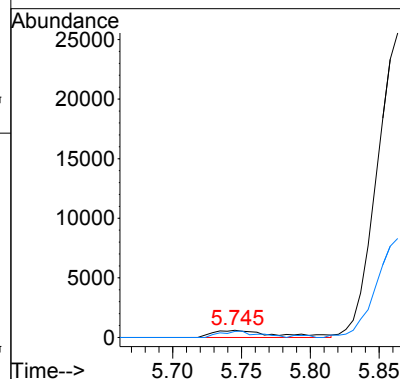
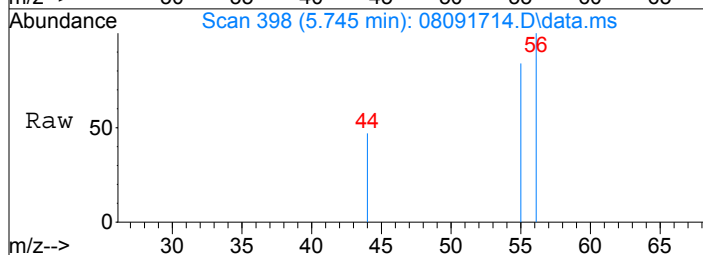
#10
Ethanol
Concen: 0.17 ng
RT: 5.42 min Scan# 338
Delta R.T. -0.033 min
Lab File: 08091714.D
Acq: 9 Aug 2017 11:42

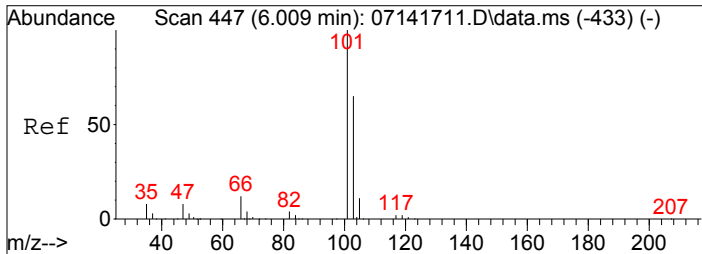
Tgt Ion: 45 Resp: 2008
Ion Ratio Lower Upper
45 100
46 27.6 20.3 60.3



#12
Acrolein
Concen: 0.19 ng
RT: 5.75 min Scan# 398
Delta R.T. 0.005 min
Lab File: 08091714.D
Acq: 9 Aug 2017 11:42

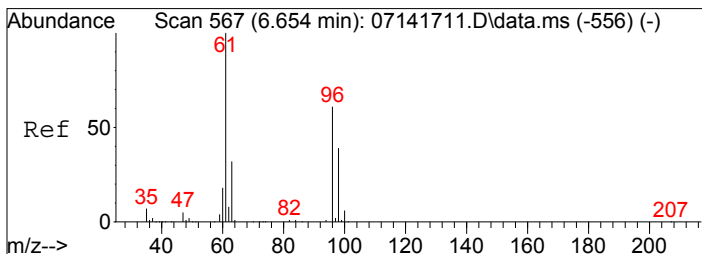
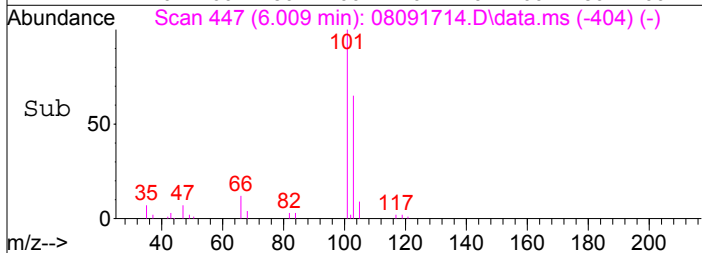
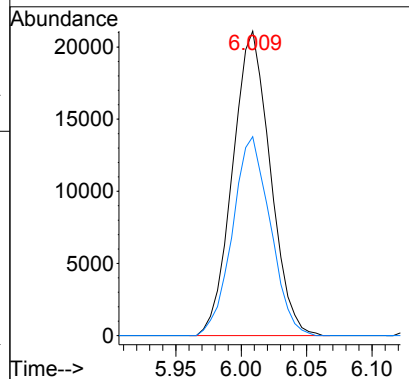
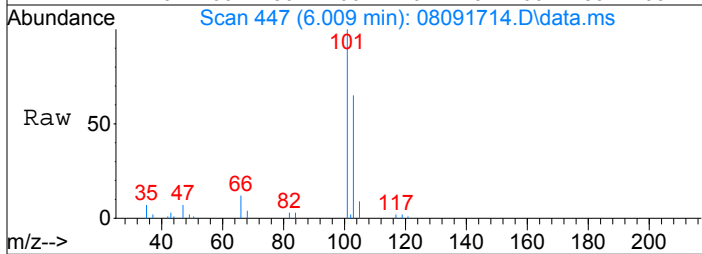
Tgt Ion: 56 Resp: 1922
Ion Ratio Lower Upper
56 100
55 52.8 49.9 89.9





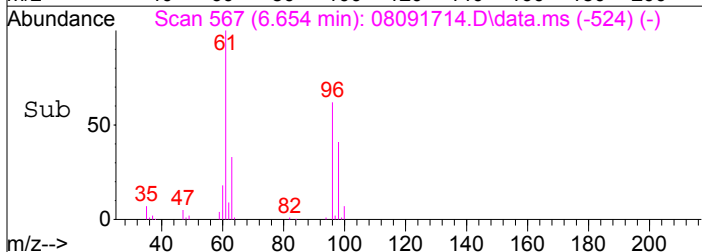
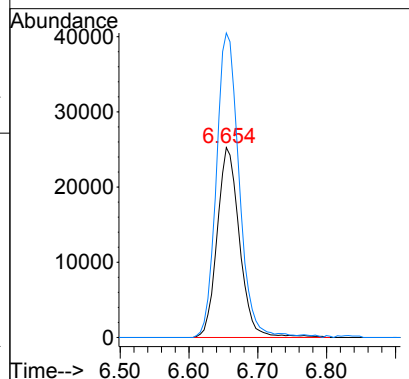
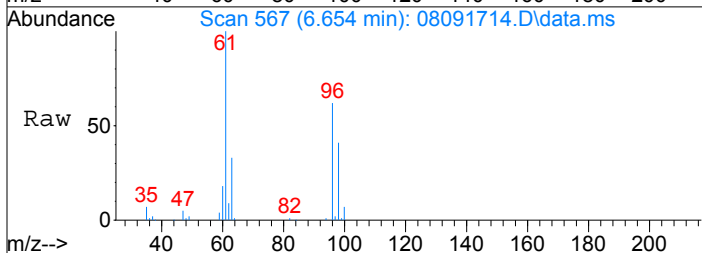
#14
 Trichlorofluoromethane
 Concen: 1.15 ng
 RT: 6.01 min Scan# 447
 Delta R.T. -0.016 min
 Lab File: 08091714.D
 Acq: 9 Aug 2017 11:42

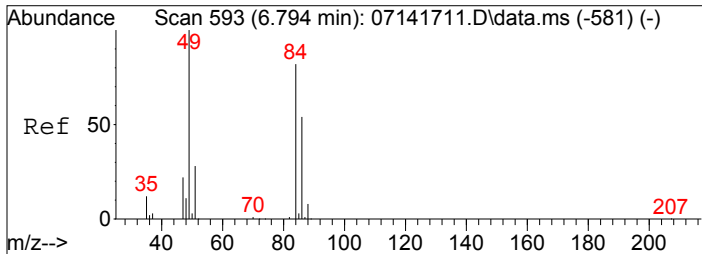
Tgt Ion: 101 Resp: 42260
 Ion Ratio Lower Upper
 101 100
 103 65.5 45.2 85.2



#17
 1,1-Dichloroethene
 Concen: 3.30 ng
 RT: 6.65 min Scan# 567
 Delta R.T. -0.016 min
 Lab File: 08091714.D
 Acq: 9 Aug 2017 11:42

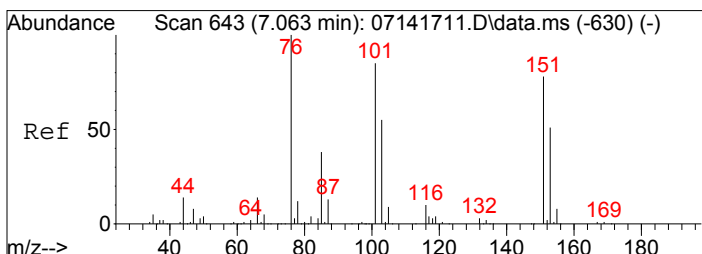
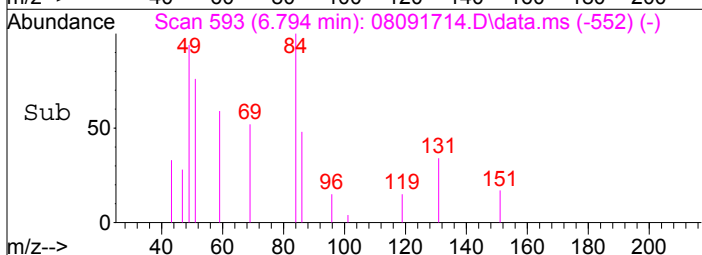
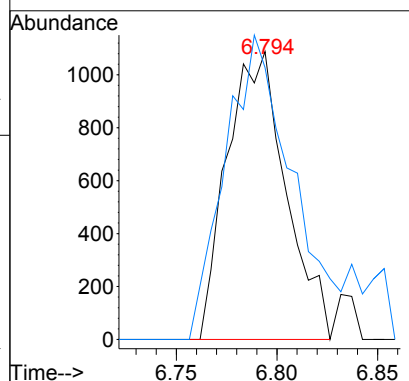
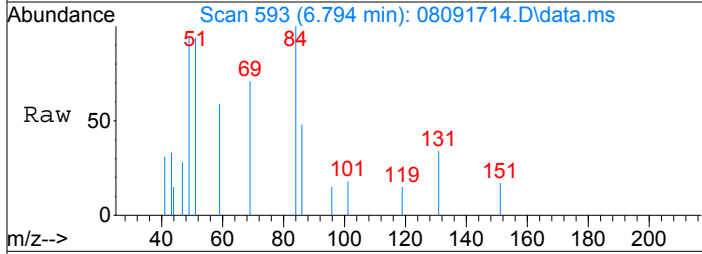
Tgt Ion: 96 Resp: 57046
 Ion Ratio Lower Upper
 96 100
 61 162.8 139.4 179.4





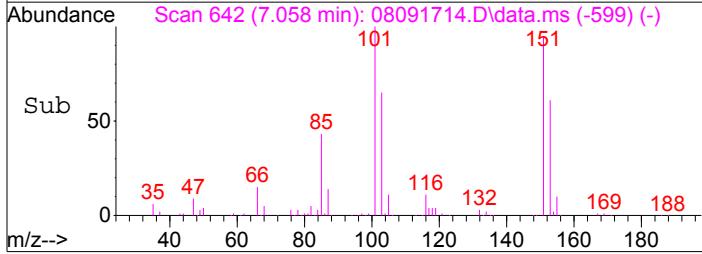
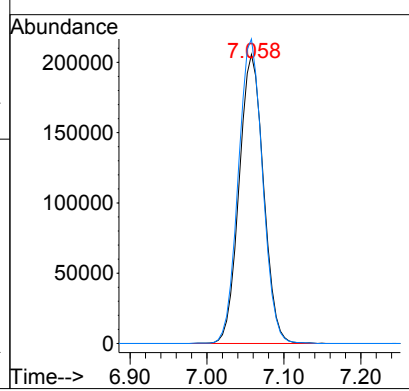
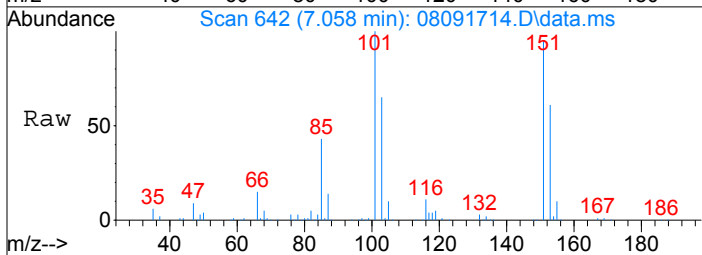
#19
Methylene Chloride
Concen: 0.14 ng
RT: 6.79 min Scan# 593
Delta R.T. -0.027 min
Lab File: 08091714.D
Acq: 9 Aug 2017 11:42

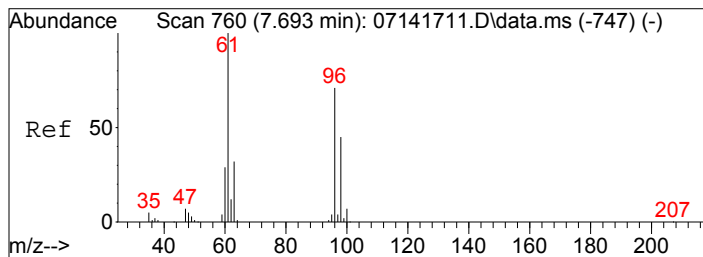
Tgt Ion: 84	Resp: 2222
Ion Ratio	Lower Upper
84	100
49	120.2 96.4 146.4



#21
Trichlorotrifluoroethane
Concen: 24.79 ng
RT: 7.06 min Scan# 642
Delta R.T. -0.016 min
Lab File: 08091714.D
Acq: 9 Aug 2017 11:42

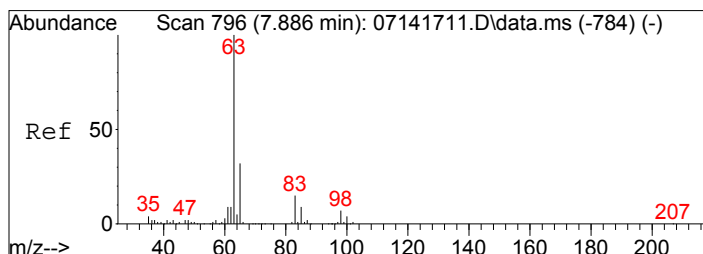
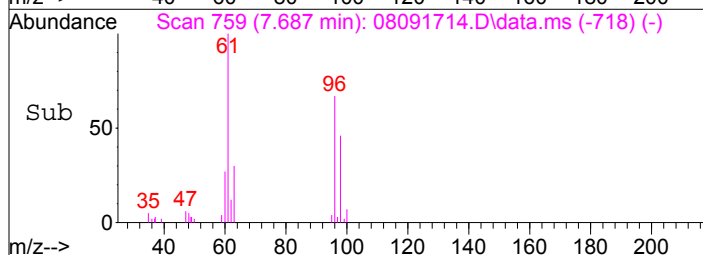
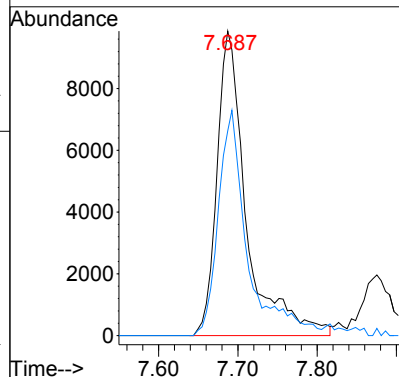
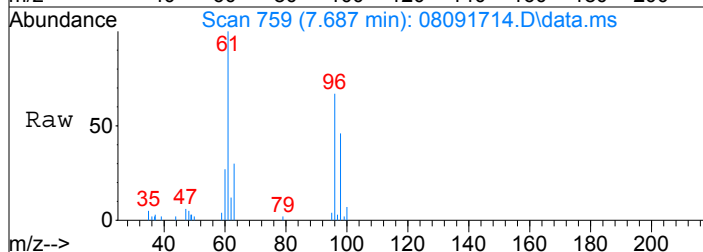
Tgt Ion: 151	Resp: 452119
Ion Ratio	Lower Upper
151	100
101	105.0 90.9 130.9





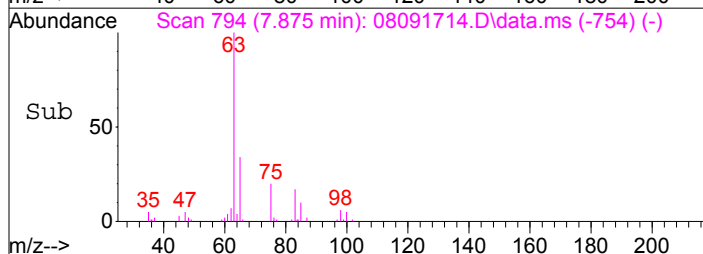
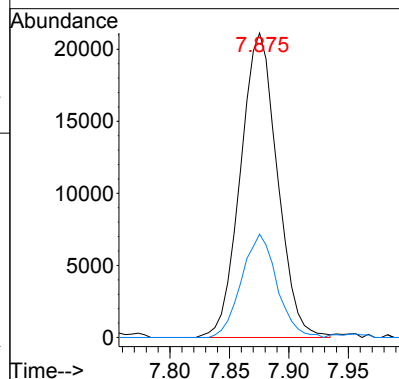
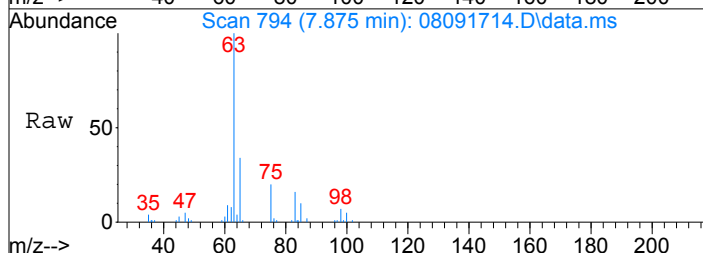
#23
trans-1,2-Dichloroethene
Concen: 1.03 ng
RT: 7.69 min Scan# 759
Delta R.T. -0.027 min
Lab File: 08091714.D
Acq: 9 Aug 2017 11:42

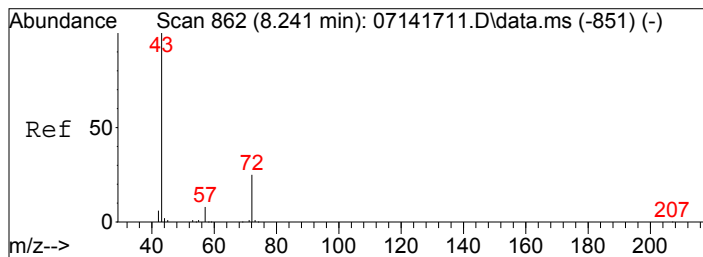
Tgt Ion: 61 Resp: 25472
Ion Ratio Lower Upper
61 100
96 72.6 53.5 93.5



#24
1,1-Dichloroethane
Concen: 1.51 ng
RT: 7.88 min Scan# 794
Delta R.T. -0.033 min
Lab File: 08091714.D
Acq: 9 Aug 2017 11:42

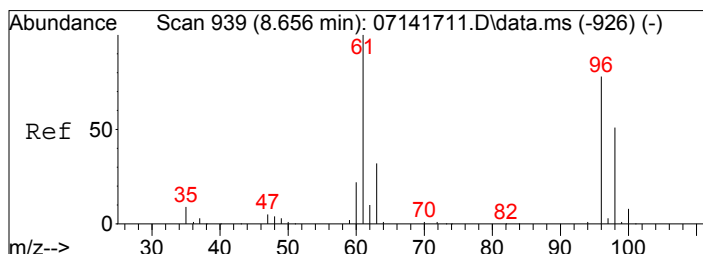
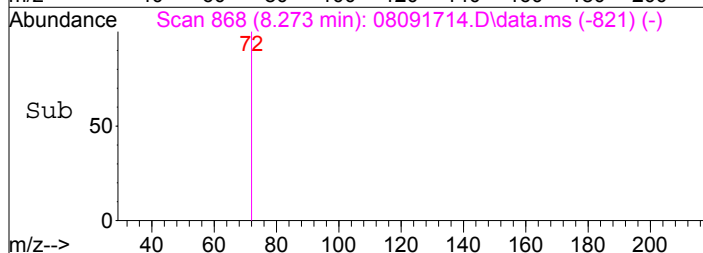
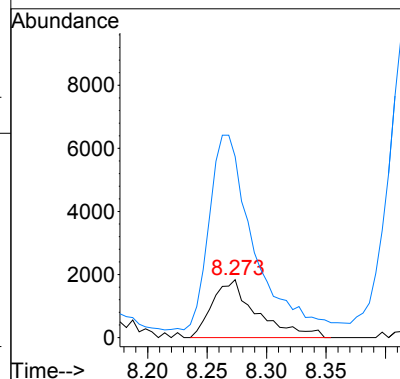
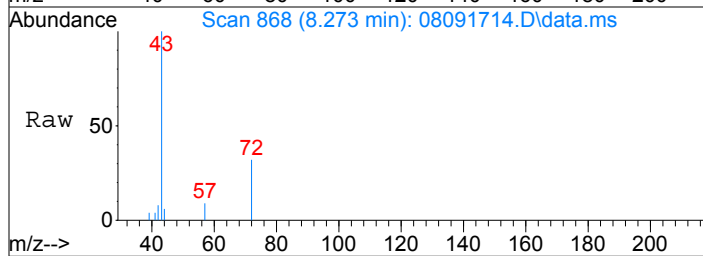
Tgt Ion: 63 Resp: 45657
Ion Ratio Lower Upper
63 100
65 32.5 11.9 51.9





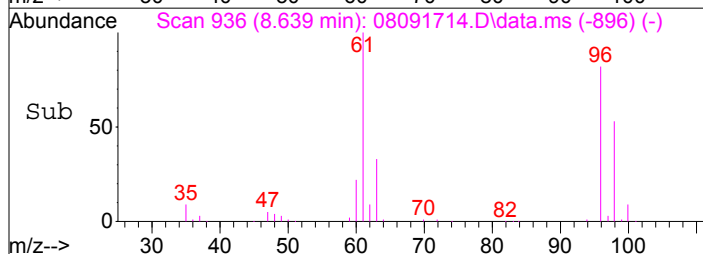
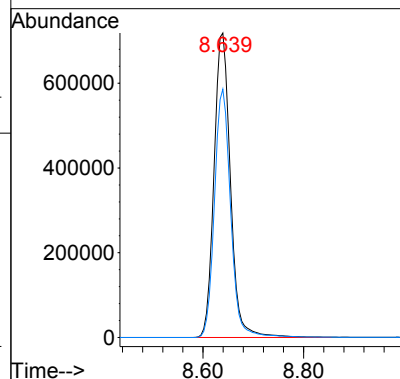
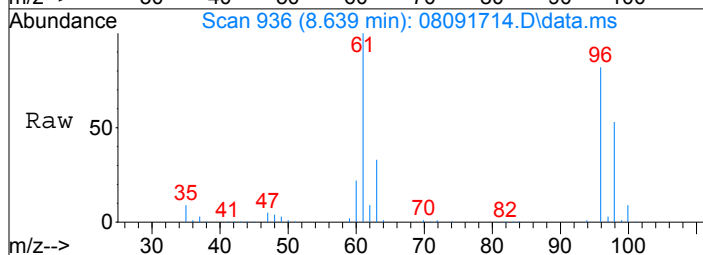
#27
2-Butanone (MEK)
Concen: 0.46 ng
RT: 8.27 min Scan# 868
Delta R.T. 0.005 min
Lab File: 08091714.D
Acq: 9 Aug 2017 11:42

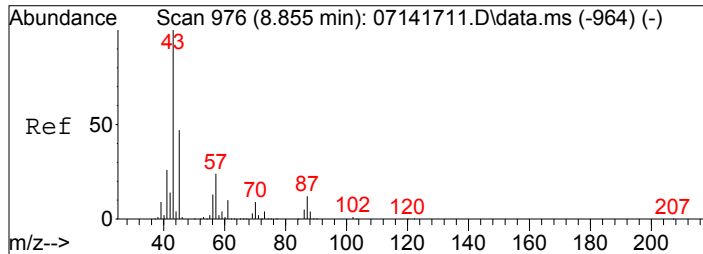
Tgt Ion: 72 Resp: 4743
Ion Ratio Lower Upper
72 100
43 334.4 362.5 402.5#



#28
cis-1,2-Dichloroethene
Concen: 67.31 ng
RT: 8.64 min Scan# 936
Delta R.T. -0.033 min
Lab File: 08091714.D
Acq: 9 Aug 2017 11:42

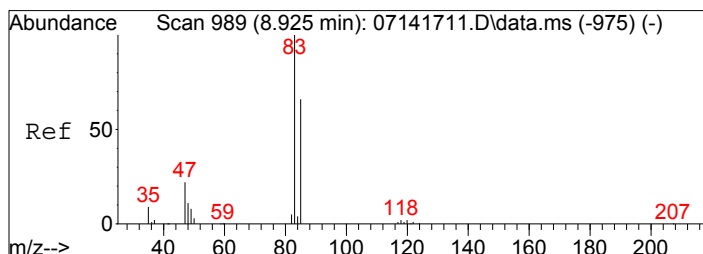
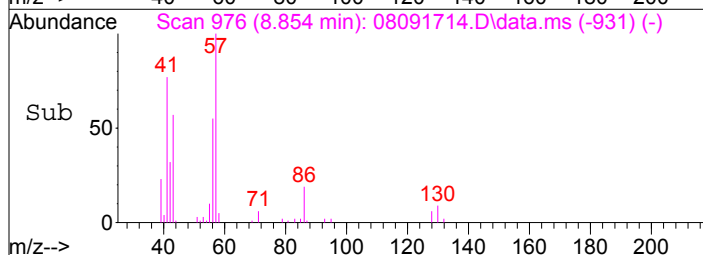
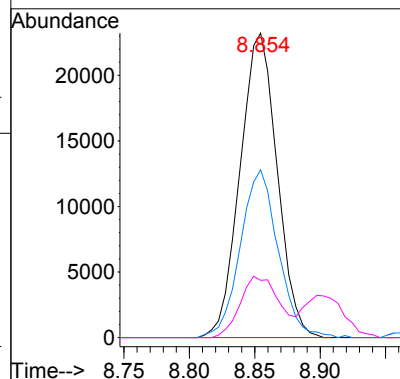
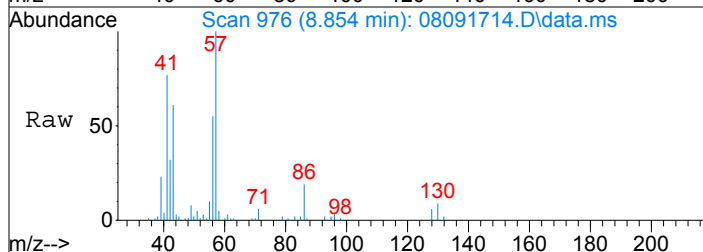
Tgt Ion: 61 Resp: 1627844
Ion Ratio Lower Upper
61 100
96 80.6 60.4 100.4





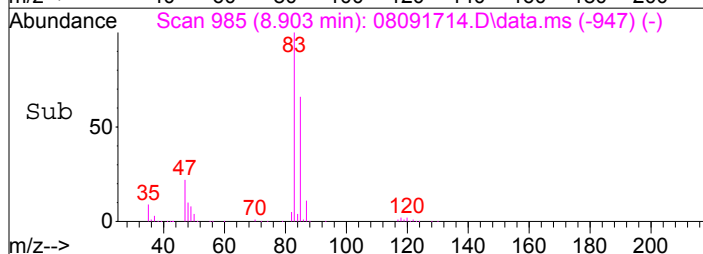
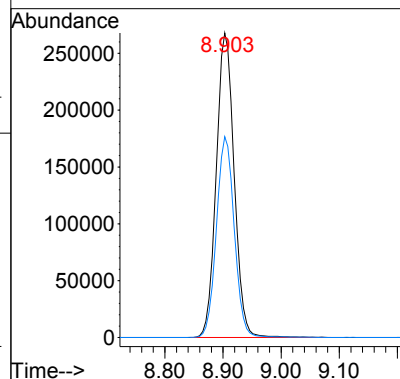
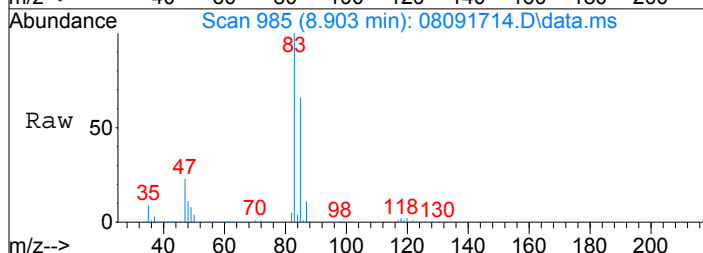
#31
n-Hexane
Concen: 1.94 ng
RT: 8.85 min Scan# 976
Delta R.T. -0.011 min
Lab File: 08091714.D
Acq: 9 Aug 2017 11:42

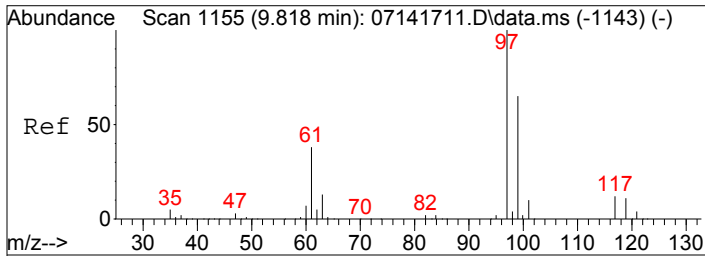
Tgt Ion: 57 Resp: 45855
Ion Ratio Lower Upper
57 100
56 56.3 42.8 64.2
86 21.7 15.9 23.9



#32
Chloroform
Concen: 17.09 ng
RT: 8.90 min Scan# 985
Delta R.T. -0.043 min
Lab File: 08091714.D
Acq: 9 Aug 2017 11:42

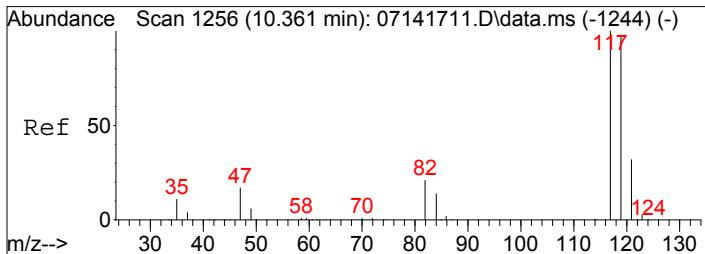
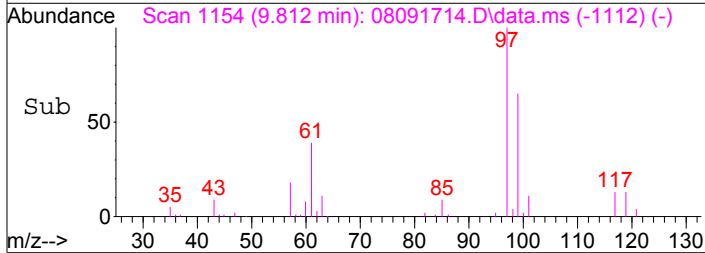
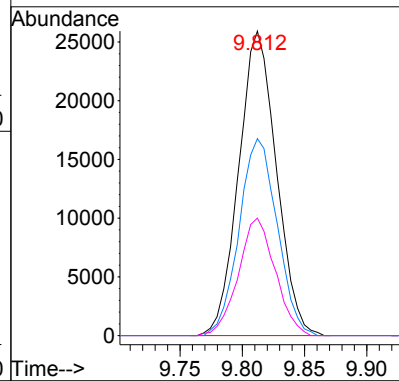
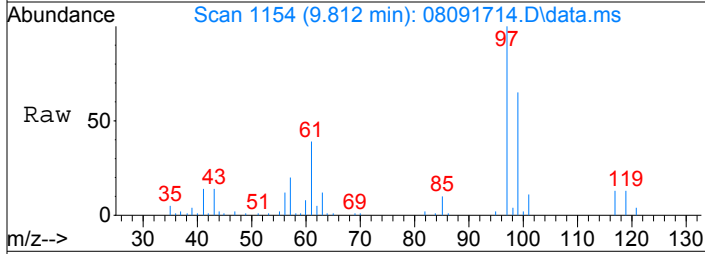
Tgt Ion: 83 Resp: 573637
Ion Ratio Lower Upper
83 100
85 65.9 45.4 85.4





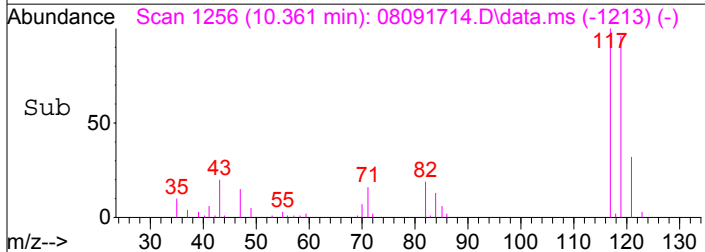
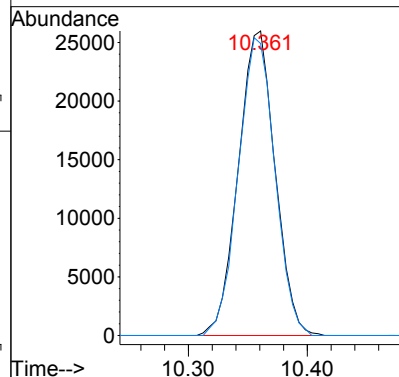
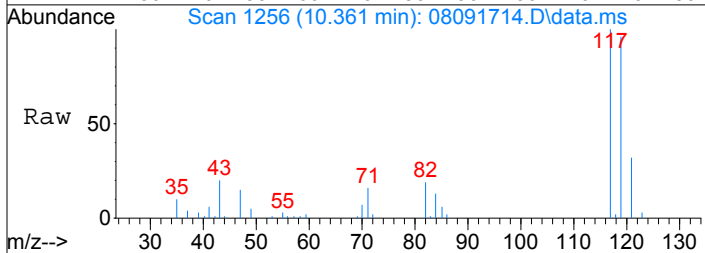
#38
 1,1,1-Trichloroethane
 Concen: 1.57 ng
 RT: 9.81 min Scan# 1154
 Delta R.T. -0.022 min
 Lab File: 08091714.D
 Acq: 9 Aug 2017 11:42

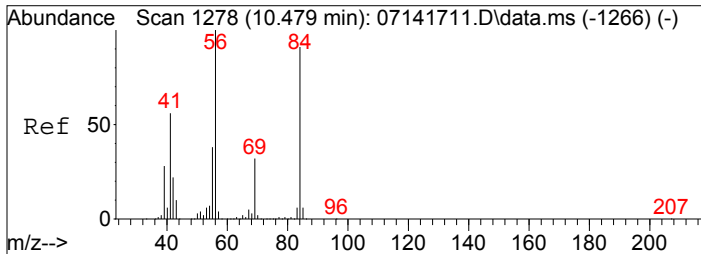
Tgt Ion: 97 Resp: 54566
 Ion Ratio Lower Upper
 97 100
 99 65.4 45.0 85.0
 61 37.7 18.8 58.8



#42
 Carbon Tetrachloride
 Concen: 1.77 ng
 RT: 10.36 min Scan# 1256
 Delta R.T. -0.016 min
 Lab File: 08091714.D
 Acq: 9 Aug 2017 11:42

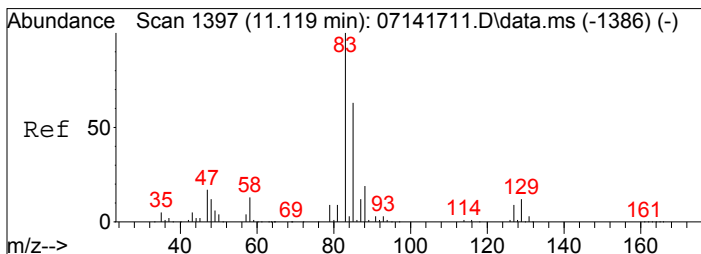
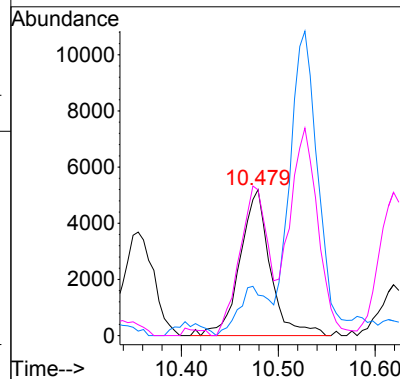
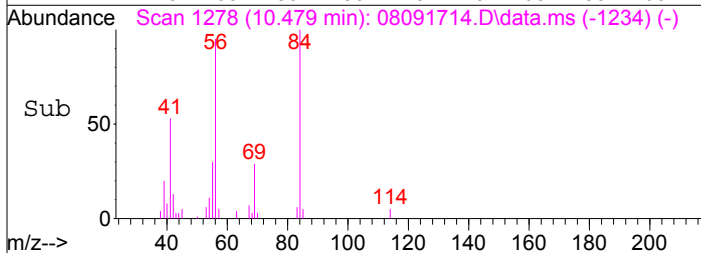
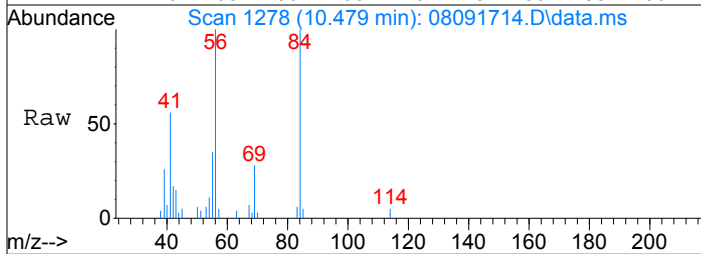
Tgt Ion: 117 Resp: 56011
 Ion Ratio Lower Upper
 117 100
 119 97.2 76.2 116.2





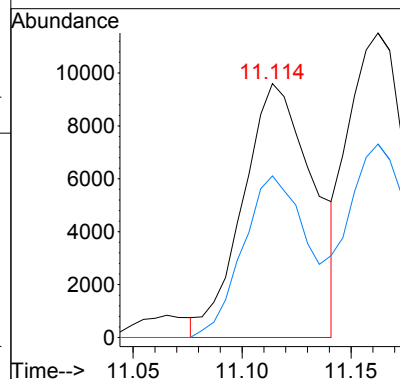
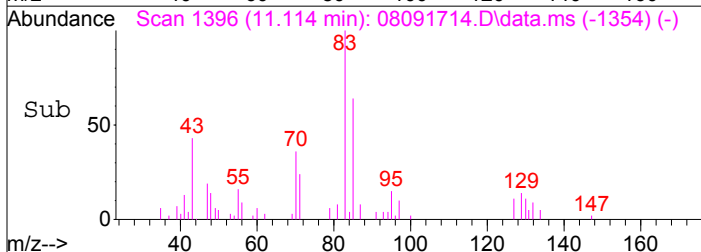
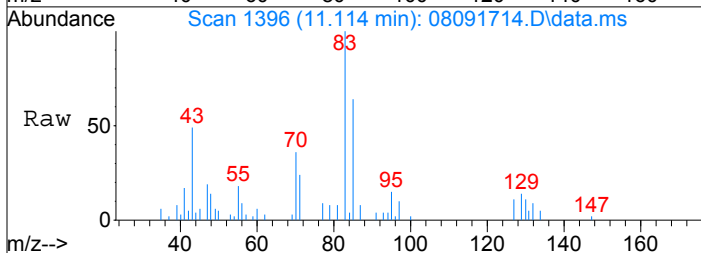
#43
Cyclohexane
Concen: 0.39 ng
RT: 10.48 min Scan# 1278
Delta R.T. -0.011 min
Lab File: 08091714.D
Acq: 9 Aug 2017 11:42

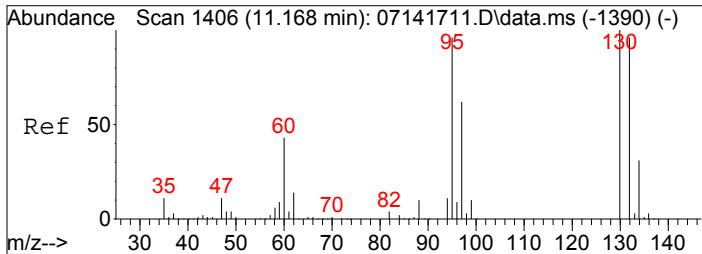
Tgt Ion: 84 Resp: 11287
Ion Ratio Lower Upper
84 100
69 33.4 14.9 54.9
56 93.9 91.9 131.9



#46
Bromodichloromethane
Concen: 0.84 ng
RT: 11.11 min Scan# 1396
Delta R.T. -0.022 min
Lab File: 08091714.D
Acq: 9 Aug 2017 11:42

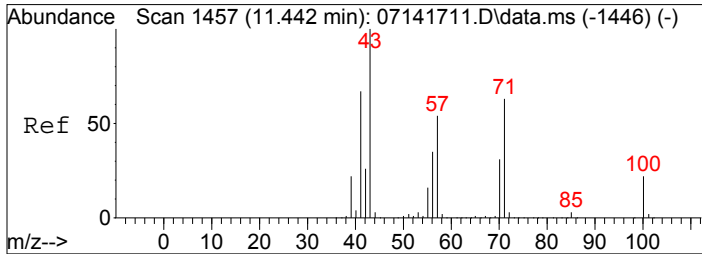
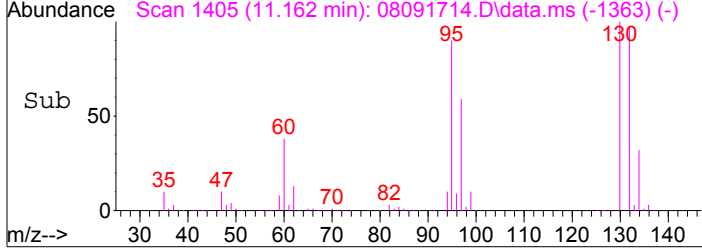
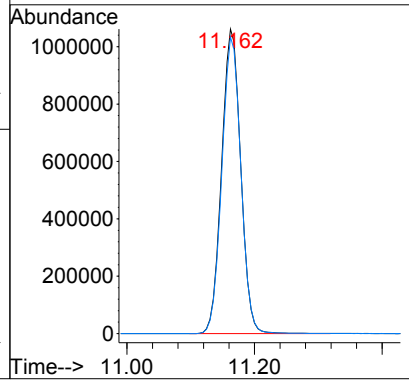
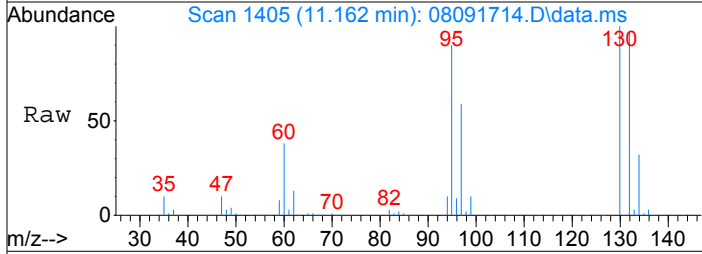
Tgt Ion: 83 Resp: 21517
Ion Ratio Lower Upper
83 100
85 56.7 44.4 84.4





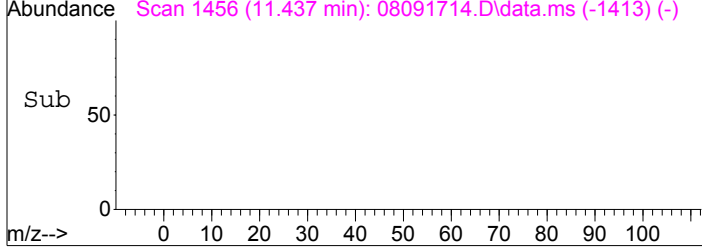
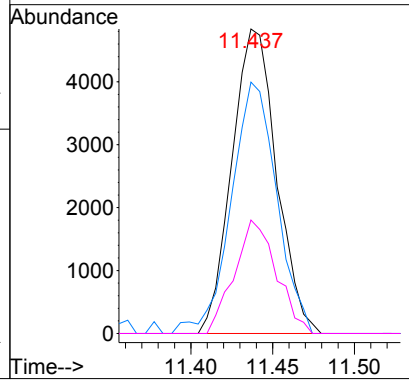
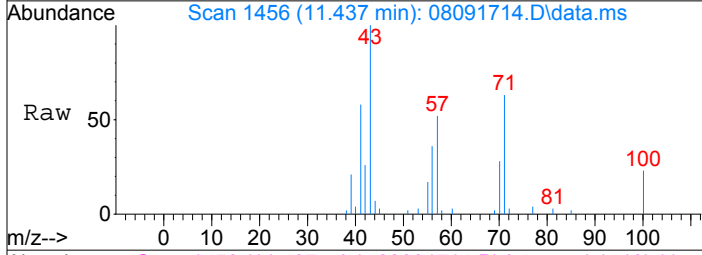
#47
 Trichloroethene
 Concen: 105.92 ng
 RT: 11.16 min Scan# 1405
 Delta R.T. -0.022 min
 Lab File: 08091714.D
 Acq: 9 Aug 2017 11:42

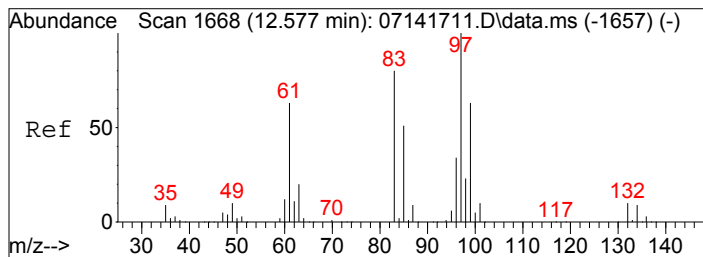
Tgt Ion: 130 Resp: 2201460
 Ion Ratio Lower Upper
 130 100
 132 97.1 76.7 116.7



#51
 n-Heptane
 Concen: 0.55 ng
 RT: 11.44 min Scan# 1456
 Delta R.T. -0.016 min
 Lab File: 08091714.D
 Acq: 9 Aug 2017 11:42

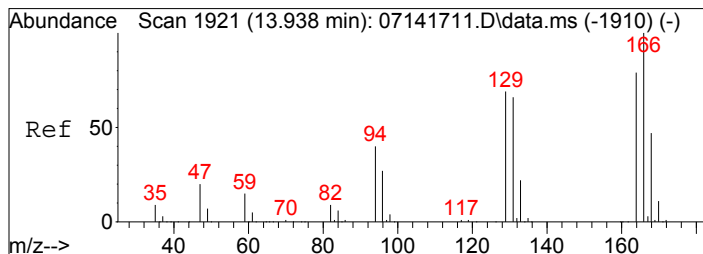
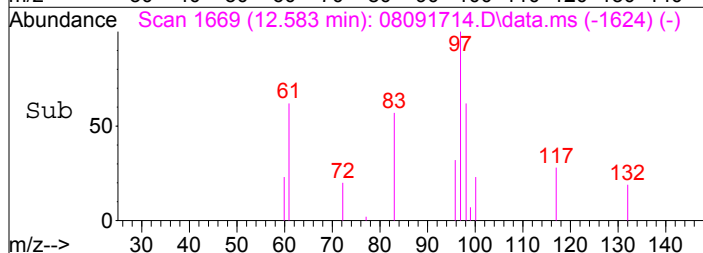
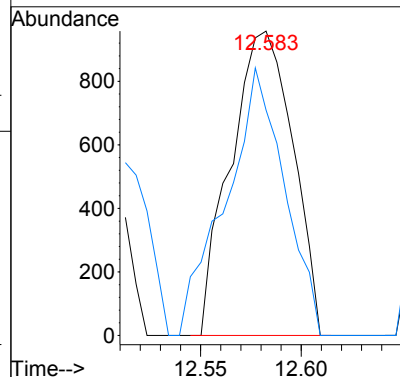
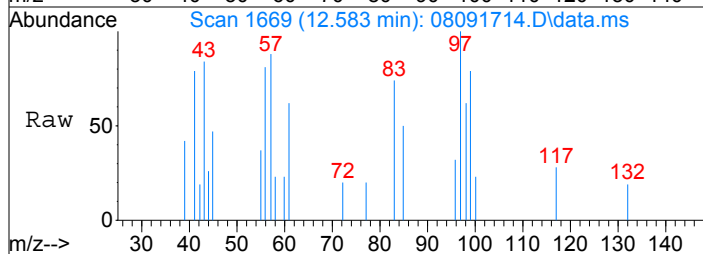
Tgt Ion: 71 Resp: 9195
 Ion Ratio Lower Upper
 71 100
 57 84.1 67.8 107.8
 100 35.1 16.1 56.1





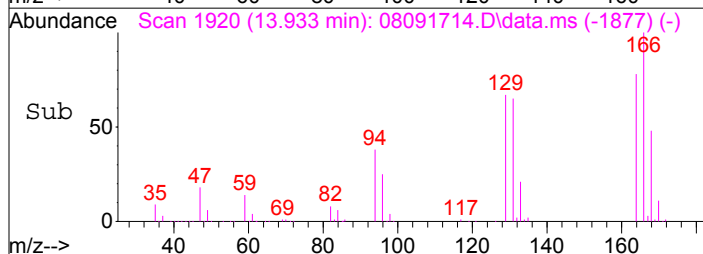
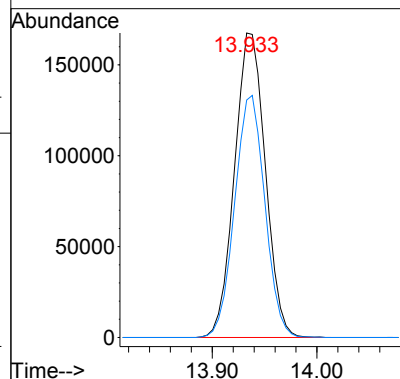
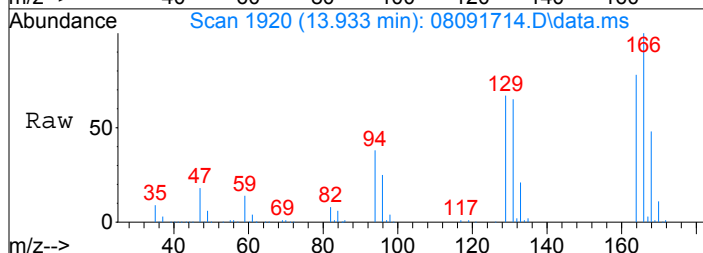
#55
1,1,2-Trichloroethane
Concen: 0.12 ng
RT: 12.58 min Scan# 1669
Delta R.T. -0.010 min
Lab File: 08091714.D
Acq: 9 Aug 2017 11:42

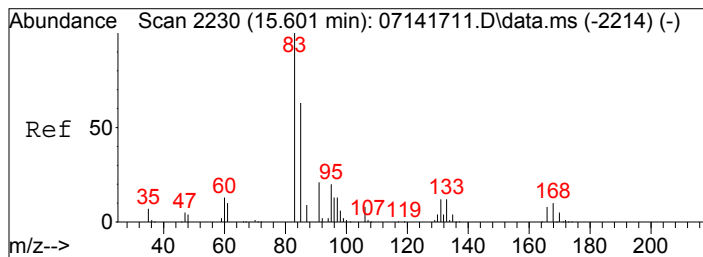
Tgt Ion: 97 Resp: 2062
Ion Ratio Lower Upper
97 100
83 82.9 59.2 99.2



#64
Tetrachloroethene
Concen: 14.42 ng
RT: 13.93 min Scan# 1920
Delta R.T. -0.016 min
Lab File: 08091714.D
Acq: 9 Aug 2017 11:42

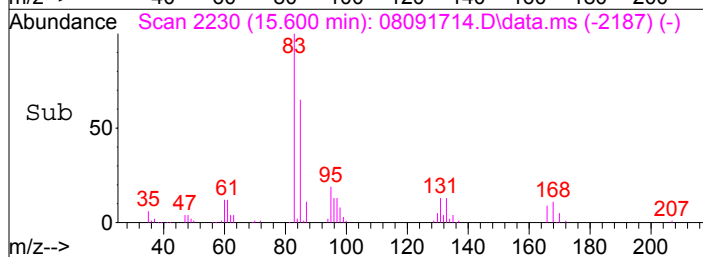
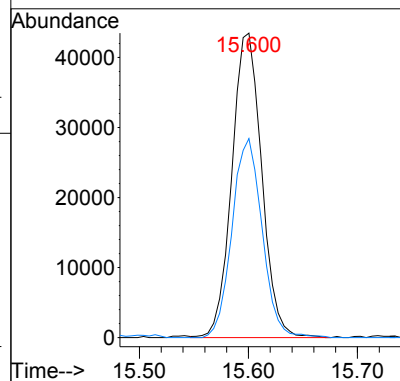
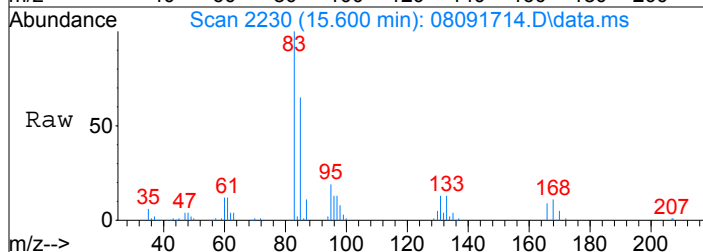
Tgt Ion: 166 Resp: 343012
Ion Ratio Lower Upper
166 100
164 78.0 58.4 98.4





#72
 1,1,2,2-Tetrachloroethane
 Concen: 2.87 ng
 RT: 15.60 min Scan# 2230
 Delta R.T. -0.016 min
 Lab File: 08091714.D
 Acq: 9 Aug 2017 11:42

Tgt Ion: 83 Resp: 82799
 Ion Ratio Lower Upper
 83 100
 85 65.9 45.1 85.1



Data File: I:\MS08\Data\2017 08\09\08091704.D

Acq On : 9 Aug 2017 5:08

Operator: WA/AB

Sample : MB R8080917 1000mL

Misc : S31-07131701 AS00703

ALS Vial : 1 Sample Multiplier: 1

Quant Time: Aug 09 08:20:51 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 12:51:06 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

WA 8/9/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.78	130	171342	12.500	ng	-0.04
37) 1,4-Difluorobenzene (IS2)	10.52	114	810179	12.500	ng	-0.03
56) Chlorobenzene-d5 (IS3)	14.56	82	355008	12.500	ng	-0.01

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.47	65	278322	11.824	ng	-0.03
Spiked Amount	12.500	Range	70 - 130	Recovery	=	94.56%
57) Toluene-d8 (SS2)	12.75	98	858267	12.139	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.12%
73) Bromofluorobenzene (SS3)	16.06	174	339134	14.217	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	113.76%

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	5.44	45	765	N.D.		
11) Acetonitrile	5.66	41	52	N.D.		
12) Acrolein	0.00	56	0	N.D.		
13) Acetone	5.93	58	1304	0.122	ng	# 43
14) Trichlorofluoromethane	0.00	101	0	N.D.		
15) 2-Propanol (Isopropanol)	6.21	45	631	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...	6.80	59	172	N.D.		
19) Methylene Chloride	6.82	84	685	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	0.00	76	0	N.D.	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.		
41) Benzene	10.22	78	1170	N.D.		
42) Carbon Tetrachloride	0.00	117	0	N.D.		
43) Cyclohexane	10.47	84	405	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...	11.21	57	640	N.D.		

Data File: I:\MS08\Data\2017 08\09\08091704.D

Acq On : 9 Aug 2017 5:08

Operator: WA/AB

Sample : MB R8080917 1000mL

Misc : S31-07131701 AS00703

ALS Vial : 1 Sample Multiplier: 1

Quant Time: Aug 09 08:20:51 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 12:51:06 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	12.86	91	1240	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	14.59	112	692	N.D.		
66) Ethylbenzene	14.99	91	1052	N.D.		
67) m- & p-Xylenes	15.18	91	680	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	0.00	104	0	N.D.		
70) o-Xylene	15.64	91	560	N.D.		
71) n-Nonane	15.83	43	838	N.D.		
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.		
74) Cumene	16.21	105	1125	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	16.72	91	916	N.D.		
77) 3-Ethyltoluene	16.81	105	642	N.D.		
78) 4-Ethyltoluene	16.81	105	642	N.D.		
79) 1,3,5-Trimethylbenzene	16.92	105	1092	N.D.		
80) alpha-Methylstyrene	0.00	118	0	N.D.		
81) 2-Ethyltoluene	17.11	105	804	N.D.		
82) 1,2,4-Trimethylbenzene	17.33	105	560	N.D.		
83) n-Decane	0.00	57	0	N.D.		
84) Benzyl Chloride	17.29	91	450	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	17.57	105	778	N.D.		
88) 4-Isopropyltoluene (p-...	17.73	119	826	N.D.		
89) 1,2,3-Trimethylbenzene	17.73	105	496	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	19.65	128	784	N.D.		
96) n-Dodecane	0.00	57	0	N.D.		
97) Hexachlorobutadiene	19.90	225	737	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.		
99) tert-Butylbenzene	17.29	119	694	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\2017 08\09\08091704.D

Acq On : 9 Aug 2017 5:08

Operator: WA/AB

Sample : MB R8080917 1000mL

Misc : S31-07131701 AS00703

ALS Vial : 1 Sample Multiplier: 1

Quant Time: Aug 09 08:20:51 2017

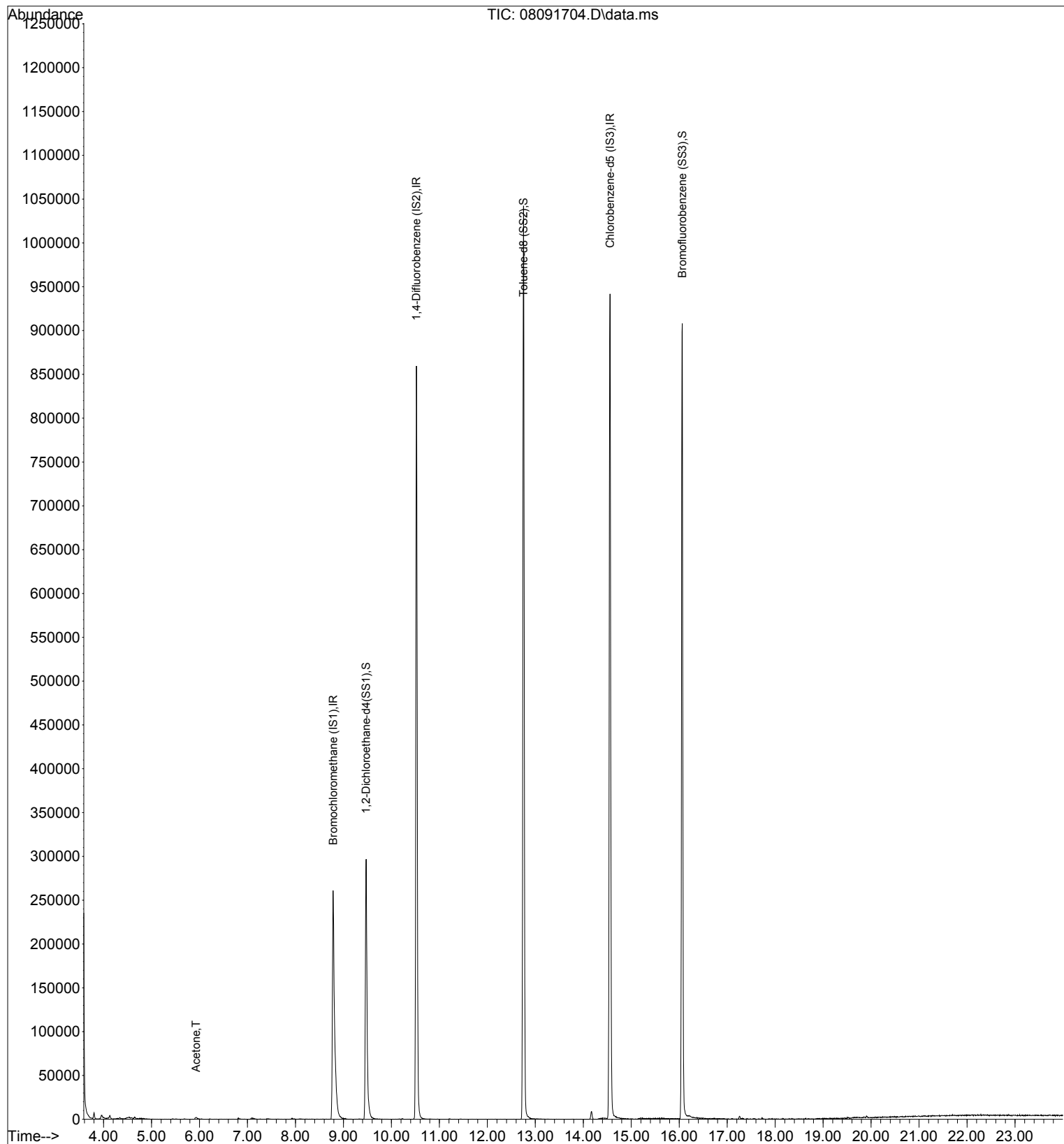
Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 12:51:06 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS08\Data\2017 08\09\08091705.D

Acq On : 9 Aug 2017 5:41

Operator: WA/AB

Sample : LCS R8080917 25ng

Misc : S31-07131701/S31-0801701 (8/31)

ALS Vial : 1 Sample Multiplier: 1

Quant Time: Aug 09 06:49:34 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 12:51:06 2017

Response via : Initial Calibration

8/9/17

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.80	130	193681	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	10.53	114	858925	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	14.56	82	383098	12.500	ng	-0.01

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.48	65	304161	11.432	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	91.44%
57) Toluene-d8 (SS2)	12.76	98	910522	11.934	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.44%
73) Bromofluorobenzene (SS3)	16.06	174	383429	14.895	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	119.20%

Target Compounds

						Qvalue
2) Propene	3.88	42	324169	18.412	ng	95
3) Dichlorodifluoromethan...	3.99	85	810484	19.573	ng	99
4) Chloromethane	4.19	50	442781	22.242	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.35	135	420218	21.544	ng	99
6) Vinyl Chloride	4.47	62	495718	24.941	ng	99
7) 1,3-Butadiene	4.65	54	387853	25.424	ng	100
8) Bromomethane	4.96	94	354805	24.814	ng	99
9) Chloroethane	5.17	64	268537	21.237	ng	100
10) Ethanol	5.40	45	1223898	96.711	ng	98
11) Acetonitrile	5.59	41	583609	18.120	ng	98
12) Acrolein	5.72	56	226249	21.373	ng	92
13) Acetone	5.85	58	1305596	107.743	ng	95
14) Trichlorofluoromethane	6.01	101	765283	19.489	ng	100
15) 2-Propanol (Isopropanol)	6.15	45	1931764	41.402	ng	98
16) Acrylonitrile	6.35	53	470015	22.490	ng	98
17) 1,1-Dichloroethene	6.65	96	393915	21.291	ng	99
18) 2-Methyl-2-Propanol (t...	6.75	59	2148229	42.526	ng	98
19) Methylene Chloride	6.80	84	386735	22.286	ng	96
20) 3-Chloro-1-propene (Al...	6.91	41	552376	21.942	ng	97
21) Trichlorotrifluoroethane	7.06	151	423988	21.702	ng	94
22) Carbon Disulfide	7.04	76	1307540	21.660	ng	99
23) trans-1,2-Dichloroethene	7.69	61	568075	21.530	ng	100
24) 1,1-Dichloroethane	7.89	63	655427	20.241	ng	100
25) Methyl tert-Butyl Ether	7.93	73	1272505	21.628	ng	94
26) Vinyl Acetate	8.03	86	535061	125.646	ng	# 85
27) 2-Butanone (MEK)	8.24	72	255427	22.942	ng	96
28) cis-1,2-Dichloroethene	8.65	61	536396	20.705	ng	99
29) Diisopropyl Ether	8.84	87	336198	19.649	ng	# 88
30) Ethyl Acetate	8.84	61	235471	45.577	ng	95
31) n-Hexane	8.85	57	490496	19.395	ng	99
32) Chloroform	8.92	83	732971	20.388	ng	100
34) Tetrahydrofuran (THF)	9.26	72	246687	21.320	ng	# 90
35) Ethyl tert-Butyl Ether	9.33	87	538351	22.628	ng	95
36) 1,2-Dichloroethane	9.58	62	606189	20.081	ng	100
38) 1,1,1-Trichloroethane	9.82	97	741198	20.882	ng	99
39) Isopropyl Acetate	10.12	61	414842	43.170	ng	98
40) 1-Butanol	10.13	56	821100	51.566	ng	97
41) Benzene	10.23	78	1409824	20.701	ng	99
42) Carbon Tetrachloride	10.36	117	691338	21.358	ng	99
43) Cyclohexane	10.47	84	1236507	42.087	ng	96
44) tert-Amyl Methyl Ether	10.75	73	1166261	22.150	ng	99
45) 1,2-Dichloropropane	10.95	63	327566	20.700	ng	100
46) Bromodichloromethane	11.12	83	588889	22.410	ng	99
47) Trichloroethene	11.17	130	474253	22.345	ng	100
48) 1,4-Dioxane	11.14	88	334069	23.254	ng	96
49) 2,2,4-Trimethylpentane...	11.22	57	1509596	20.767	ng	97

Data File: I:\MS08\Data\2017 08\09\08091705.D

Acq On : 9 Aug 2017 5:41

Operator: WA/AB

Sample : LCS R8080917 25ng

Misc : S31-07131701/S31-0801701 (8/31)

ALS Vial : 1 Sample Multiplier: 1

Quant Time: Aug 09 06:49:34 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 12:51:06 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.32	100	364779	53.602	ng	95
51) n-Heptane	11.44	71	347393	20.452	ng	98
52) cis-1,3-Dichloropropene	11.93	75	654647	23.931	ng	99
53) 4-Methyl-2-pentanone	11.96	58	338842	24.572	ng	98
54) trans-1,3-Dichloropropene	12.40	75	661557	25.902	ng	100
55) 1,1,2-Trichloroethane	12.58	97	395648	22.775	ng	98
58) Toluene	12.85	91	1599356	19.975	ng	100
59) 2-Hexanone	13.07	43	805901	22.678	ng	100
60) Dibromochloromethane	13.24	129	567248	23.119	ng	100
61) 1,2-Dibromoethane	13.48	107	471345	23.569	ng	100
62) n-Butyl Acetate	13.66	43	890517	23.687	ng	99
63) n-Octane	13.78	57	307748	19.510	ng	95
64) Tetrachloroethene	13.94	166	557642	22.547	ng	99
65) Chlorobenzene	14.60	112	1158068	21.036	ng	100
66) Ethylbenzene	14.98	91	1981165	21.099	ng	99
67) m- & p-Xylenes	15.16	91	3175223	41.883	ng	99
68) Bromoform	15.23	173	521276	24.693	ng	100
69) Styrene	15.51	104	1258244	24.332	ng	99
70) o-Xylene	15.63	91	1635753	20.976	ng	100
71) n-Nonane	15.83	43	715346	20.139	ng	97
72) 1,1,2,2-Tetrachloroethane	15.60	83	656666	21.924	ng	99
74) Cumene	16.20	105	2148605	21.328	ng	100
75) alpha-Pinene	16.58	93	1126353	22.037	ng	100
76) n-Propylbenzene	16.69	91	2450531	22.064	ng	98
77) 3-Ethyltoluene	16.78	105	2072476	21.727	ng	99
78) 4-Ethyltoluene	16.83	105	2145547	23.514	ng	99
79) 1,3,5-Trimethylbenzene	16.90	105	1856476	21.369	ng	100
80) alpha-Methylstyrene	17.05	118	1003466	25.201	ng	99
81) 2-Ethyltoluene	17.09	105	2124700	21.826	ng	99
82) 1,2,4-Trimethylbenzene	17.30	105	1866515	22.041	ng	98
83) n-Decane	17.40	57	813419	21.307	ng	97
84) Benzyl Chloride	17.42	91	1718726	27.415	ng	98
85) 1,3-Dichlorobenzene	17.44	146	1113293	23.973	ng	99
86) 1,4-Dichlorobenzene	17.50	146	1139506	23.991	ng	99
87) sec-Butylbenzene	17.55	105	2409069	22.337	ng	99
88) 4-Isopropyltoluene (p-...	17.70	119	2432998	22.672	ng	100
89) 1,2,3-Trimethylbenzene	17.70	105	1939790	22.615	ng	100
90) 1,2-Dichlorobenzene	17.83	146	1068338	22.989	ng	99
91) d-Limonene	17.84	68	677787	23.433	ng	98
92) 1,2-Dibromo-3-Chloropr...	18.25	157	437910	29.541	ng	98
93) n-Undecane	18.60	57	897157	23.528	ng	98
94) 1,2,4-Trichlorobenzene	19.45	180	938921	26.734	ng	99
95) Naphthalene	19.56	128	2599768	27.729	ng	100
96) n-Dodecane	19.57	57	910878	27.688	ng	98
97) Hexachlorobutadiene	19.90	225	637059	21.987	ng	100
98) Cyclohexanone	15.30	55	558316	22.158	ng	98
99) tert-Butylbenzene	17.30	119	1898072	22.065	ng	99
100) n-Butylbenzene	18.11	91	1962254	24.051	ng	100

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

Data File: I:\MS08\Data\2017 08\09\08091705.D

Acq On : 9 Aug 2017 5:41

Operator: WA/AB

Sample : LCS R8080917 25ng

Misc : S31-07131701/S31-0801701 (8/31)

ALS Vial : 1 Sample Multiplier: 1

Quant Time: Aug 09 06:49:34 2017

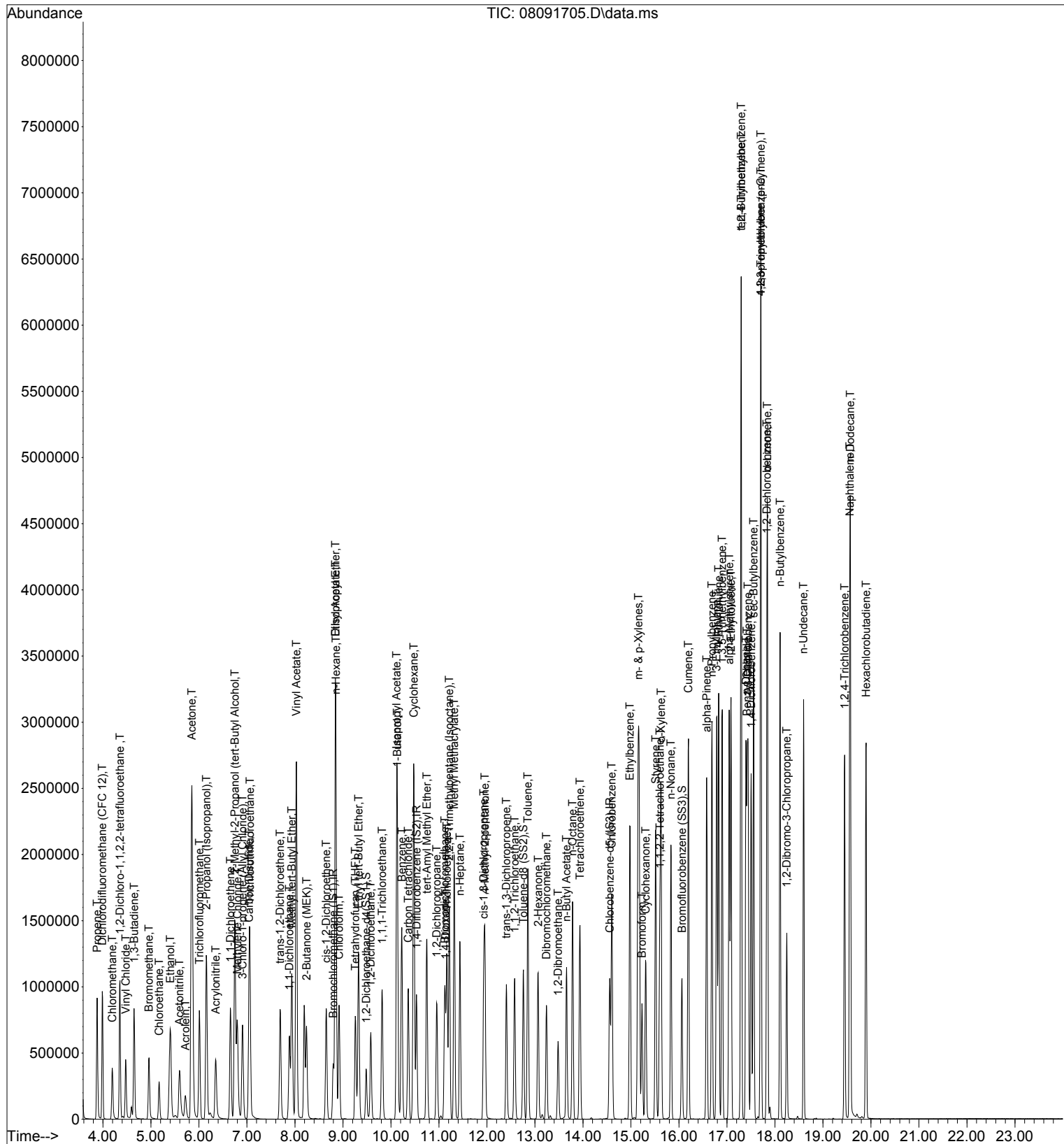
Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 12:51:06 2017

Response via : Initial Calibration

DataAcq Meth:T015.M



Method Path : I:\MS08\Methods\
 Method File : R8071417.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Fri Jul 14 12:51:06 2017
 Response Via : Initial Calibration

Calibration Files

0.08=07141705.D 0.10=07141706.D 0.20=07141707.D 0.40=07141708.D 1.0 =07141709.D 5.0 =07141710.D 25 =07141711.D
 50 =07141712.D 100 =07141713.D

Compound	0.08	0.10	0.20	0.40	1.0	5.0	25	50	100	Avg	%RSD
-----ISTD-----											
1) IR Bromochloromethane...											
2) T Propene	1.548	1.316	1.173	1.074	1.144	0.952	1.037	0.960	1.022	1.136	16.91
3) T Dichlorodifluo...	3.403	2.995	2.786	2.622	2.802	2.397	2.566	2.334	2.147	2.672	14.17
4) T Chloromethane	1.506	1.464	1.321	1.231	1.362	1.072	1.301	1.271	1.035	1.285	12.28
5) T 1,2-Dichloro-1...	1.476	1.472	1.320	1.237	1.262	1.107	1.176	1.137	1.144	1.259	11.05
6) T Vinyl Chloride	1.385	1.365	1.154	1.234	1.306	1.185	1.297	1.282	1.336	1.283	6.13
7) T 1,3-Butadiene	1.111	0.966	0.921	0.935	0.976	0.863	1.007	1.030	1.051	0.985	7.57
8) T Bromomethane	1.107	1.014	0.996	0.812	0.979	0.785	0.910	0.853	0.849	0.923	11.65
9) T Chloroethane	1.003	0.900	0.791	0.759	0.846	0.718	0.811	0.775	0.743	0.816	10.92
10) T Ethanol	1.135	0.987	0.867	0.795	0.819	0.670	0.739	0.690	0.647	0.817	19.63
11) T Acetonitrile	3.001	2.528	2.141	1.976	1.989	1.686	1.854	1.790	1.743	2.079	20.65
12) T Acrolein			0.697	0.676	0.750	0.649	0.695	0.667	0.648	0.683	5.15
13) T Acetone			0.910	0.844	0.852	0.755	0.766	0.702	0.645	0.782	11.81
14) T Trichlorofluor...	3.289	2.853	2.720	2.534	2.585	2.234	2.334	2.185	2.073	2.534	15.11
15) T 2-Propanol (Is...	3.698	3.451	3.102	2.936	3.086	2.727	2.999	2.778	2.326	3.011	13.33
16) T Acrylonitrile	1.422	1.378	1.193	1.305	1.403	1.294	1.439	1.371	1.334	1.349	5.68
17) T 1,1-Dichloroet...	1.460	1.434	1.168	1.155	1.206	1.049	1.152	1.088	1.036	1.194	12.89
18) T 2-Methyl-2-Pro...	3.936	3.740	3.373	3.206	3.342	2.949	3.161	2.941	2.692	3.260	12.07
19) T Methylene Chlo...			1.208	1.258	1.060	1.131	1.068	0.994	1.120		8.85
20) T 3-Chloro-1-pro...	1.925	1.682	1.437	1.624	1.626	1.503	1.672	1.612	1.541	1.625	8.52
21) T Trichlorotrifl...	1.514	1.555	1.316	1.225	1.306	1.096	1.176	1.107	1.053	1.261	14.25
22) T Carbon Disulfide			4.652	4.400	3.551	3.832	3.575	3.365	3.896		13.26
23) T trans-1,2-Dich...	2.026	1.764	1.732	1.632	1.765	1.542	1.715	1.614	1.535	1.703	8.81
24) T 1,1-Dichloroet...	2.457	2.411	2.200	2.111	2.142	1.861	1.961	1.875	1.790	2.090	11.46
25) T Methyl tert-Bu...	4.939	4.408	3.891	3.627	3.695	3.353	3.589	3.408	3.264	3.797	14.43
26) T Vinyl Acetate	0.249	0.214	0.263	0.281	0.306	0.291	0.304	0.289	0.277	0.275	10.63
27) T 2-Butanone (MEK)			0.629	0.684	0.804	0.715	0.761	0.733	0.704	0.719	7.77
28) T cis-1,2-Dichlo...	2.145	1.740	1.641	1.656	1.711	1.496	1.637	1.546	1.477	1.672	11.91
29) T Diisopropyl Ether	1.469	1.523	1.162	1.079	1.080	0.944	0.955	0.890	0.837	1.104	22.13
30) T Ethyl Acetate	0.298	0.332	0.310	0.360	0.383	0.341	0.346	0.325	0.306	0.333	8.26
31) T n-Hexane			2.029	1.882	1.861	1.580	1.451	1.354	1.268	1.632	17.99
32) T Chloroform	2.861	2.725	2.286	2.229	2.368	2.085	2.228	2.102	1.999	2.320	12.59
33) S 1,2-Dichloroet...	1.669	1.695	1.720	1.732	1.741	1.744	1.723	1.730	1.700	1.717	1.43
34) T Tetrahydrofura...	0.874	0.776	0.772	0.696	0.779	0.682	0.739	0.712	0.689	0.747	8.22
35) T Ethyl tert-But...	1.848	1.701	1.553	1.522	1.577	1.378	1.491	1.407	1.342	1.535	10.50
36) T 1,2-Dichloroet...	2.242	2.273	2.007	1.899	2.013	1.755	1.893	1.778	1.676	1.948	10.67
-----ISTD-----											
37) IR 1,4-Difluorobenzen...											
38) T 1,1,1-Trichlor...	0.643	0.571	0.529	0.504	0.544	0.464	0.510	0.461	0.424	0.517	12.71
39) T Isopropyl Acetate	0.162	0.160	0.144	0.137	0.149	0.129	0.136	0.125	0.116	0.140	11.25
40) T 1-Butanol			0.179	0.197	0.244	0.234	0.278	0.255	0.235	0.232	14.47
41) T Benzene	1.276	1.176	1.031	0.975	1.019	0.865	0.924	0.853	0.803	0.991	15.66
42) T Carbon Tetrach...	0.560	0.520	0.480	0.464	0.490	0.431	0.471	0.429	0.394	0.471	10.68

Method Path : I:\MS08\Methods\
Method File : R8071417.M

Title		: EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)															ISTD-----															
43) T	Cyclohexane	0.569	0.513	0.459	0.421	0.439	0.369	0.395	0.357	0.325	0.428	18.11																				
44) T	tert-Amyl Meth...	0.977	0.922	0.786	0.743	0.780	0.672	0.735	0.669	0.612	0.766	15.50																				
45) T	1,2-Dichloropr...	0.292	0.274	0.233	0.219	0.237	0.202	0.219	0.204	0.191	0.230	14.59																				
46) T	Bromodichlorom...	0.417	0.421	0.382	0.368	0.407	0.358	0.396	0.362	0.332	0.382	7.89																				
47) T	Trichloroethene	0.399	0.346	0.319	0.299	0.313	0.274	0.298	0.275	0.257	0.309	14.01																				
48) T	1,4-Dioxane	0.232	0.228	0.197	0.200	0.223	0.196	0.220	0.200	0.185	0.209	8.01																				
49) T	2,2,4-Trimethy...	1.303	1.264	1.120	1.035	1.108	0.933	1.008	0.916	0.834	1.058	14.86																				
50) T	Methyl Methacr...	0.075	0.085	0.089	0.097	0.117	0.105	0.116	0.107	0.101	0.099	14.13																				
51) T	n-Heptane	0.321	0.281	0.248	0.246	0.265	0.220	0.231	0.213	0.201	0.247	15.17																				
52) T	cis-1,3-Dichlo...	0.431	0.403	0.367	0.375	0.420	0.384	0.435	0.399	0.369	0.398	6.58																				
53) T	4-Methyl-2-pen...	0.175	0.190	0.172	0.197	0.220	0.210	0.234	0.213	0.196	0.201	10.23																				
54) T	trans-1,3-Dich...	0.304 0.305 0.386 0.377 0.442 0.408 0.380 0.372															13.71															
55) T	1,1,2-Trichlor...	0.276	0.276	0.245	0.257	0.267	0.231	0.260	0.240	0.224	0.253	7.58																				
56) IR	Chlorobenzene-d5 (...)	ISTD-----																														
57) S	Toluene-d8 (SS2)	2.558	2.552	2.530	2.521	2.477	2.449	2.425	2.447	2.447	2.489	2.04																				
58) T	Toluene	3.396	3.063	2.807	2.548	2.728	2.271	2.402	2.224	2.074	2.613	16.43																				
59) T	2-Hexanone	0.878 1.294 1.179 1.297 1.200 1.108 1.160															13.42															
60) T	Dibromochlorom...	0.880	0.870	0.794	0.726	0.847	0.735	0.835	0.779	0.739	0.801	7.50																				
61) T	1,2-Dibromoethane	0.663	0.610	0.649	0.619	0.719	0.630	0.703	0.656	0.623	0.653	5.81																				
62) T	n-Butyl Acetate	0.994 1.018 1.364 1.258 1.417 1.318 1.227															13.41															
63) T	n-Octane	0.744	0.540	0.534	0.493	0.542	0.447	0.474	0.444	0.415	0.515	18.95																				
64) T	Tetrachloroethene	0.918	0.909	0.830	0.816	0.852	0.725	0.788	0.730	0.695	0.807	9.90																				
65) T	Chlorobenzene	2.426	2.082	1.888	1.751	1.824	1.538	1.668	1.545	1.445	1.796	17.15																				
66) T	Ethylbenzene	3.649	3.589	3.230	2.984	3.187	2.743	2.973	2.723	2.494	3.064	12.74																				
67) T	m- & p-Xylenes	3.166	2.963	2.494	2.446	2.549	2.193	2.364	2.156	1.931	2.474	15.73																				
68) T	Bromoform	0.787	0.661	0.649	0.633	0.703	0.643	0.751	0.704	0.667	0.689	7.61																				
69) T	Styrene	1.777	1.734	1.607	1.571	1.786	1.617	1.821	1.699	1.573	1.687	5.78																				
70) T	o-Xylene	3.222	2.924	2.607	2.469	2.665	2.282	2.453	2.240	2.038	2.544	14.27																				
71) T	n-Nonane	1.480	1.317	1.197	1.150	1.219	1.040	1.110	1.008	0.911	1.159	14.75																				
72) T	1,1,2,2-Tetrac...	1.176	1.037	0.939	0.939	1.053	0.903	0.992	0.913	0.843	0.977	10.21																				
73) S	Bromofluoroben...	0.847	0.817	0.815	0.828	0.837	0.851	0.852	0.857	0.857	0.840	1.97																				
74) T	Cumene	4.276	3.759	3.451	3.204	3.422	2.928	3.134	2.849	2.558	3.287	15.69																				
75) T	alpha-Pinene	2.011	1.889	1.720	1.632	1.680	1.498	1.663	1.525	1.393	1.668	11.53																				
76) T	n-Propylbenzene	4.408	4.099	3.696	3.468	3.867	3.347	3.606	3.246	2.877	3.624	12.75																				
77) T	3-Ethyltoluene	3.618	3.196	3.188	3.013	3.491	2.848	3.203	2.848	2.606	3.112	10.32																				
78) T	4-Ethyltoluene	3.608	3.499	2.857	2.924	3.115	2.793	2.885	2.726	2.388	2.977	12.78																				
79) T	1,3,5-Trimethy...	3.832	3.061	3.037	2.695	2.947	2.506	2.731	2.470	2.234	2.835	16.41																				
80) T	alpha-Methylst...	1.419	1.272	1.288	1.202	1.348	1.197	1.429	1.312	1.226	1.299	6.65																				
81) T	2-Ethyltoluene	4.062	3.603	3.320	3.113	3.347	2.840	3.046	2.768	2.489	3.176	14.89																				
82) T	1,2,4-Trimethy...	3.412	3.103	2.827	2.725	3.027	2.511	2.715	2.434	2.115	2.763	14.05																				
83) T	n-Decane	1.477	1.406	1.285	1.305	1.335	1.110	1.209	1.099	0.983	1.246	12.77																				
84) T	Benzyl Chloride	1.733	1.847	1.684	1.823	2.193	2.136	2.577	2.336	2.082	2.046	14.62																				
85) T	1,3-Dichlorobe...	1.696	1.639	1.514	1.445	1.615	1.387	1.561	1.433	1.346	1.515	7.97																				
86) T	1,4-Dichlorobe...	1.753	1.425	1.683	1.546	1.683	1.419	1.597	1.465	1.377	1.550	8.80																				
87) T	sec-Butylbenzene	4.342	3.985	3.557	3.463	3.829	3.217	3.439	3.089	2.750	3.519	13.74																				
88) T	4-Isopropyltol...	4.313	3.828	3.562	3.473	3.882	3.236	3.470	3.092	2.657	3.501	13.80																				
89) T	1,2,3-Trimethy...	3.494	3.154	2.866	2.815	2.985	2.527	2.752	2.469	2.127	2.799	14.32																				
90) T	1,2-Dichlorobe...	1.814	1.773	1.517	1.473	1.599	1.343	1.489	1.363	1.274	1.516	12.25																				
91) T	d-Limonene	1.095	1.034	0.929	0.924	0.980	0.859	0.993	0.902	0.778	0.944	10.03																				
92) T	1,2-Dibromo-3-...	0.418	0.349	0.370	0.443	0.553	0.521	0.605	0.564	0.531	0.484	18.89																				
93) T	n-Undecane	1.524	1.389	1.224	1.235	1.204	1.056	1.318	1.194	1.055	1.244	12.07																				
94) T	1,2,4-Trichlor...	1.430	1.049	0.963	1.061	1.137	1.044	1.302	1.199	1.129	1.146	12.67																				

Method Path : I:\MS08\Methods\
 Method File : R8071417.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

95) T	Naphthalene	1.284	1.199	1.034	1.113	0.760	0.693	1.361	1.205	1.012	1.073	3.059	13.38
96) T	n-Dodecane	1.315	1.078	0.954	0.905	0.965	0.817	0.888	0.822	0.765	0.945	21.09	21.09
97) T	Hexachlorobuta...	0.838	0.852	0.757	0.807	0.898	0.782	0.886	0.818	0.762	0.822	17.71	17.71
98) T	Cyclohexanone	3.492	3.308	2.933	2.743	2.998	2.528	2.687	2.419	2.154	2.807	6.20	6.20
99) T	tert-Butylbenzene	2.869	2.697	2.571	2.615	2.989	2.591	2.832	2.549	2.245	2.662	15.14	15.14
100) T	n-Butylbenzene											8.21	8.21

(#) = Out of Range

1ng/L Std. ID: S31-07111710
4ng/L Std. ID: S31-07111710
20ng/L Std. ID: S31-07111708
200ng/L Std. ID: S31-07111705

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	
Allyl Chloride	1.052	210.4	21.04	4.208	1.052	
Trichlorotrifluoroethane	1.049	209.8	20.98	4.196	1.049	
Carbon Disulfide	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	
1,1,2-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	

Working STD Conc.(ng/L):	Primary Source Standards Concentrations (Working & Initial Calibration)									
	4	4	4	4	4	20	20	200	200	200
Injection (L):	0.020	0.025	0.050	0.100	0.050	0.25	0.25	0.125	0.25	0.50
ICAL Points:	0.08288	0.1036	0.2072	0.4144	0.2072	5.180	5.180	25.900	51.80	103.6
	0.08376	0.1047	0.2094	0.4188	0.2094	5.235	5.235	26.175	52.35	104.7
	0.08040	0.1005	0.2010	0.4020	0.2010	5.025	5.025	25.125	50.25	100.5
	0.08040	0.1005	0.2010	0.4020	0.2010	5.025	5.025	25.125	50.25	100.5
	0.08184	0.1023	0.2046	0.4092	0.2046	5.115	5.115	25.575	51.15	102.3
	0.08456	0.1057	0.2114	0.4228	0.2114	5.285	5.285	26.425	52.85	105.7
	0.07944	0.0993	0.1986	0.3972	0.0993	4.965	4.965	24.825	49.65	99.3
	0.08072	0.1009	0.2018	0.4036	0.2018	5.045	5.045	25.225	50.45	100.9
	0.41656	0.5207	1.0414	2.0828	0.5207	26.035	26.035	130.175	260.35	520.7
	0.08368	0.1046	0.2092	0.4184	0.2092	5.230	5.230	26.150	52.30	104.6
	0.08328	0.1041	0.2082	0.4164	0.2082	5.205	5.205	26.025	52.05	104.1
	0.42504	0.5313	1.0626	2.1252	0.5313	26.565	26.565	132.825	265.65	531.3
	0.08392	0.1049	0.2098	0.4196	0.2098	5.245	5.245	26.225	52.45	104.9
	0.16840	0.2105	0.4210	0.8420	0.2105	10.525	10.525	52.625	105.25	210.5
	0.08440	0.1055	0.2110	0.4220	0.2110	5.275	5.275	26.375	52.75	105.5
	0.08472	0.1059	0.2118	0.4236	0.2118	5.295	5.295	26.475	52.95	105.9
	0.16912	0.2114	0.4228	0.8456	0.2114	10.570	10.570	52.850	105.70	211.4
	0.08456	0.1057	0.2114	0.4228	0.2114	5.285	5.285	26.425	52.85	105.7
	0.08416	0.1052	0.2104	0.4208	0.2104	5.260	5.260	26.300	52.60	105.2
	0.08392	0.1049	0.2098	0.4196	0.2098	5.245	5.245	26.225	52.45	104.9
	0.08512	0.1064	0.2128	0.4256	0.2128	5.320	5.320	26.600	53.20	106.4
	0.08496	0.1062	0.2124	0.4248	0.2124	5.310	5.310	26.550	53.10	106.2
	0.17032	0.2129	0.4258	0.8516	0.2129	10.645	10.645	53.225	106.45	212.9
	0.08504	0.1063	0.2126	0.4252	0.2126	5.315	5.315	26.575	53.15	106.3
	0.08464	0.1058	0.2116	0.4232	0.2116	5.290	5.290	26.450	52.90	105.8
	0.08496	0.1062	0.2124	0.4248	0.2124	5.310	5.310	26.550	53.10	106.2
	0.08456	0.1057	0.2114	0.4228	0.2114	5.285	5.285	26.425	52.85	105.7
	0.08416	0.1052	0.2104	0.4208	0.2104	5.260	5.260	26.300	52.60	105.2
	0.08592	0.1074	0.2148	0.4296	0.2148	5.370	5.370	26.850	53.70	107.4
	0.16832	0.2104	0.4208	0.8416	0.2104	10.520	10.520	52.600	105.20	210.4
	0.16840	0.2105	0.4210	0.8420	0.2105	10.525	10.525	52.625	105.25	210.5
	0.08416	0.1052	0.2104	0.4208	0.2104	5.260	5.260	26.300	52.60	105.2
	0.08440	0.1055	0.2110	0.4220	0.2110	5.275	5.275	26.375	52.75	105.5
	0.17040	0.2130	0.4260	0.8520	0.2130	10.650	10.650	53.250	106.50	213.0
	0.08432	0.1054	0.2108	0.4216	0.2108	5.270	5.270	26.350	52.70	105.4
	0.08496	0.1062	0.2124	0.4248	0.2124	5.310	5.310	26.550	53.10	106.2
	0.08528	0.1066	0.2132	0.4264	0.2132	5.330	5.330	26.650	53.30	106.6
	0.08490	0.1060	0.2120	0.4240	0.2120	5.300	5.300	26.500	53.00	106.0
	0.08496	0.1062	0.2124	0.4248	0.2124	5.310	5.310	26.550	53.10	106.2
	0.08472	0.1059	0.2118	0.4236	0.2118	5.295	5.295	26.475	52.95	105.9
	0.16880	0.2110	0.4220	0.8440	0.2110	10.550	10.550	52.750	105.50	211.0
	0.08496	0.1062	0.2124	0.4248	0.2124	5.310	5.310	26.550	53.10	106.2
	0.08928	0.1116	0.2232	0.4464	0.1116	5.580	5.580	27.900	55.80	111.6
	0.08464	0.1058	0.2116	0.4232	0.2116	5.290	5.290	26.450	52.90	105.8
	0.08512	0.1064	0.2128	0.4256	0.2128	5.320	5.320	26.600	53.20	106.4
	0.08488	0.1061	0.2122	0.4244	0.2122	5.305	5.305	26.525	53.05	106.1
	0.08424	0.1053	0.2106	0.4212	0.2106	5.265	5.265	26.325	52.65	105.3
	0.08488	0.1061	0.2122	0.4244	0.2122	5.305	5.305	26.525	53.05	106.1

AB 7/17/17

Primary Source Standards Concentrations (Working & Initial Calibration)

7/17/17

1ng/L Std. ID:
4ng/L Std. ID: S31-07111710
20ng/L Std. ID: S31-07111708
200ng/L Std. ID: S31-07111705

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	
4-Ethyltoluene	1.050	210.0	21.00	4.200	1.050	
3-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	
n-Butylbenzene	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		200		200	
	0.020	0.025	0.050	0.100	0.050	0.100	0.050	0.25	0.125	0.25	0.25	200
Injection (L):	0.08ng	0.10g	0.20g	0.40g	0.20g	0.40g	1.0g	5.0g	25.0g	50g	50ng	100ng
ICAL Points:	0.08496	0.1062	0.2124	0.4248	0.2112	0.4248	1.062	5.310	26.550	53.10	53.10	106.2
	0.08448	0.1056	0.2112	0.4244	0.2112	0.4244	1.056	5.280	26.400	52.80	52.80	105.6
	0.08512	0.1064	0.2128	0.4256	0.2128	0.4256	1.064	5.320	26.600	53.20	53.20	106.4
	0.08456	0.1057	0.2114	0.4248	0.2114	0.4248	1.057	5.285	26.425	52.85	52.85	105.7
	0.08488	0.1061	0.2122	0.4244	0.2122	0.4244	1.061	5.305	26.525	53.05	53.05	106.1
	0.08488	0.1061	0.2122	0.4244	0.2122	0.4244	1.061	5.305	26.525	53.05	53.05	106.1
	0.08440	0.1055	0.2110	0.4220	0.2110	0.4220	1.055	5.275	26.375	52.75	52.75	105.5
	0.16984	0.2123	0.4246	0.8492	0.4246	0.8492	2.123	10.615	53.075	106.15	106.15	212.3
	0.08504	0.1063	0.2126	0.4252	0.2126	0.4252	1.063	5.315	26.575	53.15	53.15	106.3
	0.08488	0.1061	0.2122	0.4244	0.2122	0.4244	1.061	5.305	26.525	53.05	53.05	106.1
	0.08432	0.1054	0.2108	0.4216	0.2108	0.4216	1.054	5.270	26.350	52.70	52.70	105.4
	0.08432	0.1054	0.2108	0.4216	0.2108	0.4216	1.054	5.270	26.350	52.70	52.70	105.4
	0.08448	0.1056	0.2112	0.4224	0.2112	0.4224	1.056	5.280	26.400	52.80	52.80	105.6
	0.08400	0.1050	0.2100	0.4200	0.2100	0.4200	1.050	5.250	26.250	52.50	52.50	105.0
	0.08352	0.1044	0.2088	0.4176	0.2088	0.4176	1.044	5.220	26.100	52.20	52.20	104.4
	0.08504	0.1063	0.2126	0.4252	0.2126	0.4252	1.063	5.315	26.575	53.15	53.15	106.3
	0.08400	0.1050	0.2100	0.4200	0.2100	0.4200	1.050	5.250	26.250	52.50	52.50	105.0
	0.08392	0.1049	0.2098	0.4196	0.2098	0.4196	1.049	5.245	26.225	52.45	52.45	104.9
	0.08392	0.1049	0.2098	0.4196	0.2098	0.4196	1.049	5.245	26.225	52.45	52.45	104.9
	0.08400	0.1050	0.2100	0.4200	0.2100	0.4200	1.050	5.250	26.250	52.50	52.50	105.0
	0.08496	0.1062	0.2124	0.4248	0.2124	0.4248	1.062	5.310	26.550	53.10	53.10	106.2
	0.08416	0.1052	0.2104	0.4208	0.2104	0.4208	1.052	5.260	26.300	52.60	52.60	105.2
	0.08424	0.1053	0.2106	0.4212	0.2106	0.4212	1.053	5.265	26.325	52.65	52.65	105.3
	0.08488	0.1061	0.2122	0.4244	0.2122	0.4244	1.061	5.305	26.525	53.05	53.05	106.1
	0.08464	0.1058	0.2116	0.4232	0.2116	0.4232	1.058	5.290	26.450	52.90	52.90	105.8
	0.08464	0.1058	0.2116	0.4232	0.2116	0.4232	1.058	5.290	26.450	52.90	52.90	105.8
	0.08432	0.1054	0.2108	0.4216	0.2108	0.4216	1.054	5.270	26.350	52.70	52.70	105.4
	0.08216	0.1027	0.2054	0.4108	0.2054	0.4108	1.027	5.135	25.675	51.35	51.35	102.7
	0.08216	0.1027	0.2054	0.4108	0.2054	0.4108	1.027	5.135	25.675	51.35	51.35	102.7
	0.08464	0.1058	0.2116	0.4232	0.2116	0.4232	1.058	5.290	26.450	52.90	52.90	105.8
	0.08040	0.1005	0.2010	0.4020	0.2010	0.4020	1.005	5.025	25.125	50.25	50.25	100.5
	0.08424	0.1053	0.2106	0.4212	0.2106	0.4212	1.053	5.265	26.325	52.65	52.65	105.3
	0.08432	0.1054	0.2108	0.4216	0.2108	0.4216	1.054	5.270	26.350	52.70	52.70	105.4
	0.08344	0.1043	0.2086	0.4172	0.2086	0.4172	1.043	5.215	26.075	52.15	52.15	104.3
	0.08664	0.1083	0.2166	0.4332	0.2166	0.4332	1.083	5.415	27.075	54.15	54.15	108.3
	0.08360	0.1045	0.2090	0.4180	0.2090	0.4180	1.045	5.225	26.125	52.25	52.25	104.5
	0.08472	0.1059	0.2118	0.4236	0.2118	0.4236	1.059	5.295	26.475	52.95	52.95	105.9
	0.08520	0.1065	0.2130	0.4260	0.2130	0.4260	1.065	5.325	26.625	53.25	53.25	106.5
	0.08448	0.1056	0.2112	0.4224	0.2112	0.4224	1.056	5.280	26.400	52.80	52.80	105.6
	0.08408	0.1051	0.2102	0.4204	0.2102	0.4204	1.051	5.255	26.275	52.55	52.55	105.1
	0.08448	0.1056	0.2112	0.4224	0.2112	0.4224	1.056	5.280	26.400	52.80	52.80	105.6

Method : I:\MS08\Methods\R8071417.M (RTE Integrator)
 Title : EPA T0-15 per SOP VOA-T015 (CASS T0-15/GC-MS)
 Last Update : Fri Jul 14 12:51:06 2017
 Response via : Initial Calibration

AB 7/17/17

USA 7/17/17

#	ID	Conc	ISTD Conc	Path\File
1	0.08	0	13	I:\MS08\Data\2017_07\14\07141705.D
2	0.10	0	13	I:\MS08\Data\2017_07\14\07141706.D
3	0.20	0	13	I:\MS08\Data\2017_07\14\07141707.D
4	0.40	0	13	I:\MS08\Data\2017_07\14\07141708.D
5	1.0	1	13	I:\MS08\Data\2017_07\14\07141709.D
6	5.0	5	13	I:\MS08\Data\2017_07\14\07141710.D
7	25	26	13	I:\MS08\Data\2017_07\14\07141711.D
8	50	52	13	I:\MS08\Data\2017_07\14\07141712.D
9	100	104	13	I:\MS08\Data\2017_07\14\07141713.D

#	ID	Update Time	Quant Time	Acquisition Time
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2	0.10	Jul 14 12:49 2017	Jul 14 11:21 2017	14 Jul 2017 7:54
3	0.20	Jul 14 12:49 2017	Jul 14 11:28 2017	14 Jul 2017 8:26
4	0.40	Jul 14 12:49 2017	Jul 14 11:31 2017	14 Jul 2017 8:59
5	1.0	Jul 14 12:50 2017	Jul 14 11:07 2017	14 Jul 2017 9:31
6	5.0	Jul 14 12:50 2017	Jul 14 11:07 2017	14 Jul 2017 10:04
7	25	Jul 14 12:50 2017	Jul 14 11:07 2017	14 Jul 2017 10:36
8	50	Jul 14 12:50 2017	Jul 14 11:46 2017	14 Jul 2017 11:08
9	100	Jul 14 12:51 2017	Jul 14 12:46 2017	14 Jul 2017 11:41

R8071417.M

Fri Jul 14 14:43:59 2017

Data File: I:\MS08\Data\2017 07\14\07141705.D

Acq On : 14 Jul 2017 7:22

Operator: WA/AB

Sample : 0.08ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111710 (8/10)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 14 11:11:39 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

AB 7/19/17

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

WA 7/19/17

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.78	130	199035	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	10.52	114	923379	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	14.56	82	378550	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.47	65	332271	13.627	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	109.04%
57) Toluene-d8 (SS2)	12.75	98	968191	13.237	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	105.92%
73) Bromofluorobenzene (SS3)	16.06	174	320606	11.806	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	94.48%

Target Compounds

						Qvalue
2) Propene	3.94	42	2043	0.114	ng	93
3) Dichlorodifluoromethan...	4.04	85	4538	0.120	ng	# 90
4) Chloromethane	4.26	50	1928	0.097	ng	88
5) 1,2-Dichloro-1,1,2,2-t...	4.40	135	1889	0.113	ng	91
6) Vinyl Chloride	4.54	62	1805	0.098	ng	# 43
7) 1,3-Butadiene	4.70	54	1496	0.109	ng	# 79
8) Bromomethane	5.01	94	1400	0.107	ng	92
9) Chloroethane	5.22	64	1289	0.103	ng	# 43
10) Ethanol	5.43	45	7528	0.602	ng	83
11) Acetonitrile	5.67	41	3998	0.118	ng	# 53
12) Acrolein	5.82	56	1106	0.103	ng	# 62
13) Acetone	5.89	58	7775	0.593	ng	93
14) Trichlorofluoromethane	6.04	101	4395	0.128	ng	96
15) 2-Propanol (Isopropanol)	6.19	45	9915	0.211	ng	86
16) Acrylonitrile	6.44	53	1911	0.084	ng	# 76
17) 1,1-Dichloroethene	6.68	96	1969	0.104	ng	96
18) 2-Methyl-2-Propanol (t...	6.79	59	10598	0.256	ng	95
19) Methylene Chloride	6.80	84	3040	0.165	ng	95
20) 3-Chloro-1-propene (Al...	6.92	41	2580	0.099	ng	80
21) Trichlorotrifluoroethane	7.07	151	2023	0.109	ng	93
22) Carbon Disulfide	7.08	76	12743	0.201	ng	83
23) trans-1,2-Dichloroethene	7.70	61	2754	0.112	ng	# 71
24) 1,1-Dichloroethane	7.88	63	3192	0.099	ng	97
25) Methyl tert-Butyl Ether	7.97	73	6707	0.140	ng	86
26) Vinyl Acetate	8.05	86	1667	0.352	ng	# 35
27) 2-Butanone (MEK)	8.29	72	846	0.073	ng	# 74
28) cis-1,2-Dichloroethene	8.65	61	2907	0.120	ng	94
29) Diisopropyl Ether	8.87	87	1987	0.126	ng	# 80
30) Ethyl Acetate	8.91	61	807m	0.150	ng	
31) n-Hexane	8.85	57	3252	0.128	ng	97
32) Chloroform	8.91	83	3856	0.116	ng	93
34) Tetrahydrofuran (THF)	9.30	72	1183	0.103	ng	# 82
35) Ethyl tert-Butyl Ether	9.34	87	2488	0.124	ng	96
36) 1,2-Dichloroethane	9.57	62	3004	0.116	ng	97
38) 1,1,1-Trichloroethane	9.81	97	4081	0.124	ng	98
39) Isopropyl Acetate	10.13	61	2020	0.201	ng	96
40) 1-Butanol	10.22	56	1356	0.074	ng	# 48
41) Benzene	10.22	78	7932	0.106	ng	100
42) Carbon Tetrachloride	10.35	117	3493	0.120	ng	98
43) Cyclohexane	10.47	84	7160	0.226	ng	95
44) tert-Amyl Methyl Ether	10.76	73	6088	0.126	ng	96
45) 1,2-Dichloropropane	10.96	63	1834	0.111	ng	82
46) Bromodichloromethane	11.13	83	2629	0.106	ng	95
47) Trichloroethene	11.16	130	2501	0.119	ng	90
48) 1,4-Dioxane	11.17	88	1455	0.099	ng	# 71
49) 2,2,4-Trimethylpentane...	11.22	57	8152	0.100	ng	96

Data File: I:\MS08\Data\2017 07\14\07141705.D

Acq On : 14 Jul 2017 7:22

Operator: WA/AB

Sample : 0.08ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111710 (8/10)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 14 11:11:39 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

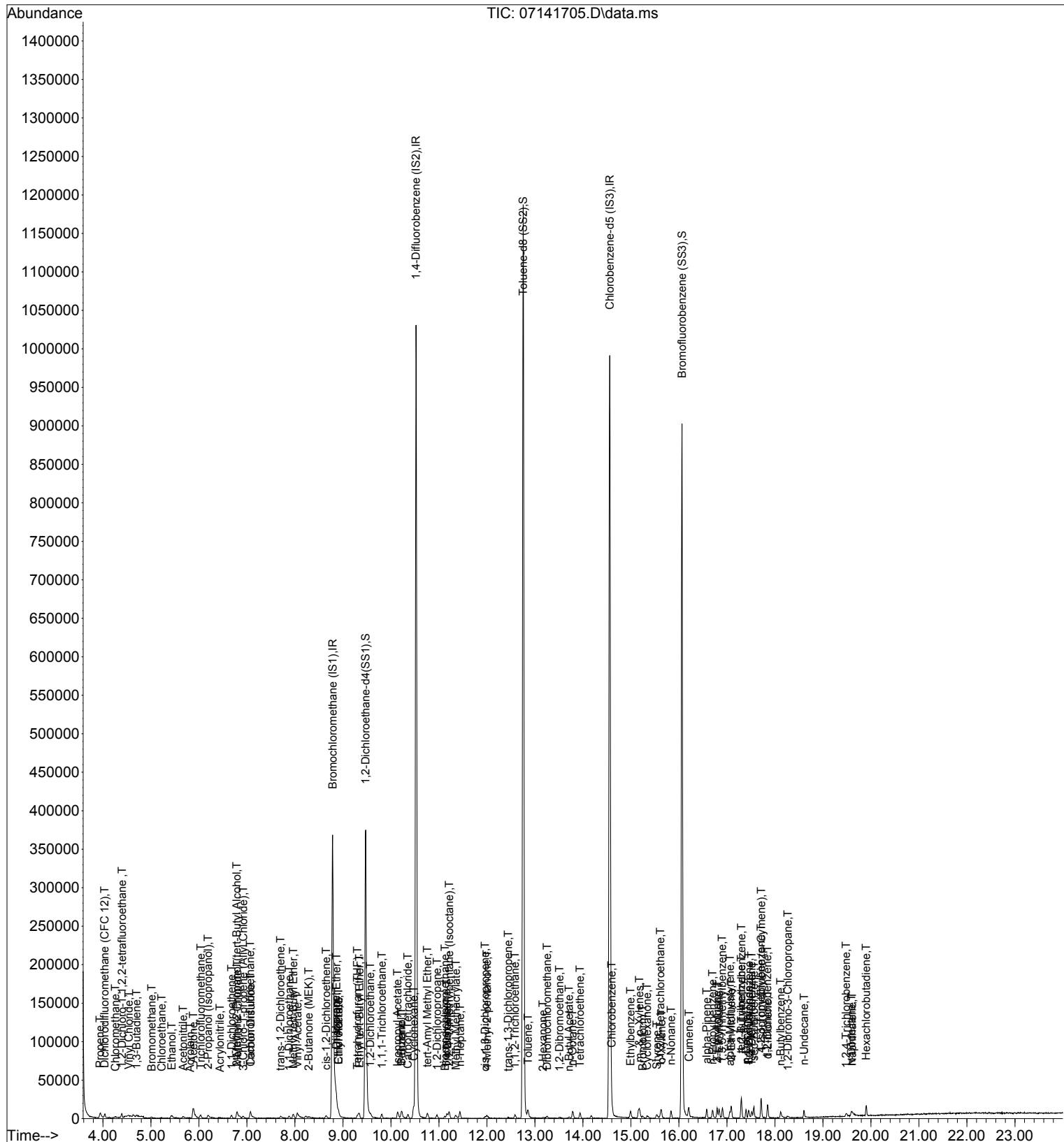
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.36	100	934	0.119	ng	# 54
51) n-Heptane	11.44	71	2015	0.112	ng	91
52) cis-1,3-Dichloropropene	11.96	75	2842	0.100	ng	91
53) 4-Methyl-2-pentanone	12.00	58	1093	0.069	ng	# 47
54) trans-1,3-Dichloropropene	12.44	75	1194	0.044	ng	# 42
55) 1,1,2-Trichloroethane	12.58	97	1732	0.097	ng	84
58) Toluene	12.86	91	8664	0.115	ng	99
59) 2-Hexanone	13.16	43	580	0.017	ng	# 56
60) Dibromochloromethane	13.26	129	2265	0.115	ng	95
61) 1,2-Dibromoethane	13.51	107	1695	0.097	ng	95
62) n-Butyl Acetate	13.71	43	1936	0.053	ng	89
63) n-Octane	13.78	57	1905	0.129	ng	86
64) Tetrachloroethene	13.94	166	2361	0.104	ng	86
65) Chlorobenzene	14.60	112	6237	0.121	ng	91
66) Ethylbenzene	14.99	91	9328	0.107	ng	98
67) m- & p-Xylenes	15.18	91	16282	0.235	ng	100
68) Bromoform	15.25	173	2028	0.123	ng	90
69) Styrene	15.54	104	4568	0.096	ng	# 75
70) o-Xylene	15.64	91	8228	0.117	ng	97
71) n-Nonane	15.84	43	3778	0.109	ng	93
72) 1,1,2,2-Tetrachloroethane	15.61	83	3009	0.108	ng	97
74) Cumene	16.21	105	10878	0.117	ng	97
75) alpha-Pinene	16.58	93	5086	0.109	ng	98
76) n-Propylbenzene	16.70	91	11352	0.109	ng	98
77) 3-Ethyltoluene	16.79	105	9203	0.105	ng	97
78) 4-Ethyltoluene	16.84	105	9169	0.108	ng	97
79) 1,3,5-Trimethylbenzene	16.90	105	9738	0.121	ng	98
80) alpha-Methylstyrene	17.06	118	3609	0.102	ng	# 77
81) 2-Ethyltoluene	17.09	105	10450	0.117	ng	95
82) 1,2,4-Trimethylbenzene	17.30	105	8696	0.115	ng	97
83) n-Decane	17.40	57	3769	0.104	ng	93
84) Benzyl Chloride	17.45	91	4455	0.076	ng	83
85) 1,3-Dichlorobenzene	17.46	146	4348	0.102	ng	96
86) 1,4-Dichlorobenzene	17.52	146	4494	0.100	ng	94
87) sec-Butylbenzene	17.56	105	11088	0.110	ng	93
88) 4-Isopropyltoluene (p-...	17.71	119	10731	0.111	ng	98
89) 1,2,3-Trimethylbenzene	17.71	105	8693	0.114	ng	95
90) 1,2-Dichlorobenzene	17.84	146	4650	0.111	ng	98
91) d-Limonene	17.85	68	2665	0.102	ng	93
92) 1,2-Dibromo-3-Chloropr...	18.27	157	1066	0.071	ng	85
93) n-Undecane	18.61	57	3891	0.105	ng	88
94) 1,2,4-Trichlorobenzene	19.48	180	3613	0.119	ng	# 77
95) Naphthalene	19.61	128	2430	0.028	ng	# 71
96) n-Dodecane	19.59	57	3251	0.099	ng	88
97) Hexachlorobutadiene	19.90	225	3375	0.144	ng	100
98) Cyclohexanone	15.34	55	2145	0.097	ng	92
99) tert-Butylbenzene	17.30	119	8891	0.114	ng	97
100) n-Butylbenzene	18.12	91	7340	0.097	ng	95

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

ALS Vial : 13 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: J:\MS08\Data\2017 07\14\07141705.D

Acq On : 14 Jul 2017 7:22

Operator: WA/AB

Sample : 0.08ng TO-15 ICAL Std

Inst : MS08

Misc : S31-07131701/S31-07111710 (8/10)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 14 11:07:26 2017

Quant Method : I:\MS08\Methods\R8071417.M

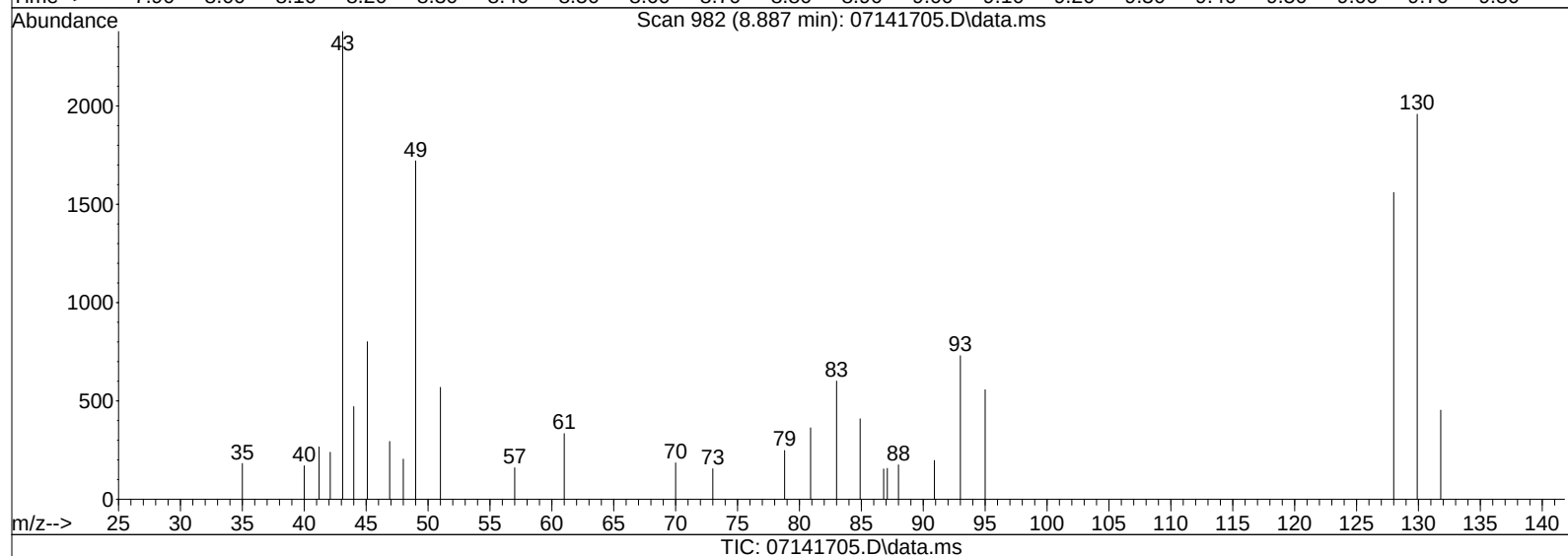
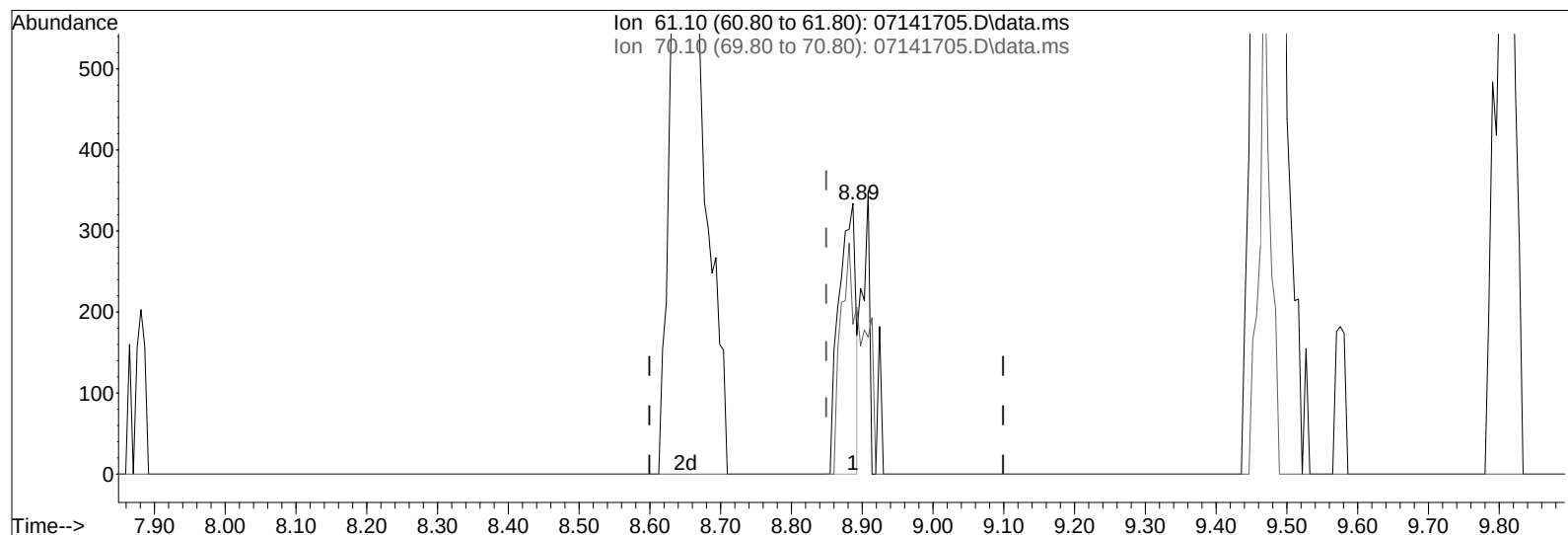
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Quant Results File: R8071417.RES



(30) Ethyl Acetate (T)

8.887min (+0.038) 0.10ng

response 551

Data File: I:\MS08\Data\2017 07\14\07141705.D

Acq On : 14 Jul 2017 7:22

Operator: WA/AB

Sample : 0.08ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111710 (8/10)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 14 11:11:39 2017

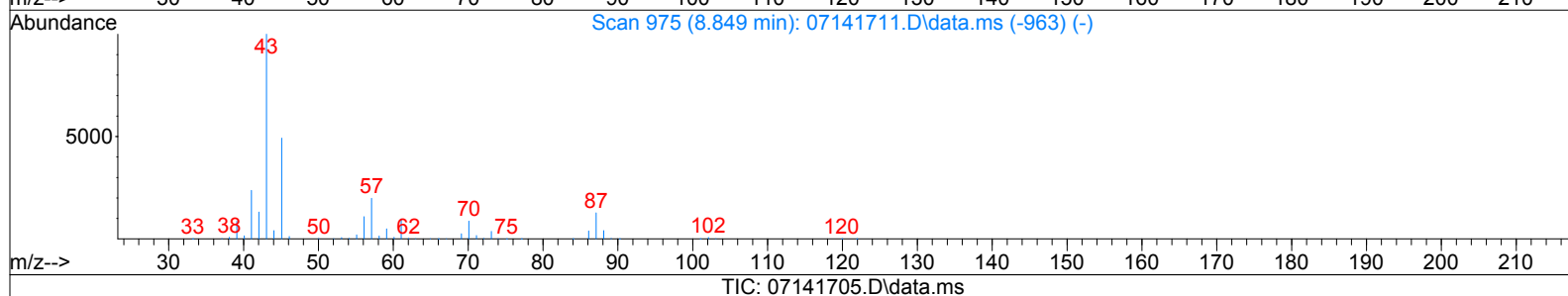
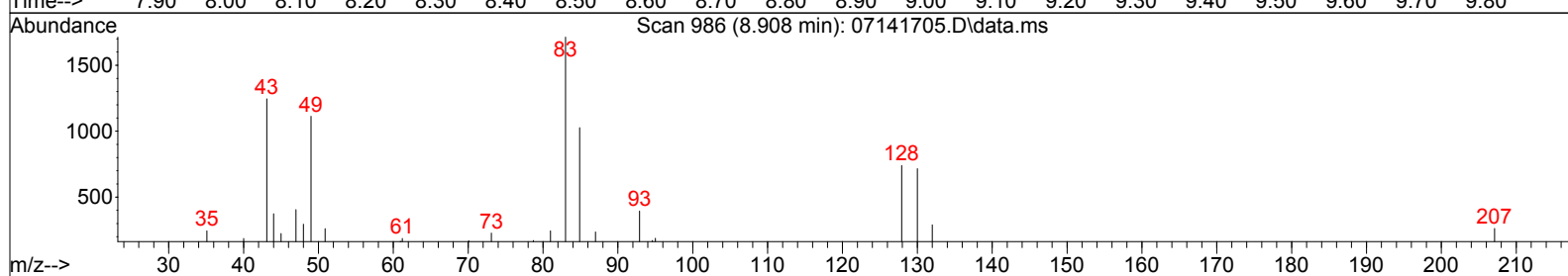
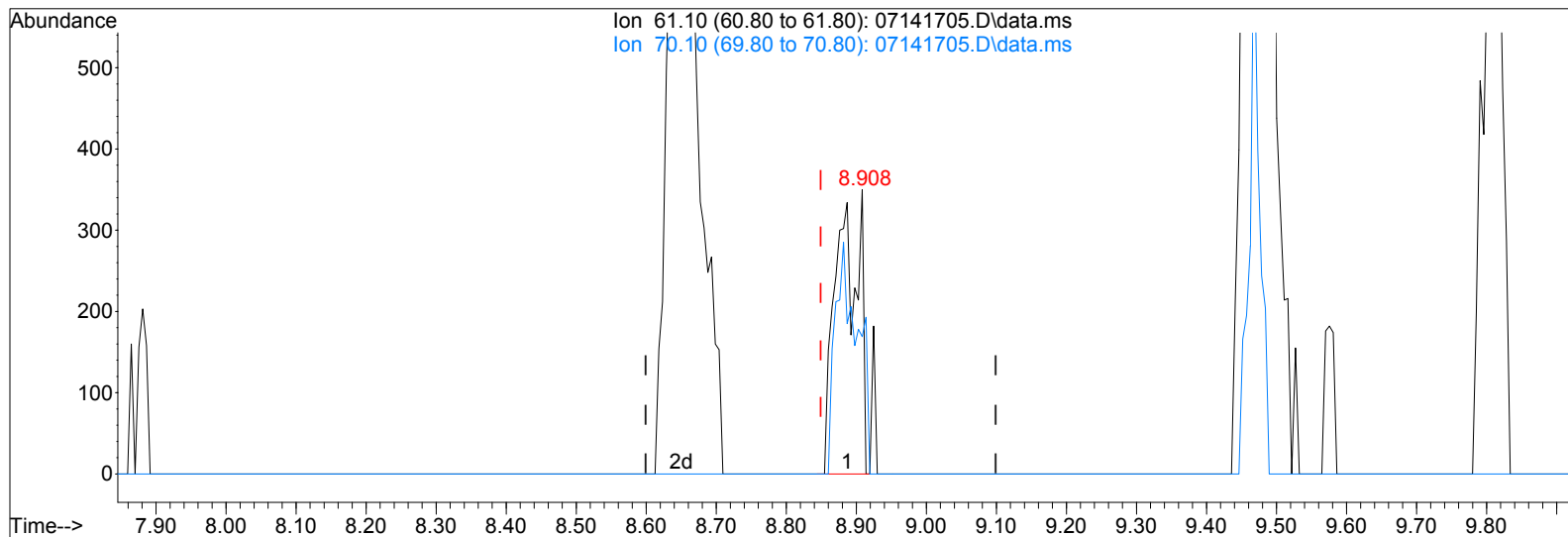
Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



(30) Ethyl Acetate (T)

8.908min (+0.059) 0.15ng m

response 807

SP

AB 7/19/17

Ion	Exp%	Act%
61.10	100	100
70.10	87.60	78.19
0.00	0.00	0.00
0.00	0.00	0.00

DA 7/19/17

Data File: I:\MS08\Data\2017 07\14\07141706.D

Acq On : 14 Jul 2017 7:54

Operator: WA/AB

Sample : 0.10ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111710 (8/10)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 14 11:21:14 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

AB 7/19/17

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

DA 7/19/17

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.78	130	191390	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	10.53	114	898438	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	14.56	82	371202	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.47	65	324476	13.839	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	110.72%
57) Toluene-d8 (SS2)	12.75	98	947153	13.205	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	105.68%
73) Bromofluorobenzene (SS3)	16.06	174	303106	11.383	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	91.04%

Target Compounds

						Qvalue
2) Propene	3.94	42	2088	0.121	ng	90
3) Dichlorodifluoromethan...	4.04	85	4802	0.132	ng	# 89
4) Chloromethane	4.25	50	2252m	0.118	ng	
5) 1,2-Dichloro-1,1,2,2-t...	4.39	135	2265	0.141	ng	90
6) Vinyl Chloride	4.53	62	2138	0.120	ng	97
7) 1,3-Butadiene	4.71	54	1564	0.119	ng	# 72
8) Bromomethane	5.01	94	1542	0.122	ng	98
9) Chloroethane	5.22	64	1390	0.116	ng	# 43
10) Ethanol	5.43	45	7871	0.654	ng	90
11) Acetonitrile	5.68	41	4048	0.124	ng	# 70
12) Acrolein	5.81	56	1109	0.107	ng	# 59
13) Acetone	5.87	58	9218	0.731	ng	95
14) Trichlorofluoromethane	6.04	101	4583	0.139	ng	97
15) 2-Propanol (Isopropanol)	6.19	45	11122	0.246	ng	90
16) Acrylonitrile	6.43	53	2226	0.102	ng	79
17) 1,1-Dichloroethene	6.68	96	2325	0.127	ng	93
18) 2-Methyl-2-Propanol (t...	6.79	59	12106	0.304	ng	93
19) Methylene Chloride	6.80	84	3312	0.187	ng	# 73
20) 3-Chloro-1-propene (Al...	6.92	41	2710	0.108	ng	86
21) Trichlorotrifluoroethane	7.07	151	2498	0.141	ng	98
22) Carbon Disulfide	7.07	76	8228	0.135	ng	96
23) trans-1,2-Dichloroethene	7.71	61	2882	0.121	ng	89
24) 1,1-Dichloroethane	7.88	63	3766	0.121	ng	95
25) Methyl tert-Butyl Ether	7.97	73	7194	0.156	ng	95
26) Vinyl Acetate	8.05	86	1725	0.379	ng	# 62
27) 2-Butanone (MEK)	8.29	72	930	0.084	ng	# 62
28) cis-1,2-Dichloroethene	8.64	61	2834	0.122	ng	89
29) Diisopropyl Ether	8.86	87	2476	0.163	ng	# 68
30) Ethyl Acetate	8.89	61	1083m	0.210	ng	
31) n-Hexane	8.86	57	3603	0.148	ng	98
32) Chloroform	8.90	83	4414	0.138	ng	93
34) Tetrahydrofuran (THF)	9.30	72	1262	0.114	ng	# 74
35) Ethyl tert-Butyl Ether	9.34	87	2753	0.143	ng	90
36) 1,2-Dichloroethane	9.58	62	3662	0.147	ng	97
38) 1,1,1-Trichloroethane	9.82	97	4404	0.138	ng	97
39) Isopropyl Acetate	10.13	61	2418	0.247	ng	# 81
40) 1-Butanol	10.21	56	993	0.056	ng	# 12
41) Benzene	10.23	78	8889	0.122	ng	97
42) Carbon Tetrachloride	10.36	117	3943	0.139	ng	98
43) Cyclohexane	10.47	84	7854	0.255	ng	95
44) tert-Amyl Methyl Ether	10.76	73	6984	0.149	ng	97
45) 1,2-Dichloropropane	10.96	63	2092	0.130	ng	92
46) Bromodichloromethane	11.12	83	3222	0.134	ng	93
47) Trichloroethene	11.16	130	2637	0.129	ng	96
48) 1,4-Dioxane	11.18	88	1741	0.121	ng	# 73
49) 2,2,4-Trimethylpentane...	11.22	57	9624	0.121	ng	98

Data File: I:\MS08\Data\2017 07\14\07141706.D

Acq On : 14 Jul 2017 7:54

Operator: WA/AB

Sample : 0.10ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111710 (8/10)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 14 11:21:14 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

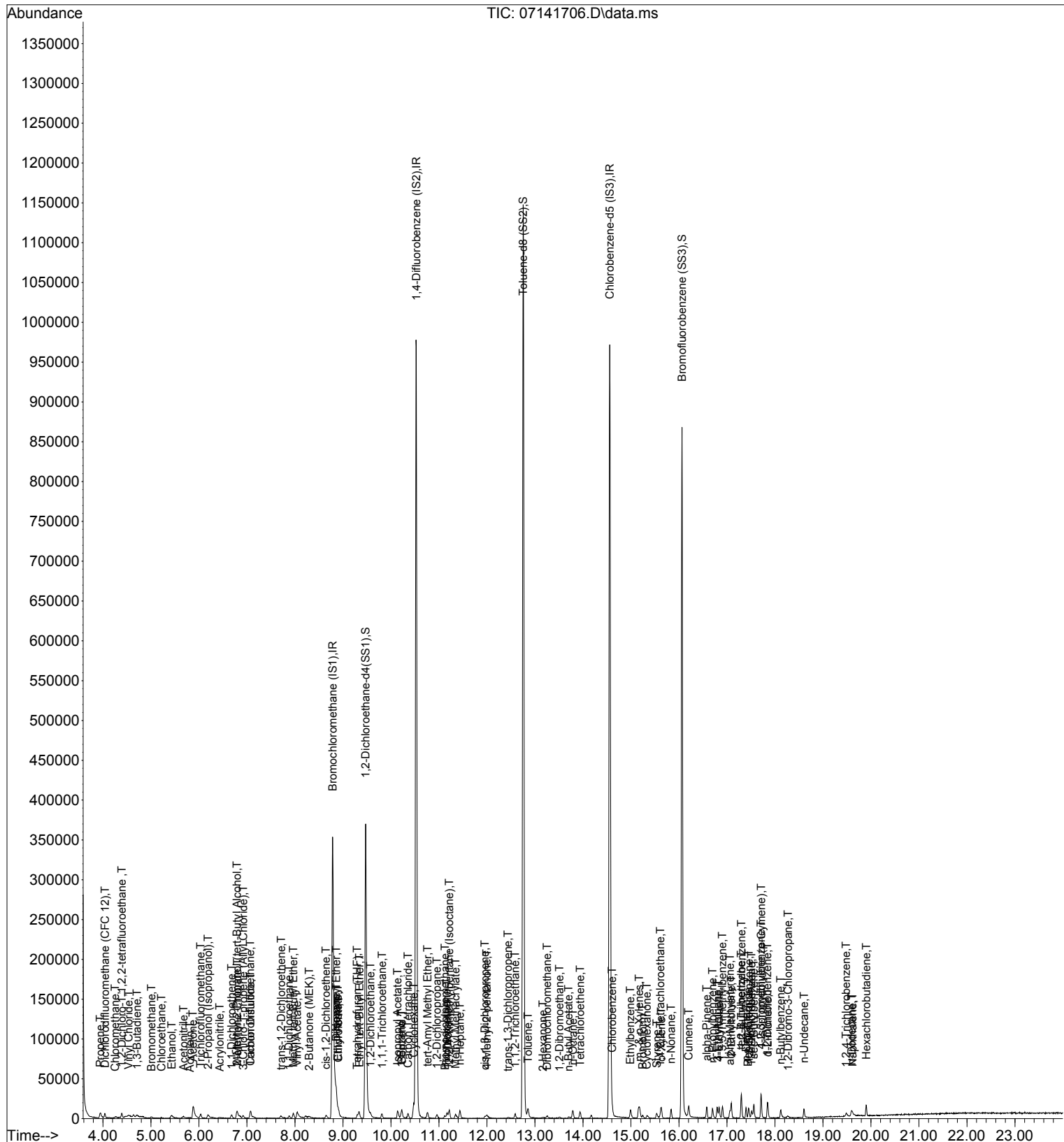
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.35	100	1290	0.170	ng	96
51) n-Heptane	11.44	71	2144	0.122	ng	92
52) cis-1,3-Dichloropropene	11.96	75	3233	0.117	ng	# 43
53) 4-Methyl-2-pentanone	12.00	58	1444m	0.093	ng	
54) trans-1,3-Dichloropropene	12.44	75	1898m	0.072	ng	
55) 1,1,2-Trichloroethane	12.59	97	2107	0.121	ng	94
58) Toluene	12.86	91	9577	0.129	ng	97
59) 2-Hexanone	13.16	43	731	0.021	ng	# 24
60) Dibromochloromethane	13.25	129	2745	0.142	ng	88
61) 1,2-Dibromoethane	13.51	107	1912	0.112	ng	98
62) n-Butyl Acetate	13.70	43	2664	0.075	ng	93
63) n-Octane	13.79	57	1694	0.117	ng	91
64) Tetrachloroethene	13.94	166	2865	0.128	ng	97
65) Chlorobenzene	14.61	112	6559	0.130	ng	86
66) Ethylbenzene	14.99	91	11243	0.132	ng	93
67) m- & p-Xylenes	15.17	91	18679	0.275	ng	98
68) Bromoform	15.25	173	2088	0.129	ng	97
69) Styrene	15.54	104	5464	0.117	ng	96
70) o-Xylene	15.63	91	9153	0.133	ng	97
71) n-Nonane	15.84	43	4121	0.121	ng	96
72) 1,1,2,2-Tetrachloroethane	15.61	83	3252	0.119	ng	97
74) Cumene	16.20	105	11722	0.129	ng	95
75) alpha-Pinene	16.58	93	5857	0.128	ng	97
76) n-Propylbenzene	16.70	91	12940	0.127	ng	96
77) 3-Ethyltoluene	16.80	105	9966	0.116	ng	96
78) 4-Ethyltoluene	16.84	105	10900	0.131	ng	93
79) 1,3,5-Trimethylbenzene	16.91	105	9534	0.121	ng	95
80) alpha-Methylstyrene	17.06	118	3966	0.114	ng	# 82
81) 2-Ethyltoluene	17.09	105	11362	0.129	ng	98
82) 1,2,4-Trimethylbenzene	17.30	105	9694	0.131	ng	100
83) n-Decane	17.40	57	4398	0.124	ng	95
84) Benzyl Chloride	17.44	91	5818	0.101	ng	87
85) 1,3-Dichlorobenzene	17.46	146	5148	0.123	ng	98
86) 1,4-Dichlorobenzene	17.51	146	4477	0.101	ng	# 73
87) sec-Butylbenzene	17.56	105	12473	0.126	ng	96
88) 4-Isopropyltoluene (p-...	17.71	119	11675	0.123	ng	97
89) 1,2,3-Trimethylbenzene	17.71	105	9620	0.128	ng	99
90) 1,2-Dichlorobenzene	17.84	146	5570	0.136	ng	88
91) d-Limonene	17.85	68	3087	0.121	ng	95
92) 1,2-Dibromo-3-Chloropr...	18.27	157	1090	0.075	ng	# 64
93) n-Undecane	18.61	57	4346	0.120	ng	94
94) 1,2,4-Trichlorobenzene	19.48	180	3248	0.109	ng	91
95) Naphthalene	19.62	128	4015	0.047	ng	# 71
96) n-Dodecane	19.60	57	3722	0.115	ng	93
97) Hexachlorobutadiene	19.90	225	3390	0.147	ng	93
98) Cyclohexanone	15.33	55	2672	0.123	ng	91
99) tert-Butylbenzene	17.29	119	10325	0.135	ng	94
100) n-Butylbenzene	18.12	91	8456	0.114	ng	97

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

ALS Vial : 13 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: J:\MS08\Data\2017 07\14\07141706.D

Acq On : 14 Jul 2017 7:54

Sample : 0.10ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111710 (8/10)

ALS Vial : 13 Sample Multiplier: 1

Operator: WA/AB

Inst : MS08

Quant Time: Jul 14 11:07:27 2017

Quant Method : I:\MS08\Methods\R8071417.M

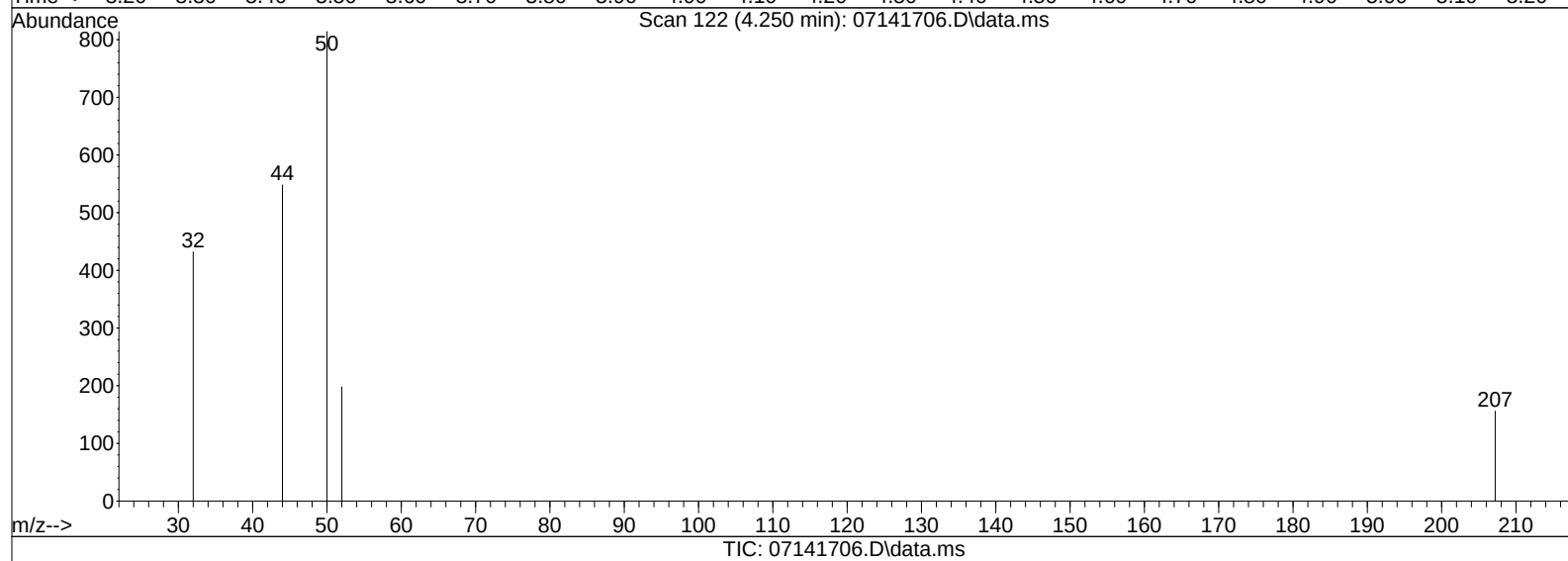
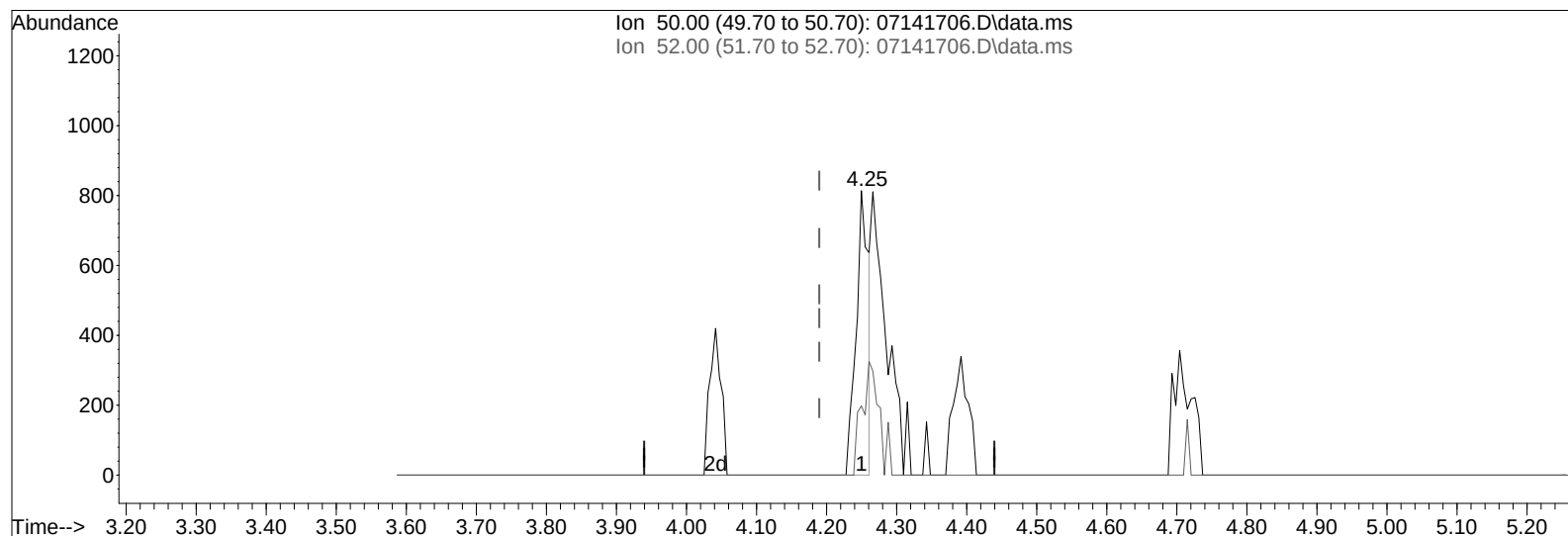
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Quant Results File: R8071417.RES



(4) Chloromethane (T)

4.250min (+0.060) 0.05ng

response 994

Data File: I:\MS08\Data\2017 07\14\07141706.D

Acq On : 14 Jul 2017 7:54

Operator: WA/AB

Sample : 0.10ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111710 (8/10)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 14 11:21:14 2017

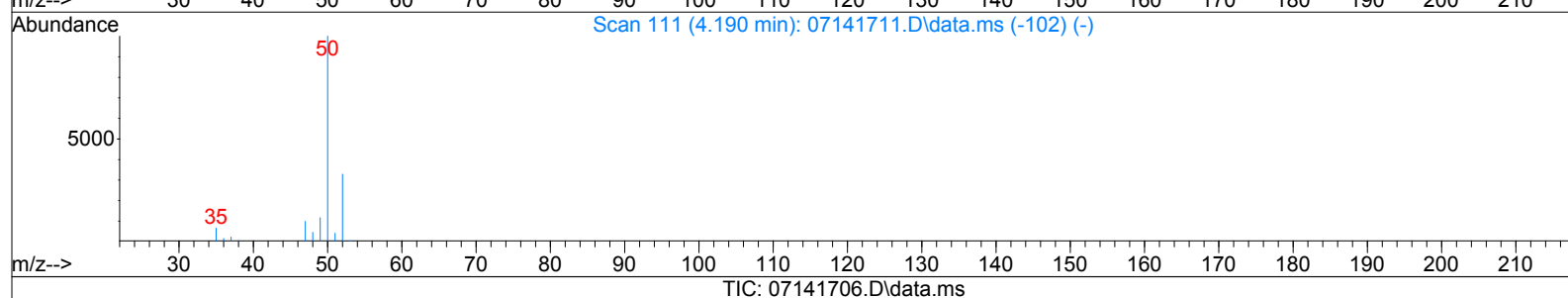
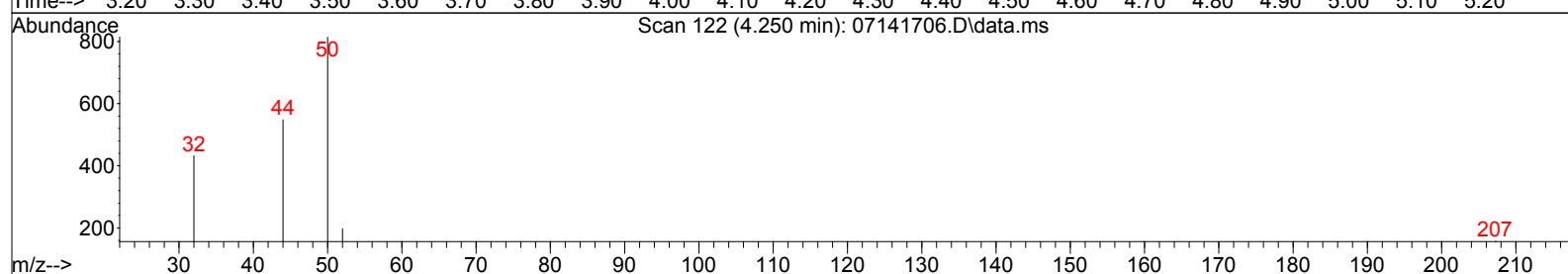
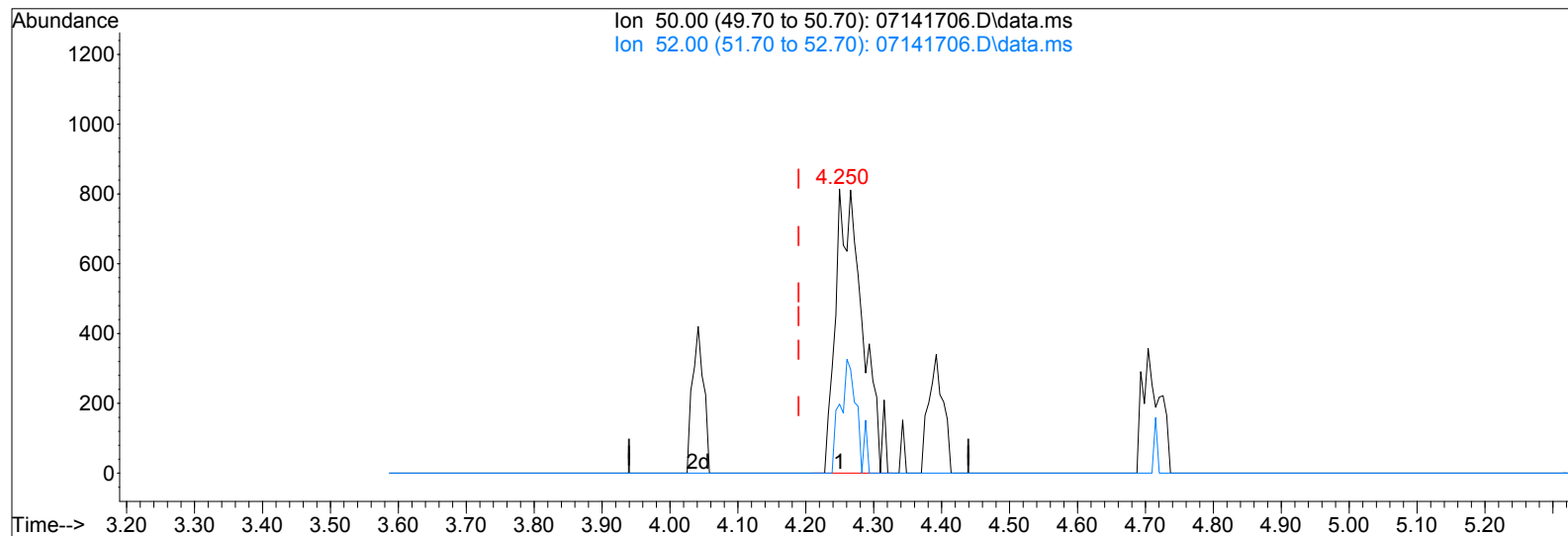
Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 07141706.D\data.ms

(4) Chloromethane (T)

4.250min (+0.060) 0.12ng m

SP

response 2252

Ion	Exp%	Act%
50.00	100	100
52.00	33.20	25.09
0.00	0.00	0.00
0.00	0.00	0.00

AB 7/19/17

WA 7/19/17

Data File: J:\MS08\Data\2017 07\14\07141706.D

Acq On : 14 Jul 2017 7:54

Operator: WA/AB

Sample : 0.10ng TO-15 ICAL Std

Inst : MS08

Misc : S31-07131701/S31-07111710 (8/10)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 14 11:07:27 2017

Quant Method : I:\MS08\Methods\R8071417.M

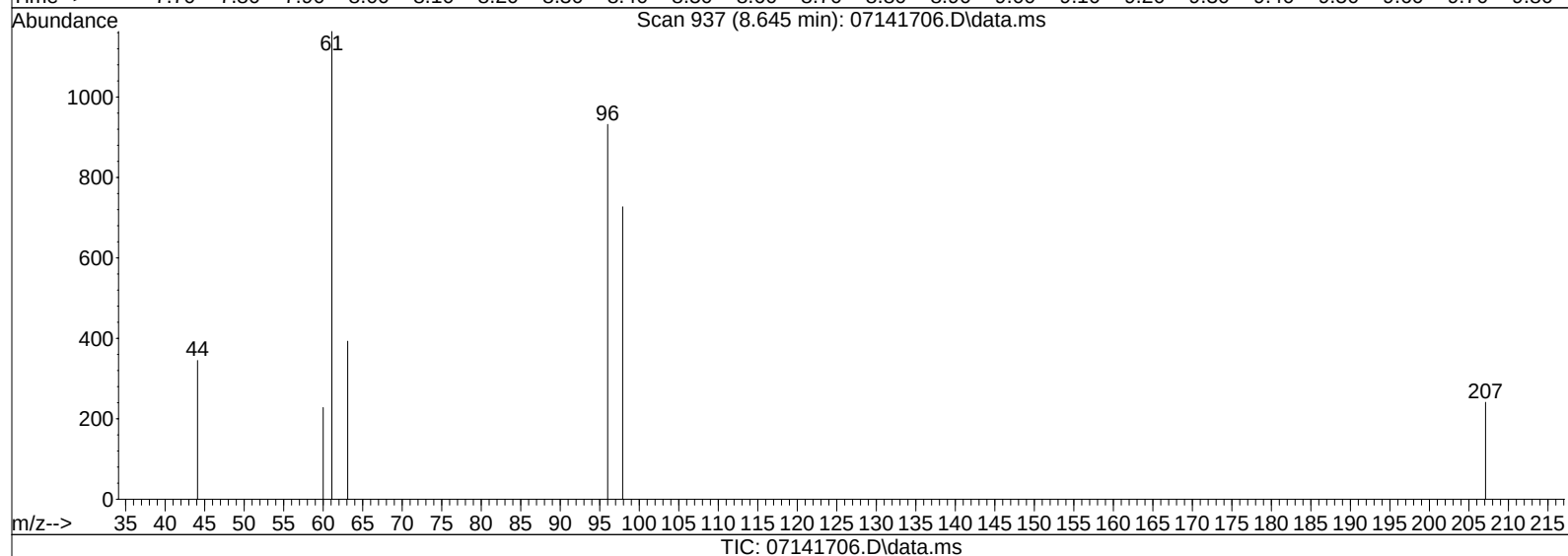
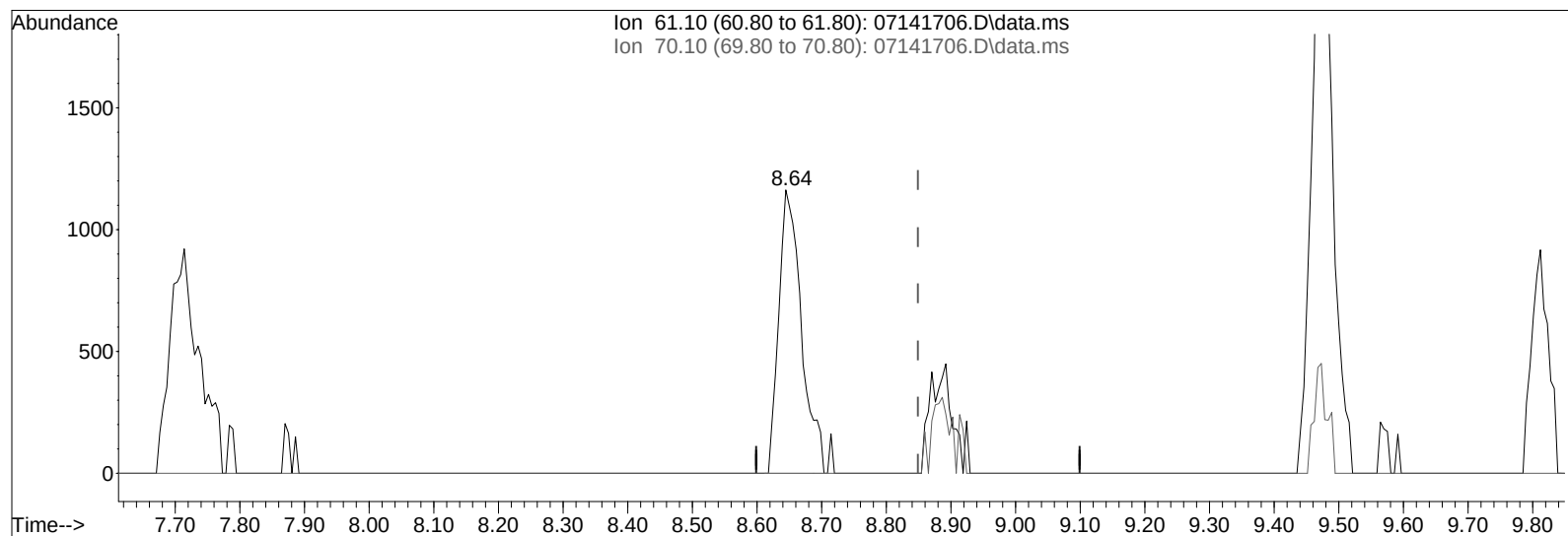
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Quant Results File: R8071417.RES



TIC: 07141706.D\data.ms

(30) Ethyl Acetate (T)

8.645min (-0.205) 0.55ng

response 2834

Data File: I:\MS08\Data\2017 07\14\07141706.D

Acq On : 14 Jul 2017 7:54

Operator: WA/AB

Sample : 0.10ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111710 (8/10)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 14 11:21:14 2017

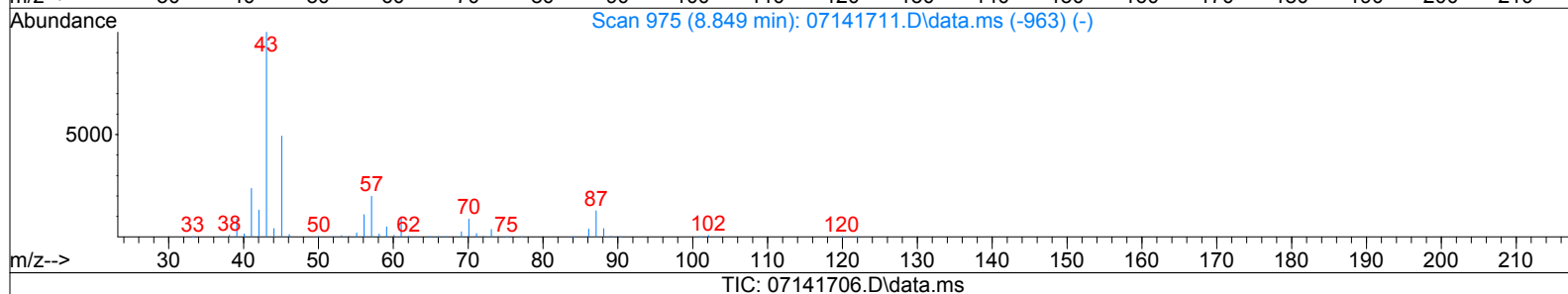
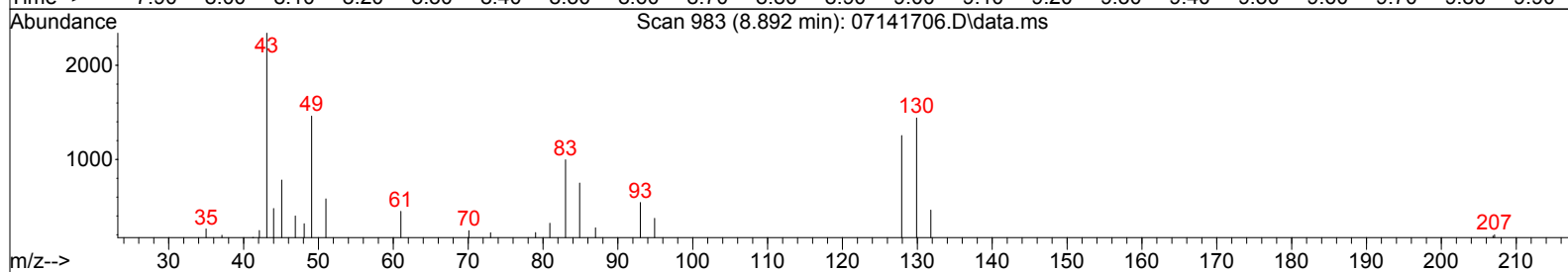
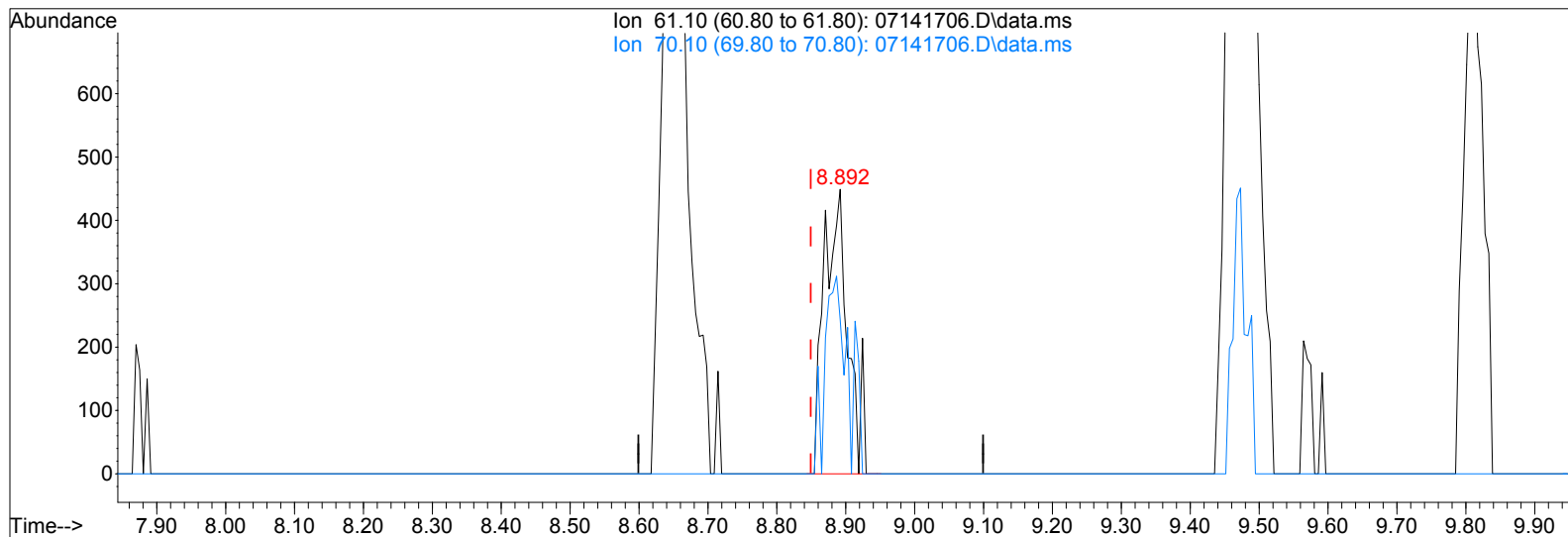
Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 07141706.D\data.ms

(30) Ethyl Acetate (T)

8.892min (+0.043) 0.21ng m

response 1083

MP

Ion	Exp%	Act%
61.10	100	100
70.10	87.60	68.98
0.00	0.00	0.00
0.00	0.00	0.00

AB 7/19/17

WA 7/19/17

Data File: J:\MS08\Data\2017 07\14\07141706.D

Acq On : 14 Jul 2017 7:54

Operator: WA/AB

Sample : 0.10ng TO-15 ICAL Std

Inst : MS08

Misc : S31-07131701/S31-07111710 (8/10)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 14 11:07:27 2017

Quant Method : I:\MS08\Methods\R8071417.M

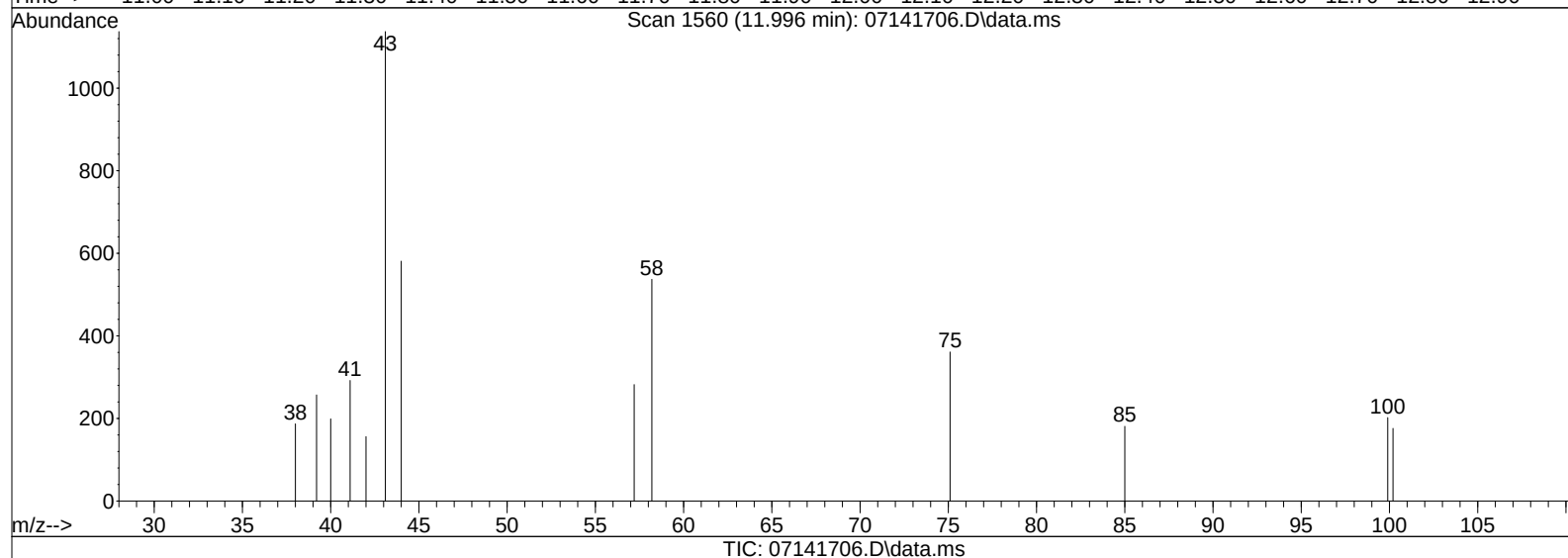
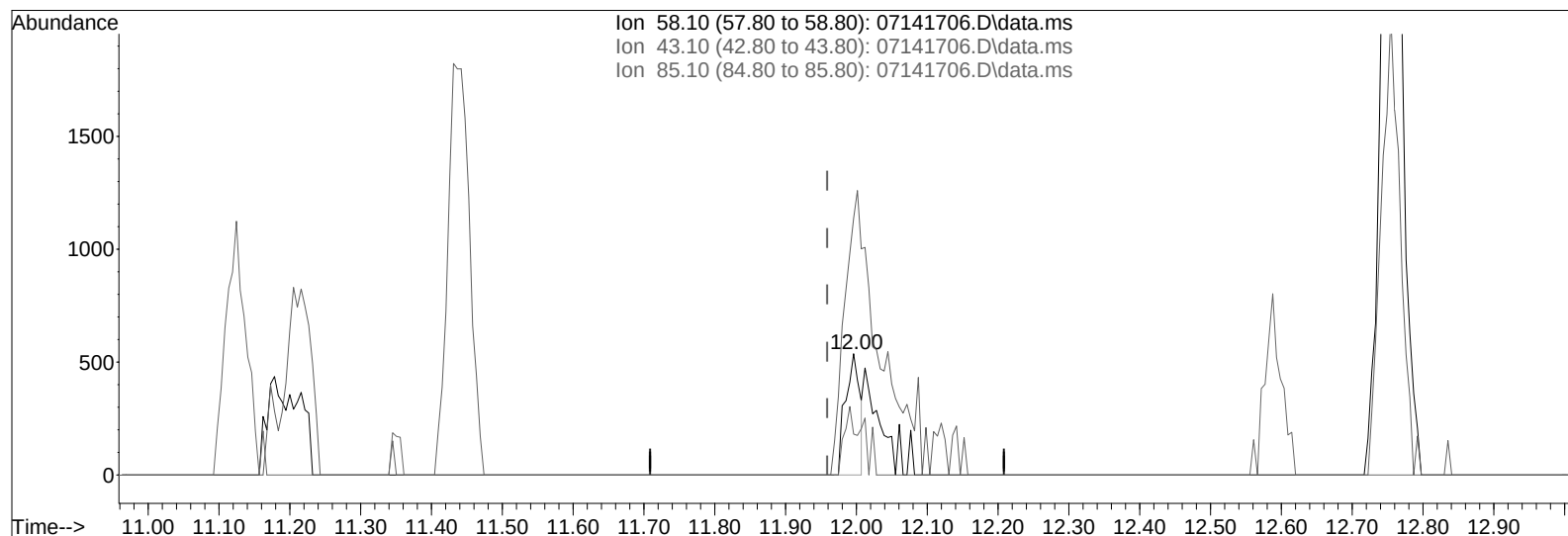
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Quant Results File: R8071417.RES



(53) 4-Methyl-2-pentanone (T)

11.996min (+0.037) 0.05ng

response 753

Data File: I:\MS08\Data\2017 07\14\07141706.D

Acq On : 14 Jul 2017 7:54

Operator: WA/AB

Sample : 0.10ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111710 (8/10)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 14 11:21:14 2017

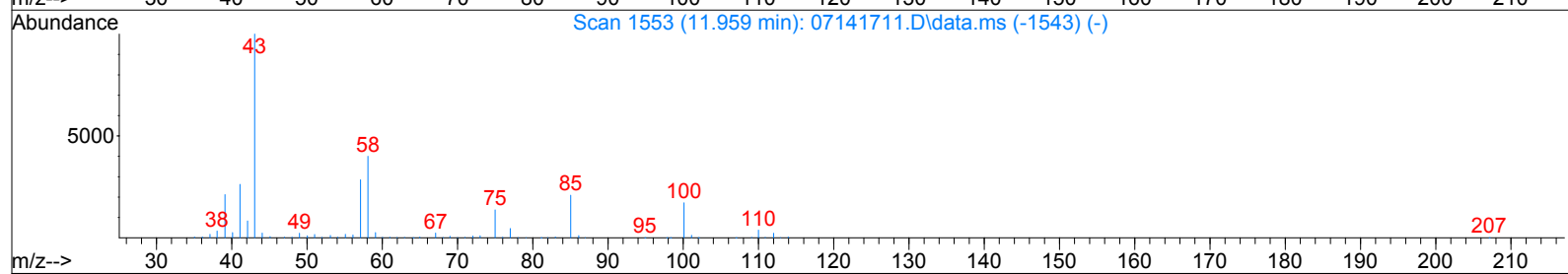
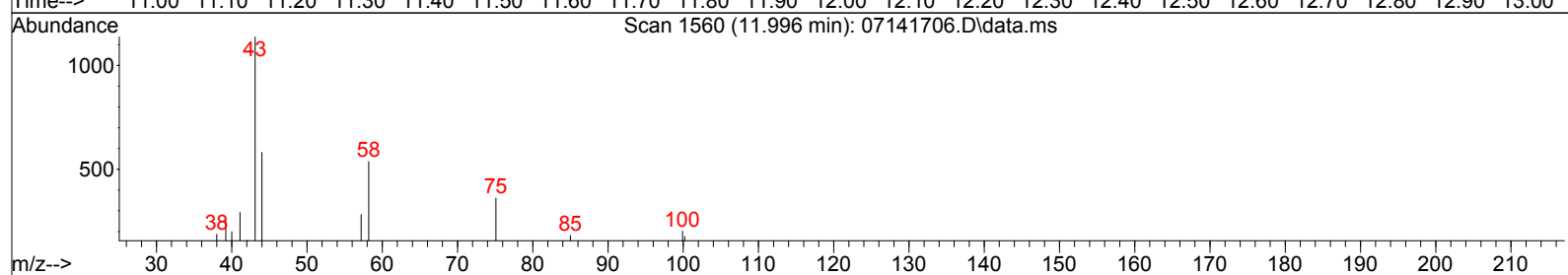
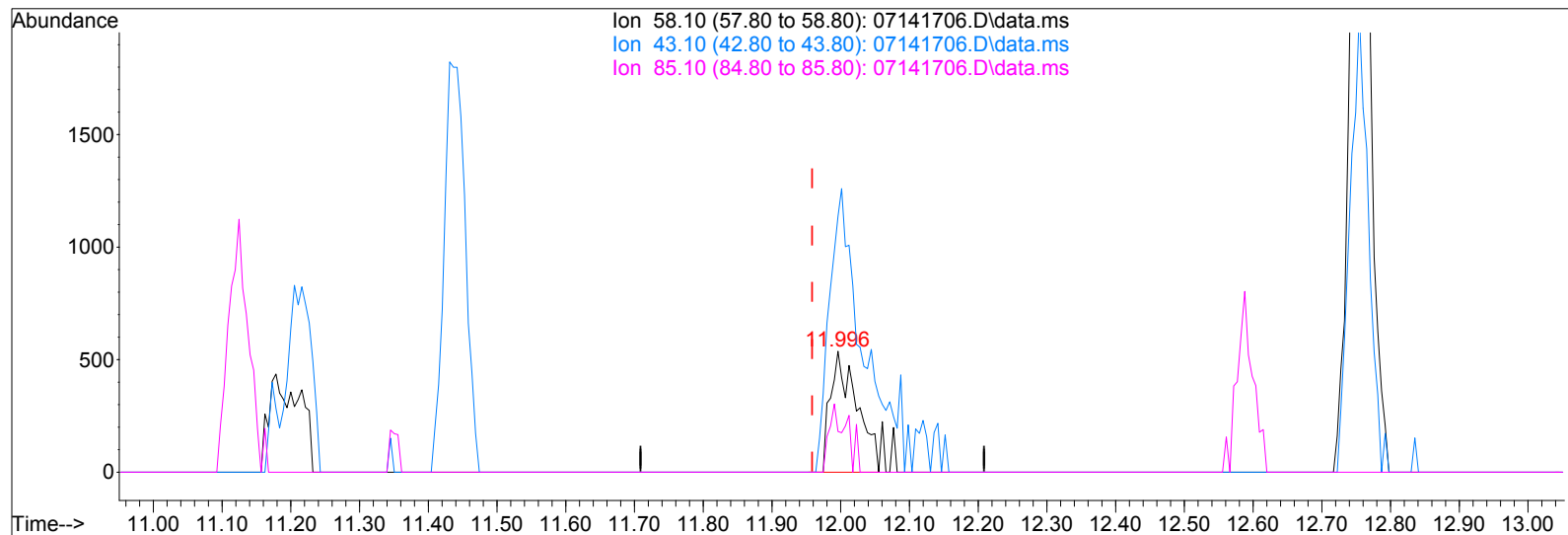
Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 07141706.D\data.ms

(53) 4-Methyl-2-pentanone (T)

11.996min (+0.037) 0.09ng m

response 1444

SP

Ion	Exp%	Act%

58.10	100	100

43.10	248.00	302.08#

85.10	54.10	37.81#

0.00	0.00	0.00

AB 7/19/17

WA 7/19/17

Data File: J:\MS08\Data\2017 07\14\07141706.D

Acq On : 14 Jul 2017 7:54

Operator: WA/AB

Sample : 0.10ng TO-15 ICAL Std

Inst : MS08

Misc : S31-07131701/S31-07111710 (8/10)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 14 11:07:27 2017

Quant Method : I:\MS08\Methods\R8071417.M

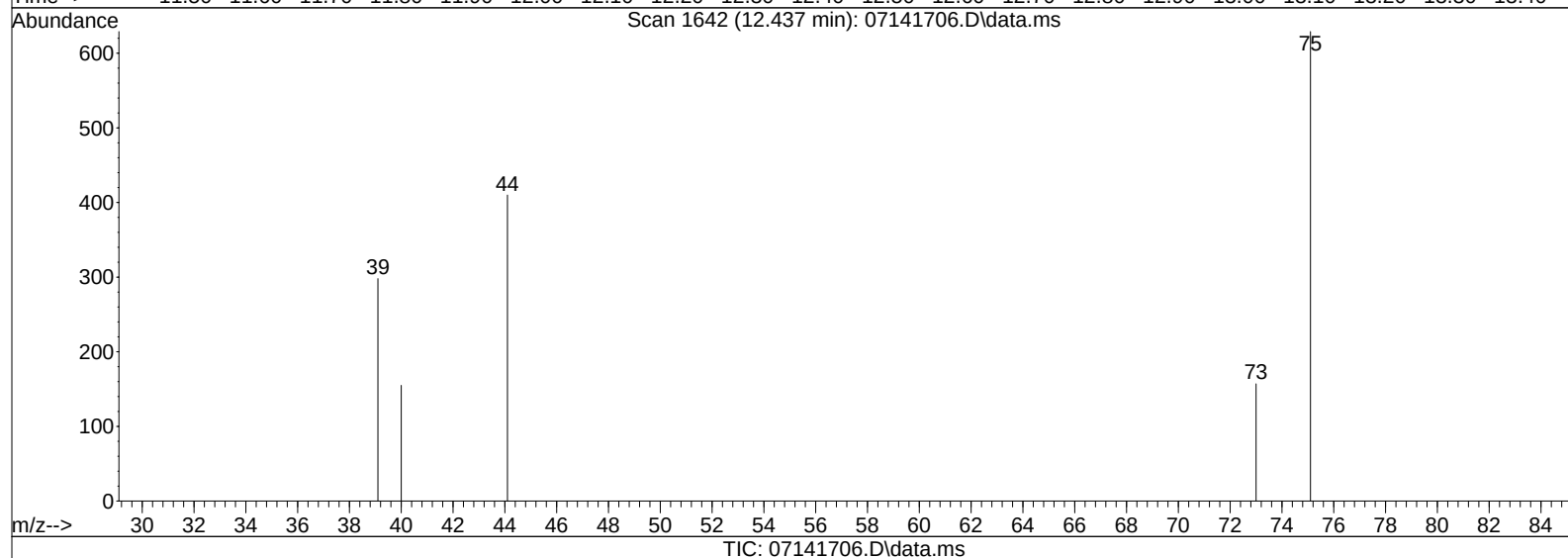
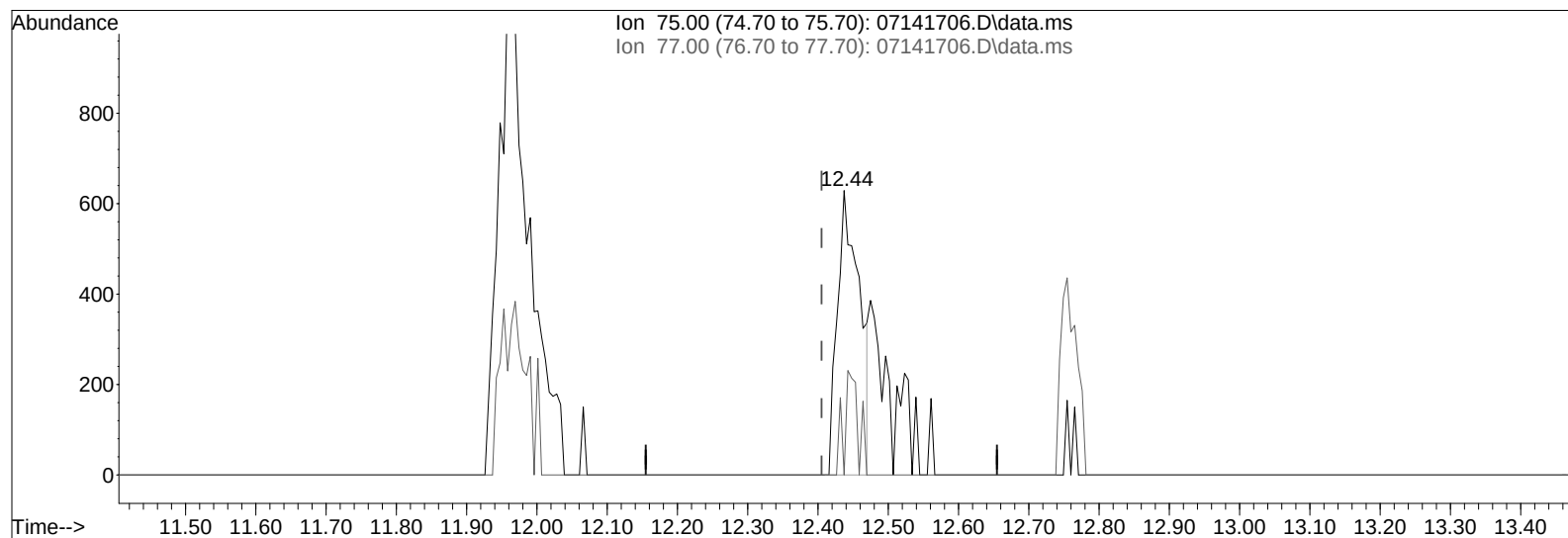
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Quant Results File: R8071417.RES



TIC: 07141706.D\data.ms

(54) trans-1,3-Dichloropropene (T)

12.437min (+0.032) 0.05ng

response 1366

Data File: I:\MS08\Data\2017 07\14\07141706.D

Acq On : 14 Jul 2017 7:54

Operator: WA/AB

Sample : 0.10ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111710 (8/10)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 14 11:21:14 2017

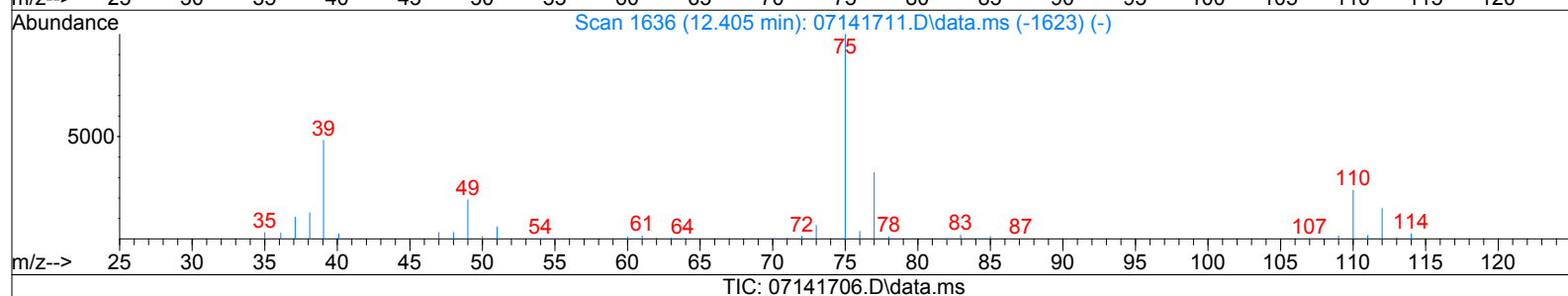
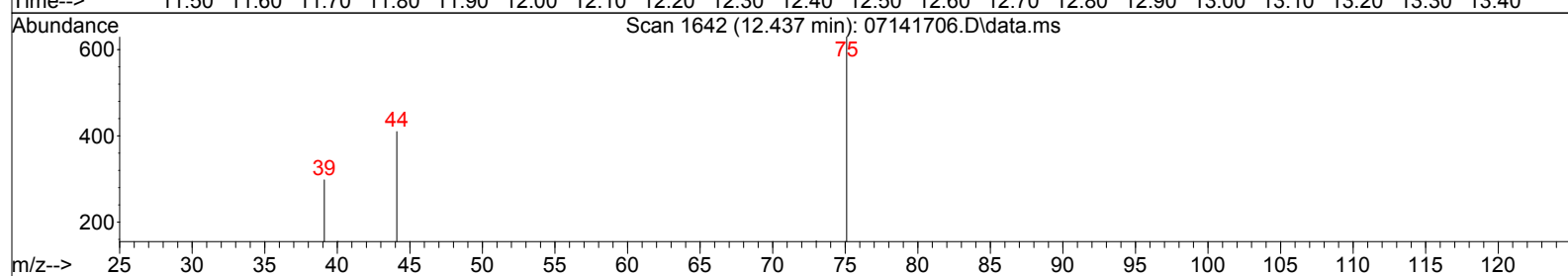
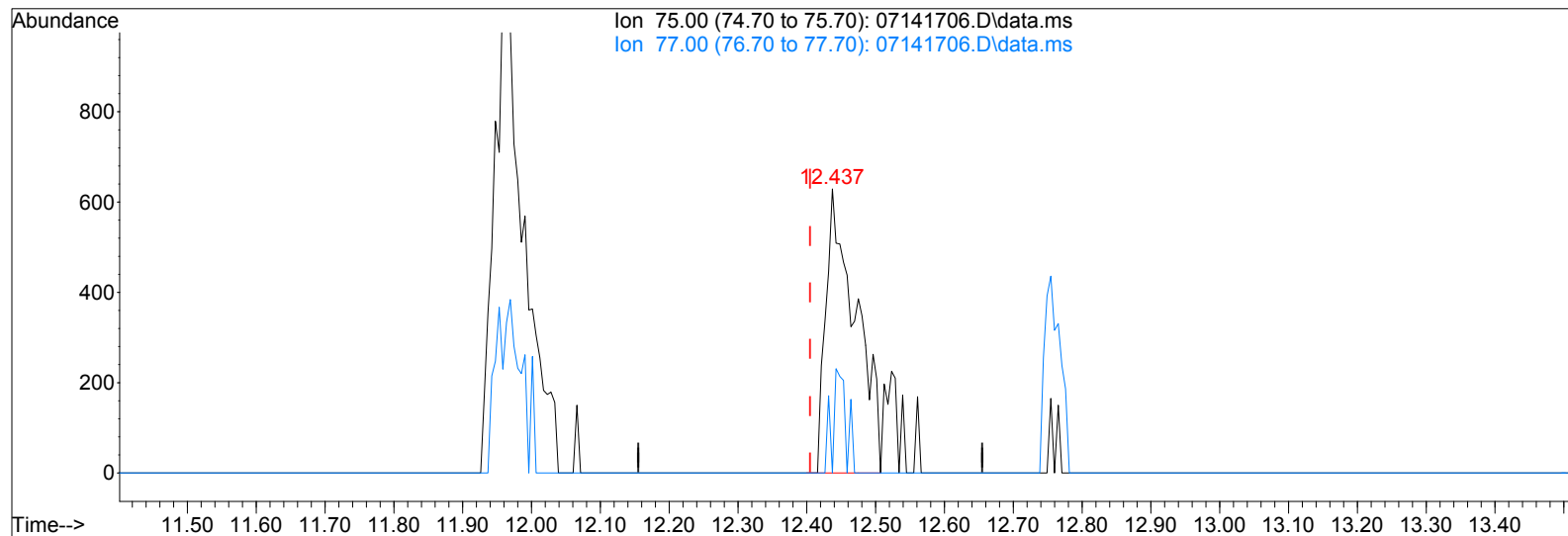
Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



(54) trans-1,3-Dichloropropene (T)

12.437min (+0.032) 0.07ng m

response 1898

SP

Ion	Exp%	Act%

75.00	100	100

77.00	32.30	16.75

0.00	0.00	0.00

0.00	0.00	0.00

AB 7/19/17

107 7/19/17

Data File: I:\MS08\Data\2017 07\14\07141707.D

Acq On : 14 Jul 2017 8:26

Operator: WA/AB

Sample : 0.20ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111710 (8/10)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 14 11:28:08 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

AB 7/19/17

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

DA 7/19/17

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.78	130	188395	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	10.53	114	884086	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	14.56	82	368884	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.47	65	323998	14.038	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	112.32%
57) Toluene-d8 (SS2)	12.75	98	933265	13.094	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	104.72%
73) Bromofluorobenzene (SS3)	16.06	174	300618	11.360	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	90.88%

Target Compounds

						Qvalue
2) Propene	3.93	42	3663	0.216	ng	97
3) Dichlorodifluoromethan...	4.03	85	8793	0.245	ng	96
4) Chloromethane	4.25	50	4001	0.213	ng	94
5) 1,2-Dichloro-1,1,2,2-t...	4.38	135	3999	0.253	ng	97
6) Vinyl Chloride	4.52	62	3559	0.204	ng	95
7) 1,3-Butadiene	4.69	54	2936	0.226	ng	# 86
8) Bromomethane	5.00	94	2981	0.240	ng	90
9) Chloroethane	5.21	64	2405	0.204	ng	75
10) Ethanol	5.43	45	13615	1.150	ng	97
11) Acetonitrile	5.66	41	6749	0.211	ng	79
12) Acrolein	5.76	56	2188	0.214	ng	88
13) Acetone	5.86	58	14575	1.175	ng	99
14) Trichlorofluoromethane	6.03	101	8601	0.265	ng	95
15) 2-Propanol (Isopropanol)	6.17	45	19682	0.443	ng	92
16) Acrylonitrile	6.42	53	3795	0.176	ng	95
17) 1,1-Dichloroethene	6.68	96	3728	0.208	ng	93
18) 2-Methyl-2-Propanol (t...	6.77	59	21496	0.549	ng	97
19) Methylene Chloride	6.79	84	4206	0.242	ng	94
20) 3-Chloro-1-propene (Al...	6.91	41	4556	0.184	ng	97
21) Trichlorotrifluoroethane	7.07	151	4160	0.238	ng	99
22) Carbon Disulfide	7.07	76	18713	0.312	ng	87
23) trans-1,2-Dichloroethene	7.70	61	5571	0.238	ng	98
24) 1,1-Dichloroethane	7.88	63	6765	0.221	ng	92
25) Methyl tert-Butyl Ether	7.96	73	12503	0.276	ng	96
26) Vinyl Acetate	8.03	86	4179	0.932	ng	# 82
27) 2-Butanone (MEK)	8.27	72	1989m	0.182	ng	
28) cis-1,2-Dichloroethene	8.64	61	5262	0.230	ng	93
29) Diisopropyl Ether	8.85	87	3721	0.249	ng	# 95
30) Ethyl Acetate	8.86	61	1990	0.392	ng	96
31) n-Hexane	8.86	57	6501	0.270	ng	98
32) Chloroform	8.90	83	7289	0.232	ng	98
34) Tetrahydrofuran (THF)	9.30	72	2472	0.227	ng	# 82
35) Ethyl tert-Butyl Ether	9.33	87	4948	0.261	ng	99
36) 1,2-Dichloroethane	9.58	62	6363	0.260	ng	99
38) 1,1,1-Trichloroethane	9.81	97	8034	0.255	ng	97
39) Isopropyl Acetate	10.13	61	4287	0.445	ng	# 88
40) 1-Butanol	10.19	56	5343	0.306	ng	# 42
41) Benzene	10.22	78	15335	0.214	ng	97
42) Carbon Tetrachloride	10.36	117	7169	0.257	ng	96
43) Cyclohexane	10.47	84	13841	0.456	ng	97
44) tert-Amyl Methyl Ether	10.75	73	11719	0.254	ng	97
45) 1,2-Dichloropropane	10.96	63	3497	0.221	ng	97
46) Bromodichloromethane	11.12	83	5766	0.243	ng	97
47) Trichloroethene	11.17	130	4777	0.237	ng	95
48) 1,4-Dioxane	11.17	88	2952	0.209	ng	88
49) 2,2,4-Trimethylpentane...	11.22	57	16777	0.215	ng	99

Data File: I:\MS08\Data\2017 07\14\07141707.D

Acq On : 14 Jul 2017 8:26

Operator: WA/AB

Sample : 0.20ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111710 (8/10)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 14 11:28:08 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

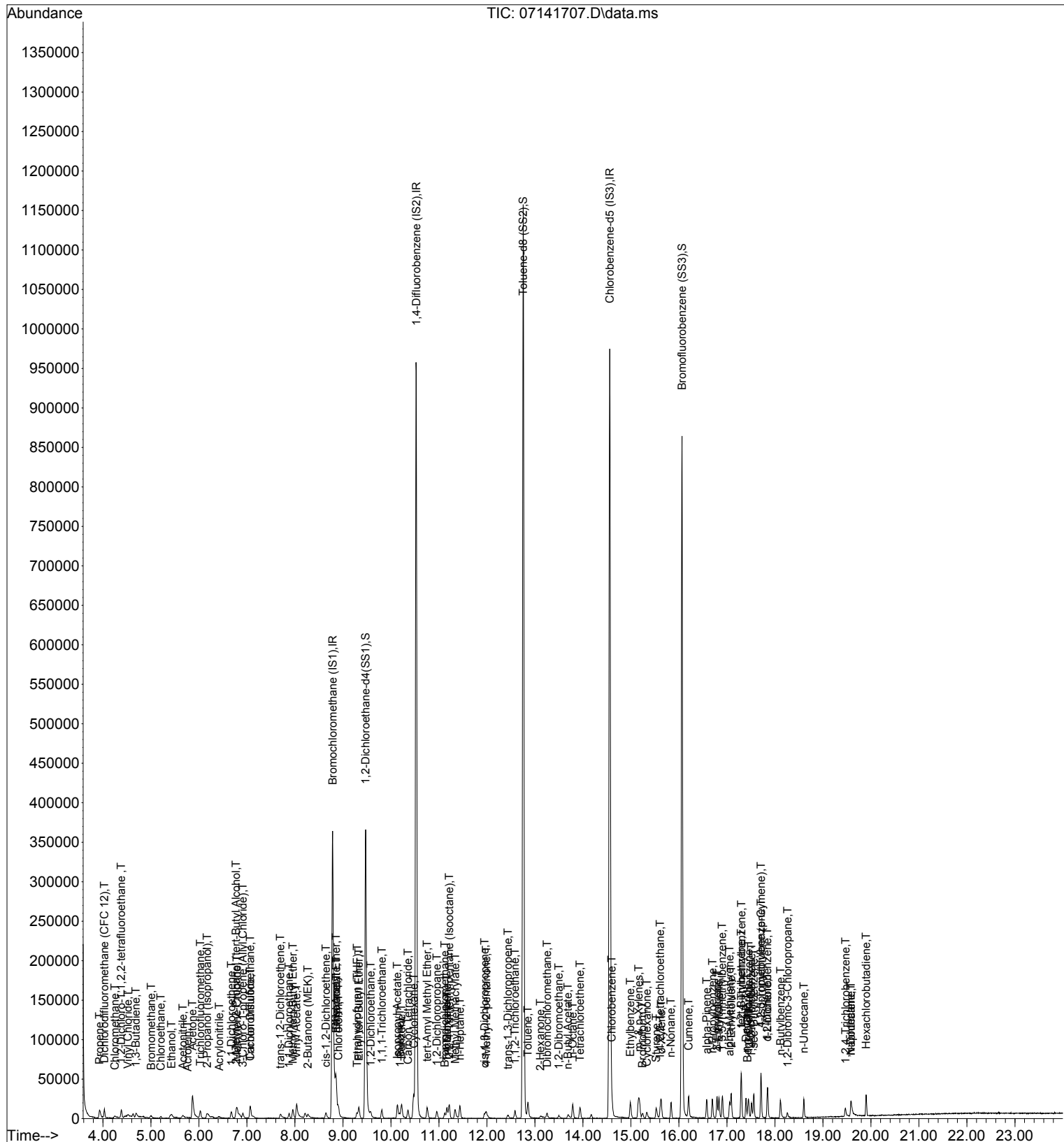
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.34	100	2665	0.356	ng	97
51) n-Heptane	11.44	71	3724	0.216	ng	89
52) cis-1,3-Dichloropropene	11.95	75	5790	0.213	ng	98
53) 4-Methyl-2-pentanone	11.99	58	2743	0.180	ng	96
54) trans-1,3-Dichloropropene	12.44	75	4570	0.176	ng	92
55) 1,1,2-Trichloroethane	12.58	97	3682	0.215	ng	100
58) Toluene	12.85	91	17447	0.237	ng	99
59) 2-Hexanone	13.12	43	1411	0.041	ng	# 1
60) Dibromochloromethane	13.26	129	4974	0.259	ng	99
61) 1,2-Dibromoethane	13.50	107	4048	0.238	ng	97
62) n-Butyl Acetate	13.69	43	6241	0.176	ng	93
63) n-Octane	13.79	57	3334	0.233	ng	98
64) Tetrachloroethene	13.94	166	5196	0.234	ng	99
65) Chlorobenzene	14.60	112	11823	0.236	ng	99
66) Ethylbenzene	14.99	91	20115	0.237	ng	98
67) m- & p-Xylenes	15.16	91	31255	0.463	ng	99
68) Bromoform	15.24	173	4073	0.254	ng	90
69) Styrene	15.53	104	10063	0.217	ng	97
70) o-Xylene	15.63	91	16215	0.236	ng	98
71) n-Nonane	15.83	43	7444	0.219	ng	93
72) 1,1,2,2-Tetrachloroethane	15.61	83	5855	0.216	ng	98
74) Cumene	16.20	105	21387	0.237	ng	97
75) alpha-Pinene	16.58	93	10599	0.233	ng	98
76) n-Propylbenzene	16.70	91	23190	0.228	ng	98
77) 3-Ethyltoluene	16.79	105	19758	0.231	ng	98
78) 4-Ethyltoluene	16.83	105	17690	0.214	ng	99
79) 1,3,5-Trimethylbenzene	16.90	105	18802	0.240	ng	98
80) alpha-Methylstyrene	17.05	118	7979	0.231	ng	95
81) 2-Ethyltoluene	17.09	105	20812	0.239	ng	99
82) 1,2,4-Trimethylbenzene	17.30	105	17551	0.238	ng	97
83) n-Decane	17.40	57	7988	0.227	ng	97
84) Benzyl Chloride	17.43	91	10548	0.184	ng	95
85) 1,3-Dichlorobenzene	17.45	146	9456	0.228	ng	95
86) 1,4-Dichlorobenzene	17.51	146	10508	0.239	ng	100
87) sec-Butylbenzene	17.56	105	22129	0.226	ng	95
88) 4-Isopropyltoluene (p-...	17.71	119	21591	0.228	ng	95
89) 1,2,3-Trimethylbenzene	17.71	105	17374	0.233	ng	96
90) 1,2-Dichlorobenzene	17.84	146	9472	0.233	ng	98
91) d-Limonene	17.84	68	5510	0.217	ng	100
92) 1,2-Dibromo-3-Chloropr...	18.26	157	2297	0.158	ng	# 70
93) n-Undecane	18.60	57	7612	0.211	ng	95
94) 1,2,4-Trichlorobenzene	19.47	180	5927	0.200	ng	97
95) Naphthalene	19.59	128	12716	0.151	ng	# 71
96) n-Dodecane	19.58	57	6376	0.199	ng	97
97) Hexachlorobutadiene	19.90	225	5962	0.261	ng	96
98) Cyclohexanone	15.33	55	4718	0.219	ng	94
99) tert-Butylbenzene	17.30	119	18191	0.240	ng	99
100) n-Butylbenzene	18.12	91	16025	0.218	ng	99

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

ALS Vial : 13 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: J:\MS08\Data\2017 07\14\07141707.D

Acq On : 14 Jul 2017 8:26

Operator: WA/AB

Sample : 0.20ng TO-15 ICAL Std

Inst : MS08

Misc : S31-07131701/S31-07111710 (8/10)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 14 11:07:30 2017

Quant Method : I:\MS08\Methods\R8071417.M

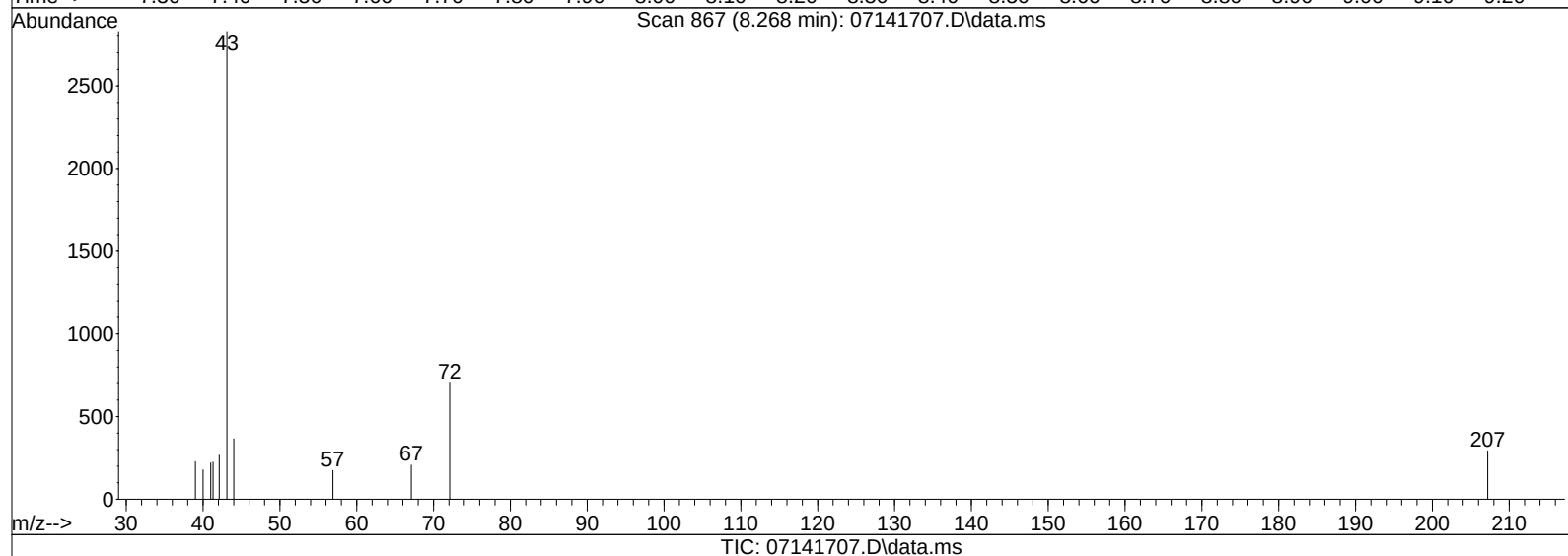
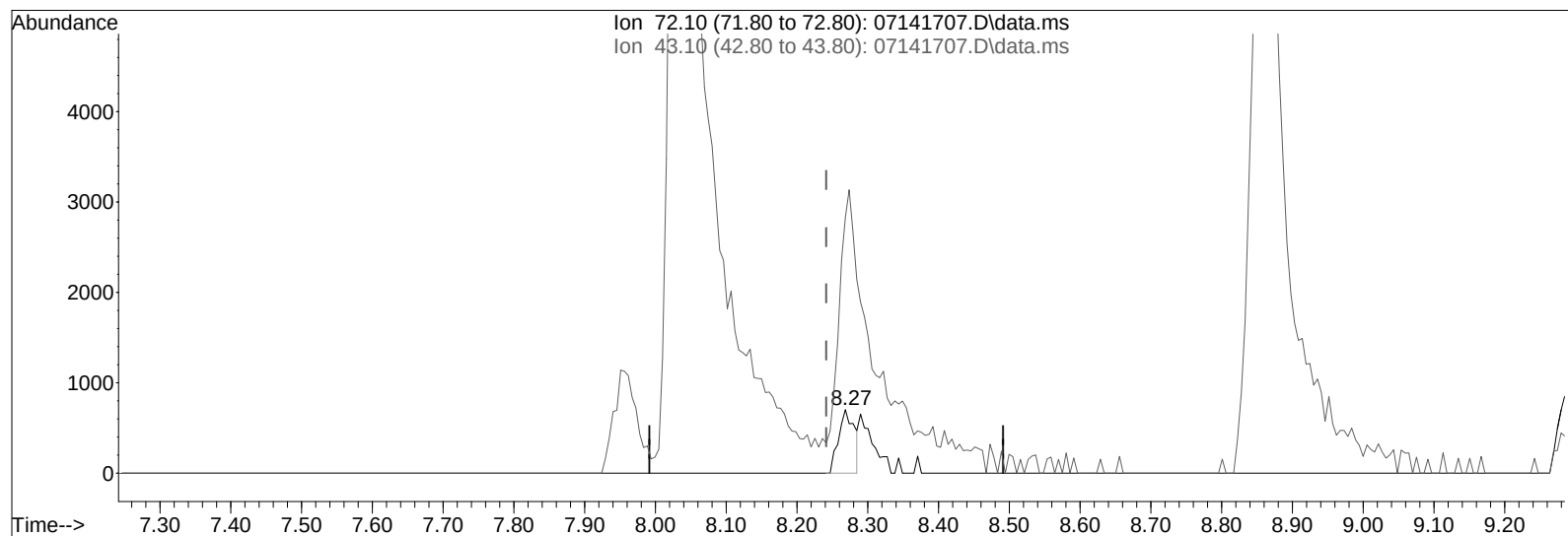
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Quant Results File: R8071417.RES



TIC: 07141707.D\data.ms

(27) 2-Butanone (MEK) (T)

8.268min (+0.027) 0.10ng

response 1090

Data File: I:\MS08\Data\2017 07\14\07141707.D

Acq On : 14 Jul 2017 8:26

Operator: WA/AB

Sample : 0.20ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111710 (8/10)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 14 11:28:08 2017

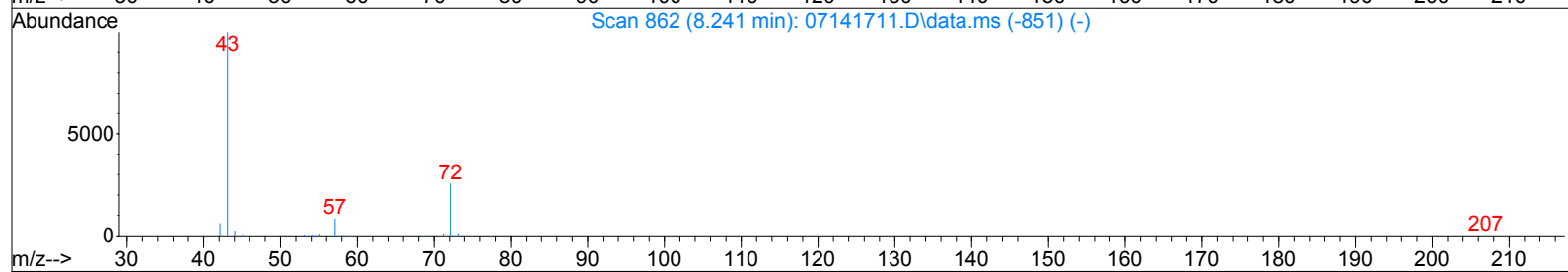
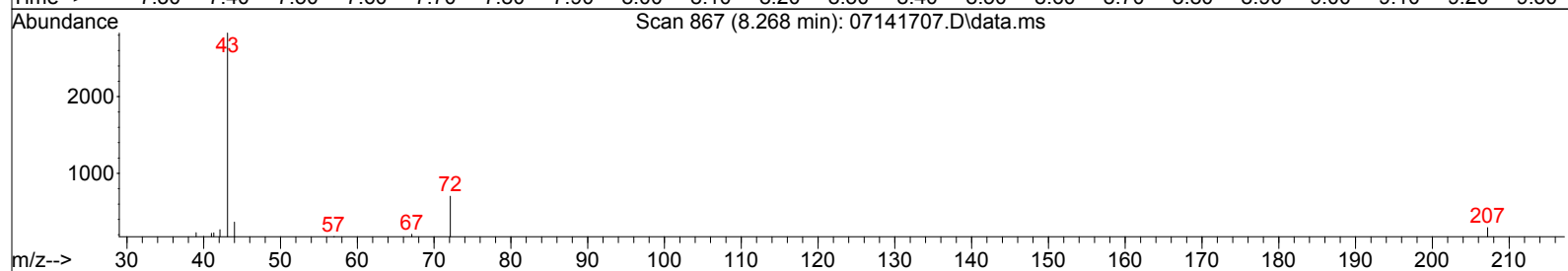
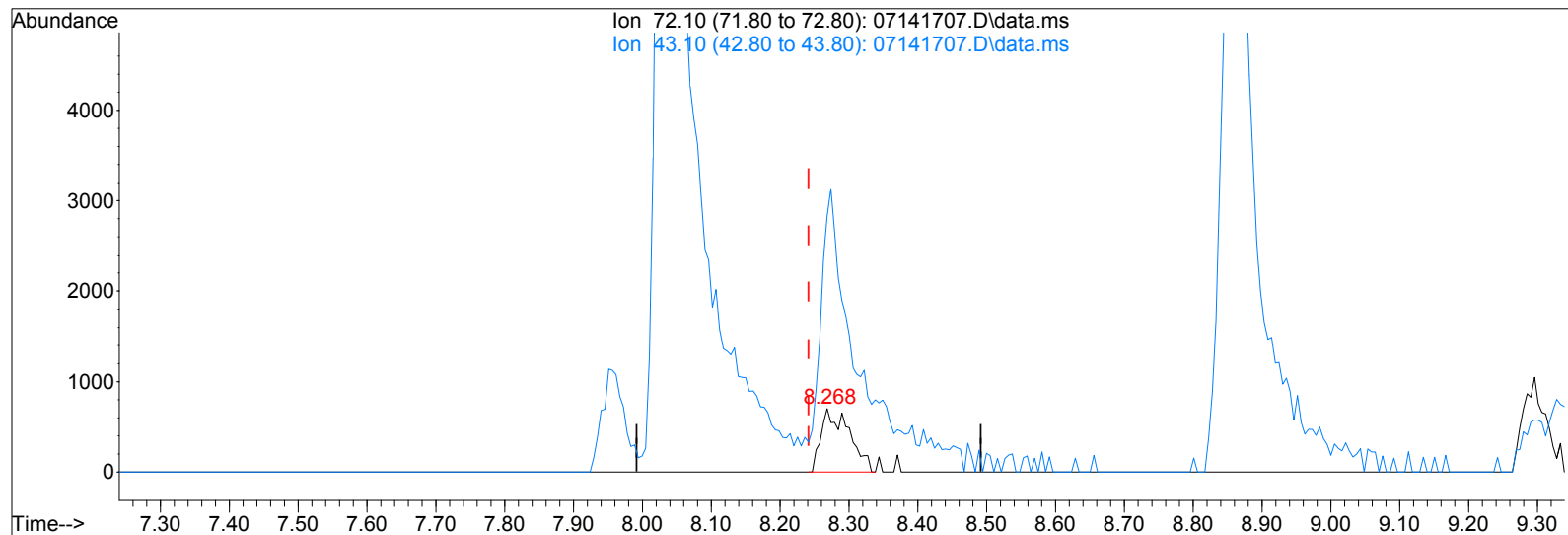
Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 07141707.D\data.ms

(27) 2-Butanone (MEK) (T)

8.268min (+0.027) 0.18ng m

response 1989

SP

Ion	Exp%	Act%

72.10	100	100

43.10	387.30	425.64#

0.00	0.00	0.00

0.00	0.00	0.00

AB 7/19/17

107 7/19/17

Data File: I:\MS08\Data\2017 07\14\07141708.D

Acq On : 14 Jul 2017 8:59

Operator: WA/AB

Sample : 0.40ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111710 (8/10)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 14 11:31:45 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

AB 7/19/17

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

DA 7/19/17

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.79	130	187726	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	10.53	114	875446	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	14.56	82	365974	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.47	65	325173	14.140	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	113.12%
57) Toluene-d8 (SS2)	12.75	98	922739	13.049	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	104.40%
73) Bromofluorobenzene (SS3)	16.06	174	303050	11.543	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	92.32%

Target Compounds

						Qvalue
2) Propene	3.93	42	6687	0.396	ng	94
3) Dichlorodifluoromethan...	4.03	85	16489	0.460	ng	99
4) Chloromethane	4.24	50	7431	0.396	ng	90
5) 1,2-Dichloro-1,1,2,2-t...	4.39	135	7469	0.475	ng	100
6) Vinyl Chloride	4.52	62	7583	0.436	ng	96
7) 1,3-Butadiene	4.69	54	5939	0.459	ng	94
8) Bromomethane	4.99	94	4844	0.391	ng	98
9) Chloroethane	5.20	64	4599	0.391	ng	98
10) Ethanol	5.43	45	24875	2.109	ng	99
11) Acetonitrile	5.67	41	12417m	0.389	ng	
12) Acrolein	5.75	56	4228	0.416	ng	93
13) Acetone	5.86	58	26948	2.180	ng	94
14) Trichlorofluoromethane	6.02	101	15968	0.493	ng	96
15) 2-Propanol (Isopropanol)	6.15	45	37122	0.838	ng	91
16) Acrylonitrile	6.41	53	8272	0.385	ng	96
17) 1,1-Dichloroethene	6.68	96	7345	0.411	ng	94
18) 2-Methyl-2-Propanol (t...	6.77	59	40712	1.043	ng	98
19) Methylene Chloride	6.80	84	7671	0.443	ng	95
20) 3-Chloro-1-propene (Al...	6.92	41	10266	0.416	ng	92
21) Trichlorotrifluoroethane	7.07	151	7719	0.443	ng	97
22) Carbon Disulfide	7.07	76	29652	0.495	ng	89
23) trans-1,2-Dichloroethene	7.70	61	10462	0.449	ng	98
24) 1,1-Dichloroethane	7.88	63	12936	0.425	ng	99
25) Methyl tert-Butyl Ether	7.95	73	23228	0.514	ng	98
26) Vinyl Acetate	8.03	86	8896	1.991	ng	98
27) 2-Butanone (MEK)	8.27	72	4311	0.396	ng	# 82
28) cis-1,2-Dichloroethene	8.64	61	10585	0.464	ng	100
29) Diisopropyl Ether	8.85	87	6881	0.463	ng	96
30) Ethyl Acetate	8.85	61	4604	0.909	ng	91
31) n-Hexane	8.85	57	12015	0.501	ng	98
32) Chloroform	8.91	83	14168	0.452	ng	99
34) Tetrahydrofuran (THF)	9.29	72	4439	0.408	ng	# 83
35) Ethyl tert-Butyl Ether	9.33	87	9663	0.512	ng	98
36) 1,2-Dichloroethane	9.58	62	11998	0.491	ng	100
38) 1,1,1-Trichloroethane	9.81	97	15157	0.486	ng	100
39) Isopropyl Acetate	10.13	61	8086	0.848	ng	# 91
40) 1-Butanol	10.18	56	11631	0.673	ng	# 73
41) Benzene	10.22	78	28742	0.406	ng	96
42) Carbon Tetrachloride	10.36	117	13714	0.496	ng	100
43) Cyclohexane	10.47	84	25133	0.836	ng	97
44) tert-Amyl Methyl Ether	10.75	73	21935	0.480	ng	97
45) 1,2-Dichloropropane	10.96	63	6527	0.416	ng	98
46) Bromodichloromethane	11.12	83	10985	0.468	ng	100
47) Trichloroethene	11.16	130	8892	0.445	ng	95
48) 1,4-Dioxane	11.16	88	5952	0.426	ng	84
49) 2,2,4-Trimethylpentane...	11.22	57	30698	0.397	ng	100

Data File: I:\MS08\Data\2017 07\14\07141708.D

Acq On : 14 Jul 2017 8:59

Operator: WA/AB

Sample : 0.40ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111710 (8/10)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 14 11:31:45 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

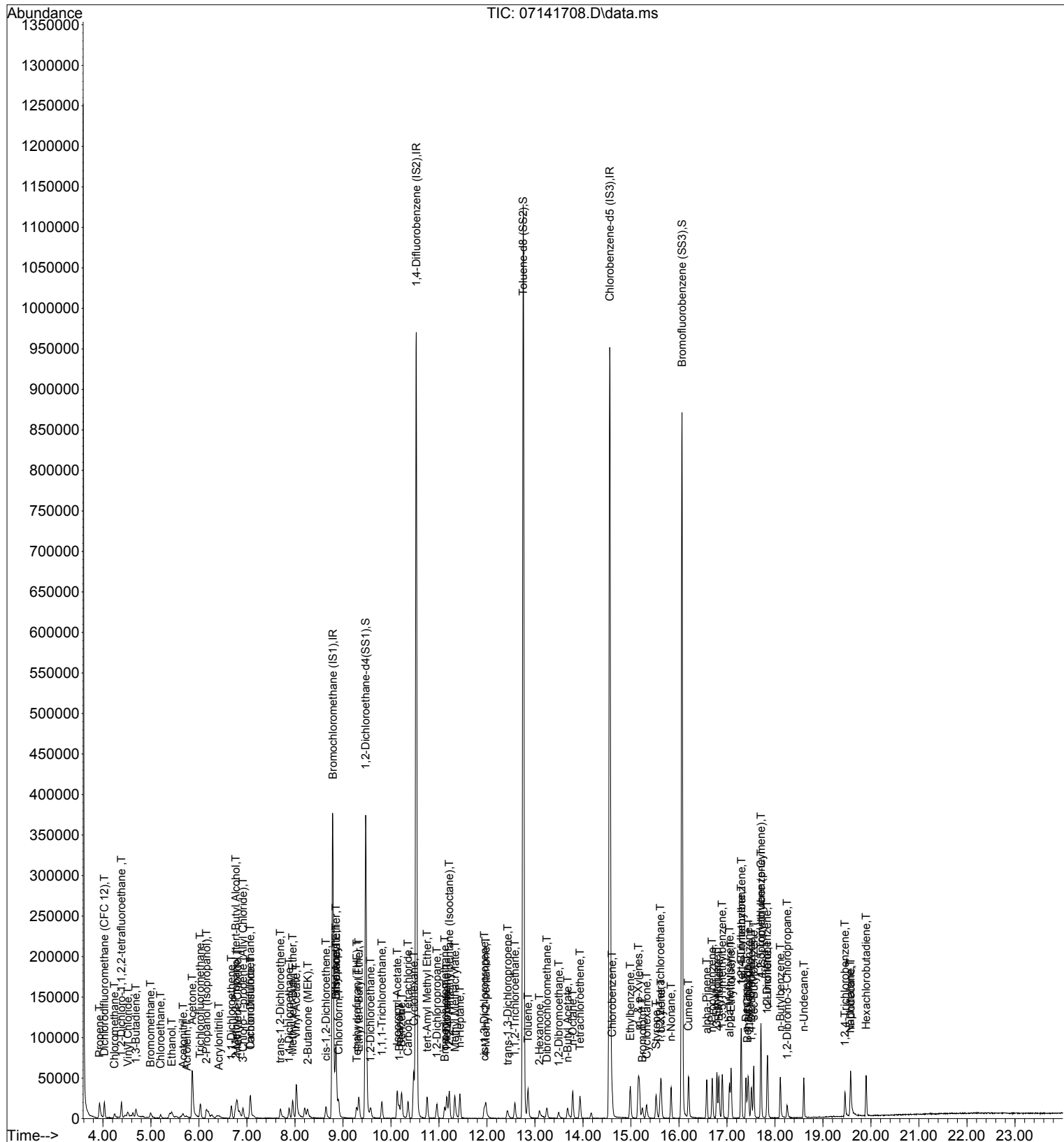
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.33	100	5749	0.776	ng	99
51) n-Heptane	11.44	71	7311	0.428	ng	95
52) cis-1,3-Dichloropropene	11.95	75	11732	0.436	ng	99
53) 4-Methyl-2-pentanone	11.97	58	5848	0.388	ng	98
54) trans-1,3-Dichloropropene	12.43	75	9098	0.353	ng	98
55) 1,1,2-Trichloroethane	12.58	97	7624	0.449	ng	96
58) Toluene	12.86	91	31421	0.430	ng	100
59) 2-Hexanone	13.09	43	10911	0.323	ng	89
60) Dibromochloromethane	13.25	129	9028	0.474	ng	97
61) 1,2-Dibromoethane	13.50	107	7651	0.454	ng	98
62) n-Butyl Acetate	13.68	43	12679	0.361	ng	92
63) n-Octane	13.79	57	6106	0.429	ng	99
64) Tetrachloroethene	13.94	166	10141	0.460	ng	98
65) Chlorobenzene	14.61	112	21752	0.437	ng	97
66) Ethylbenzene	14.99	91	36866	0.438	ng	100
67) m- & p-Xylenes	15.16	91	60822	0.908	ng	97
68) Bromoform	15.24	173	7882	0.495	ng	97
69) Styrene	15.53	104	19518	0.425	ng	99
70) o-Xylene	15.63	91	30475	0.448	ng	99
71) n-Nonane	15.84	43	14196	0.422	ng	95
72) 1,1,2,2-Tetrachloroethane	15.61	83	11609	0.431	ng	100
74) Cumene	16.20	105	39402	0.439	ng	98
75) alpha-Pinene	16.58	93	19949	0.441	ng	99
76) n-Propylbenzene	16.69	91	43172	0.428	ng	100
77) 3-Ethyltoluene	16.79	105	37053	0.437	ng	99
78) 4-Ethyltoluene	16.83	105	35923	0.438	ng	100
79) 1,3,5-Trimethylbenzene	16.90	105	33104	0.425	ng	97
80) alpha-Methylstyrene	17.05	118	14785	0.431	ng	87
81) 2-Ethyltoluene	17.09	105	38722	0.448	ng	99
82) 1,2,4-Trimethylbenzene	17.30	105	33572	0.459	ng	100
83) n-Decane	17.40	57	16088	0.460	ng	93
84) Benzyl Chloride	17.43	91	22647	0.398	ng	97
85) 1,3-Dichlorobenzene	17.45	146	17906	0.435	ng	100
86) 1,4-Dichlorobenzene	17.51	146	19155	0.440	ng	98
87) sec-Butylbenzene	17.56	105	42746	0.439	ng	97
88) 4-Isopropyltoluene (p-...	17.71	119	41767	0.445	ng	98
89) 1,2,3-Trimethylbenzene	17.71	105	33855	0.458	ng	97
90) 1,2-Dichlorobenzene	17.84	146	18254	0.452	ng	100
91) d-Limonene	17.84	68	10880	0.432	ng	98
92) 1,2-Dibromo-3-Chloropr...	18.25	157	5467	0.379	ng	93
93) n-Undecane	18.60	57	15240	0.425	ng	95
94) 1,2,4-Trichlorobenzene	19.46	180	12960	0.440	ng	99
95) Naphthalene	19.57	128	33250	0.397	ng	94
96) n-Dodecane	19.58	57	13617	0.428	ng	92
97) Hexachlorobutadiene	19.90	225	11218	0.495	ng	98
98) Cyclohexanone	15.33	55	9974	0.467	ng	95
99) tert-Butylbenzene	17.29	119	33763	0.448	ng	99
100) n-Butylbenzene	18.11	91	32341	0.444	ng	98

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

ALS Vial : 13 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: J:\MS08\Data\2017 07\14\07141708.D

Acq On : 14 Jul 2017 8:59

Operator: WA/AB

Sample : 0.40ng TO-15 ICAL Std

Inst : MS08

Misc : S31-07131701/S31-07111710 (8/10)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 14 11:07:31 2017

Quant Method : I:\MS08\Methods\R8071417.M

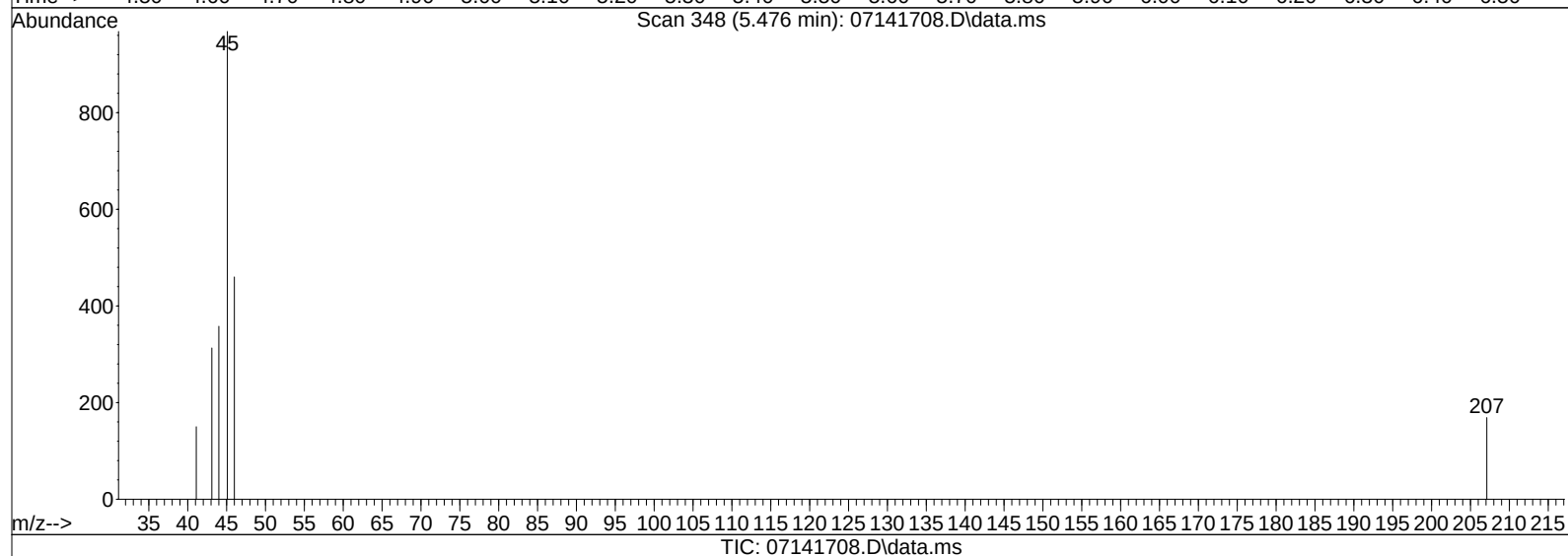
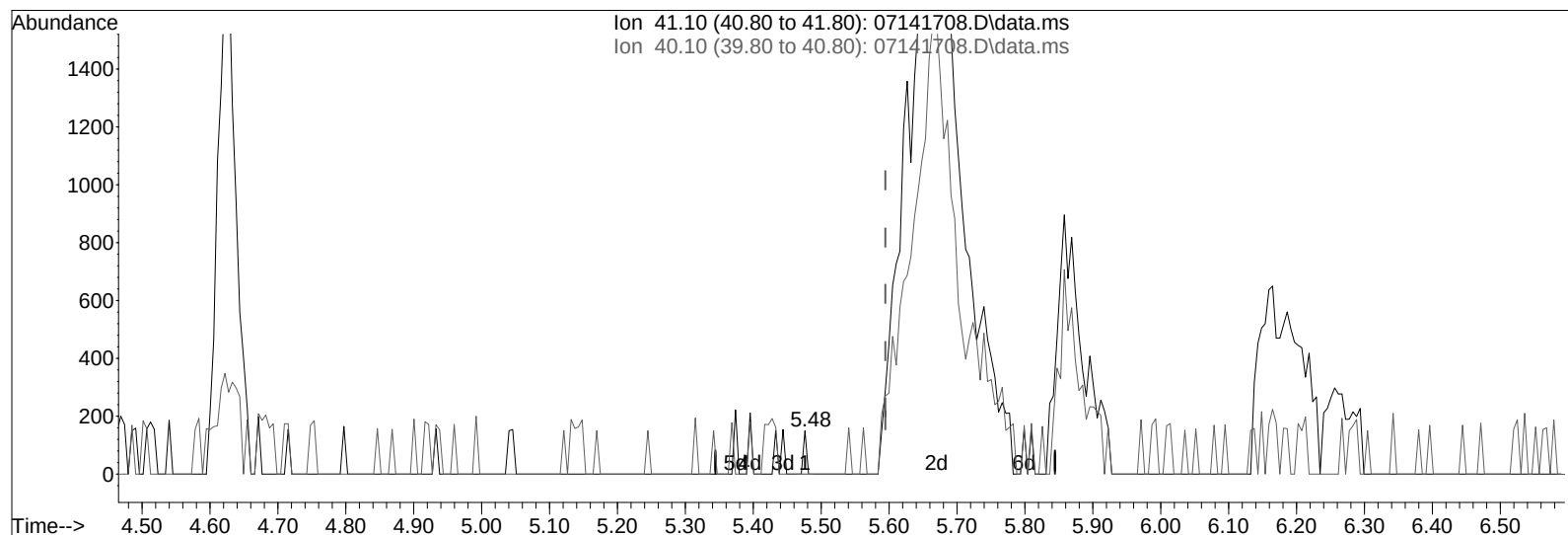
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Quant Results File: R8071417.RES



(11) Acetonitrile (T)

5.476min (-0.119) 0.00ng

response 48

Data File: I:\MS08\Data\2017 07\14\07141708.D

Acq On : 14 Jul 2017 8:59

Operator: WA/AB

Sample : 0.40ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111710 (8/10)

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Jul 14 11:31:45 2017

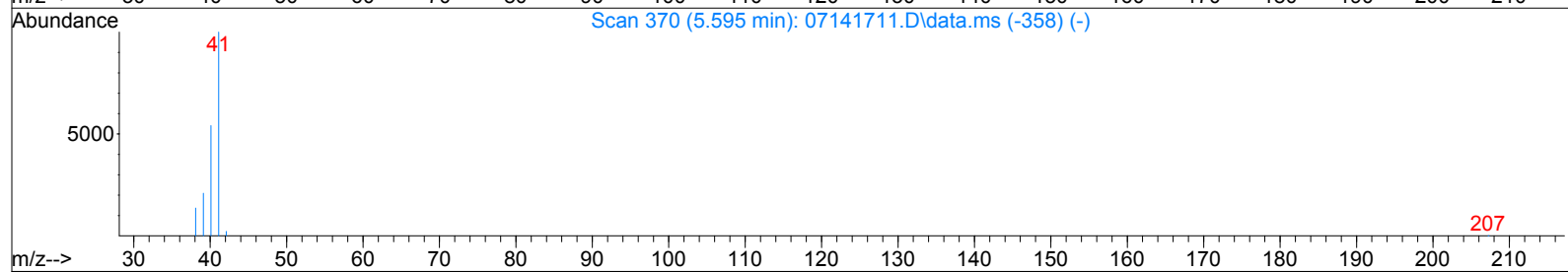
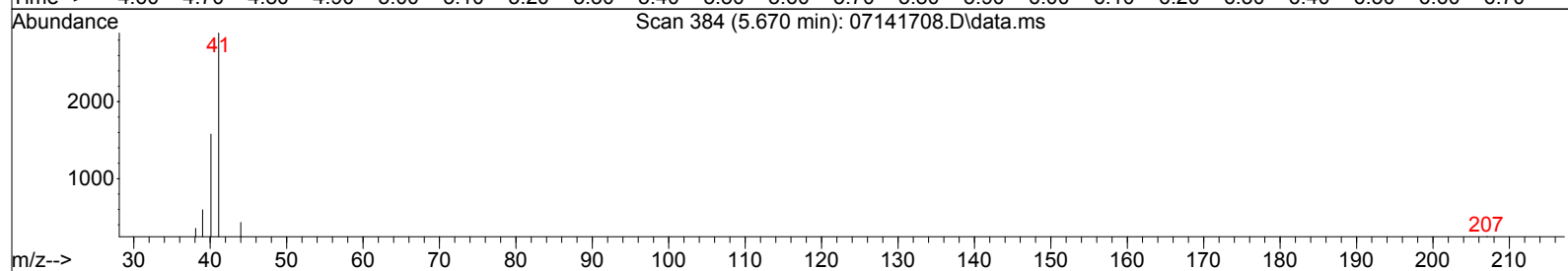
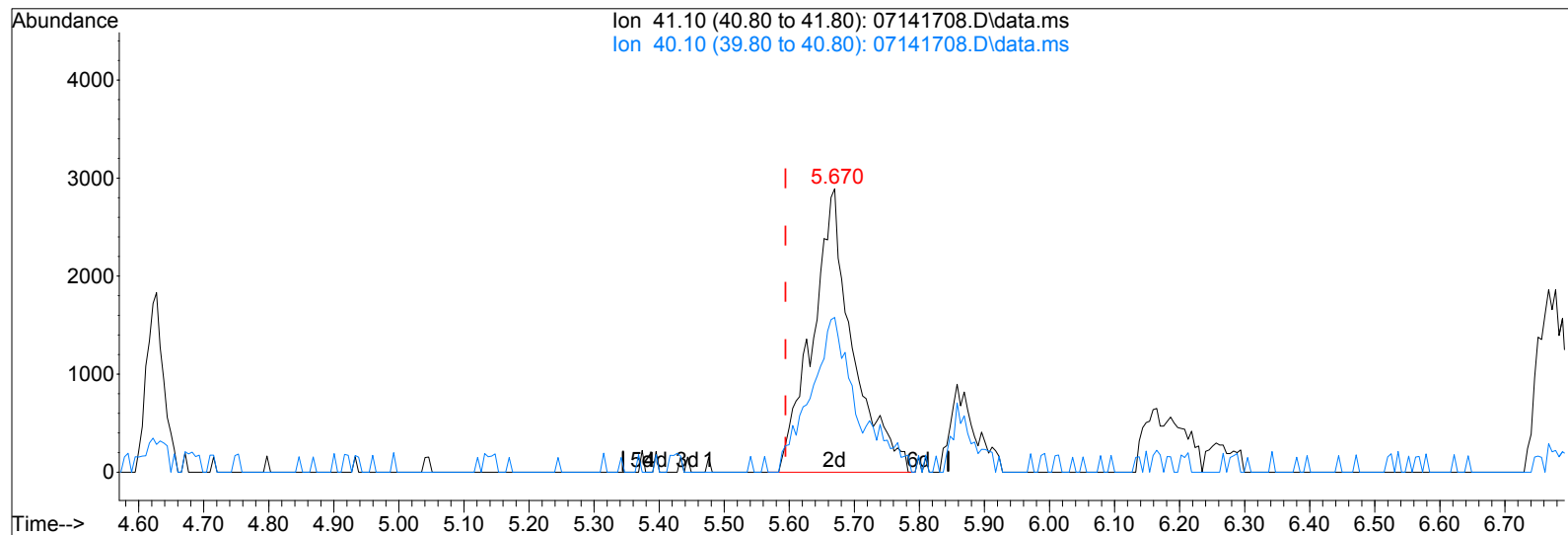
Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 07141708.D\data.ms

(11) Acetonitrile (T)

5.670min (+0.075) 0.39ng m

MP

response 12417

AB 7/19/17

Ion	Exp%	Act%
41.10	100	100
40.10	54.70	63.03
0.00	0.00	0.00
0.00	0.00	0.00

WA 7/19/17

Data File: I:\MS08\Data\2017 07\14\07141709.D

Acq On : 14 Jul 2017 9:31

Operator: WA/AB

Sample : 1.0ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111708 (8/10)

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Jul 14 11:07:34 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

AB 7/19/17

QLast Update : Fri Jul 14 11:06:38 2017

DA 7/19/17

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.78	130	186299	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	10.53	114	846114	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	14.56	82	359535	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.47	65	324338	14.211	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	113.68%
57) Toluene-d8 (SS2)	12.75	98	890400	12.817	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.56%
73) Bromofluorobenzene (SS3)	16.06	174	300796	11.662	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	93.28%

Target Compounds

						Qvalue
2) Propene	3.92	42	17666	1.054	ng	98
3) Dichlorodifluoromethan...	4.01	85	43724	1.230	ng	99
4) Chloromethane	4.22	50	20404	1.096	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.38	135	18898	1.210	ng	97
6) Vinyl Chloride	4.50	62	19915	1.153	ng	98
7) 1,3-Butadiene	4.67	54	15368	1.197	ng	92
8) Bromomethane	4.98	94	14489	1.179	ng	93
9) Chloroethane	5.19	64	12724	1.090	ng	100
10) Ethanol	5.37	45	63574	5.431	ng	100
11) Acetonitrile	5.66	41	31012	0.979	ng	95
12) Acrolein	5.72	56	11632	1.153	ng	98
13) Acetone	5.85	58	67427	5.496	ng	91
14) Trichlorofluoromethane	6.02	101	40419	1.257	ng	100
15) 2-Propanol (Isopropanol)	6.14	45	96809	2.202	ng	94
16) Acrylonitrile	6.35	53	22061	1.034	ng	99
17) 1,1-Dichloroethene	6.66	96	19041	1.072	ng	99
18) 2-Methyl-2-Propanol (t...	6.73	59	105309	2.719	ng	98
19) Methylene Chloride	6.79	84	19823	1.153	ng	99
20) 3-Chloro-1-propene (Al...	6.91	41	25489	1.042	ng	99
21) Trichlorotrifluoroethane	7.07	151	20417	1.180	ng	99
22) Carbon Disulfide	7.06	76	69576	1.171	ng	95
23) trans-1,2-Dichloroethene	7.69	61	28070	1.215	ng	89
24) 1,1-Dichloroethane	7.88	63	32568	1.077	ng	100
25) Methyl tert-Butyl Ether	7.95	73	58711	1.310	ng	98
26) Vinyl Acetate	8.02	86	23990	5.411	ng	# 92
27) 2-Butanone (MEK)	8.25	72	12564	1.164	ng	97
28) cis-1,2-Dichloroethene	8.64	61	27138	1.199	ng	100
29) Diisopropyl Ether	8.84	87	17100	1.159	ng	96
30) Ethyl Acetate	8.85	61	12157	2.419	ng	99
31) n-Hexane	8.85	57	29482	1.240	ng	100
32) Chloroform	8.91	83	37347	1.202	ng	99
34) Tetrahydrofuran (THF)	9.27	72	12332	1.143	ng	91
35) Ethyl tert-Butyl Ether	9.33	87	24850	1.326	ng	98
36) 1,2-Dichloroethane	9.58	62	31555	1.302	ng	100
38) 1,1,1-Trichloroethane	9.81	97	39556	1.311	ng	100
39) Isopropyl Acetate	10.12	61	21278	2.309	ng	97
40) 1-Butanol	10.16	56	34789	2.082	ng	89
41) Benzene	10.22	78	72553	1.060	ng	100
42) Carbon Tetrachloride	10.36	117	35007	1.309	ng	99
43) Cyclohexane	10.47	84	63353	2.181	ng	99
44) tert-Amyl Methyl Ether	10.75	73	55625	1.261	ng	98
45) 1,2-Dichloropropane	10.95	63	17052	1.126	ng	98
46) Bromodichloromethane	11.11	83	29372	1.294	ng	98
47) Trichloroethene	11.16	130	22493	1.165	ng	100
48) 1,4-Dioxane	11.15	88	16024	1.187	ng	98
49) 2,2,4-Trimethylpentane...	11.22	57	79423	1.062	ng	99

Data File: I:\MS08\Data\2017 07\14\07141709.D

Acq On : 14 Jul 2017 9:31

Operator: WA/AB

Sample : 1.0ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111708 (8/10)

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Jul 14 11:07:34 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

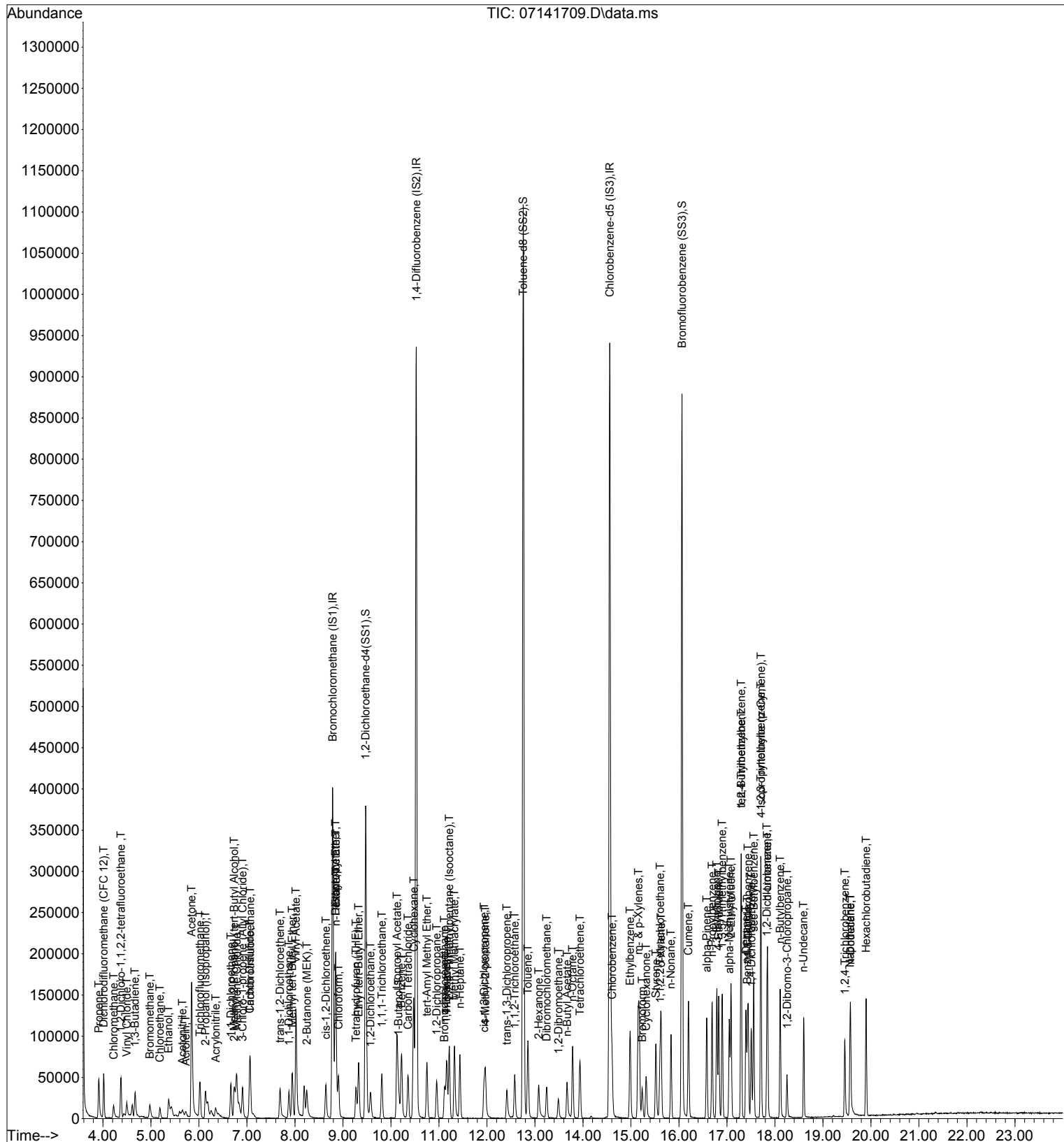
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.32	100	16664	2.326	ng	96
51) n-Heptane	11.44	71	19030	1.153	ng	99
52) cis-1,3-Dichloropropene	11.94	75	31709	1.220	ng	100
53) 4-Methyl-2-pentanone	11.97	58	15767	1.081	ng	90
54) trans-1,3-Dichloropropene	12.42	75	27825	1.118	ng	95
55) 1,1,2-Trichloroethane	12.58	97	19176	1.169	ng	98
58) Toluene	12.85	91	82624	1.152	ng	99
59) 2-Hexanone	13.08	43	39501	1.190	ng	97
60) Dibromochloromethane	13.24	129	25877	1.382	ng	97
61) 1,2-Dibromoethane	13.49	107	21849	1.320	ng	98
62) n-Butyl Acetate	13.67	43	41741	1.209	ng	97
63) n-Octane	13.78	57	16475	1.179	ng	96
64) Tetrachloroethene	13.94	166	25986	1.200	ng	99
65) Chlorobenzene	14.61	112	55649	1.139	ng	99
66) Ethylbenzene	14.98	91	96722	1.170	ng	99
67) m- & p-Xylenes	15.16	91	155655	2.365	ng	99
68) Bromoform	15.23	173	21486	1.374	ng	99
69) Styrene	15.52	104	54497	1.208	ng	99
70) o-Xylene	15.63	91	80797	1.208	ng	99
71) n-Nonane	15.83	43	36965	1.118	ng	98
72) 1,1,2,2-Tetrachloroethane	15.61	83	31992	1.209	ng	98
74) Cumene	16.20	105	103344	1.173	ng	99
75) alpha-Pinene	16.58	93	50433	1.136	ng	95
76) n-Propylbenzene	16.69	91	118245	1.195	ng	99
77) 3-Ethyltoluene	16.79	105	105429	1.267	ng	99
78) 4-Ethyltoluene	16.83	105	93987	1.167	ng	100
79) 1,3,5-Trimethylbenzene	16.90	105	88908	1.163	ng	99
80) alpha-Methylstyrene	17.05	118	40724	1.208	ng	100
81) 2-Ethyltoluene	17.09	105	102236	1.203	ng	99
82) 1,2,4-Trimethylbenzene	17.30	105	91600	1.275	ng	99
83) n-Decane	17.40	57	40421	1.176	ng	96
84) Benzyl Chloride	17.42	91	66920	1.197	ng	99
85) 1,3-Dichlorobenzene	17.44	146	49157	1.217	ng	100
86) 1,4-Dichlorobenzene	17.51	146	51208	1.197	ng	100
87) sec-Butylbenzene	17.56	105	116065	1.215	ng	99
88) 4-Isopropyltoluene (p-...	17.71	119	114676	1.244	ng	99
89) 1,2,3-Trimethylbenzene	17.70	105	88184	1.215	ng	100
90) 1,2-Dichlorobenzene	17.83	146	48664	1.227	ng	99
91) d-Limonene	17.84	68	28331	1.145	ng	98
92) 1,2-Dibromo-3-Chloropr...	18.25	157	16741	1.182	ng	95
93) n-Undecane	18.60	57	36494	1.037	ng	98
94) 1,2,4-Trichlorobenzene	19.46	180	34104	1.179	ng	100
95) Naphthalene	19.57	128	90652	1.101	ng	97
96) n-Dodecane	19.58	57	22851	0.732	ng	99
97) Hexachlorobutadiene	19.90	225	29394	1.319	ng	99
98) Cyclohexanone	15.32	55	27280	1.299	ng	97
99) tert-Butylbenzene	17.30	119	90620	1.225	ng	100
100) n-Butylbenzene	18.11	91	90788	1.268	ng	99

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

ALS Vial : 14 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS08\Data\2017 07\14\07141710.D

Acq On : 14 Jul 2017 10:04

Operator: WA/AB

Sample : 5.0ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111708 (8/10)

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Jul 14 11:07:36 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

AB 7/19/17

QLast Update : Fri Jul 14 11:06:38 2017

7/19/17

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.79	130	198373	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	10.53	114	911954	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	14.56	82	394048	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.47	65	346038	14.239	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	113.92%
57) Toluene-d8 (SS2)	12.76	98	964832	12.672	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.36%
73) Bromofluorobenzene (SS3)	16.06	174	335156	11.856	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	94.88%

Target Compounds

						Qvalue
2) Propene	3.88	42	78263	4.384	ng	100
3) Dichlorodifluoromethan...	3.99	85	199161	5.263	ng	100
4) Chloromethane	4.20	50	85524	4.316	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.35	135	88239	5.306	ng	99
6) Vinyl Chloride	4.47	62	96163	5.228	ng	99
7) 1,3-Butadiene	4.65	54	72421	5.295	ng	99
8) Bromomethane	4.96	94	61871	4.727	ng	100
9) Chloroethane	5.17	64	57456	4.621	ng	100
10) Ethanol	5.37	45	276986	22.221	ng	100
11) Acetonitrile	5.58	41	139976	4.149	ng	98
12) Acrolein	5.71	56	53650	4.993	ng	98
13) Acetone	5.84	58	318359	24.370	ng	100
14) Trichlorofluoromethane	6.01	101	185970	5.433	ng	98
15) 2-Propanol (Isopropanol)	6.13	45	455545	9.730	ng	98
16) Acrylonitrile	6.33	53	108345	4.769	ng	100
17) 1,1-Dichloroethene	6.65	96	88108	4.660	ng	97
18) 2-Methyl-2-Propanol (t...	6.73	59	494733	11.997	ng	99
19) Methylene Chloride	6.78	84	88890	4.855	ng	97
20) 3-Chloro-1-propene (Al...	6.90	41	125460	4.816	ng	100
21) Trichlorotrifluoroethane	7.06	151	91214	4.952	ng	99
22) Carbon Disulfide	7.04	76	298995	4.728	ng	98
23) trans-1,2-Dichloroethene	7.68	61	130545	5.306	ng	100
24) 1,1-Dichloroethane	7.88	63	150590	4.678	ng	100
25) Methyl tert-Butyl Ether	7.93	73	283638	5.943	ng	98
26) Vinyl Acetate	8.02	86	121741	25.789	ng	97
27) 2-Butanone (MEK)	8.24	72	59481	5.175	ng	96
28) cis-1,2-Dichloroethene	8.64	61	126314	5.242	ng	100
29) Diisopropyl Ether	8.84	87	79572	5.064	ng	97
30) Ethyl Acetate	8.84	61	57680	10.780	ng	96
31) n-Hexane	8.85	57	133275	5.264	ng	100
32) Chloroform	8.91	83	175005	5.288	ng	100
34) Tetrahydrofuran (THF)	9.26	72	57506	5.007	ng	92
35) Ethyl tert-Butyl Ether	9.32	87	115609	5.794	ng	99
36) 1,2-Dichloroethane	9.58	62	146461	5.676	ng	99
38) 1,1,1-Trichloroethane	9.81	97	181974	5.598	ng	100
39) Isopropyl Acetate	10.12	61	98859	9.953	ng	99
40) 1-Butanol	10.13	56	179446	9.965	ng	94
41) Benzene	10.22	78	331769	4.498	ng	100
42) Carbon Tetrachloride	10.36	117	165711	5.750	ng	100
43) Cyclohexane	10.47	84	287004	9.166	ng	99
44) tert-Amyl Methyl Ether	10.74	73	258253	5.430	ng	100
45) 1,2-Dichloropropane	10.95	63	78438	4.804	ng	100
46) Bromodichloromethane	11.11	83	139023	5.684	ng	100
47) Trichloroethene	11.16	130	105850	5.088	ng	100
48) 1,4-Dioxane	11.14	88	75846	5.211	ng	99
49) 2,2,4-Trimethylpentane...	11.21	57	360347	4.471	ng	98

Data File: I:\MS08\Data\2017 07\14\07141710.D

Acq On : 14 Jul 2017 10:04

Operator: WA/AB

Sample : 5.0ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111708 (8/10)

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Jul 14 11:07:36 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

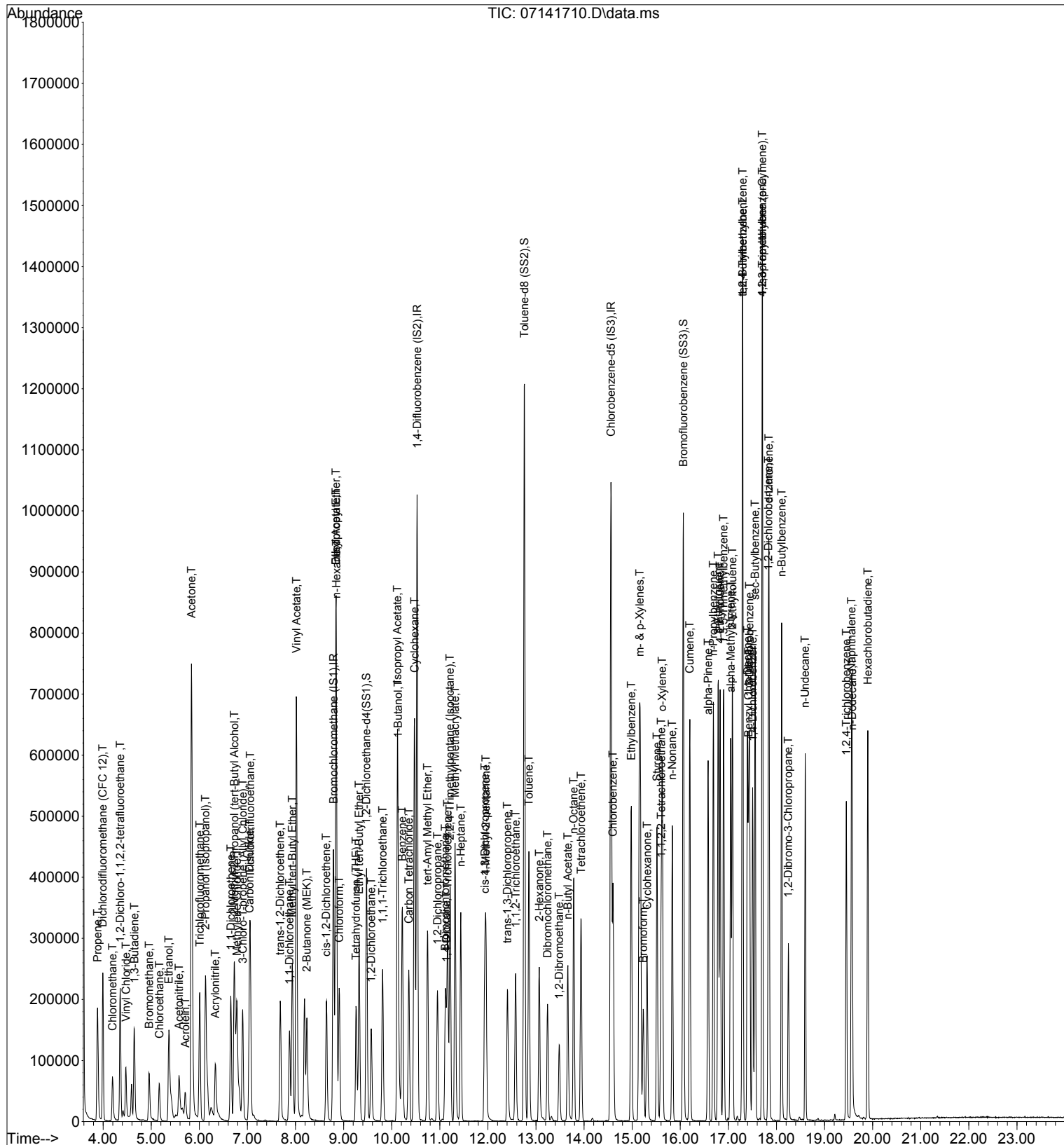
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.32	100	80439	10.418	ng	99
51) n-Heptane	11.44	71	85219	4.789	ng	99
52) cis-1,3-Dichloropropene	11.94	75	156361	5.582	ng	99
53) 4-Methyl-2-pentanone	11.96	58	81152	5.162	ng	99
54) trans-1,3-Dichloropropene	12.41	75	146236	5.452	ng	99
55) 1,1,2-Trichloroethane	12.58	97	89332	5.055	ng	100
58) Toluene	12.85	91	376983	4.795	ng	99
59) 2-Hexanone	13.07	43	197250	5.423	ng	99
60) Dibromochloromethane	13.24	129	122979	5.991	ng	100
61) 1,2-Dibromoethane	13.48	107	104910	5.784	ng	99
62) n-Butyl Acetate	13.66	43	211010	5.575	ng	99
63) n-Octane	13.78	57	74440	4.861	ng	98
64) Tetrachloroethene	13.94	166	121221	5.109	ng	100
65) Chlorobenzene	14.60	112	257280	4.803	ng	100
66) Ethylbenzene	14.98	91	456169	5.035	ng	100
67) m- & p-Xylenes	15.16	91	733836	10.175	ng	99
68) Bromoform	15.23	173	107746	6.285	ng	99
69) Styrene	15.51	104	270488	5.471	ng	99
70) o-Xylene	15.62	91	379143	5.173	ng	100
71) n-Nonane	15.83	43	172828	4.769	ng	98
72) 1,1,2,2-Tetrachloroethane	15.60	83	150313	5.183	ng	99
74) Cumene	16.20	105	484624	5.020	ng	99
75) alpha-Pinene	16.58	93	246550	5.066	ng	99
76) n-Propylbenzene	16.69	91	560741	5.168	ng	100
77) 3-Ethyltoluene	16.79	105	471343	5.167	ng	97
78) 4-Ethyltoluene	16.83	105	461804	5.233	ng	96
79) 1,3,5-Trimethylbenzene	16.90	105	414277	4.944	ng	99
80) alpha-Methylstyrene	17.05	118	198146	5.362	ng	99
81) 2-Ethyltoluene	17.09	105	475319	5.102	ng	100
82) 1,2,4-Trimethylbenzene	17.30	105	416363	5.286	ng	100
83) n-Decane	17.40	57	184282	4.894	ng	100
84) Benzyl Chloride	17.42	91	357195	5.829	ng	100
85) 1,3-Dichlorobenzene	17.44	146	231290	5.224	ng	99
86) 1,4-Dichlorobenzene	17.51	146	236626	5.046	ng	100
87) sec-Butylbenzene	17.55	105	534481	5.104	ng	99
88) 4-Isopropyltoluene (p-...	17.70	119	523895	5.185	ng	99
89) 1,2,3-Trimethylbenzene	17.70	105	408977	5.140	ng	100
90) 1,2-Dichlorobenzene	17.83	146	224040	5.155	ng	99
91) d-Limonene	17.84	68	136048	5.019	ng	98
92) 1,2-Dibromo-3-Chloropr...	18.25	157	86511	5.571	ng	99
93) n-Undecane	18.60	57	175424	4.548	ng	99
94) 1,2,4-Trichlorobenzene	19.45	180	171631	5.414	ng	99
95) Naphthalene	19.56	128	467508	5.180	ng	99
96) n-Dodecane	19.58	57	114095	3.334	ng	98
97) Hexachlorobutadiene	19.90	225	136396	5.585	ng	99
98) Cyclohexanone	15.31	55	130097	5.652	ng	100
99) tert-Butylbenzene	17.30	119	418749	5.163	ng	100
100) n-Butylbenzene	18.11	91	431324	5.498	ng	100

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

ALS Vial : 14 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS08\Data\2017 07\14\07141711.D

Acq On : 14 Jul 2017 10:36

Operator: WA/AB

Sample : 25ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111705 (8/10)

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Jul 14 11:07:38 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

AB 7/19/17

QLast Update : Fri Jul 14 11:06:38 2017

DA 7/19/17

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.80	130	207506	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	10.53	114	932797	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	14.56	82	409183	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.49	65	357480	14.063	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	112.48%
57) Toluene-d8 (SS2)	12.76	98	992198	12.549	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.40%
73) Bromofluorobenzene (SS3)	16.06	174	348655	11.878	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.04%

Target Compounds

						Qvalue
2) Propene	3.87	42	446035	23.885	ng	100
3) Dichlorodifluoromethan...	3.99	85	1114776	28.161	ng	100
4) Chloromethane	4.19	50	542704	26.180	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.35	135	490401	28.189	ng	100
6) Vinyl Chloride	4.47	62	550605	28.616	ng	100
7) 1,3-Butadiene	4.64	54	441714	30.876	ng	100
8) Bromomethane	4.95	94	375120	27.396	ng	100
9) Chloroethane	5.17	64	339680	26.118	ng	100
10) Ethanol	5.40	45	1597017	122.479	ng	100
11) Acetonitrile	5.59	41	804769	22.802	ng	100
12) Acrolein	5.71	56	300118	26.703	ng	100
13) Acetone	5.85	58	1689824	123.659	ng	100
14) Trichlorofluoromethane	6.01	101	1016077	28.377	ng	100
15) 2-Propanol (Isopropanol)	6.15	45	2620325	53.506	ng	100
16) Acrylonitrile	6.35	53	629993	26.512	ng	100
17) 1,1-Dichloroethene	6.65	96	506087	25.590	ng	100
18) 2-Methyl-2-Propanol (t...	6.75	59	2773591	64.298	ng	100
19) Methylene Chloride	6.79	84	496184	25.908	ng	100
20) 3-Chloro-1-propene (Al...	6.91	41	729830	26.784	ng	100
21) Trichlorotrifluoroethane	7.06	151	511986	26.570	ng	100
22) Carbon Disulfide	7.04	76	1687468	25.507	ng	100
23) trans-1,2-Dichloroethene	7.69	61	759602	29.514	ng	100
24) 1,1-Dichloroethane	7.89	63	830189	24.653	ng	100
25) Methyl tert-Butyl Ether	7.93	73	1587825	31.807	ng	100
26) Vinyl Acetate	8.03	86	663448	134.357	ng	100
27) 2-Butanone (MEK)	8.24	72	331469	27.567	ng	100
28) cis-1,2-Dichloroethene	8.66	61	722768	28.676	ng	100
29) Diisopropyl Ether	8.84	87	420717	25.597	ng	100
30) Ethyl Acetate	8.85	61	305557	54.595	ng	100
31) n-Hexane	8.85	57	640327	24.179	ng	100
32) Chloroform	8.92	83	978380	28.259	ng	100
34) Tetrahydrofuran (THF)	9.26	72	325599	27.103	ng	100
35) Ethyl tert-Butyl Ether	9.33	87	653938	31.333	ng	100
36) 1,2-Dichloroethane	9.58	62	826368	30.616	ng	100
38) 1,1,1-Trichloroethane	9.82	97	1021766	30.729	ng	100
39) Isopropyl Acetate	10.12	61	535676	52.728	ng	100
40) 1-Butanol	10.14	56	1091040	59.234	ng	100
41) Benzene	10.23	78	1812829	24.029	ng	100
42) Carbon Tetrachloride	10.36	117	927961	31.480	ng	100
43) Cyclohexane	10.48	84	1568898	48.984	ng	100
44) tert-Amyl Methyl Ether	10.75	73	1445342	29.709	ng	100
45) 1,2-Dichloropropane	10.96	63	434068	25.991	ng	100
46) Bromodichloromethane	11.12	83	787164	31.465	ng	100
47) Trichloroethene	11.17	130	588412	27.654	ng	100
48) 1,4-Dioxane	11.14	88	436320	29.310	ng	100
49) 2,2,4-Trimethylpentane...	11.22	57	1991926	24.163	ng	100

Data File: I:\MS08\Data\2017 07\14\07141711.D

Acq On : 14 Jul 2017 10:36

Operator: WA/AB

Sample : 25ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111705 (8/10)

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Jul 14 11:07:38 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.32	100	455993	57.735	ng	100
51) n-Heptane	11.44	71	457725	25.145	ng	100
52) cis-1,3-Dichloropropene	11.94	75	905544	31.608	ng	100
53) 4-Methyl-2-pentanone	11.96	58	461356	28.693	ng	100
54) trans-1,3-Dichloropropene	12.41	75	877195	31.972	ng	100
55) 1,1,2-Trichloroethane	12.58	97	514647	28.469	ng	100
58) Toluene	12.86	91	2070049	25.358	ng	100
59) 2-Hexanone	13.07	43	1126361	29.824	ng	100
60) Dibromochloromethane	13.24	129	726078	34.064	ng	100
61) 1,2-Dibromoethane	13.49	107	607808	32.268	ng	100
62) n-Butyl Acetate	13.66	43	1233448	31.381	ng	100
63) n-Octane	13.79	57	409936	25.779	ng	100
64) Tetrachloroethene	13.94	166	683874	27.758	ng	100
65) Chlorobenzene	14.61	112	1448608	26.042	ng	100
66) Ethylbenzene	14.98	91	2566956	27.285	ng	100
67) m- & p-Xylenes	15.16	91	4107526	54.846	ng	100
68) Bromoform	15.23	173	653142	36.690	ng	100
69) Styrene	15.51	104	1581269	30.801	ng	100
70) o-Xylene	15.63	91	2115578	27.795	ng	100
71) n-Nonane	15.84	43	957035	25.429	ng	100
72) 1,1,2,2-Tetrachloroethane	15.60	83	856949	28.456	ng	100
74) Cumene	16.20	105	2693301	26.866	ng	100
75) alpha-Pinene	16.58	93	1420727	28.112	ng	100
76) n-Propylbenzene	16.69	91	3137246	27.847	ng	100
77) 3-Ethyltoluene	16.79	105	2752359	29.055	ng	100
78) 4-Ethyltoluene	16.83	105	2476572	27.027	ng	100
79) 1,3,5-Trimethylbenzene	16.90	105	2344797	26.947	ng	100
80) alpha-Methylstyrene	17.05	118	1227954	32.001	ng	100
81) 2-Ethyltoluene	17.09	105	2647491	27.368	ng	100
82) 1,2,4-Trimethylbenzene	17.30	105	2337275	28.575	ng	100
83) n-Decane	17.40	57	1042162	26.652	ng	100
84) Benzyl Chloride	17.42	91	2237332	35.160	ng	100
85) 1,3-Dichlorobenzene	17.45	146	1351989	29.409	ng	100
86) 1,4-Dichlorobenzene	17.50	146	1382879	28.399	ng	100
87) sec-Butylbenzene	17.56	105	2966352	27.278	ng	100
88) 4-Isopropyltoluene (p-...	17.71	119	2916335	27.798	ng	100
89) 1,2,3-Trimethylbenzene	17.70	105	2312970	27.994	ng	100
90) 1,2-Dichlorobenzene	17.83	146	1289605	28.575	ng	100
91) d-Limonene	17.84	68	816591	29.009	ng	100
92) 1,2-Dibromo-3-Chloropr...	18.25	157	521018	32.313	ng	100
93) n-Undecane	18.60	57	1137077	28.391	ng	100
94) 1,2,4-Trichlorobenzene	19.45	180	1111255	33.760	ng	100
95) Naphthalene	19.56	128	3287043	35.076	ng	100
96) n-Dodecane	19.58	57	1163602	32.740	ng	100
97) Hexachlorobutadiene	19.90	225	769345	30.336	ng	100
98) Cyclohexanone	15.31	55	765599	32.033	ng	100
99) tert-Butylbenzene	17.30	119	2310843	27.439	ng	100
100) n-Butylbenzene	18.11	91	2447663	30.047	ng	100

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

Data File: I:\MS08\Data\2017 07\14\07141712.D

Acq On : 14 Jul 2017 11:08

Operator: WA/AB

Sample : 50ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111705 (8/10)

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Jul 14 11:46:48 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

AB 7/19/17

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

107 7/19/17

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.81	130	214396	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	10.54	114	993564	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	14.56	82	429436	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.49	65	370975	14.125	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	112.96%
57) Toluene-d8 (SS2)	12.77	98	1050942	12.665	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.36%
73) Bromofluorobenzene (SS3)	16.06	174	367836	11.940	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.52%

Target Compounds

						Qvalue
2) Propene	3.88	42	852516	44.185	ng	99
3) Dichlorodifluoromethan...	3.99	85	2096044	51.248	ng	99
4) Chloromethane	4.20	50	1095817	51.164	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.36	135	980022	54.523	ng	100
6) Vinyl Chloride	4.48	62	1125014	56.590	ng	100
7) 1,3-Butadiene	4.66	54	933774	63.173	ng	100
8) Bromomethane	4.97	94	726500	51.353	ng	100
9) Chloroethane	5.18	64	670869	49.926	ng	99
10) Ethanol	5.43	45	3081259	228.715	ng	100
11) Acetonitrile	5.62	41	1606084	44.043	ng	100
12) Acrolein	5.73	56	595302	51.264	ng	99
13) Acetone	5.87	58	3197214	226.449	ng	97
14) Trichlorofluoromethane	6.02	101	1965971	53.141	ng	100
15) 2-Propanol (Isopropanol)	6.18	45	5014171	99.098	ng	99
16) Acrylonitrile	6.36	53	1240045	50.508	ng	100
17) 1,1-Dichloroethene	6.66	96	987931	48.348	ng	99
18) 2-Methyl-2-Propanol (t...	6.77	59	5332362	119.644	ng	99
19) Methylene Chloride	6.81	84	968240	48.931	ng	99
20) 3-Chloro-1-propene (Al...	6.92	41	1454028	51.646	ng	99
21) Trichlorotrifluoroethane	7.07	151	995981	50.027	ng	99
22) Carbon Disulfide	7.05	76	3252928	47.590	ng	100
23) trans-1,2-Dichloroethene	7.70	61	1477156	55.550	ng	99
24) 1,1-Dichloroethane	7.90	63	1640012	47.136	ng	100
25) Methyl tert-Butyl Ether	7.95	73	3115777	60.409	ng	98
26) Vinyl Acetate	8.04	86	1304232	255.636	ng	# 92
27) 2-Butanone (MEK)	8.25	72	659105	53.054	ng	99
28) cis-1,2-Dichloroethene	8.66	61	1410318	54.156	ng	100
29) Diisopropyl Ether	8.85	87	810581	47.732	ng	96
30) Ethyl Acetate	8.85	61	593123	102.571	ng	100
31) n-Hexane	8.86	57	1234280	45.108	ng	100
32) Chloroform	8.93	83	1907230	53.318	ng	100
34) Tetrahydrofuran (THF)	9.27	72	648911	52.280	ng	99
35) Ethyl tert-Butyl Ether	9.33	87	1275302	59.141	ng	99
36) 1,2-Dichloroethane	9.59	62	1604486	57.533	ng	100
38) 1,1,1-Trichloroethane	9.82	97	1966483	55.523	ng	100
39) Isopropyl Acetate	10.13	61	1043334	96.417	ng	96
40) 1-Butanol	10.15	56	2130043	108.571	ng	99
41) Benzene	10.23	78	3565211	44.367	ng	99
42) Carbon Tetrachloride	10.37	117	1799100	57.299	ng	100
43) Cyclohexane	10.48	84	3019017	88.495	ng	99
44) tert-Amyl Methyl Ether	10.75	73	2803561	54.103	ng	100
45) 1,2-Dichloropropane	10.96	63	862559	48.490	ng	100
46) Bromodichloromethane	11.12	83	1531604	57.478	ng	100
47) Trichloroethene	11.17	130	1158366	51.110	ng	99
48) 1,4-Dioxane	11.15	88	845374	53.315	ng	99
49) 2,2,4-Trimethylpentane...	11.22	57	3856654	43.922	ng	99

Data File: I:\MS08\Data\2017 07\14\07141712.D

Acq On : 14 Jul 2017 11:08

Operator: WA/AB

Sample : 50ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111705 (8/10)

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Jul 14 11:46:48 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 11:06:38 2017

Response via : Initial Calibration

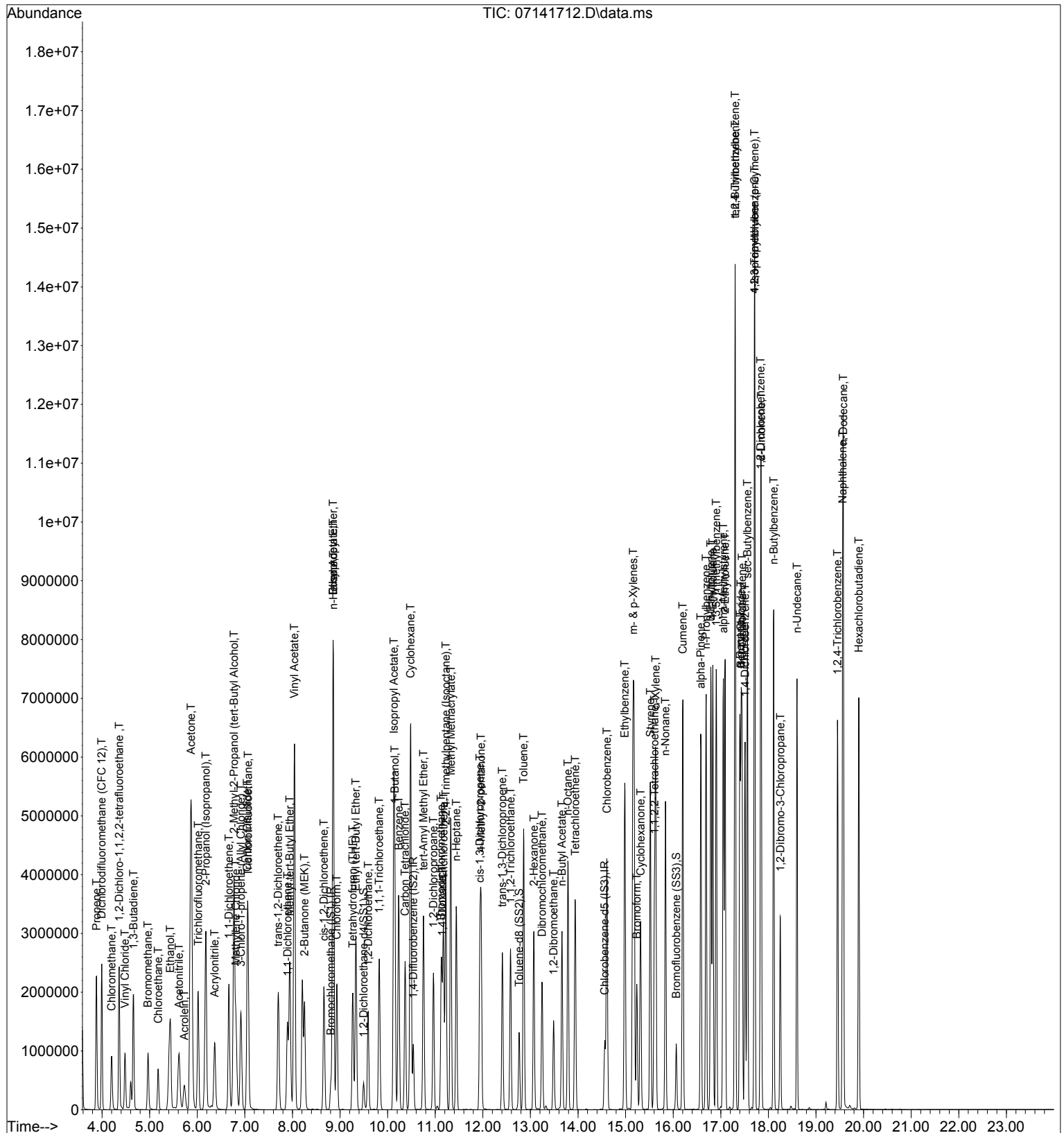
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.33	100	898494	106.805	ng	98
51) n-Heptane	11.44	71	897129	46.270	ng	100
52) cis-1,3-Dichloropropene	11.94	75	1771428	58.050	ng	100
53) 4-Methyl-2-pentanone	11.96	58	894091	52.205	ng	99
54) trans-1,3-Dichloropropene	12.41	75	1723429	58.974	ng	100
55) 1,1,2-Trichloroethane	12.58	97	1010562	52.483	ng	100
58) Toluene	12.86	91	4022327	46.950	ng	100
59) 2-Hexanone	13.07	43	2186656	55.169	ng	99
60) Dibromochloromethane	13.24	129	1420564	63.502	ng	100
61) 1,2-Dibromoethane	13.49	107	1189704	60.182	ng	99
62) n-Butyl Acetate	13.66	43	2409560	58.413	ng	100
63) n-Octane	13.79	57	805567	48.270	ng	99
64) Tetrachloroethene	13.94	166	1330020	51.438	ng	99
65) Chlorobenzene	14.61	112	2814908	48.217	ng	100
66) Ethylbenzene	14.98	91	4935094	49.983	ng	99
67) m- & p-Xylenes	15.16	91	7863882	100.050	ng	99
68) Bromoform	15.23	173	1286352	68.853	ng	100
69) Styrene	15.52	104	3097312	57.487	ng	100
70) o-Xylene	15.63	91	4055276	50.767	ng	99
71) n-Nonane	15.84	43	1825340	46.214	ng	99
72) 1,1,2,2-Tetrachloroethane	15.61	83	1656396	52.408	ng	100
74) Cumene	16.20	105	5138590	48.840	ng	99
75) alpha-Pinene	16.58	93	2734157	51.550	ng	100
76) n-Propylbenzene	16.69	91	5927192	50.130	ng	99
77) 3-Ethyltoluene	16.79	105	5136819	51.668	ng	100
78) 4-Ethyltoluene	16.83	105	4911848	51.076	ng	99
79) 1,3,5-Trimethylbenzene	16.91	105	4451572	48.745	ng	99
80) alpha-Methylstyrene	17.05	118	2366142	58.755	ng	99
81) 2-Ethyltoluene	17.09	105	5048978	49.732	ng	99
82) 1,2,4-Trimethylbenzene	17.30	105	4398081	51.234	ng	98
83) n-Decane	17.40	57	1988712	48.460	ng	99
84) Benzyl Chloride	17.42	91	4257591	63.754	ng	99
85) 1,3-Dichlorobenzene	17.45	146	2604393	53.980	ng	100
86) 1,4-Dichlorobenzene	17.51	146	2662109	52.091	ng	100
87) sec-Butylbenzene	17.56	105	5592804	49.005	ng	99
88) 4-Isopropyltoluene (p-...	17.71	119	5455501	49.548	ng	99
89) 1,2,3-Trimethylbenzene	17.71	105	4355018	50.223	ng	99
90) 1,2-Dichlorobenzene	17.84	146	2477976	52.317	ng	100
91) d-Limonene	17.85	68	1557213	52.710	ng	99
92) 1,2-Dibromo-3-Chloropr...	18.25	157	1021007	60.335	ng	98
93) n-Undecane	18.60	57	2162202	51.440	ng	100
94) 1,2,4-Trichlorobenzene	19.45	180	2148944	62.207	ng	100
95) Naphthalene	19.56	128	6269470	63.747	ng	99
96) n-Dodecane	19.58	57	2163866	58.013	ng	99
97) Hexachlorobutadiene	19.90	225	1496177	56.213	ng	99
98) Cyclohexanone	15.32	55	1483234	59.132	ng	99
99) tert-Butylbenzene	17.30	119	4367940	49.419	ng	99
100) n-Butylbenzene	18.11	91	4624566	54.093	ng	100

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

ALS Vial : 15 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS08\Data\2017 07\14\07141713.D

Acq On : 14 Jul 2017 11:41

Operator: WA/AB

Sample : 100ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111705 (8/10)

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Jul 14 12:46:53 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jun 23 07:11:22 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

AB 7/19/17

DA 7/19/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.82	130	221508	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	10.54	114	1051560	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	14.56	82	450933	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.50	65	376475	13.874	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	110.96%
57) Toluene-d8 (SS2)	12.77	98	1103640	12.667	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.36%
73) Bromofluorobenzene (SS3)	16.07	174	386424	11.946	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.60%

Target Compounds

						Qvalue
2) Propene	3.88	42	1875630	94.090	ng	95
3) Dichlorodifluoromethan...	3.99	85	3982735	94.251	ng	99
4) Chloromethane	4.20	50	1842749	83.275	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.35	135	2036666	109.672	ng	99
6) Vinyl Chloride	4.48	62	2422711	117.953	ng	100
7) 1,3-Butadiene	4.65	54	1967955	128.864	ng	99
8) Bromomethane	4.97	94	1493475	102.178	ng	100
9) Chloroethane	5.17	64	1327640	95.630	ng	99
10) Ethanol	5.46	45	5971889	429.047	ng	99
11) Acetonitrile	5.63	41	3230893	85.756	ng	99
12) Acrolein	5.73	56	1196015	99.688	ng	92
13) Acetone	5.89	58	6075370	416.483	ng	98
14) Trichlorofluoromethane	6.01	101	3852985	100.804	ng	100
15) 2-Propanol (Isopropanol)	6.20	45	8675930	165.962	ng	98
16) Acrylonitrile	6.38	53	2493811	98.315	ng	98
17) 1,1-Dichloroethene	6.67	96	1944793	92.120	ng	96
18) 2-Methyl-2-Propanol (t...	6.79	59	10086341	219.044	ng	98
19) Methylene Chloride	6.82	84	1862453	91.099	ng	98
20) 3-Chloro-1-propene (Al...	6.92	41	2873447	98.785	ng	100
21) Trichlorotrifluoroethane	7.07	151	1957971	95.189	ng	98
22) Carbon Disulfide	7.05	76	6326109	89.578	ng	99
23) trans-1,2-Dichloroethene	7.71	61	2902091	105.633	ng	99
24) 1,1-Dichloroethane	7.90	63	3235304	90.001	ng	99
25) Methyl tert-Butyl Ether	7.95	73	6165420	115.699	ng	95
26) Vinyl Acetate	8.06	86	2582488	489.928	ng	# 73
27) 2-Butanone (MEK)	8.26	72	1309409	102.015	ng	98
28) cis-1,2-Dichloroethene	8.67	61	2784998	103.510	ng	98
29) Diisopropyl Ether	8.85	87	1575251	89.782	ng	# 85
30) Ethyl Acetate	8.87	61	1153749	193.115	ng	95
31) n-Hexane	8.86	57	2388947	84.504	ng	99
32) Chloroform	8.94	83	3747003	101.386	ng	100
34) Tetrahydrofuran (THF)	9.27	72	1297308	101.162	ng	92
35) Ethyl tert-Butyl Ether	9.34	87	2514149	112.848	ng	97
36) 1,2-Dichloroethane	9.60	62	3123535	108.407	ng	99
38) 1,1,1-Trichloroethane	9.83	97	3827863	102.118	ng	99
39) Isopropyl Acetate	10.13	61	2045698	178.621	ng	96
40) 1-Butanol	10.17	56	4164591	200.567	ng	97
41) Benzene	10.24	78	7105863	83.551	ng	98
42) Carbon Tetrachloride	10.37	117	3493560	105.129	ng	99
43) Cyclohexane	10.48	84	5831237	161.500	ng	96
44) tert-Amyl Methyl Ether	10.76	73	5430583	99.020	ng	98
45) 1,2-Dichloropropane	10.97	63	1706932	90.665	ng	100
46) Bromodichloromethane	11.13	83	2975861	105.519	ng	100
47) Trichloroethene	11.18	130	2289513	95.448	ng	100
48) 1,4-Dioxane	11.15	88	1654384	98.582	ng	98
49) 2,2,4-Trimethylpentane...	11.23	57	7428646	79.935	ng	95

Data File: I:\MS08\Data\2017 07\14\07141713.D

Acq On : 14 Jul 2017 11:41

Operator: WA/AB

Sample : 100ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111705 (8/10)

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Jul 14 12:46:53 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jun 23 07:11:22 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.33	100	1786798	200.684	ng	97
51) n-Heptane	11.45	71	1794725	87.458	ng	100
52) cis-1,3-Dichloropropene	11.94	75	3461717	107.184	ng	99
53) 4-Methyl-2-pentanone	11.97	58	1742099	96.109	ng	98
54) trans-1,3-Dichloropropene	12.42	75	3405248	110.098	ng	100
55) 1,1,2-Trichloroethane	12.59	97	1995116	97.900	ng	100
58) Toluene	12.86	91	7877318	87.564	ng	99
59) 2-Hexanone	13.08	43	4241060	101.900	ng	100
60) Dibromochloromethane	13.25	129	2831681	120.548	ng	100
61) 1,2-Dibromoethane	13.49	107	2374962	114.412	ng	99
62) n-Butyl Acetate	13.67	43	4676281	107.959	ng	99
63) n-Octane	13.79	57	1580661	90.198	ng	98
64) Tetrachloroethene	13.94	166	2661461	98.024	ng	100
65) Chlorobenzene	14.61	112	5531592	90.235	ng	99
66) Ethylbenzene	14.99	91	9492819	91.561	ng	99
67) m- & p-Xylenes	15.18	91	14789621	179.195	ng	98
68) Bromoform	15.24	173	2557358	130.359	ng	100
69) Styrene	15.53	104	6019847	106.403	ng	97
70) o-Xylene	15.64	91	7749335	92.387	ng	100
71) n-Nonane	15.84	43	3462524	83.485	ng	98
72) 1,1,2,2-Tetrachloroethane	15.61	83	3212394	96.795	ng	99
74) Cumene	16.20	105	9690997	87.718	ng	98
75) alpha-Pinene	16.59	93	5244988	94.175	ng	98
76) n-Propylbenzene	16.69	91	11033794	88.871	ng	97
77) 3-Ethyltoluene	16.79	105	9870527	94.549	ng	98
78) 4-Ethyltoluene	16.84	105	9037143	89.493	ng	97
79) 1,3,5-Trimethylbenzene	16.91	105	8454936	88.169	ng	99
80) alpha-Methylstyrene	17.06	118	4643123	109.800	ng	99
81) 2-Ethyltoluene	17.10	105	9535157	89.444	ng	98
82) 1,2,4-Trimethylbenzene	17.31	105	8026716	89.047	ng	96
83) n-Decane	17.40	57	3735320	86.681	ng	97
84) Benzyl Chloride	17.43	91	7968806	113.638	ng	97
85) 1,3-Dichlorobenzene	17.45	146	5139016	101.436	ng	99
86) 1,4-Dichlorobenzene	17.52	146	5255889	97.942	ng	99
87) sec-Butylbenzene	17.56	105	10455178	87.243	ng	97
88) 4-Isopropyltoluene (p-...	17.71	119	9842713	85.132	ng	96
89) 1,2,3-Trimethylbenzene	17.71	105	7880751	86.550	ng	96
90) 1,2-Dichlorobenzene	17.84	146	4862846	97.774	ng	99
91) d-Limonene	17.85	68	2820445	90.918	ng	94
92) 1,2-Dibromo-3-Chloropr...	18.25	157	2015911	113.448	ng	99
93) n-Undecane	18.60	57	4011161	90.878	ng	96
94) 1,2,4-Trichlorobenzene	19.46	180	4247648	117.097	ng	99
95) Naphthalene	19.57	128	11741302	113.692	ng	97
96) n-Dodecane	19.58	57	3814204	97.384	ng	95
97) Hexachlorobutadiene	19.90	225	2920630	104.501	ng	100
98) Cyclohexanone	15.32	55	2903153	110.223	ng	98
99) tert-Butylbenzene	17.31	119	8167469	88.002	ng	97
100) n-Butylbenzene	18.11	91	8552272	95.267	ng	97

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

Data File: I:\MS08\Data\2017 07\14\07141713.D

Acq On : 14 Jul 2017 11:41

Operator: WA/AB

Sample : 100ng TO-15 ICAL Std

Misc : S31-07131701/S31-07111705 (8/10)

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Jul 14 12:46:53 2017

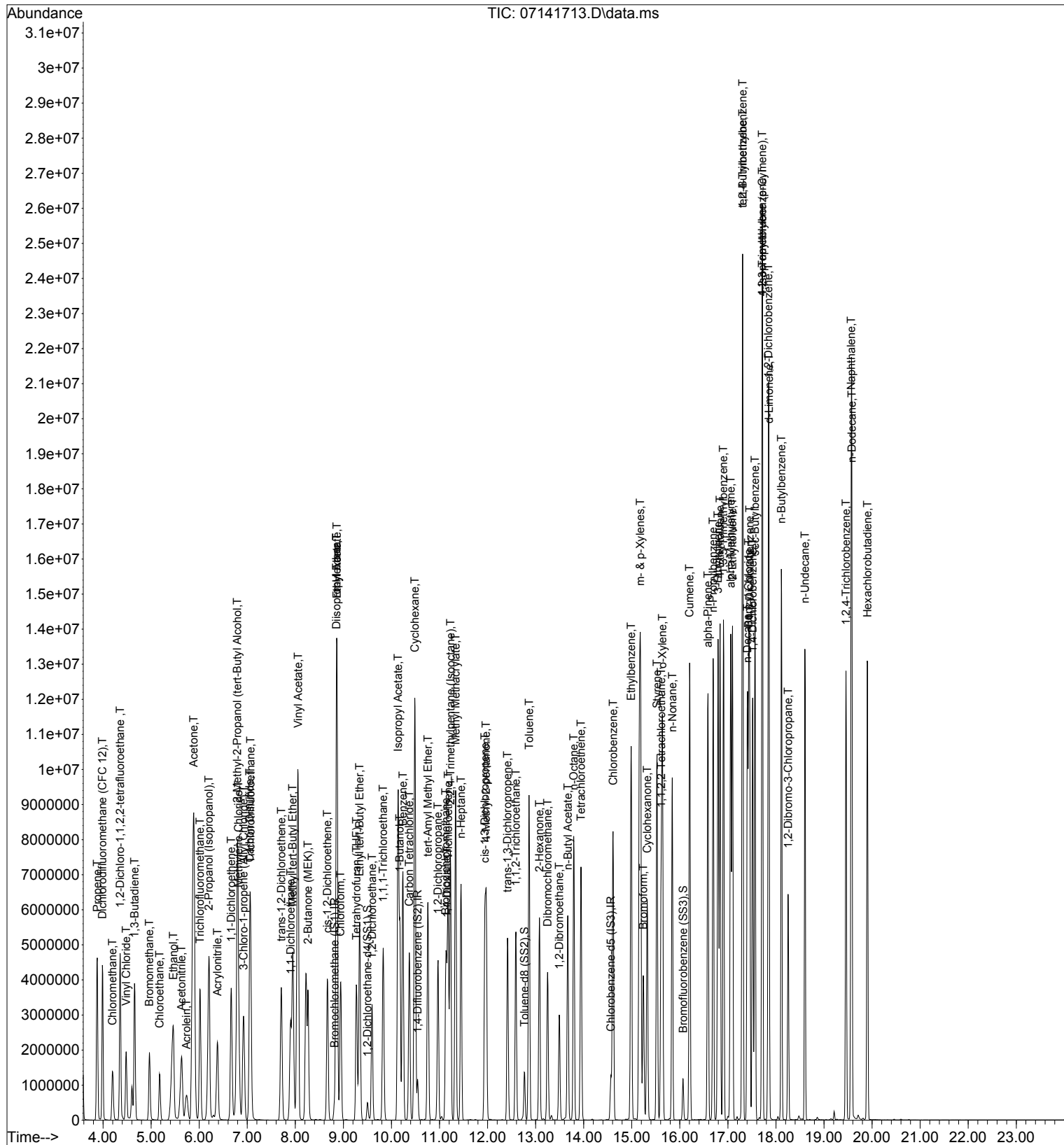
Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jun 23 07:11:22 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS08\Data\2017 07\14\07141715.D

Acq On : 14 Jul 2017 12:46

Operator: WA/AB

Sample : 25ng TO-15 ICV Std

Misc : S31-07131701/S31-06221704 (7/21)

ALS Vial : 1 Sample Multiplier: 1

Quant Time: Jul 14 13:13:38 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

AB 7/17/17

DA 7/17/17

QLast Update : Fri Jul 14 12:51:06 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.80	130	236794	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	10.53	114	1062052	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	14.56	82	465578	12.500	ng	-0.01

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.49	65	388386	11.939	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.52%
57) Toluene-d8 (SS2)	12.76	98	1127244	12.157	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.28%
73) Bromofluorobenzene (SS3)	16.06	174	400540	12.803	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.40%

Target Compounds

						Qvalue
2) Propene	3.88	42	447928	20.809	ng	96
3) Dichlorodifluoromethan...	3.99	85	1051291	20.766	ng	99
4) Chloromethane	4.20	50	594539	24.428	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.36	135	541497	22.708	ng	100
6) Vinyl Chloride	4.48	62	645047	26.545	ng	100
7) 1,3-Butadiene	4.66	54	507878	27.231	ng	99
8) Bromomethane	4.96	94	462775	26.473	ng	99
9) Chloroethane	5.17	64	360327	23.307	ng	99
10) Ethanol	5.41	45	1629006	105.286	ng	99
11) Acetonitrile	5.60	41	834064	21.182	ng	99
12) Acrolein	5.72	56	296605	22.917	ng	100
13) Acetone	5.85	58	1716053	115.832	ng	95
14) Trichlorofluoromethane	6.01	101	993033	20.685	ng	100
15) 2-Propanol (Isopropanol)	6.15	45	2557354	44.830	ng	98
16) Acrylonitrile	6.35	53	643588	25.188	ng	99
17) 1,1-Dichloroethene	6.66	96	504833	22.318	ng	98
18) 2-Methyl-2-Propanol (t...	6.75	59	2626522	42.528	ng	98
19) Methylene Chloride	6.80	84	503396	23.727	ng	99
20) 3-Chloro-1-propene (Al...	6.91	41	761388	24.738	ng	100
21) Trichlorotrifluoroethane	7.06	151	514978	21.560	ng	98
22) Carbon Disulfide	7.05	76	1708285	23.147	ng	99
23) trans-1,2-Dichloroethene	7.70	61	747828	23.182	ng	99
24) 1,1-Dichloroethane	7.89	63	868603	21.941	ng	99
25) Methyl tert-Butyl Ether	7.94	73	1584594	22.029	ng	97
26) Vinyl Acetate	8.03	86	647444	124.355	ng	96
27) 2-Butanone (MEK)	8.24	72	335307	24.634	ng	99
28) cis-1,2-Dichloroethene	8.66	61	711496	22.463	ng	98
29) Diisopropyl Ether	8.84	87	432789	20.688	ng	96
30) Ethyl Acetate	8.85	61	309047	48.927	ng	98
31) n-Hexane	8.85	57	669875	21.666	ng	99
32) Chloroform	8.92	83	948853	21.587	ng	100
34) Tetrahydrofuran (THF)	9.26	72	328060	23.191	ng	94
35) Ethyl tert-Butyl Ether	9.33	87	641792	22.064	ng	99
36) 1,2-Dichloroethane	9.58	62	788637	21.368	ng	100
38) 1,1,1-Trichloroethane	9.82	97	972651	22.162	ng	100
39) Isopropyl Acetate	10.12	61	545115	45.878	ng	99
40) 1-Butanol	10.13	56	1008974	51.245	ng	95
41) Benzene	10.23	78	1865370	22.152	ng	99
42) Carbon Tetrachloride	10.36	117	900166	22.491	ng	100
43) Cyclohexane	10.48	84	1600844	44.067	ng	100
44) tert-Amyl Methyl Ether	10.75	73	1420985	21.826	ng	99
45) 1,2-Dichloropropane	10.96	63	441367	22.557	ng	100
46) Bromodichloromethane	11.12	83	763498	23.498	ng	99
47) Trichloroethene	11.17	130	588189	22.413	ng	99
48) 1,4-Dioxane	11.14	88	432185	24.330	ng	99
49) 2,2,4-Trimethylpentane...	11.22	57	2033453	22.624	ng	97

Data File: I:\MS08\Data\2017 07\14\07141715.D

Acq On : 14 Jul 2017 12:46

Operator: WA/AB

Sample : 25ng TO-15 ICV Std

Misc : S31-07131701/S31-06221704 (7/21)

ALS Vial : 1 Sample Multiplier: 1

Quant Time: Jul 14 13:13:38 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 12:51:06 2017

Response via : Initial Calibration

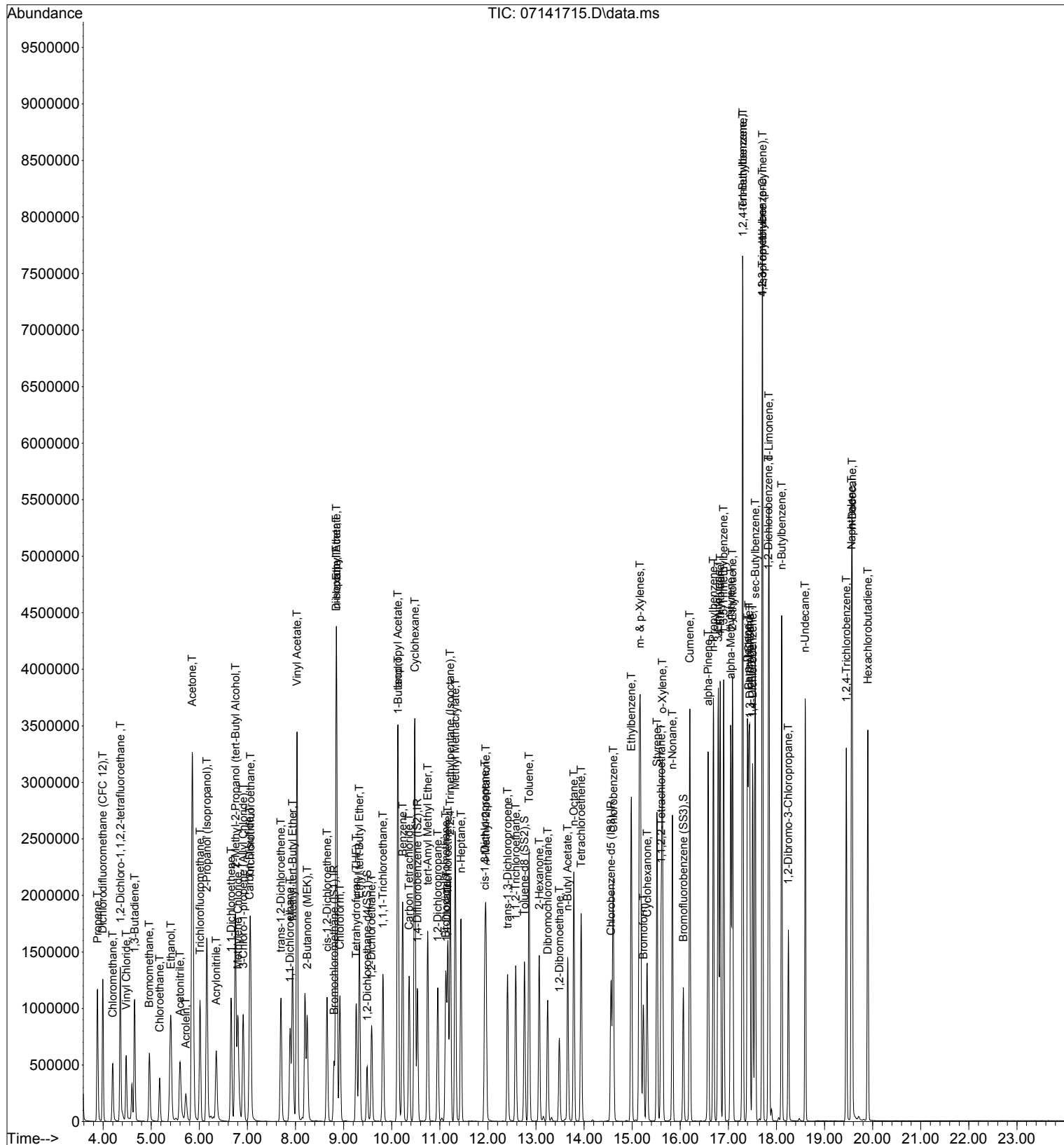
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.32	100	461257	54.816	ng	99
51) n-Heptane	11.44	71	469514	22.355	ng	99
52) cis-1,3-Dichloropropene	11.94	75	846650	25.031	ng	99
53) 4-Methyl-2-pentanone	11.96	58	448839	26.323	ng	99
54) trans-1,3-Dichloropropene	12.41	75	854393	27.054	ng	100
55) 1,1,2-Trichloroethane	12.58	97	511632	23.818	ng	100
58) Toluene	12.86	91	2065985	21.231	ng	100
59) 2-Hexanone	13.07	43	1063145	24.617	ng	99
60) Dibromochloromethane	13.24	129	703926	23.607	ng	99
61) 1,2-Dibromoethane	13.49	107	597924	24.602	ng	100
62) n-Butyl Acetate	13.66	43	1159539	25.379	ng	100
63) n-Octane	13.79	57	412615	21.524	ng	98
64) Tetrachloroethene	13.94	166	676633	22.512	ng	100
65) Chlorobenzene	14.61	112	1443365	21.573	ng	100
66) Ethylbenzene	14.98	91	2532753	22.195	ng	99
67) m- & p-Xylenes	15.16	91	4033957	43.784	ng	99
68) Bromoform	15.23	173	629335	24.530	ng	100
69) Styrene	15.51	104	1549044	24.649	ng	98
70) o-Xylene	15.63	91	2083467	21.984	ng	98
71) n-Nonane	15.84	43	959204	22.220	ng	100
72) 1,1,2,2-Tetrachloroethane	15.60	83	843609	23.176	ng	100
74) Cumene	16.20	105	2673383	21.836	ng	99
75) alpha-Pinene	16.58	93	1396138	22.476	ng	98
76) n-Propylbenzene	16.69	91	3094224	22.924	ng	100
77) 3-Ethyltoluene	16.79	105	2664322	22.983	ng	100
78) 4-Ethyltoluene	16.83	105	2526422	22.783	ng	100
79) 1,3,5-Trimethylbenzene	16.90	105	2277622	21.572	ng	99
80) alpha-Methylstyrene	17.05	118	1133585	23.426	ng	99
81) 2-Ethyltoluene	17.09	105	2609916	22.060	ng	100
82) 1,2,4-Trimethylbenzene	17.30	105	2280162	22.155	ng	99
83) n-Decane	17.40	57	1044446	22.512	ng	99
84) Benzyl Chloride	17.42	91	2089774	27.428	ng	99
85) 1,3-Dichlorobenzene	17.45	146	1323807	23.456	ng	99
86) 1,4-Dichlorobenzene	17.50	146	1362747	23.609	ng	100
87) sec-Butylbenzene	17.56	105	2917465	22.259	ng	99
88) 4-Isopropyltoluene (p-...	17.71	119	2886714	22.135	ng	99
89) 1,2,3-Trimethylbenzene	17.70	105	2335103	22.401	ng	99
90) 1,2-Dichlorobenzene	17.83	146	1270500	22.496	ng	99
91) d-Limonene	17.84	68	778811	22.155	ng	99
92) 1,2-Dibromo-3-Chloropr...	18.25	157	512687	28.459	ng	98
93) n-Undecane	18.60	57	1107693	23.903	ng	99
94) 1,2,4-Trichlorobenzene	19.45	180	1072459	25.127	ng	100
95) Naphthalene	19.56	128	2991942	26.259	ng	100
96) n-Dodecane	19.58	57	1069716	26.756	ng	100
97) Hexachlorobutadiene	19.90	225	738181	20.963	ng	100
98) Cyclohexanone	15.31	55	655062	21.392	ng	98
99) tert-Butylbenzene	17.30	119	2270816	21.721	ng	100
100) n-Butylbenzene	18.11	91	2357166	23.773	ng	100

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

ALS Vial : 1 Sample Multiplier: 1

DataAcq Meth:T015.M



Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: 07141715.D

Acq. Method File: TO15.M

AB 7/17/17

Data File Path: I:\MS08\Data\2017_07\14\

Sample Name: 25ng TO-15 ICV Std

DA 7/17/17

Operator: WA/AB

Misc Info: S31-07131701/S31-06221704

Date Acquired: 7/14/2017

12:46

Instrument Name: MS08

#	Compound Name	Ret. Time	Amt. (ng)	Spike Amt.(ng)	% Rec.	Lower Limit	Upper Limit	* OR Fail	ICV/AZ 70-130%
2)	Propene	3.88	20.809	26.275	79	52	127	*	*
3)	Dichlorodifluoromethane (CFC 1	3.99	20.766	26.250	79	68	109	*	*
4)	Chloromethane	4.20	24.428	26.225	93	51	130	*	*
5)	1,2-Dichloro-1,1,2,2-tetrafluoroet	4.36	22.708	26.375	86	66	114	*	*
6)	Vinyl Chloride	4.48	26.545	26.250	101	61	125	*	*
7)	1,3-Butadiene	4.66	27.231	26.250	104	62	144	*	*
8)	Bromomethane	4.96	26.473	26.250	101	73	123	*	*
9)	Chloroethane	5.18	23.307	26.225	89	69	122	*	*
10)	Ethanol	5.41	105.286	132.650	79	62	124	*	*
11)	Acetonitrile	5.60	21.182	26.650	79	57	114	*	*
12)	Acrolein	5.72	22.917	26.525	86	62	116	*	*
13)	Acetone	5.85	115.832	133.050	87	57	117	*	*
14)	Trichlorofluoromethane	6.01	20.685	26.275	79	63	98	*	*
15)	2-Propanol (Isopropanol)	6.15	44.830	53.025	85	66	121	*	*
16)	Acrylonitrile	6.35	25.188	26.575	95	68	123	*	*
17)	1,1-Dichloroethene	6.66	22.318	26.575	84	76	118	*	*
18)	2-Methyl-2-Propanol (tert-Butyl Alc	6.75	42.528	53.275	80	74	126	*	*
19)	Methylene Chloride	6.80	23.727	26.550	110	60	118	*	*
20)	3-Chloro-1-propene (Allyl Chloride	6.91	24.738	26.500	93	65	126	*	*
21)	Trichlorotrifluoroethane	7.06	21.560	26.450	82	73	114	*	*
22)	Carbon Disulfide	7.05	23.147	26.675	87	57	102	*	*
23)	trans-1,2-Dichloroethene	7.70	23.182	26.675	87	74	123	*	*
24)	1,1-Dichloroethane	7.89	21.941	26.550	83	69	111	*	*
25)	Methyl tert-Butyl Ether	7.94	22.029	26.600	83	69	113	*	*
26)	Vinyl Acetate	8.03	124.355	132.550	94	76	128	*	*
27)	2-Butanone (MEK)	8.24	24.634	26.550	93	63	127	*	*
28)	cis-1,2-Dichloroethene	8.66	22.463	26.475	85	72	117	*	*
29)	Diisopropyl Ether	8.84	20.688	26.575	78	64	118	*	*
30)	Ethyl Acetate	8.85	48.927	53.275	92	68	127	*	*
31)	n-Hexane	8.85	21.666	26.600	81	55	116	*	*
32)	Chloroform	8.92	21.587	26.475	82	70	109	*	*
34)	Tetrahydrofuran (THF)	9.26	23.191	26.575	87	72	113	*	*
35)	Ethyl tert-Butyl Ether	9.33	22.064	26.525	83	73	117	*	*
36)	1,2-Dichloroethane	9.58	21.368	26.500	81	69	113	*	*
38)	1,1,1-Trichloroethane	9.82	22.162	26.475	84	72	115	*	*
39)	Isopropyl Acetate	10.12	45.878	53.050	86	68	122	*	*
40)	1-Butanol	10.13	51.245	53.075	97	75	141	*	*
41)	Benzene	10.23	22.152	26.525	84	65	107	*	*
42)	Carbon Tetrachloride	10.36	22.491	26.600	85	71	113	*	*
43)	Cyclohexane	10.48	44.067	53.125	83	71	115	*	*
44)	tert-Amyl Methyl Ether	10.75	21.826	26.525	82	73	115	*	*
45)	1,2-Dichloropropane	10.96	22.557	26.525	85	71	115	*	*
46)	Bromodichloromethane	11.12	23.498	26.700	88	75	118	*	*
47)	Trichloroethene	11.17	22.413	26.550	84	68	114	*	*
48)	1,4-Dioxane	11.14	24.330	26.600	91	81	131	*	*
49)	2,2,4-Trimethylpentane (Isooctane)	11.22	22.624	26.525	85	68	112	*	*

Bold = 75 Compound List

* = Pass

Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: 07141715.D

Data File Path: I:\MS08\Data\2017_07\14\

Operator: WA/AB

Date Acquired: 7/14/2017

12:46

TO15.M

Sample Name: 25ng TO-15 ICV Std

Misc Info: S31-07131701/S31-06221704

Instrument Name: MS08

#	Compound Name	Ret. Time	Amt. (ng)	Spike Amt.(ng)	% Rec.	Lower Limit	Upper Limit	* OR Fail	ICV/AZ 70-130%
50)	Methyl Methacrylate	11.32	54.816	53.000	103	72	130	*	*
51)	n-Heptane	11.44	22.355	26.600	84	68	116	*	*
52)	cis-1,3-Dichloropropene	11.94	25.031	26.275	95	77	126	*	*
53)	4-Methyl-2-pentanone	11.96	26.323	26.575	99	69	126	*	*
54)	trans-1,3-Dichloropropene	12.41	27.054	26.675	101	79	125	*	*
55)	1,1,2-Trichloroethane	12.58	23.818	26.525	90	75	119	*	*
58)	Toluene	12.86	21.231	26.450	80	59	118	*	*
59)	2-Hexanone	13.07	24.617	26.575	93	69	129	*	*
60)	Dibromochloromethane	13.24	23.607	26.600	89	74	136	*	*
61)	1,2-Dibromoethane	13.49	24.602	26.450	93	73	131	*	*
62)	n-Butyl Acetate	13.66	25.379	26.950	94	69	130	*	*
63)	n-Octane	13.79	21.524	26.500	81	66	120	*	*
64)	Tetrachloroethene	13.94	22.512	26.575	85	65	130	*	*
65)	Chlorobenzene	14.61	21.573	26.500	81	68	120	*	*
66)	Ethylbenzene	14.98	22.195	26.450	84	68	122	*	*
67)	m- & p-Xylenes	15.16	43.784	53.025	83	68	123	*	*
68)	Bromoform	15.23	24.530	26.550	92	69	130	*	*
69)	Styrene	15.51	24.649	26.475	93	71	133	*	*
70)	o-Xylene	15.63	21.984	26.450	83	68	122	*	*
71)	n-Nonane	15.84	22.220	26.475	84	65	120	*	*
72)	1,1,2,2-Tetrachloroethane	15.60	23.176	26.500	87	69	130	*	*
74)	Cumene	16.20	21.836	26.525	82	70	123	*	*
75)	alpha-Pinene	16.58	22.476	26.575	85	70	128	*	*
76)	n-Propylbenzene	16.69	22.924	26.725	86	69	125	*	*
77)	3-Ethyltoluene	16.79	22.983	26.550	87	67	128	*	*
78)	4-Ethyltoluene	16.83	22.783	26.525	86	67	130	*	*
79)	1,3,5-Trimethylbenzene	16.90	21.572	26.525	81	67	124	*	*
80)	alpha-Methylstyrene	17.05	23.426	26.550	88	67	141	*	*
81)	2-Ethyltoluene	17.09	22.060	26.550	83	67	124	*	*
82)	1,2,4-Trimethylbenzene	17.30	22.155	26.525	84	67	129	*	*
83)	n-Decane	17.40	22.512	26.525	85	66	124	*	*
84)	Benzyl Chloride	17.42	27.428	26.550	103	79	138	*	*
85)	1,3-Dichlorobenzene	17.45	23.456	26.475	89	65	136	*	*
86)	1,4-Dichlorobenzene	17.50	23.609	26.650	89	66	141	*	*
87)	sec-Butylbenzene	17.56	22.259	26.550	84	68	125	*	*
88)	4-Isopropyltoluene (p-Cymene)	17.71	22.135	26.550	83	68	131	*	*
89)	1,2,3-Trimethylbenzene	17.70	22.401	26.500	85	68	132	*	*
90)	1,2-Dichlorobenzene	17.83	22.496	26.550	85	67	136	*	*
91)	d-Limonene	17.84	22.155	26.550	83	71	134	*	*
92)	1,2-Dibromo-3-Chloropropane	18.25	28.459	26.475	107	73	136	*	*
93)	n-Undecane	18.60	23.903	26.600	90	68	132	*	*
94)	1,2,4-Trichlorobenzene	19.45	25.127	26.500	95	64	134	*	*
95)	Naphthalene	19.56	26.259	26.700	98	62	136	*	*
96)	n-Dodecane	19.58	26.756	26.550	101	61	137	*	*
97)	Hexachlorobutadiene	19.90	20.963	26.575	79	60	133	*	*
98)	Cyclohexanone	15.31	21.392	26.575	80	64	131	*	*
99)	tert-Butylbenzene	17.30	21.721	26.500	82	67	128	*	*
100)	n-Butylbenzene	18.11	23.773	26.500	90	68	128	*	*

Data File: I:\MS08\Data\2017 08\09\08091702.D

Acq On : 9 Aug 2017 4:03

Operator: WA/AB

Sample : CCV R8080917 25ng

Misc : S31-07131701/S31-08021705 (8/31)

ALS Vial : 16 Sample Multiplier: 1

Quant Time: Aug 09 06:49:28 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 12:51:06 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%

8/9/17

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1 IR	Bromochloromethane (IS1)	1.000	1.000	0.0	90	-0.03
2 T	Propene	1.136	0.850	25.2	73	-0.01
3 T	Dichlorodifluoromethane (CF	2.672	2.084	22.0	73	-0.01
4 T	Chloromethane	1.285	1.217	5.3	84	-0.01
5 T	1,2-Dichloro-1,1,2,2-tetra	1.259	1.129	10.3	86	-0.02
6 T	Vinyl Chloride	1.283	1.324	-3.2	91	-0.02
7 T	1,3-Butadiene	0.985	1.025	-4.1	91	-0.02
8 T	Bromomethane	0.923	0.931	-0.9	92	-0.02
9 T	Chloroethane	0.816	0.699	14.3	77	-0.02
10 T	Ethanol	0.817	0.641	21.5	78	-0.05
11 T	Acetonitrile	2.079	1.558	25.1	75	-0.04
12 T	Acrolein	0.683	0.594	13.0	77	-0.02
13 T	Acetone	0.782	0.671	14.2	78	-0.04
14 T	Trichlorofluoromethane	2.534	1.963	22.5	75	-0.02
15 T	2-Propanol (Isopropanol)	3.011	2.501	16.9	75	-0.04
16 T	Acrylonitrile	1.349	1.216	9.9	76	-0.03
17 T	1,1-Dichloroethene	1.194	1.010	15.4	79	-0.02
18 T	2-Methyl-2-Propanol (tert-B	3.260	2.808	13.9	79	-0.04
19 T	Methylene Chloride	1.120	0.986	12.0	78	-0.03
20 T	3-Chloro-1-propene (Allyl C	1.625	1.389	14.5	74	-0.02
21 T	Trichlorotrifluoroethane	1.261	1.091	13.5	83	-0.02
22 T	Carbon Disulfide	3.896	3.355	13.9	78	-0.02
23 T	trans-1,2-Dichloroethene	1.703	1.432	15.9	75	-0.02
24 T	1,1-Dichloroethane	2.090	1.685	19.4	77	-0.03
25 T	Methyl tert-Butyl Ether	3.797	3.268	13.9	82	-0.02
26 T	Vinyl Acetate	0.275	0.280	-1.8	82	-0.03
27 T	2-Butanone (MEK)	0.719	0.662	7.9	78	-0.03
28 T	cis-1,2-Dichloroethene	1.672	1.379	17.5	75	-0.02
29 T	Diisopropyl Ether	1.104	0.868	21.4	81	-0.02
30 T	Ethyl Acetate	0.333	0.305	8.4	79	-0.03
31 T	n-Hexane	1.632	1.284	21.3	79	-0.02
32 T	Chloroform	2.320	1.881	18.9	76	-0.03
33 S	1,2-Dichloroethane-d4 (SS1)	1.717	1.559	9.2	81	-0.02
34 T	Tetrahydrofuran (THF)	0.747	0.641	14.2	78	-0.02
35 T	Ethyl tert-Butyl Ether	1.535	1.378	10.2	83	-0.02
36 T	1,2-Dichloroethane	1.948	1.525	21.7	72	-0.02
37 IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	89	-0.02
38 T	1,1,1-Trichloroethane	0.517	0.422	18.4	74	-0.02
39 T	Isopropyl Acetate	0.140	0.121	13.6	79	-0.02
40 T	1-Butanol	0.232	0.242	-4.3	78	-0.04
41 T	Benzene	0.991	0.807	18.6	78	-0.02
42 T	Carbon Tetrachloride	0.471	0.391	17.0	74	-0.02
43 T	Cyclohexane	0.428	0.355	17.1	80	-0.02
44 T	tert-Amyl Methyl Ether	0.766	0.669	12.7	81	-0.02
45 T	1,2-Dichloropropane	0.230	0.189	17.8	77	-0.02
46 T	Bromodichloromethane	0.382	0.329	13.9	74	-0.02
47 T	Trichloroethene	0.309	0.272	12.0	82	-0.02
48 T	1,4-Dioxane	0.209	0.192	8.1	78	-0.02
49 T	2,2,4-Trimethylpentane (Iso	1.058	0.865	18.2	77	-0.02
50 T	Methyl Methacrylate	0.099	0.105	-6.1	81	-0.02
51 T	n-Heptane	0.247	0.200	19.0	77	-0.02
52 T	cis-1,3-Dichloropropene	0.398	0.372	6.5	77	-0.02
53 T	4-Methyl-2-pentanone	0.201	0.196	2.5	75	-0.02
54 T	trans-1,3-Dichloropropene	0.372	0.373	-0.3	75	-0.02

Data File: I:\MS08\Data\2017 08\09\08091702.D

Acq On : 9 Aug 2017 4:03

Operator: WA/AB

Sample : CCV R8080917 25ng

Misc : S31-07131701/S31-08021705 (8/31)

ALS Vial : 16 Sample Multiplier: 1

Quant Time: Aug 09 06:49:28 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 12:51:06 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	0.253	0.225	11.1	77	-0.02
56 IR	Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	90	-0.01
57 S	Toluene-d8 (SS2)	2.489	2.368	4.9	88	-0.01
58 T	Toluene	2.613	2.086	20.2	78	-0.02
59 T	2-Hexanone	1.160	1.048	9.7	73	-0.02
60 T	Dibromochloromethane	0.801	0.719	10.2	78	-0.02
61 T	1,2-Dibromoethane	0.653	0.606	7.2	78	-0.02
62 T	n-Butyl Acetate	1.227	1.148	6.4	73	-0.02
63 T	n-Octane	0.515	0.397	22.9	76	-0.02
64 T	Tetrachloroethene	0.807	0.716	11.3	82	-0.01
65 T	Chlorobenzene	1.796	1.483	17.4	80	-0.02
66 T	Ethylbenzene	3.064	2.556	16.6	78	-0.02
67 T	m- & p-Xylenes	2.474	2.041	17.5	78	-0.02
68 T	Bromoform	0.689	0.667	3.2	80	-0.02
69 T	Styrene	1.687	1.615	4.3	80	-0.02
70 T	o-Xylene	2.544	2.105	17.3	78	-0.02
71 T	n-Nonane	1.159	0.927	20.0	75	-0.02
72 T	1,1,2,2-Tetrachloroethane	0.977	0.862	11.8	79	-0.02
73 S	Bromofluorobenzene (SS3)	0.840	0.994	-18.3	105	-0.01
74 T	Cumene	3.287	2.746	16.5	79	-0.01
75 T	alpha-Pinene	1.668	1.436	13.9	78	-0.02
76 T	n-Propylbenzene	3.624	3.095	14.6	78	-0.01
77 T	3-Ethyltoluene	3.112	2.757	11.4	78	-0.02
78 T	4-Ethyltoluene	2.977	2.620	12.0	82	-0.02
79 T	1,3,5-Trimethylbenzene	2.835	2.383	15.9	79	-0.01
80 T	alpha-Methylstyrene	1.299	1.272	2.1	80	-0.02
81 T	2-Ethyltoluene	3.176	2.698	15.1	80	-0.01
82 T	1,2,4-Trimethylbenzene	2.763	2.376	14.0	79	-0.02
83 T	n-Decane	1.246	1.047	16.0	78	-0.01
84 T	Benzyl Chloride	2.046	2.174	-6.3	76	-0.02
85 T	1,3-Dichlorobenzene	1.515	1.421	6.2	82	-0.02
86 T	1,4-Dichlorobenzene	1.550	1.442	7.0	82	-0.02
87 T	sec-Butylbenzene	3.519	3.043	13.5	80	-0.02
88 T	4-Isopropyltoluene (p-Cymen	3.501	3.103	11.4	81	-0.02
89 T	1,2,3-Trimethylbenzene	2.799	2.423	13.4	80	-0.02
90 T	1,2-Dichlorobenzene	1.516	1.360	10.3	82	-0.02
91 T	d-Limonene	0.944	0.865	8.4	79	-0.02
92 T	1,2-Dibromo-3-Chloropropane	0.484	0.563	-16.3	84	-0.01
93 T	n-Undecane	1.244	1.147	7.8	79	-0.01
94 T	1,2,4-Trichlorobenzene	1.146	1.161	-1.3	81	-0.01
95 T	Naphthalene	3.059	3.212	-5.0	78	-0.01
96 T	n-Dodecane	1.073	1.186	-10.5	79	-0.01
97 T	Hexachlorobutadiene	0.945	0.801	15.2	81	0.00
98 T	Cyclohexanone	0.822	0.734	10.7	75	-0.02
99 T	tert-Butylbenzene	2.807	2.414	14.0	81	-0.02
100 T	n-Butylbenzene	2.662	2.507	5.8	80	-0.01

(#) = Out of Range

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

Data File: I:\MS08\Data\2017 08\09\08091702.D

Acq On : 9 Aug 2017 4:03

Operator: WA/AB

Sample : CCV R8080917 25ng

Misc : S31-07131701/S31-08021705 (8/31)

ALS Vial : 16 Sample Multiplier: 1

Quant Time: Aug 09 06:49:28 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 12:51:06 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

8/9/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	8.80	130	185740	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	10.53	114	833879	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	14.56	82	369653	12.500	ng	-0.01

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	9.48	65	289501	11.346	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	90.80%
57) Toluene-d8 (SS2)	12.76	98	875169	11.888	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.12%
73) Bromofluorobenzene (SS3)	16.06	174	367528	14.797	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	118.40%

Target Compounds

						Qvalue
2) Propene	3.88	42	326968	19.365	ng	95
3) Dichlorodifluoromethan...	3.99	85	810374	20.407	ng	100
4) Chloromethane	4.19	50	454496	23.807	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.35	135	421387	22.528	ng	100
6) Vinyl Chloride	4.47	62	503312	26.406	ng	99
7) 1,3-Butadiene	4.65	54	402329	27.501	ng	98
8) Bromomethane	4.95	94	343606	25.058	ng	99
9) Chloroethane	5.17	64	261901	21.597	ng	99
10) Ethanol	5.40	45	1239221	102.109	ng	98
11) Acetonitrile	5.59	41	605402	19.600	ng	99
12) Acrolein	5.72	56	229836	22.640	ng	99
13) Acetone	5.85	58	1325031	114.022	ng	95
14) Trichlorofluoromethane	6.01	101	765032	20.316	ng	100
15) 2-Propanol (Isopropanol)	6.15	45	1955656	43.706	ng	98
16) Acrylonitrile	6.35	53	476546	23.777	ng	97
17) 1,1-Dichloroethene	6.65	96	397490	22.403	ng	99
18) 2-Methyl-2-Propanol (t...	6.75	59	2204980	45.516	ng	97
19) Methylene Chloride	6.79	84	387334	23.275	ng	95
20) 3-Chloro-1-propene (Al...	6.91	41	542744	22.482	ng	98
21) Trichlorotrifluoroethane	7.06	151	425047	22.686	ng	95
22) Carbon Disulfide	7.04	76	1322146	22.839	ng	100
23) trans-1,2-Dichloroethene	7.69	61	567616	22.432	ng	98
24) 1,1-Dichloroethane	7.88	63	638453	20.560	ng	99
25) Methyl tert-Butyl Ether	7.93	73	1294295	22.939	ng	96
26) Vinyl Acetate	8.03	86	547152	133.979	ng	# 84
27) 2-Butanone (MEK)	8.24	72	257776	24.143	ng	96
28) cis-1,2-Dichloroethene	8.65	61	545122	21.941	ng	99
29) Diisopropyl Ether	8.84	87	342547	20.876	ng	# 88
30) Ethyl Acetate	8.84	61	241503	48.743	ng	96
31) n-Hexane	8.85	57	507224	20.914	ng	98
32) Chloroform	8.92	83	739312	21.443	ng	100
34) Tetrahydrofuran (THF)	9.26	72	252960	22.797	ng	# 90
35) Ethyl tert-Butyl Ether	9.32	87	541155	23.718	ng	97
36) 1,2-Dichloroethane	9.58	62	596047	20.589	ng	100
38) 1,1,1-Trichloroethane	9.82	97	756055	21.940	ng	99
39) Isopropyl Acetate	10.12	61	424388	45.490	ng	97
40) 1-Butanol	10.13	56	848283	54.873	ng	99
41) Benzene	10.22	78	1416685	21.427	ng	99
42) Carbon Tetrachloride	10.36	117	687819	21.887	ng	100
43) Cyclohexane	10.47	84	1260225	44.183	ng	96
44) tert-Amyl Methyl Ether	10.74	73	1176214	23.010	ng	99
45) 1,2-Dichloropropane	10.95	63	335274	21.823	ng	99
46) Bromodichloromethane	11.12	83	584104	22.896	ng	99
47) Trichloroethene	11.16	130	480706	23.329	ng	99
48) 1,4-Dioxane	11.14	88	339538	24.345	ng	96
49) 2,2,4-Trimethylpentane...	11.22	57	1527561	21.646	ng	97

Data File: I:\MS08\Data\2017 08\09\08091702.D

Acq On : 9 Aug 2017 4:03

Operator: WA/AB

Sample : CCV R8080917 25ng

Misc : S31-07131701/S31-08021705 (8/31)

ALS Vial : 16 Sample Multiplier: 1

Quant Time: Aug 09 06:49:28 2017

Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 12:51:06 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	11.32	100	369474	55.923	ng	96
51) n-Heptane	11.44	71	354411	21.492	ng	98
52) cis-1,3-Dichloropropene	11.93	75	693027	26.095	ng	99
53) 4-Methyl-2-pentanone	11.96	58	346219	25.861	ng	97
54) trans-1,3-Dichloropropene	12.41	75	662169	26.704	ng	100
55) 1,1,2-Trichloroethane	12.58	97	398475	23.627	ng	98
58) Toluene	12.85	91	1623692	21.016	ng	100
59) 2-Hexanone	13.06	43	822138	23.977	ng	100
60) Dibromochloromethane	13.24	129	564768	23.855	ng	100
61) 1,2-Dibromoethane	13.48	107	472971	24.511	ng	99
62) n-Butyl Acetate	13.66	43	902838	24.888	ng	99
63) n-Octane	13.78	57	309942	20.364	ng	94
64) Tetrachloroethene	13.94	166	561598	23.533	ng	99
65) Chlorobenzene	14.60	112	1162932	21.892	ng	99
66) Ethylbenzene	14.98	91	1993270	22.000	ng	99
67) m- & p-Xylenes	15.16	91	3203802	43.797	ng	99
68) Bromoform	15.23	173	524125	25.731	ng	100
69) Styrene	15.51	104	1266551	25.383	ng	99
70) o-Xylene	15.62	91	1640600	21.804	ng	100
71) n-Nonane	15.83	43	722077	21.068	ng	97
72) 1,1,2,2-Tetrachloroethane	15.60	83	672991	23.286	ng	99
74) Cumene	16.20	105	2131474	21.928	ng	100
75) alpha-Pinene	16.57	93	1108220	22.470	ng	100
76) n-Propylbenzene	16.69	91	2432360	22.697	ng	98
77) 3-Ethyltoluene	16.78	105	2140342	23.255	ng	99
78) 4-Ethyltoluene	16.83	105	2031936	23.079	ng	99
79) 1,3,5-Trimethylbenzene	16.90	105	1848438	22.050	ng	99
80) alpha-Methylstyrene	17.05	118	987256	25.696	ng	99
81) 2-Ethyltoluene	17.09	105	2118084	22.549	ng	99
82) 1,2,4-Trimethylbenzene	17.30	105	1847759	22.613	ng	98
83) n-Decane	17.40	57	815379	22.135	ng	98
84) Benzyl Chloride	17.42	91	1705198	28.189	ng	98
85) 1,3-Dichlorobenzene	17.44	146	1111132	24.796	ng	99
86) 1,4-Dichlorobenzene	17.50	146	1128086	24.615	ng	99
87) sec-Butylbenzene	17.55	105	2370881	22.783	ng	99
88) 4-Isopropyltoluene (p-...	17.70	119	2356102	22.754	ng	99
89) 1,2,3-Trimethylbenzene	17.70	105	1839550	22.226	ng	99
90) 1,2-Dichlorobenzene	17.83	146	1063900	23.726	ng	99
91) d-Limonene	17.84	68	642912	23.036	ng	97
92) 1,2-Dibromo-3-Chloropr...	18.25	157	438252	30.640	ng	98
93) n-Undecane	18.60	57	893507	24.284	ng	98
94) 1,2,4-Trichlorobenzene	19.45	180	895146	26.415	ng	100
95) Naphthalene	19.56	128	2572075	28.432	ng	100
96) n-Dodecane	19.57	57	916131	28.861	ng	98
97) Hexachlorobutadiene	19.90	225	627004	22.427	ng	100
98) Cyclohexanone	15.30	55	573177	23.575	ng	98
99) tert-Butylbenzene	17.30	119	1875810	22.599	ng	99
100) n-Butylbenzene	18.11	91	1956999	24.859	ng	99

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

Data File: I:\MS08\Data\2017 08\09\08091702.D

Acq On : 9 Aug 2017 4:03

Operator: WA/AB

Sample : CCV R8080917 25ng

Misc : S31-07131701/S31-08021705 (8/31)

ALS Vial : 16 Sample Multiplier: 1

Quant Time: Aug 09 06:49:28 2017

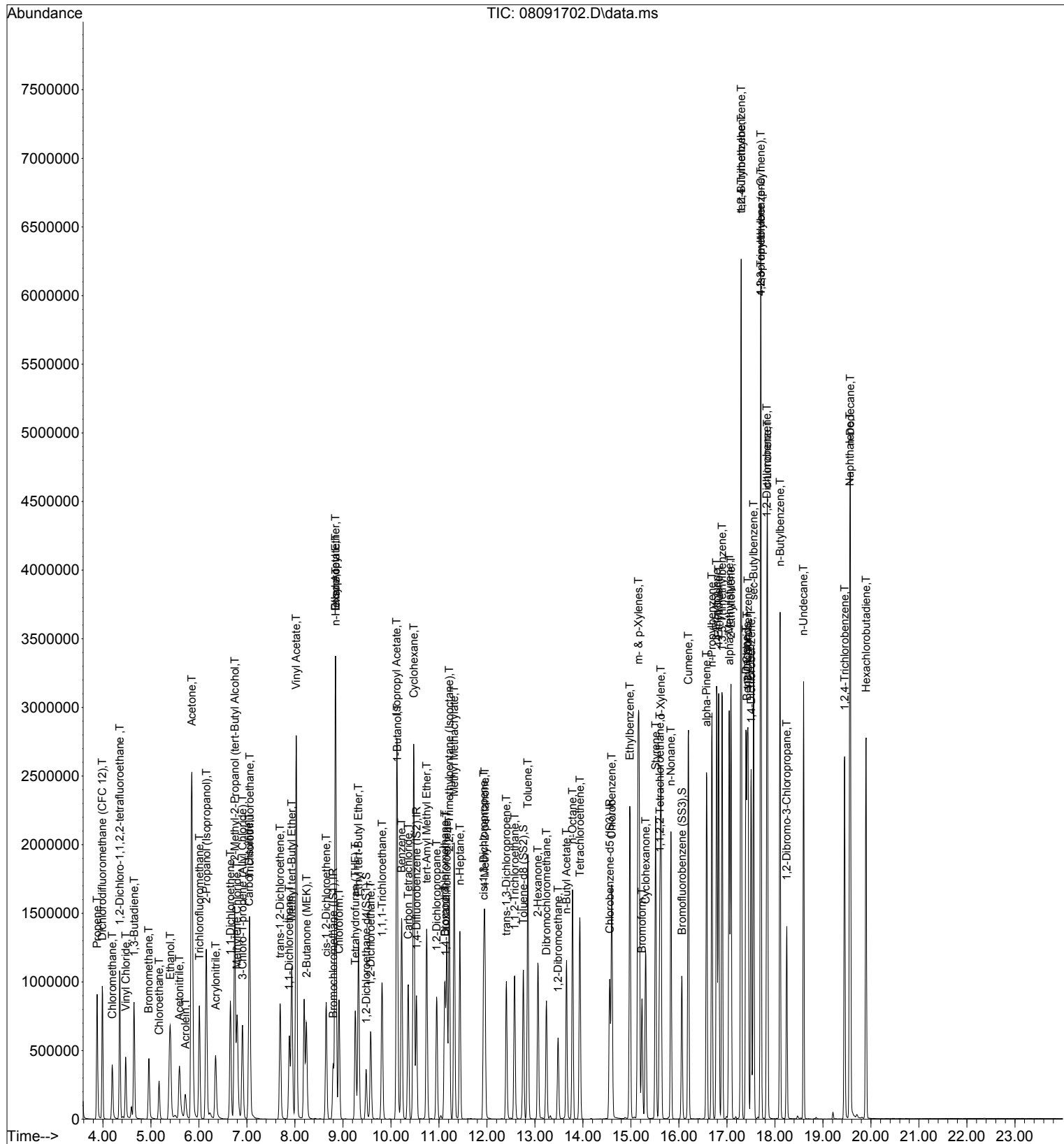
Quant Method : I:\MS08\Methods\R8071417.M

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

QLast Update : Fri Jul 14 12:51:06 2017

Response via : Initial Calibration

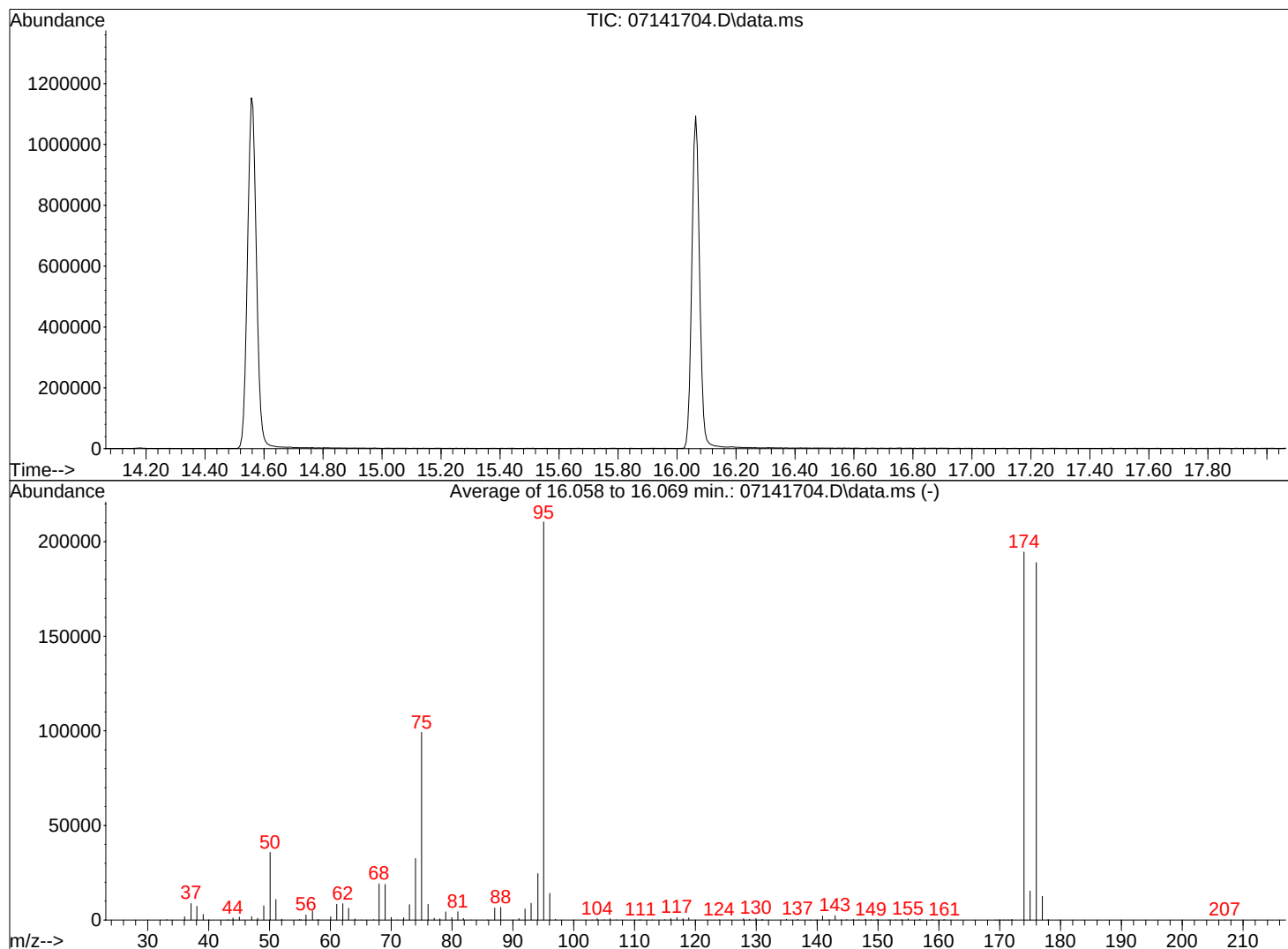
DataAcq Meth:TO15.M



Data Path : I:\MS08\Data\2017 07\14\
 Data File : 07141704.D
 Acq On : 14 Jul 2017 6:49 am
 Operator : WA/AB
 Sample : BFB R8071417
 Misc : S31-07131701
 ALS Vial : 1 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS08\Methods\R8071417.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Fri Jul 14 12:51:06 2017



AutoFind: Scans 2315, 2316, 2317; Background Corrected with Scan 2307

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	17.0	35771	PASS
75	95	30	66	47.1	99211	PASS
95	95	100	100	100.0	210432	PASS
96	95	5	9	6.7	14068	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	92.5	194560	PASS
175	174	4	9	7.9	15404	PASS
176	174	93	101	97.1	188949	PASS
177	176	5	9	6.6	12537	PASS

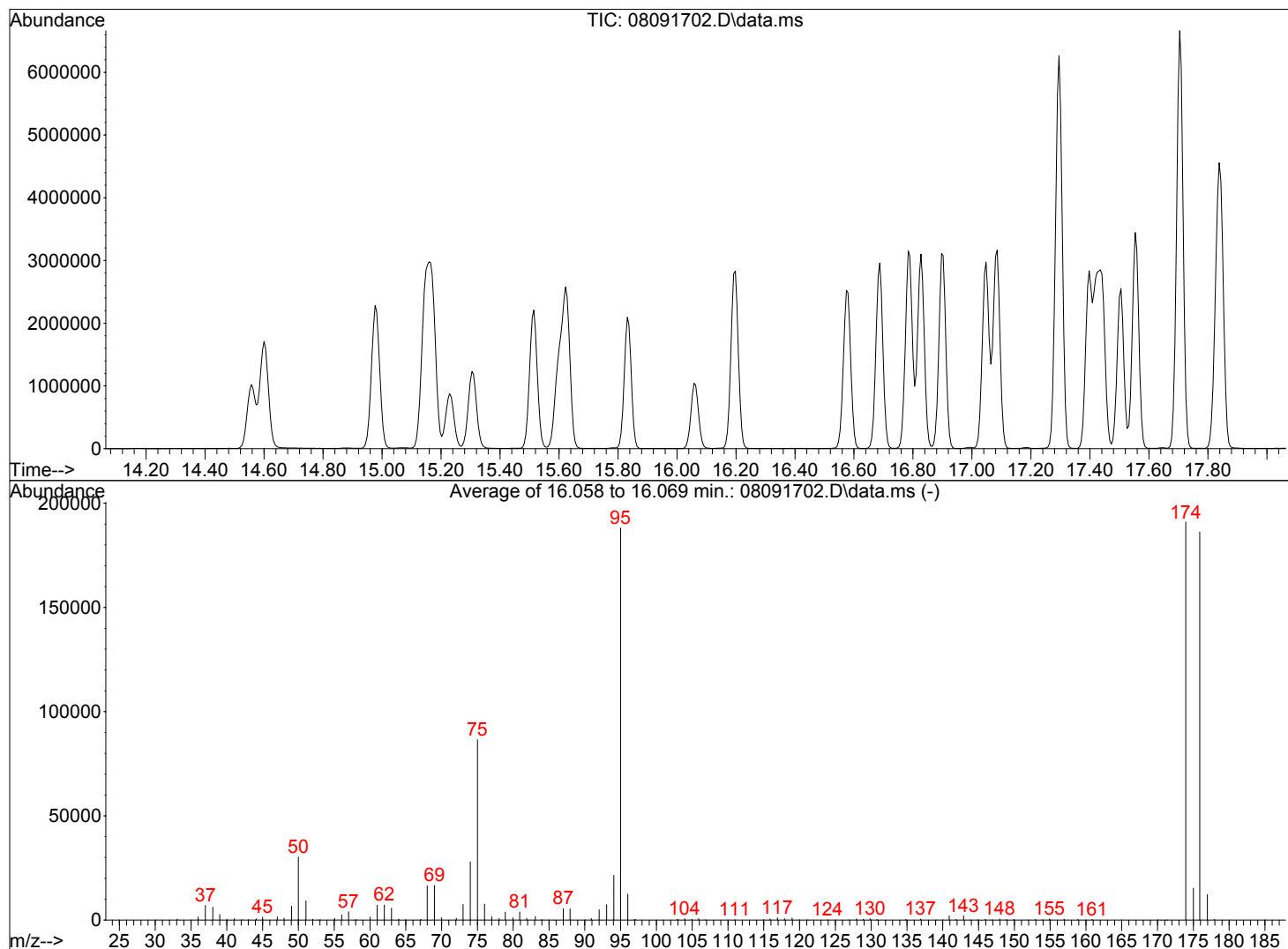
AB 7/17/17

AB 7/17/17

Data Path : I:\MS08\Data\2017 08\09\
 Data File : 08091702.D
 Acq On : 9 Aug 2017 4:03
 Operator : WA/AB
 Sample : CCV R8080917 25ng
 Misc : S31-07131701/S31-08021705 (8/31)
 ALS Vial : 16 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS08\Methods\R8071417.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Fri Jul 14 12:51:06 2017



AutoFind: Scans 2315, 2316, 2317; Background Corrected with Scan 2304

WA 8/9/17

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	16.1	30200	PASS
75	95	30	66	46.0	86568	PASS
95	95	100	100	100.0	188139	PASS
96	95	5	9	6.6	12390	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	101.5	191019	PASS
175	174	4	9	8.0	15292	PASS
176	174	93	101	97.5	186240	PASS
177	176	5	9	6.6	12223	PASS

Injection Log

Directory: J:\MS08\Data\2017_07\14\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	7/14/17 4:30	07141701.D	CCV R8071417_25ng	S31-07131701/S31-07111705 (8/10)	WA/AB	15	
2	7/14/17 5:03	07141702.D	CCV C8071417_5ng	S31-07131701/S31-06201703 (7/19)	WA/AB	1	
3	7/14/17 5:35	07141703.D	CCV R8071417_5ng	S31-07131701/S31-06221704 (7/21)	WA/AB	16	
4	7/14/17 6:49	07141704.D	BFB R8071417	S31-07131701	WA/AB	1	Passes
5	7/14/17 7:22	07141705.D	0.08ng TO-15 ICAL Std	S31-07131701/S31-07111710 (8/10)	WA/AB	13	
6	7/14/17 7:54	07141706.D	0.10ng TO-15 ICAL Std	S31-07131701/S31-07111710 (8/10)	WA/AB	13	
7	7/14/17 8:26	07141707.D	0.20ng TO-15 ICAL Std	S31-07131701/S31-07111710 (8/10)	WA/AB	13	
8	7/14/17 8:59	07141708.D	0.40ng TO-15 ICAL Std	S31-07131701/S31-07111710 (8/10)	WA/AB	13	
9	7/14/17 9:31	07141709.D	1.0ng TO-15 ICAL Std	S31-07131701/S31-07111708 (8/10)	WA/AB	14	
10	7/14/17 10:04	07141710.D	5.0ng TO-15 ICAL Std	S31-07131701/S31-07111708 (8/10)	WA/AB	14	
11	7/14/17 10:36	07141711.D	25ng TO-15 ICAL Std	S31-07131701/S31-07111705 (8/10)	WA/AB	15	
12	7/14/17 11:08	07141712.D	50ng TO-15 ICAL Std	S31-07131701/S31-07111705 (8/10)	WA/AB	15	
13	7/14/17 11:41	07141713.D	100ng TO-15 ICAL Std	S31-07131701/S31-07111705 (8/10)	WA/AB	15	
14	7/14/17 12:13	07141714.D	Blank	S31-07131701	WA/AB	1	
15	7/14/17 12:46	07141715.D	25ng TO-15 ICV Std	S31-07131701/S31-06221704 (7/21)	WA/AB	1	Passes all cmpds
16	7/14/17 13:18	07141716.D	25ng TO-15 ICV Std	S31-07131701/S31-06221704 (7/21)	WA/AB	1	
R8071417.M: Good for low level 75 compounds							
Specific ranges: Acetone: 1.0ng --> 500ng; 1-Butanol: 0.4ng --> 200ng							
Acrolein, n-Hexane, trans-1,3,-DCP, n-Butyl Acetate: 0.2ng --> 100ng							
MeCl2, CS2, MEK, 2-Hexanone, Naphthalene: 0.4ng --> 100ng							

AB 7/17/17

Injection Log

Directory: I:\MS08\Data\2017_08\09\

[illegible]



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LABORATORY REPORT

November 6, 2017

Todd Calhoun
Trinity Analysis & Development Corp.
1002 N. Eglin Pkwy.
Shalimar, FL 32579

RE: DDMT SVE / 1006 0131 Task 2.0

Dear Todd:

Enclosed are the results of the sample submitted to our laboratory on October 17, 2017. For your reference, this analysis has been assigned our service request number P1705134.

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 10:27 am, 11/07/17

Kate Kaneko
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: Trinity Analysis & Development Corp.
Project: DDMT SVE / 1006 0131 Task 2.0

Service Request No: P1705134

CASE NARRATIVE

The sample was received intact under chain of custody on October 17, 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	T104704413-17-8
Utah DOH (NELAP)	http://health.utah.gov/lab/environmental-lab-certification/	CA01627201 7-8
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: Trinity Analysis & Development Corp.
Project ID: DDMT SVE / 1006 0131 Task 2.0

Service Request: P1705134

Date Received: 10/17/2017
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-Y7Q2A	P1705134-001	Air	10/10/2017	09:04	SC00532	-0.31	3.59

X



Air - Chain of Custody Record & Analytical Service Request

2355 Park Center Drive, Suite A
Simi Valley, California 92063
Phone (305) 526-7161
Fax (805) 526-7270

Page 1 of 1

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.

P1705134

Company Name & Address (Reporting Information)

HDR 9781 S. Meridian Blvd.
Suite 400
Englewood, CO 80112

Project Manager

T. Holmes

Phone

404-295-3279

Fax

Email Address for Result Reporting

Project Name

DDMT SVF

Project Number

1006 0131 TASK 20

P.O. # / Billing Information

ALS Contact:

Analysis Method

Sampler (Print & Sign)

Comments
e.g. Actual
Preservative or
specific instructions

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/belg

Sample
Volume

ODSVF-EFF-Y7G2A

10/10/17

0904 SC00532

-38

-1

6L

Report Time Limits - please select

Two (2) Business Days (if not specified)

Five (5) Business Days (if not specified)

Ten (10) Business Days (if not specified)

Emergency - Yes / No

Time:

Chain of Custody Seal (Check)
INTACT BROKEN ABSENT

Project Requirements
(MRLs, OADR)

Prepared by: (Signature)

T. Holmes

Date:

10/11/17

Time:

1200

Prepared by: (Signature)

Henry Perez

10/17/17 0930

Cooler / Blank
Temperature °C

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: Trinity Analysis & Development Corp.

Client Sample ID: ODSVE-EFF-Y7Q2A

Client Project ID: DDMT SVE / 1006 0131 Task 2.0

ALS Project ID: P1705134

ALS Sample ID: P1705134-001

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Wida Ang

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC00532

Date Collected: 10/10/17

Date Received: 10/17/17

Date Analyzed: 10/26/17

Volume(s) Analyzed: 1.00 Liter(s)

0.20 Liter(s)

Initial Pressure (psig): -0.31

Final Pressure (psig): 3.59

Container Dilution Factor: 1.27

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	0.33	0.37	0.30	0.10	J
75-71-8	Dichlorodifluoromethane (CFC 12)	0.87	0.13	0.11	0.044	
74-87-3	Chloromethane	0.25	0.31	0.25	0.092	U
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	0.073	0.091	0.073	0.035	U
75-01-4	Vinyl Chloride	0.091	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	3.1	3.4	1.4	0.54	J
75-05-8	Acetonitrile	0.32	0.38	0.32	0.14	U
107-02-8	Acrolein	0.36	1.1	0.23	0.094	J
67-64-1	Acetone	5.4	2.7	1.1	0.41	B
75-69-4	Trichlorofluoromethane	0.40	0.11	0.095	0.038	
67-63-0	2-Propanol (Isopropyl Alcohol)	0.26	2.6	0.43	0.22	J
107-13-1	Acrylonitrile	0.25	0.29	0.25	0.10	U
75-35-4	1,1-Dichloroethene	1.2	0.16	0.13	0.054	
75-09-2	Methylene Chloride	0.32	0.18	0.15	0.062	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	0.17	0.20	0.17	0.065	U
76-13-1	Trichlorotrifluoroethane	4.6	0.083	0.070	0.028	
75-15-0	Carbon Disulfide	1.2	2.0	0.17	0.061	J
156-60-5	trans-1,2-Dichloroethene	0.56	0.16	0.14	0.061	
75-34-3	1,1-Dichloroethane	0.56	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	1.1	1.8	0.76	0.23	J
78-93-3	2-Butanone (MEK)	0.59	2.2	0.18	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.

B = Analyte detected in both the sample and associated method blank.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 2 of 3

Client: Trinity Analysis & Development Corp.

Client Sample ID: ODSVE-EFF-Y7Q2A

Client Project ID: DDMT SVE / 1006 0131 Task 2.0

ALS Project ID: P1705134

ALS Sample ID: P1705134-001

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Wida Ang

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC00532

Date Collected: 10/10/17

Date Received: 10/17/17

Date Analyzed: 10/26/17

Volume(s) Analyzed: 1.00 Liter(s)

0.20 Liter(s)

Initial Pressure (psig): -0.31 Final Pressure (psig): 3.59

Container Dilution Factor: 1.27

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	35	0.80	0.69	0.26	D
141-78-6	Ethyl Acetate	1.2	0.35	0.30	0.12	
110-54-3	n-Hexane	0.10	0.18	0.15	0.054	J
67-66-3	Chloroform	6.5	0.13	0.11	0.044	
109-99-9	Tetrahydrofuran (THF)	0.12	0.22	0.18	0.086	J
107-06-2	1,2-Dichloroethane	0.13	0.16	0.13	0.050	U
71-55-6	1,1,1-Trichloroethane	0.41	0.12	0.10	0.040	
71-43-2	Benzene	0.11	0.20	0.17	0.064	J
56-23-5	Carbon Tetrachloride	0.49	0.10	0.085	0.030	
110-82-7	Cyclohexane	0.31	0.37	0.31	0.11	U
78-87-5	1,2-Dichloropropane	0.12	0.14	0.12	0.044	U
75-27-4	Bromodichloromethane	0.17	0.095	0.082	0.028	
79-01-6	Trichloroethene	27	0.59	0.50	0.17	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	0.084	0.16	0.13	0.050	J
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	0.36	0.17	0.14	0.057	
591-78-6	2-Hexanone	0.090	0.16	0.13	0.050	J
124-48-1	Dibromochloromethane	0.063	0.075	0.063	0.024	U
106-93-4	1,2-Dibromoethane	0.069	0.083	0.069	0.026	U
123-86-4	n-Butyl Acetate	0.054	0.13	0.11	0.043	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.

D = The reported result is from a dilution.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 3 of 3

Client: Trinity Analysis & Development Corp.
Client Sample ID: ODSVE-EFF-Y7Q2A
Client Project ID: DDMT SVE / 1006 0131 Task 2.0

ALS Project ID: P1705134
 ALS Sample ID: P1705134-001

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Wida Ang
Sampling Media: 6.0 L Summa Canister
Test Notes:
Container ID: SC00532

Date Collected: 10/10/17
Date Received: 10/17/17
Date Analyzed: 10/26/17
Volume(s) Analyzed: 1.00 Liter(s)
 0.20 Liter(s)

Initial Pressure (psig): -0.31 Final Pressure (psig): 3.59

Container 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	2.6	0.094	0.079	0.026	
108-90-7	Chlorobenzene	0.12	0.14	0.12	0.044	U
100-41-4	Ethylbenzene	0.053	0.15	0.12	0.047	J
179601-23-1	m,p-Xylenes	0.20	0.29	0.25	0.088	J
75-25-2	Bromoform	0.053	0.061	0.053	0.018	U
100-42-5	Styrene	0.046	0.15	0.13	0.045	J
95-47-6	o-Xylene	0.079	0.15	0.12	0.044	J
111-84-2	n-Nonane	0.10	0.12	0.10	0.036	U
79-34-5	1,1,2,2-Tetrachloroethane	0.60	0.093	0.078	0.028	
98-82-8	Cumene	0.11	0.13	0.11	0.039	U
80-56-8	alpha-Pinene	0.096	0.11	0.096	0.032	U
103-65-1	n-Propylbenzene	0.11	0.13	0.11	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	0.042	0.13	0.11	0.039	J
100-44-7	Benzyl Chloride	0.10	0.12	0.10	0.027	U
541-73-1	1,3-Dichlorobenzene	0.089	0.11	0.089	0.032	U
106-46-7	1,4-Dichlorobenzene	0.089	0.11	0.089	0.030	U
95-50-1	1,2-Dichlorobenzene	0.089	0.11	0.089	0.032	U
5989-27-5	d-Limonene	0.091	0.11	0.091	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	0.10	0.12	0.10	0.044	U
87-68-3	Hexachlorobutadiene	0.050	0.060	0.050	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.
 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 1 of 3

Client: Trinity Analysis & Development Corp.

Client Sample ID: Method Blank

Client Project ID: DDMT SVE / 1006 0131 Task 2.0

ALS Project ID: P1705134

ALS Sample ID: P171026-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Wida Ang

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 10/26/17

Volume(s) Analyzed: 1.00 Liter(s)

Container 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)	0.085	0.10	0.085	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)	0.057	0.072	0.057	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	0.25	0.30	0.25	0.11	U
107-02-8	Acrolein	0.18	0.87	0.18	0.074	U
67-64-1	Acetone	0.39	2.1	0.88	0.32	J
75-69-4	Trichlorofluoromethane	0.075	0.089	0.075	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)	0.13	0.16	0.13	0.051	U
76-13-1	Trichlorotrifluoroethane	0.055	0.065	0.055	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	0.60	1.4	0.60	0.18	U
78-93-3	2-Butanone (MEK)	0.14	1.7	0.14	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.

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: Trinity Analysis & Development Corp.

Client Sample ID: Method Blank

Client Project ID: DDMT SVE / 1006 0131 Task 2.0

ALS Project ID: P1705134

ALS Sample ID: P171026-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Wida Ang

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 10/26/17

Volume(s) Analyzed: 1.00 Liter(s)

Container 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	0.086	0.10	0.086	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	0.079	0.092	0.079	0.031	U
71-43-2	Benzene	0.13	0.16	0.13	0.050	U
56-23-5	Carbon Tetrachloride	0.067	0.080	0.067	0.024	U
110-82-7	Cyclohexane	0.25	0.29	0.25	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	0.078	0.093	0.078	0.026	U
123-91-1	1,4-Dioxane	0.12	0.14	0.12	0.044	U
80-62-6	Methyl Methacrylate	0.21	0.24	0.21	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	0.10	0.12	0.10	0.039	U
124-48-1	Dibromochloromethane	0.049	0.059	0.049	0.019	U
106-93-4	1,2-Dibromoethane	0.055	0.065	0.055	0.021	U
123-86-4	n-Butyl Acetate	0.091	0.11	0.091	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: Trinity Analysis & Development Corp.
Client Sample ID: Method Blank
Client Project ID: DDMT SVE / 1006 0131 Task 2.0

ALS Project ID: P1705134
 ALS Sample ID: P171026-MB

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Wida Ang
Sampling Media: 6.0 L Summa Canister
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 10/26/17
Volume(s) Analyzed: 1.00 Liter(s)

Container Dilution Factor: 1.00

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	0.090	0.11	0.090	0.039	U
127-18-4	Tetrachloroethene	0.062	0.074	0.062	0.021	U
108-90-7	Chlorobenzene	0.091	0.11	0.091	0.035	U
100-41-4	Ethylbenzene	0.097	0.12	0.097	0.037	U
179601-23-1	m,p-Xylenes	0.20	0.23	0.20	0.069	U
75-25-2	Bromoform	0.042	0.048	0.042	0.015	U
100-42-5	Styrene	0.099	0.12	0.099	0.035	U
95-47-6	o-Xylene	0.097	0.12	0.097	0.035	U
111-84-2	n-Nonane	0.080	0.095	0.080	0.029	U
79-34-5	1,1,2,2-Tetrachloroethane	0.061	0.073	0.061	0.022	U
98-82-8	Cumene	0.085	0.10	0.085	0.031	U
80-56-8	alpha-Pinene	0.075	0.090	0.075	0.025	U
103-65-1	n-Propylbenzene	0.088	0.10	0.088	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	0.081	0.097	0.081	0.021	U
541-73-1	1,3-Dichlorobenzene	0.070	0.083	0.070	0.025	U
106-46-7	1,4-Dichlorobenzene	0.070	0.083	0.070	0.023	U
95-50-1	1,2-Dichlorobenzene	0.070	0.083	0.070	0.025	U
5989-27-5	d-Limonene	0.072	0.090	0.072	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	0.082	0.095	0.082	0.034	U
87-68-3	Hexachlorobutadiene	0.039	0.047	0.039	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: Trinity Analysis & Development Corp.
Client Project ID: DDMT SVE / 1006 0131 Task 2.0

ALS Project ID: P1705134

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Wida Ang
Sampling Media: 6.0 L Summa Canister(s)
Test Notes:

Date(s) Collected: 10/10/17
Date(s) Received: 10/17/17
Date(s) Analyzed: 10/26/17

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	P171026-MB	103	99	91	70-130	
Lab Control Sample	P171026-LCS	102	98	92	70-130	
ODSVE-EFF-Y7Q2A	P1705134-001	112	97	81	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: Trinity Analysis & Development Corp.

Client Sample ID: Lab Control Sample

Client Project ID: DDMT SVE / 1006 0131 Task 2.0

ALS Project ID: P1705134

ALS Sample ID: P171026-LCS

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Wida Ang

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 10/26/17

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	DOD Acceptance Limits	Data Qualifier
115-07-1	Propene	122	115	94	57-136	
75-71-8	Dichlorodifluoromethane (CFC 12)	43.1	42.5	99	59-128	
74-87-3	Chloromethane	102	106	104	59-132	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	30.1	32.2	107	63-121	
75-01-4	Vinyl Chloride	82.5	89.9	109	64-127	
106-99-0	1,3-Butadiene	94.9	108	114	66-134	
74-83-9	Bromomethane	54.1	57.4	106	63-134	
75-00-3	Chloroethane	79.6	85.1	107	63-127	
64-17-5	Ethanol	554	597	108	59-125	
75-05-8	Acetonitrile	125	140	112	63-132	
107-02-8	Acrolein	91.0	95.0	104	62-126	
67-64-1	Acetone	444	443	100	58-128	
75-69-4	Trichlorofluoromethane	37.1	38.0	102	62-126	
67-63-0	2-Propanol (Isopropyl Alcohol)	172	187	109	52-125	
107-13-1	Acrylonitrile	97.5	105	108	71-137	
75-35-4	1,1-Dichloroethene	53.8	56.4	105	61-133	
75-09-2	Methylene Chloride	61.3	54.9	90	62-115	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	67.8	77.2	114	71-131	
76-13-1	Trichlorotrifluoroethane	27.9	28.2	101	66-126	
75-15-0	Carbon Disulfide	68.7	63.0	92	57-134	
156-60-5	trans-1,2-Dichloroethene	53.9	60.0	111	67-124	
75-34-3	1,1-Dichloroethane	52.4	53.6	102	68-126	
1634-04-4	Methyl tert-Butyl Ether	59.1	62.4	106	66-126	
108-05-4	Vinyl Acetate	302	335	111	56-139	
78-93-3	2-Butanone (MEK)	71.8	74.2	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: Trinity Analysis & Development Corp.

Client Sample ID: Lab Control Sample

Client Project ID: DDMT SVE / 1006 0131 Task 2.0

ALS Project ID: P1705134

ALS Sample ID: P171026-LCS

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Wida Ang

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 10/26/17

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	53.4	57.3	107	70-121	
141-78-6	Ethyl Acetate	118	131	111	65-128	
110-54-3	n-Hexane	60.5	59.0	98	63-120	
67-66-3	Chloroform	43.4	45.1	104	68-123	
109-99-9	Tetrahydrofuran (THF)	72.0	69.0	96	64-123	
107-06-2	1,2-Dichloroethane	52.4	55.7	106	65-128	
71-55-6	1,1,1-Trichloroethane	38.9	40.2	103	68-125	
71-43-2	Benzene	66.7	66.2	99	69-119	
56-23-5	Carbon Tetrachloride	34.0	35.8	105	68-132	
110-82-7	Cyclohexane	124	125	101	70-117	
78-87-5	1,2-Dichloropropane	45.9	47.4	103	69-123	
75-27-4	Bromodichloromethane	31.9	33.6	105	72-128	
79-01-6	Trichloroethene	39.5	39.0	99	71-123	
123-91-1	1,4-Dioxane	59.1	62.7	106	71-122	
80-62-6	Methyl Methacrylate	103	104	101	70-128	
142-82-5	n-Heptane	52.0	51.1	98	69-123	
10061-01-5	cis-1,3-Dichloropropene	45.9	48.9	107	70-128	
108-10-1	4-Methyl-2-pentanone	52.0	55.5	107	67-130	
10061-02-6	trans-1,3-Dichloropropene	46.9	51.5	110	75-133	
79-00-5	1,1,2-Trichloroethane	38.9	40.3	104	73-119	
108-88-3	Toluene	56.1	55.8	99	66-119	
591-78-6	2-Hexanone	51.6	56.2	109	62-128	
124-48-1	Dibromochloromethane	24.8	26.7	108	70-130	
106-93-4	1,2-Dibromoethane	27.5	29.4	107	74-122	
123-86-4	n-Butyl Acetate	45.2	49.3	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: Trinity Analysis & Development Corp.

Client Sample ID: Lab Control Sample

Client Project ID: DDMT SVE / 1006 0131 Task 2.0

ALS Project ID: P1705134

ALS Sample ID: P171026-LCS

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Wida Ang

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 10/26/17

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	45.4	46.1	102	69-121	
127-18-4	Tetrachloroethene	31.3	31.3	100	66-124	
108-90-7	Chlorobenzene	46.1	46.1	100	70-119	
100-41-4	Ethylbenzene	48.8	49.9	102	70-124	
179601-23-1	m,p-Xylenes	97.6	99.2	102	61-134	
75-25-2	Bromoform	20.5	21.9	107	66-139	
100-42-5	Styrene	49.5	52.0	105	73-127	
95-47-6	o-Xylene	48.6	50.3	103	67-125	
111-84-2	n-Nonane	40.4	41.8	103	63-128	
79-34-5	1,1,2,2-Tetrachloroethane	30.8	32.6	106	65-127	
98-82-8	Cumene	43.2	44.5	103	68-124	
80-56-8	alpha-Pinene	38.2	40.0	105	66-123	
103-65-1	n-Propylbenzene	43.6	45.4	104	69-123	
622-96-8	4-Ethyltoluene	43.0	46.6	108	67-129	
108-67-8	1,3,5-Trimethylbenzene	43.1	44.9	104	67-130	
95-63-6	1,2,4-Trimethylbenzene	43.2	46.0	106	66-132	
100-44-7	Benzyl Chloride	41.0	45.9	112	50-147	
541-73-1	1,3-Dichlorobenzene	35.2	36.9	105	65-130	
106-46-7	1,4-Dichlorobenzene	35.6	36.3	102	60-131	
95-50-1	1,2-Dichlorobenzene	35.6	37.4	105	63-129	
5989-27-5	d-Limonene	38.2	41.3	108	62-133	
96-12-8	1,2-Dibromo-3-chloropropane	21.8	24.4	112	62-155	
120-82-1	1,2,4-Trichlorobenzene	29.3	34.8	119	55-142	
91-20-3	Naphthalene	39.9	44.9	113	57-138	
87-68-3	Hexachlorobutadiene	19.9	20.5	103	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: Trinity Analysis & Development Corp.
Client Project ID: DDMT SVE / 1006 0131 Task 2.0

ALS Project ID: P1705134

Method Blank Summary

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Wida Ang
Sampling Media: 6.0 L Summa Canister(s)
Test Notes:

Lab File ID: 10261704.D
Date Analyzed: 10/26/17
Time Analyzed: 04:46

Client Sample ID	ALS Sample ID	Lab File ID	Time Analyzed
Lab Control Sample	P171026-LCS	10261705.D	05:20
ODSVE-EFF-Y7Q2A	P1705134-001	10261714.D	12:25
ODSVE-EFF-Y7Q2A (Dilution)	P1705134-001	10261716.D	13:50

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Trinity Analysis & Development Corp.
Client Project ID: DDMT SVE / 1006 0131 Task 2.0

ALS Project ID: P1705134

Internal Standard Area and RT Summary

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Wida Ang
Sampling Media: 6.0 L Summa Canister(s)
Test Notes:

Lab File ID: 10261703.D
Date Analyzed: 10/26/17
Time Analyzed: 04:13

	IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
	AREA	#	RT	#	AREA	#
24 Hour Standard	93117	11.14	454464	13.23	174851	17.52
Upper Limit	130364	11.47	636250	13.56	244791	17.85
Lower Limit	55870	10.81	272678	12.90	104911	17.19

Client Sample ID						
01	Method Blank	87123	11.13	434309	13.22	167916
02	Lab Control Sample	90810	11.15	440929	13.23	168924
03	ODSVE-EFF-Y7Q2A	112973	11.14	564388	13.23	230234
04	ODSVE-EFF-Y7Q2A (Dilution)	116409	11.14	577555	13.23	232836
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 10\26\10261714.D
 Acq On : 26 Oct 2017 12:25
 Sample : P1705134-001 (1000mL)
 Misc : S31-09111703

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Oct 27 11:32:56 2017

Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:36:07 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

10/27/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.14	130	112973	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.23	114	564388	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.52	82	230234	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.97	65	159024	13.989	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	111.92%	
57) Toluene-d8 (SS2)	15.65	98	579122	12.038	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	96.32%	
73) Bromofluorobenzene (SS3)	18.91	174	187154	10.083	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	80.64%	

Target Compounds

						Qvalue
2) Propene	4.38	42	5386	0.448	ng	96
3) Dichlorodifluoromethan...	4.52	85	66901	3.396	ng	99
4) Chloromethane	4.78	50	713	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	5.04	135	995	0.091	ng	75
6) Vinyl Chloride	5.19	62	2556	0.183	ng	96
7) 1,3-Butadiene	5.45	54	138	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.49	45	33080	4.535	ng	100
11) Acetonitrile	6.78	41	2826	0.156	ng	84
12) Acrolein	6.97	56	4337	0.658	ng	97
13) Acetone	7.16	58	79067	10.155	ng	92
14) Trichlorofluoromethane	7.38	101	29538	1.753	ng	100
15) 2-Propanol (Isopropanol)	7.64	45	12866	0.508	ng	91
16) Acrylonitrile	7.94	53	574	N.D.		
17) 1,1-Dichloroethene	8.29	96	39692	3.854	ng	92
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.	d	
19) Methylene Chloride	8.49	84	10696	0.879	ng	93
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.	d	
21) Trichlorotrifluoroethane	8.91	151	294391	27.883	ng	92
22) Carbon Disulfide	8.76	76	126284	2.942	ng	100
23) trans-1,2-Dichloroethene	9.73	61	23588	1.749	ng	91
24) 1,1-Dichloroethane	9.98	63	32280	1.798	ng	100
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.	d	
26) Vinyl Acetate	10.20	86	7045	3.011	ng	# 62
27) 2-Butanone (MEK)	10.49	72	9808	1.361	ng	# 80
28) cis-1,2-Dichloroethene	10.96	61	1499863	113.134	ng	94
29) Diisopropyl Ether	0.00	87	0	N.D.	d	
30) Ethyl Acetate	11.28	61	12059	3.513	ng	92
31) n-Hexane	11.25	57	4608	0.283	ng	# 40
32) Chloroform	11.30	83	429633	24.926	ng	99
34) Tetrahydrofuran (THF)	11.76	72	2042	0.268	ng	# 51
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.09	62	767	N.D.		
38) 1,1,1-Trichloroethane	12.37	97	27994	1.743	ng	98
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	12.84	78	12020	0.275	ng	98
42) Carbon Tetrachloride	13.00	117	35147	2.424	ng	100
43) Cyclohexane	13.13	84	2760	0.165	ng	95
44) tert-Amyl Methyl Ether	13.54	73	883	N.D.		
45) 1,2-Dichloropropane	13.68	63	119	N.D.		
46) Bromodichloromethane	13.86	83	12262	0.887	ng	99
47) Trichloroethene	13.92	130	1513795	114.430	ng	99
48) 1,4-Dioxane	0.00	88	0	N.D.	d	
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d	
50) Methyl Methacrylate	14.26	100	363	N.D.		

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Data File : I:\MS13\DATA\2017 10\26\10261714.D
 Acq On : 26 Oct 2017 12:25
 Sample : P1705134-001 (1000mL)
 Misc : S31-09111703

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Oct 27 11:32:56 2017

Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:36:07 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

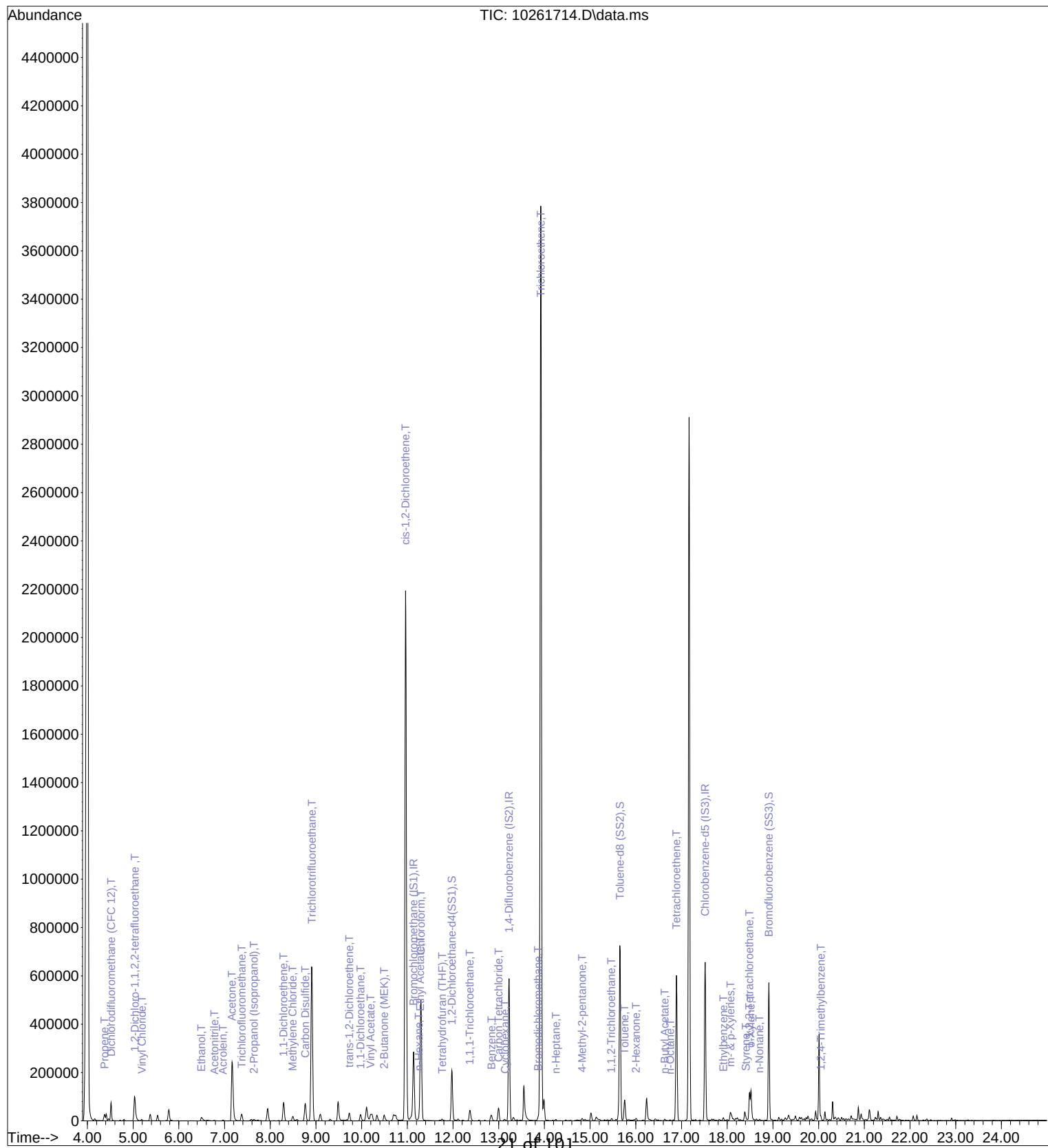
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.25	71	1636	0.153	ng	95
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	14.82	58	2615	0.271	ng	# 55
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	15.46	97	1651	0.156	ng	99
58) Toluene	15.75	91	52017	1.067	ng	97
59) 2-Hexanone	16.00	43	6873	0.290	ng	87
60) Dibromochloromethane	16.16	129	609	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.63	43	5309	0.201	ng	98
63) n-Octane	16.75	57	941	0.099	ng	# 74
64) Tetrachloroethene	16.89	166	220165	14.128	ng	100
65) Chlorobenzene	17.56	112	686	N.D.		
66) Ethylbenzene	17.92	91	9866	0.181	ng	97
67) m- & p-Xylenes	18.07	91	29103	0.684	ng	99
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.41	104	5460	0.154	ng	97
70) o-Xylene	18.51	91	11522	0.270	ng	95
71) n-Nonane	18.71	43	2459	0.113	ng	88
72) 1,1,2,2-Tetrachloroethane	18.48	83	63007	3.229	ng	98
74) Cumene	19.04	105	920	N.D.		
75) alpha-Pinene	19.38	93	1251	N.D.		
76) n-Propylbenzene	19.49	91	2524	N.D.		
77) 3-Ethyltoluene	0.00	105	0	N.D.	d	
78) 4-Ethyltoluene	19.62	105	2693	N.D.		
79) 1,3,5-Trimethylbenzene	19.68	105	2774	N.D.		
80) alpha-Methylstyrene	19.82	118	571	N.D.		
81) 2-Ethyltoluene	19.85	105	2756	N.D.		
82) 1,2,4-Trimethylbenzene	20.05	105	7406	0.161	ng	86
83) n-Decane	0.00	57	0	N.D.	d	
84) Benzyl Chloride	20.16	91	251	N.D.		
85) 1,3-Dichlorobenzene	20.19	146	845	N.D.		
86) 1,4-Dichlorobenzene	20.24	146	1137	N.D.		
87) sec-Butylbenzene	20.29	105	159	N.D.		
88) 4-Isopropyltoluene (p-...	20.42	119	1632	N.D.		
89) 1,2,3-Trimethylbenzene	20.42	105	2766	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	20.55	68	1477	N.D.		
92) 1,2-Dibromo-3-Chloropr...	20.86	157	306	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	22.15	128	2147	N.D.		
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	20.04	119	902	N.D.		
100) n-Butylbenzene	20.78	91	1797	N.D.		

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

Data File : I:\MS13\DATA\2017 10\26\10261714.D
Acq On : 26 Oct 2017 12:25
Sample : P1705134-001 (1000mL)
Misc : S31-09111703

Vial: 2
Operator: WA
Inst : MS13

Quant Time: Oct 27 11:32:56 2017
Quant Method : I:\MS13\METHODS\R13092317.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Mon Sep 25 06:36:07 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2017 10\26\10261714.D
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QLast Update : Mon Sep 25 06:36:07 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

10/27/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.14	130	112973	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.23	114	564388	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.52	82	230234	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.97	65	159024	13.989	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	111.92%	
57) Toluene-d8 (SS2)	15.65	98	579122	12.038	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	96.32%	
73) Bromofluorobenzene (SS3)	18.91	174	187154	10.083	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	80.64%	

Target Compounds

						Qvalue
2) Propene	4.38	42	5386	0.448	ng	96
3) Dichlorodifluoromethan...	4.52	85	66901	3.396	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	5.04	135	995	0.091	ng	75
6) Vinyl Chloride	5.19	62	2556	0.183	ng	96
10) Ethanol	6.49	45	33080	4.535	ng	100
11) Acetonitrile	6.78	41	2826	0.156	ng	84
12) Acrolein	6.97	56	4337	0.658	ng	97
13) Acetone	7.16	58	79067	10.155	ng	92
14) Trichlorofluoromethane	7.38	101	29538	1.753	ng	100
15) 2-Propanol (Isopropanol)	7.64	45	12866	0.508	ng	91
17) 1,1-Dichloroethene	8.29	96	39692	3.854	ng	92
19) Methylene Chloride	8.49	84	10696	0.879	ng	93
21) Trichlorotrifluoroethane	8.91	151	294391	27.883	ng	92
22) Carbon Disulfide	8.76	76	126284	2.942	ng	100
23) trans-1,2-Dichloroethene	9.73	61	23588	1.749	ng	91
24) 1,1-Dichloroethane	9.98	63	32280	1.798	ng	100
26) Vinyl Acetate	10.20	86	7045	3.011	ng	# 62
27) 2-Butanone (MEK)	10.49	72	9808	1.361	ng	# 80
28) cis-1,2-Dichloroethene	10.96	61	1499863	113.134	ng	94
30) Ethyl Acetate	11.28	61	12059	3.513	ng	92
31) n-Hexane	11.25	57	4608	0.283	ng	# 40
32) Chloroform	11.30	83	429633	24.926	ng	99
34) Tetrahydrofuran (THF)	11.76	72	2042	0.268	ng	# 51
38) 1,1,1-Trichloroethane	12.37	97	27994	1.743	ng	98
41) Benzene	12.84	78	12020	0.275	ng	98
42) Carbon Tetrachloride	13.00	117	35147	2.424	ng	100
43) Cyclohexane	13.13	84	2760	0.165	ng	95
46) Bromodichloromethane	13.86	83	12262	0.887	ng	99
47) Trichloroethene	13.92	130	1513795	114.430	ng	99
51) n-Heptane	14.25	71	1636	0.153	ng	95
53) 4-Methyl-2-pentanone	14.82	58	2615	0.271	ng	# 55
55) 1,1,2-Trichloroethane	15.46	97	1651	0.156	ng	99
58) Toluene	15.75	91	52017	1.067	ng	97
59) 2-Hexanone	16.00	43	6873	0.290	ng	87
62) n-Butyl Acetate	16.63	43	5309	0.201	ng	98
63) n-Octane	16.75	57	941	0.099	ng	# 74
64) Tetrachloroethene	16.89	166	220165	14.128	ng	100
66) Ethylbenzene	17.92	91	9866	0.181	ng	97
67) m- & p-Xylenes	18.07	91	29103	0.684	ng	99
69) Styrene	18.41	104	5460	0.154	ng	97
70) o-Xylene	18.51	91	11522	0.270	ng	95
71) n-Nonane	18.71	43	2459	0.113	ng	88
72) 1,1,2,2-Tetrachloroethane	18.48	83	63007	3.229	ng	98
82) 1,2,4-Trimethylbenzene	20.05	105	7406	0.161	ng	86

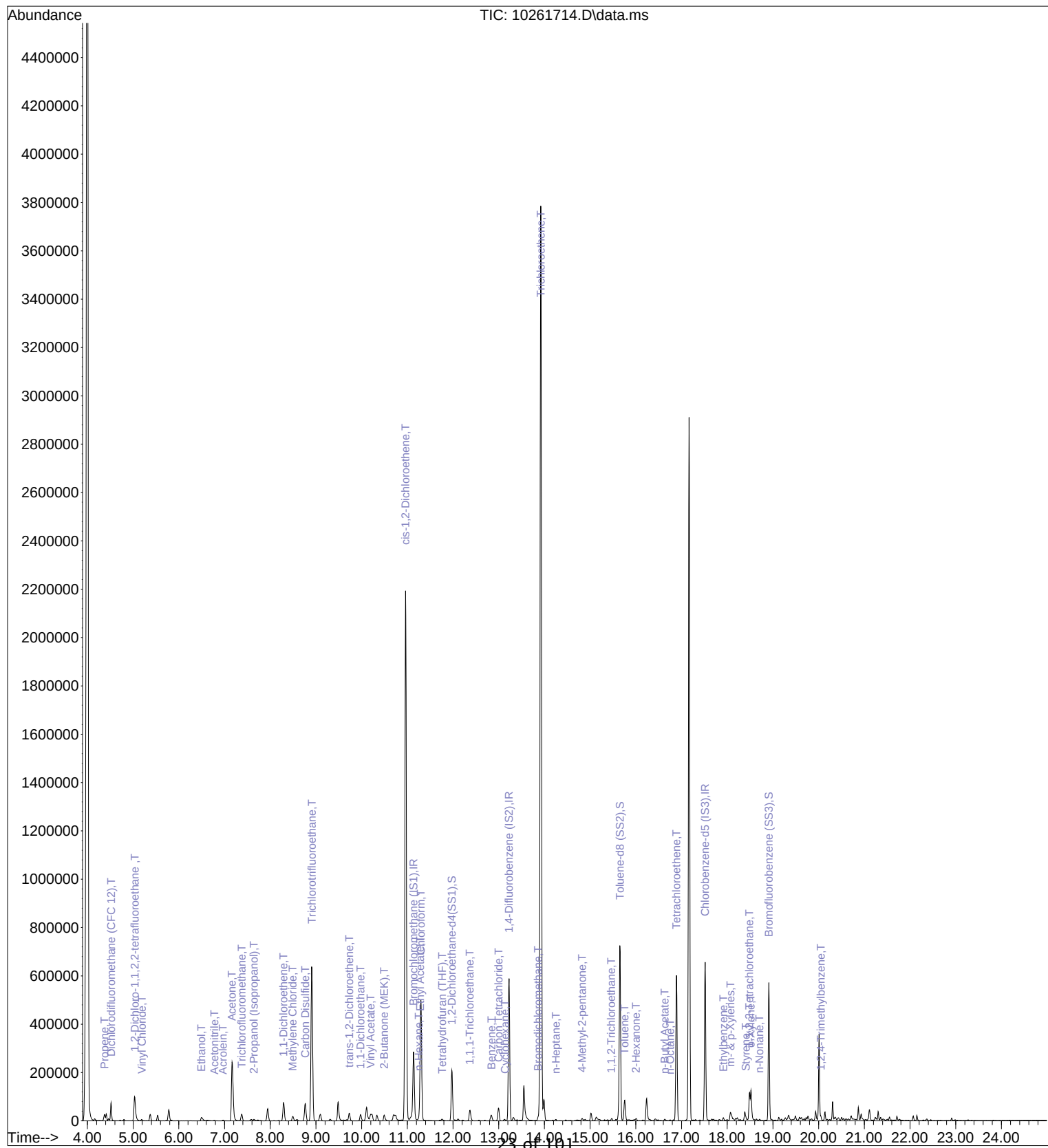
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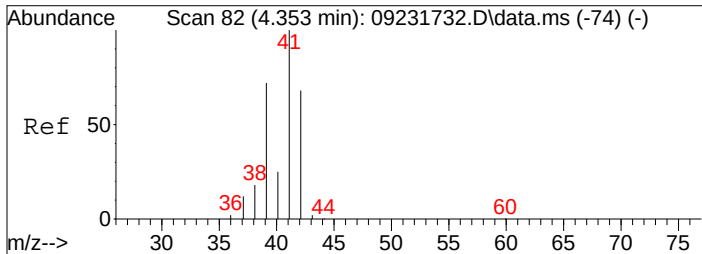
22 of 101

Data File : I:\MS13\DATA\2017 10\26\10261714.D
Acq On : 26 Oct 2017 12:25
Sample : P1705134-001 (1000mL)
Misc : S31-09111703

Vial: 2
Operator: WA
Inst : MS13

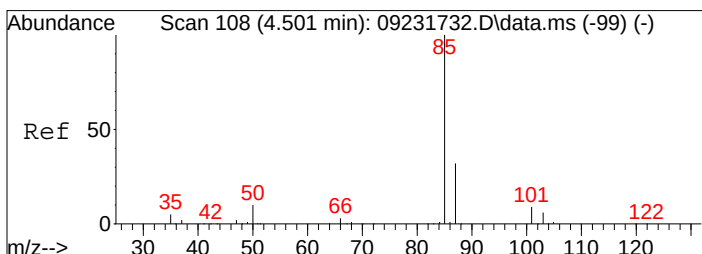
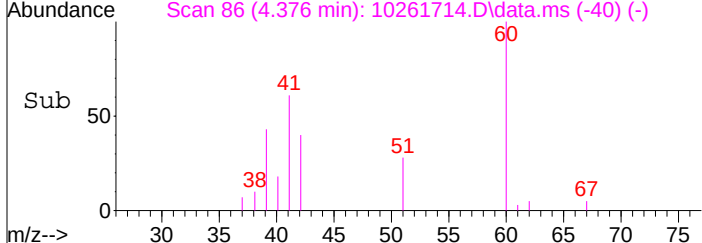
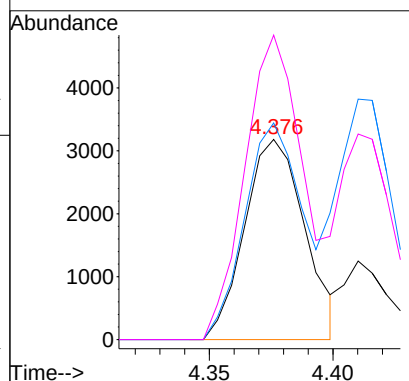
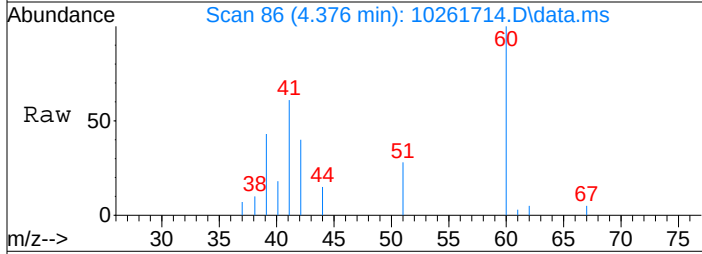
Quant Time: Oct 27 11:32:56 2017
Quant Method : I:\MS13\METHODS\R13092317.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
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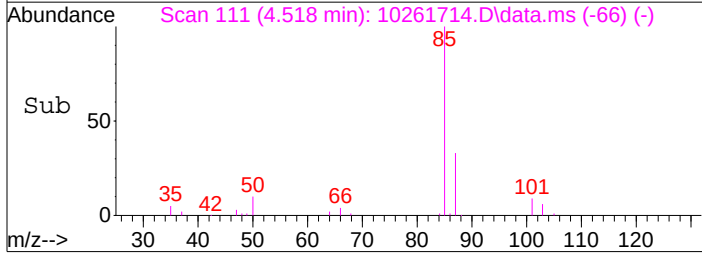
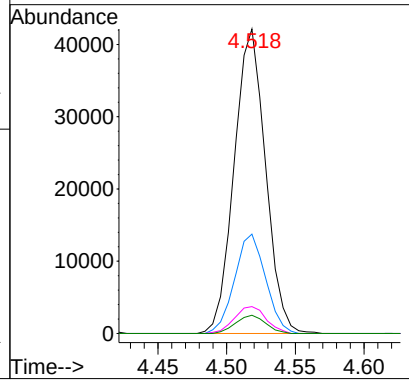
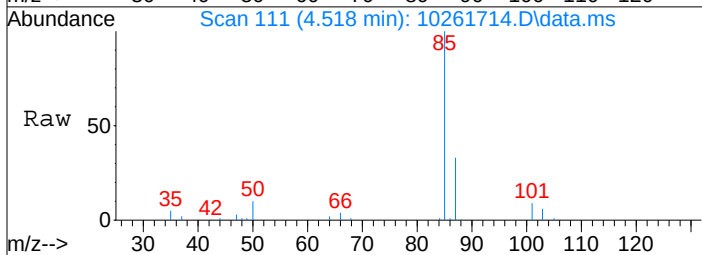
#2
 Propene
 Concen: 0.45 ng
 RT: 4.38 min Scan# 86
 Delta R.T. 0.011 min
 Lab File: 10261714.D
 Acq: 26 Oct 2017 12:25

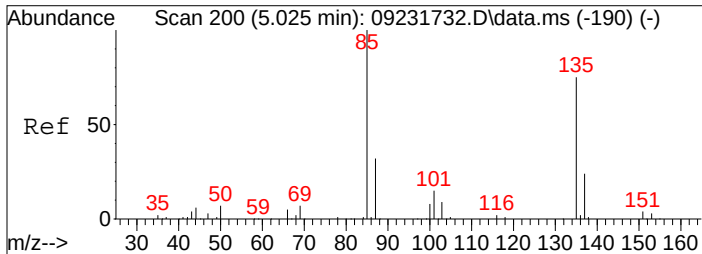
Tgt Ion:	42	Resp:	5386
Ion Ratio	Lower	Upper	
42	100		
39	103.6	85.9	125.9
41	141.9	127.6	167.6



#3
 Dichlorodifluoromethane (CFC 12)
 Concen: 3.40 ng
 RT: 4.52 min Scan# 111
 Delta R.T. 0.006 min
 Lab File: 10261714.D
 Acq: 26 Oct 2017 12:25

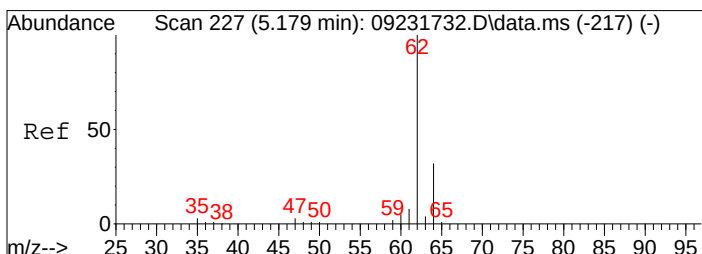
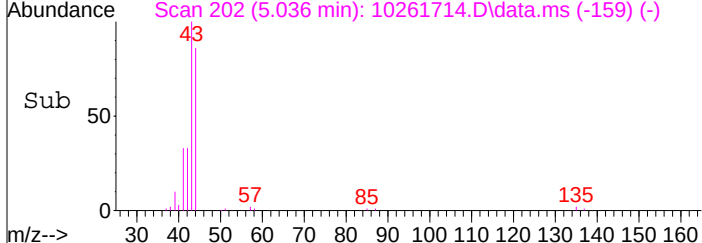
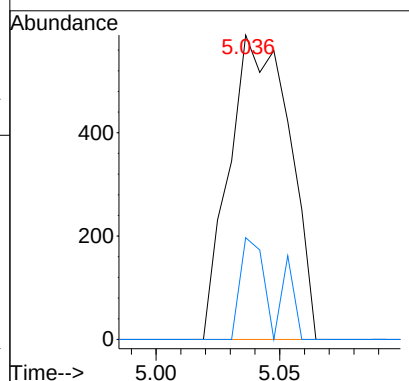
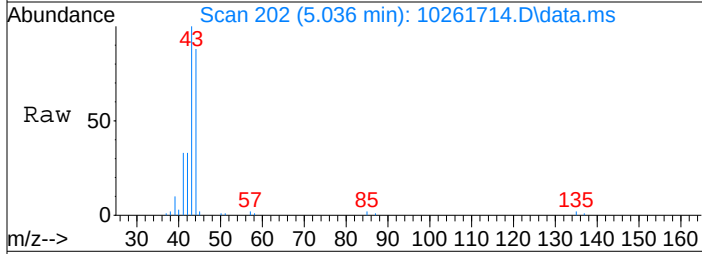
Tgt Ion:	85	Resp:	66901
Ion Ratio	Lower	Upper	
85	100		
87	32.3	12.6	52.6
101	9.0	0.0	29.2
103	5.7	0.0	25.9





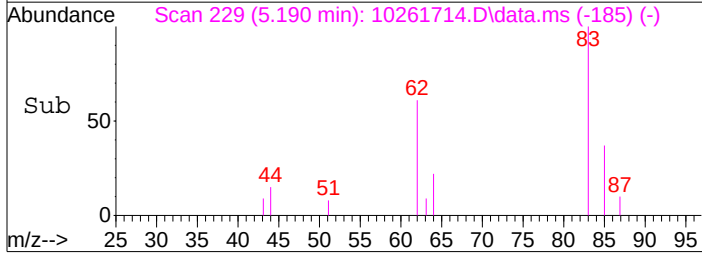
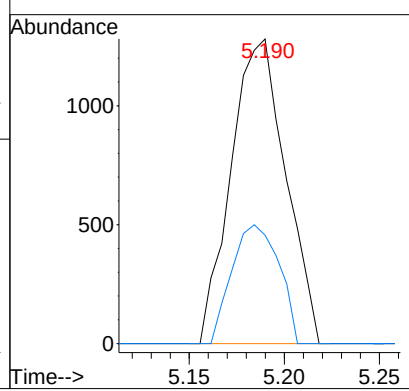
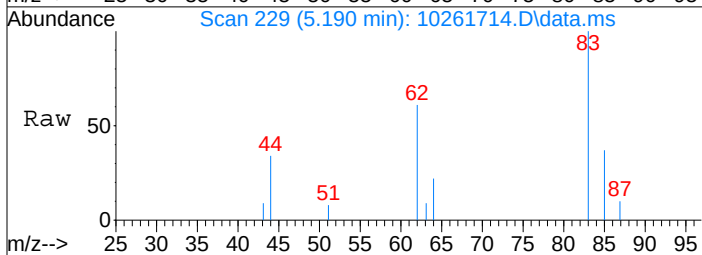
#5
 1,2-Dichloro-1,1,2,2-tetrafluoroethane
 Concen: 0.09 ng
 RT: 5.04 min Scan# 202
 Delta R.T. -0.006 min
 Lab File: 10261714.D
 Acq: 26 Oct 2017 12:25

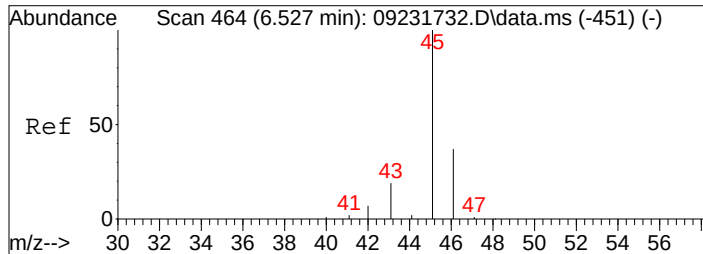
Tgt Ion: 135	Resp: 995
Ion Ratio	Lower Upper
135	100
137	18.3 12.1 52.1



#6
 Vinyl Chloride
 Concen: 0.18 ng
 RT: 5.19 min Scan# 229
 Delta R.T. -0.000 min
 Lab File: 10261714.D
 Acq: 26 Oct 2017 12:25

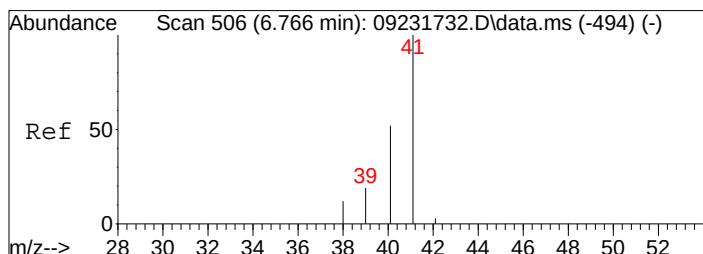
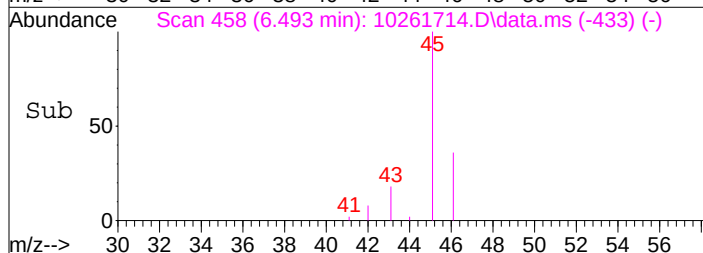
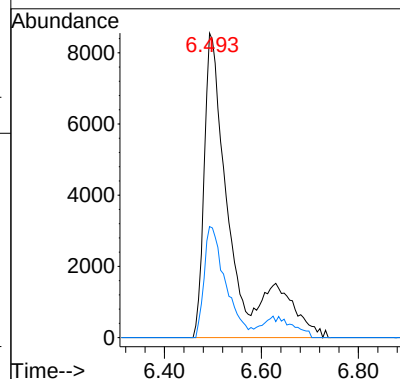
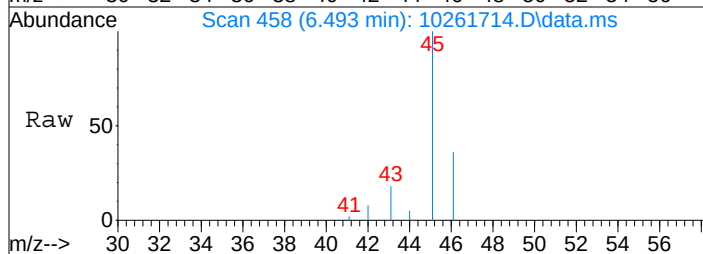
Tgt Ion: 62	Resp: 2556
Ion Ratio	Lower Upper
62	100
64	33.8 11.8 51.8





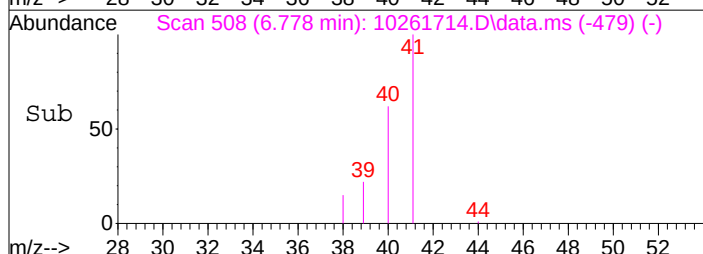
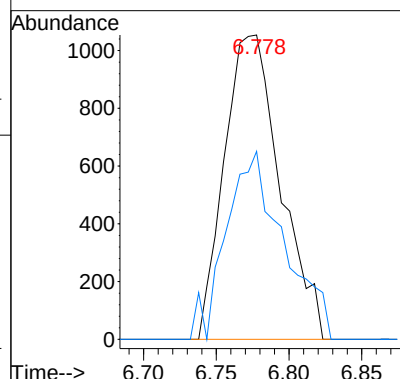
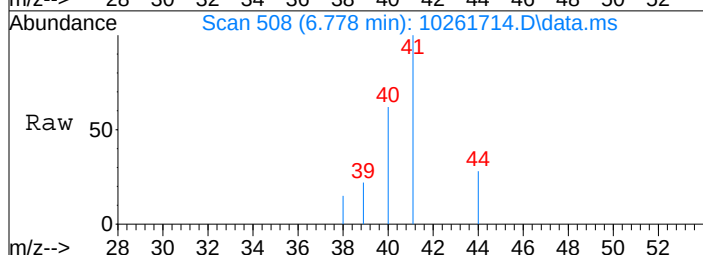
#10
Ethanol
Concen: 4.53 ng
RT: 6.49 min Scan# 458
Delta R.T. -0.108 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

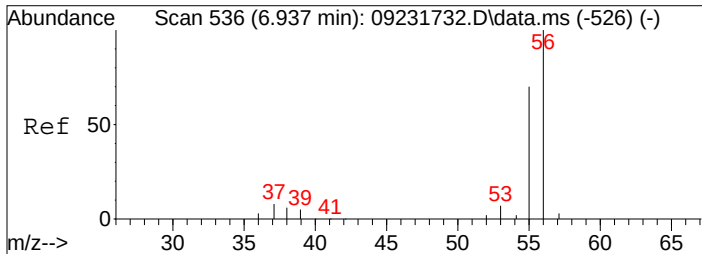
Tgt Ion: 45 Resp: 33080
Ion Ratio Lower Upper
45 100
46 36.9 16.8 56.8



#11
Acetonitrile
Concen: 0.16 ng
RT: 6.78 min Scan# 508
Delta R.T. -0.034 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

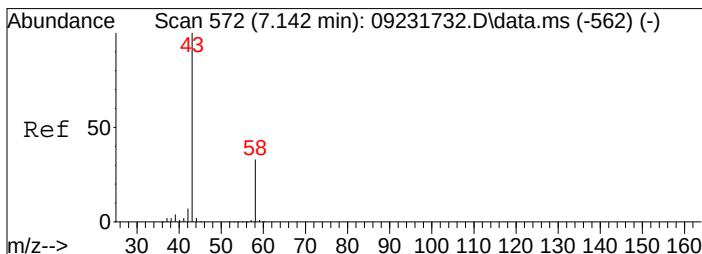
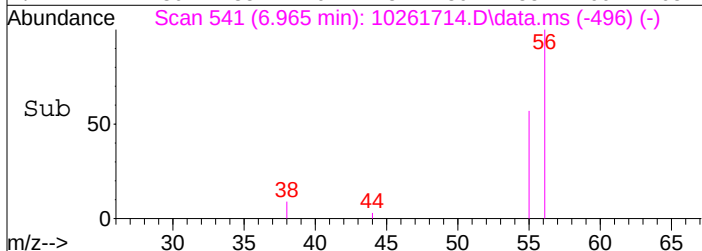
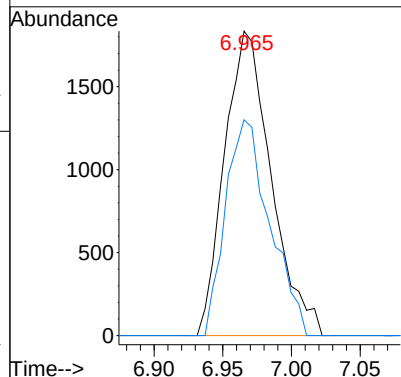
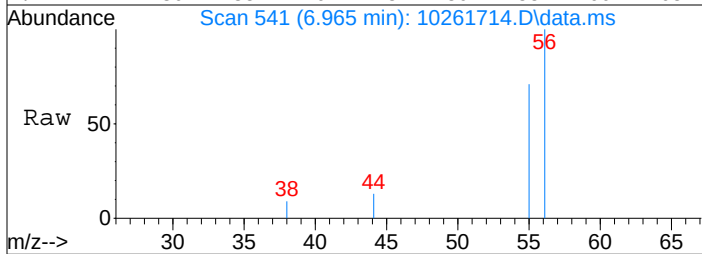
Tgt Ion: 41 Resp: 2826
Ion Ratio Lower Upper
41 100
40 63.8 32.6 72.6





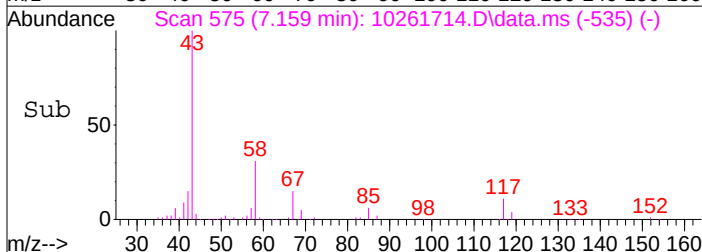
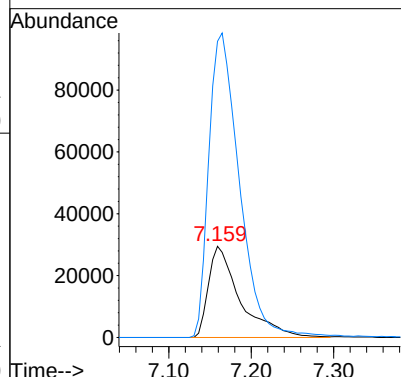
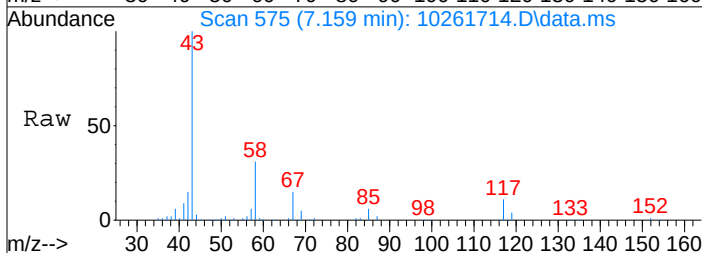
#12
Acrolein
Concen: 0.66 ng
RT: 6.97 min Scan# 541
Delta R.T. 0.005 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

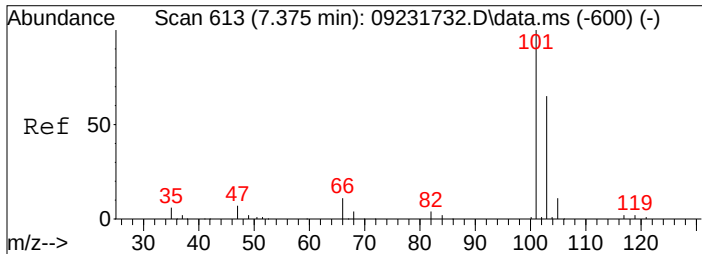
Tgt Ion	56	55	Resp	4337
Ion Ratio	100	66.9	Lower	Upper
			49.8	89.8



#13
Acetone
Concen: 10.16 ng
RT: 7.16 min Scan# 575
Delta R.T. -0.023 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

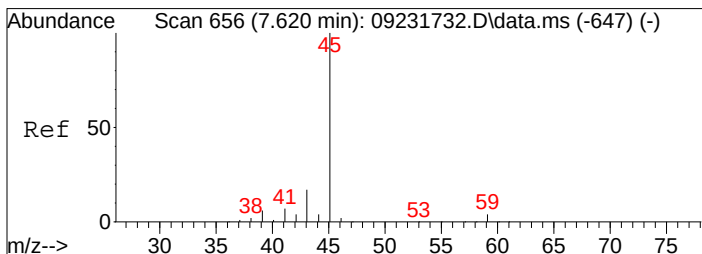
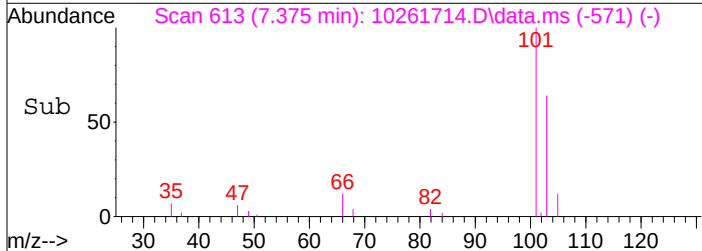
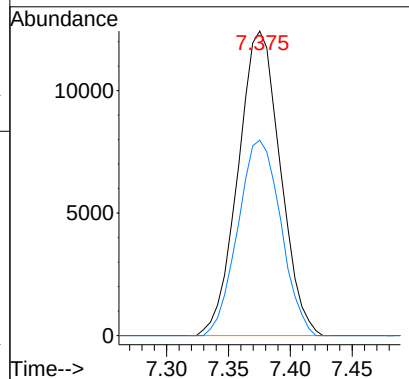
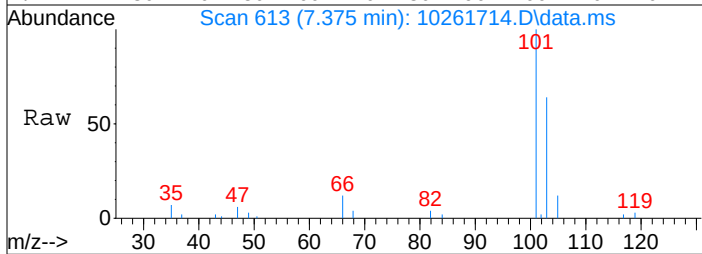
Tgt Ion	58	43	Resp	79067
Ion Ratio	100	322.5	Lower	Upper
			275.7	335.7





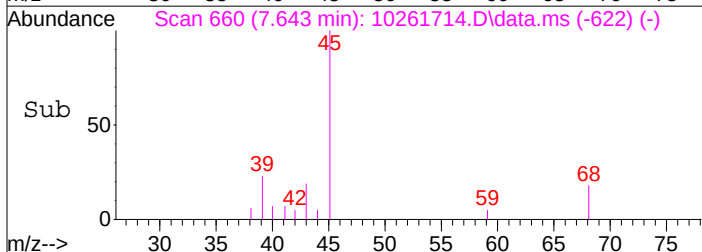
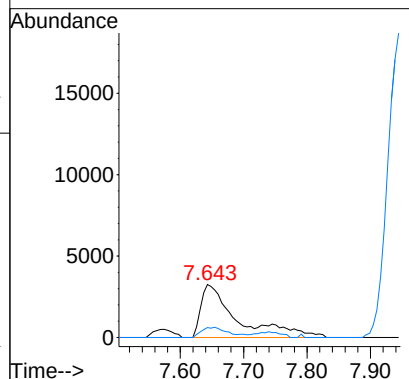
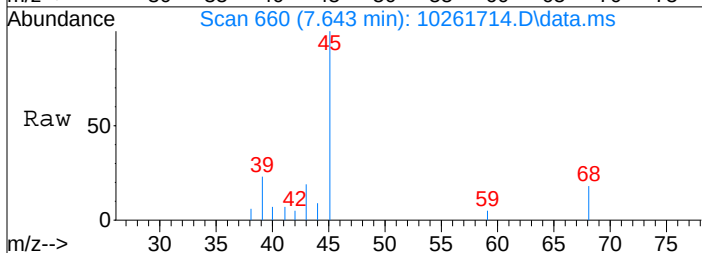
#14
Trichlorofluoromethane
Concen: 1.75 ng
RT: 7.38 min Scan# 613
Delta R.T. -0.012 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

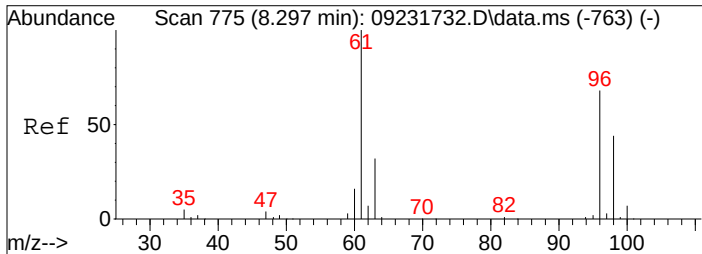
Tgt Ion: 101 Resp: 29538
Ion Ratio Lower Upper
101 100
103 65.1 44.9 84.9



#15
2-Propanol (Isopropanol)
Concen: 0.51 ng
RT: 7.64 min Scan# 660
Delta R.T. -0.034 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

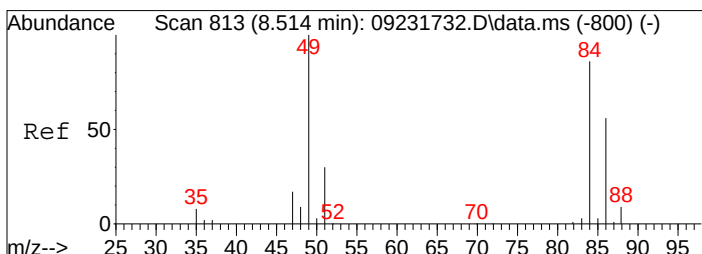
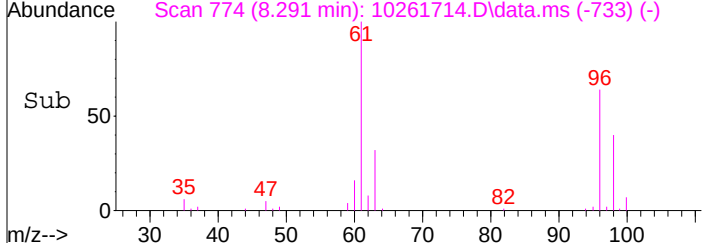
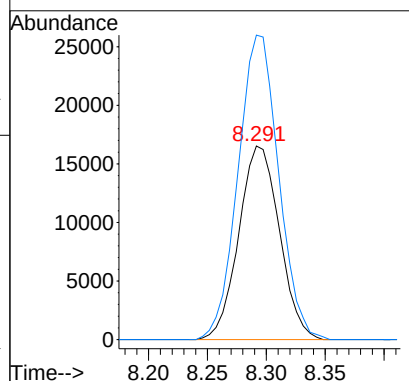
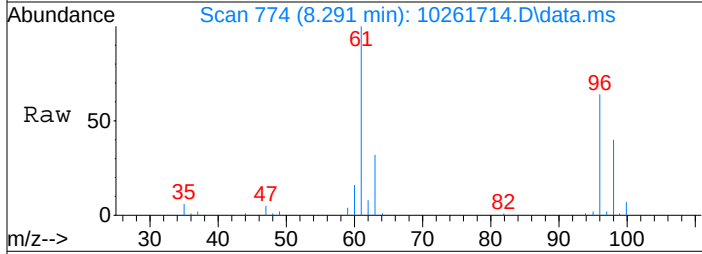
Tgt Ion: 45 Resp: 12866
Ion Ratio Lower Upper
45 100
43 21.8 0.0 37.7





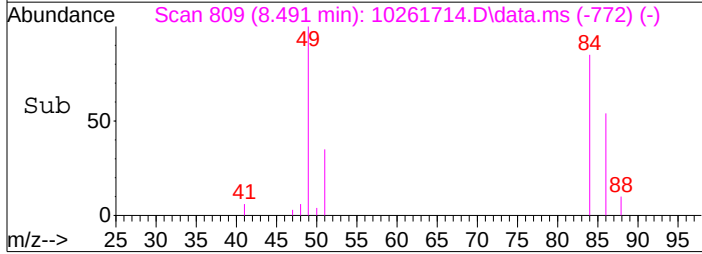
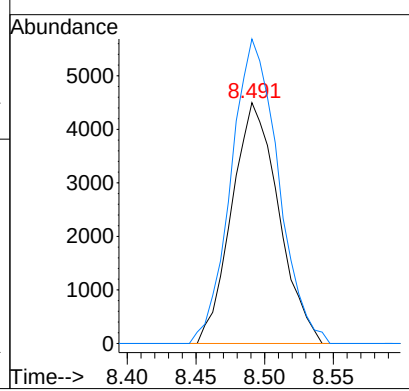
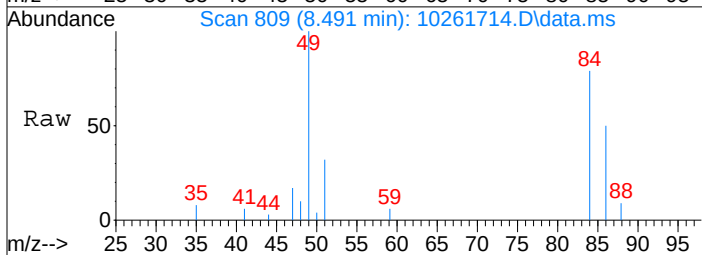
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 1,1-Dichloroethene
 Concen: 3.85 ng
 RT: 8.29 min Scan# 774
 Delta R.T. -0.017 min
 Lab File: 10261714.D
 Acq: 26 Oct 2017 12:25

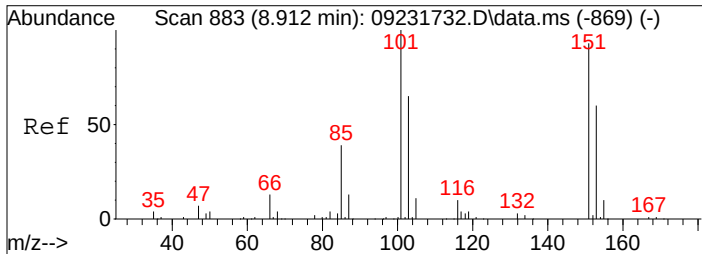
Tgt Ion:	96	Resp:	39692
Ion Ratio	Lower	Upper	
96	100		
61	157.2	127.1	167.1



#19
 Methylene Chloride
 Concen: 0.88 ng
 RT: 8.49 min Scan# 809
 Delta R.T. -0.040 min
 Lab File: 10261714.D
 Acq: 26 Oct 2017 12:25

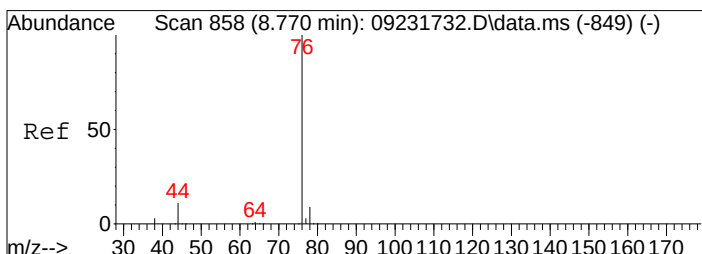
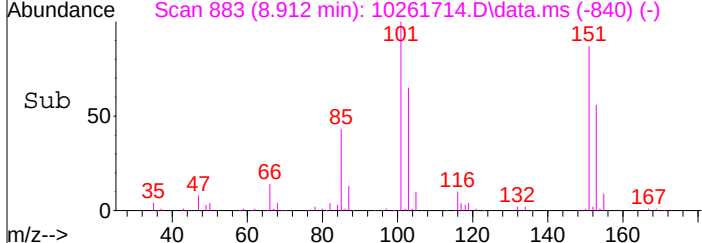
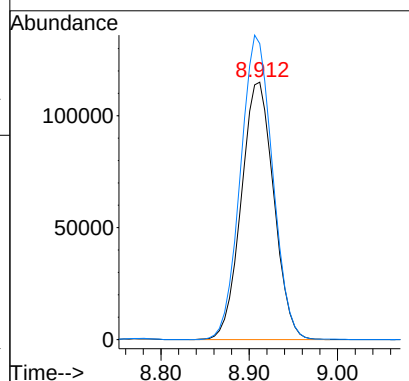
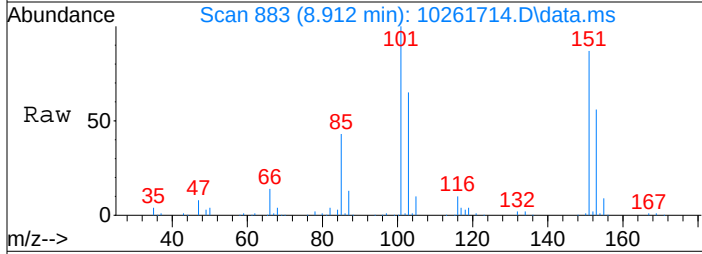
Tgt Ion:	84	Resp:	10696
Ion Ratio	Lower	Upper	
84	100		
49	127.4	94.9	144.9





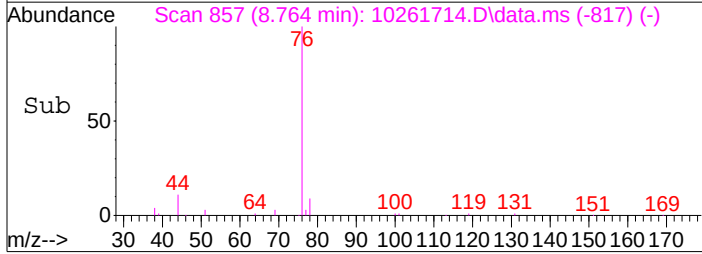
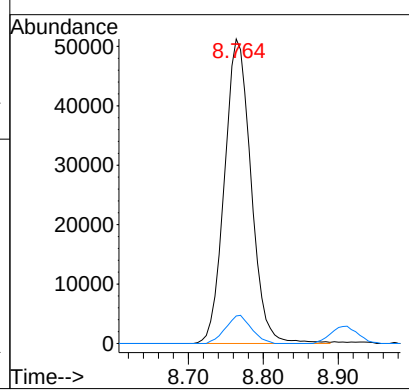
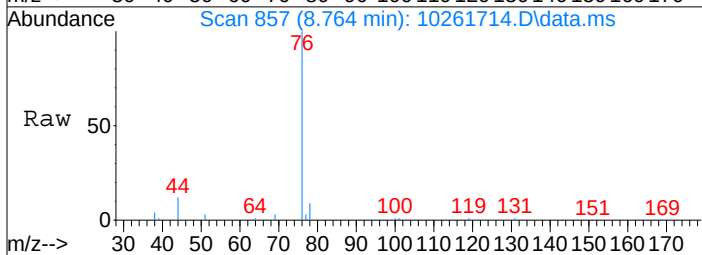
#21
 Trichlorotrifluoroethane
 Concen: 27.88 ng
 RT: 8.91 min Scan# 883
 Delta R.T. -0.006 min
 Lab File: 10261714.D
 Acq: 26 Oct 2017 12:25

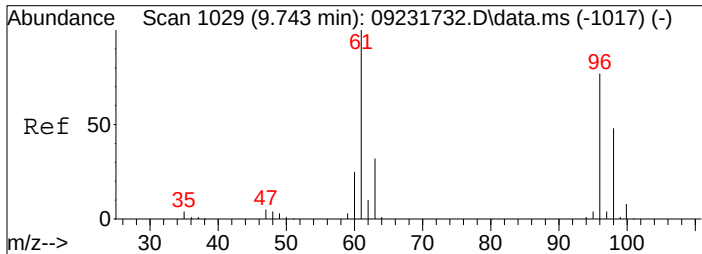
Tgt Ion: 151	Resp: 294391
Ion Ratio	Lower Upper
151	100
101	116.9 88.3 128.3



#22
 Carbon Disulfide
 Concen: 2.94 ng
 RT: 8.76 min Scan# 857
 Delta R.T. -0.023 min
 Lab File: 10261714.D
 Acq: 26 Oct 2017 12:25

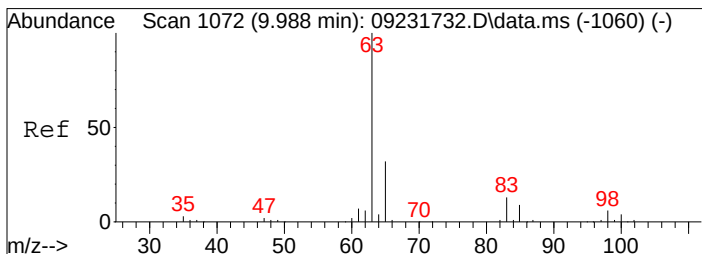
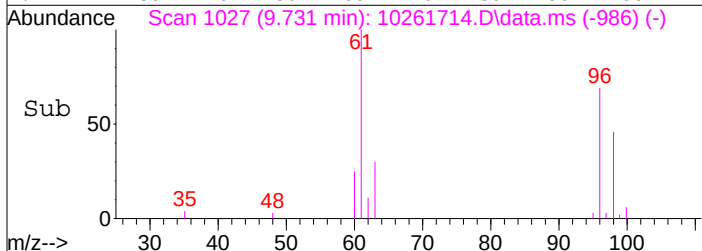
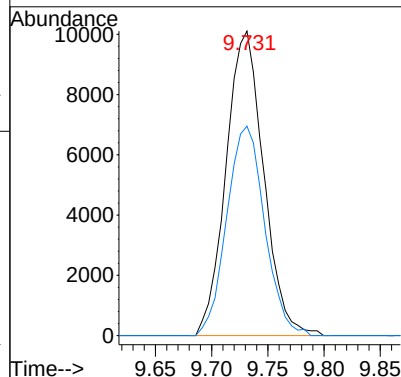
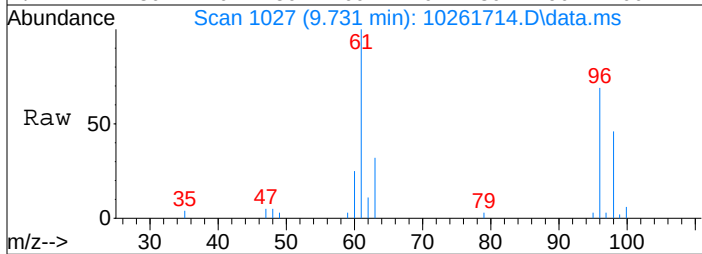
Tgt Ion: 76	Resp: 126284
Ion Ratio	Lower Upper
76	100
78	8.9 0.0 29.1





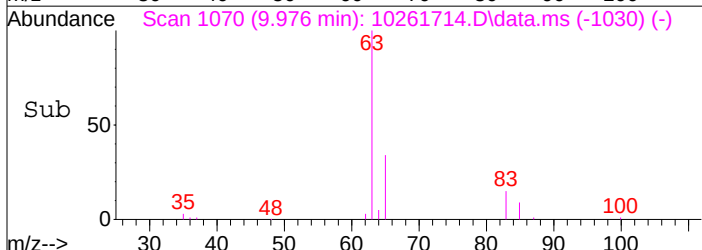
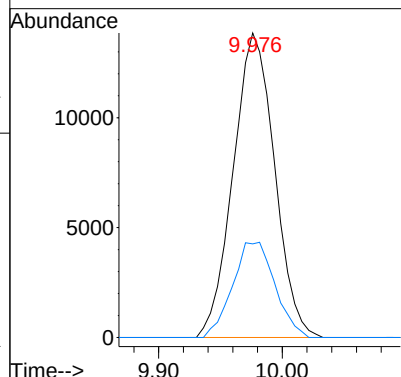
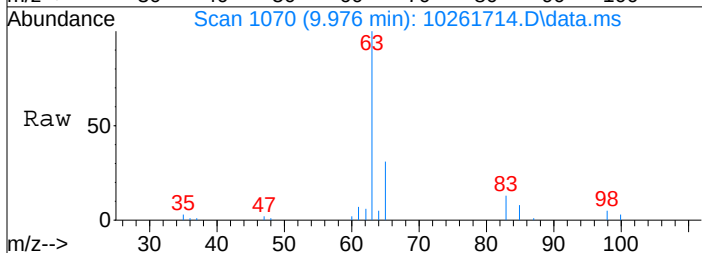
#23
trans-1,2-Dichloroethene
Concen: 1.75 ng
RT: 9.73 min Scan# 1027
Delta R.T. -0.017 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

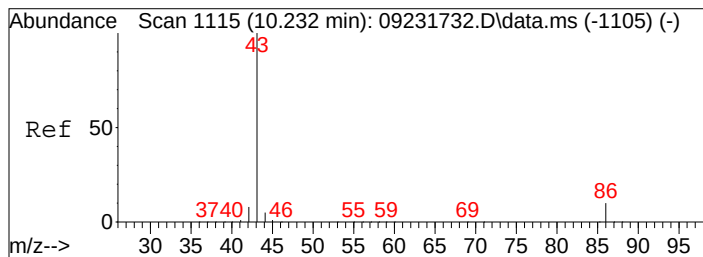
Tgt Ion: 61 Resp: 23588
Ion Ratio Lower Upper
61 100
96 69.1 56.5 96.5



#24
1,1-Dichloroethane
Concen: 1.80 ng
RT: 9.98 min Scan# 1070
Delta R.T. -0.023 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

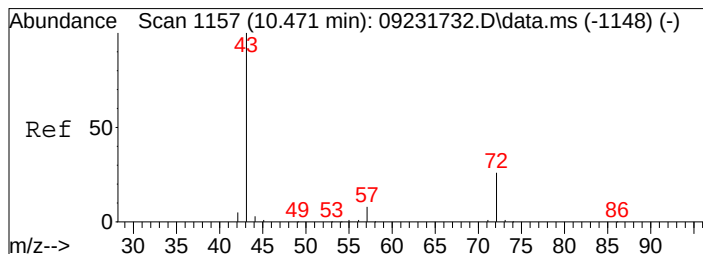
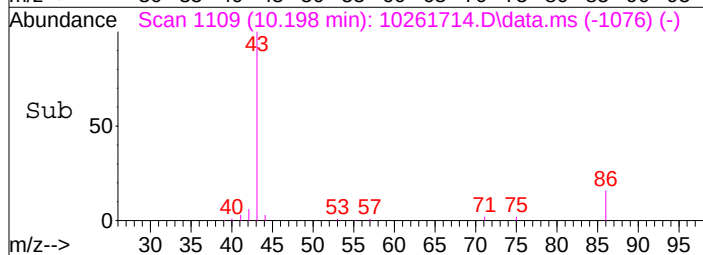
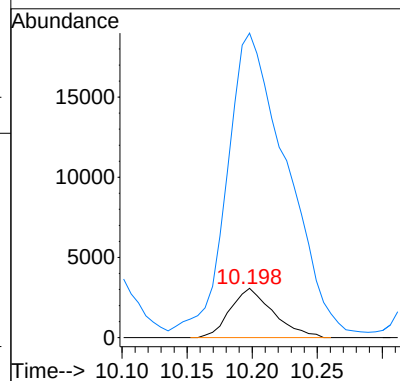
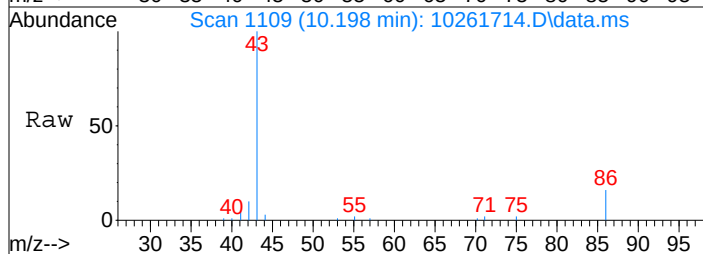
Tgt Ion: 63 Resp: 32280
Ion Ratio Lower Upper
63 100
65 32.0 11.9 51.9





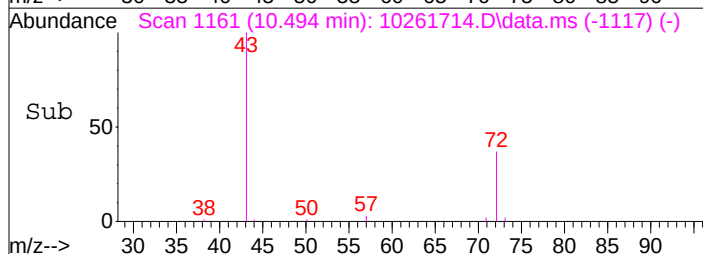
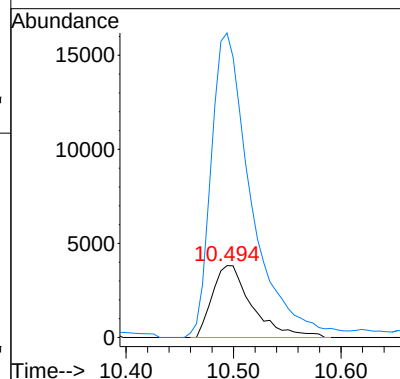
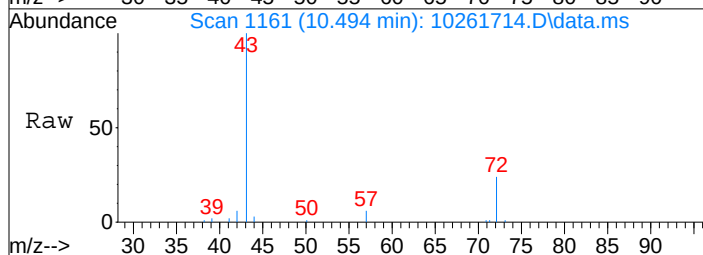
#26
Vinyl Acetate
Concen: 3.01 ng
RT: 10.20 min Scan# 1109
Delta R.T. -0.063 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

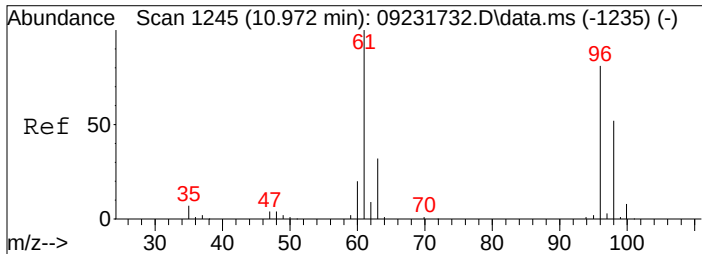
Tgt Ion: 86 Resp: 7045
Ion Ratio Lower Upper
86 100
43 875.2 1031.4 1071.4#



#27
2-Butanone (MEK)
Concen: 1.36 ng
RT: 10.49 min Scan# 1161
Delta R.T. -0.000 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

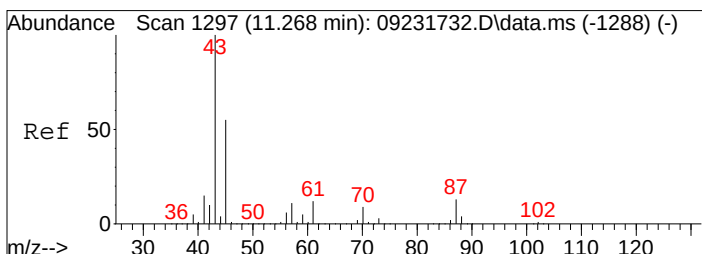
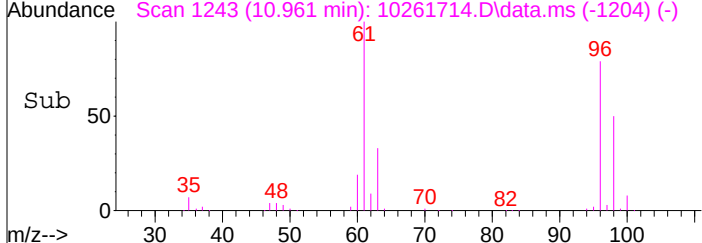
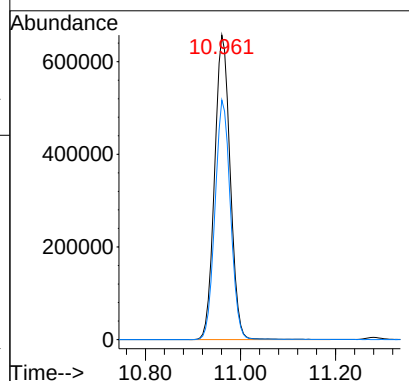
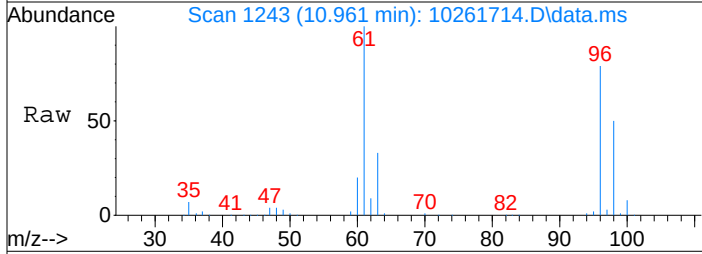
Tgt Ion: 72 Resp: 9808
Ion Ratio Lower Upper
72 100
43 430.3 364.5 404.5#





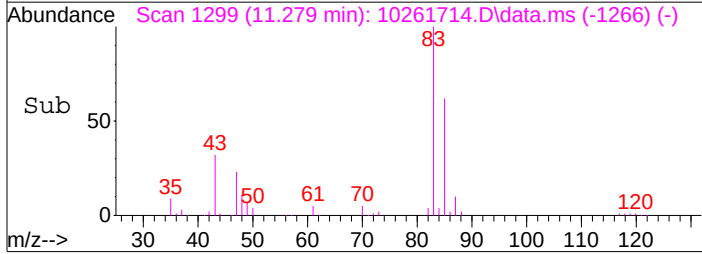
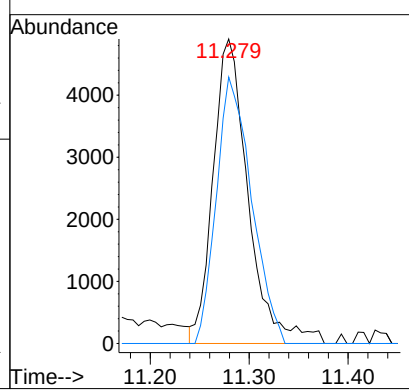
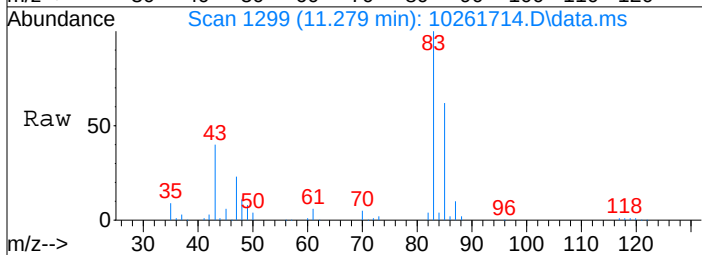
#28
 cis-1,2-Dichloroethene
 Concen: 113.13 ng
 RT: 10.96 min Scan# 1243
 Delta R.T. -0.029 min
 Lab File: 10261714.D
 Acq: 26 Oct 2017 12:25

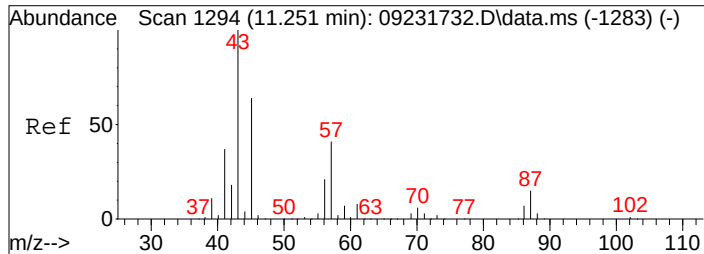
Tgt Ion:	61	Resp:	1499863
Ion Ratio	Lower	Upper	
61	100		
96	78.0	63.2	103.2



#30
 Ethyl Acetate
 Concen: 3.51 ng
 RT: 11.28 min Scan# 1299
 Delta R.T. -0.012 min
 Lab File: 10261714.D
 Acq: 26 Oct 2017 12:25

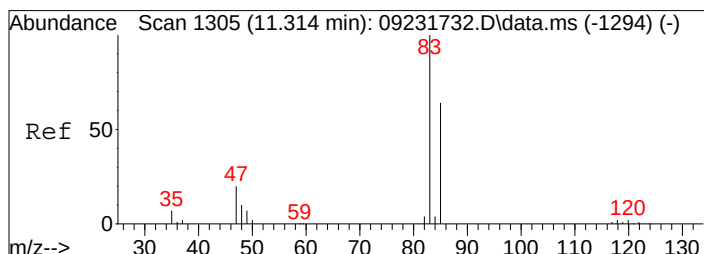
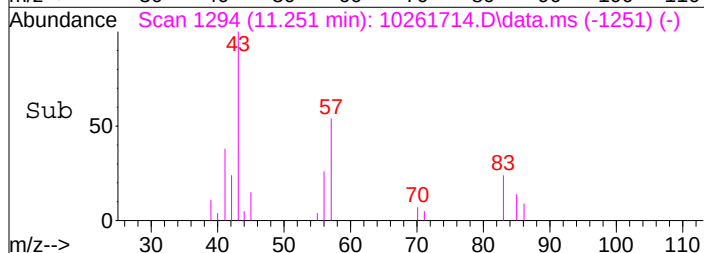
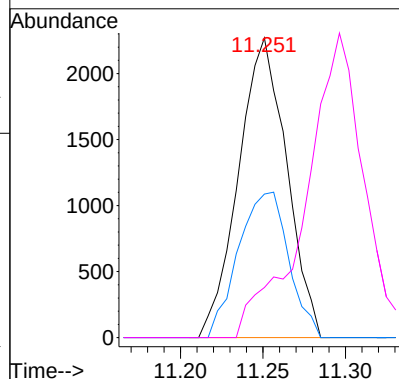
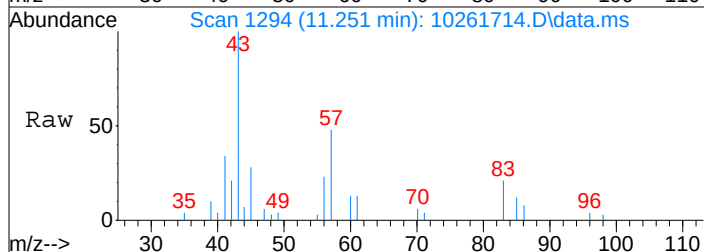
Tgt Ion:	61	Resp:	12059
Ion Ratio	Lower	Upper	
61	100		
70	87.9	60.5	100.5





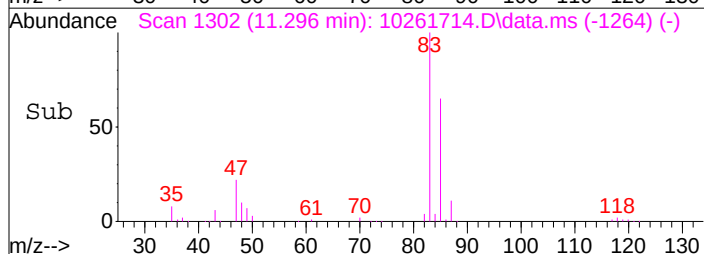
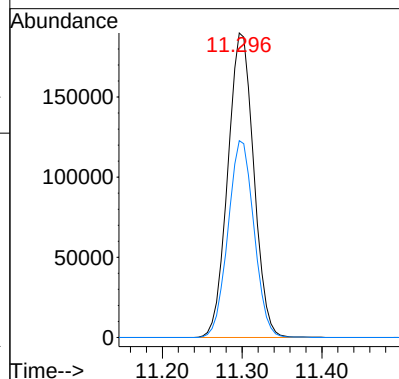
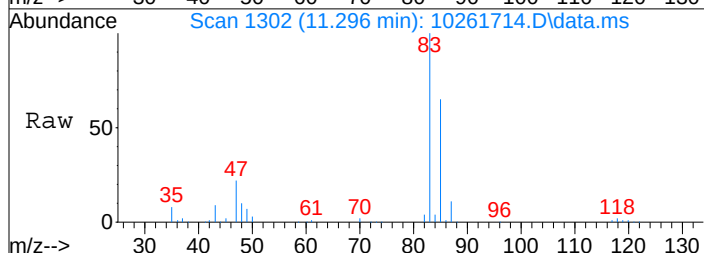
#31
n-Hexane
Concen: 0.28 ng
RT: 11.25 min Scan# 1294
Delta R.T. -0.006 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

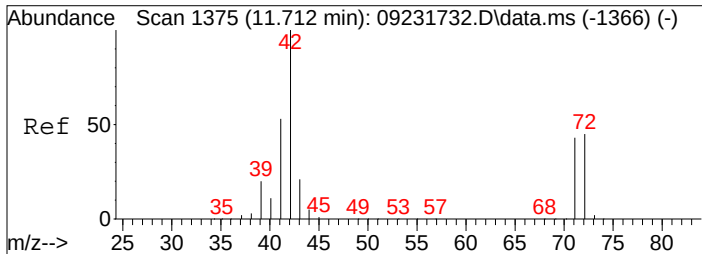
Tgt Ion: 57 Resp: 4608
Ion Ratio Lower Upper
57 100
56 50.7 41.4 62.0
86 120.3 13.1 19.7#



#32
Chloroform
Concen: 24.93 ng
RT: 11.30 min Scan# 1302
Delta R.T. -0.034 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

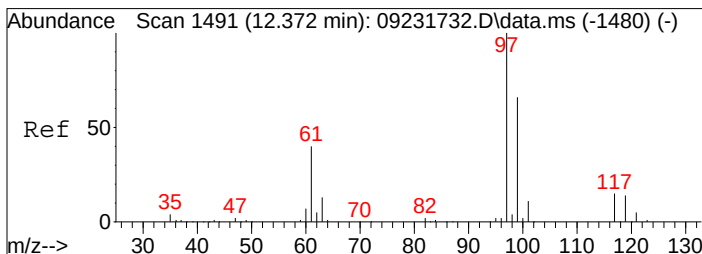
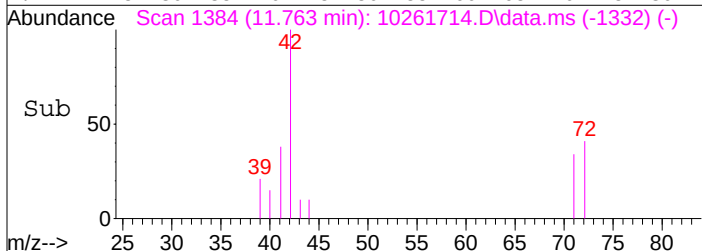
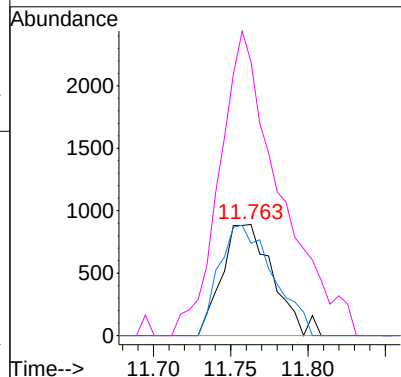
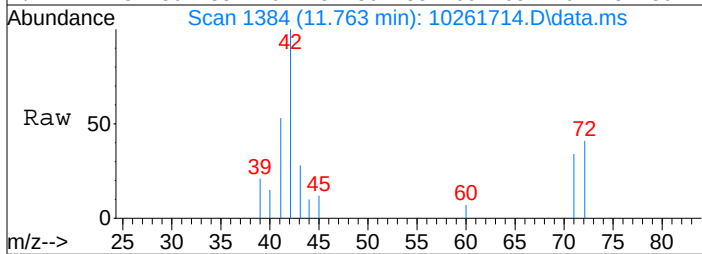
Tgt Ion: 83 Resp: 429633
Ion Ratio Lower Upper
83 100
85 64.7 45.5 85.5





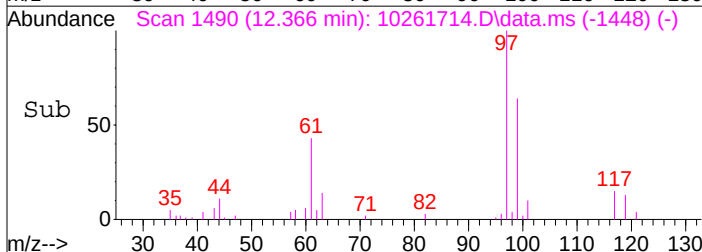
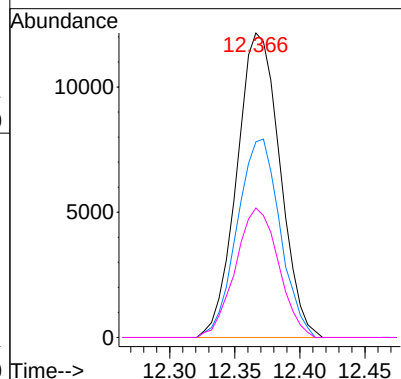
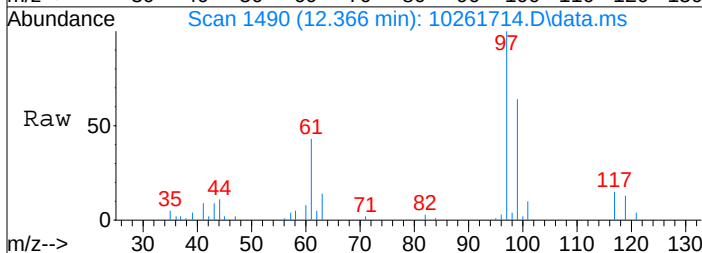
#34
Tetrahydrofuran (THF)
Concen: 0.27 ng
RT: 11.76 min Scan# 1384
Delta R.T. 0.045 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

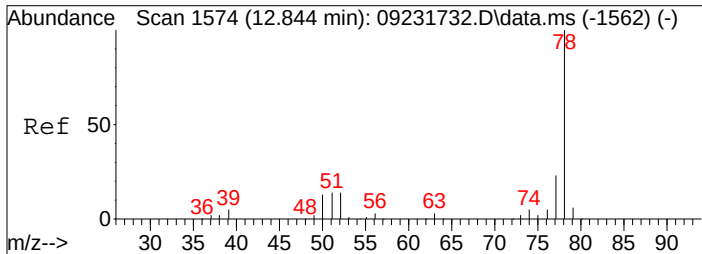
Tgt Ion:	72	Resp:	2042
Ion Ratio	Lower	Upper	
72	100		
71	105.3	75.7	115.7
42	325.1	199.8	239.8#



#38
1,1,1-Trichloroethane
Concen: 1.74 ng
RT: 12.37 min Scan# 1490
Delta R.T. -0.012 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

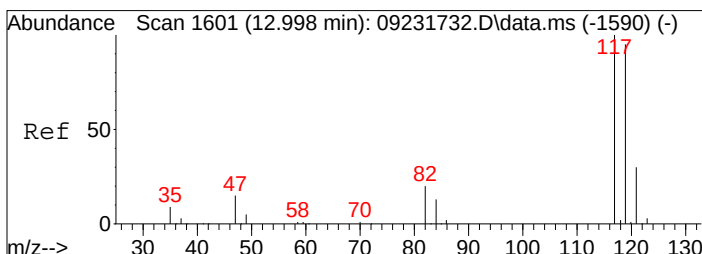
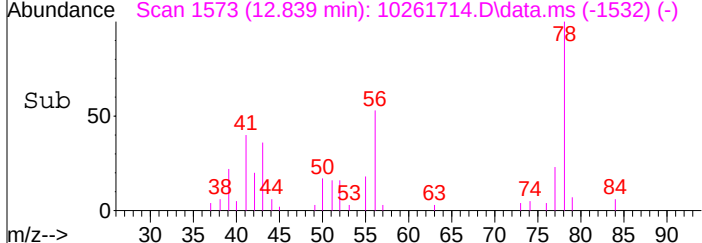
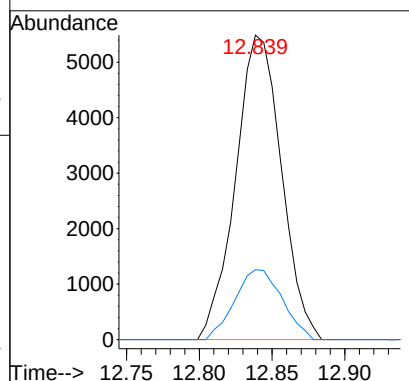
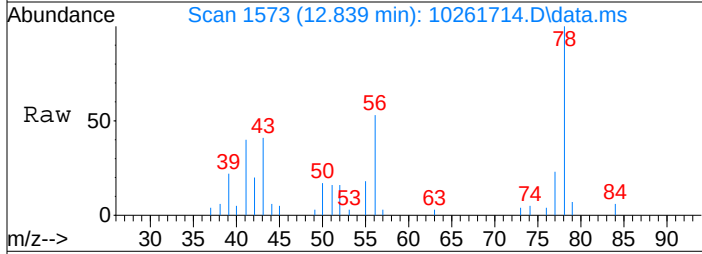
Tgt Ion:	97	Resp:	27994
Ion Ratio	Lower	Upper	
97	100		
99	64.7	45.0	85.0
61	42.6	19.0	59.0





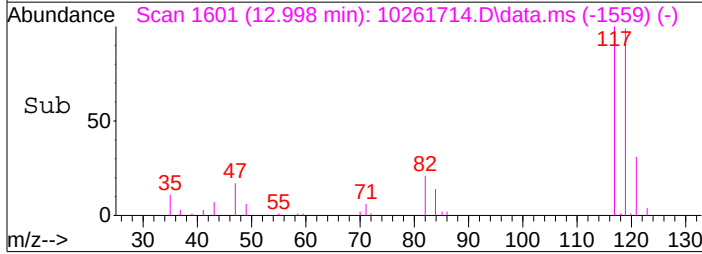
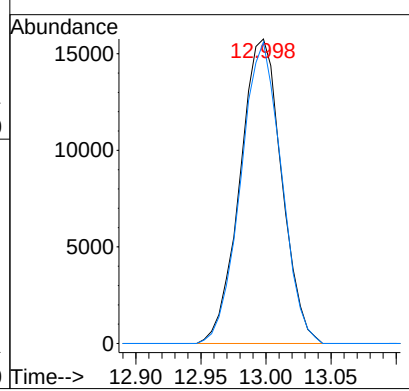
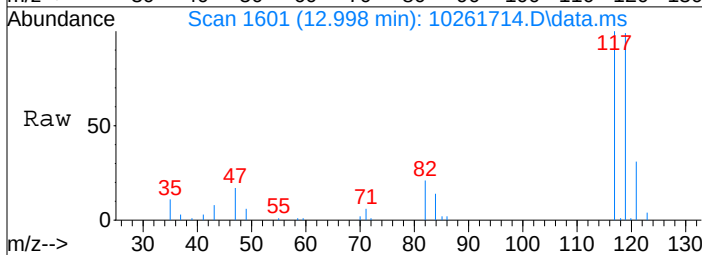
#41
Benzene
Concen: 0.28 ng
RT: 12.84 min Scan# 1573
Delta R.T. -0.017 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

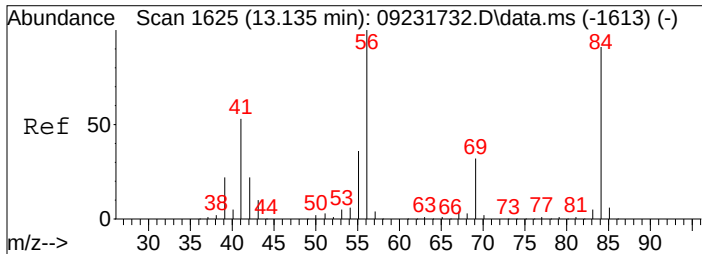
Tgt Ion: 78	Resp: 12020
Ion Ratio	Lower Upper
78	100
77	23.7 3.0 43.0



#42
Carbon Tetrachloride
Concen: 2.42 ng
RT: 13.00 min Scan# 1601
Delta R.T. -0.012 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

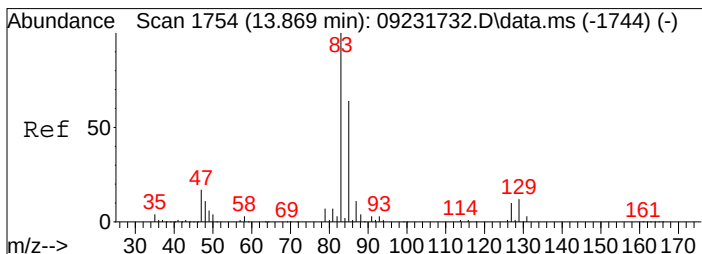
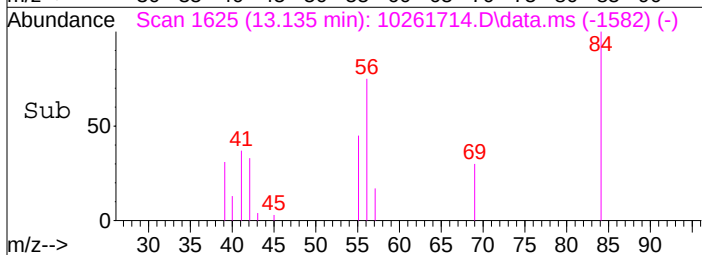
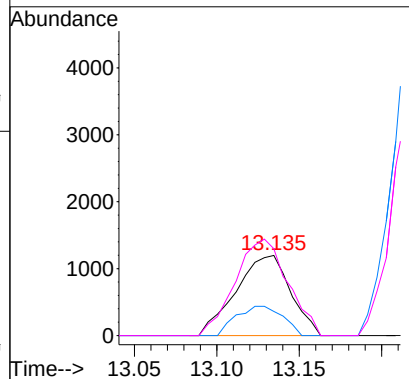
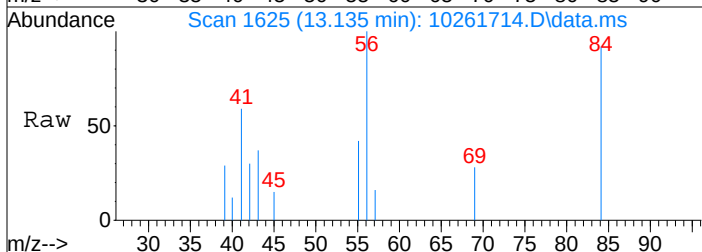
Tgt Ion: 117	Resp: 35147
Ion Ratio	Lower Upper
117	100
119	96.3 76.5 116.5





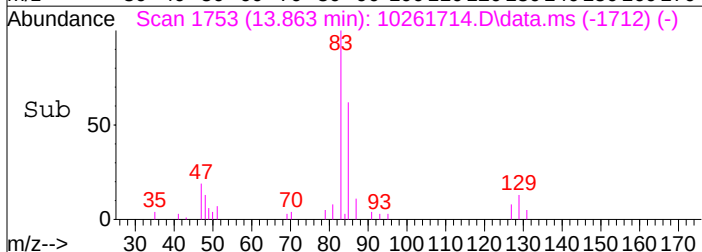
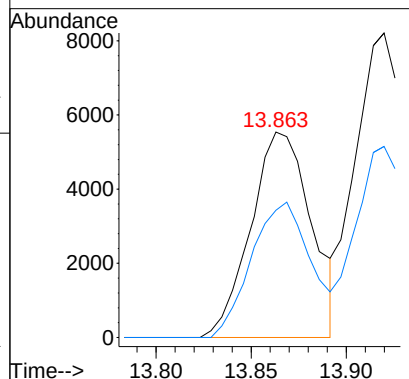
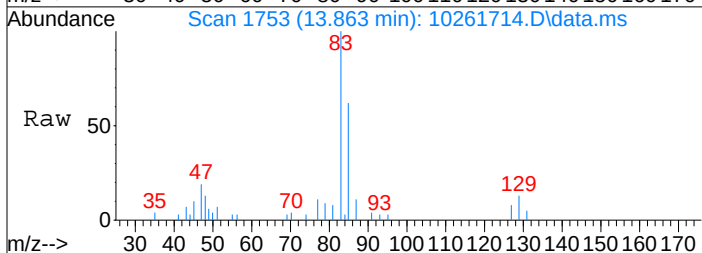
#43
Cyclohexane
Concen: 0.17 ng
RT: 13.13 min Scan# 1625
Delta R.T. -0.006 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

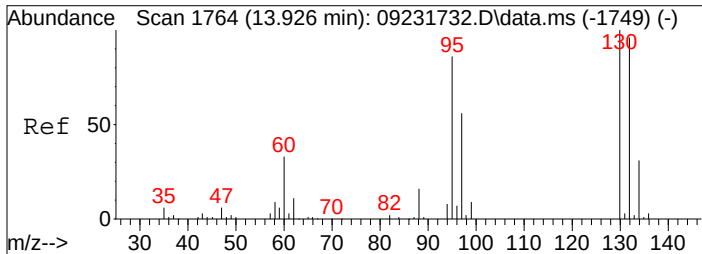
Tgt Ion:	84	Resp:	2760
Ion Ratio	Lower	Upper	
84	100		
69	31.2	15.8	55.8
56	116.1	91.9	131.9



#46
Bromodichloromethane
Concen: 0.89 ng
RT: 13.86 min Scan# 1753
Delta R.T. -0.017 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

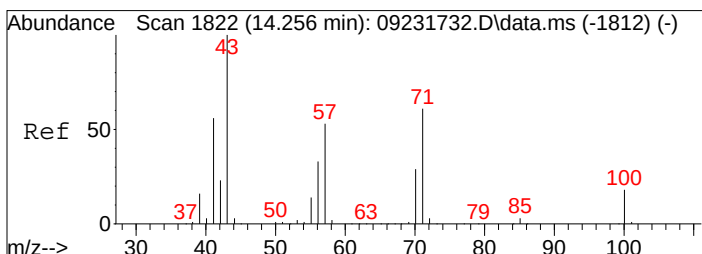
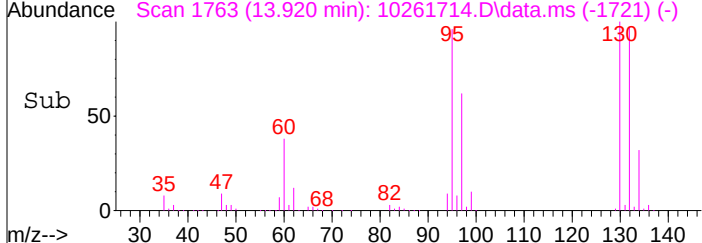
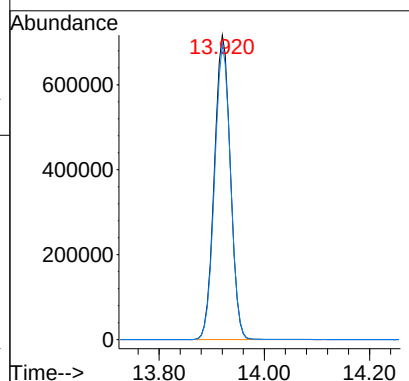
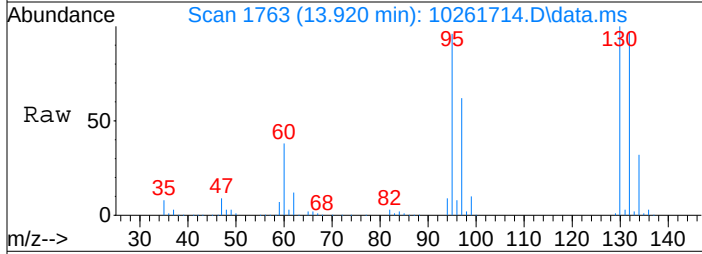
Tgt Ion:	83	Resp:	12262
Ion Ratio	Lower	Upper	
83	100		
85	64.6	44.2	84.2





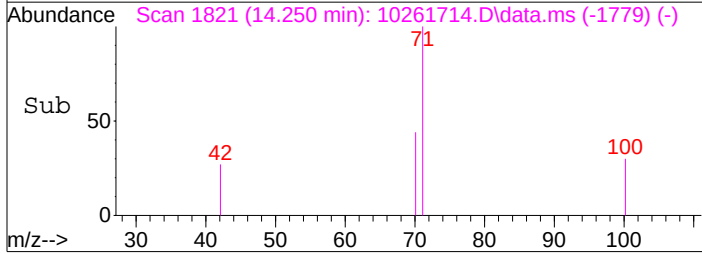
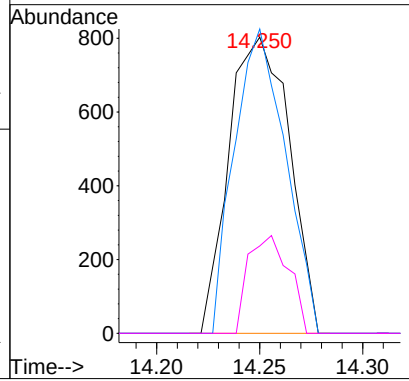
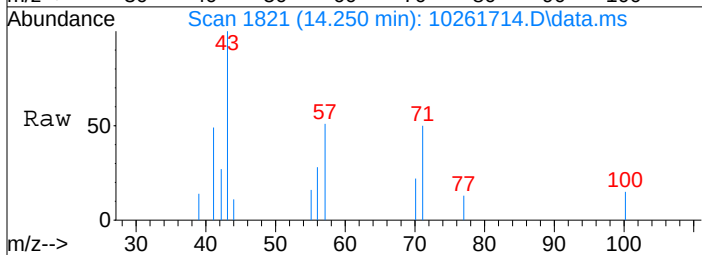
#47
 Trichloroethene
 Concen: 114.43 ng
 RT: 13.92 min Scan# 1763
 Delta R.T. -0.012 min
 Lab File: 10261714.D
 Acq: 26 Oct 2017 12:25

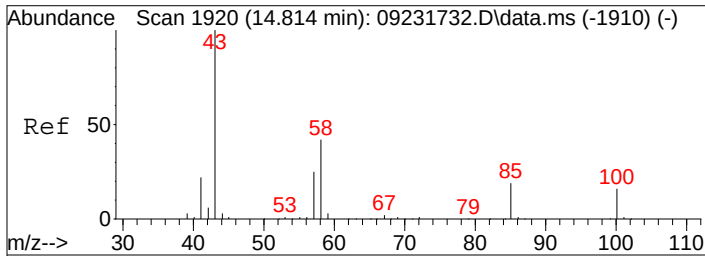
Tgt Ion:	130	Resp:	1513795
Ion Ratio	Lower	Upper	
130	100		
132	96.6	76.1	116.1



#51
 n-Heptane
 Concen: 0.15 ng
 RT: 14.25 min Scan# 1821
 Delta R.T. -0.012 min
 Lab File: 10261714.D
 Acq: 26 Oct 2017 12:25

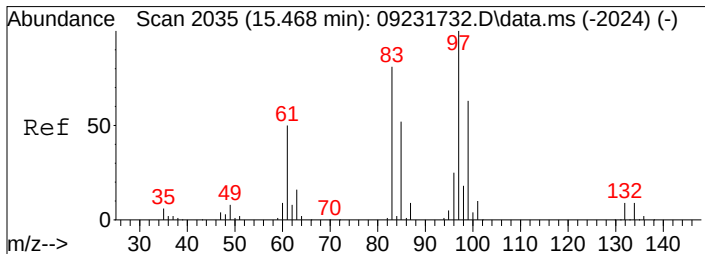
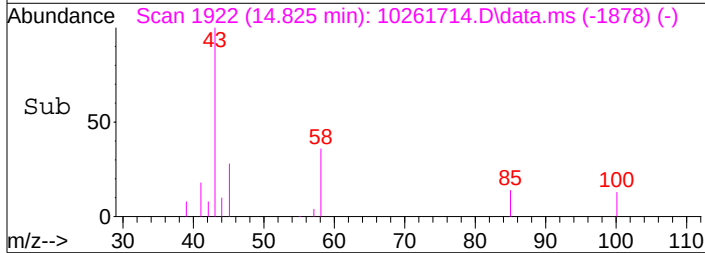
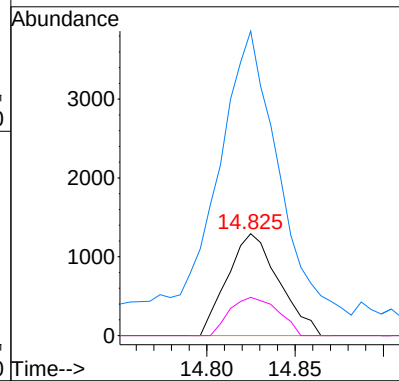
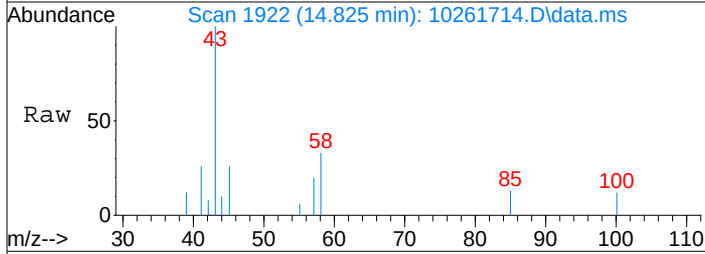
Tgt Ion:	71	Resp:	1636
Ion Ratio	Lower	Upper	
71	100		
57	86.9	68.8	108.8
100	22.2	9.4	49.4





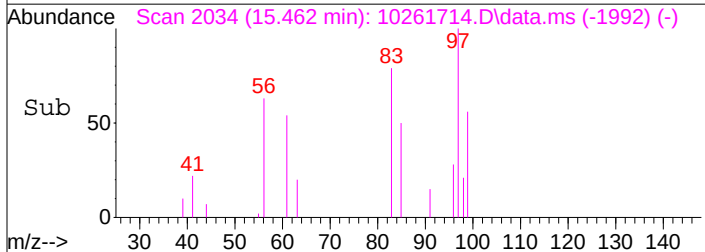
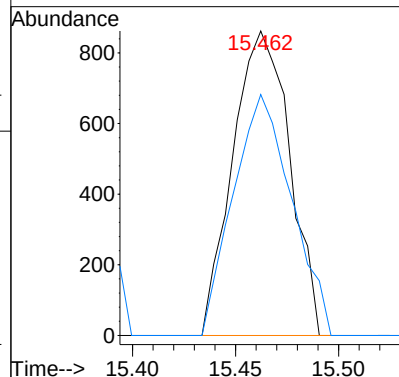
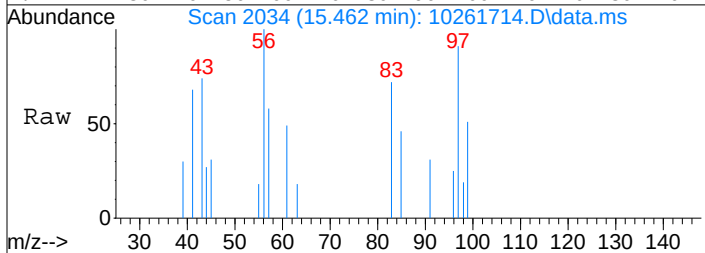
#53
4-Methyl-2-pentanone
Concen: 0.27 ng
RT: 14.82 min Scan# 1922
Delta R.T. -0.000 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

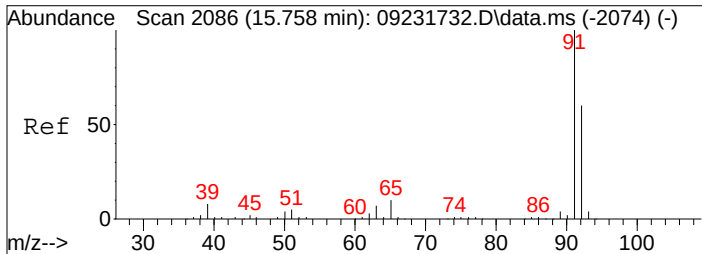
Tgt Ion	Ratio	Lower	Upper
58	100		
43	326.8	192.6	288.8#
85	35.3	38.4	57.6#



#55
1,1,2-Trichloroethane
Concen: 0.16 ng
RT: 15.46 min Scan# 2034
Delta R.T. -0.012 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

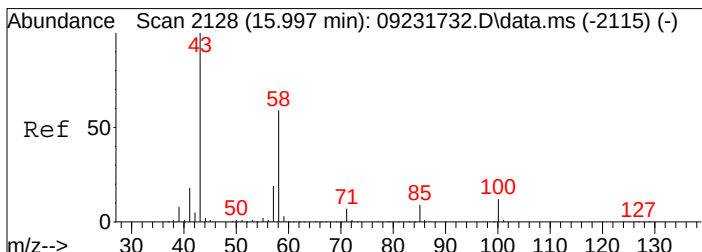
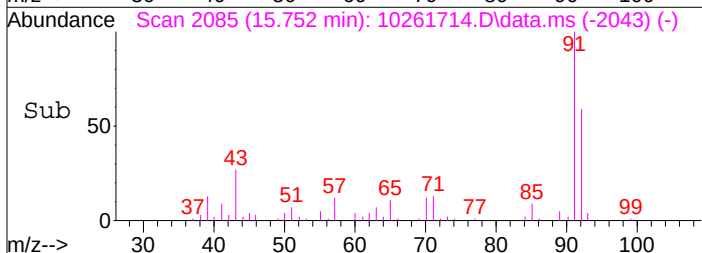
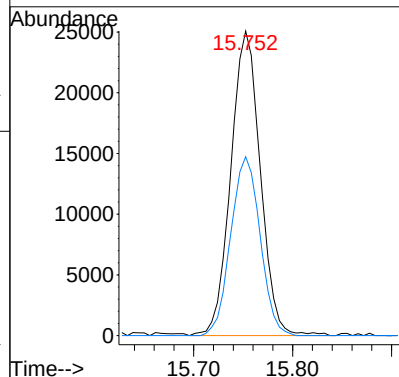
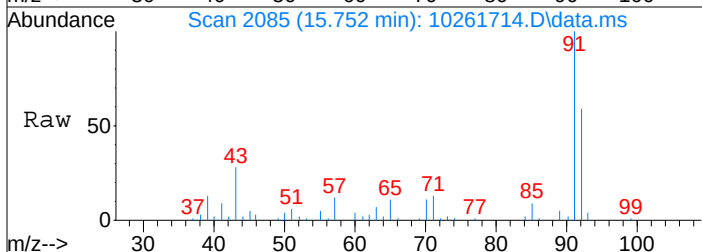
Tgt Ion	Ratio	Lower	Upper
97	100		
83	81.6	62.2	102.2





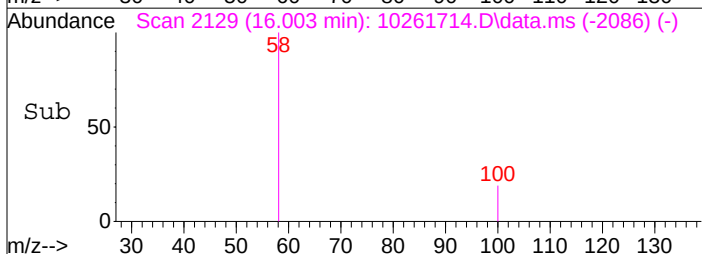
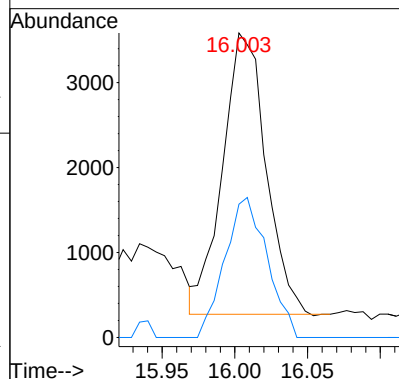
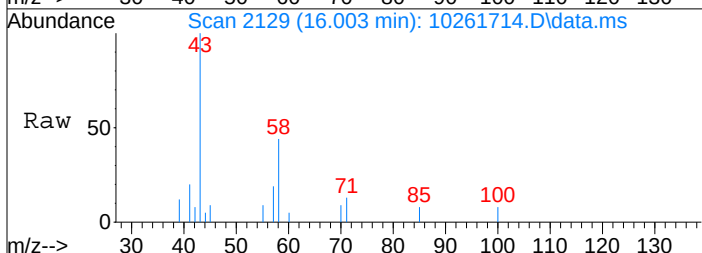
#58
Toluene
Concen: 1.07 ng
RT: 15.75 min Scan# 2085
Delta R.T. -0.012 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

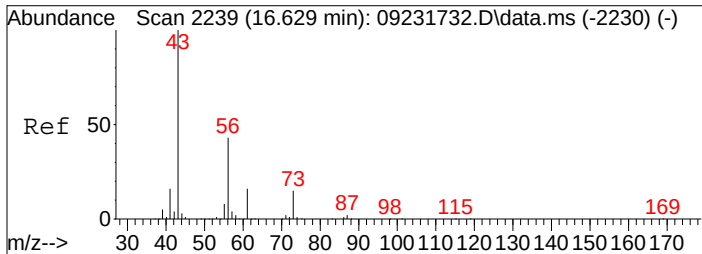
Tgt Ion: 91 Resp: 52017
Ion Ratio Lower Upper
91 100
92 58.4 40.7 80.7



#59
2-Hexanone
Concen: 0.29 ng
RT: 16.00 min Scan# 2129
Delta R.T. -0.006 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

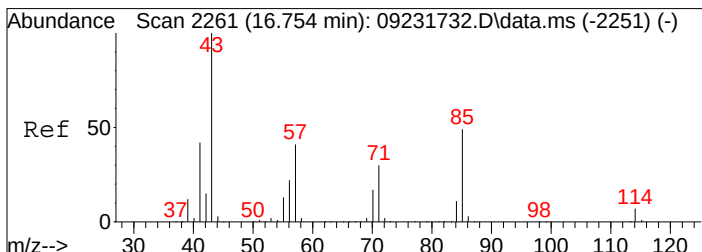
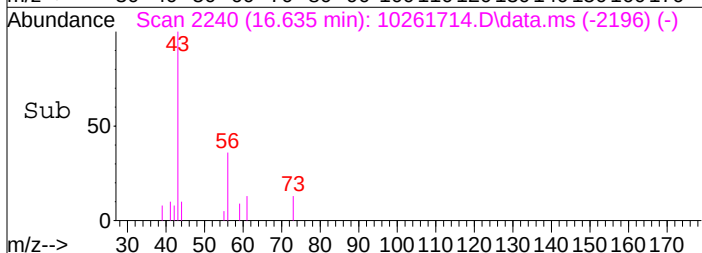
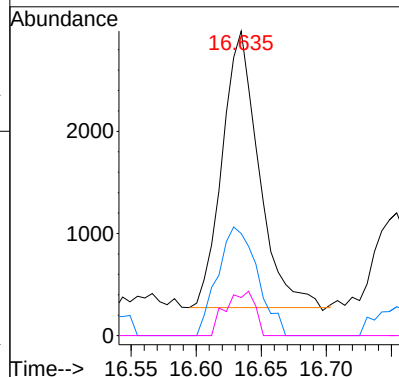
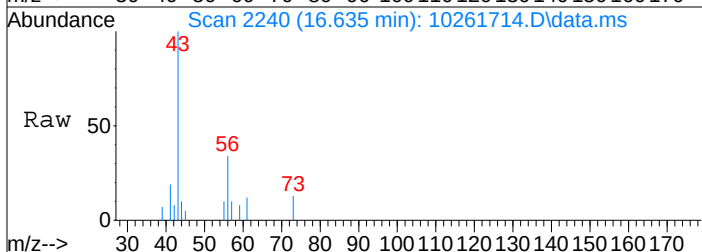
Tgt Ion: 43 Resp: 6873
Ion Ratio Lower Upper
43 100
58 48.3 38.3 78.3





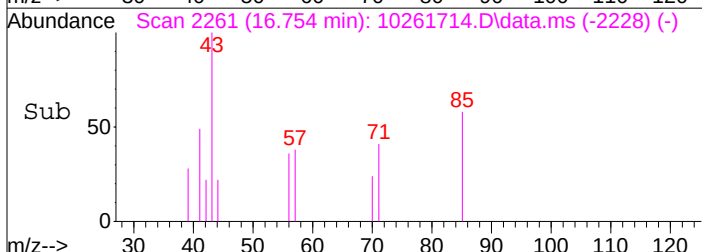
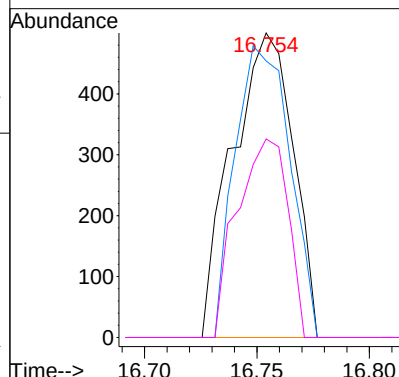
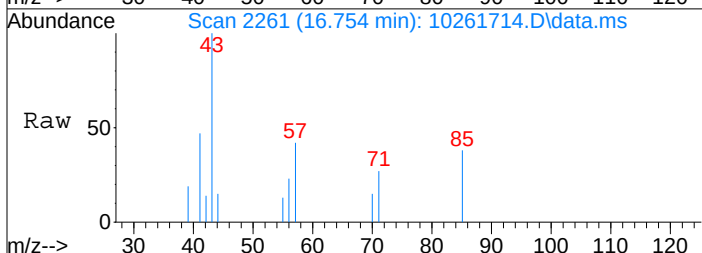
#62
n-Butyl Acetate
Concen: 0.20 ng
RT: 16.63 min Scan# 2240
Delta R.T. -0.000 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

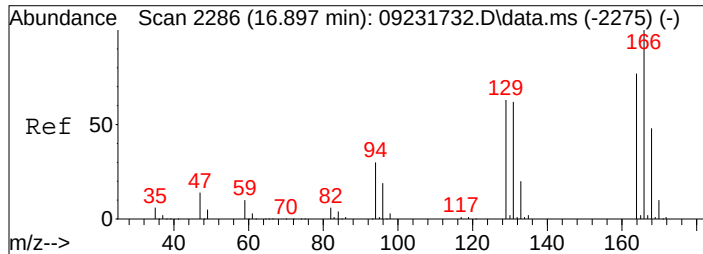
Tgt Ion: 43 Resp: 5309
Ion Ratio Lower Upper
43 100
56 42.6 23.3 63.3
73 12.9 0.0 35.4



#63
n-Octane
Concen: 0.10 ng
RT: 16.75 min Scan# 2261
Delta R.T. -0.012 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

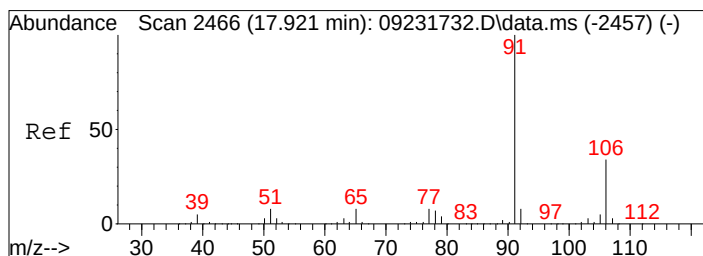
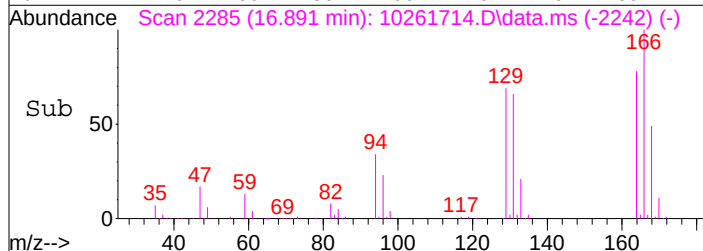
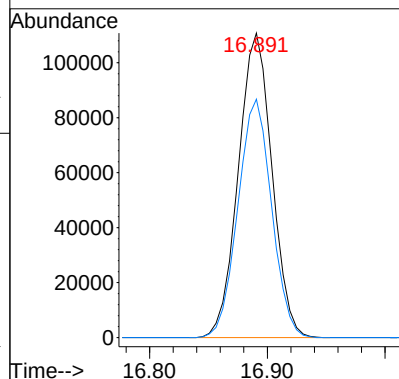
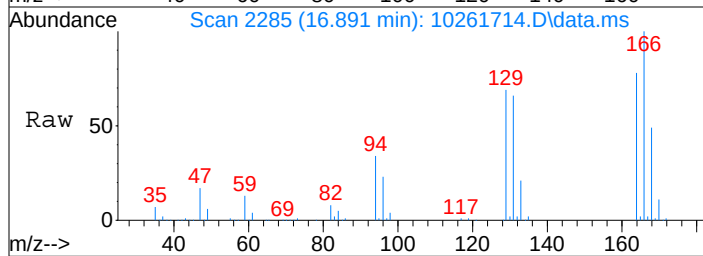
Tgt Ion: 57 Resp: 941
Ion Ratio Lower Upper
57 100
85 86.7 95.9 143.9#
71 54.4 57.1 85.7#





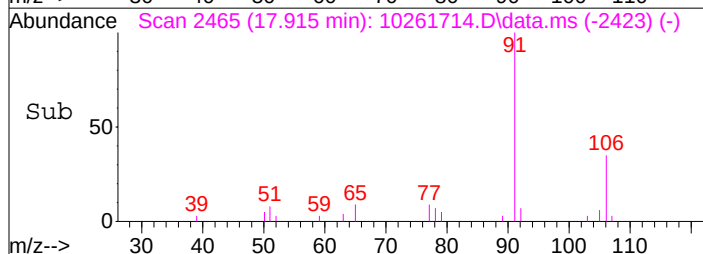
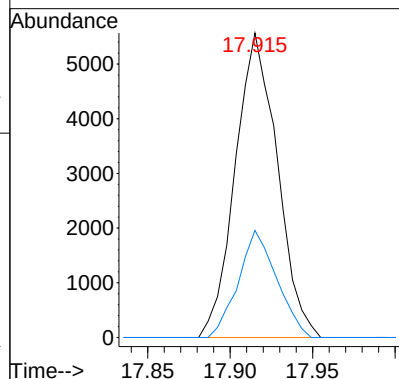
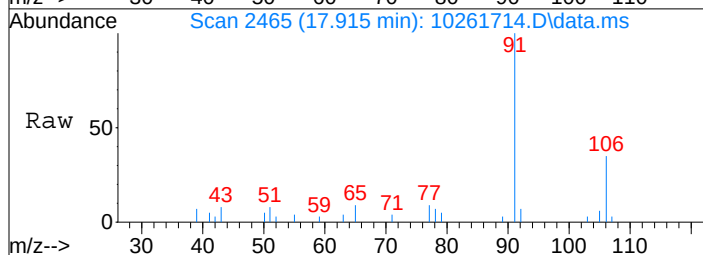
#64
Tetrachloroethene
Concen: 14.13 ng
RT: 16.89 min Scan# 2285
Delta R.T. -0.006 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

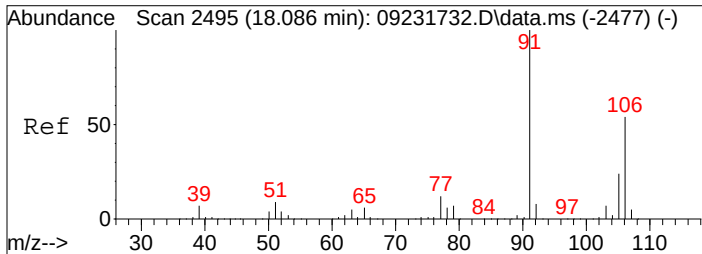
Tgt Ion: 166 Resp: 220165
Ion Ratio Lower Upper
166 100
164 78.4 58.2 98.2



#66
Ethylbenzene
Concen: 0.18 ng
RT: 17.92 min Scan# 2465
Delta R.T. -0.012 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

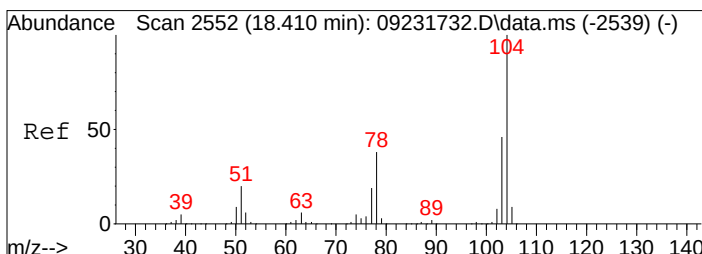
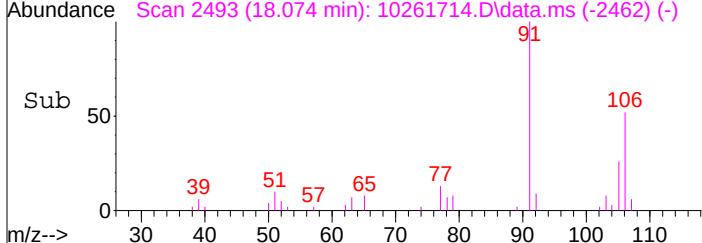
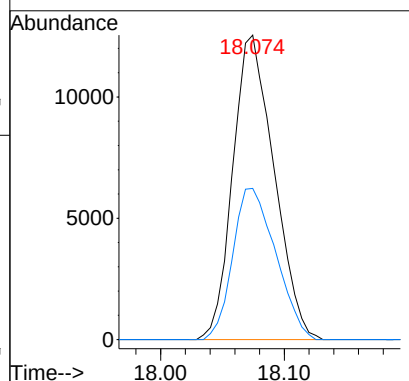
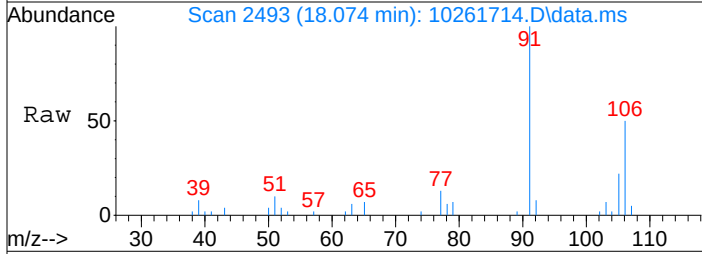
Tgt Ion: 91 Resp: 9866
Ion Ratio Lower Upper
91 100
106 32.1 13.6 53.6





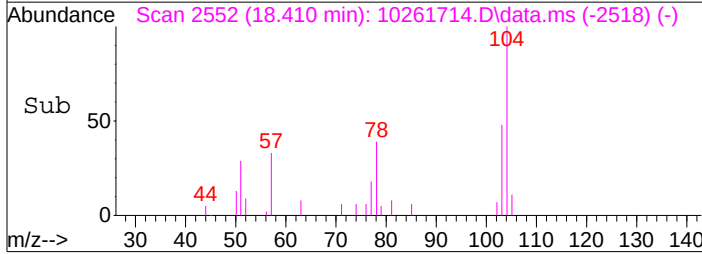
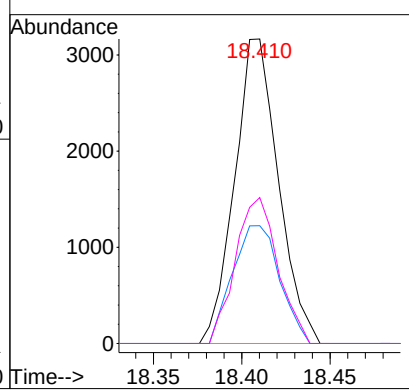
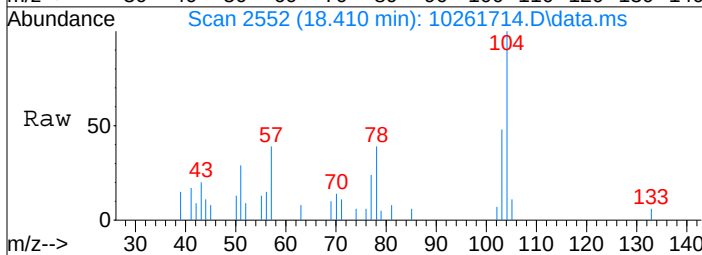
#67
 m- & p-Xylenes
 Concen: 0.68 ng
 RT: 18.07 min Scan# 2493
 Delta R.T. -0.023 min
 Lab File: 10261714.D
 Acq: 26 Oct 2017 12:25

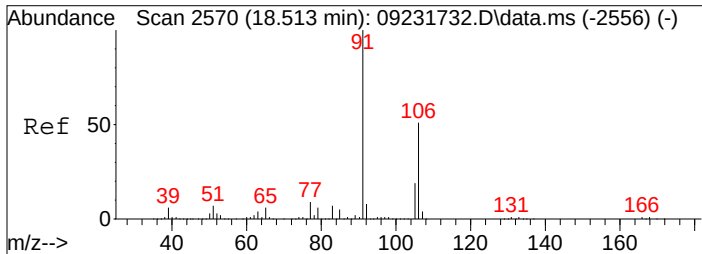
Tgt Ion:	91	Resp:	29103
Ion Ratio	Lower	Upper	
91	100		
106	51.8	32.7	72.7



#69
 Styrene
 Concen: 0.15 ng
 RT: 18.41 min Scan# 2552
 Delta R.T. -0.006 min
 Lab File: 10261714.D
 Acq: 26 Oct 2017 12:25

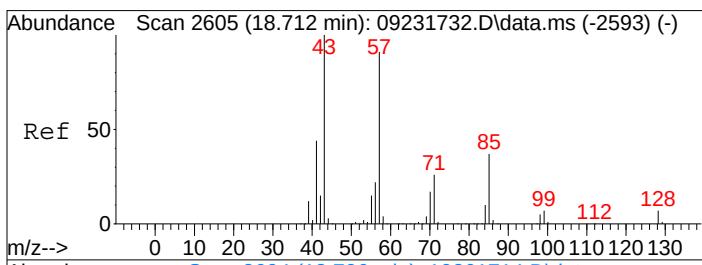
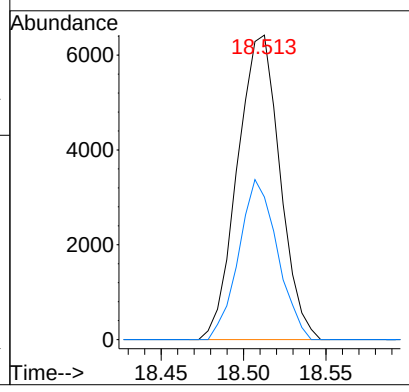
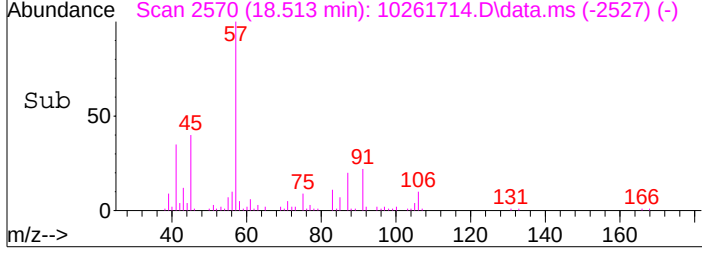
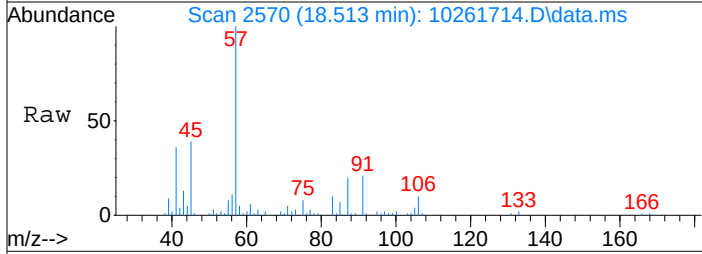
Tgt Ion:	104	Resp:	5460
Ion Ratio	Lower	Upper	
104	100		
78	41.6	18.0	58.0
103	46.5	26.0	66.0





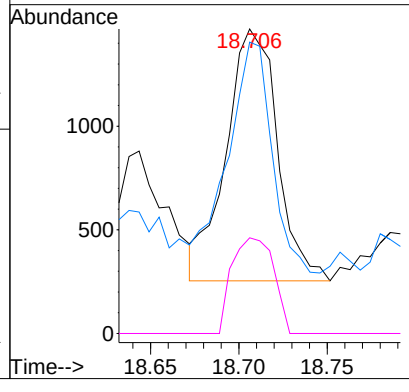
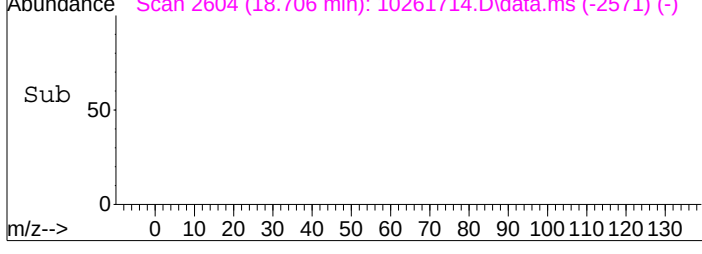
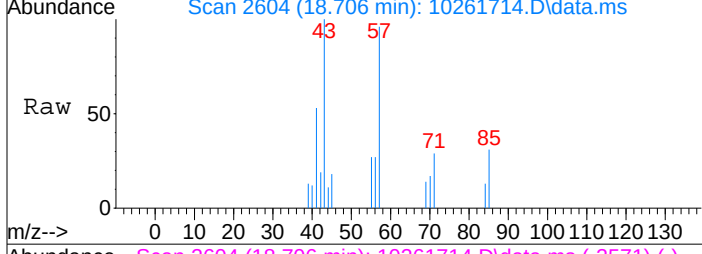
#70
o-Xylene
Concen: 0.27 ng
RT: 18.51 min Scan# 2570
Delta R.T. -0.006 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

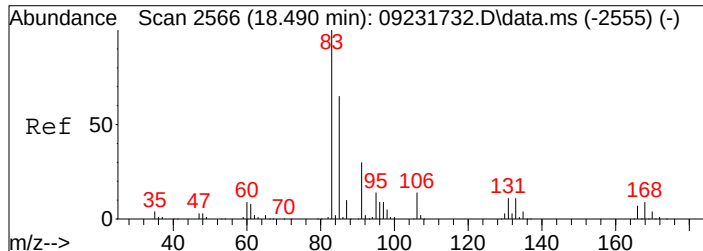
Tgt Ion:	91	Resp:	11522
Ion Ratio	Lower	Upper	
91	100		
106	47.8	31.0	71.0



#71
n-Nonane
Concen: 0.11 ng
RT: 18.71 min Scan# 2604
Delta R.T. -0.012 min
Lab File: 10261714.D
Acq: 26 Oct 2017 12:25

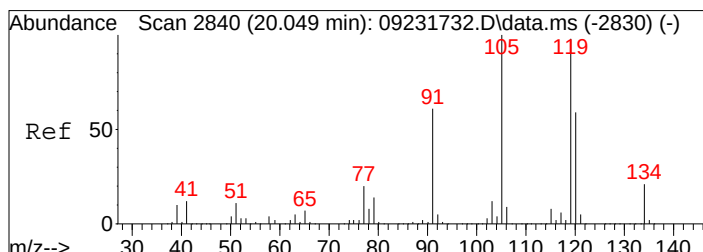
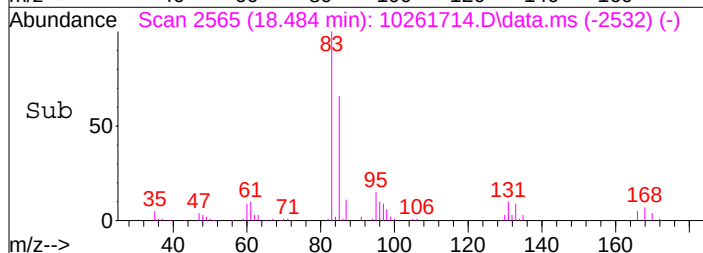
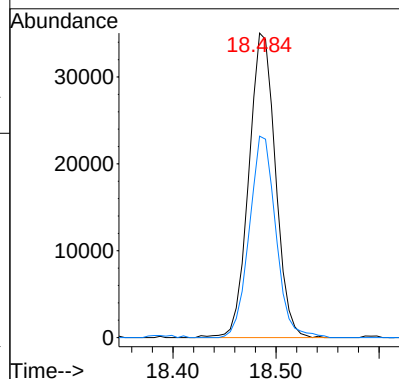
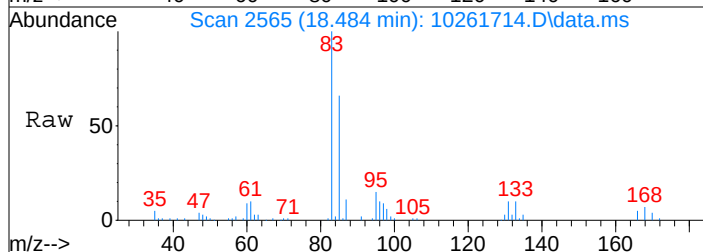
Tgt Ion:	43	Resp:	2459
Ion Ratio	Lower	Upper	
43	100		
57	79.0	71.1	111.1
85	30.9	16.5	56.5





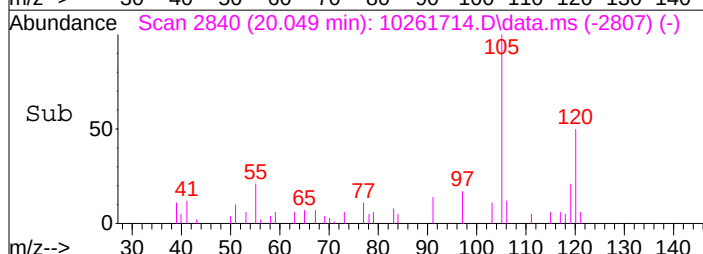
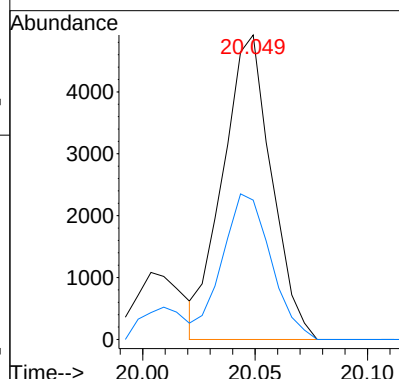
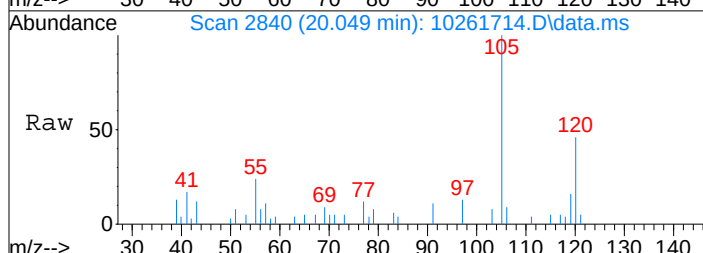
#72
 1,1,2,2-Tetrachloroethane
 Concen: 3.23 ng
 RT: 18.48 min Scan# 2565
 Delta R.T. -0.012 min
 Lab File: 10261714.D
 Acq: 26 Oct 2017 12:25

Tgt Ion: 83 Resp: 63007
 Ion Ratio Lower Upper
 83 100
 85 65.9 44.7 84.7



#82
 1,2,4-Trimethylbenzene
 Concen: 0.16 ng
 RT: 20.05 min Scan# 2840
 Delta R.T. -0.012 min
 Lab File: 10261714.D
 Acq: 26 Oct 2017 12:25

Tgt Ion: 105 Resp: 7406
 Ion Ratio Lower Upper
 105 100
 120 48.1 38.9 78.9



Data File : I:\MS13\DATA\2017 10\26\10261716.D
 Acq On : 26 Oct 2017 13:50
 Sample : P1705134-001d1l (200mL)
 Misc : S31-09111703

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Oct 27 11:36:41 2017

Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:36:07 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

10/27/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.14	130	116409	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.23	114	577555	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.52	82	232836	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.97	65	162932	13.910	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	111.28%	
57) Toluene-d8 (SS2)	15.65	98	588693	12.100	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	96.80%	
73) Bromofluorobenzene (SS3)	18.91	174	187544	9.991	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	79.92%	

Target Compounds

						Qvalue
2) Propene	4.38	42	1480	0.120	ng	96
3) Dichlorodifluoromethan...	4.54	85	13087	0.645	ng	98
4) Chloromethane	4.80	50	375	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.		
6) Vinyl Chloride	5.20	62	336	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	6.51	45	6521	0.868	ng	83
11) Acetonitrile	6.78	41	77	N.D.		
12) Acrolein	6.98	56	618	0.091	ng	# 72
13) Acetone	7.17	58	17493	2.180	ng	97
14) Trichlorofluoromethane	7.38	101	5885	0.339	ng	98
15) 2-Propanol (Isopropanol)	7.67	45	3669	0.141	ng	83
16) Acrylonitrile	0.00	53	0	N.D.		
17) 1,1-Dichloroethene	8.30	96	7805	0.736	ng	89
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.	d	
19) Methylene Chloride	8.49	84	2593	0.207	ng	79
20) 3-Chloro-1-propene (Al...	8.59	41	156	N.D.		
21) Trichlorotrifluoroethane	8.91	151	59899	5.506	ng	92
22) Carbon Disulfide	8.77	76	27850	0.630	ng	98
23) trans-1,2-Dichloroethene	9.73	61	4260	0.306	ng	94
24) 1,1-Dichloroethane	9.98	63	6386	0.345	ng	99
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.		
26) Vinyl Acetate	10.20	86	1102	0.457	ng	# 96
27) 2-Butanone (MEK)	10.51	72	1505	0.203	ng	# 41
28) cis-1,2-Dichloroethene	10.96	61	301882	22.099	ng	93
29) Diisopropyl Ether	0.00	87	0	N.D.	d	
30) Ethyl Acetate	11.29	61	2166	0.612	ng	86
31) n-Hexane	11.26	57	799	N.D.		
32) Chloroform	11.30	83	84679	4.768	ng	100
34) Tetrahydrofuran (THF)	11.78	72	614	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	12.37	97	5735	0.349	ng	96
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	12.84	78	2920	N.D.		
42) Carbon Tetrachloride	12.99	117	6722	0.453	ng	97
43) Cyclohexane	13.12	84	399	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	13.86	83	2279	0.161	ng	91
47) Trichloroethene	13.92	130	305185	22.543	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	0.00	100	0	N.D.	d	

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Data File : I:\MS13\DATA\2017 10\26\10261716.D
 Acq On : 26 Oct 2017 13:50
 Sample : P1705134-001dil (200mL)
 Misc : S31-09111703

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Oct 27 11:36:41 2017

Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:36:07 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

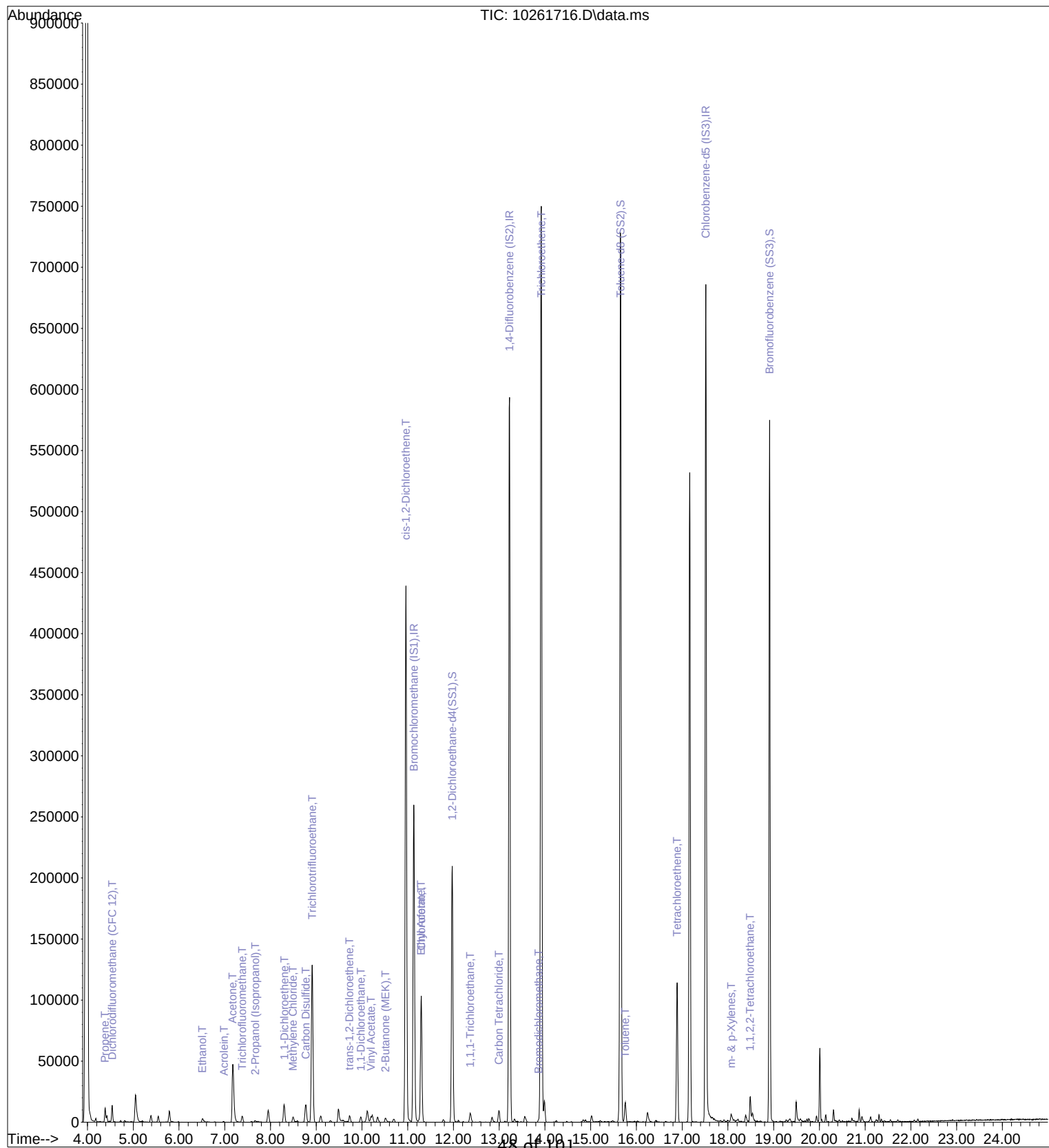
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.24	71	337	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	14.84	58	452	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	15.46	97	117	N.D.		
58) Toluene	15.75	91	10067	0.204	ng	96
59) 2-Hexanone	16.03	43	1654	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.64	43	1121	N.D.		
63) n-Octane	0.00	57	0	N.D.		
64) Tetrachloroethene	16.89	166	43491	2.760	ng	100
65) Chlorobenzene	0.00	112	0	N.D.		
66) Ethylbenzene	17.92	91	1786	N.D.		
67) m- & p-Xylenes	18.07	91	5613	0.130	ng	97
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.41	104	987	N.D.		
70) o-Xylene	18.51	91	2161	N.D.		
71) n-Nonane	18.71	43	1116	N.D.		
72) 1,1,2,2-Tetrachloroethane	18.48	83	11889	0.602	ng	100
74) Cumene	0.00	105	0	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	19.49	91	418	N.D.		
77) 3-Ethyltoluene	19.58	105	1080	N.D.		
78) 4-Ethyltoluene	19.62	105	530	N.D.		
79) 1,3,5-Trimethylbenzene	19.69	105	400	N.D.		
80) alpha-Methylstyrene	20.00	118	697	N.D.		
81) 2-Ethyltoluene	19.85	105	404	N.D.		
82) 1,2,4-Trimethylbenzene	20.04	105	1312	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	20.42	105	416	N.D.		
88) 4-Isopropyltoluene (p-...	20.42	119	176	N.D.		
89) 1,2,3-Trimethylbenzene	20.42	105	416	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	20.55	68	162	N.D.		
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	21.24	57	1055	N.D.		
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	22.17	128	373	N.D.		
96) n-Dodecane	22.15	57	752	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	18.22	55	1132	N.D.		
99) tert-Butylbenzene	20.00	119	1033	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 10\26\10261716.D
Acq On : 26 Oct 2017 13:50
Sample : P1705134-001dil (200mL)
Misc : S31-09111703

Vial: 2
Operator: WA
Inst : MS13

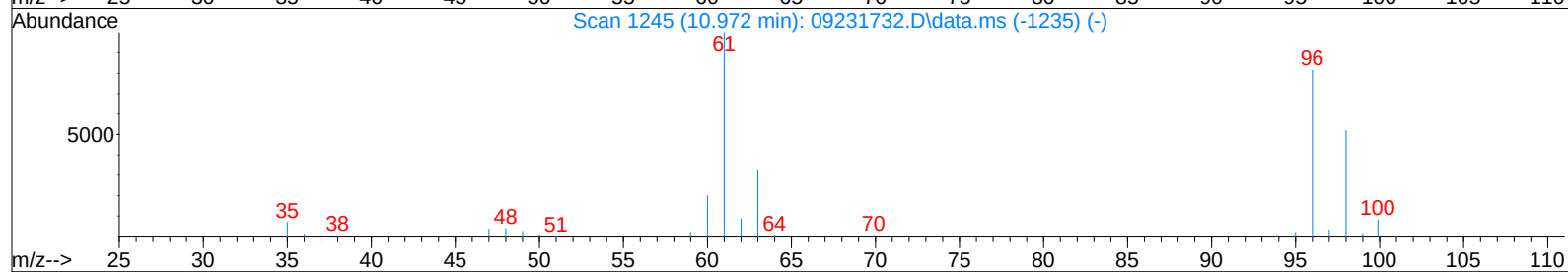
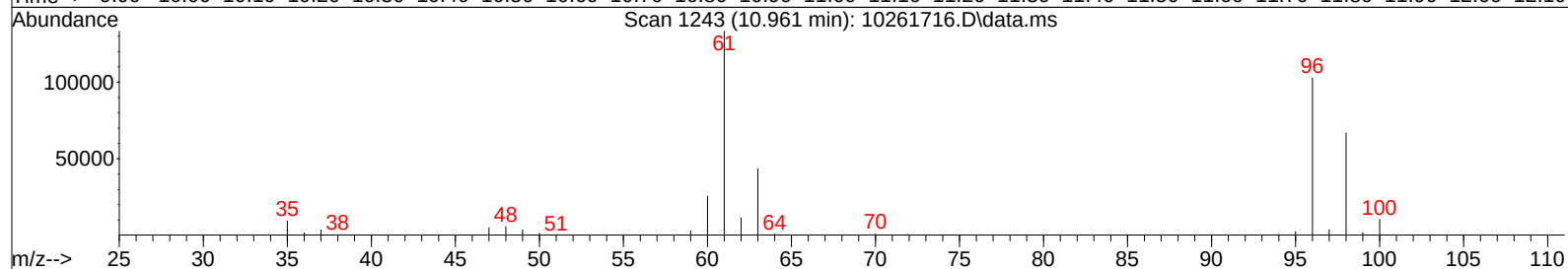
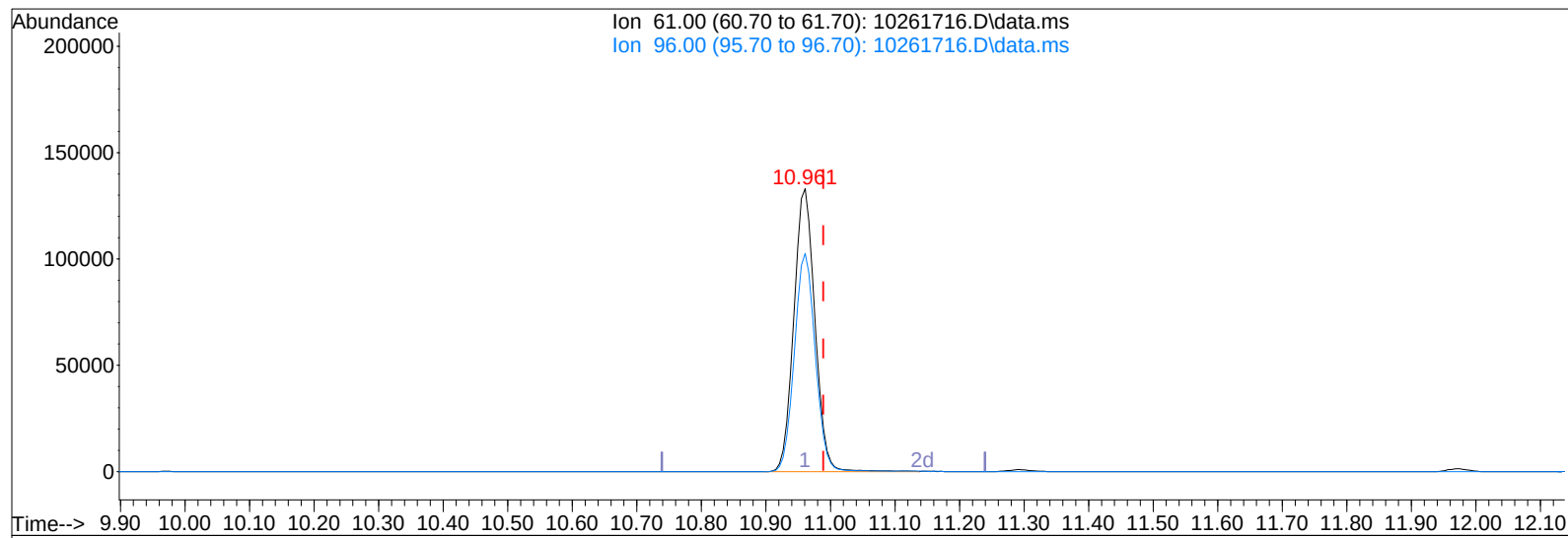
Quant Time: Oct 27 11:36:41 2017
Quant Method : I:\MS13\METHODS\R13092317.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Mon Sep 25 06:36:07 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2017 10\26\10261716.D
Acq On : 26 Oct 2017 13:50
Sample : P1705134-001dil (200mL)
Misc : S31-09111703

Vial: 2
Operator: WA
Inst : MS13

Quant Time: Oct 26 14:53:49 2017
Quant Method : I:\MS13\METHODS\R13092317.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Mon Sep 25 06:36:07 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 10261716.D\data.ms

(28) cis-1,2-Dichloroethene (T)

10.961min (-0.029) 22.10ng

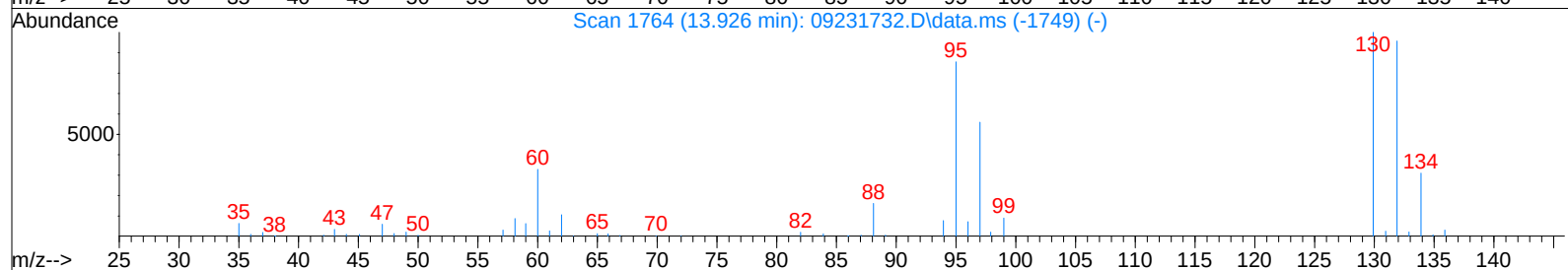
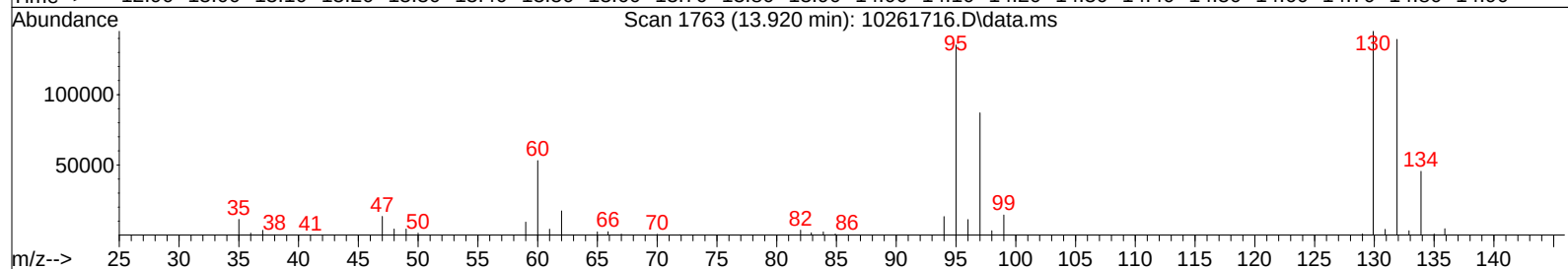
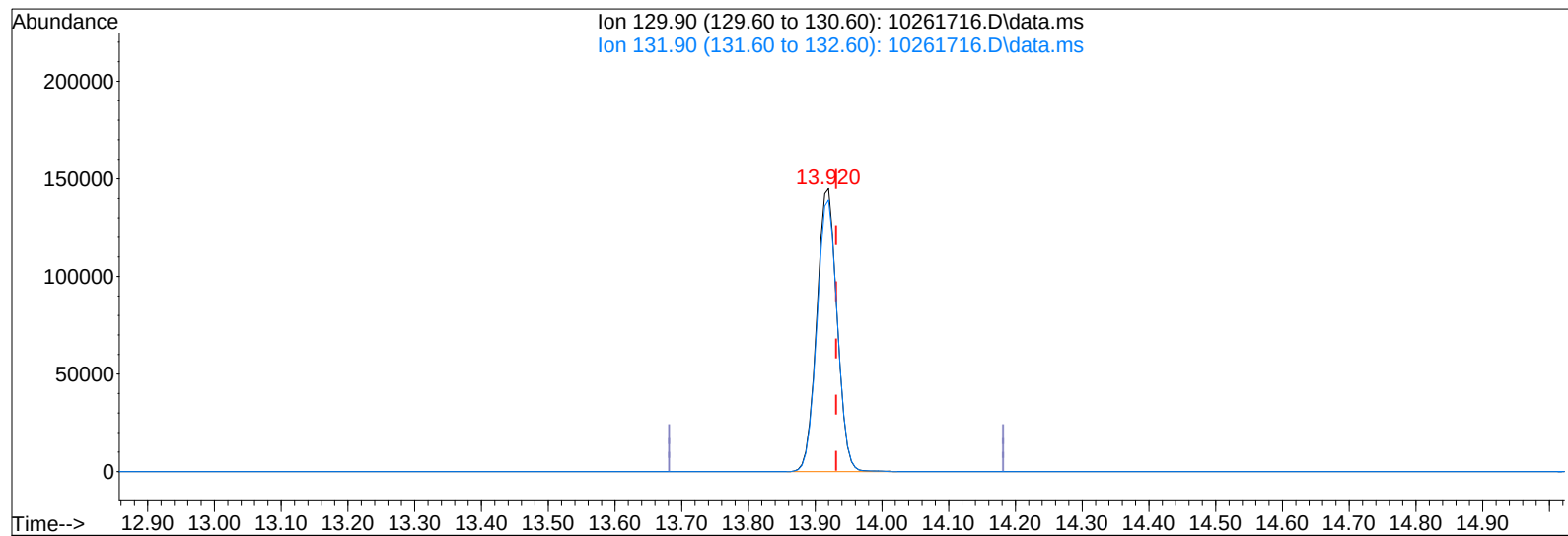
response 301882

Ion	Exp%	Act%
61.00	100	100
96.00	83.20	76.85
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2017 10\26\10261716.D
Acq On : 26 Oct 2017 13:50
Sample : P1705134-001dil (200mL)
Misc : S31-09111703

Vial: 2
Operator: WA
Inst : MS13

Quant Time: Oct 26 14:53:49 2017
Quant Method : I:\MS13\METHODS\R13092317.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Mon Sep 25 06:36:07 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 10261716.D\data.ms

(47) Trichloroethene (T)

13.920min (-0.011) 22.54ng

response 305185

Ion	Exp%	Act%

129.90	100	100

131.90	96.10	96.71

0.00	0.00	0.00

0.00	0.00	0.00

Data File : I:\MS13\DATA\2017 10\26\10261704.D
 Acq On : 26 Oct 2017 4:46
 Sample : MB R13102617 1000mL
 Misc : S31-09111703_AC00880

Vial: 3
 Operator: WA
 Inst : MS13

Quant Time: Oct 26 06:11:14 2017

Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:36:07 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

10/27/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.13	130	87123	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.22	114	434309	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.52	82	167916	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.97	65	112111	12.789	ng	-0.03
Spiked Amount	12.500	Range 70	- 130	Recovery	=	102.32%
57) Toluene-d8 (SS2)	15.65	98	436388	12.438	ng	-0.01
Spiked Amount	12.500	Range 70	- 130	Recovery	=	99.52%
73) Bromofluorobenzene (SS3)	18.91	174	153885	11.367	ng	0.00
Spiked Amount	12.500	Range 70	- 130	Recovery	=	90.96%

Target Compounds

						Qvalue
2) Propene	4.39	42	252	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	5.45	54	115	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.53	45	923	0.164	ng	# 59
11) Acetonitrile	0.00	41	0	N.D.		
12) Acrolein	6.97	56	518	0.102	ng	# 74
13) Acetone	7.19	58	5519	0.919	ng	# 53
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	8.50	84	525	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	8.78	76	2599	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)	10.55	72	320	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	12.87	56	521	N.D.		
41) Benzene	12.84	78	1068	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.		

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Data File : I:\MS13\DATA\2017 10\26\10261704.D
 Acq On : 26 Oct 2017 4:46
 Sample : MB R13102617 1000mL
 Misc : S31-09111703_AC00880

Vial: 3
 Operator: WA
 Inst : MS13

Quant Time: Oct 26 06:11:14 2017

Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:36:07 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

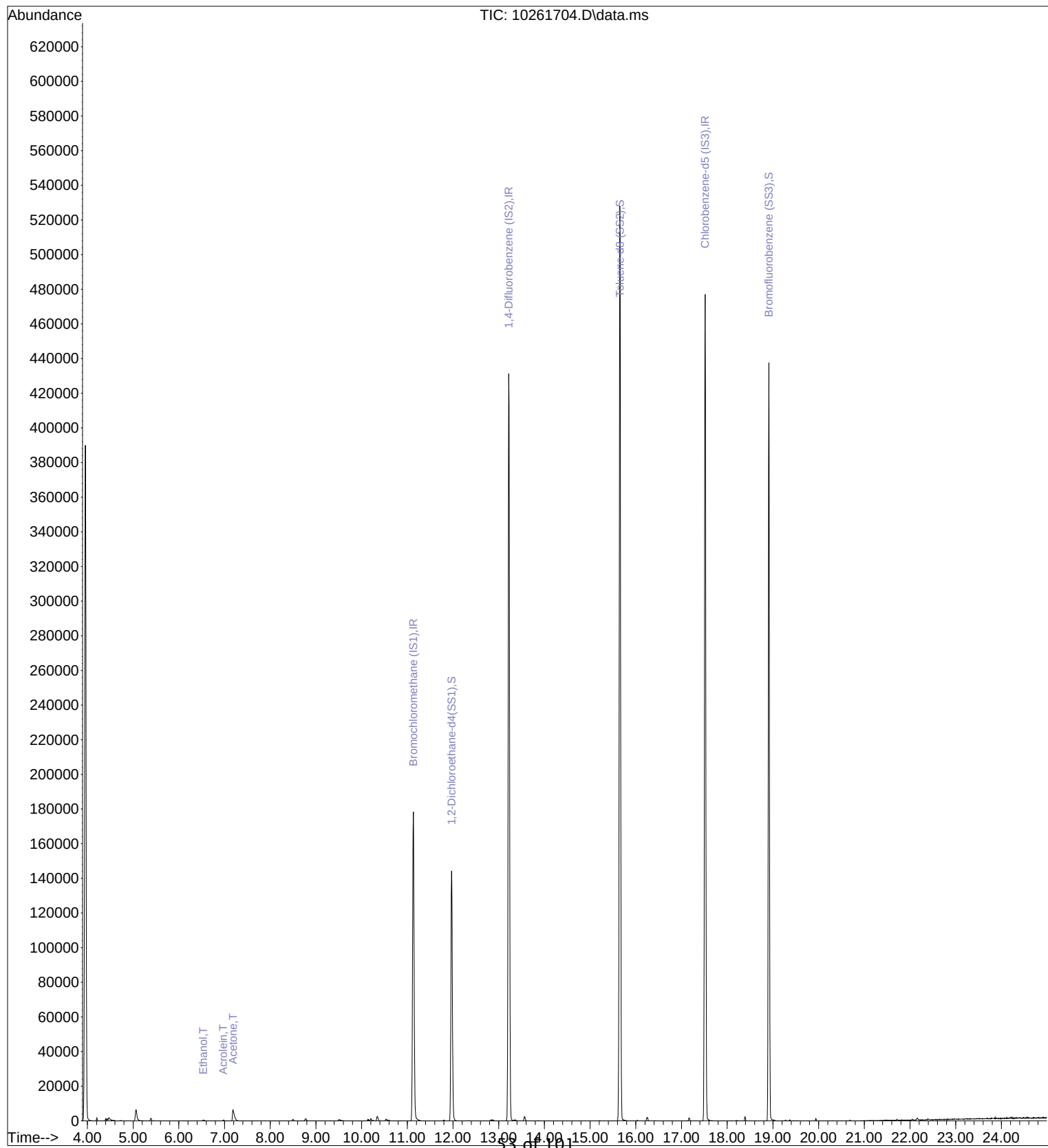
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	0.00	71	0	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	0.00	91	0	N.D.		
59) 2-Hexanone	16.03	43	344	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	18.92	105	114	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	19.46	91	109	N.D.		
77) 3-Ethyltoluene	19.36	105	331	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	19.94	57	275	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	21.12	57	128	N.D.		
94) 1,2,4-Trichlorobenzene	22.05	180	250	N.D.		
95) Naphthalene	22.15	128	1648	N.D.		
96) n-Dodecane	0.00	57	0	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	18.23	55	139	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 10\26\10261704.D
Acq On : 26 Oct 2017 4:46
Sample : MB R13102617 1000mL
Misc : S31-09111703_AC00880

Vial: 3
Operator: WA
Inst : MS13

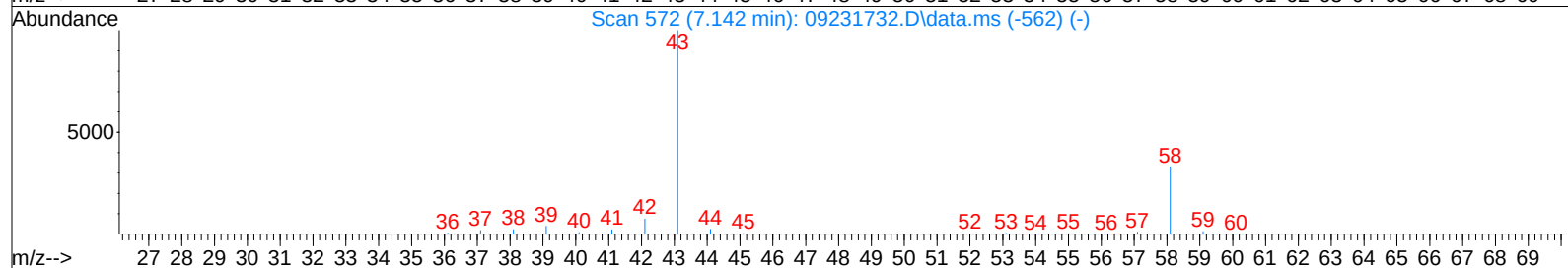
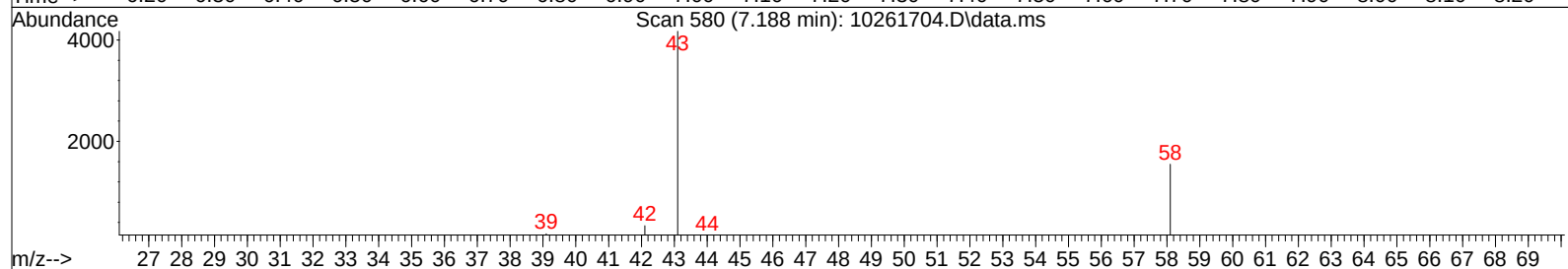
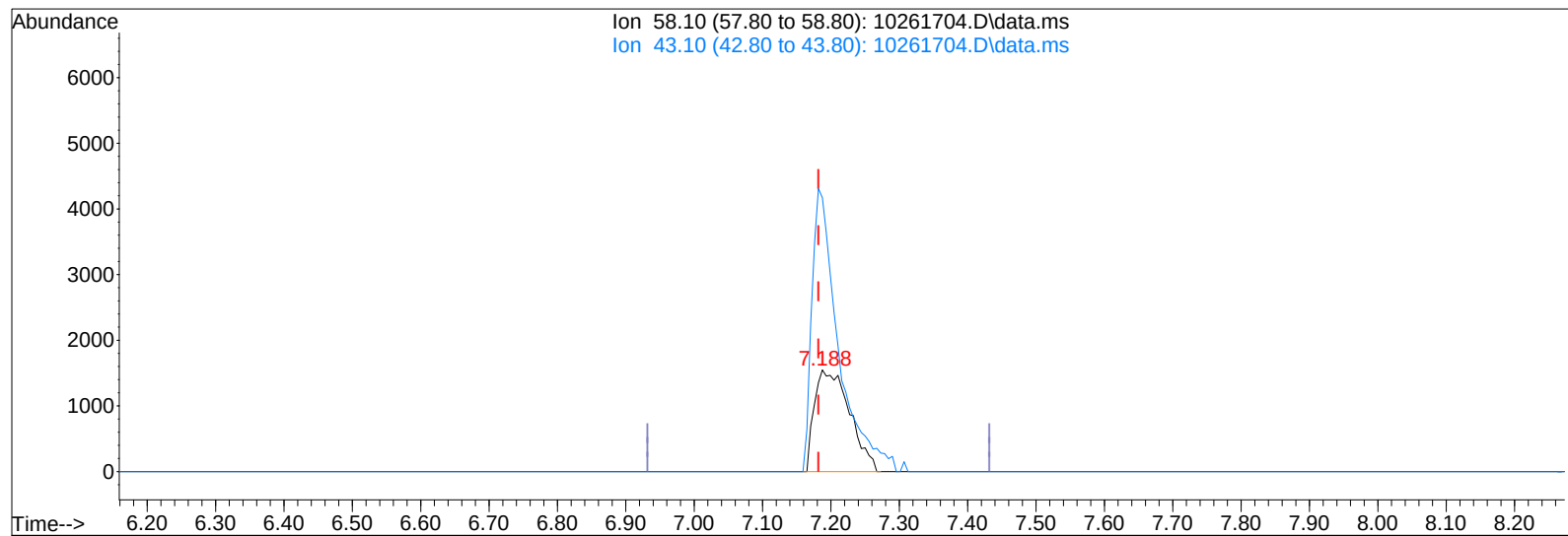
Quant Time: Oct 26 06:11:14 2017
Quant Method : I:\MS13\METHODS\R13092317.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Mon Sep 25 06:36:07 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2017 10\26\10261704.D
Acq On : 26 Oct 2017 4:46
Sample : MB R13102617 1000mL
Misc : S31-09111703_AC00880

Vial: 3
Operator: WA
Inst : MS13

Quant Time: Oct 26 06:11:14 2017
Quant Method : I:\MS13\METHODS\R13092317.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Mon Sep 25 06:36:07 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 10261704.D\data.ms

(13) Acetone (T)

7.188min (+0.006) 0.92ng

response 5519

Ion	Exp%	Act%
58.10	100	100
43.10	305.70	211.85#
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2017 10\26\10261705.D
 Acq On : 26 Oct 2017 5:20
 Sample : LCS R13102617 5ng
 Misc : S31-09111703/S31-10091704 (11/7)

Vial: 3
 Operator: WA
 Inst : MS13

Quant Time: Oct 26 06:11:16 2017

Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:36:07 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

10/26/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.15	130	90810	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.23	114	440929	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.52	82	168924	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.99	65	116564	12.757	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	102.08%	
57) Toluene-d8 (SS2)	15.66	98	432545	12.254	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	98.00%	
73) Bromofluorobenzene (SS3)	18.91	174	156855	11.517	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	92.16%	

Target Compounds

						Qvalue
2) Propene	4.36	42	238367	24.676	ng	98
3) Dichlorodifluoromethan...	4.51	85	415322	26.229	ng	100
4) Chloromethane	4.78	50	322474	27.253	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	5.04	135	247967	28.156	ng	100
6) Vinyl Chloride	5.18	62	321651	28.705	ng	99
7) 1,3-Butadiene	5.44	54	255441	29.952	ng	98
8) Bromomethane	5.86	94	210193	27.866	ng	99
9) Chloroethane	6.17	64	163526	28.051	ng	100
10) Ethanol	6.53	45	823669	140.472	ng	100
11) Acetonitrile	6.77	41	428012	29.333	ng	99
12) Acrolein	6.94	56	144069	27.212	ng	100
13) Acetone	7.15	58	822631	131.446	ng	99
14) Trichlorofluoromethane	7.38	101	361317	26.678	ng	100
15) 2-Propanol (Isopropanol)	7.62	45	1167181	57.313	ng	100
16) Acrylonitrile	7.87	53	308876	28.359	ng	100
17) 1,1-Dichloroethene	8.30	96	231113	27.919	ng	99
18) 2-Methyl-2-Propanol (t...	8.46	59	1183254	58.089	ng	100
19) Methylene Chloride	8.51	84	232950	23.824	ng	99
20) 3-Chloro-1-propene (Al...	8.67	41	357492	30.175	ng	100
21) Trichlorotrifluoroethane	8.91	151	229471	27.039	ng	98
22) Carbon Disulfide	8.78	76	846144	24.525	ng	100
23) trans-1,2-Dichloroethene	9.74	61	322411	29.735	ng	99
24) 1,1-Dichloroethane	9.99	63	391164	27.104	ng	99
25) Methyl tert-Butyl Ether	10.08	73	700540	28.101	ng	100
26) Vinyl Acetate	10.23	86	277348	147.484	ng	98
27) 2-Butanone (MEK)	10.47	72	158396	27.337	ng	99
28) cis-1,2-Dichloroethene	10.98	61	302764	28.411	ng	99
29) Diisopropyl Ether	11.26	87	231152	29.119	ng	98
30) Ethyl Acetate	11.27	61	162928	59.043	ng	100
31) n-Hexane	11.25	57	340146	25.973	ng	100
32) Chloroform	11.31	83	381167	27.511	ng	100
34) Tetrahydrofuran (THF)	11.71	72	155922	25.421	ng	99
35) Ethyl tert-Butyl Ether	11.84	87	284216	27.791	ng	98
36) 1,2-Dichloroethane	12.10	62	273120	28.156	ng	100
38) 1,1,1-Trichloroethane	12.37	97	344247	27.434	ng	99
39) Isopropyl Acetate	12.79	61	279825	54.413	ng	99
40) 1-Butanol	12.81	56	483581	56.767	ng	100
41) Benzene	12.84	78	902742	26.441	ng	100
42) Carbon Tetrachloride	13.00	117	318661	28.126	ng	100
43) Cyclohexane	13.13	84	704280	53.893	ng	99
44) tert-Amyl Methyl Ether	13.47	73	669372	27.377	ng	100
45) 1,2-Dichloropropane	13.68	63	217204	27.393	ng	100
46) Bromodichloromethane	13.87	83	303421	28.091	ng	100
47) Trichloroethene	13.93	130	270428	26.166	ng	99
48) 1,4-Dioxane	13.90	88	199122	28.251	ng	100
49) 2,2,4-Trimethylpentane...	13.99	57	932967	26.977	ng	100
50) Methyl Methacrylate	14.12	100	203410	53.075	ng	98

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Data File : I:\MS13\DATA\2017 10\26\10261705.D
 Acq On : 26 Oct 2017 5:20
 Sample : LCS R13102617 5ng
 Misc : S31-09111703/S31-10091704 (11/7)

Vial: 3
 Operator: WA
 Inst : MS13

Quant Time: Oct 26 06:11:16 2017

Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:36:07 2017

Response via : Initial Calibration

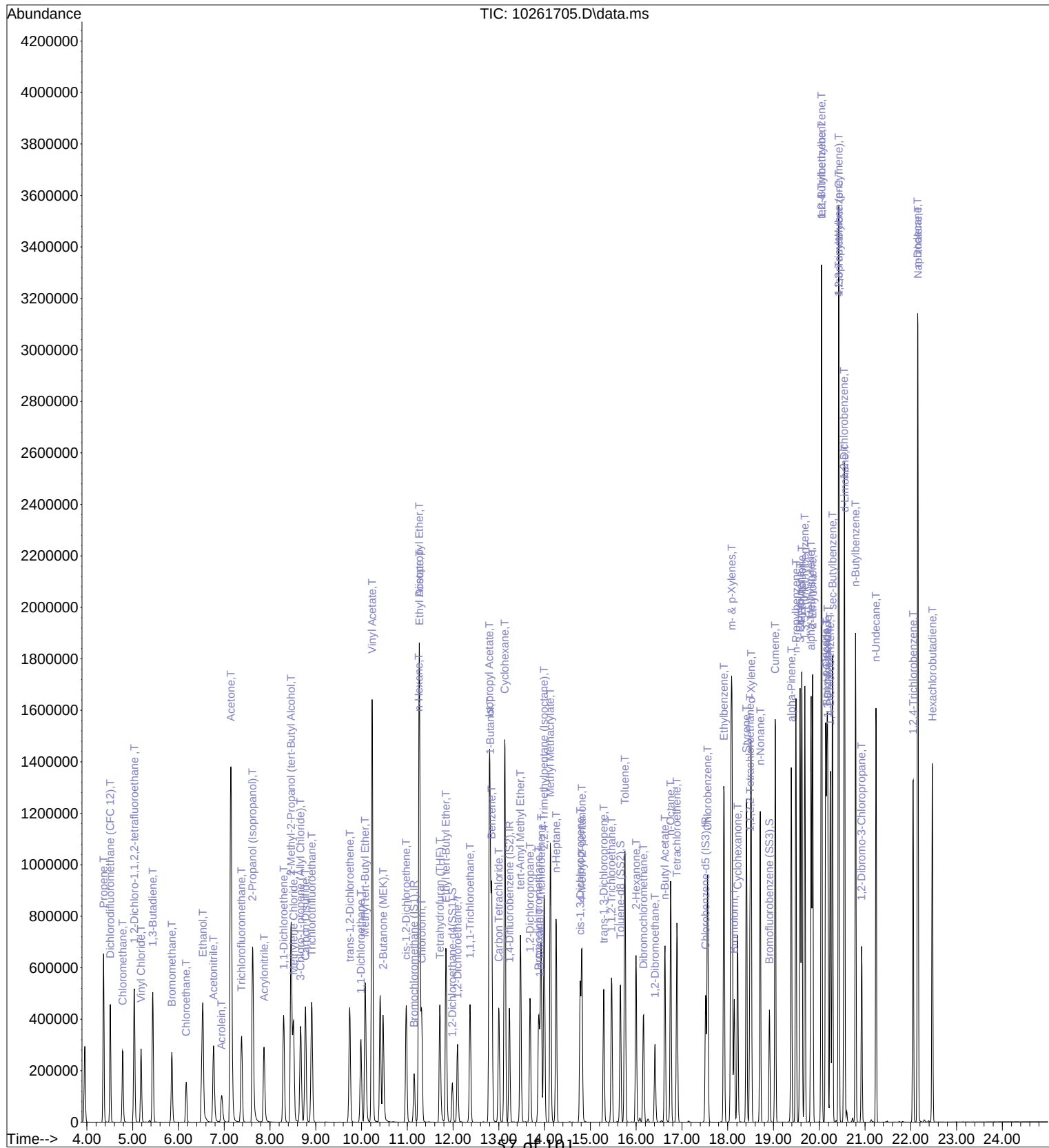
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.25	71	218779	26.151	ng	99
52) cis-1,3-Dichloropropene	14.78	75	373848	27.738	ng	100
53) 4-Methyl-2-pentanone	14.81	58	214097	28.426	ng	99
54) trans-1,3-Dichloropropene	15.29	75	345502	29.236	ng	100
55) 1,1,2-Trichloroethane	15.46	97	227482	27.473	ng	99
58) Toluene	15.75	91	939097	26.264	ng	100
59) 2-Hexanone	16.00	43	499428	28.752	ng	99
60) Dibromochloromethane	16.16	129	289814	28.412	ng	99
61) 1,2-Dibromoethane	16.41	107	261613	28.256	ng	99
62) n-Butyl Acetate	16.63	43	565587	29.249	ng	99
63) n-Octane	16.75	57	187379	26.938	ng	100
64) Tetrachloroethene	16.89	166	303176	26.516	ng	100
65) Chlorobenzene	17.56	112	661149	26.546	ng	100
66) Ethylbenzene	17.92	91	1083710	27.066	ng	99
67) m- & p-Xylenes	18.09	91	1681373	53.838	ng	100
68) Bromoform	18.14	173	266488	28.274	ng	99
69) Styrene	18.41	104	719843	27.658	ng	99
70) o-Xylene	18.51	91	854260	27.298	ng	99
71) n-Nonane	18.71	43	437344	27.430	ng	99
72) 1,1,2,2-Tetrachloroethane	18.49	83	400812	27.994	ng	100
74) Cumene	19.04	105	1134406	27.324	ng	99
75) alpha-Pinene	19.39	93	580331	27.816	ng	99
76) n-Propylbenzene	19.49	91	1325549	27.914	ng	99
77) 3-Ethyltoluene	19.58	105	1121235	26.625	ng	99
78) 4-Ethyltoluene	19.62	105	1110759	28.639	ng	99
79) 1,3,5-Trimethylbenzene	19.69	105	941584	27.592	ng	98
80) alpha-Methylstyrene	19.82	118	544204	26.867	ng	99
81) 2-Ethyltoluene	19.86	105	1116446	27.741	ng	98
82) 1,2,4-Trimethylbenzene	20.05	105	955586	28.271	ng	98
83) n-Decane	20.14	57	476293	29.508	ng	99
84) Benzyl Chloride	20.16	91	865287	29.723	ng	99
85) 1,3-Dichlorobenzene	20.19	146	611387	27.723	ng	100
86) 1,4-Dichlorobenzene	20.24	146	616304	27.281	ng	100
87) sec-Butylbenzene	20.29	105	1264013	27.324	ng	99
88) 4-Isopropyltoluene (p-...	20.42	119	1226153	27.232	ng	99
89) 1,2,3-Trimethylbenzene	20.42	105	980956	28.842	ng	98
90) 1,2-Dichlorobenzene	20.54	146	585296	28.075	ng	100
91) d-Limonene	20.56	68	365884	28.772	ng	98
92) 1,2-Dibromo-3-Chloropr...	20.93	157	221867	29.447	ng	97
93) n-Undecane	21.24	57	502594	27.455	ng	100
94) 1,2,4-Trichlorobenzene	22.05	180	483417	32.269	ng	100
95) Naphthalene	22.16	128	1396406	29.433	ng	100
96) n-Dodecane	22.15	57	502538	29.927	ng	100
97) Hexachlorobutadiene	22.47	225	310546	27.267	ng	99
98) Cyclohexanone	18.22	55	328563	28.799	ng	99
99) tert-Butylbenzene	20.05	119	951169	27.348	ng	99
100) n-Butylbenzene	20.79	91	999313	28.350	ng	99

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

Vial: 3
Operator: WA
Inst : MS13

Quant Time: Oct 26 06:11:16 2017
Quant Method : I:\MS13\METHODS\R13092317.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Mon Sep 25 06:36:07 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



Method Path : I:\MS13\METHODS\
 Method File : R13092317.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Mon Sep 25 06:36:07 2017
 Response Via : Initial Calibration

Calibration Files

0.08=09121706.D 0.10=09231727.D 0.20=09231728.D 0.40=09231729.D 1.0 =09231730.D 5.0 =09231731.D 25 =09231732.D
 50 =09231733.D 100 =09231734.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	1.299	1.373	1.333	1.341	1.295	1.405	1.260	1.333	1.330		3.45
3) T	Dichlorodifluo...	2.187	2.067	2.143	2.268	2.171	2.395	2.160	2.045	2.180		5.11
4) T	Chloromethane	1.630	1.525	1.585	1.725	1.594	1.783	1.690	1.499	1.629		6.04
5) T	1,2-Dichloro-1...	1.089	1.069	1.242	1.234	1.191	1.321	1.278	1.274	1.212		7.49
6) T	Vinyl Chloride	1.451	1.386	1.470	1.581	1.515	1.708	1.621	1.607	1.542		6.84
7) T	1,3-Butadiene	1.110	1.007	1.090	1.156	1.138	1.337	1.295	1.259	1.174		9.60
8) T	Bromomethane	1.043	1.012	1.026	1.090	0.943	1.155	0.994	1.043	1.038		6.12
9) T	Chloroethane	0.612	0.739	0.805	0.867	0.817	0.916	0.846	0.818	0.802		11.52
10) T	Ethanol	0.696	0.807	0.809	0.865	0.812	0.894	0.807	0.767	0.807		7.37
11) T	Acetonitrile	1.648	1.663	1.855	2.100	2.133	2.360	2.178	2.132	2.009		12.83
12) T	Acrolein			0.688	0.688	0.713	0.816	0.742	0.725	0.729		6.54
13) T	Acetone	0.905	0.877	0.932	0.876	0.837	0.909	0.808	0.747	0.861		7.09
14) T	Trichlorofluor...	1.769	1.762	1.845	1.962	1.866	2.024	1.859	1.827	1.864		4.82
15) T	2-Propanol (Is...	2.596	2.609	2.757	2.927	2.855	3.253	2.927	2.502	2.803		8.62
16) T	Acrylonitrile			1.236	1.440	1.500	1.704	1.573	1.542	1.499		10.42
17) T	1,1-Dichloroet...	0.891	1.130	1.151	1.170	1.131	1.281	1.193	1.168	1.139		9.76
18) T	2-Methyl-2-Pro...	2.527	2.655	2.828	2.944	2.888	3.298	2.952	2.340	2.804		10.51
19) T	Methylene Chlo...	1.941	1.499	1.338	1.258	1.141	1.279	1.181	1.130	1.346		19.98
20) T	3-Chloro-1-pro...	1.409	1.395	1.580	1.584	1.676	1.927	1.767	1.709	1.631		10.98
21) T	Trichlorotrifl...	1.090	1.029	1.154	1.188	1.162	1.309	1.217	1.197	1.168		7.19
22) T	Carbon Disulfide		5.904	5.265	4.658	4.256	4.657	4.320	4.184	4.749		13.22
23) T	trans-1,2-Dich...	1.157	1.291	1.424	1.547	1.560	1.758	1.626	1.578	1.493		12.94
24) T	1,1-Dichloroet...	1.919	1.898	1.910	2.047	1.965	2.182	2.011	1.961	1.987		4.74
25) T	Methyl tert-Bu...	3.013	3.195	3.405	3.528	3.462	3.854	3.556	3.439	3.432		7.28
26) T	Vinyl Acetate			0.216	0.245	0.252	0.295	0.276	0.268	0.259		10.64
27) T	2-Butanone (MEK)			0.725	0.762	0.798	0.879	0.819	0.803	0.798		6.55
28) T	cis-1,2-Dichlo...	1.333	1.268	1.404	1.501	1.486	1.689	1.553	1.502	1.467		8.96
29) T	Diisopropyl Ether	0.931	1.063	1.166	1.231	1.167	1.272	0.988	0.923	1.093		12.44
30) T	Ethyl Acetate	0.286	0.342	0.370	0.413	0.415	0.440	0.398	0.376	0.380		12.84
31) T	n-Hexane	1.892	1.773	1.940	1.965	1.853	1.813	1.617	1.567	1.803		8.03
32) T	Chloroform	1.745	1.718	1.866	2.013	1.886	2.140	1.968	1.920	1.907		7.25
33) S	1,2-Dichloroet...	1.231	1.251	1.262	1.260	1.283	1.279	1.254	1.242	1.258		1.40
34) T	Tetrahydrofura...	1.009	0.820	0.852	0.844	0.785	0.862	0.801	0.782	0.844		8.66
35) T	Ethyl tert-But...	1.196	1.302	1.395	1.471	1.426	1.586	1.465	1.421	1.408		8.29
36) T	1,2-Dichloroet...	1.094	1.194	1.312	1.391	1.380	1.539	1.410	1.362	1.335		10.28
37) IR	1,4-Difluorobenzen...	-----ISTD-----										
38) T	1,1,1-Trichlor...	0.327	0.311	0.352	0.367	0.355	0.402	0.373	0.359	0.356		7.83
39) T	Isopropyl Acetate	0.140	0.134	0.143	0.153	0.147	0.162	0.149	0.138	0.146		6.22
40) T	1-Butanol		0.181	0.209	0.228	0.240	0.277	0.257	0.237	0.233		13.46
41) T	Benzene	1.047	0.951	0.968	0.990	0.933	1.029	0.950	0.875	0.968		5.66
42) T	Carbon Tetrach...	0.286	0.288	0.300	0.323	0.319	0.372	0.347	0.334	0.321		9.25

10/1 9/25/17

Method	Path : I:\MS13\METHODS\											
Method	File : R13092317.M											
Title	: EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)											
43)	T	Cyclohexane	0.356	0.347	0.372	0.386	0.365	0.409	0.376	0.352	0.370	5.42
44)	T	tert-Amyl Meth...	0.652	0.639	0.677	0.705	0.679	0.782	0.726	0.685	0.693	6.49
45)	T	1,2-Dichloropr...	0.197	0.204	0.220	0.237	0.227	0.251	0.236	0.226	0.225	7.93
46)	T	Bromodichlorom...	0.275	0.280	0.288	0.307	0.305	0.350	0.328	0.316	0.306	8.24
47)	T	Trichloroethene	0.279	0.280	0.284	0.304	0.284	0.320	0.301	0.292	0.293	4.90
48)	T	1,4-Dioxane	0.150	0.171	0.200	0.215	0.203	0.232	0.218	0.209	0.200	13.32
49)	T	2,2,4-Trimethy...	0.954	0.909	0.976	1.022	0.962	1.085	1.002	0.932	0.980	5.66
50)	T	Methyl Methacr...		0.082	0.101	0.110	0.106	0.118	0.111	0.107	0.105	10.85
51)	T	n-Heptane	0.243	0.240	0.231	0.247	0.235	0.250	0.231	0.221	0.237	4.05
52)	T	cis-1,3-Dichlo...	0.302	0.310	0.360	0.382	0.382	0.437	0.410	0.394	0.372	12.51
53)	T	4-Methyl-2-pen...	0.172	0.185	0.211	0.226	0.218	0.248	0.230	0.218	0.214	11.50
54)	T	trans-1,3-Dich...	0.234	0.251	0.292	0.328	0.340	0.396	0.376	0.363	0.322	18.21
55)	T	1,1,2-Trichlor...	0.206	0.212	0.227	0.241	0.232	0.267	0.250	0.242	0.235	8.45
56)	IR	Chlorobenzene-d5 (...)	-----ISTD-----									
57)	S	Toluene-d8 (SS2)	2.645	2.640	2.637	2.628	2.595	2.591	2.585	2.574	2.612	1.09
58)	T	Toluene	2.630	2.499	2.661	2.756	2.566	2.878	2.646	2.530	2.646	4.69
59)	T	2-Hexanone	1.074	1.151	1.206	1.346	1.336	1.502	1.370	1.297	1.285	10.58
60)	T	Dibromochlorom...	0.601	0.625	0.734	0.779	0.767	0.893	0.829	0.812	0.755	13.20
61)	T	1,2-Dibromoethane	0.541	0.585	0.664	0.725	0.696	0.796	0.745	0.729	0.685	12.42
62)	T	n-Butyl Acetate	1.233	1.232	1.359	1.503	1.467	1.675	1.537	1.442	1.431	10.61
63)	T	n-Octane	0.486	0.501	0.513	0.535	0.516	0.565	0.515	0.486	0.515	5.07
64)	T	Tetrachloroethene	0.784	0.770	0.821	0.886	0.833	0.936	0.874	0.863	0.846	6.50
65)	T	Chlorobenzene	1.760	1.705	1.878	1.895	1.802	2.029	1.876	1.798	1.843	5.40
66)	T	Ethylbenzene	2.791	2.803	2.966	3.060	2.924	3.314	3.018	2.827	2.963	5.86
67)	T	m- & p-Xylenes	2.192	2.158	2.270	2.435	2.239	2.607	2.379	2.207	2.311	6.60
68)	T	Bromoform	0.563	0.578	0.635	0.706	0.697	0.840	0.788	0.772	0.697	14.40
69)	T	Styrene	1.675	1.730	1.801	1.978	1.942	2.250	2.067	1.964	1.926	9.74
70)	T	o-Xylene	2.190	2.119	2.275	2.433	2.279	2.605	2.387	2.237	2.316	6.66
71)	T	n-Nonane	1.031	1.146	1.188	1.267	1.204	1.333	1.191	1.079	1.180	8.19
72)	T	1,1,2,2-Tetrac...	0.965	0.938	0.998	1.085	1.052	1.230	1.136	1.073	1.059	8.97
73)	S	Bromofluoroben...	0.999	1.011	0.999	1.011	1.004	1.008	1.022	1.007	1.008	0.75
74)	T	Cumene	2.861	2.882	3.001	3.221	3.054	3.479	3.161	2.919	3.072	6.80
75)	T	alpha-Pinene	1.344	1.340	1.480	1.639	1.565	1.785	1.646	1.551	1.544	9.90
76)	T	n-Propylbenzene	3.324	3.246	3.431	3.687	3.535	4.016	3.610	3.262	3.514	7.38
77)	T	3-Ethyltoluene	2.985	2.832	3.020	3.275	3.104	3.481	3.333	2.900	3.116	7.28
78)	T	4-Ethyltoluene	2.685	2.653	2.727	2.987	2.868	3.347	2.890	2.801	2.870	7.78
79)	T	1,3,5-Trimethy...	2.381	2.280	2.357	2.642	2.531	2.894	2.649	2.467	2.525	7.88
80)	T	alpha-Methylst...			1.227	1.491	1.477	1.719	1.587	1.493	1.499	10.79
81)	T	2-Ethyltoluene	2.784	2.680	2.926	3.119	2.980	3.391	3.098	2.846	2.978	7.52
82)	T	1,2,4-Trimethy...	2.230	2.238	2.359	2.657	2.548	2.919	2.654	2.406	2.501	9.51
83)	T	n-Decane	0.974	1.010	1.125	1.345	1.267	1.418	1.271	1.146	1.194	13.18
84)	T	Benzyl Chloride			1.751	1.936	2.076	2.556	2.388	2.219	2.154	13.72
85)	T	1,3-Dichlorobe...	1.499	1.487	1.540	1.695	1.606	1.871	1.723	1.633	1.632	7.92
86)	T	1,4-Dichlorobe...	1.558	1.523	1.570	1.710	1.632	1.914	1.781	1.685	1.672	7.82
87)	T	sec-Butylbenzene	3.217	3.216	3.358	3.572	3.408	3.900	3.526	3.189	3.423	7.02
88)	T	4-Isopropyltol...	3.145	3.073	3.282	3.545	3.354	3.833	3.422	3.001	3.332	8.17
89)	T	1,2,3-Trimethy...	2.245	2.201	2.377	2.673	2.558	2.958	2.684	2.438	2.517	10.05
90)	T	1,2-Dichlorobe...	1.434	1.368	1.484	1.626	1.519	1.769	1.628	1.513	1.543	8.22
91)	T	d-Limonene	0.813	0.762	0.843	1.017	1.003	1.144	1.029	0.917	0.941	13.77
92)	T	1,2-Dibromo-3-...	0.443	0.420	0.506	0.568	0.577	0.686	0.642	0.619	0.558	16.96
93)	T	n-Undecane				1.383	1.343	1.501	1.341	1.206	1.355	7.81
94)	T	1,2,4-Trichlor...	0.845	0.772	0.792	1.226	1.203	1.423	1.335	1.273	1.109	23.70

Method Path : I:\MS13\METHODS\
Method File : R13092317.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

95) T	Naphthalene				1.930	3.695	3.696	4.308	3.938	3.497	3.511	23.44
96) T	n-Dodecane					1.235	1.230	1.421	1.252	1.075	1.243	9.88
97) T	Hexachlorobuta...	0.754	0.752	0.808	0.873	0.826	0.953	0.899	0.876	0.843		8.40
98) T	Cyclohexanone	0.721	0.693	0.785	0.886	0.856	1.000	0.933	0.880	0.844		12.41
99) T	tert-Butylbenzene	2.402	2.377	2.535	2.723	2.587	2.921	2.642	2.402	2.574		7.30
100) T	n-Butylbenzene	2.376	2.278	2.426	2.777	2.681	3.059	2.755	2.516	2.608		9.86

(#) = Out of Range

Primary Source Standards Concentrations (Working & Initial Calibration)

9/25/17

1ng/L Std. ID:
 4ng/L Std. ID: S31-09121704
 20ng/L Std. ID: S31-09231704
 200ng/L Std. ID: S31-09231702

Dilution Factors:		5	50	250	1000	Working STD Conc.(ng/L):	4	4	4	4	20	20	200	200	200
Source Std.		Primary Working Standards				Injection (L):	0.020	0.025	0.050	0.100	0.050	0.25	0.125	0.25	0.50
Compounds	mg/m ³	200ng/L	20ng/L	4ng/L	1ng/L	ICAL Points:	0.08ng	0.1ng	0.2ng	0.4ng	1ng	5ng	25ng	50ng	100ng
Propene	1.037	207.4	20.74	4.148	1.037		0.08296	0.1037	0.2074	0.4148	1.037	5.185	25.925	51.85	103.7
Dichlorodifluoromethane	1.048	209.6	20.96	4.192	1.048		0.08384	0.1048	0.2096	0.4192	1.048	5.240	26.200	52.40	104.8
Chloromethane	1.006	201.2	20.12	4.024	1.006		0.08048	0.1006	0.2012	0.4024	1.006	5.030	25.150	50.30	100.6
Freon-114	1.021	204.2	20.42	4.084	1.021		0.08168	0.1021	0.2042	0.4084	1.021	5.105	25.525	51.05	102.1
Vinyl Chloride	1.032	206.4	20.64	4.128	1.032		0.08256	0.1032	0.2064	0.4128	1.032	5.160	25.800	51.60	103.2
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
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	1.012	202.4	20.24	4.048	1.012		0.08096	0.1012	0.2024	0.4048	1.012	5.060	25.300	50.60	101.2
Ethanol	5.271	1054.2	105.42	21.084	5.271		0.42168	0.5271	1.0542	2.1084	5.271	26.355	131.775	263.55	527.1
Acetonitrile	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
Acrolein	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
Acetone	5.322	1064.4	106.44	21.288	5.322		0.42576	0.5322	1.0644	2.1288	5.322	26.610	133.050	266.10	532.2
Trichlorofluoromethane	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
Isopropanol	2.107	421.4	42.14	8.428	2.107		0.16856	0.2107	0.4214	0.8428	2.107	10.535	52.675	105.35	210.7
Acrylonitrile	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
1,1-Dichloroethene	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
tert-Butanol	2.120	424.0	42.40	8.480	2.120		0.16960	0.2120	0.4240	0.8480	2.120	10.600	53.000	106.00	212.0
Methylene Chloride	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
Allyl Chloride	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
Trichlorotrifluoroethane	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
Carbon Disulfide	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
trans-1,2-Dichloroethene	1.081	216.2	21.62	4.324	1.081		0.08648	0.1081	0.2162	0.4324	1.081	5.405	27.025	54.05	108.1
1,1-Dichloroethane	1.022	204.4	20.44	4.088	1.022		0.08176	0.1022	0.2044	0.4088	1.022	5.110	25.550	51.10	102.2
Methyl tert-Butyl Ether	1.070	214.0	21.40	4.280	1.070		0.08560	0.1070	0.2140	0.4280	1.070	5.350	26.750	53.50	107.0
Vinyl Acetate	5.281	1056.2	105.62	21.124	5.281		0.42248	0.5281	1.0562	2.1124	5.281	26.405	132.025	264.05	528.1
2-Butanone	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
cis-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
Diisopropyl Ether	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
Ethyl Acetate	2.136	427.2	42.72	8.544	2.136		0.17088	0.2136	0.4272	0.8544	2.136	10.680	53.400	106.80	213.6
n-Hexane	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
Chloroform	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
Tetrahydrofuran	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
Ethyl tert-Butyl Ether	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
1,2-Dichloroethane	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
1,1,1-Trichloroethane	1.077	215.4	21.54	4.308	1.077		0.08616	0.1077	0.2154	0.4308	1.077	5.385	26.925	53.85	107.7
Isopropyl Acetate	2.113	422.6	42.26	8.452	2.113		0.16904	0.2113	0.4226	0.8452	2.113	10.565	52.825	105.65	211.3
1-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
Benzene	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
Carbon Tetrachloride	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
Cyclohexane	2.135	427.0	42.70	8.540	2.135		0.17080	0.2135	0.4270	0.8540	2.135	10.675	53.375	106.75	213.5
tert-Amyl Methyl 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-Dichloropropane	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
Bromodichloromethane	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
Trichloroethene	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
1,4-Dioxane	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
Isooctane	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
Methyl Methacrylate	2.112	422.4	42.24	8.448	2.112		0.16896	0.2112	0.4224	0.8448	2.112	10.560	52.800	105.60	211.2
n-Heptane	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

Primary Source Standards Concentrations (Working & Initial Calibration)

1ng/L Std. ID:

4ng/L Std. ID: S31-09121704

20ng/L Std. ID: S31-09231704

200ng/L Std. ID: S31-09231702

Dilution Factors: 5 50 250 1000

200ng/L Std. ID: S31-09231702					Working STD Conc.(ng/L):										
Dilution Factors:		5	50	250		1000	4	4	4	4	20	20	200	200	200
	Source Std.	Primary Working Standards				Injection (L):	0.020	0.025	0.050	0.100	0.050	0.25	0.125	0.25	0.50
Compounds	mg/m ³	200ng/L	20ng/L	4ng/L	1ng/L	ICAL Points:	0.08ng	0.1ng	0.2ng	0.4ng	1ng	5ng	25ng	50ng	100ng
cis-1,3-Dichloropropene	1.120	224.0	22.40	4.480	1.120		0.08960	0.1120	0.2240	0.4480	1.120	5.600	28.000	56.00	112.0
4-Methyl-2-pentanone	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
trans-1,3-Dichloropropene	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
1,1,2-Trichloroethane	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
Toluene	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
2-Hexanone	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
Dibromochloromethane	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
1,2-Dibromoethane	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-Butyl Acetate	1.068	213.6	21.36	4.272	1.068		0.08544	0.1068	0.2136	0.4272	1.068	5.340	26.700	53.40	106.8
n-Octane	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
Tetrachloroethene	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
Chlorobenzene	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
Ethylbenzene	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
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	1.058	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
o-Xylene	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
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	1.057	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
Camphene	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
alpha-Pinene	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
n-Propylbenzene	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
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	1.049	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
2-Ethyltoluene	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
1,2,4-Trimethylbenzene	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-Decane	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
Benzyl Chloride	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
1,3-Dichlorobenzene	1.071	214.2	21.42	4.284	1.071		0.08568	0.1071	0.2142	0.4284	1.071	5.355	26.775	53.55	107.1
1,4-Dichlorobenzene	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
sec-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
p-Isopropyltoluene	1.026	205.2	20.52	4.104	1.026		0.08208	0.1026	0.2052	0.4104	1.026	5.130	25.650	51.30	102.6
1,2,3-Trimethylbenzene	1.026	205.2	20.52	4.104	1.026		0.08208	0.1026	0.2052	0.4104	1.026	5.130	25.650	51.30	102.6
1,2-Dichlorobenzene	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
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	1.051	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-Undecane	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
1,2,4-Trichlorobenzene	1.097	219.4	21.94	4.388	1.097		0.08776	0.1097	0.2194	0.4388	1.097	5.485	27.425	54.85	109.7
Naphthalene	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-Dodecane	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	
Hexachloro-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	
Methacrylonitrile	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	
Cyclohexanone	1.039	207.8	20.78	4.156	1.039	0.08312	0.1039	0.2078	0.4156	1.039	5.195	25.975	51.95	103.9	
tert-Butylbenzene	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	
n-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	

Method : I:\MS13\METHODS\R13092317.M (RTE Integrator)
 Title : EPA T0-15 per SOP VOA-T015 (CASS T0-15/GC-MS)
 Last Update : Mon Sep 25 06:36:07 2017
 Response via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	0.08	0	13	
2	0.10	0	13	I:\MS13\DATA\2017_09\23\09231727.D
3	0.20	0	13	I:\MS13\DATA\2017_09\23\09231728.D
4	0.40	0	13	I:\MS13\DATA\2017_09\23\09231729.D
5	1.0	1	13	I:\MS13\DATA\2017_09\23\09231730.D
6	5.0	5	13	I:\MS13\DATA\2017_09\23\09231731.D
7	25	26	13	I:\MS13\DATA\2017_09\23\09231732.D
8	50	52	13	I:\MS13\DATA\2017_09\23\09231733.D
9	100	104	13	I:\MS13\DATA\2017_09\23\09231734.D

#	ID	Update Time	Quant Time	Acquisition Time
1	0.08			
2	0.10	Sep 25 06:34 2017	Sep 25 06:24 2017	23 Sep 2017 16:34
3	0.20	Sep 25 06:35 2017	Sep 25 06:24 2017	23 Sep 2017 17:09
4	0.40	Sep 25 06:35 2017	Sep 25 06:25 2017	23 Sep 2017 17:44
5	1.0	Sep 25 06:35 2017	Sep 25 06:25 2017	23 Sep 2017 18:19
6	5.0	Sep 25 06:35 2017	Sep 25 06:25 2017	23 Sep 2017 18:53
7	25	Sep 25 06:35 2017	Sep 25 06:25 2017	23 Sep 2017 19:28
8	50	Sep 25 06:35 2017	Sep 25 06:25 2017	23 Sep 2017 20:03
9	100	Sep 25 06:36 2017	Sep 25 06:25 2017	23 Sep 2017 20:38

107 9/25/17

R13092317.M

Mon Sep 25 15:37:29 2017

Data File : I:\MS13\DATA\2017 09\23\09231727.D
 Acq On : 23 Sep 2017 16:34
 Sample : 0.10ng TO-15 ICAL Std
 Misc : S31-09111702/S31-09121704 (10/11)

Vial: 14
 Operator: WA
 Inst : MS13

Quant Time: Sep 25 06:24:57 2017

Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:24:19 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

WA 9/25/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.13	130	115264	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.22	114	565570	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.52	82	214612	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.97	65	141838	11.727	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	93.84%
57) Toluene-d8 (SS2)	15.65	98	567554	12.201	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.60%
73) Bromofluorobenzene (SS3)	18.91	174	214421	15.315	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	122.56%

Target Compounds

						Qvalue
2) Propene	4.39	42	1242	0.083	ng	# 87
3) Dichlorodifluoromethan...	4.54	85	2113	0.096	ng	# 87
4) Chloromethane	4.80	50	1512	0.083	ng	89
5) 1,2-Dichloro-1,1,2,2-t...	5.05	135	1025	0.083	ng	74
6) Vinyl Chloride	5.20	62	1381	0.079	ng	74
7) 1,3-Butadiene	5.45	54	1084	0.092	ng	93
8) Bromomethane	5.86	94	955	0.092	ng	94
9) Chloroethane	6.18	64	571	0.066	ng	# 43
10) Ethanol	6.49	45	3385	0.374	ng	88
11) Acetonitrile	6.77	41	1609	0.060	ng	92
12) Acrolein	6.97	56	334	0.039	ng	# 35
13) Acetone	7.17	58	4440	0.470	ng	99
14) Trichlorofluoromethane	7.38	101	1714	0.090	ng	94
15) 2-Propanol (Isopropanol)	7.65	45	5043	0.158	ng	84
16) Acrylonitrile	7.86	53	674	0.042	ng	91
17) 1,1-Dichloroethene	8.30	96	872	0.072	ng	# 79
18) 2-Methyl-2-Propanol (t...	8.51	59	4939	0.166	ng	83
19) Methylene Chloride	8.49	84	1894	0.146	ng	94
20) 3-Chloro-1-propene (Al...	8.66	41	1369	0.070	ng	85
21) Trichlorotrifluoroethane	8.92	151	1058	0.091	ng	96
22) Carbon Disulfide	8.78	76	7934	0.168	ng	95
23) trans-1,2-Dichloroethene	9.73	61	1153	0.068	ng	90
24) 1,1-Dichloroethane	9.96	63	1808	0.084	ng	84
25) Methyl tert-Butyl Ether	10.13	73	2973	0.081	ng	83
26) Vinyl Acetate	10.23	86	676	0.279	ng	# 1
27) 2-Butanone (MEK)	10.51	72	365	0.042	ng	# 1
28) cis-1,2-Dichloroethene	10.95	61	1312	0.081	ng	93
29) Diisopropyl Ether	11.29	87	914	0.077	ng	# 58
30) Ethyl Acetate	11.29	61	563	0.127	ng	86
31) n-Hexane	11.25	57	1860	0.085	ng	# 87
32) Chloroform	11.29	83	1707	0.085	ng	94
34) Tetrahydrofuran (THF)	11.76	72	990	0.102	ng	93
35) Ethyl tert-Butyl Ether	11.87	87	1168	0.079	ng	94
36) 1,2-Dichloroethane	12.08	62	1064	0.074	ng	74
38) 1,1,1-Trichloroethane	12.37	97	1595	0.090	ng	86
39) Isopropyl Acetate	12.81	61	1335	0.167	ng	# 90
40) 1-Butanol	12.84	56	1432	0.108	ng	# 65
41) Benzene	12.84	78	5006	0.098	ng	92
42) Carbon Tetrachloride	13.00	117	1373	0.088	ng	99
43) Cyclohexane	13.13	84	3442	0.181	ng	99
44) tert-Amyl Methyl Ether	13.50	73	3117	0.088	ng	91
45) 1,2-Dichloropropane	13.68	63	949	0.078	ng	100
46) Bromodichloromethane	13.86	83	1330	0.085	ng	88
47) Trichloroethene	13.92	130	1340	0.090	ng	95
48) 1,4-Dioxane	13.93	88	723	0.068	ng	98
49) 2,2,4-Trimethylpentane...	13.99	57	4575	0.087	ng	95
50) Methyl Methacrylate	14.14	100	708	0.139	ng	# 73

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Data File : I:\MS13\DATA\2017 09\23\09231727.D
 Acq On : 23 Sep 2017 16:34
 Sample : 0.10ng TO-15 ICAL Std
 Misc : S31-09111702/S31-09121704 (10/11)

Vial: 14
 Operator: WA
 Inst : MS13

Quant Time: Sep 25 06:24:57 2017

Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:24:19 2017

Response via : Initial Calibration

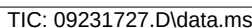
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev	(Min)
51) n-Heptane	14.25	71	1169	0.094	ng	#	87
52) cis-1,3-Dichloropropene	14.78	75	1531	0.079	ng		90
53) 4-Methyl-2-pentanone	14.83	58	823	0.068	ng	#	75
54) trans-1,3-Dichloropropene	15.29	75	1128	0.068	ng		80
55) 1,1,2-Trichloroethane	15.46	97	993	0.083	ng		94
58) Toluene	15.75	91	4760	0.089	ng		100
59) 2-Hexanone	16.01	43	1955	0.068	ng		86
60) Dibromochloromethane	16.16	129	1095	0.076	ng		95
61) 1,2-Dibromoethane	16.41	107	988	0.074	ng		100
62) n-Butyl Acetate	16.63	43	2261	0.072	ng		96
63) n-Octane	16.75	57	885	0.077	ng	#	91
64) Tetrachloroethene	16.89	166	1431	0.093	ng		92
65) Chlorobenzene	17.56	112	3221	0.091	ng		100
66) Ethylbenzene	17.92	91	5041	0.087	ng		99
67) m- & p-Xylenes	18.08	91	7990	0.178	ng		98
68) Bromoform	18.14	173	1027	0.080	ng		78
69) Styrene	18.40	104	3042	0.082	ng		96
70) o-Xylene	18.51	91	3967	0.087	ng		95
71) n-Nonane	18.71	43	1865	0.070	ng		90
72) 1,1,2,2-Tetrachloroethane	18.49	83	1751	0.088	ng		96
74) Cumene	19.04	105	5167	0.088	ng		98
75) alpha-Pinene	19.38	93	2413	0.078	ng		81
76) n-Propylbenzene	19.49	91	6073	0.089	ng		95
77) 3-Ethyltoluene	19.58	105	5381	0.090	ng		100
78) 4-Ethyltoluene	19.62	105	4835	0.088	ng		96
79) 1,3,5-Trimethylbenzene	19.68	105	4288	0.088	ng		95
80) alpha-Methylstyrene	19.82	118	1985	0.072	ng		91
81) 2-Ethyltoluene	19.85	105	5066	0.088	ng		99
82) 1,2,4-Trimethylbenzene	20.05	105	4024	0.083	ng		100
83) n-Decane	20.14	57	1771	0.065	ng		96
84) Benzyl Chloride	20.16	91	2856	0.073	ng		92
85) 1,3-Dichlorobenzene	20.18	146	2757	0.091	ng		98
86) 1,4-Dichlorobenzene	20.24	146	2846	0.094	ng		99
87) sec-Butylbenzene	20.29	105	5827	0.089	ng		99
88) 4-Isopropyltoluene (p-...	20.43	119	5540	0.089	ng		99
89) 1,2,3-Trimethylbenzene	20.43	105	3954	0.081	ng		98
90) 1,2-Dichlorobenzene	20.54	146	2666	0.094	ng		99
91) d-Limonene	20.55	68	1403	0.069	ng		92
92) 1,2-Dibromo-3-Chloropr...	20.93	157	799	0.077	ng		92
93) n-Undecane	21.24	57	915	0.031	ng		88
94) 1,2,4-Trichlorobenzene	22.05	180	1591	0.073	ng		93
95) Naphthalene	22.16	128	3651	0.055	ng		94
96) n-Dodecane	22.15	57	370	0.013	ng	#	59
97) Hexachlorobutadiene	22.47	225	1368	0.094	ng		91
98) Cyclohexanone	18.23	55	1287	0.070	ng		96
99) tert-Butylbenzene	20.04	119	4331	0.089	ng		99
100) n-Butylbenzene	20.80	91	4299	0.083	ng		96

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

Vial: 14
Operator: WA
Inst : MS13

Quant Time: Sep 25 06:24:57 2017



Data File : I:\MS13\DATA\2017 09\23\09231728.D
 Acq On : 23 Sep 2017 17:09
 Sample : 0.20ng TO-15 ICAL Std
 Misc : S31-09111702/S31-09121704 (10/11)

Vial: 14
 Operator: WA
 Inst : MS13

Quant Time: Sep 25 06:24:59 2017

Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:24:19 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

WA 9/25/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.13	130	114459	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.23	114	565013	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.52	82	214110	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.97	65	143200	11.923	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	95.36%	
57) Toluene-d8 (SS2)	15.65	98	565299	12.181	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.44%	
73) Bromofluorobenzene (SS3)	18.91	174	216550	15.504	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	124.00%	

Target Compounds

						Qvalue
2) Propene	4.39	42	2607	0.176	ng	94
3) Dichlorodifluoromethan...	4.54	85	3968	0.182	ng	# 91
4) Chloromethane	4.80	50	2809	0.156	ng	97
5) 1,2-Dichloro-1,1,2,2-t...	5.05	135	1998	0.162	ng	82
6) Vinyl Chloride	5.20	62	2620	0.152	ng	95
7) 1,3-Butadiene	5.45	54	1953	0.167	ng	94
8) Bromomethane	5.86	94	1840	0.179	ng	95
9) Chloroethane	6.17	64	1369	0.159	ng	73
10) Ethanol	6.49	45	7793	0.867	ng	88
11) Acetonitrile	6.75	41	3225	0.122	ng	85
12) Acrolein	6.95	56	1099	0.130	ng	97
13) Acetone	7.16	58	8551	0.912	ng	98
14) Trichlorofluoromethane	7.38	101	3392	0.179	ng	100
15) 2-Propanol (Isopropanol)	7.63	45	10067	0.318	ng	94
16) Acrylonitrile	7.86	53	1851	0.115	ng	100
17) 1,1-Dichloroethene	8.30	96	2196	0.184	ng	93
18) 2-Methyl-2-Propanol (t...	8.49	59	10309	0.348	ng	94
19) Methylene Chloride	8.50	84	2904	0.226	ng	99
20) 3-Chloro-1-propene (Al...	8.66	41	2692	0.139	ng	92
21) Trichlorotrifluoroethane	8.91	151	1984	0.172	ng	97
22) Carbon Disulfide	8.77	76	11494	0.246	ng	95
23) trans-1,2-Dichloroethene	9.73	61	2555	0.152	ng	97
24) 1,1-Dichloroethane	9.97	63	3552	0.167	ng	95
25) Methyl tert-Butyl Ether	10.12	73	6260	0.172	ng	96
26) Vinyl Acetate	10.23	86	1738	0.721	ng	# 64
27) 2-Butanone (MEK)	10.50	72	1162	0.133	ng	# 61
28) cis-1,2-Dichloroethene	10.97	61	2477	0.153	ng	93
29) Diisopropyl Ether	11.29	87	2074	0.177	ng	# 91
30) Ethyl Acetate	11.29	61	1338	0.304	ng	94
31) n-Hexane	11.25	57	3462	0.159	ng	# 95
32) Chloroform	11.30	83	3339	0.168	ng	100
34) Tetrahydrofuran (THF)	11.75	72	1597	0.165	ng	# 88
35) Ethyl tert-Butyl Ether	11.87	87	2526	0.173	ng	98
36) 1,2-Dichloroethane	12.09	62	2307	0.162	ng	92
38) 1,1,1-Trichloroethane	12.37	97	3026	0.170	ng	97
39) Isopropyl Acetate	12.80	61	2552	0.319	ng	99
40) 1-Butanol	12.83	56	3462	0.261	ng	91
41) Benzene	12.84	78	9091	0.178	ng	98
42) Carbon Tetrachloride	12.99	117	2762	0.178	ng	98
43) Cyclohexane	13.12	84	6704	0.352	ng	98
44) tert-Amyl Methyl Ether	13.49	73	6109	0.172	ng	98
45) 1,2-Dichloropropane	13.68	63	1965	0.162	ng	96
46) Bromodichloromethane	13.87	83	2705	0.172	ng	94
47) Trichloroethene	13.92	130	2685	0.180	ng	97
48) 1,4-Dioxane	13.92	88	1645	0.154	ng	91
49) 2,2,4-Trimethylpentane...	13.99	57	8715	0.165	ng	97
50) Methyl Methacrylate	14.13	100	1566	0.308	ng	# 84

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Data File : I:\MS13\DATA\2017 09\23\09231728.D
 Acq On : 23 Sep 2017 17:09
 Sample : 0.20ng TO-15 ICAL Std
 Misc : S31-09111702/S31-09121704 (10/11)

Vial: 14
 Operator: WA
 Inst : MS13

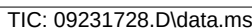
Quant Time: Sep 25 06:24:59 2017
 Quant Method : I:\MS13\METHODS\R13092317.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Mon Sep 25 06:24:19 2017
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.26	71	2307	0.185	ng	92
52) cis-1,3-Dichloropropene	14.77	75	3141	0.163	ng	95
53) 4-Methyl-2-pentanone	14.83	58	1774	0.146	ng #	94
54) trans-1,3-Dichloropropene	15.30	75	2421	0.146	ng	86
55) 1,1,2-Trichloroethane	15.46	97	2036	0.171	ng	99
58) Toluene	15.75	91	9024	0.168	ng	98
59) 2-Hexanone	16.01	43	4179	0.145	ng	88
60) Dibromochloromethane	16.16	129	2270	0.158	ng	98
61) 1,2-Dibromoethane	16.41	107	2134	0.161	ng	100
62) n-Butyl Acetate	16.63	43	4507	0.143	ng	95
63) n-Octane	16.75	57	1821	0.159	ng	95
64) Tetrachloroethene	16.89	166	2805	0.182	ng	95
65) Chlorobenzene	17.56	112	6227	0.176	ng	98
66) Ethylbenzene	17.92	91	10100	0.174	ng	100
67) m- & p-Xylenes	18.09	91	15696	0.350	ng	100
68) Bromoform	18.14	173	2105	0.164	ng	97
69) Styrene	18.41	104	6269	0.169	ng	94
70) o-Xylene	18.51	91	7657	0.168	ng	99
71) n-Nonane	18.71	43	4138	0.156	ng	99
72) 1,1,2,2-Tetrachloroethane	18.49	83	3397	0.172	ng	98
74) Cumene	19.04	105	10385	0.178	ng	100
75) alpha-Pinene	19.39	93	4803	0.156	ng	81
76) n-Propylbenzene	19.49	91	11831	0.174	ng	99
77) 3-Ethyltoluene	19.58	105	10186	0.171	ng	98
78) 4-Ethyltoluene	19.62	105	9534	0.174	ng	99
79) 1,3,5-Trimethylbenzene	19.69	105	8194	0.169	ng	97
80) alpha-Methylstyrene	19.82	118	3872	0.141	ng	94
81) 2-Ethyltoluene	19.86	105	9733	0.170	ng	98
82) 1,2,4-Trimethylbenzene	20.05	105	8057	0.166	ng	99
83) n-Decane	20.14	57	3663	0.135	ng	93
84) Benzyl Chloride	20.16	91	5567	0.143	ng	93
85) 1,3-Dichlorobenzene	20.19	146	5457	0.180	ng	99
86) 1,4-Dichlorobenzene	20.24	146	5551	0.183	ng	98
87) sec-Butylbenzene	20.28	105	11624	0.179	ng	97
88) 4-Isopropyltoluene (p-...	20.42	119	10801	0.174	ng	96
89) 1,2,3-Trimethylbenzene	20.42	105	7736	0.158	ng	98
90) 1,2-Dichlorobenzene	20.54	146	5077	0.179	ng	96
91) d-Limonene	20.55	68	2622	0.129	ng	96
92) 1,2-Dibromo-3-Chloropr...	20.93	157	1512	0.146	ng	89
93) n-Undecane	21.24	57	1765	0.060	ng	99
94) 1,2,4-Trichlorobenzene	22.05	180	2900	0.133	ng	98
95) Naphthalene	22.15	128	7031	0.106	ng	97
96) n-Dodecane	22.15	57	657	0.023	ng #	65
97) Hexachlorobutadiene	22.47	225	2723	0.188	ng	96
98) Cyclohexanone	18.22	55	2466	0.135	ng	97
99) tert-Butylbenzene	20.05	119	8549	0.176	ng	97
100) n-Butylbenzene	20.79	91	8226	0.159	ng	100

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

Vial: 14
Operator: WA
Inst : MS13

Quant Time: Sep 25 06:24:59 2017



Data File : I:\MS13\DATA\2017 09\23\09231729.D
 Acq On : 23 Sep 2017 17:44
 Sample : 0.40ng TO-15 ICAL Std
 Misc : S31-09111702/S31-09121704 (10/11)

Vial: 14
 Operator: WA
 Inst : MS13

Quant Time: Sep 25 06:25:01 2017

Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:24:19 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

WA 9/25/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.13	130	105858	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.23	114	519000	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.52	82	196852	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.97	65	133640	12.031	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	96.24%	
57) Toluene-d8 (SS2)	15.65	98	519134	12.167	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.36%	
73) Bromofluorobenzene (SS3)	18.91	174	196647	15.313	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	122.48%	

Target Compounds

						Qvalue
2) Propene	4.38	42	4681	0.341	ng	98
3) Dichlorodifluoromethan...	4.53	85	7608	0.378	ng	98
4) Chloromethane	4.79	50	5400	0.324	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	5.05	135	4297	0.377	ng	94
6) Vinyl Chloride	5.19	62	5138	0.322	ng	97
7) 1,3-Butadiene	5.45	54	3911	0.362	ng	99
8) Bromomethane	5.86	94	3451	0.363	ng	94
9) Chloroethane	6.17	64	2760	0.346	ng	99
10) Ethanol	6.48	45	14451	1.738	ng	89
11) Acetonitrile	6.74	41	6653	0.272	ng	93
12) Acrolein	6.94	56	2458	0.315	ng	95
13) Acetone	7.15	58	16801	1.937	ng	95
14) Trichlorofluoromethane	7.38	101	6570	0.374	ng	100
15) 2-Propanol (Isopropanol)	7.61	45	19680	0.671	ng	99
16) Acrylonitrile	7.85	53	4422	0.298	ng	95
17) 1,1-Dichloroethene	8.29	96	4138	0.374	ng	97
18) 2-Methyl-2-Propanol (t...	8.47	59	20310	0.742	ng	98
19) Methylene Chloride	8.49	84	4795	0.404	ng	100
20) 3-Chloro-1-propene (Al...	8.66	41	5640	0.315	ng	95
21) Trichlorotrifluoroethane	8.91	151	4115	0.385	ng	100
22) Carbon Disulfide	8.77	76	18960	0.438	ng	99
23) trans-1,2-Dichloroethene	9.73	61	5216	0.337	ng	98
24) 1,1-Dichloroethane	9.96	63	6611	0.336	ng	97
25) Methyl tert-Butyl Ether	10.10	73	12340	0.366	ng	96
26) Vinyl Acetate	10.22	86	3863	1.733	ng	# 83
27) 2-Butanone (MEK)	10.50	72	2584	0.320	ng	# 80
28) cis-1,2-Dichloroethene	10.96	61	5074	0.340	ng	94
29) Diisopropyl Ether	11.27	87	4207	0.388	ng	# 95
30) Ethyl Acetate	11.28	61	2674	0.656	ng	99
31) n-Hexane	11.26	57	7007	0.349	ng	98
32) Chloroform	11.29	83	6707	0.364	ng	98
34) Tetrahydrofuran (THF)	11.73	72	3071	0.344	ng	94
35) Ethyl tert-Butyl Ether	11.86	87	5004	0.370	ng	99
36) 1,2-Dichloroethane	12.08	62	4690	0.356	ng	96
38) 1,1,1-Trichloroethane	12.37	97	6298	0.386	ng	97
39) Isopropyl Acetate	12.80	61	5018	0.684	ng	98
40) 1-Butanol	12.82	56	7337	0.602	ng	91
41) Benzene	12.84	78	16997	0.362	ng	99
42) Carbon Tetrachloride	13.00	117	5274	0.370	ng	94
43) Cyclohexane	13.13	84	13201	0.755	ng	98
44) tert-Amyl Methyl Ether	13.48	73	11890	0.364	ng	98
45) 1,2-Dichloropropane	13.68	63	3898	0.349	ng	95
46) Bromodichloromethane	13.86	83	5101	0.353	ng	95
47) Trichloroethene	13.92	130	5000	0.365	ng	99
48) 1,4-Dioxane	13.92	88	3534	0.361	ng	99
49) 2,2,4-Trimethylpentane...	13.99	57	17189	0.355	ng	99
50) Methyl Methacrylate	14.13	100	3544	0.758	ng	98

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Data File : I:\MS13\DATA\2017 09\23\09231729.D
 Acq On : 23 Sep 2017 17:44
 Sample : 0.40ng TO-15 ICAL Std
 Misc : S31-09111702/S31-09121704 (10/11)

Vial: 14
 Operator: WA
 Inst : MS13

Quant Time: Sep 25 06:25:01 2017

Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:24:19 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.25	71	4081	0.356	ng	94
52) cis-1,3-Dichloropropene	14.78	75	6688	0.377	ng	98
53) 4-Methyl-2-pentanone	14.82	58	3715	0.332	ng	98
54) trans-1,3-Dichloropropene	15.30	75	5167	0.338	ng	97
55) 1,1,2-Trichloroethane	15.46	97	4020	0.368	ng	94
58) Toluene	15.75	91	17666	0.358	ng	99
59) 2-Hexanone	16.01	43	8056	0.304	ng	96
60) Dibromochloromethane	16.16	129	4907	0.372	ng	99
61) 1,2-Dibromoethane	16.41	107	4449	0.365	ng	100
62) n-Butyl Acetate	16.63	43	9143	0.316	ng	98
63) n-Octane	16.76	57	3425	0.326	ng	99
64) Tetrachloroethene	16.89	166	5500	0.389	ng	93
65) Chlorobenzene	17.56	112	12611	0.388	ng	97
66) Ethylbenzene	17.92	91	19656	0.369	ng	95
67) m- & p-Xylenes	18.09	91	30359	0.736	ng	98
68) Bromoform	18.14	173	4251	0.361	ng	98
69) Styrene	18.41	104	12006	0.352	ng	97
70) o-Xylene	18.51	91	15118	0.362	ng	99
71) n-Nonane	18.71	43	7888	0.323	ng	96
72) 1,1,2,2-Tetrachloroethane	18.49	83	6642	0.365	ng	98
74) Cumene	19.04	105	19884	0.371	ng	100
75) alpha-Pinene	19.39	93	9755	0.345	ng	92
76) n-Propylbenzene	19.49	91	22994	0.367	ng	100
77) 3-Ethyltoluene	19.58	105	19972	0.365	ng	100
78) 4-Ethyltoluene	19.62	105	18022	0.358	ng	98
79) 1,3,5-Trimethylbenzene	19.69	105	15578	0.350	ng	99
80) alpha-Methylstyrene	19.82	118	8106	0.320	ng	91
81) 2-Ethyltoluene	19.86	105	19535	0.371	ng	99
82) 1,2,4-Trimethylbenzene	20.05	105	15616	0.350	ng	98
83) n-Decane	20.14	57	7505	0.300	ng	99
84) Benzyl Chloride	20.16	91	11844	0.331	ng	99
85) 1,3-Dichlorobenzene	20.19	146	10390	0.373	ng	100
86) 1,4-Dichlorobenzene	20.24	146	10520	0.377	ng	98
87) sec-Butylbenzene	20.29	105	22319	0.373	ng	99
88) 4-Isopropyltoluene (p-...	20.42	119	21211	0.371	ng	98
89) 1,2,3-Trimethylbenzene	20.42	105	15364	0.342	ng	99
90) 1,2-Dichlorobenzene	20.54	146	10125	0.389	ng	98
91) d-Limonene	20.55	68	5334	0.286	ng	99
92) 1,2-Dibromo-3-Chloropr...	20.93	157	3351	0.351	ng	97
93) n-Undecane	21.24	57	3663	0.136	ng	95
94) 1,2,4-Trichlorobenzene	22.05	180	5474	0.273	ng	93
95) Naphthalene	22.15	128	12837	0.210	ng	98
96) n-Dodecane	22.15	57	1284	0.049	ng	92
97) Hexachlorobutadiene	22.47	225	5381	0.405	ng	97
98) Cyclohexanone	18.22	55	5136	0.305	ng	96
99) tert-Butylbenzene	20.05	119	16766	0.376	ng	99
100) n-Butylbenzene	20.79	91	16107	0.338	ng	100

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

Data File : I:\MS13\DATA\2017 09\23\09231729.D
Acq On : 23 Sep 2017 17:44
Sample : 0.40ng TO-15 ICAL Std
Misc : S31-09111702/S31-09121704 (10/11)

Vial: 14
Operator: WA
Inst : MS13

Quant Time: Sep 25 06:25:01 2017

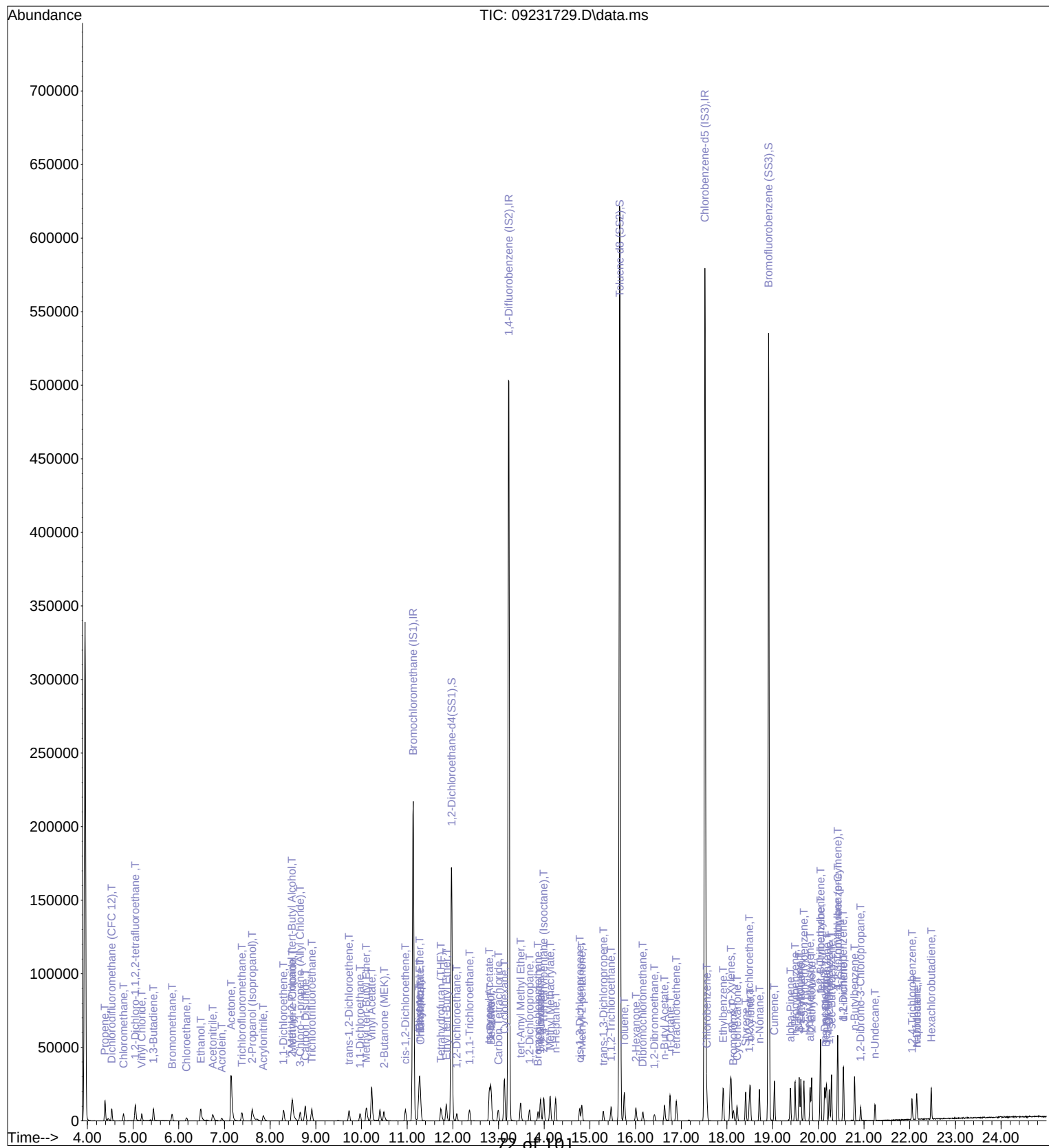
Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:24:19 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2017 09\23\09231730.D
 Acq On : 23 Sep 2017 18:19
 Sample : 1.0ng TO-15 ICAL Std
 Misc : S31-09111702/S31-09231704 (10/22)

Vial: 15
 Operator: WA
 Inst : MS13

Quant Time: Sep 25 06:25:03 2017

Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:24:19 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

9/25/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.13	130	112231	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.23	114	542501	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.52	82	206075	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.97	65	141467	12.012	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	96.08%	
57) Toluene-d8 (SS2)	15.66	98	541518	12.124	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	96.96%	
73) Bromofluorobenzene (SS3)	18.91	174	208410	15.503	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	124.00%	

Target Compounds

						Qvalue
2) Propene	4.37	42	12488	0.859	ng	97
3) Dichlorodifluoromethan...	4.52	85	21344	1.001	ng	99
4) Chloromethane	4.78	50	15580	0.882	ng	98
5) 1,2-Dichloro-1,1,2,2-t...	5.04	135	11312	0.937	ng	99
6) Vinyl Chloride	5.18	62	14646	0.865	ng	99
7) 1,3-Butadiene	5.43	54	10987	0.960	ng	99
8) Bromomethane	5.84	94	9722	0.964	ng	100
9) Chloroethane	6.16	64	7874	0.932	ng	98
10) Ethanol	6.48	45	40942	4.644	ng	99
11) Acetonitrile	6.74	41	19964	0.770	ng	99
12) Acrolein	6.93	56	6508	0.787	ng	98
13) Acetone	7.13	58	41844	4.551	ng	98
14) Trichlorofluoromethane	7.38	101	18516	0.995	ng	100
15) 2-Propanol (Isopropanol)	7.59	45	55380	1.782	ng	100
16) Acrylonitrile	7.85	53	13651	0.868	ng	99
17) 1,1-Dichloroethene	8.30	96	11146	0.951	ng	99
18) 2-Methyl-2-Propanol (t...	8.45	59	56036	1.930	ng	99
19) Methylene Chloride	8.49	84	11946	0.949	ng	99
20) 3-Chloro-1-propene (Al...	8.66	41	14993	0.790	ng	100
21) Trichlorotrifluoroethane	8.91	151	11233	0.992	ng	94
22) Carbon Disulfide	8.76	76	44453	0.969	ng	100
23) trans-1,2-Dichloroethene	9.72	61	15011	0.914	ng	100
24) 1,1-Dichloroethane	9.97	63	18786	0.902	ng	99
25) Methyl tert-Butyl Ether	10.10	73	33893	0.947	ng	100
26) Vinyl Acetate	10.22	86	11622	4.919	ng	# 91
27) 2-Butanone (MEK)	10.48	72	7195	0.841	ng	# 88
28) cis-1,2-Dichloroethene	10.96	61	14377	0.908	ng	100
29) Diisopropyl Ether	11.27	87	11770	1.024	ng	# 94
30) Ethyl Acetate	11.27	61	7926	1.834	ng	98
31) n-Hexane	11.25	57	18804	0.883	ng	99
32) Chloroform	11.30	83	19179	0.982	ng	97
34) Tetrahydrofuran (THF)	11.73	72	8061	0.851	ng	99
35) Ethyl tert-Butyl Ether	11.85	87	13987	0.975	ng	100
36) 1,2-Dichloroethane	12.09	62	13180	0.943	ng	98
38) 1,1,1-Trichloroethane	12.37	97	17164	1.006	ng	99
39) Isopropyl Acetate	12.79	61	14076	1.835	ng	99
40) 1-Butanol	12.81	56	20929	1.643	ng	95
41) Benzene	12.84	78	45426	0.925	ng	100
42) Carbon Tetrachloride	12.99	117	14850	0.997	ng	98
43) Cyclohexane	13.13	84	35722	1.954	ng	100
44) tert-Amyl Methyl Ether	13.48	73	32347	0.947	ng	99
45) 1,2-Dichloropropane	13.68	63	10980	0.941	ng	99
46) Bromodichloromethane	13.86	83	14212	0.942	ng	98
47) Trichloroethene	13.92	130	13995	0.977	ng	100
48) 1,4-Dioxane	13.91	88	9901	0.967	ng	97
49) 2,2,4-Trimethylpentane...	13.99	57	47025	0.929	ng	99
50) Methyl Methacrylate	14.12	100	10038	2.054	ng	100

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Data File : I:\MS13\DATA\2017 09\23\09231730.D
 Acq On : 23 Sep 2017 18:19
 Sample : 1.0ng TO-15 ICAL Std
 Misc : S31-09111702/S31-09231704 (10/22)

Vial: 15
 Operator: WA
 Inst : MS13

Quant Time: Sep 25 06:25:03 2017

Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:24:19 2017

Response via : Initial Calibration

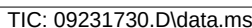
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.25	71	11439	0.954	ng	99
52) cis-1,3-Dichloropropene	14.78	75	18572	1.003	ng	98
53) 4-Methyl-2-pentanone	14.82	58	10387	0.888	ng	99
54) trans-1,3-Dichloropropene	15.29	75	15187	0.951	ng	100
55) 1,1,2-Trichloroethane	15.46	97	11142	0.976	ng	100
58) Toluene	15.75	91	47896	0.928	ng	99
59) 2-Hexanone	16.00	43	23515	0.848	ng	97
60) Dibromochloromethane	16.16	129	13623	0.986	ng	100
61) 1,2-Dibromoethane	16.41	107	12710	0.995	ng	97
62) n-Butyl Acetate	16.63	43	26457	0.872	ng	100
63) n-Octane	16.75	57	9348	0.849	ng	99
64) Tetrachloroethene	16.89	166	15526	1.049	ng	99
65) Chlorobenzene	17.56	112	33308	0.979	ng	99
66) Ethylbenzene	17.92	91	53079	0.951	ng	100
67) m- & p-Xylenes	18.08	91	85227	1.973	ng	99
68) Bromoform	18.14	173	12377	1.004	ng	99
69) Styrene	18.41	104	34504	0.967	ng	99
70) o-Xylene	18.51	91	42324	0.967	ng	99
71) n-Nonane	18.71	43	22008	0.862	ng	99
72) 1,1,2,2-Tetrachloroethane	18.49	83	18904	0.993	ng	99
74) Cumene	19.04	105	55863	0.995	ng	100
75) alpha-Pinene	19.39	93	28261	0.955	ng	97
76) n-Propylbenzene	19.49	91	64679	0.987	ng	99
77) 3-Ethyltoluene	19.58	105	56689	0.991	ng	99
78) 4-Ethyltoluene	19.62	105	51661	0.980	ng	100
79) 1,3,5-Trimethylbenzene	19.69	105	45683	0.981	ng	100
80) alpha-Methylstyrene	19.82	118	25788	0.973	ng	92
81) 2-Ethyltoluene	19.85	105	54511	0.989	ng	100
82) 1,2,4-Trimethylbenzene	20.05	105	46031	0.984	ng	99
83) n-Decane	20.14	57	23478	0.898	ng	98
84) Benzyl Chloride	20.16	91	34281	0.914	ng	100
85) 1,3-Dichlorobenzene	20.18	146	29936	1.026	ng	99
86) 1,4-Dichlorobenzene	20.24	146	29996	1.026	ng	99
87) sec-Butylbenzene	20.29	105	62119	0.992	ng	99
88) 4-Isopropyltoluene (p-...	20.42	119	59969	1.003	ng	100
89) 1,2,3-Trimethylbenzene	20.42	105	45217	0.962	ng	100
90) 1,2-Dichlorobenzene	20.54	146	29029	1.065	ng	100
91) d-Limonene	20.55	68	16857	0.864	ng	99
92) 1,2-Dibromo-3-Chloropr...	20.93	157	9835	0.984	ng	97
93) n-Undecane	21.24	57	24001	0.854	ng	100
94) 1,2,4-Trichlorobenzene	22.05	180	22169	1.057	ng	99
95) Naphthalene	22.16	128	64321	1.007	ng	99
96) n-Dodecane	22.15	57	21504	0.781	ng	98
97) Hexachlorobutadiene	22.47	225	15208	1.093	ng	99
98) Cyclohexanone	18.22	55	15184	0.862	ng	99
99) tert-Butylbenzene	20.05	119	47144	1.010	ng	99
100) n-Butylbenzene	20.79	91	48255	0.968	ng	100

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

Vial: 15
Operator: WA
Inst : MS13

Quant Time: Sep 25 06:25:03 2017



Data File : I:\MS13\DATA\2017 09\23\09231731.D
 Acq On : 23 Sep 2017 18:53
 Sample : 5.0ng TO-15 ICAL Std
 Misc : S31-09111702/S31-09231704 (10/22)

Vial: 15
 Operator: WA
 Inst : MS13

Quant Time: Sep 25 06:25:05 2017

Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:24:19 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

WA 9/25/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.14	130	104411	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.23	114	509220	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.52	82	195452	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.97	65	133980	12.229	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.84%	
57) Toluene-d8 (SS2)	15.66	98	507198	11.973	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	95.76%	
73) Bromofluorobenzene (SS3)	18.91	174	196264	15.393	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	123.12%	

Target Compounds

						Qvalue
2) Propene	4.36	42	56086	4.147	ng	100
3) Dichlorodifluoromethan...	4.52	85	95009	4.790	ng	100
4) Chloromethane	4.77	50	66972	4.076	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	5.04	135	50792	4.521	ng	99
6) Vinyl Chloride	5.18	62	65316	4.146	ng	99
7) 1,3-Butadiene	5.43	54	50325	4.725	ng	99
8) Bromomethane	5.84	94	39092	4.166	ng	99
9) Chloroethane	6.16	64	34527	4.393	ng	98
10) Ethanol	6.50	45	178722	21.789	ng	99
11) Acetonitrile	6.75	41	94357	3.912	ng	99
12) Acrolein	6.93	56	31408	4.085	ng	97
13) Acetone	7.13	58	186097	21.756	ng	100
14) Trichlorofluoromethane	7.38	101	81885	4.730	ng	99
15) 2-Propanol (Isopropanol)	7.60	45	251246	8.691	ng	100
16) Acrylonitrile	7.85	53	66155	4.521	ng	98
17) 1,1-Dichloroethene	8.30	96	50103	4.594	ng	99
18) 2-Methyl-2-Propanol (t...	8.45	59	255693	9.465	ng	100
19) Methylene Chloride	8.50	84	50418	4.304	ng	100
20) 3-Chloro-1-propene (Al...	8.66	41	73775	4.180	ng	99
21) Trichlorotrifluoroethane	8.91	151	51098	4.852	ng	99
22) Carbon Disulfide	8.76	76	188929	4.428	ng	100
23) trans-1,2-Dichloroethene	9.73	61	70420	4.607	ng	99
24) 1,1-Dichloroethane	9.98	63	83881	4.327	ng	100
25) Methyl tert-Butyl Ether	10.08	73	154728	4.648	ng	99
26) Vinyl Acetate	10.22	86	55689	25.333	ng	# 92
27) 2-Butanone (MEK)	10.47	72	35051	4.406	ng	98
28) cis-1,2-Dichloroethene	10.97	61	66198	4.496	ng	99
29) Diisopropyl Ether	11.26	87	51925	4.854	ng	# 91
30) Ethyl Acetate	11.27	61	37002	9.202	ng	98
31) n-Hexane	11.25	57	82501	4.163	ng	100
32) Chloroform	11.30	83	83567	4.598	ng	99
34) Tetrahydrofuran (THF)	11.72	72	34882	3.957	ng	99
35) Ethyl tert-Butyl Ether	11.85	87	63058	4.727	ng	99
36) 1,2-Dichloroethane	12.09	62	60802	4.676	ng	100
38) 1,1,1-Trichloroethane	12.37	97	77779	4.858	ng	99
39) Isopropyl Acetate	12.79	61	63475	8.815	ng	100
40) 1-Butanol	12.80	56	103455	8.654	ng	99
41) Benzene	12.84	78	200766	4.355	ng	100
42) Carbon Tetrachloride	13.00	117	68916	4.930	ng	100
43) Cyclohexane	13.13	84	158942	9.263	ng	99
44) tert-Amyl Methyl Ether	13.48	73	146289	4.564	ng	99
45) 1,2-Dichloropropane	13.68	63	49373	4.506	ng	100
46) Bromodichloromethane	13.87	83	66269	4.679	ng	99
47) Trichloroethene	13.92	130	61351	4.564	ng	99
48) 1,4-Dioxane	13.90	88	43941	4.572	ng	99
49) 2,2,4-Trimethylpentane...	13.99	57	207805	4.372	ng	99
50) Methyl Methacrylate	14.13	100	45432	9.903	ng	99

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Data File : I:\MS13\DATA\2017 09\23\09231731.D
 Acq On : 23 Sep 2017 18:53
 Sample : 5.0ng TO-15 ICAL Std
 Misc : S31-09111702/S31-09231704 (10/22)

Vial: 15
 Operator: WA
 Inst : MS13

Quant Time: Sep 25 06:25:05 2017

Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:24:19 2017

Response via : Initial Calibration

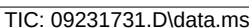
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.25	71	51063	4.537	ng	99
52) cis-1,3-Dichloropropene	14.77	75	87226	5.017	ng	99
53) 4-Methyl-2-pentanone	14.81	58	46977	4.281	ng	98
54) trans-1,3-Dichloropropene	15.29	75	73977	4.934	ng	100
55) 1,1,2-Trichloroethane	15.46	97	50329	4.696	ng	99
58) Toluene	15.75	91	211438	4.318	ng	99
59) 2-Hexanone	16.00	43	110744	4.211	ng	98
60) Dibromochloromethane	16.16	129	63587	4.855	ng	99
61) 1,2-Dibromoethane	16.41	107	57895	4.778	ng	99
62) n-Butyl Acetate	16.63	43	122487	4.257	ng	99
63) n-Octane	16.75	57	42766	4.095	ng	99
64) Tetrachloroethene	16.89	166	69222	4.930	ng	98
65) Chlorobenzene	17.56	112	150140	4.652	ng	100
66) Ethylbenzene	17.92	91	240501	4.544	ng	99
67) m- & p-Xylenes	18.08	91	371658	9.073	ng	98
68) Bromoform	18.14	173	57926	4.954	ng	99
69) Styrene	18.41	104	160650	4.749	ng	100
70) o-Xylene	18.51	91	187982	4.529	ng	99
71) n-Nonane	18.71	43	99206	4.097	ng	99
72) 1,1,2,2-Tetrachloroethane	18.49	83	86970	4.819	ng	100
74) Cumene	19.04	105	251198	4.719	ng	100
75) alpha-Pinene	19.39	93	128022	4.561	ng	99
76) n-Propylbenzene	19.49	91	294044	4.730	ng	100
77) 3-Ethyltoluene	19.58	105	254822	4.696	ng	100
78) 4-Ethyltoluene	19.62	105	235218	4.705	ng	100
79) 1,3,5-Trimethylbenzene	19.69	105	207592	4.700	ng	99
80) alpha-Methylstyrene	19.82	118	121114	4.819	ng	99
81) 2-Ethyltoluene	19.86	105	246958	4.726	ng	100
82) 1,2,4-Trimethylbenzene	20.05	105	209324	4.719	ng	100
83) n-Decane	20.14	57	104925	4.229	ng	100
84) Benzyl Chloride	20.16	91	174309	4.900	ng	100
85) 1,3-Dichlorobenzene	20.18	146	134511	4.861	ng	100
86) 1,4-Dichlorobenzene	20.24	146	135780	4.898	ng	100
87) sec-Butylbenzene	20.29	105	281063	4.730	ng	100
88) 4-Isopropyltoluene (p-...	20.43	119	269016	4.744	ng	100
89) 1,2,3-Trimethylbenzene	20.43	105	205219	4.604	ng	99
90) 1,2-Dichlorobenzene	20.54	146	128654	4.978	ng	100
91) d-Limonene	20.56	68	78813	4.261	ng	98
92) 1,2-Dibromo-3-Chloropr...	20.93	157	47401	4.998	ng	99
93) n-Undecane	21.24	57	110531	4.145	ng	100
94) 1,2,4-Trichlorobenzene	22.05	180	103186	5.188	ng	100
95) Naphthalene	22.16	128	305148	5.036	ng	100
96) n-Dodecane	22.15	57	101508	3.885	ng	99
97) Hexachlorobutadiene	22.47	225	68271	5.172	ng	100
98) Cyclohexanone	18.22	55	69520	4.162	ng	99
99) tert-Butylbenzene	20.05	119	212326	4.798	ng	100
100) n-Butylbenzene	20.79	91	220884	4.670	ng	100

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

Vial: 15
Operator: WA
Inst : MS13

Quant Time: Sep 25 06:25:05 2017



Data File : I:\MS13\DATA\2017 09\23\09231732.D
 Acq On : 23 Sep 2017 19:28
 Sample : 25ng TO-15 ICAL Std
 Misc : S31-09111702/S31-09231702 (10/22)

Vial: 16
 Operator: WA
 Inst : MS13

Quant Time: Sep 25 06:25:07 2017

Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:24:19 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

9/25/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.15	130	104271	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.23	114	496666	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.52	82	191410	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.99	65	133341	12.187	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.52%
57) Toluene-d8 (SS2)	15.66	98	496008	11.956	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.68%
73) Bromofluorobenzene (SS3)	18.92	174	193025	15.458	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	123.68%

Target Compounds

						Qvalue
2) Propene	4.35	42	303802	22.493	ng	100
3) Dichlorodifluoromethan...	4.50	85	523466	26.424	ng	100
4) Chloromethane	4.77	50	374131	22.803	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	5.03	135	281275	25.072	ng	100
6) Vinyl Chloride	5.18	62	367637	23.370	ng	100
7) 1,3-Butadiene	5.43	54	295211	27.756	ng	100
8) Bromomethane	5.85	94	239128	25.520	ng	100
9) Chloroethane	6.16	64	193353	24.633	ng	100
10) Ethanol	6.53	45	982193	119.905	ng	100
11) Acetonitrile	6.77	41	521171	21.639	ng	100
12) Acrolein	6.94	56	179369	23.360	ng	100
13) Acetone	7.14	58	1009334	118.158	ng	100
14) Trichlorofluoromethane	7.38	101	443672	25.663	ng	100
15) 2-Propanol (Isopropanol)	7.62	45	1429175	49.506	ng	99
16) Acrylonitrile	7.86	53	375357	25.684	ng	100
17) 1,1-Dichloroethene	8.30	96	283538	26.036	ng	100
18) 2-Methyl-2-Propanol (t...	8.46	59	1457975	54.042	ng	100
19) Methylene Chloride	8.51	84	282284	24.130	ng	100
20) 3-Chloro-1-propene (Al...	8.67	41	423634	24.035	ng	100
21) Trichlorotrifluoroethane	8.91	151	287462	27.334	ng	100
22) Carbon Disulfide	8.77	76	1032258	24.225	ng	100
23) trans-1,2-Dichloroethene	9.74	61	396304	25.962	ng	100
24) 1,1-Dichloroethane	9.99	63	465046	24.022	ng	100
25) Methyl tert-Butyl Ether	10.08	73	860006	25.869	ng	100
26) Vinyl Acetate	10.23	86	325388	148.219	ng	100
27) 2-Butanone (MEK)	10.47	72	192825	24.269	ng	100
28) cis-1,2-Dichloroethene	10.97	61	375891	25.563	ng	100
29) Diisopropyl Ether	11.26	87	282582	26.451	ng	100
30) Ethyl Acetate	11.27	61	195988	48.803	ng	100
31) n-Hexane	11.25	57	403115	20.368	ng	100
32) Chloroform	11.31	83	473571	26.089	ng	100
34) Tetrahydrofuran (THF)	11.71	72	191338	21.735	ng	100
35) Ethyl tert-Butyl Ether	11.84	87	350170	26.284	ng	100
36) 1,2-Dichloroethane	12.10	62	338623	26.079	ng	100
38) 1,1,1-Trichloroethane	12.37	97	430221	27.548	ng	100
39) Isopropyl Acetate	12.79	61	339505	48.339	ng	100
40) 1-Butanol	12.81	56	582532	49.962	ng	100
41) Benzene	12.84	78	1080769	24.038	ng	100
42) Carbon Tetrachloride	13.00	117	391209	28.695	ng	100
43) Cyclohexane	13.13	84	866881	51.799	ng	100
44) tert-Amyl Methyl Ether	13.47	73	820551	26.249	ng	100
45) 1,2-Dichloropropane	13.68	63	265785	24.868	ng	100
46) Bromodichloromethane	13.87	83	371270	26.877	ng	100
47) Trichloroethene	13.93	130	337187	25.720	ng	100
48) 1,4-Dioxane	13.90	88	245273	26.163	ng	100
49) 2,2,4-Trimethylpentane...	13.99	57	1142142	24.639	ng	100
50) Methyl Methacrylate	14.13	100	247945	55.409	ng	100

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Data File : I:\MS13\DATA\2017 09\23\09231732.D
 Acq On : 23 Sep 2017 19:28
 Sample : 25ng TO-15 ICAL Std
 Misc : S31-09111702/S31-09231702 (10/22)

Vial: 16
 Operator: WA
 Inst : MS13

Quant Time: Sep 25 06:25:07 2017

Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:24:19 2017

Response via : Initial Calibration

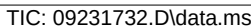
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.26	71	264274	24.076	ng	100
52) cis-1,3-Dichloropropene	14.78	75	485817	28.647	ng	100
53) 4-Methyl-2-pentanone	14.81	58	261316	24.414	ng	100
54) trans-1,3-Dichloropropene	15.29	75	419480	28.687	ng	100
55) 1,1,2-Trichloroethane	15.47	97	281896	26.970	ng	100
58) Toluene	15.76	91	1161212	24.214	ng	100
59) 2-Hexanone	16.00	43	609585	23.667	ng	100
60) Dibromochloromethane	16.16	129	362675	28.274	ng	100
61) 1,2-Dibromoethane	16.41	107	324262	27.324	ng	100
62) n-Butyl Acetate	16.63	43	684653	24.300	ng	100
63) n-Octane	16.75	57	229377	22.428	ng	100
64) Tetrachloroethene	16.90	166	380953	27.705	ng	100
65) Chlorobenzene	17.56	112	828101	26.197	ng	100
66) Ethylbenzene	17.92	91	1334681	25.751	ng	100
67) m- & p-Xylenes	18.09	91	2119170	52.827	ng	100
68) Bromoform	18.14	173	341935	29.860	ng	100
69) Styrene	18.41	104	911269	27.507	ng	100
70) o-Xylene	18.51	91	1052118	25.884	ng	100
71) n-Nonane	18.71	43	537959	22.684	ng	100
72) 1,1,2,2-Tetrachloroethane	18.49	83	497645	28.155	ng	100
74) Cumene	19.04	105	1401148	26.880	ng	100
75) alpha-Pinene	19.39	93	714706	26.002	ng	100
76) n-Propylbenzene	19.49	91	1635901	26.873	ng	100
77) 3-Ethyltoluene	19.58	105	1399347	26.331	ng	100
78) 4-Ethyltoluene	19.62	105	1344247	27.459	ng	100
79) 1,3,5-Trimethylbenzene	19.69	105	1162235	26.870	ng	100
80) alpha-Methylstyrene	19.82	118	690113	28.039	ng	100
81) 2-Ethyltoluene	19.86	105	1375887	26.884	ng	100
82) 1,2,4-Trimethylbenzene	20.05	105	1174511	27.039	ng	100
83) n-Decane	20.14	57	574731	23.656	ng	100
84) Benzyl Chloride	20.16	91	1050986	30.166	ng	100
85) 1,3-Dichlorobenzene	20.19	146	767099	28.310	ng	100
86) 1,4-Dichlorobenzene	20.24	146	779762	28.725	ng	100
87) sec-Butylbenzene	20.29	105	1575050	27.069	ng	100
88) 4-Isopropyltoluene (p-...	20.42	119	1505404	27.111	ng	100
89) 1,2,3-Trimethylbenzene	20.42	105	1161635	26.610	ng	100
90) 1,2-Dichlorobenzene	20.54	146	733542	28.980	ng	100
91) d-Limonene	20.56	68	440235	24.305	ng	100
92) 1,2-Dibromo-3-Chloropr...	20.93	157	275893	29.707	ng	100
93) n-Undecane	21.24	57	605181	23.176	ng	100
94) 1,2,4-Trichlorobenzene	22.05	180	597566	30.679	ng	100
95) Naphthalene	22.16	128	1741433	29.345	ng	100
96) n-Dodecane	22.15	57	574619	22.456	ng	100
97) Hexachlorobutadiene	22.47	225	385730	29.838	ng	100
98) Cyclohexanone	18.22	55	397745	24.317	ng	100
99) tert-Butylbenzene	20.05	119	1174318	27.099	ng	100
100) n-Butylbenzene	20.79	91	1234172	26.644	ng	100

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

Vial: 16
Operator: WA
Inst : MS13

Quant Time: Sep 25 06:25:07 2017



Data File : I:\MS13\DATA\2017 09\23\09231733.D
 Acq On : 23 Sep 2017 20:03
 Sample : 50ng TO-15 ICAL Std
 Misc : S31-09111702/S31-09231702 (10/22)

Vial: 16
 Operator: WA
 Inst : MS13

Quant Time: Sep 25 06:25:09 2017

Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:24:19 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

9/25/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.15	130	110704	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.24	114	522250	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.52	82	203153	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.99	65	138779	11.947	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.60%
57) Toluene-d8 (SS2)	15.66	98	525217	11.928	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.44%
73) Bromofluorobenzene (SS3)	18.92	174	207629	15.667	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	125.36%

Target Compounds

						Qvalue
2) Propene	4.36	42	578412	40.336	ng	99
3) Dichlorodifluoromethan...	4.51	85	1002577	47.669	ng	100
4) Chloromethane	4.78	50	752748	43.214	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	5.04	135	577957	48.524	ng	100
6) Vinyl Chloride	5.18	62	740828	44.356	ng	100
7) 1,3-Butadiene	5.44	54	607118	53.765	ng	100
8) Bromomethane	5.86	94	437260	43.953	ng	100
9) Chloroethane	6.17	64	379301	45.515	ng	100
10) Ethanol	6.56	45	1882878	216.503	ng	100
11) Acetonitrile	6.78	41	1021230	39.937	ng	100
12) Acrolein	6.95	56	346389	42.491	ng	99
13) Acetone	7.16	58	1904875	210.037	ng	98
14) Trichlorofluoromethane	7.38	101	865333	47.144	ng	100
15) 2-Propanol (Isopropanol)	7.65	45	2730536	89.088	ng	100
16) Acrylonitrile	7.88	53	735402	47.396	ng	99
17) 1,1-Dichloroethene	8.30	96	560292	48.459	ng	99
18) 2-Methyl-2-Propanol (t...	8.49	59	2771076	96.746	ng	100
19) Methylene Chloride	8.52	84	553297	44.549	ng	98
20) 3-Chloro-1-propene (Al...	8.67	41	824521	44.060	ng	99
21) Trichlorotrifluoroethane	8.91	151	567520	50.828	ng	100
22) Carbon Disulfide	8.78	76	2033611	44.951	ng	100
23) trans-1,2-Dichloroethene	9.74	61	778514	48.037	ng	100
24) 1,1-Dichloroethane	9.99	63	910196	44.285	ng	100
25) Methyl tert-Butyl Ether	10.08	73	1684929	47.737	ng	100
26) Vinyl Acetate	10.24	86	646059	277.189	ng	# 89
27) 2-Butanone (MEK)	10.48	72	381390	45.213	ng	98
28) cis-1,2-Dichloroethene	10.98	61	733636	46.993	ng	98
29) Diisopropyl Ether	11.27	87	465967	41.083	ng	# 75
30) Ethyl Acetate	11.28	61	376113	88.214	ng	100
31) n-Hexane	11.26	57	763389	36.330	ng	99
32) Chloroform	11.32	83	924853	47.990	ng	100
34) Tetrahydrofuran (THF)	11.71	72	377278	40.366	ng	99
35) Ethyl tert-Butyl Ether	11.85	87	686802	48.556	ng	99
36) 1,2-Dichloroethane	12.10	62	658631	47.777	ng	100
38) 1,1,1-Trichloroethane	12.38	97	838787	51.078	ng	100
39) Isopropyl Acetate	12.80	61	657353	89.010	ng	97
40) 1-Butanol	12.83	56	1133888	92.486	ng	99
41) Benzene	12.85	78	2097137	44.359	ng	100
42) Carbon Tetrachloride	13.00	117	769288	53.663	ng	100
43) Cyclohexane	13.13	84	1676764	95.285	ng	99
44) tert-Amyl Methyl Ether	13.48	73	1603140	48.771	ng	100
45) 1,2-Dichloropropane	13.69	63	525674	46.775	ng	100
46) Bromodichloromethane	13.87	83	731005	50.327	ng	100
47) Trichloroethene	13.93	130	667603	48.428	ng	100
48) 1,4-Dioxane	13.90	88	483409	49.039	ng	98
49) 2,2,4-Trimethylpentane...	13.99	57	2219413	45.533	ng	99
50) Methyl Methacrylate	14.13	100	489584	104.049	ng	98

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Data File : I:\MS13\DATA\2017 09\23\09231733.D
 Acq On : 23 Sep 2017 20:03
 Sample : 50ng TO-15 ICAL Std
 Misc : S31-09111702/S31-09231702 (10/22)

Vial: 16
 Operator: WA
 Inst : MS13

Quant Time: Sep 25 06:25:09 2017
 Quant Method : I:\MS13\METHODS\R13092317.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Mon Sep 25 06:24:19 2017
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.26	71	512998	44.445	ng	99
52) cis-1,3-Dichloropropene	14.78	75	959045	53.781	ng	100
53) 4-Methyl-2-pentanone	14.82	58	508406	45.171	ng	99
54) trans-1,3-Dichloropropene	15.30	75	837066	54.440	ng	99
55) 1,1,2-Trichloroethane	15.47	97	555162	50.512	ng	99
58) Toluene	15.76	91	2266660	44.533	ng	99
59) 2-Hexanone	16.00	43	1179715	43.155	ng	100
60) Dibromochloromethane	16.16	129	714451	52.479	ng	99
61) 1,2-Dibromoethane	16.41	107	644224	51.147	ng	100
62) n-Butyl Acetate	16.63	43	1334212	44.617	ng	100
63) n-Octane	16.76	57	443255	40.836	ng	99
64) Tetrachloroethene	16.90	166	755374	51.759	ng	100
65) Chlorobenzene	17.56	112	1625414	48.449	ng	100
66) Ethylbenzene	17.92	91	2579854	46.898	ng	100
67) m- & p-Xylenes	18.09	91	4103402	96.378	ng	100
68) Bromoform	18.15	173	680632	56.002	ng	99
69) Styrene	18.41	104	1777341	50.549	ng	99
70) o-Xylene	18.51	91	2046442	47.436	ng	99
71) n-Nonane	18.71	43	1020069	40.527	ng	99
72) 1,1,2,2-Tetrachloroethane	18.50	83	975529	52.002	ng	100
74) Cumene	19.04	105	2702298	48.845	ng	100
75) alpha-Pinene	19.39	93	1398742	47.947	ng	100
76) n-Propylbenzene	19.49	91	3121065	48.306	ng	99
77) 3-Ethyltoluene	19.58	105	2844127	50.424	ng	100
78) 4-Ethyltoluene	19.62	105	2463882	47.421	ng	100
79) 1,3,5-Trimethylbenzene	19.69	105	2257888	49.183	ng	100
80) alpha-Methylstyrene	19.83	118	1353176	51.800	ng	100
81) 2-Ethyltoluene	19.86	105	2668802	49.133	ng	100
82) 1,2,4-Trimethylbenzene	20.06	105	2266238	49.156	ng	100
83) n-Decane	20.14	57	1093910	42.423	ng	99
84) Benzyl Chloride	20.17	91	2083883	56.355	ng	99
85) 1,3-Dichlorobenzene	20.19	146	1499437	52.138	ng	100
86) 1,4-Dichlorobenzene	20.24	146	1540039	53.452	ng	100
87) sec-Butylbenzene	20.29	105	3022687	48.945	ng	99
88) 4-Isopropyltoluene (p-...	20.43	119	2853226	48.413	ng	99
89) 1,2,3-Trimethylbenzene	20.43	105	2237965	48.303	ng	100
90) 1,2-Dichlorobenzene	20.55	146	1432296	53.314	ng	100
91) d-Limonene	20.56	68	840427	43.717	ng	99
92) 1,2-Dibromo-3-Chloropr...	20.93	157	548409	55.637	ng	99
93) n-Undecane	21.24	57	1147181	41.392	ng	99
94) 1,2,4-Trichlorobenzene	22.05	180	1190223	57.574	ng	100
95) Naphthalene	22.16	128	3379558	53.658	ng	99
96) n-Dodecane	22.15	57	1074060	39.548	ng	99
97) Hexachlorobutadiene	22.47	225	772571	56.308	ng	99
98) Cyclohexanone	18.22	55	787398	45.356	ng	100
99) tert-Butylbenzene	20.06	119	2253968	49.007	ng	99
100) n-Butylbenzene	20.79	91	2359564	47.995	ng	99

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

Data File : I:\MS13\DATA\2017 09\23\09231734.D
 Acq On : 23 Sep 2017 20:38
 Sample : 100ng TO-15 ICAL Std
 Misc : S31-09111702/S31-09231702 (10/22)

Vial: 16
 Operator: WA
 Inst : MS13

Quant Time: Sep 25 06:25:11 2017

Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:24:19 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

407 9/25/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.17	130	112603	12.500	ng	0.02
37) 1,4-Difluorobenzene (IS2)	13.24	114	539108	12.500	ng	0.01
56) Chlorobenzene-d5 (IS3)	17.52	82	208482	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.00	65	139853	11.836	ng	0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	94.72%
57) Toluene-d8 (SS2)	15.66	98	536601	11.875	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.04%
73) Bromofluorobenzene (SS3)	18.92	174	209911	15.434	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	123.44%

Target Compounds

						Qvalue
2) Propene	4.36	42	1244962	85.355	ng	99
3) Dichlorodifluoromethan...	4.51	85	1930717	90.251	ng	100
4) Chloromethane	4.79	50	1358122	76.652	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	5.04	135	1171706	96.716	ng	100
6) Vinyl Chloride	5.19	62	1493757	87.929	ng	99
7) 1,3-Butadiene	5.45	54	1201440	104.603	ng	99
8) Bromomethane	5.87	94	933421	92.245	ng	99
9) Chloroethane	6.18	64	745515	87.952	ng	100
10) Ethanol	6.60	45	3640452	411.539	ng	99
11) Acetonitrile	6.81	41	2034091	78.205	ng	100
12) Acrolein	6.96	56	688076	82.982	ng	99
13) Acetone	7.18	58	3581165	388.210	ng	94
14) Trichlorofluoromethane	7.39	101	1729613	92.642	ng	100
15) 2-Propanol (Isopropanol)	7.68	45	4749770	152.356	ng	100
16) Acrylonitrile	7.90	53	1467204	92.965	ng	100
17) 1,1-Dichloroethene	8.31	96	1116550	94.940	ng	98
18) 2-Methyl-2-Propanol (t...	8.51	59	4468277	153.369	ng	100
19) Methylene Chloride	8.53	84	1077152	85.264	ng	96
20) 3-Chloro-1-propene (Al...	8.68	41	1622706	85.251	ng	98
21) Trichlorotrifluoroethane	8.92	151	1135741	100.003	ng	99
22) Carbon Disulfide	8.79	76	4006740	87.071	ng	100
23) trans-1,2-Dichloroethene	9.75	61	1536261	93.193	ng	99
24) 1,1-Dichloroethane	10.00	63	1805074	86.343	ng	100
25) Methyl tert-Butyl Ether	10.09	73	3315112	92.339	ng	100
26) Vinyl Acetate	10.26	86	1274535	537.611	ng	# 70
27) 2-Butanone (MEK)	10.49	72	761191	88.715	ng	95
28) cis-1,2-Dichloroethene	10.99	61	1443525	90.906	ng	97
29) Diisopropyl Ether	11.27	87	885171	76.726	ng	# 80
30) Ethyl Acetate	11.29	61	722751	166.657	ng	97
31) n-Hexane	11.26	57	1504746	70.404	ng	100
32) Chloroform	11.33	83	1835076	93.615	ng	99
34) Tetrahydrofuran (THF)	11.72	72	749300	78.818	ng	98
35) Ethyl tert-Butyl Ether	11.85	87	1356052	94.254	ng	98
36) 1,2-Dichloroethane	12.11	62	1294051	92.287	ng	100
38) 1,1,1-Trichloroethane	12.38	97	1667082	98.342	ng	99
39) Isopropyl Acetate	12.80	61	1261563	165.483	ng	# 93
40) 1-Butanol	12.85	56	2165148	171.078	ng	# 1
41) Benzene	12.86	78	3988549	81.728	ng	99
42) Carbon Tetrachloride	13.01	117	1529079	103.328	ng	100
43) Cyclohexane	13.14	84	3242036	178.473	ng	97
44) tert-Amyl Methyl Ether	13.48	73	3121147	91.983	ng	100
45) 1,2-Dichloropropane	13.69	63	1037604	89.439	ng	100
46) Bromodichloromethane	13.88	83	1453584	96.945	ng	100
47) Trichloroethene	13.93	130	1337079	93.960	ng	100
48) 1,4-Dioxane	13.91	88	959586	94.301	ng	98
49) 2,2,4-Trimethylpentane...	14.00	57	4260220	84.670	ng	100
50) Methyl Methacrylate	14.14	100	85 of 101	199.870	ng	97

Data File : I:\MS13\DATA\2017 09\23\09231734.D
 Acq On : 23 Sep 2017 20:38
 Sample : 100ng TO-15 ICAL Std
 Misc : S31-09111702/S31-09231702 (10/22)

Vial: 16
 Operator: WA
 Inst : MS13

Quant Time: Sep 25 06:25:11 2017

Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:24:19 2017

Response via : Initial Calibration

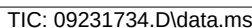
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.26	71	1015696	85.247	ng	99
52) cis-1,3-Dichloropropene	14.79	75	1902431	103.347	ng	100
53) 4-Methyl-2-pentanone	14.82	58	995026	85.642	ng	97
54) trans-1,3-Dichloropropene	15.30	75	1670148	105.225	ng	99
55) 1,1,2-Trichloroethane	15.47	97	1112522	98.058	ng	100
58) Toluene	15.76	91	4446892	85.135	ng	99
59) 2-Hexanone	16.01	43	2293664	81.759	ng	99
60) Dibromochloromethane	16.17	129	1436264	102.803	ng	99
61) 1,2-Dibromoethane	16.42	107	1293891	100.101	ng	99
62) n-Butyl Acetate	16.63	43	2568297	83.691	ng	99
63) n-Octane	16.77	57	859618	77.170	ng	98
64) Tetrachloroethene	16.90	166	1530722	102.205	ng	100
65) Chlorobenzene	17.57	112	3196953	92.855	ng	99
66) Ethylbenzene	17.93	91	4959359	87.850	ng	99
67) m- & p-Xylenes	18.10	91	7814484	178.849	ng	99
68) Bromoform	18.15	173	1369498	109.802	ng	100
69) Styrene	18.42	104	3465232	96.035	ng	99
70) o-Xylene	18.52	91	3936649	88.918	ng	99
71) n-Nonane	18.72	43	1897023	73.441	ng	97
72) 1,1,2,2-Tetrachloroethane	18.50	83	1890768	98.214	ng	100
74) Cumene	19.05	105	5121296	90.204	ng	98
75) alpha-Pinene	19.39	93	2706661	90.410	ng	100
76) n-Propylbenzene	19.50	91	5788998	87.308	ng	97
77) 3-Ethyltoluene	19.59	105	5078250	87.731	ng	98
78) 4-Ethyltoluene	19.63	105	4901355	91.922	ng	98
79) 1,3,5-Trimethylbenzene	19.69	105	4316682	91.626	ng	99
80) alpha-Methylstyrene	19.83	118	2611447	97.412	ng	99
81) 2-Ethyltoluene	19.86	105	5032304	90.277	ng	98
82) 1,2,4-Trimethylbenzene	20.06	105	4218137	89.155	ng	100
83) n-Decane	20.15	57	2023535	76.470	ng	98
84) Benzyl Chloride	20.17	91	3974216	104.728	ng	98
85) 1,3-Dichlorobenzene	20.19	146	2916863	98.832	ng	100
86) 1,4-Dichlorobenzene	20.25	146	2990749	101.150	ng	99
87) sec-Butylbenzene	20.29	105	5611198	88.537	ng	97
88) 4-Isopropyltoluene (p-...	20.44	119	5134803	84.900	ng	96
89) 1,2,3-Trimethylbenzene	20.43	105	4172187	87.748	ng	99
90) 1,2-Dichlorobenzene	20.55	146	2732518	99.112	ng	99
91) d-Limonene	20.56	68	1536834	77.898	ng	95
92) 1,2-Dibromo-3-Chloropr...	20.93	157	1085227	107.284	ng	98
93) n-Undecane	21.24	57	2118053	74.470	ng	98
94) 1,2,4-Trichlorobenzene	22.06	180	2328688	109.764	ng	100
95) Naphthalene	22.16	128	6159921	95.302	ng	98
96) n-Dodecane	22.16	57	1893594	67.941	ng	96
97) Hexachlorobutadiene	22.47	225	1545155	109.739	ng	99
98) Cyclohexanone	18.23	55	1524906	85.592	ng	99
99) tert-Butylbenzene	20.06	119	4206285	89.118	ng	99
100) n-Butylbenzene	20.80	91	4422843	87.663	ng	98

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

Vial: 16
Operator: WA
Inst : MS13

Quant Time: Sep 25 06:25:11 2017



Data File : I:\MS13\DATA\2017 09\23\09231737.D
 Acq On : 23 Sep 2017 22:23
 Sample : 25ng TO-15 ICV Std
 Misc : S31-09111702/S31-09051703 (10/4)

Vial: 12
 Operator: WA
 Inst : MS13

Quant Time: Sep 25 16:28:03 2017

Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:36:07 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

407 9/25/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.15	130	109573	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.23	114	525712	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.52	82	202557	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.99	65	134386	12.189	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.52%
57) Toluene-d8 (SS2)	15.66	98	525350	12.412	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.28%
73) Bromofluorobenzene (SS3)	18.92	174	202423	12.395	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.20%

Target Compounds

						Qvalue
2) Propene	4.35	42	296942	25.476	ng	99
3) Dichlorodifluoromethan...	4.50	85	498026	26.066	ng	100
4) Chloromethane	4.77	50	391000	27.386	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	5.03	135	300785	28.305	ng	100
6) Vinyl Chloride	5.17	62	387269	28.643	ng	99
7) 1,3-Butadiene	5.43	54	302255	29.372	ng	100
8) Bromomethane	5.85	94	256031	28.130	ng	100
9) Chloroethane	6.16	64	195252	27.758	ng	99
10) Ethanol	6.52	45	899453	127.129	ng	99
11) Acetonitrile	6.76	41	482107	27.383	ng	100
12) Acrolein	6.94	56	169721	26.568	ng	100
13) Acetone	7.14	58	968795	128.293	ng	97
14) Trichlorofluoromethane	7.38	101	426815	26.117	ng	99
15) 2-Propanol (Isopropanol)	7.61	45	1346954	54.815	ng	99
16) Acrylonitrile	7.86	53	361031	27.471	ng	100
17) 1,1-Dichloroethene	8.29	96	277457	27.778	ng	97
18) 2-Methyl-2-Propanol (t...	8.46	59	1368664	55.686	ng	100
19) Methylene Chloride	8.51	84	276387	23.427	ng	98
20) 3-Chloro-1-propene (Al...	8.66	41	422987	29.590	ng	100
21) Trichlorotrifluoroethane	8.91	151	281953	27.534	ng	100
22) Carbon Disulfide	8.77	76	1018348	24.462	ng	100
23) trans-1,2-Dichloroethene	9.74	61	380194	29.060	ng	99
24) 1,1-Dichloroethane	9.98	63	466140	26.769	ng	100
25) Methyl tert-Butyl Ether	10.08	73	832717	27.683	ng	100
26) Vinyl Acetate	10.23	86	330696	145.740	ng	# 95
27) 2-Butanone (MEK)	10.47	72	190352	27.226	ng	97
28) cis-1,2-Dichloroethene	10.97	61	357966	27.839	ng	98
29) Diisopropyl Ether	11.26	87	276200	28.836	ng	100
30) Ethyl Acetate	11.27	61	192436	57.795	ng	100
31) n-Hexane	11.25	57	404612	25.605	ng	100
32) Chloroform	11.31	83	451399	27.001	ng	100
34) Tetrahydrofuran (THF)	11.71	72	185671	25.088	ng	99
35) Ethyl tert-Butyl Ether	11.84	87	339980	27.551	ng	100
36) 1,2-Dichloroethane	12.10	62	317754	27.148	ng	99
38) 1,1,1-Trichloroethane	12.37	97	406523	27.172	ng	99
39) Isopropyl Acetate	12.79	61	333972	54.469	ng	97
40) 1-Butanol	12.81	56	547467	55.897	ng	100
41) Benzene	12.84	78	1084615	26.645	ng	100
42) Carbon Tetrachloride	13.00	117	378809	28.043	ng	100
43) Cyclohexane	13.13	84	856458	54.968	ng	99
44) tert-Amyl Methyl Ether	13.47	73	796712	27.330	ng	100
45) 1,2-Dichloropropane	13.68	63	262191	27.734	ng	100
46) Bromodichloromethane	13.87	83	360779	28.014	ng	100
47) Trichloroethene	13.93	130	331196	26.877	ng	100
48) 1,4-Dioxane	13.90	88	238246	28.350	ng	99
49) 2,2,4-Trimethylpentane...	13.99	57	1120858	27.183	ng	98
50) Methyl Methacrylate	14.13	100	247723	56.180	ng	98

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Data File : I:\MS13\DATA\2017 09\23\09231737.D
 Acq On : 23 Sep 2017 22:23
 Sample : 25ng TO-15 ICV Std
 Misc : S31-09111702/S31-09051703 (10/4)

Vial: 12
 Operator: WA
 Inst : MS13

Quant Time: Sep 25 16:28:03 2017

Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:36:07 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.25	71	264976	26.565	ng	99
52) cis-1,3-Dichloropropene	14.78	75	446486	28.531	ng	100
53) 4-Methyl-2-pentanone	14.81	58	254888	28.384	ng	99
54) trans-1,3-Dichloropropene	15.29	75	407441	30.054	ng	100
55) 1,1,2-Trichloroethane	15.46	97	276099	27.967	ng	100
58) Toluene	15.76	91	1136069	26.497	ng	100
59) 2-Hexanone	16.00	43	583871	28.033	ng	99
60) Dibromochloromethane	16.16	129	348649	28.505	ng	100
61) 1,2-Dibromoethane	16.41	107	315705	28.437	ng	100
62) n-Butyl Acetate	16.63	43	665861	28.717	ng	100
63) n-Octane	16.75	57	224486	26.914	ng	99
64) Tetrachloroethene	16.89	166	374209	27.294	ng	100
65) Chlorobenzene	17.56	112	808836	27.084	ng	100
66) Ethylbenzene	17.92	91	1300700	27.091	ng	100
67) m- & p-Xylenes	18.09	91	1997024	53.328	ng	98
68) Bromoform	18.14	173	325156	28.770	ng	100
69) Styrene	18.41	104	870848	27.904	ng	99
70) o-Xylene	18.51	91	1018389	27.139	ng	99
71) n-Nonane	18.71	43	520138	27.206	ng	99
72) 1,1,2,2-Tetrachloroethane	18.49	83	476234	27.739	ng	100
74) Cumene	19.04	105	1361501	27.349	ng	100
75) alpha-Pinene	19.39	93	696152	27.827	ng	100
76) n-Propylbenzene	19.49	91	1573726	27.638	ng	100
77) 3-Ethyltoluene	19.58	105	1322924	26.198	ng	100
78) 4-Ethyltoluene	19.62	105	1336697	28.742	ng	100
79) 1,3,5-Trimethylbenzene	19.69	105	1113824	27.220	ng	100
80) alpha-Methylstyrene	19.82	118	649628	26.746	ng	100
81) 2-Ethyltoluene	19.86	105	1325379	27.465	ng	100
82) 1,2,4-Trimethylbenzene	20.05	105	1123012	27.707	ng	100
83) n-Decane	20.14	57	560450	28.956	ng	100
84) Benzyl Chloride	20.16	91	997482	28.574	ng	100
85) 1,3-Dichlorobenzene	20.19	146	726455	27.471	ng	100
86) 1,4-Dichlorobenzene	20.24	146	733376	27.073	ng	100
87) sec-Butylbenzene	20.29	105	1515409	27.319	ng	100
88) 4-Isopropyltoluene (p-...	20.43	119	1462939	27.096	ng	100
89) 1,2,3-Trimethylbenzene	20.43	105	1148300	28.156	ng	100
90) 1,2-Dichlorobenzene	20.54	146	690478	27.621	ng	100
91) d-Limonene	20.56	68	423441	27.770	ng	99
92) 1,2-Dibromo-3-Chloropr...	20.93	157	256829	28.427	ng	99
93) n-Undecane	21.24	57	586075	26.699	ng	100
94) 1,2,4-Trichlorobenzene	22.05	180	532077	29.620	ng	99
95) Naphthalene	22.16	128	1469858	25.837	ng	100
96) n-Dodecane	22.15	57	568681	28.243	ng	100
97) Hexachlorobutadiene	22.47	225	352698	25.826	ng	99
98) Cyclohexanone	18.22	55	382071	27.928	ng	100
99) tert-Butylbenzene	20.05	119	1140703	27.352	ng	100
100) n-Butylbenzene	20.80	91	1170515	27.693	ng	100

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

Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: 09231737.D

Acq. Method File: TO15.M

9/25/17

Data File Path: I:\MS13\DATA\2017_09\23\

Sample Name: 25ng TO-15 ICV Std

Operator: WA

Misc Info: S31-09111702/S31-09051703 (

Date Acquired: 9/23/2017

22:23

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	4.35	25.476	26.275	97	52	127	*	*
3)	Dichlorodifluoromethane (CFC 1	4.50	26.066	26.600	98	68	109	*	*
4)	Chloromethane	4.77	27.386	26.250	104	51	130	*	*
5)	1,2-Dichloro-1,1,2,2-tetrafluoroet	5.03	28.305	26.325	108	66	114	*	*
6)	Vinyl Chloride	5.17	28.643	26.350	109	61	125	*	*
7)	1,3-Butadiene	5.43	29.372	26.225	112	62	144	*	*
8)	Bromomethane	5.85	28.130	26.225	107	73	123	*	*
9)	Chloroethane	6.16	27.758	26.250	106	69	122	*	*
10)	Ethanol	6.52	127.129	130.375	98	62	124	*	*
11)	Acetonitrile	6.76	27.383	26.200	105	57	114	*	*
12)	Acrolein	6.94	26.568	26.075	102	62	116	*	*
13)	Acetone	7.14	128.293	131.825	97	57	117	*	*
14)	Trichlorofluoromethane	7.38	26.117	26.025	100	63	98	FAIL	*
15)	2-Propanol (Isopropanol)	7.61	54.815	52.775	104	66	121	*	*
16)	Acrylonitrile	7.86	27.471	26.450	104	68	123	*	*
17)	1,1-Dichloroethene	8.29	27.778	26.675	104	76	118	*	*
18)	2-Methyl-2-Propanol (tert-Butyl Alc	8.46	55.686	53.350	104	74	126	*	*
19)	Methylene Chloride	8.51	23.427	26.600	88	60	118	*	*
20)	3-Chloro-1-propene (Allyl Chloride	8.66	29.590	26.525	112	65	126	*	*
21)	Trichlorotrifluoroethane	8.91	27.534	26.750	103	73	114	*	*
22)	Carbon Disulfide	8.77	24.462	26.725	92	57	102	*	*
23)	trans-1,2-Dichloroethene	9.74	29.060	26.700	109	74	123	*	*
24)	1,1-Dichloroethane	9.98	26.769	26.525	101	69	111	*	*
25)	Methyl tert-Butyl Ether	10.08	27.683	26.625	104	69	113	*	*
26)	Vinyl Acetate	10.23	145.740	132.750	110	76	128	*	*
27)	2-Butanone (MEK)	10.47	27.226	26.450	103	63	127	*	*
28)	cis-1,2-Dichloroethene	10.97	27.839	26.475	105	72	117	*	*
29)	Diisopropyl Ether	11.26	28.836	26.600	108	64	118	*	*
30)	Ethyl Acetate	11.27	57.795	53.300	108	68	127	*	*
31)	n-Hexane	11.25	25.605	26.625	96	55	116	*	*
32)	Chloroform	11.31	27.001	26.500	102	70	109	*	*
34)	Tetrahydrofuran (THF)	11.71	25.088	26.550	94	72	113	*	*
35)	Ethyl tert-Butyl Ether	11.84	27.551	26.525	104	73	117	*	*
36)	1,2-Dichloroethane	12.10	27.148	26.500	102	69	113	*	*
38)	1,1,1-Trichloroethane	12.37	27.172	26.525	102	72	115	*	*
39)	Isopropyl Acetate	12.79	54.469	53.275	102	68	122	*	*
40)	1-Butanol	12.81	55.897	53.300	105	75	141	*	*
41)	Benzene	12.84	26.645	26.625	100	65	107	*	*
42)	Carbon Tetrachloride	13.00	28.043	26.700	105	71	113	*	*
43)	Cyclohexane	13.13	54.968	53.150	103	71	115	*	*
44)	tert-Amyl Methyl Ether	13.47	27.330	26.550	103	73	115	*	*
45)	1,2-Dichloropropane	13.68	27.734	26.525	105	71	115	*	*
46)	Bromodichloromethane	13.87	28.014	26.700	105	75	118	*	*
47)	Trichloroethene	13.93	26.877	26.550	101	68	114	*	*
48)	1,4-Dioxane	13.90	28.350	26.600	107	81	131	*	*
49)	2,2,4-Trimethylpentane (Isooctane)	13.99	27.183	26.525	102	68	112	*	*

Bold = 75 Compound List

* = Pass

Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: **09231737.D**

Data File Path: **I:\MS13\DATA\2017_09\23**

Operator: **WA**

Date Acquired: **9/23/2017**

22:23

TO15.M

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

Misc Info: **S31-09111702/S31-09051703**

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	14.13	56.180	52.950	106	72	130	*	*
51)	n-Heptane	14.25	26.565	26.625	100	68	116	*	*
52)	cis-1,3-Dichloropropene	14.78	28.531	26.025	110	77	126	*	*
53)	4-Methyl-2-pentanone	14.81	28.384	26.650	107	69	126	*	*
54)	trans-1,3-Dichloropropene	15.29	30.054	26.625	113	79	125	*	*
55)	1,1,2-Trichloroethane	15.46	27.967	26.500	106	75	119	*	*
58)	Toluene	15.76	26.497	26.400	100	59	118	*	*
59)	2-Hexanone	16.00	28.033	26.425	106	69	129	*	*
60)	Dibromochloromethane	16.16	28.505	26.450	108	74	136	*	*
61)	1,2-Dibromoethane	16.41	28.437	26.425	108	73	131	*	*
62)	n-Butyl Acetate	16.63	28.717	26.850	107	69	130	*	*
63)	n-Octane	16.75	26.914	26.525	101	66	120	*	*
64)	Tetrachloroethene	16.89	27.294	26.500	103	65	130	*	*
65)	Chlorobenzene	17.56	27.084	26.525	102	68	120	*	*
66)	Ethylbenzene	17.92	27.091	26.475	102	68	122	*	*
67)	m- & p-Xylenes	18.09	53.328	52.975	101	68	123	*	*
68)	Bromoform	18.14	28.770	26.525	108	69	130	*	*
69)	Styrene	18.41	27.904	26.350	106	71	133	*	*
70)	o-Xylene	18.51	27.139	26.400	103	68	122	*	*
71)	n-Nonane	18.71	27.206	26.500	103	65	120	*	*
72)	1,1,2,2-Tetrachloroethane	18.49	27.739	26.450	105	69	130	*	*
74)	Cumene	19.04	27.349	26.525	103	70	123	*	*
75)	alpha-Pinene	19.39	27.827	26.600	105	70	128	*	*
76)	n-Propylbenzene	19.49	27.638	26.750	103	69	125	*	*
77)	3-Ethyltoluene	19.58	26.198	26.450	99	67	128	*	*
78)	4-Ethyltoluene	19.62	28.742	26.425	109	67	130	*	*
79)	1,3,5-Trimethylbenzene	19.69	27.220	26.500	103	67	124	*	*
80)	alpha-Methylstyrene	19.82	26.746	26.525	101	67	141	*	*
81)	2-Ethyltoluene	19.86	27.465	26.700	103	67	124	*	*
82)	1,2,4-Trimethylbenzene	20.05	27.707	26.550	104	67	129	*	*
83)	n-Decane	20.14	28.956	26.625	109	66	124	*	*
84)	Benzyl Chloride	20.16	28.574	26.550	108	79	138	*	*
85)	1,3-Dichlorobenzene	20.19	27.471	26.475	104	65	136	*	*
86)	1,4-Dichlorobenzene	20.24	27.073	26.750	101	66	141	*	*
87)	sec-Butylbenzene	20.29	27.319	26.575	103	68	125	*	*
88)	4-Isopropyltoluene (p-Cymene)	20.43	27.096	26.600	102	68	131	*	*
89)	1,2,3-Trimethylbenzene	20.43	28.156	26.600	106	68	132	*	*
90)	1,2-Dichlorobenzene	20.54	27.621	26.750	103	67	136	*	*
91)	d-Limonene	20.56	27.770	26.625	104	71	134	*	*
92)	1,2-Dibromo-3-Chloropropane	20.93	28.427	26.300	108	73	136	*	*
93)	n-Undecane	21.24	26.699	26.775	100	68	132	*	*
94)	1,2,4-Trichlorobenzene	22.05	29.620	27.200	109	64	134	*	*
95)	Naphthalene	22.16	25.837	26.125	99	62	136	*	*
96)	n-Dodecane	22.15	28.243	26.825	105	61	137	*	*
97)	Hexachlorobutadiene	22.47	25.826	26.550	97	60	133	*	*
98)	Cyclohexanone	18.22	27.928	26.150	107	64	131	*	*
99)	tert-Butylbenzene	20.05	27.352	26.525	103	67	128	*	*
100)	n-Butylbenzene	20.80	27.693	26.575	104	68	128	*	*

Data File : I:\MS13\DATA\2017 10\26\10261703.D
 Acq On : 26 Oct 2017 4:13
 Sample : CCV R13102617 5ng
 Misc : S31-09111703/S31-09291701 (10/28)

Vial: 3
 Operator: WA
 Inst : MS13

Quant Time: Oct 26 06:11:12 2017
 Quant Method : I:\MS13\METHODS\R13092317.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Mon Sep 25 06:36:07 2017
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

10/27/17

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	89	-0.02
2 T	Propene	1.182	1.212	-2.5	83	0.00
3 T	Dichlorodifluoromethane (CF	1.937	1.944	-0.4	80	0.00
4 T	Chloromethane	1.448	1.437	0.8	80	0.00
5 T	1,2-Dichloro-1,1,2,2-tetra	1.078	1.173	-8.8	88	0.00
6 T	Vinyl Chloride	1.371	1.483	-8.2	87	-0.01
7 T	1,3-Butadiene	1.043	1.168	-12.0	92	-0.01
8 T	Bromomethane	0.923	0.975	-5.6	92	-0.02
9 T	Chloroethane	0.713	0.773	-8.4	84	-0.02
10 T	Ethanol	0.717	0.748	-4.3	82	-0.10
11 T	Acetonitrile	1.785	1.957	-9.6	82	-0.06
12 T	Acrolein	0.625	0.637	-1.9	80	-0.02
13 T	Acetone	0.766	0.807	-5.4	86	-0.05
14 T	Trichlorofluoromethane	1.657	1.726	-4.2	83	-0.01
15 T	2-Propanol (Isopropanol)	2.492	2.521	-1.2	79	-0.07
16 T	Acrylonitrile	1.285	1.374	-6.9	82	-0.05
17 T	1,1-Dichloroethene	1.013	1.047	-3.4	83	-0.01
18 T	2-Methyl-2-Propanol (tert-B	2.492	2.579	-3.5	80	-0.07
19 T	Methylene Chloride	1.196	1.081	9.6	84	-0.03
20 T	3-Chloro-1-propene (Allyl C	1.450	1.548	-6.8	82	-0.02
21 T	Trichlorotrifluoroethane	1.038	1.063	-2.4	82	0.00
22 T	Carbon Disulfide	4.155	3.943	5.1	83	-0.02
23 T	trans-1,2-Dichloroethene	1.327	1.446	-9.0	83	-0.02
24 T	1,1-Dichloroethane	1.766	1.834	-3.9	83	-0.02
25 T	Methyl tert-Butyl Ether	3.050	3.267	-7.1	84	0.00
26 T	Vinyl Acetate	0.222	0.243	-9.5	86	-0.04
27 T	2-Butanone (MEK)	0.684	0.734	-7.3	82	-0.02
28 T	cis-1,2-Dichloroethene	1.304	1.374	-5.4	82	-0.02
29 T	Diisopropyl Ether	0.971	1.105	-13.8	84	-0.01
30 T	Ethyl Acetate	0.338	0.389	-15.1	84	-0.02
31 T	n-Hexane	1.602	1.764	-10.1	85	0.00
32 T	Chloroform	1.695	1.764	-4.1	83	-0.03
33 S	1,2-Dichloroethane-d4 (SS1)	1.118	1.269	-13.5	88	-0.02
34 T	Tetrahydrofuran (THF)	0.750	0.730	2.7	83	0.00
35 T	Ethyl tert-Butyl Ether	1.251	1.327	-6.1	83	-0.01
36 T	1,2-Dichloroethane	1.187	1.256	-5.8	81	-0.02
37 IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	89	-0.02
38 T	1,1,1-Trichloroethane	0.316	0.324	-2.5	82	-0.01
39 T	Isopropyl Acetate	0.130	0.140	-7.7	85	-0.01
40 T	1-Butanol	0.207	0.220	-6.3	82	-0.05
41 T	Benzene	0.860	0.880	-2.3	84	-0.02
42 T	Carbon Tetrachloride	0.286	0.292	-2.1	82	-0.01
43 T	Cyclohexane	0.329	0.340	-3.3	83	-0.01
44 T	tert-Amyl Methyl Ether	0.616	0.638	-3.6	84	0.00
45 T	1,2-Dichloropropane	0.200	0.212	-6.0	83	-0.02
46 T	Bromodichloromethane	0.272	0.279	-2.6	82	-0.01
47 T	Trichloroethene	0.260	0.256	1.5	81	-0.01
48 T	1,4-Dioxane	0.178	0.191	-7.3	84	0.00
49 T	2,2,4-Trimethylpentane (Iso	0.871	0.899	-3.2	83	-0.01
50 T	Methyl Methacrylate	0.093	0.095	-2.2	80	-0.02
51 T	n-Heptane	0.211	0.218	-3.3	83	-0.01
52 T	cis-1,3-Dichloropropene	0.334	0.349	-4.5	81	-0.01
53 T	4-Methyl-2-pentanone	0.190	0.204	-7.4	84	-0.01
54 T	trans-1,3-Dichloropropene	0.293	0.310	-5.8	81	-0.01
55 T	1,1,2-Trichloroethane	0.209	0.215	-2.9	83	-0.01

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Data File : I:\MS13\DATA\2017 10\26\10261703.D
 Acq On : 26 Oct 2017 4:13
 Sample : CCV R13102617 5ng
 Misc : S31-09111703/S31-09291701 (10/28)

Vial: 3
 Operator: WA
 Inst : MS13

Quant Time: Oct 26 06:11:12 2017
 Quant Method : I:\MS13\METHODS\R13092317.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Mon Sep 25 06:36:07 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	89	0.00
57	S Toluene-d8 (SS2)	2.322	2.591	-11.6	89	0.00
58	T Toluene	2.352	2.398	-2.0	84	-0.01
59	T 2-Hexanone	1.143	1.232	-7.8	82	-0.01
60	T Dibromochloromethane	0.671	0.690	-2.8	80	-0.01
61	T 1,2-Dibromoethane	0.609	0.630	-3.4	81	0.00
62	T n-Butyl Acetate	1.272	1.339	-5.3	82	0.00
63	T n-Octane	0.458	0.476	-3.9	83	-0.01
64	T Tetrachloroethene	0.752	0.748	0.5	80	0.00
65	T Chlorobenzene	1.638	1.621	1.0	81	-0.01
66	T Ethylbenzene	2.634	2.731	-3.7	84	-0.01
67	T m- & p-Xylenes	2.054	2.073	-0.9	83	-0.01
68	T Bromoform	0.620	0.614	1.0	79	0.00
69	T Styrene	1.712	1.736	-1.4	80	0.00
70	T o-Xylene	2.058	2.109	-2.5	83	-0.01
71	T n-Nonane	1.049	1.116	-6.4	83	0.00
72	T 1,1,2,2-Tetrachloroethane	0.942	0.987	-4.8	84	-0.01
73	S Bromofluorobenzene (SS3)	0.896	0.931	-3.9	83	0.00
74	T Cumene	2.731	2.820	-3.3	83	-0.01
75	T alpha-Pinene	1.372	1.435	-4.6	82	0.00
76	T n-Propylbenzene	3.123	3.269	-4.7	83	0.00
77	T 3-Ethyltoluene	2.770	2.906	-4.9	84	-0.01
78	T 4-Ethyltoluene	2.551	2.597	-1.8	81	-0.01
79	T 1,3,5-Trimethylbenzene	2.245	2.339	-4.2	83	0.00
80	T alpha-Methylstyrene	1.285	1.312	-2.1	79	0.00
81	T 2-Ethyltoluene	2.647	2.752	-4.0	83	0.00
82	T 1,2,4-Trimethylbenzene	2.223	2.378	-7.0	84	-0.01
83	T n-Decane	1.062	1.197	-12.7	84	0.00
84	T Benzyl Chloride	1.846	1.892	-2.5	82	-0.01
85	T 1,3-Dichlorobenzene	1.451	1.439	0.8	80	-0.01
86	T 1,4-Dichlorobenzene	1.486	1.473	0.9	81	0.00
87	T sec-Butylbenzene	3.043	3.135	-3.0	82	0.00
88	T 4-Isopropyltoluene (p-Cymen	2.962	3.066	-3.5	82	-0.01
89	T 1,2,3-Trimethylbenzene	2.237	2.367	-5.8	83	0.00
90	T 1,2-Dichlorobenzene	1.371	1.376	-0.4	81	0.00
91	T d-Limonene	0.836	0.921	-10.2	82	-0.01
92	T 1,2-Dibromo-3-Chloropropane	0.496	0.513	-3.4	80	0.00
93	T n-Undecane	1.129	1.266	-12.1	84	0.00
94	T 1,2,4-Trichlorobenzene	0.985	1.070	-8.6	80	-0.01
95	T Naphthalene	3.009	3.240	-7.7	78	0.00
96	T n-Dodecane	1.035	1.258	-21.5	92	0.00
97	T Hexachlorobutadiene	0.749	0.757	-1.1	82	0.00
98	T Cyclohexanone	0.750	0.777	-3.6	81	-0.01
99	T tert-Butylbenzene	2.288	2.346	-2.5	81	0.00
100	T n-Butylbenzene	2.319	2.467	-6.4	82	0.00

(#) = Out of Range

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

Data File : I:\MS13\DATA\2017 10\26\10261703.D
 Acq On : 26 Oct 2017 4:13
 Sample : CCV R13102617 5ng
 Misc : S31-09111703/S31-09291701 (10/28)

Vial: 3
 Operator: WA
 Inst : MS13

Quant Time: Oct 26 06:11:12 2017

Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:36:07 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

10/27/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.14	130	93117	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.23	114	454464	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.52	82	174851	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.97	65	118157	12.611	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	100.88%	
57) Toluene-d8 (SS2)	15.66	98	452956	12.398	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	99.20%	
73) Bromofluorobenzene (SS3)	18.91	174	162752	11.545	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	92.40%	

Target Compounds

						Qvalue
2) Propene	4.37	42	46807	4.725	ng	98
3) Dichlorodifluoromethan...	4.52	85	75880	4.673	ng	100
4) Chloromethane	4.78	50	53839	4.437	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	5.04	135	44608	4.940	ng	99
6) Vinyl Chloride	5.18	62	57021	4.963	ng	98
7) 1,3-Butadiene	5.43	54	46062	5.267	ng	98
8) Bromomethane	5.85	94	36069	4.663	ng	99
9) Chloroethane	6.16	64	29151	4.877	ng	100
10) Ethanol	6.50	45	146932	24.438	ng	99
11) Acetonitrile	6.75	41	77190	5.159	ng	98
12) Acrolein	6.94	56	24994	4.604	ng	97
13) Acetone	7.13	58	160045	24.940	ng	97
14) Trichlorofluoromethane	7.38	101	67570	4.865	ng	99
15) 2-Propanol (Isopropanol)	7.60	45	197808	9.472	ng	100
16) Acrylonitrile	7.85	53	54024	4.837	ng	100
17) 1,1-Dichloroethene	8.30	96	41364	4.873	ng	98
18) 2-Methyl-2-Propanol (t...	8.45	59	203646	9.750	ng	100
19) Methylene Chloride	8.50	84	42591	4.248	ng	99
20) 3-Chloro-1-propene (Al...	8.66	41	60763	5.002	ng	98
21) Trichlorotrifluoroethane	8.92	151	41686	4.790	ng	98
22) Carbon Disulfide	8.77	76	156129	4.413	ng	100
23) trans-1,2-Dichloroethene	9.73	61	58236	5.238	ng	99
24) 1,1-Dichloroethane	9.98	63	69809	4.717	ng	99
25) Methyl tert-Butyl Ether	10.08	73	130201	5.093	ng	99
26) Vinyl Acetate	10.22	86	47757	24.766	ng	# 90
27) 2-Butanone (MEK)	10.47	72	28755	4.840	ng	99
28) cis-1,2-Dichloroethene	10.97	61	54597	4.996	ng	98
29) Diisopropyl Ether	11.26	87	43843	5.386	ng	# 94
30) Ethyl Acetate	11.27	61	30923	10.928	ng	99
31) n-Hexane	11.25	57	70026	5.215	ng	100
32) Chloroform	11.30	83	69702	4.906	ng	100
34) Tetrahydrofuran (THF)	11.72	72	28946	4.602	ng	99
35) Ethyl tert-Butyl Ether	11.84	87	52342	4.991	ng	98
36) 1,2-Dichloroethane	12.09	62	49365	4.963	ng	100
38) 1,1,1-Trichloroethane	12.37	97	63439	4.905	ng	100
39) Isopropyl Acetate	12.79	61	53960	10.180	ng	97
40) 1-Butanol	12.80	56	84534	9.628	ng	97
41) Benzene	12.84	78	169038	4.804	ng	100
42) Carbon Tetrachloride	13.00	117	56274	4.819	ng	100
43) Cyclohexane	13.13	84	131952	9.797	ng	98
44) tert-Amyl Methyl Ether	13.48	73	122667	4.868	ng	99
45) 1,2-Dichloropropane	13.68	63	41008	5.018	ng	99
46) Bromodichloromethane	13.87	83	54172	4.866	ng	99
47) Trichloroethene	13.92	130	49453	4.642	ng	100
48) 1,4-Dioxane	13.90	88	36867	5.075	ng	100
49) 2,2,4-Trimethylpentane...	13.99	57	173136	4.857	ng	100
50) Methyl Methacrylate	14.13	100	36350	9.202	ng	94

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Data File : I:\MS13\DATA\2017 10\26\10261703.D
 Acq On : 26 Oct 2017 4:13
 Sample : CCV R13102617 5ng
 Misc : S31-09111703/S31-09291701 (10/28)

Vial: 3
 Operator: WA
 Inst : MS13

Quant Time: Oct 26 06:11:12 2017
 Quant Method : I:\MS13\METHODS\R13092317.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Mon Sep 25 06:36:07 2017
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.25	71	42202	4.894	ng	99
52) cis-1,3-Dichloropropene	14.77	75	71076	5.116	ng	100
53) 4-Methyl-2-pentanone	14.81	58	39239	5.055	ng	99
54) trans-1,3-Dichloropropene	15.29	75	60219	4.944	ng	100
55) 1,1,2-Trichloroethane	15.46	97	41611	4.876	ng	98
58) Toluene	15.75	91	176795	4.777	ng	99
59) 2-Hexanone	16.00	43	91308	5.078	ng	98
60) Dibromochloromethane	16.16	129	51187	4.848	ng	100
61) 1,2-Dibromoethane	16.41	107	46902	4.894	ng	100
62) n-Butyl Acetate	16.63	43	99997	4.996	ng	99
63) n-Octane	16.75	57	35288	4.901	ng	99
64) Tetrachloroethene	16.89	166	55643	4.702	ng	100
65) Chlorobenzene	17.56	112	120889	4.689	ng	100
66) Ethylbenzene	17.92	91	200967	4.849	ng	98
67) m- & p-Xylenes	18.09	91	307872	9.524	ng	100
68) Bromoform	18.14	173	45633	4.677	ng	100
69) Styrene	18.41	104	128452	4.768	ng	99
70) o-Xylene	18.51	91	155606	4.804	ng	99
71) n-Nonane	18.71	43	82304	4.987	ng	100
72) 1,1,2,2-Tetrachloroethane	18.48	83	72984	4.925	ng	99
74) Cumene	19.04	105	207476	4.828	ng	99
75) alpha-Pinene	19.39	93	104954	4.860	ng	97
76) n-Propylbenzene	19.49	91	243258	4.949	ng	99
77) 3-Ethyltoluene	19.58	105	213399	4.896	ng	98
78) 4-Ethyltoluene	19.62	105	190513	4.746	ng	98
79) 1,3,5-Trimethylbenzene	19.69	105	171606	4.858	ng	98
80) alpha-Methylstyrene	19.82	118	96245	4.590	ng	99
81) 2-Ethyltoluene	19.86	105	204002	4.897	ng	98
82) 1,2,4-Trimethylbenzene	20.05	105	174811	4.996	ng	97
83) n-Decane	20.14	57	88649	5.306	ng	99
84) Benzyl Chloride	20.16	91	142121	4.716	ng	99
85) 1,3-Dichlorobenzene	20.18	146	107824	4.723	ng	100
86) 1,4-Dichlorobenzene	20.24	146	109579	4.686	ng	99
87) sec-Butylbenzene	20.29	105	231330	4.831	ng	99
88) 4-Isopropyltoluene (p-...	20.43	119	220038	4.721	ng	99
89) 1,2,3-Trimethylbenzene	20.43	105	169888	4.826	ng	99
90) 1,2-Dichlorobenzene	20.54	146	104212	4.829	ng	100
91) d-Limonene	20.55	68	64712	4.916	ng	98
92) 1,2-Dibromo-3-Chloropr...	20.93	157	37705	4.835	ng	96
93) n-Undecane	21.24	57	93274	4.922	ng	100
94) 1,2,4-Trichlorobenzene	22.05	180	82100	5.295	ng	100
95) Naphthalene	22.16	128	239267	4.872	ng	99
96) n-Dodecane	22.15	57	92886	5.344	ng	99
97) Hexachlorobutadiene	22.47	225	55955	4.747	ng	99
98) Cyclohexanone	18.22	55	56466	4.782	ng	98
99) tert-Butylbenzene	20.05	119	172298	4.786	ng	99
100) n-Butylbenzene	20.79	91	181829	4.984	ng	99

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

Data File : I:\MS13\DATA\2017 10\26\10261703.D
Acq On : 26 Oct 2017 4:13
Sample : CCV R13102617 5ng
Misc : S31-09111703/S31-09291701 (10/28)

Vial: 3
Operator: WA
Inst : MS13

Quant Time: Oct 26 06:11:12 2017

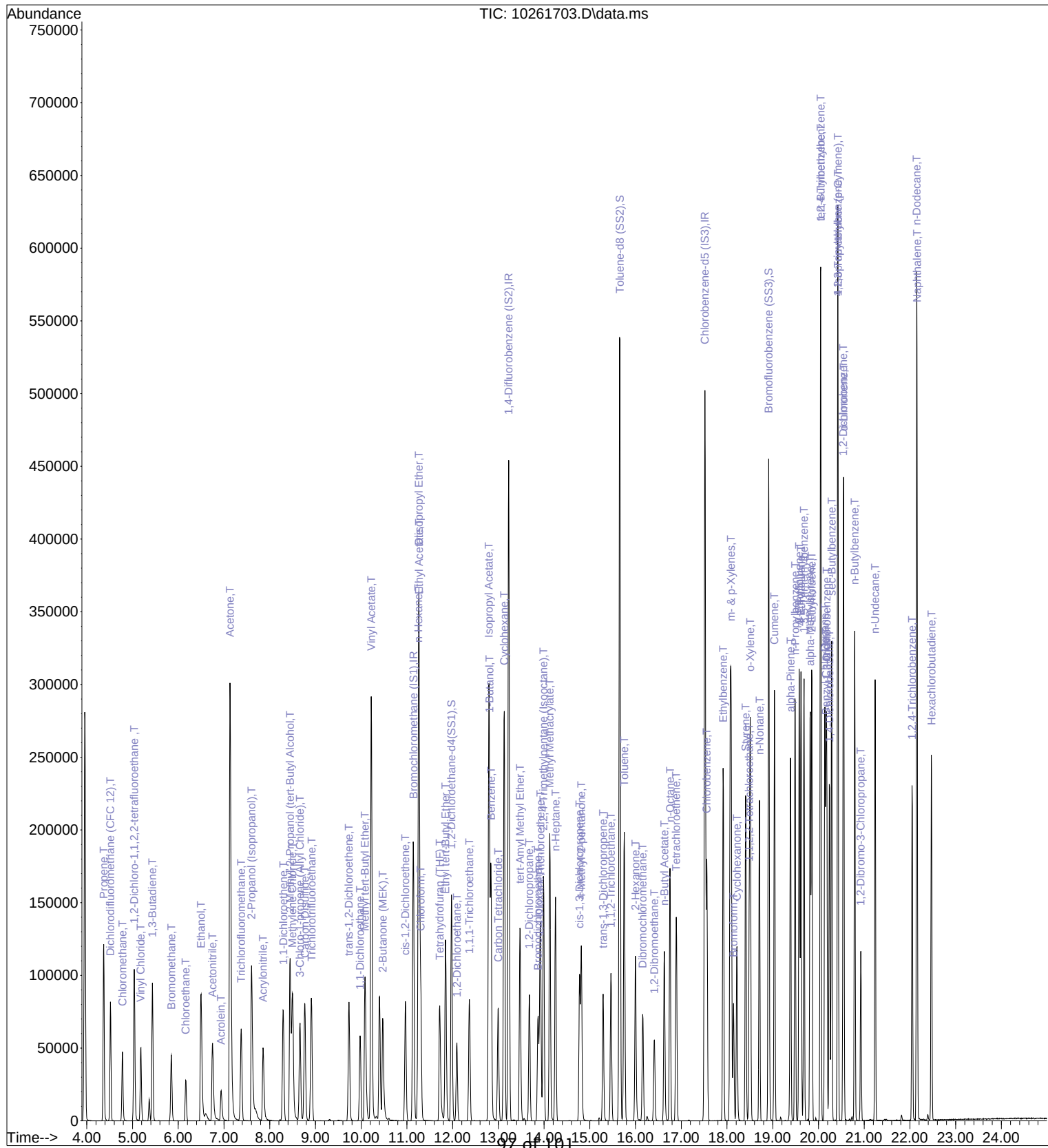
Quant Method : I:\MS13\METHODS\R13092317.M

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

QLast Update : Mon Sep 25 06:36:07 2017

Response via : Initial Calibration

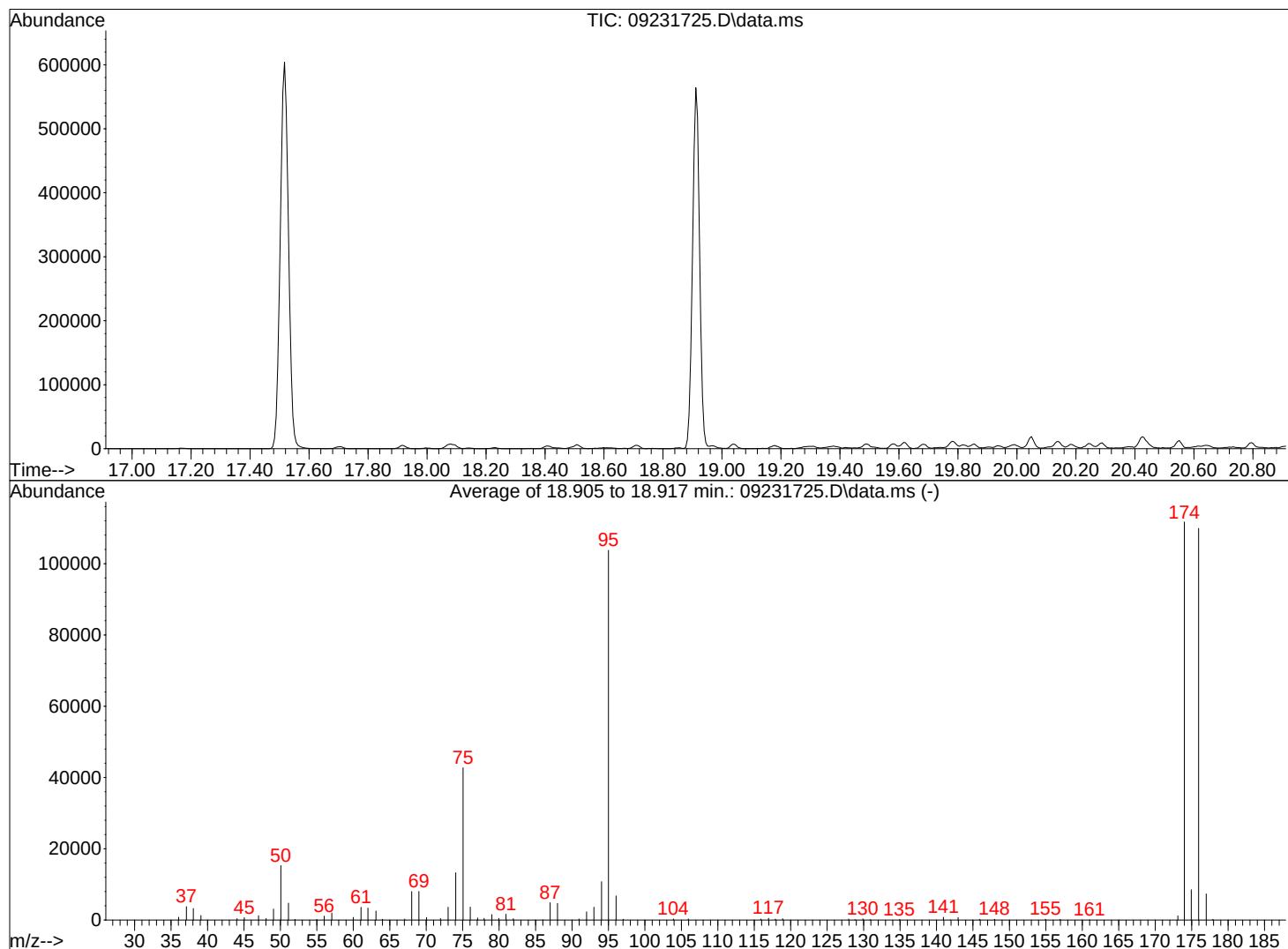
DataAcq Meth:TO15.M



Data Path : I:\MS13\DATA\2017 09\23\
 Data File : 09231725.D
 Acq On : 23 Sep 2017 15:24
 Operator : WA
 Sample : BFB Std
 Misc : S31-09111702
 ALS Vial : 3 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS13\METHODS\R13092317.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Mon Sep 25 06:36:07 2017



AutoFind: Scans 2639, 2640, 2641; Background Corrected with Scan 2632

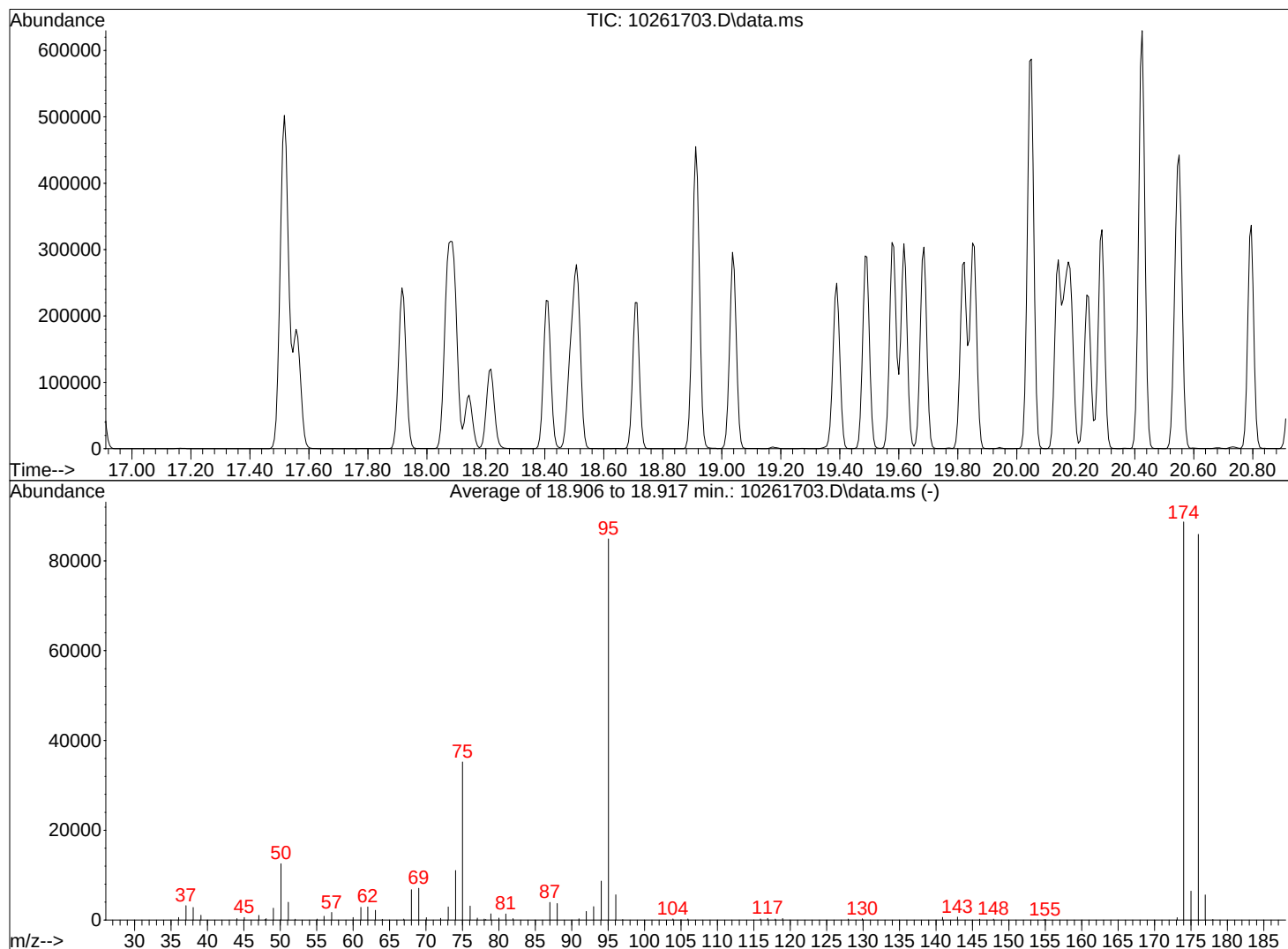
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	14.7	15279	PASS
75	95	30	66	41.2	42723	PASS
95	95	100	100	100.0	103736	PASS
96	95	5	9	6.5	6762	PASS
173	174	0.00	2	1.1	1185	PASS
174	95	50	120	107.7	111699	PASS
175	174	4	9	7.6	8534	PASS
176	174	93	101	98.4	109899	PASS
177	176	5	9	6.7	7332	PASS

WA 9/25/17

Data Path : I:\MS13\DATA\2017 10\26\
 Data File : 10261703.D
 Acq On : 26 Oct 2017 4:13
 Operator : WA
 Sample : CCV R13102617 5ng
 Misc : S31-09111703/S31-09291701 (10/28)
 ALS Vial : 3 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS13\METHODS\R13092317.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Mon Sep 25 06:36:07 2017



AutoFind: Scans 2639, 2640, 2641; Background Corrected with Scan 2632

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	14.8	12556	PASS
75	95	30	66	41.5	35200	PASS
95	95	100	100	100.0	84901	PASS
96	95	5	9	6.6	5626	PASS
173	174	0.00	2	0.6	551	PASS
174	95	50	120	104.5	88683	PASS
175	174	4	9	7.3	6445	PASS
176	174	93	101	96.9	85925	PASS
177	176	5	9	6.5	5597	PASS

WA 10/27/17

Injection Log

Directory: J:\MS13\DATA\2017_09\23\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
25	9/23/17 15:24	09231725.D	BFB Std	S31-09111702	WA	3	<i>Passes</i>
26	9/23/17 16:00	09231726.D	0.08ng TO-15 ICAL Std	S31-09111702/S31-09121704 (10/11)	WA	14	<i>not used</i>
27	9/23/17 16:34	09231727.D	0.10ng TO-15 ICAL Std	S31-09111702/S31-09121704 (10/11)	WA	14	
28	9/23/17 17:09	09231728.D	0.20ng TO-15 ICAL Std	S31-09111702/S31-09121704 (10/11)	WA	14	
29	9/23/17 17:44	09231729.D	0.40ng TO-15 ICAL Std	S31-09111702/S31-09121704 (10/11)	WA	14	
30	9/23/17 18:19	09231730.D	1.0ng TO-15 ICAL Std	S31-09111702/S31-09231704 (10/22)	WA	15	
31	9/23/17 18:53	09231731.D	5.0ng TO-15 ICAL Std	S31-09111702/S31-09231704 (10/22)	WA	15	
32	9/23/17 19:28	09231732.D	25ng TO-15 ICAL Std	S31-09111702/S31-09231702 (10/22)	WA	16	
33	9/23/17 20:03	09231733.D	50ng TO-15 ICAL Std	S31-09111702/S31-09231702 (10/22)	WA	16	
34	9/23/17 20:38	09231734.D	100ng TO-15 ICAL Std	S31-09111702/S31-09231702 (10/22)	WA	16	
35	9/23/17 21:13	09231735.D	Blank	S31-09111702	WA	3	
36	9/23/17 21:48	09231736.D	0.40ng TO-15 ICAL Std	S31-09111702/S31-09121704 (10/11)	WA	11	<i>not used</i>
37	9/23/17 22:23	09231737.D	25ng TO-15 ICV Std	S31-09111702/S31-09051703 (10/4)	WA	12	<i>Passes all cmpmps</i>
38	9/23/17 22:58	09231738.D	0.5ng Std Check	S31-09111702/S31-09201705 (10/19)	WA	3	
Saved as R13092317.M: ranges from 0.1ng ---> 100ng, except: Acrolein, Acrylonitrile, MEK, a-MeStyrene, Benzyl-C, naphthalene: 0.4ng ---> 100ng							
CS2, cis/trans-1,3-Dichloropropene: 0.2ng ---> 100ng; vinyl Acetate: 2ng ---> 500ng; Undecane, Dodecane: 1.0ng ---> 100ng							

 9/25/17

Injection Log

Directory: I:\MS13\DATA\2017_10\26\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	10/26/17 3:04	10261701.D	System	S31-09111703/S31-09291701 (10/28)	WA	15	
2	10/26/17 3:38	10261702.D	CCV C13102517_25ng	S31-09111703/S31-10091704 (11/7)	WA	16	<i>not used</i>
3	10/26/17 4:13	10261703.D	CCV R13102617_5ng	S31-09111703/S31-09291701 (10/28)	WA	3	<i>Passes</i>
4	10/26/17 4:46	10261704.D	MB R13102617_1000mL	S31-09111703_AC00880	WA	3	<i>Passes</i>
5	10/26/17 5:20	10261705.D	LCS R13102617_5ng	S31-09111703/S31-10091704 (11/7)	WA	3	<i>Passes</i>
6	10/26/17 7:27	10261706.D	LCSD R13102617_25ng	S31-09111703/S31-10091704 (11/7)	WA	3	<i>Passes</i>
7	10/26/17 8:00	10261707.D	P1705099-001 (400mL) PF2	S31-09111703	WA	6	
8	10/26/17 8:34	10261708.D	P1705099-002 (400mL) PF2	S31-09111703	WA	5	
9	10/26/17 9:07	10261709.D	P1705099-003 (400mL) PF2	S31-09111703	WA	7	
10	10/26/17 9:41	10261710.D	P1705099-002dil (100mL) PF2	S31-09111703	WA	5	
11	10/26/17 10:15	10261711.D	P1705064-001 Conf. (1000mL) PF3	S31-09111703	WA	1	
12	10/26/17 11:17	10261712.D	P1705166-001 (7.5mL)	S31-09111703	WA	4	
13	10/26/17 11:51	10261713.D	P1705166-001dup (7.5mL)	S31-09111703	WA	4	<i>Passes for dup</i>
14	10/26/17 12:25	10261714.D	P1705134-001 (1000mL)	S31-09111703	WA	2	
15	10/26/17 13:16	10261715.D	P1705293-001 (100mL)	S31-09111703	WA	8	
16	10/26/17 13:50	10261716.D	P1705134-001dil (200mL)	S31-09111703	WA	2	
17	10/26/17 14:29	10261717.D	Blank	S31-09111703	WA	4	
18	10/26/17 15:10	10261718.D	P1705161-003 (0.4mL)	S31-09111703	WA	4	
19	10/26/17 15:46	10261719.D	P1705161-001 (4.0mL)	S31-09111703	WA	4	
20	10/26/17 16:44	10261720.D	P1705161-001 (20mL)	S31-09111703	WA	7	
21	10/26/17 17:31	10261721.D	P1705161-002 (100mL)	S31-09111703	WA	8	
22	10/26/17 18:05	10261722.D	P1705161-002dil (25mL)	S31-09111703	WA	8	
23	10/26/17 18:39	10261723.D	P1705282-001 (100mL)	S31-09111703	WA	12	
24	10/26/17 19:12	10261724.D	P1705282-002 (100mL)	S31-09111703	WA	13	
25	10/26/17 19:46	10261725.D	System	S31-09111703	WA	14	
26	10/26/17 20:20	10261726.D	CCVend R13102617_25ng	S31-09111703/S31-09291701 (10/28)	WA	15	<i>rerun</i>
27	10/26/17 20:54	10261727.D	CCV2 C13102617_5ng	S31-09111703/S31-10101704 (11/8)	WA	16	
28	10/26/17 21:28	10261728.D	CCV2 R13102617_5ng_CCVend	S31-09111703/S31-09291704 (10/28)	WA	3	<i>Passes</i>
	LCS/LCSD: trichlorofluoromethane above current; w/in 130% (passes for DoD)						
	end CCV (5ng) : biased high for acrylonitrile					10/27/17	



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LABORATORY REPORT

January 3, 2018

Todd Calhoun
Trinity Analysis & Development Corp.
1002 N. Eglin Pkwy.
Shalimar, FL 32579

RE: DDMT SVE / 10060131 TO 20

Dear Todd:

Enclosed are the results of the sample submitted to our laboratory on December 11, 2017. For your reference, this analysis has been assigned our service request number P1706191.

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 Sue Anderson at 8:42 am, Jan 04, 2018

For Kate Kaneko
Project Manager



2655 Park Center Dr., Suite A
Simi Valley, CA 93065
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www.alsglobal.com

Client: Trinity Analysis & Development Corp.
Project: DDMT SVE / 10060131 TO 20

Service Request No: P1706191

CASE NARRATIVE

The sample was received intact under chain of custody on December 11, 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.

Manual integration were performed. Refer to the raw data for additional information.

Sample Identification(s)	Analyte(s)
P1706191-001	Bromodichloromethane

The container was cleaned, prior to sampling, down to the method reporting limit (MRL) reported for this project. For projects requiring DoD QSM 5.1 compliance canisters were cleaned to <1/2 the MRL. 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	T104704413-17-8
Utah DOH (NELAP)	http://health.utah.gov/lab/environmental-lab-certification/	CA01627201 7-8
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: Trinity Analysis & Development Corp.
Project ID: DDMT SVE / 10060131 T0 20

Service Request: P1706191

Date Received: 12/11/2017
Time Received: 15:00

TO-15 - VOC Cans

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)
ODSVE-EFF-Y7Q3	P1706191-001	Air	12/5/2017	11:57	SC01870	0.59	3.69

X



Air - Chain of Custody Record & Analytical Service Request

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

Page _____ of _____

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 21706191									
Company Name & Address (Reporting Information) HDR 9781 S. Meridian Blvd. Englewood, CO 80112 Project Manager T. Holmes		Project Name DDMT SVE									
Phone 404 295 3279		Project Number 1006031									
Fax T. Holmes		P.O. # / Billing Information T020									
Email Address for Result Reporting		Sampler (Print & Sign)									
Client Sample ID ODSVE-EFF-#703	Laboratory ID Number SC01870	Canister ID (Bar code # - AC, SC, etc.) SC01870	Flow Controller ID (Bar code # - FC #) FC-0523	Canister Start Pressure "Hg -38	Canister End Pressure "Hg/psig -1	Sample Volume 6L	ALS Contact: Analysis Method 70-15 X	Comments e.g. Actual Preservative or specific instructions			
Report Tier Levels - please select Tier I - Results (Default in not specified) _____ Tier II (Results + QC Summaries) _____ Tier III (Results + QC & Calibration Summaries) _____ Tier IV (Date Validation Package) 10% Surcharge				Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT		Project Requirements (MRLs, QAPP)					
Relinquished by: (Signature) Lyle Carroll		Date: 12-5-17		Time: 1730		Received by: (Signature) [Signature]		Date: 12-5-17		Time: 1700	
Relinquished by: (Signature)		Date:		Time:		Received by: (Signature)		Date:		Time:	

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: Trinity Analysis & Development Corp.

Client Sample ID: ODSVE-EFF-Y7Q3

Client Project ID: DDMT SVE / 10060131 T0 20

ALS Project ID: P1706191

ALS Sample ID: P1706191-001

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC01870

Date Collected: 12/5/17

Date Received: 12/11/17

Date Analyzed: 12/13/17

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): 0.59

Final Pressure (psig): 3.69

Container Dilution Factor: 1.20

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	0.36	0.35	0.29	0.098	
75-71-8	Dichlorodifluoromethane (CFC 12)	0.67	0.12	0.10	0.041	
74-87-3	Chloromethane	0.23	0.29	0.23	0.087	U
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	0.070	0.086	0.070	0.033	U
75-01-4	Vinyl Chloride	0.19	0.23	0.19	0.080	U
106-99-0	1,3-Butadiene	0.23	0.27	0.23	0.12	U
74-83-9	Bromomethane	0.12	0.15	0.12	0.059	U
75-00-3	Chloroethane	0.18	0.23	0.18	0.077	U
64-17-5	Ethanol	0.62	3.2	1.3	0.51	J
75-05-8	Acetonitrile	0.30	0.36	0.30	0.13	U
107-02-8	Acrolein	0.24	1.0	0.22	0.089	J
67-64-1	Acetone	1.1	2.5	1.1	0.39	U
75-69-4	Trichlorofluoromethane	0.33	0.11	0.090	0.036	
67-63-0	2-Propanol (Isopropyl Alcohol)	0.41	2.4	0.41	0.21	U
107-13-1	Acrylonitrile	0.23	0.28	0.23	0.094	U
75-35-4	1,1-Dichloroethene	0.97	0.15	0.13	0.051	
75-09-2	Methylene Chloride	0.081	0.17	0.15	0.059	J
107-05-1	3-Chloro-1-propene (Allyl Chloride)	0.16	0.19	0.16	0.061	U
76-13-1	Trichlorotrifluoroethane	3.5	0.078	0.066	0.027	
75-15-0	Carbon Disulfide	2.9	1.9	0.17	0.058	
156-60-5	trans-1,2-Dichloroethene	0.38	0.15	0.13	0.058	
75-34-3	1,1-Dichloroethane	0.40	0.15	0.12	0.047	
1634-04-4	Methyl tert-Butyl Ether	0.14	0.17	0.14	0.057	U
108-05-4	Vinyl Acetate	0.72	1.7	0.72	0.22	U
78-93-3	2-Butanone (MEK)	0.77	2.0	0.17	0.085	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: Trinity Analysis & Development Corp.

Client Sample ID: ODSVE-EFF-Y7Q3

Client Project ID: DDMT SVE / 10060131 T0 20

ALS Project ID: P1706191

ALS Sample ID: P1706191-001

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC01870

Date Collected: 12/5/17

Date Received: 12/11/17

Date Analyzed: 12/13/17

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): 0.59 Final Pressure (psig): 3.69

Container Dilution Factor: 1.20

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	26	0.15	0.13	0.048	
141-78-6	Ethyl Acetate	0.28	0.33	0.28	0.12	U
110-54-3	n-Hexane	0.98	0.17	0.15	0.051	
67-66-3	Chloroform	5.0	0.12	0.10	0.042	
109-99-9	Tetrahydrofuran (THF)	0.18	0.20	0.18	0.081	U
107-06-2	1,2-Dichloroethane	0.12	0.15	0.12	0.047	U
71-55-6	1,1,1-Trichloroethane	0.39	0.11	0.095	0.037	
71-43-2	Benzene	0.16	0.19	0.16	0.060	U
56-23-5	Carbon Tetrachloride	0.39	0.095	0.080	0.029	
110-82-7	Cyclohexane	1.7	0.35	0.30	0.10	
78-87-5	1,2-Dichloropropane	0.11	0.13	0.11	0.042	U
75-27-4	Bromodichloromethane	0.21	0.090	0.077	0.027	
79-01-6	Trichloroethene	18	0.11	0.094	0.031	
123-91-1	1,4-Dioxane	0.14	0.17	0.14	0.053	U
80-62-6	Methyl Methacrylate	0.25	0.29	0.25	0.091	U
142-82-5	n-Heptane	0.12	0.15	0.13	0.050	J
10061-01-5	cis-1,3-Dichloropropene	0.12	0.13	0.12	0.037	U
108-10-1	4-Methyl-2-pentanone	0.12	0.15	0.12	0.047	U
10061-02-6	trans-1,3-Dichloropropene	0.11	0.13	0.11	0.042	U
79-00-5	1,1,2-Trichloroethane	0.095	0.11	0.095	0.035	U
108-88-3	Toluene	0.13	0.16	0.13	0.054	U
591-78-6	2-Hexanone	0.054	0.15	0.12	0.047	J
124-48-1	Dibromochloromethane	0.059	0.070	0.059	0.023	U
106-93-4	1,2-Dibromoethane	0.067	0.078	0.067	0.025	U
123-86-4	n-Butyl Acetate	0.11	0.13	0.11	0.040	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.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 3 of 3

Client: Trinity Analysis & Development Corp.
Client Sample ID: ODSVE-EFF-Y7Q3
Client Project ID: DDMT SVE / 10060131 T0 20

ALS Project ID: P1706191
 ALS Sample ID: P1706191-001

Test Code: EPA TO-15
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16
 Analyst: Lusine Hakobyan
 Sampling Media: 6.0 L Summa Canister
 Test Notes:
 Container ID: SC01870

Date Collected: 12/5/17
 Date Received: 12/11/17
 Date Analyzed: 12/13/17
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): 0.59 Final Pressure (psig): 3.69

Container Dilution Factor: 1.20

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	0.11	0.13	0.11	0.046	U
127-18-4	Tetrachloroethene	2.3	0.089	0.076	0.025	
108-90-7	Chlorobenzene	0.11	0.13	0.11	0.042	U
100-41-4	Ethylbenzene	0.12	0.14	0.12	0.044	U
179601-23-1	m,p-Xylenes	0.23	0.28	0.23	0.083	U
75-25-2	Bromoform	0.050	0.058	0.050	0.017	U
100-42-5	Styrene	0.12	0.14	0.12	0.042	U
95-47-6	o-Xylene	0.12	0.14	0.12	0.041	U
111-84-2	n-Nonane	0.096	0.11	0.096	0.034	U
79-34-5	1,1,2,2-Tetrachloroethane	0.66	0.087	0.073	0.026	
98-82-8	Cumene	0.10	0.12	0.10	0.037	U
80-56-8	alpha-Pinene	0.090	0.11	0.090	0.030	U
103-65-1	n-Propylbenzene	0.11	0.12	0.11	0.039	U
622-96-8	4-Ethyltoluene	0.10	0.12	0.10	0.039	U
108-67-8	1,3,5-Trimethylbenzene	0.10	0.12	0.10	0.039	U
95-63-6	1,2,4-Trimethylbenzene	0.10	0.12	0.10	0.037	U
100-44-7	Benzyl Chloride	0.10	0.12	0.10	0.026	U
541-73-1	1,3-Dichlorobenzene	0.086	0.10	0.086	0.030	U
106-46-7	1,4-Dichlorobenzene	0.086	0.10	0.086	0.028	U
95-50-1	1,2-Dichlorobenzene	0.086	0.10	0.086	0.030	U
5989-27-5	d-Limonene	0.086	0.11	0.086	0.030	U
96-12-8	1,2-Dibromo-3-chloropropane	0.052	0.062	0.052	0.012	U
120-82-1	1,2,4-Trichlorobenzene	0.071	0.081	0.071	0.026	U
91-20-3	Naphthalene	0.096	0.11	0.096	0.041	U
87-68-3	Hexachlorobutadiene	0.047	0.056	0.047	0.016	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: Trinity Analysis & Development Corp.

Client Sample ID: Method Blank

Client Project ID: DDMT SVE / 10060131 T0 20

ALS Project ID: P1706191

ALS Sample ID: P171213-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 12/13/17

Volume(s) Analyzed: 1.00 Liter(s)

Container 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)	0.085	0.10	0.085	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	0.25	0.30	0.25	0.11	U
107-02-8	Acrolein	0.18	0.87	0.18	0.074	U
67-64-1	Acetone	0.88	2.1	0.88	0.32	U
75-69-4	Trichlorofluoromethane	0.075	0.089	0.075	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)	0.13	0.16	0.13	0.051	U
76-13-1	Trichlorotrifluoroethane	0.055	0.065	0.055	0.022	U
75-15-0	Carbon Disulfide	0.14	1.6	0.14	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	0.60	1.4	0.60	0.18	U
78-93-3	2-Butanone (MEK)	0.14	1.7	0.14	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: Trinity Analysis & Development Corp.

Client Sample ID: Method Blank

Client Project ID: DDMT SVE / 10060131 T0 20

ALS Project ID: P1706191

ALS Sample ID: P171213-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 12/13/17

Volume(s) Analyzed: 1.00 Liter(s)

Container 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	0.086	0.10	0.086	0.035	U
109-99-9	Tetrahydrofuran (THF)	0.15	0.17	0.15	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	0.079	0.092	0.079	0.031	U
71-43-2	Benzene	0.13	0.16	0.13	0.050	U
56-23-5	Carbon Tetrachloride	0.067	0.080	0.067	0.024	U
110-82-7	Cyclohexane	0.25	0.29	0.25	0.084	U
78-87-5	1,2-Dichloropropane	0.093	0.11	0.093	0.035	U
75-27-4	Bromodichloromethane	0.064	0.075	0.064	0.022	U
79-01-6	Trichloroethene	0.078	0.093	0.078	0.026	U
123-91-1	1,4-Dioxane	0.12	0.14	0.12	0.044	U
80-62-6	Methyl Methacrylate	0.21	0.24	0.21	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	0.079	0.092	0.079	0.029	U
108-88-3	Toluene	0.11	0.13	0.11	0.045	U
591-78-6	2-Hexanone	0.10	0.12	0.10	0.039	U
124-48-1	Dibromochloromethane	0.049	0.059	0.049	0.019	U
106-93-4	1,2-Dibromoethane	0.056	0.065	0.056	0.021	U
123-86-4	n-Butyl Acetate	0.091	0.11	0.091	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: Trinity Analysis & Development Corp.
Client Sample ID: Method Blank
Client Project ID: DDMT SVE / 10060131 T0 20

ALS Project ID: P1706191
 ALS Sample ID: P171213-MB

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16
Analyst: Lusine Hakobyan
Sampling Media: 6.0 L Summa Canister
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 12/13/17
Volume(s) Analyzed: 1.00 Liter(s)

Container Dilution Factor: 1.00

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	0.090	0.11	0.090	0.039	U
127-18-4	Tetrachloroethene	0.063	0.074	0.063	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	0.20	0.23	0.20	0.069	U
75-25-2	Bromoform	0.042	0.048	0.042	0.015	U
100-42-5	Styrene	0.099	0.12	0.099	0.035	U
95-47-6	o-Xylene	0.097	0.12	0.097	0.035	U
111-84-2	n-Nonane	0.080	0.095	0.080	0.029	U
79-34-5	1,1,2,2-Tetrachloroethane	0.061	0.073	0.061	0.022	U
98-82-8	Cumene	0.085	0.10	0.085	0.031	U
80-56-8	alpha-Pinene	0.075	0.090	0.075	0.025	U
103-65-1	n-Propylbenzene	0.088	0.10	0.088	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	0.072	0.083	0.072	0.023	U
95-50-1	1,2-Dichlorobenzene	0.072	0.083	0.072	0.025	U
5989-27-5	d-Limonene	0.072	0.090	0.072	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	0.059	0.067	0.059	0.022	U
91-20-3	Naphthalene	0.080	0.095	0.080	0.034	U
87-68-3	Hexachlorobutadiene	0.039	0.047	0.039	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: Trinity Analysis & Development Corp.
Client Project ID: DDMT SVE / 10060131 T0 20

ALS Project ID: P1706191

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16
Analyst: Lusine Hakobyan
Sampling Media: 6.0 L Summa Canister(s)
Test Notes:

Date(s) Collected: 12/5/17
Date(s) Received: 12/11/17
Date(s) Analyzed: 12/13/17

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	P171213-MB	107	101	94	70-130	
Lab Control Sample	P171213-LCS	103	100	96	70-130	
ODSVE-EFF-Y7Q3	P1706191-001	103	100	97	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: Trinity Analysis & Development Corp.

Client Sample ID: Lab Control Sample

Client Project ID: DDMT SVE / 10060131 T0 20

ALS Project ID: P1706191

ALS Sample ID: P171213-LCS

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 12/13/17

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	DOD Acceptance Limits	Data Qualifier
115-07-1	Propene	122	117	96	57-136	
75-71-8	Dichlorodifluoromethane (CFC 12)	43.1	37.4	87	59-128	
74-87-3	Chloromethane	102	84.6	83	59-132	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	30.1	26.1	87	63-121	
75-01-4	Vinyl Chloride	82.5	77.2	94	64-127	
106-99-0	1,3-Butadiene	94.9	93.1	98	66-134	
74-83-9	Bromomethane	54.1	48.8	90	63-134	
75-00-3	Chloroethane	79.6	74.6	94	63-127	
64-17-5	Ethanol	554	541	98	59-125	
75-05-8	Acetonitrile	125	117	94	63-132	
107-02-8	Acrolein	91.0	92.2	101	62-126	
67-64-1	Acetone	444	427	96	58-128	
75-69-4	Trichlorofluoromethane	37.1	32.6	88	62-126	
67-63-0	2-Propanol (Isopropyl Alcohol)	172	156	91	52-125	
107-13-1	Acrylonitrile	97.5	96.3	99	71-137	
75-35-4	1,1-Dichloroethene	53.8	47.1	88	61-133	
75-09-2	Methylene Chloride	61.3	55.5	91	62-115	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	67.8	64.0	94	71-131	
76-13-1	Trichlorotrifluoroethane	27.9	23.4	84	66-126	
75-15-0	Carbon Disulfide	68.7	65.6	95	57-134	
156-60-5	trans-1,2-Dichloroethene	53.9	52.0	96	67-124	
75-34-3	1,1-Dichloroethane	52.4	46.8	89	68-126	
1634-04-4	Methyl tert-Butyl Ether	59.1	52.9	90	66-126	
108-05-4	Vinyl Acetate	302	347	115	56-139	
78-93-3	2-Butanone (MEK)	71.8	67.5	94	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: Trinity Analysis & Development Corp.

Client Sample ID: Lab Control Sample

Client Project ID: DDMT SVE / 10060131 T0 20

ALS Project ID: P1706191

ALS Sample ID: P171213-LCS

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 12/13/17

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	53.4	49.1	92	70-121	
141-78-6	Ethyl Acetate	118	112	95	65-128	
110-54-3	n-Hexane	60.5	52.9	87	63-120	
67-66-3	Chloroform	43.4	37.6	87	68-123	
109-99-9	Tetrahydrofuran (THF)	72.0	66.2	92	64-123	
107-06-2	1,2-Dichloroethane	52.4	46.9	90	65-128	
71-55-6	1,1,1-Trichloroethane	38.9	34.6	89	68-125	
71-43-2	Benzene	66.7	53.3	80	69-119	
56-23-5	Carbon Tetrachloride	34.0	32.1	94	68-132	
110-82-7	Cyclohexane	124	107	86	70-117	
78-87-5	1,2-Dichloropropane	45.9	40.7	89	69-123	
75-27-4	Bromodichloromethane	31.9	29.4	92	72-128	
79-01-6	Trichloroethene	39.5	31.5	80	71-123	
123-91-1	1,4-Dioxane	59.1	52.7	89	71-122	
80-62-6	Methyl Methacrylate	103	94.0	91	70-128	
142-82-5	n-Heptane	52.0	46.4	89	69-123	
10061-01-5	cis-1,3-Dichloropropene	45.9	45.8	100	70-128	
108-10-1	4-Methyl-2-pentanone	52.0	48.9	94	67-130	
10061-02-6	trans-1,3-Dichloropropene	46.9	49.8	106	75-133	
79-00-5	1,1,2-Trichloroethane	38.9	34.1	88	73-119	
108-88-3	Toluene	56.1	46.3	83	66-119	
591-78-6	2-Hexanone	51.6	48.7	94	62-128	
124-48-1	Dibromochloromethane	24.8	23.6	95	70-130	
106-93-4	1,2-Dibromoethane	27.5	24.8	90	74-122	
123-86-4	n-Butyl Acetate	45.2	43.8	97	62-140	

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: Trinity Analysis & Development Corp.

Client Sample ID: Lab Control Sample

Client Project ID: DDMT SVE / 10060131 T0 20

ALS Project ID: P1706191

ALS Sample ID: P171213-LCS

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 12/13/17

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	45.4	40.5	89	69-121	
127-18-4	Tetrachloroethene	31.3	24.8	79	66-124	
108-90-7	Chlorobenzene	46.1	38.5	84	70-119	
100-41-4	Ethylbenzene	48.8	41.8	86	70-124	
179601-23-1	m,p-Xylenes	97.6	82.3	84	61-134	
75-25-2	Bromoform	20.5	20.3	99	66-139	
100-42-5	Styrene	49.5	42.8	86	73-127	
95-47-6	o-Xylene	48.6	41.0	84	67-125	
111-84-2	n-Nonane	40.4	36.5	90	63-128	
79-34-5	1,1,2,2-Tetrachloroethane	30.8	29.7	96	65-127	
98-82-8	Cumene	43.2	36.3	84	68-124	
80-56-8	alpha-Pinene	38.2	31.9	84	69-122	
103-65-1	n-Propylbenzene	43.6	37.2	85	69-123	
622-96-8	4-Ethyltoluene	43.0	39.4	92	67-129	
108-67-8	1,3,5-Trimethylbenzene	43.1	36.1	84	67-130	
95-63-6	1,2,4-Trimethylbenzene	43.2	35.8	83	66-132	
100-44-7	Benzyl Chloride	41.0	43.9	107	50-147	
541-73-1	1,3-Dichlorobenzene	35.2	30.1	86	65-130	
106-46-7	1,4-Dichlorobenzene	35.6	28.6	80	60-131	
95-50-1	1,2-Dichlorobenzene	35.6	29.9	84	63-129	
5989-27-5	d-Limonene	38.2	30.8	81	64-135	
96-12-8	1,2-Dibromo-3-chloropropane	21.8	25.6	117	73-136	
120-82-1	1,2,4-Trichlorobenzene	29.3	27.1	92	55-142	
91-20-3	Naphthalene	39.9	35.9	90	57-138	
87-68-3	Hexachlorobutadiene	19.9	17.4	87	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: Trinity Analysis & Development Corp.
Client Project ID: DDMT SVE / 10060131 T0 20

ALS Project ID: P1706191

Method Blank Summary

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16
Analyst: Lusine Hakobyan
Sampling Media: 6.0 L Summa Canister(s)
Test Notes:

Lab File ID: 12131704.D
Date Analyzed: 12/13/17
Time Analyzed: 05:12

Client Sample ID	ALS Sample ID	Lab File ID	Time Analyzed
Lab Control Sample	P171213-LCS	12131705.D	05:45
ODSVE-EFF-Y7Q3	P1706191-001	12131725.D	20:37

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Trinity Analysis & Development Corp.
Client Project ID: DDMT SVE / 10060131 T0 20

ALS Project ID: P1706191

Internal Standard Area and RT Summary

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16
Analyst: Lusine Hakobyan
Sampling Media: 6.0 L Summa Canister(s)
Test Notes:

Lab File ID: 12131702.D
Date Analyzed: 12/13/17
Time Analyzed: 04:05

	IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
	AREA	#	RT	#	AREA	#
24 Hour Standard	289642	11.35	1412756	13.45	560739	17.73
Upper Limit	405499	11.68	1977858	13.78	785035	18.06
Lower Limit	173785	11.02	847654	13.12	336443	17.40

Client Sample ID						
01	Method Blank	272090	11.32	1375471	13.43	534688
02	Lab Control Sample	284773	11.35	1395744	13.45	547374
03	ODSVE-EFF-Y7Q3	298124	11.33	1488657	13.44	581836
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:\MS16\DATA\2017 12\13\12131725.D

Acq On : 13 Dec 2017 20:37

Operator: LH

Sample : P1706191-001 (1000mL)

Misc : S31-12041701

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Dec 15 15:04:39 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

LH 12/15/17

QLast Update : Tue Nov 21 08:29:15 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.33	130	298124	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.44	114	1488657	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.73	82	581836	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.18	65	383630	12.819	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.56%
57) Toluene-d8 (SS2)	15.88	98	1476559	12.446	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.60%
73) Bromofluorobenzene (SS3)	19.09	174	535080	12.127	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.04%

Target Compounds

						Qvalue
2) Propene	4.06	42	14748	0.511	ng	98
3) Dichlorodifluoromethan...	4.22	85	157402	2.769	ng	99
4) Chloromethane	4.54	50	1230	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	2796	N.D.		
6) Vinyl Chloride	4.98	62	4929	0.116	ng	87
7) 1,3-Butadiene	5.26	54	385	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.46	45	18655	0.977	ng	93
11) Acetonitrile	6.75	41	4945	0.101	ng	81
12) Acrolein	6.94	56	7525	0.451	ng	96
13) Acetone	0.00	58	0	N.D.	d	
14) Trichlorofluoromethane	7.36	101	77526	1.543	ng	100
15) 2-Propanol (Isopropanol)	7.68	45	16240	0.247	ng	83
16) Acrylonitrile	0.00	53	0	N.D.	d	
17) 1,1-Dichloroethene	8.36	96	97552	3.218	ng	96
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.	d	
19) Methylene Chloride	8.59	84	7116	0.234	ng	94
20) 3-Chloro-1-propene (Al...	8.79	41	107	N.D.		
21) Trichlorotrifluoroethane	9.00	151	687251	22.565	ng	99
22) Carbon Disulfide	8.86	76	805381	7.617	ng	99
23) trans-1,2-Dichloroethene	9.87	61	48477	1.251	ng	94
24) 1,1-Dichloroethane	10.13	63	70322	1.348	ng	94
25) Methyl tert-Butyl Ether	10.26	73	3380	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.	d	
27) 2-Butanone (MEK)	10.65	72	37459	1.890	ng	95
28) cis-1,2-Dichloroethene	11.15	61	3259509	84.343	ng	98
29) Diisopropyl Ether	11.42	87	1281	N.D.		
30) Ethyl Acetate	0.00	61	0	N.D.	d	
31) n-Hexane	11.42	57	138162	2.884	ng	95
32) Chloroform	11.49	83	1040245	20.199	ng	100
34) Tetrahydrofuran (THF)	11.94	72	1529	N.D.		
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	12.57	97	78736	1.779	ng	98
39) Isopropyl Acetate	13.00	61	1434	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	13.05	78	20147	0.149	ng	98
42) Carbon Tetrachloride	13.21	117	75539	2.036	ng	99
43) Cyclohexane	13.34	84	230826	4.902	ng	93
44) tert-Amyl Methyl Ether	13.75	73	3115	N.D.		
45) 1,2-Dichloropropane	13.90	63	811	N.D.		
46) Bromodichloromethane	14.10	83	46507m	1.193	ng	
47) Trichloroethene	14.14	130	3178752	82.281	ng	99
48) 1,4-Dioxane	0.00	88	0	N.D.	d	
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d	

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Data File: I:\MS16\DATA\2017 12\13\12131725.D

Acq On : 13 Dec 2017 20:37

Operator: LH

Sample : P1706191-001 (1000mL)

Misc : S31-12041701

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Dec 15 15:04:39 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:29:15 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.	d	
51) n-Heptane	14.46	71	12789	0.424	ng	97
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	15.51	75	106	N.D.		
55) 1,1,2-Trichloroethane	15.69	97	4135	0.132	ng	# 32
58) Toluene	0.00	91	0	N.D.	d	
59) 2-Hexanone	16.22	43	10692	0.183	ng	78
60) Dibromochloromethane	16.40	129	2668	N.D.		
61) 1,2-Dibromoethane	16.64	107	638	N.D.		
62) n-Butyl Acetate	16.85	43	3798	N.D.		
63) n-Octane	16.95	57	1185	N.D.		
64) Tetrachloroethene	17.11	166	549232	12.981	ng	100
65) Chlorobenzene	17.79	112	3379	N.D.		
66) Ethylbenzene	18.11	91	2754	N.D.		
67) m- & p-Xylenes	18.27	91	7103	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.59	104	1417	N.D.		
70) o-Xylene	18.69	91	3328	N.D.		
71) n-Nonane	18.87	43	1972	N.D.		
72) 1,1,2,2-Tetrachloroethane	18.68	83	185783	3.776	ng	98
74) Cumene	19.21	105	2056	N.D.		
75) alpha-Pinene	19.55	93	2025	N.D.		
76) n-Propylbenzene	19.64	91	1932	N.D.		
77) 3-Ethyltoluene	19.74	105	3204	N.D.		
78) 4-Ethyltoluene	19.77	105	2081	N.D.		
79) 1,3,5-Trimethylbenzene	19.84	105	1688	N.D.		
80) alpha-Methylstyrene	19.97	118	436	N.D.		
81) 2-Ethyltoluene	20.01	105	2204	N.D.		
82) 1,2,4-Trimethylbenzene	20.19	105	5221	N.D.		
83) n-Decane	20.27	57	2914	N.D.		
84) Benzyl Chloride	20.31	91	816	N.D.		
85) 1,3-Dichlorobenzene	20.33	146	925	N.D.		
86) 1,4-Dichlorobenzene	20.39	146	3433	N.D.		
87) sec-Butylbenzene	20.43	105	738	N.D.		
88) 4-Isopropyltoluene (p-...	20.56	119	8781	N.D.		
89) 1,2,3-Trimethylbenzene	20.56	105	2957	N.D.		
90) 1,2-Dichlorobenzene	20.69	146	669	N.D.		
91) d-Limonene	20.68	68	2195	N.D.		
92) 1,2-Dibromo-3-Chloropr...	20.98	157	1338	N.D.		
93) n-Undecane	21.35	57	2824	N.D.		
94) 1,2,4-Trichlorobenzene	22.18	180	809	N.D.		
95) Naphthalene	22.28	128	11156	N.D.		
96) n-Dodecane	22.25	57	4025	N.D.		
97) Hexachlorobutadiene	22.59	225	470	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.	d	
99) tert-Butylbenzene	20.19	119	2412	N.D.		
100) n-Butylbenzene	20.90	91	3823	N.D.		

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

Data File: I:\MS16\DATA\2017 12\13\12131725.D

Acq On : 13 Dec 2017 20:37

Operator: LH

Sample : P1706191-001 (1000mL)

Misc : S31-12041701

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Dec 15 15:04:39 2017

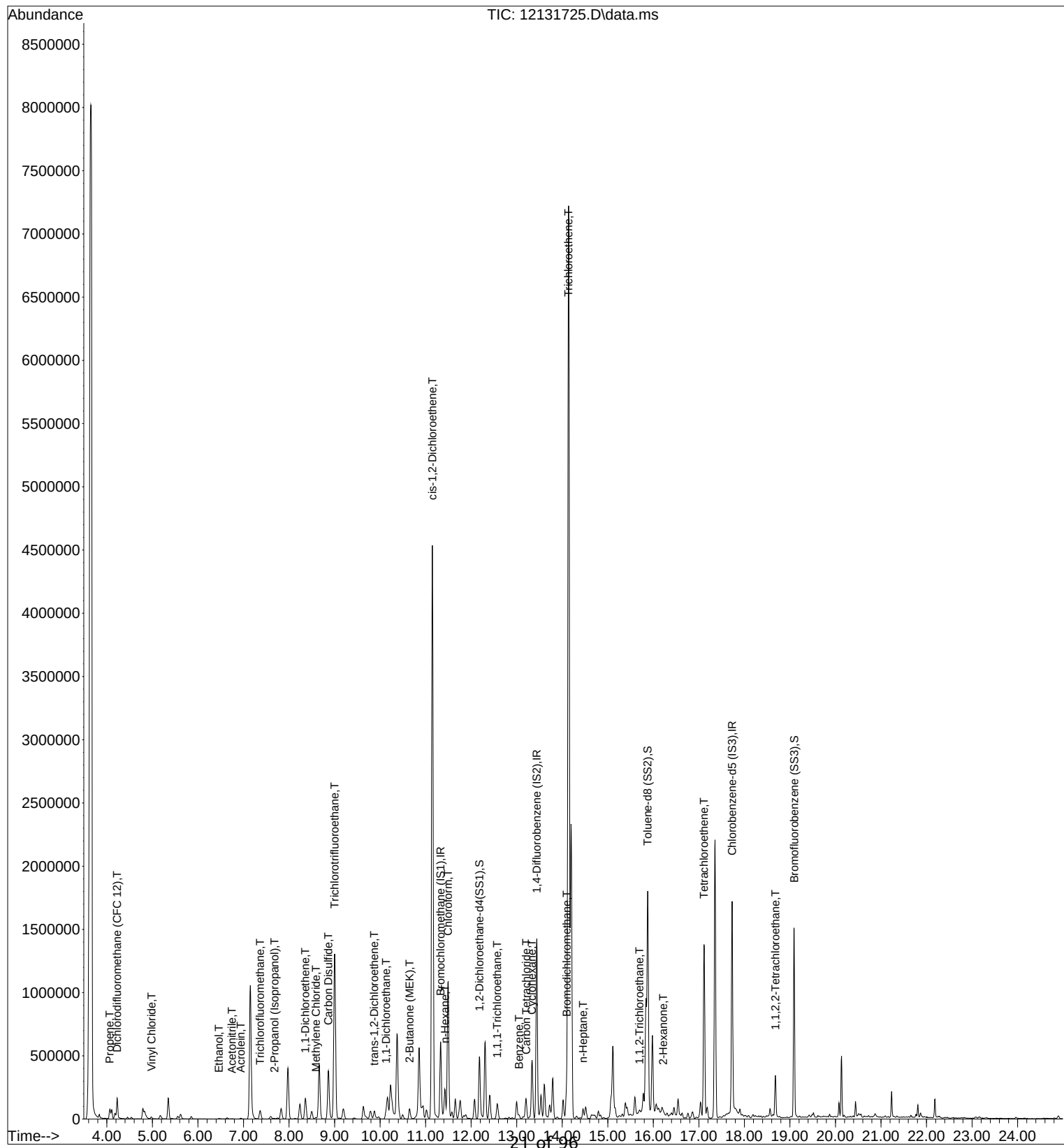
Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:29:15 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS16\DATA\2017 12\13\12131725.D

Acq On : 13 Dec 2017 20:37

Operator: LH

Sample : P1706191-001 (1000mL)

Misc : S31-12041701

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Dec 15 15:04:39 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:29:15 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 12/15/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.33	130	298124	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.44	114	1488657	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.73	82	581836	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.18	65	383630	12.819	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.56%
57) Toluene-d8 (SS2)	15.88	98	1476559	12.446	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.60%
73) Bromofluorobenzene (SS3)	19.09	174	535080	12.127	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.04%

Target Compounds

						Qvalue
2) Propene	4.06	42	14748	0.511	ng	98
3) Dichlorodifluoromethan...	4.22	85	157402	2.769	ng	99
6) Vinyl Chloride	4.98	62	4929	0.116	ng	87
10) Ethanol	6.46	45	18655	0.977	ng	93
11) Acetonitrile	6.75	41	4945	0.101	ng	81
12) Acrolein	6.94	56	7525	0.451	ng	96
14) Trichlorofluoromethane	7.36	101	77526	1.543	ng	100
15) 2-Propanol (Isopropanol)	7.68	45	16240	0.247	ng	83
17) 1,1-Dichloroethene	8.36	96	97552	3.218	ng	96
19) Methylene Chloride	8.59	84	7116	0.234	ng	94
21) Trichlorotrifluoroethane	9.00	151	687251	22.565	ng	99
22) Carbon Disulfide	8.86	76	805381	7.617	ng	99
23) trans-1,2-Dichloroethene	9.87	61	48477	1.251	ng	94
24) 1,1-Dichloroethane	10.13	63	70322	1.348	ng	94
27) 2-Butanone (MEK)	10.65	72	37459	1.890	ng	95
28) cis-1,2-Dichloroethene	11.15	61	3259509	84.343	ng	98
31) n-Hexane	11.42	57	138162	2.884	ng	95
32) Chloroform	11.49	83	1040245	20.199	ng	100
38) 1,1,1-Trichloroethane	12.57	97	78736	1.779	ng	98
41) Benzene	13.05	78	20147	0.149	ng	98
42) Carbon Tetrachloride	13.21	117	75539	2.036	ng	99
43) Cyclohexane	13.34	84	230826	4.902	ng	93
46) Bromodichloromethane	14.10	83	46507m	1.193	ng	
47) Trichloroethene	14.14	130	3178752	82.281	ng	99
51) n-Heptane	14.46	71	12789	0.424	ng	97
55) 1,1,2-Trichloroethane	15.69	97	4135	0.132	ng	# 32
59) 2-Hexanone	16.22	43	10692	0.183	ng	78
64) Tetrachloroethene	17.11	166	549232	12.981	ng	100
72) 1,1,2,2-Tetrachloroethane	18.68	83	185783	3.776	ng	98

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

Data File: I:\MS16\DATA\2017 12\13\12131725.D

Acq On : 13 Dec 2017 20:37

Operator: LH

Sample : P1706191-001 (1000mL)

Misc : S31-12041701

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Dec 15 15:04:39 2017

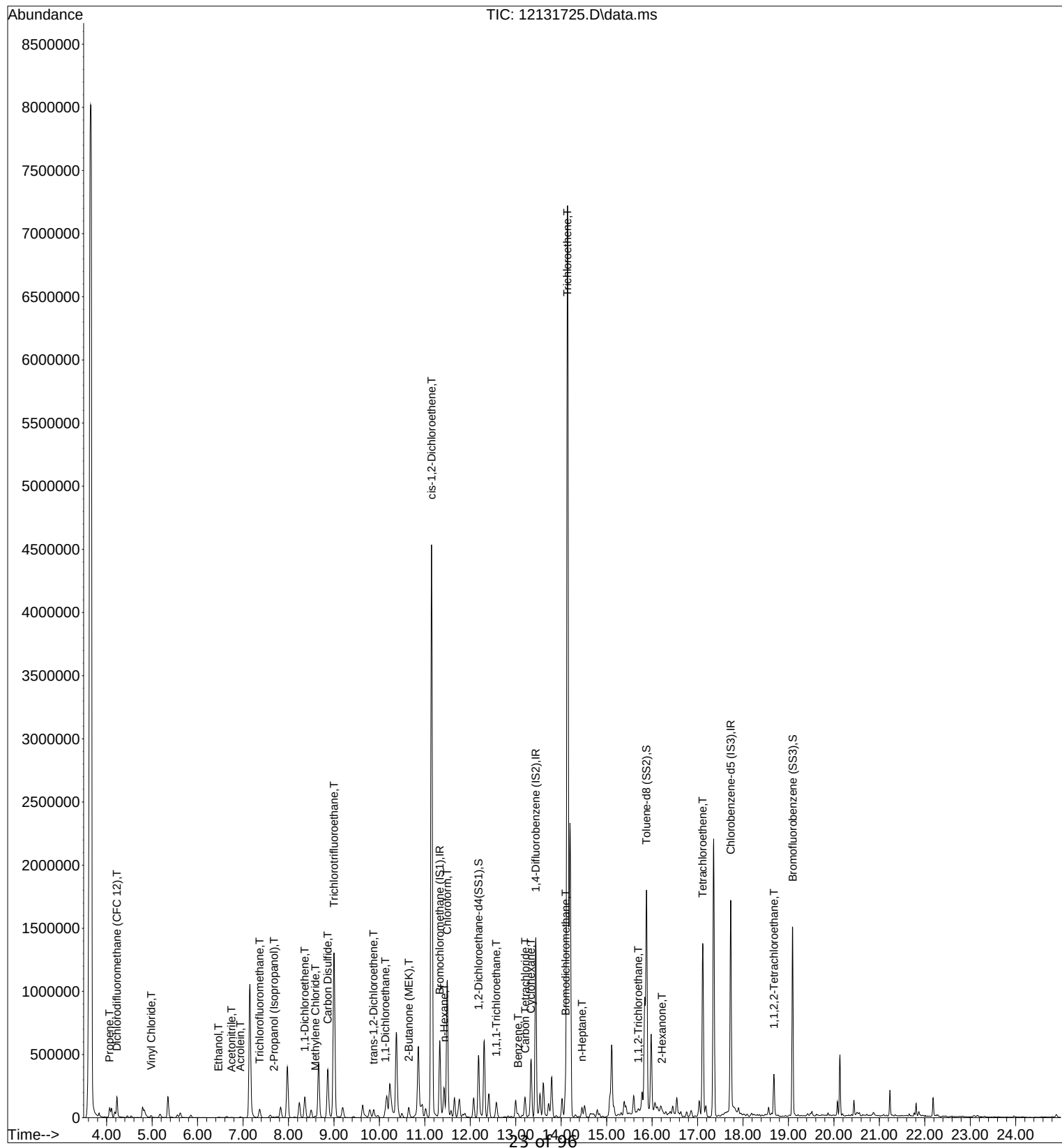
Quant Method : I:\MS16\METHODS\R16112017.M

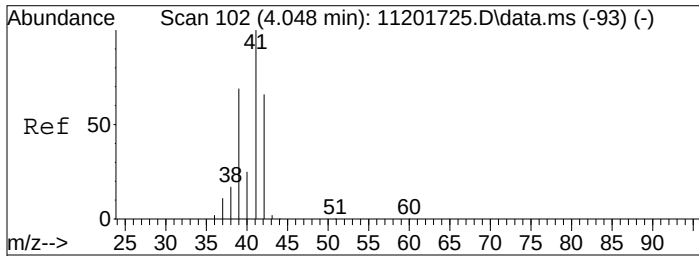
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Nov 21 08:29:15 2017

Response via : Initial Calibration

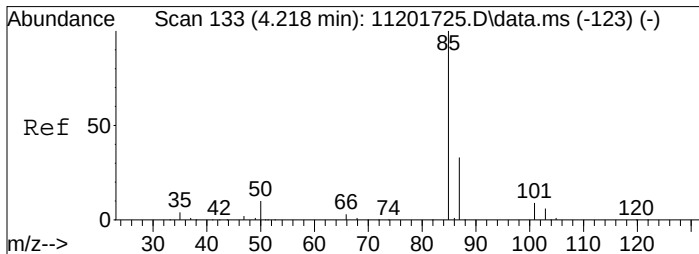
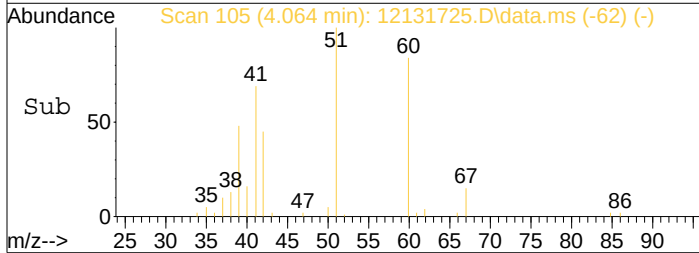
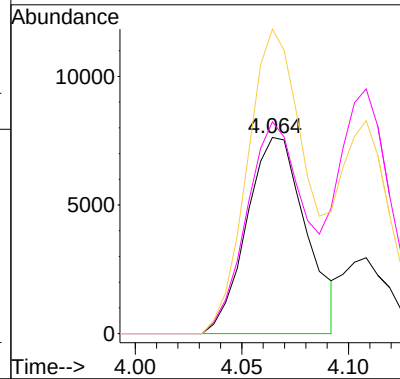
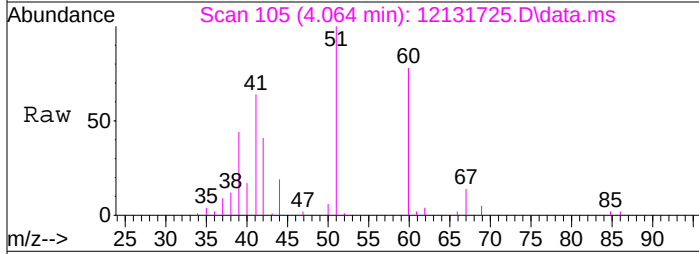
DataAcq Meth:TO15.M





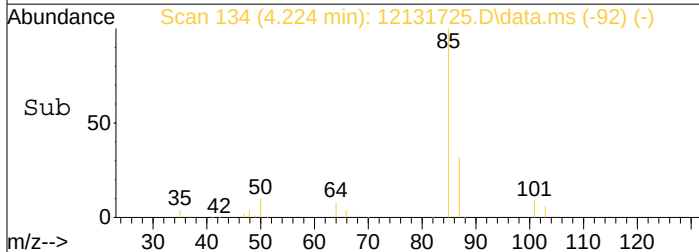
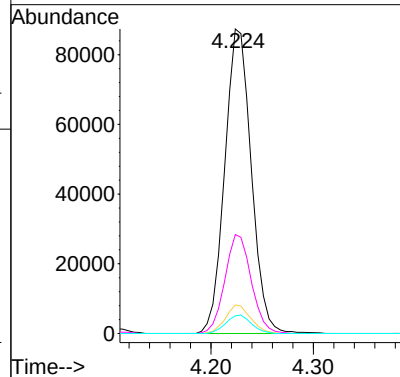
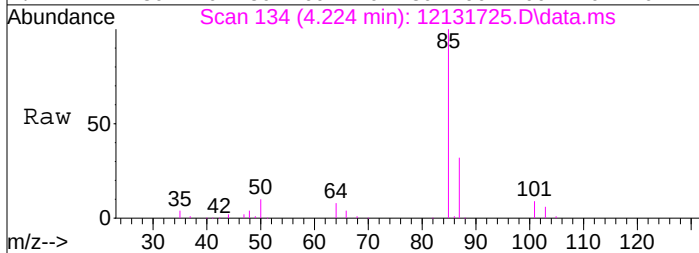
#2
Propene
Concen: 0.51 ng
RT: 4.06 min Scan# 105
Delta R.T. -0.011 min
Lab File: 12131725.D
Acq: 13 Dec 2017 20:37

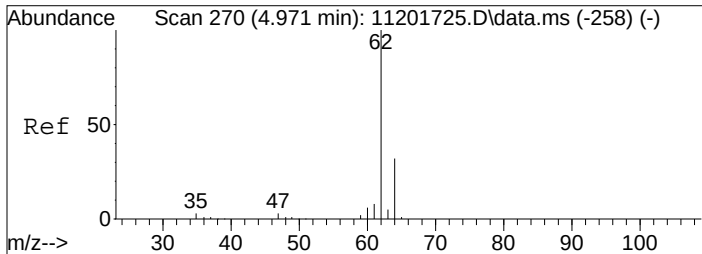
Tgt Ion: 42 Resp: 14748
Ion Ratio Lower Upper
42 100
39 105.1 83.9 123.9
41 146.9 129.8 169.8



#3
Dichlorodifluoromethane (CFC 12)
Concen: 2.77 ng
RT: 4.22 min Scan# 134
Delta R.T. -0.016 min
Lab File: 12131725.D
Acq: 13 Dec 2017 20:37

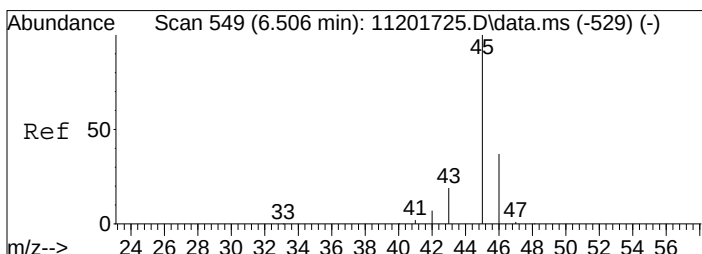
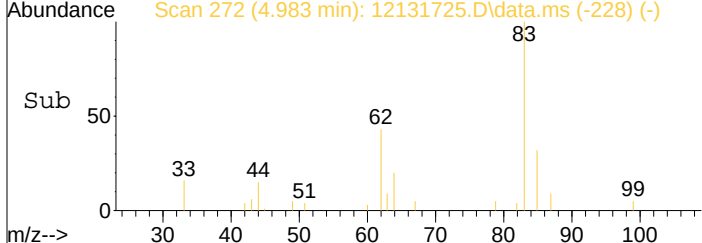
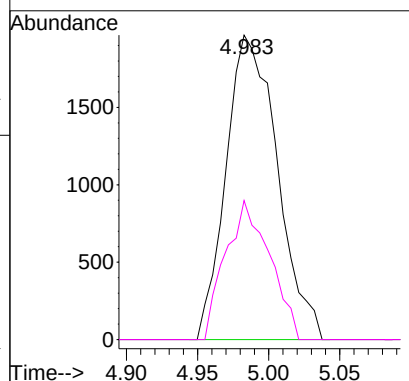
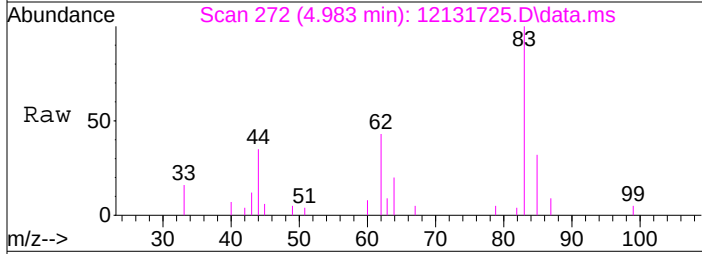
Tgt Ion: 85 Resp: 157402
Ion Ratio Lower Upper
85 100
87 32.2 12.6 52.6
101 8.9 0.0 29.0
103 5.8 0.0 25.8





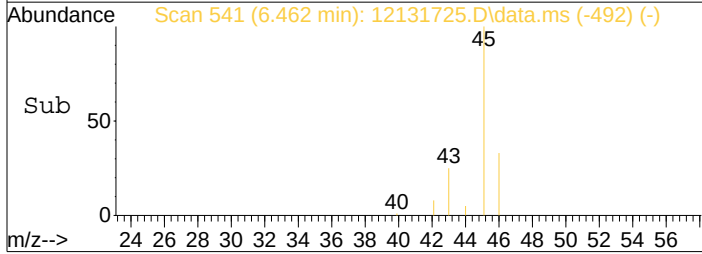
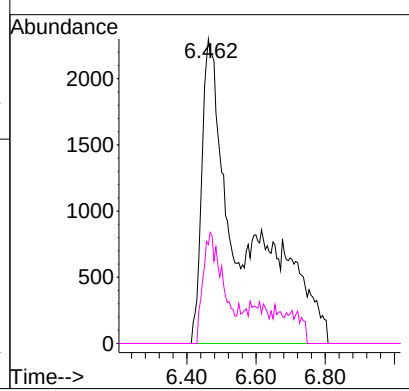
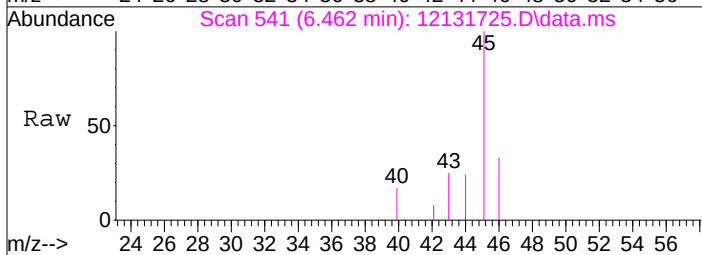
#6
 Vinyl Chloride
 Concen: 0.12 ng
 RT: 4.98 min Scan# 272
 Delta R.T. -0.005 min
 Lab File: 12131725.D
 Acq: 13 Dec 2017 20:37

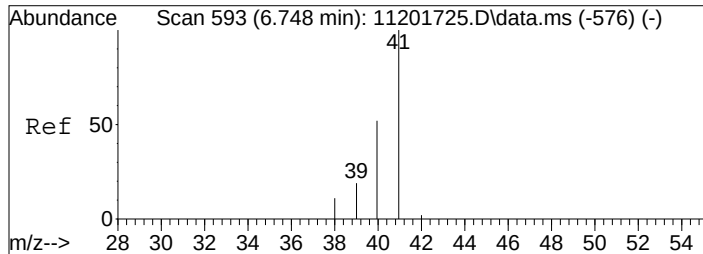
Tgt Ion:	62	Resp:	4929
Ion Ratio	Lower	Upper	
62	100		
64	39.3	12.1	52.1



#10
 Ethanol
 Concen: 0.98 ng
 RT: 6.46 min Scan# 541
 Delta R.T. 0.022 min
 Lab File: 12131725.D
 Acq: 13 Dec 2017 20:37

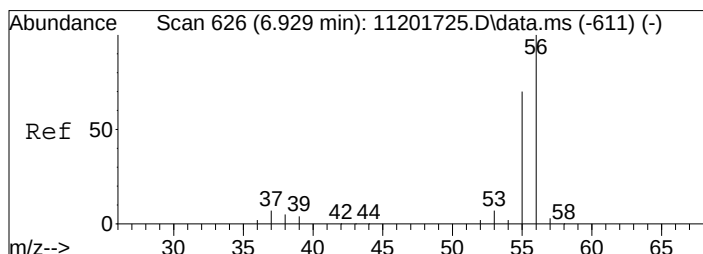
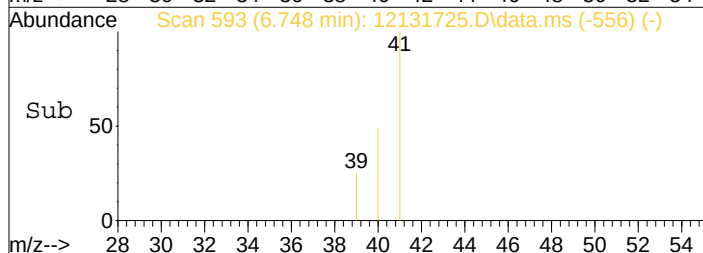
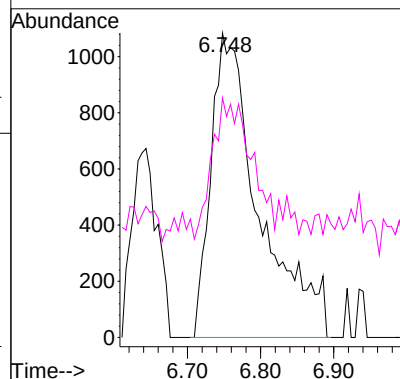
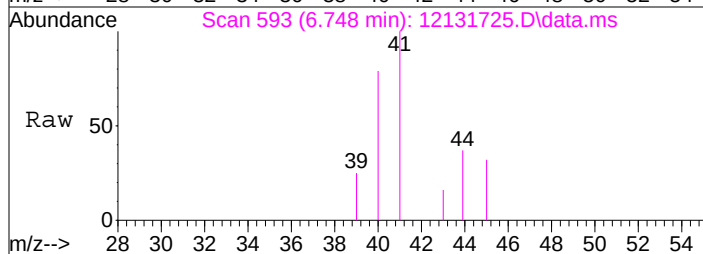
Tgt Ion:	45	Resp:	18655
Ion Ratio	Lower	Upper	
45	100		
46	33.1	17.0	57.0





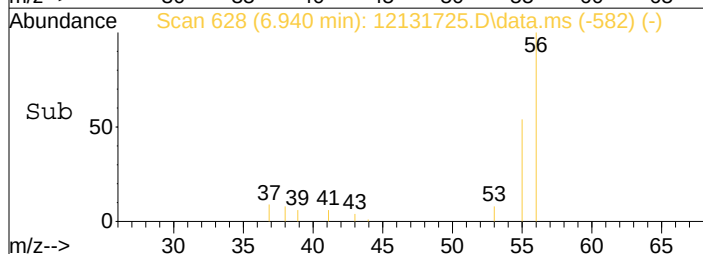
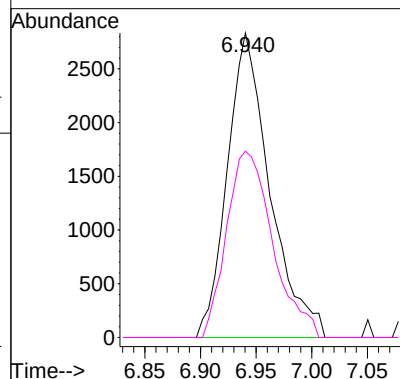
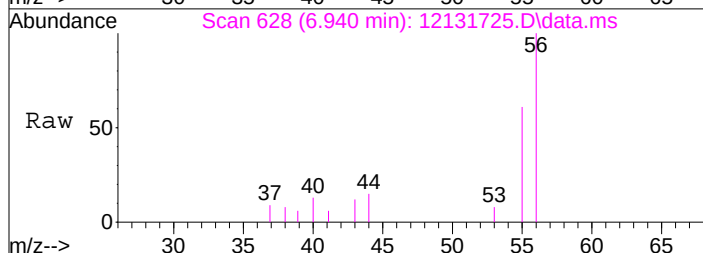
#11
Acetonitrile
Concen: 0.10 ng
RT: 6.75 min Scan# 593
Delta R.T. 0.006 min
Lab File: 12131725.D
Acq: 13 Dec 2017 20:37

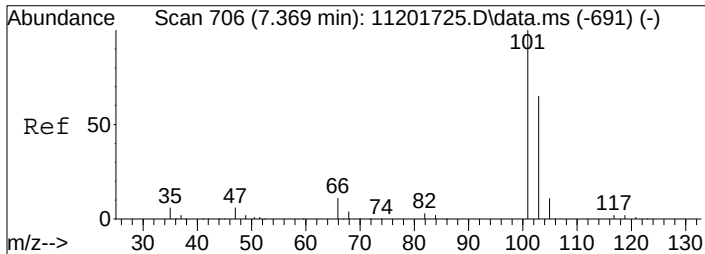
Tgt Ion: 41 Resp: 4945
Ion Ratio Lower Upper
41 100
40 66.0 32.4 72.4



#12
Acrolein
Concen: 0.45 ng
RT: 6.94 min Scan# 628
Delta R.T. 0.006 min
Lab File: 12131725.D
Acq: 13 Dec 2017 20:37

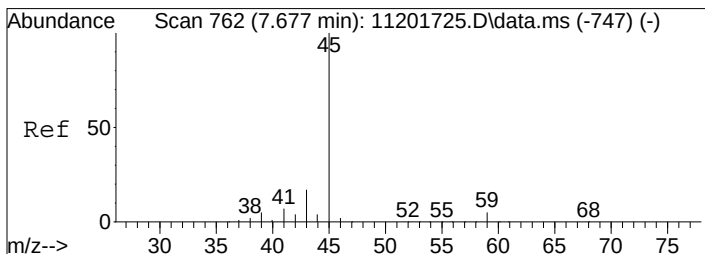
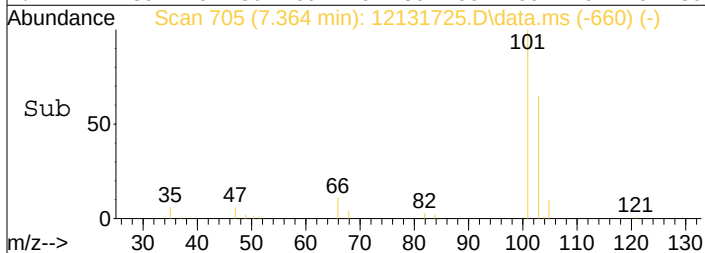
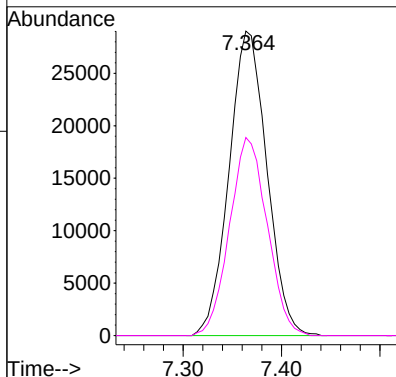
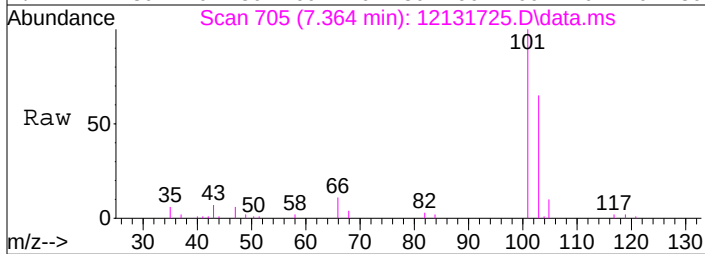
Tgt Ion: 56 Resp: 7525
Ion Ratio Lower Upper
56 100
55 66.3 49.9 89.9





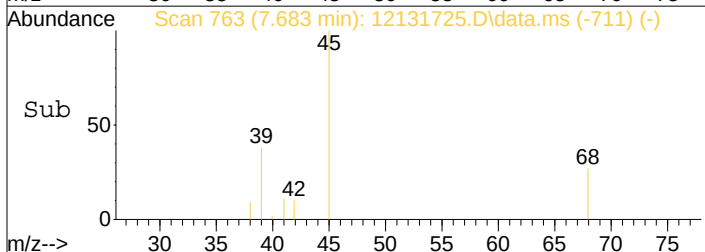
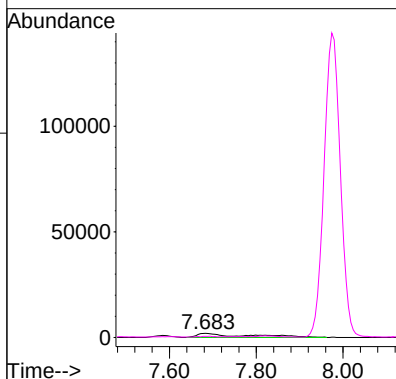
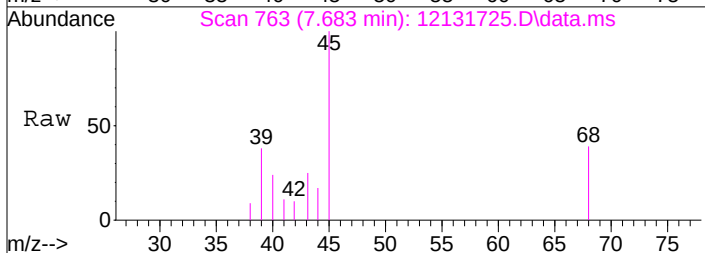
#14
 Trichlorofluoromethane
 Concen: 1.54 ng
 RT: 7.36 min Scan# 705
 Delta R.T. -0.005 min
 Lab File: 12131725.D
 Acq: 13 Dec 2017 20:37

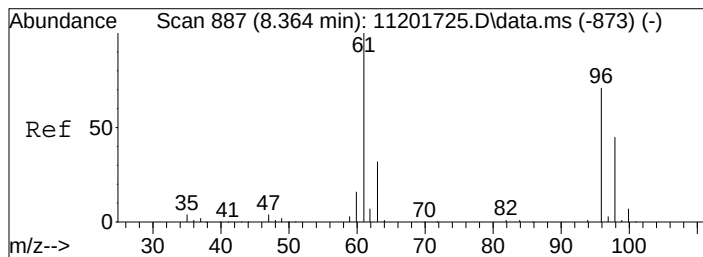
Tgt Ion: 101 Resp: 77526
 Ion Ratio Lower Upper
 101 100
 103 64.7 44.9 84.9



#15
 2-Propanol (Isopropanol)
 Concen: 0.25 ng
 RT: 7.68 min Scan# 763
 Delta R.T. 0.039 min
 Lab File: 12131725.D
 Acq: 13 Dec 2017 20:37

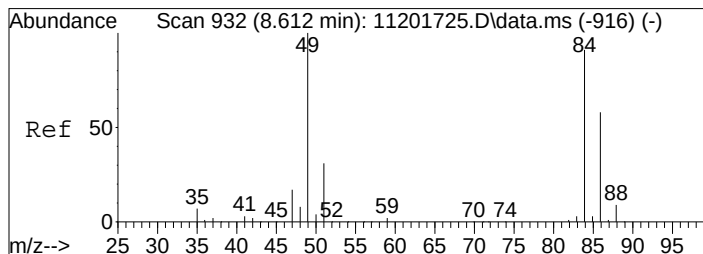
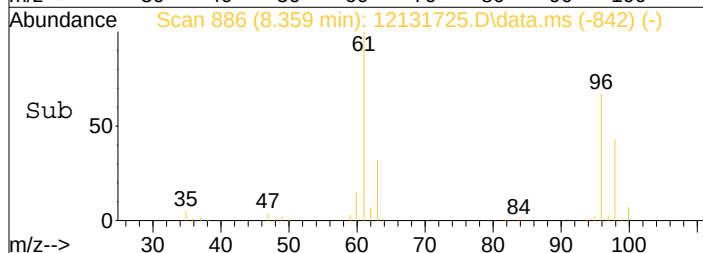
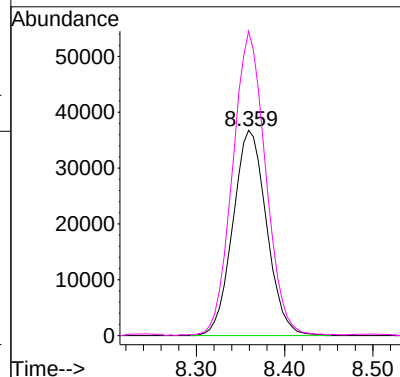
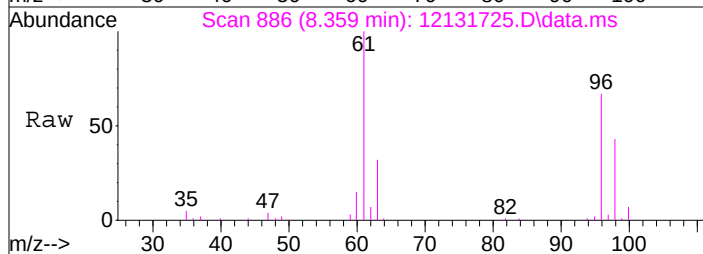
Tgt Ion: 45 Resp: 16240
 Ion Ratio Lower Upper
 45 100
 43 9.9 0.0 37.2





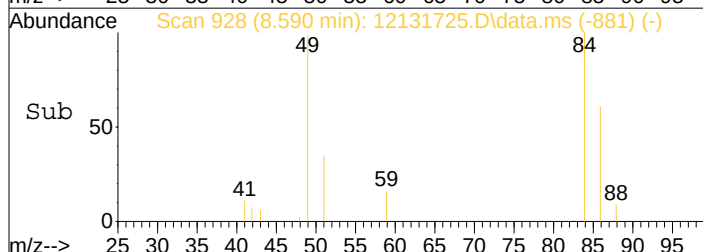
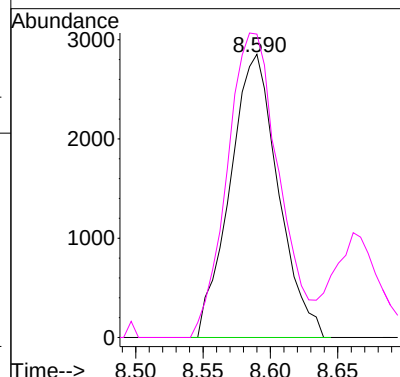
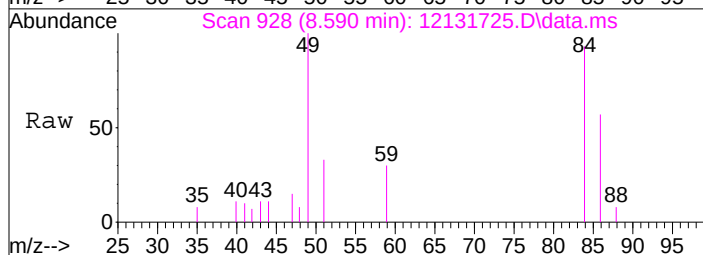
#17
1,1-Dichloroethene
Concen: 3.22 ng
RT: 8.36 min Scan# 886
Delta R.T. -0.005 min
Lab File: 12131725.D
Acq: 13 Dec 2017 20:37

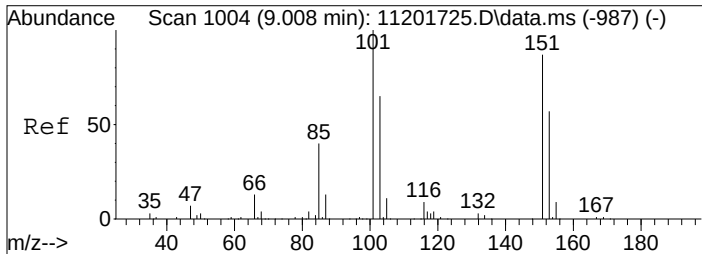
Tgt Ion: 96 Resp: 97552
Ion Ratio Lower Upper
96 100
61 146.2 121.1 161.1



#19
Methylene Chloride
Concen: 0.23 ng
RT: 8.59 min Scan# 928
Delta R.T. 0.006 min
Lab File: 12131725.D
Acq: 13 Dec 2017 20:37

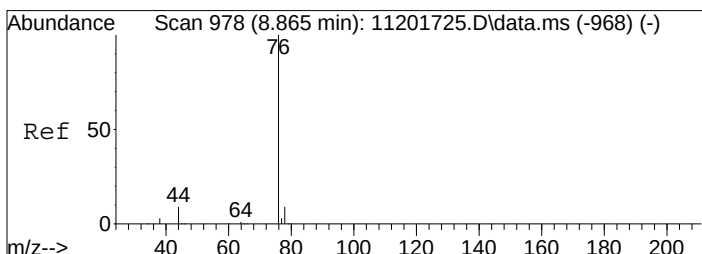
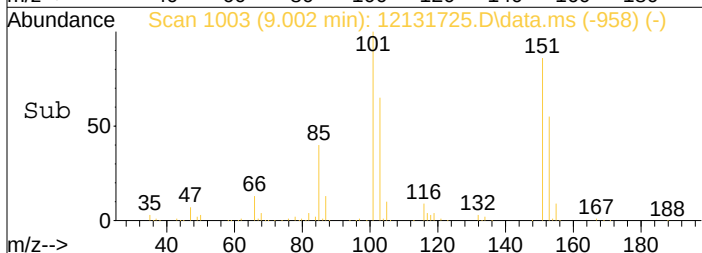
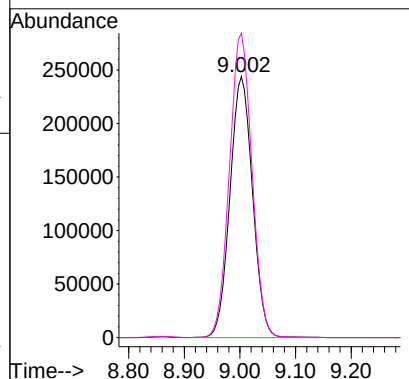
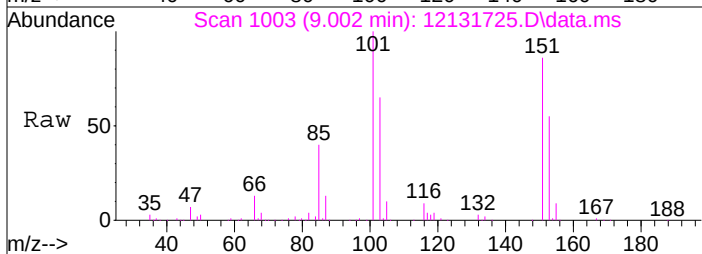
Tgt Ion: 84 Resp: 7116
Ion Ratio Lower Upper
84 100
49 116.3 85.2 135.2





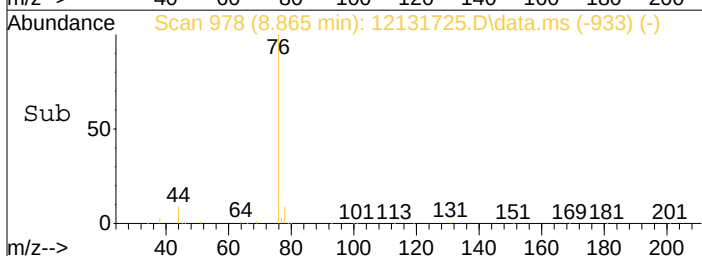
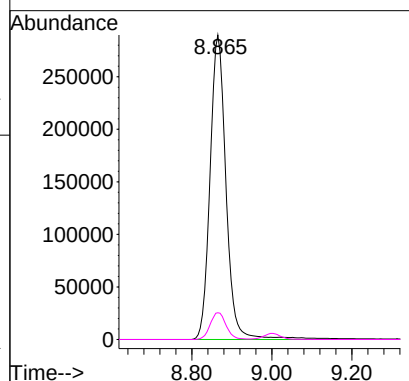
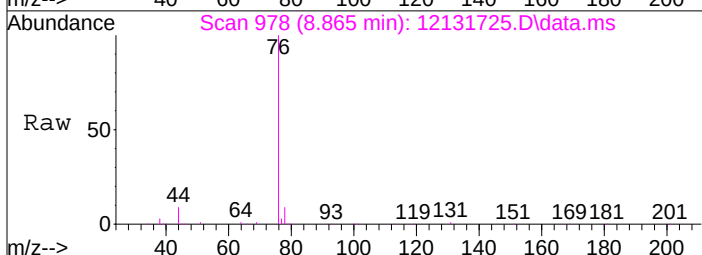
#21
 Trichlorotrifluoroethane
 Concen: 22.56 ng
 RT: 9.00 min Scan# 1003
 Delta R.T. 0.000 min
 Lab File: 12131725.D
 Acq: 13 Dec 2017 20:37

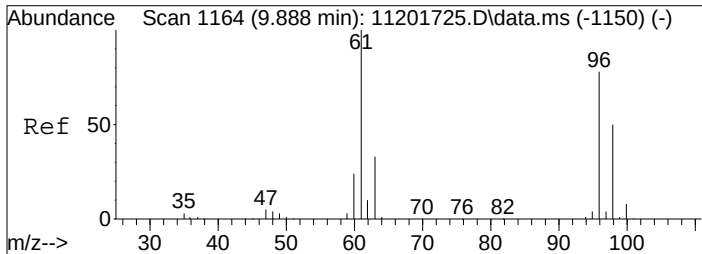
Tgt Ion: 151 Resp: 687251
 Ion Ratio Lower Upper
 151 100
 101 116.6 95.2 135.2



#22
 Carbon Disulfide
 Concen: 7.62 ng
 RT: 8.86 min Scan# 978
 Delta R.T. -0.005 min
 Lab File: 12131725.D
 Acq: 13 Dec 2017 20:37

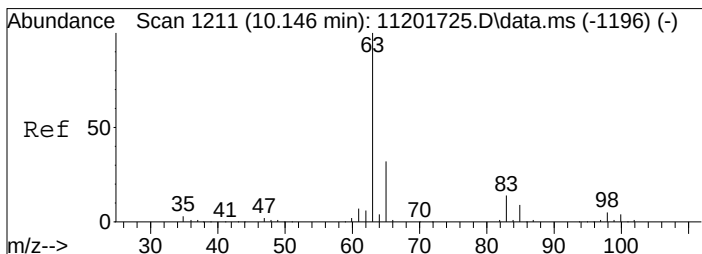
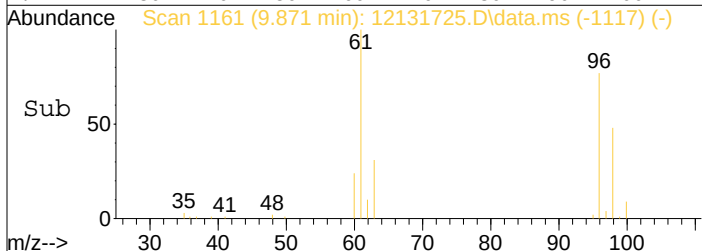
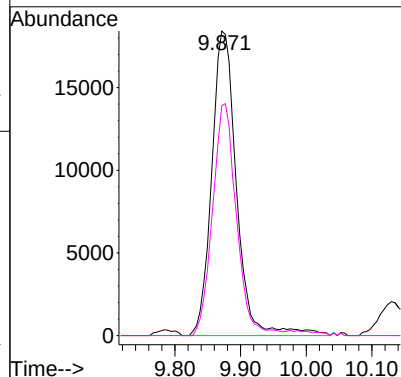
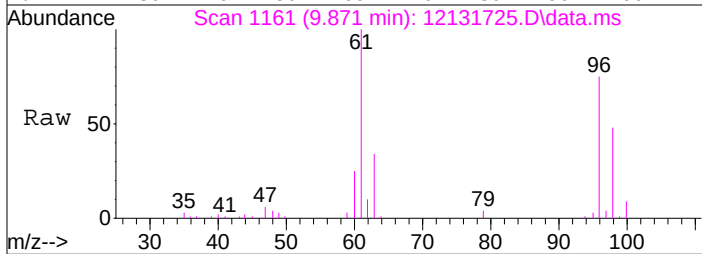
Tgt Ion: 76 Resp: 805381
 Ion Ratio Lower Upper
 76 100
 78 8.8 0.0 29.2





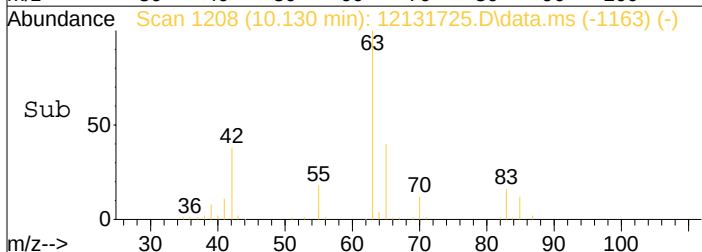
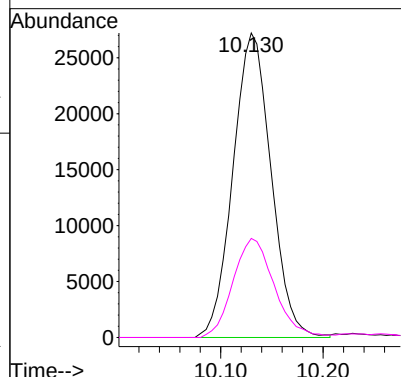
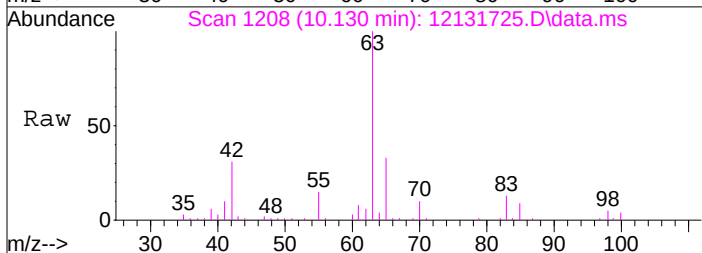
#23
trans-1,2-Dichloroethene
Concen: 1.25 ng
RT: 9.87 min Scan# 1161
Delta R.T. -0.005 min
Lab File: 12131725.D
Acq: 13 Dec 2017 20:37

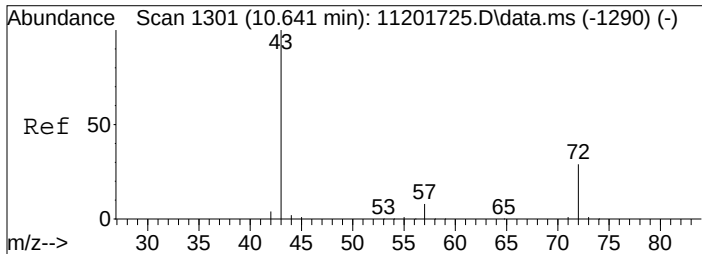
Tgt Ion: 61 Resp: 48477
Ion Ratio Lower Upper
61 100
96 73.1 58.1 98.1



#24
1,1-Dichloroethane
Concen: 1.35 ng
RT: 10.13 min Scan# 1208
Delta R.T. 0.000 min
Lab File: 12131725.D
Acq: 13 Dec 2017 20:37

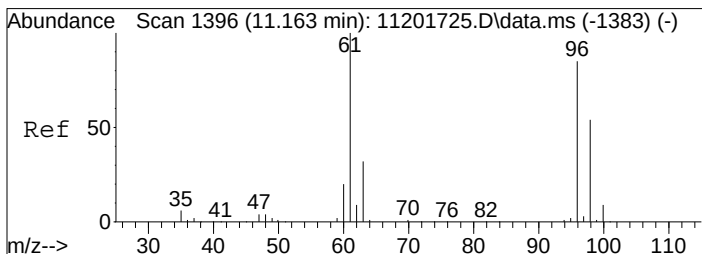
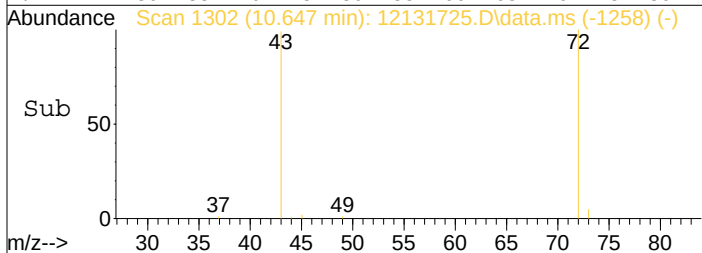
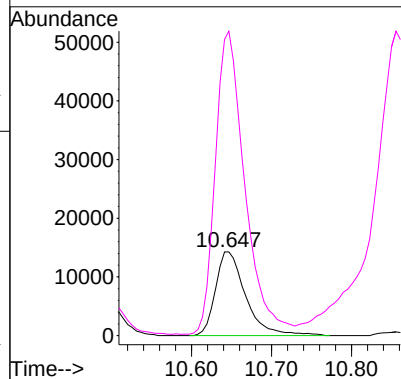
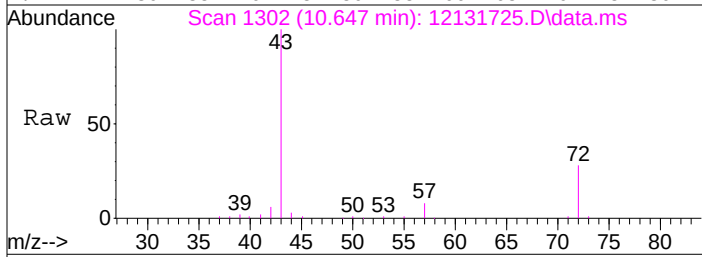
Tgt Ion: 63 Resp: 70322
Ion Ratio Lower Upper
63 100
65 35.3 12.1 52.1





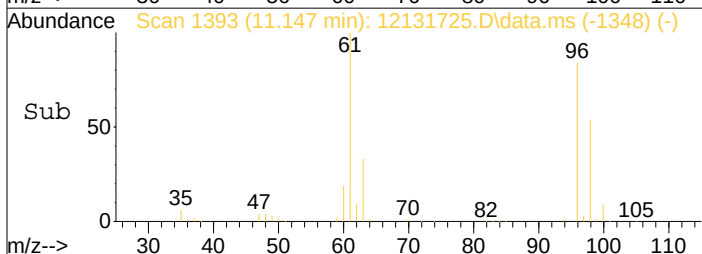
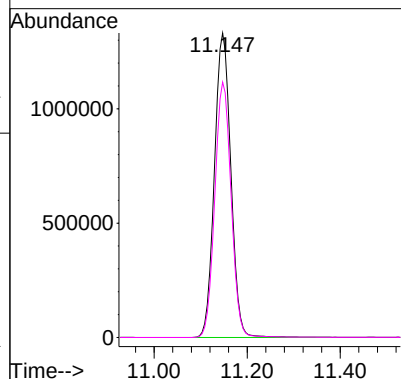
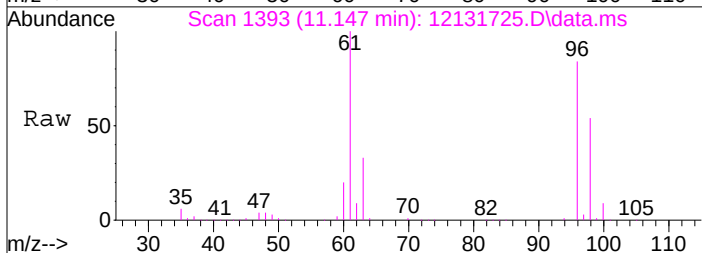
#27
2-Butanone (MEK)
Concen: 1.89 ng
RT: 10.65 min Scan# 1302
Delta R.T. -0.005 min
Lab File: 12131725.D
Acq: 13 Dec 2017 20:37

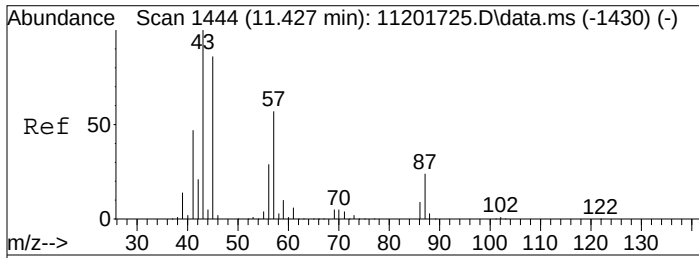
Tgt Ion: 72 Resp: 37459
Ion Ratio Lower Upper
72 100
43 353.9 323.2 363.2



#28
cis-1,2-Dichloroethene
Concen: 84.34 ng
RT: 11.15 min Scan# 1393
Delta R.T. 0.000 min
Lab File: 12131725.D
Acq: 13 Dec 2017 20:37

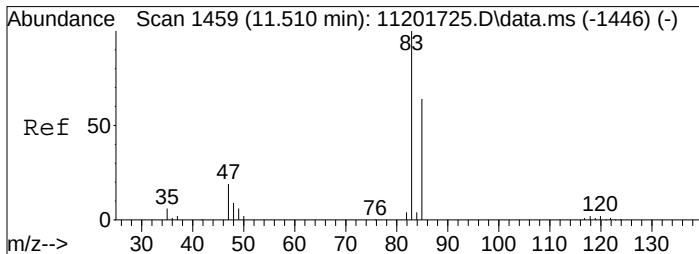
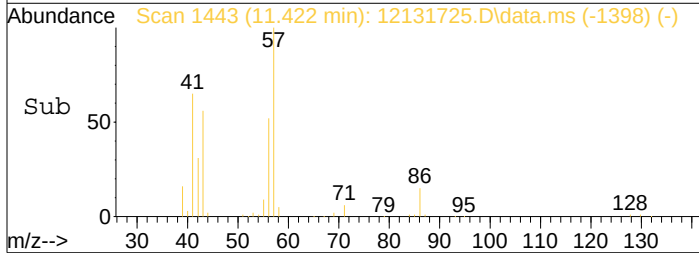
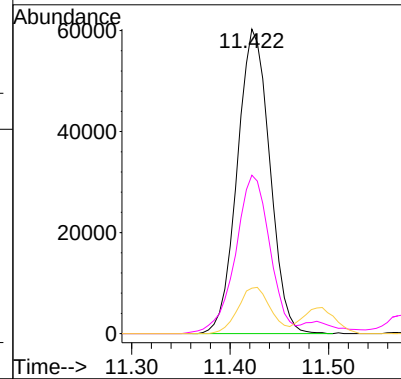
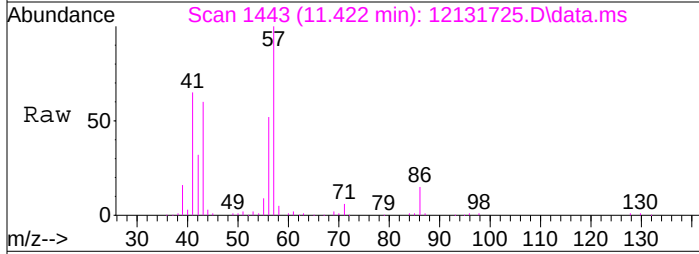
Tgt Ion: 61 Resp: 3259509
Ion Ratio Lower Upper
61 100
96 83.7 65.7 105.7





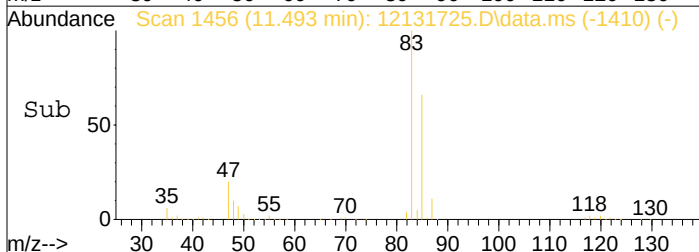
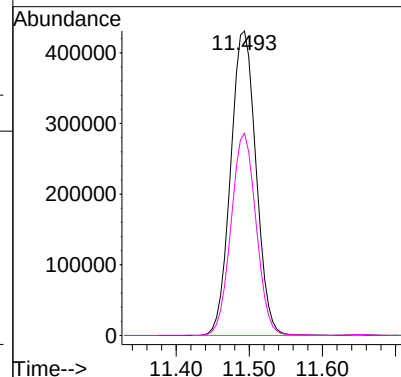
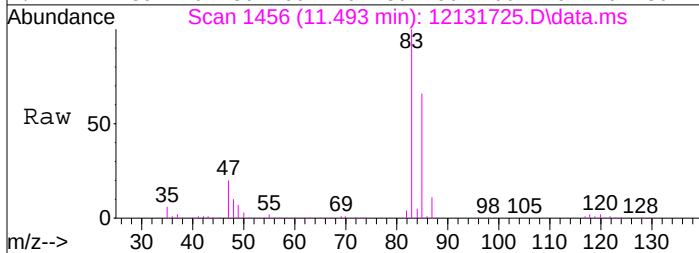
#31
n-Hexane
Concen: 2.88 ng
RT: 11.42 min Scan# 1443
Delta R.T. 0.000 min
Lab File: 12131725.D
Acq: 13 Dec 2017 20:37

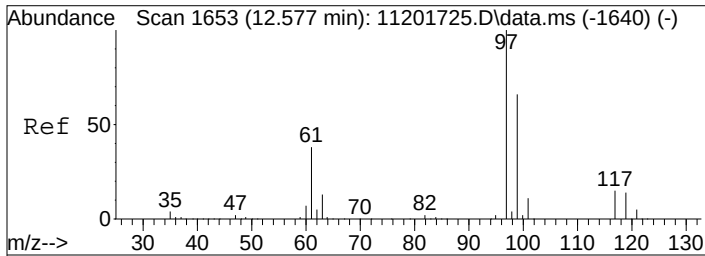
Tgt Ion: 57 Resp: 138162
Ion Ratio Lower Upper
57 100
56 55.5 41.0 61.6
86 15.4 12.9 19.3



#32
Chloroform
Concen: 20.20 ng
RT: 11.49 min Scan# 1456
Delta R.T. 0.006 min
Lab File: 12131725.D
Acq: 13 Dec 2017 20:37

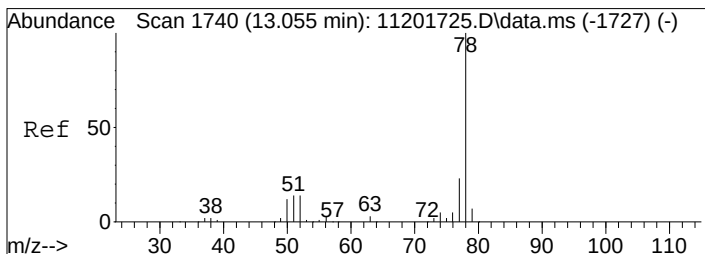
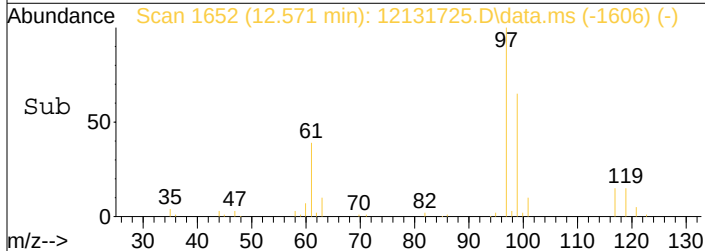
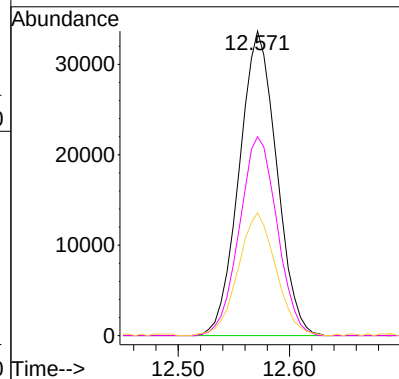
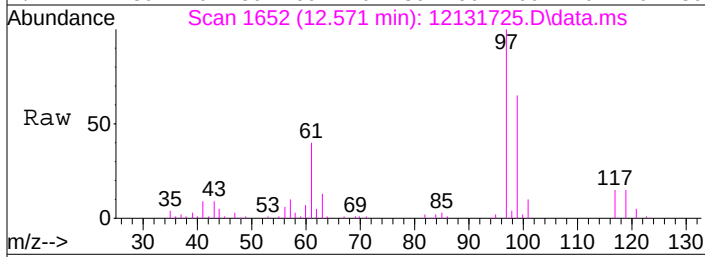
Tgt Ion: 83 Resp: 1040245
Ion Ratio Lower Upper
83 100
85 65.7 45.4 85.4





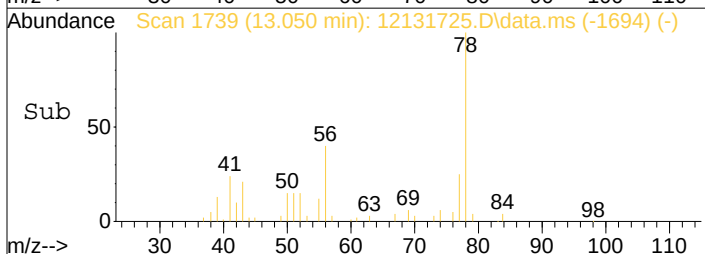
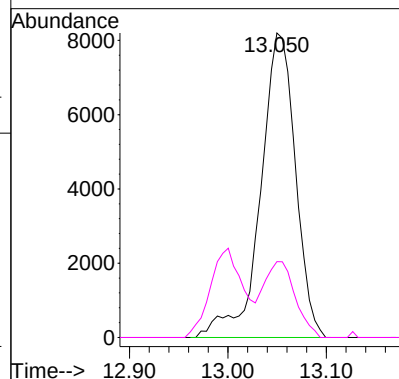
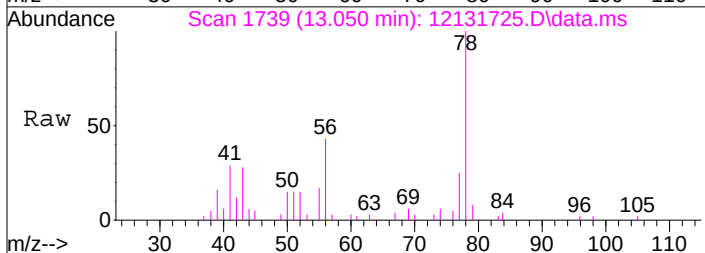
#38
 1,1,1-Trichloroethane
 Concen: 1.78 ng
 RT: 12.57 min Scan# 1652
 Delta R.T. 0.006 min
 Lab File: 12131725.D
 Acq: 13 Dec 2017 20:37

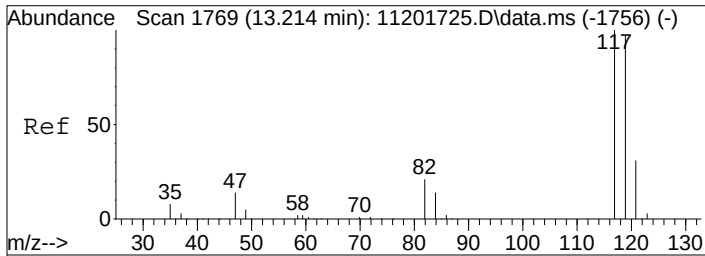
Tgt Ion: 97 Resp: 78736
 Ion Ratio Lower Upper
 97 100
 99 65.7 45.1 85.1
 61 40.7 18.6 58.6



#41
 Benzene
 Concen: 0.15 ng
 RT: 13.05 min Scan# 1739
 Delta R.T. 0.000 min
 Lab File: 12131725.D
 Acq: 13 Dec 2017 20:37

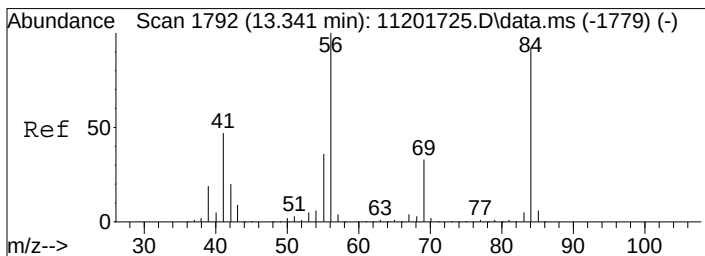
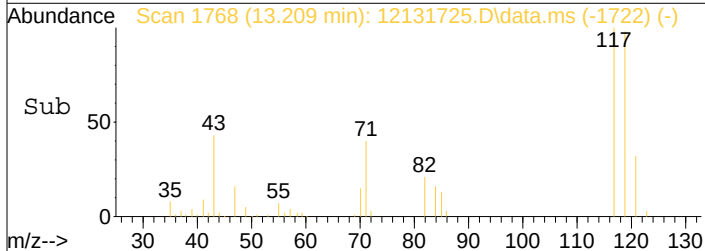
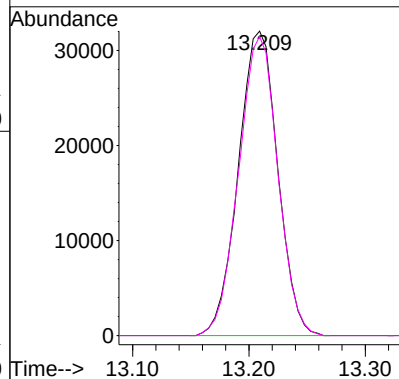
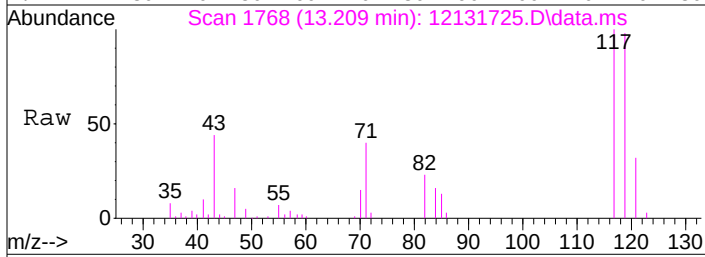
Tgt Ion: 78 Resp: 20147
 Ion Ratio Lower Upper
 78 100
 77 22.3 3.3 43.3





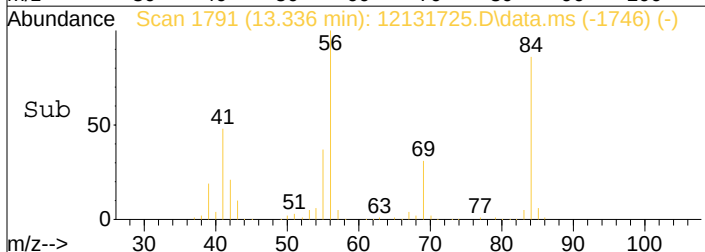
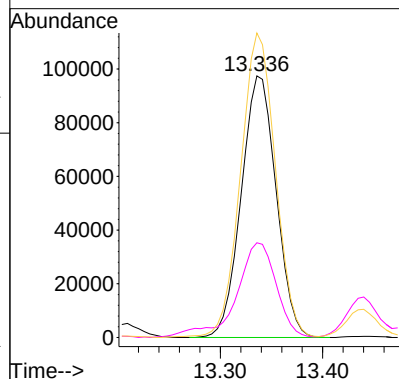
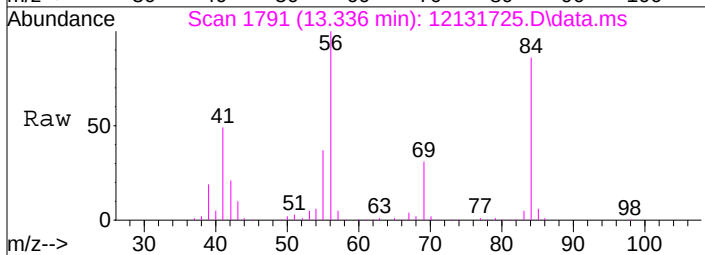
#42
Carbon Tetrachloride
Concen: 2.04 ng
RT: 13.21 min Scan# 1768
Delta R.T. 0.006 min
Lab File: 12131725.D
Acq: 13 Dec 2017 20:37

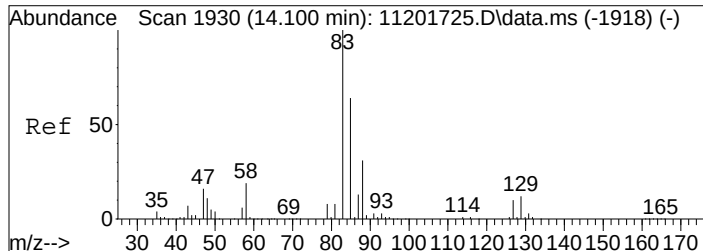
Tgt Ion: 117 Resp: 75539
Ion Ratio Lower Upper
117 100
119 97.6 76.5 116.5



#43
Cyclohexane
Concen: 4.90 ng
RT: 13.34 min Scan# 1791
Delta R.T. 0.000 min
Lab File: 12131725.D
Acq: 13 Dec 2017 20:37

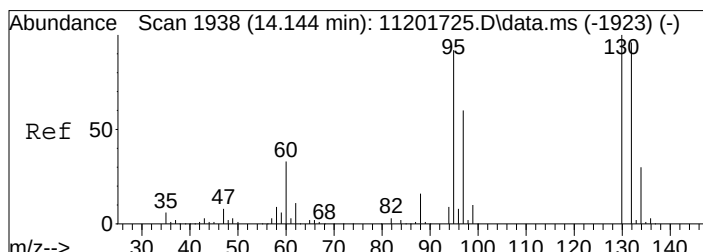
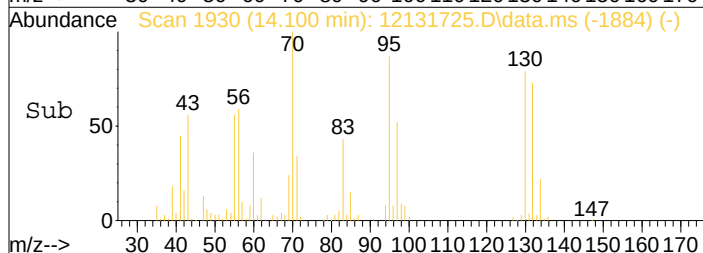
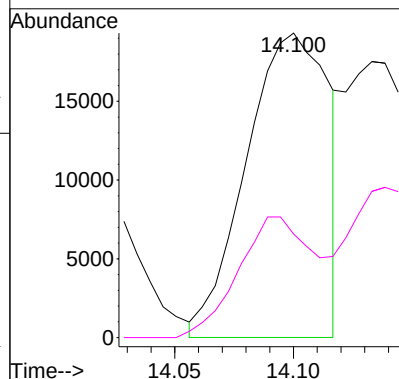
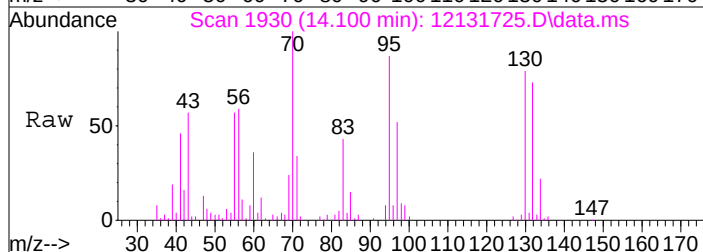
Tgt Ion: 84 Resp: 230826
Ion Ratio Lower Upper
84 100
69 41.4 15.9 55.9
56 116.2 89.9 129.9





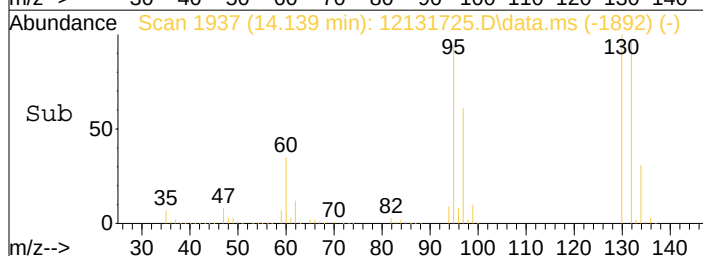
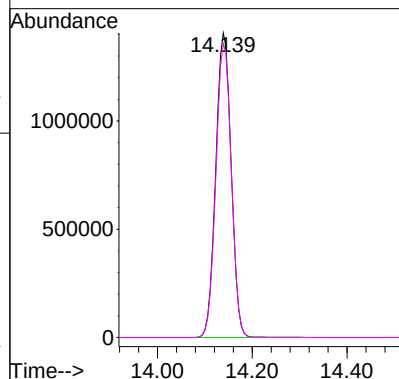
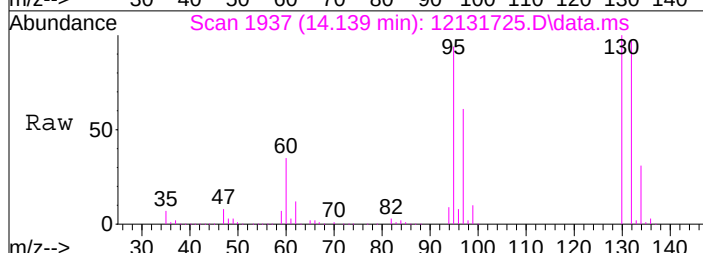
#46
Bromodichloromethane
Concen: 1.19 ng m
RT: 14.10 min Scan# 1930
Delta R.T. 0.006 min
Lab File: 12131725.D
Acq: 13 Dec 2017 20:37

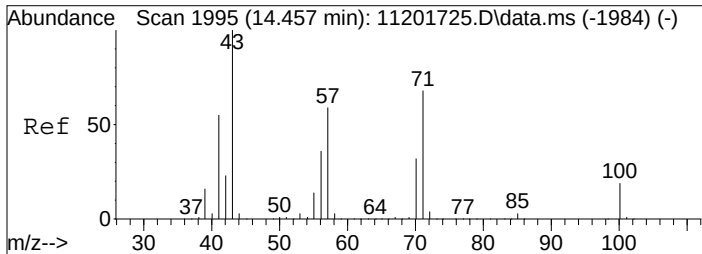
Tgt Ion: 83 Resp: 46507
Ion Ratio Lower Upper
83 100
85 35.1 44.4 84.4#



#47
Trichloroethene
Concen: 82.28 ng
RT: 14.14 min Scan# 1937
Delta R.T. 0.000 min
Lab File: 12131725.D
Acq: 13 Dec 2017 20:37

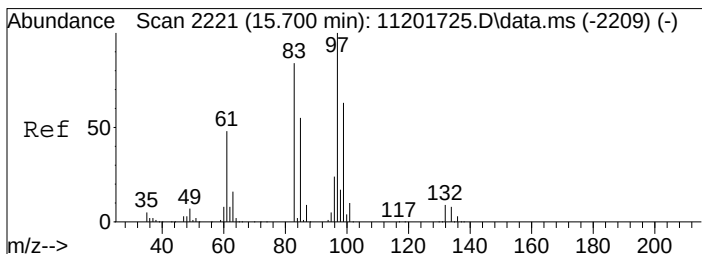
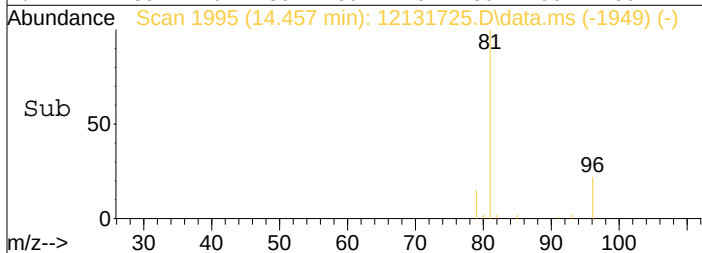
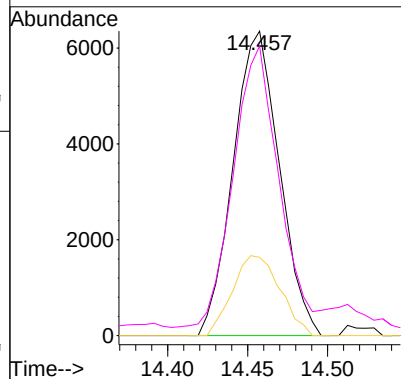
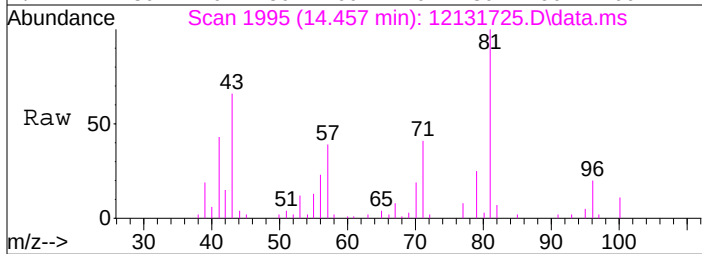
Tgt Ion: 130 Resp: 3178752
Ion Ratio Lower Upper
130 100
132 96.7 76.1 116.1





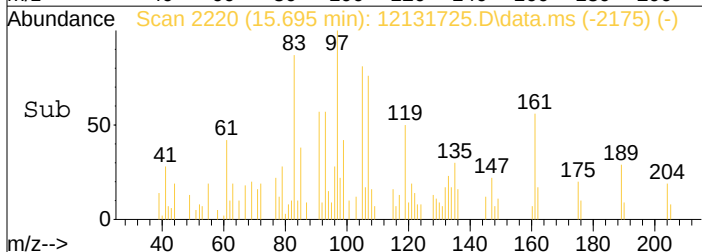
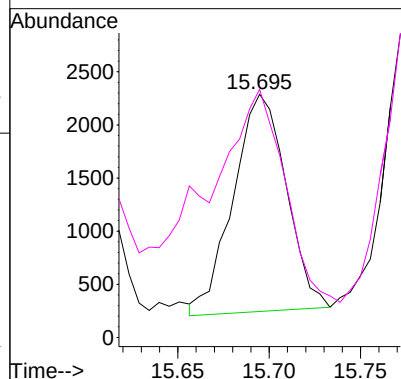
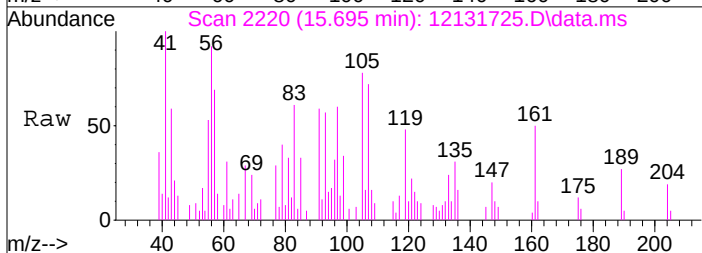
#51
n-Heptane
Concen: 0.42 ng
RT: 14.46 min Scan# 1995
Delta R.T. 0.006 min
Lab File: 12131725.D
Acq: 13 Dec 2017 20:37

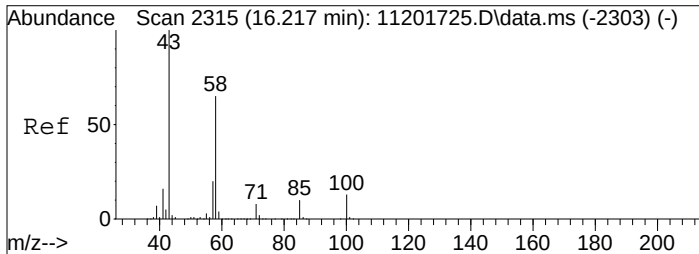
Tgt Ion: 71 Resp: 12789
Ion Ratio Lower Upper
71 100
57 89.7 67.2 107.2
100 26.9 8.5 48.5



#55
1,1,2-Trichloroethane
Concen: 0.13 ng
RT: 15.69 min Scan# 2220
Delta R.T. 0.000 min
Lab File: 12131725.D
Acq: 13 Dec 2017 20:37

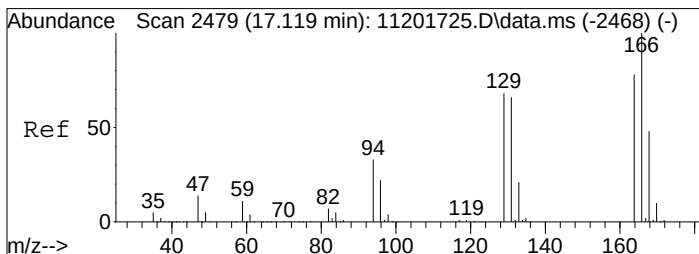
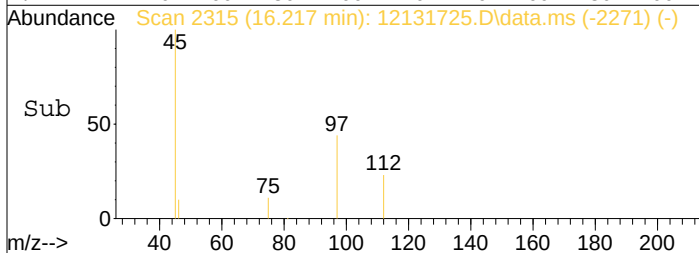
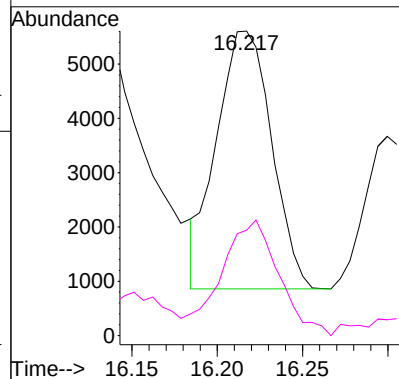
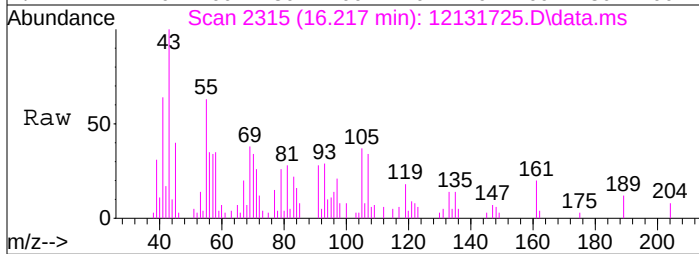
Tgt Ion: 97 Resp: 4135
Ion Ratio Lower Upper
97 100
83 146.6 65.0 105.0#





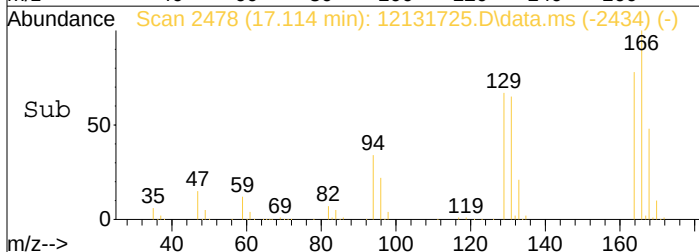
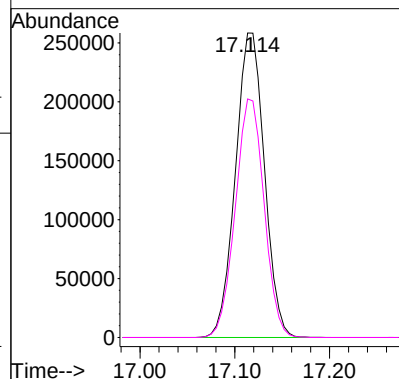
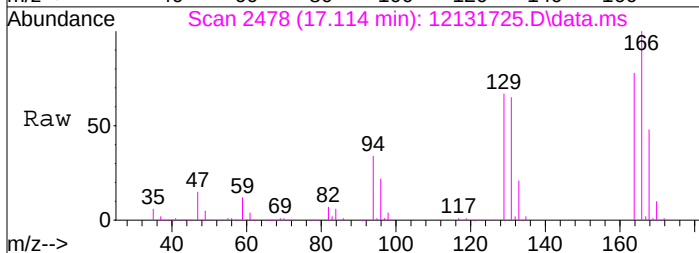
#59
2-Hexanone
Concen: 0.18 ng
RT: 16.22 min Scan# 2315
Delta R.T. -0.005 min
Lab File: 12131725.D
Acq: 13 Dec 2017 20:37

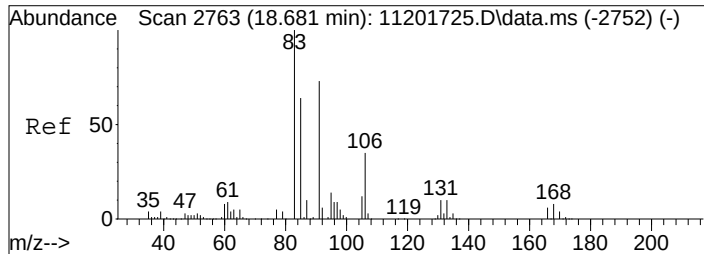
Tgt Ion: 43 Resp: 10692
Ion Ratio Lower Upper
43 100
58 46.7 44.2 84.2



#64
Tetrachloroethene
Concen: 12.98 ng
RT: 17.11 min Scan# 2478
Delta R.T. -0.005 min
Lab File: 12131725.D
Acq: 13 Dec 2017 20:37

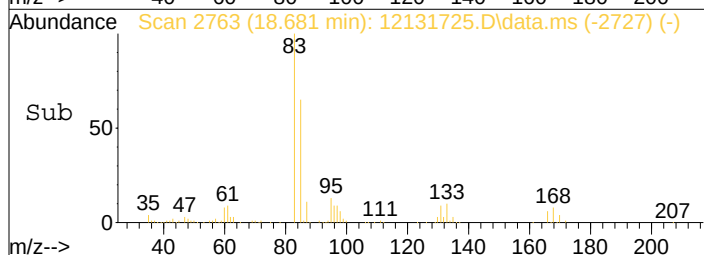
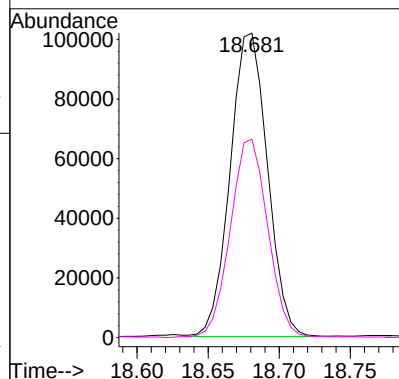
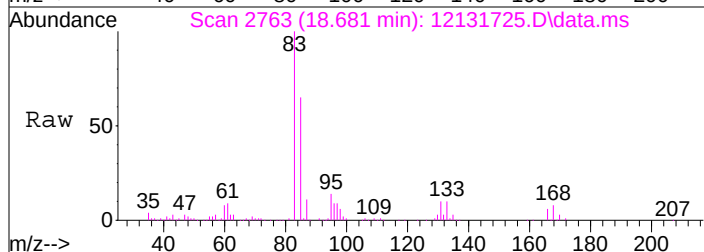
Tgt Ion: 166 Resp: 549232
Ion Ratio Lower Upper
166 100
164 77.9 57.8 97.8





#72
 1,1,2,2-Tetrachloroethane
 Concen: 3.78 ng
 RT: 18.68 min Scan# 2763
 Delta R.T. 0.000 min
 Lab File: 12131725.D
 Acq: 13 Dec 2017 20:37

Tgt Ion: 83 Resp: 185783
 Ion Ratio Lower Upper
 83 100
 85 66.1 44.7 84.7



Data File: I:\MS16\DATA\2017 12\13\12131725.D

Acq On : 13 Dec 2017 20:37

Operator: LH

Sample : P1706191-001 (1000mL)

Misc : S31-12041701

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Dec 14 08:34:10 2017

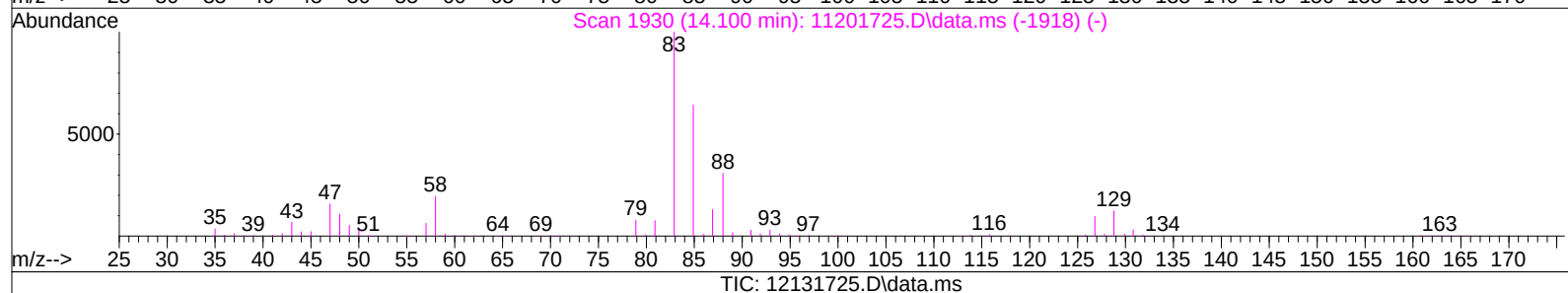
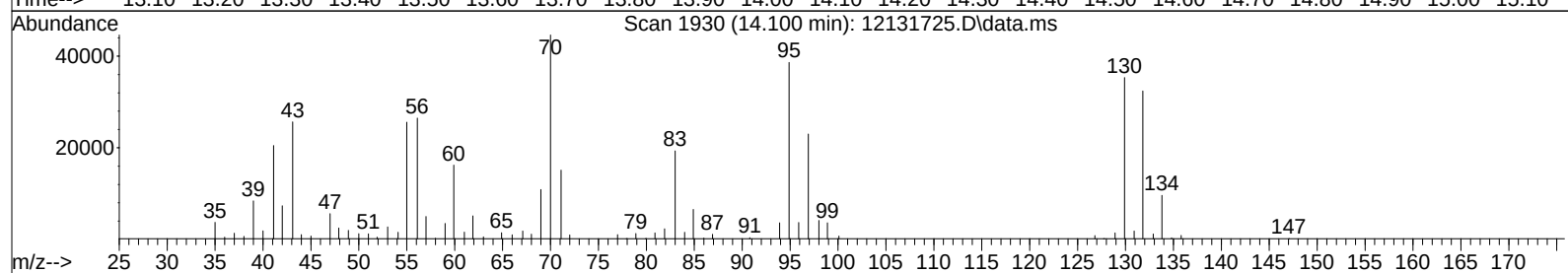
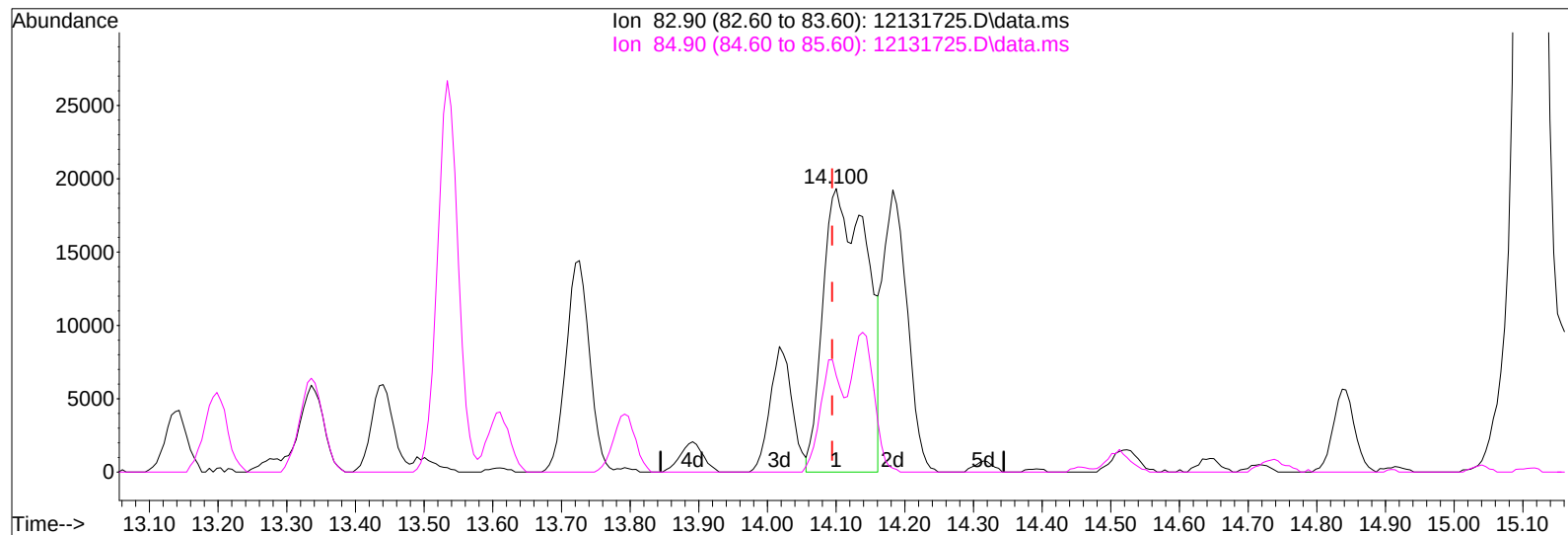
Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:29:15 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



(46) Bromodichloromethane (T)

14.100min (+0.006) 2.22ng

response 86471

Ion	Exp%	Act%
82.90	100	100
84.90	64.40	18.87#
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS16\DATA\2017 12\13\12131725.D

Acq On : 13 Dec 2017 20:37

Operator: LH

Sample : P1706191-001 (1000mL)

Misc : S31-12041701

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Dec 14 08:34:10 2017

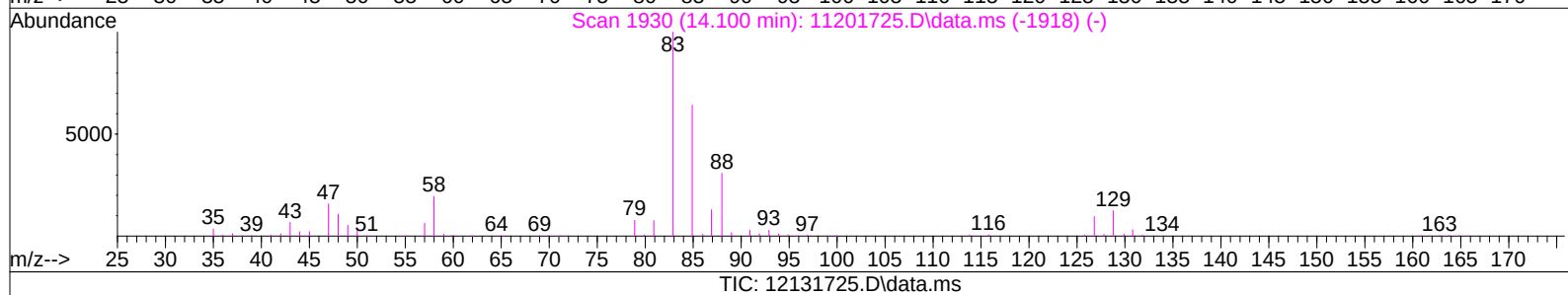
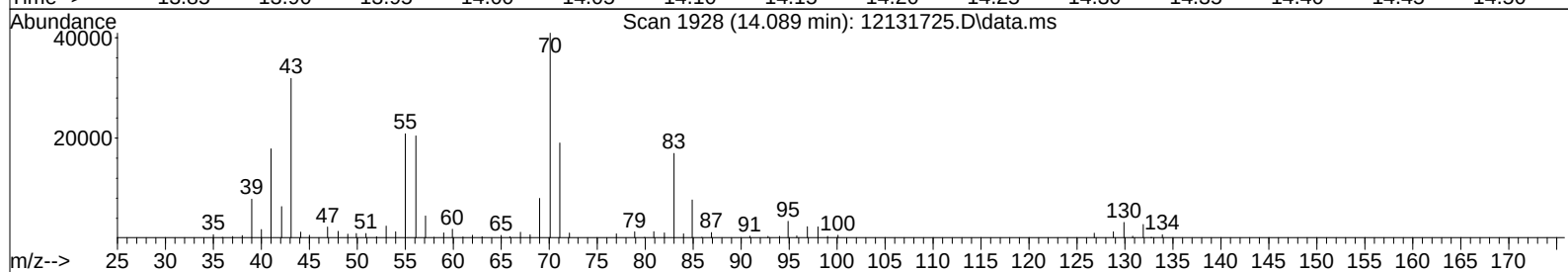
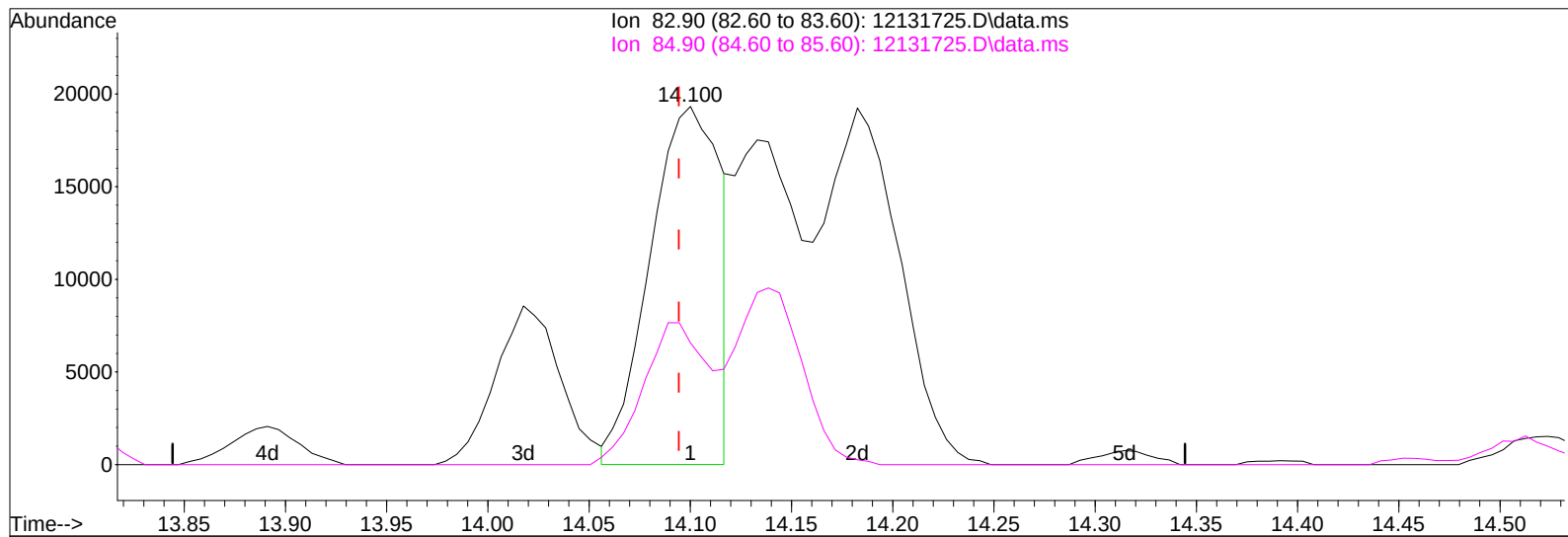
Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:29:15 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



(46) Bromodichloromethane (T)

14.100min (+0.006) 1.19ng m

IPC

response 46507

LH 12/15/17

12/18/17

Ion	Exp%	Act%
82.90	100	100
84.90	64.40	35.09#
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS16\DATA\2017 12\13\12131704.D

Acq On : 13 Dec 2017 5:12

Operator: LH

Sample : MB R16121317 1000mL

Misc : S31-12041701 AS00442

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 13 08:48:49 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

LH 12/13/17

QLast Update : Tue Nov 21 08:29:15 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.32	130	272090	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.43	114	1375471	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.73	82	534688	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.18	65	364369	13.341	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	106.72%
57) Toluene-d8 (SS2)	15.88	98	1370055	12.566	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.56%
73) Bromofluorobenzene (SS3)	19.09	174	478159	11.792	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	94.32%

Target Compounds

						Qvalue
2) Propene	4.07	42	724	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	6.51	45	1943	0.112	ng	# 53
11) Acetonitrile	6.82	41	1652	N.D.		
12) Acrolein	6.95	56	74	N.D.		
13) Acetone	7.20	58	4258	0.237	ng	92
14) Trichlorofluoromethane	0.00	101	0	N.D.		
15) 2-Propanol (Isopropanol)	7.72	45	163	N.D.		
16) Acrylonitrile	8.00	53	54	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	8.60	84	2688	0.097	ng	93
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	6775	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)	10.70	72	247	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	11.42	57	679	N.D.		
32) Chloroform	0.00	83	0	N.D.		
34) Tetrahydrofuran (THF)	11.98	72	448	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	13.07	56	1894	N.D.		
41) Benzene	13.05	78	3269	N.D.		
42) Carbon Tetrachloride	0.00	117	0	N.D.		
43) Cyclohexane	13.43	84	627	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...	14.19	57	41 2254	N.D.		

Data File: I:\MS16\DATA\2017 12\13\12131704.D

Acq On : 13 Dec 2017 5:12 Operator: LH
 Sample : MB R16121317 1000mL
 Misc : S31-12041701 AS00442
 ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 13 08:48:49 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:29:15 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	14.45	71	303	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	15.98	91	5144	N.D.		
59) 2-Hexanone	16.24	43	1342	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.87	43	766	N.D.		
63) n-Octane	16.96	57	824	N.D.		
64) Tetrachloroethene	17.12	166	160	N.D.		
65) Chlorobenzene	17.77	112	1464	N.D.		
66) Ethylbenzene	18.12	91	1540	N.D.		
67) m- & p-Xylenes	18.27	91	3593	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.60	104	1151	N.D.		
70) o-Xylene	18.69	91	1172	N.D.		
71) n-Nonane	18.87	43	367	N.D.		
72) 1,1,2,2-Tetrachloroethane	18.69	83	133	N.D.		
74) Cumene	19.21	105	1752	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	19.62	91	2850	N.D.		
77) 3-Ethyltoluene	19.74	105	1577	N.D.		
78) 4-Ethyltoluene	19.78	105	1017	N.D.		
79) 1,3,5-Trimethylbenzene	19.84	105	1633	N.D.		
80) alpha-Methylstyrene	19.97	118	482	N.D.		
81) 2-Ethyltoluene	20.01	105	1058	N.D.		
82) 1,2,4-Trimethylbenzene	20.19	105	988	N.D.		
83) n-Decane	0.00	57	0	N.D.		
84) Benzyl Chloride	20.32	91	655	N.D.		
85) 1,3-Dichlorobenzene	20.34	146	1346	N.D.		
86) 1,4-Dichlorobenzene	20.40	146	2110	N.D.		
87) sec-Butylbenzene	20.43	105	284	N.D.		
88) 4-Isopropyltoluene (p-...	20.57	119	562	N.D.		
89) 1,2,3-Trimethylbenzene	20.57	105	696	N.D.		
90) 1,2-Dichlorobenzene	20.69	146	1114	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	22.21	180	1944	N.D.		
95) Naphthalene	22.33	128	9918	N.D.		
96) n-Dodecane	22.29	57	524	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	18.43	55	867	N.D.		
99) tert-Butylbenzene	20.20	119	299	N.D.		
100) n-Butylbenzene	20.97	91	820	N.D.		

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

Data File: I:\MS16\DATA\2017 12\13\12131704.D

Acq On : 13 Dec 2017 5:12

Operator: LH

Sample : MB R16121317 1000mL

Misc : S31-12041701 AS00442

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 13 08:48:49 2017

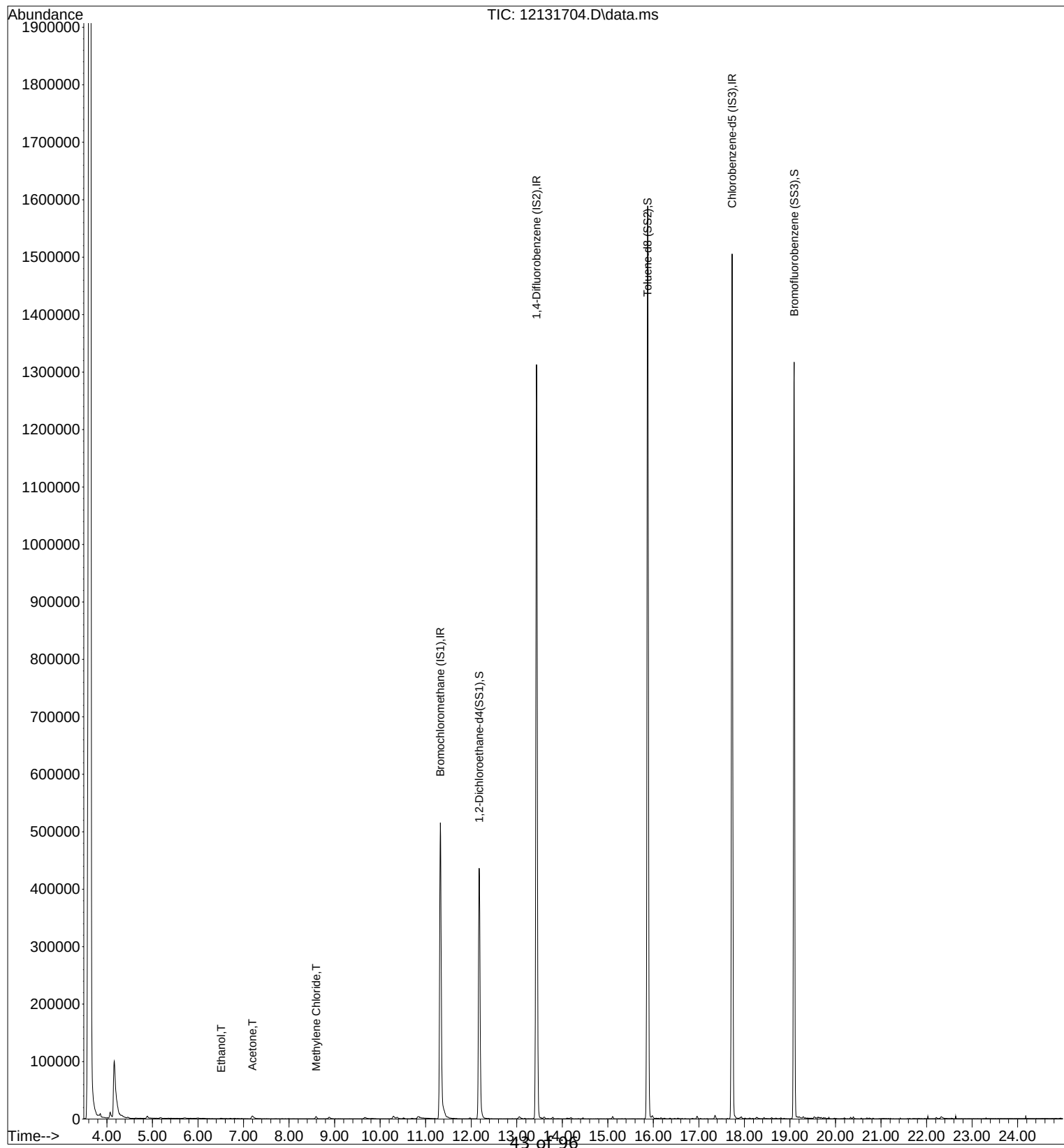
Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:29:15 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS16\DATA\2017 12\13\12131705.D

Acq On : 13 Dec 2017 5:45

Operator: LH

Sample : LCS R16121317 25ng

Misc : S31-12041701/S31-11271703 (12/26)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 13 08:49:07 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

LH 12/13/17

QLast Update : Tue Nov 21 08:29:15 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.35	130	284773	12.500	ng	0.02
37) 1,4-Difluorobenzene (IS2)	13.45	114	1395744	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.73	82	547374	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.19	65	370109	12.947	ng	0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.60%
57) Toluene-d8 (SS2)	15.88	98	1395872	12.506	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.08%
73) Bromofluorobenzene (SS3)	19.09	174	498995	12.021	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	96.16%

Target Compounds

						Qvalue
2) Propene	4.06	42	696116	25.227	ng	99
3) Dichlorodifluoromethan...	4.22	85	1254557	23.105	ng	100
4) Chloromethane	4.53	50	869835	21.821	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	719902	22.785	ng	100
6) Vinyl Chloride	4.97	62	1000709	24.670	ng	100
7) 1,3-Butadiene	5.25	54	729675	25.736	ng	99
8) Bromomethane	5.71	94	656702	23.654	ng	100
9) Chloroethane	6.06	64	510215	24.612	ng	100
10) Ethanol	6.51	45	2324020	127.465	ng	100
11) Acetonitrile	6.75	41	1144220	24.486	ng	100
12) Acrolein	6.92	56	421198	26.421	ng	100
13) Acetone	7.14	58	2385159	126.731	ng	98
14) Trichlorofluoromethane	7.37	101	1098725	22.896	ng	100
15) 2-Propanol (Isopropanol)	7.68	45	3016842	47.957	ng	99
16) Acrylonitrile	7.94	53	900540	26.101	ng	100
17) 1,1-Dichloroethene	8.36	96	676167	23.347	ng	95
18) 2-Methyl-2-Propanol (t...	8.56	59	3198588	48.386	ng	100
19) Methylene Chloride	8.61	84	701440	24.106	ng	95
20) 3-Chloro-1-propene (Al...	8.77	41	894110	25.032	ng	98
21) Trichlorotrifluoroethane	9.00	151	651704	22.401	ng	98
22) Carbon Disulfide	8.86	76	2576248	25.509	ng	100
23) trans-1,2-Dichloroethene	9.88	61	952610	25.737	ng	96
24) 1,1-Dichloroethane	10.14	63	1178119	23.648	ng	100
25) Methyl tert-Butyl Ether	10.22	73	1971537	23.825	ng	99
26) Vinyl Acetate	10.39	86	787563	152.790	ng	# 91
27) 2-Butanone (MEK)	10.64	72	471083	24.883	ng	93
28) cis-1,2-Dichloroethene	11.16	61	897398	24.310	ng	97
29) Diisopropyl Ether	11.43	87	537154	24.259	ng	# 91
30) Ethyl Acetate	11.45	61	501017	50.356	ng	98
31) n-Hexane	11.42	57	1065378	23.284	ng	100
32) Chloroform	11.51	83	1127545	22.921	ng	100
34) Tetrahydrofuran (THF)	11.90	72	461414	24.389	ng	96
35) Ethyl tert-Butyl Ether	12.03	87	793929	23.684	ng	97
36) 1,2-Dichloroethane	12.31	62	774737	23.731	ng	100
38) 1,1,1-Trichloroethane	12.58	97	977518	23.554	ng	99
39) Isopropyl Acetate	12.99	61	879880	49.206	ng	96
40) 1-Butanol	13.02	56	1311458	53.181	ng	98
41) Benzene	13.06	78	2693306	21.279	ng	100
42) Carbon Tetrachloride	13.21	117	878408	25.257	ng	100
43) Cyclohexane	13.34	84	2026059	45.892	ng	97
44) tert-Amyl Methyl Ether	13.68	73	1892607	24.002	ng	99
45) 1,2-Dichloropropane	13.91	63	683300	23.489	ng	99
46) Bromodichloromethane	14.10	83	897664	24.569	ng	100
47) Trichloroethene	14.14	130	767268	21.183	ng	100
48) 1,4-Dioxane	14.12	88	573362	23.735	ng	97
49) 2,2,4-Trimethylpentane...	14.20	57	2708406	22.999	ng	100

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Data File: I:\MS16\DATA\2017 12\13\12131705.D

Acq On : 13 Dec 2017 5:45

Operator: LH

Sample : LCS R16121317 25ng

Misc : S31-12041701/S31-11271703 (12/26)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 13 08:49:07 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:29:15 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.34	100	585452	48.107	ng	96
51) n-Heptane	14.46	71	672593	23.769	ng	99
52) cis-1,3-Dichloropropene	15.00	75	1110233	25.965	ng	100
53) 4-Methyl-2-pentanone	15.03	58	629551	25.042	ng	97
54) trans-1,3-Dichloropropene	15.52	75	997022	28.256	ng	100
55) 1,1,2-Trichloroethane	15.69	97	683372	23.239	ng	99
58) Toluene	15.98	91	2741103	21.821	ng	100
59) 2-Hexanone	16.21	43	1368252	24.920	ng	98
60) Dibromochloromethane	16.40	129	824097	25.157	ng	100
61) 1,2-Dibromoethane	16.65	107	790678	23.857	ng	100
62) n-Butyl Acetate	16.84	43	1566468	26.029	ng	99
63) n-Octane	16.97	57	561795	23.615	ng	98
64) Tetrachloroethene	17.12	166	836024	21.003	ng	100
65) Chlorobenzene	17.77	112	1885937	22.182	ng	100
66) Ethylbenzene	18.11	91	3108031	22.669	ng	99
67) m- & p-Xylenes	18.28	91	4639819	44.670	ng	100
68) Bromoform	18.35	173	733782	26.196	ng	100
69) Styrene	18.60	104	1946155	22.775	ng	99
70) o-Xylene	18.70	91	2351687	22.270	ng	99
71) n-Nonane	18.87	43	1166461	23.924	ng	97
72) 1,1,2,2-Tetrachloroethane	18.68	83	1181461	25.525	ng	100
74) Cumene	19.21	105	3095790	22.314	ng	100
75) alpha-Pinene	19.55	93	1534416	22.210	ng	99
76) n-Propylbenzene	19.65	91	3710152	22.839	ng	99
77) 3-Ethyltoluene	19.74	105	2960019	21.291	ng	100
78) 4-Ethyltoluene	19.78	105	3048271	24.218	ng	99
79) 1,3,5-Trimethylbenzene	19.84	105	2489381	22.166	ng	99
80) alpha-Methylstyrene	19.97	118	1322637	22.399	ng	99
81) 2-Ethyltoluene	20.01	105	2970963	22.012	ng	99
82) 1,2,4-Trimethylbenzene	20.19	105	2454600	21.985	ng	100
83) n-Decane	20.27	57	1328405	23.729	ng	99
84) Benzyl Chloride	20.31	91	2074013	28.383	ng	99
85) 1,3-Dichlorobenzene	20.33	146	1566386	22.623	ng	100
86) 1,4-Dichlorobenzene	20.39	146	1577017	21.501	ng	100
87) sec-Butylbenzene	20.43	105	3348419	22.213	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	3068603	22.007	ng	99
89) 1,2,3-Trimethylbenzene	20.57	105	2493314	22.267	ng	99
90) 1,2-Dichlorobenzene	20.69	146	1482385	22.485	ng	99
91) d-Limonene	20.69	68	861677	21.421	ng	97
92) 1,2-Dibromo-3-Chloropr...	21.07	157	588941	30.938	ng	96
93) n-Undecane	21.35	57	1398963	24.230	ng	98
94) 1,2,4-Trichlorobenzene	22.18	180	1261385	25.136	ng	100
95) Naphthalene	22.28	128	3632395	23.535	ng	100
96) n-Dodecane	22.25	57	1370541	25.581	ng	98
97) Hexachlorobutadiene	22.59	225	802359	23.217	ng	100
98) Cyclohexanone	18.41	55	919868	24.047	ng	98
99) tert-Butylbenzene	20.19	119	2414088	22.007	ng	99
100) n-Butylbenzene	20.92	91	2701622	23.041	ng	100

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

Method Path : I:\MS16\METHODS\
Method File : R16112017.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Tue Nov 21 08:29:15 2017
Response Via : Initial Calibration

Calibration Files

0.08=11201719.D 0.10=11201720.D 0.20=11201721.D 0.40=11201729.D 1.0 =11201723.D 5.0 =11201724.D 25 =11201725.D
50 =11201726.D 100 =11201727.D

Compound	0.08	0.10	0.20	0.40	1.0	5.0	25	50	100	Avg	%RSD
-----ISTD-----											
1) IR Bromochloromethane...											
2) T Propene	1.520	1.436	1.203	1.348	1.130	1.014	1.136	1.010	1.105	1.211	15.11
3) T Dichlorodifluo...	2.999	2.898	2.424	2.546	2.267	2.047	2.299	2.051	1.918	2.383	15.79
4) T Chloromethane	2.287	2.182	1.871	2.038	1.773	1.367	1.713	1.406	1.112	1.750	22.56
5) T 1,2-Dichloro-1...	1.715	1.626	1.380	1.533	1.294	1.185	1.349	1.230	1.170	1.387	14.16
6) T Vinyl Chloride	2.181	2.059	1.708	2.007	1.676	1.531	1.764	1.603	1.496	1.781	13.76
7) T 1,3-Butadiene	1.493	1.391	1.116	1.456	1.147	1.048	1.315	1.158	1.076	1.245	13.71
8) T Bromomethane	1.531	1.490	1.161	1.434	1.106	0.984	1.197	1.052	1.013	1.219	17.38
9) T Chloroethane	1.096	0.977	0.908	1.012	0.887	0.805	0.930	0.834	0.741	0.910	12.02
10) T Ethanol	0.971	0.833	0.696	1.000	0.803	0.716	0.811	0.713	0.662	0.800	14.97
11) T Acetonitrile	2.666	2.149	1.890	2.480	1.938	1.779	1.996	1.815	1.748	2.051	15.75
12) T Acrolein	0.711	0.670	0.608	0.811	0.685	0.667	0.764	0.700	0.682	0.700	8.38
13) T Acetone				1.042	0.876	0.804	0.855	0.732	0.647	0.826	16.37
14) T Trichlorofluor...	2.716	2.485	2.120	2.261	1.972	1.794	2.007	1.840	1.764	2.106	15.51
15) T 2-Propanol (Is...	3.408	3.107	2.686	3.239	2.717	2.438	2.845	2.473	1.939	2.761	16.41
16) T Acrylonitrile	1.697	1.310	1.427	1.826	1.471	1.394	1.612	1.478	1.415	1.514	10.87
17) T 1,1-Dichloroet...	1.485	1.507	1.259	1.396	1.198	1.086	1.257	1.152	1.101	1.271	12.46
18) T 2-Methyl-2-Pro...	3.549	3.247	2.821	3.337	2.785	2.583	2.971	2.652	2.171	2.902	14.67
19) T Methylene Chlo...				1.679	1.340	1.156	1.293	1.150	1.046	1.277	17.51
20) T 3-Chloro-1-pro...	1.950	1.871	1.457	1.747	1.499	1.297	1.546	1.408	1.335	1.568	14.96
21) T Trichlorotrifl...	1.592	1.488	1.288	1.397	1.199	1.082	1.231	1.130	1.086	1.277	14.20
22) T Carbon Disulfide				5.183	4.565	4.097	4.634	4.212	3.907	4.433	10.38
23) T trans-1,2-Dich...	1.834	1.762	1.511	1.778	1.596	1.465	1.677	1.533	1.466	1.625	8.77
24) T 1,1-Dichloroet...	2.711	2.541	2.161	2.397	2.096	1.880	2.129	1.933	1.832	2.187	13.92
25) T Methyl tert-Bu...	4.489	4.188	3.481	4.064	3.447	3.148	3.568	3.256	3.048	3.632	13.79
26) T Vinyl Acetate				0.208	0.184	0.220	0.276	0.248	0.222	0.226	14.16
27) T 2-Butanone (MEK)	0.938	0.855	0.750	0.964	0.821	0.770	0.863	0.784	0.732	0.831	9.82
28) T cis-1,2-Dichlo...	1.938	1.845	1.551	1.791	1.547	1.423	1.618	1.476	1.394	1.620	11.97
29) T Diisopropyl Ether				1.084	1.229	0.996	0.900	0.979	0.858	0.757	15.93
30) T Ethyl Acetate	0.499	0.465	0.430	0.517	0.446	0.417	0.448	0.383	0.327	0.437	13.24
31) T n-Hexane	2.727	2.480	2.029	2.272	1.914	1.765	1.874	1.619	1.395	2.008	20.99
32) T Chloroform	2.720	2.519	2.172	2.379	2.064	1.849	2.078	1.886	1.766	2.159	14.94
33) S 1,2-Dichloroet...	1.255	1.269	1.254	1.261	1.251	1.260	1.257	1.239	1.247	1.255	0.68
34) T Tetrahydrofura...				0.931	0.966	0.827	0.753	0.843	0.770	0.830	10.99
35) T Ethyl tert-But...	1.766	1.724	1.371	1.650	1.398	1.289	1.453	1.334	1.258	1.471	13.08
36) T 1,2-Dichloroet...	1.734	1.689	1.363	1.594	1.345	1.233	1.408	1.291	1.240	1.433	13.36
-----ISTD-----											
37) IR 1,4-Difluorobenzen...											
38) T 1,1,1-Trichlor...	0.447	0.429	0.365	0.400	0.349	0.322	0.367	0.340	0.326	0.372	11.97
39) T Isopropyl Acetate	0.184	0.175	0.156	0.185	0.158	0.147	0.163	0.145	0.128	0.160	11.86
40) T 1-Butanol	0.246	0.189	0.173	0.282	0.227	0.217	0.247	0.220	0.187	0.221	15.64
41) T Benzene	1.547	1.596	1.229	1.244	1.033	0.918	1.002	0.885	0.748	1.134	25.92
42) T Carbon Tetrach...	0.348	0.327	0.289	0.330	0.294	0.275	0.332	0.309	0.300	0.311	7.66

11/21/17

Method Path : I:\MS16\METHODS\
 Method File : R16112017.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

95) T	Naphthalene	4.517	3.517	2.548	5.491	3.126	2.990	3.653	3.237	2.642	3.525	26.78
96) T	n-Dodecane	1.418	1.216	1.038	1.556	1.237	1.200	1.323	1.126	0.898	1.223	16.07
97) T	Hexachlorobuta...	0.889	0.843	0.758	0.913	0.768	0.703	0.813	0.746	0.670	0.789	10.36
98) T	Cyclohexanone	0.991	0.922	0.774	1.038	0.869	0.808	0.912	0.822	0.726	0.874	11.69
99) T	tert-Butylbenzene	3.195	3.036	2.568	3.000	2.530	2.229	2.367	1.998	1.622	2.505	20.64
100) T	n-Butylbenzene	3.198	3.044	2.567	3.316	2.728	2.420	2.646	2.291	1.889	2.678	17.05

(#) = Out of Range

1ng/L Std. ID:
4ng/L Std. ID: S31-11171704
20ng/L Std. ID: S31-11091702
200ng/L Std. ID: S31-11161703

Dilution Factors:

Compounds	Source Std. mg/ml ^a	Primary Working Standards				
		200ng/L	20ng/L	4ng/L	1ng/L	1000
Propene	1.037	207.4	20.74	4.148	1.037	
Dichlorodifluoromethane	1.048	209.6	20.96	4.192	1.048	
Chloromethane	1.006	201.2	20.12	4.024	1.006	
Freon-114	1.021	204.2	20.42	4.084	1.021	
Vinyl Chloride	1.032	206.4	20.64	4.128	1.032	
1,3-Butadiene	1.059	211.8	21.18	4.236	1.059	
Bromomethane	0.993	198.6	19.86	3.972	0.993	
Chloroethane	1.012	202.4	20.24	4.048	1.012	
Ethanol	5.271	1054.2	105.42	21.084	5.271	
Acetonitrile	1.059	211.8	21.18	4.236	1.059	
Acrolein	1.054	210.8	21.08	4.216	1.054	
Acetone	5.322	1064.4	106.44	21.288	5.322	
Trichlorofluoromethane	1.051	210.2	21.02	4.204	1.051	
Isopropanol	2.107	421.4	42.14	8.428	2.107	
Acrylonitrile	1.056	211.2	21.12	4.224	1.056	
1,1-Dichloroethene	1.061	212.2	21.22	4.244	1.061	
tert-Butanol	2.120	424.0	42.40	8.480	2.120	
Methylene Chloride	1.058	211.6	21.16	4.232	1.058	
1,1,1-Trichloroethane	1.054	210.8	21.08	4.216	1.054	
1,1,2-Dichloroethane	1.053	210.6	21.06	4.212	1.053	
Carbon Disulfide	1.063	212.6	21.26	4.252	1.063	
trans-1,2-Dichloroethene	1.081	216.2	21.62	4.324	1.081	
1,1-Dichloroethane	1.022	204.4	20.44	4.088	1.022	
Methyl tert-Butyl Ether	1.070	214.0	21.40	4.280	1.070	
Vinyl Acetate	5.281	1056.2	105.62	21.124	5.281	
2-Butanone	1.052	210.4	21.04	4.208	1.052	
cis-1,2-Dichloroethene	1.067	213.4	21.34	4.268	1.067	
Diisopropyl Ether	1.065	213.0	21.30	4.260	1.065	
Ethyl Acetate	2.136	427.2	42.72	8.544	2.136	
n-Hexane	1.066	213.2	21.32	4.264	1.066	
Chloroform	1.061	212.2	21.22	4.244	1.061	
Tetrahydrofuran	1.064	212.8	21.28	4.256	1.064	
Ethyl tert-Butyl Ether	1.059	211.8	21.18	4.236	1.059	
1,2-Dichloroethane	1.055	211.0	21.10	4.220	1.055	
1,1,1-Trichloroethane	1.077	215.4	21.54	4.308	1.077	
Isopropyl Acetate	2.113	422.6	42.26	8.452	2.113	
1-Butanol	2.114	422.8	42.28	8.456	2.114	
Benzene	1.057	211.4	21.14	4.228	1.057	
Carbon Tetrachloride	1.060	212.0	21.20	4.240	1.060	
Cyclohexane	2.135	427.0	42.70	8.540	2.135	
tert-Amyl Methyl Ether	1.057	211.4	21.14	4.228	1.057	
1,2-Dichloropropane	1.066	213.2	21.32	4.264	1.066	
Bromochloromethane	1.067	213.4	21.34	4.268	1.067	
Trichloroethene	1.061	212.2	21.22	4.244	1.061	
1,4-Dioxane	1.063	212.6	21.26	4.252	1.063	
Isooctane	1.060	212.0	21.20	4.240	1.060	
Methyl Methacrylate	2.112	422.4	42.24	8.448	2.112	
n-Heptane	1.065	213.0	21.30	4.260	1.065	

Q17015 Std. ConcentrationsMS16 Std. Conc/2017R16112017ICAL Conc. (Primary Source)

Primary Source Standards Concentrations (Working & Initial Calibration)

Working STD Conc.(ng/L): Injection (L): ICAL Points:																
	4	4			4			20			200			200		
	0.020	0.025	0.050	0.100	0.050	0.200	0.400	0.050	0.200	0.400	0.025	0.100	0.250	0.500	1.000	
	0.08ng	0.1ng	0.2ng	0.4ng	0.8ng	1.6ng	3.2ng	0.1ng	0.2ng	0.4ng	0.8ng	1.6ng	3.2ng	6.4ng	12.8ng	
	0.08296	0.1037	0.2074	0.4148	0.8296	1.6592	3.3184	0.1037	0.2074	0.4148	0.8296	1.6592	3.3184	6.6368	13.2736	
	0.08384	0.1048	0.2096	0.4192	0.8384	1.6768	3.3536	0.1048	0.2096	0.4192	0.8384	1.6768	3.3536	6.7072	13.4144	
	0.08048	0.1006	0.2012	0.4024	0.8048	1.6096	3.2192	0.1006	0.2012	0.4024	0.8048	1.6096	3.2192	6.4384	12.8768	
	0.08168	0.1021	0.2042	0.4084	0.8168	1.6336	3.2672	0.1021	0.2042	0.4084	0.8168	1.6336	3.2672	6.5344	13.0688	
	0.08256	0.1032	0.2064	0.4128	0.8256	1.6512	3.3024	0.1032	0.2064	0.4128	0.8256	1.6512	3.3024	6.6048	13.2096	
	0.08472	0.1059	0.2118	0.4236	0.8472	1.6944	3.3888	0.1059	0.2118	0.4236	0.8472	1.6944	3.3888	6.7776	13.5552	
	0.07944	0.0993	0.1986	0.3972	0.7944	1.5888	3.1776	0.0993	0.1986	0.3972	0.7944	1.5888	3.1776	6.3744	12.7488	
	0.08096	0.1012	0.2024	0.4048	0.8096	1.6192	3.2384	0.1012	0.2024	0.4048	0.8096	1.6192	3.2384	6.4768	12.9536	
	0.42168	0.5271	1.0542	2.1084	4.2168	8.4336	16.8672	0.5271	1.0542	2.1084	4.2168	8.4336	16.8672	33.7344	67.4688	
	0.08472	0.1059	0.2118	0.4236	0.8472	1.6944	3.3888	0.1059	0.2118	0.4236	0.8472	1.6944	3.3888	6.7776	13.5552	
	0.08432	0.1054	0.2108	0.4216	0.8432	1.6864	3.3728	0.1054	0.2108	0.4216	0.8432	1.6864	3.3728	6.7456	13.4912	
	0.08424	0.1053	0.2106	0.4212	0.8424	1.6848	3.3696	0.1053	0.2106	0.4212	0.8424	1.6848	3.3696	6.7392	13.4784	
	0.08504	0.1063	0.2126	0.4252	0.8504	1.7008	3.4016	0.1063	0.2126	0.4252	0.8504	1.7008	3.4016	6.8032	13.6064	
	0.08648	0.1081	0.2162	0.4324	0.8648	1.7296	3.4592	0.1081	0.2162	0.4324	0.8648	1.7296	3.4592	6.9184	13.8368	
	0.08176	0.1022	0.2044	0.4088	0.8176	1.6352	3.2704	0.1022	0.2044	0.4088	0.8176	1.6352	3.2704	6.5104	13.0208	
	0.08560	0.1070	0.2140	0.4280	0.8560	1.7120	3.4240	0.1070	0.2140	0.4280	0.8560	1.7120	3.4240	6.8480	13.6960	
	0.42248	0.5281	1.0562	2.1124	4.2248	8.4496	16.8992	0.5281	1.0562	2.1124	4.2248	8.4496	16.8992	33.7984	67.5968	
	0.08416	0.1052	0.2104	0.4208	0.8416	1.6832	3.3664	0.1052	0.2104	0.4208	0.8416	1.6832	3.3664	6.7328	13.4656	
	0.08536	0.1067	0.2134	0.4268	0.8536	1.7072	3.4144	0.1067	0.2134	0.4268	0.8536	1.7072	3.4144	6.8288	13.6576	
	0.08520	0.1065	0.2130	0.4260	0.8520	1.7040	3.4080	0.1065	0.2130	0.4260	0.8520	1.7040	3.4080	6.8160	13.6320	
	0.17088	0.2136	0.4272	0.8544	1.7088	3.4176	6.8352	0.2136	0.4272	0.8544	1.7088	3.4176	6.8352	13.6704	27.3408	
	0.08528	0.1066	0.2132	0.4264	0.8528	1.7056	3.4112	0.1066	0.2132	0.4264	0.8528	1.7056	3.4112	6.8224	13.6448	
	0.08488	0.1061	0.2122	0.4244	0.8488	1.6976	3.3952	0.1061	0.2122	0.4244	0.8488	1.6976	3.3952	6.7904	13.5808	
	0.08512	0.1064	0.2128	0.4256	0.8512	1.7024	3.4048	0.1064	0.2128	0.4256	0.8512	1.7024	3.4048	6.8096	13.6192	
	0.08472	0.1059	0.2118	0.4236	0.8472	1.6944	3.3888	0.1059	0.2118	0.4236	0.8472	1.6944	3.3888	6.7776	13.5552	
	0.08440	0.1055	0.2110	0.4220	0.8440	1.6880	3.3760	0.1055	0.2110	0.4220	0.8440	1.6880	3.3760	6.7520	13.5040	
	0.08616	0.1077	0.2154	0.4308	0.8616	1.7232	3.4464	0.1077	0.2154	0.4308	0.8616	1.7232	3.4464	6.8928	13.7856	
	0.16904	0.2113	0.4226	0.8452	1.6904	3.3808	6.7616	0.2113	0.4226	0.8452	1.6904	3.3808	6.7616	13.5232	27.0464	
	0.16912	0.2114	0.4228	0.8456	1.6912	3.3824	6.7648	0.2114	0.4228	0.8456	1.6912	3.3824	6.7648	13.5296	27.0592	
	0.08456	0.1057	0.2114	0.4228	0.8456	1.6912	3.3824	0.1057	0.2114	0.4228	0.8456	1.6912	3.3824	6.7648	13.5296	
	0.08480	0.1060	0.2120	0.4240	0.8480	1.6960	3.3920	0.1060	0.2120	0.4240	0.8480	1.6960	3.3920	6.7840	13.5680	
	0.17080	0.2135	0.4270	0.8540	1.7080	3.4160	6.8320	0.2135	0.4270	0.8540	1.7080	3.4160	6.8320	13.6640	27.3280	
	0.08456	0.1057	0.2114	0.4228	0.8456	1.6912	3.3824	0.1057	0.2114	0.4228	0.8456	1.6912	3.3824	6.7648	13.5296	
	0.08528	0.1066	0.2132	0.4264	0.8528	1.7056	3.4112	0.1066	0.2132	0.4264	0.8528	1.7056	3.4112	6.8224	13.6448	
	0.08536	0.1067	0.2134	0.4268	0.8536	1.7072	3.4144	0.1067	0.2134	0.4268	0.8536	1.7072	3.4144	6.8288	13.6576	
	0.08488	0.1061	0.2122	0.4244	0.8488	1.6976	3.3952	0.1061	0.2122	0.4244	0.8488	1.6976	3.3952	6.7904	13.5808	
	0.08504	0.1063	0.2126	0.4252	0.8504	1.7008	3.4016	0.1063	0.2126	0.4252	0.8504	1.7008	3.4016	6.8032	13.6064	
	0.08480	0.1060	0.2120	0.4240	0.8480	1.6960	3.3920	0.1060	0.2120	0.4240	0.8480	1.6960	3.3920	6.7840	13.5680	
	0.16896	0.2112	0.4224	0.8448	1.6896	3.3792	6.7584	0.2112	0.4224	0.8448	1.6896	3.3792	6.7584	13.5168	27.0336	
	0.08520	0.1065	0.2130	0.4260	0.8520	1.7040	3.4080	0.1065	0.2130	0.4260	0.8520	1.7040	3.4080	6.8160	13.6320	

Primary Source Standards Concentrations (Working & Initial Calibration)

1ng/L Std. ID:
4ng/L Std. ID: S31-11171704
20ng/L Std. ID: S31-11091702
200ng/L Std. ID: S31-11161703

Dilution Factors:

200ng/L Std. ID: S31-11161703												
Dilution Factors:			5		50		250		1000			
		Source Std.	200ng/L	20ng/L	4ng/L	1ng/L						
Compounds		mg/L ^a	Primary Working Standards									
cis-1,3-Dichloropropene		1.120	224.0	22.40	4.480	1.120						
4-Methyl-2-pentanone		1.059	211.8	21.18	4.236	1.059						
trans-1,3-Dichloropropene		1.067	213.4	21.34	4.268	1.067						
1,1,2-Trichloroethane		1.064	212.8	21.28	4.256	1.064						
Toluene		1.054	210.8	21.08	4.216	1.054						
2-Hexanone		1.060	212.0	21.20	4.240	1.060						
Dibromochloromethane		1.061	212.2	21.22	4.244	1.061						
1,2-Dibromoethane		1.064	212.8	21.28	4.256	1.064						
n-Butyl Acetate		1.068	213.6	21.36	4.272	1.068						
n-Octane		1.060	212.0	21.20	4.240	1.060						
Tetrachloroethene		1.063	212.6	21.26	4.252	1.063						
Chlorobenzene		1.066	213.2	21.32	4.264	1.066						
Ethylbenzene		1.052	210.4	21.04	4.208	1.052						
m-&p-Xylene		2.123	424.6	42.46	8.492	2.123						
Bromolorm		1.063	212.6	21.26	4.252	1.063						
Styrene		1.058	211.6	21.16	4.232	1.058						
o-Xylene		1.055	211.0	21.10	4.220	1.055						
n-Nonane		1.054	210.8	21.08	4.216	1.054						
1,1,2,2-Tetrachloroethane		1.057	211.4	21.14	4.228	1.057						
o-Tolene		1.052	210.4	21.04	4.208	1.052						
alpha-Phene		1.046	209.2	20.92	4.184	1.046						
n-Propylbenzene		1.064	212.8	21.28	4.256	1.064						
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		1.049	209.8	20.98	4.196	1.049						
2-Ethyltoluene		1.060	212.0	21.20	4.240	1.060						
1,2,4-Trimethylbenzene		1.051	210.2	21.02	4.204	1.051						
n-Decane		1.059	211.8	21.18	4.236	1.059						
Benzyl Chloride		1.074	214.8	21.48	4.296	1.074						
1,3-Dichlorobenzene		1.071	214.2	21.42	4.284	1.071						
1,4-Dichlorobenzene		1.064	212.8	21.28	4.256	1.064						
sec-Butylbenzene		1.055	211.0	21.10	4.220	1.055						
p-Isopropyltoluene		1.026	205.2	20.52	4.104	1.026						
1,2,3-Trimethylbenzene		1.026	205.2	20.52	4.104	1.026						
1,2-Dichlorobenzene		1.083	216.6	21.66	4.332	1.083						
d-Limonene		1.005	201.0	20.10	4.020	1.005						
1,2-Dibromo-3-chloropropane		1.051	210.2	21.02	4.204	1.051						
n-Undecane		1.053	210.6	21.06	4.212	1.053						
1,2,4-Trichlorobenzene		1.097	219.4	21.94	4.388	1.097						
Naphthalene		1.056	211.2	21.12	4.224	1.056						
n-Dodecane		1.056	211.2	21.12	4.224	1.056						
Hexachloro-1,3-butadiene		1.057	211.4	21.14	4.228	1.057						
Methacrylonitrile		1.067	213.4	21.34	4.268	1.067						
Cyclohexanone		1.039	207.8	20.78	4.156	1.039						
tert-Butylbenzene		1.050	210.0	21.00	4.200	1.050						
n-Butylbenzene		1.054	210.8	21.08	4.216	1.054						

Working STD Conc.(ng/L): Injection (L): ICAL Points:	4		4	4	4	20	200	200	200	200	200
	0.020	0.025	0.1ng	0.025	0.050	0.100	0.050	0.025	0.125	25ng	50ng
	0.08ng	0.1ng	0.2ng	0.4ng	1ng	5ng	200	0.025	0.125	25ng	50ng
	0.08960	0.1120	0.2240	0.4480	1.120	5.600	28.000	28.000	56.00	112.0	112.0
	0.08472	0.1059	0.2118	0.4236	1.059	5.295	26.475	26.475	52.95	105.9	105.9
	0.08536	0.1067	0.2134	0.4268	1.067	5.335	26.675	26.675	53.35	106.7	106.7
	0.08512	0.1064	0.2128	0.4256	1.064	5.320	26.600	26.600	53.20	106.4	106.4
	0.08432	0.1054	0.2108	0.4216	1.054	5.270	26.350	26.350	52.70	105.4	105.4
	0.08480	0.1060	0.2120	0.4240	1.060	5.300	26.500	26.500	53.00	106.0	106.0
	0.08488	0.1061	0.2122	0.4244	1.061	5.305	26.525	26.525	53.05	106.1	106.1
	0.08512	0.1064	0.2128	0.4256	1.064	5.320	26.600	26.600	53.20	106.4	106.4
	0.08544	0.1068	0.2136	0.4272	1.068	5.340	26.700	26.700	53.40	106.8	106.8
	0.08480	0.1060	0.2120	0.4240	1.060	5.300	26.500	26.500	53.00	106.0	106.0
	0.08504	0.1063	0.2126	0.4252	1.063	5.315	26.575	26.575	53.15	106.3	106.3
	0.08528	0.1066	0.2132	0.4264	1.066	5.330	26.650	26.650	53.30	106.6	106.6
	0.08416	0.1052	0.2104	0.4208	1.052	5.260	26.300	26.300	52.60	105.2	105.2
	0.16984	0.2123	0.4246	0.8492	2.123	10.615	53.075	53.075	106.15	212.3	212.3
	0.08504	0.1063	0.2126	0.4252	1.063	5.315	26.575	26.575	53.15	106.3	106.3
	0.08464	0.1058	0.2116	0.4232	1.058	5.290	26.450	26.450	52.90	105.8	105.8
	0.08440	0.1055	0.2110	0.4220	1.055	5.275	26.375	26.375	52.75	105.5	105.5
	0.08432	0.1054	0.2108	0.4216	1.054	5.270	26.350	26.350	52.70	105.4	105.4
	0.08456	0.1057	0.2114	0.4228	1.057	5.285	26.425	26.425	52.85	105.7	105.7
	0.08416	0.1052	0.2104	0.4208	1.052	5.260	26.300	26.300	52.60	105.2	105.2
	0.08368	0.1046	0.2092	0.4184	1.046	5.230	26.150	26.150	52.30	104.6	104.6
	0.08512	0.1064	0.2128	0.4256	1.064	5.320	26.600	26.600	53.20	106.4	106.4
	0.08400	0.1050	0.2100	0.4200	1.050	5.250	26.250	26.250	52.50	105.0	105.0
	0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	26.225	52.45	104.9	104.9
	0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	26.225	52.45	104.9	104.9
	0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	26.225	52.45	104.9	104.9
	0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	26.225	52.45	104.9	104.9
	0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	26.225	52.45	104.9	104.9
	0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	26.225	52.45	104.9	104.9
	0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	26.225	52.45	104.9	104.9
	0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	26.225	52.45	104.9	104.9
	0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	26.225	52.45	104.9	104.9
	0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	26.225	52.45	104.9	104.9
	0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	26.225	52.45	104.9	104.9
	0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	26.225	52.45	104.9	104.9
	0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	26.225	52.45	104.9	104.9
	0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	26.225	52.45	104.9	104.9
	0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	26.225	52.45	104.9	104.9
	0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	26.225	52.45	104.9	104.9
	0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	26.225	52.45	104.9	104.9
	0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	26.225	52.45	104.9	104.9
	0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	26.225	52.45	104.9	104.9
	0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	26.225	52.45	104.9	104.9
	0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	26.225	52.45	104.9	104.9
	0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	26.225	52.45	104.9	104.9
	0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	26.225	52.45	104.9	104.9
	0.08392	0.1049	0.2098	0.4196	1.049	5.245	26.225	26.225			

Method : I:\MS16\METHODS\R16112017.M (RTE Integrator)
 Title : EPA T0-15 per SOP VOA-T015 (CASS T0-15/GC-MS)
 Last Update : Tue Nov 21 08:29:15 2017
 Response via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	0.08	0	13	I:\MS16\DATA\2017_11\20\11201719.D
2	0.10	0	13	I:\MS16\DATA\2017_11\20\11201720.D
3	0.20	0	13	I:\MS16\DATA\2017_11\20\11201721.D
4	0.40	0	13	I:\MS16\DATA\2017_11\20\11201729.D
5	1.0	1	13	I:\MS16\DATA\2017_11\20\11201723.D
6	5.0	5	13	I:\MS16\DATA\2017_11\20\11201724.D
7	25	26	13	I:\MS16\DATA\2017_11\20\11201725.D
8	50	52	13	I:\MS16\DATA\2017_11\20\11201726.D
9	100	104	13	I:\MS16\DATA\2017_11\20\11201727.D

 11/21/17

#	ID	Update Time	Quant Time	Acquisition Time
1	0.08	Nov 21 08:25 2017	Nov 21 08:18 2017	20 Nov 2017 17:03
2	0.10	Nov 21 08:25 2017	Nov 21 08:18 2017	20 Nov 2017 17:36
3	0.20	Nov 21 08:25 2017	Nov 21 08:18 2017	20 Nov 2017 18:09
4	0.40	Nov 21 08:29 2017	Nov 21 08:18 2017	20 Nov 2017 22:34
5	1.0	Nov 21 08:25 2017	Nov 21 08:18 2017	20 Nov 2017 19:16
6	5.0	Nov 21 08:26 2017	Nov 21 08:18 2017	20 Nov 2017 19:49
7	25	Nov 21 08:26 2017	Nov 21 08:18 2017	20 Nov 2017 20:22
8	50	Nov 21 08:26 2017	Nov 21 08:18 2017	20 Nov 2017 20:55
9	100	Nov 21 08:26 2017	Nov 21 08:18 2017	20 Nov 2017 21:28

R16112017.M

Tue Nov 21 09:07:57 2017

Data File : I:\MS16\DATA\2017 11\20\11201719.D
 Acq On : 20 Nov 2017 17:03
 Sample : 0.08ng TO-15 ICAL Std
 Misc : S31-11031701/S31-11171704 (12/16)

Vial: 13
 Operator: WA
 Inst : GCMS-16

Quant Time: Nov 21 08:18:25 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:11:29 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

11/21/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.33	130	298020	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.44	114	1469907	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.73	82	574140	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.18	65	373970	11.430	ng	-0.02
Spiked Amount	12.500	Range 70	- 130	Recovery	=	91.44%
57) Toluene-d8 (SS2)	15.88	98	1456383	12.848	ng	0.00
Spiked Amount	12.500	Range 70	- 130	Recovery	=	102.80%
73) Bromofluorobenzene (SS3)	19.09	174	542342	14.314	ng	0.00
Spiked Amount	12.500	Range 70	- 130	Recovery	=	114.48%

Target Compounds

						Qvalue
2) Propene	4.08	42	3007	0.087	ng	88
3) Dichlorodifluoromethan...	4.24	85	5995	0.095	ng	# 96
4) Chloromethane	4.56	50	4388	0.087	ng	95
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	3339	0.096	ng	94
6) Vinyl Chloride	5.00	62	4293	0.083	ng	94
7) 1,3-Butadiene	5.27	54	3016	0.091	ng	95
8) Bromomethane	5.74	94	2899	0.091	ng	99
9) Chloroethane	6.08	64	2116	0.082	ng	93
10) Ethanol	6.49	45	9759	0.394	ng	81
11) Acetonitrile	6.78	41	5385	0.087	ng	92
12) Acrolein	6.96	56	1429	0.067	ng	# 75
13) Acetone	7.17	58	12923	0.479	ng	99
14) Trichlorofluoromethane	7.37	101	5445	0.100	ng	99
15) 2-Propanol (Isopropanol)	7.69	45	13694	0.167	ng	93
16) Acrylonitrile	7.95	53	3417	0.076	ng	92
17) 1,1-Dichloroethene	8.37	96	3006	0.091	ng	94
18) 2-Methyl-2-Propanol (t...	8.61	59	14351	0.203	ng	90
19) Methylene Chloride	8.59	84	6055	0.181	ng	99
20) 3-Chloro-1-propene (Al...	8.77	41	3920	0.086	ng	82
21) Trichlorotrifluoroethane	9.01	151	3198	0.104	ng	96
22) Carbon Disulfide	8.88	76	15266	0.129	ng	94
23) trans-1,2-Dichloroethene	9.88	61	3782	0.083	ng	98
24) 1,1-Dichloroethane	10.13	63	5285	0.087	ng	100
25) Methyl tert-Butyl Ether	10.25	73	9162	0.094	ng	97
26) Vinyl Acetate	10.40	86	1497	0.222	ng	# 37
27) 2-Butanone (MEK)	10.67	72	1883	0.079	ng	# 50
28) cis-1,2-Dichloroethene	11.15	61	3944	0.087	ng	95
29) Diisopropyl Ether	11.44	87	3141	0.106	ng	# 79
30) Ethyl Acetate	11.47	61	2033	0.162	ng	97
31) n-Hexane	11.43	57	5544	0.095	ng	97
32) Chloroform	11.49	83	5504	0.096	ng	100
34) Tetrahydrofuran (THF)	11.95	72	3336	0.146	ng	# 88
35) Ethyl tert-Butyl Ether	12.04	87	3568	0.091	ng	98
36) 1,2-Dichloroethane	12.30	62	3489	0.088	ng	97
38) 1,1,1-Trichloroethane	12.57	97	4525	0.093	ng	97
39) Isopropyl Acetate	13.01	61	3667	0.162	ng	# 85
40) 1-Butanol	13.07	56	4896	0.145	ng	# 71
41) Benzene	13.05	78	15380	0.099	ng	98
42) Carbon Tetrachloride	13.21	117	3467	0.083	ng	95
43) Cyclohexane	13.34	84	10358	0.199	ng	97
44) tert-Amyl Methyl Ether	13.69	73	8544	0.090	ng	98
45) 1,2-Dichloropropane	13.90	63	3245	0.091	ng	97
46) Bromodichloromethane	14.09	83	3906	0.091	ng	98
47) Trichloroethene	14.14	130	4367	0.113	ng	95
48) 1,4-Dioxane	14.14	88	2578	0.091	ng	# 71
49) 2,2,4-Trimethylpentane...	14.20	57	13799	0.094	ng	99
50) Methyl Methacrylate	14.35	100	2501	0.180	ng	93

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Data File : I:\MS16\DATA\2017 11\20\11201719.D
 Acq On : 20 Nov 2017 17:03
 Sample : 0.08ng TO-15 ICAL Std
 Misc : S31-11031701/S31-11171704 (12/16)

Vial: 13
 Operator: WA
 Inst : GCMS-16

Quant Time: Nov 21 08:18:25 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:11:29 2017

Response via : Initial Calibration

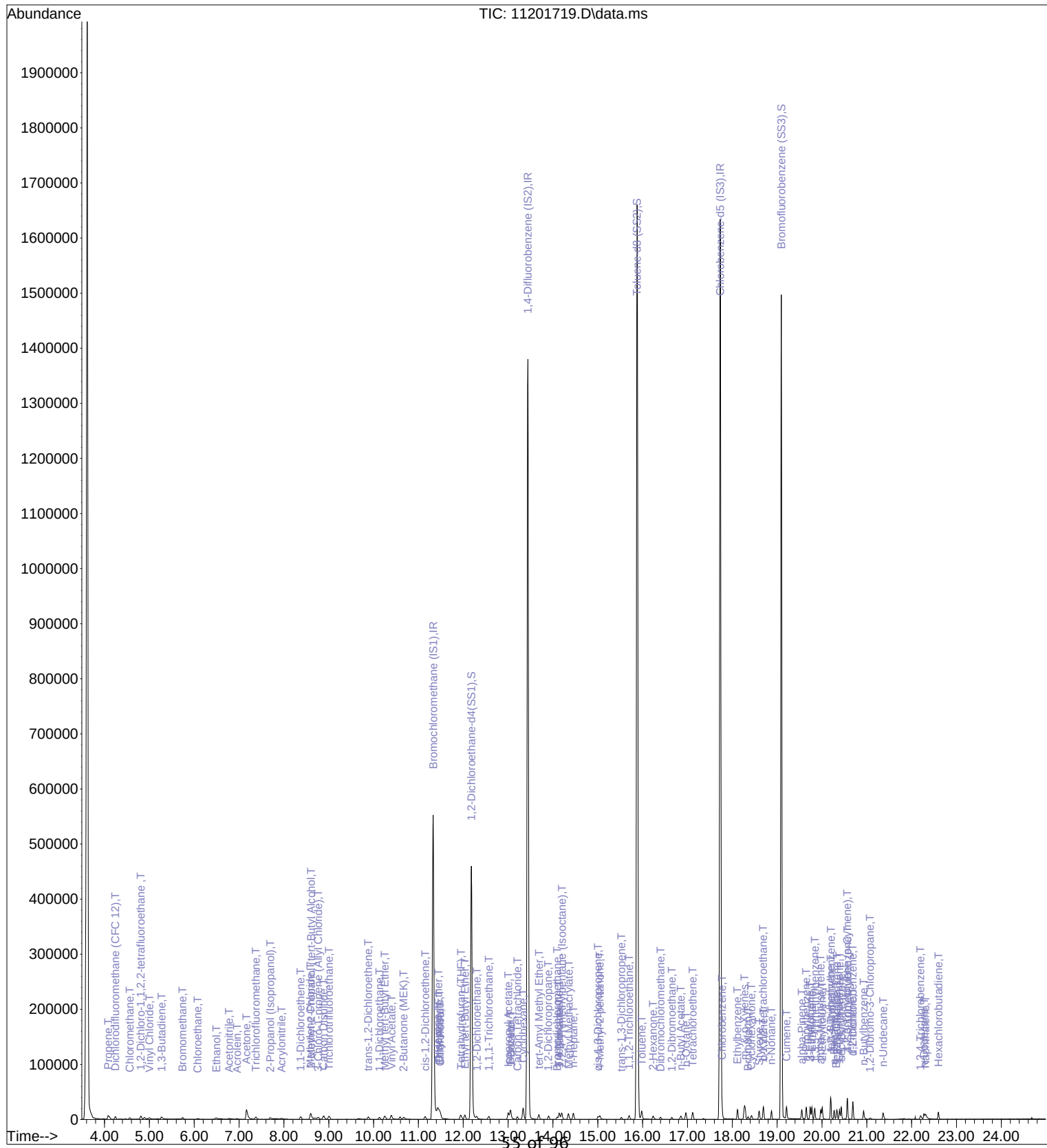
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.46	71	3120	0.089	ng	93
52) cis-1,3-Dichloropropene	15.00	75	4352	0.084	ng	98
53) 4-Methyl-2-pentanone	15.05	58	2506	0.078	ng	80
54) trans-1,3-Dichloropropene	15.52	75	3138	0.077	ng	98
55) 1,1,2-Trichloroethane	15.70	97	3241	0.097	ng	100
58) Toluene	15.98	91	14817	0.119	ng	95
59) 2-Hexanone	16.23	43	5627	0.084	ng	95
60) Dibromochloromethane	16.40	129	3309	0.096	ng	96
61) 1,2-Dibromoethane	16.65	107	3563	0.103	ng	99
62) n-Butyl Acetate	16.85	43	6203	0.085	ng	95
63) n-Octane	16.96	57	2639	0.094	ng	94
64) Tetrachloroethene	17.12	166	5064	0.136	ng	99
65) Chlorobenzene	17.77	112	9907	0.112	ng	98
66) Ethylbenzene	18.11	91	15349	0.103	ng	98
67) m- & p-Xylenes	18.27	91	24166	0.217	ng	99
68) Bromoform	18.35	173	2617	0.092	ng	95
69) Styrene	18.60	104	9237	0.104	ng	99
70) o-Xylene	18.70	91	12379	0.109	ng	98
71) n-Nonane	18.87	43	5360	0.090	ng	96
72) 1,1,2,2-Tetrachloroethane	18.69	83	4474	0.084	ng	97
74) Cumene	19.21	105	16084	0.110	ng	96
75) alpha-Pinene	19.55	93	7220	0.098	ng	76
76) n-Propylbenzene	19.65	91	18677	0.108	ng	98
77) 3-Ethyltoluene	19.74	105	15964	0.107	ng	94
78) 4-Ethyltoluene	19.77	105	13229	0.101	ng	99
79) 1,3,5-Trimethylbenzene	19.84	105	11963	0.101	ng	99
80) alpha-Methylstyrene	19.97	118	6090	0.100	ng	97
81) 2-Ethyltoluene	20.01	105	16023	0.114	ng	93
82) 1,2,4-Trimethylbenzene	20.20	105	13146	0.114	ng	95
83) n-Decane	20.27	57	6223	0.096	ng	97
84) Benzyl Chloride	20.32	91	4839	0.065	ng	86
85) 1,3-Dichlorobenzene	20.34	146	7796	0.111	ng	98
86) 1,4-Dichlorobenzene	20.39	146	8985	0.124	ng	97
87) sec-Butylbenzene	20.43	105	17033	0.107	ng	97
88) 4-Isopropyltoluene (p-...	20.56	119	15342	0.106	ng	98
89) 1,2,3-Trimethylbenzene	20.57	105	12228	0.105	ng	98
90) 1,2-Dichlorobenzene	20.69	146	7875	0.119	ng	97
91) d-Limonene	20.69	68	4054	0.088	ng	96
92) 1,2-Dibromo-3-Chloropr...	21.07	157	1353	0.065	ng	93
93) n-Undecane	21.36	57	6103	0.091	ng	88
94) 1,2,4-Trichlorobenzene	22.19	180	5405	0.110	ng	94
95) Naphthalene	22.31	128	17529	0.108	ng	93
96) n-Dodecane	22.28	57	5501	0.092	ng	92
97) Hexachlorobutadiene	22.60	225	3452	0.101	ng	99
98) Cyclohexanone	18.43	55	3784	0.078	ng	100
99) tert-Butylbenzene	20.19	119	12326	0.108	ng	99
100) n-Butylbenzene	20.93	91	12387	0.098	ng	96

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

Vial: 13
Operator: WA
Inst : GCMS-16

Quant Time: Nov 21 08:18:25 2017
Quant Method : I:\MS16\METHODS\R16112017.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Nov 21 08:11:29 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS16\DATA\2017 11\20\11201720.D
 Acq On : 20 Nov 2017 17:36
 Sample : 0.10ng TO-15 ICAL Std
 Misc : S31-11031701/S31-11171704 (12/16)

Vial: 13
 Operator: WA
 Inst : GCMS-16

Quant Time: Nov 21 08:18:28 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:11:29 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

11/21/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.33	130	293489	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.44	114	1460666	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.73	82	562883	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.18	65	372339	11.556	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	92.48%	
57) Toluene-d8 (SS2)	15.88	98	1445188	13.004	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	104.00%	
73) Bromofluorobenzene (SS3)	19.09	174	522317	14.062	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	112.48%	

Target Compounds

						Qvalue
2) Propene	4.08	42	3496	0.103	ng	93
3) Dichlorodifluoromethan...	4.24	85	7132	0.115	ng	97
4) Chloromethane	4.56	50	5154	0.104	ng	93
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	3898	0.113	ng	94
6) Vinyl Chloride	4.99	62	4988	0.098	ng	99
7) 1,3-Butadiene	5.27	54	3459	0.106	ng	94
8) Bromomethane	5.74	94	3473	0.110	ng	93
9) Chloroethane	6.08	64	2322	0.092	ng	90
10) Ethanol	6.47	45	10308	0.422	ng	76
11) Acetonitrile	6.78	41	5343	0.088	ng	# 55
12) Acrolein	6.96	56	1657	0.079	ng	83
13) Acetone	7.16	58	14148	0.532	ng	95
14) Trichlorofluoromethane	7.37	101	6131	0.115	ng	96
15) 2-Propanol (Isopropanol)	7.69	45	15370	0.190	ng	89
16) Acrylonitrile	7.94	53	3248	0.073	ng	86
17) 1,1-Dichloroethene	8.38	96	3755	0.116	ng	95
18) 2-Methyl-2-Propanol (t...	8.61	59	16160	0.232	ng	89
19) Methylene Chloride	8.59	84	6444	0.196	ng	99
20) 3-Chloro-1-propene (Al...	8.77	41	4630	0.103	ng	85
21) Trichlorotrifluoroethane	9.01	151	3680	0.121	ng	96
22) Carbon Disulfide	8.88	76	17091	0.147	ng	94
23) trans-1,2-Dichloroethene	9.88	61	4473	0.100	ng	95
24) 1,1-Dichloroethane	10.13	63	6097	0.102	ng	97
25) Methyl tert-Butyl Ether	10.24	73	10522	0.110	ng	94
26) Vinyl Acetate	10.40	86	1710	0.257	ng	# 13
27) 2-Butanone (MEK)	10.67	72	2112	0.090	ng	# 55
28) cis-1,2-Dichloroethene	11.15	61	4621	0.104	ng	97
29) Diisopropyl Ether	11.44	87	3641	0.124	ng	# 76
30) Ethyl Acetate	11.47	61	2333	0.189	ng	99
31) n-Hexane	11.43	57	6208	0.108	ng	98
32) Chloroform	11.49	83	6276	0.111	ng	100
34) Tetrahydrofuran (THF)	11.94	72	3191	0.142	ng	# 87
35) Ethyl tert-Butyl Ether	12.04	87	4287	0.111	ng	98
36) 1,2-Dichloroethane	12.30	62	4184	0.108	ng	98
38) 1,1,1-Trichloroethane	12.57	97	5401	0.112	ng	99
39) Isopropyl Acetate	13.00	61	4317	0.192	ng	# 91
40) 1-Butanol	13.07	56	4663	0.139	ng	81
41) Benzene	13.05	78	19716	0.128	ng	100
42) Carbon Tetrachloride	13.20	117	4054	0.097	ng	98
43) Cyclohexane	13.34	84	11617	0.224	ng	96
44) tert-Amyl Methyl Ether	13.68	73	9833	0.105	ng	97
45) 1,2-Dichloropropane	13.91	63	3838	0.109	ng	97
46) Bromodichloromethane	14.09	83	4584	0.108	ng	98
47) Trichloroethene	14.14	130	4964	0.130	ng	99
48) 1,4-Dioxane	14.15	88	2932	0.104	ng	# 69
49) 2,2,4-Trimethylpentane...	14.19	57	15938	0.110	ng	99
50) Methyl Methacrylate	14.34	100	2917	0.211	ng	98

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Data File : I:\MS16\DATA\2017 11\20\11201720.D
 Acq On : 20 Nov 2017 17:36
 Sample : 0.10ng TO-15 ICAL Std
 Misc : S31-11031701/S31-11171704 (12/16)

Vial: 13
 Operator: WA
 Inst : GCMS-16

Quant Time: Nov 21 08:18:28 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:11:29 2017

Response via : Initial Calibration

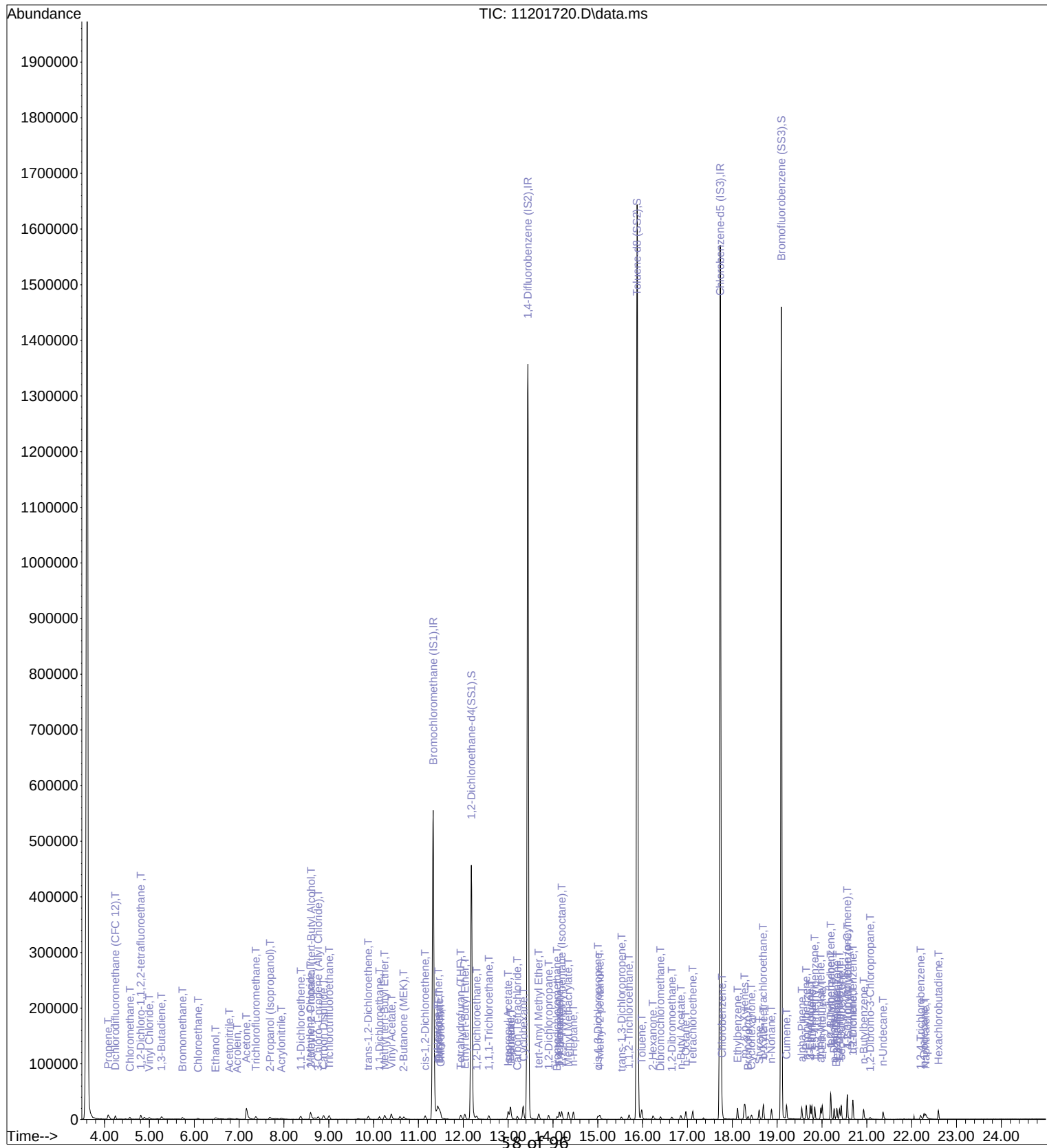
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.46	71	3757	0.108	ng	94
52) cis-1,3-Dichloropropene	15.01	75	5251	0.103	ng	98
53) 4-Methyl-2-pentanone	15.05	58	2890	0.091	ng	86
54) trans-1,3-Dichloropropene	15.53	75	3572	0.088	ng	95
55) 1,1,2-Trichloroethane	15.69	97	3645	0.109	ng	98
58) Toluene	15.98	91	16582	0.136	ng	98
59) 2-Hexanone	16.23	43	6273	0.096	ng	96
60) Dibromochloromethane	16.39	129	3689	0.109	ng	98
61) 1,2-Dibromoethane	16.65	107	3840	0.113	ng	97
62) n-Butyl Acetate	16.85	43	6709	0.093	ng	97
63) n-Octane	16.96	57	3094	0.113	ng	94
64) Tetrachloroethene	17.12	166	5522	0.151	ng	99
65) Chlorobenzene	17.77	112	11415	0.132	ng	97
66) Ethylbenzene	18.12	91	17206	0.118	ng	100
67) m- & p-Xylenes	18.27	91	26795	0.246	ng	100
68) Bromoform	18.35	173	3069	0.110	ng	89
69) Styrene	18.60	104	10217	0.117	ng	99
70) o-Xylene	18.70	91	13565	0.122	ng	99
71) n-Nonane	18.87	43	6399	0.109	ng	93
72) 1,1,2,2-Tetrachloroethane	18.69	83	5381	0.103	ng	100
74) Cumene	19.21	105	17667	0.123	ng	99
75) alpha-Pinene	19.55	93	8230	0.114	ng	77
76) n-Propylbenzene	19.65	91	21012	0.123	ng	97
77) 3-Ethyltoluene	19.74	105	17879	0.122	ng	98
78) 4-Ethyltoluene	19.77	105	15329	0.119	ng	99
79) 1,3,5-Trimethylbenzene	19.84	105	14992	0.129	ng	96
80) alpha-Methylstyrene	19.97	118	6299	0.105	ng	86
81) 2-Ethyltoluene	20.01	105	17679	0.129	ng	96
82) 1,2,4-Trimethylbenzene	20.19	105	14251	0.126	ng	100
83) n-Decane	20.27	57	7113	0.112	ng	97
84) Benzyl Chloride	20.32	91	5033	0.069	ng	91
85) 1,3-Dichlorobenzene	20.34	146	8684	0.126	ng	99
86) 1,4-Dichlorobenzene	20.39	146	9400	0.133	ng	99
87) sec-Butylbenzene	20.43	105	19454	0.125	ng	97
88) 4-Isopropyltoluene (p-...	20.56	119	17267	0.122	ng	98
89) 1,2,3-Trimethylbenzene	20.57	105	14198	0.124	ng	96
90) 1,2-Dichlorobenzene	20.69	146	8599	0.132	ng	97
91) d-Limonene	20.69	68	4475	0.099	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.08	157	1515	0.074	ng	92
93) n-Undecane	21.36	57	6870	0.105	ng	92
94) 1,2,4-Trichlorobenzene	22.20	180	5576	0.116	ng	98
95) Naphthalene	22.32	128	16723	0.105	ng	94
96) n-Dodecane	22.28	57	5782	0.098	ng	92
97) Hexachlorobutadiene	22.60	225	4012	0.120	ng	100
98) Cyclohexanone	18.43	55	4316	0.091	ng	97
99) tert-Butylbenzene	20.19	119	14357	0.129	ng	97
100) n-Butylbenzene	20.93	91	14447	0.117	ng	95

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

Vial: 13
Operator: WA
Inst : GCMS-16

Quant Time: Nov 21 08:18:28 2017
Quant Method : I:\MS16\METHODS\R16112017.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Nov 21 08:11:29 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS16\DATA\2017 11\20\11201721.D
 Acq On : 20 Nov 2017 18:09
 Sample : 0.20ng TO-15 ICAL Std
 Misc : S31-11031701/S31-11171704 (12/16)

Vial: 13
 Operator: WA
 Inst : GCMS-16

Quant Time: Nov 21 08:18:30 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:11:29 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

11/21/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.33	130	299719	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.44	114	1471229	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.73	82	572776	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.18	65	375838	11.422	ng	-0.02
Spiked Amount	12.500	Range 70	- 130	Recovery	=	91.36%
57) Toluene-d8 (SS2)	15.88	98	1460592	12.916	ng	0.00
Spiked Amount	12.500	Range 70	- 130	Recovery	=	103.36%
73) Bromofluorobenzene (SS3)	19.09	174	542323	14.348	ng	0.00
Spiked Amount	12.500	Range 70	- 130	Recovery	=	114.80%

Target Compounds

						Qvalue
2) Propene	4.07	42	5982	0.172	ng	97
3) Dichlorodifluoromethan...	4.25	85	12184	0.192	ng	98
4) Chloromethane	4.56	50	9025	0.178	ng	98
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	6758	0.193	ng	95
6) Vinyl Chloride	4.99	62	8451	0.163	ng	98
7) 1,3-Butadiene	5.27	54	5668	0.170	ng	96
8) Bromomethane	5.74	94	5529	0.172	ng	96
9) Chloroethane	6.08	64	4407	0.171	ng	93
10) Ethanol	6.47	45	17594	0.706	ng	95
11) Acetonitrile	6.76	41	9600	0.155	ng	86
12) Acrolein	6.94	56	3075	0.143	ng	98
13) Acetone	7.15	58	24040	0.886	ng	98
14) Trichlorofluoromethane	7.37	101	10684	0.195	ng	98
15) 2-Propanol (Isopropanol)	7.67	45	27143	0.329	ng	90
16) Acrylonitrile	7.94	53	7228	0.160	ng	97
17) 1,1-Dichloroethene	8.37	96	6405	0.193	ng	99
18) 2-Methyl-2-Propanol (t...	8.58	59	28680	0.403	ng	98
19) Methylene Chloride	8.60	84	9289	0.277	ng	100
20) 3-Chloro-1-propene (Al...	8.77	41	7365	0.161	ng	90
21) Trichlorotrifluoroethane	9.01	151	6503	0.210	ng	98
22) Carbon Disulfide	8.88	76	27045	0.227	ng	97
23) trans-1,2-Dichloroethene	9.88	61	7833	0.171	ng	98
24) 1,1-Dichloroethane	10.12	63	10593	0.173	ng	99
25) Methyl tert-Butyl Ether	10.24	73	17864	0.182	ng	99
26) Vinyl Acetate	10.39	86	3336	0.491	ng	# 57
27) 2-Butanone (MEK)	10.67	72	3786	0.158	ng	# 63
28) cis-1,2-Dichloroethene	11.15	61	7937	0.174	ng	99
29) Diisopropyl Ether	11.44	87	5538	0.185	ng	99
30) Ethyl Acetate	11.46	61	4404	0.349	ng	95
31) n-Hexane	11.42	57	10371	0.176	ng	98
32) Chloroform	11.49	83	11049	0.192	ng	99
34) Tetrahydrofuran (THF)	11.93	72	4752	0.207	ng	94
35) Ethyl tert-Butyl Ether	12.03	87	6961	0.177	ng	93
36) 1,2-Dichloroethane	12.30	62	6898	0.174	ng	99
38) 1,1,1-Trichloroethane	12.57	97	9255	0.191	ng	99
39) Isopropyl Acetate	12.99	61	7766	0.344	ng	94
40) 1-Butanol	13.06	56	8601	0.255	ng	# 78
41) Benzene	13.05	78	30581	0.197	ng	99
42) Carbon Tetrachloride	13.20	117	7210	0.172	ng	100
43) Cyclohexane	13.34	84	20070	0.384	ng	95
44) tert-Amyl Methyl Ether	13.68	73	17048	0.180	ng	97
45) 1,2-Dichloropropane	13.90	63	6670	0.188	ng	95
46) Bromodichloromethane	14.09	83	8038	0.187	ng	96
47) Trichloroethene	14.14	130	8332	0.216	ng	98
48) 1,4-Dioxane	14.14	88	5095	0.180	ng	98
49) 2,2,4-Trimethylpentane...	14.19	57	27284	0.187	ng	98
50) Methyl Methacrylate	14.34	100	5022	0.361	ng	93

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Data File : I:\MS16\DATA\2017 11\20\11201721.D
 Acq On : 20 Nov 2017 18:09
 Sample : 0.20ng TO-15 ICAL Std
 Misc : S31-11031701/S31-11171704 (12/16)

Vial: 13
 Operator: WA
 Inst : GCMS-16

Quant Time: Nov 21 08:18:30 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:11:29 2017

Response via : Initial Calibration

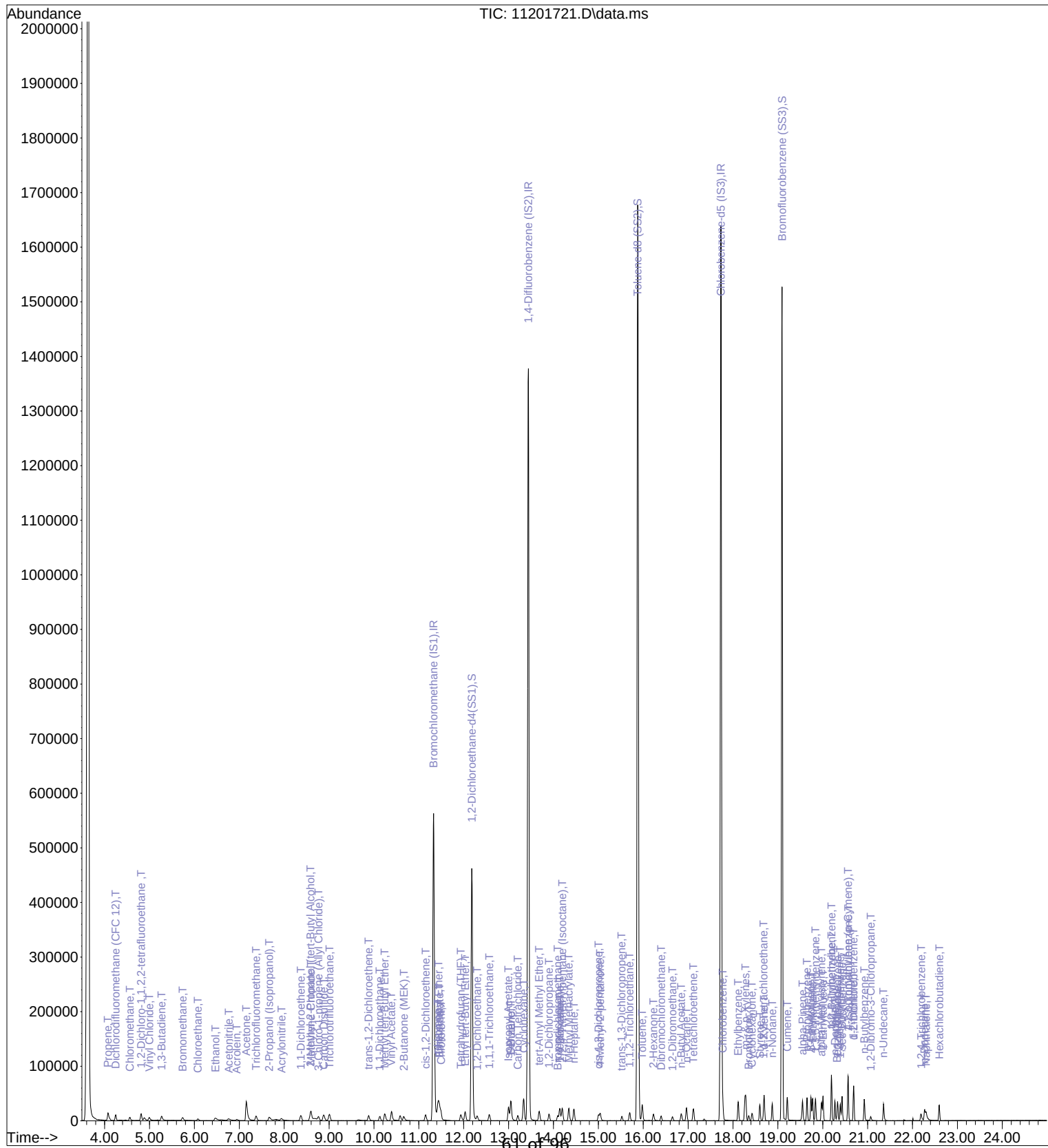
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.46	71	6373	0.181	ng	99
52) cis-1,3-Dichloropropene	15.01	75	8973	0.174	ng	100
53) 4-Methyl-2-pentanone	15.04	58	5227	0.163	ng	86
54) trans-1,3-Dichloropropene	15.52	75	6319	0.154	ng	100
55) 1,1,2-Trichloroethane	15.69	97	6351	0.189	ng	98
58) Toluene	15.98	91	27631	0.223	ng	99
59) 2-Hexanone	16.23	43	11357	0.170	ng	92
60) Dibromochloromethane	16.40	129	6597	0.192	ng	99
61) 1,2-Dibromoethane	16.65	107	6769	0.196	ng	99
62) n-Butyl Acetate	16.84	43	12404	0.170	ng	97
63) n-Octane	16.96	57	5267	0.188	ng	95
64) Tetrachloroethene	17.12	166	8825	0.238	ng	98
65) Chlorobenzene	17.77	112	18679	0.212	ng	98
66) Ethylbenzene	18.11	91	29596	0.200	ng	100
67) m- & p-Xylenes	18.28	91	45508	0.410	ng	100
68) Bromoform	18.35	173	5292	0.186	ng	98
69) Styrene	18.60	104	17516	0.197	ng	100
70) o-Xylene	18.69	91	23254	0.206	ng	100
71) n-Nonane	18.87	43	10946	0.184	ng	97
72) 1,1,2,2-Tetrachloroethane	18.68	83	9367	0.177	ng	99
74) Cumene	19.21	105	30498	0.209	ng	99
75) alpha-Pinene	19.55	93	14980	0.203	ng	67
76) n-Propylbenzene	19.65	91	35759	0.206	ng	97
77) 3-Ethyltoluene	19.74	105	28824	0.194	ng	98
78) 4-Ethyltoluene	19.77	105	28226	0.215	ng	100
79) 1,3,5-Trimethylbenzene	19.84	105	25175	0.213	ng	95
80) alpha-Methylstyrene	19.97	118	11766	0.193	ng	96
81) 2-Ethyltoluene	20.01	105	30060	0.215	ng	96
82) 1,2,4-Trimethylbenzene	20.19	105	24467	0.213	ng	97
83) n-Decane	20.27	57	12468	0.194	ng	100
84) Benzyl Chloride	20.32	91	8796	0.118	ng	91
85) 1,3-Dichlorobenzene	20.34	146	14514	0.207	ng	98
86) 1,4-Dichlorobenzene	20.39	146	14842	0.206	ng	99
87) sec-Butylbenzene	20.43	105	33726	0.213	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	30326	0.210	ng	99
89) 1,2,3-Trimethylbenzene	20.57	105	24515	0.211	ng	98
90) 1,2-Dichlorobenzene	20.69	146	14567	0.220	ng	97
91) d-Limonene	20.69	68	8375	0.183	ng	95
92) 1,2-Dibromo-3-Chloropr...	21.07	157	2737	0.131	ng	82
93) n-Undecane	21.35	57	12350	0.185	ng	95
94) 1,2,4-Trichlorobenzene	22.19	180	8773	0.179	ng	95
95) Naphthalene	22.30	128	24654	0.153	ng	95
96) n-Dodecane	22.27	57	10047	0.168	ng	95
97) Hexachlorobutadiene	22.60	225	7343	0.216	ng	100
98) Cyclohexanone	18.42	55	7369	0.153	ng	97
99) tert-Butylbenzene	20.19	119	24713	0.218	ng	99
100) n-Butylbenzene	20.92	91	24791	0.197	ng	98

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

Vial: 13
Operator: WA
Inst : GCMS-16

Quant Time: Nov 21 08:18:30 2017
Quant Method : I:\MS16\METHODS\R16112017.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Nov 21 08:11:29 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS16\DATA\2017 11\20\11201729.D
 Acq On : 20 Nov 2017 22:34
 Sample : 0.40ng TO-15 ICAL Std
 Misc : S31-11031701/S31-11091702 (12/8)

Vial: 14
 Operator: WA
 Inst : GCMS-16

Quant Time: Nov 21 08:18:44 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:11:29 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

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Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.33	130	297247	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.44	114	1478656	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.73	82	568906	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.18	65	374782	11.485	ng	-0.02
Spiked Amount	12.500	Range 70	- 130	Recovery	=	91.84%
57) Toluene-d8 (SS2)	15.88	98	1464554	13.039	ng	0.00
Spiked Amount	12.500	Range 70	- 130	Recovery	=	104.32%
73) Bromofluorobenzene (SS3)	19.09	174	547059	14.572	ng	0.00
Spiked Amount	12.500	Range 70	- 130	Recovery	=	116.56%

Target Compounds

						Qvalue
2) Propene	4.08	42	13293	0.386	ng	98
3) Dichlorodifluoromethan...	4.24	85	25382	0.402	ng	99
4) Chloromethane	4.55	50	19501	0.388	ng	97
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	14886	0.428	ng	99
6) Vinyl Chloride	4.99	62	19705	0.383	ng	97
7) 1,3-Butadiene	5.26	54	14663	0.444	ng	98
8) Bromomethane	5.72	94	13546	0.424	ng	98
9) Chloroethane	6.07	64	9737	0.380	ng	99
10) Ethanol	6.44	45	50122	2.028	ng	98
11) Acetonitrile	6.74	41	24981	0.407	ng	99
12) Acrolein	6.93	56	8132	0.383	ng	92
13) Acetone	7.14	58	52768	1.960	ng	96
14) Trichlorofluoromethane	7.37	101	22605	0.417	ng	100
15) 2-Propanol (Isopropanol)	7.64	45	64905	0.794	ng	89
16) Acrylonitrile	7.92	53	18343	0.409	ng	98
17) 1,1-Dichloroethene	8.36	96	14092	0.429	ng	99
18) 2-Methyl-2-Propanol (t...	8.55	59	67286	0.954	ng	98
19) Methylene Chloride	8.58	84	16898	0.508	ng	100
20) 3-Chloro-1-propene (Al...	8.76	41	17511	0.385	ng	91
21) Trichlorotrifluoroethane	9.00	151	13992	0.455	ng	99
22) Carbon Disulfide	8.87	76	52409	0.444	ng	99
23) trans-1,2-Dichloroethene	9.88	61	18286	0.403	ng	99
24) 1,1-Dichloroethane	10.13	63	23306	0.385	ng	100
25) Methyl tert-Butyl Ether	10.23	73	41359	0.425	ng	99
26) Vinyl Acetate	10.39	86	10442	1.550	ng	# 73
27) 2-Butanone (MEK)	10.65	72	9649	0.406	ng	91
28) cis-1,2-Dichloroethene	11.15	61	18175	0.402	ng	100
29) Diisopropyl Ether	11.43	87	12455	0.420	ng	99
30) Ethyl Acetate	11.45	61	10496	0.838	ng	99
31) n-Hexane	11.42	57	23035	0.395	ng	99
32) Chloroform	11.49	83	24010	0.420	ng	99
34) Tetrahydrofuran (THF)	11.92	72	9778	0.430	ng	97
35) Ethyl tert-Butyl Ether	12.03	87	16618	0.426	ng	99
36) 1,2-Dichloroethane	12.30	62	16000	0.407	ng	100
38) 1,1,1-Trichloroethane	12.57	97	20368	0.418	ng	99
39) Isopropyl Acetate	12.99	61	18485	0.814	ng	# 92
40) 1-Butanol	13.03	56	28170	0.831	ng	# 73
41) Benzene	13.05	78	62218	0.398	ng	100
42) Carbon Tetrachloride	13.20	117	16532	0.393	ng	100
43) Cyclohexane	13.34	84	44622	0.850	ng	98
44) tert-Amyl Methyl Ether	13.68	73	38957	0.410	ng	98
45) 1,2-Dichloropropane	13.90	63	14245	0.399	ng	100
46) Bromodichloromethane	14.09	83	17564	0.407	ng	96
47) Trichloroethene	14.14	130	17748	0.458	ng	100
48) 1,4-Dioxane	14.13	88	12672	0.444	ng	97
49) 2,2,4-Trimethylpentane...	14.19	57	57960	0.394	ng	98
50) Methyl Methacrylate	14.34	100	12634	0.904	ng	99

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Data File : I:\MS16\DATA\2017 11\20\11201729.D
 Acq On : 20 Nov 2017 22:34
 Sample : 0.40ng TO-15 ICAL Std
 Misc : S31-11031701/S31-11091702 (12/8)

Vial: 14
 Operator: WA
 Inst : GCMS-16

Quant Time: Nov 21 08:18:44 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:11:29 2017

Response via : Initial Calibration

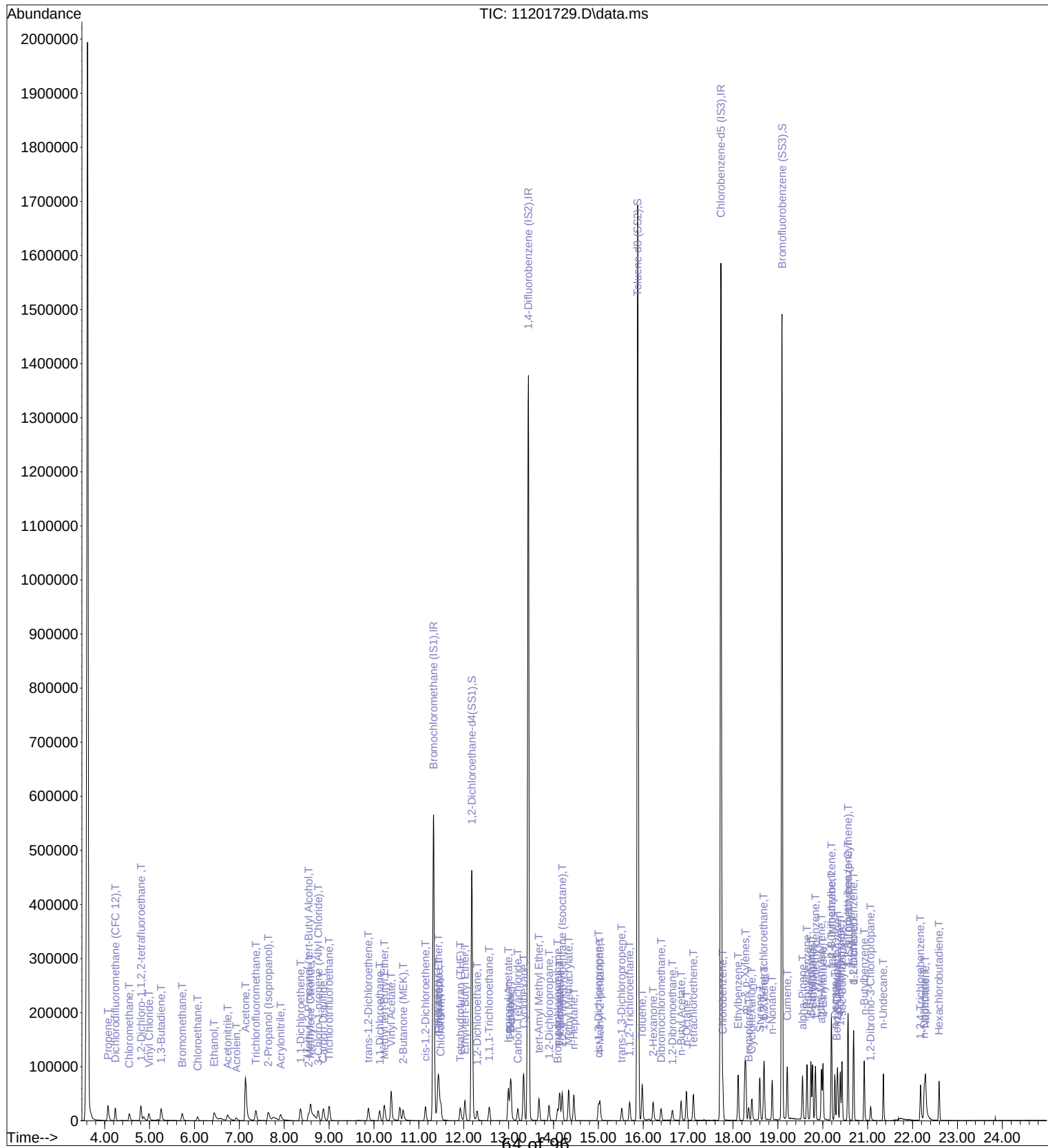
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.45	71	14106	0.399	ng	97
52) cis-1,3-Dichloropropene	15.00	75	22677	0.437	ng	99
53) 4-Methyl-2-pentanone	15.03	58	13118	0.406	ng	91
54) trans-1,3-Dichloropropene	15.52	75	17823	0.433	ng	97
55) 1,1,2-Trichloroethane	15.69	97	14936	0.443	ng	99
58) Toluene	15.98	91	63685	0.518	ng	98
59) 2-Hexanone	16.22	43	29426	0.444	ng	95
60) Dibromochloromethane	16.40	129	15356	0.450	ng	98
61) 1,2-Dibromoethane	16.65	107	17113	0.498	ng	98
62) n-Butyl Acetate	16.84	43	31175	0.429	ng	98
63) n-Octane	16.96	57	11984	0.432	ng	98
64) Tetrachloroethene	17.12	166	18867	0.512	ng	99
65) Chlorobenzene	17.77	112	43639	0.498	ng	99
66) Ethylbenzene	18.11	91	70849	0.481	ng	99
67) m- & p-Xylenes	18.28	91	110586	1.004	ng	99
68) Bromoform	18.35	173	13070	0.463	ng	99
69) Styrene	18.60	104	45569	0.516	ng	99
70) o-Xylene	18.70	91	54385	0.484	ng	99
71) n-Nonane	18.87	43	25318	0.428	ng	97
72) 1,1,2,2-Tetrachloroethane	18.68	83	23438	0.445	ng	99
74) Cumene	19.21	105	69978	0.484	ng	100
75) alpha-Pinene	19.55	93	34505	0.471	ng	86
76) n-Propylbenzene	19.65	91	85304	0.496	ng	98
77) 3-Ethyltoluene	19.74	105	69402	0.470	ng	100
78) 4-Ethyltoluene	19.77	105	68446	0.526	ng	98
79) 1,3,5-Trimethylbenzene	19.84	105	56472	0.480	ng	96
80) alpha-Methylstyrene	19.97	118	31759	0.524	ng	99
81) 2-Ethyltoluene	20.01	105	69669	0.502	ng	100
82) 1,2,4-Trimethylbenzene	20.19	105	59023	0.517	ng	99
83) n-Decane	20.27	57	29280	0.458	ng	99
84) Benzyl Chloride	20.31	91	32394	0.438	ng	97
85) 1,3-Dichlorobenzene	20.33	146	39663	0.569	ng	100
86) 1,4-Dichlorobenzene	20.39	146	42777	0.597	ng	99
87) sec-Butylbenzene	20.43	105	78855	0.501	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	72476	0.505	ng	99
89) 1,2,3-Trimethylbenzene	20.56	105	58867	0.511	ng	99
90) 1,2-Dichlorobenzene	20.69	146	37890	0.577	ng	99
91) d-Limonene	20.69	68	20565	0.452	ng	97
92) 1,2-Dibromo-3-Chloropr...	21.07	157	9431	0.456	ng	90
93) n-Undecane	21.35	57	30732	0.464	ng	96
94) 1,2,4-Trichlorobenzene	22.18	180	32755	0.673	ng	98
95) Naphthalene	22.29	128	105559	0.658	ng	98
96) n-Dodecane	22.26	57	29918	0.504	ng	97
97) Hexachlorobutadiene	22.59	225	17561	0.521	ng	99
98) Cyclohexanone	18.42	55	19626	0.411	ng	99
99) tert-Butylbenzene	20.19	119	57339	0.508	ng	99
100) n-Butylbenzene	20.92	91	63629	0.509	ng	98

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

Vial: 14
Operator: WA
Inst : GCMS-16

Quant Time: Nov 21 08:18:44 2017
Quant Method : I:\MS16\METHODS\R16112017.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Nov 21 08:11:29 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS16\DATA\2017 11\20\11201723.D
 Acq On : 20 Nov 2017 19:16
 Sample : 1.0ng TO-15 ICAL Std
 Misc : S31-11031701/S31-11091702 (12/8)

Vial: 14
 Operator: WA
 Inst : GCMS-16

Quant Time: Nov 21 08:18:34 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:11:29 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

11/21/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.33	130	297826	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.44	114	1450024	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.73	82	566095	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.18	65	372512	11.393	ng	-0.02
Spiked Amount	12.500	Range 70	- 130	Recovery	=	91.12%
57) Toluene-d8 (SS2)	15.88	98	1437739	12.864	ng	0.00
Spiked Amount	12.500	Range 70	- 130	Recovery	=	102.88%
73) Bromofluorobenzene (SS3)	19.09	174	535998	14.348	ng	0.00
Spiked Amount	12.500	Range 70	- 130	Recovery	=	114.80%

Target Compounds

						Qvalue
2) Propene	4.06	42	27916	0.810	ng	99
3) Dichlorodifluoromethan...	4.23	85	56614	0.896	ng	100
4) Chloromethane	4.54	50	42495	0.843	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	31479	0.903	ng	100
6) Vinyl Chloride	4.98	62	41199	0.799	ng	100
7) 1,3-Butadiene	5.25	54	28943	0.875	ng	99
8) Bromomethane	5.72	94	26172	0.818	ng	100
9) Chloroethane	6.06	64	21383	0.833	ng	98
10) Ethanol	6.43	45	100784	4.069	ng	100
11) Acetonitrile	6.73	41	48897	0.794	ng	100
12) Acrolein	6.92	56	17206	0.808	ng	99
13) Acetone	7.13	58	111108	4.120	ng	96
14) Trichlorofluoromethane	7.36	101	49376	0.909	ng	100
15) 2-Propanol (Isopropanol)	7.63	45	136400	1.665	ng	93
16) Acrylonitrile	7.91	53	37003	0.824	ng	100
17) 1,1-Dichloroethene	8.36	96	30285	0.921	ng	98
18) 2-Methyl-2-Propanol (t...	8.53	59	140686	1.991	ng	98
19) Methylene Chloride	8.58	84	33769	1.013	ng	98
20) 3-Chloro-1-propene (Al...	8.75	41	37655	0.826	ng	94
21) Trichlorotrifluoroethane	9.00	151	30092	0.976	ng	99
22) Carbon Disulfide	8.86	76	115622	0.978	ng	99
23) trans-1,2-Dichloroethene	9.87	61	41102	0.903	ng	99
24) 1,1-Dichloroethane	10.12	63	51040	0.841	ng	99
25) Methyl tert-Butyl Ether	10.22	73	87870	0.901	ng	99
26) Vinyl Acetate	10.38	86	23157	3.430	ng	# 77
27) 2-Butanone (MEK)	10.65	72	20588	0.865	ng	93
28) cis-1,2-Dichloroethene	11.15	61	39333	0.869	ng	99
29) Diisopropyl Ether	11.43	87	25276	0.851	ng	# 91
30) Ethyl Acetate	11.45	61	22700	1.808	ng	100
31) n-Hexane	11.42	57	48615	0.831	ng	99
32) Chloroform	11.49	83	52188	0.912	ng	99
34) Tetrahydrofuran (THF)	11.91	72	20954	0.920	ng	99
35) Ethyl tert-Butyl Ether	12.03	87	35271	0.902	ng	98
36) 1,2-Dichloroethane	12.30	62	33816	0.858	ng	98
38) 1,1,1-Trichloroethane	12.57	97	43653	0.914	ng	99
39) Isopropyl Acetate	12.99	61	38705	1.737	ng	93
40) 1-Butanol	13.03	56	55753	1.677	ng	91
41) Benzene	13.05	78	126693	0.827	ng	99
42) Carbon Tetrachloride	13.21	117	36207	0.877	ng	98
43) Cyclohexane	13.34	84	94864	1.844	ng	96
44) tert-Amyl Methyl Ether	13.68	73	82503	0.885	ng	98
45) 1,2-Dichloropropane	13.90	63	30653	0.875	ng	100
46) Bromodichloromethane	14.09	83	38311	0.906	ng	100
47) Trichloroethene	14.14	130	37536	0.988	ng	99
48) 1,4-Dioxane	14.13	88	26180	0.936	ng	97
49) 2,2,4-Trimethylpentane...	14.19	57	124835	0.866	ng	99
50) Methyl Methacrylate	14.34	100	650196	1.890	ng	97

Data File : I:\MS16\DATA\2017 11\20\11201723.D
 Acq On : 20 Nov 2017 19:16
 Sample : 1.0ng TO-15 ICAL Std
 Misc : S31-11031701/S31-11091702 (12/8)

Vial: 14
 Operator: WA
 Inst : GCMS-16

Quant Time: Nov 21 08:18:34 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:11:29 2017

Response via : Initial Calibration

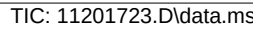
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.45	71	30055	0.868	ng	98
52) cis-1,3-Dichloropropene	15.00	75	47461	0.934	ng	99
53) 4-Methyl-2-pentanone	15.03	58	28289	0.893	ng	95
54) trans-1,3-Dichloropropene	15.52	75	36601	0.908	ng	99
55) 1,1,2-Trichloroethane	15.69	97	31397	0.950	ng	100
58) Toluene	15.98	91	127468	1.041	ng	100
59) 2-Hexanone	16.22	43	59929	0.909	ng	97
60) Dibromochloromethane	16.40	129	33733	0.993	ng	100
61) 1,2-Dibromoethane	16.65	107	34221	1.001	ng	99
62) n-Butyl Acetate	16.84	43	65406	0.905	ng	98
63) n-Octane	16.96	57	25214	0.913	ng	98
64) Tetrachloroethene	17.12	166	39790	1.085	ng	100
65) Chlorobenzene	17.77	112	86087	0.988	ng	98
66) Ethylbenzene	18.11	91	142819	0.974	ng	99
67) m- & p-Xylenes	18.27	91	220651	2.013	ng	100
68) Bromoform	18.35	173	28017	0.997	ng	100
69) Styrene	18.60	104	90194	1.025	ng	99
70) o-Xylene	18.70	91	112689	1.008	ng	100
71) n-Nonane	18.87	43	53436	0.909	ng	98
72) 1,1,2,2-Tetrachloroethane	18.68	83	50928	0.972	ng	99
74) Cumene	19.21	105	146958	1.020	ng	98
75) alpha-Pinene	19.55	93	73640	1.010	ng	94
76) n-Propylbenzene	19.65	91	176629	1.032	ng	98
77) 3-Ethyltoluene	19.74	105	144858	0.986	ng	99
78) 4-Ethyltoluene	19.77	105	141045	1.089	ng	97
79) 1,3,5-Trimethylbenzene	19.84	105	119507	1.022	ng	99
80) alpha-Methylstyrene	19.97	118	63605	1.054	ng	99
81) 2-Ethyltoluene	20.01	105	146023	1.057	ng	99
82) 1,2,4-Trimethylbenzene	20.19	105	120855	1.065	ng	100
83) n-Decane	20.27	57	62825	0.987	ng	98
84) Benzyl Chloride	20.31	91	62745	0.852	ng	96
85) 1,3-Dichlorobenzene	20.33	146	74581	1.074	ng	99
86) 1,4-Dichlorobenzene	20.39	146	74371	1.043	ng	99
87) sec-Butylbenzene	20.43	105	165360	1.055	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	152175	1.066	ng	99
89) 1,2,3-Trimethylbenzene	20.56	105	120272	1.049	ng	99
90) 1,2-Dichlorobenzene	20.69	146	72025	1.102	ng	99
91) d-Limonene	20.68	68	44437	0.981	ng	97
92) 1,2-Dibromo-3-Chloropr...	21.07	157	19576	0.951	ng	93
93) n-Undecane	21.35	57	65037	0.987	ng	97
94) 1,2,4-Trichlorobenzene	22.18	180	51291	1.060	ng	99
95) Naphthalene	22.29	128	149519	0.936	ng	98
96) n-Dodecane	22.25	57	59174	1.001	ng	97
97) Hexachlorobutadiene	22.60	225	36765	1.095	ng	100
98) Cyclohexanone	18.42	55	40877	0.860	ng	99
99) tert-Butylbenzene	20.19	119	120324	1.072	ng	98
100) n-Butylbenzene	20.92	91	130212	1.046	ng	98

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

Vial: 14
Operator: WA
Inst : GCMS-16

Quant Time: Nov 21 08:18:34 2017



Data File : I:\MS16\DATA\2017 11\20\11201724.D
 Acq On : 20 Nov 2017 19:49
 Sample : 5.0ng TO-15 ICAL Std
 Misc : S31-11031701/S31-11091702 (12/8)

Vial: 14
 Operator: WA
 Inst : GCMS-16

Quant Time: Nov 21 08:18:36 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:11:29 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

11/21/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.33	130	294725	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.44	114	1447572	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.73	82	567368	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.19	65	371355	11.477	ng	-0.01
Spiked Amount	12.500	Range 70	- 130	Recovery	=	91.84%
57) Toluene-d8 (SS2)	15.88	98	1437438	12.832	ng	0.00
Spiked Amount	12.500	Range 70	- 130	Recovery	=	102.64%
73) Bromofluorobenzene (SS3)	19.09	174	541648	14.467	ng	0.00
Spiked Amount	12.500	Range 70	- 130	Recovery	=	115.76%

Target Compounds

						Qvalue
2) Propene	4.06	42	123918	3.632	ng	99
3) Dichlorodifluoromethan...	4.22	85	252845	4.043	ng	100
4) Chloromethane	4.53	50	162096	3.250	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	142610	4.132	ng	100
6) Vinyl Chloride	4.97	62	186324	3.649	ng	100
7) 1,3-Butadiene	5.25	54	130876	3.996	ng	99
8) Bromomethane	5.71	94	115226	3.640	ng	100
9) Chloroethane	6.05	64	96024	3.780	ng	100
10) Ethanol	6.45	45	444695	18.143	ng	100
11) Acetonitrile	6.73	41	222078	3.646	ng	100
12) Acrolein	6.91	56	82938	3.935	ng	98
13) Acetone	7.12	58	504339	18.897	ng	100
14) Trichlorofluoromethane	7.36	101	222272	4.136	ng	100
15) 2-Propanol (Isopropanol)	7.64	45	605666	7.470	ng	99
16) Acrylonitrile	7.91	53	173559	3.904	ng	100
17) 1,1-Dichloroethene	8.36	96	135806	4.172	ng	97
18) 2-Methyl-2-Propanol (t...	8.53	59	645500	9.233	ng	99
19) Methylene Chloride	8.59	84	144192	4.369	ng	97
20) 3-Chloro-1-propene (Al...	8.75	41	161200	3.573	ng	98
21) Trichlorotrifluoroethane	9.00	151	134275	4.403	ng	98
22) Carbon Disulfide	8.86	76	513458	4.389	ng	100
23) trans-1,2-Dichloroethene	9.88	61	186660	4.144	ng	99
24) 1,1-Dichloroethane	10.14	63	226490	3.771	ng	100
25) Methyl tert-Butyl Ether	10.22	73	397114	4.117	ng	100
26) Vinyl Acetate	10.38	86	136867	20.489	ng	# 86
27) 2-Butanone (MEK)	10.64	72	95523	4.055	ng	98
28) cis-1,2-Dichloroethene	11.15	61	179060	3.997	ng	100
29) Diisopropyl Ether	11.43	87	112944	3.841	ng	# 91
30) Ethyl Acetate	11.44	61	104956	8.448	ng	97
31) n-Hexane	11.42	57	221849	3.833	ng	99
32) Chloroform	11.50	83	231321	4.085	ng	100
34) Tetrahydrofuran (THF)	11.91	72	94396	4.189	ng	99
35) Ethyl tert-Butyl Ether	12.03	87	160970	4.160	ng	99
36) 1,2-Dichloroethane	12.30	62	153336	3.932	ng	100
38) 1,1,1-Trichloroethane	12.57	97	200627	4.207	ng	100
39) Isopropyl Acetate	12.99	61	180412	8.110	ng	95
40) 1-Butanol	13.01	56	266073	8.018	ng	96
41) Benzene	13.05	78	561550	3.673	ng	100
42) Carbon Tetrachloride	13.21	117	168973	4.099	ng	99
43) Cyclohexane	13.34	84	424442	8.263	ng	99
44) tert-Amyl Methyl Ether	13.68	73	374608	4.027	ng	99
45) 1,2-Dichloropropane	13.90	63	137428	3.932	ng	99
46) Bromodichloromethane	14.09	83	178495	4.227	ng	100
47) Trichloroethene	14.14	130	164297	4.334	ng	100
48) 1,4-Dioxane	14.12	88	119529	4.281	ng	99
49) 2,2,4-Trimethylpentane...	14.19	57	555089	3.859	ng	100
50) Methyl Methacrylate	14.34	100	120179	8.785	ng	97

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Data File : I:\MS16\DATA\2017 11\20\11201724.D
 Acq On : 20 Nov 2017 19:49
 Sample : 5.0ng TO-15 ICAL Std
 Misc : S31-11031701/S31-11091702 (12/8)

Vial: 14
 Operator: WA
 Inst : GCMS-16

Quant Time: Nov 21 08:18:36 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:11:29 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.46	71	136088	3.936	ng	99
52) cis-1,3-Dichloropropene	15.00	75	227518	4.483	ng	99
53) 4-Methyl-2-pentanone	15.03	58	129374	4.093	ng	96
54) trans-1,3-Dichloropropene	15.52	75	183348	4.555	ng	99
55) 1,1,2-Trichloroethane	15.69	97	140616	4.260	ng	99
58) Toluene	15.98	91	572094	4.664	ng	100
59) 2-Hexanone	16.21	43	272167	4.117	ng	100
60) Dibromochloromethane	16.40	129	161441	4.740	ng	99
61) 1,2-Dibromoethane	16.65	107	158791	4.635	ng	100
62) n-Butyl Acetate	16.84	43	308460	4.256	ng	99
63) n-Octane	16.96	57	113639	4.104	ng	98
64) Tetrachloroethene	17.12	166	176805	4.810	ng	99
65) Chlorobenzene	17.77	112	385509	4.412	ng	100
66) Ethylbenzene	18.11	91	645436	4.392	ng	100
67) m- & p-Xylenes	18.27	91	985221	8.967	ng	100
68) Bromoform	18.35	173	140532	4.992	ng	100
69) Styrene	18.60	104	414177	4.699	ng	99
70) o-Xylene	18.70	91	500573	4.468	ng	99
71) n-Nonane	18.87	43	238636	4.048	ng	97
72) 1,1,2,2-Tetrachloroethane	18.68	83	243130	4.631	ng	100
74) Cumene	19.21	105	654320	4.533	ng	99
75) alpha-Pinene	19.55	93	337866	4.625	ng	98
76) n-Propylbenzene	19.65	91	785788	4.580	ng	99
77) 3-Ethyltoluene	19.74	105	651158	4.424	ng	99
78) 4-Ethyltoluene	19.77	105	624664	4.811	ng	98
79) 1,3,5-Trimethylbenzene	19.84	105	532434	4.541	ng	100
80) alpha-Methylstyrene	19.97	118	299135	4.948	ng	100
81) 2-Ethyltoluene	20.01	105	641076	4.630	ng	99
82) 1,2,4-Trimethylbenzene	20.19	105	537214	4.722	ng	100
83) n-Decane	20.27	57	277659	4.354	ng	99
84) Benzyl Chloride	20.31	91	366309	4.962	ng	98
85) 1,3-Dichlorobenzene	20.33	146	332429	4.778	ng	100
86) 1,4-Dichlorobenzene	20.39	146	329784	4.613	ng	99
87) sec-Butylbenzene	20.43	105	731012	4.653	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	673879	4.709	ng	99
89) 1,2,3-Trimethylbenzene	20.56	105	527330	4.587	ng	100
90) 1,2-Dichlorobenzene	20.69	146	318921	4.870	ng	100
91) d-Limonene	20.69	68	202993	4.473	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.07	157	107736	5.221	ng	97
93) n-Undecane	21.35	57	294737	4.463	ng	98
94) 1,2,4-Trichlorobenzene	22.17	180	244162	5.033	ng	100
95) Naphthalene	22.28	128	716638	4.478	ng	100
96) n-Dodecane	22.25	57	287643	4.855	ng	98
97) Hexachlorobutadiene	22.59	225	168733	5.016	ng	100
98) Cyclohexanone	18.41	55	190539	3.998	ng	99
99) tert-Butylbenzene	20.19	119	531175	4.723	ng	99
100) n-Butylbenzene	20.92	91	578971	4.641	ng	99

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

Data File : I:\MS16\DATA\2017 11\20\11201724.D
Acq On : 20 Nov 2017 19:49
Sample : 5.0ng TO-15 ICAL Std
Misc : S31-11031701/S31-11091702 (12/8)

Vial: 14
Operator: WA
Inst : GCMS-16

Quant Time: Nov 21 08:18:36 2017

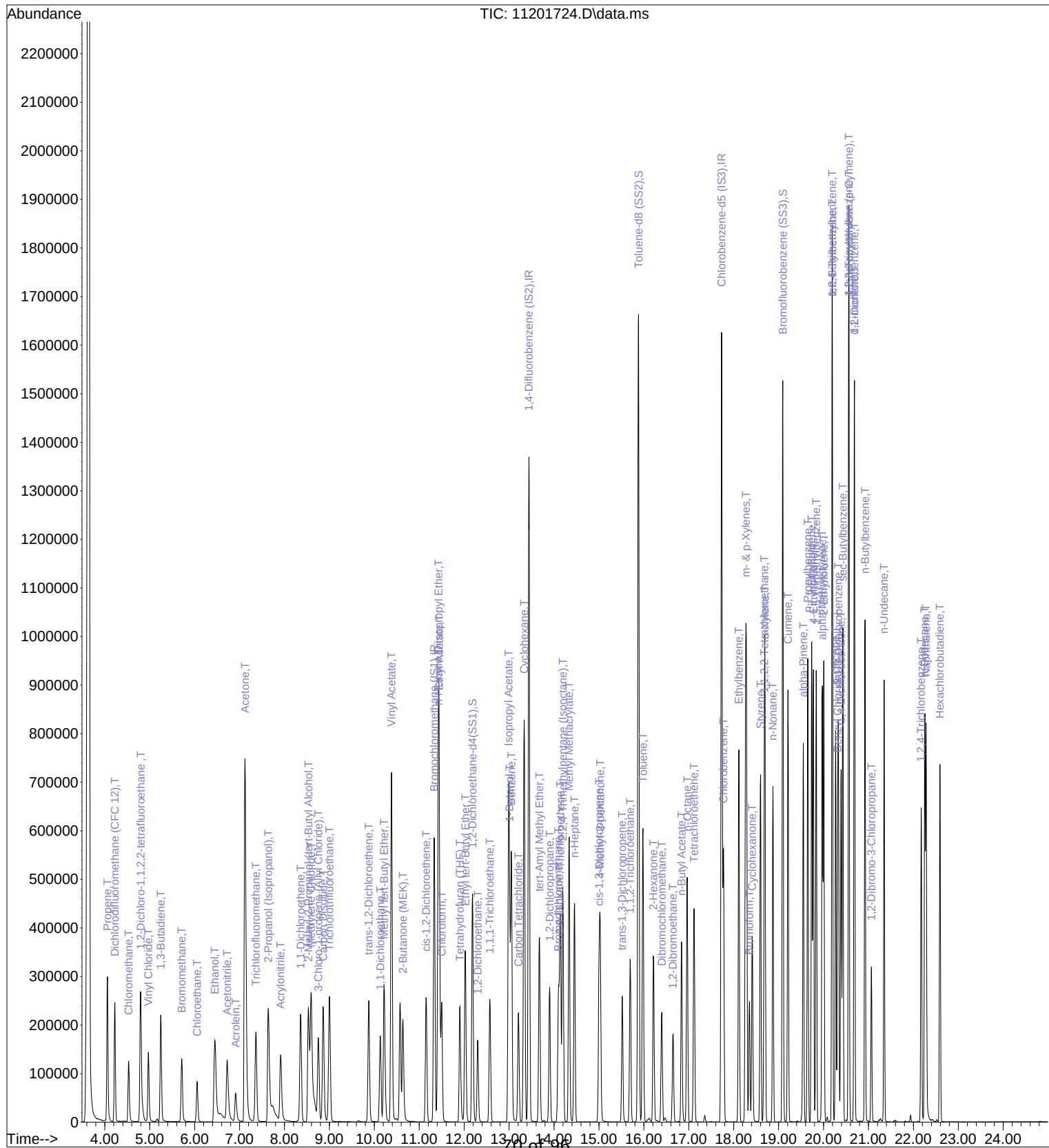
Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:11:29 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File : I:\MS16\DATA\2017 11\20\11201725.D
 Acq On : 20 Nov 2017 20:22
 Sample : 25ng TO-15 ICAL Std
 Misc : S31-11031701/S31-11161703 (12/15)

Vial: 15
 Operator: WA
 Inst : GCMS-16

Quant Time: Nov 21 08:18:38 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:11:29 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

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Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.34	130	287235	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.45	114	1404504	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.73	82	549533	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.20	65	361171	11.454	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	91.60%
57) Toluene-d8 (SS2)	15.88	98	1406539	12.964	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.68%
73) Bromofluorobenzene (SS3)	19.09	174	526582	14.521	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	116.16%

Target Compounds

						Qvalue
2) Propene	4.05	42	676608	20.348	ng	100
3) Dichlorodifluoromethan...	4.22	85	1383837	22.704	ng	100
4) Chloromethane	4.53	50	989790	20.363	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	791318	23.525	ng	100
6) Vinyl Chloride	4.97	62	1046030	21.022	ng	100
7) 1,3-Butadiene	5.25	54	799758	25.057	ng	100
8) Bromomethane	5.71	94	682735	22.133	ng	100
9) Chloroethane	6.06	64	540466	21.831	ng	100
10) Ethanol	6.51	45	2454686	102.761	ng	100
11) Acetonitrile	6.75	41	1214222	20.457	ng	100
12) Acrolein	6.93	56	462526	22.519	ng	100
13) Acetone	7.14	58	2613884	100.493	ng	100
14) Trichlorofluoromethane	7.37	101	1211697	23.132	ng	100
15) 2-Propanol (Isopropanol)	7.68	45	3443904	43.583	ng	100
16) Acrylonitrile	7.94	53	977878	22.567	ng	100
17) 1,1-Dichloroethene	8.36	96	766349	24.156	ng	100
18) 2-Methyl-2-Propanol (t...	8.57	59	3618145	53.103	ng	100
19) Methylene Chloride	8.61	84	785690	24.430	ng	100
20) 3-Chloro-1-propene (Al...	8.77	41	935942	21.285	ng	100
21) Trichlorotrifluoroethane	9.01	151	744383	25.045	ng	100
22) Carbon Disulfide	8.86	76	2829722	24.821	ng	100
23) trans-1,2-Dichloroethene	9.89	61	1041289	23.723	ng	100
24) 1,1-Dichloroethane	10.15	63	1250082	21.358	ng	100
25) Methyl tert-Butyl Ether	10.22	73	2193379	23.331	ng	100
26) Vinyl Acetate	10.39	86	837103	128.581	ng	100
27) 2-Butanone (MEK)	10.64	72	521843	22.731	ng	100
28) cis-1,2-Dichloroethene	11.16	61	991684	22.715	ng	100
29) Diisopropyl Ether	11.43	87	598685	20.892	ng	100
30) Ethyl Acetate	11.45	61	549223	45.361	ng	100
31) n-Hexane	11.43	57	1147882	20.349	ng	100
32) Chloroform	11.51	83	1266645	22.950	ng	100
34) Tetrahydrofuran (THF)	11.90	72	515405	23.469	ng	100
35) Ethyl tert-Butyl Ether	12.03	87	883805	23.435	ng	100
36) 1,2-Dichloroethane	12.31	62	853175	22.446	ng	100
38) 1,1,1-Trichloroethane	12.58	97	1111315	24.018	ng	100
39) Isopropyl Acetate	12.99	61	966910	44.801	ng	100
40) 1-Butanol	13.02	56	1465896	45.529	ng	100
41) Benzene	13.06	78	2975641	20.060	ng	100
42) Carbon Tetrachloride	13.21	117	987810	24.695	ng	100
43) Cyclohexane	13.34	84	2280199	45.754	ng	100
44) tert-Amyl Methyl Ether	13.68	73	2088123	23.133	ng	100
45) 1,2-Dichloropropane	13.91	63	753481	22.218	ng	100
46) Bromodichloromethane	14.10	83	996754	24.326	ng	100
47) Trichloroethene	14.14	130	889461	24.182	ng	100
48) 1,4-Dioxane	14.12	88	653013	24.104	ng	100
49) 2,2,4-Trimethylpentane...	14.20	57	2963126	21.232	ng	100
50) Methyl Methacrylate	14.34	100	664587	50.073	ng	100

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Data File : I:\MS16\DATA\2017 11\20\11201725.D
 Acq On : 20 Nov 2017 20:22
 Sample : 25ng TO-15 ICAL Std
 Misc : S31-11031701/S31-11161703 (12/15)

Vial: 15
 Operator: WA
 Inst : GCMS-16

Quant Time: Nov 21 08:18:38 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:11:29 2017

Response via : Initial Calibration

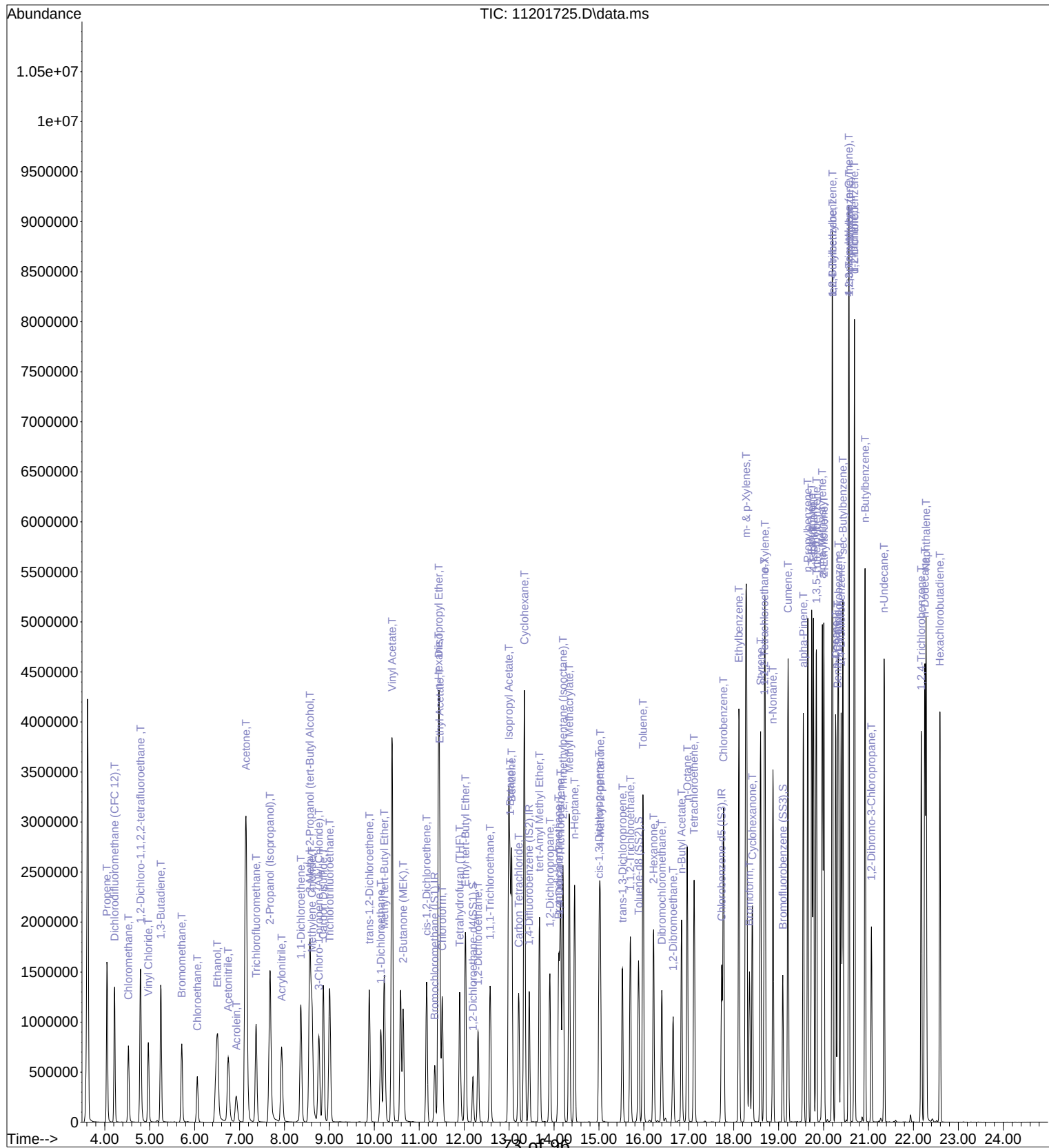
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.46	71	736064	21.939	ng	100
52) cis-1,3-Dichloropropene	15.00	75	1303890	26.477	ng	100
53) 4-Methyl-2-pentanone	15.03	58	694276	22.638	ng	100
54) trans-1,3-Dichloropropene	15.52	75	1104290	28.277	ng	100
55) 1,1,2-Trichloroethane	15.70	97	774412	24.180	ng	100
58) Toluene	15.98	91	3103108	26.117	ng	100
59) 2-Hexanone	16.22	43	1485552	23.201	ng	100
60) Dibromochloromethane	16.40	129	939155	28.466	ng	100
61) 1,2-Dibromoethane	16.65	107	900588	27.143	ng	100
62) n-Butyl Acetate	16.84	43	1693339	24.124	ng	100
63) n-Octane	16.96	57	610630	22.769	ng	100
64) Tetrachloroethene	17.12	166	965792	27.128	ng	100
65) Chlorobenzene	17.77	112	2152107	25.432	ng	100
66) Ethylbenzene	18.11	91	3505328	24.628	ng	100
67) m- & p-Xylenes	18.28	91	5268745	49.512	ng	100
68) Bromoform	18.35	173	857683	31.454	ng	100
69) Styrene	18.60	104	2277400	26.674	ng	100
70) o-Xylene	18.70	91	2641287	24.343	ng	100
71) n-Nonane	18.87	43	1236889	21.664	ng	100
72) 1,1,2,2-Tetrachloroethane	18.68	83	1323959	26.036	ng	100
74) Cumene	19.21	105	3501941	25.050	ng	100
75) alpha-Pinene	19.55	93	1820397	25.728	ng	100
76) n-Propylbenzene	19.65	91	4170705	25.099	ng	100
77) 3-Ethyltoluene	19.74	105	3656210	25.646	ng	100
78) 4-Ethyltoluene	19.77	105	3112895	24.753	ng	100
79) 1,3,5-Trimethylbenzene	19.84	105	2835631	24.970	ng	100
80) alpha-Methylstyrene	19.97	118	1620773	27.678	ng	100
81) 2-Ethyltoluene	20.01	105	3361257	25.063	ng	100
82) 1,2,4-Trimethylbenzene	20.20	105	2787109	25.296	ng	100
83) n-Decane	20.27	57	1445992	23.408	ng	100
84) Benzyl Chloride	20.31	91	2443246	34.172	ng	100
85) 1,3-Dichlorobenzene	20.34	146	1803122	26.760	ng	100
86) 1,4-Dichlorobenzene	20.39	146	1822296	26.319	ng	100
87) sec-Butylbenzene	20.43	105	3796856	24.950	ng	100
88) 4-Isopropyltoluene (p-...	20.56	119	3442003	24.835	ng	100
89) 1,2,3-Trimethylbenzene	20.57	105	2719619	24.426	ng	100
90) 1,2-Dichlorobenzene	20.69	146	1698304	26.774	ng	100
91) d-Limonene	20.69	68	1027225	23.368	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.07	157	662211	33.130	ng	100
93) n-Undecane	21.35	57	1541041	24.094	ng	100
94) 1,2,4-Trichlorobenzene	22.18	180	1450279	30.868	ng	100
95) Naphthalene	22.28	128	4239759	27.355	ng	100
96) n-Dodecane	22.25	57	1535182	26.751	ng	100
97) Hexachlorobutadiene	22.59	225	944591	28.994	ng	100
98) Cyclohexanone	18.42	55	1041873	22.571	ng	100
99) tert-Butylbenzene	20.20	119	2732084	25.079	ng	100
100) n-Butylbenzene	20.92	91	3065287	25.370	ng	100

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

Vial: 15
Operator: WA
Inst : GCMS-16

Quant Time: Nov 21 08:18:38 2017
Quant Method : I:\MS16\METHODS\R16112017.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Nov 21 08:11:29 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS16\DATA\2017 11\20\11201726.D
 Acq On : 20 Nov 2017 20:55
 Sample : 50ng TO-15 ICAL Std
 Misc : S31-11031701/S31-11161703 (12/15)

Vial: 15
 Operator: WA
 Inst : GCMS-16

Quant Time: Nov 21 08:18:40 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:11:29 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

11/21/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.36	130	293661	12.500	ng	0.01
37) 1,4-Difluorobenzene (IS2)	13.45	114	1422393	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.73	82	557363	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.20	65	363892	11.287	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	90.32%
57) Toluene-d8 (SS2)	15.89	98	1419085	12.896	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.20%
73) Bromofluorobenzene (SS3)	19.09	174	529463	14.395	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	115.20%

Target Compounds

						Qvalue
2) Propene	4.06	42	1230146	36.185	ng	99
3) Dichlorodifluoromethan...	4.23	85	2525166	40.523	ng	100
4) Chloromethane	4.54	50	1661792	33.440	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	1475398	42.902	ng	100
6) Vinyl Chloride	4.98	62	1942868	38.192	ng	100
7) 1,3-Butadiene	5.26	54	1440875	44.156	ng	100
8) Bromomethane	5.72	94	1227180	38.912	ng	100
9) Chloroethane	6.07	64	991292	39.164	ng	100
10) Ethanol	6.54	45	4413864	180.735	ng	100
11) Acetonitrile	6.77	41	2257786	37.206	ng	100
12) Acrolein	6.94	56	866172	41.249	ng	100
13) Acetone	7.17	58	4575990	172.079	ng	100
14) Trichlorofluoromethane	7.38	101	2271220	42.411	ng	100
15) 2-Propanol (Isopropanol)	7.70	45	6120413	75.760	ng	100
16) Acrylonitrile	7.95	53	1833758	41.392	ng	100
17) 1,1-Dichloroethene	8.38	96	1435244	44.251	ng	100
18) 2-Methyl-2-Propanol (t...	8.59	59	6604158	94.807	ng	99
19) Methylene Chloride	8.62	84	1429208	43.466	ng	99
20) 3-Chloro-1-propene (Al...	8.78	41	1743305	38.778	ng	98
21) Trichlorotrifluoroethane	9.01	151	1397306	45.984	ng	100
22) Carbon Disulfide	8.88	76	5258810	45.118	ng	100
23) trans-1,2-Dichloroethene	9.89	61	1946433	43.374	ng	100
24) 1,1-Dichloroethane	10.15	63	2320298	38.776	ng	100
25) Methyl tert-Butyl Ether	10.23	73	4092930	42.583	ng	100
26) Vinyl Acetate	10.41	86	1540010	231.372	ng	# 88
27) 2-Butanone (MEK)	10.65	72	969283	41.297	ng	98
28) cis-1,2-Dichloroethene	11.17	61	1850331	41.456	ng	100
29) Diisopropyl Ether	11.44	87	1073975	36.658	ng	# 92
30) Ethyl Acetate	11.46	61	959987	77.552	ng	98
31) n-Hexane	11.43	57	2027089	35.149	ng	99
32) Chloroform	11.52	83	2350671	41.659	ng	100
34) Tetrahydrofuran (THF)	11.91	72	961901	42.841	ng	98
35) Ethyl tert-Butyl Ether	12.03	87	1659116	43.031	ng	98
36) 1,2-Dichloroethane	12.31	62	1599463	41.159	ng	100
38) 1,1,1-Trichloroethane	12.58	97	2083309	44.459	ng	100
39) Isopropyl Acetate	12.99	61	1740438	79.627	ng	97
40) 1-Butanol	13.03	56	2641730	81.017	ng	100
41) Benzene	13.06	78	5322208	35.428	ng	100
42) Carbon Tetrachloride	13.21	117	1861015	45.940	ng	100
43) Cyclohexane	13.35	84	4084619	80.930	ng	98
44) tert-Amyl Methyl Ether	13.68	73	3881265	42.458	ng	99
45) 1,2-Dichloropropane	13.91	63	1391375	40.511	ng	100
46) Bromodichloromethane	14.11	83	1849684	44.575	ng	100
47) Trichloroethene	14.15	130	1649473	44.281	ng	100
48) 1,4-Dioxane	14.12	88	1187560	43.283	ng	99
49) 2,2,4-Trimethylpentane...	14.20	57	5317607	37.624	ng	100
50) Methyl Methacrylate	14.34	100	1218859	90.678	ng	98

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Data File : I:\MS16\DATA\2017 11\20\11201726.D
 Acq On : 20 Nov 2017 20:55
 Sample : 50ng TO-15 ICAL Std
 Misc : S31-11031701/S31-11161703 (12/15)

Vial: 15
 Operator: WA
 Inst : GCMS-16

Quant Time: Nov 21 08:18:40 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:11:29 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.46	71	1343588	39.544	ng	100
52) cis-1,3-Dichloropropene	15.01	75	2423157	48.586	ng	100
53) 4-Methyl-2-pentanone	15.03	58	1253181	40.348	ng	99
54) trans-1,3-Dichloropropene	15.52	75	2102765	53.166	ng	100
55) 1,1,2-Trichloroethane	15.70	97	1442140	44.463	ng	100
58) Toluene	15.99	91	5699703	47.297	ng	100
59) 2-Hexanone	16.22	43	2715131	41.808	ng	99
60) Dibromochloromethane	16.40	129	1778241	53.142	ng	100
61) 1,2-Dibromoethane	16.65	107	1695443	50.381	ng	100
62) n-Butyl Acetate	16.84	43	3103648	43.595	ng	99
63) n-Octane	16.96	57	1103253	40.561	ng	99
64) Tetrachloroethene	17.12	166	1805330	49.998	ng	100
65) Chlorobenzene	17.77	112	3979441	46.365	ng	100
66) Ethylbenzene	18.12	91	6359722	44.056	ng	99
67) m- & p-Xylenes	18.28	91	9386290	86.966	ng	100
68) Bromoform	18.36	173	1624501	58.739	ng	100
69) Styrene	18.60	104	4156263	47.996	ng	99
70) o-Xylene	18.70	91	4719206	42.883	ng	100
71) n-Nonane	18.88	43	2137762	36.916	ng	98
72) 1,1,2,2-Tetrachloroethane	18.69	83	2351843	45.600	ng	99
74) Cumene	19.21	105	6273097	44.241	ng	100
75) alpha-Pinene	19.55	93	3296355	45.933	ng	99
76) n-Propylbenzene	19.65	91	7380692	43.793	ng	99
77) 3-Ethyltoluene	19.74	105	6328059	43.764	ng	99
78) 4-Ethyltoluene	19.77	105	5684274	44.566	ng	100
79) 1,3,5-Trimethylbenzene	19.84	105	5063139	43.958	ng	100
80) alpha-Methylstyrene	19.97	118	2922784	49.210	ng	100
81) 2-Ethyltoluene	20.01	105	5952224	43.759	ng	100
82) 1,2,4-Trimethylbenzene	20.20	105	4785457	42.822	ng	99
83) n-Decane	20.28	57	2486452	39.686	ng	99
84) Benzyl Chloride	20.32	91	4492377	61.949	ng	99
85) 1,3-Dichlorobenzene	20.34	146	3206244	46.915	ng	100
86) 1,4-Dichlorobenzene	20.40	146	3319164	47.265	ng	100
87) sec-Butylbenzene	20.43	105	6610889	42.832	ng	99
88) 4-Isopropyltoluene (p-...	20.57	119	5787226	41.170	ng	98
89) 1,2,3-Trimethylbenzene	20.57	105	4644675	41.130	ng	99
90) 1,2-Dichlorobenzene	20.69	146	2953289	45.905	ng	100
91) d-Limonene	20.69	68	1707386	38.295	ng	97
92) 1,2-Dibromo-3-Chloropr...	21.07	157	1252041	61.760	ng	99
93) n-Undecane	21.35	57	2651223	40.868	ng	99
94) 1,2,4-Trichlorobenzene	22.18	180	2718415	57.047	ng	100
95) Naphthalene	22.28	128	7619809	48.472	ng	99
96) n-Dodecane	22.25	57	2649871	45.525	ng	98
97) Hexachlorobutadiene	22.59	225	1758056	53.204	ng	100
98) Cyclohexanone	18.42	55	1903915	40.666	ng	99
99) tert-Butylbenzene	20.20	119	4677144	42.330	ng	100
100) n-Butylbenzene	20.92	91	5383297	43.929	ng	99

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

Data File : I:\MS16\DATA\2017 11\20\11201726.D
Acq On : 20 Nov 2017 20:55
Sample : 50ng TO-15 ICAL Std
Misc : S31-11031701/S31-11161703 (12/15)

Vial: 15
Operator: WA
Inst : GCMS-16

Quant Time: Nov 21 08:18:40 2017

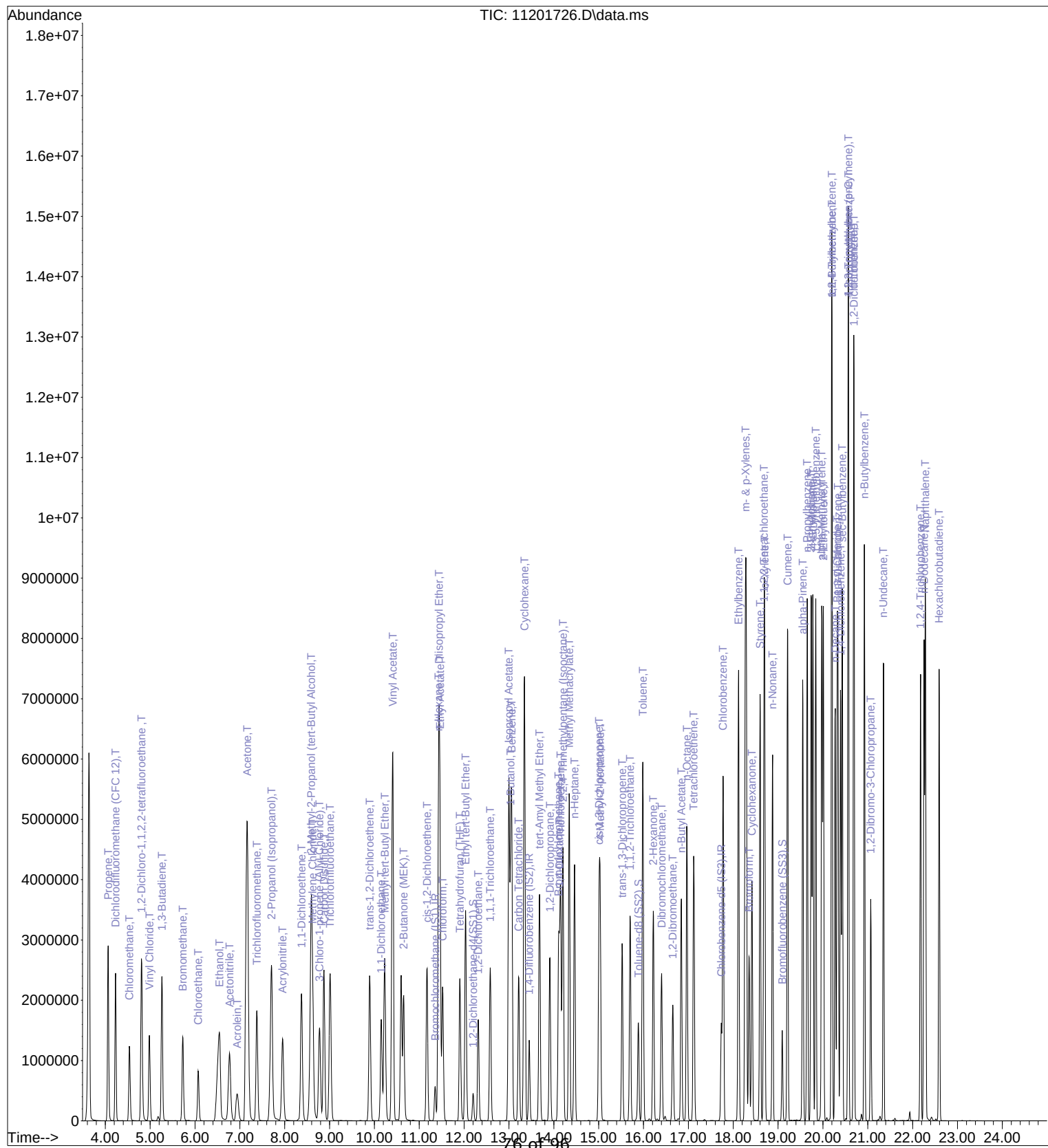
Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:11:29 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File : I:\MS16\DATA\2017 11\20\11201727.D

Vial: 15

Acq On : 20 Nov 2017 21:28

Operator: WA

Sample : 100ng TO-15 ICAL Std

Inst : GCMS-16

Misc : S31-11031701/S31-11161703 (12/15)

Quant Time: Nov 21 08:18:42 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:11:29 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

11/21/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.37	130	292698	12.500	ng	0.02
37) 1,4-Difluorobenzene (IS2)	13.46	114	1407499	12.500	ng	0.01
56) Chlorobenzene-d5 (IS3)	17.73	82	558620	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.21	65	365027	11.360	ng	0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	90.88%
57) Toluene-d8 (SS2)	15.89	98	1414427	12.824	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.56%
73) Bromofluorobenzene (SS3)	19.09	174	525513	14.256	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	114.08%

Target Compounds

						Qvalue
2) Propene	4.07	42	2683537	79.196	ng	99
3) Dichlorodifluoromethan...	4.23	85	4707728	75.796	ng	99
4) Chloromethane	4.54	50	2618447	52.864	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.82	135	2796649	81.589	ng	100
6) Vinyl Chloride	4.99	62	3614684	71.289	ng	100
7) 1,3-Butadiene	5.27	54	2669354	82.072	ng	100
8) Bromomethane	5.74	94	2354784	74.913	ng	100
9) Chloroethane	6.08	64	1756628	69.630	ng	100
10) Ethanol	6.59	45	8168265	335.567	ng	100
11) Acetonitrile	6.80	41	4334379	71.660	ng	100
12) Acrolein	6.96	56	1682456	80.385	ng	100
13) Acetone	7.19	58	8067406	304.371	ng	99
14) Trichlorofluoromethane	7.39	101	4340097	81.310	ng	100
15) 2-Propanol (Isopropanol)	7.74	45	9565667	118.796	ng	100
16) Acrylonitrile	7.98	53	3499568	79.254	ng	100
17) 1,1-Dichloroethene	8.38	96	2734184	84.576	ng	100
18) 2-Methyl-2-Propanol (t...	8.62	59	10776042	155.207	ng	98
19) Methylene Chloride	8.63	84	2591426	79.072	ng	97
20) 3-Chloro-1-propene (Al...	8.79	41	3295705	73.550	ng	97
21) Trichlorotrifluoroethane	9.02	151	2678855	88.449	ng	99
22) Carbon Disulfide	8.88	76	9725606	83.716	ng	100
23) trans-1,2-Dichloroethene	9.90	61	3710171	82.949	ng	100
24) 1,1-Dichloroethane	10.16	63	4384322	73.511	ng	100
25) Methyl tert-Butyl Ether	10.23	73	7636746	79.714	ng	100
26) Vinyl Acetate	10.43	86	2740947	413.156	ng	# 71
27) 2-Butanone (MEK)	10.67	72	1801967	77.026	ng	95
28) cis-1,2-Dichloroethene	11.18	61	3482954	78.290	ng	99
29) Diisopropyl Ether	11.45	87	1887912	64.652	ng	# 82
30) Ethyl Acetate	11.48	61	1634550	132.481	ng	95
31) n-Hexane	11.43	57	3483308	60.598	ng	99
32) Chloroform	11.53	83	4387848	78.018	ng	100
34) Tetrahydrofuran (THF)	11.91	72	1802731	80.554	ng	97
35) Ethyl tert-Butyl Ether	12.04	87	3120106	81.189	ng	95
36) 1,2-Dichloroethane	12.32	62	3062382	79.064	ng	100
38) 1,1,1-Trichloroethane	12.59	97	3955380	85.304	ng	100
39) Isopropyl Acetate	13.01	61	3043693	140.726	ng	93
40) 1-Butanol	13.06	56	4452007	137.979	ng	# 55
41) Benzene	13.07	78	8903941	59.897	ng	99
42) Carbon Tetrachloride	13.22	117	3576597	89.225	ng	100
43) Cyclohexane	13.35	84	7047977	141.122	ng	96
44) tert-Amyl Methyl Ether	13.69	73	7170718	79.271	ng	99
45) 1,2-Dichloropropane	13.92	63	2560060	75.327	ng	99
46) Bromodichloromethane	14.11	83	3418623	83.256	ng	100
47) Trichloroethene	14.15	130	2991502	81.159	ng	100
48) 1,4-Dioxane	14.13	88	2107945	77.642	ng	98
49) 2,2,4-Trimethylpentane...	14.21	57	9261553	66.222	ng	98
50) Methyl Methacrylate	14.35	100	2186908	164.418	ng	94

Data File : I:\MS16\DATA\2017 11\20\11201727.D
 Acq On : 20 Nov 2017 21:28
 Sample : 100ng TO-15 ICAL Std
 Misc : S31-11031701/S31-11161703 (12/15)

Vial: 15
 Operator: WA
 Inst : GCMS-16

Quant Time: Nov 21 08:18:42 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:11:29 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

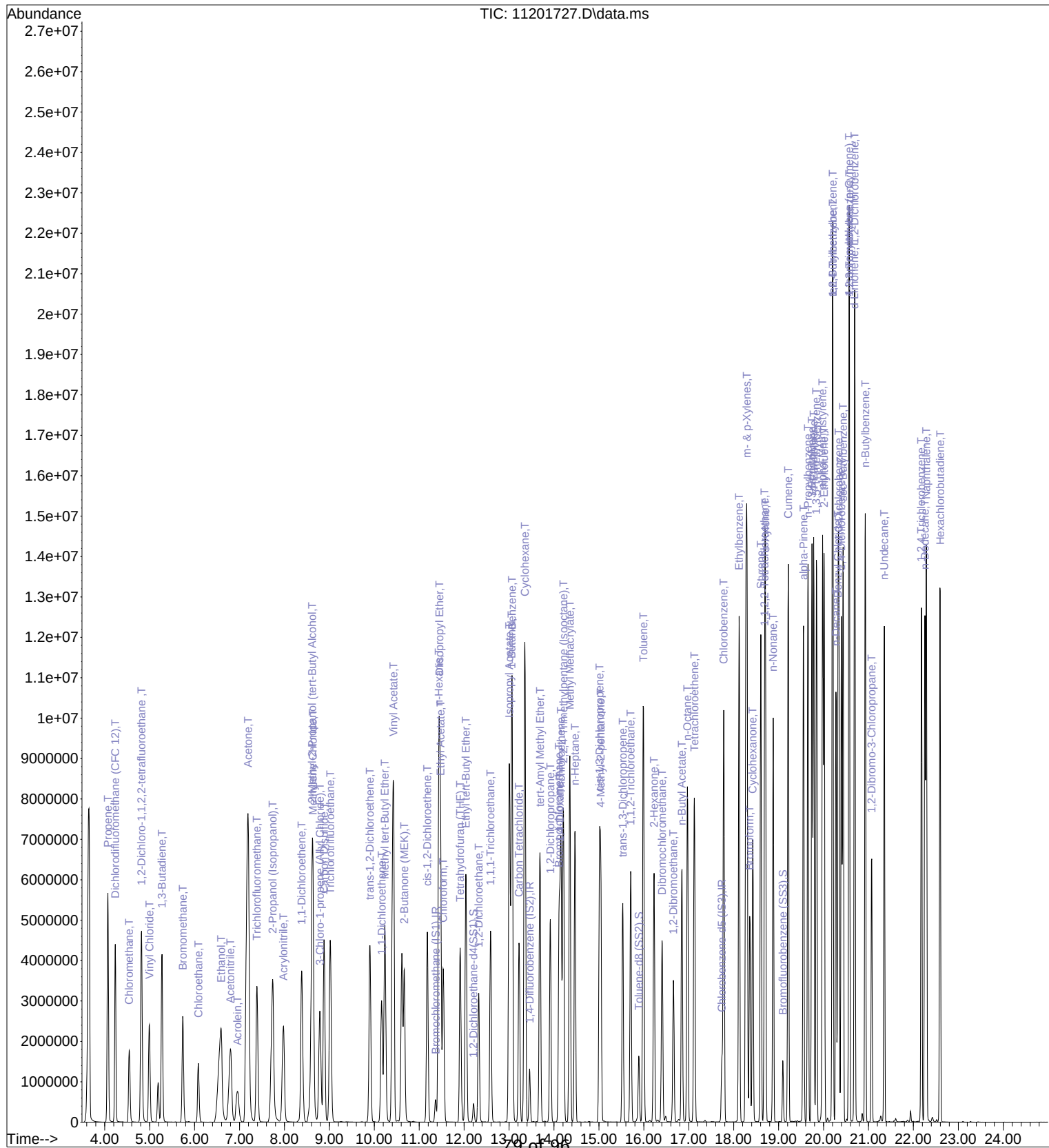
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.47	71	2418366	71.929	ng	98
52) cis-1,3-Dichloropropene	15.01	75	4452357	90.218	ng	100
53) 4-Methyl-2-pentanone	15.04	58	2231369	72.602	ng	96
54) trans-1,3-Dichloropropene	15.53	75	4001888	102.255	ng	100
55) 1,1,2-Trichloroethane	15.71	97	2672761	83.276	ng	100
58) Toluene	15.99	91	10138639	83.942	ng	99
59) 2-Hexanone	16.23	43	4870004	74.820	ng	99
60) Dibromochloromethane	16.40	129	3359967	100.185	ng	99
61) 1,2-Dibromoethane	16.66	107	3178377	94.235	ng	100
62) n-Butyl Acetate	16.84	43	5495313	77.015	ng	98
63) n-Octane	16.97	57	1951152	71.572	ng	96
64) Tetrachloroethene	17.12	166	3336669	92.199	ng	99
65) Chlorobenzene	17.78	112	7230973	84.060	ng	99
66) Ethylbenzene	18.12	91	11106596	76.765	ng	98
67) m- & p-Xylenes	18.29	91	15805536	146.113	ng	99
68) Bromoform	18.36	173	3055621	110.236	ng	100
69) Styrene	18.60	104	7288899	83.982	ng	98
70) o-Xylene	18.71	91	7942874	72.013	ng	100
71) n-Nonane	18.88	43	3492689	60.178	ng	94
72) 1,1,2,2-Tetrachloroethane	18.69	83	3922880	75.890	ng	99
74) Cumene	19.21	105	10708150	75.350	ng	98
75) alpha-Pinene	19.56	93	5722086	79.556	ng	98
76) n-Propylbenzene	19.65	91	12152193	71.943	ng	96
77) 3-Ethyltoluene	19.74	105	11158414	76.997	ng	98
78) 4-Ethyltoluene	19.78	105	9136567	71.471	ng	98
79) 1,3,5-Trimethylbenzene	19.84	105	8682312	75.211	ng	99
80) alpha-Methylstyrene	19.98	118	5086115	85.441	ng	99
81) 2-Ethyltoluene	20.01	105	9981638	73.217	ng	98
82) 1,2,4-Trimethylbenzene	20.20	105	7796429	69.609	ng	99
83) n-Decane	20.28	57	4025861	64.111	ng	97
84) Benzyl Chloride	20.32	91	7759172	106.757	ng	98
85) 1,3-Dichlorobenzene	20.34	146	5533209	80.782	ng	100
86) 1,4-Dichlorobenzene	20.40	146	5789108	82.251	ng	100
87) sec-Butylbenzene	20.43	105	10841634	70.084	ng	97
88) 4-Isopropyltoluene (p-...	20.57	119	9144599	64.907	ng	96
89) 1,2,3-Trimethylbenzene	20.57	105	7530232	66.533	ng	98
90) 1,2-Dichlorobenzene	20.69	146	4849561	75.211	ng	100
91) d-Limonene	20.69	68	2646409	59.223	ng	91
92) 1,2-Dibromo-3-Chloropr...	21.07	157	2321745	114.267	ng	99
93) n-Undecane	21.35	57	4233105	65.106	ng	96
94) 1,2,4-Trichlorobenzene	22.18	180	4920869	103.034	ng	100
95) Naphthalene	22.29	128	12470135	79.148	ng	98
96) n-Dodecane	22.26	57	4235650	72.606	ng	95
97) Hexachlorobutadiene	22.60	225	3164580	95.555	ng	99
98) Cyclohexanone	18.42	55	3370330	71.826	ng	98
99) tert-Butylbenzene	20.20	119	7610885	68.726	ng	99
100) n-Butylbenzene	20.93	91	8897017	72.439	ng	97

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

Data File : I:\MS16\DATA\2017 11\20\11201727.D
Acq On : 20 Nov 2017 21:28
Sample : 100ng TO-15 ICAL Std
Misc : S31-11031701/S31-11161703 (12/15)

Vial: 15
Operator: WA
Inst : GCMS-16

Quant Time: Nov 21 08:18:42 2017
Quant Method : I:\MS16\METHODS\R16112017.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Nov 21 08:11:29 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS16\DATA\2017 11\20\11201730.D
 Acq On : 20 Nov 2017 23:07
 Sample : 25ng TO-15 ICV Std
 Misc : S31-11031701/S31-11061705 (12/5)

Vial: 2
 Operator: WA
 Inst : GCMS-16

Quant Time: Nov 21 10:12:20 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:29:15 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

11/21/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.34	130	312068	12.500	ng	0.02
37) 1,4-Difluorobenzene (IS2)	13.45	114	1529714	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.73	82	601957	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.19	65	391726	12.505	ng	0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.08%
57) Toluene-d8 (SS2)	15.88	98	1519101	12.376	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.04%
73) Bromofluorobenzene (SS3)	19.09	174	574368	12.582	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.64%

Target Compounds

						Qvalue
2) Propene	4.05	42	657502	21.744	ng	99
3) Dichlorodifluoromethan...	4.22	85	1245932	20.939	ng	100
4) Chloromethane	4.53	50	822380	18.826	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	745606	21.535	ng	100
6) Vinyl Chloride	4.97	62	972888	21.887	ng	99
7) 1,3-Butadiene	5.25	54	713699	22.970	ng	100
8) Bromomethane	5.71	94	671899	22.085	ng	100
9) Chloroethane	6.06	64	502436	22.117	ng	100
10) Ethanol	6.50	45	2249337	112.578	ng	100
11) Acetonitrile	6.74	41	1096019	21.403	ng	100
12) Acrolein	6.92	56	415584	23.789	ng	99
13) Acetone	7.14	58	2365762	114.706	ng	100
14) Trichlorofluoromethane	7.37	101	1107937	21.069	ng	100
15) 2-Propanol (Isopropanol)	7.67	45	2925847	42.442	ng	99
16) Acrylonitrile	7.93	53	890096	23.541	ng	100
17) 1,1-Dichloroethene	8.36	96	696720	21.953	ng	100
18) 2-Methyl-2-Propanol (t...	8.56	59	3139820	43.343	ng	99
19) Methylene Chloride	8.61	84	716847	22.481	ng	99
20) 3-Chloro-1-propene (Al...	8.77	41	871832	22.274	ng	99
21) Trichlorotrifluoroethane	9.01	151	683297	21.432	ng	100
22) Carbon Disulfide	8.86	76	2600398	23.496	ng	100
23) trans-1,2-Dichloroethene	9.89	61	948085	23.375	ng	100
24) 1,1-Dichloroethane	10.15	63	1174755	21.518	ng	100
25) Methyl tert-Butyl Ether	10.22	73	2004829	22.109	ng	100
26) Vinyl Acetate	10.39	86	776329	137.438	ng	100
27) 2-Butanone (MEK)	10.64	72	480147	23.143	ng	100
28) cis-1,2-Dichloroethene	11.16	61	896110	22.152	ng	99
29) Diisopropyl Ether	11.43	87	555781	22.905	ng	99
30) Ethyl Acetate	11.45	61	503211	46.153	ng	100
31) n-Hexane	11.42	57	1056053	21.062	ng	100
32) Chloroform	11.51	83	1150661	21.345	ng	100
34) Tetrahydrofuran (THF)	11.90	72	469339	22.638	ng	100
35) Ethyl tert-Butyl Ether	12.03	87	816537	22.228	ng	100
36) 1,2-Dichloroethane	12.31	62	780445	21.815	ng	100
38) 1,1,1-Trichloroethane	12.58	97	999551	21.975	ng	100
39) Isopropyl Acetate	12.99	61	882967	45.054	ng	99
40) 1-Butanol	13.02	56	1269107	46.957	ng	98
41) Benzene	13.06	78	2778740	20.031	ng	100
42) Carbon Tetrachloride	13.21	117	893951	23.452	ng	100
43) Cyclohexane	13.34	84	2090916	43.214	ng	100
44) tert-Amyl Methyl Ether	13.68	73	1936686	22.410	ng	100
45) 1,2-Dichloropropane	13.91	63	685894	21.513	ng	100
46) Bromodichloromethane	14.10	83	918248	22.931	ng	99
47) Trichloroethene	14.14	130	810234	20.410	ng	99
48) 1,4-Dioxane	14.12	88	594010	22.437	ng	100
49) 2,2,4-Trimethylpentane...	14.20	57	2704292	20.953	ng	100
50) Methyl Methacrylate	14.34	100	613100	45.967	ng	100

80 of 96

Data File : I:\MS16\DATA\2017 11\20\11201730.D
 Acq On : 20 Nov 2017 23:07
 Sample : 25ng TO-15 ICV Std
 Misc : S31-11031701/S31-11061705 (12/5)

Vial: 2
 Operator: WA
 Inst : GCMS-16

Quant Time: Nov 21 10:12:20 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:29:15 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

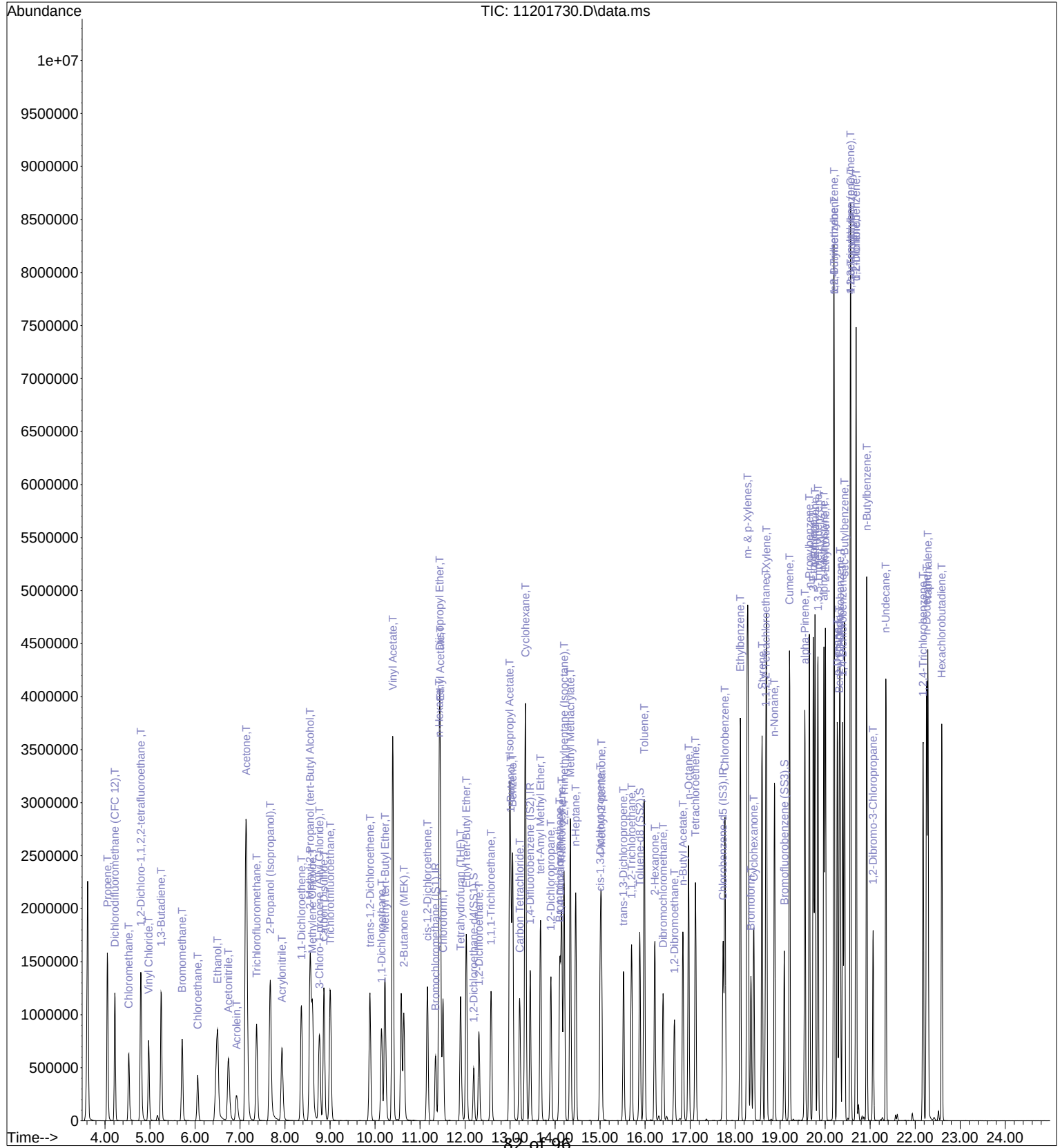
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.46	71	677568	21.847	ng	100
52) cis-1,3-Dichloropropene	15.00	75	1136593	24.254	ng	100
53) 4-Methyl-2-pentanone	15.03	58	631395	22.916	ng	99
54) trans-1,3-Dichloropropene	15.52	75	1013945	26.219	ng	100
55) 1,1,2-Trichloroethane	15.70	97	710966	22.060	ng	100
58) Toluene	15.98	91	2865100	20.740	ng	100
59) 2-Hexanone	16.22	43	1329181	22.013	ng	100
60) Dibromochloromethane	16.40	129	862547	23.943	ng	100
61) 1,2-Dibromoethane	16.65	107	825375	22.646	ng	100
62) n-Butyl Acetate	16.84	43	1510835	22.829	ng	99
63) n-Octane	16.96	57	559163	21.373	ng	100
64) Tetrachloroethene	17.12	166	890755	20.348	ng	100
65) Chlorobenzene	17.77	112	1964810	21.015	ng	100
66) Ethylbenzene	18.11	91	3229410	21.418	ng	100
67) m- & p-Xylenes	18.28	91	4831799	42.300	ng	100
68) Bromoform	18.35	173	775384	25.171	ng	100
69) Styrene	18.60	104	2091537	22.257	ng	100
70) o-Xylene	18.70	91	2445539	21.059	ng	100
71) n-Nonane	18.87	43	1138512	21.233	ng	100
72) 1,1,2,2-Tetrachloroethane	18.68	83	1212228	23.815	ng	100
74) Cumene	19.21	105	3253609	21.325	ng	100
75) alpha-Pinene	19.55	93	1698364	22.354	ng	100
76) n-Propylbenzene	19.65	91	3859363	21.603	ng	100
77) 3-Ethyltoluene	19.74	105	3316847	21.694	ng	99
78) 4-Ethyltoluene	19.77	105	2974322	21.487	ng	99
79) 1,3,5-Trimethylbenzene	19.84	105	2606796	21.107	ng	99
80) alpha-Methylstyrene	19.97	118	1510985	23.268	ng	100
81) 2-Ethyltoluene	20.01	105	3100989	20.892	ng	99
82) 1,2,4-Trimethylbenzene	20.20	105	2580281	21.015	ng	100
83) n-Decane	20.27	57	1330771	21.616	ng	100
84) Benzyl Chloride	20.31	91	2230696	27.759	ng	100
85) 1,3-Dichlorobenzene	20.34	146	1665222	21.869	ng	100
86) 1,4-Dichlorobenzene	20.39	146	1687488	20.921	ng	100
87) sec-Butylbenzene	20.43	105	3497174	21.096	ng	100
88) 4-Isopropyltoluene (p-...	20.56	119	3203363	20.890	ng	99
89) 1,2,3-Trimethylbenzene	20.57	105	2606207	21.165	ng	99
90) 1,2-Dichlorobenzene	20.69	146	1569454	21.647	ng	100
91) d-Limonene	20.69	68	982862	22.218	ng	99
92) 1,2-Dibromo-3-Chloropr...	21.07	157	614726	29.364	ng	100
93) n-Undecane	21.35	57	1398902	22.032	ng	100
94) 1,2,4-Trichlorobenzene	22.18	180	1336182	24.212	ng	100
95) Naphthalene	22.28	128	3795107	22.359	ng	100
96) n-Dodecane	22.25	57	1358945	23.065	ng	100
97) Hexachlorobutadiene	22.59	225	850509	22.379	ng	100
98) Cyclohexanone	18.42	55	893629	21.243	ng	100
99) tert-Butylbenzene	20.20	119	2531395	20.984	ng	100
100) n-Butylbenzene	20.92	91	2801636	21.727	ng	100

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

Data File : I:\MS16\DATA\2017 11\20\11201730.D
Acq On : 20 Nov 2017 23:07
Sample : 25ng TO-15 ICV Std
Misc : S31-11031701/S31-11061705 (12/5)

Vial: 2
Operator: WA
Inst : GCMS-16

Quant Time: Nov 21 10:12:20 2017
Quant Method : I:\MS16\METHODS\R16112017.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Nov 21 08:29:15 2017
Response via : Initial Calibration
DataAcq Meth:TO15.M



Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: 11201730.D

Acq. Method File: TO15.M

11/21/17

Data File Path: I:\MS16\DATA\2017_11\20\

Sample Name: 25ng TO-15 ICV Std

Operator: WA

Misc Info: S31-11031701/S31-11061705 (

Date Acquired: 11/20/2017

23:07

Instrument Name: GCMS-16

#	Compound Name	Ret. Time	Amt. (ng)	Spike Amt.(ng)	% Rec.	Lower Limit	Upper Limit	* OR Fail	ICV/AZ 70-130%
2)	Propene	4.05	21.744	26.275	83	54	133	*	*
3)	Dichlorodifluoromethane (CFC 1	4.22	20.939	26.600	79	64	115	*	*
4)	Chloromethane	4.53	18.826	26.250	72	47	140	*	*
5)	1,2-Dichloro-1,1,2,2-tetrafluoroet	4.80	21.535	26.325	82	60	112	*	*
6)	Vinyl Chloride	4.97	21.887	26.350	83	63	127	*	*
7)	1,3-Butadiene	5.25	22.970	26.225	88	57	149	*	*
8)	Bromomethane	5.71	22.085	26.225	84	63	132	*	*
9)	Chloroethane	6.06	22.117	26.250	84	68	129	*	*
10)	Ethanol	6.50	112.578	130.375	86	62	131	*	*
11)	Acetonitrile	6.74	21.403	26.200	82	56	136	*	*
12)	Acrolein	6.92	23.789	26.075	91	60	132	*	*
13)	Acetone	7.14	114.706	131.825	87	63	124	*	*
14)	Trichlorofluoromethane	7.37	21.069	26.025	81	65	113	*	*
15)	2-Propanol (Isopropanol)	7.67	42.442	52.775	80	62	135	*	*
16)	Acrylonitrile	7.93	23.541	26.450	89	68	138	*	*
17)	1,1-Dichloroethene	8.36	21.953	26.675	82	72	118	*	*
18)	2-Methyl-2-Propanol (tert-Butyl Alc	8.56	43.343	53.350	81	61	128	*	*
19)	Methylene Chloride	8.61	22.481	26.600	85	67	116	*	*
20)	3-Chloro-1-propene (Allyl Chloride	8.77	22.274	26.525	84	61	143	*	*
21)	Trichlorotrifluoroethane	9.01	21.432	26.750	80	68	113	*	*
22)	Carbon Disulfide	8.86	23.496	26.725	88	68	120	*	*
23)	trans-1,2-Dichloroethene	9.89	23.375	26.700	88	71	125	*	*
24)	1,1-Dichloroethane	10.15	21.518	26.525	81	68	118	*	*
25)	Methyl tert-Butyl Ether	10.22	22.109	26.625	83	60	123	*	*
26)	Vinyl Acetate	10.39	137.438	132.750	104	73	135	*	*
27)	2-Butanone (MEK)	10.64	23.143	26.450	87	70	129	*	*
28)	cis-1,2-Dichloroethene	11.16	22.152	26.475	84	69	121	*	*
29)	Diisopropyl Ether	11.43	22.905	26.600	86	65	117	*	*
30)	Ethyl Acetate	11.45	46.153	53.300	87	66	140	*	*
31)	n-Hexane	11.42	21.062	26.625	79	61	124	*	*
32)	Chloroform	11.51	21.345	26.500	81	69	113	*	*
34)	Tetrahydrofuran (THF)	11.90	22.638	26.550	85	66	121	*	*
35)	Ethyl tert-Butyl Ether	12.03	22.228	26.525	84	69	120	*	*
36)	1,2-Dichloroethane	12.31	21.815	26.500	82	62	120	*	*
38)	1,1,1-Trichloroethane	12.58	21.975	26.525	83	65	116	*	*
39)	Isopropyl Acetate	12.99	45.054	53.275	85	70	126	*	*
40)	1-Butanol	13.02	46.957	53.300	88	62	141	*	*
41)	Benzene	13.06	20.031	26.625	75	66	111	*	*
42)	Carbon Tetrachloride	13.21	23.452	26.700	88	64	122	*	*
43)	Cyclohexane	13.34	43.214	53.150	81	69	115	*	*
44)	tert-Amyl Methyl Ether	13.68	22.410	26.550	84	68	119	*	*
45)	1,2-Dichloropropane	13.91	21.513	26.525	81	69	121	*	*
46)	Bromodichloromethane	14.10	22.931	26.700	86	69	123	*	*
47)	Trichloroethene	14.14	20.410	26.550	77	69	112	*	*
48)	1,4-Dioxane	14.12	22.437	26.600	84	74	123	*	*
49)	2,2,4-Trimethylpentane (Isooctane)	14.20	20.953	26.525	79	67	120	*	*

Bold = 75 Compound List

* = Pass

Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: 11201730.D

Data File Path: I:\MS16\DATA\2017_11\20\

Operator: WA

Date Acquired: 11/20/2017

23:07

TO15.M

Sample Name: 25ng TO-15 ICV Std

Misc Info: S31-11031701/S31-11061705

Instrument Name: GCMS-16

#	Compound Name	Ret. Time	Amt. (ng)	Spike Amt.(ng)	% Rec.	Lower Limit	Upper Limit	* OR Fail	ICV/AZ 70-130%
50)	Methyl Methacrylate	14.34	45.967	52.950	87	75	125	*	*
51)	n-Heptane	14.46	21.847	26.625	82	68	118	*	*
52)	cis-1,3-Dichloropropene	15.00	24.254	26.025	93	74	129	*	*
53)	4-Methyl-2-pentanone	15.03	22.916	26.650	86	66	138	*	*
54)	trans-1,3-Dichloropropene	15.52	26.219	26.625	98	75	130	*	*
55)	1,1,2-Trichloroethane	15.70	22.060	26.500	83	73	117	*	*
58)	Toluene	15.98	20.740	26.400	79	66	114	*	*
59)	2-Hexanone	16.22	22.013	26.425	83	58	146	*	*
60)	Dibromochloromethane	16.40	23.943	26.450	91	67	130	*	*
61)	1,2-Dibromoethane	16.65	22.646	26.425	86	70	127	*	*
62)	n-Butyl Acetate	16.84	22.829	26.850	85	62	140	*	*
63)	n-Octane	16.96	21.373	26.525	81	65	121	*	*
64)	Tetrachloroethene	17.12	20.348	26.500	77	62	119	*	*
65)	Chlorobenzene	17.77	21.015	26.525	79	66	115	*	*
66)	Ethylbenzene	18.11	21.418	26.475	81	69	117	*	*
67)	m- & p-Xylenes	18.28	42.300	52.975	80	67	117	*	*
68)	Bromoform	18.35	25.171	26.525	95	67	135	*	*
69)	Styrene	18.60	22.257	26.350	84	70	128	*	*
70)	o-Xylene	18.70	21.059	26.400	80	67	118	*	*
71)	n-Nonane	18.87	21.233	26.500	80	61	127	*	*
72)	1,1,2,2-Tetrachloroethane	18.68	23.815	26.450	90	70	125	*	*
74)	Cumene	19.21	21.325	26.525	80	68	116	*	*
75)	alpha-Pinene	19.55	22.354	26.600	84	69	122	*	*
76)	n-Propylbenzene	19.65	21.603	26.750	81	70	118	*	*
77)	3-Ethyltoluene	19.74	21.694	26.450	82	68	117	*	*
78)	4-Ethyltoluene	19.77	21.487	26.425	81	69	124	*	*
79)	1,3,5-Trimethylbenzene	19.84	21.107	26.500	80	65	117	*	*
80)	alpha-Methylstyrene	19.97	23.268	26.525	88	71	132	*	*
81)	2-Ethyltoluene	20.01	20.892	26.700	78	67	119	*	*
82)	1,2,4-Trimethylbenzene	20.20	21.015	26.550	79	67	124	*	*
83)	n-Decane	20.27	21.616	26.625	81	63	129	*	*
84)	Benzyl Chloride	20.31	27.759	26.550	105	75	142	*	*
85)	1,3-Dichlorobenzene	20.34	21.869	26.475	83	70	124	*	*
86)	1,4-Dichlorobenzene	20.39	20.921	26.750	78	63	124	*	*
87)	sec-Butylbenzene	20.43	21.096	26.575	79	68	119	*	*
88)	4-Isopropyltoluene (p-Cymene)	20.56	20.890	26.600	79	65	122	*	*
89)	1,2,3-Trimethylbenzene	20.57	21.165	26.600	80	66	128	*	*
90)	1,2-Dichlorobenzene	20.69	21.647	26.750	81	66	125	*	*
91)	d-Limonene	20.69	22.218	26.625	83	64	135	*	*
92)	1,2-Dibromo-3-Chloropropane	21.07	29.364	26.300	112	73	136	*	*
93)	n-Undecane	21.35	22.032	26.775	82	67	135	*	*
94)	1,2,4-Trichlorobenzene	22.18	24.212	27.200	89	70	141	*	*
95)	Naphthalene	22.28	22.359	26.125	86	71	146	*	*
96)	n-Dodecane	22.25	23.065	26.825	86	69	152	*	*
97)	Hexachlorobutadiene	22.59	22.379	26.550	84	63	126	*	*
98)	Cyclohexanone	18.42	21.243	26.150	81	58	138	*	*
99)	tert-Butylbenzene	20.20	20.984	26.525	79	65	121	*	*
100)	n-Butylbenzene	20.92	21.727	26.575	82	71	125	*	*

Data File: I:\MS16\DATA\2017 12\13\12131702.D

Acq On : 13 Dec 2017 4:05

Operator: LH

Sample : CCV R16121317 25ng

Misc : S31-12041701/S31-11161703 (12/15)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 13 08:48:31 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:29:15 2017

LH 12/13/17

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	101	0.02
2 T	Propene	1.211	1.139	5.9	101	-0.02
3 T	Dichlorodifluoromethane (CF	2.383	2.166	9.1	95	-0.02
4 T	Chloromethane	1.750	1.623	7.3	96	-0.02
5 T	1,2-Dichloro-1,1,2,2-tetra	1.387	1.252	9.7	94	-0.01
6 T	Vinyl Chloride	1.781	1.735	2.6	99	-0.01
7 T	1,3-Butadiene	1.245	1.285	-3.2	99	0.00
8 T	Bromomethane	1.219	1.147	5.9	97	0.00
9 T	Chloroethane	0.910	0.888	2.4	96	-0.01
10 T	Ethanol	0.800	0.786	1.8	98	0.07
11 T	Acetonitrile	2.051	1.960	4.4	99	0.00
12 T	Acrolein	0.700	0.736	-5.1	97	0.00
13 T	Acetone	0.826	0.824	0.2	97	0.00
14 T	Trichlorofluoromethane	2.106	1.904	9.6	96	0.00
15 T	2-Propanol (Isopropanol)	2.761	2.732	1.1	97	0.03
16 T	Acrylonitrile	1.514	1.559	-3.0	98	0.02
17 T	1,1-Dichloroethene	1.271	1.168	8.1	94	0.00
18 T	2-Methyl-2-Propanol (tert-B	2.902	2.856	1.6	97	0.02
19 T	Methylene Chloride	1.277	1.206	5.6	94	0.03
20 T	3-Chloro-1-propene (Allyl C	1.568	1.503	4.1	98	0.00
21 T	Trichlorotrifluoroethane	1.277	1.127	11.7	92	0.00
22 T	Carbon Disulfide	4.433	4.419	0.3	96	0.00
23 T	trans-1,2-Dichloroethene	1.625	1.619	0.4	97	0.01
24 T	1,1-Dichloroethane	2.187	2.045	6.5	97	0.01
25 T	Methyl tert-Butyl Ether	3.632	3.398	6.4	96	-0.02
26 T	Vinyl Acetate	0.226	0.273	-20.8	100	0.00
27 T	2-Butanone (MEK)	0.831	0.816	1.8	95	-0.01
28 T	cis-1,2-Dichloroethene	1.620	1.558	3.8	97	0.02
29 T	Diisopropyl Ether	0.972	0.920	5.3	95	0.00
30 T	Ethyl Acetate	0.437	0.429	1.8	97	0.00
31 T	n-Hexane	2.008	1.826	9.1	98	0.00
32 T	Chloroform	2.159	1.957	9.4	95	0.02
33 S	1,2-Dichloroethane-d4 (SS1)	1.255	1.302	-3.7	104	0.01
34 T	Tetrahydrofuran (THF)	0.830	0.800	3.6	96	-0.02
35 T	Ethyl tert-Butyl Ether	1.471	1.379	6.3	96	0.00
36 T	1,2-Dichloroethane	1.433	1.351	5.7	97	0.01
37 IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	101	0.00
38 T	1,1,1-Trichloroethane	0.372	0.348	6.5	95	0.01
39 T	Isopropyl Acetate	0.160	0.157	1.9	97	0.00
40 T	1-Butanol	0.221	0.235	-6.3	96	-0.02
41 T	Benzene	1.134	0.947	16.5	95	0.00
42 T	Carbon Tetrachloride	0.311	0.312	-0.3	95	0.00
43 T	Cyclohexane	0.395	0.357	9.6	95	0.00
44 T	tert-Amyl Methyl Ether	0.706	0.673	4.7	96	0.00
45 T	1,2-Dichloropropane	0.261	0.241	7.7	96	0.00
46 T	Bromodichloromethane	0.327	0.315	3.7	95	0.00
47 T	Trichloroethene	0.324	0.271	16.4	91	0.00
48 T	1,4-Dioxane	0.216	0.204	5.6	94	-0.02
49 T	2,2,4-Trimethylpentane (Iso	1.055	0.960	9.0	97	0.00
50 T	Methyl Methacrylate	0.109	0.105	3.7	94	0.00
51 T	n-Heptane	0.253	0.236	6.7	96	0.00
52 T	cis-1,3-Dichloropropene	0.383	0.394	-2.9	96	0.00
53 T	4-Methyl-2-pentanone	0.225	0.226	-0.4	97	0.00
54 T	trans-1,3-Dichloropropene	0.316	0.352	-11.7	96	0.00

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Data File: I:\MS16\DATA\2017 12\13\12131702.D

Acq On : 13 Dec 2017 4:05

Operator: LH

Sample : CCV R16121317 25ng

Misc : S31-12041701/S31-11161703 (12/15)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 13 08:48:31 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:29:15 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	0.263	0.243	7.6	94	0.00
56 IR	Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	102	0.00
57 S	Toluene-d8 (SS2)	2.549	2.518	1.2	100	0.00
58 T	Toluene	2.869	2.477	13.7	94	0.00
59 T	2-Hexanone	1.254	1.235	1.5	99	-0.01
60 T	Dibromochloromethane	0.748	0.746	0.3	95	0.00
61 T	1,2-Dibromoethane	0.757	0.710	6.2	94	0.00
62 T	n-Butyl Acetate	1.374	1.401	-2.0	99	0.00
63 T	n-Octane	0.543	0.500	7.9	97	0.00
64 T	Tetrachloroethene	0.909	0.748	17.7	92	0.00
65 T	Chlorobenzene	1.942	1.681	13.4	93	0.00
66 T	Ethylbenzene	3.131	2.820	9.9	95	0.00
67 T	m- & p-Xylenes	2.372	2.092	11.8	95	0.00
68 T	Bromoform	0.640	0.665	-3.9	92	0.00
69 T	Styrene	1.951	1.785	8.5	93	0.00
70 T	o-Xylene	2.412	2.109	12.6	94	0.00
71 T	n-Nonane	1.113	1.044	6.2	100	0.00
72 T	1,1,2,2-Tetrachloroethane	1.057	1.076	-1.8	96	0.00
73 S	Bromofluorobenzene (SS3)	0.948	0.906	4.4	97	0.00
74 T	Cumene	3.168	2.787	12.0	94	0.00
75 T	alpha-Pinene	1.578	1.445	8.4	93	0.00
76 T	n-Propylbenzene	3.710	3.322	10.5	95	0.00
77 T	3-Ethyltoluene	3.175	2.733	13.9	88	0.00
78 T	4-Ethyltoluene	2.874	2.672	7.0	101	0.00
79 T	1,3,5-Trimethylbenzene	2.565	2.253	12.2	93	0.00
80 T	alpha-Methylstyrene	1.348	1.224	9.2	89	0.00
81 T	2-Ethyltoluene	3.082	2.653	13.9	94	0.00
82 T	1,2,4-Trimethylbenzene	2.550	2.219	13.0	94	0.00
83 T	n-Decane	1.278	1.186	7.2	97	0.00
84 T	Benzyl Chloride	1.669	1.908	-14.3	94	0.00
85 T	1,3-Dichlorobenzene	1.581	1.387	12.3	92	0.00
86 T	1,4-Dichlorobenzene	1.675	1.410	15.8	92	0.00
87 T	sec-Butylbenzene	3.442	3.018	12.3	94	0.00
88 T	4-Isopropyltoluene (p-Cymen	3.184	2.789	12.4	93	0.00
89 T	1,2,3-Trimethylbenzene	2.557	2.219	13.2	94	0.00
90 T	1,2-Dichlorobenzene	1.506	1.292	14.2	92	0.00
91 T	d-Limonene	0.919	0.849	7.6	93	0.00
92 T	1,2-Dibromo-3-Chloropropane	0.435	0.532	-22.3	95	0.00
93 T	n-Undecane	1.319	1.272	3.6	97	0.00
94 T	1,2,4-Trichlorobenzene	1.146	1.087	5.1	92	0.00
95 T	Naphthalene	3.525	3.296	6.5	92	0.00
96 T	n-Dodecane	1.223	1.256	-2.7	97	-0.01
97 T	Hexachlorobutadiene	0.789	0.734	7.0	92	0.00
98 T	Cyclohexanone	0.874	0.843	3.5	94	0.00
99 T	tert-Butylbenzene	2.505	2.166	13.5	93	0.00
100 T	n-Butylbenzene	2.678	2.446	8.7	94	0.00

(#)= Out of Range

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

Data File: I:\MS16\DATA\2017 12\13\12131702.D

Acq On : 13 Dec 2017 4:05

Operator: LH

Sample : CCV R16121317 25ng

Misc : S31-12041701/S31-11161703 (12/15)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 13 08:48:31 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

LH 12/13/17

QLast Update : Tue Nov 21 08:29:15 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.35	130	289642	12.500	ng	0.02
37) 1,4-Difluorobenzene (IS2)	13.45	114	1412756	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.73	82	560739	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.19	65	376983	12.966	ng	0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.76%
57) Toluene-d8 (SS2)	15.88	98	1412019	12.350	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.80%
73) Bromofluorobenzene (SS3)	19.09	174	508307	11.954	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.60%

Target Compounds

						Qvalue
2) Propene	4.06	42	684243	24.380	ng	100
3) Dichlorodifluoromethan...	4.22	85	1315001	23.811	ng	100
4) Chloromethane	4.53	50	945924	23.331	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	740756	23.051	ng	100
6) Vinyl Chloride	4.98	62	1037285	25.142	ng	100
7) 1,3-Butadiene	5.25	54	788462	27.341	ng	99
8) Bromomethane	5.72	94	659537	23.357	ng	100
9) Chloroethane	6.06	64	520618	24.691	ng	99
10) Ethanol	6.51	45	2400074	129.423	ng	100
11) Acetonitrile	6.75	41	1202287	25.296	ng	100
12) Acrolein	6.93	56	449307	27.711	ng	99
13) Acetone	7.14	58	2539187	132.647	ng	98
14) Trichlorofluoromethane	7.37	101	1159164	23.749	ng	100
15) 2-Propanol (Isopropanol)	7.68	45	3334527	52.116	ng	99
16) Acrylonitrile	7.94	53	953843	27.181	ng	100
17) 1,1-Dichloroethene	8.36	96	718019	24.376	ng	95
18) 2-Methyl-2-Propanol (t...	8.56	59	3506869	52.158	ng	99
19) Methylene Chloride	8.61	84	739385	24.983	ng	95
20) 3-Chloro-1-propene (Al...	8.77	41	917854	25.265	ng	98
21) Trichlorotrifluoroethane	9.01	151	687484	23.233	ng	98
22) Carbon Disulfide	8.86	76	2720950	26.489	ng	100
23) trans-1,2-Dichloroethene	9.89	61	1013641	26.926	ng	96
24) 1,1-Dichloroethane	10.14	63	1210956	23.899	ng	100
25) Methyl tert-Butyl Ether	10.22	73	2106145	25.024	ng	99
26) Vinyl Acetate	10.39	86	835079	159.285	ng	# 91
27) 2-Butanone (MEK)	10.64	72	497231	25.822	ng	93
28) cis-1,2-Dichloroethene	11.16	61	963287	25.656	ng	97
29) Diisopropyl Ether	11.43	87	567541	25.200	ng	# 91
30) Ethyl Acetate	11.45	61	530389	52.412	ng	99
31) n-Hexane	11.42	57	1127413	24.226	ng	100
32) Chloroform	11.51	83	1202705	24.037	ng	100
34) Tetrahydrofuran (THF)	11.90	72	493293	25.636	ng	96
35) Ethyl tert-Butyl Ether	12.03	87	846199	24.819	ng	98
36) 1,2-Dichloroethane	12.31	62	825362	24.857	ng	100
38) 1,1,1-Trichloroethane	12.58	97	1059717	25.227	ng	99
39) Isopropyl Acetate	12.99	61	935959	51.711	ng	96
40) 1-Butanol	13.02	56	1405477	56.308	ng	98
41) Benzene	13.06	78	2827663	22.071	ng	100
42) Carbon Tetrachloride	13.21	117	933894	26.529	ng	100
43) Cyclohexane	13.34	84	2156172	48.251	ng	97
44) tert-Amyl Methyl Ether	13.68	73	2011424	25.202	ng	99
45) 1,2-Dichloropropane	13.90	63	727079	24.693	ng	100
46) Bromodichloromethane	14.10	83	949735	25.681	ng	100
47) Trichloroethene	14.14	130	813358	22.185	ng	100
48) 1,4-Dioxane	14.12	88	612060	25.032	ng	97
49) 2,2,4-Trimethylpentane...	14.20	57	2874696	24.117	ng	100

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Data File: I:\MS16\DATA\2017 12\13\12131702.D

Acq On : 13 Dec 2017 4:05

Operator: LH

Sample : CCV R16121317 25ng

Misc : S31-12041701/S31-11161703 (12/15)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 13 08:48:31 2017

Quant Method : I:\MS16\METHODS\R16112017.M

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

QLast Update : Tue Nov 21 08:29:15 2017

Response via : Initial Calibration

DataAcq Meth:TO15.M

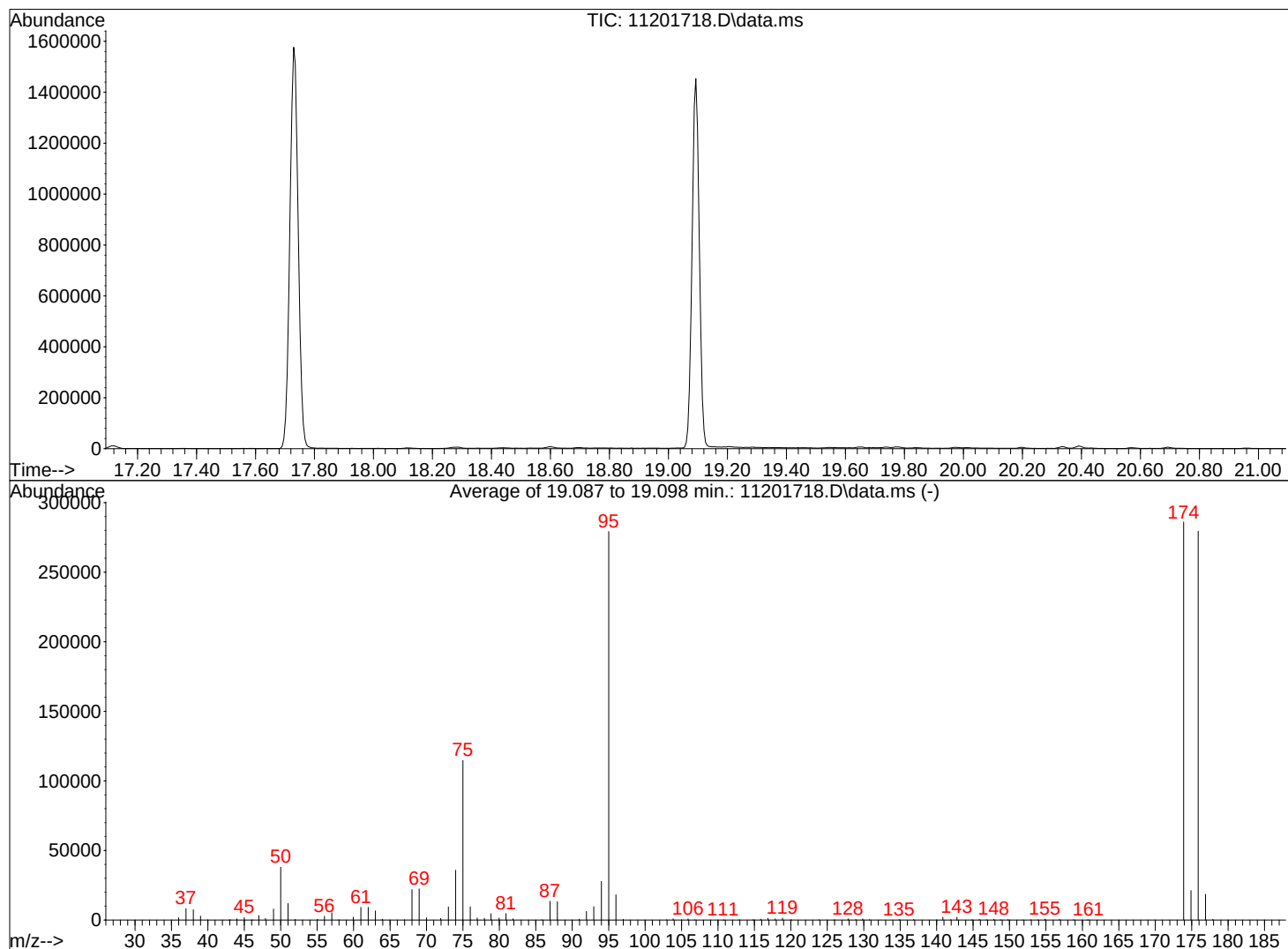
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.34	100	623925	50.651	ng	97
51) n-Heptane	14.46	71	709469	24.770	ng	99
52) cis-1,3-Dichloropropene	15.00	75	1247624	28.827	ng	100
53) 4-Methyl-2-pentanone	15.03	58	674866	26.521	ng	97
54) trans-1,3-Dichloropropene	15.52	75	1065287	29.827	ng	100
55) 1,1,2-Trichloroethane	15.69	97	731106	24.563	ng	98
58) Toluene	15.98	91	2927375	22.748	ng	100
59) 2-Hexanone	16.21	43	1468092	26.101	ng	98
60) Dibromochloromethane	16.40	129	887871	26.458	ng	99
61) 1,2-Dibromoethane	16.65	107	846996	24.948	ng	100
62) n-Butyl Acetate	16.84	43	1678406	27.225	ng	98
63) n-Octane	16.97	57	594194	24.382	ng	98
64) Tetrachloroethene	17.12	166	891598	21.865	ng	100
65) Chlorobenzene	17.77	112	2009780	23.076	ng	100
66) Ethylbenzene	18.11	91	3327406	23.691	ng	100
67) m- & p-Xylenes	18.28	91	4981742	46.819	ng	99
68) Bromoform	18.35	173	792378	27.614	ng	100
69) Styrene	18.60	104	2118271	24.198	ng	99
70) o-Xylene	18.70	91	2495065	23.064	ng	99
71) n-Nonane	18.87	43	1234424	24.714	ng	97
72) 1,1,2,2-Tetrachloroethane	18.68	83	1275107	26.892	ng	100
74) Cumene	19.21	105	3287606	23.132	ng	99
75) alpha-Pinene	19.55	93	1694498	23.942	ng	99
76) n-Propylbenzene	19.65	91	3964465	23.823	ng	99
77) 3-Ethyltoluene	19.74	105	3218722	22.600	ng	99
78) 4-Ethyltoluene	19.78	105	3143502	24.379	ng	99
79) 1,3,5-Trimethylbenzene	19.84	105	2650354	23.037	ng	99
80) alpha-Methylstyrene	19.97	118	1440269	23.810	ng	99
81) 2-Ethyltoluene	20.01	105	3153307	22.806	ng	99
82) 1,2,4-Trimethylbenzene	20.19	105	2615123	22.865	ng	100
83) n-Decane	20.27	57	1408804	24.566	ng	99
84) Benzyl Chloride	20.31	91	2298049	30.699	ng	99
85) 1,3-Dichlorobenzene	20.34	146	1666482	23.495	ng	100
86) 1,4-Dichlorobenzene	20.39	146	1682687	22.395	ng	100
87) sec-Butylbenzene	20.43	105	3570212	23.120	ng	100
88) 4-Isopropyltoluene (p-...	20.56	119	3208855	22.464	ng	99
89) 1,2,3-Trimethylbenzene	20.57	105	2553425	22.261	ng	99
90) 1,2-Dichlorobenzene	20.69	146	1568918	23.231	ng	100
91) d-Limonene	20.69	68	956642	23.215	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.07	157	626749	32.139	ng	96
93) n-Undecane	21.35	57	1501657	25.388	ng	98
94) 1,2,4-Trichlorobenzene	22.17	180	1337078	26.010	ng	100
95) Naphthalene	22.28	128	3903196	24.687	ng	100
96) n-Dodecane	22.25	57	1487106	27.095	ng	98
97) Hexachlorobutadiene	22.59	225	870448	24.587	ng	100
98) Cyclohexanone	18.41	55	981696	25.051	ng	98
99) tert-Butylbenzene	20.19	119	2550332	22.695	ng	99
100) n-Butylbenzene	20.92	91	2890690	24.065	ng	100

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

Data Path : I:\MS16\DATA\2017 11\20\
 Data File : 11201718.D
 Acq On : 20 Nov 2017 16:30
 Operator : WA
 Sample : BFB Std
 Misc : S31-11031701
 ALS Vial : 2 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS16\METHODS\R16112017.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Tue Nov 21 08:29:15 2017



AutoFind: Scans 2837, 2838, 2839; Background Corrected with Scan 2829

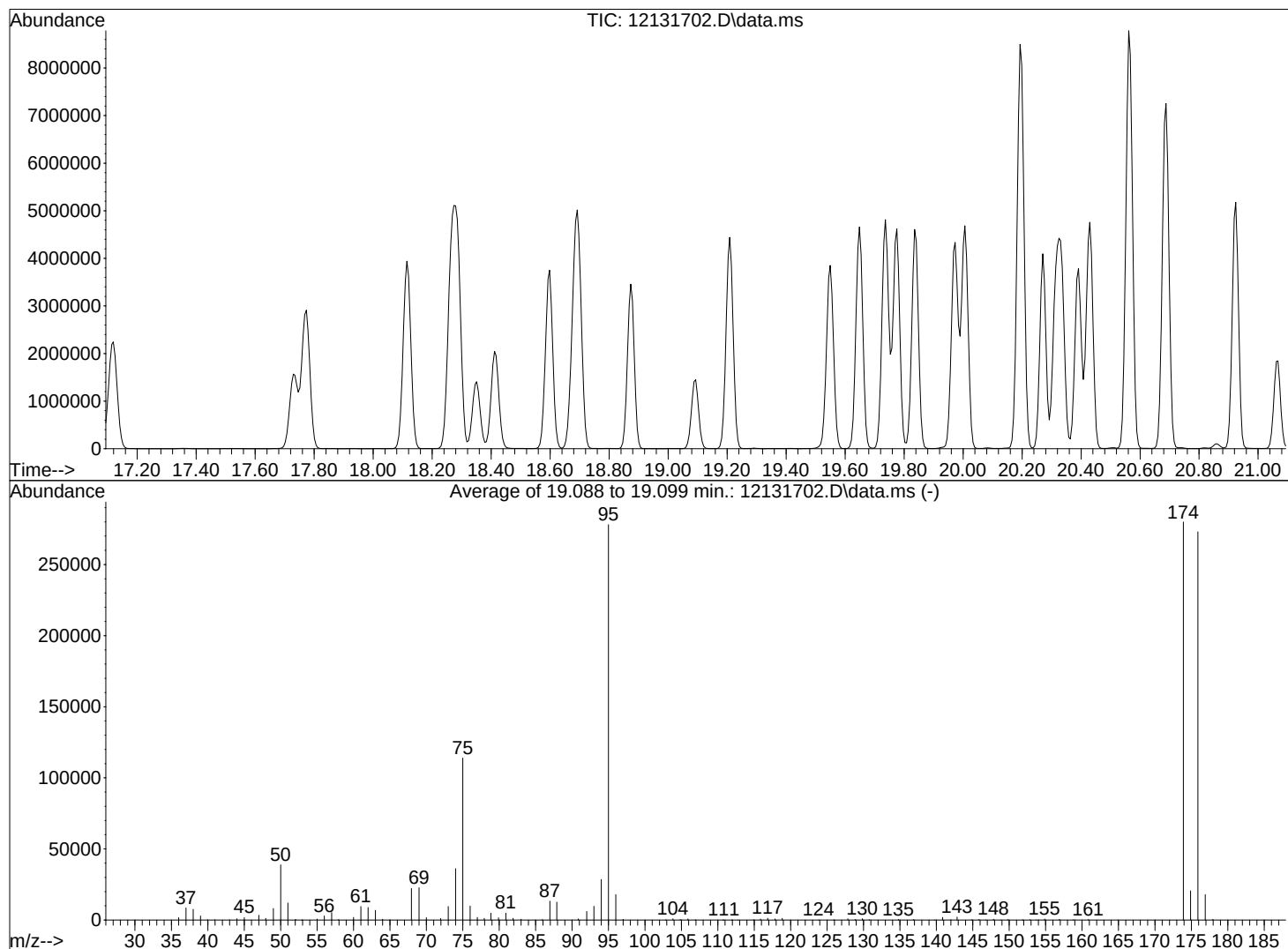
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	13.6	38091	PASS
75	95	30	66	41.1	114741	PASS
95	95	100	100	100.0	279232	PASS
96	95	5	9	6.5	18150	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	102.5	286101	PASS
175	174	4	9	7.4	21253	PASS
176	174	93	101	97.7	279509	PASS
177	176	5	9	6.6	18421	PASS

WA 11/21/17

Data Path : I:\MS16\DATA\2017 12\13\
 Data File : 12131702.D
 Acq On : 13 Dec 2017 4:05
 Operator : LH
 Sample : CCV R16121317 25ng
 Misc : S31-12041701/S31-11161703 (12/15)
 ALS Vial : 2 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS16\METHODS\R16112017.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Tue Nov 21 08:29:15 2017



AutoFind: Scans 2837, 2838, 2839; Background Corrected with Scan 2828

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	14.0	38837	PASS
75	95	30	66	41.0	113925	PASS
95	95	100	100	100.0	278037	PASS
96	95	5	9	6.4	17893	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	100.7	279957	PASS
175	174	4	9	7.3	20555	PASS
176	174	93	101	97.5	273067	PASS
177	176	5	9	6.5	17833	PASS

LH 12/13/17

Injection Log

Directory: I:\MS16\DATA\2017_11\20\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	11/20/17 16:30	11201718.D	BFB Std	S31-11031701	WA	2	<i>Passes</i>
2	11/20/17 17:03	11201719.D	0.08ng TO-15 ICAL Std	S31-11031701/S31-11171704 (12/16)	WA	13	
3	11/20/17 17:36	11201720.D	0.10ng TO-15 ICAL Std	S31-11031701/S31-11171704 (12/16)	WA	13	
4	11/20/17 18:09	11201721.D	0.20ng TO-15 ICAL Std	S31-11031701/S31-11171704 (12/16)	WA	13	
5	11/20/17 18:43	11201722.D	0.40ng TO-15 ICAL Std	S31-11031701/S31-11171704 (12/16)	WA	13	<i>rerun</i>
6	11/20/17 19:16	11201723.D	1.0ng TO-15 ICAL Std	S31-11031701/S31-11091702 (12/8)	WA	14	
7	11/20/17 19:49	11201724.D	5.0ng TO-15 ICAL Std	S31-11031701/S31-11091702 (12/8)	WA	14	
8	11/20/17 20:22	11201725.D	25ng TO-15 ICAL Std	S31-11031701/S31-11161703 (12/15)	WA	15	
9	11/20/17 20:55	11201726.D	50ng TO-15 ICAL Std	S31-11031701/S31-11161703 (12/15)	WA	15	
10	11/20/17 21:28	11201727.D	100ng TO-15 ICAL Std	S31-11031701/S31-11161703 (12/15)	WA	15	
11	11/20/17 22:01	11201728.D	Blank	S31-11031701	WA	2	
12	11/20/17 22:34	11201729.D	0.40ng TO-15 ICAL Std	S31-11031701/S31-11091702 (12/8)	WA	14	
13	11/20/17 23:07	11201730.D	25ng TO-15 ICV Std	S31-11031701/S31-11061705 (12/5)	WA	2	<i>Passes all cmpds</i>
14	11/20/17 23:40	11201731.D	25ng TO-15 ICV Std	S31-11031701/S31-11061705 (12/5)	WA	2	<i>Passes all cmpds</i>
	<i>Saved as R16112017.M, ranges from 0.0ng ---> 100ng; except: MeCl2, CS2, Benzyl-Cl: 0.4ng ---> 100ng; DIPE, THF: from 0.2ng ---> 100ng,</i>						
	<i>Acetone and Vinyl Acetate: 2.0ng ---> 500ng</i>						
						<i>WA</i> 11/21/17	

Injection Log

Directory: I:\MS16\DATA\2017_12\13\

[illegible]

SIMIVALLEY QC Certification

Conditioner: P-Conditioner-07

Cycles: 30

Batch: 21519

Batch Started By: SMOH on 11/30/17 0522
Finished Cleaning By: SMOH on 11/30/17 0522

Container IDs	Cleaned Date	QC Date Analyzed	QC Results	Initial Vacuum		Final Vacuum		Comments
				Vacuum	Date/Time	Vacuum	Date/Time	
SSC00089	11/30/17	11/30/17	Pass w/ Conditions	-14.3	11/30/17 0522	-14.0	12/1/17 0428	SMOH
SSC00135	11/30/17	11/30/17	Pass w/ Conditions	-14.3	11/30/17 0522	-14.0	12/1/17 0428	SMOH
SSC00273	11/30/17	11/30/17	Pass w/ Conditions	-14.3	11/30/17 0522	-14.0	12/1/17 0428	SMOH
SSC00350	11/30/17	11/30/17	Pass w/ Conditions	-14.3	11/30/17 0522	-14.0	12/1/17 0428	SMOH
SC01640	11/30/17	11/30/17	Pass w/ Conditions	-14.3	11/30/17 0522	-14.0	12/4/17 1215	SMOH
SSC00440	11/30/17	11/30/17	Pass w/ Conditions	-14.3	11/30/17 0522	-14.0	12/1/17 0428	SMOH
SSC00983	11/30/17	11/30/17	Pass w/ Conditions	-14.3	11/30/17 0522	-14.0	12/1/17 0233	SMOH
SSC00186	11/30/17	11/30/17	Pass w/ Conditions	-14.3	11/30/17 0522	-14.0	12/1/17 0521	SMOH
SC01870	11/30/17	11/30/17	Pass w/ Conditions	-14.3	11/30/17 0522	-14.0	12/1/17 0234	SMOH
SC00357	11/30/17	11/30/17	Pass w/ Conditions	-14.3	11/30/17 0522	-14.0	12/1/17 0236	SMOH

Passed For: TO-15 (75 Comp 0.1 ug/m3 + TICs)

Exceptions:

COMPONENTID	Date / Time	MODULE	USER	COMMENTS

Batch Comment:

* QC Canister

Data Path : I:\MS21\DATA\2017 11\30\
 Data File : 11301713.D
 Acq On : 30 Nov 2017 16:23
 Operator : JM
 Sample : 113017 SC01640 21519 (Sig #1); 113017 SC01640_COND.7 (Sig #2)
 Misc : LL+TICS (Sig #1); S31-11031705 (Sig #2)
 ALS Vial : 206 Sample Multiplier: 1

Quant Time: Nov 30 17:15:50 2017
 Quant Method : I:\MS21\Methods\F21111517.M
 Quant Title : EPA TO-15
 QLast Update : Thu Nov 16 09:50:03 2017
 Response via : Initial Calibration

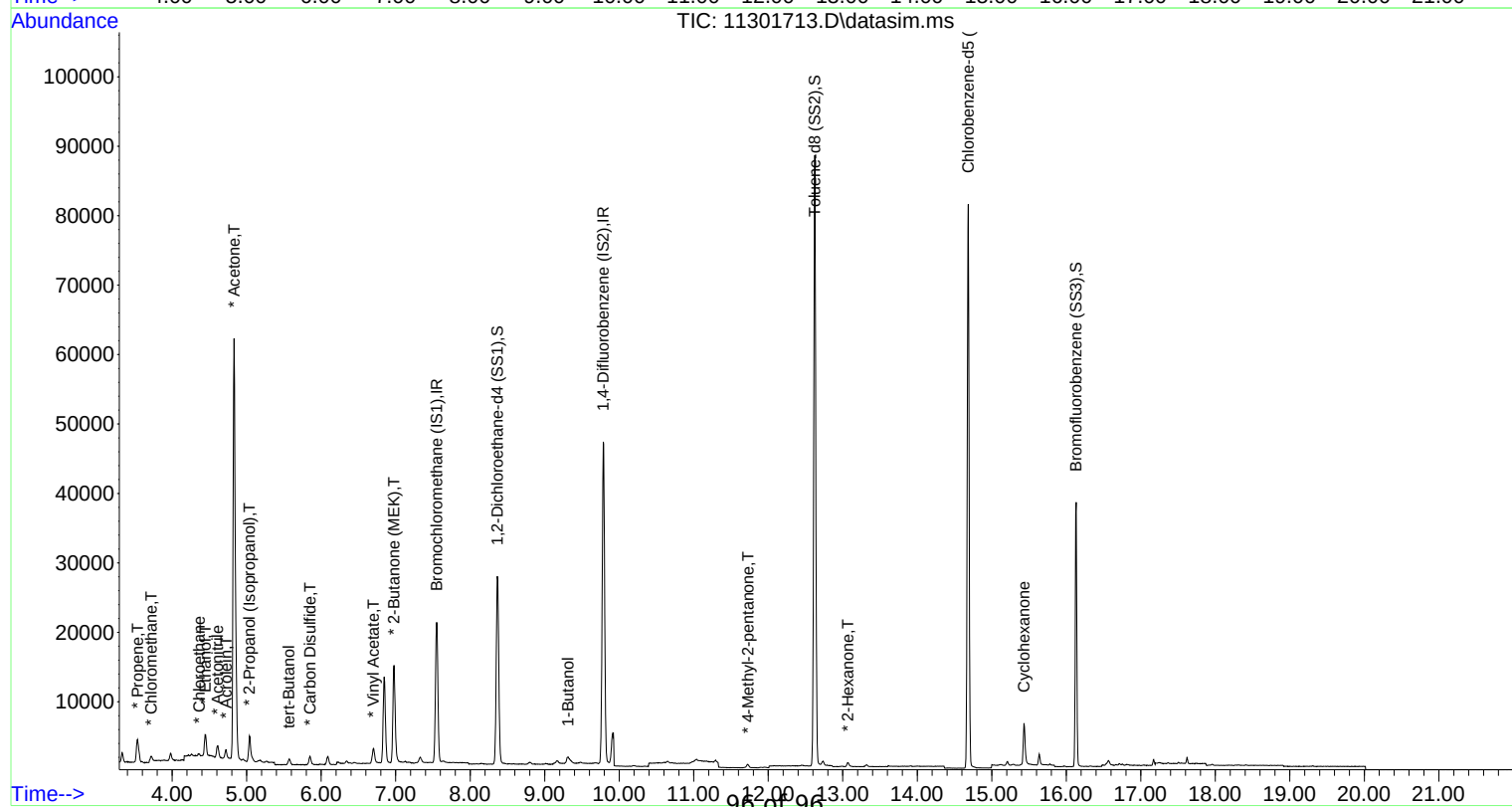
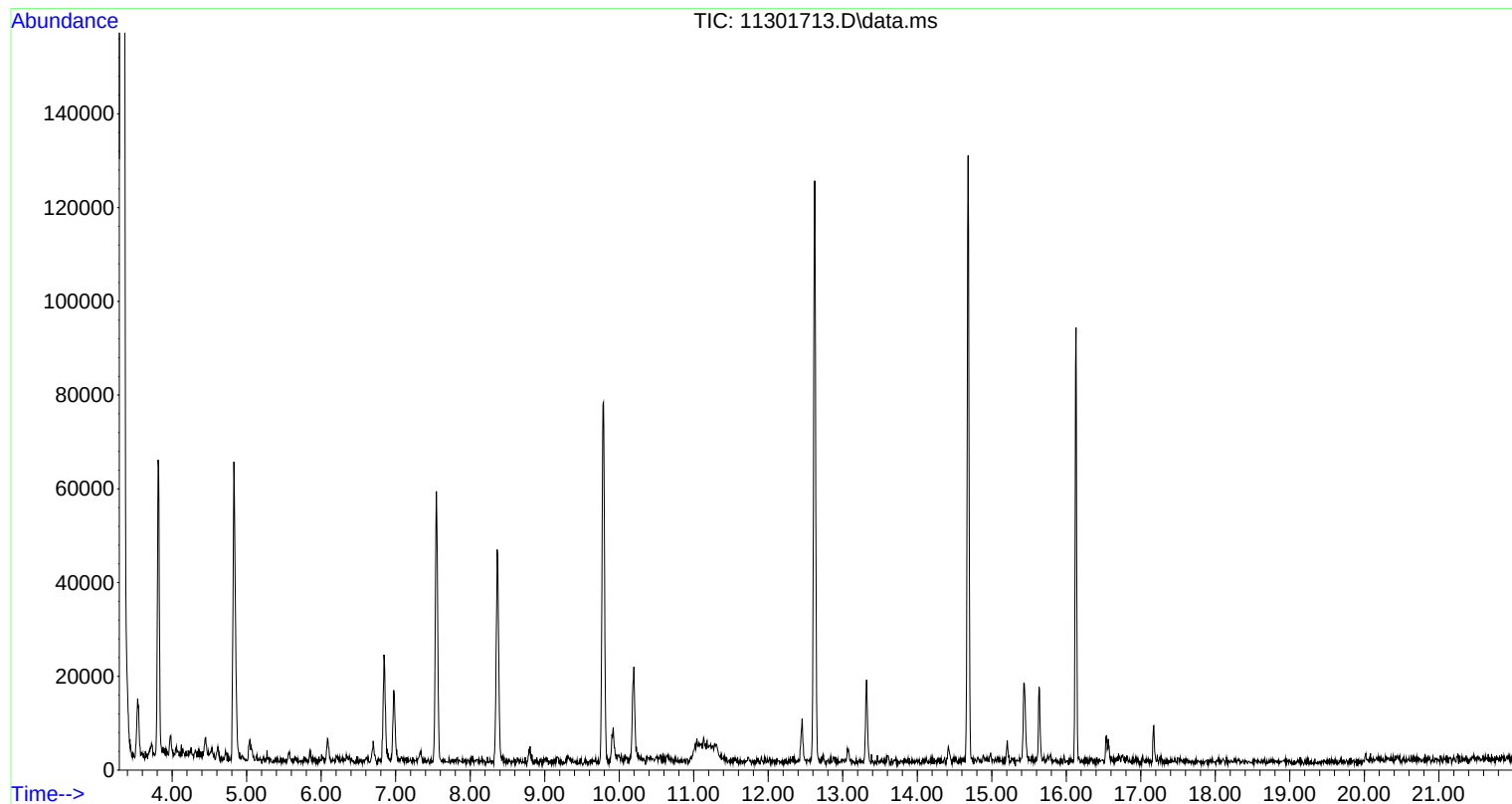
JM 11/30/17

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	7.55	130	25128	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.79	114	85116	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.69	117	76662	1000.000	pg	0.00
System Monitoring Compounds						
33) 1,2-Dichloroethane-d4 ...	8.36	65	41517	954.001	pg	0.00
Spiked Amount 1000.000			Recovery	=	95.40%	
57) Toluene-d8 (SS2)	12.62	98	96441	975.643	pg	0.00
Spiked Amount 1000.000			Recovery	=	97.56%	
74) Bromofluorobenzene (SS3)	16.13	174	26833	1064.301	pg	0.00
Spiked Amount 1000.000			Recovery	=	106.43%	
Target Compounds						Qvalue
2) * Propene	3.54	42	1671	39.112	pg	# 65
4) * Chloromethane	3.72	50	873	11.318	pg	93
9) * Chloroethane	4.36	64	433	11.488	pg	91
10) * Ethanol	4.44	45	3671	110.983	pg	100
11) * Acetonitrile	4.61	41	2392	28.214	pg	96
12) * Acrolein	4.72	56	1324	38.772	pg	92
13) * Acetone	4.83	58	36909	1064.669	pg	# 38
15) * 2-Propanol (Isopropa...	5.04	45	5383	84.571	pg	94
18) tert-Butanol	5.57	59	848	18.905	pg	# 100
22) * Carbon Disulfide	5.85	76	2183	16.786	pg	98
26) * Vinyl Acetate	6.70	86	468	85.623	pg	# 23
27) * 2-Butanone (MEK)	6.98	72	4886	217.880	pg	97
41) 1-Butanol	9.31	56	918	89.746	pg	# 31
53) * 4-Methyl-2-pentanone	11.73	58	238	10.842	pg	99
59) * 2-Hexanone	13.07	58	1054	58.661	pg	97
69) Cyclohexanone	15.43	98	2964	327.027	pg	86

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

Data Path : I:\MS21\DATA\2017 11\30\
Data File : 11301713.D
Acq On : 30 Nov 2017 16:23
Operator : JM
Sample : 113017 SC01640 21519 (Sig #1); 113017 SC01640_COND.7 (Sig #2)
Misc : LL+TICS (Sig #1); S31-11031705 (Sig #2)
ALS Vial : 206 Sample Multiplier: 1

Quant Time: Nov 30 17:15:50 2017
Quant Method : I:\MS21\Methods\F21111517.M
Quant Title : EPA TO-15
QLast Update : Thu Nov 16 09:50:03 2017
Response via : Initial Calibration





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LABORATORY REPORT

April 30, 2018

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

RE: Memphis DDMT SVE / 10060131 T020 Task 2.0

Dear Thomas:

Enclosed are the results of the sample submitted to our laboratory on April 9, 2018. For your reference, this analysis has been assigned our service request number P1801754.

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 10:57 am, 04/30/18

Kate Kaneko
Project Manager



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www.alsglobal.com

Client: HDR Environmental, Operations & Construction, Inc. Service Request No: P1801754
Project: Memphis DDMT SVE / 10060131 T020 Task 2.0

CASE NARRATIVE

The sample was received intact under chain of custody on April 9, 2018 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. For projects requiring DoD QSM 5.1 compliance canisters were cleaned to <1/2 the MRL. 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	1347317
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	4068-005
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	T104704413-17-8
Utah DOH (NELAP)	http://health.utah.gov/lab/environmental-lab-certification/	CA01627201 7-8
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: Memphis DDMT SVE / 10060131 T020 Task 2.0

Service Request: P1801754

Date Received: 4/9/2018
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-Y7Q4	P1801754-001	Air	4/3/2018	09:46	SC01988	-0.11	3.63

X

Air - Chain of Custody Record & Analytical Service Request

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

ALS
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Company Name & Address (Reporting Information)
HDR 9781 S. Meridian Blvd Ste 400
Englewood, CO 80112

Project Manager **Tom Holmes**

Phone **404 - 295 - 3279**

Fax

Email Address for Result Reporting

Thomas.Holmes@HDRinc.com

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected
ODSVE-EFF-Y7Q4	(1)	4/3/18	0946

Sampler (Print & Sign)

Nick Hether *Nick Hether*

Canister ID (Bar code # - AC, SC, etc.)	Flow Controller ID (Bar code # - FC #)	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	Sample Volume
SC01988	-	-14.30	0.00	6L

P.O. # / Billing Information

10060131 TO20 Task 2.0

Project Name **Memphis DDMT SVE**

ALS Contact:

Analysis Method

TO-15 VOCs

Comments
e.g. Actual
Preservative
or
specific
instructions

ALS Project No.

4801754

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

Report Tier Levels - please select

Tier I - Results (Default if not specified) _____
Tier II (Results + QC Summaries) _____
Tier III (Results + QC & Calibration Summaries) _____
Tier IV (Date Validation Package) 10% Surcharge

Chain of Custody Seal: (Circle)

INTACT BROKEN ABSENT

EDD required YES / NO

Type: _____ Units: _____

Relinquished by: (Signature) *Thomas Holmes*

Date: **4/3/18**

Time: **1027**

Received by: (Signature)

Date:

Time:

Relinquished by: (Signature)

Date:

Time:

Received by: (Signature)

Date:

Time:

Project Requirements
(MRLs, QAPP)

Cooler / Blank Temperature _____ °C

5 of 114

ALS Environmental **Sample Acceptance Check Form**

Client: Trinity Analysis & Development Corp. Work order: P1801754
 Project: Memphis DDMT SVE / 10060131 T020 Task 2.0
 Sample(s) received on: 4/9/18 Date opened: 4/9/18 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.

	<u>Yes</u>	<u>No</u>	<u>N/A</u>
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
P1801754-001.01	6.0 L Source Can					

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-Y7Q4

ALS Project ID: P1801754

Client Project ID: Memphis DDMT SVE / 10060131 T020 Task 2.0

ALS Sample ID: P1801754-001

Test Code: EPA TO-15

Date Collected: 4/3/18

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: 4/9/18

Analyst: Raneem Sahtah

Date Analyzed: 4/16/18

Sampling Media: 6.0 L Summa Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container ID: SC01988

Initial Pressure (psig): -0.11

Final Pressure (psig): 3.63

Container Dilution Factor: 1.26

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	1.2	0.37	0.30	0.10	
75-71-8	Dichlorodifluoromethane (CFC 12)	0.62	0.13	0.11	0.043	
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)	0.074	0.090	0.074	0.034	U
75-01-4	Vinyl Chloride	0.20	0.25	0.20	0.084	U
106-99-0	1,3-Butadiene	0.24	0.28	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	0.081	U
64-17-5	Ethanol	6.2	3.3	1.4	0.54	
75-05-8	Acetonitrile	0.22	0.38	0.32	0.14	J
107-02-8	Acrolein	0.62	1.1	0.23	0.093	J
67-64-1	Acetone	11	2.7	1.1	0.41	
75-69-4	Trichlorofluoromethane	0.29	0.11	0.094	0.038	
67-63-0	2-Propanol (Isopropyl Alcohol)	1.3	2.6	0.43	0.22	J
107-13-1	Acrylonitrile	0.24	0.29	0.24	0.099	U
75-35-4	1,1-Dichloroethene	0.91	0.16	0.13	0.054	
75-09-2	Methylene Chloride	0.38	0.18	0.15	0.062	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	0.17	0.20	0.17	0.064	U
76-13-1	Trichlorotrifluoroethane	2.4	0.082	0.069	0.028	
75-15-0	Carbon Disulfide	1.7	2.0	0.17	0.061	J
156-60-5	trans-1,2-Dichloroethene	0.34	0.16	0.14	0.060	
75-34-3	1,1-Dichloroethane	0.44	0.16	0.13	0.050	
1634-04-4	Methyl tert-Butyl Ether	0.15	0.17	0.15	0.059	U
108-05-4	Vinyl Acetate	0.75	1.8	0.75	0.23	U
78-93-3	2-Butanone (MEK)	0.89	2.1	0.18	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-Y7Q4

ALS Project ID: P1801754

Client Project ID: Memphis DDMT SVE / 10060131 T020 Task 2.0

ALS Sample ID: P1801754-001

Test Code: EPA TO-15

Date Collected: 4/3/18

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: 4/9/18

Analyst: Raneem Sahtah

Date Analyzed: 4/16/18

Sampling Media: 6.0 L Summa Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container ID: SC01988

Initial Pressure (psig): -0.11 Final Pressure (psig): 3.63

Container Dilution Factor: 1.26

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	25	0.16	0.14	0.051	
141-78-6	Ethyl Acetate	26	0.35	0.30	0.12	
110-54-3	n-Hexane	0.55	0.18	0.15	0.054	
67-66-3	Chloroform	5.1	0.13	0.11	0.044	
109-99-9	Tetrahydrofuran (THF)	0.13	0.21	0.18	0.085	J
107-06-2	1,2-Dichloroethane	0.40	0.16	0.13	0.050	
71-55-6	1,1,1-Trichloroethane	0.34	0.12	0.099	0.039	
71-43-2	Benzene	0.22	0.20	0.17	0.063	
56-23-5	Carbon Tetrachloride	0.40	0.10	0.084	0.030	
110-82-7	Cyclohexane	2.3	0.37	0.31	0.11	
78-87-5	1,2-Dichloropropane	0.12	0.14	0.12	0.044	U
75-27-4	Bromodichloromethane	0.067	0.094	0.081	0.028	J
79-01-6	Trichloroethene	23	0.12	0.099	0.033	
123-91-1	1,4-Dioxane	0.15	0.17	0.15	0.056	U
80-62-6	Methyl Methacrylate	0.26	0.31	0.26	0.095	U
142-82-5	n-Heptane	0.38	0.15	0.13	0.052	
10061-01-5	cis-1,3-Dichloropropene	0.12	0.14	0.12	0.039	U
108-10-1	4-Methyl-2-pentanone	0.13	0.15	0.13	0.049	U
10061-02-6	trans-1,3-Dichloropropene	0.12	0.14	0.12	0.044	U
79-00-5	1,1,2-Trichloroethane	0.099	0.12	0.099	0.037	U
108-88-3	Toluene	1.9	0.17	0.14	0.057	
591-78-6	2-Hexanone	0.076	0.15	0.13	0.049	J
124-48-1	Dibromochloromethane	0.062	0.074	0.062	0.024	U
106-93-4	1,2-Dibromoethane	0.071	0.082	0.071	0.026	U
123-86-4	n-Butyl Acetate	0.92	0.13	0.11	0.042	

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 3 of 3

Client: HDR Environmental, Operations & Construction, Inc.
Client Sample ID: ODSVE-EFF-Y7Q4
Client Project ID: Memphis DDMT SVE / 10060131 T020 Task 2.0

ALS Project ID: P1801754
 ALS Sample ID: P1801754-001

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Raneem Sahtah
Sampling Media: 6.0 L Summa Canister
Test Notes:
Container ID: SC01988

Date Collected: 4/3/18
Date Received: 4/9/18
Date Analyzed: 4/16/18
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.11 Final Pressure (psig): 3.63

Container Dilution Factor: 1.26

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	0.11	0.13	0.11	0.049	J
127-18-4	Tetrachloroethene	2.2	0.093	0.080	0.026	
108-90-7	Chlorobenzene	0.12	0.14	0.12	0.044	U
100-41-4	Ethylbenzene	0.17	0.15	0.12	0.046	
179601-23-1	m,p-Xylenes	0.61	0.29	0.25	0.087	
75-25-2	Bromoform	0.052	0.061	0.052	0.018	U
100-42-5	Styrene	0.18	0.15	0.12	0.044	
95-47-6	o-Xylene	0.22	0.15	0.12	0.044	
111-84-2	n-Nonane	0.073	0.12	0.10	0.036	J
79-34-5	1,1,2,2-Tetrachloroethane	0.48	0.092	0.077	0.028	
98-82-8	Cumene	0.11	0.13	0.11	0.038	U
80-56-8	alpha-Pinene	0.042	0.11	0.095	0.032	J
103-65-1	n-Propylbenzene	0.11	0.13	0.11	0.041	U
622-96-8	4-Ethyltoluene	0.11	0.13	0.11	0.041	U
108-67-8	1,3,5-Trimethylbenzene	0.060	0.13	0.11	0.041	J
95-63-6	1,2,4-Trimethylbenzene	0.14	0.13	0.11	0.038	
100-44-7	Benzyl Chloride	0.10	0.12	0.10	0.027	U
541-73-1	1,3-Dichlorobenzene	0.090	0.10	0.090	0.031	U
106-46-7	1,4-Dichlorobenzene	0.090	0.10	0.090	0.029	U
95-50-1	1,2-Dichlorobenzene	0.090	0.10	0.090	0.031	U
5989-27-5	d-Limonene	0.097	0.11	0.090	0.032	J
96-12-8	1,2-Dibromo-3-chloropropane	0.055	0.065	0.055	0.013	U
120-82-1	1,2,4-Trichlorobenzene	0.075	0.085	0.075	0.027	U
91-20-3	Naphthalene	0.075	0.12	0.10	0.043	J
87-68-3	Hexachlorobutadiene	0.050	0.059	0.050	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.
 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 1 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Method Blank

Client Project ID: Memphis DDMT SVE / 10060131 T020 Task 2.0

ALS Project ID: P1801754

ALS Sample ID: P180416-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Raneem Sahtah

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 4/16/18

Volume(s) Analyzed: 1.00 Liter(s)

Container 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)	0.085	0.10	0.085	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	0.25	0.30	0.25	0.11	U
107-02-8	Acrolein	0.18	0.87	0.18	0.074	U
67-64-1	Acetone	0.88	2.1	0.88	0.32	U
75-69-4	Trichlorofluoromethane	0.075	0.089	0.075	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)	0.13	0.16	0.13	0.051	U
76-13-1	Trichlorotrifluoroethane	0.055	0.065	0.055	0.022	U
75-15-0	Carbon Disulfide	0.14	1.6	0.14	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	0.60	1.4	0.60	0.18	U
78-93-3	2-Butanone (MEK)	0.14	1.7	0.14	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: Memphis DDMT SVE / 10060131 T020 Task 2.0

ALS Project ID: P1801754

ALS Sample ID: P180416-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Raneem Sahtah

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 4/16/18

Volume(s) Analyzed: 1.00 Liter(s)

Container 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	0.086	0.10	0.086	0.035	U
109-99-9	Tetrahydrofuran (THF)	0.15	0.17	0.15	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	0.079	0.092	0.079	0.031	U
71-43-2	Benzene	0.13	0.16	0.13	0.050	U
56-23-5	Carbon Tetrachloride	0.067	0.080	0.067	0.024	U
110-82-7	Cyclohexane	0.25	0.29	0.25	0.084	U
78-87-5	1,2-Dichloropropane	0.093	0.11	0.093	0.035	U
75-27-4	Bromodichloromethane	0.064	0.075	0.064	0.022	U
79-01-6	Trichloroethene	0.078	0.093	0.078	0.026	U
123-91-1	1,4-Dioxane	0.12	0.14	0.12	0.044	U
80-62-6	Methyl Methacrylate	0.21	0.24	0.21	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	0.079	0.092	0.079	0.029	U
108-88-3	Toluene	0.11	0.13	0.11	0.045	U
591-78-6	2-Hexanone	0.10	0.12	0.10	0.039	U
124-48-1	Dibromochloromethane	0.049	0.059	0.049	0.019	U
106-93-4	1,2-Dibromoethane	0.056	0.065	0.056	0.021	U
123-86-4	n-Butyl Acetate	0.091	0.11	0.091	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: Memphis DDMT SVE / 10060131 T020 Task 2.0

ALS Project ID: P1801754
 ALS Sample ID: P180416-MB

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Raneem Sahtah
Sampling Media: 6.0 L Summa Canister
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 4/16/18
Volume(s) Analyzed: 1.00 Liter(s)

Container Dilution Factor: 1.00

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	0.090	0.11	0.090	0.039	U
127-18-4	Tetrachloroethene	0.063	0.074	0.063	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	0.20	0.23	0.20	0.069	U
75-25-2	Bromoform	0.042	0.048	0.042	0.015	U
100-42-5	Styrene	0.099	0.12	0.099	0.035	U
95-47-6	o-Xylene	0.097	0.12	0.097	0.035	U
111-84-2	n-Nonane	0.080	0.095	0.080	0.029	U
79-34-5	1,1,2,2-Tetrachloroethane	0.061	0.073	0.061	0.022	U
98-82-8	Cumene	0.085	0.10	0.085	0.031	U
80-56-8	alpha-Pinene	0.075	0.090	0.075	0.025	U
103-65-1	n-Propylbenzene	0.088	0.10	0.088	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	0.072	0.083	0.072	0.023	U
95-50-1	1,2-Dichlorobenzene	0.072	0.083	0.072	0.025	U
5989-27-5	d-Limonene	0.072	0.090	0.072	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	0.059	0.067	0.059	0.022	U
91-20-3	Naphthalene	0.080	0.095	0.080	0.034	U
87-68-3	Hexachlorobutadiene	0.039	0.047	0.039	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: Memphis DDMT SVE / 10060131 T020 Task 2.0

ALS Project ID: P1801754

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Raneem Sahtah
Sampling Media: 6.0 L Summa Canister(s)
Test Notes:

Date(s) Collected: 4/3/18
Date(s) Received: 4/9/18
Date(s) Analyzed: 4/16/18

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	P180416-MB	106	96	81	70-130	
Lab Control Sample	P180416-LCS	103	94	85	70-130	
Duplicate Lab Control Sample	P180416-DLCS	102	94	88	70-130	
ODSVE-EFF-Y7Q4	P1801754-001	102	95	84	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 / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Duplicate Lab Control Sample

Client Project ID: Memphis DDMT SVE / 10060131 T020 Task 2.0

ALS Project ID: P1801754

ALS Sample ID: P180416-DLCS

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Raneem Sahtah

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 4/16/18

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount	Result		% Recovery		DOD	RPD	RPD	Data
		LCS / DLCS ppbV	LCS ppbV	DLCS ppbV	LCS	DLCS	Acceptance Limits			
115-07-1	Propene	122	110	110	90	90	57-136	0	25	
75-71-8	Dichlorodifluoromethane (CFC 12)	43.1	35.2	35.4	82	82	59-128	0	25	
74-87-3	Chloromethane	102	91.8	90.8	90	89	59-132	1	25	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	30.1	23.1	23.5	77	78	63-121	1	25	
75-01-4	Vinyl Chloride	82.5	76.4	77.6	93	94	64-127	1	25	
106-99-0	1,3-Butadiene	94.9	101	99.3	106	105	66-134	0.9	25	
74-83-9	Bromomethane	54.1	44.9	45.8	83	85	63-134	2	25	
75-00-3	Chloroethane	79.6	69.8	71.4	88	90	63-127	2	25	
64-17-5	Ethanol	554	548	560	99	101	59-125	2	25	
75-05-8	Acetonitrile	125	129	132	103	106	63-132	3	25	
107-02-8	Acrolein	91.0	81.4	83.4	89	92	62-126	3	25	
67-64-1	Acetone	444	397	402	89	91	58-128	2	25	
75-69-4	Trichlorofluoromethane	37.1	30.0	30.4	81	82	62-126	1	25	
67-63-0	2-Propanol (Isopropyl Alcohol)	172	158	161	92	94	52-125	2	25	
107-13-1	Acrylonitrile	97.5	97.1	99.1	100	102	71-137	2	25	
75-35-4	1,1-Dichloroethene	53.8	43.7	44.7	81	83	61-133	2	25	
75-09-2	Methylene Chloride	61.3	46.7	47.8	76	78	62-115	3	25	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	67.8	64.2	65.4	95	96	71-131	1	25	
76-13-1	Trichlorotrifluoroethane	27.9	19.7	20.2	71	72	66-126	1	25	
75-15-0	Carbon Disulfide	68.7	54.2	55.2	79	80	57-134	1	25	
156-60-5	trans-1,2-Dichloroethene	53.9	54.3	55.7	101	103	67-124	2	25	
75-34-3	1,1-Dichloroethane	52.4	43.5	44.7	83	85	68-126	2	25	
1634-04-4	Methyl tert-Butyl Ether	59.1	46.7	49.1	79	83	66-126	5	25	
108-05-4	Vinyl Acetate	302	288	295	95	98	56-139	3	25	
78-93-3	2-Butanone (MEK)	71.8	67.9	69.9	95	97	67-130	2	25	

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 / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Page 2 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Duplicate Lab Control Sample

Client Project ID: Memphis DDMT SVE / 10060131 T020 Task 2.0

ALS Project ID: P1801754

ALS Sample ID: P180416-DLCS

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Raneem Sahtah

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 4/16/18

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount	Result		% Recovery		DOD	RPD	RPD	Data
		LCS / DLCS ppbV	LCS ppbV	DLCS ppbV	LCS	DLCS	Acceptance Limits			
156-59-2	cis-1,2-Dichloroethene	53.4	46.9	47.7	88	89	70-121	1	25	
141-78-6	Ethyl Acetate	118	116	120	98	102	65-128	4	25	
110-54-3	n-Hexane	60.5	52.2	54.4	86	90	63-120	5	25	
67-66-3	Chloroform	43.4	36.0	36.9	83	85	68-123	2	25	
109-99-9	Tetrahydrofuran (THF)	72.0	58.3	59.7	81	83	64-123	2	25	
107-06-2	1,2-Dichloroethane	52.4	45.6	46.4	87	89	65-128	2	25	
71-55-6	1,1,1-Trichloroethane	38.9	32.8	33.5	84	86	68-125	2	25	
71-43-2	Benzene	66.7	57.4	58.7	86	88	69-119	2	25	
56-23-5	Carbon Tetrachloride	34.0	28.2	28.8	83	85	68-132	2	25	
110-82-7	Cyclohexane	124	103	105	83	85	70-117	2	25	
78-87-5	1,2-Dichloropropane	45.9	39.6	40.8	86	89	69-123	3	25	
75-27-4	Bromodichloromethane	31.9	24.7	25.2	77	79	72-128	3	25	
79-01-6	Trichloroethene	39.5	31.6	32.4	80	82	71-123	2	25	
123-91-1	1,4-Dioxane	59.1	52.2	53.7	88	91	71-122	3	25	
80-62-6	Methyl Methacrylate	103	89.7	92.6	87	90	70-128	3	25	
142-82-5	n-Heptane	52.0	43.6	45.2	84	87	69-123	4	25	
10061-01-5	cis-1,3-Dichloropropene	45.9	45.2	46.4	98	101	70-128	3	25	
108-10-1	4-Methyl-2-pentanone	52.0	50.5	51.5	97	99	67-130	2	25	
10061-02-6	trans-1,3-Dichloropropene	46.9	46.7	47.9	100	102	75-133	2	25	
79-00-5	1,1,2-Trichloroethane	38.9	35.1	35.9	90	92	73-119	2	25	
108-88-3	Toluene	56.1	41.6	42.2	74	75	66-119	1	25	
591-78-6	2-Hexanone	51.6	44.8	45.3	87	88	62-128	1	25	
124-48-1	Dibromochloromethane	24.8	21.1	21.5	85	87	70-130	2	25	
106-93-4	1,2-Dibromoethane	27.5	26.3	26.6	96	97	74-122	1	25	
123-86-4	n-Butyl Acetate	45.2	41.9	42.4	93	94	62-140	1	25	

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 / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Page 3 of 3

Client: HDR Environmental, Operations & Construction, Inc.

Client Sample ID: Duplicate Lab Control Sample

Client Project ID: Memphis DDMT SVE / 10060131 T020 Task 2.0

ALS Project ID: P1801754

ALS Sample ID: P180416-DLCS

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Raneem Sahtah

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 4/16/18

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount	Result		% Recovery		DOD	RPD	RPD	Data
		LCS / DLCS ppbV	LCS ppbV	DLCS ppbV	LCS	DLCS	Acceptance Limits			
111-65-9	n-Octane	45.4	35.8	36.5	79	80	69-121	1	25	
127-18-4	Tetrachloroethene	31.3	21.8	22.4	70	72	66-124	3	25	
108-90-7	Chlorobenzene	46.1	34.1	34.7	74	75	70-119	1	25	
100-41-4	Ethylbenzene	48.8	37.8	38.3	77	78	70-124	1	25	
179601-23-1	m,p-Xylenes	97.6	75.9	76.8	78	79	61-134	1	25	
75-25-2	Bromoform	20.5	17.0	17.2	83	84	66-139	1	25	
100-42-5	Styrene	49.5	42.3	42.9	85	87	73-127	2	25	
95-47-6	o-Xylene	48.6	38.4	38.8	79	80	67-125	1	25	
111-84-2	n-Nonane	40.4	32.6	33.1	81	82	63-128	1	25	
79-34-5	1,1,2,2-Tetrachloroethane	30.8	26.5	26.8	86	87	65-127	1	25	
98-82-8	Cumene	43.2	32.8	33.1	76	77	68-124	1	25	
80-56-8	alpha-Pinene	38.2	30.5	31.0	80	81	69-122	1	25	
103-65-1	n-Propylbenzene	43.6	34.7	35.0	80	80	69-123	0	25	
622-96-8	4-Ethyltoluene	43.0	33.6	34.0	78	79	67-129	1	25	
108-67-8	1,3,5-Trimethylbenzene	43.1	31.2	31.4	72	73	67-130	1	25	
95-63-6	1,2,4-Trimethylbenzene	43.2	34.7	34.8	80	81	66-132	1	25	
100-44-7	Benzyl Chloride	41.0	44.3	45.4	108	111	50-147	3	25	
541-73-1	1,3-Dichlorobenzene	35.2	29.1	29.6	83	84	65-130	1	25	
106-46-7	1,4-Dichlorobenzene	35.6	27.2	27.6	76	78	60-131	3	25	
95-50-1	1,2-Dichlorobenzene	35.6	29.1	29.4	82	83	63-129	1	25	
5989-27-5	d-Limonene	38.2	33.0	33.3	86	87	64-135	1	25	
96-12-8	1,2-Dibromo-3-chloropropane	21.8	18.5	18.8	85	86	73-136	1	25	
120-82-1	1,2,4-Trichlorobenzene	29.3	24.0	24.4	82	83	55-142	1	25	
91-20-3	Naphthalene	39.9	35.9	36.5	90	91	57-138	1	25	
87-68-3	Hexachlorobutadiene	19.9	13.2	13.4	66	67	56-138	2	25	

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. ALS Project ID: P1801754
Client Project ID: Memphis DDMT SVE / 10060131 T020 Task 2.0

Method Blank Summary

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13 Lab File ID: 04161803.D
Analyst: Raneem Sahtah Date Analyzed: 4/16/18
Sampling Media: 6.0 L Summa Canister(s) Time Analyzed: 09:14
Test Notes:

Client Sample ID	ALS Sample ID	Lab File ID	Time Analyzed
Lab Control Sample	P180416-LCS	04161804.D	09:48
Duplicate Lab Control Sample	P180416-DLCS	04161809.D	13:10
ODSVE-EFF-Y7Q4	P1801754-001	04161816.D	17:40

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: HDR Environmental, Operations & Construction, Inc. ALS Project ID: P1801754
Client Project ID: Memphis DDMT SVE / 10060131 T020 Task 2.0

Internal Standard Area and RT Summary

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13 Lab File ID: 04161802.D
Analyst: Raneem Sahtah Date Analyzed: 4/16/18
Sampling Media: 6.0 L Summa Canister(s) Time Analyzed: 08:25
Test Notes:

	IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
	AREA	#	RT	#	AREA	#
24 Hour Standard	111012	11.15	539276	13.23	192029	17.51
Upper Limit	155417	11.48	754986	13.56	268841	17.84
Lower Limit	66607	10.82	323566	12.90	115217	17.18

Client Sample ID						
01	Method Blank	104397	11.13	528586	13.21	188453
02	Lab Control Sample	111497	11.14	539354	13.23	193900
03	Duplicate Lab Control Sample	110131	11.14	535474	13.22	194339
04	ODSVE-EFF-Y7Q4	107057	11.13	528764	13.22	190242
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\2018 04\16\04161816.D
 Acq On : 16 Apr 2018 17:40
 Sample : P1801754-001 (1000mL)
 Misc : S31-03281803

Vial: 5
 Operator: RS
 Inst : MS13

RS 4/18/18

Quant Time: Apr 18 15:49:23 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:58:13 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.13	130	107057	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.22	114	528764	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.51	82	190242	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.97	65	125700	12.727	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.84%
57) Toluene-d8 (SS2)	15.64	98	498310	11.854	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	94.80%
73) Bromofluorobenzene (SS3)	18.91	174	124499	10.501	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	84.00%

Target Compounds

						Qvalue
2) Propene	4.35	42	16346	1.573	ng	94
3) Dichlorodifluoromethan...	4.51	85	44068	2.444	ng	99
4) Chloromethane	4.78	50	1450	0.103	ng	82
5) 1,2-Dichloro-1,1,2,2-t...	5.03	135	716	N.D.		
6) Vinyl Chloride	5.19	62	1829	0.131	ng	98
7) 1,3-Butadiene	5.43	54	107	N.D.		
8) Bromomethane	5.84	94	199	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.49	45	57585	9.317	ng	99
11) Acetonitrile	6.78	41	4314	0.288	ng	99
12) Acrolein	6.95	56	6461	1.121	ng	99
13) Acetone	7.14	58	146260	20.358	ng	# 1
14) Trichlorofluoromethane	7.36	101	20146	1.276	ng	100
15) 2-Propanol (Isopropanol)	7.61	45	53276	2.462	ng	96
16) Acrylonitrile	0.00	53	0	N.D.	d	
17) 1,1-Dichloroethene	8.29	96	29364	2.850	ng	97
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.	d	
19) Methylene Chloride	8.49	84	12175	1.058	ng	97
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.	d	
21) Trichlorotrifluoroethane	8.90	151	154396	14.512	ng	92
22) Carbon Disulfide	8.76	76	171909	4.315	ng	99
23) trans-1,2-Dichloroethene	9.73	61	12078	1.057	ng	95
24) 1,1-Dichloroethane	9.96	63	24197	1.415	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)	10.49	72	13003	2.071	ng	98
28) cis-1,2-Dichloroethene	10.96	61	978790	78.857	ng	100
29) Diisopropyl Ether	0.00	87	0	N.D.	d	
30) Ethyl Acetate	11.26	61	242686	73.850	ng	93
31) n-Hexane	11.24	57	23816	1.533	ng	99
32) Chloroform	11.29	83	327416	19.951	ng	98
34) Tetrahydrofuran (THF)	11.77	72	2253	0.309	ng	# 58
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.09	62	13346	1.275	ng	99
38) 1,1,1-Trichloroethane	12.36	97	20671	1.483	ng	99
39) Isopropyl Acetate	0.00	61	0	N.D.	d	
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	12.83	78	22833	0.569	ng	98
42) Carbon Tetrachloride	12.99	117	25008	2.014	ng	100
43) Cyclohexane	13.12	84	100877	6.148	ng	96
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	13.68	63	667	N.D.		
46) Bromodichloromethane	13.86	83	5034	0.356	ng	89
47) Trichloroethene	13.91	130	1169115	97.032	ng	100
48) 1,4-Dioxane	13.94	88	1236	0.145	ng	86
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d	
50) Methyl Methacrylate	0.00	100	0	N.D.	d	

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Data File : I:\MS13\DATA\2018 04\16\04161816.D
 Acq On : 16 Apr 2018 17:40
 Sample : P1801754-001 (1000mL)
 Misc : S31-03281803

Vial: 5
 Operator: RS
 Inst : MS13

Quant Time: Apr 18 15:49:23 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:58:13 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

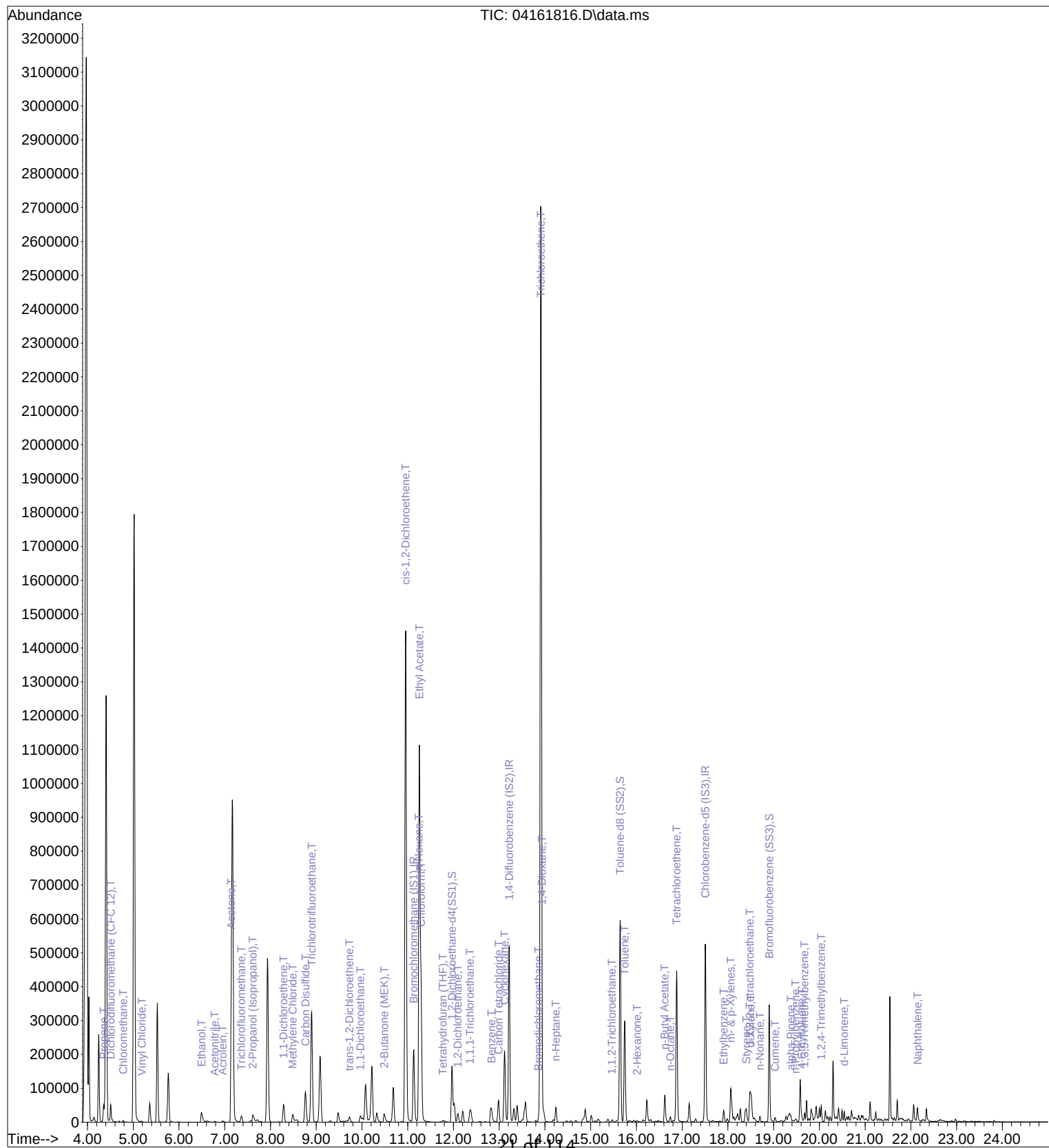
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.24	71	12767	1.243	ng	97
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.	d	
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	15.46	97	1161	0.123	ng	84
58) Toluene	15.74	91	265033	5.585	ng	100
59) 2-Hexanone	16.01	43	4907	0.247	ng	89
60) Dibromochloromethane	16.15	129	502	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.62	43	70302	3.479	ng	98
63) n-Octane	16.74	57	3629	0.391	ng	88
64) Tetrachloroethene	16.88	166	172528	11.582	ng	100
65) Chlorobenzene	17.56	112	806	N.D.		
66) Ethylbenzene	17.91	91	30452	0.596	ng	97
67) m- & p-Xylenes	18.06	91	84672	2.091	ng	99
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.40	104	18765	0.614	ng	99
70) o-Xylene	18.50	91	31173	0.773	ng	98
71) n-Nonane	18.70	43	6030	0.304	ng	95
72) 1,1,2,2-Tetrachloroethane	18.48	83	47149	2.601	ng	100
74) Cumene	19.03	105	7731	0.145	ng	99
75) alpha-Pinene	19.38	93	4929	0.187	ng	# 1
76) n-Propylbenzene	19.48	91	6511	0.108	ng	91
77) 3-Ethyltoluene	0.00	105	0	N.D.	d	
78) 4-Ethyltoluene	19.61	105	6568	0.135	ng	94
79) 1,3,5-Trimethylbenzene	19.67	105	10874	0.234	ng	95
80) alpha-Methylstyrene	0.00	118	0	N.D.	d	
81) 2-Ethyltoluene	0.00	105	0	N.D.	d	
82) 1,2,4-Trimethylbenzene	20.04	105	24482	0.565	ng	86
83) n-Decane	0.00	57	0	N.D.	d	
84) Benzyl Chloride	20.16	91	457	N.D.		
85) 1,3-Dichlorobenzene	20.24	146	585	N.D.		
86) 1,4-Dichlorobenzene	20.24	146	585	N.D.		
87) sec-Butylbenzene	20.28	105	587	N.D.		
88) 4-Isopropyltoluene (p-...	0.00	119	0	N.D.	d	
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D.	d	
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	20.54	68	6737	0.427	ng	92
92) 1,2-Dibromo-3-Chloropr...	20.85	157	325	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	22.15	128	16267	0.310	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	20.04	119	3127	N.D.		
100) n-Butylbenzene	0.00	91	0	N.D.	d	

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

Data File : I:\MS13\DATA\2018 04\16\04161816.D
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Sample : P1801754-001 (1000mL)
Misc : S31-03281803

Vial: 5
Operator: RS
Inst : MS13

Quant Time: Apr 18 15:49:23 2018
Quant Method : I:\MS13\METHODS\R13032918.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Mar 30 08:58:13 2018
Response via : Initial Calibration
DataAcq Meth:TO15.M



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Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.13	130	107057	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.22	114	528764	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.51	82	190242	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.97	65	125700	12.727	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	101.84%	
57) Toluene-d8 (SS2)	15.64	98	498310	11.854	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	94.80%	
73) Bromofluorobenzene (SS3)	18.91	174	124499	10.501	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	84.00%	

Target Compounds

						Qvalue
2) Propene	4.35	42	16346	1.573	ng	94
3) Dichlorodifluoromethan...	4.51	85	44068	2.444	ng	99
4) Chloromethane	4.78	50	1450	0.103	ng	82
6) Vinyl Chloride	5.19	62	1829	0.131	ng	98
10) Ethanol	6.49	45	57585	9.317	ng	99
11) Acetonitrile	6.78	41	4314	0.288	ng	99
12) Acrolein	6.95	56	6461	1.121	ng	99
13) Acetone	7.14	58	146260	20.358	ng	# 1
14) Trichlorofluoromethane	7.36	101	20146	1.276	ng	100
15) 2-Propanol (Isopropanol)	7.61	45	53276	2.462	ng	96
17) 1,1-Dichloroethene	8.29	96	29364	2.850	ng	97
19) Methylene Chloride	8.49	84	12175	1.058	ng	97
21) Trichlorotrifluoroethane	8.90	151	154396	14.512	ng	92
22) Carbon Disulfide	8.76	76	171909	4.315	ng	99
23) trans-1,2-Dichloroethene	9.73	61	12078	1.057	ng	95
24) 1,1-Dichloroethane	9.96	63	24197	1.415	ng	98
27) 2-Butanone (MEK)	10.49	72	13003	2.071	ng	98
28) cis-1,2-Dichloroethene	10.96	61	978790	78.857	ng	100
30) Ethyl Acetate	11.26	61	242686	73.850	ng	93
31) n-Hexane	11.24	57	23816	1.533	ng	99
32) Chloroform	11.29	83	327416	19.951	ng	98
34) Tetrahydrofuran (THF)	11.77	72	2253	0.309	ng	# 58
36) 1,2-Dichloroethane	12.09	62	13346	1.275	ng	99
38) 1,1,1-Trichloroethane	12.36	97	20671	1.483	ng	99
41) Benzene	12.83	78	22833	0.569	ng	98
42) Carbon Tetrachloride	12.99	117	25008	2.014	ng	100
43) Cyclohexane	13.12	84	100877	6.148	ng	96
46) Bromodichloromethane	13.86	83	5034	0.356	ng	89
47) Trichloroethene	13.91	130	1169115	97.032	ng	100
48) 1,4-Dioxane	13.94	88	1236	0.145	ng	86
51) n-Heptane	14.24	71	12767	1.243	ng	97
55) 1,1,2-Trichloroethane	15.46	97	1161	0.123	ng	84
58) Toluene	15.74	91	265033	5.585	ng	100
59) 2-Hexanone	16.01	43	4907	0.247	ng	89
62) n-Butyl Acetate	16.62	43	70302	3.479	ng	98
63) n-Octane	16.74	57	3629	0.391	ng	88
64) Tetrachloroethene	16.88	166	172528	11.582	ng	100
66) Ethylbenzene	17.91	91	30452	0.596	ng	97
67) m- & p-Xylenes	18.06	91	84672	2.091	ng	99
69) Styrene	18.40	104	18765	0.614	ng	99
70) o-Xylene	18.50	91	31173	0.773	ng	98
71) n-Nonane	18.70	43	6030	0.304	ng	95
72) 1,1,2,2-Tetrachloroethane	18.48	83	47149	2.601	ng	100
74) Cumene	19.03	105	7731	0.145	ng	99
75) alpha-Pinene	19.38	93	4929	0.187	ng	# 1
76) n-Propylbenzene	19.48	91	6511	0.108	ng	91
78) 4-Ethyltoluene	19.61	105	6568	0.135	ng	94

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Data File : I:\MS13\DATA\2018 04\16\04161816.D
Acq On : 16 Apr 2018 17:40
Sample : P1801754-001 (1000mL)
Misc : S31-03281803

Vial: 5
Operator: RS
Inst : MS13

Quant Time: Apr 18 15:49:23 2018
Quant Method : I:\MS13\METHODS\R13032918.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Mar 30 08:58:13 2018
Response via : Initial Calibration
DataAcq Meth:TO15.M

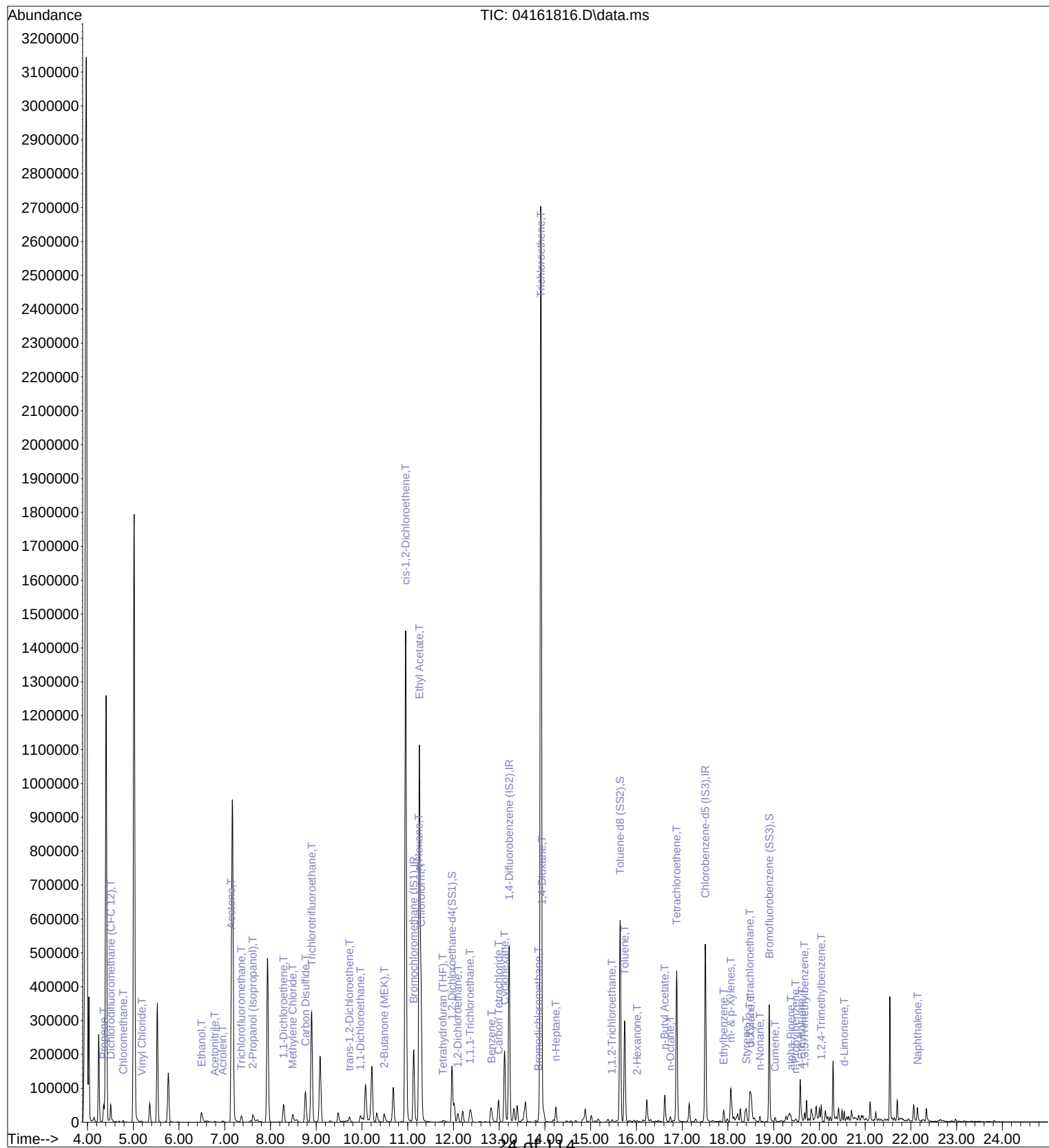
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
79) 1,3,5-Trimethylbenzene	19.67	105	10874	0.234	ng	95
82) 1,2,4-Trimethylbenzene	20.04	105	24482	0.565	ng	86
91) d-Limonene	20.54	68	6737	0.427	ng	92
95) Naphthalene	22.15	128	16267	0.310	ng	99

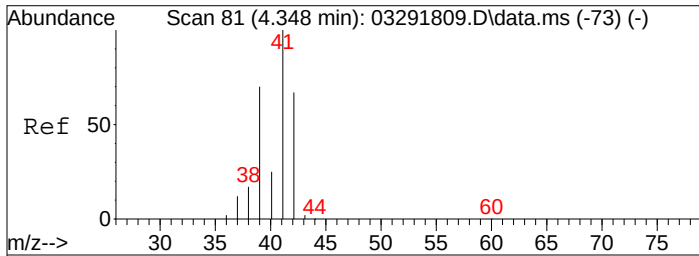
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2018 04\16\04161816.D
Acq On : 16 Apr 2018 17:40
Sample : P1801754-001 (1000mL)
Misc : S31-03281803

Vial: 5
Operator: RS
Inst : MS13

Quant Time: Apr 18 15:49:23 2018
Quant Method : I:\MS13\METHODS\R13032918.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Mar 30 08:58:13 2018
Response via : Initial Calibration
DataAcq Meth:TO15.M





#2

Propene

Concen: 1.57 ng

RT: 4.35 min Scan# 82

Delta R.T. -0.006 min

Lab File: 04161816.D

Acq: 16 Apr 2018 17:40

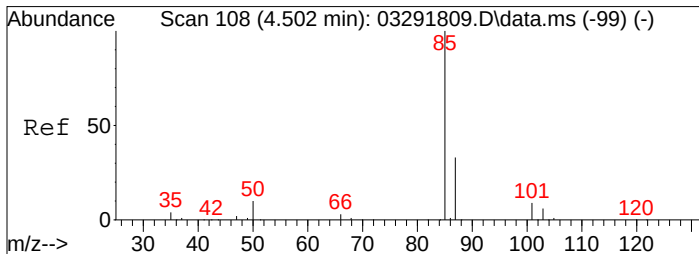
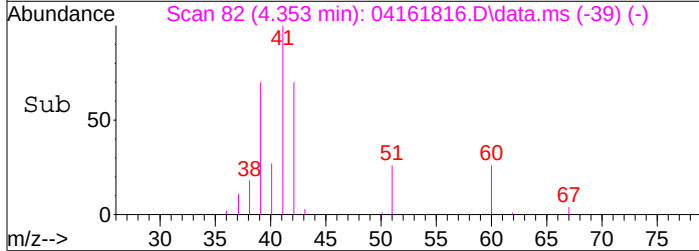
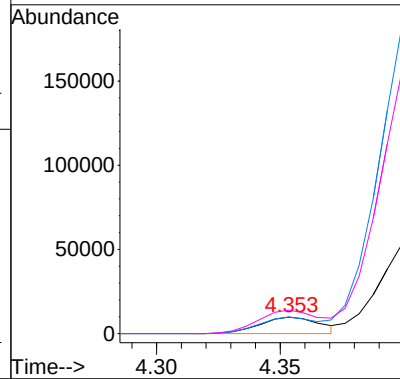
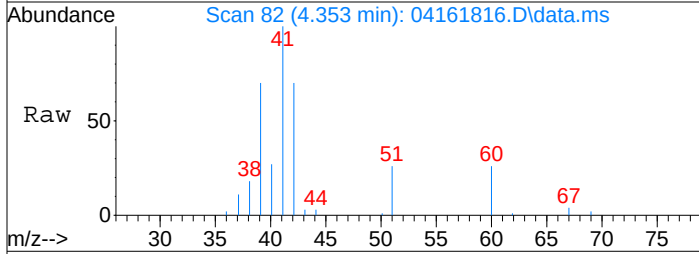
Tgt Ion: 42 Resp: 16346

Ion Ratio Lower Upper

42 100

39 93.5 84.6 124.6

41 152.6 129.8 169.8



#3

Dichlorodifluoromethane (CFC 12)

Concen: 2.44 ng

RT: 4.51 min Scan# 109

Delta R.T. -0.000 min

Lab File: 04161816.D

Acq: 16 Apr 2018 17:40

Tgt Ion: 85 Resp: 44068

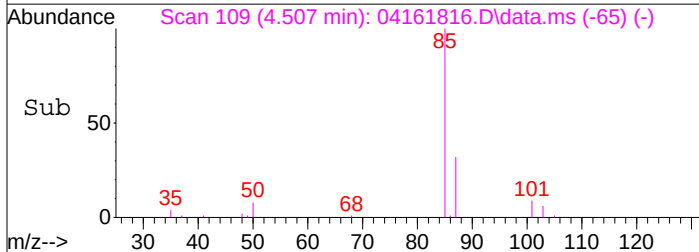
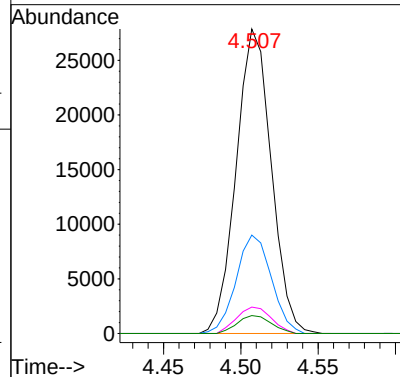
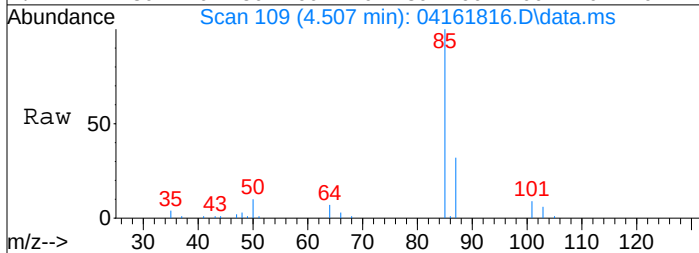
Ion Ratio Lower Upper

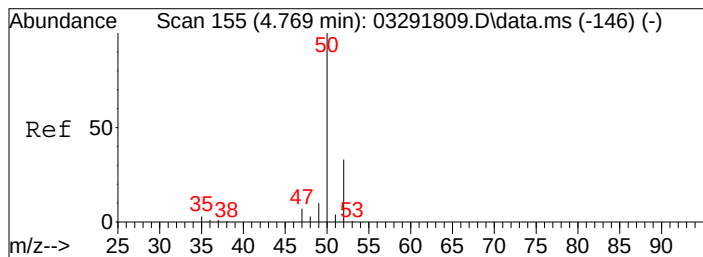
85 100

87 32.5 12.7 52.7

101 8.6 0.0 29.2

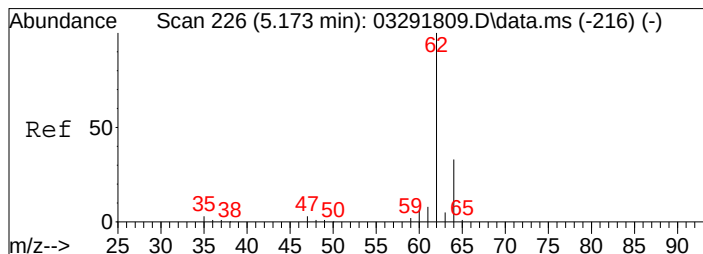
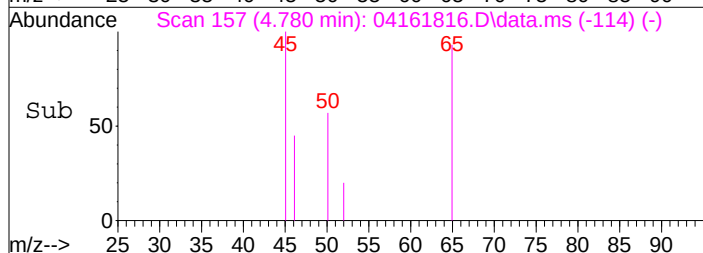
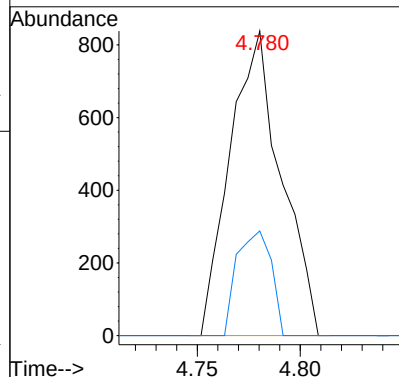
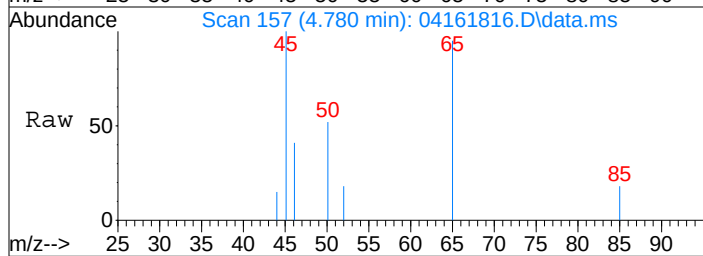
103 5.7 0.0 26.1





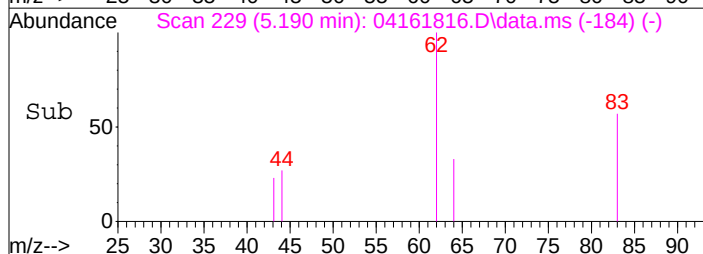
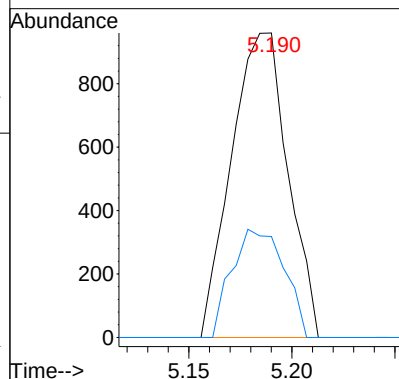
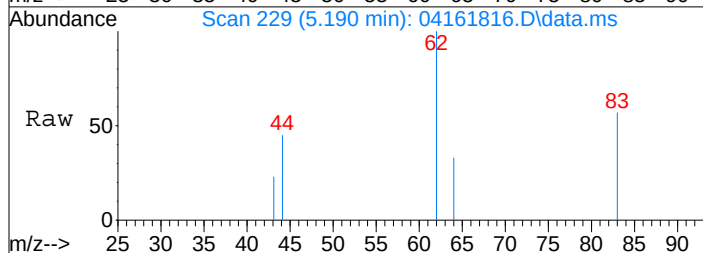
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Chloromethane
Concen: 0.10 ng
RT: 4.78 min Scan# 157
Delta R.T. -0.006 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

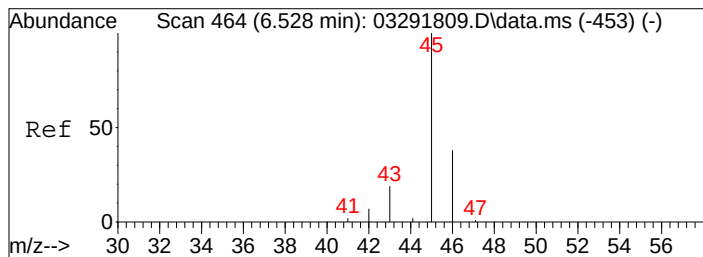
Tgt Ion: 50 Resp: 1450
Ion Ratio Lower Upper
50 100
52 23.0 13.0 53.0



#6
Vinyl Chloride
Concen: 0.13 ng
RT: 5.19 min Scan# 229
Delta R.T. 0.006 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

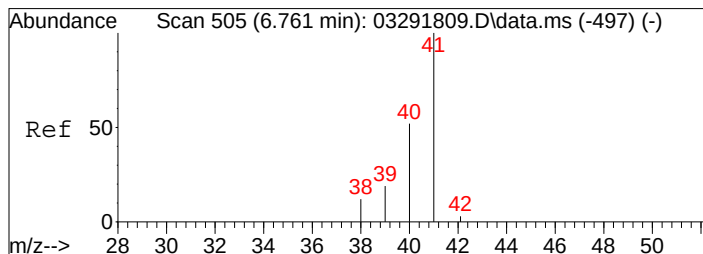
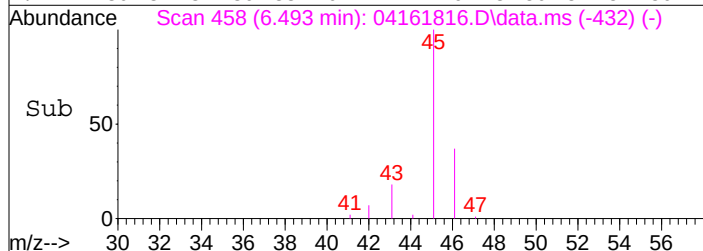
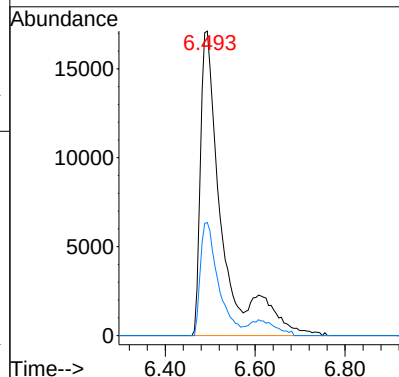
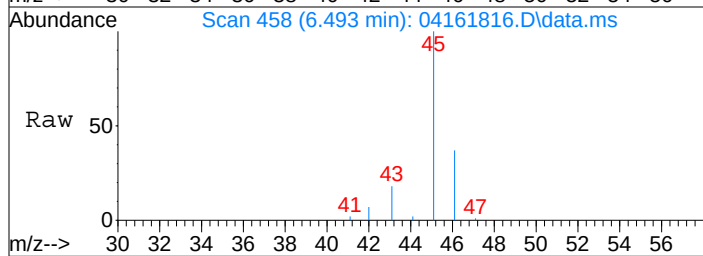
Tgt Ion: 62 Resp: 1829
Ion Ratio Lower Upper
62 100
64 33.0 12.1 52.1





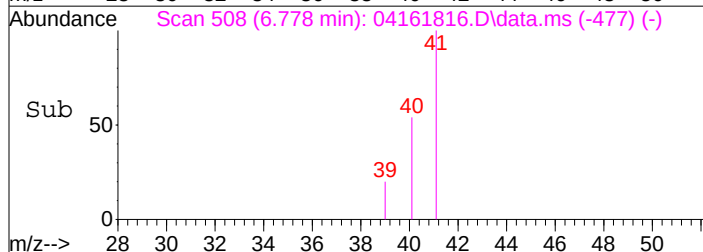
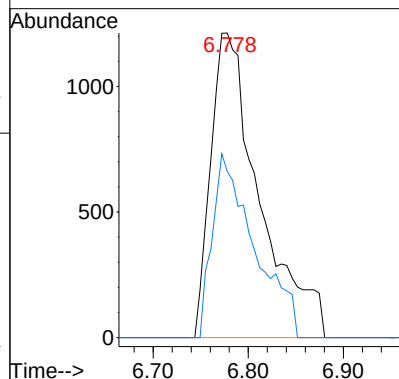
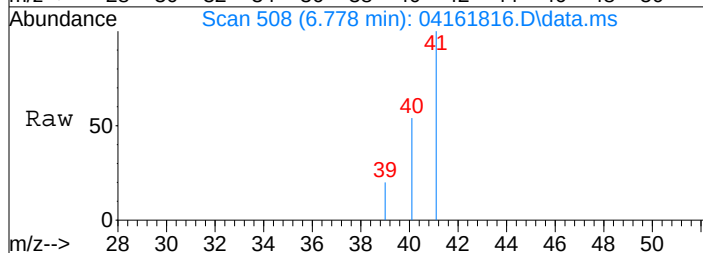
#10
Ethanol
Concen: 9.32 ng
RT: 6.49 min Scan# 458
Delta R.T. -0.103 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

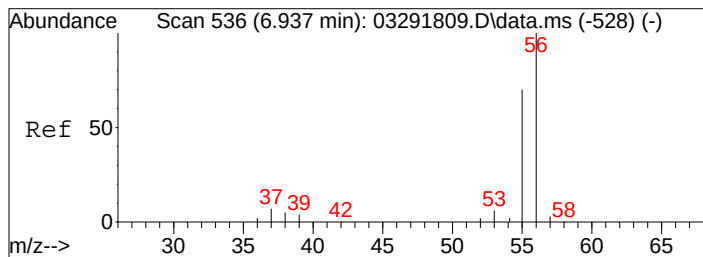
Tgt Ion: 45 Resp: 57585
Ion Ratio Lower Upper
45 100
46 36.9 17.5 57.5



#11
Acetonitrile
Concen: 0.29 ng
RT: 6.78 min Scan# 508
Delta R.T. -0.023 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

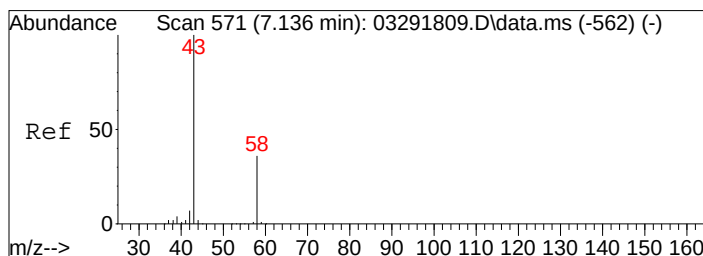
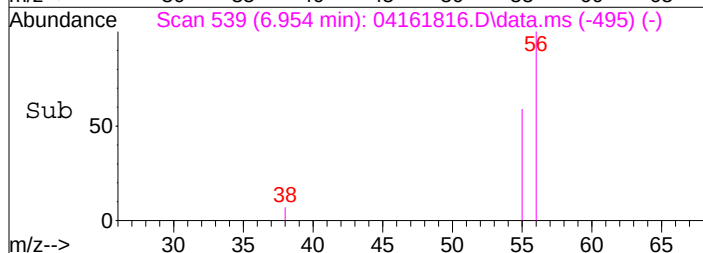
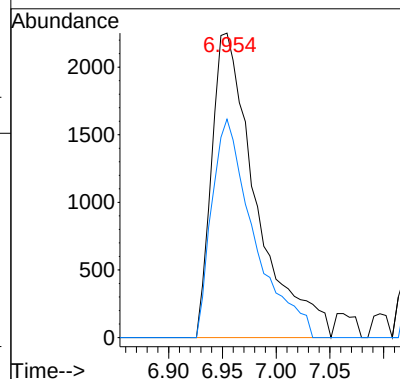
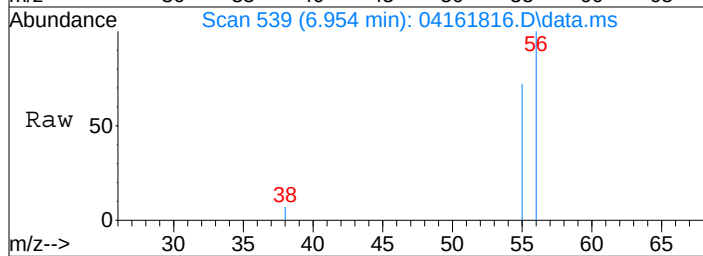
Tgt Ion: 41 Resp: 4314
Ion Ratio Lower Upper
41 100
40 52.2 32.6 72.6





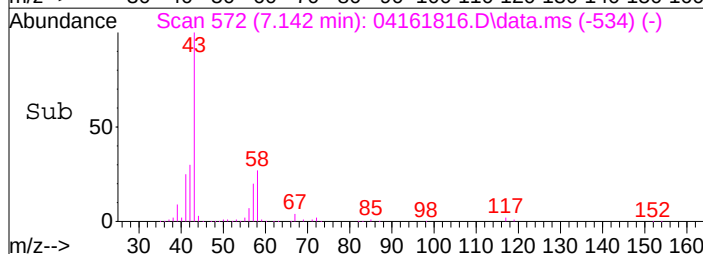
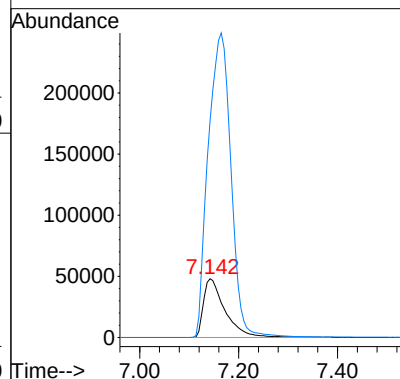
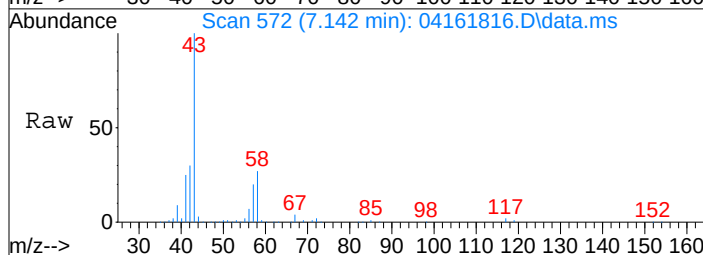
#12
Acrolein
Concen: 1.12 ng
RT: 6.95 min Scan# 539
Delta R.T. -0.000 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

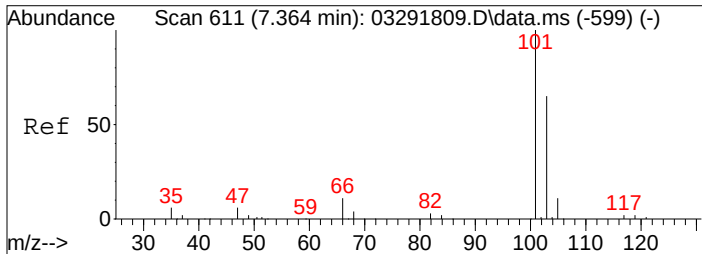
Tgt Ion: 56 Resp: 6461
Ion Ratio Lower Upper
56 100
55 68.1 49.1 89.1



#13
Acetone
Concen: 20.36 ng
RT: 7.14 min Scan# 572
Delta R.T. -0.034 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

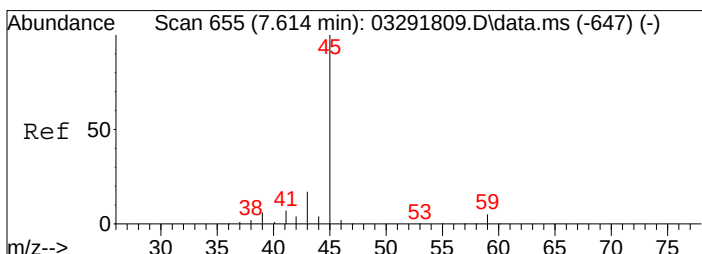
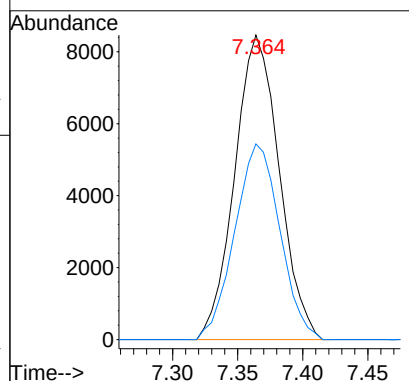
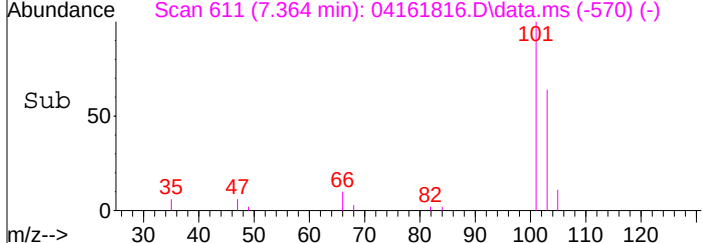
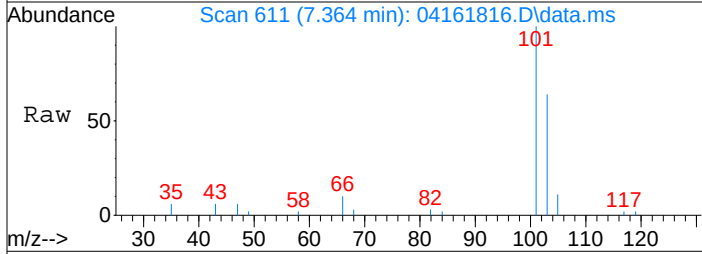
Tgt Ion: 58 Resp: 146260
Ion Ratio Lower Upper
58 100
43 546.7 244.3 304.3#





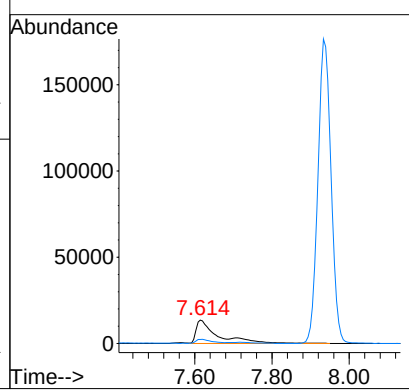
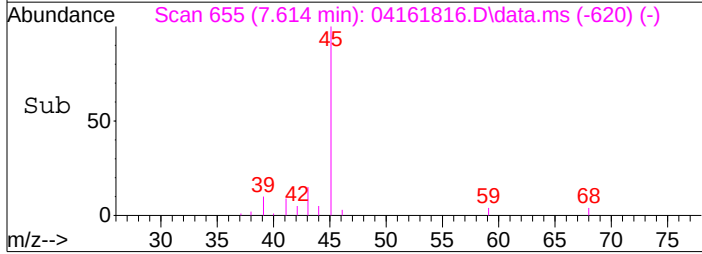
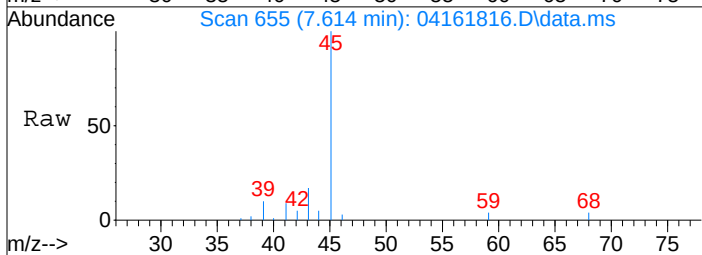
#14
 Trichlorofluoromethane
 Concen: 1.28 ng
 RT: 7.36 min Scan# 611
 Delta R.T. -0.017 min
 Lab File: 04161816.D
 Acq: 16 Apr 2018 17:40

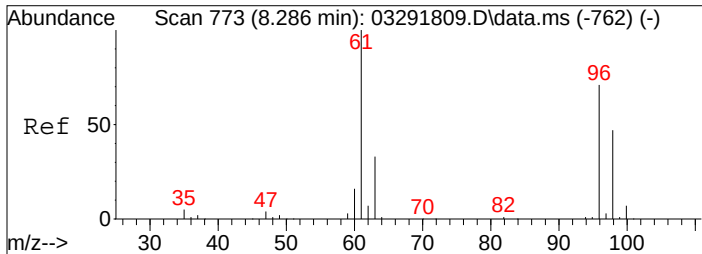
Tgt Ion:101	Resp:	20146
Ion Ratio	Lower	Upper
101	100	
103	65.2	45.0 85.0



#15
 2-Propanol (Isopropanol)
 Concen: 2.46 ng
 RT: 7.61 min Scan# 655
 Delta R.T. -0.051 min
 Lab File: 04161816.D
 Acq: 16 Apr 2018 17:40

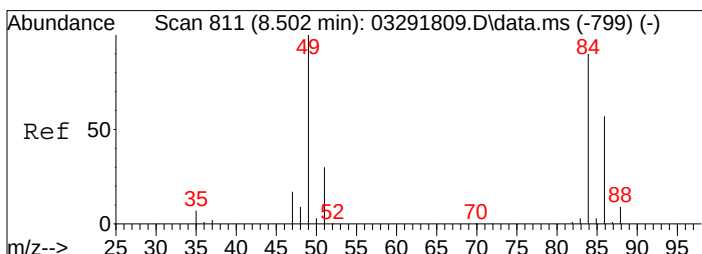
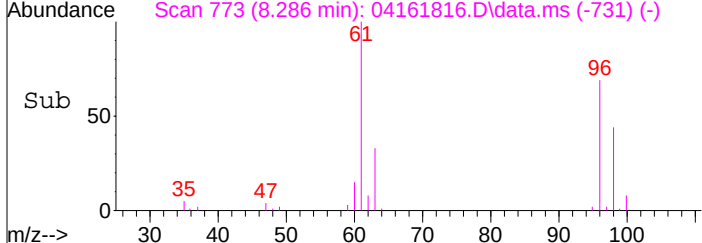
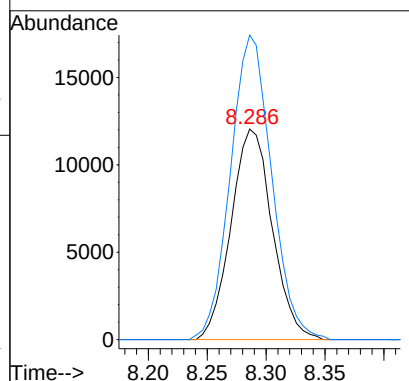
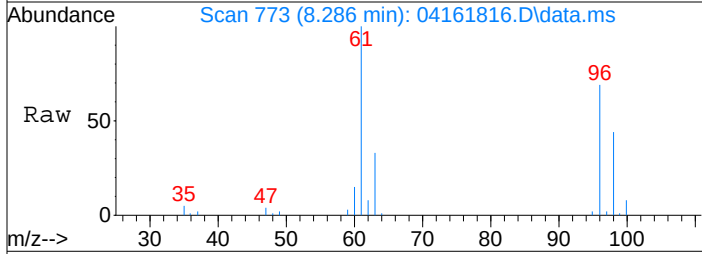
Tgt Ion: 45	Resp:	53276
Ion Ratio	Lower	Upper
45	100	
43	18.9	0.0 37.2





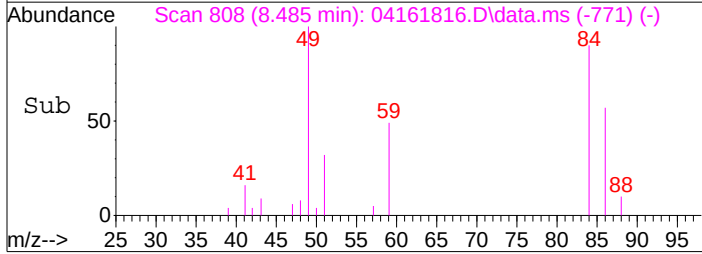
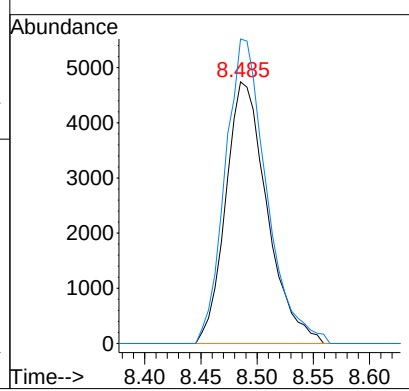
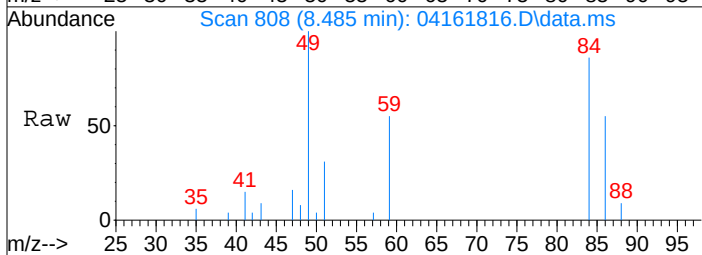
#17
 1,1-Dichloroethene
 Concen: 2.85 ng
 RT: 8.29 min Scan# 773
 Delta R.T. -0.011 min
 Lab File: 04161816.D
 Acq: 16 Apr 2018 17:40

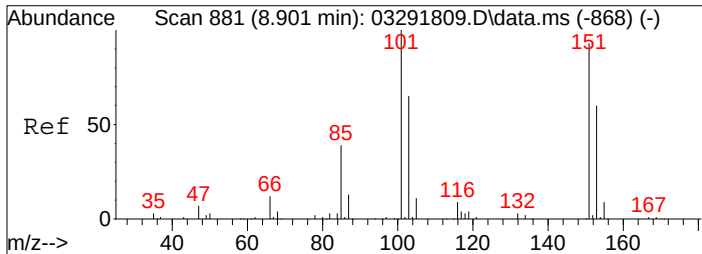
Tgt Ion:	96	Resp:	29364
Ion Ratio	Lower	Upper	
96	100		
61	144.4	120.2	160.2



#19
 Methylene Chloride
 Concen: 1.06 ng
 RT: 8.49 min Scan# 808
 Delta R.T. -0.040 min
 Lab File: 04161816.D
 Acq: 16 Apr 2018 17:40

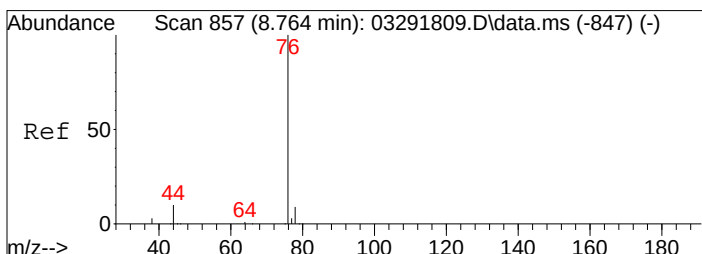
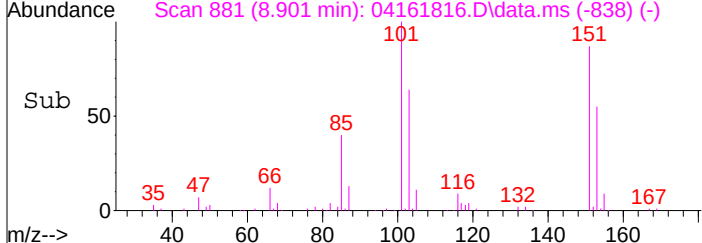
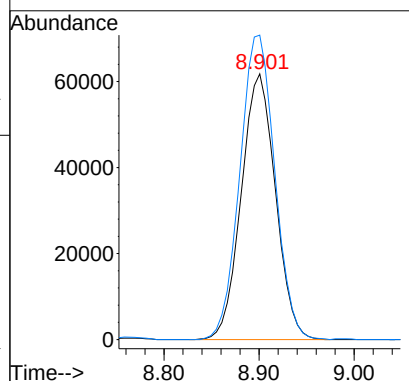
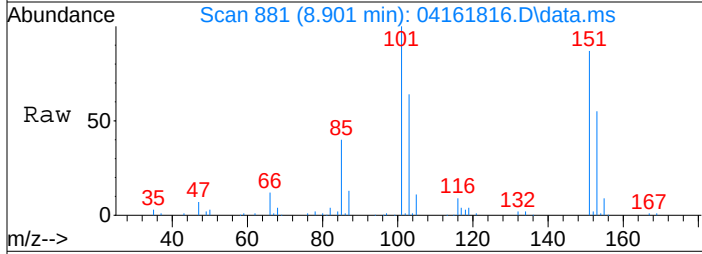
Tgt Ion:	84	Resp:	12175
Ion Ratio	Lower	Upper	
84	100		
49	116.3	87.7	137.7





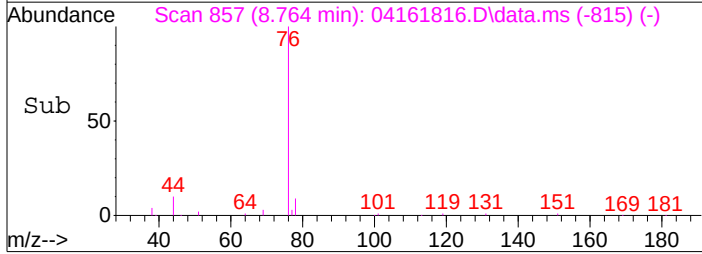
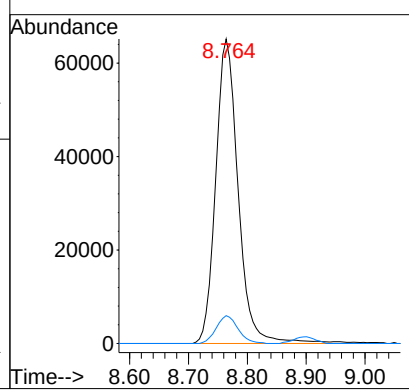
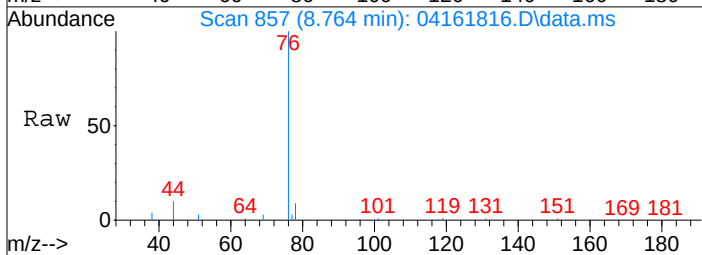
#21
 Trichlorotrifluoroethane
 Concen: 14.51 ng
 RT: 8.90 min Scan# 881
 Delta R.T. -0.006 min
 Lab File: 04161816.D
 Acq: 16 Apr 2018 17:40

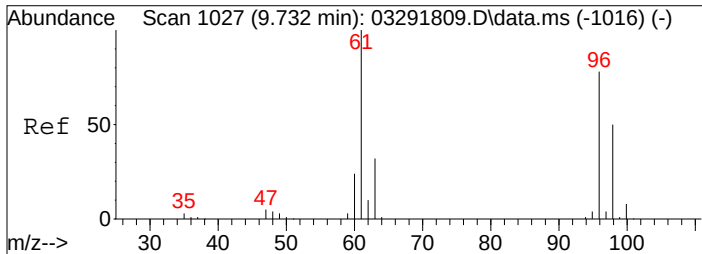
Tgt Ion: 151	Resp: 154396
Ion Ratio	Lower Upper
151	100
101	117.3 88.8 128.8



#22
 Carbon Disulfide
 Concen: 4.32 ng
 RT: 8.76 min Scan# 857
 Delta R.T. -0.011 min
 Lab File: 04161816.D
 Acq: 16 Apr 2018 17:40

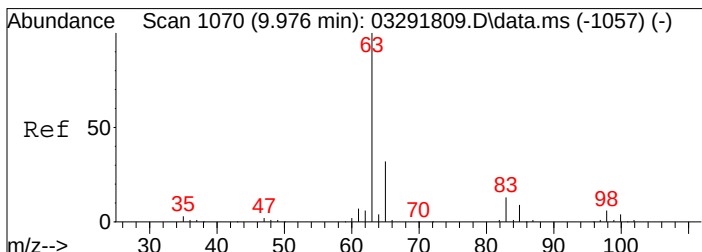
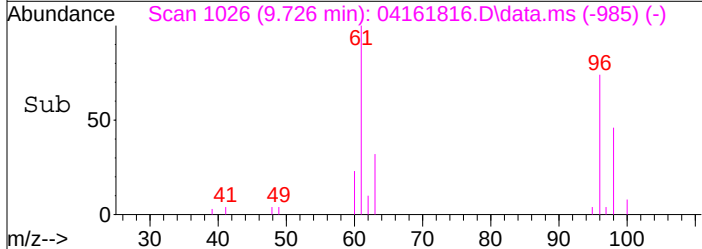
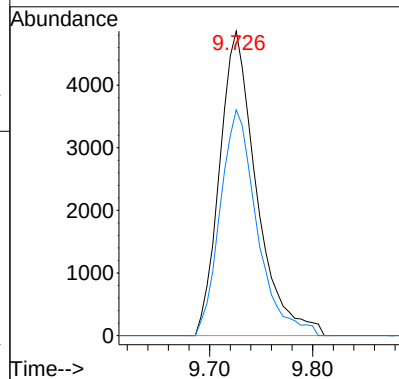
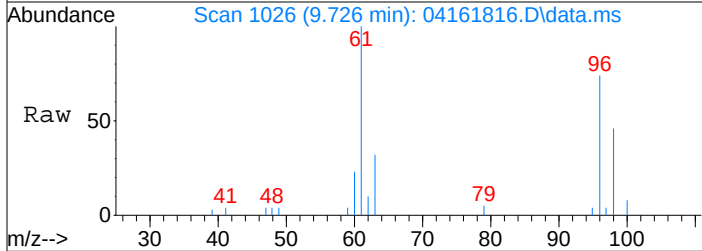
Tgt Ion: 76	Resp: 171909
Ion Ratio	Lower Upper
76	100
78	8.9 0.0 29.2





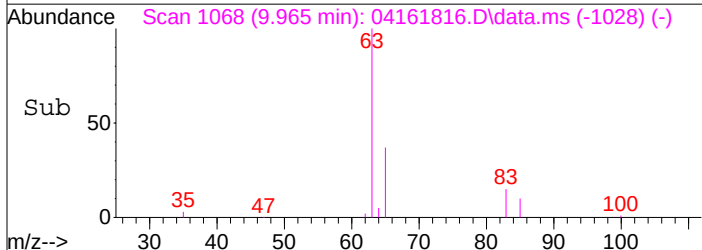
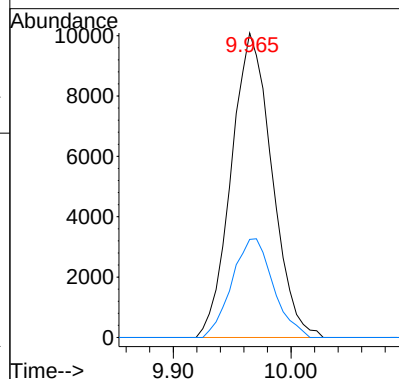
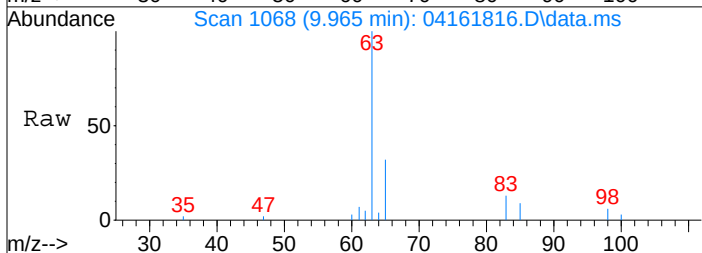
#23
trans-1,2-Dichloroethene
Concen: 1.06 ng
RT: 9.73 min Scan# 1026
Delta R.T. -0.017 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

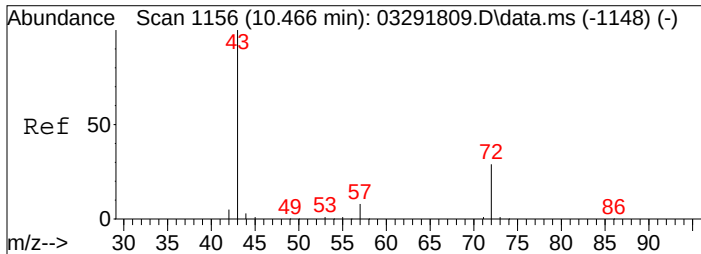
Tgt Ion	61	Resp	12078	Ion Ratio	Lower	Upper
61	100					
96	74.0	58.0	98.0			



#24
1,1-Dichloroethane
Concen: 1.41 ng
RT: 9.96 min Scan# 1068
Delta R.T. -0.023 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

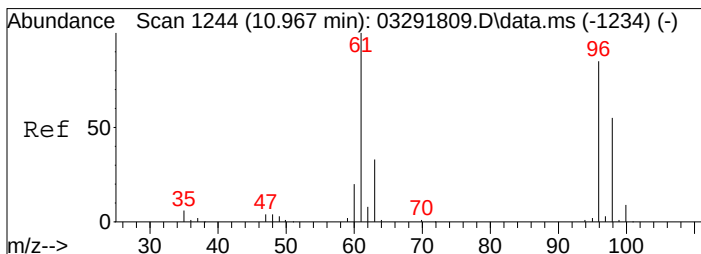
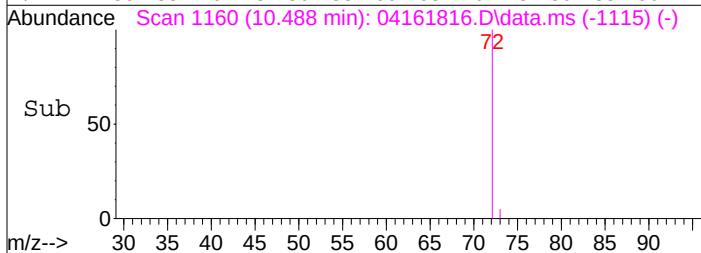
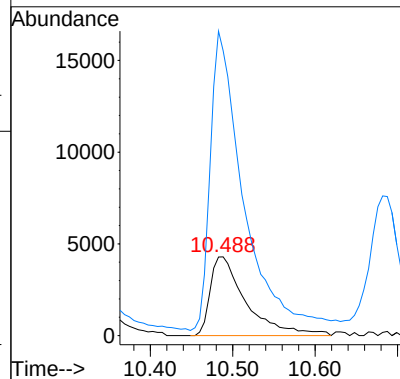
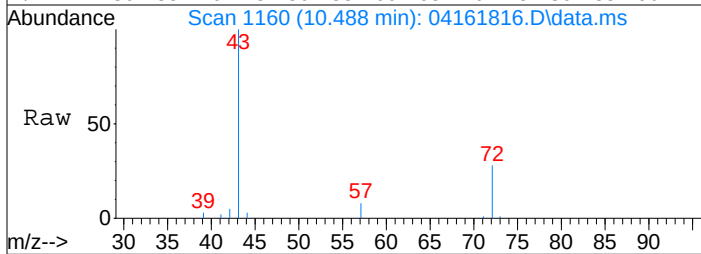
Tgt Ion	63	Resp	24197	Ion Ratio	Lower	Upper
63	100					
65	32.9	11.9	51.9			





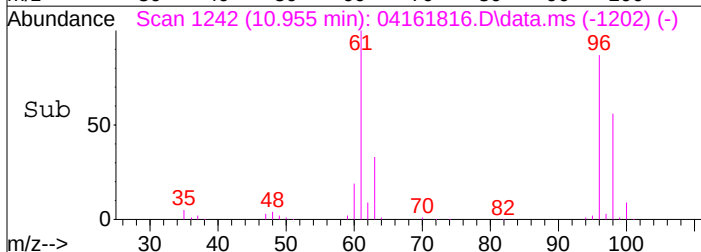
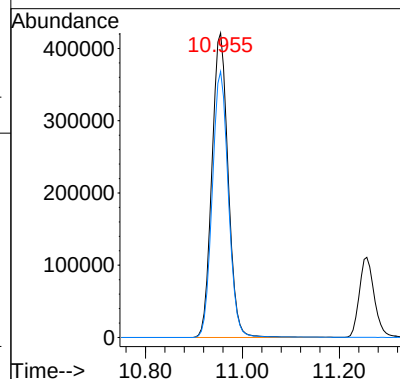
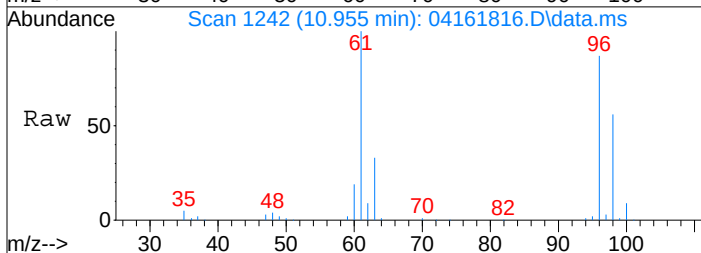
#27
2-Butanone (MEK)
Concen: 2.07 ng
RT: 10.49 min Scan# 1160
Delta R.T. 0.006 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

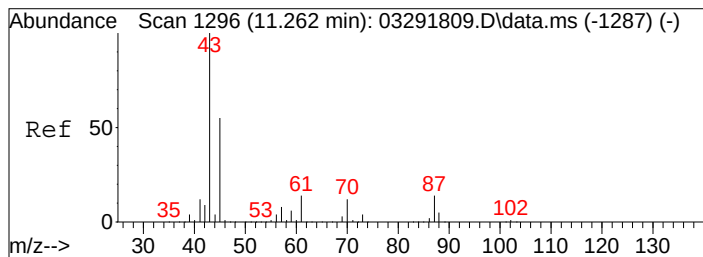
Tgt Ion: 72 Resp: 13003
Ion Ratio Lower Upper
72 100
43 355.9 331.0 371.0



#28
cis-1,2-Dichloroethene
Concen: 78.86 ng
RT: 10.96 min Scan# 1242
Delta R.T. -0.023 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

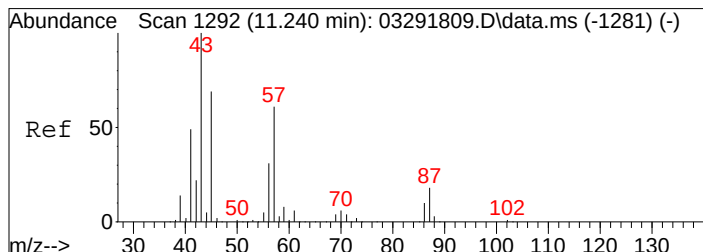
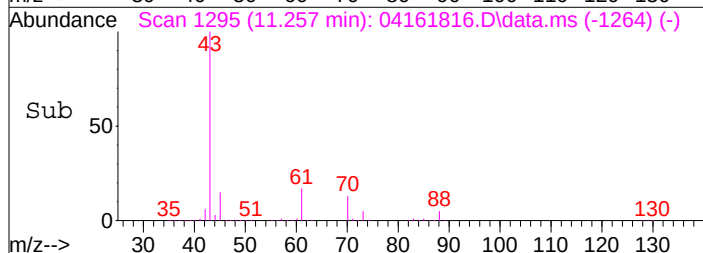
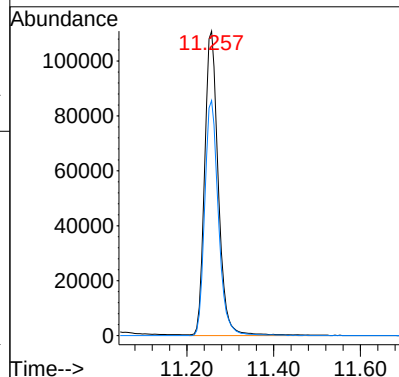
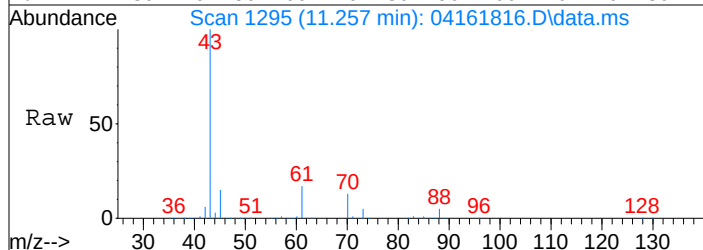
Tgt Ion: 61 Resp: 978790
Ion Ratio Lower Upper
61 100
96 86.8 66.4 106.4





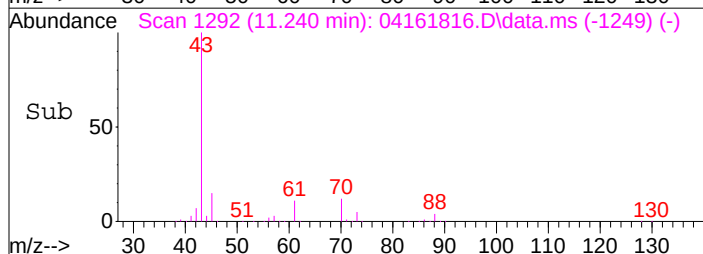
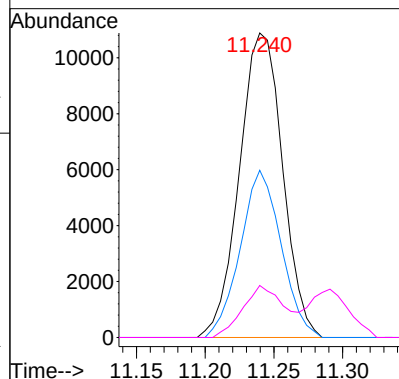
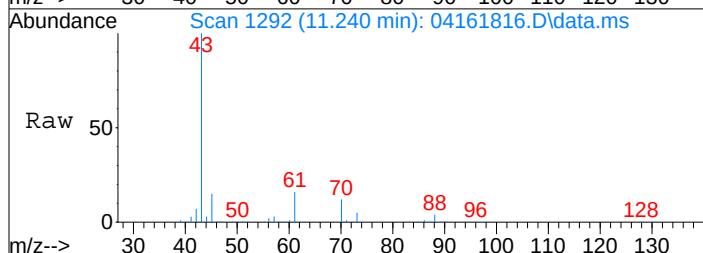
#30
Ethyl Acetate
Concen: 73.85 ng
RT: 11.26 min Scan# 1295
Delta R.T. -0.023 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

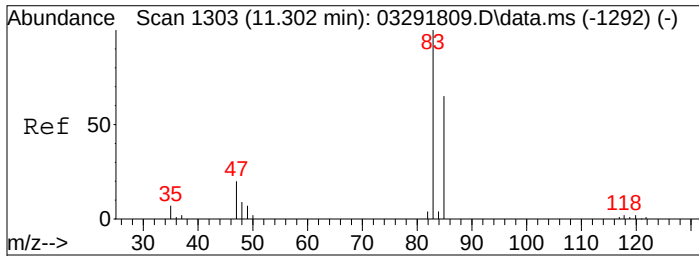
Tgt Ion: 61 Resp: 242686
Ion Ratio Lower Upper
61 100
70 77.3 63.7 103.7



#31
n-Hexane
Concen: 1.53 ng
RT: 11.24 min Scan# 1292
Delta R.T. -0.006 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

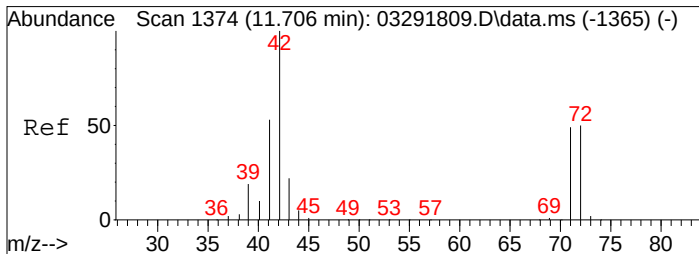
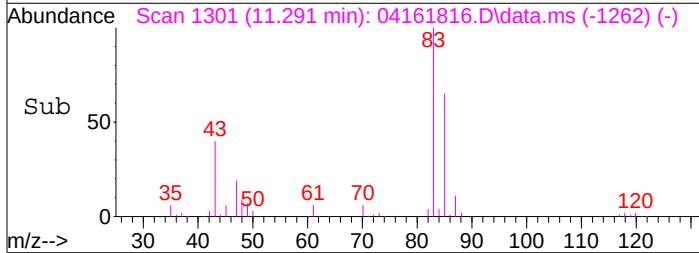
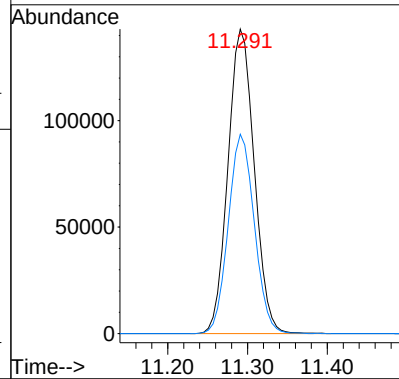
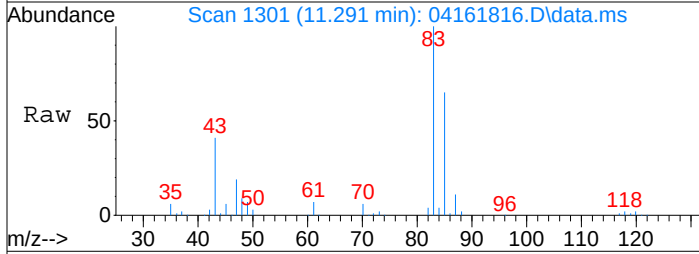
Tgt Ion: 57 Resp: 23816
Ion Ratio Lower Upper
57 100
56 52.0 40.9 61.3
86 16.9 13.7 20.5





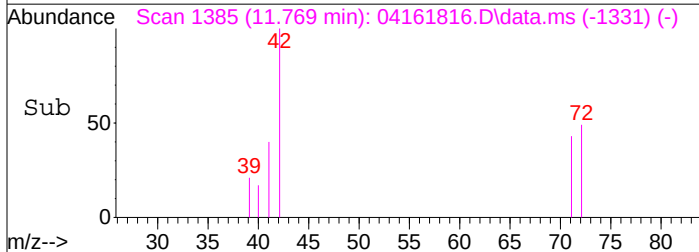
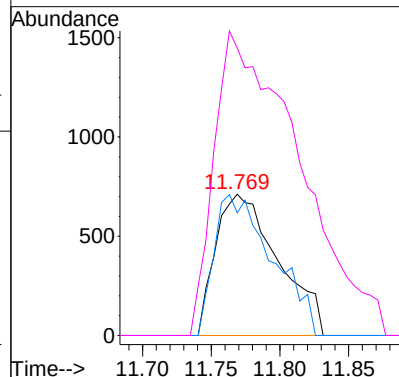
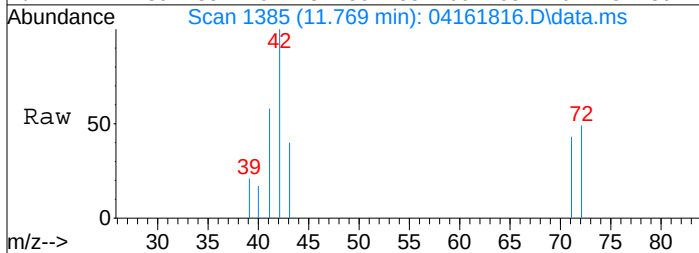
#32
Chloroform
Concen: 19.95 ng
RT: 11.29 min Scan# 1301
Delta R.T. -0.029 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

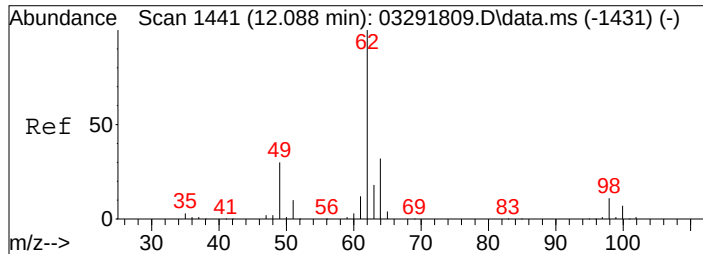
Tgt Ion: 83 Resp: 327416
Ion Ratio Lower Upper
83 100
85 64.9 46.1 86.1



#34
Tetrahydrofuran (THF)
Concen: 0.31 ng
RT: 11.77 min Scan# 1385
Delta R.T. 0.057 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

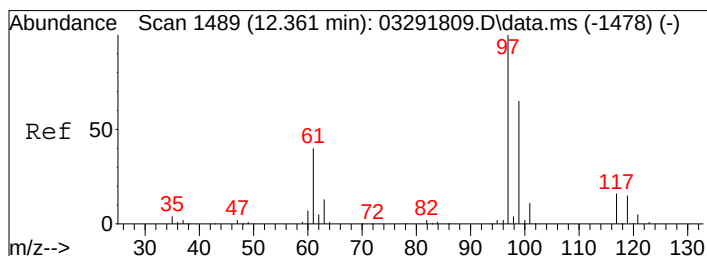
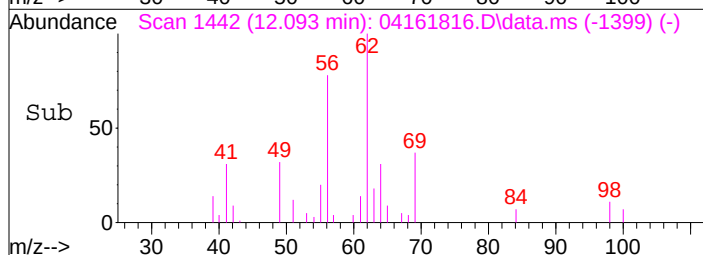
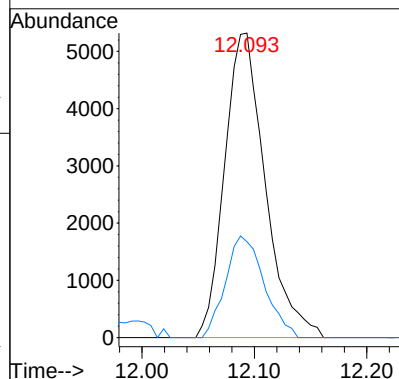
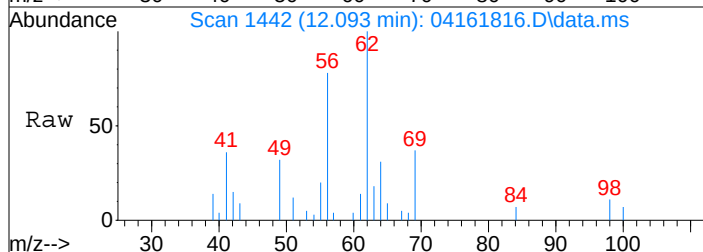
Tgt Ion: 72 Resp: 2253
Ion Ratio Lower Upper
72 100
71 92.6 76.9 116.9
42 293.4 181.2 221.2#





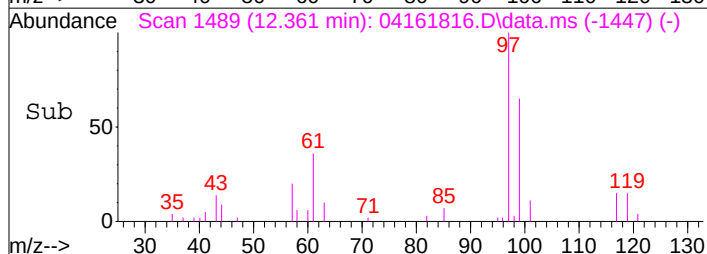
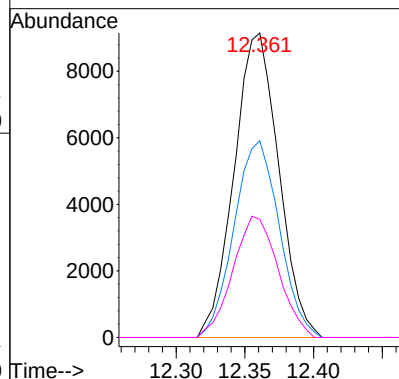
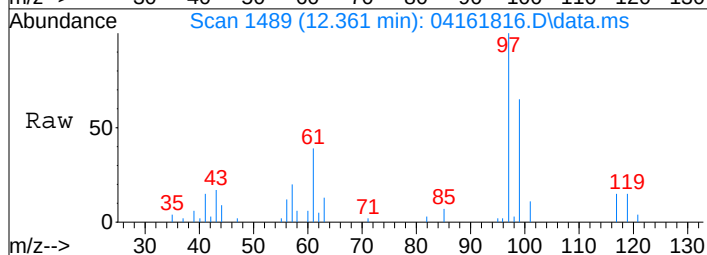
#36
1,2-Dichloroethane
Concen: 1.28 ng
RT: 12.09 min Scan# 1442
Delta R.T. -0.006 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

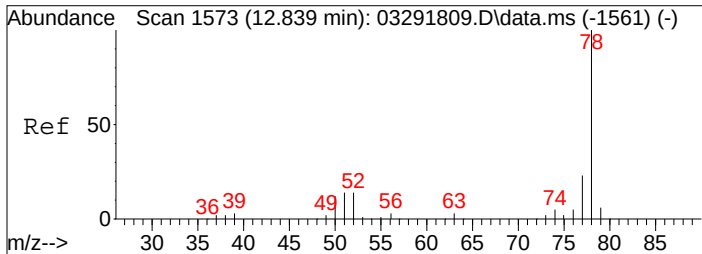
Tgt Ion: 62 Resp: 13346
Ion Ratio Lower Upper
62 100
64 31.7 12.5 52.5



#38
1,1,1-Trichloroethane
Concen: 1.48 ng
RT: 12.36 min Scan# 1489
Delta R.T. -0.011 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

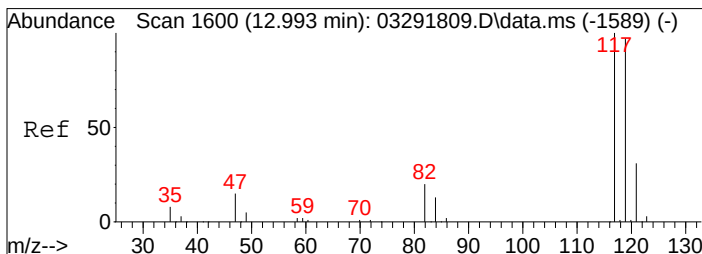
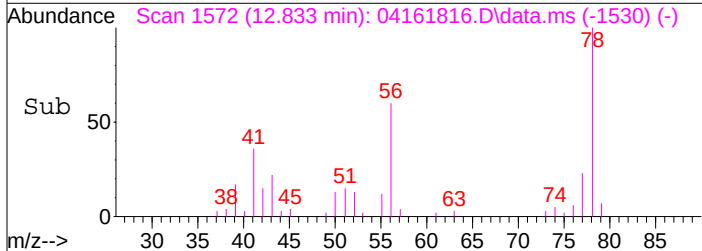
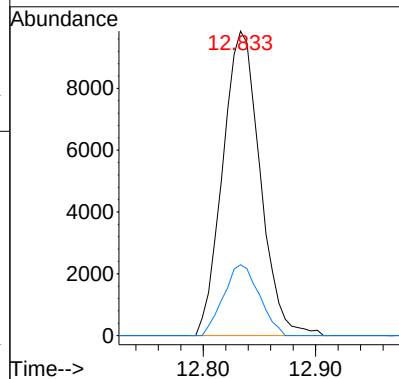
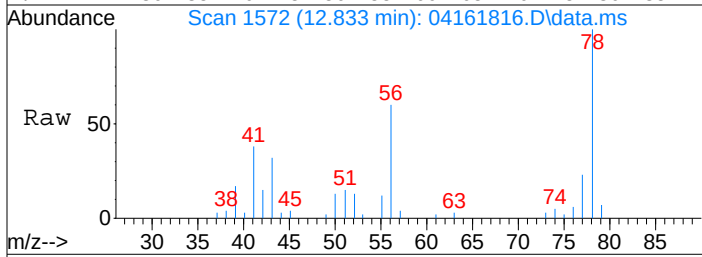
Tgt Ion: 97 Resp: 20671
Ion Ratio Lower Upper
97 100
99 65.5 45.1 85.1
61 40.4 19.4 59.4





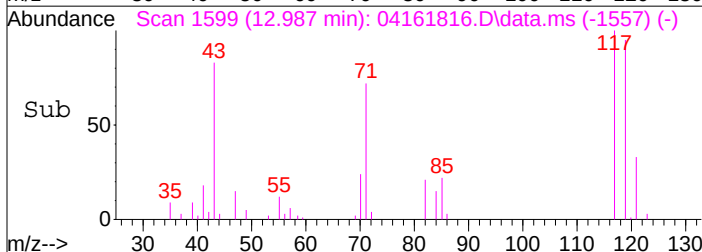
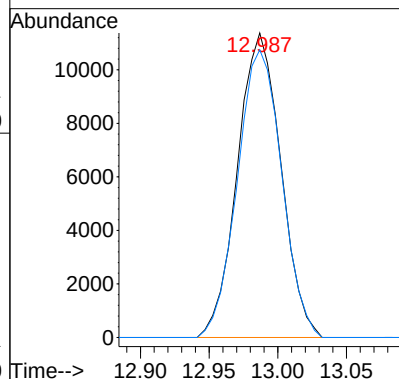
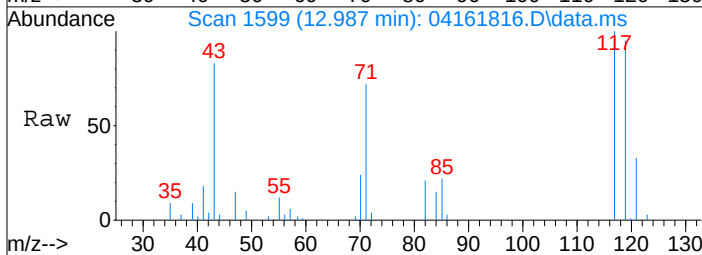
#41
Benzene
Concen: 0.57 ng
RT: 12.83 min Scan# 1572
Delta R.T. -0.012 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

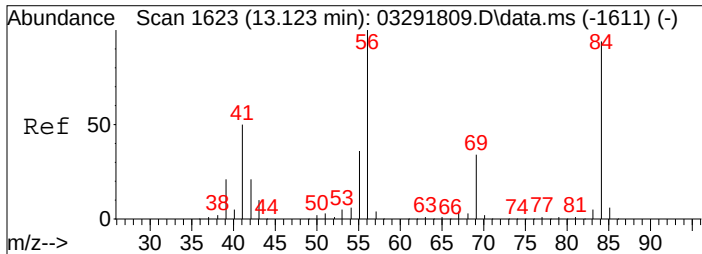
Tgt Ion	78	77	Ratio	22.2	Resp	3.2	Lower	Upper	43.2
Ion	100								



#42
Carbon Tetrachloride
Concen: 2.01 ng
RT: 12.99 min Scan# 1599
Delta R.T. -0.011 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

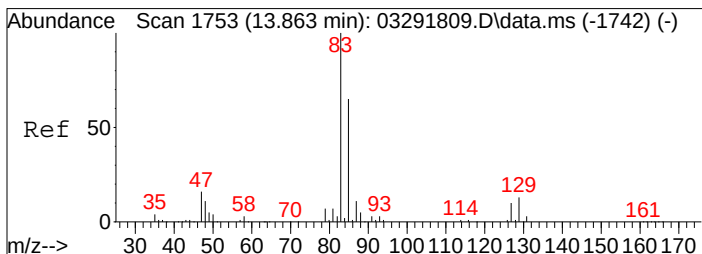
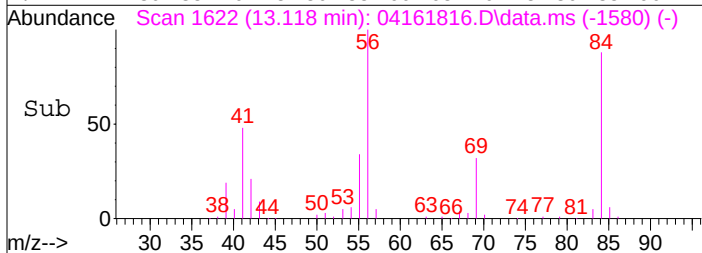
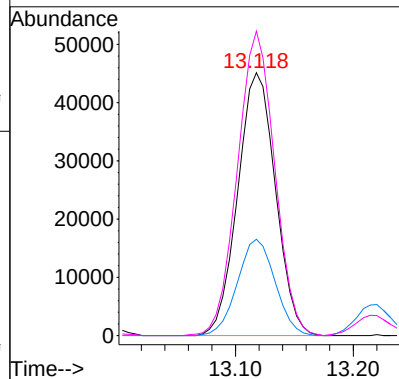
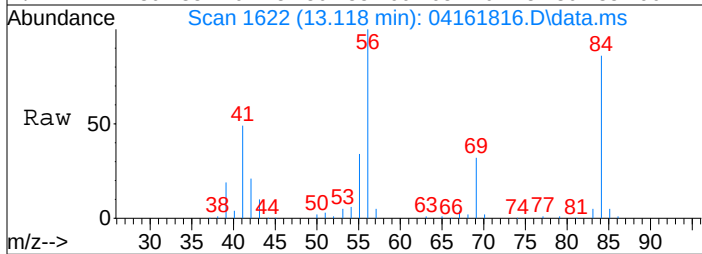
Tgt Ion	117	119	Ratio	96.5	Resp	76.7	Lower	Upper	116.7
Ion	100								





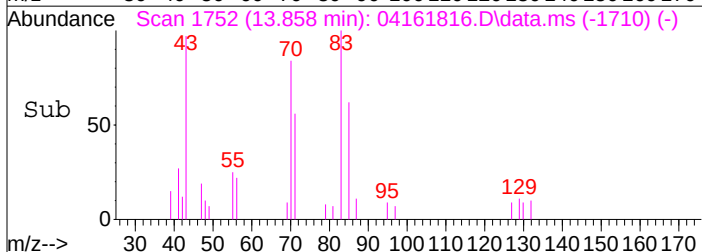
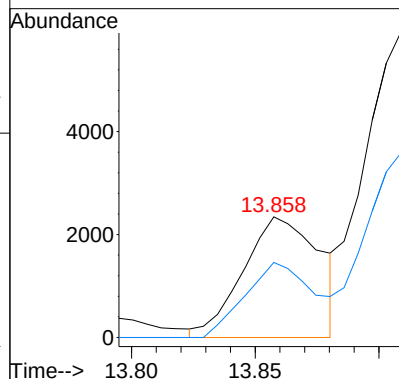
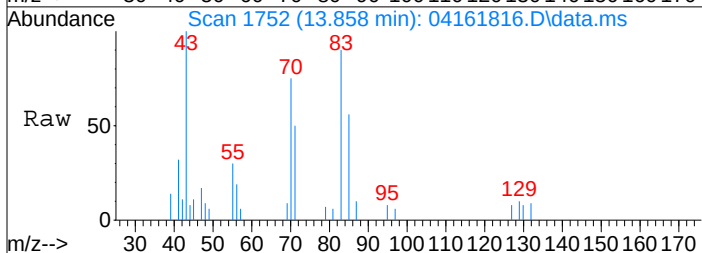
#43
Cyclohexane
Concen: 6.15 ng
RT: 13.12 min Scan# 1622
Delta R.T. -0.011 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

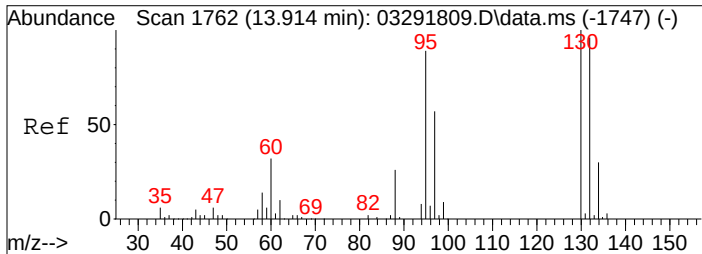
Tgt Ion: 84 Resp: 100877
Ion Ratio Lower Upper
84 100
69 36.5 16.3 56.3
56 114.2 88.1 128.1



#46
Bromodichloromethane
Concen: 0.36 ng
RT: 13.86 min Scan# 1752
Delta R.T. -0.011 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

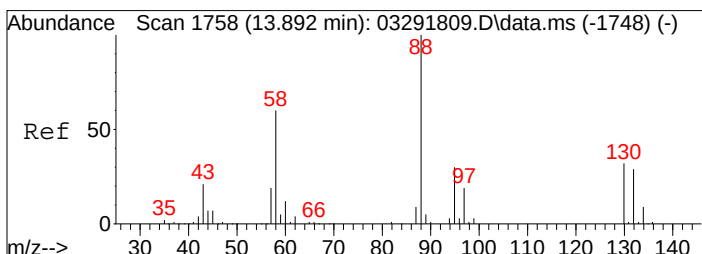
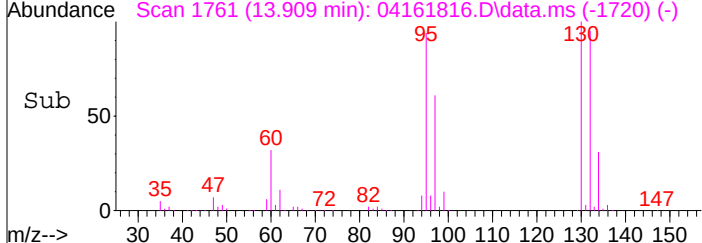
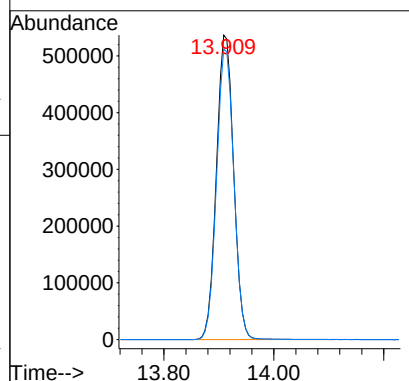
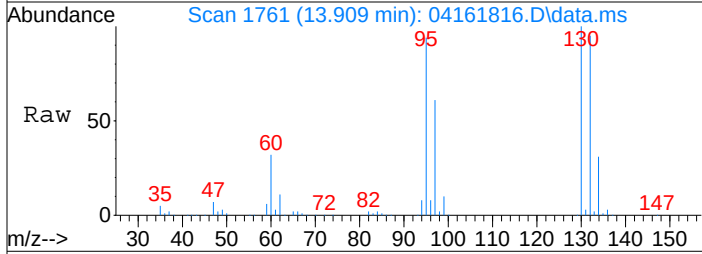
Tgt Ion: 83 Resp: 5034
Ion Ratio Lower Upper
83 100
85 56.0 44.7 84.7





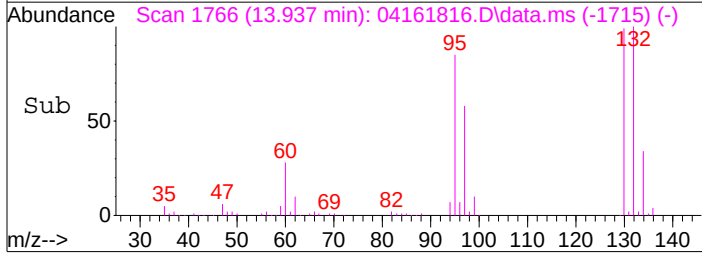
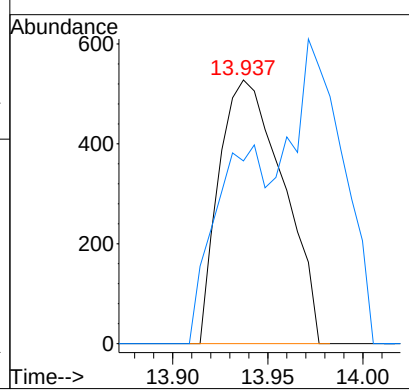
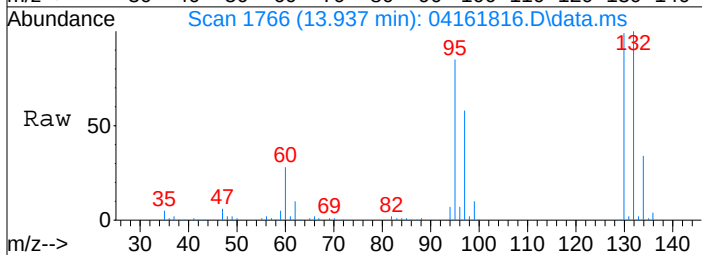
#47
 Trichloroethene
 Concen: 97.03 ng
 RT: 13.91 min Scan# 1761
 Delta R.T. -0.017 min
 Lab File: 04161816.D
 Acq: 16 Apr 2018 17:40

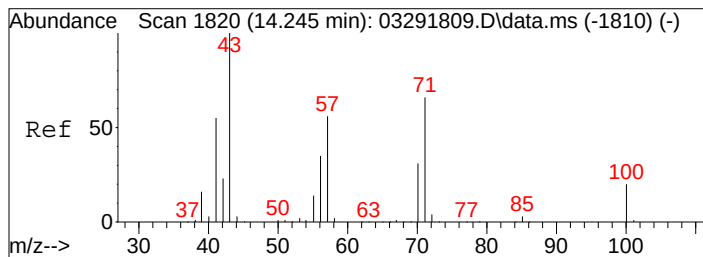
Tgt Ion:	130	Resp:	1169115
Ion Ratio	Lower	Upper	
130	100		
132	95.8	75.5	115.5



#48
 1,4-Dioxane
 Concen: 0.14 ng
 RT: 13.94 min Scan# 1766
 Delta R.T. 0.040 min
 Lab File: 04161816.D
 Acq: 16 Apr 2018 17:40

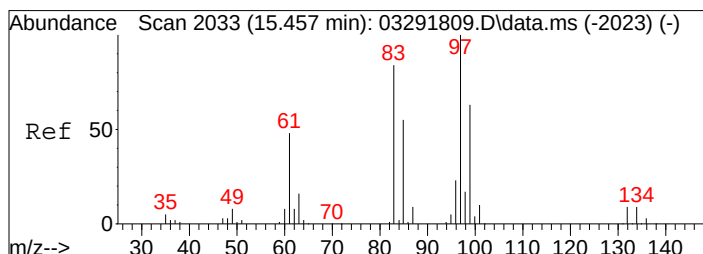
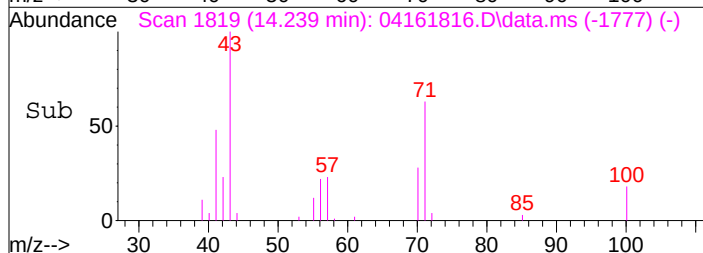
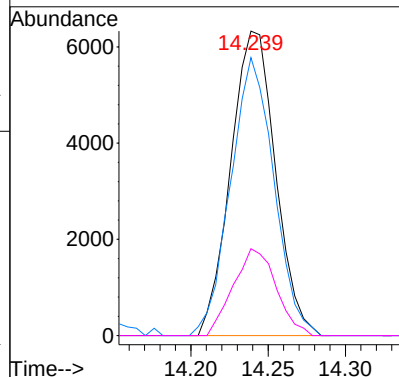
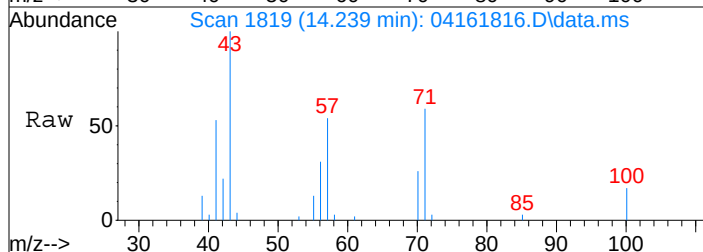
Tgt Ion:	88	Resp:	1236
Ion Ratio	Lower	Upper	
88	100		
58	68.4	37.9	77.9





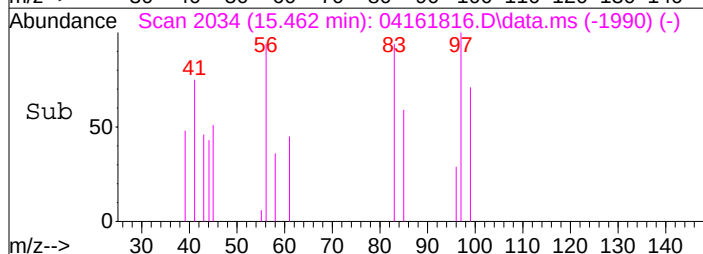
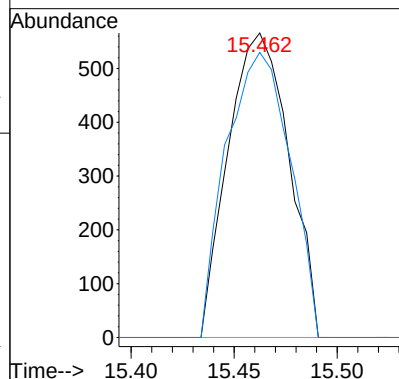
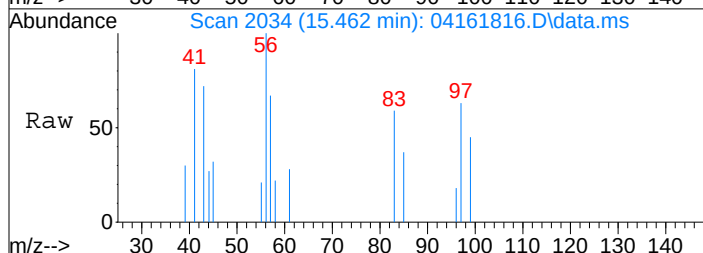
#51
n-Heptane
Concen: 1.24 ng
RT: 14.24 min Scan# 1819
Delta R.T. -0.011 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

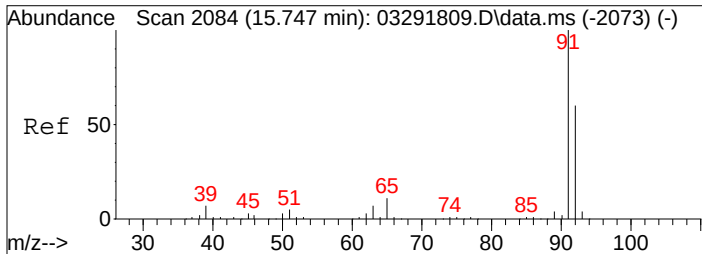
Tgt Ion: 71 Resp: 12767
Ion Ratio Lower Upper
71 100
57 88.4 66.8 106.8
100 27.3 9.9 49.9



#55
1,1,2-Trichloroethane
Concen: 0.12 ng
RT: 15.46 min Scan# 2034
Delta R.T. -0.000 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

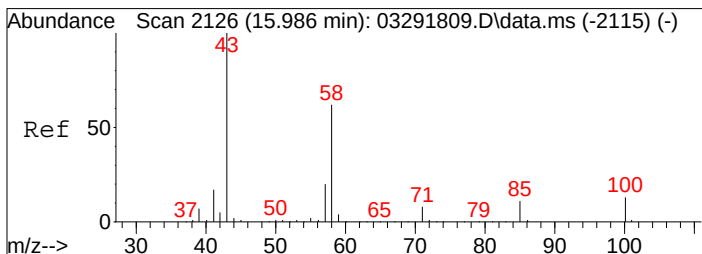
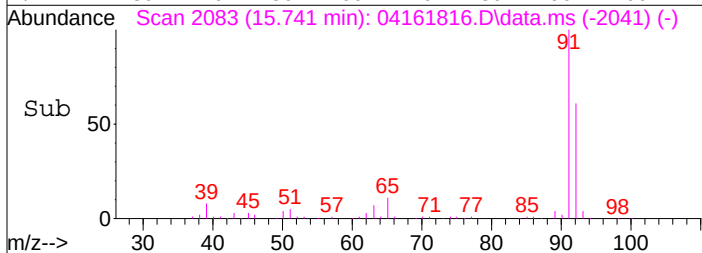
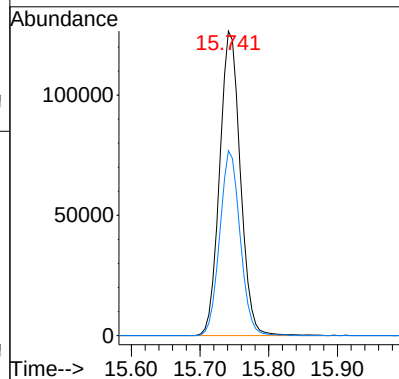
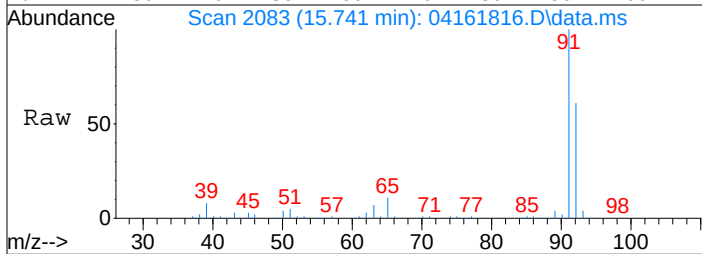
Tgt Ion: 97 Resp: 1161
Ion Ratio Lower Upper
97 100
83 98.3 64.1 104.1





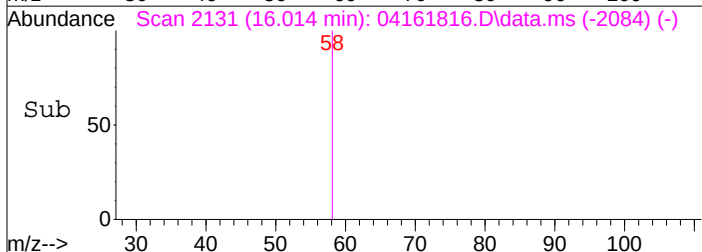
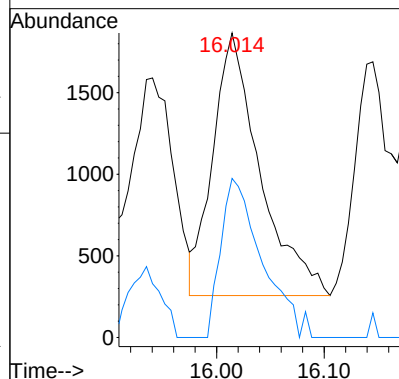
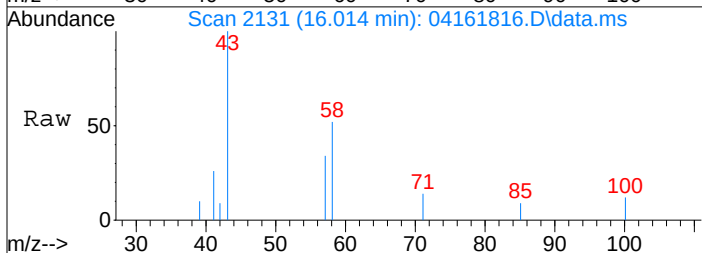
#58
Toluene
Concen: 5.59 ng
RT: 15.74 min Scan# 2083
Delta R.T. -0.011 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

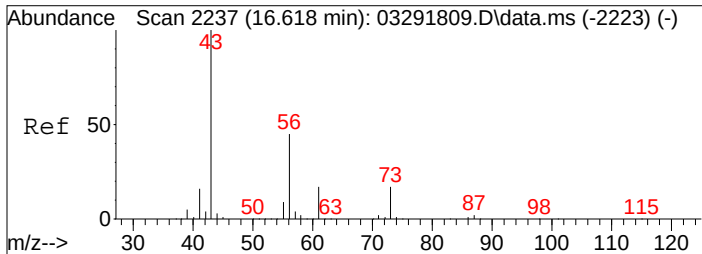
Tgt Ion: 91 Resp: 265033
Ion Ratio Lower Upper
91 100
92 59.8 40.1 80.1



#59
2-Hexanone
Concen: 0.25 ng
RT: 16.01 min Scan# 2131
Delta R.T. 0.017 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

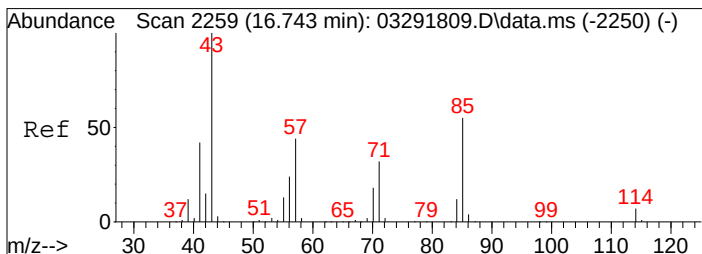
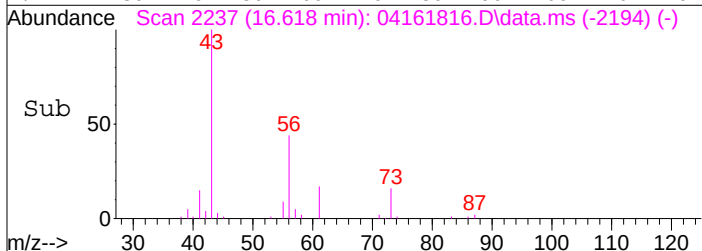
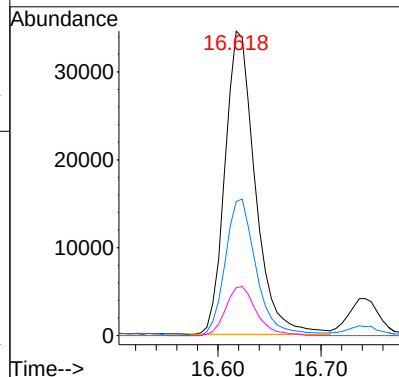
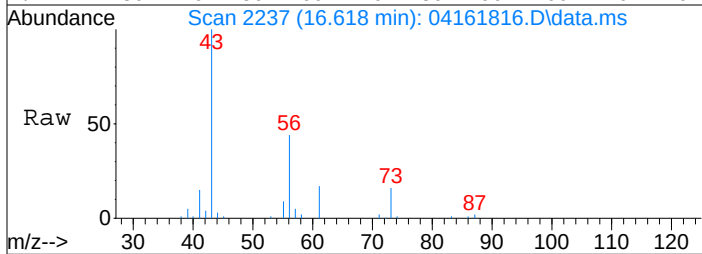
Tgt Ion: 43 Resp: 4907
Ion Ratio Lower Upper
43 100
58 53.0 41.5 81.5





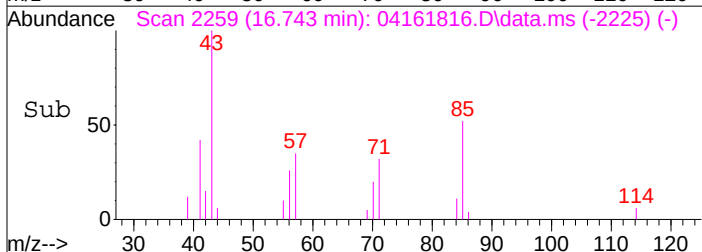
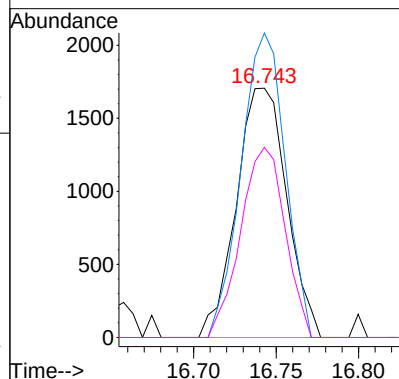
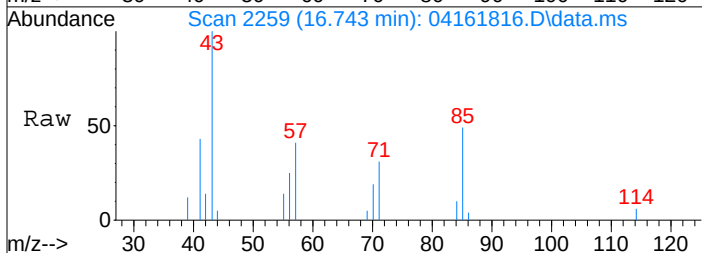
#62
n-Butyl Acetate
Concen: 3.48 ng
RT: 16.62 min Scan# 2237
Delta R.T. -0.006 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

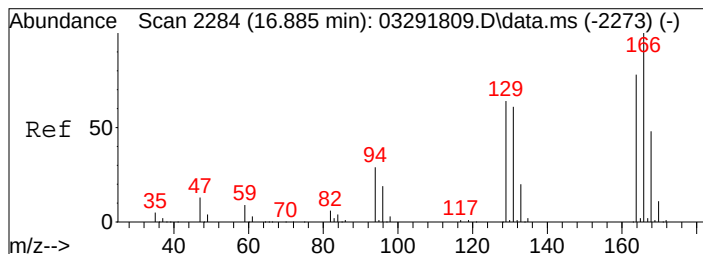
Tgt Ion: 43 Resp: 70302
Ion Ratio Lower Upper
43 100
56 46.1 24.7 64.7
73 16.4 0.0 36.9



#63
n-Octane
Concen: 0.39 ng
RT: 16.74 min Scan# 2259
Delta R.T. -0.006 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

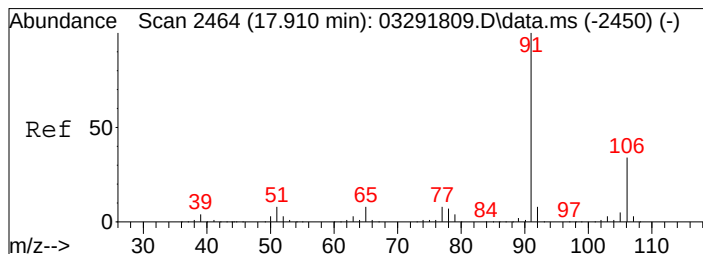
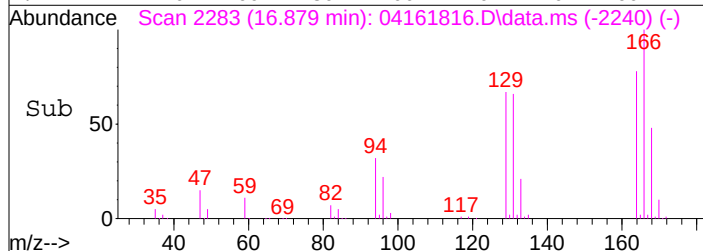
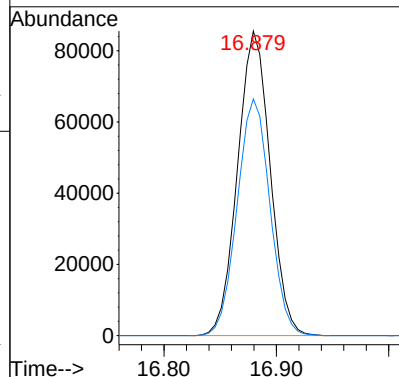
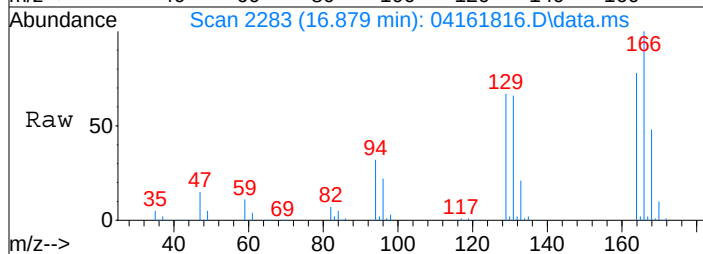
Tgt Ion: 57 Resp: 3629
Ion Ratio Lower Upper
57 100
85 106.7 99.3 148.9
71 67.2 58.0 87.0





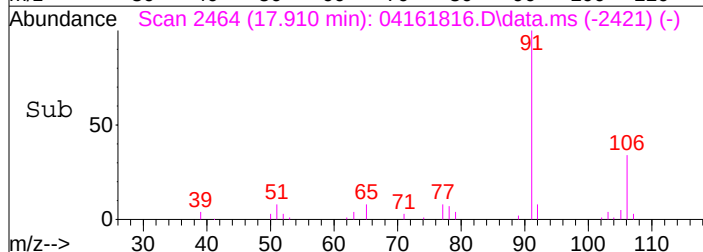
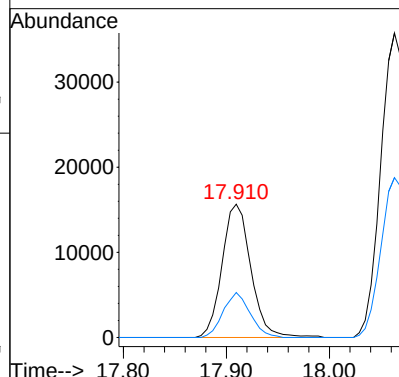
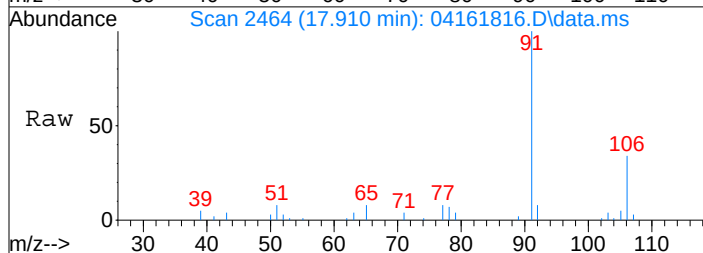
#64
Tetrachloroethene
Concen: 11.58 ng
RT: 16.88 min Scan# 2283
Delta R.T. -0.006 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

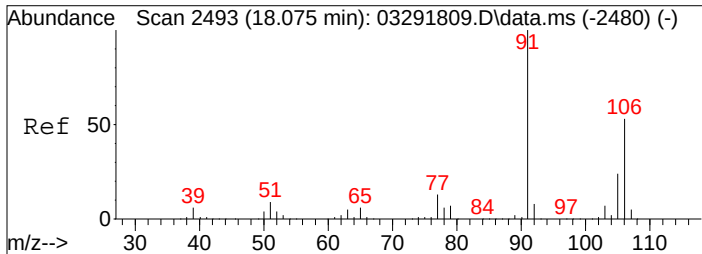
Tgt Ion: 166 Resp: 172528
Ion Ratio Lower Upper
166 100
164 78.1 57.9 97.9



#66
Ethylbenzene
Concen: 0.60 ng
RT: 17.91 min Scan# 2464
Delta R.T. -0.006 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

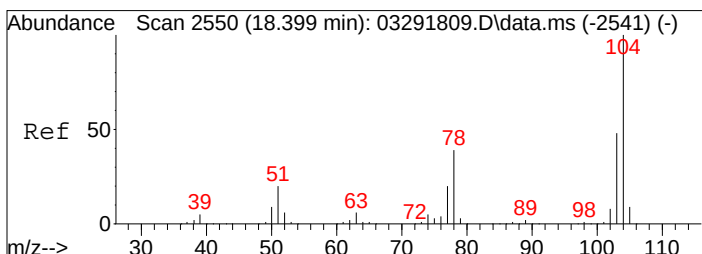
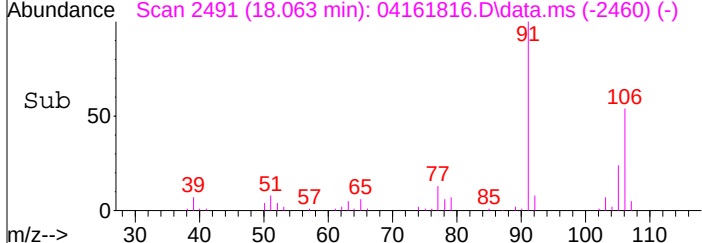
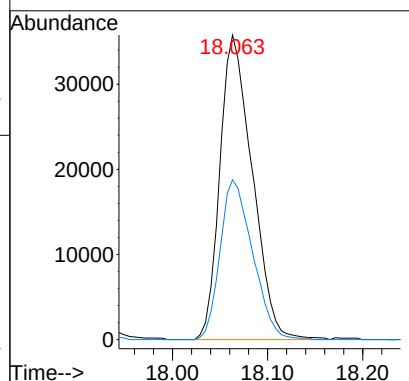
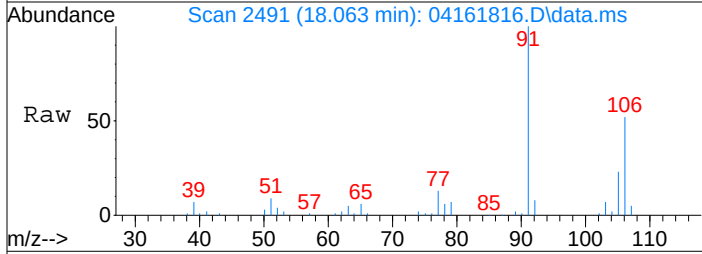
Tgt Ion: 91 Resp: 30452
Ion Ratio Lower Upper
91 100
106 31.5 13.1 53.1





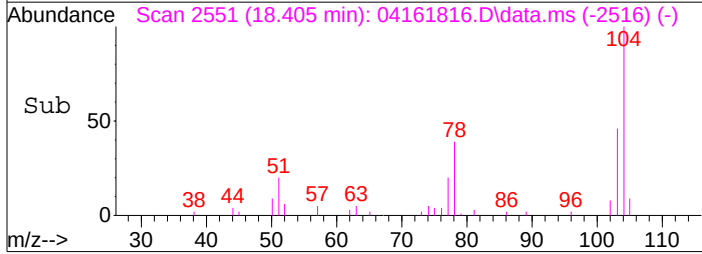
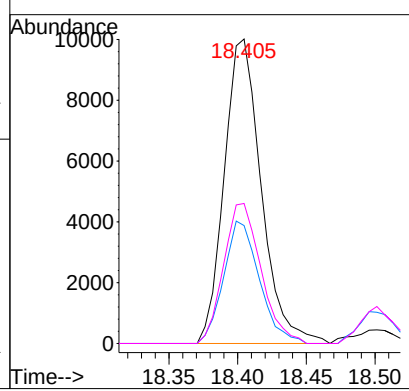
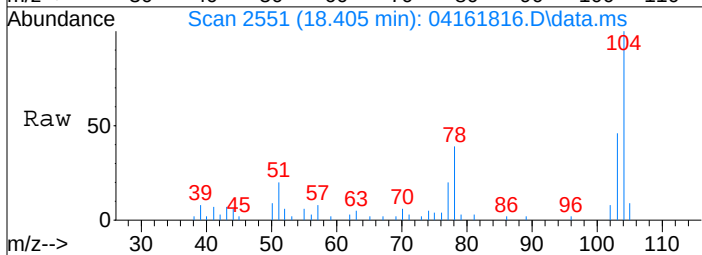
#67
 m- & p-Xylenes
 Concen: 2.09 ng
 RT: 18.06 min Scan# 2491
 Delta R.T. -0.023 min
 Lab File: 04161816.D
 Acq: 16 Apr 2018 17:40

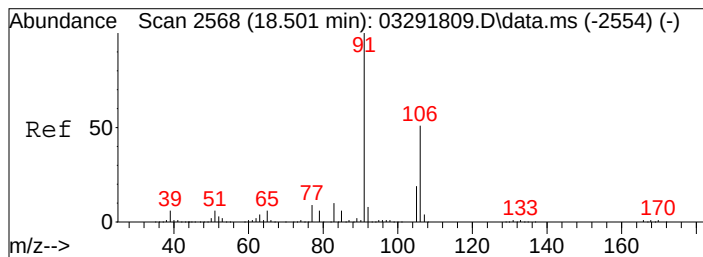
Tgt Ion:	91	Resp:	84672
Ion Ratio	Lower	Upper	
91	100		
106	52.6	32.0	72.0



#69
 Styrene
 Concen: 0.61 ng
 RT: 18.40 min Scan# 2551
 Delta R.T. -0.000 min
 Lab File: 04161816.D
 Acq: 16 Apr 2018 17:40

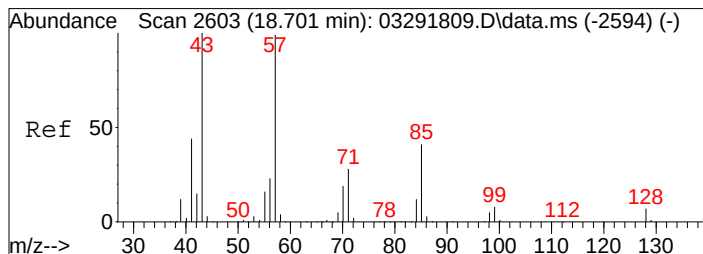
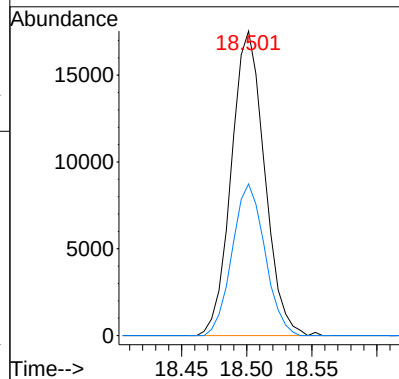
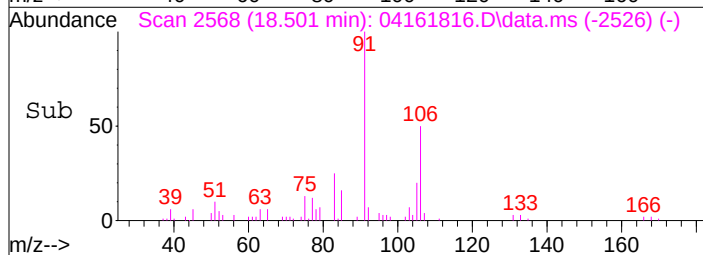
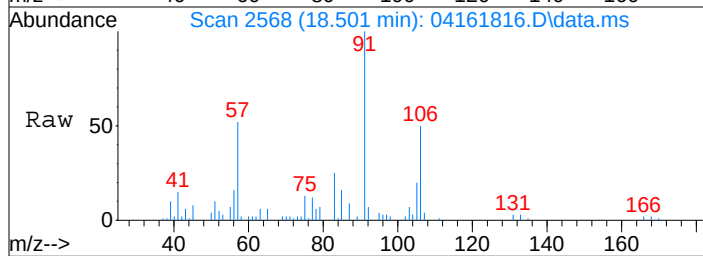
Tgt Ion:	104	Resp:	18765
Ion Ratio	Lower	Upper	
104	100		
78	38.8	17.8	57.8
103	46.3	27.2	67.2





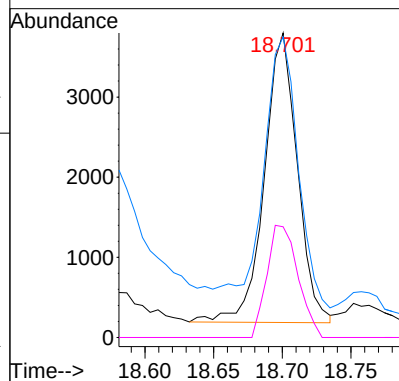
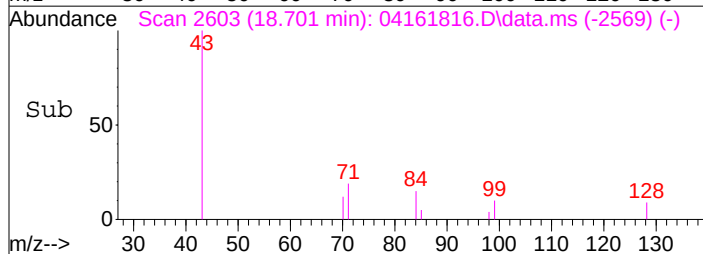
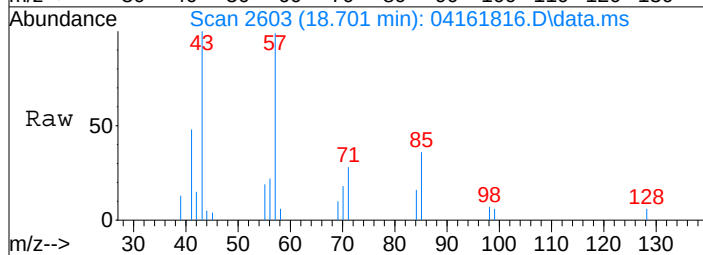
#70
o-Xylene
Concen: 0.77 ng
RT: 18.50 min Scan# 2568
Delta R.T. -0.011 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

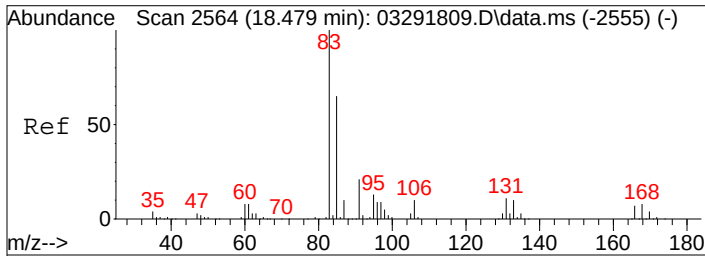
Tgt Ion: 91 Resp: 31173
Ion Ratio Lower Upper
91 100
106 48.9 30.5 70.5



#71
n-Nonane
Concen: 0.30 ng
RT: 18.70 min Scan# 2603
Delta R.T. -0.006 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

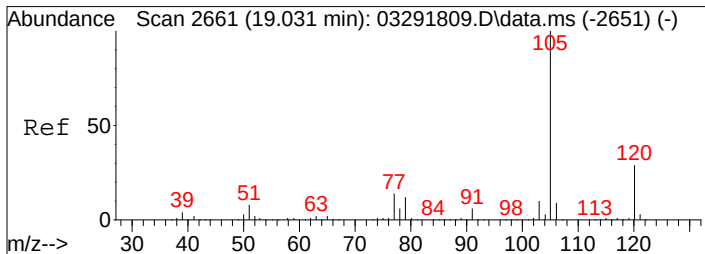
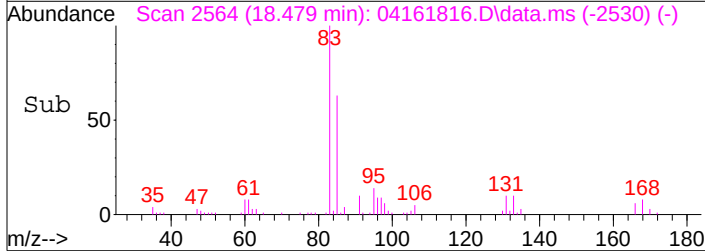
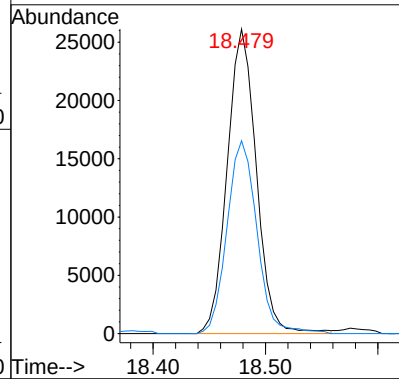
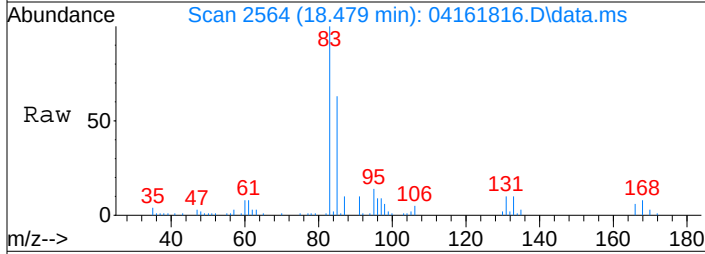
Tgt Ion: 43 Resp: 6030
Ion Ratio Lower Upper
43 100
57 94.5 78.4 118.4
85 36.4 20.3 60.3





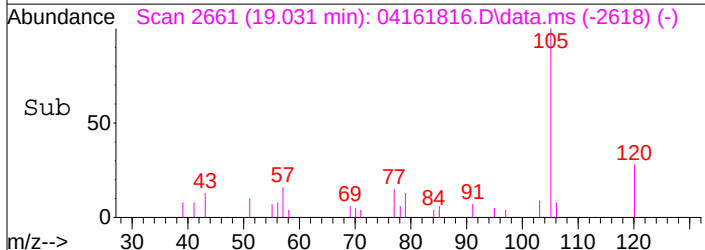
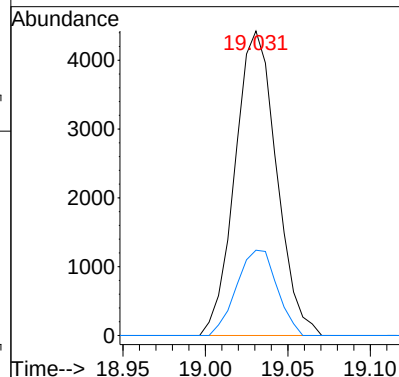
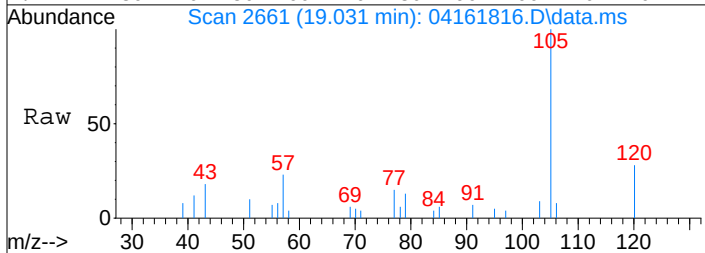
#72
1,1,2,2-Tetrachloroethane
Concen: 2.60 ng
RT: 18.48 min Scan# 2564
Delta R.T. -0.006 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

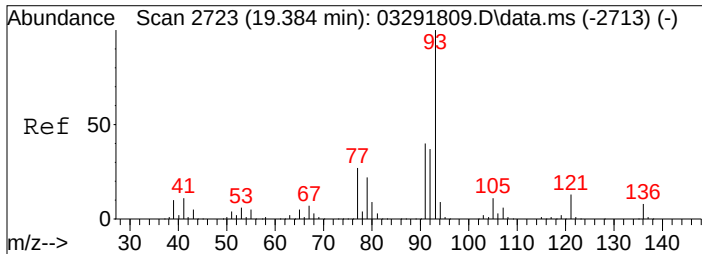
Tgt Ion: 83 Resp: 47149
Ion Ratio Lower Upper
83 100
85 65.1 45.0 85.0



#74
Cumene
Concen: 0.15 ng
RT: 19.03 min Scan# 2661
Delta R.T. -0.006 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

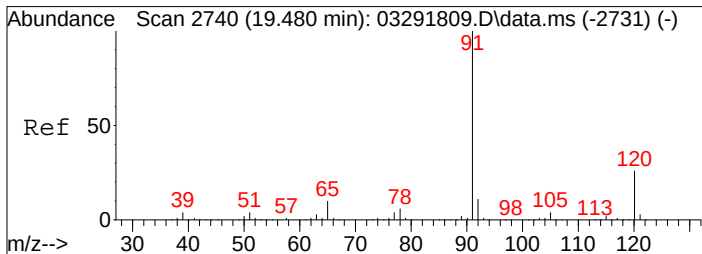
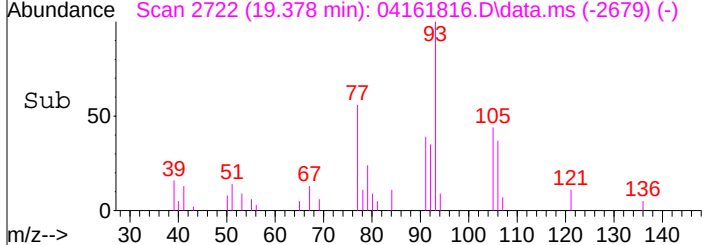
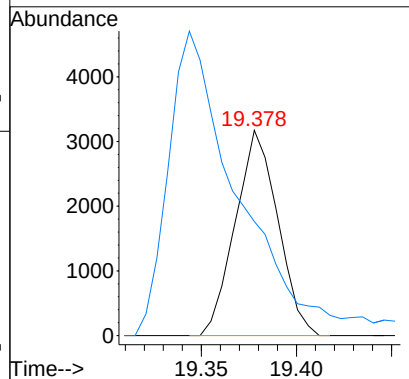
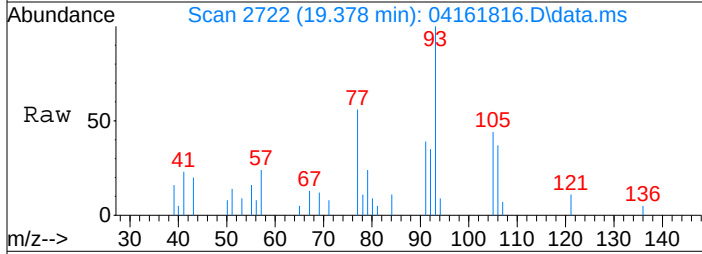
Tgt Ion: 105 Resp: 7731
Ion Ratio Lower Upper
105 100
120 27.4 8.1 48.1





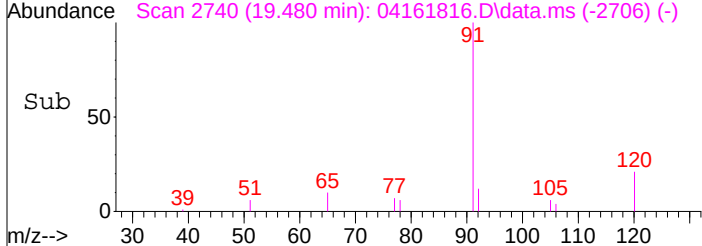
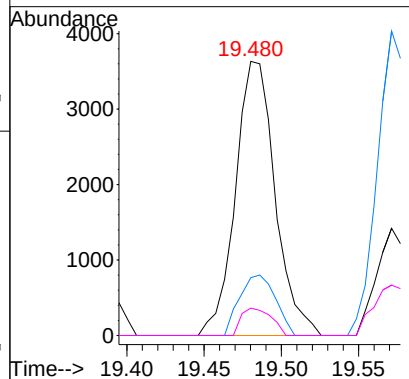
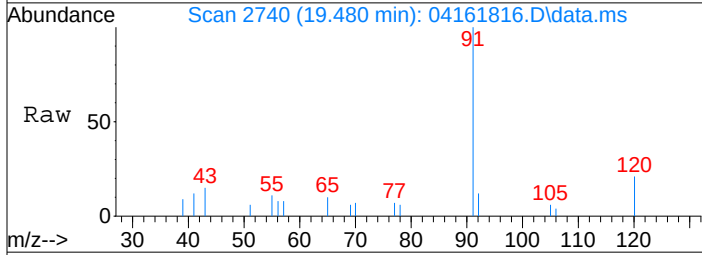
#75
 alpha-Pinene
 Concen: 0.19 ng
 RT: 19.38 min Scan# 2722
 Delta R.T. -0.006 min
 Lab File: 04161816.D
 Acq: 16 Apr 2018 17:40

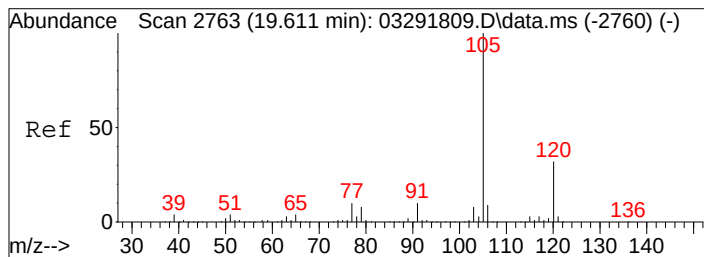
Tgt Ion: 93 Resp: 4929
 Ion Ratio Lower Upper
 93 100
 77 250.6 8.0 48.0#



#76
 n-Propylbenzene
 Concen: 0.11 ng
 RT: 19.48 min Scan# 2740
 Delta R.T. -0.006 min
 Lab File: 04161816.D
 Acq: 16 Apr 2018 17:40

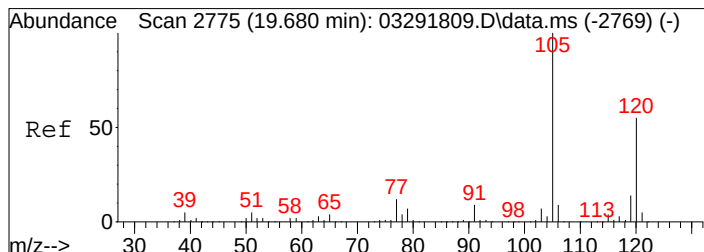
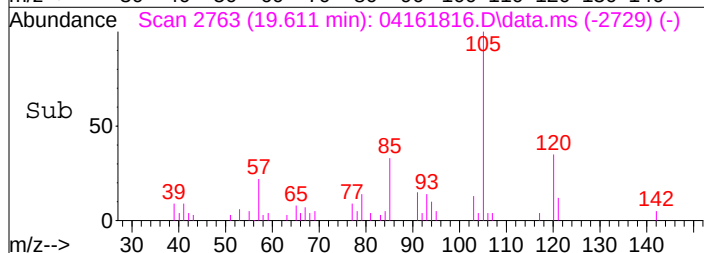
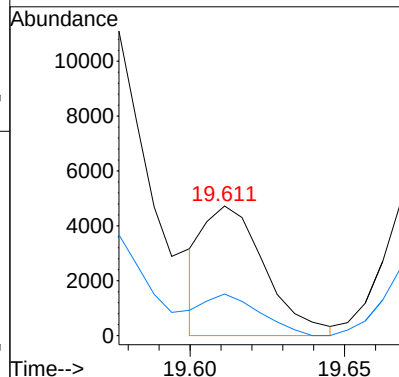
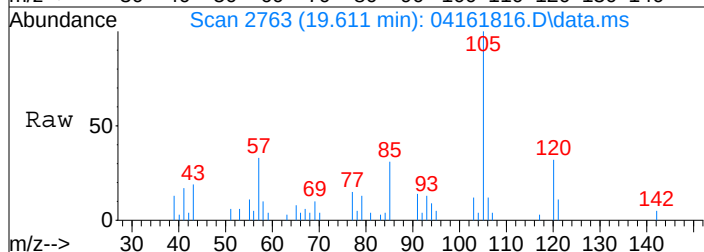
Tgt Ion: 91 Resp: 6511
 Ion Ratio Lower Upper
 91 100
 120 19.9 5.4 45.4
 65 7.5 0.0 29.2





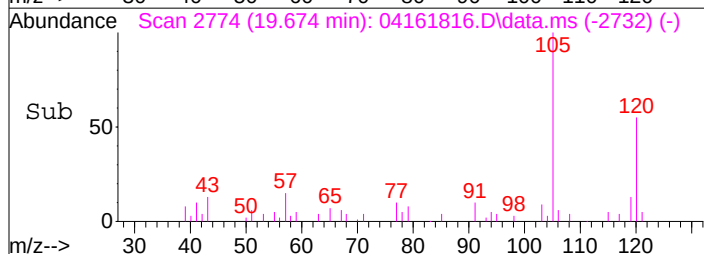
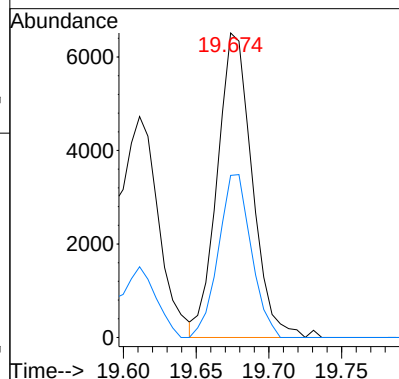
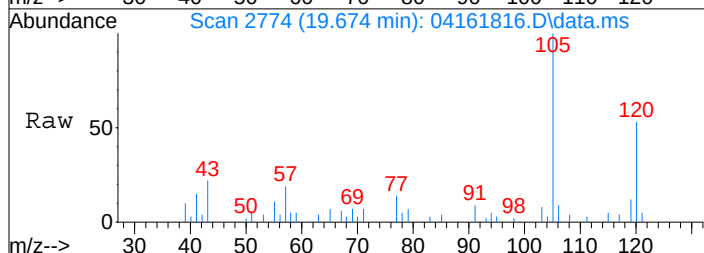
#78
4-Ethyltoluene
Concen: 0.13 ng
RT: 19.61 min Scan# 2763
Delta R.T. -0.006 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

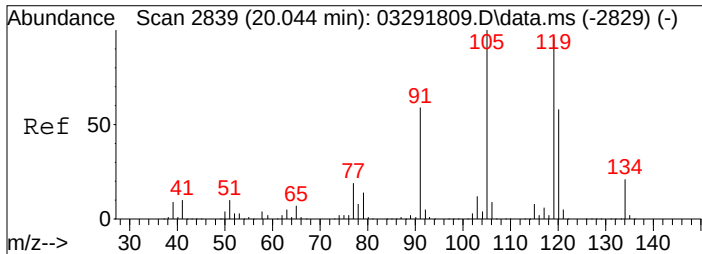
Tgt Ion:105 Resp: 6568
Ion Ratio Lower Upper
105 100
120 28.9 12.1 52.1



#79
1,3,5-Trimethylbenzene
Concen: 0.23 ng
RT: 19.67 min Scan# 2774
Delta R.T. -0.011 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

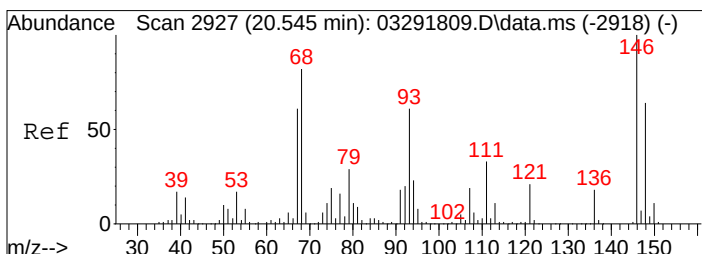
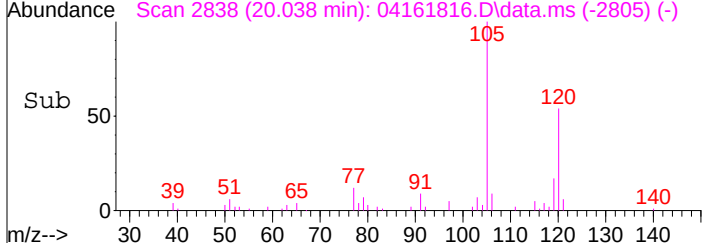
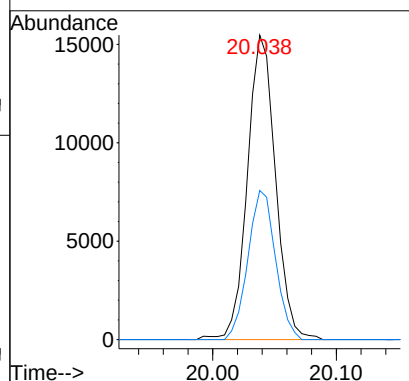
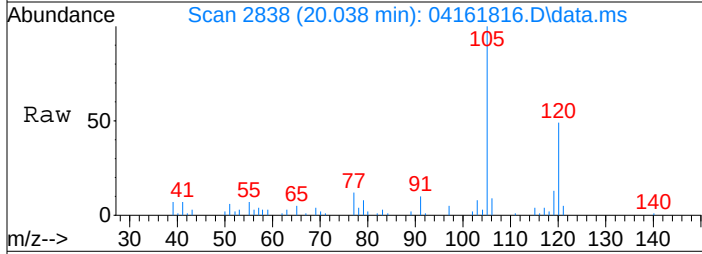
Tgt Ion:105 Resp: 10874
Ion Ratio Lower Upper
105 100
120 50.4 33.8 73.8





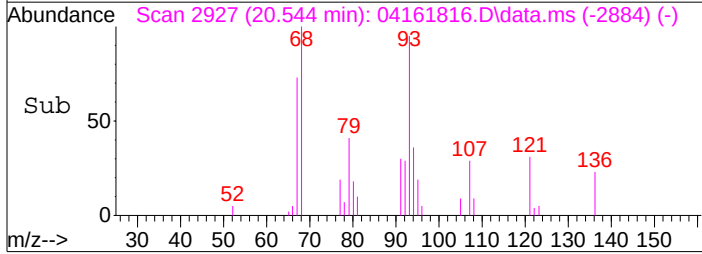
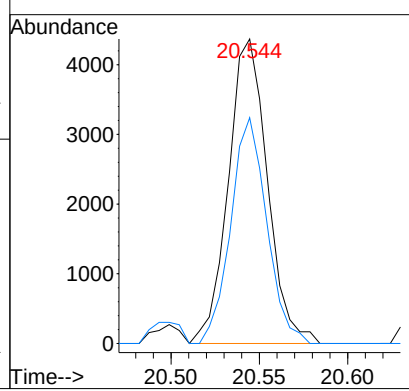
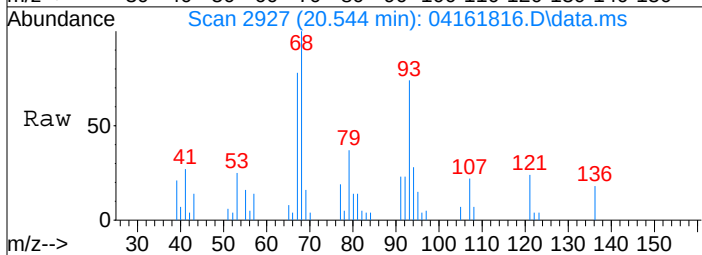
#82
1,2,4-Trimethylbenzene
Concen: 0.57 ng
RT: 20.04 min Scan# 2838
Delta R.T. -0.011 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

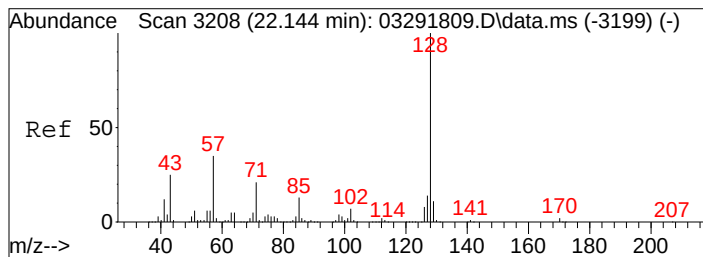
Tgt Ion: 105	Resp: 24482
Ion Ratio	Lower Upper
105	100
120	47.9 38.1 78.1



#91
d-Limonene
Concen: 0.43 ng
RT: 20.54 min Scan# 2927
Delta R.T. -0.006 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

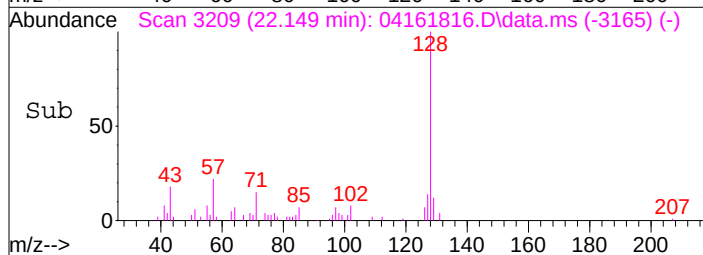
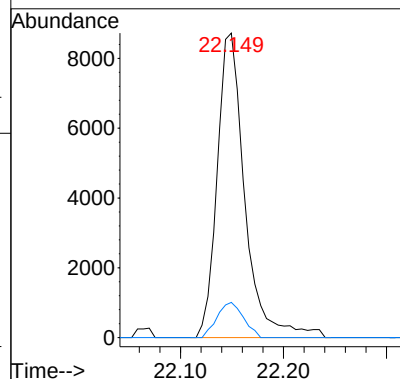
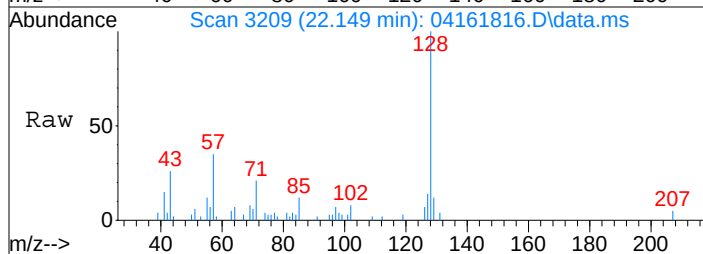
Tgt Ion: 68	Resp: 6737
Ion Ratio	Lower Upper
68	100
93	68.2 54.7 94.7





#95
Naphthalene
Concen: 0.31 ng
RT: 22.15 min Scan# 3209
Delta R.T. -0.000 min
Lab File: 04161816.D
Acq: 16 Apr 2018 17:40

Tgt Ion:128 Resp: 16267
Ion Ratio Lower Upper
128 100
129 11.0 0.0 31.2



Data File : I:\MS13\DATA\2018 04\16\04161803.D
 Acq On : 16 Apr 2018 9:14
 Sample : MB R13041618 1000mL
 Misc : S31-03281803/AC00880

Vial: 3
 Operator: RS
 Inst : MS13

RS 4/16/18

Quant Time: Apr 16 10:36:55 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:58:13 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.13	130	104397	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.21	114	528586	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.51	82	188453	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.96	65	127499	13.238	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	105.92%
57) Toluene-d8 (SS2)	15.64	98	498564	11.973	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.76%
73) Bromofluorobenzene (SS3)	18.91	174	118706	10.108	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	80.88%

Target Compounds

						Qvalue
2) Propene	4.39	42	220	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	0.00	41	0	N.D.		
12) Acrolein	0.00	56	0	N.D.		
13) Acetone	7.20	58	3205	0.457	ng	94
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	8.50	84	1407	0.125	ng	91
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.		
21) Trichlorotrifluoroethane	0.00	151	0	N.D.		
22) Carbon Disulfide	0.00	76	0	N.D.	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.		
41) Benzene	12.83	78	888	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.		

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Data File : I:\MS13\DATA\2018 04\16\04161803.D
 Acq On : 16 Apr 2018 9:14
 Sample : MB R13041618 1000mL
 Misc : S31-03281803/AC00880

Vial: 3
 Operator: RS
 Inst : MS13

Quant Time: Apr 16 10:36:55 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:58:13 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

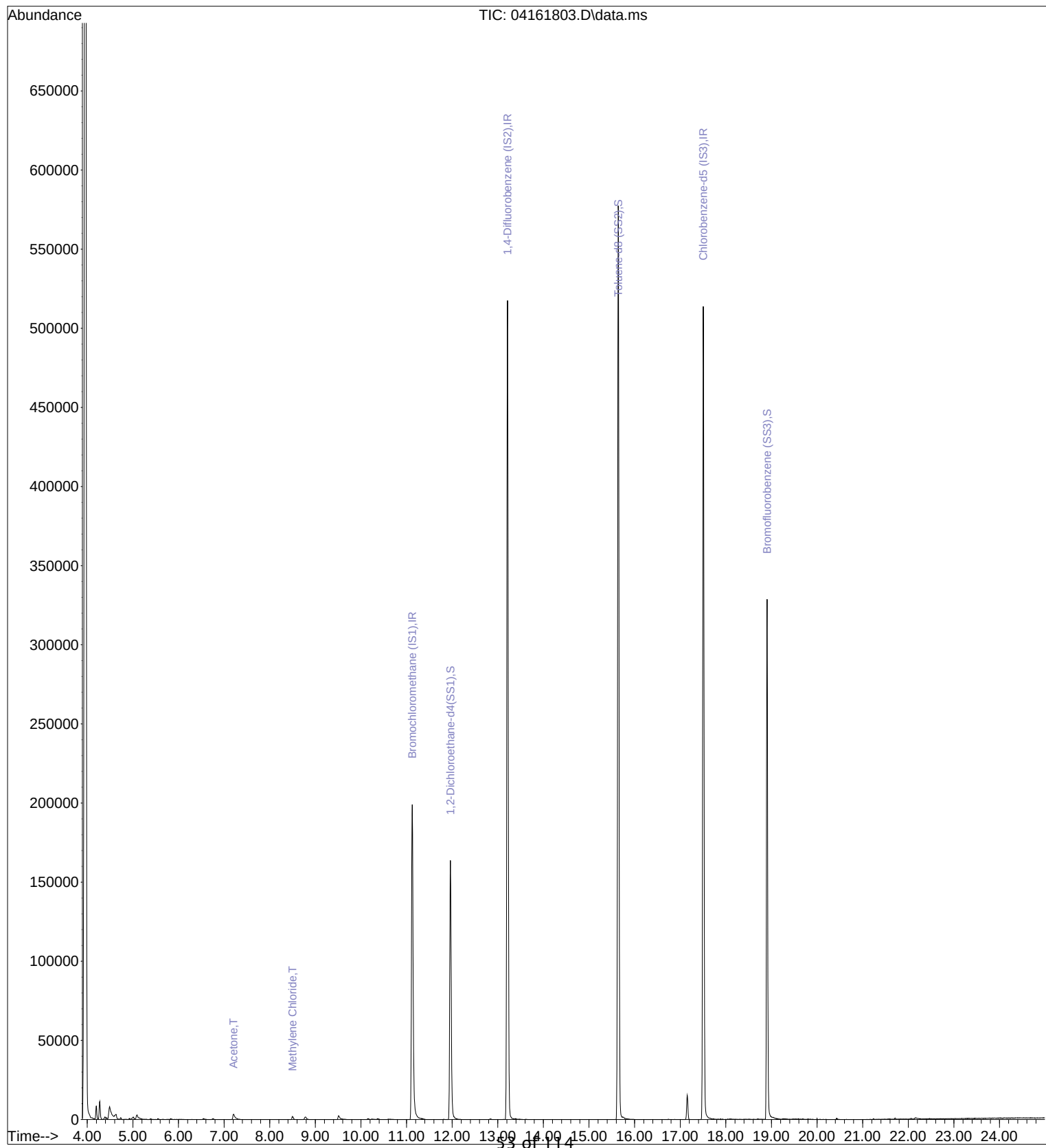
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	0.00	71	0	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	15.76	91	783	N.D.		
59) 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	16.74	43	234	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	17.89	91	166	N.D.		
67) m- & p-Xylenes	18.09	91	238	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	18.70	43	114	N.D.		
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.		
74) Cumene	19.04	105	1243	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	19.48	91	474	N.D.		
77) 3-Ethyltoluene	19.59	105	1742	N.D.		
78) 4-Ethyltoluene	19.59	105	1742	N.D.		
79) 1,3,5-Trimethylbenzene	19.69	105	1155	N.D.		
80) alpha-Methylstyrene	0.00	118	0	N.D.		
81) 2-Ethyltoluene	19.86	105	245	N.D.		
82) 1,2,4-Trimethylbenzene	20.06	105	297	N.D.		
83) n-Decane	0.00	57	0	N.D.		
84) Benzyl Chloride	20.20	91	174	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	20.43	105	291	N.D.		
88) 4-Isopropyltoluene (p-...	20.43	119	343	N.D.		
89) 1,2,3-Trimethylbenzene	20.43	105	291	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	21.23	57	264	N.D.		
94) 1,2,4-Trichlorobenzene	22.06	180	263	N.D.		
95) Naphthalene	22.17	128	2221	N.D.		
96) n-Dodecane	22.14	57	341	N.D.		
97) Hexachlorobutadiene	22.46	225	166	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\2018 04\16\04161803.D
Acq On : 16 Apr 2018 9:14
Sample : MB R13041618 1000mL
Misc : S31-03281803/AC00880

Vial: 3
Operator: RS
Inst : MS13

Quant Time: Apr 16 10:36:55 2018
Quant Method : I:\MS13\METHODS\R13032918.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Mar 30 08:58:13 2018
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2018 04\16\04161804.D
 Acq On : 16 Apr 2018 9:48
 Sample : LCS R13041618 25ng
 Misc : S31-03281803/S31-03231802 (4/21)

Vial: 3
 Operator: RS
 Inst : MS13

RS 4/16/18

Quant Time: Apr 16 10:33:57 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:58:13 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.14	130	111497	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.23	114	539354	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.51	82	193900	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.97	65	131928	12.826	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	102.64%	
57) Toluene-d8 (SS2)	15.64	98	504856	11.783	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	94.24%	
73) Bromofluorobenzene (SS3)	18.91	174	128603	10.643	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	85.12%	

Target Compounds

						Qvalue
2) Propene	4.35	42	255217	23.583	ng	98
3) Dichlorodifluoromethan...	4.50	85	408448	21.753	ng	100
4) Chloromethane	4.77	50	347479	23.684	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	5.03	135	239484	20.149	ng	99
6) Vinyl Chloride	5.18	62	354496	24.399	ng	100
7) 1,3-Butadiene	5.43	54	262031	27.785	ng	97
8) Bromomethane	5.85	94	215007	21.802	ng	99
9) Chloroethane	6.16	64	171677	23.029	ng	100
10) Ethanol	6.52	45	830107	128.957	ng	99
11) Acetonitrile	6.76	41	422786	27.113	ng	99
12) Acrolein	6.94	56	140015	23.330	ng	99
13) Acetone	7.14	58	881097	117.757	ng	93
14) Trichlorofluoromethane	7.37	101	346344	21.066	ng	100
15) 2-Propanol (Isopropanol)	7.61	45	1097138	48.680	ng	98
16) Acrylonitrile	7.86	53	306730	26.331	ng	98
17) 1,1-Dichloroethene	8.29	96	232585	21.672	ng	98
18) 2-Methyl-2-Propanol (t...	8.45	59	907212	39.629	ng	99
19) Methylene Chloride	8.51	84	242966	20.264	ng	98
20) 3-Chloro-1-propene (Al...	8.66	41	335228	25.094	ng	97
21) Trichlorotrifluoroethane	8.90	151	208728	18.838	ng	91
22) Carbon Disulfide	8.76	76	874261	21.073	ng	100
23) trans-1,2-Dichloroethene	9.73	61	320128	26.905	ng	98
24) 1,1-Dichloroethane	9.98	63	391811	21.996	ng	99
25) Methyl tert-Butyl Ether	10.07	73	639387	21.022	ng	99
26) Vinyl Acetate	10.23	86	276318	126.575	ng	# 87
27) 2-Butanone (MEK)	10.47	72	163632	25.025	ng	100
28) cis-1,2-Dichloroethene	10.97	61	300113	23.216	ng	98
29) Diisopropyl Ether	11.26	87	238085	24.322	ng	# 86
30) Ethyl Acetate	11.26	61	178687	52.209	ng	97
31) n-Hexane	11.25	57	372203	23.001	ng	99
32) Chloroform	11.30	83	375862	21.991	ng	99
34) Tetrahydrofuran (THF)	11.71	72	163043	21.471	ng	97
35) Ethyl tert-Butyl Ether	11.84	87	276821	22.810	ng	96
36) 1,2-Dichloroethane	12.09	62	251523	23.081	ng	100
38) 1,1,1-Trichloroethane	12.36	97	318354	22.389	ng	100
39) Isopropyl Acetate	12.78	61	305676	50.802	ng	100
40) 1-Butanol	12.80	56	436805	51.173	ng	100
41) Benzene	12.83	78	937762	22.924	ng	100
42) Carbon Tetrachloride	12.99	117	281116	22.190	ng	100
43) Cyclohexane	13.12	84	740796	44.261	ng	95
44) tert-Amyl Methyl Ether	13.46	73	654410	23.027	ng	99
45) 1,2-Dichloropropane	13.68	63	227357	22.846	ng	99
46) Bromodichloromethane	13.86	83	298916	20.702	ng	100
47) Trichloroethene	13.91	130	260526	21.198	ng	100
48) 1,4-Dioxane	13.89	88	204795	23.513	ng	96
49) 2,2,4-Trimethylpentane...	13.98	57	980272	21.829	ng	99
50) Methyl Methacrylate	14.12	100	196128	45.917	ng	# 86

54 of 114

Data File : I:\MS13\DATA\2018 04\16\04161804.D
 Acq On : 16 Apr 2018 9:48
 Sample : LCS R13041618 25ng
 Misc : S31-03281803/S31-03231802 (4/21)

Vial: 3
 Operator: RS
 Inst : MS13

Quant Time: Apr 16 10:33:57 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:58:13 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.24	71	234023	22.333	ng	98
52) cis-1,3-Dichloropropene	14.77	75	369914	25.630	ng	100
53) 4-Methyl-2-pentanone	14.80	58	217626	25.852	ng	98
54) trans-1,3-Dichloropropene	15.29	75	325649	26.471	ng	100
55) 1,1,2-Trichloroethane	15.46	97	230419	23.958	ng	99
58) Toluene	15.75	91	947183	19.584	ng	100
59) 2-Hexanone	15.99	43	464541	22.936	ng	100
60) Dibromochloromethane	16.15	129	269895	22.472	ng	99
61) 1,2-Dibromoethane	16.40	107	260380	25.289	ng	100
62) n-Butyl Acetate	16.62	43	511904	24.853	ng	99
63) n-Octane	16.74	57	197364	20.887	ng	97
64) Tetrachloroethene	16.88	166	280564	18.479	ng	100
65) Chlorobenzene	17.55	112	642126	19.599	ng	100
66) Ethylbenzene	17.91	91	1068967	20.515	ng	100
67) m- & p-Xylenes	18.07	91	1700316	41.206	ng	100
68) Bromoform	18.13	173	242803	22.017	ng	100
69) Styrene	18.40	104	699830	22.481	ng	99
70) o-Xylene	18.50	91	856139	20.823	ng	100
71) n-Nonane	18.70	43	431747	21.342	ng	98
72) 1,1,2,2-Tetrachloroethane	18.48	83	419397	22.699	ng	100
74) Cumene	19.03	105	1094592	20.155	ng	100
75) alpha-Pinene	19.38	93	570865	21.263	ng	99
76) n-Propylbenzene	19.48	91	1305002	21.306	ng	99
77) 3-Ethyltoluene	19.57	105	1138198	20.995	ng	99
78) 4-Ethyltoluene	19.61	105	1024669	20.628	ng	100
79) 1,3,5-Trimethylbenzene	19.67	105	906332	19.149	ng	98
80) alpha-Methylstyrene	19.81	118	525977	23.246	ng	99
81) 2-Ethyltoluene	19.84	105	1089268	20.301	ng	100
82) 1,2,4-Trimethylbenzene	20.04	105	940573	21.312	ng	98
83) n-Decane	20.13	57	493248	21.917	ng	98
84) Benzyl Chloride	20.16	91	764534	28.691	ng	98
85) 1,3-Dichlorobenzene	20.17	146	579277	21.830	ng	99
86) 1,4-Dichlorobenzene	20.23	146	589201	20.429	ng	100
87) sec-Butylbenzene	20.28	105	1241498	20.394	ng	99
88) 4-Isopropyltoluene (p-...	20.42	119	1156175	20.258	ng	98
89) 1,2,3-Trimethylbenzene	20.41	105	963786	21.465	ng	98
90) 1,2-Dichlorobenzene	20.53	146	565172	21.886	ng	99
91) d-Limonene	20.54	68	369406	22.956	ng	98
92) 1,2-Dibromo-3-Chloropr...	20.92	157	199769	22.361	ng	94
93) n-Undecane	21.23	57	501274	22.560	ng	99
94) 1,2,4-Trichlorobenzene	22.04	180	422452	22.232	ng	99
95) Naphthalene	22.14	128	1257223	23.499	ng	100
96) n-Dodecane	22.14	57	467259	26.965	ng	99
97) Hexachlorobutadiene	22.46	225	260455	17.569	ng	100
98) Cyclohexanone	18.21	55	291419	21.634	ng	98
99) tert-Butylbenzene	20.04	119	905599	20.212	ng	100
100) n-Butylbenzene	20.78	91	980197	21.815	ng	98

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

Abundance

TIC: 04161804.D\data.ms

Time-->

3800000

3600000

3400000

3200000

3000000

2800000

2600000

2400000

2200000

2000000

1800000

1600000

1400000

1200000

1000000

800000

600000

400000

200000

0

4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00 18.00 19.00 20.00 21.00 22.00 23.00 24.00

Peak labels (from left to right):

- 4.00: Dichlorodifluoromethane (CFC 12), T
- 4.50: Chloromethane, T
- 4.80: Vinyl Chloride, T
- 5.00: 1,2-Dichloro-1,1,2,2-tetrafluoroethane, T
- 5.50: 1,3-Butadiene, T
- 6.00: Bromomethane, T
- 6.50: Chloroethane, T
- 7.00: Ethanol, T
- 7.20: Acetonitrile, T
- 7.50: Trichlorofluoromethane, T
- 7.80: 2-Propanol (isopropanol), T
- 8.20: Acrylonitrile, T
- 8.50: 1,1-Dichloroethane, T
- 8.80: Propanol (tert-Butyl Alcohol), T
- 9.00: 3-Chloro-1,2-dichloroethane, T
- 9.20: Trichlorofluoroethane, T
- 10.00: trans-1,2-Dichloroethene, T
- 10.20: 1,1-Dichloro-1,2-dichloroethane, T
- 10.50: Vinyl Acetate, T
- 10.80: 2-Butanone (MEK), T
- 11.00: cis-1,2-Dichloroethene, T
- 11.20: Bromochlorodifluoromethane (S1), IR
- 11.50: Tetrahydrofuran, T
- 11.80: 1,2-Dichloroethane (S2), S
- 12.00: 1,1,1-Trichloroethane, T
- 12.20: 1-Isobutyl Acetate, T
- 12.50: Benzene, T
- 12.80: Carbon Tetrachloride, T
- 13.00: 1,4-Difluorobenzene (S2), IR
- 13.20: tert-Amyl Methyl Ether, T
- 13.50: 1,2-Dichloropropane, T
- 13.80: 1,2-Dichloroethane (S1), S
- 14.00: 1,2-Dichloroethane (S2), S
- 14.20: n-Heptane, T
- 14.50: cis-1,3-Dichloropropene, T
- 14.80: trans-1,3-Dichloropropene, T
- 15.00: 1,1,1-Trichloroethane, T
- 15.20: Toluene, T
- 15.50: 2-Hexanone, T
- 15.80: Dibromochloromethane, T
- 16.00: 1,2-Dibromoethane, T
- 16.20: n-Butyl Acetate, T
- 16.50: n-Octane, T
- 16.80: Tetrachloroethene, T
- 17.00: Chlorobenzene-d5 (S3), IR
- 17.20: Ethylbenzene, T
- 17.50: Bromomethylcyclohexanone, T
- 17.80: m- & p-Xylenes, T
- 18.00: o-Xylene, T
- 18.20: n-Nonane, T
- 18.50: Bromofluorobenzene (S3), S
- 18.80: Cumene, T
- 19.00: alpha-Pinene, T
- 19.20: 1,2-Dichloroethane (S1), S
- 19.50: 1,2-Dichloroethane (S2), S
- 19.80: 1,2-Dichloroethane (S3), S
- 20.00: 1,2-Dichloroethane (S4), S
- 20.20: 1,2-Dichloroethane (S5), S
- 20.50: 1,2-Dichloroethane (S6), S
- 20.80: 1,2-Dichloroethane (S7), S
- 21.00: 1,2-Dichloroethane (S8), S
- 21.20: 1,2-Dichloroethane (S9), S
- 21.50: 1,2-Dichloroethane (S10), S
- 21.80: 1,2-Dichloroethane (S11), S
- 22.00: 1,2-Dichloroethane (S12), S
- 22.20: 1,2-Dichloroethane (S13), S
- 22.50: 1,2-Dichloroethane (S14), S
- 22.80: 1,2-Dichloroethane (S15), S
- 23.00: 1,2-Dichloroethane (S16), S
- 23.20: 1,2-Dichloroethane (S17), S
- 23.50: 1,2-Dichloroethane (S18), S
- 23.80: 1,2-Dichloroethane (S19), S
- 24.00: 1,2-Dichloroethane (S20), S

Data File : I:\MS13\DATA\2018 04\16\04161809.D
 Acq On : 16 Apr 2018 13:10
 Sample : LCSD R13041618 25ng
 Misc : S31-03281803/S31-03231802 (4/21)

Vial: 3
 Operator: RS
 Inst : MS13

Quant Time: Apr 16 13:45:45 2018

RS 4/16/18

Quant Method : I:\MS13\METHODS\R13032918.M

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

QLast Update : Fri Mar 30 08:58:13 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.14	130	110131	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.22	114	535474	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.51	82	194339	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.97	65	128984	12.695	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.52%
57) Toluene-d8 (SS2)	15.64	98	504411	11.746	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	94.00%
73) Bromofluorobenzene (SS3)	18.91	174	132564	10.946	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	87.60%

Target Compounds

						Qvalue
2) Propene	4.35	42	252684	23.639	ng	98
3) Dichlorodifluoromethan...	4.50	85	406067	21.894	ng	100
4) Chloromethane	4.77	50	339520	23.429	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	5.03	135	240783	20.510	ng	100
6) Vinyl Chloride	5.17	62	355762	24.790	ng	100
7) 1,3-Butadiene	5.43	54	255665	27.446	ng	97
8) Bromomethane	5.85	94	216281	22.203	ng	99
9) Chloroethane	6.16	64	173449	23.556	ng	100
10) Ethanol	6.52	45	839008	131.956	ng	99
11) Acetonitrile	6.76	41	425217	27.607	ng	99
12) Acrolein	6.94	56	141586	23.884	ng	99
13) Acetone	7.14	58	882891	119.460	ng	93
14) Trichlorofluoromethane	7.37	101	346977	21.366	ng	100
15) 2-Propanol (Isopropanol)	7.61	45	1104194	49.600	ng	98
16) Acrylonitrile	7.86	53	309277	26.879	ng	98
17) 1,1-Dichloroethene	8.29	96	234502	22.121	ng	98
18) 2-Methyl-2-Propanol (t...	8.45	59	944939	41.789	ng	99
19) Methylene Chloride	8.50	84	245555	20.734	ng	98
20) 3-Chloro-1-propene (Al...	8.66	41	337283	25.560	ng	97
21) Trichlorotrifluoroethane	8.90	151	211380	19.314	ng	91
22) Carbon Disulfide	8.76	76	880153	21.478	ng	100
23) trans-1,2-Dichloroethene	9.73	61	324043	27.571	ng	98
24) 1,1-Dichloroethane	9.98	63	397891	22.615	ng	100
25) Methyl tert-Butyl Ether	10.07	73	665025	22.136	ng	99
26) Vinyl Acetate	10.22	86	279675	129.702	ng	# 87
27) 2-Butanone (MEK)	10.47	72	166336	25.754	ng	99
28) cis-1,2-Dichloroethene	10.97	61	301660	23.625	ng	98
29) Diisopropyl Ether	11.25	87	240978	24.923	ng	# 87
30) Ethyl Acetate	11.26	61	181963	53.826	ng	97
31) n-Hexane	11.25	57	382696	23.943	ng	99
32) Chloroform	11.30	83	380416	22.534	ng	99
34) Tetrahydrofuran (THF)	11.70	72	165134	22.016	ng	97
35) Ethyl tert-Butyl Ether	11.84	87	282338	23.553	ng	97
36) 1,2-Dichloroethane	12.09	62	252645	23.472	ng	99
38) 1,1,1-Trichloroethane	12.36	97	322619	22.854	ng	100
39) Isopropyl Acetate	12.78	61	310269	51.939	ng	99
40) 1-Butanol	12.80	56	442858	52.258	ng	99
41) Benzene	12.83	78	951804	23.436	ng	100
42) Carbon Tetrachloride	12.99	117	284912	22.653	ng	100
43) Cyclohexane	13.12	84	750332	45.156	ng	95
44) tert-Amyl Methyl Ether	13.46	73	664263	23.543	ng	99
45) 1,2-Dichloropropane	13.68	63	232873	23.570	ng	100
46) Bromodichloromethane	13.86	83	302328	21.090	ng	100
47) Trichloroethene	13.91	130	265698	21.776	ng	99
48) 1,4-Dioxane	13.89	88	208923	24.160	ng	96
49) 2,2,4-Trimethylpentane...	13.98	57	993509	22.284	ng	99
50) Methyl Methacrylate	14.12	100	200896	47.374	ng	# 86

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Data File : I:\MS13\DATA\2018 04\16\04161809.D
 Acq On : 16 Apr 2018 13:10
 Sample : LCSD R13041618 25ng
 Misc : S31-03281803/S31-03231802 (4/21)

Vial: 3
 Operator: RS
 Inst : MS13

Quant Time: Apr 16 13:45:45 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:58:13 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.24	71	240738	23.140	ng	98
52) cis-1,3-Dichloropropene	14.77	75	377254	26.328	ng	100
53) 4-Methyl-2-pentanone	14.80	58	220578	26.393	ng	98
54) trans-1,3-Dichloropropene	15.28	75	331713	27.159	ng	100
55) 1,1,2-Trichloroethane	15.46	97	233380	24.442	ng	99
58) Toluene	15.75	91	964211	19.891	ng	100
59) 2-Hexanone	15.99	43	470838	23.195	ng	100
60) Dibromochloromethane	16.15	129	274900	22.837	ng	100
61) 1,2-Dibromoethane	16.40	107	264037	25.586	ng	99
62) n-Butyl Acetate	16.62	43	519159	25.148	ng	99
63) n-Octane	16.74	57	201533	21.280	ng	97
64) Tetrachloroethene	16.88	166	288526	18.961	ng	100
65) Chlorobenzene	17.55	112	655223	19.953	ng	100
66) Ethylbenzene	17.91	91	1086265	20.800	ng	100
67) m- & p-Xylenes	18.07	91	1723737	41.679	ng	100
68) Bromoform	18.13	173	246104	22.266	ng	100
69) Styrene	18.40	104	712694	22.842	ng	99
70) o-Xylene	18.50	91	868054	21.065	ng	100
71) n-Nonane	18.70	43	439943	21.698	ng	98
72) 1,1,2,2-Tetrachloroethane	18.48	83	426572	23.035	ng	100
74) Cumene	19.03	105	1106614	20.330	ng	100
75) alpha-Pinene	19.38	93	580049	21.556	ng	99
76) n-Propylbenzene	19.48	91	1320928	21.517	ng	98
77) 3-Ethyltoluene	19.57	105	1152262	21.207	ng	99
78) 4-Ethyltoluene	19.61	105	1039908	20.888	ng	100
79) 1,3,5-Trimethylbenzene	19.68	105	915018	19.289	ng	99
80) alpha-Methylstyrene	19.81	118	534539	23.571	ng	99
81) 2-Ethyltoluene	19.84	105	1101177	20.476	ng	100
82) 1,2,4-Trimethylbenzene	20.04	105	944849	21.361	ng	99
83) n-Decane	20.13	57	498163	22.086	ng	99
84) Benzyl Chloride	20.16	91	783747	29.346	ng	98
85) 1,3-Dichlorobenzene	20.17	146	590997	22.222	ng	99
86) 1,4-Dichlorobenzene	20.23	146	599290	20.731	ng	100
87) sec-Butylbenzene	20.28	105	1257522	20.610	ng	99
88) 4-Isopropyltoluene (p-...	20.42	119	1168894	20.435	ng	98
89) 1,2,3-Trimethylbenzene	20.41	105	974971	21.665	ng	98
90) 1,2-Dichlorobenzene	20.54	146	571326	22.074	ng	100
91) d-Limonene	20.54	68	373934	23.184	ng	98
92) 1,2-Dibromo-3-Chloropr...	20.92	157	203263	22.700	ng	94
93) n-Undecane	21.23	57	510768	22.935	ng	99
94) 1,2,4-Trichlorobenzene	22.04	180	430417	22.600	ng	100
95) Naphthalene	22.14	128	1281912	23.906	ng	100
96) n-Dodecane	22.14	57	477297	27.482	ng	99
97) Hexachlorobutadiene	22.46	225	265367	17.860	ng	100
98) Cyclohexanone	18.21	55	294796	21.835	ng	99
99) tert-Butylbenzene	20.04	119	912626	20.323	ng	100
100) n-Butylbenzene	20.78	91	989113	21.964	ng	99

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

TIC: 04161809.D\data.ms

Abundance

Time-->

4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00 18.00 19.00 20.00 21.00 22.00 23.00 24.00

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0

Chloromethane, T

Dichlorodifluoromethane (CFC 12), T

Vinyl Chloride, T

1,2-Dichloro-1,1,2,2-tetrafluoroethane, T

1,3-Butadiene, T

Bromomethane, T

Chloroethane, T

Ethanol, T

Acetonitrile, T

Trichlorofluoromethane, T

2-Propanol (Isopropanol), T

Acrylonitrile, T

1,1-Dichloroethene, T

2-Propanol (tert-Butyl Alcohol), T

3-Chloro-1,2-dichloroethane, T

1,1,1-Trichloroethane, T

trans-1,2-Dichloroethene, T

1,1-Dichloro-2,2,2-trifluoroethane, T

2-Butanone (MEK), T

Vinyl Acetate, T

cis-1,2-Dichloroethene, T

Bromochlorodifluoromethane (S1), T

1,2-Dichloroethane (S1), T

1,1,1-Trichloroethane, T

Tetrahydrofuran, T

1,1,1-Trichloroethane, T

Carbon Tetrachloride, T

Benzene, T

1-Bromopropanol, T

Cyclohexane, T

1,4-Difluorobenzene (S2), T

tert-Amyl Methyl Ether, T

1,2-Dichloropropane, T

1,2-Dichloroethane (S2), T

1,2-Dichloroethane (S3), T

n-Heptane, T

cis-1,3-Dichloropropene, T

trans-1,3-Dichloropropene, T

1,1,2-Trichloroethane, T

Toluene, T

2-Hexanone, T

Dibromochloromethane, T

1,2-Dibromoethane, T

n-Butyl Acetate, T

Tetrachloroethene, T

Chlorobenzene, T

Ethylbenzene, T

Bromomethylcyclohexanone, T

o-Xylene, T

n-Nonane, T

Bromofluorobenzene (SS3), S

Cumene, T

alpha-Pinene, T

n-Propylacetate, T

1,2-Dichloroethane (S1), T

1,2-Dichloroethane (S2), T

1,2-Dichloroethane (S3), T

1,2-Dichloroethane (S4), T

1,2-Dichloroethane (S5), T

1,2-Dichloroethane (S6), T

1,2-Dichloroethane (S7), T

1,2-Dichloroethane (S8), T

1,2-Dichloroethane (S9), T

1,2-Dichloroethane (S10), T

1,2-Dichloroethane (S11), T

1,2-Dichloroethane (S12), T

1,2-Dichloroethane (S13), T

1,2-Dichloroethane (S14), T

1,2-Dichloroethane (S15), T

1,2-Dichloroethane (S16), T

1,2-Dichloroethane (S17), T

1,2-Dichloroethane (S18), T

1,2-Dichloroethane (S19), T

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1,2-Dichloroethane (S137), T

1,2-Dichloroethane (S138), T

1,2-Dichloroethane (S139), T

1,2-Dichloro

Method Path : I:\MS13\METHODS\
Method File : R13032918.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Fri Mar 30 11:14:38 2018
Response Via : Initial Calibration

RS 4348

Calibration Files

0.08=03291803.D 0.10=03291804.D 0.20=03291805.D 0.40=03291806.D 1.0 =03291807.D 5.0 =03291808.D 25 =03291809.D
50 =03291810.D 100 =03291811.D

Compound	0.08	0.10	0.20	0.40	1.0	5.0	25	50	100	Avg	%RSD
-----ISTD-----											
1) IR Bromochloromethane...											
2) T Propene	1.784	1.133	1.184	1.441	1.263	1.131	1.046	0.958	0.978	1.213	21.48
3) T Dichlorodifluo...	2.958	2.114	1.980	2.648	2.201	1.970	1.820	1.692	1.562	2.105	21.33
4) T Chloromethane	2.302	1.506	1.479	2.122	1.845	1.612	1.506	1.362	1.070	1.645	23.32
5) T 1,2-Dichloro-1...	1.815	1.311	1.248	1.659	1.395	1.256	1.163	1.105	1.040	1.333	19.18
6) T Vinyl Chloride	2.145	1.425	1.407	2.067	1.790	1.624	1.514	1.400	1.287	1.629	18.90
7) T 1,3-Butadiene	1.315	0.861	0.868	1.289	1.131	1.083	1.069	0.997	0.902	1.057	15.97
8) T Bromomethane	1.561	1.035	1.003	1.366	1.158	1.000	1.014	0.961	0.852	1.106	20.18
9) T Chloroethane			0.730	1.072	0.936	0.851	0.802	0.760	0.699	0.836	15.67
10) T Ethanol	0.874	0.531	0.618	0.924	0.841	0.766	0.716	0.650	0.575	0.722	19.22
11) T Acetonitrile			0.936	2.011	1.915	1.960	1.911	1.808	1.696	1.748	21.33
12) T Acrolein				0.710	0.720	0.741	0.660	0.620	0.586	0.673	9.13
13) T Acetone	1.229	0.792	0.768	1.057	0.924	0.856	0.748	0.642	0.533	0.839	25.11
14) T Trichlorofluor...	2.559	1.696	1.703	2.316	1.952	1.745	1.626	1.541	1.451	1.843	20.04
15) T 2-Propanol (Is...	2.991	2.088	2.229	3.223	2.890	2.737	2.526	2.279	1.777	2.527	18.68
16) T Acrylonitrile			1.044	1.247	1.428	1.449	1.373	1.294	1.306		11.47
17) T 1,1-Dichloroet...	1.613	1.035	1.030	1.539	1.301	1.169	1.101	1.051	0.989	1.203	19.24
18) T 2-Methyl-2-Pro...	3.264	2.310	2.403	3.416	2.948	2.707	2.461	2.145	1.444	2.566	23.52
19) T Methylene Chlo...			1.777	1.851	1.419	1.214	1.122	1.062	0.964	1.344	26.14
20) T 3-Chloro-1-pro...			1.251	1.866	1.630	1.537	1.489	1.406	1.305	1.498	13.92
21) T Trichlorotrifl...	1.744	1.141	1.143	1.502	1.301	1.176	1.103	1.064	1.007	1.242	19.16
22) T Carbon Disulfide			5.512	6.443	5.012	4.332	4.037	3.785	3.438	4.651	22.86
23) T trans-1,2-Dich...	1.374	0.681	1.018	1.671	1.579	1.539	1.462	1.388	1.294	1.334	23.17
24) T 1,1-Dichloroet...	2.653	1.803	1.755	2.428	2.166	1.988	1.835	1.730	1.614	1.997	17.57
25) T Methyl tert-Bu...	4.481	3.113	3.089	4.168	3.684	3.349	3.127	2.963	2.714	3.410	17.21
26) T Vinyl Acetate			0.234	0.249	0.271	0.264	0.242	0.209	0.245		9.08
27) T 2-Butanone (MEK)			0.661	0.767	0.803	0.764	0.724	0.679	0.733		7.52
28) T cis-1,2-Dichlo...	1.896	1.124	1.214	1.806	1.583	1.468	1.407	1.318	1.228	1.449	18.48
29) T Diisopropyl Ether	1.427	0.827	1.062	1.489	1.277	1.176	1.072	0.837	0.709	1.097	24.83
30) T Ethyl Acetate			0.433	0.443	0.429	0.386	0.336	0.336	0.275	0.384	17.29
31) T n-Hexane		1.949	1.790	2.535	2.147	1.907	1.602	1.405	1.178	1.814	23.52
32) T Chloroform	2.572	1.689	1.721	2.378	2.037	1.880	1.757	1.663	1.549	1.916	18.20
33) S 1,2-Dichloroet...	1.145	1.151	1.157	1.159	1.147	1.155	1.159	1.146	1.160	1.153	0.53
34) T Tetrahydrofura...	1.214	0.791	0.788	1.042	0.883	0.810	0.751	0.718	0.663	0.851	20.40
35) T Ethyl tert-But...	1.688	1.104	1.155	1.717	1.505	1.378	1.307	1.242	1.150	1.361	16.93
36) T 1,2-Dichloroet...			1.003	1.506	1.328	1.272	1.208	1.148	1.087	1.222	13.61
-----ISTD-----											
37) IR 1,4-Difluorobenzen...											
38) T 1,1,1-Trichlor...	0.451	0.299	0.298	0.409	0.347	0.314	0.298	0.283	0.266	0.330	18.80
39) T Isopropyl Acetate	0.164	0.119	0.118	0.184	0.163	0.151	0.134	0.121	0.102	0.139	19.57
40) T 1-Butanol			0.197	0.208	0.224	0.209	0.190	0.159	0.159	0.198	11.36
41) T Benzene		1.077	0.972	1.256	1.062	0.953	0.860	0.779	0.625	0.948	20.55
42) T Carbon Tetrach...	0.372	0.281	0.261	0.356	0.306	0.282	0.273	0.263	0.248	0.294	14.77

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Method Path : I:\MS13\METHODS\
Method File : R13032918.M
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Title	: EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)											
43) T	Cyclohexane	0.555	0.387	0.365	0.488	0.418	0.371	0.337	0.308	0.262	0.388	23.1
44) T	tert-Amyl Meth...	0.890	0.601	0.603	0.804	0.696	0.643	0.605	0.571	0.516	0.659	18.1
45) T	1,2-Dichloropr...	0.305	0.207	0.203	0.286	0.252	0.230	0.212	0.201	0.181	0.231	18.2
46) T	Bromodichlorom...	0.491	0.363	0.420	0.334	0.293	0.293	0.274	0.261	0.241	0.335	25.7
47) T	Trichloroethene	0.389	0.270	0.250	0.346	0.298	0.273	0.260	0.249	0.228	0.285	18.2
48) T	1,4-Dioxane				0.243	0.218	0.206	0.195	0.185	0.165	0.202	13.4
49) T	2,2,4-Trimethy...	1.546	1.062	0.988	1.314	1.094	0.972	0.884	0.811	0.696	1.041	24.8
50) T	Methyl Methacr...				0.107	0.105	0.104	0.099	0.094	0.083	0.099	9.0
51) T	n-Heptane	0.339	0.212	0.226	0.308	0.267	0.238	0.216	0.202	0.178	0.243	21.5
52) T	cis-1,3-Dichlo...			0.222	0.389	0.370	0.368	0.351	0.336	0.306	0.334	16.8
53) T	4-Methyl-2-pen...			0.123	0.237	0.227	0.218	0.204	0.190	0.168	0.195	20.2
54) T	trans-1,3-Dich...				0.238	0.278	0.305	0.312	0.300	0.278	0.285	9.4
55) T	1,1,2-Trichlor...	0.252	0.185	0.185	0.284	0.250	0.233	0.218	0.208	0.190	0.223	15.4
56) IR	Chlorobenzene-d5	(...)	-----	-----	-----	-----	-----	-----	-----	-----	-----	
57) S	Toluene-d8 (SS2)	2.766	2.751	2.761	2.761	2.756	2.762	2.764	2.772	2.766	2.762	0.22
58) T	Toluene	4.518	3.160	2.824	3.833	3.274	2.974	2.723	2.538	2.218	3.118	22.4
59) T	2-Hexanone				1.401	1.378	1.413	1.326	1.234	1.083	1.306	9.7
60) T	Dibromochlorom...	0.928	0.558	0.649	0.930	0.843	0.804	0.782	0.761	0.714	0.774	15.7
61) T	1,2-Dibromoethane	0.614	0.312	0.494	0.848	0.787	0.769	0.751	0.726	0.673	0.664	25.4
62) T	n-Butyl Acetate			0.715	1.471	1.488	1.552	1.480	1.381	1.208	1.328	22.0
63) T	n-Octane	0.877	0.554	0.570	0.756	0.670	0.591	0.538	0.497	0.430	0.609	22.6
64) T	Tetrachloroethene	1.390	0.857	0.900	1.213	1.017	0.924	0.878	0.846	0.784	0.979	20.2
65) S	Chlorobenzene	3.007	2.054	1.886	2.571	2.216	2.004	1.893	1.785	1.595	2.112	20.5
66) T	Ethylbenzene	4.731	3.024	3.027	4.269	3.633	3.301	3.036	2.798	2.415	3.359	21.8
67) T	m- & p-Xylenes	3.854	2.561	2.420	3.349	2.860	2.571	2.350	2.154	1.822	2.660	23.2
68) T	Bromoform	0.768	0.508	0.564	0.845	0.762	0.751	0.755	0.742	0.703	0.711	15.0
69) T	Styrene	2.405	1.708	1.551	2.431	2.197	2.130	2.045	1.920	1.674	2.007	15.8
70) T	o-Xylene	3.822	2.429	2.365	3.315	2.847	2.589	2.396	2.205	1.887	2.651	22.4
71) T	n-Nonane	1.806	1.295	1.198	1.676	1.433	1.288	1.152	1.037	0.853	1.304	22.9
72) T	1,1,2,2-Tetrac...	1.563	0.961	1.037	1.506	1.311	1.221	1.152	1.062	0.907	1.191	19.4
73) S	Bromofluoroben...	0.787	0.778	0.769	0.775	0.772	0.770	0.782	0.789	0.788	0.779	1.01
74) T	Cumene	4.949	3.388	3.145	4.479	3.743	3.397	3.118	2.862	2.429	3.501	22.5
75) T	alpha-Pinene	2.343	1.645	1.566	2.106	1.818	1.696	1.606	1.500	1.298	1.731	18.4
76) T	n-Propylbenzene	5.490	3.719	3.492	4.979	4.331	3.944	3.595	3.263	2.724	3.949	21.8
77) T	3-Ethyltoluene	4.878	3.213	2.883	4.356	3.838	3.578	3.259	2.884	2.565	3.495	21.5
78) T	4-Ethyltoluene	4.672	3.013	2.998	3.945	3.387	3.032	2.855	2.730	2.189	3.202	22.6
79) T	1,3,5-Trimethy...	4.508	3.134	2.789	3.890	3.244	2.788	2.599	2.429	2.082	3.051	24.6
80) T	alpha-Methylst...	1.666	1.164	1.189	1.766	1.629	1.530	1.520	1.424	1.240	1.459	15.0
81) T	2-Ethyltoluene	5.053	3.330	3.144	4.347	3.728	3.324	3.041	2.794	2.371	3.459	23.6
82) T	1,2,4-Trimethy...	4.098	2.683	2.550	3.650	3.113	2.818	2.552	2.284	1.859	2.845	24.1
83) T	n-Decane	2.103	1.339	1.340	1.839	1.608	1.442	1.300	1.156	0.930	1.451	24.4
84) T	Benzyl Chloride			0.832	1.648	1.646	1.944	2.150	2.047	1.759	1.718	25.4
85) T	1,3-Dichlorobe...	2.135	1.404	1.434	2.121	1.893	1.737	1.686	1.592	1.394	1.711	16.9
86) T	1,4-Dichlorobe...	2.470	1.708	1.576	2.286	2.019	1.822	1.748	1.648	1.459	1.859	18.0
87) T	sec-Butylbenzene	5.738	3.684	3.565	4.961	4.230	3.809	3.494	3.197	2.642	3.924	23.8
88) T	4-Isopropyltol...	5.367	3.436	3.351	4.788	4.074	3.658	3.303	2.883	2.254	3.679	25.8
89) T	1,2,3-Trimethy...	4.236	2.781	2.628	3.624	3.173	2.831	2.590	2.310	1.878	2.895	24.3
90) T	1,2-Dichlorobe...	2.282	1.431	1.398	2.088	1.819	1.681	1.602	1.466	1.215	1.665	20.7
91) T	d-Limonene	1.317	0.975	0.961	1.310	1.127	1.054	1.008	0.886	0.700	1.037	18.9
92) T	1,2-Dibromo-3-...			0.358	0.657	0.597	0.606	0.627	0.610	0.576	0.576	17.2
93) T	n-Undecane	1.954	1.117	1.182	1.919	1.597	1.511	1.389	1.233	0.991	1.432	23.9
94) T	1,2,4-Trichlor...	1.397	0.866	0.871	1.456	1.364	1.300	1.326	1.277	1.168	1.225	17.7

Method Path : I:\MS13\METHODS\
Method File : R13032918.M

Title		: EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)											
95)	T	Naphthalene	4.185	2.499	2.222	4.225	4.039	3.894	3.824	3.412	2.742	3.449	22.32
96)	T	n-Dodecane	1.336	0.832	0.807	1.376	1.260	1.254	1.257	1.083	0.849	1.117	20.60
97)	T	Hexachlorobuta...	1.306	0.886	0.818	1.118	0.998	0.903	0.895	0.870	0.806	0.956	17.00
98)	T	Cyclohexanone	0.943	0.582	0.673	1.084	1.017	0.959	0.910	0.867	0.780	0.868	18.75
99)	T	tert-Butylbenzene	4.237	2.815	2.704	3.701	3.140	2.804	2.527	2.247	1.821	2.888	25.29
100)	T	n-Butylbenzene	3.829	2.489	2.478	3.782	3.231	2.978	2.741	2.484	2.058	2.897	21.18

(#) = Out of Range

Primary Source Standards Concentrations (Working & Initial Calibration)

RS 4/3/18

1ng/L Std. ID:
4ng/L Std. ID: S31-02281806
20ng/L Std. ID: S31-03271803
200ng/L Std. ID: S31-03201804

Dilution Factors:		5	50	250	1000	Working STD Conc.(ng/L):									
		Source Std. mg/m ³	Primary Working Standards				4	4	4	20	20	20	200	200	200
Compounds		200ng/L	20ng/L	4ng/L	1ng/L	Injection (L):	0.020	0.025	0.050	0.020	0.050	0.25	0.125	0.25	200
ICAL Points:															
Propene		1.037	207.4	20.74	4.148	1.037	0.08296	0.1037	0.2074	0.4148	1.037	5.185	25.925	51.85	100ng
Dichlorodifluoromethane		1.048	209.6	20.96	4.192	1.048	0.08384	0.1048	0.2096	0.4192	1.048	5.240	26.200	52.40	104.8
Chloromethane		1.006	201.2	20.12	4.024	1.006	0.08048	0.1006	0.2012	0.4024	1.006	5.030	25.150	50.30	100.6
Freon-114		1.021	204.2	20.42	4.084	1.021	0.08168	0.1021	0.2042	0.4084	1.021	5.105	25.525	51.05	102.1
Vinyl Chloride		1.032	206.4	20.64	4.128	1.032	0.08256	0.1032	0.2064	0.4128	1.032	5.160	25.800	51.60	103.2
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
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		1.012	202.4	20.24	4.048	1.012	0.08096	0.1012	0.2024	0.4048	1.012	5.060	25.300	50.60	101.2
Ethanol		5.271	1054.2	105.42	21.084	5.271	0.42168	0.5271	1.0542	2.1084	5.271	26.355	131.775	263.55	527.1
Acetonitrile		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
Acrolein		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
Acetone		5.322	1064.4	106.44	21.288	5.322	0.42576	0.5322	1.0644	2.1288	5.322	26.610	133.050	266.10	532.2
Trichlorofluoromethane		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
Isopropanol		2.107	421.4	42.14	8.428	2.107	0.16856	0.2107	0.4214	0.8428	2.107	10.535	52.675	105.35	210.7
Acrylonitrile		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
1,1-Dichloroethene		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
Methylene Chloride		2.120	424.0	42.40	8.480	2.120	0.16960	0.2120	0.4240	0.8480	2.120	10.600	53.000	106.00	212.0
AM Chloride		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
Trichlorotrifluoroethane		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
Carbon Disulfide		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
trans-1,2-Dichloroethene		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
1,1-Dichloroethane		1.081	216.2	21.62	4.324	1.081	0.08648	0.1081	0.2162	0.4324	1.081	5.405	27.025	54.05	108.1
Methyl tert-Butyl Ether		1.022	204.4	20.44	4.088	1.022	0.08176	0.1022	0.2044	0.4088	1.022	5.110	25.550	51.10	102.2
Vinyl Acetate		1.070	214.0	21.40	4.280	1.070	0.08560	0.1070	0.2140	0.4280	1.070	5.350	26.750	53.50	107.0
2-Butanone		5.281	1056.2	105.62	21.124	5.281	0.42248	0.5281	1.0562	2.1124	5.281	26.405	132.025	264.05	528.1
cis-1,2-Dichloroethene		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
Diisopropyl Ether		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
Ethyl Acetate		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
n-Hexane		2.136	427.2	42.72	8.544	2.136	0.17088	0.2136	0.4272	0.8544	2.136	10.680	53.400	106.80	213.6
Chloroform		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
Tetrahydrofuran		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
Ethyl tert-Butyl Ether		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
1,2-Dichloroethane		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
1,1,1-Trichloroethane		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
Isopropyl Acetate		1.077	215.4	21.54	4.308	1.077	0.08616	0.1077	0.2154	0.4308	1.077	5.385	26.925	53.85	107.7
i-Butanol		2.113	422.6	42.26	8.452	2.113	0.16904	0.2113	0.4226	0.8452	2.113	10.565	52.825	105.65	211.3
Benzene		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
Carbon Tetrachloride		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
Cyclohexane		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
tert-Amyl Methyl Ether		2.135	427.0	42.70	8.540	2.135	0.17080	0.2135	0.4270	0.8540	2.135	10.675	53.375	106.75	213.5
1,2-Dichloropropane		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
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		1.067	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
1,4-Dioxane		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
Isocutane		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
Methyl Methacrylate		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
n-Heptane		2.112	422.4	42.24	8.448	2.112	0.16896	0.2112	0.4224	0.8448	2.112	10.560	52.800	105.60	211.2
		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

Primary Source Standards Concentrations (Working & Initial Calibration)

1ng/L Std. ID:

4ng/L Std. ID: S31-02281806

20ng/L Std. ID: S31-03271803

200ng/L Std. ID: S31-03201804

Dilution Factors:

200ng/L Std. ID: S31-03201804																	
Dilution Factors:				Working STD Conc.(ng/L):													
Compounds	Source Std. ng/ml ³	Primary Working Standards				4				20				200			
		200ng/L	224.0	240.0	4ng/L	4ng/L	1ng/L	1ng/L	0.020	0.025	0.050	0.020	0.050	0.125	0.25	0.25	
cis-1,3-Dichloropropene	1.120	224.0	224.0	224.0	4.480	1.120	0.08960	0.2240	0.1120	0.4480	28.000	56.00	112.0	200	0.50		
4-Methyl-2-pentanone	1.059	211.8	211.8	211.8	4.236	1.059	0.08472	0.2118	0.1059	0.4236	26.475	52.95	105.9				
trans-1,3-Dichloropropene	1.067	213.4	213.4	213.4	4.268	1.067	0.08536	0.2134	0.1067	0.4268	26.675	53.35	106.7				
1,1,2-Trichloroethane	1.064	212.8	212.8	212.8	4.256	1.064	0.08512	0.2128	0.1064	0.4256	26.600	53.20	106.4				
Toluene	1.054	210.8	210.8	210.8	4.216	1.054	0.08432	0.2108	0.1054	0.4216	26.350	52.70	105.4				
2-Hexanone	1.060	212.0	212.0	212.0	4.240	1.060	0.08480	0.2120	0.1060	0.4240	26.500	53.00	106.0				
Dibromochloromethane	1.061	212.2	212.2	212.2	4.244	1.061	0.08488	0.2122	0.1061	0.4244	26.525	53.05	106.1				
1,2-Dibromoethane	1.064	212.8	212.8	212.8	4.256	1.064	0.08512	0.2128	0.1064	0.4256	26.600	53.20	106.4				
n-Butyl Acetate	1.068	213.6	213.6	213.6	4.272	1.068	0.08544	0.2136	0.1068	0.4272	26.700	53.40	106.8				
n-Octane	1.060	212.0	212.0	212.0	4.240	1.060	0.08480	0.2120	0.1060	0.4240	26.500	53.00	106.0				
Tetrachloroethene	1.063	212.6	212.6	212.6	4.252	1.063	0.08504	0.2126	0.1063	0.4252	26.575	53.15	106.3				
Chlorobenzene	1.066	213.2	213.2	213.2	4.264	1.066	0.08528	0.2132	0.1066	0.4264	26.650	53.30	106.6				
Ethylbenzene	1.052	210.4	210.4	210.4	4.208	1.052	0.08416	0.2104	0.1052	0.4208	26.300	52.60	105.2				
m-8p-Xylene	2.123	424.6	424.6	424.6	8.492	2.123	0.16984	0.2123	0.1061	0.4246	26.575	53.15	106.3				
Bromoform	1.063	212.6	212.6	212.6	4.252	1.063	0.08504	0.2126	0.1063	0.4252	26.575	53.15	106.3				
Styrene	1.058	211.6	211.6	211.6	4.232	1.058	0.08464	0.2116	0.1058	0.4232	26.450	52.90	105.8				
o-Xylene	1.055	211.0	211.0	211.0	4.220	1.055	0.08440	0.2110	0.1055	0.4220	26.375	52.75	105.5				
n-Nonane	1.054	210.8	210.8	210.8	4.216	1.054	0.08432	0.2108	0.1054	0.4216	26.350	52.70	105.4				
1,1,2,2-Tetrachloroethane	1.057	211.4	211.4	211.4	4.228	1.057	0.08456	0.2114	0.1057	0.4228	26.425	52.85	105.7				
Octane	1.052	210.4	210.4	210.4	4.208	1.052	0.08416	0.2104	0.1052	0.4208	26.300	52.60	105.2				
alpha-Pinene	1.046	209.2	209.2	209.2	4.184	1.046	0.08368	0.2092	0.1046	0.4184	26.150	52.30	104.6				
n-Propylbenzene	1.064	212.8	212.8	212.8	4.256	1.064	0.08512	0.2128	0.1064	0.4256	26.600	53.20	106.4				
3-Ethyltoluene	1.050	210.0	210.0	210.0	4.200	1.050	0.08400	0.2100	0.1050	0.4200	26.250	52.50	105.0				
4-Ethyltoluene	1.049	209.8	209.8	209.8	4.196	1.049	0.08392	0.2098	0.1049	0.4196	26.225	52.45	104.9				
1,3,5-Trimethylbenzene	1.049	209.8	209.8	209.8	4.196	1.049	0.08392	0.2098	0.1049	0.4196	26.225	52.45	104.9				
alpha-Methylstyrene	1.049	209.8	209.8	209.8	4.196	1.049	0.08392	0.2098	0.1049	0.4196	26.225	52.45	104.9				
2-Ethyltoluene	1.060	212.0	212.0	212.0	4.240	1.060	0.08480	0.2120	0.1060	0.4240	26.500	53.00	106.0				
1,2,4-Trimethylbenzene	1.051	210.2	210.2	210.2	4.204	1.051	0.08408	0.2102	0.1051	0.4204	26.275	52.55	105.1				
n-Decane	1.059	211.8	211.8	211.8	4.236	1.059	0.08472	0.2118	0.1059	0.4236	26.475	52.95	105.9				
Benzyl Chloride	1.071	214.8	214.8	214.8	4.296	1.071	0.08592	0.2148	0.1074	0.4296	26.850	53.70	107.4				
1,3-Dichlorobenzene	1.071	214.2	214.2	214.2	4.284	1.071	0.08568	0.2142	0.1071	0.4284	26.775	53.55	107.1				
1,4-Dichlorobenzene	1.064	212.8	212.8	212.8	4.256	1.064	0.08512	0.2128	0.1064	0.4256	26.600	53.20	106.4				
sec-Butylbenzene	1.055	211.0	211.0	211.0	4.220	1.055	0.08440	0.2110	0.1055	0.4220	26.375	52.75	105.5				
p-Isopropyltoluene	1.026	205.2	205.2	205.2	4.104	1.026	0.08208	0.2052	0.1026	0.4104	25.650	51.30	102.6				
1,2,3-Trimethylbenzene	1.026	205.2	205.2	205.2	4.104	1.026	0.08208	0.2052	0.1026	0.4104	25.650	51.30	102.6				
1,2-Dichlorobenzene	1.083	216.6	216.6	216.6	4.332	1.083	0.08664	0.2166	0.1083	0.4332	27.075	54.15	108.3				
d-Limonene	1.005	201.0	201.0	201.0	4.020	1.005	0.08040	0.2010	0.1005	0.4020	25.125	50.25	100.5				
1,2-Dibromo-3-chloropropane	1.051	210.2	210.2	210.2	4.204	1.051	0.08408	0.2102	0.1051	0.4204	26.275	52.55	105.1				
n-Undecane	1.053	210.6	210.6	210.6	4.212	1.053	0.08424	0.2106	0.1053	0.4212	26.325	52.65	105.3				
1,2,4-Trichlorobenzene	1.097	219.4	219.4	219.4	4.388	1.097	0.08776	0.2194	0.1097	0.4388	27.425	54.85	109.7				
Naphthalene	1.056	211.2	211.2	211.2	4.224	1.056	0.08448	0.2112	0.1056	0.4224	26.400	52.80	105.6				
n-Dodecane	1.056	211.2	211.2	211.2	4.224	1.056	0.08448	0.2112	0.1056	0.4224	26.400	52.80	105.6				
Hexachloro-1,3-butadiene	1.057	211.4	211.4	211.4	4.228	1.057	0.08456	0.2114	0.1057	0.4228	26.425	52.85	105.7				
Methacrylonitrile	1.067	213.4	213.4	213.4	4.268	1.067	0.08536	0.2134	0.1067	0.4268	26.675	53.35	106.7				
Cyclohexanone	1.039	207.8	207.8	207.8	4.156	1.039	0.08312	0.2078	0.1039	0.4156	25.975	51.95	103.9				
tert-Butylbenzene	1.050	210.0	210.0	210.0	4.200	1.050	0.08400	0.2100	0.1050	0.4200	26.250	52.50	105.0				
n-Butylbenzene	1.054	210.8	210.8	210.8	4.216	1.054	0.08432	0.2108	0.1054	0.4216	26.350	52.70	105.4				

Method : I:\MS13\METHODS\R13032918.M (RTE Integrator)
 Title : EPA T0-15 per SOP VOA-T015 (CASS T0-15/GC-MS)
 Last Update : Fri Mar 30 08:58:13 2018
 Response via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	0.08	0	13	I:\MS13\DATA\2018_03\29\03291803.D
2	0.10	0	13	I:\MS13\DATA\2018_03\29\03291804.D
3	0.20	0	13	I:\MS13\DATA\2018_03\29\03291805.D
4	0.40	0	13	I:\MS13\DATA\2018_03\29\03291806.D
5	1.0	1	13	I:\MS13\DATA\2018_03\29\03291807.D
6	5.0	5	13	I:\MS13\DATA\2018_03\29\03291808.D
7	25	26	13	I:\MS13\DATA\2018_03\29\03291809.D
8	50	52	13	I:\MS13\DATA\2018_03\29\03291810.D
9	100	104	13	I:\MS13\DATA\2018_03\29\03291811.D

RS 3/30/18

#	ID	Update Time	Quant Time	Acquisition Time
1	0.08	Mar 30 08:57 2018	Mar 30 08:53 2018	29 Mar 2018 16:40
2	0.10	Mar 30 08:57 2018	Mar 30 08:53 2018	29 Mar 2018 17:13
3	0.20	Mar 30 08:57 2018	Mar 30 08:54 2018	29 Mar 2018 17:47
4	0.40	Mar 30 08:57 2018	Mar 30 08:47 2018	29 Mar 2018 18:21
5	1.0	Mar 30 08:57 2018	Mar 30 08:47 2018	29 Mar 2018 18:55
6	5.0	Mar 30 08:57 2018	Mar 30 08:47 2018	29 Mar 2018 19:28
7	25	Mar 30 08:58 2018	Mar 30 08:47 2018	29 Mar 2018 20:02
8	50	Mar 30 08:58 2018	Mar 30 08:47 2018	29 Mar 2018 20:36
9	100	Mar 30 08:58 2018	Mar 30 08:47 2018	29 Mar 2018 21:10

R13032918.M

Fri Mar 30 09:10:35 2018

Data File : I:\MS13\DATA\2018 03\29\03291803.D
 Acq On : 29 Mar 2018 16:40
 Sample : 0.08ng TO15 ICAL std
 Misc : S31-03281803/S31-02281806 (3/29)

Vial: 8
 Operator: RS
 Inst : MS13

Quant Time: Mar 30 08:53:37 2018

Quant Method : I:\MS13\METHODS\R13032918.M

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

QLast Update : Fri Mar 30 08:47:08 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

RS 3/30/18

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.13	130	108753	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.21	114	546845	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.51	82	185111	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.96	65	124476	9.162	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	73.28%
57) Toluene-d8 (SS2)	15.64	98	512037	13.731	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	109.84%
73) Bromofluorobenzene (SS3)	18.91	174	145647	12.460	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.68%

Target Compounds

						Qvalue
2) Propene	4.41	42	1288	0.093	ng	89
3) Dichlorodifluoromethan...	4.55	85	2158	0.085	ng	# 88
4) Chloromethane	4.83	50	1612	0.078	ng	89
5) 1,2-Dichloro-1,1,2,2-t...	5.06	135	1290	0.092	ng	95
6) Vinyl Chloride	5.22	62	1541	0.071	ng	85
7) 1,3-Butadiene	5.47	54	969	0.060	ng	95
8) Bromomethane	5.88	94	1079	0.090	ng	97
9) Chloroethane	0.00	64	0	N.D.	d	
10) Ethanol	6.56	45	3206	0.358	ng	# 65
11) Acetonitrile	0.00	41	0	N.D.	d	
12) Acrolein	0.00	56	0	N.D.		
13) Acetone	7.20	58	4551	0.429	ng	98
14) Trichlorofluoromethane	7.39	101	1872	0.086	ng	96
15) 2-Propanol (Isopropanol)	7.72	45	4387	0.140	ng	78
16) Acrylonitrile	0.00	53	0	N.D.		
17) 1,1-Dichloroethene	8.31	96	1191	0.095	ng	98
18) 2-Methyl-2-Propanol (t...	8.56	59	4816	0.160	ng	# 80
19) Methylene Chloride	0.00	84	0	N.D.	d	
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.	d	
21) Trichlorotrifluoroethane	8.91	151	1278	0.111	ng	97
22) Carbon Disulfide	0.00	76	0	N.D.	d	
23) trans-1,2-Dichloroethene	9.75	61	1034	0.062	ng	93
24) 1,1-Dichloroethane	9.98	63	1887	0.081	ng	85
25) Methyl tert-Butyl Ether	10.16	73	3337	0.088	ng	83
26) Vinyl Acetate	0.00	86	0	N.D.		
27) 2-Butanone (MEK)	0.00	72	0	N.D.		
28) cis-1,2-Dichloroethene	10.97	61	1408	0.082	ng	93
29) Diisopropyl Ether	11.30	87	1058	0.093	ng	# 1
30) Ethyl Acetate	0.00	61	0	N.D.		
31) n-Hexane	0.00	57	0	N.D.	d	
32) Chloroform	11.30	83	1899	0.087	ng	94
34) Tetrahydrofuran (THF)	11.80	72	899	0.112	ng	# 86
35) Ethyl tert-Butyl Ether	11.88	87	1244	0.086	ng	91
36) 1,2-Dichloroethane	0.00	62	0	N.D.	d	
38) 1,1,1-Trichloroethane	12.37	97	1700	0.093	ng	94
39) Isopropyl Acetate	12.82	61	1212	0.147	ng	# 78
40) 1-Butanol	0.00	56	0	N.D.		
41) Benzene	12.83	78	5992	0.115	ng	94
42) Carbon Tetrachloride	12.99	117	1381	0.088	ng	94
43) Cyclohexane	13.12	84	4147	0.195	ng	90
44) tert-Amyl Methyl Ether	13.50	73	3292	0.092	ng	94
45) 1,2-Dichloropropane	13.68	63	1138	0.090	ng	89
46) Bromodichloromethane	0.00	83	0	N.D.	d	
47) Trichloroethene	13.92	130	1445	0.105	ng	97
48) 1,4-Dioxane	0.00	88	0	N.D.	d	
49) 2,2,4-Trimethylpentane...	13.98	57	5734	0.099	ng	95
50) Methyl Methacrylate	14.16	100	125	0.029	ng	# 1

Data File : I:\MS13\DATA\2018 03\29\03291803.D
 Acq On : 29 Mar 2018 16:40
 Sample : 0.08ng TO15 ICAL std
 Misc : S31-03281803/S31-02281806 (3/29)

Vial: 8
 Operator: RS
 Inst : MS13

Quant Time: Mar 30 08:53:37 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:47:08 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.24	71	1265	0.088	ng	97
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.	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	15.47	97	937	0.081	ng	98
58) Toluene	15.75	91	5641	0.127	ng	99
59) 2-Hexanone	0.00	43	0	N.D.	d	
60) Dibromochloromethane	16.17	129	1166	0.110	ng	90
61) 1,2-Dibromoethane	16.44	107	774	0.078	ng	90
62) n-Butyl Acetate	0.00	43	0	N.D.	d	
63) n-Octane	16.75	57	1101	0.106	ng	88
64) Tetrachloroethene	16.89	166	1750	0.144	ng	97
65) Chlorobenzene	17.55	112	3797	0.130	ng	98
66) Ethylbenzene	17.92	91	5896	0.119	ng	95
67) m- & p-Xylenes	18.09	91	9694	0.248	ng	98
68) Bromoform	18.15	173	967	0.112	ng	87
69) Styrene	18.42	104	3015	0.109	ng	84
70) o-Xylene	18.51	91	4777	0.121	ng	95
71) n-Nonane	18.71	43	2255	0.091	ng	98
72) 1,1,2,2-Tetrachloroethane	18.48	83	1957	0.111	ng	92
74) Cumene	19.04	105	6168	0.112	ng	96
75) alpha-Pinene	19.38	93	2904	0.118	ng	93
76) n-Propylbenzene	19.49	91	6920	0.107	ng	94
77) 3-Ethyltoluene	19.58	105	6068	0.111	ng	99
78) 4-Ethyltoluene	19.62	105	5806	0.127	ng	97
79) 1,3,5-Trimethylbenzene	19.68	105	5602	0.121	ng	95
80) alpha-Methylstyrene	19.82	118	2071	0.106	ng	94
81) 2-Ethyltoluene	19.85	105	6346	0.130	ng	94
82) 1,2,4-Trimethylbenzene	20.04	105	5102	0.126	ng	97
83) n-Decane	20.13	57	2639	0.103	ng	90
84) Benzyl Chloride	0.00	91	0	N.D.	d	
85) 1,3-Dichlorobenzene	20.19	146	2709	0.115	ng	95
86) 1,4-Dichlorobenzene	20.24	146	3113	0.128	ng	98
87) sec-Butylbenzene	20.28	105	7172	0.131	ng	95
88) 4-Isopropyltoluene (p-...	20.42	119	6524	0.120	ng	98
89) 1,2,3-Trimethylbenzene	20.42	105	5149	0.116	ng	94
90) 1,2-Dichlorobenzene	20.54	146	2928	0.131	ng	100
91) d-Limonene	20.55	68	1568	0.100	ng	99
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.	d	
93) n-Undecane	21.23	57	2437	0.098	ng	89
94) 1,2,4-Trichlorobenzene	22.05	180	1815	0.121	ng	# 95
95) Naphthalene	22.16	128	5236	0.111	ng	76
96) n-Dodecane	22.14	57	1671	0.082	ng	87
97) Hexachlorobutadiene	22.46	225	1636	0.144	ng	98
98) Cyclohexanone	18.23	55	1161	0.077	ng	# 83
99) tert-Butylbenzene	20.04	119	5270	0.135	ng	98
100) n-Butylbenzene	20.79	91	4781	0.111	ng	96

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

Vial: 8
Operator: RS
Inst : MS13

Quant Time: Mar 30 08:53:37 2018

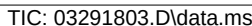
Quant Method : I:\MS13\METHODS\R13032918.M

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

QLast Update : Fri Mar 30 08:47:08 2018

Response via : Initial Calibration

DataAcq Meth:T015.M



Data File : I:\MS13\DATA\2018 03\29\03291804.D
 Acq On : 29 Mar 2018 17:13
 Sample : 0.10ng TO15 ICAL std
 Misc : S31-03281803/S31-02281806 (3/29)

Vial: 8
 Operator: RS
 Inst : MS13

Quant Time: Mar 30 08:53:17 2018

RS 3/30/18

Quant Method : I:\MS13\METHODS\R13032918.M

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

QLast Update : Fri Mar 30 08:47:08 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.13	130	108113	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.21	114	544215	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.51	82	187001	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.96	65	124483	9.217	ng	-0.02
Spiked Amount	12.500	Range 70	- 130	Recovery	=	73.76%
57) Toluene-d8 (SS2)	15.64	98	514409	13.656	ng	0.00
Spiked Amount	12.500	Range 70	- 130	Recovery	=	109.28%
73) Bromofluorobenzene (SS3)	18.91	174	145567	12.327	ng	0.00
Spiked Amount	12.500	Range 70	- 130	Recovery	=	98.64%

Target Compounds

						Qvalue
2) Propene	4.40	42	1016	0.074	ng	# 83
3) Dichlorodifluoromethan...	4.55	85	1916	0.076	ng	# 88
4) Chloromethane	4.82	50	1310	0.064	ng	74
5) 1,2-Dichloro-1,1,2,2-t...	5.06	135	1158	0.083	ng	81
6) Vinyl Chloride	5.22	62	1272	0.059	ng	73
7) 1,3-Butadiene	5.47	54	789	0.049	ng	91
8) Bromomethane	5.88	94	889	0.075	ng	95
9) Chloroethane	0.00	64	0	N.D.	d	
10) Ethanol	6.57	45	2423	0.272	ng	# 56
11) Acetonitrile	0.00	41	0	N.D.		
12) Acrolein	0.00	56	0	N.D.		
13) Acetone	7.21	58	3647	0.346	ng	97
14) Trichlorofluoromethane	7.39	101	1542	0.071	ng	96
15) 2-Propanol (Isopropanol)	7.75	45	3805	0.122	ng	70
16) Acrylonitrile	0.00	53	0	N.D.		
17) 1,1-Dichloroethene	8.31	96	950	0.076	ng	97
18) 2-Methyl-2-Propanol (t...	8.57	59	4236	0.142	ng	# 78
19) Methylene Chloride	0.00	84	0	N.D.	d	
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.	d	
21) Trichlorotrifluoroethane	8.91	151	1039	0.091	ng	91
22) Carbon Disulfide	0.00	76	0	N.D.	d	
23) trans-1,2-Dichloroethene	9.75	61	637	0.039	ng	85
24) 1,1-Dichloroethane	9.97	63	1594	0.069	ng	84
25) Methyl tert-Butyl Ether	10.16	73	2881	0.077	ng	87
26) Vinyl Acetate	0.00	86	0	N.D.		
27) 2-Butanone (MEK)	0.00	72	0	N.D.		
28) cis-1,2-Dichloroethene	10.97	61	1037	0.061	ng	90
29) Diisopropyl Ether	11.30	87	762	0.067	ng	# 1
30) Ethyl Acetate	0.00	61	0	N.D.		
31) n-Hexane	11.25	57	1797	0.075	ng	# 86
32) Chloroform	11.29	83	1550	0.071	ng	100
34) Tetrahydrofuran (THF)	11.80	72	728	0.091	ng	# 84
35) Ethyl tert-Butyl Ether	11.88	87	1011	0.070	ng	# 80
36) 1,2-Dichloroethane	0.00	62	0	N.D.	d	
38) 1,1,1-Trichloroethane	12.35	97	1403	0.077	ng	91
39) Isopropyl Acetate	12.82	61	1093	0.133	ng	95
40) 1-Butanol	0.00	56	0	N.D.		
41) Benzene	12.84	78	4957	0.096	ng	92
42) Carbon Tetrachloride	12.99	117	1297	0.083	ng	91
43) Cyclohexane	13.12	84	3595	0.170	ng	89
44) tert-Amyl Methyl Ether	13.50	73	2764	0.077	ng	93
45) 1,2-Dichloropropane	13.68	63	962	0.076	ng	85
46) Bromodichloromethane	13.87	83	2281	0.145	ng	97
47) Trichloroethene	13.91	130	1246	0.091	ng	93
48) 1,4-Dioxane	0.00	88	0	N.D.	d	
49) 2,2,4-Trimethylpentane...	13.98	57	4901	0.085	ng	94
50) Methyl Methacrylate	0.00	100	0	N.D.	d	

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Data File : I:\MS13\DATA\2018 03\29\03291804.D
 Acq On : 29 Mar 2018 17:13
 Sample : 0.10ng TO15 ICAL std
 Misc : S31-03281803/S31-02281806 (3/29)

Vial: 8
 Operator: RS
 Inst : MS13

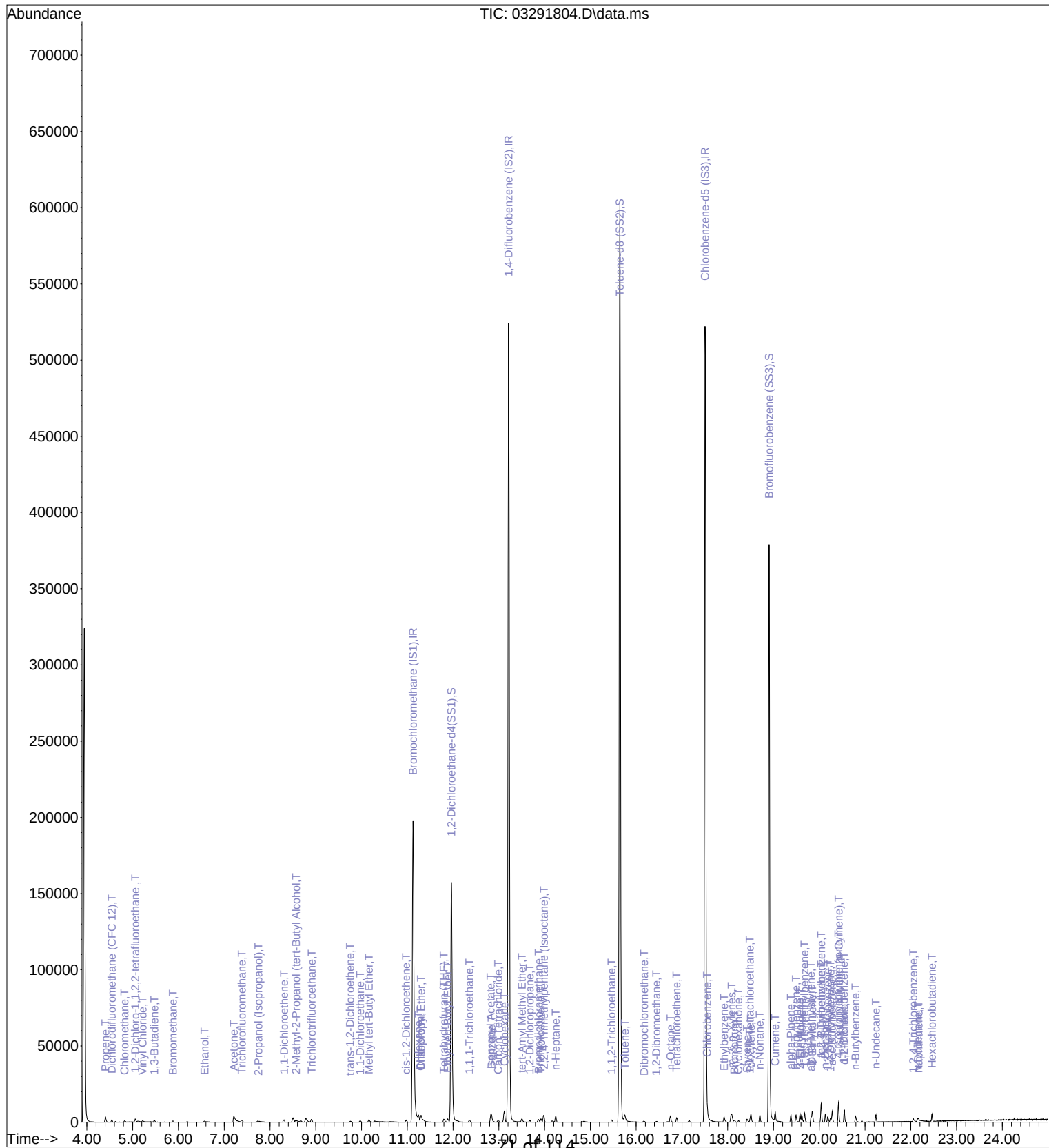
Quant Time: Mar 30 08:53:17 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:47:08 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.24	71	981	0.068	ng	92
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.	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	15.46	97	859	0.074	ng	88
58) Toluene	15.75	91	4982	0.111	ng	94
59) 2-Hexanone	0.00	43	0	N.D.		
60) Dibromochloromethane	16.17	129	886	0.083	ng	86
61) 1,2-Dibromoethane	16.44	107	496	0.049	ng	97
62) n-Butyl Acetate	0.00	43	0	N.D.	d	
63) n-Octane	16.75	57	878	0.084	ng	93
64) Tetrachloroethene	16.89	166	1363	0.111	ng	98
65) Chlorobenzene	17.55	112	3275	0.111	ng	92
66) Ethylbenzene	17.92	91	4759	0.095	ng	97
67) m- & p-Xylenes	18.09	91	8134	0.206	ng	96
68) Bromoform	18.15	173	808	0.092	ng	81
69) Styrene	18.42	104	2703	0.097	ng	80
70) o-Xylene	18.51	91	3834	0.096	ng	99
71) n-Nonane	18.70	43	2042	0.082	ng	91
72) 1,1,2,2-Tetrachloroethane	18.48	83	1520	0.085	ng	96
74) Cumene	19.04	105	5332	0.096	ng	96
75) alpha-Pinene	19.38	93	2574	0.104	ng	95
76) n-Propylbenzene	19.49	91	5920	0.091	ng	90
77) 3-Ethyltoluene	19.58	105	5047	0.091	ng	97
78) 4-Ethyltoluene	19.62	105	4728	0.102	ng	99
79) 1,3,5-Trimethylbenzene	19.68	105	4918	0.105	ng	92
80) alpha-Methylstyrene	19.82	118	1827	0.092	ng	96
81) 2-Ethyltoluene	19.85	105	5281	0.107	ng	96
82) 1,2,4-Trimethylbenzene	20.04	105	4218	0.104	ng	95
83) n-Decane	20.13	57	2121	0.082	ng	88
84) Benzyl Chloride	0.00	91	0	N.D.	d	
85) 1,3-Dichlorobenzene	20.19	146	2249	0.095	ng	99
86) 1,4-Dichlorobenzene	20.25	146	2718	0.110	ng	93
87) sec-Butylbenzene	20.28	105	5815	0.105	ng	96
88) 4-Isopropyltoluene (p-...	20.42	119	5274	0.096	ng	97
89) 1,2,3-Trimethylbenzene	20.42	105	4269	0.095	ng	98
90) 1,2-Dichlorobenzene	20.54	146	2318	0.103	ng	95
91) d-Limonene	20.55	68	1466	0.093	ng	98
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.	d	
93) n-Undecane	21.24	57	1759	0.070	ng	99
94) 1,2,4-Trichlorobenzene	22.06	180	1421	0.093	ng	# 87
95) Naphthalene	22.17	128	3948	0.083	ng	# 71
96) n-Dodecane	22.15	57	1315	0.064	ng	# 71
97) Hexachlorobutadiene	22.46	225	1401	0.122	ng	97
98) Cyclohexanone	18.23	55	904	0.060	ng	# 85
99) tert-Butylbenzene	20.04	119	4422	0.112	ng	96
100) n-Butylbenzene	20.79	91	3925	0.091	ng	# 89

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

Vial: 8
Operator: RS
Inst : MS13

Quant Time: Mar 30 08:53:17 2018
Quant Method : I:\MS13\METHODS\R13032918.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Mar 30 08:47:08 2018
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2018 03\29\03291805.D
 Acq On : 29 Mar 2018 17:47
 Sample : 0.20ng TO15 ICAL std
 Misc : S31-03281803/S31-02281806 (3/29)

Vial: 8
 Operator: RS
 Inst : MS13

RS 3/30/18

Quant Time: Mar 30 08:54:42 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:47:08 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.13	130	108559	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.21	114	549176	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.51	82	186972	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.96	65	125570	9.259	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	74.08%	
57) Toluene-d8 (SS2)	15.64	98	516313	13.708	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	109.68%	
73) Bromofluorobenzene (SS3)	18.91	174	143857	12.184	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.44%	

Target Compounds

						Qvalue
2) Propene	4.40	42	2132	0.154	ng	96
3) Dichlorodifluoromethan...	4.54	85	3604	0.142	ng	# 92
4) Chloromethane	4.81	50	2585	0.125	ng	91
5) 1,2-Dichloro-1,1,2,2-t...	5.05	135	2213	0.158	ng	92
6) Vinyl Chloride	5.21	62	2522	0.116	ng	93
7) 1,3-Butadiene	5.46	54	1596	0.099	ng	95
8) Bromomethane	5.87	94	1730	0.145	ng	98
9) Chloroethane	6.18	64	1283	0.130	ng	87
10) Ethanol	6.53	45	5654	0.633	ng	78
11) Acetonitrile	6.83	41	1722	0.085	ng	99
12) Acrolein	0.00	56	0	N.D.	d	
13) Acetone	7.19	58	7100	0.671	ng	90
14) Trichlorofluoromethane	7.38	101	3109	0.142	ng	99
15) 2-Propanol (Isopropanol)	7.69	45	8156	0.260	ng	92
16) Acrylonitrile	0.00	53	0	N.D.		
17) 1,1-Dichloroethene	8.30	96	1899	0.152	ng	100
18) 2-Methyl-2-Propanol (t...	8.54	59	8849	0.295	ng	86
19) Methylene Chloride	8.50	84	3266	0.262	ng	98
20) 3-Chloro-1-propene (Al...	8.67	41	2291	0.119	ng	82
21) Trichlorotrifluoroethane	8.91	151	2091	0.183	ng	99
22) Carbon Disulfide	8.78	76	10178	0.229	ng	91
23) trans-1,2-Dichloroethene	9.74	61	1911	0.115	ng	99
24) 1,1-Dichloroethane	9.97	63	3116	0.135	ng	96
25) Methyl tert-Butyl Ether	10.14	73	5741	0.152	ng	93
26) Vinyl Acetate	0.00	86	0	N.D.	d	
27) 2-Butanone (MEK)	0.00	72	0	N.D.	d	
28) cis-1,2-Dichloroethene	10.97	61	2250	0.131	ng	99
29) Diisopropyl Ether	11.29	87	1965	0.172	ng	# 62
30) Ethyl Acetate	0.00	61	0	N.D.	d	
31) n-Hexane	11.25	57	3314	0.137	ng	# 97
32) Chloroform	11.30	83	3171	0.145	ng	95
34) Tetrahydrofuran (THF)	11.79	72	1457	0.182	ng	90
35) Ethyl tert-Butyl Ether	11.87	87	2124	0.147	ng	90
36) 1,2-Dichloroethane	12.10	62	1838	0.113	ng	78
38) 1,1,1-Trichloroethane	12.36	97	2819	0.153	ng	98
39) Isopropyl Acetate	12.81	61	2182	0.264	ng	# 83
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	12.83	78	9027	0.173	ng	97
42) Carbon Tetrachloride	12.99	117	2427	0.154	ng	94
43) Cyclohexane	13.12	84	6848	0.320	ng	93
44) tert-Amyl Methyl Ether	13.49	73	5600	0.155	ng	96
45) 1,2-Dichloropropane	13.68	63	1897	0.149	ng	93
46) Bromodichloromethane	13.86	83	3399	0.214	ng	99
47) Trichloroethene	13.92	130	2330	0.169	ng	99
48) 1,4-Dioxane	0.00	88	0	N.D.	d	
49) 2,2,4-Trimethylpentane...	13.98	57	9199	0.159	ng	98
50) Methyl Methacrylate	0.00	100	0	N.D.	d	

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Data File : I:\MS13\DATA\2018 03\29\03291805.D
 Acq On : 29 Mar 2018 17:47
 Sample : 0.20ng TO15 ICAL std
 Misc : S31-03281803/S31-02281806 (3/29)

Vial: 8
 Operator: RS
 Inst : MS13

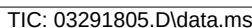
Quant Time: Mar 30 08:54:42 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:47:08 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.24	71	2113	0.146	ng	98
52) cis-1,3-Dichloropropene	14.80	75	2187	0.121	ng	79
53) 4-Methyl-2-pentanone	14.85	58	1140	0.104	ng	# 49
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.	d	
55) 1,1,2-Trichloroethane	15.47	97	1733	0.148	ng	100
58) Toluene	15.75	91	8905	0.198	ng	98
59) 2-Hexanone	0.00	43	0	N.D.	d	
60) Dibromochloromethane	16.16	129	2060	0.192	ng	92
61) 1,2-Dibromoethane	16.42	107	1571	0.156	ng	98
62) n-Butyl Acetate	16.66	43	2285	0.090	ng	# 82
63) n-Octane	16.75	57	1808	0.173	ng	93
64) Tetrachloroethene	16.89	166	2862	0.233	ng	95
65) Chlorobenzene	17.55	112	6013	0.204	ng	99
66) Ethylbenzene	17.92	91	9525	0.190	ng	96
67) m- & p-Xylenes	18.08	91	15367	0.389	ng	96
68) Bromoform	18.14	173	1794	0.205	ng	89
69) Styrene	18.42	104	4909	0.175	ng	96
70) o-Xylene	18.51	91	7464	0.187	ng	99
71) n-Nonane	18.70	43	3778	0.151	ng	99
72) 1,1,2,2-Tetrachloroethane	18.49	83	3280	0.184	ng	94
74) Cumene	19.03	105	9899	0.178	ng	96
75) alpha-Pinene	19.38	93	4899	0.198	ng	96
76) n-Propylbenzene	19.49	91	11116	0.170	ng	95
77) 3-Ethyltoluene	19.58	105	9056	0.164	ng	100
78) 4-Ethyltoluene	19.61	105	9407	0.203	ng	98
79) 1,3,5-Trimethylbenzene	19.68	105	8751	0.188	ng	96
80) alpha-Methylstyrene	19.82	118	3731	0.188	ng	99
81) 2-Ethyltoluene	19.85	105	9969	0.202	ng	96
82) 1,2,4-Trimethylbenzene	20.04	105	8016	0.197	ng	98
83) n-Decane	20.13	57	4245	0.164	ng	94
84) Benzyl Chloride	20.17	91	2672	0.093	ng	80
85) 1,3-Dichlorobenzene	20.18	146	4596	0.193	ng	98
86) 1,4-Dichlorobenzene	20.24	146	5016	0.204	ng	96
87) sec-Butylbenzene	20.28	105	11250	0.203	ng	97
88) 4-Isopropyltoluene (p-...	20.42	119	10284	0.188	ng	97
89) 1,2,3-Trimethylbenzene	20.42	105	8067	0.180	ng	99
90) 1,2-Dichlorobenzene	20.54	146	4528	0.201	ng	98
91) d-Limonene	20.54	68	2888	0.182	ng	93
92) 1,2-Dibromo-3-Chloropr...	20.93	157	1126	0.159	ng	97
93) n-Undecane	21.23	57	3723	0.148	ng	95
94) 1,2,4-Trichlorobenzene	22.05	180	2858	0.188	ng	# 94
95) Naphthalene	22.16	128	7018	0.148	ng	86
96) n-Dodecane	22.15	57	2549	0.124	ng	87
97) Hexachlorobutadiene	22.46	225	2587	0.225	ng	95
98) Cyclohexanone	18.23	55	2093	0.138	ng	93
99) tert-Butylbenzene	20.04	119	8495	0.215	ng	99
100) n-Butylbenzene	20.79	91	7812	0.180	ng	94

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

Vial: 8
Operator: RS
Inst : MS13

Quant Time: Mar 30 08:54:42 2018



Data File : I:\MS13\DATA\2018 03\29\03291806.D
 Acq On : 29 Mar 2018 18:21
 Sample : 0.40ng TO15 ICAL std
 Misc : S31-03281803/S31-03271803 (4/25)

Vial: 7
 Operator: RS
 Inst : MS13

RS 3/30/18

Quant Time: Mar 30 08:47:37 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:47:08 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.13	130	106834	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.21	114	542080	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.51	82	184149	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.96	65	123852	9.280	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	74.24%	
57) Toluene-d8 (SS2)	15.64	98	508500	13.708	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	109.68%	
73) Bromofluorobenzene (SS3)	18.91	174	142796	12.280	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	98.24%	

Target Compounds

						Qvalue
2) Propene	4.39	42	5110	0.375	ng	93
3) Dichlorodifluoromethan...	4.54	85	9489	0.381	ng	98
4) Chloromethane	4.80	50	7297	0.360	ng	93
5) 1,2-Dichloro-1,1,2,2-t...	5.04	135	5789	0.419	ng	97
6) Vinyl Chloride	5.20	62	7293	0.341	ng	96
7) 1,3-Butadiene	5.45	54	4665	0.293	ng	97
8) Bromomethane	5.86	94	4637	0.394	ng	97
9) Chloroethane	6.18	64	3710	0.382	ng	94
10) Ethanol	6.50	45	16654	1.895	ng	94
11) Acetonitrile	6.80	41	7281	0.366	ng	96
12) Acrolein	6.98	56	2558	0.399	ng	# 73
13) Acetone	7.15	58	19240	1.847	ng	97
14) Trichlorofluoromethane	7.38	101	8321	0.388	ng	98
15) 2-Propanol (Isopropanol)	7.64	45	23217	0.753	ng	95
16) Acrylonitrile	7.92	53	3769	0.249	ng	86
17) 1,1-Dichloroethene	8.30	96	5583	0.454	ng	95
18) 2-Methyl-2-Propanol (t...	8.49	59	24759	0.839	ng	98
19) Methylene Chloride	8.50	84	6696	0.545	ng	99
20) 3-Chloro-1-propene (Al...	8.67	41	6722	0.354	ng	88
21) Trichlorotrifluoroethane	8.91	151	5406	0.480	ng	95
22) Carbon Disulfide	8.78	76	23414	0.536	ng	98
23) trans-1,2-Dichloroethene	9.74	61	6175	0.379	ng	96
24) 1,1-Dichloroethane	9.96	63	8483	0.373	ng	97
25) Methyl tert-Butyl Ether	10.11	73	15247	0.411	ng	98
26) Vinyl Acetate	10.23	86	4224	1.618	ng	# 36
27) 2-Butanone (MEK)	10.53	72	2377	0.315	ng	# 87
28) cis-1,2-Dichloroethene	10.96	61	6586	0.390	ng	96
29) Diisopropyl Ether	11.28	87	5421	0.483	ng	# 87
30) Ethyl Acetate	11.29	61	3161	0.742	ng	93
31) n-Hexane	11.25	57	9239	0.388	ng	98
32) Chloroform	11.29	83	8627	0.401	ng	96
34) Tetrahydrofuran (THF)	11.76	72	3790	0.480	ng	91
35) Ethyl tert-Butyl Ether	11.85	87	6215	0.438	ng	98
36) 1,2-Dichloroethane	12.09	62	5430	0.338	ng	94
38) 1,1,1-Trichloroethane	12.36	97	7642	0.421	ng	98
39) Isopropyl Acetate	12.80	61	6748	0.827	ng	96
40) 1-Butanol	12.84	56	7227	0.645	ng	# 70
41) Benzene	12.83	78	23031	0.447	ng	97
42) Carbon Tetrachloride	12.99	117	6544	0.422	ng	100
43) Cyclohexane	13.12	84	18063	0.856	ng	96
44) tert-Amyl Methyl Ether	13.48	73	14745	0.415	ng	97
45) 1,2-Dichloropropane	13.68	63	5290	0.420	ng	100
46) Bromodichloromethane	13.86	83	7771	0.495	ng	99
47) Trichloroethene	13.91	130	6375	0.468	ng	100
48) 1,4-Dioxane	13.94	88	4486	0.457	ng	88
49) 2,2,4-Trimethylpentane...	13.98	57	24162	0.423	ng	99
50) Methyl Methacrylate	14.14	100	3935	0.925	ng	92

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Data File : I:\MS13\DATA\2018 03\29\03291806.D
 Acq On : 29 Mar 2018 18:21
 Sample : 0.40ng TO15 ICAL std
 Misc : S31-03281803/S31-03271803 (4/25)

Vial: 7
 Operator: RS
 Inst : MS13

Quant Time: Mar 30 08:47:37 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:47:08 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

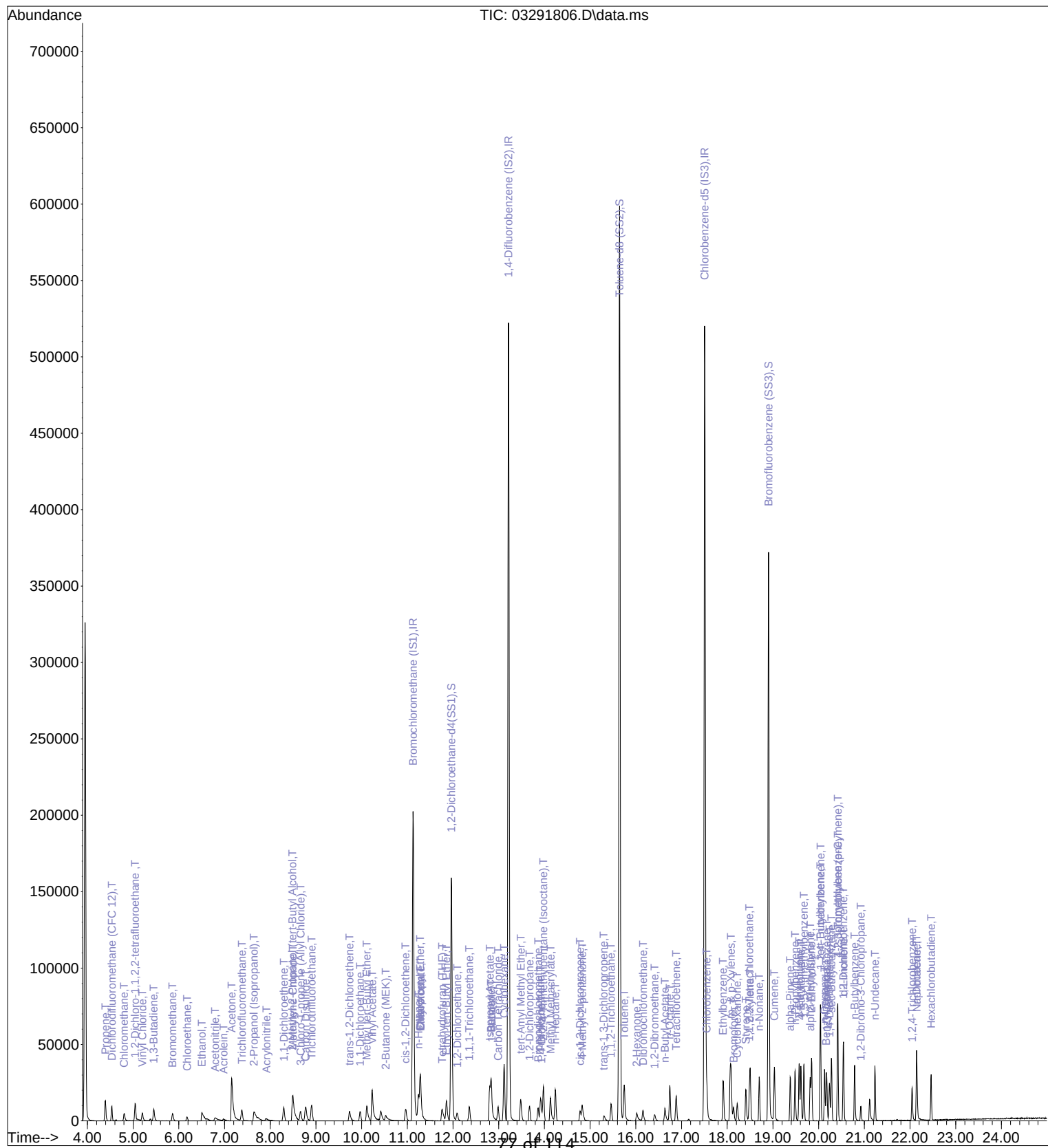
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.24	71	5682	0.398	ng	96
52) cis-1,3-Dichloropropene	14.78	75	7561	0.425	ng	93
53) 4-Methyl-2-pentanone	14.83	58	4348	0.404	ng	84
54) trans-1,3-Dichloropropene	15.30	75	4408	0.297	ng	93
55) 1,1,2-Trichloroethane	15.46	97	5243	0.455	ng	98
58) Toluene	15.75	91	23807	0.537	ng	100
59) 2-Hexanone	16.02	43	8749	0.404	ng	89
60) Dibromochloromethane	16.16	129	5812	0.550	ng	99
61) 1,2-Dibromoethane	16.41	107	5317	0.536	ng	99
62) n-Butyl Acetate	16.63	43	9259	0.370	ng	97
63) n-Octane	16.74	57	4725	0.459	ng	96
64) Tetrachloroethene	16.89	166	7599	0.628	ng	95
65) Chlorobenzene	17.55	112	16149	0.556	ng	100
66) Ethylbenzene	17.91	91	26464	0.536	ng	97
67) m- & p-Xylenes	18.08	91	41903	1.078	ng	99
68) Bromoform	18.14	173	5293	0.614	ng	99
69) Styrene	18.41	104	15156	0.550	ng	99
70) o-Xylene	18.50	91	20610	0.525	ng	100
71) n-Nonane	18.70	43	10410	0.422	ng	97
72) 1,1,2,2-Tetrachloroethane	18.48	83	9383	0.534	ng	100
74) Cumene	19.03	105	27765	0.507	ng	97
75) alpha-Pinene	19.38	93	12983	0.532	ng	99
76) n-Propylbenzene	19.49	91	31217	0.486	ng	98
77) 3-Ethyltoluene	19.58	105	26955	0.496	ng	100
78) 4-Ethyltoluene	19.61	105	24383	0.535	ng	99
79) 1,3,5-Trimethylbenzene	19.68	105	24044	0.524	ng	94
80) alpha-Methylstyrene	19.82	118	10917	0.559	ng	97
81) 2-Ethyltoluene	19.84	105	27152	0.559	ng	97
82) 1,2,4-Trimethylbenzene	20.04	105	22604	0.563	ng	99
83) n-Decane	20.13	57	11476	0.451	ng	96
84) Benzyl Chloride	20.16	91	10429	0.370	ng	94
85) 1,3-Dichlorobenzene	20.18	146	13389	0.572	ng	100
86) 1,4-Dichlorobenzene	20.24	146	14332	0.591	ng	98
87) sec-Butylbenzene	20.28	105	30845	0.566	ng	98
88) 4-Isopropyltoluene (p-...	20.42	119	28950	0.536	ng	99
89) 1,2,3-Trimethylbenzene	20.42	105	21910	0.495	ng	100
90) 1,2-Dichlorobenzene	20.54	146	13326	0.600	ng	99
91) d-Limonene	20.54	68	7756	0.497	ng	96
92) 1,2-Dibromo-3-Chloropr...	20.93	157	4069	0.583	ng	97
93) n-Undecane	21.23	57	11907	0.480	ng	95
94) 1,2,4-Trichlorobenzene	22.05	180	9412	0.628	ng	98
95) Naphthalene	22.15	128	26289	0.562	ng	95
96) n-Dodecane	22.14	57	8563	0.423	ng	95
97) Hexachlorobutadiene	22.46	225	6964	0.616	ng	99
98) Cyclohexanone	18.22	55	6636	0.445	ng	98
99) tert-Butylbenzene	20.04	119	22900	0.589	ng	99
100) n-Butylbenzene	20.79	91	23489	0.551	ng	95

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

Data File : I:\MS13\DATA\2018 03\29\03291806.D
Acq On : 29 Mar 2018 18:21
Sample : 0.40ng TO15 ICAL std
Misc : S31-03281803/S31-03271803 (4/25)

Vial: 7
Operator: RS
Inst : MS13

Quant Time: Mar 30 08:47:37 2018
Quant Method : I:\MS13\METHODS\R13032918.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Mar 30 08:47:08 2018
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2018 03\29\03291807.D
 Acq On : 29 Mar 2018 18:55
 Sample : 1.0ng TO15 ICAL std
 Misc : S31-03281803/S31-03271803 (4/25)

Vial: 7
 Operator: RS
 Inst : MS13

RS 3/30/18

Quant Time: Mar 30 08:47:39 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:47:08 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.13	130	109332	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.21	114	550344	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.51	82	186681	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.96	65	125440	9.184	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	73.44%	
57) Toluene-d8 (SS2)	15.64	98	514480	13.681	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	109.44%	
73) Bromofluorobenzene (SS3)	18.91	174	144104	12.224	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.76%	

Target Compounds

						Qvalue
2) Propene	4.38	42	11460	0.821	ng	98
3) Dichlorodifluoromethan...	4.52	85	20171	0.791	ng	99
4) Chloromethane	4.80	50	16230	0.782	ng	98
5) 1,2-Dichloro-1,1,2,2-t...	5.04	135	12458	0.881	ng	98
6) Vinyl Chloride	5.20	62	16153	0.738	ng	97
7) 1,3-Butadiene	5.44	54	10478	0.643	ng	98
8) Bromomethane	5.86	94	10060	0.834	ng	99
9) Chloroethane	6.17	64	8283	0.833	ng	99
10) Ethanol	6.49	45	38761	4.310	ng	98
11) Acetonitrile	6.76	41	17740	0.870	ng	97
12) Acrolein	6.95	56	6641	1.013	ng	98
13) Acetone	7.14	58	43007	4.034	ng	98
14) Trichlorofluoromethane	7.38	101	17945	0.817	ng	99
15) 2-Propanol (Isopropanol)	7.61	45	53265	1.687	ng	97
16) Acrylonitrile	7.88	53	11522	0.744	ng	99
17) 1,1-Dichloroethene	8.29	96	12072	0.960	ng	96
18) 2-Methyl-2-Propanol (t...	8.46	59	54665	1.809	ng	99
19) Methylene Chloride	8.50	84	13135	1.046	ng	97
20) 3-Chloro-1-propene (Al...	8.66	41	15031	0.774	ng	93
21) Trichlorotrifluoroethane	8.91	151	11980	1.039	ng	100
22) Carbon Disulfide	8.77	76	46601	1.043	ng	98
23) trans-1,2-Dichloroethene	9.73	61	14927	0.895	ng	100
24) 1,1-Dichloroethane	9.96	63	19366	0.832	ng	98
25) Methyl tert-Butyl Ether	10.10	73	34481	0.907	ng	99
26) Vinyl Acetate	10.22	86	11507	4.306	ng	# 63
27) 2-Butanone (MEK)	10.49	72	7057	0.915	ng	93
28) cis-1,2-Dichloroethene	10.96	61	14769	0.854	ng	99
29) Diisopropyl Ether	11.27	87	11897	1.035	ng	# 83
30) Ethyl Acetate	11.27	61	8275	1.897	ng	93
31) n-Hexane	11.24	57	20018	0.822	ng	99
32) Chloroform	11.29	83	18899	0.859	ng	99
34) Tetrahydrofuran (THF)	11.74	72	8221	1.017	ng	92
35) Ethyl tert-Butyl Ether	11.85	87	13941	0.960	ng	99
36) 1,2-Dichloroethane	12.09	62	12255	0.745	ng	99
38) 1,1,1-Trichloroethane	12.36	97	16445	0.891	ng	100
39) Isopropyl Acetate	12.79	61	15182	1.832	ng	96
40) 1-Butanol	12.82	56	19387	1.704	ng	90
41) Benzene	12.83	78	49431	0.944	ng	99
42) Carbon Tetrachloride	12.99	117	14301	0.908	ng	99
43) Cyclohexane	13.12	84	39328	1.836	ng	97
44) tert-Amyl Methyl Ether	13.48	73	32389	0.897	ng	98
45) 1,2-Dichloropropane	13.67	63	11809	0.925	ng	98
46) Bromodichloromethane	13.86	83	15699	0.985	ng	99
47) Trichloroethene	13.91	130	13912	1.006	ng	99
48) 1,4-Dioxane	13.91	88	10189	1.023	ng	94
49) 2,2,4-Trimethylpentane...	13.98	57	51076	0.880	ng	99
50) Methyl Methacrylate	14.13	100	9755	2.260	ng	88

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Data File : I:\MS13\DATA\2018 03\29\03291807.D
 Acq On : 29 Mar 2018 18:55
 Sample : 1.0ng TO15 ICAL std
 Misc : S31-03281803/S31-03271803 (4/25)

Vial: 7
 Operator: RS
 Inst : MS13

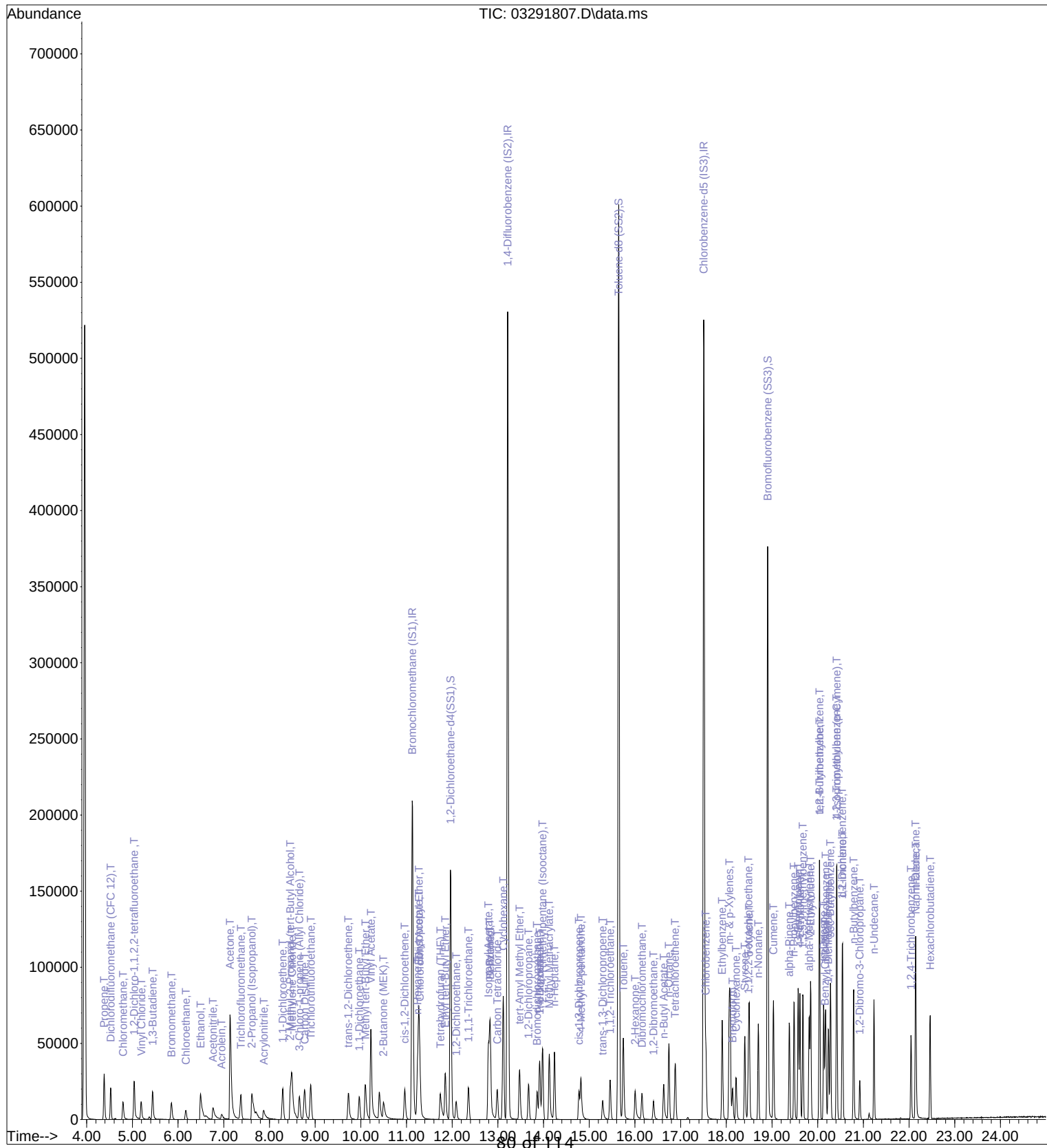
Quant Time: Mar 30 08:47:39 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:47:08 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.24	71	12518	0.863	ng	99
52) cis-1,3-Dichloropropene	14.77	75	18234	1.010	ng	97
53) 4-Methyl-2-pentanone	14.82	58	10580	0.968	ng	93
54) trans-1,3-Dichloropropene	15.29	75	13050	0.866	ng	95
55) 1,1,2-Trichloroethane	15.46	97	11716	1.002	ng	100
58) Toluene	15.75	91	51528	1.147	ng	100
59) 2-Hexanone	16.00	43	21812	0.994	ng	98
60) Dibromochloromethane	16.16	129	13361	1.248	ng	99
61) 1,2-Dibromoethane	16.41	107	12513	1.243	ng	99
62) n-Butyl Acetate	16.63	43	23730	0.936	ng	98
63) n-Octane	16.74	57	10599	1.015	ng	97
64) Tetrachloroethene	16.88	166	16139	1.316	ng	98
65) Chlorobenzene	17.55	112	35285	1.199	ng	98
66) Ethylbenzene	17.91	91	57074	1.141	ng	98
67) m- & p-Xylenes	18.07	91	90666	2.301	ng	99
68) Bromoform	18.14	173	12095	1.385	ng	99
69) Styrene	18.40	104	34717	1.243	ng	99
70) o-Xylene	18.50	91	44852	1.128	ng	100
71) n-Nonane	18.70	43	22549	0.902	ng	97
72) 1,1,2,2-Tetrachloroethane	18.48	83	20696	1.161	ng	99
74) Cumene	19.03	105	58811	1.059	ng	98
75) alpha-Pinene	19.38	93	28396	1.149	ng	98
76) n-Propylbenzene	19.48	91	68820	1.056	ng	98
77) 3-Ethyltoluene	19.57	105	60185	1.092	ng	100
78) 4-Ethyltoluene	19.61	105	53061	1.149	ng	99
79) 1,3,5-Trimethylbenzene	19.67	105	50819	1.092	ng	96
80) alpha-Methylstyrene	19.82	118	25514	1.289	ng	100
81) 2-Ethyltoluene	19.84	105	59014	1.199	ng	97
82) 1,2,4-Trimethylbenzene	20.04	105	48857	1.201	ng	99
83) n-Decane	20.13	57	25437	0.987	ng	97
84) Benzyl Chloride	20.16	91	26407	0.925	ng	95
85) 1,3-Dichlorobenzene	20.17	146	30277	1.276	ng	99
86) 1,4-Dichlorobenzene	20.23	146	32081	1.306	ng	97
87) sec-Butylbenzene	20.28	105	66647	1.207	ng	99
88) 4-Isopropyltoluene (p-...	20.42	119	62423	1.140	ng	98
89) 1,2,3-Trimethylbenzene	20.41	105	48617	1.084	ng	100
90) 1,2-Dichlorobenzene	20.54	146	29428	1.308	ng	100
91) d-Limonene	20.54	68	16908	1.069	ng	99
92) 1,2-Dibromo-3-Chloropr...	20.92	157	9376	1.326	ng	96
93) n-Undecane	21.23	57	25109	0.998	ng	97
94) 1,2,4-Trichlorobenzene	22.04	180	22348	1.472	ng	98
95) Naphthalene	22.15	128	63696	1.344	ng	97
96) n-Dodecane	22.14	57	19868	0.968	ng	96
97) Hexachlorobutadiene	22.46	225	15757	1.375	ng	99
98) Cyclohexanone	18.21	55	15773	1.043	ng	98
99) tert-Butylbenzene	20.04	119	49236	1.248	ng	99
100) n-Butylbenzene	20.79	91	50855	1.176	ng	97

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

Vial: 7
Operator: RS
Inst : MS13

Quant Time: Mar 30 08:47:39 2018
Quant Method : I:\MS13\METHODS\R13032918.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Mar 30 08:47:08 2018
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2018 03\29\03291808.D
 Acq On : 29 Mar 2018 19:28
 Sample : 5.0ng TO15 ICAL std
 Misc : S31-03281803/S31-03271803 (4/25)

Vial: 7
 Operator: RS
 Inst : MS13

RS 3/30/18

Quant Time: Mar 30 08:47:41 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:47:08 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.14	130	107148	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.22	114	540280	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.51	82	182159	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.97	65	123706	9.242	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	73.92%	
57) Toluene-d8 (SS2)	15.64	98	503102	13.710	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	109.68%	
73) Bromofluorobenzene (SS3)	18.91	174	140217	12.189	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.52%	

Target Compounds

						Qvalue
2) Propene	4.36	42	50268	3.677	ng	100
3) Dichlorodifluoromethan...	4.51	85	88504	3.541	ng	100
4) Chloromethane	4.77	50	69494	3.417	ng	98
5) 1,2-Dichloro-1,1,2,2-t...	5.03	135	54983	3.969	ng	100
6) Vinyl Chloride	5.18	62	71852	3.351	ng	99
7) 1,3-Butadiene	5.43	54	49174	3.080	ng	99
8) Bromomethane	5.84	94	42568	3.603	ng	100
9) Chloroethane	6.16	64	36917	3.787	ng	99
10) Ethanol	6.49	45	172991	19.627	ng	100
11) Acetonitrile	6.75	41	88967	4.453	ng	100
12) Acrolein	6.94	56	33479	5.211	ng	100
13) Acetone	7.13	58	195340	18.695	ng	99
14) Trichlorofluoromethane	7.36	101	78587	3.649	ng	99
15) 2-Propanol (Isopropanol)	7.60	45	247167	7.990	ng	99
16) Acrylonitrile	7.85	53	64644	4.258	ng	99
17) 1,1-Dichloroethene	8.29	96	53149	4.314	ng	99
18) 2-Methyl-2-Propanol (t...	8.44	59	245969	8.307	ng	99
19) Methylene Chloride	8.50	84	55047	4.471	ng	99
20) 3-Chloro-1-propene (Al...	8.66	41	69422	3.646	ng	98
21) Trichlorotrifluoroethane	8.90	151	53080	4.695	ng	100
22) Carbon Disulfide	8.76	76	197342	4.506	ng	100
23) trans-1,2-Dichloroethene	9.73	61	71296	4.360	ng	100
24) 1,1-Dichloroethane	9.97	63	87098	3.816	ng	99
25) Methyl tert-Butyl Ether	10.08	73	153589	4.124	ng	100
26) Vinyl Acetate	10.22	86	61282	23.400	ng	# 79
27) 2-Butanone (MEK)	10.47	72	36198	4.789	ng	99
28) cis-1,2-Dichloroethene	10.96	61	67135	3.959	ng	99
29) Diisopropyl Ether	11.26	87	53665	4.763	ng	# 85
30) Ethyl Acetate	11.26	61	39262	9.184	ng	98
31) n-Hexane	11.24	57	87137	3.651	ng	100
32) Chloroform	11.30	83	85504	3.964	ng	100
34) Tetrahydrofuran (THF)	11.72	72	36950	4.666	ng	99
35) Ethyl tert-Butyl Ether	11.84	87	62526	4.393	ng	98
36) 1,2-Dichloroethane	12.09	62	57528	3.569	ng	100
38) 1,1,1-Trichloroethane	12.36	97	73166	4.039	ng	100
39) Isopropyl Acetate	12.79	61	68757	8.452	ng	96
40) 1-Butanol	12.80	56	102470	9.176	ng	97
41) Benzene	12.83	78	217691	4.237	ng	100
42) Carbon Tetrachloride	12.99	117	64679	4.183	ng	100
43) Cyclohexane	13.12	84	171196	8.140	ng	98
44) tert-Amyl Methyl Ether	13.46	73	146887	4.145	ng	99
45) 1,2-Dichloropropane	13.67	63	52880	4.217	ng	100
46) Bromodichloromethane	13.86	83	67650	4.325	ng	99
47) Trichloroethene	13.91	130	62590	4.609	ng	99
48) 1,4-Dioxane	13.90	88	47274	4.834	ng	98
49) 2,2,4-Trimethylpentane...	13.98	57	222747	3.909	ng	99
50) Methyl Methacrylate	14.12	100	47695	11.254	ng	97

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Data File : I:\MS13\DATA\2018 03\29\03291808.D
 Acq On : 29 Mar 2018 19:28
 Sample : 5.0ng TO15 ICAL std
 Misc : S31-03281803/S31-03271803 (4/25)

Vial: 7
 Operator: RS
 Inst : MS13

Quant Time: Mar 30 08:47:41 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:47:08 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

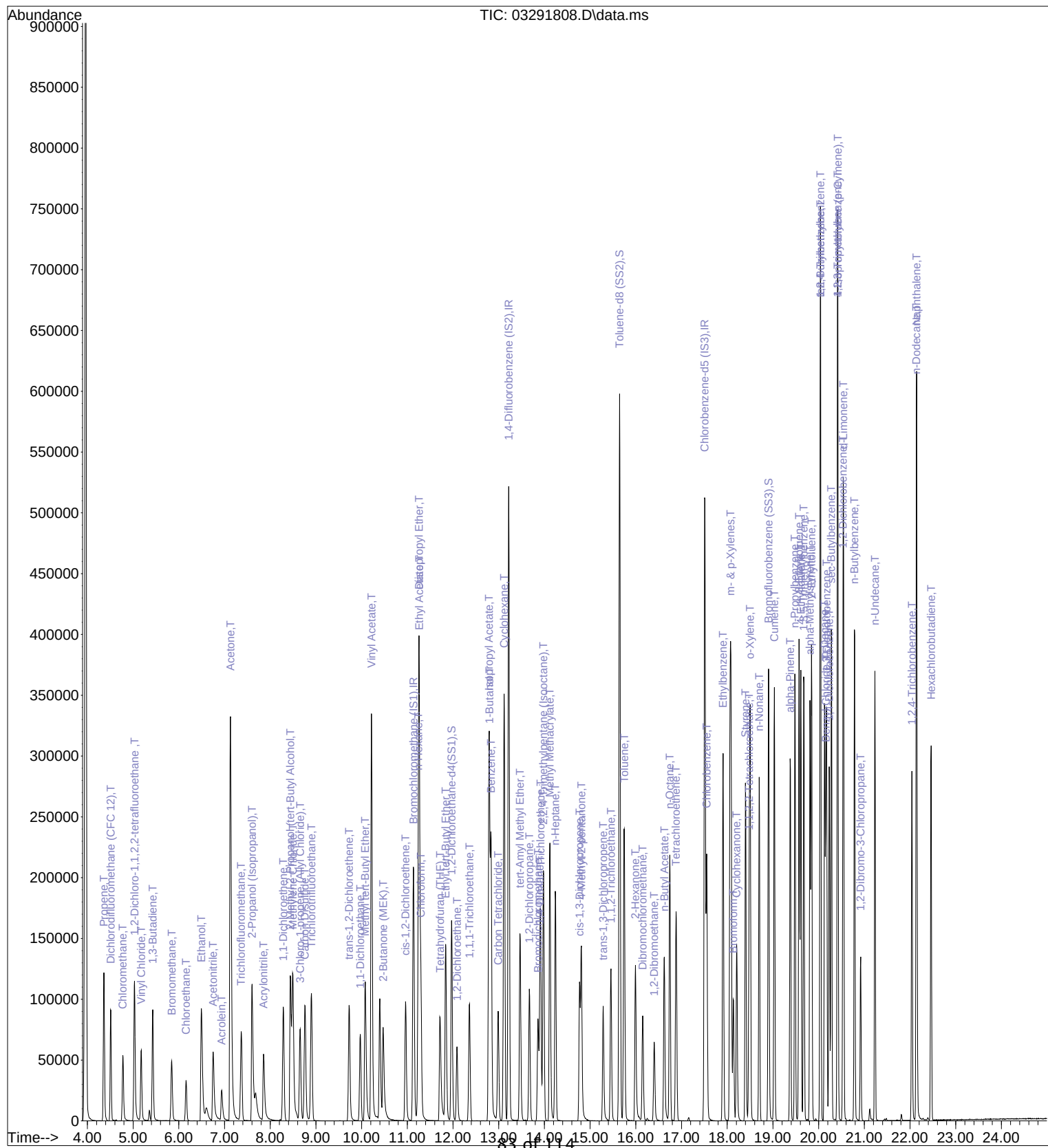
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.24	71	54776	3.848	ng	99
52) cis-1,3-Dichloropropene	14.77	75	88996	5.021	ng	99
53) 4-Methyl-2-pentanone	14.81	58	49913	4.650	ng	96
54) trans-1,3-Dichloropropene	15.29	75	70282	4.749	ng	100
55) 1,1,2-Trichloroethane	15.46	97	53612	4.669	ng	100
58) Toluene	15.75	91	228377	5.210	ng	99
59) 2-Hexanone	15.99	43	109137	5.098	ng	100
60) Dibromochloromethane	16.15	129	62136	5.949	ng	100
61) 1,2-Dibromoethane	16.40	107	59653	6.074	ng	100
62) n-Butyl Acetate	16.62	43	120756	4.881	ng	99
63) n-Octane	16.74	57	45616	4.478	ng	99
64) Tetrachloroethene	16.88	166	71539	5.978	ng	100
65) Chlorobenzene	17.55	112	155658	5.419	ng	100
66) Ethylbenzene	17.91	91	252998	5.185	ng	99
67) m- & p-Xylenes	18.07	91	397752	10.346	ng	100
68) Bromoform	18.13	173	58177	6.826	ng	99
69) Styrene	18.40	104	164198	6.024	ng	99
70) o-Xylene	18.50	91	199002	5.127	ng	99
71) n-Nonane	18.70	43	98919	4.057	ng	98
72) 1,1,2,2-Tetrachloroethane	18.48	83	94043	5.407	ng	100
74) Cumene	19.03	105	260425	4.806	ng	98
75) alpha-Pinene	19.38	93	129243	5.358	ng	96
76) n-Propylbenzene	19.48	91	305774	4.810	ng	98
77) 3-Ethyltoluene	19.57	105	273714	5.088	ng	98
78) 4-Ethyltoluene	19.61	105	231718	5.143	ng	99
79) 1,3,5-Trimethylbenzene	19.67	105	213102	4.691	ng	99
80) alpha-Methylstyrene	19.81	118	116959	6.058	ng	99
81) 2-Ethyltoluene	19.84	105	256755	5.348	ng	98
82) 1,2,4-Trimethylbenzene	20.04	105	215794	5.437	ng	99
83) n-Decane	20.13	57	111263	4.424	ng	98
84) Benzyl Chloride	20.16	91	152096	5.458	ng	98
85) 1,3-Dichlorobenzene	20.17	146	135522	5.854	ng	99
86) 1,4-Dichlorobenzene	20.23	146	141283	5.894	ng	99
87) sec-Butylbenzene	20.28	105	292816	5.434	ng	99
88) 4-Isopropyltoluene (p-...	20.42	119	273432	5.118	ng	99
89) 1,2,3-Trimethylbenzene	20.41	105	211660	4.836	ng	100
90) 1,2-Dichlorobenzene	20.53	146	132671	6.043	ng	99
91) d-Limonene	20.54	68	77171	5.000	ng	99
92) 1,2-Dibromo-3-Chloropr...	20.92	157	46389	6.725	ng	98
93) n-Undecane	21.23	57	115961	4.725	ng	98
94) 1,2,4-Trichlorobenzene	22.04	180	103908	7.014	ng	100
95) Naphthalene	22.14	128	299626	6.481	ng	99
96) n-Dodecane	22.14	57	96459	4.817	ng	97
97) Hexachlorobutadiene	22.46	225	69539	6.217	ng	99
98) Cyclohexanone	18.21	55	72613	4.920	ng	99
99) tert-Butylbenzene	20.04	119	214527	5.575	ng	99
100) n-Butylbenzene	20.78	91	228738	5.421	ng	98

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

Data File : I:\MS13\DATA\2018 03\29\03291808.D
Acq On : 29 Mar 2018 19:28
Sample : 5.0ng TO15 ICAL std
Misc : S31-03281803/S31-03271803 (4/25)

Vial: 7
Operator: RS
Inst : MS13

Quant Time: Mar 30 08:47:41 2018
Quant Method : I:\MS13\METHODS\R13032918.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Mar 30 08:47:08 2018
Response via : Initial Calibration
DataAcq Meth:TO15.M



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Data File : I:\MS13\DATA\2018 03\29\03291809.D
 Acq On : 29 Mar 2018 20:02
 Sample : 25ng TO15 ICAL std
 Misc : S31-03281803/S31-03201804 (4/18)

Vial: 3
 Operator: RS
 Inst : MS13

RS 3/30/18

Quant Time: Mar 30 08:47:43 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:47:08 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.14	130	112102	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.22	114	563733	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.51	82	188376	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.98	65	129928	9.278	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	74.24%	
57) Toluene-d8 (SS2)	15.65	98	520671	13.721	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	109.76%	
73) Bromofluorobenzene (SS3)	18.91	174	147328	12.385	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	99.04%	

Target Compounds

						Qvalue
2) Propene	4.35	42	243308	17.009	ng	100
3) Dichlorodifluoromethan...	4.50	85	427597	16.352	ng	100
4) Chloromethane	4.77	50	339751	15.969	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	5.03	135	266237	18.369	ng	100
6) Vinyl Chloride	5.17	62	350342	15.616	ng	100
7) 1,3-Butadiene	5.43	54	253919	15.203	ng	100
8) Bromomethane	5.84	94	225691	18.257	ng	100
9) Chloroethane	6.16	64	181934	17.840	ng	100
10) Ethanol	6.53	45	846256	91.769	ng	100
11) Acetonitrile	6.76	41	453811	21.713	ng	100
12) Acrolein	6.94	56	156013	23.210	ng	100
13) Acetone	7.14	58	892317	81.627	ng	100
14) Trichlorofluoromethane	7.36	101	383102	17.003	ng	100
15) 2-Propanol (Isopropanol)	7.61	45	1193460	36.874	ng	100
16) Acrylonitrile	7.86	53	343013	21.597	ng	100
17) 1,1-Dichloroethene	8.29	96	261804	20.309	ng	100
18) 2-Methyl-2-Propanol (t...	8.45	59	1169574	37.754	ng	100
19) Methylene Chloride	8.50	84	266193	20.665	ng	100
20) 3-Chloro-1-propene (Al...	8.66	41	351974	17.668	ng	100
21) Trichlorotrifluoroethane	8.90	151	260365	22.014	ng	100
22) Carbon Disulfide	8.76	76	962175	21.000	ng	100
23) trans-1,2-Dichloroethene	9.73	61	354437	20.719	ng	100
24) 1,1-Dichloroethane	9.98	63	420468	17.607	ng	100
25) Methyl tert-Butyl Ether	10.07	73	750273	19.257	ng	100
26) Vinyl Acetate	10.23	86	312674	114.115	ng	100
27) 2-Butanone (MEK)	10.47	72	180255	22.792	ng	100
28) cis-1,2-Dichloroethene	10.97	61	336705	18.979	ng	100
29) Diisopropyl Ether	11.26	87	255966	21.713	ng	100
30) Ethyl Acetate	11.26	61	184914	41.343	ng	100
31) n-Hexane	11.24	57	382833	15.330	ng	100
32) Chloroform	11.30	83	417851	18.515	ng	100
34) Tetrahydrofuran (THF)	11.71	72	179258	21.638	ng	100
35) Ethyl tert-Butyl Ether	11.84	87	310360	20.842	ng	100
36) 1,2-Dichloroethane	12.09	62	285774	16.947	ng	100
38) 1,1,1-Trichloroethane	12.36	97	362249	19.167	ng	100
39) Isopropyl Acetate	12.78	61	318723	37.547	ng	100
40) 1-Butanol	12.80	56	497399	42.689	ng	100
41) Benzene	12.84	78	1024403	19.109	ng	100
42) Carbon Tetrachloride	12.99	117	326177	20.215	ng	100
43) Cyclohexane	13.12	84	811988	37.002	ng	100
44) tert-Amyl Methyl Ether	13.46	73	720660	19.490	ng	100
45) 1,2-Dichloropropane	13.68	63	254664	19.465	ng	100
46) Bromodichloromethane	13.86	83	329384	20.182	ng	100
47) Trichloroethene	13.91	130	310728	21.928	ng	100
48) 1,4-Dioxane	13.89	88	233340	22.868	ng	100
49) 2,2,4-Trimethylpentane...	13.98	57	1056741	17.773	ng	100
50) Methyl Methacrylate	14.12	100	236902	53.571	ng	100

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Data File : I:\MS13\DATA\2018 03\29\03291809.D
 Acq On : 29 Mar 2018 20:02
 Sample : 25ng TO15 ICAL std
 Misc : S31-03281803/S31-03201804 (4/18)

Vial: 3
 Operator: RS
 Inst : MS13

Quant Time: Mar 30 08:47:43 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:47:08 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

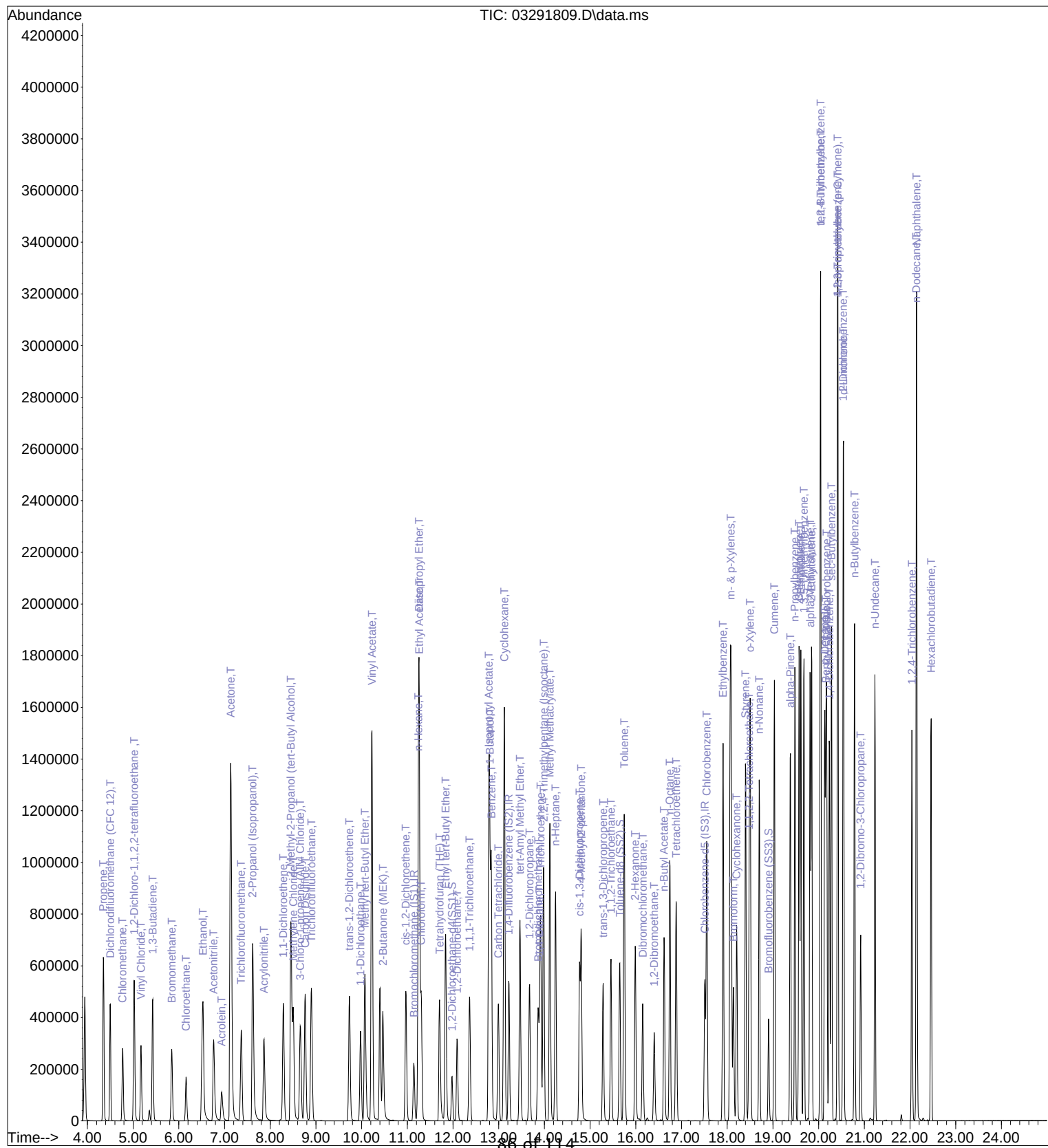
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.24	71	259460	17.467	ng	100
52) cis-1,3-Dichloropropene	14.77	75	443448	23.980	ng	100
53) 4-Methyl-2-pentanone	14.80	58	243233	21.717	ng	100
54) trans-1,3-Dichloropropene	15.29	75	375287	24.305	ng	100
55) 1,1,2-Trichloroethane	15.46	97	261762	21.846	ng	100
58) Toluene	15.75	91	1081481	23.858	ng	100
59) 2-Hexanone	15.99	43	529503	23.919	ng	100
60) Dibromochloromethane	16.15	129	312702	28.952	ng	100
61) 1,2-Dibromoethane	16.40	107	301008	29.637	ng	100
62) n-Butyl Acetate	16.62	43	595611	23.281	ng	100
63) n-Octane	16.74	57	215005	20.412	ng	100
64) Tetrachloroethene	16.89	166	351814	28.429	ng	100
65) Chlorobenzene	17.55	112	760212	25.590	ng	100
66) Ethylbenzene	17.91	91	1203453	23.848	ng	100
67) m- & p-Xylenes	18.07	91	1879906	47.286	ng	100
68) Bromoform	18.14	173	302501	34.320	ng	100
69) Styrene	18.40	104	815185	28.919	ng	100
70) o-Xylene	18.50	91	952197	23.722	ng	100
71) n-Nonane	18.70	43	457316	18.139	ng	100
72) 1,1,2,2-Tetrachloroethane	18.48	83	458620	25.497	ng	100
74) Cumene	19.03	105	1235638	22.052	ng	100
75) alpha-Pinene	19.38	93	632797	25.366	ng	100
76) n-Propylbenzene	19.48	91	1440992	21.918	ng	100
77) 3-Ethyltoluene	19.57	105	1289088	23.174	ng	100
78) 4-Ethyltoluene	19.61	105	1128529	24.220	ng	100
79) 1,3,5-Trimethylbenzene	19.68	105	1026971	21.860	ng	100
80) alpha-Methylstyrene	19.82	118	600532	30.078	ng	100
81) 2-Ethyltoluene	19.84	105	1214272	24.457	ng	100
82) 1,2,4-Trimethylbenzene	20.04	105	1010478	24.618	ng	100
83) n-Decane	20.13	57	518596	19.942	ng	100
84) Benzyl Chloride	20.16	91	869948	30.188	ng	100
85) 1,3-Dichlorobenzene	20.17	146	680113	28.409	ng	100
86) 1,4-Dichlorobenzene	20.24	146	700522	28.261	ng	100
87) sec-Butylbenzene	20.28	105	1388790	24.921	ng	100
88) 4-Isopropyltoluene (p-...	20.42	119	1276765	23.108	ng	100
89) 1,2,3-Trimethylbenzene	20.42	105	1001060	22.115	ng	100
90) 1,2-Dichlorobenzene	20.54	146	653591	28.789	ng	100
91) d-Limonene	20.54	68	381663	23.911	ng	100
92) 1,2-Dibromo-3-Chloropr...	20.92	157	248454	34.828	ng	100
93) n-Undecane	21.23	57	551081	21.714	ng	100
94) 1,2,4-Trichlorobenzene	22.04	180	548169	35.780	ng	100
95) Naphthalene	22.14	128	1521512	31.823	ng	100
96) n-Dodecane	22.14	57	500223	24.157	ng	100
97) Hexachlorobutadiene	22.46	225	356574	30.828	ng	100
98) Cyclohexanone	18.21	55	356389	23.350	ng	100
99) tert-Butylbenzene	20.04	119	999714	25.120	ng	100
100) n-Butylbenzene	20.79	91	1088311	24.940	ng	100

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

Data File : I:\MS13\DATA\2018 03\29\03291809.D
Acq On : 29 Mar 2018 20:02
Sample : 25ng TO15 ICAL std
Misc : S31-03281803/S31-03201804 (4/18)

Vial: 3
Operator: RS
Inst : MS13

Quant Time: Mar 30 08:47:43 2018
Quant Method : I:\MS13\METHODS\R13032918.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Mar 30 08:47:08 2018
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2018 03\29\03291810.D
 Acq On : 29 Mar 2018 20:36
 Sample : 50ng TO15 ICAL std
 Misc : S31-03281803/S31-03201804 (4/18)

Vial: 3
 Operator: RS
 Inst : MS13

RS 3/30/18

Quant Time: Mar 30 08:47:45 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:47:08 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.15	130	113183	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.23	114	566966	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.51	82	188431	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.99	65	129696	9.173	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	73.36%
57) Toluene-d8 (SS2)	15.65	98	522264	13.759	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	110.08%
73) Bromofluorobenzene (SS3)	18.91	174	148765	12.502	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.00%

Target Compounds

						Qvalue
2) Propene	4.36	42	449658	31.135	ng	99
3) Dichlorodifluoromethan...	4.51	85	803012	30.415	ng	100
4) Chloromethane	4.79	50	620205	28.873	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	5.04	135	510956	34.917	ng	100
6) Vinyl Chloride	5.19	62	653939	28.870	ng	100
7) 1,3-Butadiene	5.45	54	478069	28.350	ng	100
8) Bromomethane	5.86	94	431954	34.609	ng	100
9) Chloroethane	6.17	64	348250	33.822	ng	100
10) Ethanol	6.56	45	1550811	166.565	ng	100
11) Acetonitrile	6.78	41	866730	41.073	ng	100
12) Acrolein	6.95	56	295633	43.560	ng	100
13) Acetone	7.15	58	1545848	140.059	ng	100
14) Trichlorofluoromethane	7.38	101	733109	32.227	ng	100
15) 2-Propanol (Isopropanol)	7.64	45	2173788	66.522	ng	99
16) Acrylonitrile	7.88	53	656575	40.945	ng	100
17) 1,1-Dichloroethene	8.30	96	505045	38.804	ng	99
18) 2-Methyl-2-Propanol (t...	8.47	59	2059100	65.833	ng	100
19) Methylene Chloride	8.51	84	508488	39.097	ng	98
20) 3-Chloro-1-propene (Al...	8.67	41	670790	33.349	ng	99
21) Trichlorotrifluoroethane	8.91	151	507249	42.479	ng	99
22) Carbon Disulfide	8.78	76	1821439	39.374	ng	100
23) trans-1,2-Dichloroethene	9.74	61	679056	39.316	ng	99
24) 1,1-Dichloroethane	9.99	63	800351	33.195	ng	99
25) Methyl tert-Butyl Ether	10.08	73	1435537	36.493	ng	100
26) Vinyl Acetate	10.24	86	577608	208.794	ng	# 84
27) 2-Butanone (MEK)	10.47	72	345045	43.212	ng	99
28) cis-1,2-Dichloroethene	10.97	61	636885	35.556	ng	99
29) Diisopropyl Ether	11.26	87	403575	33.908	ng	# 84
30) Ethyl Acetate	11.27	61	325151	72.003	ng	96
31) n-Hexane	11.25	57	678139	26.896	ng	99
32) Chloroform	11.31	83	798840	35.059	ng	100
34) Tetrahydrofuran (THF)	11.71	72	345999	41.366	ng	98
35) Ethyl tert-Butyl Ether	11.84	87	595604	39.616	ng	98
36) 1,2-Dichloroethane	12.09	62	548119	32.194	ng	99
38) 1,1,1-Trichloroethane	12.37	97	692039	36.408	ng	100
39) Isopropyl Acetate	12.79	61	581216	68.080	ng	96
40) 1-Butanol	12.82	56	910651	77.710	ng	100
41) Benzene	12.84	78	1867517	34.637	ng	99
42) Carbon Tetrachloride	13.00	117	631402	38.909	ng	100
43) Cyclohexane	13.13	84	1492097	67.607	ng	99
44) tert-Amyl Methyl Ether	13.46	73	1368385	36.797	ng	100
45) 1,2-Dichloropropane	13.68	63	485645	36.908	ng	100
46) Bromodichloromethane	13.86	83	631744	38.488	ng	100
47) Trichloroethene	13.92	130	599838	42.088	ng	100
48) 1,4-Dioxane	13.90	88	444901	43.352	ng	100
49) 2,2,4-Trimethylpentane...	13.99	57	1948904	32.592	ng	99
50) Methyl Methacrylate	14.12	100	451182	101.445	ng	97

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Data File : I:\MS13\DATA\2018 03\29\03291810.D
 Acq On : 29 Mar 2018 20:36
 Sample : 50ng TO15 ICAL std
 Misc : S31-03281803/S31-03201804 (4/18)

Vial: 3
 Operator: RS
 Inst : MS13

Quant Time: Mar 30 08:47:45 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:47:08 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.25	71	488739	32.714	ng	99
52) cis-1,3-Dichloropropene	14.77	75	852935	45.860	ng	100
53) 4-Methyl-2-pentanone	14.81	58	456028	40.483	ng	98
54) trans-1,3-Dichloropropene	15.29	75	725035	46.689	ng	99
55) 1,1,2-Trichloroethane	15.46	97	501444	41.611	ng	100
58) Toluene	15.75	91	2016335	44.468	ng	100
59) 2-Hexanone	15.99	43	985859	44.521	ng	99
60) Dibromochloromethane	16.16	129	608316	56.305	ng	99
61) 1,2-Dibromoethane	16.41	107	582230	57.309	ng	100
62) n-Butyl Acetate	16.62	43	1111583	43.436	ng	99
63) n-Octane	16.75	57	397290	37.706	ng	98
64) Tetrachloroethene	16.89	166	677715	54.749	ng	100
65) Chlorobenzene	17.55	112	1433928	48.255	ng	100
66) Ethylbenzene	17.91	91	2218509	43.949	ng	99
67) m- & p-Xylenes	18.08	91	3446368	86.663	ng	100
68) Bromoform	18.14	173	594669	67.448	ng	99
69) Styrene	18.40	104	1531003	54.297	ng	99
70) o-Xylene	18.51	91	1753384	43.669	ng	99
71) n-Nonane	18.71	43	823979	32.672	ng	98
72) 1,1,2,2-Tetrachloroethane	18.48	83	845783	47.008	ng	100
74) Cumene	19.04	105	2269456	40.490	ng	99
75) alpha-Pinene	19.38	93	1182371	47.382	ng	99
76) n-Propylbenzene	19.49	91	2617087	39.795	ng	98
77) 3-Ethyltoluene	19.58	105	2282067	41.013	ng	99
78) 4-Ethyltoluene	19.61	105	2158466	46.310	ng	99
79) 1,3,5-Trimethylbenzene	19.68	105	1920252	40.863	ng	100
80) alpha-Methylstyrene	19.82	118	1125756	56.367	ng	99
81) 2-Ethyltoluene	19.85	105	2231897	44.940	ng	99
82) 1,2,4-Trimethylbenzene	20.04	105	1809605	44.074	ng	99
83) n-Decane	20.13	57	922352	35.457	ng	99
84) Benzyl Chloride	20.16	91	1657010	57.483	ng	98
85) 1,3-Dichlorobenzene	20.18	146	1285283	53.671	ng	100
86) 1,4-Dichlorobenzene	20.24	146	1321300	53.290	ng	99
87) sec-Butylbenzene	20.28	105	2541981	45.601	ng	99
88) 4-Isopropyltoluene (p-...	20.42	119	2229107	40.332	ng	98
89) 1,2,3-Trimethylbenzene	20.42	105	1786588	39.458	ng	99
90) 1,2-Dichlorobenzene	20.54	146	1197053	52.712	ng	100
91) d-Limonene	20.55	68	671132	42.033	ng	97
92) 1,2-Dibromo-3-Chloropr...	20.92	157	483150	67.707	ng	100
93) n-Undecane	21.23	57	978766	38.555	ng	98
94) 1,2,4-Trichlorobenzene	22.04	180	1055950	68.904	ng	100
95) Naphthalene	22.15	128	2715730	56.784	ng	99
96) n-Dodecane	22.14	57	861748	41.604	ng	97
97) Hexachlorobutadiene	22.46	225	693327	59.925	ng	100
98) Cyclohexanone	18.21	55	678901	44.468	ng	99
99) tert-Butylbenzene	20.04	119	1777908	44.662	ng	99
100) n-Butylbenzene	20.79	91	1973297	45.208	ng	99

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

Vial: 3
Operator: RS
Inst : MS13

Quant Time: Mar 30 08:47:45 2018

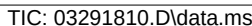
Quant Method : I:\MS13\METHODS\R13032918.M

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

QLast Update : Fri Mar 30 08:47:08 2018

Response via : Initial Calibration

DataAcq Meth:T015.M



Data File : I:\MS13\DATA\2018 03\29\03291811.D
 Acq On : 29 Mar 2018 21:10
 Sample : 100ng TO15 ICAL std
 Misc : S31-03281803/S31-03201804 (4/18)

Vial: 3
 Operator: RS
 Inst : MS13

RS 3/30/18

Quant Time: Mar 30 08:47:47 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:47:08 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.15	130	114931	12.500	ng	0.01
37) 1,4-Difluorobenzene (IS2)	13.23	114	580071	12.500	ng	0.01
56) Chlorobenzene-d5 (IS3)	17.51	82	192431	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.99	65	133327	9.286	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	74.32%
57) Toluene-d8 (SS2)	15.65	98	532212	13.729	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	109.84%
73) Bromofluorobenzene (SS3)	18.91	174	151560	12.472	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.76%

Target Compounds

						Qvalue
2) Propene	4.36	42	932736	63.602	ng	98
3) Dichlorodifluoromethan...	4.51	85	1504969	56.136	ng	99
4) Chloromethane	4.79	50	989719	45.375	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	5.04	135	975936	65.677	ng	100
6) Vinyl Chloride	5.18	62	1221459	53.105	ng	99
7) 1,3-Butadiene	5.45	54	878272	51.290	ng	99
8) Bromomethane	5.86	94	778034	61.389	ng	100
9) Chloroethane	6.17	64	650555	62.222	ng	100
10) Ethanol	6.60	45	2788726	294.968	ng	100
11) Acetonitrile	6.80	41	1651087	77.052	ng	100
12) Acrolein	6.95	56	567802	82.391	ng	100
13) Acetone	7.18	58	2610545	232.927	ng	98
14) Trichlorofluoromethane	7.38	101	1402309	60.708	ng	99
15) 2-Propanol (Isopropanol)	7.67	45	3442493	103.744	ng	99
16) Acrylonitrile	7.89	53	1256285	77.152	ng	100
17) 1,1-Dichloroethene	8.30	96	965216	73.032	ng	98
18) 2-Methyl-2-Propanol (t...	8.50	59	2814532	88.617	ng	99
19) Methylene Chloride	8.53	84	937624	70.996	ng	95
20) 3-Chloro-1-propene (Al...	8.67	41	1264252	61.898	ng	98
21) Trichlorotrifluoroethane	8.91	151	974739	80.387	ng	98
22) Carbon Disulfide	8.78	76	3359914	71.526	ng	99
23) trans-1,2-Dichloroethene	9.74	61	1286005	73.325	ng	98
24) 1,1-Dichloroethane	9.99	63	1516359	61.935	ng	99
25) Methyl tert-Butyl Ether	10.08	73	2670157	66.846	ng	100
26) Vinyl Acetate	10.26	86	1014788	361.246	ng	# 69
27) 2-Butanone (MEK)	10.48	72	656769	81.000	ng	94
28) cis-1,2-Dichloroethene	10.98	61	1204469	66.219	ng	99
29) Diisopropyl Ether	11.26	87	694564	57.469	ng	# 94
30) Ethyl Acetate	11.28	61	540416	117.851	ng	93
31) n-Hexane	11.25	57	1154737	45.102	ng	98
32) Chloroform	11.32	83	1511201	65.313	ng	100
34) Tetrahydrofuran (THF)	11.71	72	648783	76.385	ng	97
35) Ethyl tert-Butyl Ether	11.84	87	1119732	73.345	ng	95
36) 1,2-Dichloroethane	12.10	62	1054716	61.007	ng	99
38) 1,1,1-Trichloroethane	12.37	97	1328711	68.324	ng	100
39) Isopropyl Acetate	12.79	61	998915	114.363	ng	94
40) 1-Butanol	12.84	56	1556541	129.825	ng	98
41) Benzene	12.84	78	3067508	55.608	ng	98
42) Carbon Tetrachloride	13.00	117	1221435	73.568	ng	100
43) Cyclohexane	13.13	84	2591886	114.785	ng	96
44) tert-Amyl Methyl Ether	13.47	73	2529242	66.477	ng	99
45) 1,2-Dichloropropane	13.68	63	894896	66.474	ng	100
46) Bromodichloromethane	13.87	83	1194531	71.131	ng	100
47) Trichloroethene	13.93	130	1124968	77.152	ng	100
48) 1,4-Dioxane	13.90	88	814708	77.594	ng	98
49) 2,2,4-Trimethylpentane...	13.99	57	3421941	55.933	ng	96
50) Methyl Methacrylate	14.13	100	818010	179.769	ng	93

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Data File : I:\MS13\DATA\2018 03\29\03291811.D
 Acq On : 29 Mar 2018 21:10
 Sample : 100ng TO15 ICAL std
 Misc : S31-03281803/S31-03201804 (4/18)

Vial: 3
 Operator: RS
 Inst : MS13

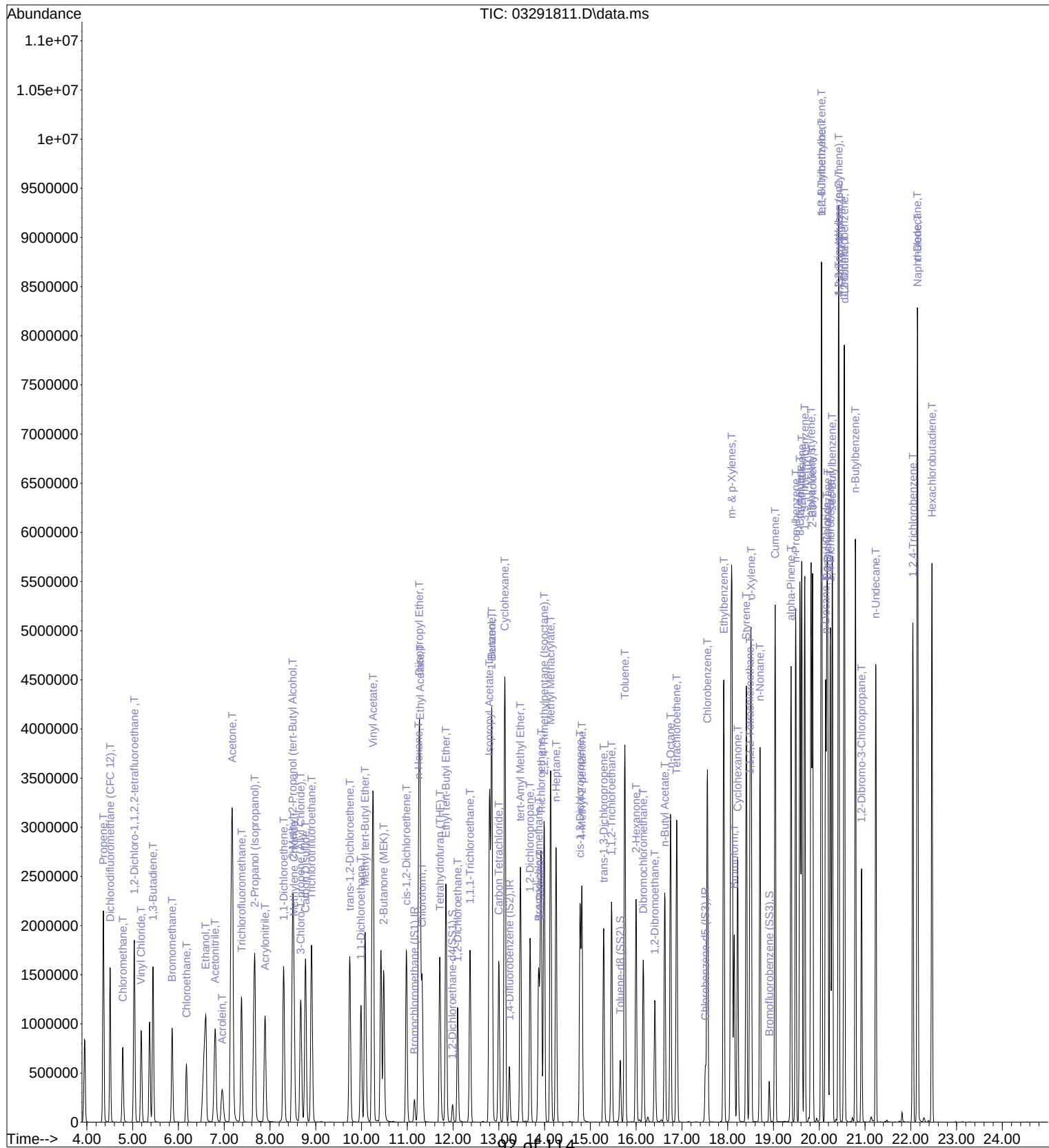
Quant Time: Mar 30 08:47:47 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:47:08 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.25	71	879846	57.563	ng	98
52) cis-1,3-Dichloropropene	14.77	75	1588377	83.474	ng	99
53) 4-Methyl-2-pentanone	14.81	58	825001	71.584	ng	96
54) trans-1,3-Dichloropropene	15.29	75	1378249	86.747	ng	99
55) 1,1,2-Trichloroethane	15.46	97	939728	76.219	ng	99
58) Toluene	15.75	91	3598255	77.705	ng	99
59) 2-Hexanone	16.00	43	1766592	78.120	ng	98
60) Dibromochloromethane	16.16	129	1166293	105.707	ng	99
61) 1,2-Dibromoethane	16.41	107	1102052	106.220	ng	100
62) n-Butyl Acetate	16.62	43	1985715	75.981	ng	98
63) n-Octane	16.75	57	700871	65.136	ng	95
64) Tetrachloroethene	16.89	166	1283734	101.550	ng	99
65) Chlorobenzene	17.56	112	2617211	86.244	ng	99
66) Ethylbenzene	17.92	91	3910491	75.857	ng	97
67) m- & p-Xylenes	18.09	91	5954481	146.620	ng	99
68) Bromoform	18.14	173	1150158	127.741	ng	99
69) Styrene	18.40	104	2727140	94.708	ng	97
70) o-Xylene	18.51	91	3064928	74.747	ng	99
71) n-Nonane	18.71	43	1383581	53.721	ng	96
72) 1,1,2,2-Tetrachloroethane	18.48	83	1475574	80.307	ng	99
74) Cumene	19.04	105	3933201	68.715	ng	97
75) alpha-Pinene	19.38	93	2089631	81.999	ng	97
76) n-Propylbenzene	19.49	91	4462030	66.439	ng	95
77) 3-Ethyltoluene	19.58	105	4146913	72.978	ng	97
78) 4-Ethyltoluene	19.62	105	3535746	74.283	ng	96
79) 1,3,5-Trimethylbenzene	19.69	105	3362118	70.058	ng	99
80) alpha-Methylstyrene	19.82	118	2002323	98.173	ng	99
81) 2-Ethyltoluene	19.86	105	3868423	76.273	ng	97
82) 1,2,4-Trimethylbenzene	20.05	105	3008469	71.749	ng	99
83) n-Decane	20.14	57	1516953	57.103	ng	96
84) Benzyl Chloride	20.16	91	2907471	98.765	ng	96
85) 1,3-Dichlorobenzene	20.19	146	2298021	93.967	ng	100
86) 1,4-Dichlorobenzene	20.24	146	2389425	94.366	ng	99
87) sec-Butylbenzene	20.28	105	4290365	75.365	ng	96
88) 4-Isopropyltoluene (p-...	20.43	119	3559625	63.067	ng	95
89) 1,2,3-Trimethylbenzene	20.43	105	2965526	64.134	ng	98
90) 1,2-Dichlorobenzene	20.54	146	2025829	87.354	ng	100
91) d-Limonene	20.55	68	1083124	66.426	ng	92
92) 1,2-Dibromo-3-Chloropr...	20.93	157	931874	127.875	ng	99
93) n-Undecane	21.23	57	1605820	61.941	ng	95
94) 1,2,4-Trichlorobenzene	22.05	180	1972454	126.033	ng	99
95) Naphthalene	22.15	128	4457287	91.262	ng	98
96) n-Dodecane	22.14	57	1380677	65.271	ng	95
97) Hexachlorobutadiene	22.46	225	1311362	110.987	ng	100
98) Cyclohexanone	18.22	55	1248263	80.062	ng	98
99) tert-Butylbenzene	20.05	119	2943639	72.408	ng	98
100) n-Butylbenzene	20.79	91	3338758	74.901	ng	97

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

Vial: 3
Operator: RS
Inst : MS13

Quant Time: Mar 30 08:47:47 2018
Quant Method : I:\MS13\METHODS\R13032918.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Mar 30 08:47:08 2018
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2018 03\29\03291814.D
 Acq On : 29 Mar 2018 22:52
 Sample : 25ng ICV TO15 std
 Misc : S31-03281803/S31-03231802 (4/21)

Vial: 3
 Operator: RS
 Inst : MS13

RS 3/30/18

Quant Time: Mar 30 09:35:50 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:58:13 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.14	130	108310	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.23	114	535447	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.51	82	183372	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.97	65	124603	12.470	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	99.76%	
57) Toluene-d8 (SS2)	15.65	98	496079	12.243	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.92%	
73) Bromofluorobenzene (SS3)	18.91	174	147864	12.939	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	103.52%	

Target Compounds

						Qvalue
2) Propene	4.35	42	227926	21.681	ng	100
3) Dichlorodifluoromethan...	4.50	85	406724	22.298	ng	100
4) Chloromethane	4.77	50	336434	23.606	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	5.03	135	266165	23.053	ng	100
6) Vinyl Chloride	5.17	62	335900	23.800	ng	100
7) 1,3-Butadiene	5.43	54	236288	25.793	ng	99
8) Bromomethane	5.84	94	229478	23.954	ng	100
9) Chloroethane	6.16	64	180081	24.868	ng	100
10) Ethanol	6.52	45	803972	128.572	ng	99
11) Acetonitrile	6.76	41	423959	27.988	ng	100
12) Acrolein	6.94	56	150986	25.898	ng	99
13) Acetone	7.14	58	844559	116.195	ng	99
14) Trichlorofluoromethane	7.36	101	365877	22.909	ng	100
15) 2-Propanol (Isopropanol)	7.61	45	1131479	51.681	ng	100
16) Acrylonitrile	7.86	53	325662	28.779	ng	100
17) 1,1-Dichloroethene	8.29	96	254244	24.387	ng	97
18) 2-Methyl-2-Propanol (t...	8.45	59	1122998	50.499	ng	100
19) Methylene Chloride	8.51	84	261362	22.440	ng	99
20) 3-Chloro-1-propene (Al...	8.66	41	346586	26.707	ng	100
21) Trichlorotrifluoroethane	8.90	151	254357	23.631	ng	100
22) Carbon Disulfide	8.76	76	926033	22.977	ng	100
23) trans-1,2-Dichloroethene	9.73	61	338424	29.279	ng	99
24) 1,1-Dichloroethane	9.98	63	416282	24.058	ng	100
25) Methyl tert-Butyl Ether	10.07	73	717116	24.271	ng	100
26) Vinyl Acetate	10.23	86	297573	140.323	ng	100
27) 2-Butanone (MEK)	10.47	72	171647	27.023	ng	100
28) cis-1,2-Dichloroethene	10.97	61	317738	25.303	ng	99
29) Diisopropyl Ether	11.26	87	244625	25.726	ng	98
30) Ethyl Acetate	11.26	61	174359	52.444	ng	99
31) n-Hexane	11.24	57	354008	22.520	ng	100
32) Chloroform	11.31	83	399823	24.082	ng	100
34) Tetrahydrofuran (THF)	11.71	72	173105	23.467	ng	98
35) Ethyl tert-Butyl Ether	11.84	87	298303	25.304	ng	99
36) 1,2-Dichloroethane	12.09	62	273669	25.852	ng	100
38) 1,1,1-Trichloroethane	12.36	97	341764	24.211	ng	100
39) Isopropyl Acetate	12.79	61	303171	50.753	ng	98
40) 1-Butanol	12.80	56	457745	54.017	ng	99
41) Benzene	12.84	78	993879	24.473	ng	100
42) Carbon Tetrachloride	12.99	117	315318	25.071	ng	100
43) Cyclohexane	13.12	84	777023	46.764	ng	100
44) tert-Amyl Methyl Ether	13.46	73	692331	24.539	ng	100
45) 1,2-Dichloropropane	13.68	63	241633	24.458	ng	100
46) Bromodichloromethane	13.86	83	319676	22.301	ng	100
47) Trichloroethene	13.91	130	299619	24.557	ng	99
48) 1,4-Dioxane	13.89	88	223969	25.902	ng	100
49) 2,2,4-Trimethylpentane...	13.98	57	1006684	22.581	ng	99
50) Methyl Methacrylate	14.12	100	228271	53.832	ng	99

93 of 114

Data File : I:\MS13\DATA\2018 03\29\03291814.D
 Acq On : 29 Mar 2018 22:52
 Sample : 25ng ICV TO15 std
 Misc : S31-03281803/S31-03231802 (4/21)

Vial: 3
 Operator: RS
 Inst : MS13

Quant Time: Mar 30 09:35:50 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:58:13 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.24	71	247503	23.791	ng	99
52) cis-1,3-Dichloropropene	14.77	75	404231	28.212	ng	100
53) 4-Methyl-2-pentanone	14.80	58	231104	27.654	ng	100
54) trans-1,3-Dichloropropene	15.29	75	359601	29.444	ng	100
55) 1,1,2-Trichloroethane	15.46	97	251673	26.359	ng	100
58) Toluene	15.75	91	1039381	22.724	ng	100
59) 2-Hexanone	15.99	43	501090	26.161	ng	100
60) Dibromochloromethane	16.15	129	302631	26.644	ng	100
61) 1,2-Dibromoethane	16.40	107	289893	29.772	ng	100
62) n-Butyl Acetate	16.62	43	563714	28.940	ng	100
63) n-Octane	16.74	57	202561	22.668	ng	99
64) Tetrachloroethene	16.89	166	341188	23.763	ng	100
65) Chlorobenzene	17.55	112	731750	23.617	ng	100
66) Ethylbenzene	17.91	91	1164185	23.625	ng	100
67) m- & p-Xylenes	18.08	91	1813535	46.473	ng	100
68) Bromoform	18.14	173	291149	27.916	ng	100
69) Styrene	18.40	104	785784	26.691	ng	100
70) o-Xylene	18.50	91	923403	23.749	ng	100
71) n-Nonane	18.70	43	440319	23.015	ng	100
72) 1,1,2,2-Tetrachloroethane	18.48	83	436144	24.961	ng	100
74) Cumene	19.03	105	1199850	23.361	ng	100
75) alpha-Pinene	19.38	93	617155	24.307	ng	100
76) n-Propylbenzene	19.48	91	1397661	24.129	ng	100
77) 3-Ethyltoluene	19.57	105	1221427	23.824	ng	100
78) 4-Ethyltoluene	19.61	105	1130854	24.073	ng	100
79) 1,3,5-Trimethylbenzene	19.68	105	997508	22.285	ng	100
80) alpha-Methylstyrene	19.82	118	591103	27.624	ng	100
81) 2-Ethyltoluene	19.84	105	1176507	23.186	ng	100
82) 1,2,4-Trimethylbenzene	20.04	105	984461	23.587	ng	100
83) n-Decane	20.13	57	500080	23.497	ng	100
84) Benzyl Chloride	20.16	91	839407	33.309	ng	100
85) 1,3-Dichlorobenzene	20.17	146	669767	26.690	ng	99
86) 1,4-Dichlorobenzene	20.24	146	676095	24.787	ng	99
87) sec-Butylbenzene	20.28	105	1348949	23.431	ng	100
88) 4-Isopropyltoluene (p-...	20.42	119	1253829	23.231	ng	100
89) 1,2,3-Trimethylbenzene	20.42	105	1008409	23.748	ng	100
90) 1,2-Dichlorobenzene	20.54	146	635380	26.017	ng	100
91) d-Limonene	20.54	68	379503	24.937	ng	100
92) 1,2-Dibromo-3-Chloropr...	20.92	157	241787	28.618	ng	100
93) n-Undecane	21.23	57	522598	24.870	ng	99
94) 1,2,4-Trichlorobenzene	22.04	180	538298	29.955	ng	100
95) Naphthalene	22.14	128	1454469	28.746	ng	100
96) n-Dodecane	22.14	57	474287	28.942	ng	100
97) Hexachlorobutadiene	22.46	225	350044	24.968	ng	100
98) Cyclohexanone	18.21	55	338402	26.564	ng	100
99) tert-Butylbenzene	20.04	119	974800	23.006	ng	100
100) n-Butylbenzene	20.79	91	1051416	24.744	ng	100

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

Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

RS 3/30/18

Data File Name: 03291814.D

Acq. Method File: TO15.M

Data File Path: I:\MS13\DATA\2018_03\29\

Sample Name: 25ng ICV TO15 std

Operator: RS

Misc Info: S31-03281803/S31-03231802 (

Date Acquired: 3/29/2018

22:52

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	4.35	21.681	26.275	83	54	133	*	*
3)	Dichlorodifluoromethane (CFC 1	4.50	22.298	26.600	84	64	115	*	*
4)	Chloromethane	4.77	23.606	26.250	90	47	140	*	*
5)	1,2-Dichloro-1,1,2,2-tetrafluoroet	5.03	23.053	26.325	88	60	112	*	*
6)	Vinyl Chloride	5.17	23.800	26.350	90	63	127	*	*
7)	1,3-Butadiene	5.43	25.793	26.225	98	57	149	*	*
8)	Bromomethane	5.84	23.954	26.225	91	63	132	*	*
9)	Chloroethane	6.16	24.868	26.250	95	68	129	*	*
10)	Ethanol	6.52	128.572	130.375	99	62	131	*	*
11)	Acetonitrile	6.76	27.988	26.200	107	56	136	*	*
12)	Acrolein	6.94	25.898	26.075	99	60	132	*	*
13)	Acetone	7.14	116.195	131.825	88	63	124	*	*
14)	Trichlorofluoromethane	7.36	22.909	26.025	88	65	113	*	*
15)	2-Propanol (Isopropanol)	7.61	51.681	52.775	98	62	135	*	*
16)	Acrylonitrile	7.86	28.779	26.450	109	68	138	*	*
17)	1,1-Dichloroethene	8.29	24.387	26.675	91	72	118	*	*
18)	2-Methyl-2-Propanol (tert-Butyl Alc	8.45	50.499	53.350	95	61	128	*	*
19)	Methylene Chloride	8.51	22.440	26.600	84	67	116	*	*
20)	3-Chloro-1-propene (Allyl Chloride	8.66	26.707	26.525	101	61	143	*	*
21)	Trichlorotrifluoroethane	8.90	23.631	26.750	88	68	113	*	*
22)	Carbon Disulfide	8.76	22.977	26.725	86	68	120	*	*
23)	trans-1,2-Dichloroethene	9.73	29.279	26.700	110	71	125	*	*
24)	1,1-Dichloroethane	9.98	24.058	26.525	91	68	118	*	*
25)	Methyl tert-Butyl Ether	10.07	24.271	26.625	91	60	123	*	*
26)	Vinyl Acetate	10.23	140.323	132.750	106	73	135	*	*
27)	2-Butanone (MEK)	10.47	27.023	26.450	102	70	129	*	*
28)	cis-1,2-Dichloroethene	10.97	25.303	26.475	96	69	121	*	*
29)	Diisopropyl Ether	11.26	25.726	26.600	97	65	117	*	*
30)	Ethyl Acetate	11.26	52.444	53.300	98	66	140	*	*
31)	n-Hexane	11.24	22.520	26.625	85	61	124	*	*
32)	Chloroform	11.31	24.082	26.500	91	69	113	*	*
34)	Tetrahydrofuran (THF)	11.71	23.467	26.550	88	66	121	*	*
35)	Ethyl tert-Butyl Ether	11.84	25.304	26.525	95	69	120	*	*
36)	1,2-Dichloroethane	12.09	25.852	26.500	98	62	120	*	*
38)	1,1,1-Trichloroethane	12.36	24.211	26.525	91	65	116	*	*
39)	Isopropyl Acetate	12.79	50.753	53.275	95	70	126	*	*
40)	1-Butanol	12.80	54.017	53.300	101	62	141	*	*
41)	Benzene	12.84	24.473	26.625	92	66	111	*	*
42)	Carbon Tetrachloride	12.99	25.071	26.700	94	64	122	*	*
43)	Cyclohexane	13.12	46.764	53.150	88	69	115	*	*
44)	tert-Amyl Methyl Ether	13.46	24.539	26.550	92	68	119	*	*
45)	1,2-Dichloropropane	13.68	24.458	26.525	92	69	121	*	*
46)	Bromodichloromethane	13.86	22.301	26.700	84	69	123	*	*
47)	Trichloroethene	13.91	24.557	26.550	92	69	112	*	*
48)	1,4-Dioxane	13.89	25.902	26.600	97	74	123	*	*
49)	2,2,4-Trimethylpentane (Isooctane)	13.98	22.581	26.525	85	67	120	*	*

Bold = 75 Compound List

* = Pass

Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: 03291814.D

TO15.M

Data File Path: I:\MS13\DATA\2018_03\29\

Sample Name: 25ng ICV TO15 std

Operator: RS

Misc Info: S31-03281803/S31-03231802 (

Date Acquired: 3/29/2018

22:52

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	14.12	53.832	52.950	102	75	125	*	*
51)	n-Heptane	14.24	23.791	26.625	89	68	118	*	*
52)	cis-1,3-Dichloropropene	14.77	28.212	26.025	108	74	129	*	*
53)	4-Methyl-2-pentanone	14.80	27.654	26.650	104	66	138	*	*
54)	trans-1,3-Dichloropropene	15.29	29.444	26.625	111	75	130	*	*
55)	1,1,2-Trichloroethane	15.46	26.359	26.500	99	73	117	*	*
58)	Toluene	15.75	22.724	26.400	86	66	114	*	*
59)	2-Hexanone	15.99	26.161	26.425	99	58	146	*	*
60)	Dibromochloromethane	16.15	26.644	26.450	101	67	130	*	*
61)	1,2-Dibromoethane	16.40	29.772	26.425	113	70	127	*	*
62)	n-Butyl Acetate	16.62	28.940	26.850	108	62	140	*	*
63)	n-Octane	16.74	22.668	26.525	85	65	121	*	*
64)	Tetrachloroethene	16.89	23.763	26.500	90	62	119	*	*
65)	Chlorobenzene	17.55	23.617	26.525	89	66	115	*	*
66)	Ethylbenzene	17.91	23.625	26.475	89	69	117	*	*
67)	m- & p-Xylenes	18.08	46.473	52.975	88	67	117	*	*
68)	Bromoform	18.14	27.916	26.525	105	67	135	*	*
69)	Styrene	18.40	26.691	26.350	101	70	128	*	*
70)	o-Xylene	18.50	23.749	26.400	90	67	118	*	*
71)	n-Nonane	18.70	23.015	26.500	87	61	127	*	*
72)	1,1,2,2-Tetrachloroethane	18.48	24.961	26.450	94	70	125	*	*
74)	Cumene	19.03	23.361	26.525	88	68	116	*	*
75)	alpha-Pinene	19.38	24.307	26.600	91	69	122	*	*
76)	n-Propylbenzene	19.48	24.129	26.750	90	70	118	*	*
77)	3-Ethyltoluene	19.57	23.824	26.450	90	68	117	*	*
78)	4-Ethyltoluene	19.61	24.073	26.425	91	69	124	*	*
79)	1,3,5-Trimethylbenzene	19.68	22.285	26.500	84	65	117	*	*
80)	alpha-Methylstyrene	19.82	27.624	26.525	104	71	132	*	*
81)	2-Ethyltoluene	19.84	23.186	26.700	87	67	119	*	*
82)	1,2,4-Trimethylbenzene	20.04	23.587	26.550	89	67	124	*	*
83)	n-Decane	20.13	23.497	26.625	88	63	129	*	*
84)	Benzyl Chloride	20.16	33.309	26.550	125	75	142	*	*
85)	1,3-Dichlorobenzene	20.17	26.690	26.475	101	70	124	*	*
86)	1,4-Dichlorobenzene	20.24	24.787	26.750	93	63	124	*	*
87)	sec-Butylbenzene	20.28	23.431	26.575	88	68	119	*	*
88)	4-Isopropyltoluene (p-Cymene)	20.42	23.231	26.600	87	65	122	*	*
89)	1,2,3-Trimethylbenzene	20.42	23.748	26.600	89	66	128	*	*
90)	1,2-Dichlorobenzene	20.54	26.017	26.750	97	66	125	*	*
91)	d-Limonene	20.54	24.937	26.625	94	64	135	*	*
92)	1,2-Dibromo-3-Chloropropane	20.92	28.618	26.300	109	73	136	*	*
93)	n-Undecane	21.23	24.870	26.775	93	67	135	*	*
94)	1,2,4-Trichlorobenzene	22.04	29.955	27.200	110	70	141	*	*
95)	Naphthalene	22.14	28.746	26.125	110	71	146	*	*
96)	n-Dodecane	22.14	28.942	26.825	108	69	152	*	*
97)	Hexachlorobutadiene	22.46	24.968	26.550	94	63	126	*	*
98)	Cyclohexanone	18.21	26.564	26.150	102	58	138	*	*
99)	tert-Butylbenzene	20.04	23.006	26.525	87	65	121	*	*
100)	n-Butylbenzene	20.79	24.744	26.575	93	71	125	*	*

Data File : I:\MS13\DATA\2018 04\16\04161802.D

Vial: 3

Acq On : 16 Apr 2018 8:25

Operator: RS

Sample : CCV R13041618 25ng

Inst : MS13

Misc : S31-03281803/S31-04041804 (5/3)

RS 4/16/18

Quant Time: Apr 16 08:54:32 2018

Quant Method : I:\MS13\METHODS\R13032918.M

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

QLast Update : Fri Mar 30 08:58:13 2018

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	99	0.00
2 T	Propene	1.213	1.127	7.1	107	0.00
3 T	Dichlorodifluoromethane (CF	2.105	1.834	12.9	100	0.00
4 T	Chloromethane	1.645	1.633	0.7	107	0.00
5 T	1,2-Dichloro-1,1,2,2-tetra	1.333	1.088	18.4	93	0.00
6 T	Vinyl Chloride	1.629	1.636	-0.4	107	0.00
7 T	1,3-Butadiene	1.057	1.208	-14.3	112	-0.01
8 T	Bromomethane	1.106	0.966	12.7	94	-0.01
9 T	Chloroethane	0.836	0.777	7.1	96	-0.01
10 T	Ethanol	0.722	0.759	-5.1	105	-0.07
11 T	Acetonitrile	1.748	1.912	-9.4	99	-0.03
12 T	Acrolein	0.673	0.626	7.0	94	-0.01
13 T	Acetone	0.839	0.794	5.4	105	-0.03
14 T	Trichlorofluoromethane	1.843	1.531	16.9	93	-0.01
15 T	2-Propanol (Isopropanol)	2.527	2.551	-0.9	100	-0.05
16 T	Acrylonitrile	1.306	1.383	-5.9	95	-0.03
17 T	1,1-Dichloroethene	1.203	1.032	14.2	93	0.00
18 T	2-Methyl-2-Propanol (tert-B	2.566	2.391	6.8	96	-0.04
19 T	Methylene Chloride	1.344	1.071	20.3	94	-0.02
20 T	3-Chloro-1-propene (Allyl C	1.498	1.481	1.1	98	-0.01
21 T	Trichlorotrifluoroethane	1.242	0.933	24.9	84	0.00
22 T	Carbon Disulfide	4.651	3.875	16.7	95	0.00
23 T	trans-1,2-Dichloroethene	1.334	1.415	-6.1	96	0.00
24 T	1,1-Dichloroethane	1.997	1.761	11.8	95	0.00
25 T	Methyl tert-Butyl Ether	3.410	2.940	13.8	93	0.00
26 T	Vinyl Acetate	0.245	0.266	-8.6	100	-0.03
27 T	2-Butanone (MEK)	0.733	0.739	-0.8	96	-0.02
28 T	cis-1,2-Dichloroethene	1.449	1.346	7.1	95	0.00
29 T	Diisopropyl Ether	1.097	1.071	2.4	99	0.00
30 T	Ethyl Acetate	0.384	0.406	-5.7	104	-0.02
31 T	n-Hexane	1.814	1.670	7.9	103	0.00
32 T	Chloroform	1.916	1.695	11.5	96	-0.01
33 S	1,2-Dichloroethane-d4 (SS1)	1.153	1.182	-2.5	101	0.00
34 T	Tetrahydrofuran (THF)	0.851	0.729	14.3	96	0.00
35 T	Ethyl tert-Butyl Ether	1.361	1.243	8.7	94	0.00
36 T	1,2-Dichloroethane	1.222	1.135	7.1	93	0.00
37 IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	96	0.00
38 T	1,1,1-Trichloroethane	0.330	0.296	10.3	95	0.00
39 T	Isopropyl Acetate	0.139	0.144	-3.6	103	0.00
40 T	1-Butanol	0.198	0.228	-15.2	105	-0.03
41 T	Benzene	0.948	0.858	9.5	96	0.00
42 T	Carbon Tetrachloride	0.294	0.260	11.6	91	0.00
43 T	Cyclohexane	0.388	0.342	11.9	97	0.00
44 T	tert-Amyl Methyl Ether	0.659	0.605	8.2	96	0.00
45 T	1,2-Dichloropropane	0.231	0.210	9.1	95	0.00
46 T	Bromodichloromethane	0.335	0.273	18.5	95	0.00
47 T	Trichloroethene	0.285	0.241	15.4	89	-0.01
48 T	1,4-Dioxane	0.202	0.194	4.0	95	0.00
49 T	2,2,4-Trimethylpentane (Iso	1.041	0.904	13.2	98	0.00
50 T	Methyl Methacrylate	0.099	0.092	7.1	88	-0.01
51 T	n-Heptane	0.243	0.216	11.1	96	0.00
52 T	cis-1,3-Dichloropropene	0.334	0.344	-3.0	94	0.00
53 T	4-Methyl-2-pentanone	0.195	0.208	-6.7	98	-0.01
54 T	trans-1,3-Dichloropropene	0.285	0.300	-5.3	92	0.00
55 T	1,1,2-Trichloroethane	0.223	0.213	4.5	93	0.00

98 of 114

Data File : I:\MS13\DATA\2018 04\16\04161802.D

Vial: 3

Acq On : 16 Apr 2018 8:25

Operator: RS

Sample : CCV R13041618 25ng

Inst : MS13

Misc : S31-03281803/S31-04041804 (5/3)

Quant Time: Apr 16 08:54:32 2018

Quant Method : I:\MS13\METHODS\R13032918.M

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

QLast Update : Fri Mar 30 08:58:13 2018

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	102	0.00
57	S Toluene-d8 (SS2)	2.762	2.633	4.7	97	0.00
58	T Toluene	3.118	2.488	20.2	93	0.00
59	T 2-Hexanone	1.306	1.271	2.7	98	-0.01
60	T Dibromochloromethane	0.774	0.706	8.8	92	0.00
61	T 1,2-Dibromoethane	0.664	0.677	-2.0	92	0.00
62	T n-Butyl Acetate	1.328	1.411	-6.2	97	0.00
63	T n-Octane	0.609	0.514	15.6	97	0.00
64	T Tetrachloroethene	0.979	0.730	25.4	85	0.00
65	T Chlorobenzene	2.112	1.676	20.6	90	0.00
66	T Ethylbenzene	3.359	2.827	15.8	95	0.00
67	T m- & p-Xylenes	2.660	2.241	15.8	97	-0.01
68	T Bromoform	0.711	0.641	9.8	86	0.00
69	T Styrene	2.007	1.857	7.5	93	0.00
70	T o-Xylene	2.651	2.252	15.1	96	-0.01
71	T n-Nonane	1.304	1.142	12.4	101	0.00
72	T 1,1,2,2-Tetrachloroethane	1.191	1.122	5.8	99	0.00
73	S Bromofluorobenzene (SS3)	0.779	0.657	15.7	86	0.00
74	T Cumene	3.501	2.860	18.3	94	0.00
75	T alpha-Pinene	1.731	1.494	13.7	95	0.00
76	T n-Propylbenzene	3.949	3.402	13.9	96	0.00
77	T 3-Ethyltoluene	3.495	3.036	13.1	95	0.00
78	T 4-Ethyltoluene	3.202	2.656	17.1	95	0.00
79	T 1,3,5-Trimethylbenzene	3.051	2.420	20.7	95	0.00
80	T alpha-Methylstyrene	1.459	1.413	3.2	95	0.00
81	T 2-Ethyltoluene	3.459	2.866	17.1	96	-0.01
82	T 1,2,4-Trimethylbenzene	2.845	2.491	12.4	99	0.00
83	T n-Decane	1.451	1.295	10.8	102	-0.01
84	T Benzyl Chloride	1.718	2.071	-20.5	98	0.00
85	T 1,3-Dichlorobenzene	1.711	1.514	11.5	92	-0.01
86	T 1,4-Dichlorobenzene	1.859	1.550	16.6	90	0.00
87	T sec-Butylbenzene	3.924	3.276	16.5	96	0.00
88	T 4-Isopropyltoluene (p-Cymen	3.679	3.089	16.0	95	0.00
89	T 1,2,3-Trimethylbenzene	2.895	2.534	12.5	100	0.00
90	T 1,2-Dichlorobenzene	1.665	1.453	12.7	92	0.00
91	T d-Limonene	1.037	1.012	2.4	102	0.00
92	T 1,2-Dibromo-3-Chloropropane	0.576	0.532	7.6	86	0.00
93	T n-Undecane	1.432	1.348	5.9	99	0.00
94	T 1,2,4-Trichlorobenzene	1.225	1.068	12.8	82	0.00
95	T Naphthalene	3.449	3.479	-0.9	93	0.00
96	T n-Dodecane	1.117	1.273	-14.0	103	0.00
97	T Hexachlorobutadiene	0.956	0.694	27.4	79	0.00
98	T Cyclohexanone	0.868	0.860	0.9	96	-0.01
99	T tert-Butylbenzene	2.888	2.373	17.8	96	0.00
100	T n-Butylbenzene	2.897	2.609	9.9	97	0.00

(#) = Out of Range

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

Data File : I:\MS13\DATA\2018 04\16\04161802.D

Vial: 3

Acq On : 16 Apr 2018 8:25

Operator: RS

Sample : CCV R13041618 25ng

Inst : MS13

Misc : S31-03281803/S31-04041804 (5/3)

Quant Time: Apr 16 08:54:32 2018

Quant Method : I:\MS13\METHODS\R13032918.M

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

RS 4/16/18

QLast Update : Fri Mar 30 08:58:13 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.15	130	111012	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.23	114	539276	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.51	82	192029	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.98	65	131269	12.817	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.56%
57) Toluene-d8 (SS2)	15.64	98	505597	11.915	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.36%
73) Bromofluorobenzene (SS3)	18.91	174	126191	10.545	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	84.32%

Target Compounds

						Qvalue
2) Propene	4.36	42	259432	24.077	ng	98
3) Dichlorodifluoromethan...	4.51	85	426654	22.822	ng	100
4) Chloromethane	4.78	50	364832	24.976	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	5.03	135	246694	20.846	ng	99
6) Vinyl Chloride	5.18	62	374912	25.917	ng	100
7) 1,3-Butadiene	5.43	54	283989	30.245	ng	97
8) Bromomethane	5.85	94	212902	21.683	ng	99
9) Chloroethane	6.16	64	174482	23.508	ng	100
10) Ethanol	6.53	45	888803	138.679	ng	99
11) Acetonitrile	6.77	41	449503	28.952	ng	99
12) Acrolein	6.94	56	146543	24.524	ng	98
13) Acetone	7.14	58	937803	125.883	ng	94
14) Trichlorofluoromethane	7.37	101	357195	21.821	ng	100
15) 2-Propanol (Isopropanol)	7.62	45	1193318	53.178	ng	99
16) Acrylonitrile	7.86	53	324227	27.955	ng	98
17) 1,1-Dichloroethene	8.29	96	243172	22.757	ng	97
18) 2-Methyl-2-Propanol (t...	8.46	59	1125560	49.382	ng	99
19) Methylene Chloride	8.51	84	251494	21.067	ng	97
20) 3-Chloro-1-propene (Al...	8.66	41	346502	26.051	ng	96
21) Trichlorotrifluoroethane	8.91	151	218228	19.781	ng	91
22) Carbon Disulfide	8.77	76	914476	22.138	ng	100
23) trans-1,2-Dichloroethene	9.74	61	339586	28.665	ng	98
24) 1,1-Dichloroethane	9.98	63	399525	22.527	ng	100
25) Methyl tert-Butyl Ether	10.07	73	698534	23.067	ng	99
26) Vinyl Acetate	10.23	86	311414	143.275	ng	# 88
27) 2-Butanone (MEK)	10.47	72	172710	26.528	ng	98
28) cis-1,2-Dichloroethene	10.97	61	318903	24.777	ng	98
29) Diisopropyl Ether	11.26	87	253282	25.988	ng	# 86
30) Ethyl Acetate	11.26	61	192365	56.451	ng	97
31) n-Hexane	11.25	57	395213	24.530	ng	99
32) Chloroform	11.31	83	399265	23.463	ng	99
34) Tetrahydrofuran (THF)	11.71	72	172226	22.780	ng	96
35) Ethyl tert-Butyl Ether	11.84	87	292266	24.188	ng	96
36) 1,2-Dichloroethane	12.09	62	265889	24.506	ng	99
38) 1,1,1-Trichloroethane	12.37	97	343638	24.171	ng	100
39) Isopropyl Acetate	12.79	61	327481	54.434	ng	97
40) 1-Butanol	12.80	56	520066	60.935	ng	96
41) Benzene	12.84	78	978483	23.923	ng	100
42) Carbon Tetrachloride	12.99	117	296756	23.428	ng	100
43) Cyclohexane	13.12	84	786949	47.025	ng	95
44) tert-Amyl Methyl Ether	13.46	73	689629	24.269	ng	99
45) 1,2-Dichloropropane	13.68	63	241761	24.297	ng	100
46) Bromodichloromethane	13.86	83	314483	21.783	ng	99
47) Trichloroethene	13.91	130	275679	22.434	ng	100
48) 1,4-Dioxane	13.89	88	222721	25.574	ng	97
49) 2,2,4-Trimethylpentane...	13.98	57	1033028	23.007	ng	99
50) Methyl Methacrylate	14.12	100	208900	48.914	ng	# 85

100 of 114

Data File : I:\MS13\DATA\2018 04\16\04161802.D
 Acq On : 16 Apr 2018 8:25
 Sample : CCV R13041618 25ng
 Misc : S31-03281803/S31-04041804 (5/3)

Vial: 3
 Operator: RS
 Inst : MS13

Quant Time: Apr 16 08:54:32 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:58:13 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.24	71	248414	23.709	ng	98
52) cis-1,3-Dichloropropene	14.77	75	415274	28.777	ng	100
53) 4-Methyl-2-pentanone	14.80	58	238046	28.282	ng	98
54) trans-1,3-Dichloropropene	15.29	75	345366	28.078	ng	100
55) 1,1,2-Trichloroethane	15.46	97	244670	25.443	ng	98
58) Toluene	15.75	91	1007324	21.031	ng	100
59) 2-Hexanone	15.99	43	517304	25.790	ng	100
60) Dibromochloromethane	16.15	129	287482	24.169	ng	99
61) 1,2-Dibromoethane	16.40	107	276477	27.114	ng	100
62) n-Butyl Acetate	16.62	43	578675	28.368	ng	100
63) n-Octane	16.74	57	209371	22.374	ng	97
64) Tetrachloroethene	16.89	166	298106	19.826	ng	99
65) Chlorobenzene	17.55	112	686315	21.152	ng	100
66) Ethylbenzene	17.91	91	1142079	22.131	ng	100
67) m- & p-Xylenes	18.07	91	1827346	44.716	ng	100
68) Bromoform	18.14	173	261590	23.951	ng	100
69) Styrene	18.40	104	754479	24.472	ng	99
70) o-Xylene	18.50	91	912309	22.406	ng	99
71) n-Nonane	18.70	43	462323	23.076	ng	98
72) 1,1,2,2-Tetrachloroethane	18.48	83	455526	24.895	ng	100
74) Cumene	19.03	105	1155569	21.485	ng	100
75) alpha-Pinene	19.38	93	600349	22.579	ng	99
76) n-Propylbenzene	19.48	91	1390292	22.920	ng	99
77) 3-Ethyltoluene	19.57	105	1224219	22.802	ng	99
78) 4-Ethyltoluene	19.61	105	1070154	21.754	ng	99
79) 1,3,5-Trimethylbenzene	19.68	105	975080	20.802	ng	98
80) alpha-Methylstyrene	19.82	118	569410	25.411	ng	99
81) 2-Ethyltoluene	19.84	105	1166565	21.953	ng	99
82) 1,2,4-Trimethylbenzene	20.04	105	1005402	23.003	ng	98
83) n-Decane	20.13	57	526850	23.639	ng	99
84) Benzyl Chloride	20.16	91	854072	32.363	ng	98
85) 1,3-Dichlorobenzene	20.17	146	622567	23.690	ng	99
86) 1,4-Dichlorobenzene	20.24	146	633299	22.171	ng	99
87) sec-Butylbenzene	20.28	105	1327261	22.015	ng	99
88) 4-Isopropyltoluene (p-...	20.42	119	1217149	21.534	ng	99
89) 1,2,3-Trimethylbenzene	20.42	105	998586	22.457	ng	98
90) 1,2-Dichlorobenzene	20.54	146	604444	23.635	ng	100
91) d-Limonene	20.54	68	390690	24.515	ng	98
92) 1,2-Dibromo-3-Chloropr...	20.92	157	214774	24.274	ng	93
93) n-Undecane	21.23	57	544950	24.764	ng	99
94) 1,2,4-Trichlorobenzene	22.04	180	450067	23.916	ng	99
95) Naphthalene	22.14	128	1411118	26.632	ng	100
96) n-Dodecane	22.14	57	516353	30.089	ng	99
97) Hexachlorobutadiene	22.46	225	281735	19.189	ng	100
98) Cyclohexanone	18.21	55	343304	25.734	ng	98
99) tert-Butylbenzene	20.04	119	956845	21.564	ng	100
100) n-Butylbenzene	20.78	91	1056272	23.738	ng	98

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

TIC: 04161802.D\data.ms

Abundance

Time-->

4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00 18.00 19.00 20.00 21.00 22.00 23.00 24.00

4200000
4000000
3800000
3600000
3400000
3200000
3000000
2800000
2600000
2400000
2200000
2000000
1800000
1600000
1400000
1200000
1000000
800000
600000
400000
200000
0

Propene, T
Dichlorodifluoromethane (CFC 12), T
Chloromethane, T
Vinyl Chloride, T
Dichloro-1,1,2,2-tetrafluoroethane, T
1,3-Butadiene, T
Bromomethane, T
Chloroethane, T
Ethanol, T
Acetonitrile, T
Acrolein, T
Trichlorofluoromethane, T
2-Propanol (Isopropanol), T
Acrylonitrile, T
1,1-Dichloroethene, T
Vinylene Chloride, T
Ethyl 2-Propanol (tert-Butyl Alcohol), T
3-Chloro-1,2-dichloroethane, T
Trichloromethane, T
trans-1,2-Dichloroethene, T
1,1-Dichloroethane, T
Vinyl Tertiary Butyl Ether, T
2-Butanone (MEK), T
cis-1,2-Dichloroethene, T
Bromochloromethane, T
Tetrahydrofuran, T
1,2-Dichloroethane (SS1), T
1,1,1-Trichloroethane, T
Carbon Tetrachloride, T
Benzene, T
1,4-Difluorobenzene (IS2), T
tert-Amyl Methyl Ether, T
1,2-Dichloropropane, T
Bromochloromethane, T
n-Heptane, T
cis-1,3-Dichloropropane, T
trans-1,3-Dichloropropane, T
1,1,2-Trichloroethane, T
Toluene, T
2-Hexanone, T
Dibromochloromethane, T
1,2-Dibromoethane, T
n-Butyl Acetate, T
Octane, T
Tetrachloroethene, T
Chlorobenzene-d5 (IS3), T
Ethylbenzene, T
Cyclohexanone, T
Styrene, T
o-Xylene, T
n-Nonane, T
Bromofluorobenzene (SS3), S
alpha-Pinene, T
n-Propylbenzene, T
alpha-Methylstyrene, T
1,2-Dichlorobenzene, T
1,3-Dichlorobenzene, T
1,4-Dichlorobenzene, T
n-Butylbenzene, T
n-Undecane, T
1,2-Dibromo-3-Chloropropane, T
1,2,4-Trichlorobenzene, T
Hexachlorobutadiene, T
n-Heptadecane, T

Data File : I:\MS13\DATA\2018 04\16\04161821.D

Vial: 3

Acq On : 16 Apr 2018 20:28

Operator: RS

Sample : CCV end R13041618 25ng

Inst : MS13

Misc : S31-03281803/S31-04041804 (5/3)

Quant Time: Apr 17 07:43:59 2018

Quant Method : I:\MS13\METHODS\R13032918.M

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

QLast Update : Fri Mar 30 08:58:13 2018

RS 4/17/18

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	99	-0.01
2 T	Propene	1.213	1.115	8.1	106	0.00
3 T	Dichlorodifluoromethane (CF	2.105	1.813	13.9	99	0.00
4 T	Chloromethane	1.645	1.574	4.3	104	0.00
5 T	1,2-Dichloro-1,1,2,2-tetra	1.333	1.075	19.4	92	0.00
6 T	Vinyl Chloride	1.629	1.563	4.1	103	0.00
7 T	1,3-Butadiene	1.057	1.160	-9.7	108	-0.01
8 T	Bromomethane	1.106	0.964	12.8	95	-0.01
9 T	Chloroethane	0.836	0.770	7.9	96	-0.01
10 T	Ethanol	0.722	0.751	-4.0	104	-0.07
11 T	Acetonitrile	1.748	1.895	-8.4	99	-0.03
12 T	Acrolein	0.673	0.626	7.0	94	-0.01
13 T	Acetone	0.839	0.782	6.8	104	-0.04
14 T	Trichlorofluoromethane	1.843	1.521	17.5	93	-0.01
15 T	2-Propanol (Isopropanol)	2.527	2.519	0.3	99	-0.05
16 T	Acrylonitrile	1.306	1.374	-5.2	94	-0.03
17 T	1,1-Dichloroethene	1.203	1.034	14.0	93	0.00
18 T	2-Methyl-2-Propanol (tert-B	2.566	2.391	6.8	97	-0.05
19 T	Methylene Chloride	1.344	1.074	20.1	95	-0.02
20 T	3-Chloro-1-propene (Allyl C	1.498	1.440	3.9	96	-0.01
21 T	Trichlorotrifluoroethane	1.242	0.938	24.5	85	0.00
22 T	Carbon Disulfide	4.651	3.848	17.3	95	0.00
23 T	trans-1,2-Dichloroethene	1.334	1.393	-4.4	95	-0.01
24 T	1,1-Dichloroethane	1.997	1.739	12.9	94	-0.01
25 T	Methyl tert-Butyl Ether	3.410	2.979	12.6	95	0.00
26 T	Vinyl Acetate	0.245	0.262	-6.9	99	-0.03
27 T	2-Butanone (MEK)	0.733	0.734	-0.1	96	-0.02
28 T	cis-1,2-Dichloroethene	1.449	1.323	8.7	94	-0.01
29 T	Diisopropyl Ether	1.097	1.054	3.9	98	0.00
30 T	Ethyl Acetate	0.384	0.396	-3.1	102	-0.02
31 T	n-Hexane	1.814	1.625	10.4	101	0.00
32 T	Chloroform	1.916	1.680	12.3	95	-0.02
33 S	1,2-Dichloroethane-d4 (SS1)	1.153	1.162	-0.8	100	-0.01
34 T	Tetrahydrofuran (THF)	0.851	0.726	14.7	96	0.00
35 T	Ethyl tert-Butyl Ether	1.361	1.235	9.3	94	0.00
36 T	1,2-Dichloroethane	1.222	1.106	9.5	91	-0.01
37 IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	96	-0.01
38 T	1,1,1-Trichloroethane	0.330	0.292	11.5	94	-0.01
39 T	Isopropyl Acetate	0.139	0.142	-2.2	102	-0.01
40 T	1-Butanol	0.198	0.222	-12.1	102	-0.03
41 T	Benzene	0.948	0.848	10.5	95	-0.01
42 T	Carbon Tetrachloride	0.294	0.258	12.2	91	0.00
43 T	Cyclohexane	0.388	0.338	12.9	96	0.00
44 T	tert-Amyl Methyl Ether	0.659	0.602	8.6	96	0.00
45 T	1,2-Dichloropropane	0.231	0.208	10.0	94	0.00
46 T	Bromodichloromethane	0.335	0.270	19.4	95	0.00
47 T	Trichloroethene	0.285	0.241	15.4	89	-0.01
48 T	1,4-Dioxane	0.202	0.193	4.5	95	0.00
49 T	2,2,4-Trimethylpentane (Iso	1.041	0.895	14.0	97	0.00
50 T	Methyl Methacrylate	0.099	0.092	7.1	89	-0.01
51 T	n-Heptane	0.243	0.214	11.9	95	0.00
52 T	cis-1,3-Dichloropropene	0.334	0.340	-1.8	93	0.00
53 T	4-Methyl-2-pentanone	0.195	0.206	-5.6	97	-0.01
54 T	trans-1,3-Dichloropropene	0.285	0.296	-3.9	91	-0.01
55 T	1,1,2-Trichloroethane	0.223	0.213	4.5	94	0.00

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Data File : I:\MS13\DATA\2018 04\16\04161821.D

Vial: 3

Acq On : 16 Apr 2018 20:28

Operator: RS

Sample : CCV end R13041618 25ng

Inst : MS13

Misc : S31-03281803/S31-04041804 (5/3)

Quant Time: Apr 17 07:43:59 2018

Quant Method : I:\MS13\METHODS\R13032918.M

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

QLast Update : Fri Mar 30 08:58:13 2018

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	103	0.00
57	S Toluene-d8 (SS2)	2.762	2.634	4.6	98	0.00
58	T Toluene	3.118	2.470	20.8	93	0.00
59	T 2-Hexanone	1.306	1.238	5.2	96	-0.01
60	T Dibromochloromethane	0.774	0.701	9.4	92	0.00
61	T 1,2-Dibromoethane	0.664	0.674	-1.5	92	0.00
62	T n-Butyl Acetate	1.328	1.379	-3.8	96	0.00
63	T n-Octane	0.609	0.507	16.7	97	0.00
64	T Tetrachloroethene	0.979	0.730	25.4	85	0.00
65	T Chlorobenzene	2.112	1.662	21.3	90	0.00
66	T Ethylbenzene	3.359	2.792	16.9	94	0.00
67	T m- & p-Xylenes	2.660	2.201	17.3	96	-0.01
68	T Bromoform	0.711	0.635	10.7	86	-0.01
69	T Styrene	2.007	1.836	8.5	92	0.00
70	T o-Xylene	2.651	2.216	16.4	95	-0.01
71	T n-Nonane	1.304	1.109	15.0	99	0.00
72	T 1,1,2,2-Tetrachloroethane	1.191	1.106	7.1	99	0.00
73	S Bromofluorobenzene (SS3)	0.779	0.673	13.6	88	0.00
74	T Cumene	3.501	2.831	19.1	93	0.00
75	T alpha-Pinene	1.731	1.474	14.8	94	0.00
76	T n-Propylbenzene	3.949	3.348	15.2	96	0.00
77	T 3-Ethyltoluene	3.495	3.026	13.4	95	0.00
78	T 4-Ethyltoluene	3.202	2.579	19.5	93	0.00
79	T 1,3,5-Trimethylbenzene	3.051	2.375	22.2	94	0.00
80	T alpha-Methylstyrene	1.459	1.388	4.9	94	-0.01
81	T 2-Ethyltoluene	3.459	2.819	18.5	95	-0.01
82	T 1,2,4-Trimethylbenzene	2.845	2.442	14.2	98	0.00
83	T n-Decane	1.451	1.257	13.4	99	-0.01
84	T Benzyl Chloride	1.718	2.006	-16.8	96	0.00
85	T 1,3-Dichlorobenzene	1.711	1.495	12.6	91	-0.01
86	T 1,4-Dichlorobenzene	1.859	1.527	17.9	90	-0.01
87	T sec-Butylbenzene	3.924	3.227	17.8	95	0.00
88	T 4-Isopropyltoluene (p-Cymen	3.679	3.041	17.3	94	0.00
89	T 1,2,3-Trimethylbenzene	2.895	2.476	14.5	98	-0.01
90	T 1,2-Dichlorobenzene	1.665	1.431	14.1	92	0.00
91	T d-Limonene	1.037	0.986	4.9	100	0.00
92	T 1,2-Dibromo-3-Chloropropane	0.576	0.526	8.7	86	0.00
93	T n-Undecane	1.432	1.310	8.5	97	0.00
94	T 1,2,4-Trichlorobenzene	1.225	1.059	13.6	82	0.00
95	T Naphthalene	3.449	3.417	0.9	92	0.00
96	T n-Dodecane	1.117	1.232	-10.3	101	0.00
97	T Hexachlorobutadiene	0.956	0.688	28.0	79	0.00
98	T Cyclohexanone	0.868	0.836	3.7	94	-0.01
99	T tert-Butylbenzene	2.888	2.340	19.0	95	-0.01
100	T n-Butylbenzene	2.897	2.561	11.6	96	0.00

(#) = Out of Range

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

Data File : I:\MS13\DATA\2018 04\16\04161821.D
 Acq On : 16 Apr 2018 20:28
 Sample : CCV end R13041618 25ng
 Misc : S31-03281803/S31-04041804 (5/3)

Vial: 3
 Operator: RS
 Inst : MS13

Quant Time: Apr 17 07:43:59 2018

RS 4/17/18

Quant Method : I:\MS13\METHODS\R13032918.M

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

QLast Update : Fri Mar 30 08:58:13 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.14	130	111522	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.22	114	542161	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.51	82	193299	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.97	65	129549	12.592	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.72%
57) Toluene-d8 (SS2)	15.64	98	509157	11.920	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.36%
73) Bromofluorobenzene (SS3)	18.91	174	130166	10.805	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	86.48%

Target Compounds

						Qvalue
2) Propene	4.36	42	257929	23.828	ng	97
3) Dichlorodifluoromethan...	4.51	85	423865	22.569	ng	100
4) Chloromethane	4.78	50	353095	24.062	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	5.03	135	244889	20.599	ng	99
6) Vinyl Chloride	5.18	62	359817	24.760	ng	100
7) 1,3-Butadiene	5.43	54	273981	29.046	ng	97
8) Bromomethane	5.85	94	213589	21.654	ng	100
9) Chloroethane	6.16	64	173834	23.314	ng	100
10) Ethanol	6.53	45	883158	137.168	ng	98
11) Acetonitrile	6.77	41	447652	28.701	ng	99
12) Acrolein	6.94	56	147248	24.529	ng	99
13) Acetone	7.14	58	928507	124.065	ng	92
14) Trichlorofluoromethane	7.37	101	356478	21.678	ng	100
15) 2-Propanol (Isopropanol)	7.61	45	1183919	52.518	ng	99
16) Acrylonitrile	7.86	53	323703	27.782	ng	98
17) 1,1-Dichloroethene	8.29	96	244782	22.803	ng	99
18) 2-Methyl-2-Propanol (t...	8.45	59	1130759	49.383	ng	98
19) Methylene Chloride	8.51	84	253468	21.135	ng	99
20) 3-Chloro-1-propene (Al...	8.66	41	338523	25.334	ng	97
21) Trichlorotrifluoroethane	8.90	151	220324	19.880	ng	91
22) Carbon Disulfide	8.77	76	912457	21.988	ng	100
23) trans-1,2-Dichloroethene	9.73	61	335851	28.220	ng	99
24) 1,1-Dichloroethane	9.98	63	396465	22.253	ng	100
25) Methyl tert-Butyl Ether	10.07	73	711065	23.373	ng	99
26) Vinyl Acetate	10.23	86	308270	141.180	ng	# 93
27) 2-Butanone (MEK)	10.47	72	172177	26.326	ng	99
28) cis-1,2-Dichloroethene	10.97	61	314965	24.359	ng	99
29) Diisopropyl Ether	11.26	87	250487	25.583	ng	# 90
30) Ethyl Acetate	11.26	61	188487	55.060	ng	97
31) n-Hexane	11.25	57	386405	23.873	ng	99
32) Chloroform	11.30	83	397479	23.251	ng	99
34) Tetrahydrofuran (THF)	11.71	72	172186	22.670	ng	98
35) Ethyl tert-Butyl Ether	11.84	87	291773	24.037	ng	97
36) 1,2-Dichloroethane	12.09	62	260157	23.868	ng	99
38) 1,1,1-Trichloroethane	12.36	97	341128	23.867	ng	100
39) Isopropyl Acetate	12.78	61	325104	53.751	ng	100
40) 1-Butanol	12.80	56	508071	59.213	ng	96
41) Benzene	12.83	78	971563	23.628	ng	100
42) Carbon Tetrachloride	12.99	117	296079	23.250	ng	100
43) Cyclohexane	13.12	84	783238	46.555	ng	96
44) tert-Amyl Methyl Ether	13.46	73	689446	24.134	ng	99
45) 1,2-Dichloropropane	13.68	63	240556	24.047	ng	99
46) Bromodichloromethane	13.86	83	312304	21.517	ng	99
47) Trichloroethene	13.91	130	277085	22.429	ng	100
48) 1,4-Dioxane	13.89	88	222647	25.430	ng	97
49) 2,2,4-Trimethylpentane...	13.98	57	1029012	22.796	ng	98
50) Methyl Methacrylate	14.12	100	210711	49.075	ng	# 87

105 of 114

Data File : I:\MS13\DATA\2018 04\16\04161821.D
 Acq On : 16 Apr 2018 20:28
 Sample : CCV end R13041618 25ng
 Misc : S31-03281803/S31-04041804 (5/3)

Vial: 3
 Operator: RS
 Inst : MS13

Quant Time: Apr 17 07:43:59 2018
 Quant Method : I:\MS13\METHODS\R13032918.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Mar 30 08:58:13 2018
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

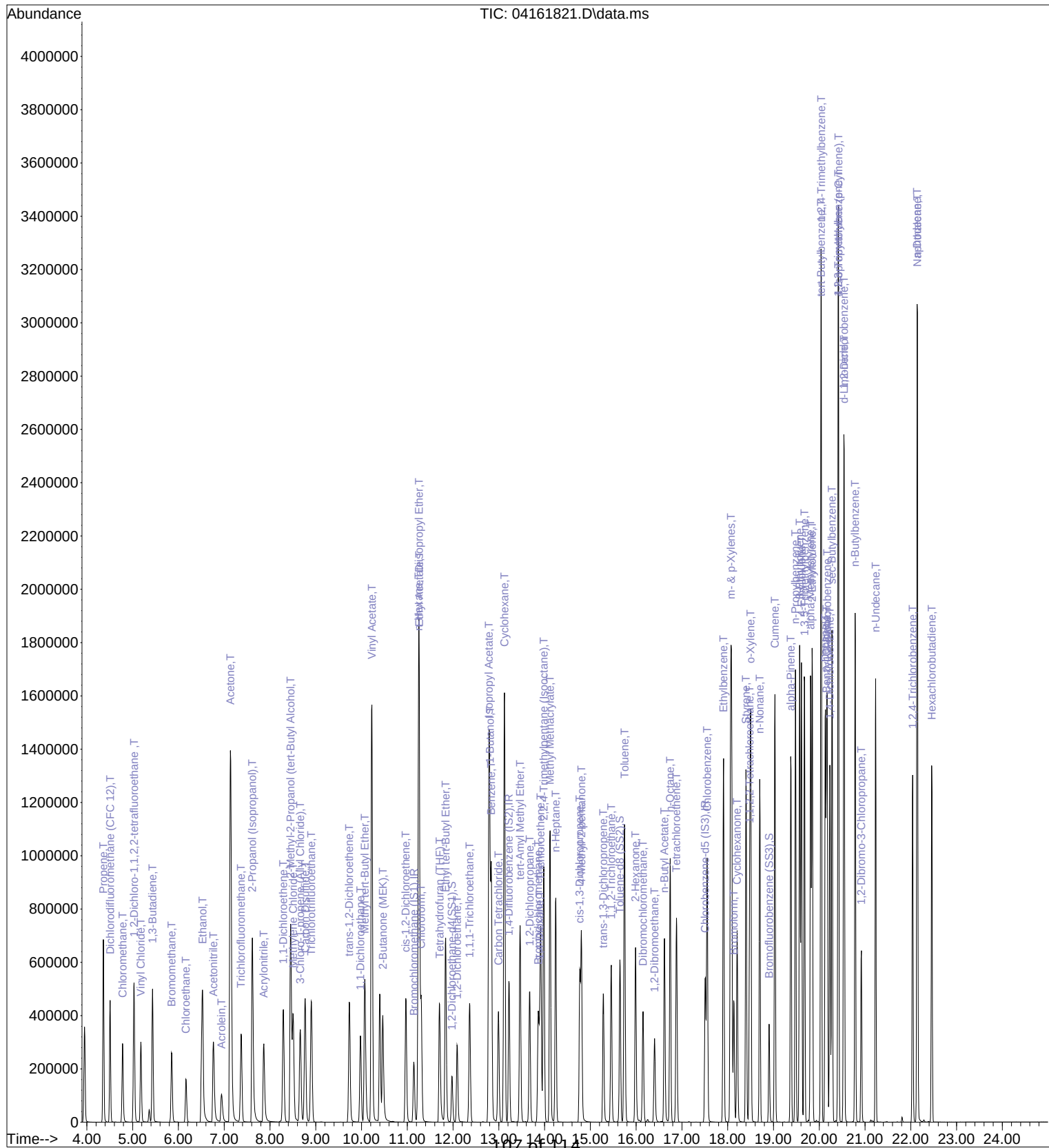
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.24	71	246823	23.432	ng	98
52) cis-1,3-Dichloropropene	14.77	75	413392	28.494	ng	100
53) 4-Methyl-2-pentanone	14.80	58	236066	27.897	ng	99
54) trans-1,3-Dichloropropene	15.28	75	342871	27.727	ng	99
55) 1,1,2-Trichloroethane	15.46	97	246206	25.467	ng	99
58) Toluene	15.75	91	1006525	20.876	ng	100
59) 2-Hexanone	15.99	43	507495	25.135	ng	100
60) Dibromochloromethane	16.15	129	287532	24.015	ng	100
61) 1,2-Dibromoethane	16.40	107	277289	27.015	ng	100
62) n-Butyl Acetate	16.62	43	569575	27.739	ng	99
63) n-Octane	16.74	57	207600	22.039	ng	97
64) Tetrachloroethene	16.88	166	300114	19.828	ng	100
65) Chlorobenzene	17.55	112	684982	20.972	ng	100
66) Ethylbenzene	17.91	91	1135482	21.859	ng	100
67) m- & p-Xylenes	18.07	91	1806468	43.914	ng	100
68) Bromoform	18.13	173	260951	23.736	ng	100
69) Styrene	18.40	104	750971	24.198	ng	99
70) o-Xylene	18.50	91	903757	22.050	ng	100
71) n-Nonane	18.70	43	451961	22.411	ng	98
72) 1,1,2,2-Tetrachloroethane	18.48	83	451940	24.536	ng	99
74) Cumene	19.03	105	1151393	21.266	ng	100
75) alpha-Pinene	19.38	93	596245	22.277	ng	100
76) n-Propylbenzene	19.48	91	1377334	22.557	ng	99
77) 3-Ethyltoluene	19.57	105	1228247	22.727	ng	100
78) 4-Ethyltoluene	19.61	105	1045932	21.122	ng	100
79) 1,3,5-Trimethylbenzene	19.68	105	963048	20.411	ng	99
80) alpha-Methylstyrene	19.81	118	563040	24.962	ng	99
81) 2-Ethyltoluene	19.84	105	1155074	21.594	ng	99
82) 1,2,4-Trimethylbenzene	20.04	105	992112	22.550	ng	98
83) n-Decane	20.13	57	514571	22.936	ng	99
84) Benzyl Chloride	20.16	91	832710	31.347	ng	98
85) 1,3-Dichlorobenzene	20.17	146	619047	23.402	ng	99
86) 1,4-Dichlorobenzene	20.23	146	627929	21.839	ng	100
87) sec-Butylbenzene	20.28	105	1316180	21.688	ng	99
88) 4-Isopropyltoluene (p-...	20.42	119	1206333	21.203	ng	99
89) 1,2,3-Trimethylbenzene	20.41	105	982135	21.942	ng	99
90) 1,2-Dichlorobenzene	20.54	146	599340	23.281	ng	100
91) d-Limonene	20.54	68	382978	23.873	ng	98
92) 1,2-Dibromo-3-Chloropr...	20.92	157	213760	24.001	ng	95
93) n-Undecane	21.23	57	533254	24.074	ng	99
94) 1,2,4-Trichlorobenzene	22.04	180	449006	23.703	ng	99
95) Naphthalene	22.14	128	1395106	26.157	ng	100
96) n-Dodecane	22.14	57	503033	29.120	ng	100
97) Hexachlorobutadiene	22.46	225	280949	19.010	ng	100
98) Cyclohexanone	18.21	55	335602	24.992	ng	99
99) tert-Butylbenzene	20.04	119	949866	21.266	ng	100
100) n-Butylbenzene	20.78	91	1043415	23.295	ng	99

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

Data File : I:\MS13\DATA\2018 04\16\04161821.D
Acq On : 16 Apr 2018 20:28
Sample : CCV end R13041618 25ng
Misc : S31-03281803/S31-04041804 (5/3)

Vial: 3
Operator: RS
Inst : MS13

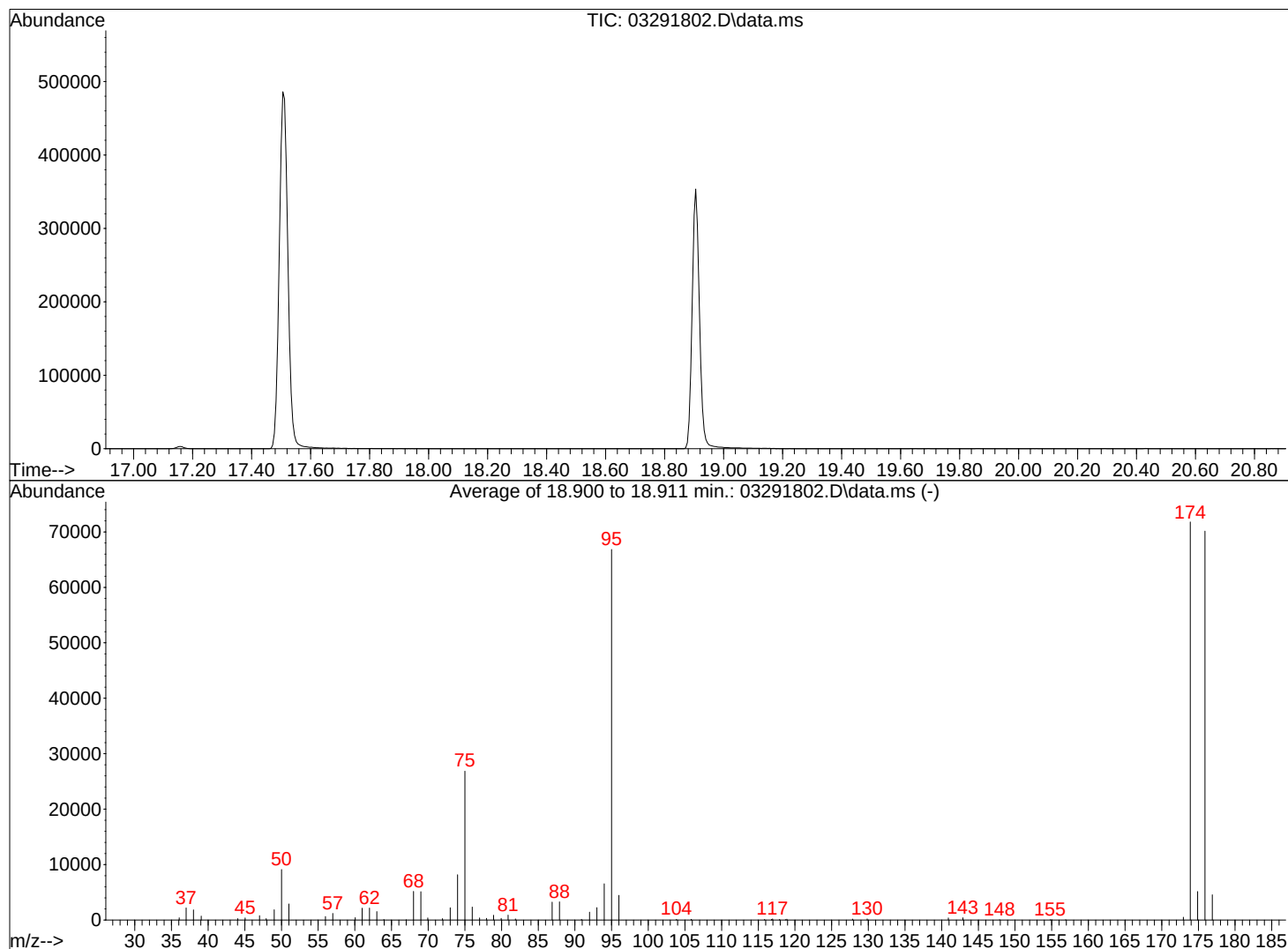
Quant Time: Apr 17 07:43:59 2018
Quant Method : I:\MS13\METHODS\R13032918.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Mar 30 08:58:13 2018
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data Path : I:\MS13\DATA\2018 03\29\
 Data File : 03291802.D
 Acq On : 29 Mar 2018 16:06
 Operator : RS
 Sample : BFB Std
 Misc : S31-03281803
 ALS Vial : 3 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS13\METHODS\R13032918.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Fri Mar 30 08:58:13 2018



AutoFind: Scans 2638, 2639, 2640; Background Corrected with Scan 2631

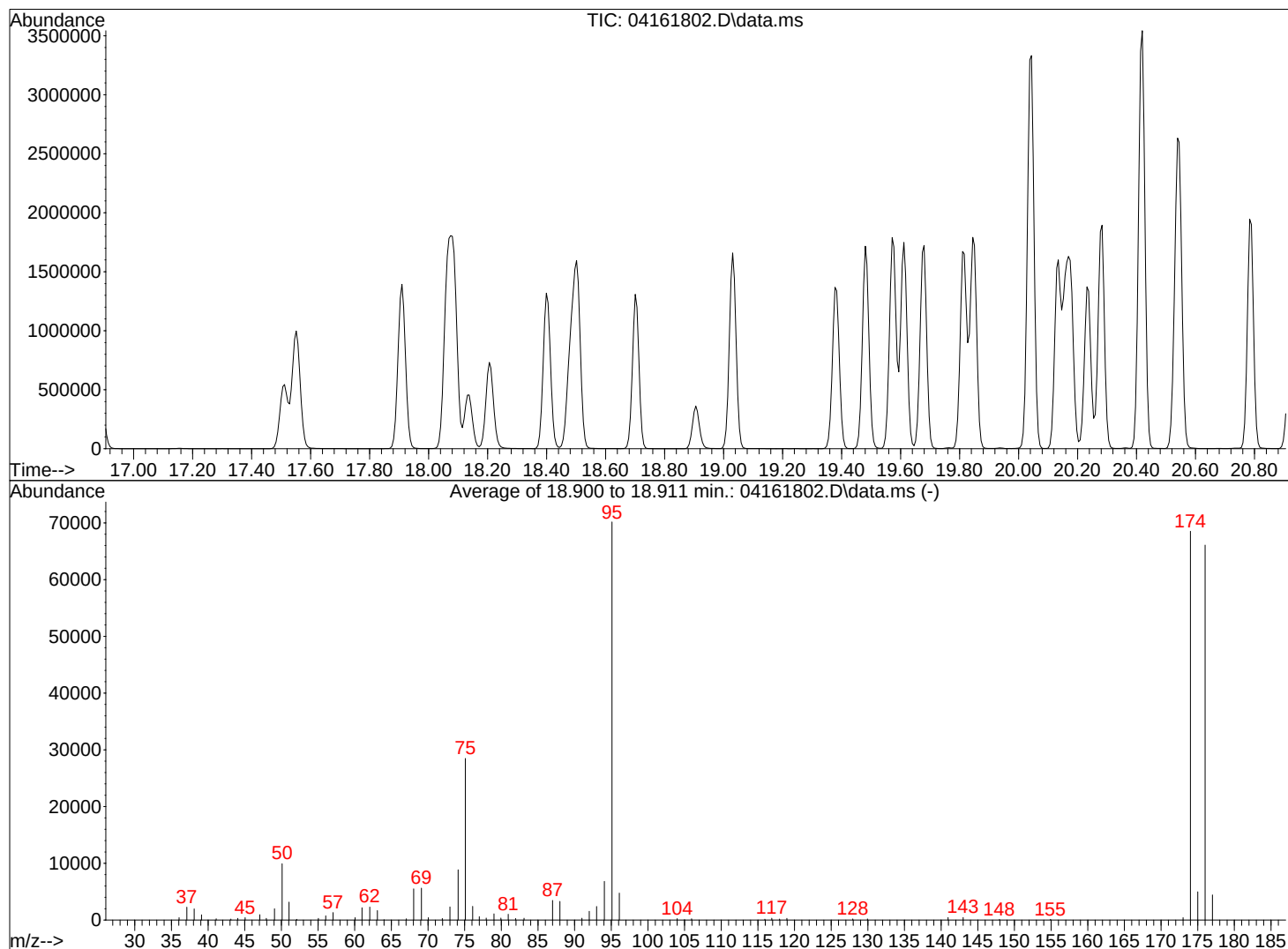
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	13.7	9125	PASS
75	95	30	66	40.2	26853	PASS
95	95	100	100	100.0	66840	PASS
96	95	5	9	6.7	4453	PASS
173	174	0.00	2	0.7	515	PASS
174	95	50	120	107.4	71795	PASS
175	174	4	9	7.2	5154	PASS
176	174	93	101	97.7	70147	PASS
177	176	5	9	6.5	4564	PASS

RS 3/30/18

Data Path : I:\MS13\DATA\2018 04\16\
 Data File : 04161802.D
 Acq On : 16 Apr 2018 8:25
 Operator : RS
 Sample : CCV R13041618 25ng
 Misc : S31-03281803/S31-04041804 (5/3)
 ALS Vial : 3 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS13\METHODS\R13032918.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Fri Mar 30 08:58:13 2018



AutoFind: Scans 2638, 2639, 2640; Background Corrected with Scan 2631

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	14.2	9935	PASS
75	95	30	66	40.6	28488	PASS
95	95	100	100	100.0	70165	PASS
96	95	5	9	6.8	4745	PASS
173	174	0.00	2	0.6	412	PASS
174	95	50	120	97.7	68520	PASS
175	174	4	9	7.2	4964	PASS
176	174	93	101	96.5	66091	PASS
177	176	5	9	6.7	4428	PASS

RS 4/16/18

Injection Log

Directory: J:\MS13\DATA\2018_03\29\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	3/29/18 15:32	03291801.D	blank	S31-03281703	RS	3	
2	3/29/18 16:06	03291802.D	BFB Std	S31-03281703	RS	3	<i>passes</i>
3	3/29/18 16:40	03291803.D	0.08ng TO15 ICAL std	S31-03281703/S31-02281806 (3/29)	RS	8	R13032918.M
4	3/29/18 17:13	03291804.D	0.10ng TO15 ICAL std	S31-03281703/S31-02281806 (3/29)	RS	8	
5	3/29/18 17:47	03291805.D	0.20ng TO15 ICAL std	S31-03281703/S31-02281806 (3/29)	RS	8	
6	3/29/18 18:21	03291806.D	0.40ng TO15 ICAL std	S31-03281703/S31-03271803 (4/25)	RS	7	
7	3/29/18 18:55	03291807.D	1.0ng TO15 ICAL std	S31-03281703/S31-03271803 (4/25)	RS	7	
8	3/29/18 19:28	03291808.D	5.0ng TO15 ICAL std	S31-03281703/S31-03271803 (4/25)	RS	7	
9	3/29/18 20:02	03291809.D	25ng TO15 ICAL std	S31-03281703/S31-03201804 (4/18)	RS	3	
10	3/29/18 20:36	03291810.D	50ng TO15 ICAL std	S31-03281703/S31-03201804 (4/18)	RS	3	
11	3/29/18 21:10	03291811.D	100ng TO15 ICAL std	S31-03281703/S31-03201804 (4/18)	RS	3	
12	3/29/18 21:44	03291812.D	blank	S31-03281703	RS	3	
13	3/29/18 22:18	03291813.D	0.40ng TO15 ICAL std	S31-03281703/S31-02281806 (3/29)	RS	8	<i>not used</i>
14	3/29/18 22:52	03291814.D	25ng ICV TO15 std	S31-03281703/S31-03231802 (4/21)	RS	3	<i>passes</i>
15	3/29/18 23:26	03291815.D	25ng ICV TO15 std	S31-03281703/S31-03231802 (4/21)	RS	3	

R13032918.M ranges from 0.08ng --> 100ng Except: n-hexane, benzene and bromodichloromethane 0.10ng-->100ng.

chloroethane, acetonitrile, methylene chloride, allyl chloride, CS₂, 1,2-dichloroethane, cis-1,3DCP, MIBK, n-butyl acetate, benzyl chloride, 1,2-dibromo-chloropropane: **0.10ng -->100ng.**

acrolein, acrylonitrile, vinyl acetate, MEK, ethyl acetate, 1-butanol, 1,4-dioxane, methyl methacrylate, trans-1,3-DCP, 2-hexanon: **0.20ng --> 100ng.**

0.20ng

RS 3/30/18

0.40ng

RS 3/30/18

Injection Log

Directory: I:\MS13\DATA\2018_04\16\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	4/16/18 7:51	04161801.D	CCV C13041618_25ng	S31-03281803/S31-03261801 (4/24)	RS	16	<i>passes</i>
2	4/16/18 8:25	04161802.D	CCV R13041618_25ng	S31-03281803/S31-04041804 (5/3)	RS	3	<i>passes</i>
3	4/16/18 9:14	04161803.D	MB R13041618_1000mL	S31-03281803/AC00880	RS	3	<i>passes</i>
4	4/16/18 9:48	04161804.D	LCS R13041618_25ng	S31-03281803/S31-03231802 (4/21)	RS	3	<i>passes</i>
5	4/16/18 10:25	04161805.D	Chamber QC_AS01142	S31-03281803	RS	8	
6	4/16/18 10:59	04161806.D	Screen1732-002 (10mL)	S31-03281803	RS	4	<i>screen</i>
7	4/16/18 11:51	04161807.D	P1801732-001 (30mL)	S31-03281803	RS	11	
8	4/16/18 12:37	04161808.D	P1801666-005 (100mL) confirm.	S31-03281803	RS	5	
9	4/16/18 13:10	04161809.D	LCSD R13041618_25ng	S31-03281803/S31-03231802 (4/21)	RS	3	<i>passes</i>
10	4/16/18 13:44	04161810.D	Screen1754-001 (5.0mL)	S31-03281803	RS	4	<i>screen</i>
11	4/16/18 14:18	04161811.D	P1801732-001 (400mL)	S31-03281803	RS	11	
12	4/16/18 14:51	04161812.D	P1801732-002 (150mL)	S31-03281803	RS	12	
13	4/16/18 15:27	04161813.D	P1801728-001 (15mL)	S31-03281803	RS	13	
14	4/16/18 16:33	04161814.D	P1801728-002 (15mL)	S31-03281803	RS	14	
15	4/16/18 17:07	04161815.D	P1801728-003 (300mL)	S31-03281803	RS	15	
16	4/16/18 17:40	04161816.D	P1801754-001 (1000mL)	S31-03281803	RS	5	
17	4/16/18 18:14	04161817.D	P1801868-001 (1000mL)	S31-03281803	RS	2	
18	4/16/18 18:48	04161818.D	P1801868-001dup (1000mL)	S31-03281803	RS	2	<i>passes</i>
19	4/16/18 19:21	04161819.D	P1801822-001 (400mL)	S31-03281803	RS	9	
20	4/16/18 19:55	04161820.D	P1801822-001dil (40mL)	S31-03281803	RS	9	
21	4/16/18 20:28	04161821.D	CCV end R13041618_25ng	S31-03281803/S31-04041804 (5/3)	RS	3	<i>passes</i>

RS 4/17/18

SIMIVALLEY QC Certification

Conditioner: P-Conditioner-02

Cycles: 30

Batch: 21884

Batch Started By: SMOH on 3/20/18 0439
Finished Cleaning By: SMOH on 3/20/18 0439

Container IDs	Cleaned Date	QC Date Analyzed	QC Results		Initial Vacuum		Final Vacuum		Comments
			Vacuum	Date/Time	User	Vacuum	Date/Time	User	
SC00932	3/20/18	3/21/18	-14.3	3/20/18 0439	SMOH	-14.0	3/23/18 1147	RTORRES	MS21_03/21/18_10.D
SC01075	3/20/18	3/21/18	-14.3	3/20/18 0439	SMOH	-14.0	3/26/18 0117	RTORRES	
SC01487	3/20/18	3/21/18	-14.3	3/20/18 0439	SMOH	-14.0	3/23/18 1147	RTORRES	
SC01555	3/20/18	3/21/18	-14.3	3/20/18 0439	SMOH	-14.0	3/23/18 1147	RTORRES	
SC00917	3/20/18	3/21/18	-14.3	3/20/18 0439	SMOH	-14.0	3/23/18 1147	RTORRES	
SC02086	3/20/18	3/21/18	-14.3	3/20/18 0439	SMOH	-14.0	3/23/18 1147	RTORRES	
SC000416	3/20/18	3/21/18	-14.3	3/20/18 0439	SMOH	-14.0	3/27/18 1041	RTORRES	
SC00197	3/20/18	3/21/18	-14.3	3/20/18 0439	SMOH	-8.0	3/26/18 0100	RTORRES	
SC02019	3/20/18	3/21/18	-14.3	3/20/18 0439	SMOH	-14.0	3/23/18 1147	RTORRES	
SC01988	3/20/18	3/21/18	-14.3	3/20/18 0439	SMOH	-14.0	3/26/18 1019	RTORRES	

Passed For: TO-15 (75 Comp 0.1 ug/m3 + TICs)

Exceptions:

COMPONENTID	Date / Time	MODULE	USER	COMMENTS

Batch Comment:

* QC Canister

Data Path : I:\MS21\DATA\2018 03\21\
 Data File : 03211810.D
 Acq On : 21 Mar 2018 15:39
 Operator : JM
 Sample : 032118 SC00932 21884
 Misc : LL+TICS (Sig #1); S31-02281802 (Sig #2)
 ALS Vial : 201 Sample Multiplier: 1

Quant Time: Mar 21 16:24:53 2018
 Quant Method : I:\MS21\Methods\F21031418.M
 Quant Title : EPA TO-15
 QLast Update : Thu Mar 15 13:12:41 2018
 Response via : Initial Calibration

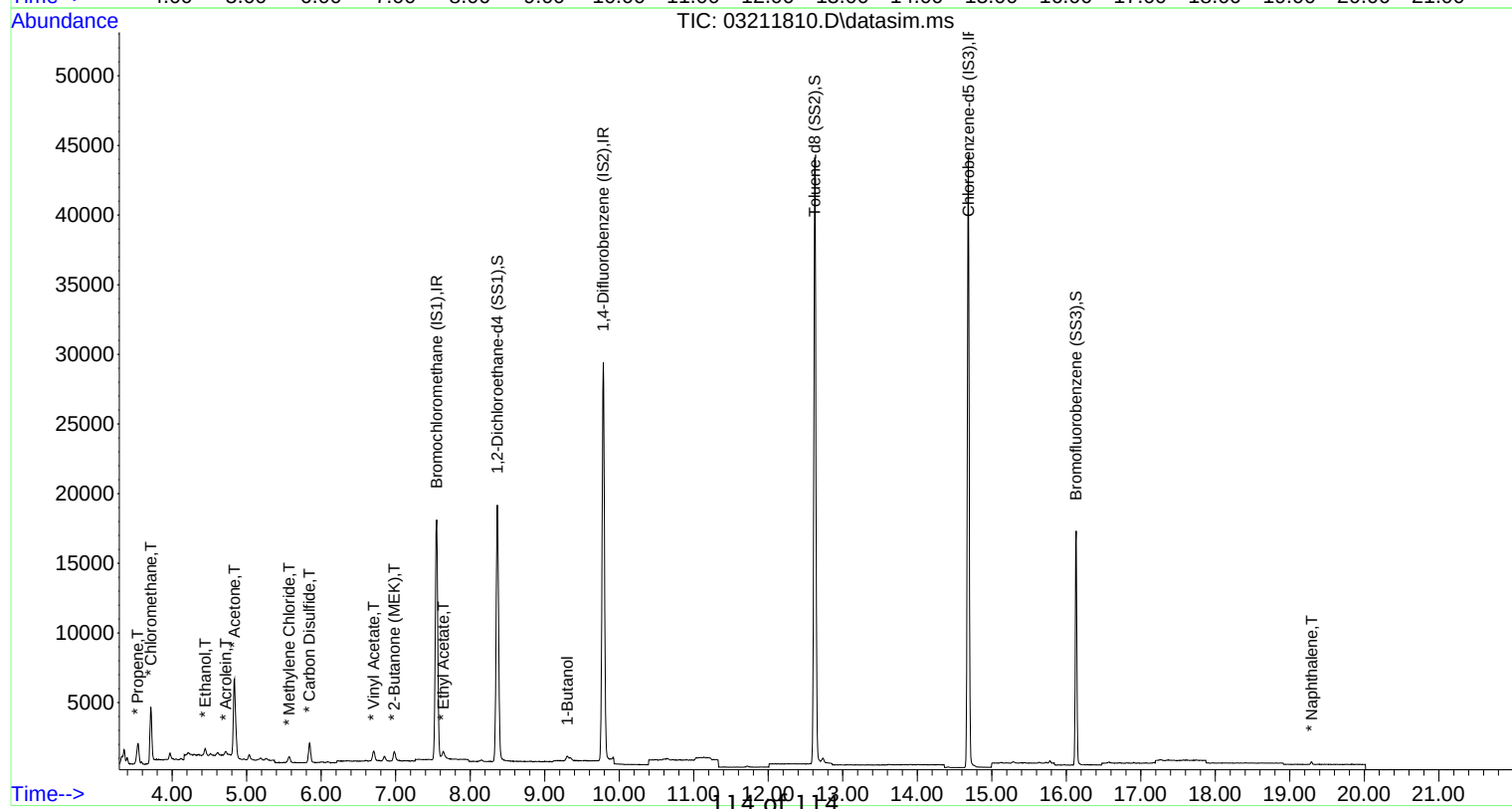
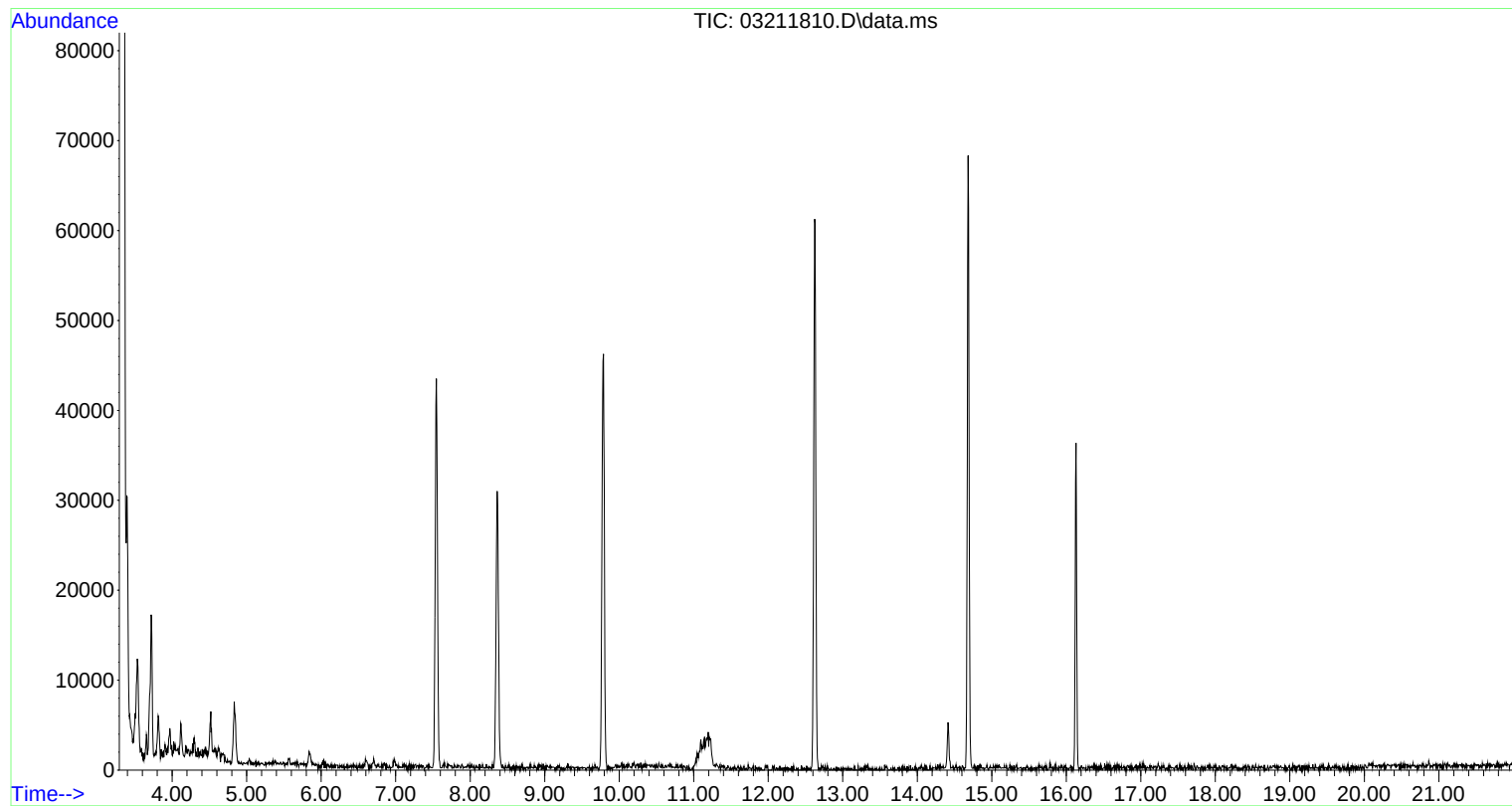
JM 03/21/18

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	7.55	130	21600	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.79	114	53866	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.69	117	44652	1000.000	pg	0.00
System Monitoring Compounds						
33) 1,2-Dichloroethane-d4 ...	8.36	65	27502	834.058	pg	0.00
Spiked Amount 1000.000			Recovery	=	83.41%	
57) Toluene-d8 (SS2)	12.62	98	48113	886.378	pg	0.00
Spiked Amount 1000.000			Recovery	=	88.64%	
74) Bromofluorobenzene (SS3)	16.13	174	12351	1017.930	pg	0.00
Spiked Amount 1000.000			Recovery	=	101.79%	
Target Compounds						Qvalue
2) * Propene	3.54	42	600	18.701	pg	# 19
4) * Chloromethane	3.71	50	4633	83.871	pg	97
10) * Ethanol	4.44	45	498	21.642	pg	# 87
12) * Acrolein	4.72	56	289	11.282	pg	99
13) * Acetone	4.84	58	4161	117.419	pg	# 48
19) * Methylene Chloride	5.57	84	404	10.589	pg	97
22) * Carbon Disulfide	5.84	76	2655	20.251	pg	98
26) * Vinyl Acetate	6.71	86	240	52.445	pg	# 1
27) * 2-Butanone (MEK)	6.98	72	267	15.934	pg	92
30) * Ethyl Acetate	7.64	61	118	17.307	pg	92
41) 1-Butanol	9.31	56	254	25.875	pg	# 57
98) * Naphthalene	19.29	128	226	34.864	pg	# 64

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

Data Path : I:\MS21\DATA\2018 03\21\
Data File : 03211810.D
Acq On : 21 Mar 2018 15:39
Operator : JM
Sample : 032118 SC00932 21884
Misc : LL+TICS (Sig #1); S31-02281802 (Sig #2)
ALS Vial : 201 Sample Multiplier: 1

Quant Time: Mar 21 16:24:53 2018
Quant Method : I:\MS21\Methods\F21031418.M
Quant Title : EPA TO-15
QLast Update : Thu Mar 15 13:12:41 2018
Response via : Initial Calibration



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F

Appendix F: Data Quality Evaluation

DATA QUALITY EVALUATION

Quarterly vapor sampling of the Off Depot AS/SVE System effluent was conducted by HDR in June 2017, October 2017, December 2017, and April 2018. Samples were collected 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, 2017).

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 June 2017, October 2017, December 2017, and April 2018. An additional sample was collected in August 2017 to confirm anomalous results in the June 2017 quarterly sample. The AS/SVE effluent sample location is on the north side of the SVE compound shown on [Figure 1](#) of the report.

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 soil gas 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

No field duplicate samples were collected to assess sampling precision. No laboratory control sample duplicate (LCSD) was analyzed.

Accuracy

Accuracy or bias was measured through the analysis of LCSs. Sample specific accuracy was measured through surrogate recovery. Accuracy is expressed as percent recovery (%R). Laboratory blanks were 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. Acetone was detected in the October 2017 method blank at a trace level, and in the sample at greater than 10 times the blank concentration, and no qualification was required. Some analytes were detected at trace



concentrations in the December 2017 and April 2018 canister certification blanks, but the sample results were well above the blank results and no qualification was required.

There were no samples analyzed for MS/MSD during Year Seven. 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 with the exception described below. 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, with the exception described below.

The following sections discuss only those deficiencies encountered during the evaluation that resulted in qualified and/or unusable data.

AS/SVE Event – June 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 June 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.

AS/SVE Event – August 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 August 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.

AS/SVE Event – October 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 October 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.

AS/SVE Event – December 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 December 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.

AS/SVE Event – April 2018

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 2018. 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
SDG SUMMARY TABLE
OFF DEPOT AS/SVE SYSTEM
ANNUAL OPERATIONS REPORT, YEAR SEVEN
Dunn Field - Defense Depot Memphis, Tennessee

SDG	Field Samples
<u>AS/SVE Effluent 1st Quarter - June 2017</u>	
P1702819	ODSVE-EFF-Y7Q1
<u>AS/SVE Effluent 1st Quarter Confirmation - August 2017</u>	
P1703804	ODSVE-EFF-Y7Q2
<u>AS/SVE Effluent 2nd Quarter - October 2017</u>	
P1705134	ODSVE-EFF-Y7Q2A
<u>AS/SVE Effluent 3rd Quarter - December 2017</u>	
P1706191	ODSVE-EFF-Y7Q3
<u>AS/SVE Effluent 4th Quarter - April 2018</u>	
P1801754	ODSVE-EFF-Y7Q4

DATA QUALITY REVIEW REPORT

VOLATILES IN AIR by USEPA Method TO-15

Project: DDMT Memphis ODSVE – Y7Q1
Project/Task Number: 10031560-282846-005
Sample Data Package: P1702819
Laboratory: ALS Environmental, Simi Valley, California
Sample Matrix: Soil Gas
Sampling Dates: 07 June 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-Y7Q1	P1702819-1	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).

DATA QUALITY REVIEW REPORT

VOLATILES IN AIR by USEPA Method TO-15

Project: DDMT Memphis ODSVE – Y7Q2
Project/Task Number: 10060131
Sample Data Package: P1703804
Laboratory: ALS Environmental, Simi Valley, California
Sample Matrix: Soil Gas
Sampling Dates: 02 August 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-Y7Q2	P1703804-1	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 blank. 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).

DATA QUALITY REVIEW REPORT

VOLATILES IN AIR by USEPA Method TO-15

Project: DDMT Memphis ODSVE – Y7Q2A
Project/Task Number: 10060131
Sample Data Package: P1705134
Laboratory: ALS Environmental, Simi Valley, California
Sample Matrix: Soil Gas
Sampling Dates: 10 October 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-Y7Q2A	P1705134-1	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

Acetone was detected in the method blank at a trace level, and in the sample at greater than 10 times the blank concentration. 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).

DATA QUALITY REVIEW REPORT

VOLATILES IN AIR by USEPA Method TO-15

Project: DDMT Memphis ODSVE – Y7Q3
Project/Task Number: 10060131
Sample Data Package: P1706191
Laboratory: ALS Environmental, Simi Valley, California
Sample Matrix: Soil Gas
Sampling Dates: 05 December 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-Y7Q3	P1706191-001	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

No target analytes were 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 reporting limit (RL). Some analytes were detected at trace concentrations, but the sample results were well above the blank results. 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).

DATA QUALITY REVIEW REPORT

VOLATILES IN AIR by USEPA Method TO-15

Project: DDMT Memphis ODSVE – Y7Q4
Project/Task Number: 10060131
Sample Data Package: P1801754
Laboratory: ALS Environmental, Simi Valley, California
Sample Matrix: Soil Gas
Sampling Dates: 03 April 2018
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-Y7Q4	P1801754-001	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 canister's initial field pressure (vacuum) was appropriate. 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

No target analytes were 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 reporting limit (RL). Some analytes were detected at trace concentrations, but the sample results were well above the blank results and no qualification was required.

VII. LABORATORY CONTROL SAMPLES (LCS)

All recoveries and relative percent differences (RPDs) were within control limits. No qualification was required.

VIII. SURROGATES

Surrogate recoveries were with 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).