

Off Depot Air Sparge/
Soil Vapor Extraction
System
Annual Operations
Report, Year Eight
(May 2018 through
July 2019)

Defense Depot Memphis, Tennessee

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Off Depot Air Sparge/ Soil Vapor Extraction System
Annual Operations Report, Year Eight (May 2018 through July 2019)
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
EPA	U.S. Environmental Protection Agency
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.
VMP	vapor monitoring point
VOC	volatile organic compound
µg/L	micrograms per liter
%	percent

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 0002 to the 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 Eight 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 2018 through 31 July 2019.

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

1.1 Site Description

DDMT, 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 EPA 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 EPA 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 EPA 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 21 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 Seven, Revision 1* (Trinity, 2018) was approved by TDEC in October 2018 and by EPA in November 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. Year Seven continued uninterrupted from May 2017 through April 2018. The system operated in standby mode to 6 August 2018 as contract actions for Year Eight and Year Nine were finalized.

1.4.2 System Monitoring and Mass Removal

Total VOC concentrations in the system effluent decreased from 1,240 parts per billion by volume (ppbv) at start-up in December 2009 to 31.8 ppbv in February 2012; total VOC concentrations have increased since February 2012 and were 77 ppbv in April 2018 at the end of Year Seven.

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 seven 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 (pounds)
Year One (2010)	97%	70.5
Year Two (2011)	94%	4.1
Year Three (2012)	97%	2.3
Year Four (2013)	91%	2.9
Year Five (January 2014-December 2015)	93%	2
Year Six (January 2016-April 2017)	93%	1.7
Year Seven (May 2017-April 2018)	89%	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 Eight 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;
- General equipment repair and modifications to include SVE well air line purging, AS wellhead repair and pad replacement; and condensate handling;
- Semiannual report to describe O&M activities, system status, performance, and monitoring results; and
- Annual operations report to summarize system operations and monitoring results with data validation and to provide recommendations for future operations.

2. System Operations

Following the system repairs and modifications conducted in October 2018 and further described below in [Section 2.4](#), the AS wells are operated in three groups of 21 to 23 AS wells with 63 AS points operated 4 hours per day (full-time) and 6 AS points operated 2 hours per day (half-time); the remaining 21 AS points are closed ([Figure 1](#)). This is a slight variation from Year Seven operations when only 60 AS points were operated 4 hours per day. This change included the full time-addition of ODAS-65, -71, and -72 to treat groundwater hydraulically upgradient from MW-159 while the attempt to obtain the property access agreement continues.

During full operation, the AS wells are operated for a total of 12 hours per day to remove volatile organic compounds (VOCs) from groundwater and the SVE wells are operated 24 hours per day to remove soil vapor with VOCs from the vadose zone. During limited operations in the alternate months, the AS manifold is closed except for brief periods during site inspections and the SVE wells are operated 12 hours per day. During Year Eight through 31 July 2019, the AS manifold was open for full operation 6 August through 5 September 2018, 29 September through 30 October 2018, 29 November through 21 December 2018, 5 January through 17 January 2019, 31 January through 6 March 2019, 26 March through 30 April 2019, 28 May through 9 July 2019, and 30 July through 31 July 2019.

2.1 System Performance

AS/SVE system uptime during periods of full operation (6 August 2018 through 31 July 2019) in Year Eight was approximately 87%, which is slightly less than in previous years. System uptime in Years One to Seven ranged from 89% to 97%. The periods of full operation in Year Eight totaled 203 days with 2,439 hours available for system operations. The AS/SVE system was down due to condensate accumulation, system alarms, and other issues for a total of 495.7 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 an inline mass flow meter and flow rates at individual wells are measured by vane-type meters at the well manifold. Vacuum measurements are collected using a 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 107 to 189 standard cubic feet per minute (scfm) and averaged 160 scfm. Air extraction rates and vacuum measurements at SVE wells and system effluent are also shown on [Table 1](#). The system was operated with both blowers operating alternately in 12-hour blocks and all 12 SVE wells during Year Eight; average flow rates at individual SVE wells were 20 to 90 actual cubic feet per minute (acfm). Combined flow from all SVE wells during full operations averaged 551 scfm at 9.2 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 160 scfm and the average combined SVE flow rate of 551 scfm, the SVE system extracted approximately 3.4 times the injection rate during Year Eight.

2.3 System Maintenance

System inspections were performed weekly and semi-annual and annual equipment maintenance was conducted by the AS/SVE equipment manufacturer. System inspections 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 previous 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. Repairs and modifications performed during Year Eight are discussed in [Section 2.4](#) and [Appendix C](#).

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

- System operated in standby mode with AS manifold closed and one SVE blower operating in Auto from 1 May through 6 August 2018.
- During routine inspection on 29 May 2018, SVE compound was found to be without power. Subcontract electrician (TriState Armature) found Blower 2 contactor in the ProLogic control cabinet with two contacts welded together; one contact was not fully engaged pushing power to the other two contacts causing them to fuse together which tripped a breaker de-energizing the building. Blower 2 circuit was locked-out and building re-energized to allow for operation of Blower 1. The electrical contacts were replaced on 12 June 2018.
- Upon startup of Blower 2 on 12 June 2018, a high-pitched whining sound was noted. Kaeser was contacted and visited the site on 14 June 2018. The technician tightened loose nuts on the air end and pulley, noted worn seals on air end and recommended replacement of the air seals during the next scheduled preventative maintenance (conducted 4 October 2018).
- A remote check of the system on 27 August 2018 identified that the system control program was closed. The event tracker did not record operations from 24 August at 0516 hours to 27 August 2018 at 2316 hours when blowers cycled. The system control program was also closed during the routine inspection on 18 September 2018; system operations were not recorded from 13 September at 0517 hours until 18 September 2018 at 1440 hours.
- On 25 September 2018, Blower 2 was found to be not operating even though it was set to Auto. The AS manifold was closed, and Blower 2 switched off and Blower 1 to Auto. No reason for the shutdown of Blower 2 could be determined.
- System operated with intermittent planned shutdowns between 3 October and 5 October 2018 during groundwater long-term monitoring event, AS/SVE point modifications, and system maintenance.
- Annual preventative maintenance on AS/SVE equipment was conducted on 4 October 2018 and no deficiencies were noted. The SVE blower air seals noted as being worn during the June 2018 maintenance inspection were replaced.
- Trouble signals noted from the door security sensor(s) were received on 21 October and replacement batteries were installed 30 October 2018.

- Internet connectivity for the system was not functioning on 12 November 2018 at 2030 hours. During the inspection on 13 November it was observed that Blower 2 was operating, but the system computer was off. Restart of the computer and operating program showed the last logged event on SVE Event Tracker was Blower 2 shutting off at 1122 hours on 12 November.
- During routine inspection on 19 November 2018, it was observed that SVE air/water separator (AWS) condensate level was near automatic transfer point and elected to transfer water manually to ensure proper operation of AWS condensate transfer pump. Pump operated slowly then stopped and Blower 1 shut off due to Transfer Pump Overload alarm. The alarm was unable to be cleared for system restart. Pump subcontractor (Blackwell Enterprises) inspected the pump on 21 November, located a tripped breaker, reset the breaker, and started the pump. Technician suspected that the pump was stopped by debris which caused the pump motor to overheat and trip the breaker; no additional issues after restarting the pump.
- ADT Security performed service call on 3 December 2018 to repair door contacts showing trouble notifications.
- Pipe wrap insulation added to AWS discharge line on 3 December 2018 and thermostats set on tank and discharge line heaters to prevent water freezing.
- ADT Security replaced faulty door contacts on 12 December 2018.
- Remote check of system on 7 January 2019 showed SVE exhaust temperature gauge reading 7 degrees Fahrenheit (°F) with outside ambient temperature of 61 °F; check on 8 January showed exhaust temperature of 0 °F. Subsequent cleanings and troubleshooting identified a bad sensor and probe was replaced on 1 April 2019.
- Several AS compressor alarms and warnings related to cold temperatures were recorded on 21 January, 22 January, 30 January, and 31 January 2019, all during a period when the AS manifold was closed. Ambient temperatures below 37 °F resulted in AS compressor motor shutdown and prevented programmed restart.
- Frequent rains were encountered during January which resulted in unplanned but controlled shut downs of the system to minimize condensate. Low ambient temperatures resulted in AS motor alarms. Closures occurred for 51.8 hours from January 2 – January 4, 5.8 hours on January 12, 5 hours on January 17, 33.8 hours from January 21 – 22, and 29.4 hours from January 23 – 24.
- Frequent rains were encountered during February which resulted in unplanned but controlled shut downs of the system to minimize condensate. Closures occurred for 19.8 hours from February 11 – 12 and 72.2 hours from February 21 – 24.
- Less rain along with warming temperatures were experienced in March which resulted in one unplanned but controlled shut down of the system to minimize condensate. The shutdown occurred for 30 hours from 3 – 4 March.
- On 3 April, SVE manifold mounted flow meters were disassembled and cleaned to clear site glasses and free interior components which had been affected by the system pulling moisture.
- On 8 April, Kaeser performed scheduled maintenance (semi-annual minor event). During maintenance they activated the emergency stop 4 times and it was reset on 9 April allowing the system to restart.
- System experienced controlled downtimes in April to facilitate LTM water level measurements, system maintenance, and heavy rain events to minimize condensate. Closures occurred for

23.25 hours on 4 – 5 April, 32.5 hours on 5 – 6 April, 48.75 hours on 7 – 9 April, and 22 hours on 13 – 14 April.

System downtime during periods of full operation of the AS/SVE system and the lost operating hours from December 2018 through April 2019 equated to approximately 461.4 hours.

2.4 System Repairs and Modifications

During the period of 3 October to 5 October 2018, previously identified issues with the AS/SVE system were addressed through general repairs and equipment modifications. Activities are summarized below; additional details are provided in [Appendix C](#).

- SVE well air line purging
 - SVE-01 and -02 – no activities conducted. Well pads and vaults were intact and no air leaks were identified. As such, the existing wellhead completion design and sediment inside the well vaults did not warrant removal of top well plug. Well pads will be replaced and wellheads modified as necessary during repair/modification activities to be performed during Year Nine to allow access.
 - SVE-03 through -06, -08, -09, and -11 – air lines purged with no water present
 - SVE-07 – not located during October 2018 repair/modifications; subsequently located adjacent to Menager Road during later field activities upon removing vegetation/gravel debris and observed to be without damage.
 - SVE-10 and -12 – air lines purged and cleared of water
- AS wellhead repair and pad replacement
 - AS-17 – repaired wellhead damaged due to excessive pressure and replaced well pad
 - AS-05, -09, -22, -31, -33, -52, -62, and -74 – repaired air leaks at wellheads associated with air line connections and wellhead plugs; installed new well pads at AS-05, -52, -62, and -74
 - AS-32 – installed new well pad
 - AS-23 and -35 – modified wellhead assembly to allow for proper fit of well vault lid
- Condensate handling
 - Suspended SVE condensate drain line beneath SVE exhaust to provide ambient heat
 - Applied dual element heater tape to SVE condensate drain line exterior of SVE enclosure to prevent localized freezing
 - Installed thermostat controlled submersible tank heater in condensate holding tank to prevent freezing.

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 (AS manifold open). PID readings and vacuum measurements at VMPs, and effluent vapor samples are collected quarterly during full operation. System monitoring was performed during full operation in August, October, and December 2018 and February, April, and June 2019.

3.1 Vacuum Measurements

Vacuum measurements are collected at VMPs by connecting a digital manometer to a quick-connect fitting in the sealed cap of each VMP well casing. Vacuum measurements ranged from 0.0 to 35.8 inches of water and the average at each VMP was 18.5 to 23.6 inches of water. Measurements are shown on [Table 2](#). The measurements indicate a partial vacuum is created throughout the treatment area by the SVE wells, and therefore vapor-phase contamination generated 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 D-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 PID. Whole air samples are collected from sampling ports at each monitoring point by directly filling a dedicated Tedlar® sample bag using an air sampling pump. The sample bag is then attached to a calibrated PID and the maximum PID reading for each bag is recorded. PID readings are made for at least three sample 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 recorded are provided in [Table 3](#). Apart from anomalous readings at SVE-09, -11, and -12 during the August event, the estimated VOC concentrations ranged from 0 to 0.9 parts per million (ppm) at the SVE wells and 0 to 0.1 ppm at the system effluent. The anomalous readings were attributed to the air sampling pump introducing moisture or moisture-rich air into the sampling bags from the SVE wells resulting in elevated readings when vacated with the PID.

Consistent with historical trends, water in the SVE air line prevented some readings at SVE-10. It should be noted that operation and performance of the SVE wells are not impacted despite water being present in the air lines. Vacuum/air flow rates at each SVE well will be evaluated during future monitoring events and adjusted as necessary to mitigate water in the air lines.

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 D-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-08 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 sample bag. The VMP PID measurements are provided in [Table 4](#). The estimated VOC concentrations were 0 ppm for approximately 41 percent of the measurements and were below 1 ppm in approximately 80

percent of the measurements. Notably high results were recorded in December 2018 that were inconsistent with historic readings. Charts showing the trend in PID measurements at VMPs since start-up tests in October 2009 are provided in [Appendix D-3](#). PID measurements at VMPs have a pattern similar to the SVE wells, with slightly lower concentrations.

A new air sampling pump and new Tedlar® bags were purchased for first use in February 2019, which saw a return to normal PID results from the SVE wells and VMPs. If anomalous PID readings are detected during future monitoring events and cannot be attributed to moisture, the sampling procedures and components will be evaluated and adjustments, repairs, and/or replacements made as necessary.

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 1 October 2018, 3 December 2018, 2 April 2019, and 4 June 2019. Due to abnormal analytical results from the 4 June sampling event, an additional effluent sample was collected on 22 July 2019. The samples were submitted for laboratory analysis of VOCs by EPA Method TO-15.

The complete tabulated analytical results are presented in [Appendix E, Table E-1](#); the complete laboratory analytical reports are provided in [Appendix F](#) (electronic copy only). [Table 5](#) provides 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 55.6 to 70.8 ppbv except for the 4 June sampling event, which was abnormally low at 28.5 ppbv. Trichloroethene (TCE) has generally been the CVOC detected at the highest concentration since 2009, but cis-1,2-Dichloroethene (cDCE) was at similar to slightly higher concentrations in Year Eight. Excluding the anomalous June 2019 sampling event results, TCE was 38 to 42% of the total primary CVOC concentration, and cDCE was 43 to 50%.

Total VOCs ranged from 75.7 to 85.2 ppbv except for the 4 June sampling event, which was abnormally high at 212.5 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 reported in the June sample were not present in the July confirmation sample ([Table 5](#)); these analytes may represent laboratory contamination. Elevated concentrations of acetone and ethyl acetate were reported in the June 2019 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 Eight 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 E, Table E-1](#).

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 Eight samples is provided in [Appendix G](#).

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 2019 sample results were omitted from the total VOC concentrations used for the mass emission calculations, only the July 2019 resampling results were used. 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 Eight. The emissions remained well below the SCHD de minimus standard of 0.1 lb/hr. The AS/SVE system removed approximately 1.5 lbs of VOCs in Year Eight and 86.7 lbs of VOCs since startup ([Table 6](#)).

4. Conclusions and Recommendations

4.1 System Operations

The AS/SVE system uptime was approximately 87% during periods of full operation in Year Eight (1 May 2018 to 31 July 2019). 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 3.4 times the AS injection rate during Year Eight. Vacuum measurements at VMPs indicated vapor capture throughout the AS/SVE treatment area. Approximately 41 percent of PID measurements at SVE wells and VMPs were 0 ppm for Year Eight, and approximately 80 percent of the measurements taken were below 1 ppm. Total VOC concentrations in effluent vapor samples ranged from 55.6 to 70.8 ppbv except for the 4 June sampling event, which was abnormally low at 28.5 ppbv. The estimated VOC emission rate in the effluent was 0.0009 lb/hr during Year Eight, well below the SCHD de minimus standard. Approximately 87 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 D-2, Figure 1](#)). The total VOCs in the effluent have been below 100 ppbv (0.1 ppm) since September 2010 except for the abnormal 4 June sampling event. 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. Measurements from Year Eight showed a decline in total VOCs to 75.7 ppbv in July 2019 ([Figure 2](#)). The July 2019 total VOC concentration (75.7 ppbv) is approximately 6 percent of the concentration at startup in December 2009 (1,240 ppbv).

Period	System Uptime	VOC Removal (pounds)
Year One (2010)	97%	70.5
Year Two (2011)	94%	4.1
Year Three (2012)	97%	2.3
Year Four (2013)	91%	2.9
Year Five (January 2014-December 2015)	93%	2
Year Six (January 2016-April 2017)	93%	1.7
Year Seven (May 2017-April 2018)	89%	1.7
Year Eight (May 2018-July 2019)	87%	1.5

System operations and SVE well extraction set points will be evaluated and adjusted during maintenance activities planned for Year Nine.

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 2019 Long-Term Monitoring Summary Report, Revision 0* (HDR, 2019). 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 99.3 µg/L in April 2019. Groundwater elevation contours and the April 2019 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 2019, CVOC concentrations exceeded a TC or MCL 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 TCs or MCLs in the Off Depot area, in these six wells are shown on [Table 7](#) for October 2014 through April 2019. 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 99.3 µg/L from 106 µg/L in April 2018 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 continued to decrease in Year Eight, returning to pre-2017 levels.
- 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. Since Year Seven, the TCE concentration in MW-246 increased briefly to 10.7 µg/L in October 2018 before falling back to 2.4 µg/L in April 2019. As of April 2019, only the TeCA concentration in MW-246, at 2.8 µg/L in April 2019, remains above the TC.
- TCE has generally been the CVOC detected at the highest concentration since 2009, but cis-1,2-dichloroethene (cDCE) was at similar to slightly higher concentrations in Year Eight.

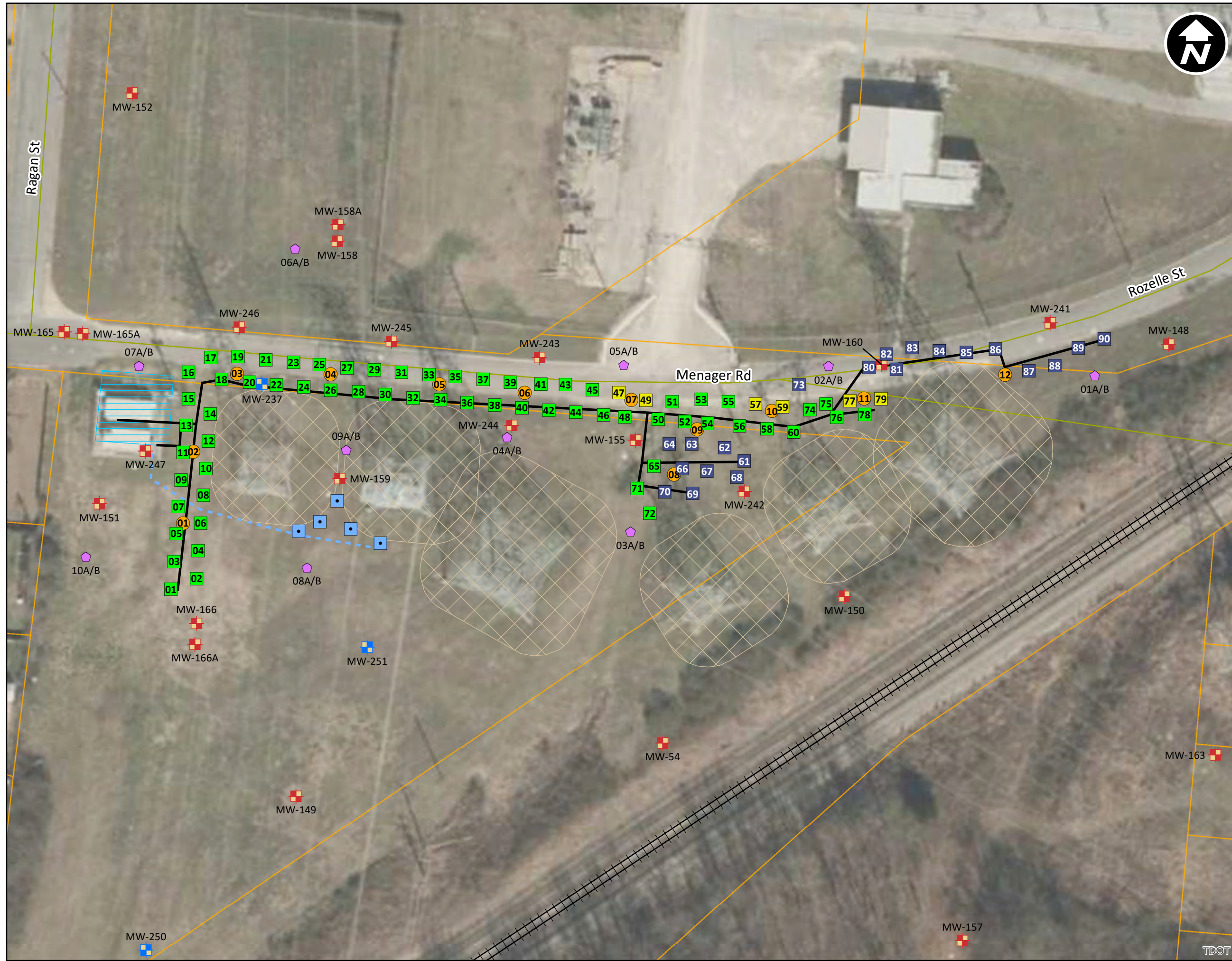
To address the continued high concentration of TCE in groundwater at MW-159, five additional AS wells will be installed and incorporated into system operations upon completion of an access agreement with MLGW. Attempts to obtain this access agreement have been ongoing since 2016. This has resulted in multiple efforts by the Army, EPA, and TDEC to contact and facilitate with MLGW to resolve this issue. USACE, Mobile District Real Estate is managing the access process. Upon receipt of Right of Entry, the *Off Depot Air Sparge Well Installation Work Plan, Dunn Field* (Trinity, 2016) approved by EPA and TDEC in 2016 will be updated and include a planned schedule of activities.

Estimated mass removals beginning with Year Three indicate that the system may be reaching or have reached asymptotic levels for VOCs while containing downgradient migration of the contaminant plume, which is observed and consistent with groundwater contaminant concentrations. Upon approval for and installation of the additional AS wells, SVE effluent mass removal will be re-evaluated and system optimizations made as necessary.

5. References

- CH2M HILL, 2004. *Memphis Depot Dunn Field Record of Decision, Defense Distribution Center (Memphis)*. Prepared for U.S. Army Corps of Engineers, Huntsville Division. March 2004.
- HDR, 2009. *Dunn Field Off Depot Groundwater Remedial Action Work Plan, Defense Depot Memphis, Tennessee, Defense Logistics Agency. Revision 2*. Prepared for the Air Force Center for Engineering and the Environment. April 2009.
- HDR, 2011a. *Dunn Field Off Depot Groundwater Interim Remedial Action Completion Report, Defense Depot Memphis, Tennessee, Department of the Army. Revision 1*. Prepared for the Air Force Center for Engineering and the Environment. July 2011.
- HDR, 2011b. *Dunn Field Off Depot Groundwater Air Sparge and Soil Vapor Extraction System Operations and Maintenance Manual, Defense Depot Memphis, Tennessee, Department of the Army, Revision 0*. Prepared for the Air Force Center for Engineering and the Environment. March 2011.
- HDR, 2017. *2017 Uniform Federal Policy-Quality Assurance Project Plan, Revision 0, Environmental Restoration Support at Former Defense Depot Memphis, Tennessee*. Prepared for U.S. Army Corps of Engineers, Mobile District. May 2017.
- HDR, 2018. *April 2018 Long-Term Monitoring Summary Report, Defense Depot Memphis, Tennessee, U.S. EPA I.D. Number TN4210020570, Department of the Army, Revision 0*. Prepared for U.S. Army Corps of Engineers, Mobile District. May 2017.
- HDR, 2019. *April 2019 Long-Term Monitoring Summary Report, Defense Depot Memphis, Tennessee, U.S. EPA I.D. Number TN4210020570, Department of the Army, Revision 0*. Prepared for U.S. Army Corps of Engineers, Mobile District. August 2019.
- Trinity Analysis & Development Corp, 2016. *Uniform Federal Policy-Quality Assurance Project Plan Off Depot Air Sparge Well Installation Work Plan, Dunn Field, Defense Depot Memphis, Tennessee, Department of the Army, Revision 1*. Prepared for the U.S. Army Corps of Engineers, Mobile District. December 2016.
- Trinity Analysis & Development Corp, 2018. *Off Depot Air Sparge – Soil Vapor Extraction System Annual Operations Report, Year Seven (May 2017 to April 2018), Dunn Field - Defense Depot Memphis, Tennessee, Department of the Army, Revision 1*. November 2018.

Figures



Air Sparge Location (full-time)

Air Sparge Location (half-time)

Air Sparge Location (closed)

Air Sparge Location (planned)

Soil Vapor Extraction Location

Vapor Monitoring Point

Monitoring Well - Fluvial Aquifer

Monitoring Well - Intermediate Aquifer

Conveyance Line

Conveyance Line (planned)

MLGW Transmission Tower with 20 foot No Construction Buffer

AS/SVE System Enclosure

Railroad

Parcel Boundary

Notes:

Sources:
U.S. Census Bureau TIGER
<http://mapgis.memphistn.gov/arcgis/services>

02550100

Feet

Figure 1

AS/SVE System Layout

Trinity Analysis & Development Corp.

Off Depot AS/SVE System

Year Eight, Annual

Operations Report

Dunn Field -

Defense Depot Memphis, Tennessee

U.S. ARMY

Contract: W91278-16-D-0054 / W9127818F0405

Scale: AS SHOWN

Date: 4/22/2020

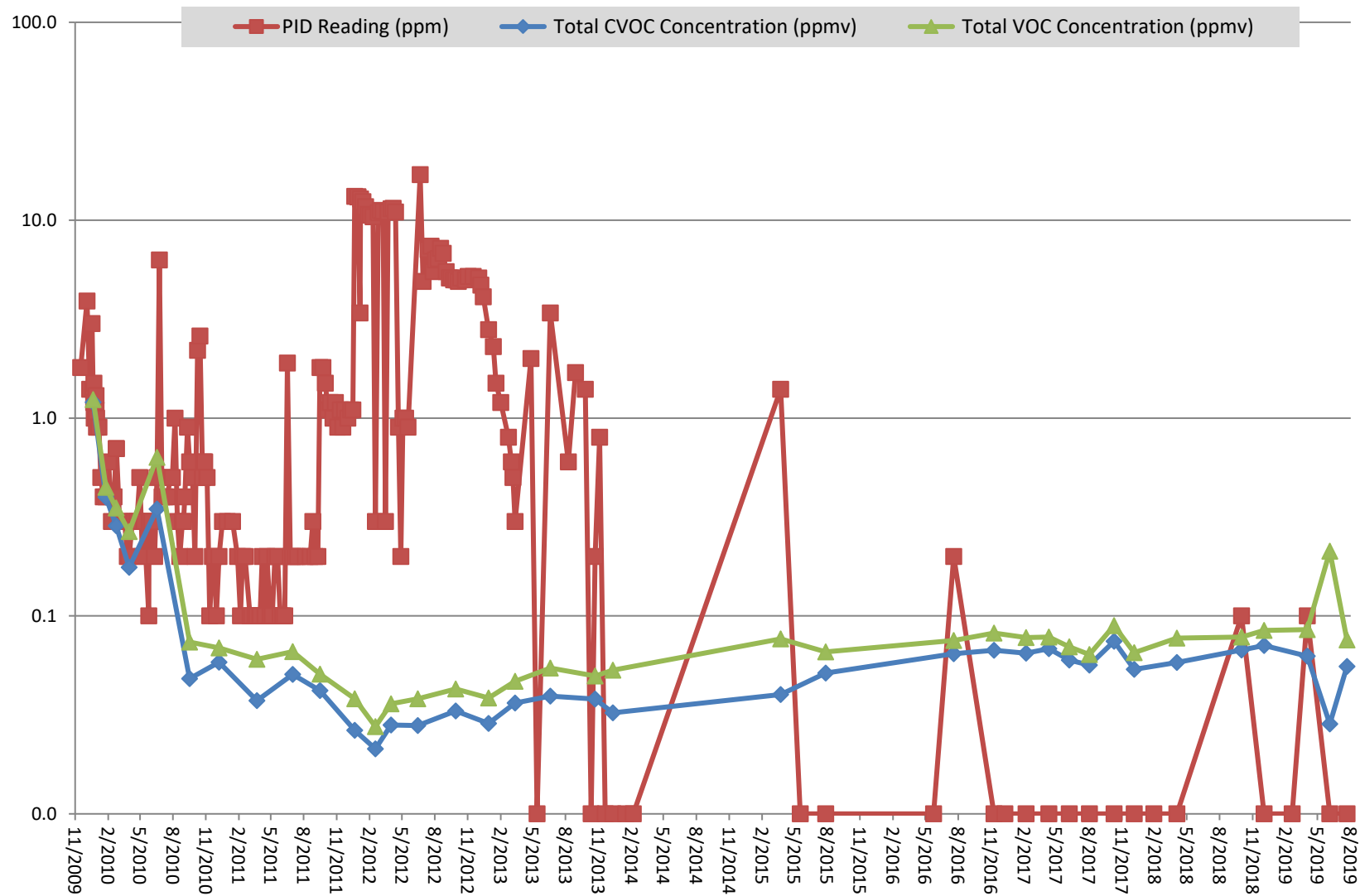


Figure 2
Effluent Concentration Trend - Analytical Results and Field PID Measurements
Off Depot AS/SVE System Annual Operations Report, Year Eight
Defense Depot Memphis, Tennessee

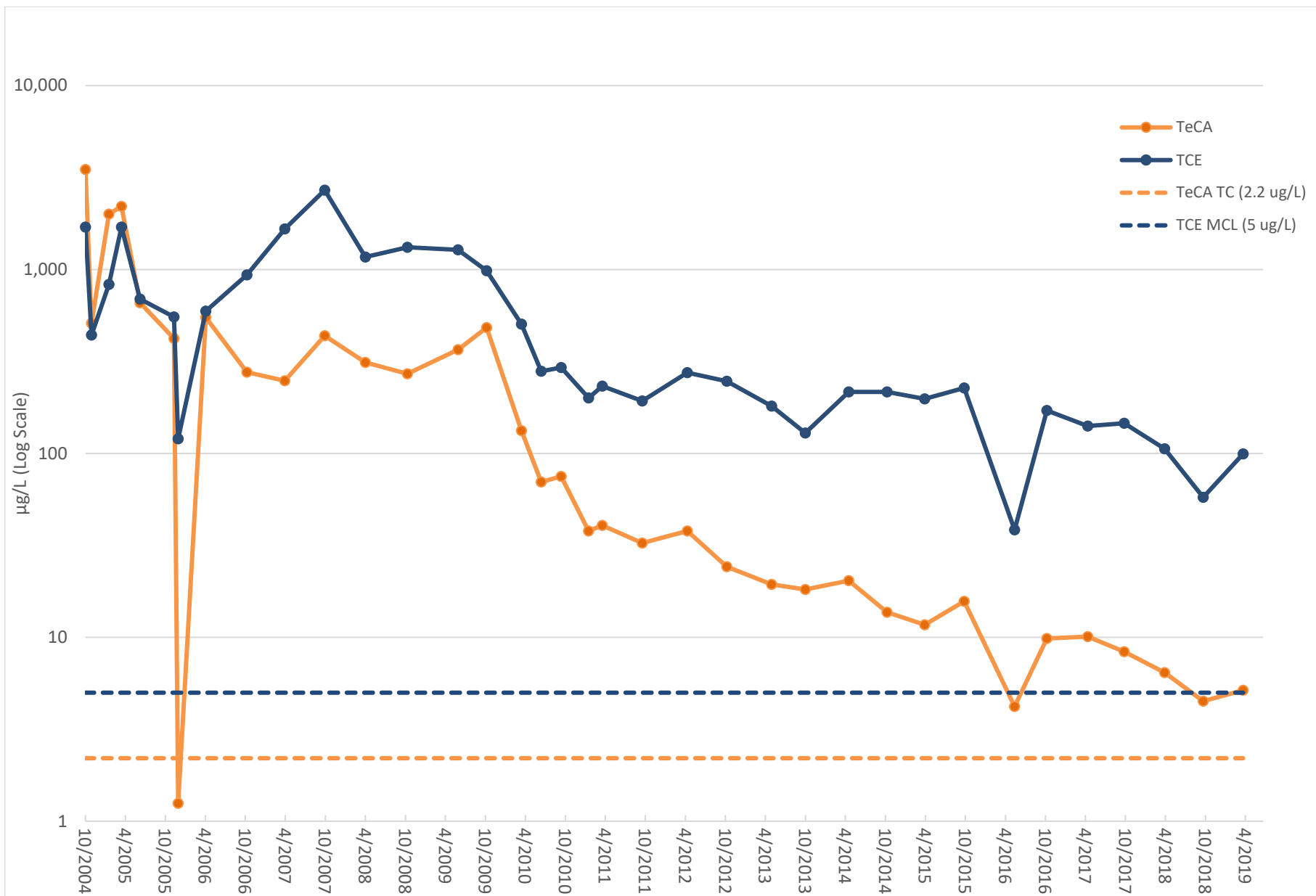


Figure 4
TeCA and TCE Concentration Trends at MW-159
Off Depot AS/SVE System Annual Operations Report, Year Eight
Defense Depot Memphis, Tennessee

Tables

Table 1
Flow Rate and Vacuum Readings at SVE Wells and Effluent
Off Depot AS/SVE System Annual Operations Report, Year Eight
Defense Depot Memphis, Tennessee

Date	Number of Blowers in Operation	AS Compressor Flow rate (scfm)	SVE Effluent		SVE-01		SVE-02		SVE-03		SVE-04		SVE-05		SVE-06		SVE-07		SVE-08		SVE-09		SVE-10		SVE-11		SVE-12	
			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)	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)	Flow rate (acfm)	Vacuum (in. H ₂ O)	Flow rate (acfm)	Vacuum (in. H ₂ O)
5/9/2018	1	C	590	7.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/15/2018	1	C	560	8.2	50	56.7	80	58.5	60	55.9	70	53.2	50	68.4	70	51.9	NR-2	74.8	70	60.3	NR-1	75.2	NR-1	53.5	70	37.4	NR-1	52.2
5/22/2018	1	C	560	8.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/31/2018	1	C	600	6.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/7/2018	1	C	570	8.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/12/2018	1	C	570	8.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/5/2018	1	C	570	8.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/9/2018	1	C	560	8.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/24/2018	1	C	560	8.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/7/2018	1	141	560	8.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/14/2018	1	159	550	8.3	60	57.4	NR-1	51.6	60	56.8	70	54.6	50	66.9	80	52.9	60	77	80	59.8	80	79.5	NR-1	57.7	70	41.8	NR-1	52.8
8/20/2018	1	163	550	8.3	60	58.1	80	52.3	60	57.8	70	54.8	50	68.5	70	53.4	60	77.7	80	60.5	80	79.8	NR-1	57.5	70	42.4	80	52.5
9/4/2018	1	167	550	8.4	60	59.9	NR-1	54.3	70	59.7	70	56.5	50	70	80	55.1	70	79.9	80	62.6	80	79.8	NR-1	59.7	70	42	80	51.9
9/18/2018	1	C	560	8	60	54.9	NR-1	52.2	60	54.7	70	51.1	50	66	80	50.6	60	76	80	58.3	80	74.9	NR-1	53.3	70	36.3	NR-1	47.3
10/1/2018	1	158	550	8.5	60	57.5	NR-1	53.9	60	57.6	70	54.2	50	66.7	80	52.5	60	78.4	80	59.5	90	79	NR-1	54.1	80	41.4	90	52.3
10/18/2018	1	162	580	8.3	60	50.9	NR-1	49.6	60	52.3	60	48.8	40	61.5	70	49.5	50	68.5	70	55.7	90	71.2	NR-1	37.5	60	40.1	80	48.5
10/30/2018	1	130	580	8.4	50	53.1	60	54.5	50	54.6	60	50.9	30	63.7	70	51.4	50	71.8	70	57.4	NR-1	72.7	NR-1	37.9	60	41.1	70	51.9
11/13/2018	1	C	580	9.2	70	60.7	80	59.5	60	57.9	70	53.2	50	69.4	80	54.3	NR-2	74.4	80	62.9	90	76.9	NR-1	56.8	60	40.9	90	54.1
11/28/2018	1	C	590	8.9	60	51.6	90	58.7	70	55.4	70	51.7	50	66.5	80	51.3	NR-2	73.2	80	58.6	NR-2	72.6	NR-1	53.4	80	38.3	90	51.2
12/3/2018	1	135	560	9.4	60	60.6	90	64.3	60	63.2	70	61.3	60	73.6	90	59.7	NR-2	81.8	80	69.2	NR-2	82.5	NR-1	63.2	80	46.9	90	58.9
12/18/2018	1	187	590	8.8	70	55.9	70	57.2	70	55.7	70	53.3	50	66.7	90	53.5	60	76.5	90	62.3	100	77.6	30	55.5	80	42.9	90	54.5
1/8/2019	1	107	580	8.6	70	58.1	80	62.5	70	59.2	80	57.4	50	69.9	90	56.3	NR-2	79.5	90	63.3	NR-2	77.8	30	60.7	80	42.7	90	60.8
1/22/2019	1	C	600	8.6	70	51.6	90	52.5	70	50.7	80	48.3	50	62.7	90	48.8	NR-2	68.9	90	56.4	NR-2	69.5	40	52.3	80	36.1	100	52.1
2/13/2019	1	188	580	8.9	60	50.9	90	57.1	70	57.8	80	56.3	50	68.2	90	55.9	NR-2	77.2	80	61.6	NR-2	79.4	20	60.6	80	44.2	90	58.5
2/19/2019	1	161	550	10.1	70	62.5	90	57.2	60	56.1	70	61.7	60	75.4	90	60.1	50	76.6	80	64.7	NR-2	89.1	20	70.3	80	43.3	80	45.1
3/6/2019	1	161	550	10.2	80	63.2	80	62.1	50	57.8	70	55.6	60	78.4	90	61.7	60	76.1	70	64.1	NR-2	88.4	30	69.7	80	44.3	80	45.2
3/19/2019	1	158	560	9.9	70	61.6	80	57.5	60	53.3	70	52.4	60	75.3	90	57.9	60	73.4	80	62.1	NR-2	87.9	30	69.3	80	41.7	70	40.8
4/2/2019	1	185	540	10.2	50	65.9	80	59.3	40	52.5	60	57.2	60	80.8	90	65.2	50	84.6	70	67.3	100	86.6	20	73.2	70	76.3	80	46.1
4/17/2019	1	189	530	9.9	50	65.1	80	64.7	30	54	60	57.4	50	83.8	90	66.8	50	82.8	70	68.6	90	85.5	20	75.0	60	46.2	70	44.6
4/30/2019	1	172	520	9.9	50	63.8	NR-1	59.8	30	54	60	57.1	50	81.8	90	65.5	50	81.2	70	65.1	80	87.7	NR-1	73.9	60	47.8	70	44.5
5/15/2019	1	151	540	9.7	50	60.3	NR-1	57.8	20	51.3	50	54.2	50	79.8	90	62.6	20	80.4	70	62.2	70	85.7	NR-1	73.8	60	46.1	70	71.6
5/28/2019	1	143	520	9.4	50	56.8	NR-1	51.4	30	47.2	60	50.2	50	75.6	90	59.3	50	77.1	70	58.9	80	83.0	NR-1	68.5	60	43.9	60	38.9
6/4/2019	1	168	520	9.9	50	64.1	NR-1	54.5	30	53.3	60	56.9	50	81.8	90	65.8	50	84	60	64.7	80	89.1	NR-1	75.1	50	50.1	70	45.0
6/24/2019	1	174	500	9.6	50	62.2	NR-1	52.4	30	51.7	60	55.3	50	80.8	90	64.6	50	83.1	60	64.4	80	89	NR-1	75.6	50	52.2	70	45.4
7/9/2019	1	174	490	9.6	50	62.9	NR-1	50.8	20	51.1	50	62.6	50	79.5	90	62.5	50	82.7	60	62.6	80	89.2	NR-1	73.3	50	51.6	60	44.2
7/23/2019	1	142	490	10	50	72.7	NR-1	61.4	20	60.5	50	63.7	50	89.5	90	72.6	50	90.6	70	72.4	80	94.5	NR-1	83.5	50	57.7	70	49.1

Notes
--- System operating in standby mode
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 collected due to:
- 1 Needle stuck, not visible
- 2 Water in gauge; needle fluctuating

Table 2
Vacuum Readings at VMPs
Off Depot AS/SVE Annual Operations Report, Year Eight
Defense Depot Memphis, Tennessee

	Date	8/20/2018	10/1/2018	12/3/2018	2/19/2019	4/2/2019	6/4/2019
Number of Blowers in Operation		1	1	1	1	1	1
Air Sparge Manifold Open		Yes	Yes	Yes	Yes	Yes	Yes
VMP-1A		4.9	9.0	9.9	3.1	0.0	3.7
VMP-1B		14.3	13.6	14.7	12.4	13.4	13.7
VMP-2A		18.0	18.4	17.3	16.1	15.4	18.4
VMP-2B		18.0	18.7	17.5	16.1	15.5	19.0
VMP-3A		NM	20.6	5.7	10.3	6.0	NM
VMP-3B		NM	20.3	20.0	17.0	19.1	20.7
VMP-4A		33.1	27.2	35.8	32.0	22.8	27.0
VMP-4B		20.6	26.7	24.0	22.8	23.2	26.6
VMP-5A		7.9	32.8	15.6	5.0	14.2	10.0
VMP-5B		23.2	22.2	22.3	19.9	21.1	25.8
VMP-6A		21.5	22.3	21.9	20.9	22.4	21.1
VMP-6B		21.7	23.8	22.7	21.1	22.5	25.6
VMP-7A		23.1	26.3	24.7	16.5	24.6	17.5
VMP-7B		22.8	26.1	18.8	22.6	24.4	27.4
VMP-8A		20.5	25.9	22.7	20.8	23.4	23.6
VMP-8B		21.9	26.0	23.0	20.8	24.0	25.6
VMP-9A		23.1	27.9	25.3	23.5	25.2	28.1
VMP-9B		24.8	28.4	25.3	23.5	26.4	28.6
VMP-10A		23.2	26.1	32.6	22	20.7	12.8
VMP-10B		23.4	30.0	23.8	23.3	26.6	28.8

Notes:

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

NM: No measurement, water in line.

Table 3
PID Measurements at SVE Wells and Effluent
Off Depot AS/SVE Annual Operations Report, Year Eight
Defense Depot Memphis, Tennessee

Date	Number of Blowers in Operation	Air Sparge Manifold Open	SVE-01	SVE-02	SVE-03	SVE-04	SVE-05	SVE-06	SVE-07	SVE-08	SVE-09	SVE-10	SVE-11	SVE-12	Effluent
8/20/2018	1	Yes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	NM	10.9	5.9	0.0
10/1/2018	1	Yes	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.3	NM	0.0	0.0	0.1
12/3/2018	1	Yes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NM	0.0	0.0	0.0
2/19/2019	1	Yes	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	NM	0.0	0.0	0.0
4/2/2019	1	Yes	0.1	0.8	0.9	0.0	0.0	0.0	0.4	0.5	0.6	0.1	0.5	0.2	0.1
6/4/2019	1	Yes	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Notes:

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

Yes: Sparge system was operating during measurements.

NM: No measurements at SVE-10 due to water in piping.

Table 4
PID Measurements at VMPs
Off Depot AS/SVE Annual Operations Report, Year Eight
Defense Depot Memphis, Tennessee

	Date	8/20/2018	10/1/2018	12/3/2018	2/19/2019	4/2/2019	6/4/2019
Number of Blowers in Operation		1	1	1	1	1	1
Air Sparge Manifold Open		Yes	Yes	Yes	Yes	Yes	Yes
VMP-1A		NM	NM	0.0	0.0	0.0	NM
VMP-1B		0.0	0.0	11.8	0.0	0.0	0.0
VMP-2A		0.0	0.0	6.3	0.1	0.1	0.2
VMP-2B		0.0	0.0	5.5	0.1	0.2	0.1
VMP-3A		NM	168 ^{A, C}	37.2	0.0	NM	NM
VMP-3B		0.0	0.1	25.6	0.0	0.1	0.0
VMP-4A		0.0	0.0	14.7	0.1	0.1	0.2
VMP-4B		0.0	0.2	13.7	0.2	0.0	0.1
VMP-5A		NM	NM	0.0	0.1	0.0	NM
VMP-5B		0.1	NM	21.6	0.2	0.2	0.0
VMP-6A		0.0	0.0	4.2	0.1	0.0	0.1
VMP-6B		0.0	0.0	0.0	0.0	0.1	0.0
VMP-7A		20.9 ^{A, B}	0.0	14.7	0.0	0.3	0.0
VMP-7B		NM	0.0	1.5	0.1	0.5	0.0
VMP-8A		0.0	0.4	77.2	0.0	0.2	NM
VMP-8B		0.0	0.0	98.2	0.1	0.2	0.0
VMP-9A		0.0	1.6	18.3	0.1	0.2	0.0
VMP-9B		0.0	1.2	16.8	0.0	0.1	0.0
VMP-10A		0.0	0.0	67.7	0.1	NM	NM
VMP-10B		0.0	0.0	65.2	0.1	0.1	0.0

Notes:

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

^A Condensate in Tedlar® sampling bag likely affecting result.

^B Average of three readings (range: 16.2 - 26 ppm)

^C Average of five readings (range: 0 - 548 ppm)

December 2018 results were inconsistent with historic readings. New Tedlar® sample bags used beginning February 2019.

NM: No measurement, water in line.

Table 5
Analytical Results Summary - SVE Effluent
Off Depot AS/SVE Annual Operations Report, Year Eight
Defense Depot Memphis, Tennessee

	SampleID	ODSVE-EFF-Y8Q1	ODSVE-DUP1-Y8Q1	ODSVE-EFF-Y8Q2	ODSVE-EFF-Y8Q3	ODSVE-EFF-Y8Q4	ODSVE-EFF-Y8Q4A
	Lab ID	P1805277-001	P1805277-002	P1806708-001	P1901884-001	P1903275-001	P1904112-001
	Date	10/1/2018	10/1/2018	12/3/2018	4/2/2019	6/4/2019	7/22/2019
Primary CVOCs	Units						
1,1,2,2-Tetrachloroethane	ppbv	0.46	0.45	0.49	0.44	0.081 U	0.34
1,1,2-Trichloroethane	ppbv	0.043 J	0.048 J	0.05 J	0.024 U	0.1 U	.031 J
1,1-Dichloroethene	ppbv	0.84	0.84	0.7	0.73	0.24 J	0.31
1,2-Dichloroethane	ppbv	0.064 U	0.026 J	0.078 U	0.035 U	0.14 U	0.056 U
Carbon Tetrachloride	ppbv	0.4	0.39	0.36	0.49	0.24 J	0.42
Chloroform	ppbv	4.8	5	5.1	4.7	2	4.9
cis-1,2-Dichloroethene	ppbv	29	29	34	28	13	28
Methylene Chloride	ppbv	0.14 U	0.13 U	0.17 U	0.1 U	1.1	0.12 U
Tetrachloroethene	ppbv	3.2 B	3.2 B	2.5	2.8	1.7	2.1
trans-1,2-Dichloroethene	ppbv	0.39	0.4	0.44	0.37	0.28 J	0.34
Trichloroethene	ppbv	28	28	27	25	9.4	19
Vinyl Chloride	ppbv	0.13 J	0.14	0.12 J	0.054 U	0.22 U	0.18 J
Total Primary CVOCs	ppbv	67.3	67.5	70.8	62.7	28.5	55.6
Other VOCs							
1,1,1-Trichloroethane	ppbv	0.32	0.31	0.31	0.34	0.11 J	0.21
1,1,2-Trichlorotrifluoroethane	ppbv	3.1	3.1	2.7	3.3	0.10 U	4.1
1,1-Dichloroethane	ppbv	0.34	0.34	0.36	0.41	0.24 J	0.31
1,2,4-Trimethylbenzene	ppbv	0.053 U	0.05 U	0.064 U	0.039 J	2.2	0.16
1,3,5-Trimethylbenzene	ppbv	0.024 J	0.05 U	0.064 U	0.038 U	0.67	0.032 J
2-Butanone	ppbv	0.45 J	0.62	0.38 J	0.09 U	0.11 U	0.21 J
2-Propanol	ppbv	0.39 U	0.16 J	0.47 U	0.22 U	0.25 U	0.34 U
Acetone	ppbv	2.8 J	3.4	2.3 J	1.2 U	110	1.5 U
Benzene	ppbv	0.053 J	0.042 J	0.058 J	0.098 J	1.4	0.042 U
Bromodichloromethane	ppbv	0.04 J	0.04 J	0.027 J	0.028 U	0.083 U	0.034 U
Carbon Disulfide	ppbv	0.16 J	0.23 J	1.1	0.12 U	3.8	4.3
Cyclohexane	ppbv	0.15 U	0.14 U	0.18 U	0.44 J	5.3	0.13 U
Dichlorodifluoromethane	ppbv	0.58	0.59	1	16	0.063 U	5.1
Ethanol	ppbv	0.84 J+	2 J+	1.5 J	0.99 J	0.44 U	5
Ethyl Acetate	ppbv	0.27 U	0.26 U	0.33 U	0.19 U	330 D	0.24 U
Ethylbenzene	ppbv	0.028 J	0.057 U	0.072 U	0.042 U	1.9	0.052 U
m,p-Xylenes	ppbv	0.12 U	0.11 U	0.14 U	0.1 J	4.6	0.076
n-Butyl Acetate	ppbv	0.028 J	0.047 J	0.066 U	0.037 U	3.8	0.037 J
n-Heptane	ppbv	0.12 U	0.11 U	0.14 U	0.05 U	8.6	0.1 U
n-Hexane	ppbv	0.14 U	0.13 U	0.17 U	0.41	7.9	0.12 U
o-Xylene	ppbv	0.06 U	0.057 U	0.072 U	0.043 J	2.1	0.045 J
Propene	ppbv	0.21 J	0.25 J	0.2 J	0.18 U	0.18 U	0.17 J
Styrene	ppbv	0.11 U	0.11 U	0.14 U	0.049 U	2.9	0.1 U
Toluene	ppbv	0.58 J	0.12 J	0.083 U	0.18 J	29	0.056 J
Trichlorofluoromethane	ppbv	0.36	0.37	0.31	0.32	0.057 U	0.26
Vinyl Acetate	ppbv	0.99 J	1.8 J	1.4 U	0.82 U	0.74 U	0.99 U
Total VOCs		78.2	80.9	81.0	85.2	212.5	75.7

DQE Flags:

U: Analyte not detected above Reporting Limit

J: Estimated

J+: Estimated with possible high bias

B: Analyte detected in both the sample and associated method blank

Table 6
Mass Removal Calculations
Off Depot AS/SVE Annual Operations Report, Year Eight
Defense Depot Memphis, Tennessee

Period	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)
Year 1	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
Year 2	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
Year 3	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
Year 4	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
Year 5	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
Year 6	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
Year 7	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
Year 8	8/6/2018	10/31/2018	692	560	78.2	77.8	0.0009	0.6	85.8
	10/31/2018	1/31/2019	202	583	81.0	79.6	0.0010	0.2	86.0
	1/31/2019	4/30/2019	585	547	85.2	83.1	0.0009	0.6	86.6
	4/30/2019	7/31/2019	170	510	75.7	80.5	0.0009	0.1	86.7

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/lb-mol (@ 60° F)

Table 7
Adjacent LTM Wells Exceeding TC or MCL
Off Depot AS/SVE Annual Operations Report, Year Eight
Defense Depot Memphis, Tennessee

1,1,2,2-Tetrachloroethane (TeCA) Concentration (µg/L)						
TC: 2.2 µg/L				MCL: NA		
Date	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
Oct 2018	-	<0.5	4.5	<0.5	-	3.1
Apr 2019	0.6	<0.5	5.2	<0.5	1.6	2.8

Trichloroethene (TCE) Concentration (µg/L)						
TC: 5 µg/L				MCL: 5 µg/L		
Date	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
Oct 2018	-	<1.0	57.7	1.0	-	10.7
Apr 2019	3.6	0.6 J	99.3	0.9 J	2.6	2.4

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**

Appendices

Appendix A Responses to EPA and TDEC Comments and Approval Letters



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

May 14, 2020

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) reviewed the U.S. Army, Defense Depot of Memphis, Tennessee, Off Depot Air Sparge-Soil Vapor Extraction System (AS/SVE) Annual Operations Report, Year 8 (May 2018 – July 2019), dated November 2019.

EPA cannot provide approval for the above mentioned report until the comments below have been addressed. 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 cursive script that reads "Diedre Lloyd".

Diedre Lloyd
Remedial Project Manager
Restoration & Sustainability Branch
Superfund Division

cc: Mr. James Foster, (Signed Original), via email: james.c.foster10.civ@mail.mil
Mr. Jamie A. Woods, PG, Tennessee, Department of Environment and Conservation, Memphis Environmental Field Office, via email: jamie.woods@tn.gov
Ms. Joan Hutton, CALIBRE, via email: Joan.Hutton@calibresys.com
Mr. Thomas Holmes, HDR Environmental, via email: Thomas.Holmes@hdrinc.com

Above Letter was also emailed to list below and can be found at the e-file location noted below.

ec: james.c.foster10.civ@mail.mil; jamie.woods@tn.gov; joan.hutton@calibresys.com;
thomas.holmes@hdrinc.com;

e-bbc: Terrell.tina@epa.gov

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**EPA COMMENTS on the
OFF DEPOT AIR SPARGE-SOIL VAPOR EXTRACTION SYSTEM
YEAR EIGHT, ANNUAL OPERATIONS REPORT**

**DUNN FIELD, REVISION 0
DATED NOVEMBER, 2019**

**DEFENSE DEPOT
MEMPHIS, TENNESSEE**

EPA Comments:

1. Section 1.3 AS/SVE [Air Sparge/Soil Vapor Extraction] System Description, Page 1-2 and Section 2.2 System Flow Rates and Vacuums, Page 2-1:

The fifth paragraph of Section 1.3 indicates that the SVE system consists of two rotary blowers installed in parallel. However, the third paragraph in Section 2.2 describe the SVE system operating with both blowers operating alternately in series. Please revise the Annual Report to address this discrepancy and ensure the text clearly discusses whether the blowers were installed in series or in parallel for Year Eight operations.

2. Section 2.4 System Repairs and Modifications, Page 2-4:

Section 2.4 summarizes the general repairs and equipment modifications performed during the period of October 3 through October 5, 2018. The following insufficiencies were noted:

- a. The text notes that SVE-01 and -02 were inaccessible; however, the text does not discuss why the wellheads were inaccessible and what actions will be taken to remedy the obstruction.
- b. The text notes that SVE-07 was not located during the October 2018 event but was subsequently located during later activities; however, the text does not discuss why SVE-07 could not be located or if any general repairs or equipment modifications were necessary/performed.

Please revise the Annual Report to address these issues.

3. Section 3.1 Vacuum Measurements, Page 3-1:

The last sentence of the first paragraph states that “air injected during sparging is being captured by the SVE wells.” Air injected during sparging should not be captured by the SVE wells. For example, the objective of the AS system is to inject air into contaminated groundwater to drive volatile contaminants into the overlying vadose zone through volatilization, with the SVE system then removing the generated vapor-phase contamination from the vadose zone. If accurate, please revise the Annual Report to state that “vapor-phase contamination generated during air sparging is being captured by the SVE wells.”

4. Section 3.2 PID [Photoionization Detector] Readings, Page 3-1:

The second paragraph of Section 3.2 indicates that elevated PID measurements at SVE wells (SVE-09, -11, and -12) in August 2018 were attributed to excess moisture in the sample bags; however, it is unclear how the excess moisture was introduced into the sample bags. Revise the Annual Report

to describe how moisture was introduced into the sample bags. Also, discuss whether bag sampling procedures may also need to be revised to prevent future moisture issues.

5. Section 3.2 PID Readings, Page 3-1 and Table 3, PID Measurements at SVE Wells and Effluent:

The last sentence of the second paragraph indicates that water in the SVE air lines at SVE-10 prevented some PID readings from being recorded. Additionally, Table 3 indicates that four of the six PID readings were not measured due to water in the piping. A cursory review of previous AS/SVE Annual Reports indicates that water in the piping of SVE-10 has been an ongoing problem. As such, revise the Annual Report to provide discussion on how the inability to monitor performance of SVE-10 potentially impacts system performance and provide recommendations to prevent water infiltrating the piping of SVE-10.

6. Section 3.2 PID Readings, Page 3-1:

The fourth full paragraph of Section 3.2 indicates that notably high results recorded in December 2018 were anomalous and attributed to the use of old Tedlar® bags, as new sample bags were purchased and used in February 2019 with a return of normal results. However, it is unclear how contamination was potentially introduced to the sample bags.

- a) Please revise the Annual Report to describe how potential contamination was introduced into the sample bags and what procedures will be implemented to prevent future cross contamination of sample equipment in the future.
- b) If sufficient information is not available to determine the reason for previous moisture issues encountered during the semi-annual event and now with contamination in the Tedlar bags, it may be advisable to include bag sampling procedures for future evaluation and implementation to prevent future moisture and contamination issues.

7. Section 3.5 Mass Removal Estimate, Page 3-3; Section 4.1 System Operations, Page 4-2; and Table 6, PID Measurements at VMPs:

The Year Eight mass removal estimate presented in the Annual Report is inconsistent. For example, Section 3.5 and Table 6 indicate that the SVE system removed approximately 1.5 pounds (lbs) of VOCs during Year Eight (May 2018 through July 2019) however, the summary table in Section 4.1 indicates the VOC removal in Year 8 was 1.7 lbs of VOCs.

Revise the Annual Report to address:

- a) Please address the discrepancy in Section 4.1 VOC removal of 1.5 lbs vs 1.7 lbs VOCs
- b) The Low Recovery Rate of less than 2 lbs VOCs

8. Section 4.1 System Operations, Page 4-1 and Table 6, PID Measurements at VMPs:

The “Estimated VOC [Volatile Organic Compound] Mass Removal During the Period” presented on Table 6 and the “VOC Removal” data presented in the summary table in Section 4.1 are inconsistent. For example, the sum of the estimated VOC mass removed in Year 2 on Table 6 is 4.1 lbs; however, the summary table in Section 4.1 indicates that Year Two (2011) VOC Removal was 3.9 lbs. Similarly, the estimated mass removal for Years 3, 4, 6 and 8 on Table 6 are inconsistent with that presented on the summary table in Section 4.1. Please revise the Annual Report to address these discrepancies.

9. Section 4.2 System Effectiveness, Page 4-2:

The Annual Report states that additional AS points are to be installed south of MW-159 upon approval of an access agreement with Memphis Light, Gas, and Water (MLGW), and incorporated into system operations, but a date of completion of the Right of Entry cannot be projected. The recommendation to install additional AS wells south of MW-159 was first proposed in the Year Five

Annual Report dated March 2016, about four years ago. As such, revise the Annual Report to include a schedule detailing when the additional AS wells will be installed during the next reporting period.

- a) Please include a brief description of the access issues that necessitated the ~ 4 year lapse in the planned AS wells south of MW-159.
- b) Please include a schedule detailing when the additional AS wells will be installed during the next reporting period
- c) Will this action require an additional decision document or can this action be a continuation of the remedial action from the Dunn Field ROD? Please provide supporting rationale.

10. Table of Contents, Page ii and Figure 4, TeCA and TCE Concentration Trends at MW-159:

The figures list on Page ii lists the title of figure 4 as TeCA and TCE Concentration Trends at MW-159 while the actual figure title is TCE and TeCA and TCE Concentration Trends at MW-159. Please Revise the Annual Report to the address this minor discrepancy.

- 11. Section 4.1, System Operations, Page 4-2:** The table in Section 4.1 is inaccurate. The table presented in Section 4.1 lists the “Period” for the Year Eight as *May 2019* through July 2019; however, the reporting period is May 2018 through July 2019. Please revise the table to address this discrepancy.

12. Table 1, Flow Rate and Vacuum Readings at SVE Wells and Effluent:

The table indicates that SVE-03 exhibited decreasing flow rates beginning in March 2019 and that readings at SVE-10 were not collected during the majority of system inspections because the needle stick was not visible; however the Annual Report lacks discussion on recommendations to increase flow rates at SVE-03 or to repair the flow meter at SVE-10 to improve system evaluation during routine inspections. Please revise the Annual Report to include recommendations to rectify performance inefficiencies at SVE-03 and SVE-10.

**Responses to Comments from:
U.S. Environmental Protection Agency (EPA) Region 4 on:
Off Depot Air Sparge/Soil Extraction System Annual Operations Report
Year Eight (May 2018 to July 2019), Dunn Field, Revision 0
Defense Depot Memphis, Tennessee
Dated November 2019
Comments Received 14 May 2020**

EPA Comments:

1. **Section 1.3 AS/SVE [Air Sparge/Soil Vapor Extraction] System Description, Page 1-2 and Section 2.2 System Flow Rates and Vacuums, Page 2-1:** The fifth paragraph of Section 1.3 indicates that the SVE system consists of two rotary blowers installed in parallel. However, the third paragraph in Section 2.2 describe the SVE system operating with both blowers operating alternately in series. Please revise the Annual Report to address this discrepancy and ensure the text clearly discusses whether the blowers were installed in series or in parallel for Year Eight operations.

Response: Concur. Blowers are installed/designed to operate in parallel, however each blower is operated independently but not in series. Text in Section 2.2 will be revised as follows:
“The system was operated with both blowers operating alternately in 12-hour blocks and 12 SVE wells during Year Eight...”.

2. **Section 2.4 System Repairs and Modifications, Page 2-4:** Section 2.4 summarizes the general repairs and equipment modifications performed during the period of October 3 through October 5, 2018. The following insufficiencies were noted:

- a. The text notes that SVE-01 and -02 were inaccessible; however, the text does not discuss why the wellheads were inaccessible and what actions will be taken to remedy the obstruction.

Response: Concur. Text modified to clarify that the SVE wells were accessible, but the PVC wellheads could not be opened due to construction and/or sediment preventing removal of top plug. Inspection did not identify air leaks so construction was not disturbed at that time. Concrete pads and PVC wellheads will be replaced/modified during July 2020 maintenance activities. Text modified as follows:

“...no activities conducted. Well pads and vaults were intact and no air leaks were identified. As such, the existing wellhead completion design and sediment inside the well vaults did not warrant removal of the top well plug. Well pads will be replaced and wellheads modified as necessary during repair/modification activities to be performed during Year Nine to allow access.”

- b. The text notes that SVE-07 was not located during the October 2018 event but was subsequently located during later activities; however, the text does not discuss why SVE-07 could not be located or if any general repairs or equipment modifications were necessary/performed.

Response: Concur. ODSVE-07 is located at the shoulder of Menager Road and was covered by vegetation/gravel. Text modified as follows:

“...subsequently located adjacent to Menager Road during later field activities upon removal of vegetation/gravel debris and observed to be without damage.”

AS and SVE well pads are now cleared of vegetation/debris every two months as necessary during O&M events.

3. **Section 3.1 Vacuum Measurements, Page 3-1:** The last sentence of the first paragraph states that “air injected during sparging is being captured by the SVE wells.” Air injected during sparging should not be captured by the SVE wells. For example, the objective of the AS system is to inject air into contaminated groundwater to drive volatile contaminants into the overlying vadose zone through volatilization, with the SVE system then removing the generated vapor-phase contamination from the vadose zone. If accurate, please revise the Annual Report to state that “vapor-phase contamination generated during air sparging is being captured by the SVE wells.”

**Responses to Comments from:
U.S. Environmental Protection Agency (EPA) Region 4 on:
Off Depot Air Sparge/Soil Extraction System Annual Operations Report
Year Eight (May 2018 to July 2019), Dunn Field, Revision 0
Defense Depot Memphis, Tennessee
Dated November 2019
Comments Received 14 May 2020**

Response: Concur. Text has been revised as follows: "The measurements indicate a partial vacuum is created throughout the treatment area by the SVE wells, and therefore vapor-phase contamination generated during sparging is being captured by the SVE wells."

4. **Section 3.2 PID [Photoionization Detector] Readings, Page 3-1:** The second paragraph of Section 3.2 indicates that elevated PID measurements at SVE wells (SVE-09, -11, and -12) in August 2018 were attributed to excess moisture in the sample bags; however, it is unclear how the excess moisture was introduced into the sample bags. Revise the Annual Report to describe how moisture was introduced into the sample bags. Also, discuss whether bag sampling procedures may also need to be revised to prevent future moisture issues.

Response: Concur that the source of the moisture was most likely not attributable to the Tedlar sample bags themselves but more likely a result of the air sampling pump drawing moisture from the SVEs into the bags and producing anomalous readings when vacated with the PID. To address this issue, new bags and a new sampling pump were purchased to address the only known potential causes and were used beginning February 2019. To that, no moisture issues or anomalous PID measurements have been noted. If the same issue repeats, the sampling procedures will be evaluated. Text revised as follows.

- 2nd paragraph - "Apart from anomalous readings at SVE-09, -11, and -12 during the August event, the estimated VOC concentrations ranged from 0 to 0.9 parts per million (ppm) at the SVE wells and 0 to 0.1 ppm at the system effluent. The anomalous readings were attributed to the air sampling pump introducing moisture or moisture-rich air into the sampling bags from the SVE wells resulting in elevated readings when vacated with the PID."
- New paragraph - "A new air sampling pump and new Tedlar® bags were purchased for first use in February 2019 which saw a return to normal PID results from the SVE wells and VMPs. If anomalous PID readings are detected during future monitoring events, the sampling procedures and components will be evaluated and adjustments, repairs, and/or replacements made as necessary."

5. **Section 3.2 PID Readings, Page 3-1 and Table 3, PID Measurements at SVE Wells and Effluent:** The last sentence of the second paragraph indicates that water in the SVE air lines at SVE-10 prevented some PID readings from being recorded. Additionally, Table 3 indicates that four of the six PID readings were not measured due to water in the piping. A cursory review of previous AS/SVE Annual Reports indicates that water in the piping of SVE-10 has been an ongoing problem. As such, revise the Annual Report to provide discussion on how the inability to monitor performance of SVE-10 potentially impacts system performance and provide recommendations to prevent water infiltrating the piping of SVE-10.

Response: SVE-10 is fully operational and performance is not impacted despite water present in the air line. Maintenance activities planned for July 2020 will evacuate water from SVE lines at the manifold. Vacuum/air flow rates at each SVE well will be evaluated and adjusted as necessary. Text revised as follows:

"Consistent with historical trends, water in the SVE air line prevented some readings at SVE-10. It should be noted that operation and performance of the SVE wells are not impacted despite water being present in the air lines. Vacuum/air flow rates at each SVE well will be evaluated during future monitoring events and adjusted as necessary to mitigate water in the air lines."

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U.S. Environmental Protection Agency (EPA) Region 4 on:
Off Depot Air Sparge/Soil Extraction System Annual Operations Report
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Dated November 2019
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6. **Section 3.2 PID Readings, Page 3-1:** The fourth full paragraph of Section 3.2 indicates that notably high results recorded in December 2018 were anomalous and attributed to the use of old Tedlar® bags, as new sample bags were purchased and used in February 2019 with a return of normal results. However, it is unclear how contamination was potentially introduced to the sample bags.

- a. The text notes that SVE-01 and -02 were inaccessible; however, the text does not discuss why the wellheads were inaccessible and what actions will be taken to remedy the obstruction.

Response: Text (Section 2.4) revised to clarify that the wells were accessible, but the completion of the wellheads prevented removal of the top plug; see response to Comment 4.

- b. If sufficient information is not available to determine the reason for previous moisture issues encountered during the semi-annual event and now with contamination in the Tedlar bags, it may be advisable to include bag sampling procedures for future evaluation and implementation to prevent future moisture and contamination issues.

Response: New text added to discuss the evaluation of sampling procedures if anomalous PID readings continue to be observed; see response to Comment 4.

7. **Section 3.5 Mass Removal Estimate, Page 3-3; Section 4.1 System Operations, Page 4-2; and Table 6, PID Measurements at VMPs:** The Year Eight mass removal estimate presented in the Annual Report is inconsistent. For example, Section 3.5 and Table 6 indicate that the SVE system removed approximately 1.5 pounds (lbs) of VOCs during Year Eight (May 2018 through July 2019) however, the summary table in Section 4.1 indicates the VOC removal in Year 8 was 1.7 lbs of VOCs. Revise the Annual Report to address:

- a. Please address the discrepancy in Section 4.1 VOC removal of 1.5 lbs vs 1.7 lbs VOCs.

Response: Concur, table in Section 4.1 has been updated to reflect the correct value of 1.5 lbs per Table 6.

- b. The Low Recovery Rate of less than 2 lbs VOCs.

Response: The effluent emission rates and the concentrations of Total VOCs in the effluent have remained generally consistent since September 2010, indicating that the system is operating efficiently and effluent concentrations reaching asymptotic levels. Upon permission for the planned installation of additional AS wells around MW-159, an increase in effluent concentrations would be expected, at least temporarily. The following text has been added to the end of Section 4.2:

“Estimated mass removals beginning with Year Three indicate that the system may be reaching or have reached asymptotic levels for VOCs while containing downgradient migration of the contaminant plume, which is observed and consistent with groundwater contaminant concentrations. Upon approval for and installation of the additional AS wells, SVE effluent mass removal will be re-evaluated and system optimizations made as necessary.”

8. **Section 4.1 System Operations, Page 4-1 and Table 6, PID Measurements at VMPs:** The “Estimated VOC [Volatile Organic Compound] Mass Removal During the Period” presented on Table 6 and the “VOC Removal” data presented in the summary table in Section 4.1 are inconsistent. For example, the sum of the estimated VOC mass removed in Year 2 on Table 6 is 4.1 lbs; however, the summary table in Section 4.1 indicates that Year Two (2011) VOC Removal was 3.9 lbs. Similarly,

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Dated November 2019
Comments Received 14 May 2020**

the estimated mass removal for Years 3, 4, 6 and 8 on Table 6 are inconsistent with that presented on the summary table in Section 4.1. Please revise the Annual Report to address these discrepancies.

Response: Concur. Mass removal values provided in Table 6 are accurate and tables included in Sections 1.4.2 and 4.1 have been revised accordingly.

9. **Section 4.1 System Operations, Page 4-1 and Table 6, PID Measurements at VMPs:** The Annual Report states that additional AS points are to be installed south of MW-159 upon approval of an access agreement with Memphis Light, Gas, and Water (MLGW), and incorporated into system operations, but a date of completion of the Right of Entry cannot be projected. The recommendation to install additional AS wells south of MW-159 was first proposed in the Year Five Annual Report dated March 2016, about four years ago. As such, revise the Annual Report to include a schedule detailing when the additional AS wells will be installed during the next reporting period.
- Please include a brief description of the access issues that necessitated the ~ 4 year lapse in the planned AS wells south of MW-159.
 - Please include a schedule detailing when the additional AS wells will be installed during the next reporting period.
 - Will this action require an additional decision document or can this action be a continuation of the remedial action from the Dunn Field ROD? Please provide supporting rationale.

Response: Text at the end of Section 4.2 was included as an accepted response to EPA comments received on the Year Seven Annual Operations Report regarding the same delays. Based on recent progress, the following text has been inserted:

“To address the continued high concentration of TCE at MW-159, five additional AS wells will be installed and incorporated into system operations upon completion of an access agreement with MLGW. Attempts to obtain this access agreement have been ongoing since 2016. This has resulted in multiple efforts by the Army, USEPA, and TDEC to contact and facilitate with MLGW to resolve this issue. USACE, Mobile District Real Estate is managing the access process. Upon receipt of Right of Entry, the *Off Depot Air Sparge Well Installation Work Plan, Dunn Field* (Trinity, 2016) approved by USEPA and TDEC in 2016 will be updated and included a planned schedule of activities.”.

The existing ROD Amendment (e2M, 2009) identifies AS/SVE as the selected remedial alternative so no additional revisions or new documents are required.

10. **Table of Contents, Page ii and Figure 4, TeCA and TCE Concentration Trends at MW-159:** The figures list on Page ii lists the title of figure 4 as TeCA and TCE Concentration Trends at MW-159 while the actual figure title is TCE and TeCA and TCE Concentration Trends at MW-159. Please Revise the Annual Report to the address this minor discrepancy.

Response: Concur, Title on figure revised to “Figure 4 TeCA and TCE Concentration Trends at MW-159”; text in report unchanged.

11. **Section 4.1, System Operations, Page 4-2:** The table in Section 4.1 is inaccurate. The table presented in Section 4.1 lists the “Period” for the Year Eight as *May 2019* through July 2019; however, the reporting period is May 2018 through July 2019. Please revise the table to address this discrepancy.

Response: Concur, Year Eight operating period revised to “May 2018-July2019”.

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Dated November 2019
Comments Received 14 May 2020**

12. Table 1, Flow Rate and Vacuum Readings at SVE Wells and Effluent:

The table indicates that SVE-03 exhibited decreasing flow rates beginning in March 2019 and that readings at SVE-10 were not collected during the majority of system inspections because the needle stick was not visible; however the Annual Report lacks discussion on recommendations to increase flow rates at SVE-03 or to repair the flow meter at SVE-10 to improve system evaluation during routine inspections. Please revise the Annual Report to include recommendations to rectify performance inefficiencies at SVE-03 and SVE-10.

Response: As noted in Section 2.2, the combined SVE flow rate was designed at 1.5 times the AS injection rate and the system extracted approximately 3.4 times the injection rate during Year 8. Per the Remedial Action Construction Report (HDR, 2011), the SVE extraction designed flow rate is 55 scfm indicating that a number of SVE wells are operating outside their designed range. As part of the July 2020 maintenance activities, the individual SVE well flow rates will be monitored and adjusted as necessary. The following text has been added to the end of Section 4.1:

“System operations and SVE well extraction set points will be evaluated during maintenance activities planned for Year Nine.”



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

September 07, 2020

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) reviewed the U.S. Army, Defense Depot of Memphis, Tennessee, responses to EPA comments on the Off Depot Air Sparge-Soil Vapor Extraction System (AS/SVE) Annual Operations Report, Year 8 (May 2018 – July 2019), dated November 2019.

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

Sincerely,

Diedre Lloyd

Diedre Lloyd
Remedial Project Manager
Restoration & Sustainability Branch
Superfund & Emergency Management Division

cc: Mr. James Foster, (Signed Original), via email: james.c.foster10.civ@mail.mil
Mr. Jamie A. Woods, PG, Tennessee, Department of Environment and Conservation, Memphis Environmental Field Office, via email: jamie.woods@tn.gov
Ms. Joan Hutton, CALIBRE, via email: Joan.Hutton@calibresys.com
Mr. Thomas Holmes, HDR Environmental, via email: Thomas.Holmes@hdrinc.com

Above Letter was also emailed to list below and can be found at the e-file location noted below.

ec: james.c.foster10.civ@mail.mil; jamie.woods@tn.gov; joan.hutton@calibresys.com;
thomas.holmes@hdrinc.com;

e-bbc: Terrell.tina@epa.gov

C:\DDMT\DDMT_SMP\...



**STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION**

Division of Remediation
Memphis Environmental Field Office
8383 Wolf Lake Drive
Bartlett, TN 38133-4119

June 9, 2020

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 AS/SVE - Year 8 Annual Operations Report
Defense Depot Memphis, Tennessee
TDoR ID # 79-736
TN4210020570**

Mr. Foster,

TDEC-DoR has reviewed the Off Depot AS/SVE - Year 8 Annual Operations Report, as submitted by Army, and approves of the document's contents. If there are additional issues of concern, please contact me at (901) 371-3041 or at jamie.woods@tn.gov.

Regards,

A handwritten signature in blue ink, appearing to read "J Woods", with a long horizontal flourish extending to the right.

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

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

TDoR MEFO: file 79-736

Appendix B Semiannual Maintenance Reports

SERVICE ORDER

72124027 Page1/16



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	Todd Calhoun - verbal
Start (approx.)	Thursday, 10/4/18 / 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

Pkg B on CSD 100
Pkg A x2 EB 420 C Blower
PM on Refrig Dryer TE 141
Inclgd Inline Filtration. 06/20 ksh

Scheduled for 10/4

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	Thursday, 10/4/18			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%)

Kaeser Compressors, Inc. P.O.Box 946, Fredericksburg, VA 22404, Phone: (540)-898-5500 Fax: (540)-898-5520 www.kaeser.com
A Company with Certified Quality and Environmental Management Systems ISO 9001-2008 and 14001-2004

Shorten service interval due to environment or operating conditions?

☒ No ☐ Yes

Work performed acc. to work plan.

Work accepted.

Any outstanding deficiencies?

☐ Yes ☒ No

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: 2018.10.04
12:25:44 -05'00'Customer's
signatureElectronically signed by: Denise Cooper
Date: 2018/10/04 - 12:25:19 UTC-06:00
Digital Signature created with: StepOver PDF Plugin 8-5-463☐ 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%)

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A Company with Certified Quality and Environmental Management Systems ISO 9001-2008 and 14001-2004

Oper.0020 **Maintain screw compressor - package B** 3.0
Type CSD 100 125 psi 460/60 US **1006272903**
Material No. 100818.1 **Year** **2009**
Serial No. 1234 **EMR** **3498678**

Previous service hours 41,515 h **Current service hours** 42,363 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	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 119.4 V	Ok
☒ -Check power consumption: Line U1 143 A V1 144 A W1 143 A	Ok
☒ -Check pressure relief valve(s)	Ok
☒ -Check airend discharge temperature 184 °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 42363 Load h 18423 Ambient temp. 95 °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. Drained the oil and refilled with M-460. Replaced the separator cartridge and o-rings. Replaced the scavenger line filter and o-ring. Cleaned the scavenger line and scavenger line housing. Rebuilt the combined auxiliary vent valve. Replaced the oil filter and the air filter. Replaced the electrical cabinet air filters. Inspected the electrical connections and ensured that they were tight. Inspected the drive coupling. Drive coupling ok. Greased the drive motor bearings and the fan motor bearings. Inspected the compressor for oil/air leaks. No leaks detected. Compressor is operating correctly with no problems at this time.	

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>
Oil filter 16bar	6.3465.0	1		0	☐ Tech. ☐ Customer
Filter mat 112x112x10	6.3572.0	2		0	☐ Tech. ☐ Customer
Oil Separator cartridge cpl.	6.3623.0	1		0	☐ Tech. ☐ Customer
Air filter cartridge Ø420x130	6.4148.1	1		0	☐ Tech. ☐ Customer
M-460 Semi-Synthetic Oil \$/(5 ANM460-5		3		0	☐ Tech. ☐ Customer
Maintenance kit Com.aux.vi	400905.0	1		0	☐ Tech. ☐ Customer
Oil Analysis Kit (red)	ANKCPIND2BR	1		0	☐ Tech. ☐ Customer
					☐ Tech. ☐ Customer

SERVICE ORDER

72124027

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KAESER COMPRESSORS

Oper. 0040 Maintain blower - package A

1.5

Type EB 420 C VAC 40,0 hp 2.460 rpm

1006272904

Material No. EBC

Year 2009

Serial No. 2138

EMR 3605958

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)	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: 4 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:		
Drained the oil and refilled with SB-220. Replaced the air filter. Inspected the belt and ensured proper tension. Greased the motor bearings. Inspected the blower for oil/air leaks. 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
					☐ Tech. ☐ Customer

SERVICE ORDER

72124027

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KAESER COMPRESSORS

Oper. 0060 **Maintain blower - package A** 1.5
Type EB 420 C VAC 40,0 hp 2.460 rpm **1006272905**
Material No. EBC **Year** **2009**
Serial No. 2140 **EMR** **3605982**

Previous service hours 5 h **Current service hours** 6 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)	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: 6 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:		
Drained the oil and refilled with SB-220. Replaced the air filter. Inspected the belt and ensured proper tension. Greased the motor bearings. Inspected the blower for oil/air leaks. 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
					☐ Tech. ☐ Customer

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KAESER COMPRESSORS

Oper.0070 **Maintain compr. air filter - package A** 1.0
Type Particulate KPF-485.2 w/ AMD1550 **1006272913**
Material No. USKPF485.2 **Year** **2009**
Serial No. * **EMR** **3742805**

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 KPF element and o-ring. Cleaned the filter housing. Inspected the air filter for leaks. No leaks detected. 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
Std 485 KPF Element	USPF-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

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KAESER COMPRESSORS

Oper.0090	Maintain compr. air receiver - package B	0.5
Type	200 Gal Tank w/ AMD 6550	1006272911
Material No.	9.9999.9	Year 2009
Serial No.	1251	EMR 4403267

Work to be done	Comment
>Tasks to be completed and current condition recorded: OK	
☒ -Ensure safe working conditions as described in the manual	Ok
☒ -Visually check air receiver exterior condition	Ok
☒ -Maintain condensate drain	Ok
☒ -Check pressure indicator	Ok
☒ -Check pressure relief valve(s) for visible damage/contamination	Ok
☒ -Check for leaks	Ok
☒ -Register service: stick label/service manual	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 air receiver. Air receiver 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

SERVICE ORDER

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KAESER COMPRESSORS

Oper.0100 **Maintain oil-water sep. - package A** 0.5
Type KCF-100 Condensate Treatment System **1006272907**
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 housing. Charged the KCF-100 with water. Inspected the KCF-100 for leaks. No leaks detected. 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**

Filter-SET Aquamat KCF100 ANKCF100CAR` 1 0

☐ Tech.
☐ Customer
☐ Tech.
☐ Customer

Oper.0110 Maintain refrigeration dryer

2.0

Type Refrig. dryer TE 141 460/3/60

1006272906

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 45 °F/°C psi/bar	Ok
☒ -Check compressed air temp.: Inlet 97 °F/°C Outlet 88 °F/°C	Ok
☒ -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 / 4.4 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 95 °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:	
Replaced the ECO-drain 31 service unit. Inspected the ECO-drain service unit for leaks. No leaks detected. ECO-drain 31 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>
Kaeser Eco-Drain 31 Service U	AN8247400370	1		0	☐ Tech. ☐ Customer ☐ Tech. ☐ Customer

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KAESER COMPRESSORS

Oper.0120 **Maintain compr. air filter - package A** 1.0
Type Oil Removal KOR-485.2 w/ AMD1550 **1006272908**
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 and o-ring. Cleaned the filter housing. Inspected the air filter for leaks. No leaks detected. 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
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

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KAESER COMPRESSORS

Oper. 0140 **Maintain filter - package B** 1.0
Type Separator - KFS-485.2 AMD 1550 **1006272910**
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
☒ -Change filter element(s)	Ok
☒ -Clean filter housing and control bores in the filter head	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:	
Replaced the KPF element and o-ring. Cleaned the filter housing. Inspected the air filter for leaks. No leaks detected. Rebuilt the AMD 1550 drain on the air filter. Inspected the AMD 1550 for leaks. No leaks detected. Air filter is operating correctly with no problems at this time.	

Consumed material	Material No.	Pc	Serial No.	Part ID/batch	Stock
Std 485 KFS Element	USFS-485	1			1001

Material delivered in advance	Material No.	Pc	Serial No.	Return	Returned by
Service Kit for AMD 1550	AN55800	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 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 w/ AMD1550		2009	USKOR485.2	1055	-----		-
Particulate KPF-485.2 w/ AMD1550		2009	USKPF485.2	1025	-----		-

Non-registered machines

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

Location	Trinity Analysis and Development	Customer	Trinity Analysis and Development
10049408	1605 Menager Rd		1605 Menager Rd
	Memphis TN 38106-7012		Memphis TN 38106-7012
Responsible	Mr. Todd Calhoun	Order	PO S352
	850-613-6800	Service point	Memphis
Start (approx.)	Monday, 4/8/19 / 12:00 AM	Pers.in charge	Sam Coats
Service techn.	Ryan Whitby		877-882-8376

Attachments

Add attachment

Periodical maintenance

Contract No: Maintenance Agreement
 Maintenance by agreement, without

Pkg A on CSD 100
 PM x2 EB 420 C Blower
 Oil Chg on Bare Blower OMEGA 53 PLUS
 PM Refrig Dryer TE 141
 Inclg Inline Filtration. 03/05 ks

Label all returned goods!

Reason for return	Returned goods	to oper.	Pc	Material No.	Serial No.	Returned by		
Disposal	As Consumed	0010	5	As Consumed		☐ 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
10:00 AM	1:45 PM	0 Min	Monday, 4/8/19	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)

accounting@trinityadc.com

Service
technician's
signatureKaeser Field
Service:PNDigitally signed by
Kaeser Field Service:PN
Date: 2019.04.08
13:44:00 -05'00'Customer's
signature

Remark:

☒ Signature unavailable

Remark:

Signature Pad Not Working.

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

Oper. 0010 **Maintain screw compressor - package A** 1.5
Type CSD 100 125 psi 460/60 US **1006746237**
Material No. 100818.1 **Year** **2009**
Serial No. 1234 **EMR** **3498678**

Previous service hours 42,363 h **Current service hours** 44,886 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 155 psi/bar	
☒ -Check shutdown function when airend discharge temp. too high	Ok
☒ -Check control voltage: L1 122.7 V	Ok
☒ -Check power consumption: Line U1 143.1 A V1 143.5 A W1 143.7 A	Ok
☒ -Check pressure relief valve(s)	Ok
☒ -Check airend discharge temperature 178 °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 44886 Load h 19261 Ambient temp. 65 °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 oil filter and the air filter. Replaced the electrical cabinet filter mats. Inspected the drive coupling. Drive coupling ok. Checked the oil level. Oil level ok. Greased the motor bearings. Inspected the compressor for oil/air leaks. No leak 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>
85964844		0			W000

<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	6.4148.1	1		0	☐ Tech. ☐ Customer
Oil filter 16bar	6.3465.0	1		0	☐ Tech. ☐ Customer
Oil Analysis Kit (red)	ANKCPIND2BR	1		0	☐ Tech. ☐ Customer ☐ Tech. ☐ Customer

Oper. 0020 **Maintain blower - package A** 1.0
Type EB 420 C VAC 40,0 hp 2.460 rpm **1006746238**
Material No. EBC **Year** 2009
Serial No. 2138 **EMR** 3605958

Previous service hours

5 h

Current service hours

6 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)	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: 6 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:		
Shutdown the blower following LoTo procedures. Drained the oil and refilled with SB-220 oil. Replaced the air filters. Inspected the belts and ensured proper tension. Inspected the blower for oil/air leaks. No leaks detected. Blower is operating correctly with no problems at this time. Could not monitor the operation due to the site not running the blowers 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
					☐ Tech. ☐ Customer

Oper. 0030 **Maintain blower - package A** 1.0
Type EB 420 C VAC 40,0 hp 2.460 rpm **1006746239**
Material No. EBC **Year** 2009
Serial No. 2140 **EMR** 3605982

Previous service hours

6 h

Current service hours

7 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)	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: 7 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:		
Shutdown the blower following LoTo procedures. Drained the oil and refilled with SB-220 oil. Replaced the air filters. Inspected the belts and ensured proper tension. Inspected the blower for oil/air leaks. No leaks detected. Blower is operating correctly with no problems at this time. Could not monitor the operation due to the site not running the blowers at this time.		

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

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

Oper. 0050 **Maintain blower - package B** 1.3
Type OMEGA 53 PLUS cyl.left vert./cpl. **1006751716**
Material No. 881150.00108 **Year** **2009**
Serial No. 2242 **EMR** **574763**

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

Work to be done	Comment
>Tasks to be completed and current condition recorded: OK	
☒ -Ensure safe working conditions as described in the manual	Ok
☐ -Clean surface of airend and motor	N/A
☐ -Check that the block mechanism turns freely	N/A
☐ -Check the block drive shaft seal	N/A
☐ -Check V-belts and change or re-tension as necessary	N/A
☐ -Check guard	N/A
☐ -Check extractor blade (enclosure)	N/A
☐ -Change air filter	N/A
☐ -Check oil and change if necessary	N/A
☐ -Check the oil drain lines and connections	N/A
☐ -Check pipe connections	N/A
☐ -Check compensator(s) and change if necessary	N/A
☐ -Open and check unloaded start valve	N/A
☐ -Open and check the check valve	N/A
☐ -Check electrical cables and cable inlets	N/A
☐ -Tighten mains terminals and check for oxidation	N/A
☐ -Check overcurrent relays and motor protection switches	N/A
☐ -Check motor bearings, re-grease (Unirex N3 only) as needed/change	N/A
☐ -Check control voltage: L1 V	N/A
☐ -Check power consumption: Line U1 A V1 A W1 A	N/A
☐ -Check overheating shutdown function (option)	N/A
☐ -Check pressure relief valve(s)	N/A
☐ -Test run, check conditions: start, load and shut-down	N/A
☐ -Check display functions	N/A
☐ -Check oil level and check for leaks	N/A
☐ -Register service: stick label/service manual/controller	N/A
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:		
Customer does not have an additional blower. Only 2 blowers are at the customer site.		

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

Material delivered in advance	Material No.	Pc	Serial No.	Return	Returned by
Omega Blower 220 Synthetic C	ANSB-220	1		1	☒ Tech. ☐ Customer ☐ Tech. ☐ Customer

Oper. 0060	Maintain compr. air receiver - package A	0.5
Type	200 Gal Tank w/ AMD 6550	1006746552
Material No.	9.9999.9	Year 2009
Serial No.	1251	EMR 4403267

Work to be done	Comment
>Tasks to be completed and current condition recorded: OK	
☒ -Ensure safe working conditions as described in the manual	Ok
☒ -Visually check air receiver exterior condition	Ok
☒ -Maintain condensate drain	Ok
☒ -Check pressure indicator	Ok
☒ -Check pressure relief valve(s) for visible damage - contamination	Ok
☒ -Check for leaks	Ok
☒ -Register service: stick label/service manual	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 air receiver. Rebuilt the AMD6550 drain on the receiver. Drain and tank are operating correctly with no problems at this time.	

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>

Rebuild Kit for AMD 6550	US50180	1	0	☐ Tech. ☐ Customer
				☐ Tech. ☐ Customer

Oper. 0070	Maintain refrigeration dryer	2.0
Type	Refrig. dryer TE 141 460/3/60	1006746240
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 300 psi/bar	Ok
☒ -Check compressed air temp.: Inlet 70 °F/°C Outlet 60 °F/°C	Ok
☒ -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 65 °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. Replaced the ECO-drain service unit on the dryer. Inspected the dryer for leaks. No leaks detected. 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>
Kaeser Eco-Drain 31 Service U	AN8247400370	1		0	☐ Tech. ☐ Customer ☐ Tech. ☐ Customer

Oper. 0080 **Maintain oil-water sep. - package A** 0.5
Type KCF-100 Condensate Treatment System **1006746241**
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 inspected for leaks. No leaks detected. 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**

Filter-SET Aquamat KCF100 ANKCF100CAR 1 0

☐ Tech.
☐ Customer
☐ Tech.
☐ Customer

Oper. 0090 **Maintain compr. air filter - package A** 1.0
Type Oil Removal KOR-485.2 w/ AMD1550 **1006746242**
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 and o-ring. Cleaned the housing and inspected for leaks. No leaks detected. Rebuilt the AMD1550 drain. Inspected the drain for leaks. No leaks detected. Filter and drain are 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
O Ring, BUNA 5.734 ID	US3098816	1		0	☐ Tech. ☐ Customer
Service Kit for AMD 1550	AN55800	1		0	☐ Tech. ☐ Customer
					☐ Tech. ☐ Customer

Oper. 0100	Maintain compr. air filter - package A	1.0
Type	Particulate KPF-485.2 w/ AMD1550	1006746566
Material No.	USKPF485.2	Year 2009
Serial No.	*	EMR 3742805

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 KPF element and o-ring. Cleaned the housing and inspected for leaks. No leaks detected. Rebuilt the AMD1550 drain. Inspected the drain for leaks. No leaks detected. Filter and drain are 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 KPF Element	USPF-485	1		0	☐ Tech. ☐ Customer
O Ring, BUNA 5.734 ID	US3098816	1		0	☐ Tech. ☐ Customer
Service Kit for AMD 1550	AN55800	1		0	☐ Tech. ☐ Customer
					☐ Tech. ☐ Customer

Oper. 0120 **Maintain filter - package B** 1.0
Type Separator - KFS-485.2 AMD 1550 **1006746503**
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
☒ -Change filter element(s)	Ok
☒ -Clean filter housing and control bores in the filter head	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:	
Replaced the KFS element and o-ring. Cleaned the housing and inspected for leaks. No leaks detected. Rebuilt the AMD1550 drain. Inspected the drain for leaks. No leaks detected. Filter and drain are operating correctly with no problems at this time.	

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>
Std 485 KFS Element	USFS-485	1		0	☐ Tech. ☐ Customer
Service Kit for AMD 1550	AN55800	1		0	☐ Tech. ☐ Customer
O Ring, BUNA 5.734 ID	US3098816	1		0	☐ Tech. ☐ Customer

SERVICE ORDER

KAESER COMPRESSORS

Equipment at customer location 10049408 Trinity Analysis and Development, 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	2140	reg.		-
EB 420 C VAC 40,0 hp 2.460 rpm		2009	EBC	2138	reg.		-
Separator - KFS-485.2 AMD 1550		2018	USKFS485.2	20150824	-----		-
Oil Removal KOR-485.2 w/ AMD1550		2009	USKOR485.2	1055	-----		-
Particulate KPF-485.2 w/ AMD1550		2009	USKPF485.2	1025	-----		-

Non-registered machines

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

Appendix C Off Depot Air Sparge/Soil Vapor Extraction System Well Repair, Modification, and Maintenance Memorandum

MEMORANDUM
OFF DEPOT AIR SPARGE/SOIL VAPOR EXTRACTION SYSTEM WELL
REPAIR, MODIFICATION, and MAINTENANCE
DEFENSE DEPOT MEMPHIS, TENNESSEE

PREPARED FOR: Joan Hutton, CALIBRE
Laura Roebuck, U.S. Army Corps of Engineers, Mobile District
PREPARED BY: Trinity Analysis & Development Corp.
DATE: 31 October 2018

This memorandum provides details pertaining to the repair, modification and maintenance of air sparge (AS) and soil vapor extraction (SVE) wells and components associated with the Off Depot AS/SVE system, Dunn Field - Defense Depot Memphis, Tennessee (DDMT). The work was performed for the Department of the Army, Office of the Assistant Chief of Staff for Installation Management, Base Realignment and Closure Division by Trinity Analysis & Development Corp. (Trinity) under Contract W91278-16-D-0005/W9127818F0405 with the U.S. Army Corps of Engineers, Mobile District.

Repair and maintenance activities were performed between 3 October and 5 October 2018. Tasks directly associated with the wells were conducted by McCray Drilling, LLC (Tennessee Well Drillers License Number 769) under subcontract to Trinity; all other tasks were performed by Trinity. The location and layout of DDMT and the AS/SVE system are shown on **Figure 1** and **Figure 2**. Site photographs are provided in **Attachment 1**.

For reference in the following discussions, all AS and SVE wellheads are completed with a 2-inch schedule 40 polyvinyl 40 chloride (PVC) tee glued directly to the well riser. The top of the tee is fitted with a 2-inch PVC female threaded coupler and male threaded plug. The lateral connection is reduced in size to allow for connection of the air lines. Surface protection consists of 2-foot by 2-foot concrete pads with 12-inch diameter flush mount well vaults, no bollards are present.

SVE Well Air Line Purging

Prior inspections have identified the presence of water in many of the SVE air lines between the manifold and wellheads. This task included the removal of any accumulated water in the air lines that may adversely affect the overall performance and operation of the remediation system.

To remove the water, both SVE blowers were turned off and wellhead plugs removed (as able). A 125 cubic foot/minute (cfm) air compressor was attached individually to each of the air lines at the manifold and fluids were then blown back to the wellhead. The following describes the activities performed at each SVE well.

- ODSVE-01 and ODSVE-02 were accessible but could not be opened at the wellhead. The male threaded plugs at these two locations were inverted during install and had become silted and no lid was present at ODSVE-02; **Attachment 1, Photograph 1** and **Photograph 2**. Due to the potential for damage to the wellheads (e.g., broken glued fittings) during plug removal, these wells were not purged as no prior issues had been noted.
- ODSVE-03 through -06, -08, -09, and -11 were purged and no water was observed to be present in the lines.
- ODSVE-07 could not be located.
- ODSVE-10 and -12 were purged and air lines cleared of water.

Wellhead Repair ODAS-17

During routine operation and maintenance (O&M) inspection in December 2017, the ODAS-17 wellhead was observed to have blown out of the ground due to suspected high pressure (**Photograph 3**). To repair, the remainder of the well pad was removed and the area around the riser was hand dug to expose the riser break and air line. After exposing the damaged wellhead, a tremie pipe was lowered to the bottom of the well and sediment flushed with potable water. Once all sediment was removed, air from the treatment system was used to blow any loose debris from the air line, and the wellhead reassembled (**Photograph 4** and **Photograph 5**). The following day, the well was turned on and it was observed that the pressure was set at 95 pounds per square inch (psi). This was lowered to the desired 40 psi and observed for 5 minutes with no indication of leaking. New well pad and flush mount protective vault set (**Photograph 6**).

Additional Well Head Repair

This task included the inspection, troubleshooting, and repair of other noted AS air line/wellhead deficiencies. The following describe the findings and applicable repairs.

- ODAS-09, -22, -31, and -33 – upon removal of vault lid, air was observed to be leaking from the threaded plug/coupler. Repairs made by removing the plugs, applying new thread-tape, and reinstalling the plugs. After repairs, wells were pressurized and no air leaks observed over 5 minutes.
- ODAS-05, -52, and -74 – upon removal of vault lid, air was observed to be leaking from the air line connection at the tee. Interior of well vault was excavated to expose air line lateral connection and breaks were noted. Repairs were made by cutting riser with an internal pipe cutter beneath the original tee, replacing the wellhead assembly with new materials, and reconnecting the air line; **Photograph 7**. After repairs, wells were pressurized and no leaks observed over 5 minutes. Placed new well pads at ODAS-05 and -52 using existing vault and placed new well pad and vault at ODAS-74; **Photograph 8**.
- ODAS-32 – well pad had been displaced resulting in the wellhead being shifted against the vault interior. Old pad and vault were removed and replaced with new materials; **Photograph 9**.
- ODAS-23 and -35 – height of PVC plug on top of wellhead prevented proper installation of the vault lid. Repairs made by cutting riser with an internal pipe cutter beneath the original tee and replacing the wellhead assembly with new materials. After repairs, wells were pressurized and no air leaks observed over 5 minutes.
- ODAS-62 – location was noted as appearing “disturbed” based on pitch of concrete pad. Lid was removed and vault observed to be full of soil with no sign of well. Soil was excavated to observe the wellhead positioned against the vault interior wall indicating that surface displacement of pad had occurred; **Photograph 10**. Additional excavation identified an air leak at the lateral tee connection. Repairs made by cutting riser with an internal pipe cutter beneath the original tee and replacement of the wellhead assembly, pad, and vault with new materials; **Photograph 11**. After repairs, well was pressurized and no air leaks observed over 5 minutes; **Photograph 12**.

Condensate Handling

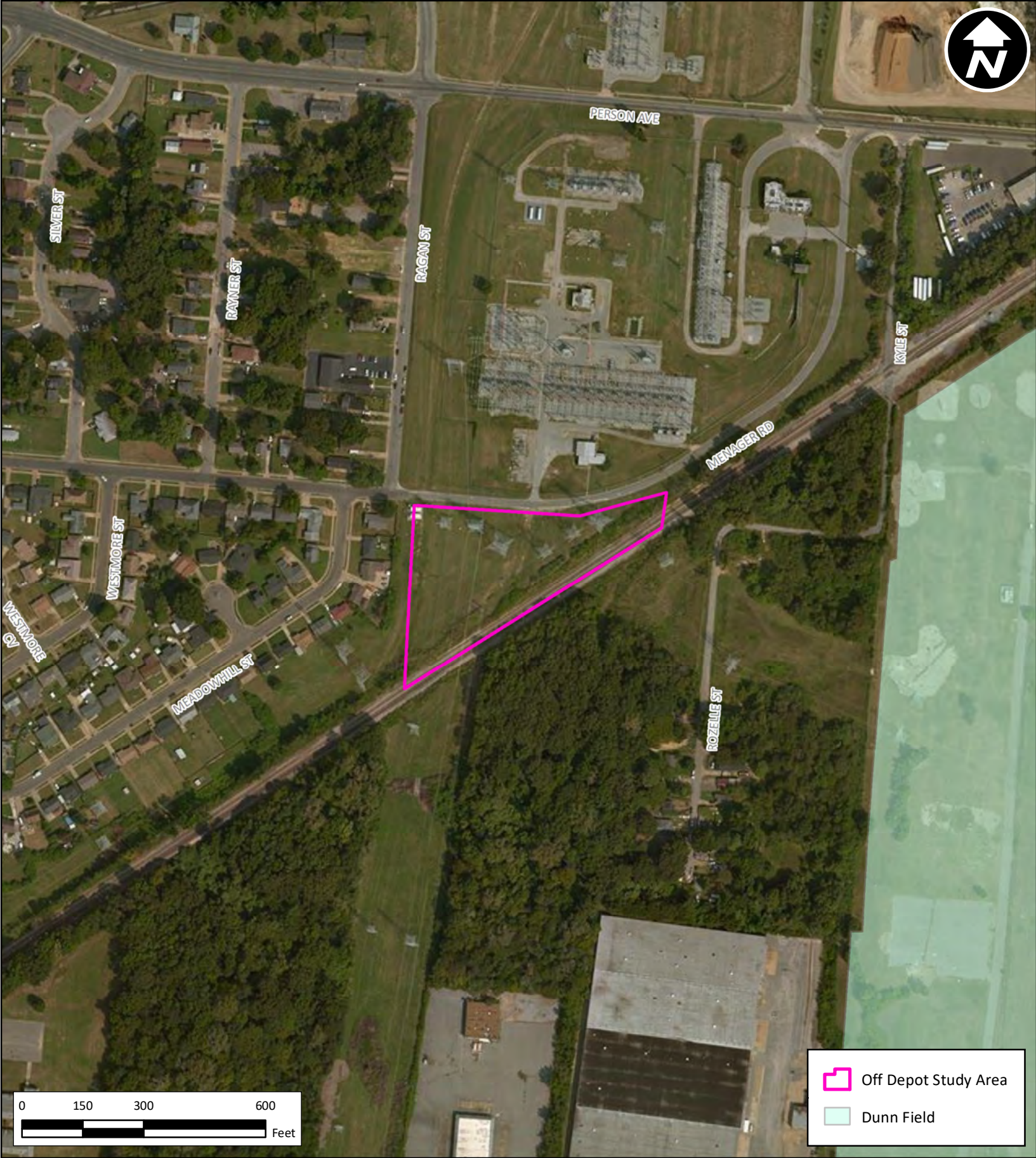
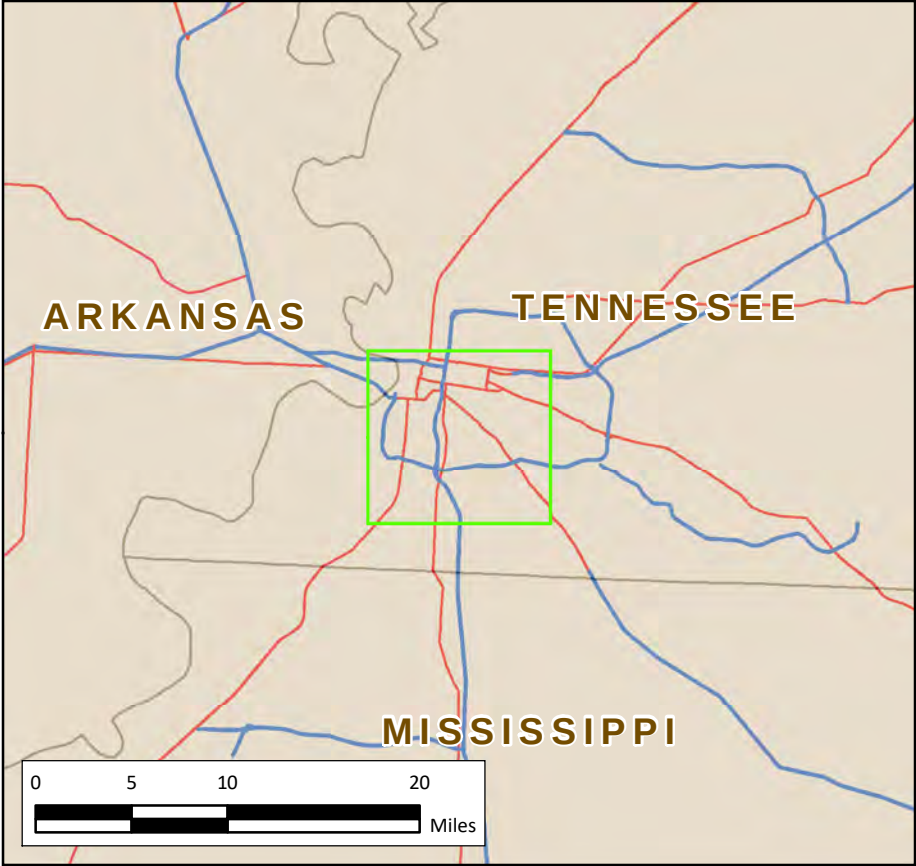
During the winter of 2017/2018, abnormally cold ambient temperatures resulted in the freezing of SVE blower condensate in the external transfer line and storage tank. To mitigate future freezing, the following activities were completed. Product brochures and user guides for installed equipment are provided in **Attachment 2**.

- Where possible, the condensate drain line from the building to the exterior storage tank was suspended beneath the SVE exhaust with metal plumber's tape to utilize an existing heat source; **Photograph 13**. Dual element heater tape was attached to the portion of the drain line positioned on the ground surface between the end of the SVE exhaust line and vertical rise to tank inlet; **Photograph 14**. The external power source was mounted in a weather proof enclosure affixed to the exterior of the system box; **Photograph 15** and **Photograph 16**.
- A thermostat controlled 1,500-watt submersible tank heater was placed in the condensate holding tank to prevent freezing; **Photograph 17**.

Miscellaneous Site Maintenance Activities

The following miscellaneous site maintenance activities were performed to ensure continued operation of the AS/SVE system.

- Replaced worn air filter seal on the air end of SVE blower #2. Need was identified during a June 2018 maintenance event and is not considered part of routine preventative maintenance.
- Well pads at the 12 SVE well locations and 70 AS well locations were cleared of all vegetation for ease of access.
- Vegetation within the system compound was removed; **Photograph 18**.
- Vegetation within the electrical enclosure of the system compound was removed; **Photograph 19**.
- Combination lock on entrance to electrical enclosure replaced with a larger shackle lock.



Service Layer Credits: © 2018 Microsoft Corporation © 2018

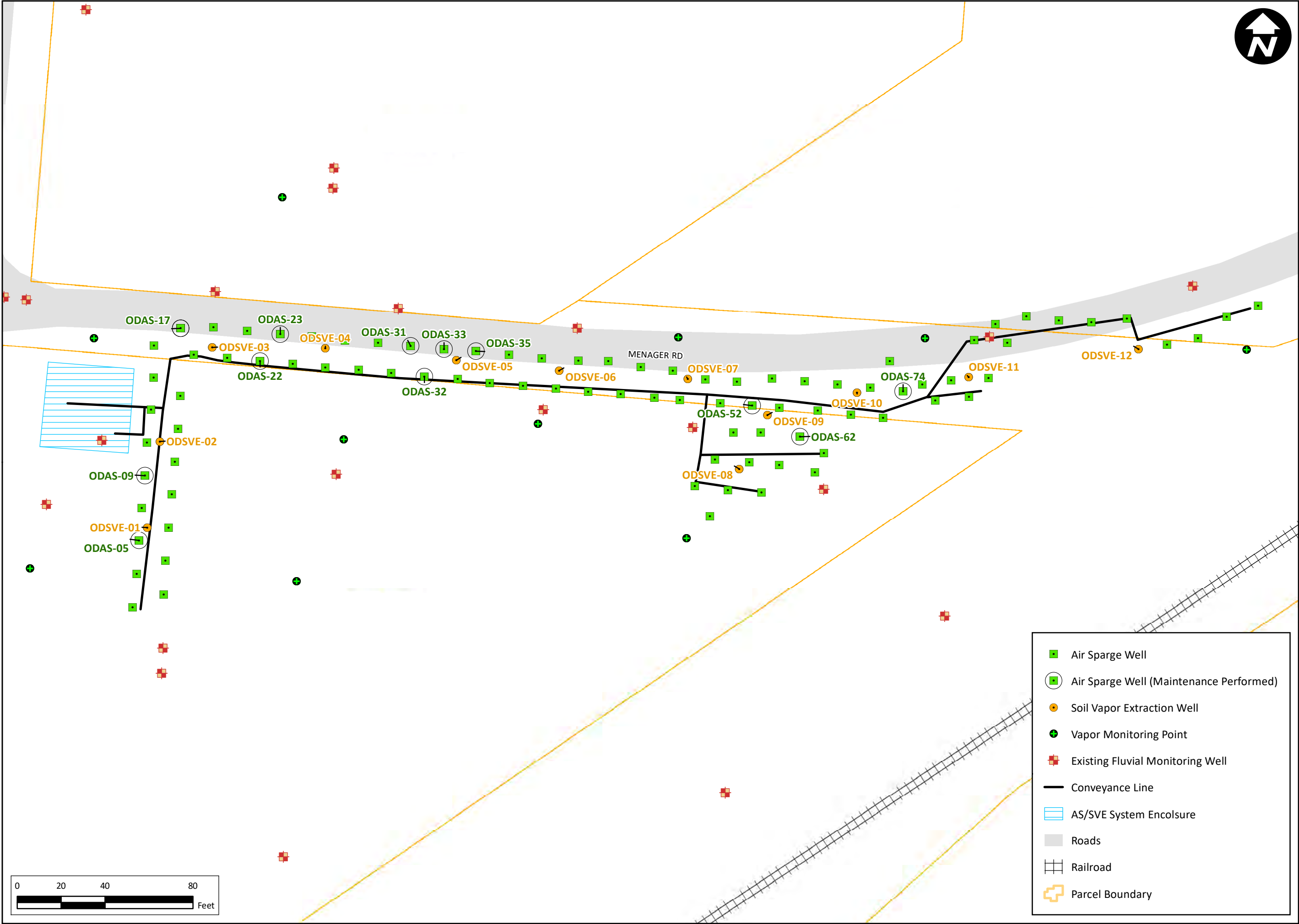
Trinity Analysis & Development Corp.



Defense Depot Memphis, Tennessee
Memphis, Shelby County, Tennessee

PROJECT NO: W91278-16-D-0005 W9127818F0405	SCALE: AS SHOWN	DATE: 10/23/2018	DRAWN BY: JTC

Figure 1
Off Depot AS/SVE
System Location



Attachment 1 Site Photographs



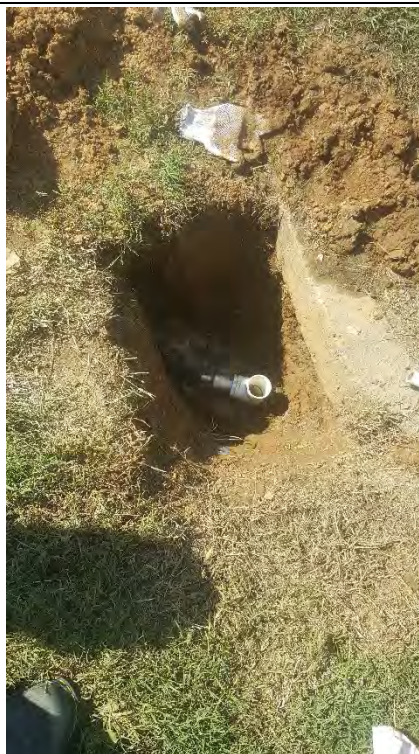
Photograph 1 ODSVE-02 location



Photograph 2 ODSVE-02 wellhead condition



Photograph 3 ODAS-17 initial damage



Photograph 4 air line repair



Photograph 5 ODAS-17 wellhead repair



Photograph 6 ODAS-17 pad/vault replacement



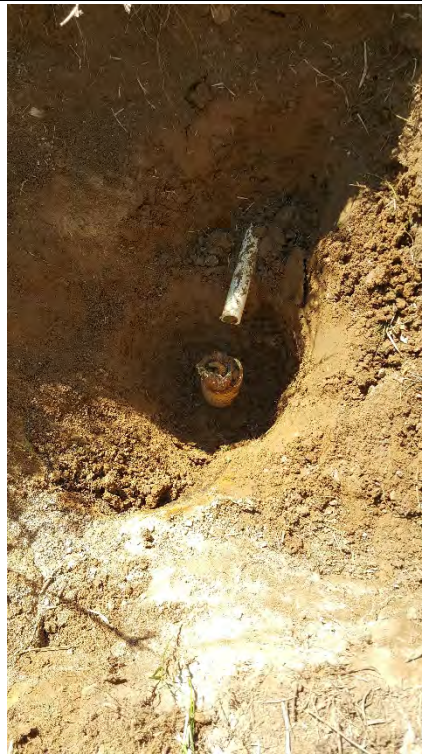
Photograph 7 ODAS-05 wellhead repair



Photograph 8 ODAS-74 pad/vault replacement



Photograph 9 ODAS-32 wellhead repair



Photograph 10 ODAS-62 wellhead initial damage



Photograph 11 ODAS-62 wellhead repair



Photograph 12 ODAS-62 pad/vault replacement



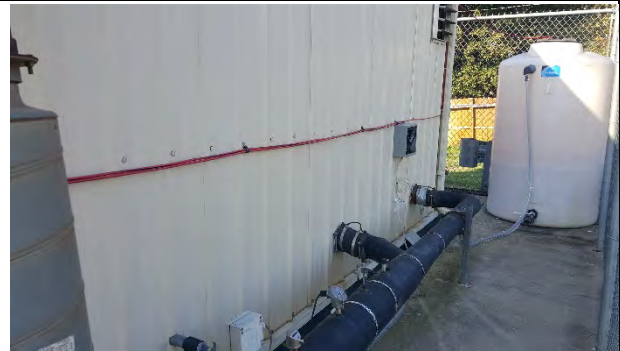
Photograph 13 Condensate line placement



Photograph 14 Condensate line heater tape



Photograph 15 Heater tape electrical



Photograph 16 Heater tape electrical



Photograph 17 Submersible tank heater



**Photograph 18 Compound area
vegetation cleared**



**Photograph 19 Electrical compound vegetation
cleared**

Attachment 2 Product Brochures and User Guides

BriskHeat®



SDC Benchtop Digital Temperature Controller



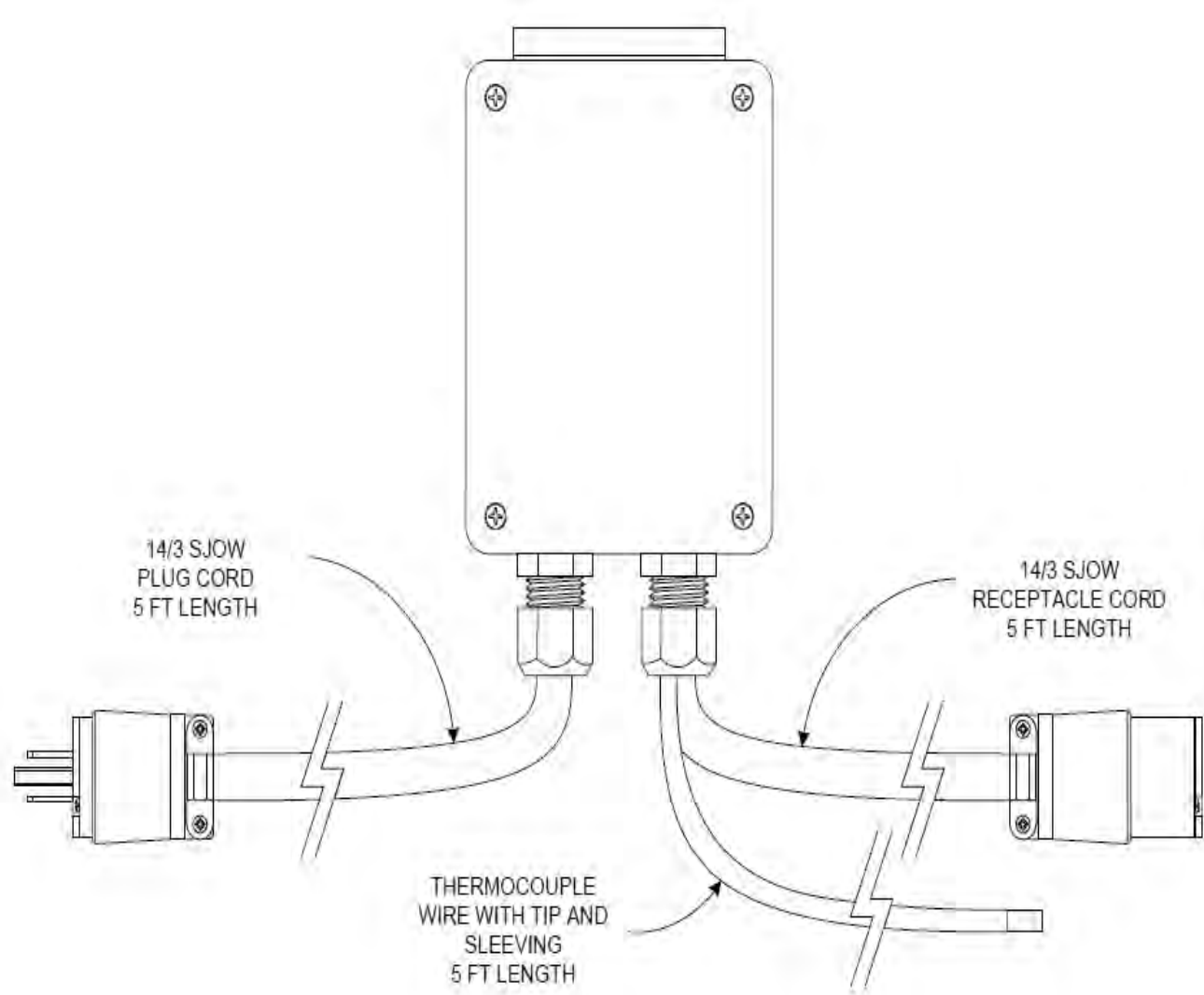
Read and understand this material before operating or servicing this temperature controller. Failure to understand how to safely operate this controller could result in an accident causing serious injury or death. This controller should only be operated by qualified personnel.

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Troubleshooting Guide.....	5
Warranty.....	BACK

Introduction

BriskHeat® SDC Benchtop Digital Temperature Controller designed for general purpose use in indoor environments to control temperatures on applications requiring automatic control. For successful operation of this controller, read and understand these instructions prior to use.



SAVE THESE INSTRUCTIONS!
Additional copies of this manual are available upon request.

Important Safety Instructions



SAFETY ALERT SYMBOL

The symbol above is used to call your attention to instructions concerning your personal safety. It points out important safety precautions. It means “**ATTENTION!** Become Alert! Your Personal Safety is involved!” Read the message that follows and be alert to the possibility of personal injury or death.

! DANGER

Immediate hazards which **WILL** result in severe personal injury or death

! WARNING

Hazards or unsafe practices which **COULD** result in severe personal injury or death

! CAUTION

Hazards or unsafe practices which **COULD** result in minor personal injury or property damage

! DANGER

A person who has not read and understood all operating instructions is not qualified to operate

! DANGER

- Do not immerse or spray any component of the temperature controller in liquid.
- Keep volatile or combustible material away from controller when in use.
- Keep sharp metal objects away from controller.

Failure to observe these warnings may result in electric shock, risk of fire, and personal injury.

! CAUTION

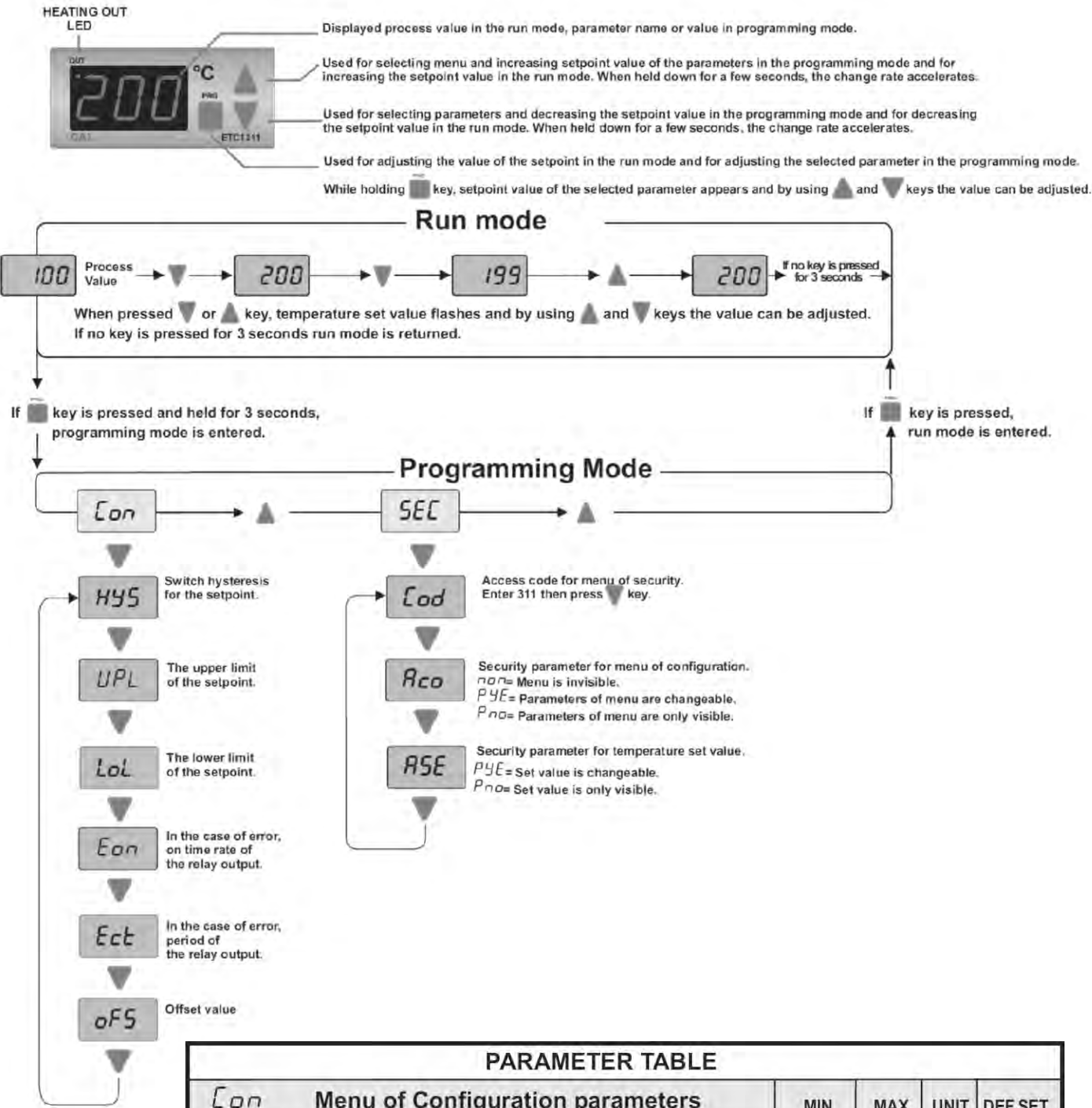
- Inspect all components before use.
 - Do not use controller if any component is damaged.
 - Do not repair a damaged or faulty controller.
 - Do not crush or apply severe physical stress on any component of system, including cord assembly.
 - Unplug controller when not in use.
- Failure to observe these warnings may result in personal injury or damage to the temperature controller.

! WARNING

End User Must Comply to the Following:

- Only qualified personnel are allowed to connect electrical wiring
- All electrical wiring must follow local electrical codes and NEC Article 427
- Final installation/wiring is to be inspected by the authority who has jurisdiction in the area where the heater and temperature control system are installed
- The end-user is responsible for providing a suitable disconnect device
- The end-user is responsible for providing a suitable over-protection device. It is highly recommended that a ground-fault circuit breaker be used

Programming Your Controller



PARAMETER TABLE					
Con	Menu of Configuration parameters		MIN	MAX	UNIT DEF.SET
HYS	Switch hysteresis for the setpoint. (When temperature falls to SET-HYS, output relay becomes active.)		1	20	°C 1
UPL	The upper limit of the setpoint.		LoL	600	°C 600
LoL	The lower limit of the setpoint.	Fe-CuNi	0	UPL	°C 0
		Pt100	-99	UPL	°C -99
Eon	In the case of error, on time rate of the relay output.		0	100	% Ect 0
Ect	In the case of error, period of the relay output.		10	250	sec 30
oFS	Offset value.		-99	99	°C 0
SEC	Menu of Parameter security				
Rco	Security parameter for menu of configuration. non= Menu is invisible. PYE= Parameters of menu are changeable. Pno= Parameters of menu are only visible.				
RSE	Security parameter for temperature set value. PYE= Set value is changeable. Pno= Set value is only visible.				

Troubleshooting Guide

Please read this guide prior to contacting BriskHeat®. This guide is designed to answer the most commonly asked questions. If you are unable to identify the problem or need additional assistance, please contact your local distributor/representative or us at:

<i>U.S. and Canada</i>	1-800-848-7673
<i>Worldwide</i>	614-294-3376
<i>Email</i>	bhtsales1@briskheat.com

Error Messages

	Means, temperature value is higher than the scale.
	Means, temperature value is lower than the scale.
	Means, temperature sensor is broken or over temperature.

Notes:

Notes:

WARRANTY INFORMATION

BriskHeat® warrants to the original purchaser for the period of eighteen (18) months from date of shipment or twelve (12) months from date of installation, whichever comes first. Contact factory at 1-800-848-7673 toll free, U.S. / Canada) or 614-294-3376 for complete details.



1055 Gibbard Avenue - Columbus, Ohio 43201

1-800-848-7673 (U.S. & Canada)

1-614-294-3376 (Worldwide)

www.BriskHeat.com

BriskHeat®

XtremeFLEX®

Heating Tapes and Cords



Instruction Manual



Read and understand this material before operating or servicing these heating tapes. Failure to understand how to safely operate these heaters could result in an accident causing serious injury or death. These heaters should only be operated by qualified personnel.

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INTRODUCTION

XtremeFLEX® Heating Tapes and Cords are designed to provide a long and efficient service life with function, reliability, and safety in mind. For additional information concerning this, or other BriskHeat® products, please contact your local BriskHeat® distributor or contact us toll free (U.S. / Canada only) at 1-800-848-7673 or 614-294-3376.



SAFETY ALERT SYMBOL

The symbol above is used to call your attention to instructions concerning your personal safety. It points out important safety precautions. It means “**ATTENTION! Become Alert! Your Personal Safety is involved!**” Read the message that follows and be alert to the possibility of personal injury or death.



Immediate hazards which WILL result in severe personal injury or death



Hazards or unsafe practices which COULD result in severe personal injury or death



Hazards or unsafe practices which COULD result in minor personal injury or property damage.

SAVE THESE INSTRUCTIONS!

Additional copies of this manual are available upon request.

IMPORTANT SAFETY INSTRUCTIONS



⚠ DANGER

A person who has not read and understood all operating instructions is not qualified to operate this product.

⚠ DANGER

- Do not immerse heater in liquid.
- Keep volatile or combustible material away from heater when in use.
- Do not use heater in hazardous locations
- Keep sharp metal objects away from heater.

Failure to observe these warnings may result in electric shock, risk of fire, and personal injury.

⚠ WARNING

End User Must Comply to the Following:

- Only qualified personnel are allowed to connect the electrical wiring.
- All electrical wiring must follow local electrical codes and highly recommend following NEC Article 427.
- Final installation / wiring is to be inspected by the authority who has jurisdiction in the area that the heating blanket is installed.
- The end-user is responsible for providing a suitable disconnecting device.
- The end-user is responsible for providing suitable electrical protection device. It is highly recommended that a ground fault circuit breaker be used.

⚠ CAUTION

- Never handle the heater while it is in operation; always disconnect the heater from the power source and allow to cool prior to handling.
- Inspect heater before use.
- Do not operate heater without a temperature control device.
- Never connect heating tape to a controller's output without assembling the two separable plug halves (if applicable).
- Never use B00 or BW0 series tape on a conductive surface.
- Do not use heater with torn or worn surfaces.
- If spillage of foreign matter onto heater occurs, disconnect from power source and clean after heater is allowed to cooled.
- Never operate a heater without an appropriate heat sink (device being heated is considered a heat sink)
- Do not operate heater at temperatures above rated temperature value
- Fasten heater to device using approved methods only
- Do not repair damaged or faulty heaters.
- Do not crush or apply severe physical stress on heater or cord assembly.
- Unplug heater when not in use.

Failure to observe these warnings may result in personal injury or damage to the heater.

SPECIFICATIONS

Model	Type	Maximum Exposure Temperature	Nominal Watts
BIH †	Heavy Insulated	900°F (482°C)	Standard: 8.6 watts/in ² Wide: 5.1 watts/in ²
BIH-G † Part # ends with 'G'	Heavy Insulated-Grounded	482°F (250°C)	9.6 watts/in ²
BWH †	Heavy Insulated	1400°F (760°C)	Standard: 13.1 watts/in ² Wide: 7.7 watts/in ²
BWH-D † Part # ends with 'D'	Dual-Element	1400°F (760°C)	13.1 watts/in ²
BS0	Silicone Rubber	450°F (232°C)	4.3 watts/in ²
BS0-G Part # ends with 'G'	Silicone Rubber-Grounded	450°F (232°C)	4.3 watts/in ²
B00 †	Standard Insulated	900°F (482°C)	8.6 watts/in ²
BW0 †	Standard Insulated	1400°F (760°C)	13.1 watts/in ²
IFG †	Heavy Insulated	482°F (250°C)	6.0 watts/in ²
ISR	Silicone Rubber	450°F (232°C)	3.0 watts/in ²
HTC †	Heating Cord	900°F (482°C)	21 watts/ft
HWC †	Heating Cord	1400°F (760°C)	60 watts/ft

† Models intended for indoor or laboratory use only. Not for outdoor use.

INSTALLATION

WARNING

Read and understand this entire manual before operating this electric heater.

STEP 1

Remove heater from box. Make visual inspection of heater. Do not use if torn or damaged.

STEP 2

Installing your heating tape: The flexible heating tape can be installed on both a flat and/or curved surface. For a flat surface, lay the heating tape onto the surface to be heated. For a curved surface, wrap the heating tape onto the surface to be heated (A). The length of one entire side of the heating tape must be in full contact with the surface.



A.) Proper Installation

Ensure the heating tape is not kinked, twisted, or any portion of the tape hanging free from the surface (B). **Do not overlap heating tape on itself (C).** Attach the heating tape to the surface by using aluminum tape, fiberglass tape, or a mechanical clamping devices which will not cause damage to the heating tape.



B.) Incorrect Installation:
Heating tape hanging free from the surface



C.) Incorrect Installation:
Heating tape overlapped on itself

STEP 3

Connecting your heating tape to a power supply:

1. Your heating tape **must** be connected to an external control device. The heater must not be operated without some form of temperature control.

⚠ WARNING Your heater is designed to operate at a specific voltage. Refer to the label on the heater for proper operating voltage and wattage information. Failure to operate the heater at the specified rating could result in overheating of the heating blanket, the surface being heated or personal injury. Also note that too low of a supply of voltage will result in under heating.

All electrical connections must be made by qualified personnel and in accordance with all applicable codes and regulations.

2. Ensure the heater is protected by a properly sized circuit breaker or fuse.

3. Use of a ground fault circuit interrupter is highly recommended and maybe required.

4A. If heating tape came with a plug:

Plug power cord into appropriate controller.

4B. If heating tape did not come with a plug:

Two wires (same color) should be connected to the power source (or temperature control device) directly, through a junction box, or to a connector that is mated to a receptacle connected to the power source. BriskHeat® XtremeFLEX® Heating Tapes are non-polarized, allowing either wire to be connected to the neutral or hot. If BIH-G or BS0-G series, the third wire, designated by the color green (or a green stripe), should be connected to ground.

TROUBLESHOOTING GUIDE

Please read this guide prior to contacting BriskHeat®. This guide is designed to answer the most commonly asked questions. If you are unable to identify the problem or need additional assistance, please contact your local distributor/ representative or us at **1-800-848-7673, 614-294-3376**, or **bhtsales1@briskheat.com**.

PROBLEM	SOLUTION(S)
Does not heat	Verify heater is connected to proper voltage. Check to see if there is a resistance reading (not an open circuit) in heater using an ohm meter.
Circuit breaker is tripping	Validate that the circuit breaker is capable of handling the amp requirement of heater. The identification label located on the power cord displays the heater's amperage requirement. Examine heater and cord for any damage.

WARRANTY INFORMATION

The BriskHeat Corporation (hereinafter referred as ("BriskHeat")) warrants to the original purchaser for the **period of eighteen (18) months from date of shipment or twelve (12) months from date of installation**, whichever comes first, that the products manufactured by BriskHeat: (A) conform to the description and specifications as set forth in BriskHeat's current catalogue or in the quotation and drawings submitted by BriskHeat: and (B) are free from defects in materials and workmanship under prescribed use and service.

Remedy. BriskHeat's obligation and the exclusive remedy under this warranty shall be limited to the repair or replacement, at BriskHeat's option, of any parts of the product which may prove defective under prescribed use and service within eighteen (18) months from date of shipment or twelve (12) months from date of installation, whichever comes first, and which, following BriskHeat's examination, is determined by BriskHeats to be defective under conditions described herein: provided, BriskHeat has, at its option, a representative of BriskHeat present at start-up. BriskHeat shall not be liable for any incidental, consequential or special damages arising from any breach of warranty, breach of contract, negligence, or any other legal theory, including but not limited to, loss of use of parts or equipment or any associated equipment, cost of capital, cost of any substitute equipment, facilities or services, overhead, downtime costs, or claims of customer of purchaser for such damages. This remedy does not include labor costs for installation or removal of the equipment or parts covered by this warranty, and BriskHeat shall not be responsible for such labor costs.

Limitation. This warranty shall not apply to any product or part thereof which has been subject to accident, negligence, alteration, damage during shipment, improper service, abuse, or misuse, including but not limited to use beyond rated capacity. BriskHeat makes no warranty whatsoever with respect to accessories or parts not supplied or manufactured by BriskHeat. BriskHeat's obligation under this warranty shall be conditioned upon BriskHeat's receiving written notice of any defect within fifteen (15) days after its discovery, and, at BriskHeat's option, return of such equipment or parts prepaid to its factory at 1055 Gibbard Ave., Columbus, Ohio 43201.

Disclaimer. **BRISKHEAT MAKES NO WARRANTY WHATSOEVER, EXPRESS OR IMPLIED, EXCEPT AS IS EXPRESSLY SET FORTH ABOVE. NO AGENT, EMPLOYEE OR REPRESENTATIVE OF BRISKHEAT HAS ANY AUTHORITY TO BIND BRISKHEAT TO ANY AFFIRMATION, REPRESENTATION OR WARRANTY COVERING THE SALE OF ANY PRODUCT, AND UNLESS SUCH AFFIRMATION, REPRESENTATION OR WARRANTY MADE BY AN AGENT, EMPLOYEE OR REPRESENTATIVE IS SPECIFICALLY ENDORSED IN WRITING BY BRISKHEAT, IT SHALL NOT BE ENFORCEABLE BY ANY BUYER. BRISKHEAT MAKES NO EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY AND NO EXPRESS OR IMPLIED WARRANTY OF FITNESS FOR PARTICULAR PURPOSE, EXCEPT AS IS EXPRESSLY SET FORTH ABOVE. BRISKHEAT SHALL NOT BE LIABLE FOR CONSEQUENTIAL, INCIDENTAL OR SPECIAL DAMAGES.**

This warranty allocates risk between the purchaser and BriskHeat as authorized by the Uniform Commercial Code and other applicable law.

BriskHeat®

BriskHeat® Corporation
1055 Gibbard Ave, Columbus, OH 43201
Toll Free: 800-848-7673
Phone: 614-294-3376
Fax: 614-294-3807
Email: bhtsales1@briskheat.com
Web site: www.briskheat.com

PN: 10315 Rev F

Hot Tips for Cold days

A guide to choosing the right de-icer



Which de-icer should I buy? This is the #1 question on consumer's minds when they walk in a store. What is the answer? Here are 4 tips to ensure that you will be satisfied with your de-icer purchase:

❄️ **FLOATER OR SINKER** – No, these aren't baseball pitches. They are de-icers as you know. Floating de-icers float on top of the water. Sinkers or submergible units rest on the bottom of the tank. If you want a semi-permanent solution, consider a Drain Plug De-Icer. It is secured in a fixed mount position and has the added benefit of the cord coming out of the bottom of the tank, unnoticed by livestock.

❄️ **METAL OR PLASTIC TANK** – Any de-icer can be used in a metal tank. If the tank is plastic, you **MUST** use a de-icer that is SAFE for use in plastic. All Farm Innovators de-icers (except H-4810, H-4815) are **SAFE IN PLASTIC** without the need for a guard.

❄️ **COPPER OR CAST ALUMINUM** – While less expensive, De-icers with copper or incoloy heating elements **MUST** have a protective guard to use in plastic. The units come with only a One (1) Year Warranty and are generally not as efficient as Cast Aluminum models. All Farm Innovators “**ICE CHASER**” Cast Aluminum De-Icers are **SAFE IN PLASTIC** without the use of a guard. These units carry a Three (3) YEAR Warranty. They are virtually indestructible and are much more cost efficient than the open heating element de-icers.

❄️ **SIZE AND TEMPERATURE** – The larger the tank size and the colder the temperature, the higher wattage will be required. See our helpful cold zone chart on the reverse side.

HELPFUL HINTS FROM THE MANUFACTURER

- ❶ Protect your tank from the wind. The wind quickly removes the heat from the surface of the stock tank.
- ❷ Refrain from using long extension cords. This will reduce the wattage (power) to the unit.
- ❸ Purchase the right de-icer for your particular need.
- ❹ Remove any lime build-up from the heating element with lime-away or white vinegar.
Lime build up will minimize the performance and life of the unit.
- ❺ Read and follow all instructions from the manufacturer.

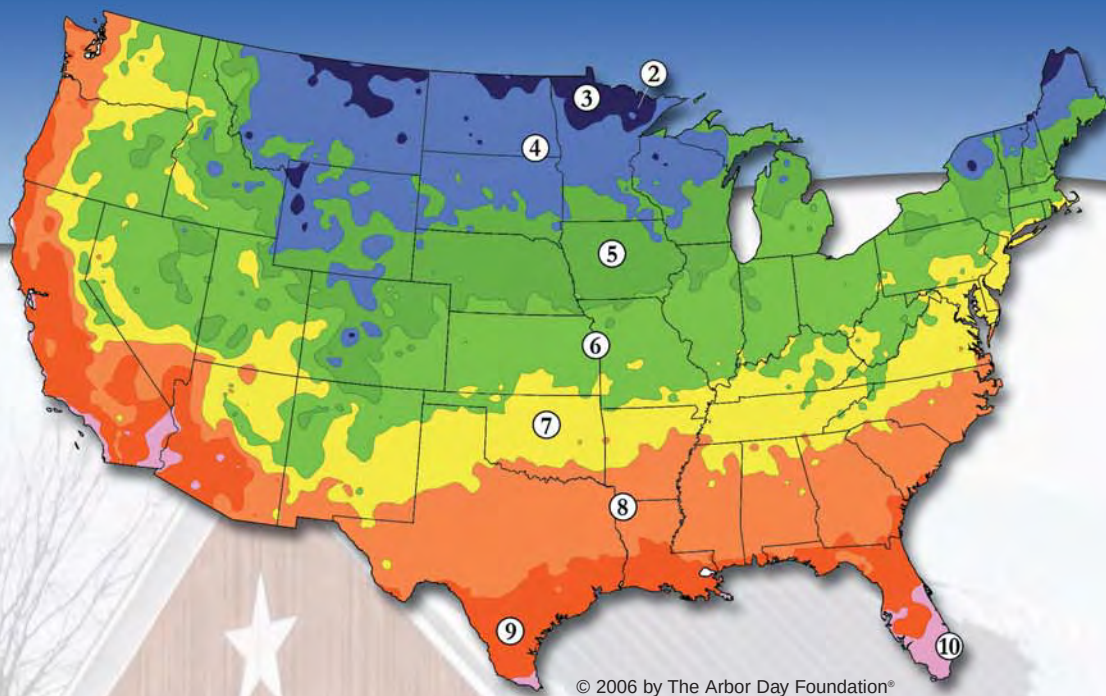


What You Need To Know About Stock Tank De-Icers

Select the right unit for your climate zone and tank size.

Zone Average Annual Low

- 2 -40°F through -50°F
- 3 -30°F through -40°F
- 4 -20°F through -30°F
- 5 -10°F through -20°F
- 6 0°F through -10°F
- 7 10°F through 0°F
- 8 20°F through 10°F
- 9 30°F through 20°F
- 10 40°F through 30°F



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Recommended De-Icer Wattage For Buckets, Stock Tanks And Other Containers

ZONE	5 GAL	25 GAL	50 GAL	100 GAL	200 GAL	300 GAL
2 - 3	500W	500W	1000W	1500W*	H-419	H-419
4	250W	500W	1000W	1500W*	1500W*	1500W*
5	250W	500W	1000W	1500W*	1500W*	1500W*
6 - 8	250W	250W	500W	1000W*	1500W*	1500W*

*Denotes Farm Innovators Exclusive 1250 Watt Cast Aluminum Floater Models H-418 and H-418C Can Be Used.

Choose The Farm Innovators Model That's Right For You:

Wattage	Model	Style	Application
250 Watts	C-250, H-49	Submersible	Automatic Waterers, Metal/Plastic Containers up to 25 Gal
500 Watts	C-500	Submersible	Automatic Waterers, Metal/Plastic Containers up to 50 Gal
1000 Watts	H-4815	Floater	Metal Stock Tanks up to 100 Gal
	H-439	Submersible	Metal/Plastic Stock Tanks up to 100 Gal
1250 Watts	H-418	Floater	Metal/Plastic Stock Tanks up to 300 Gal
	H-418C	Convert-Able	Metal/Plastic Stock Tanks up to 300 Gal
1500 Watts	H-4815	Floater	Metal Stock Tanks up to 300 Gal
	H-429	Submersible	Metal/Plastic Stock Tanks up to 300 Gal
	H-419	Submersible	Metal/Plastic Stock Tanks up to 300 Gal
	UPH-15	Drain-Plug	Metal/Plastic Stock Tanks up to 300 Gal
	DPH-15	Drain-Plug	Rubbermaid® Stock Tanks up to 300 Gal

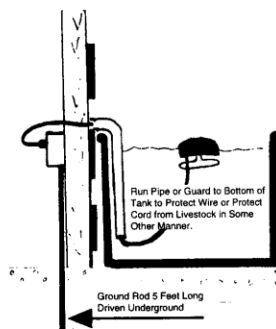


Post Office Box 546
Plymouth, IN 46563
www.farminnovators.com

IMPORTANT CONSUMER INFORMATION

(Read Carefully and Entirely)

1. The Models H-4810 and H-4815 are not safe in Plastic or Structural Foam Stock Tanks. Do not use them.
2. The Models DPH-15, UPH-15, H-418, H-418C, H-419, H-49, H-4615, P-418, P-500, H-429, H-439, H-493, C-50, C-250, C-500, and W-449 are all safe to use in Plastic, Structural Foam and Metal tank applications and all pond designs - liners, and pre-formed plastic.
3. De-icers will "only" operate when temperature reaches freezing.
4. Caution: Electricity and water are a dangerous combination—follow installations carefully and precisely.
5. All the units (except the Model W-449) are De-icers (designed to keep water de-iced only). Each unit is thermostatically controlled (except the Model B-9) to turn on when the "water temperature approaches freezing" and will "turn off according to the internal thermostat shut-off temperature".
6. The Model W-449 is a Water Heater. It is designed to "heat" a five gallon bucket to 100°F within twenty minutes. Once the water temperature of approximately 100°F has been reached—the unit will only re-activate when the water temperature cools down to approximately 80°F.
7. Low Voltage is a possible cause for failure or poor performance. Measure voltage at receptacle with unit energized. Voltage drop means wattage reduction. **Extension cords are what cause voltage drop and are unsafe to use.**



INSTALLING YOUR UNIT

Caution: To provide continued protection against electrical shock:

1. Have a qualified electrician install a properly grounded receptacle outlet, acceptable for outdoor use and protected from the rain and snow immediately adjacent to the location where the unit will be used.
2. Route supply cord through 1½" or 2" piping or conduit for safety while locating the unit so as to be protected from damage and/or chewing by livestock.
3. **DO NOT USE EXTENSION CORDS!**
4. Inspect the cord before using.
5. Do not plug unit in until the tank is filled with water and the unit is positioned in the tank. Do not operate the unit out of water. This will void the warranty.

6. Metal Tanks—Drive ground rod near tank. Securely clamp the uninsulated Copper wire to ground rod and securely clamp the other end of copper wire to the tank.
7. Plastic Tanks—Drive ground rod near tank. Securely clamp uninsulated Copper wire to ground rod and drape the other end of uninsulated Copper wire into the water inside the plastic tank. Drive rod a minimum of five (5) feet in the ground.
8. Unplug the unit at the receptacle when not in use or before removal from tank.
9. Store unit indoors after winter use following a thorough cleaning of unit.

Safety is primary when installing our units. Electricity and water are a dangerous combination—follow our instructions precisely when installing a unit.

MAINTENANCE

- If the unit freezes in due to power loss, allow the unit adequate time to melt itself free. Do not chip or cut at the unit while plugged into the receptacle.
- Do not allow lime deposits or other impurities to build up on the heating element. This can cause "hot spots" which is the primary reason for failure and voids the warranty. Remove the impurities by using vinegar or LimeAway on the Heating Element (Tubular or Cast Aluminum Element).
- When taking the unit out of service, disconnect the power supply cord, remove the unit from the water, clean the element (see above) and store indoors.

DO NOT ATTEMPT TO DISASSEMBLE THE UNIT AS THE UNIT HAS NO SERVICEABLE PARTS. THIS WILL VOID THE WARRANTY.

CHECK FOR PROPER OPERATION (Air Test)

1. Set unit in freezer for one hour or outside if the temperature is below 35°F for one hour out of water. Note: This is an air test—do not test the unit in water.
2. After an hour, plug the unit into a known good receptacle. Hold the unit by the supply cord. Within seconds, the element should begin to heat. Listen for the thermostat to "click off". Unplug and cool down the unit. The unit is working properly.

MAXIMUM EFFICIENCY IN HARSH ENVIRONMENTS

1. Protect the de-icer from high winds.
2. Install a partial cover and place the Submergible units up on a concrete block.
3. In larger tanks: Select one side to maintain open water. Wedge a loose partition about 8" high separating the ice free area.
4. Wind Breaks: 1" Styrofoam insulation, partial covering and banking up on the tank sides make heating easier in severe weather.

DE-ICER WATTAGE/GALLON REQUIREMENTS

	5 GAL	25 GAL	50 GAL	100 GAL	200 GAL	300 GAL
30°	250W	250W	500W	1000W*	1000W*	1000W*
20°	250W	250W	500W	1000W*	1000W*	1500W*
10°	250W	250W	500W	1000W*	1500W*	1500W*
0°	250W	500W	1000W	1500W*	1500W*	1500W*
-10°	250W	500W	1000W	1500W*	1500W*	1500W*
-20°	N/A	1000W	1500W	1500W*	N/A	N/A

* Denotes 1250 Watts Cast Aluminum Floater can be used.

THE FOREGOING WARRANTY DOES NOT APPLY IF:

1. The power cord or unit shows evidence of livestock damage or consumer negligence.
2. The ground terminal on the electrical plug has been removed or another plug has been used in place of the original plug.
3. Allowing lime or other water impurities to build up on the heating element causing possible "hot spots" which is a primary reason for the heating element to fail. Periodically, you should clean the heating element with vinegar or LimeAway.
4. The unit has been allowed to operate out of water except when performing Air Test.

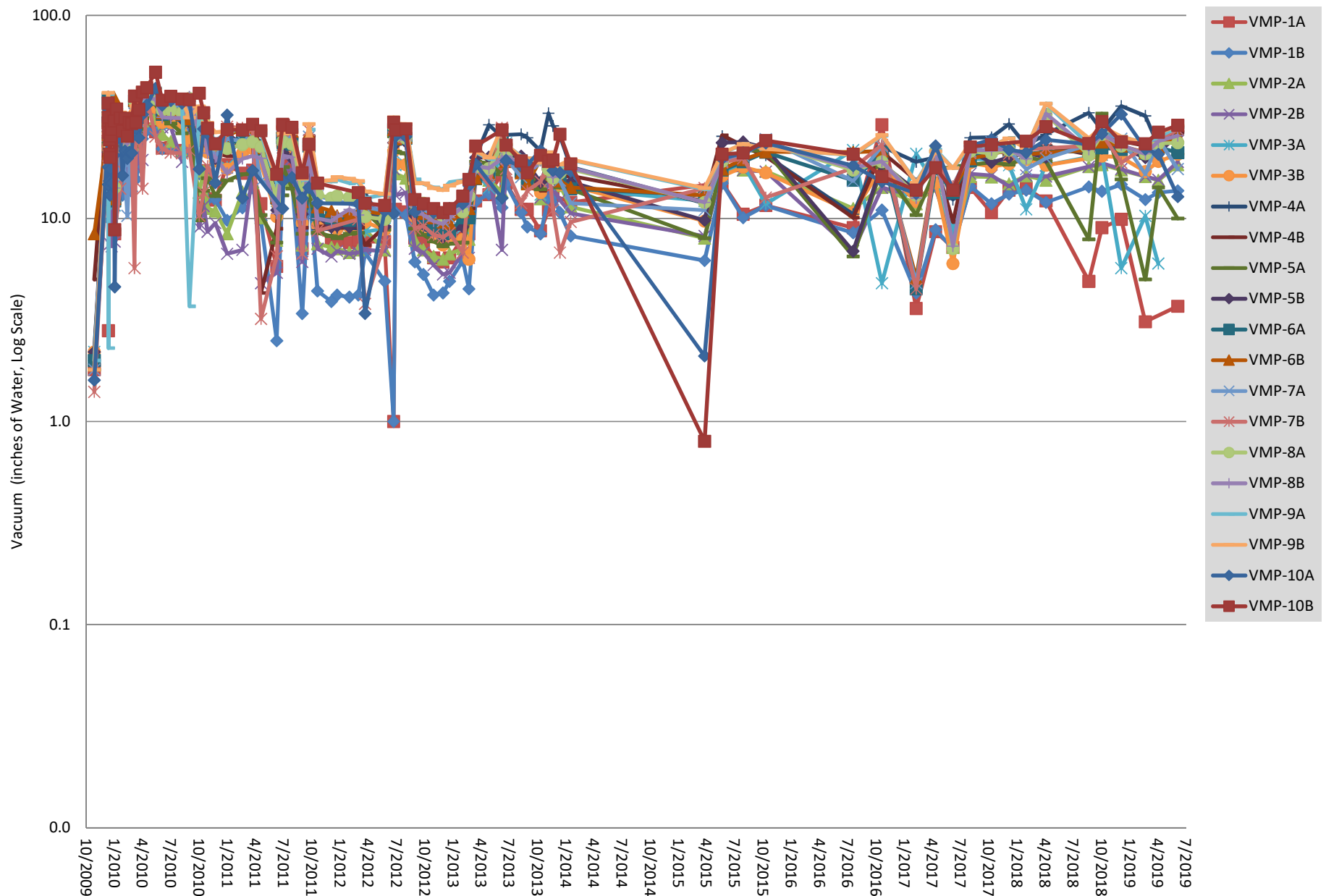
LIMITED WARRANTY

The Models H-4810, H-4815, H-439, H-429, H-4615, DPH-15, UPH-15, H-493, BD & GBD-Series C-250, C-500, P-500 and W-449 are guaranteed for one year and the Models H-418, H-418C, H-409, H-419, H-49, P-418, C-50 are guaranteed for three years after the original date of consumer purchase or date stamped on the unit against defects due to materials and the company's workmanship only. The sole obligation shall be to replace the defective unit with a replacement unit. Units should be "Checked for proper operation" prior to returning as defective. Units must be returned prepaid. No liability for loss or damage of any nature or kind, whether arising out of or from the use of the product, whether or not defective, is assumed by Farm Innovators, Incorporated.

Return Address: Farm Innovators, Inc. 2255 Walter Glaub Drive, Plymouth, IN 46563.

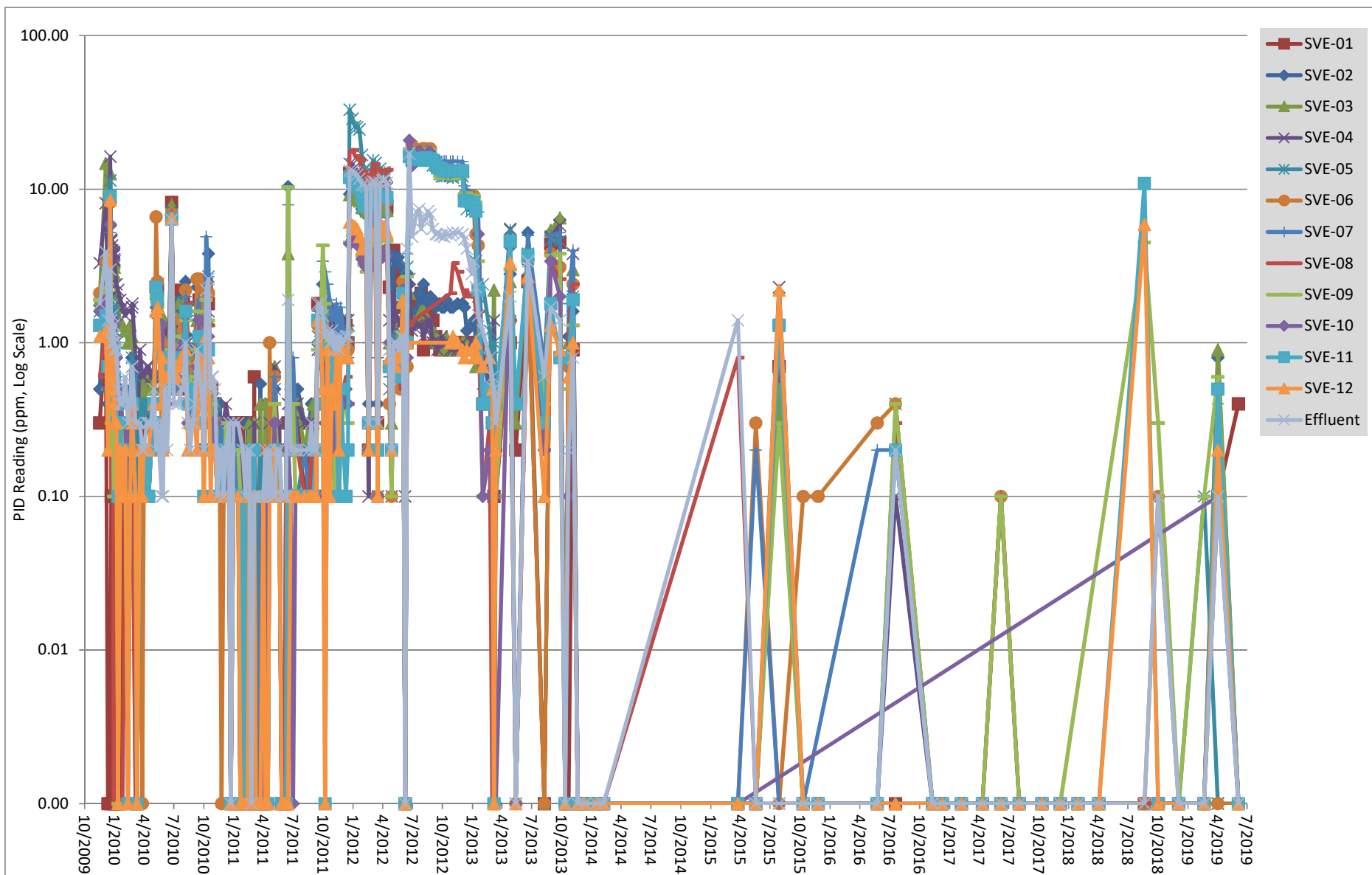
Appendix D Trend Charts for Vacuum and PID Measurements

Appendix D-1 VMP Trends – Vacuum Readings



Appendix D-1
 Figure 1
 VMP Trends - Vacuum Readings
 Off Depot AS/SVE System Annual Operations Report, Year Eight
 Defense Depot Memphis, Tennessee

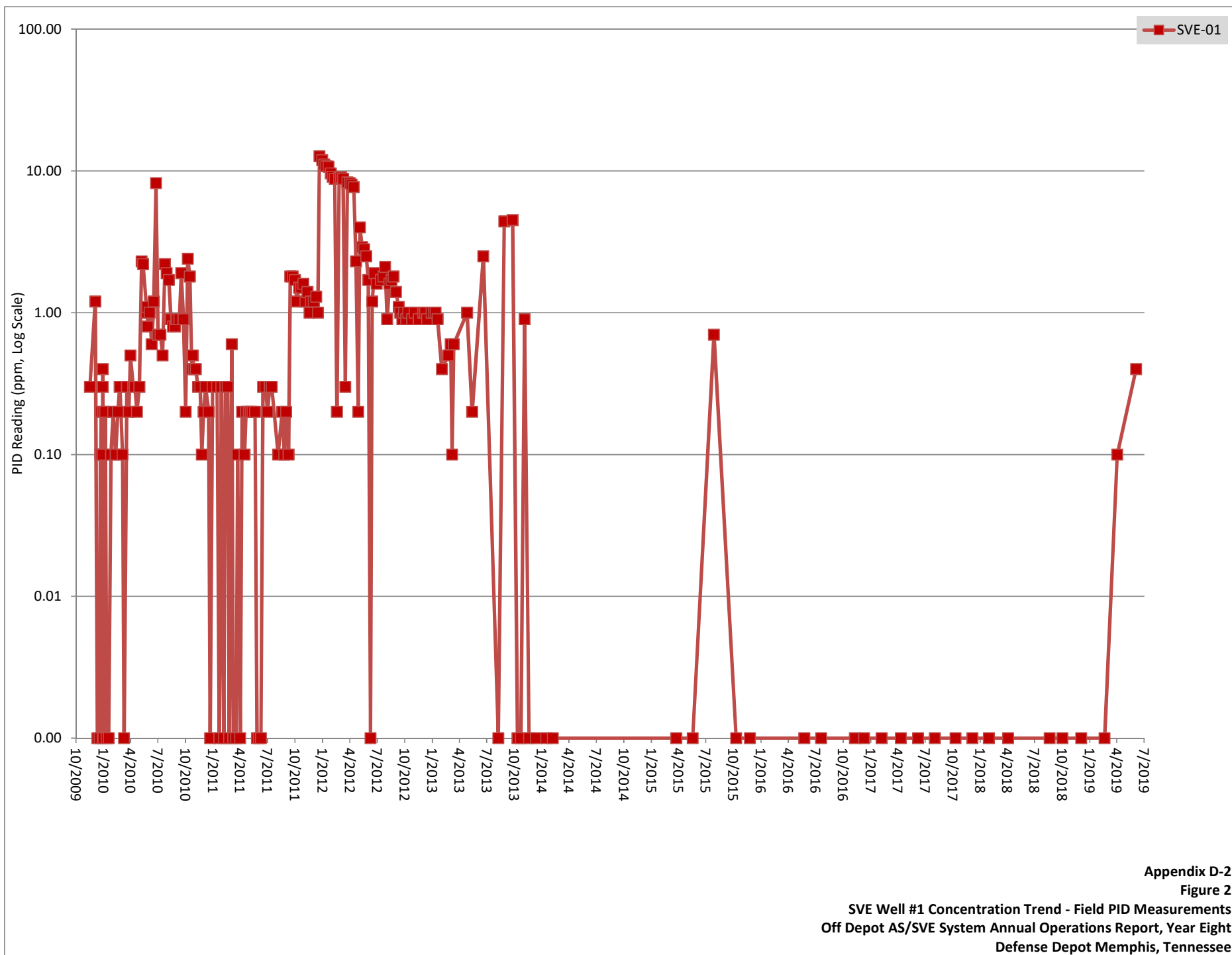
Appendix D-2 SVE Wells and Effluent Concentration Trends – Field PID Measurements



Appendix D-2

Figure 1

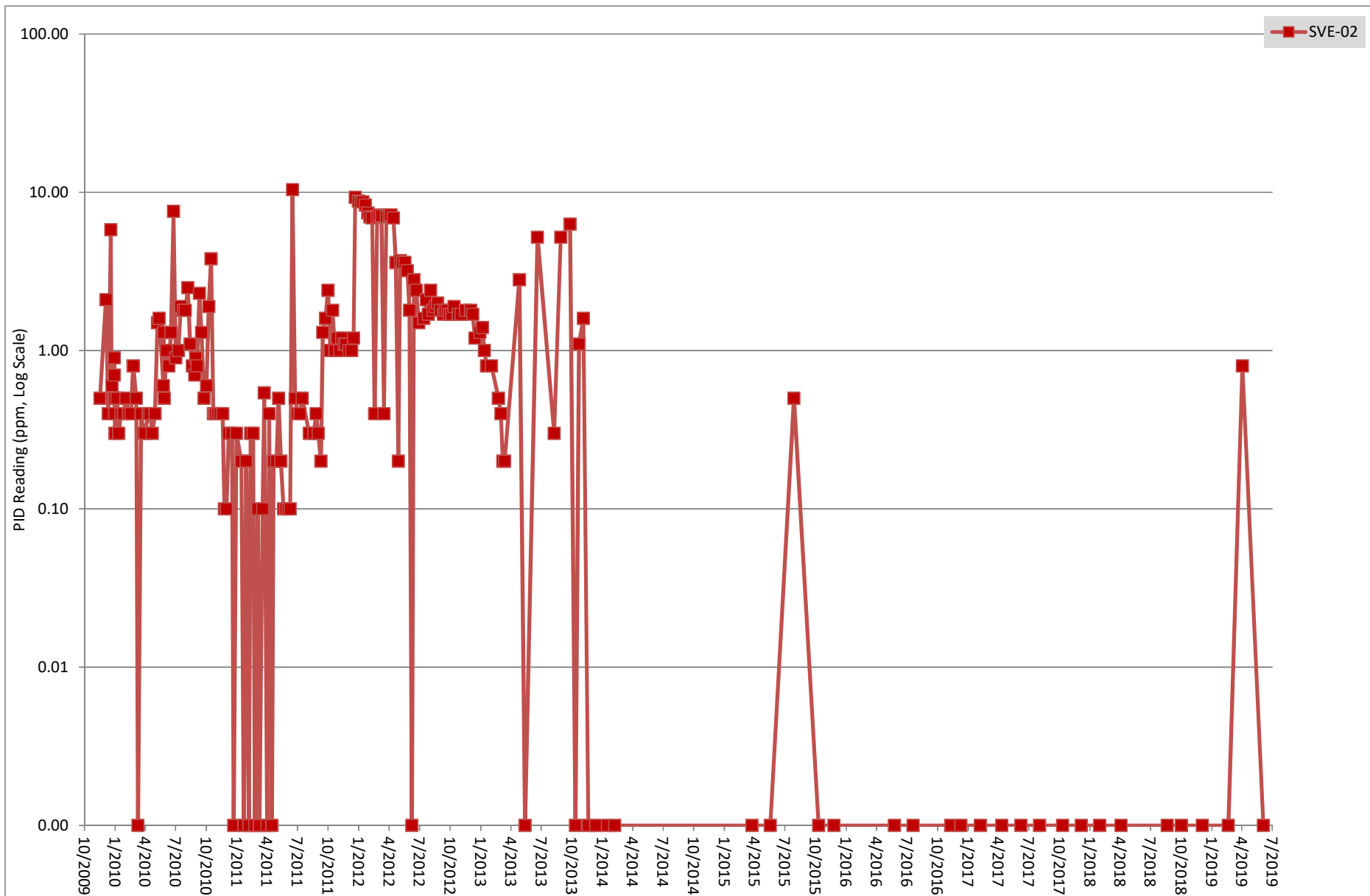
SVE Wells and Effluent Concentration Trend - Field PID Measurements
Off Depot AS/SVE System Annual Operations Report, Year Eight
Defense Depot Memphis, Tennessee



Appendix D-2

Figure 2

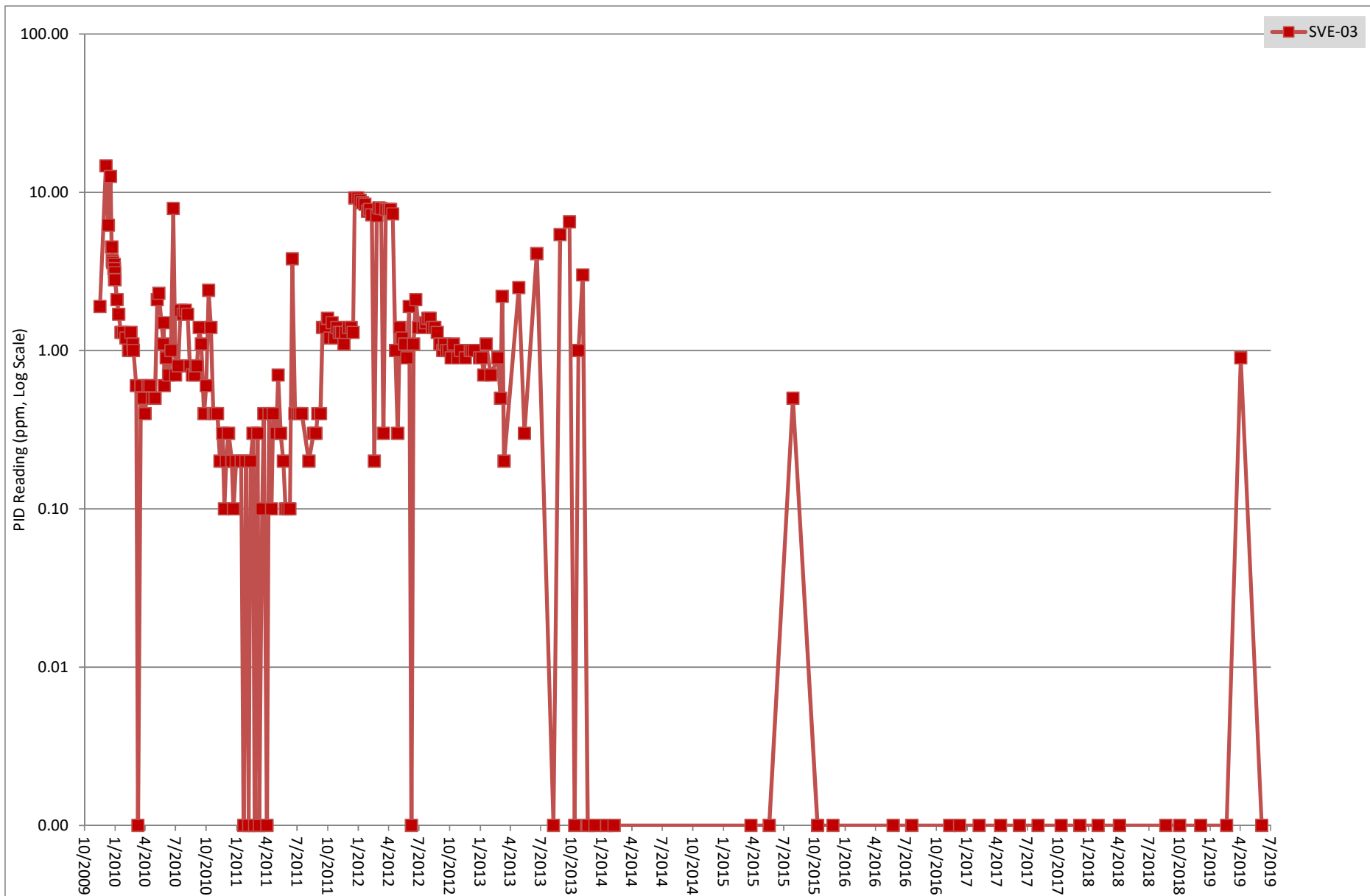
SVE Well #1 Concentration Trend - Field PID Measurements
Off Depot AS/SVE System Annual Operations Report, Year Eight
Defense Depot Memphis, Tennessee



Appendix D-2

Figure 3

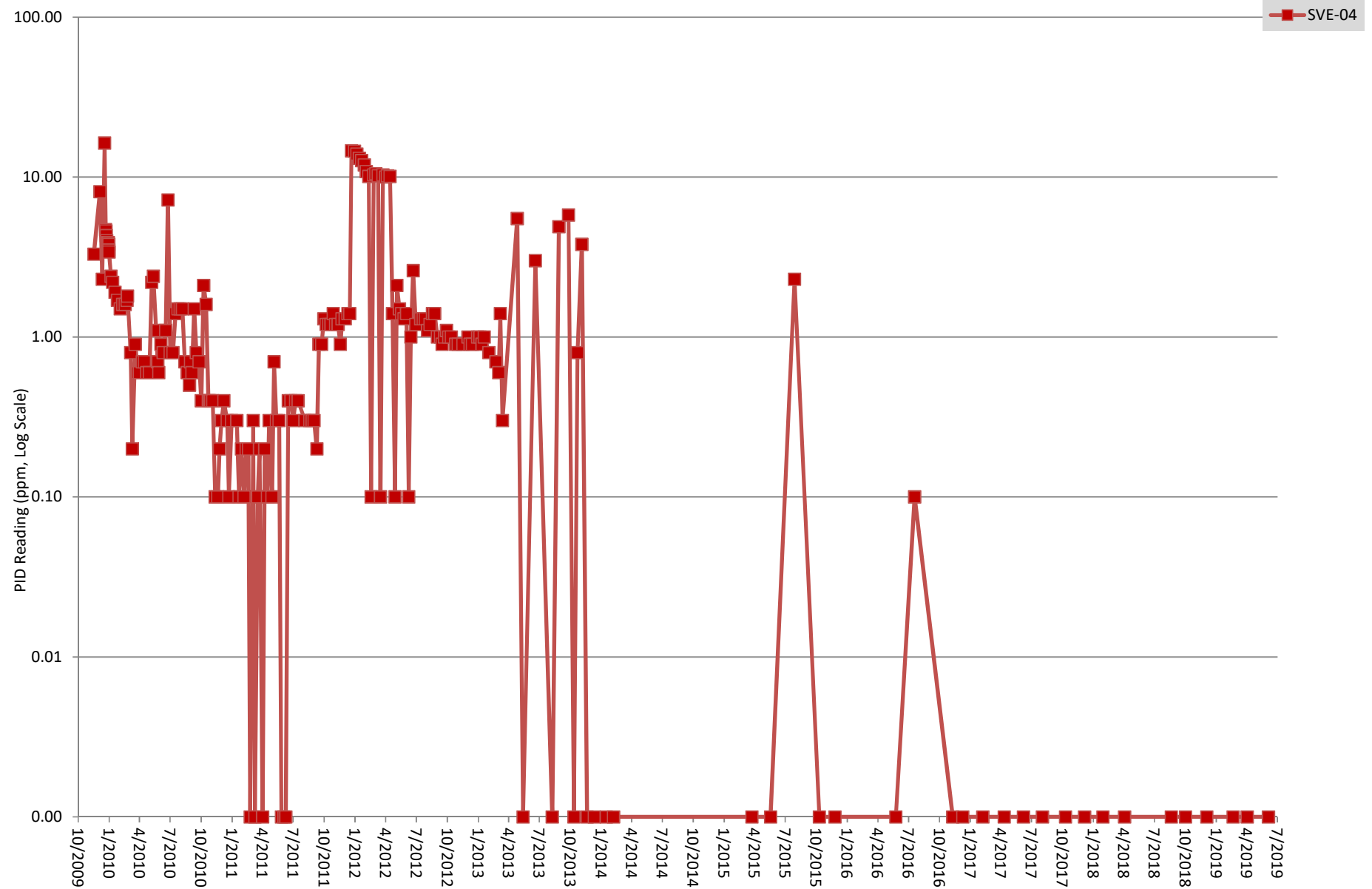
SVE Well #2 Concentration Trend - Field PID Measurements
Off Depot AS/SVE System Annual Operations Report, Year Eight
Defense Depot Memphis, Tennessee



Appendix D-2

Figure 4

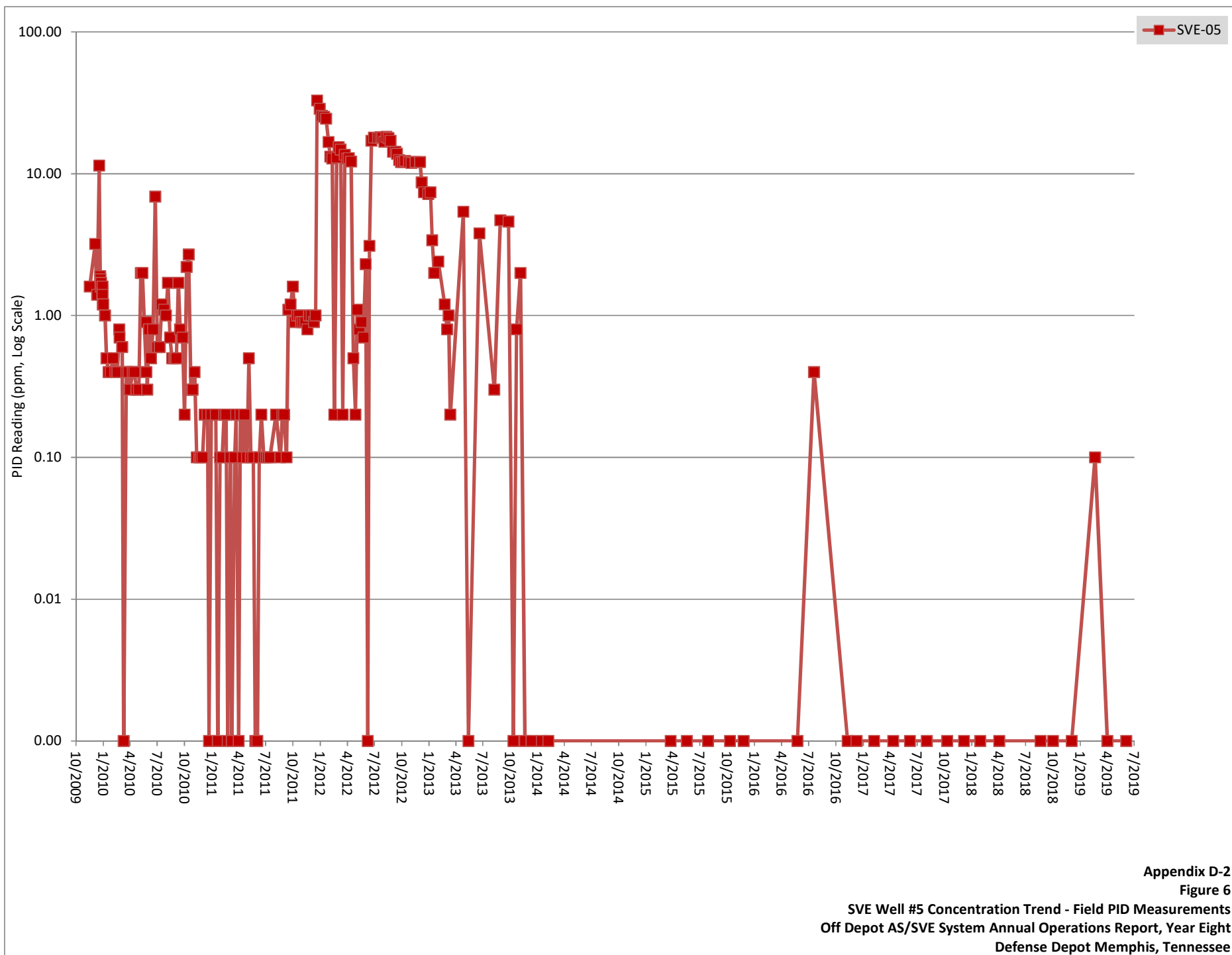
SVE Well # 3 Concentration Trend - Field PID Measurements
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Appendix D-2

Figure 5

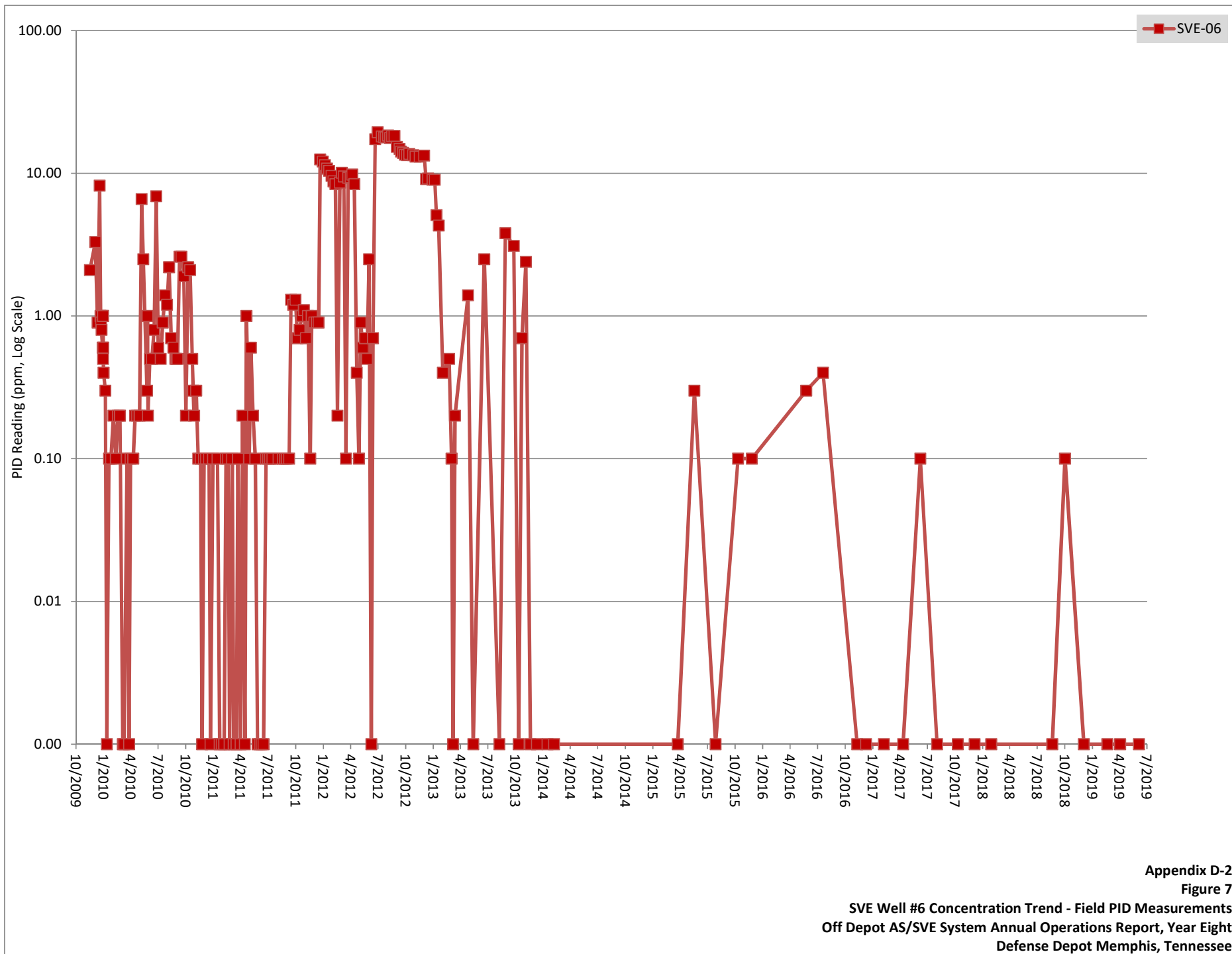
SVE Well #4 Concentration Trend - Field PID Measurements
Off Depot AS/SVE System Annual Operations Report, Year Eight
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Appendix D-2

Figure 6

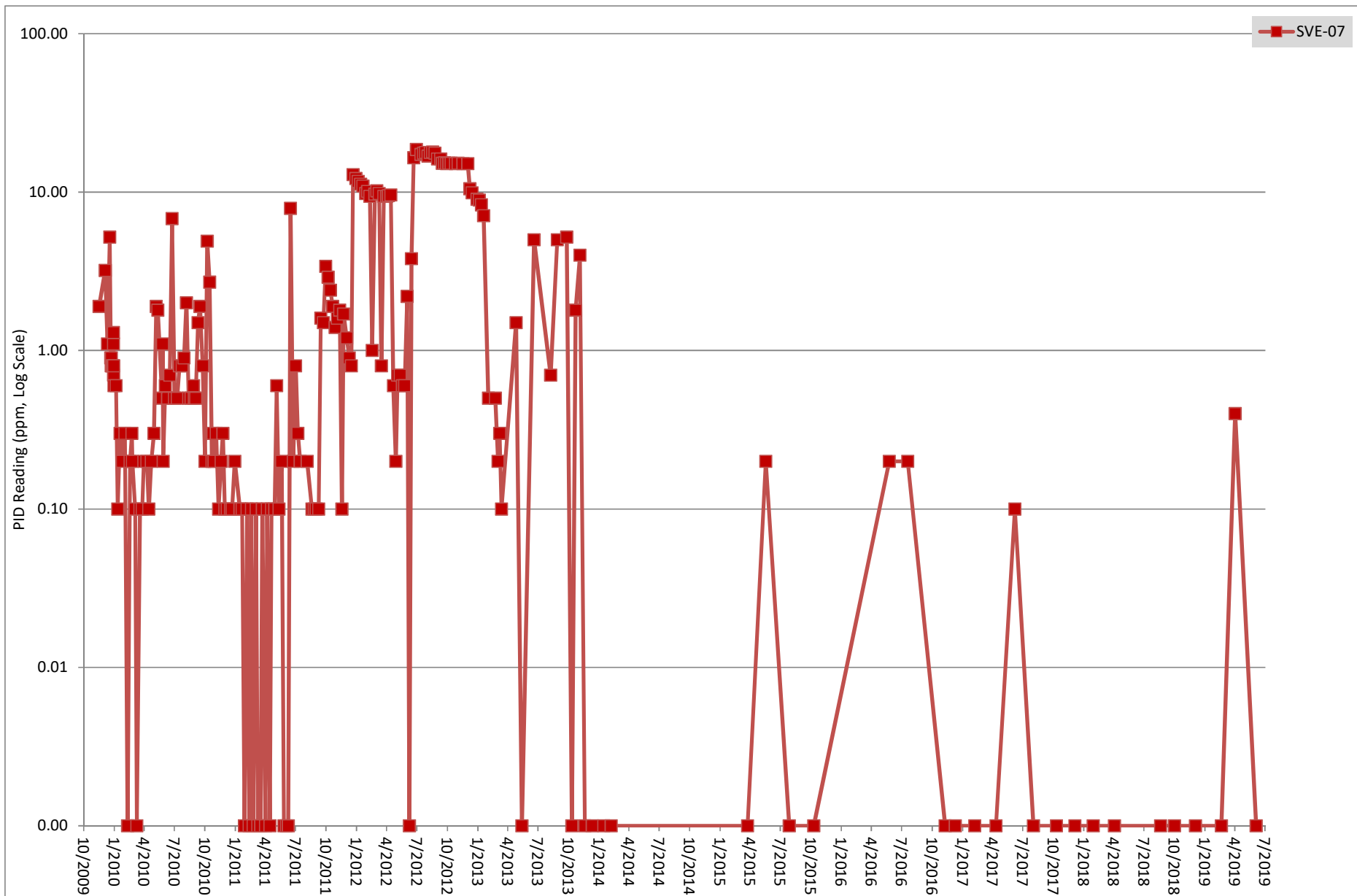
SVE Well #5 Concentration Trend - Field PID Measurements
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Appendix D-2

Figure 7

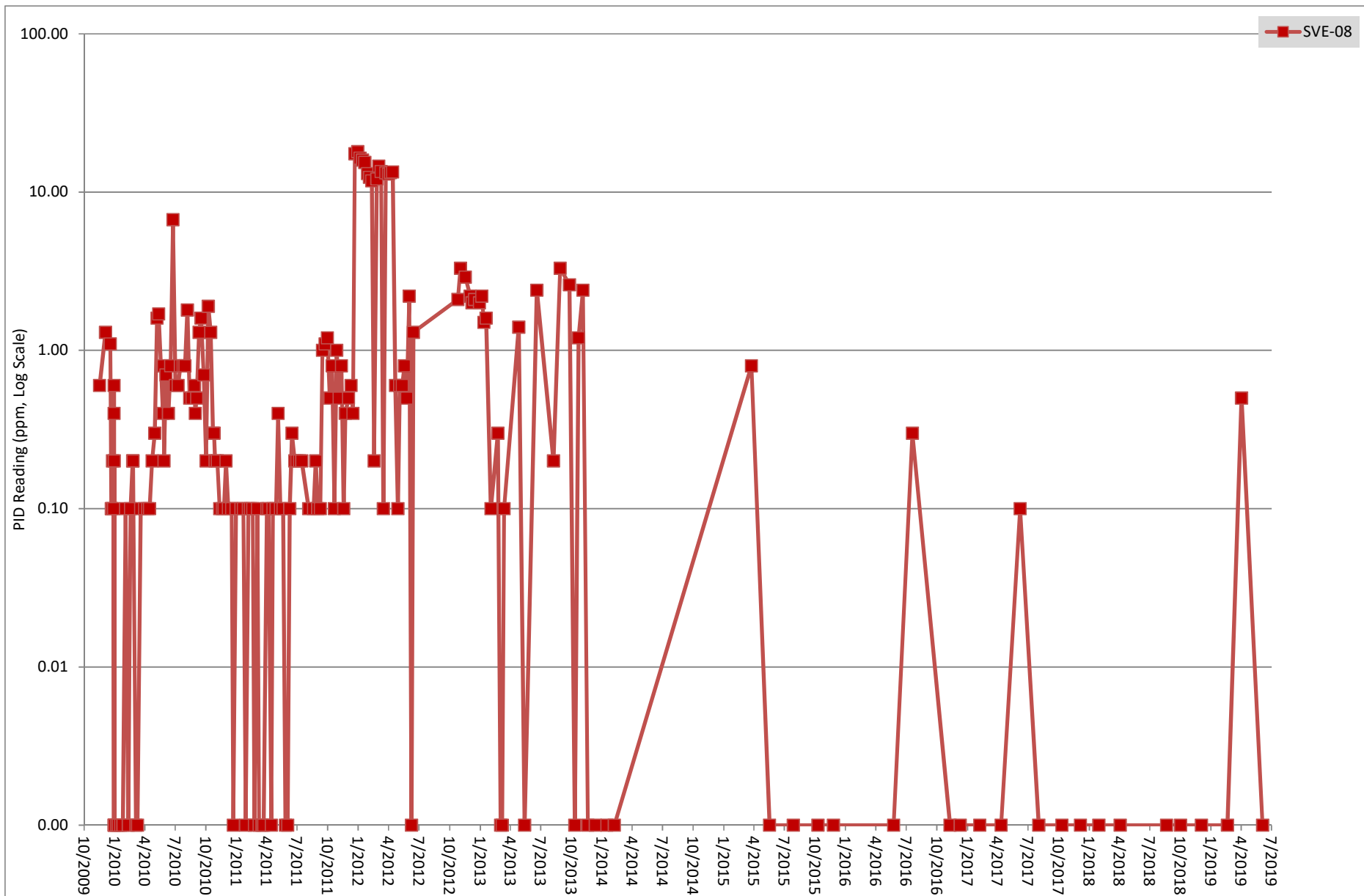
SVE Well #6 Concentration Trend - Field PID Measurements
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Appendix D-2

Figure 8

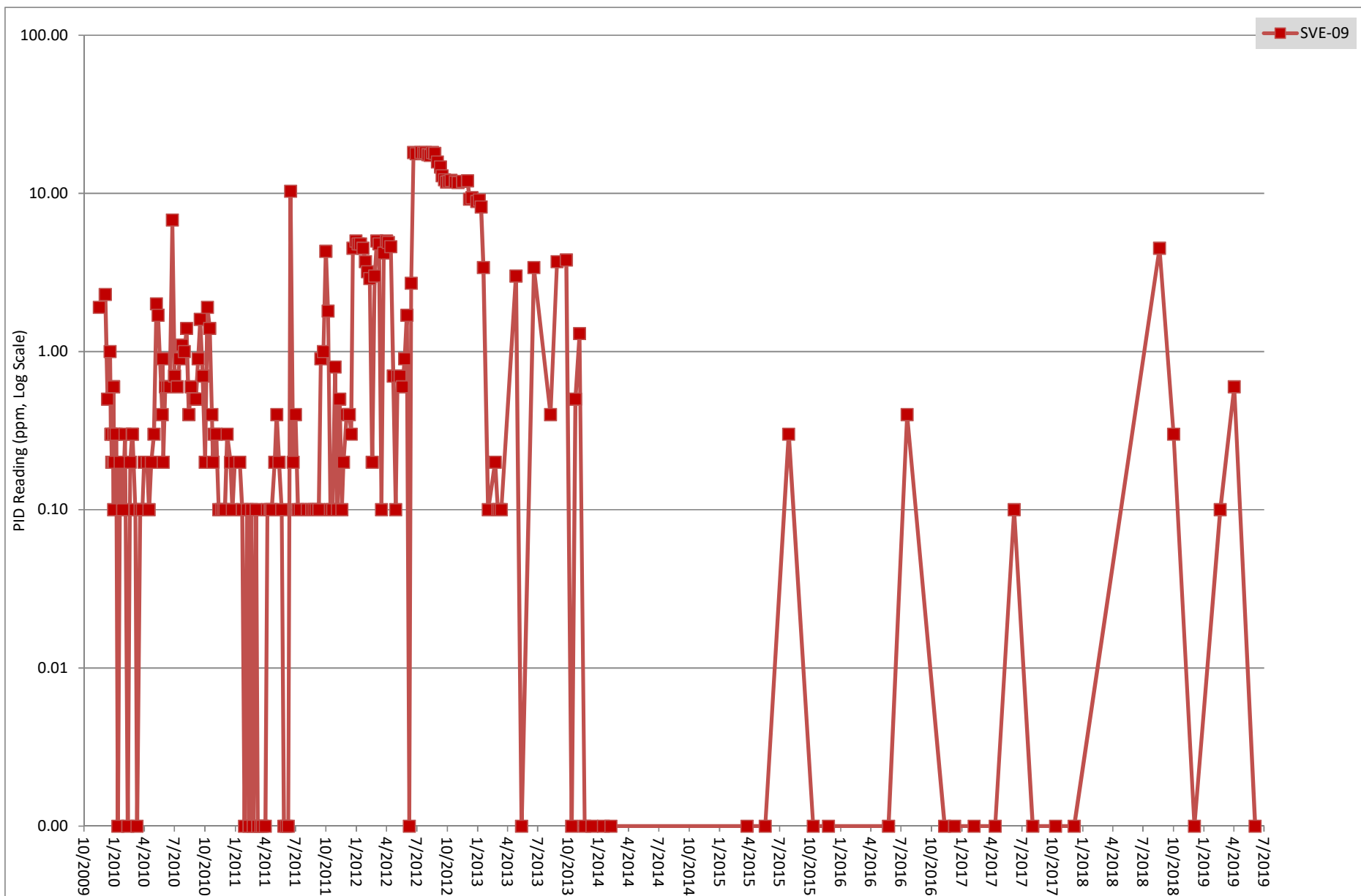
SVE Well #7 Concentration Trend - Field PID Measurements
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Appendix D-2

Figure 9

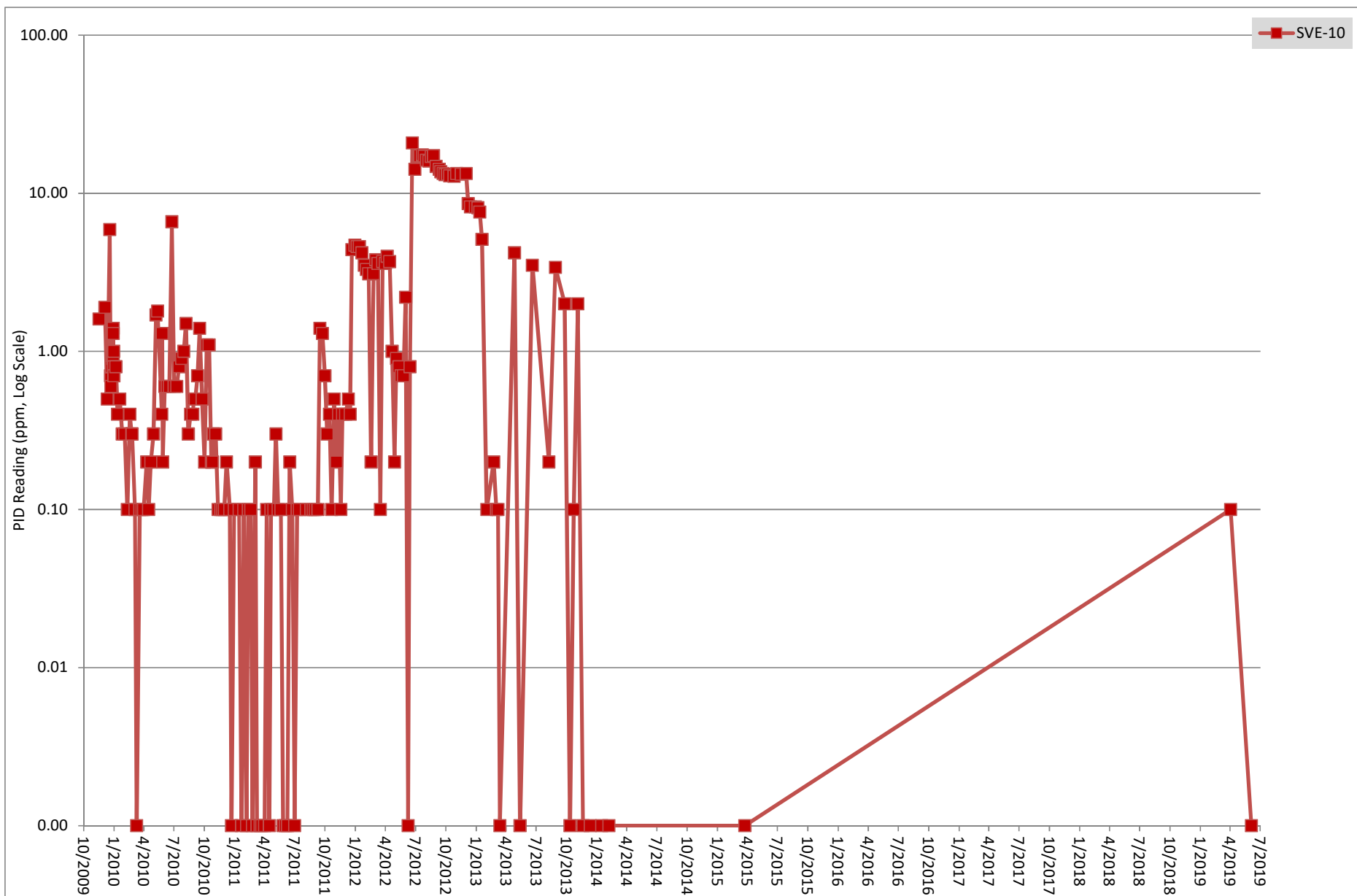
SVE Well #8 Concentration Trend - Field PID Measurements
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Defense Depot Memphis, Tennessee



Appendix D-2

Figure 10

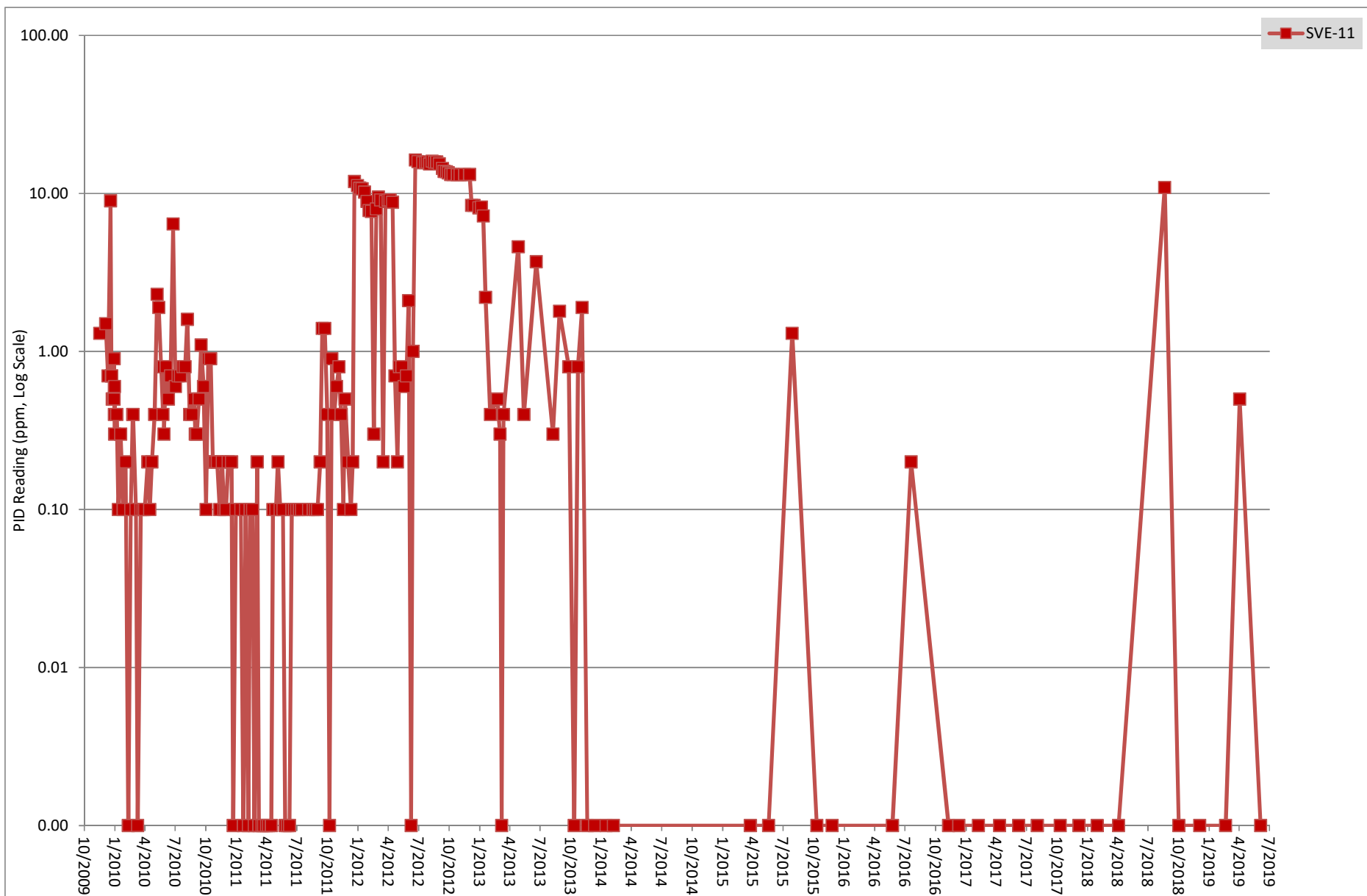
SVE Well #9 Concentration Trend - Field PID Measurements
Off Depot AS/SVE System Annual Operations Report, Year Eight
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Appendix D-2

Figure 11

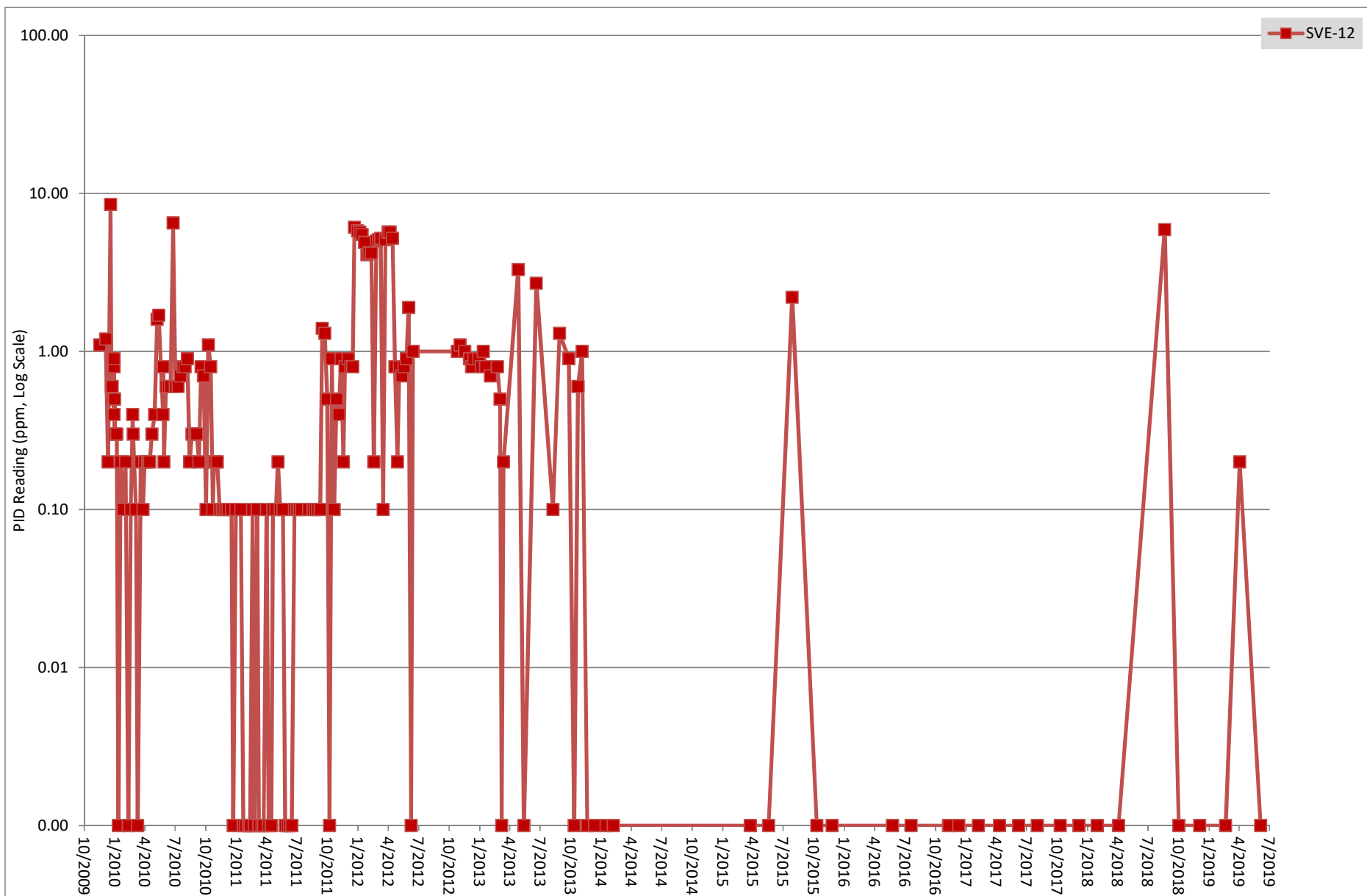
SVE Well #10 Concentration Trend - Field PID Measurements
Off Depot AS/SVE System Annual Operations Report, Year Eight
Defense Depot Memphis, Tennessee



Appendix D-2

Figure 12

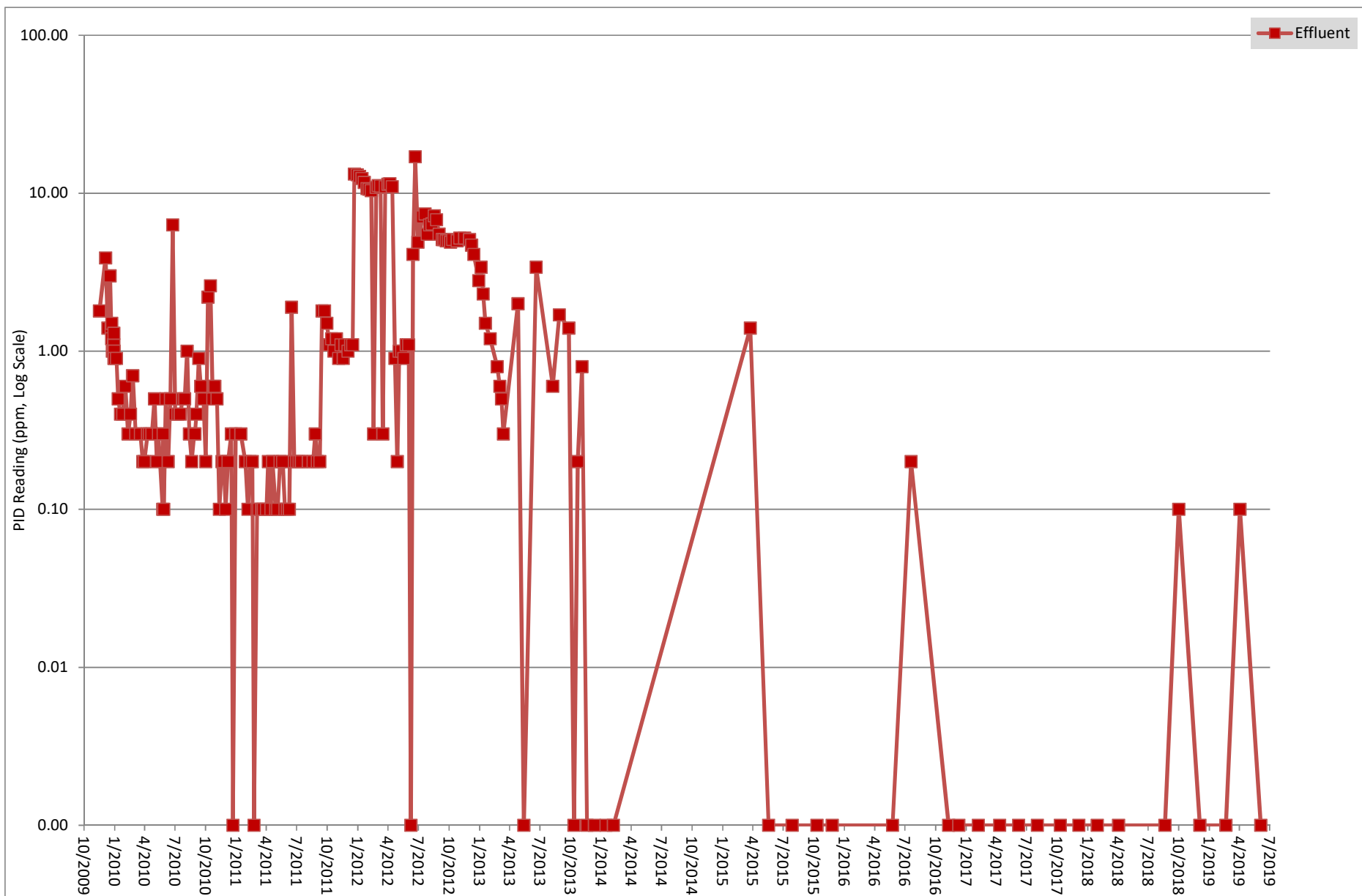
SVE Well #11 Concentration Trend - Field PID Measurements
Off Depot AS/SVE System Annual Operations Report, Year Eight
Defense Depot Memphis, Tennessee



Appendix D-2

Figure 13

SVE Well #12 Concentration Trend - Field PID Measurements
Off Depot AS/SVE System Annual Operations Report, Year Eight
Defense Depot Memphis, Tennessee

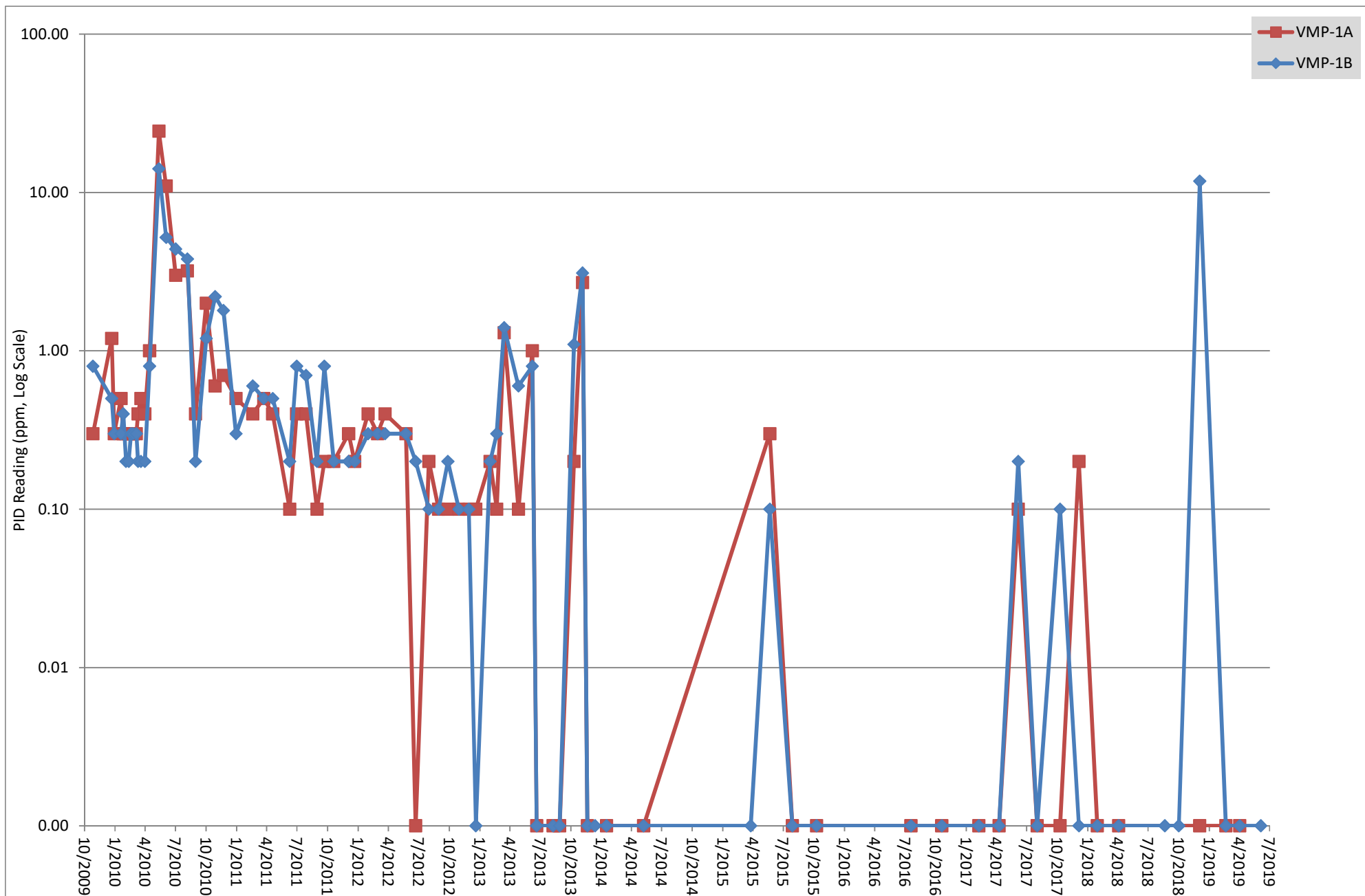


Appendix D-2

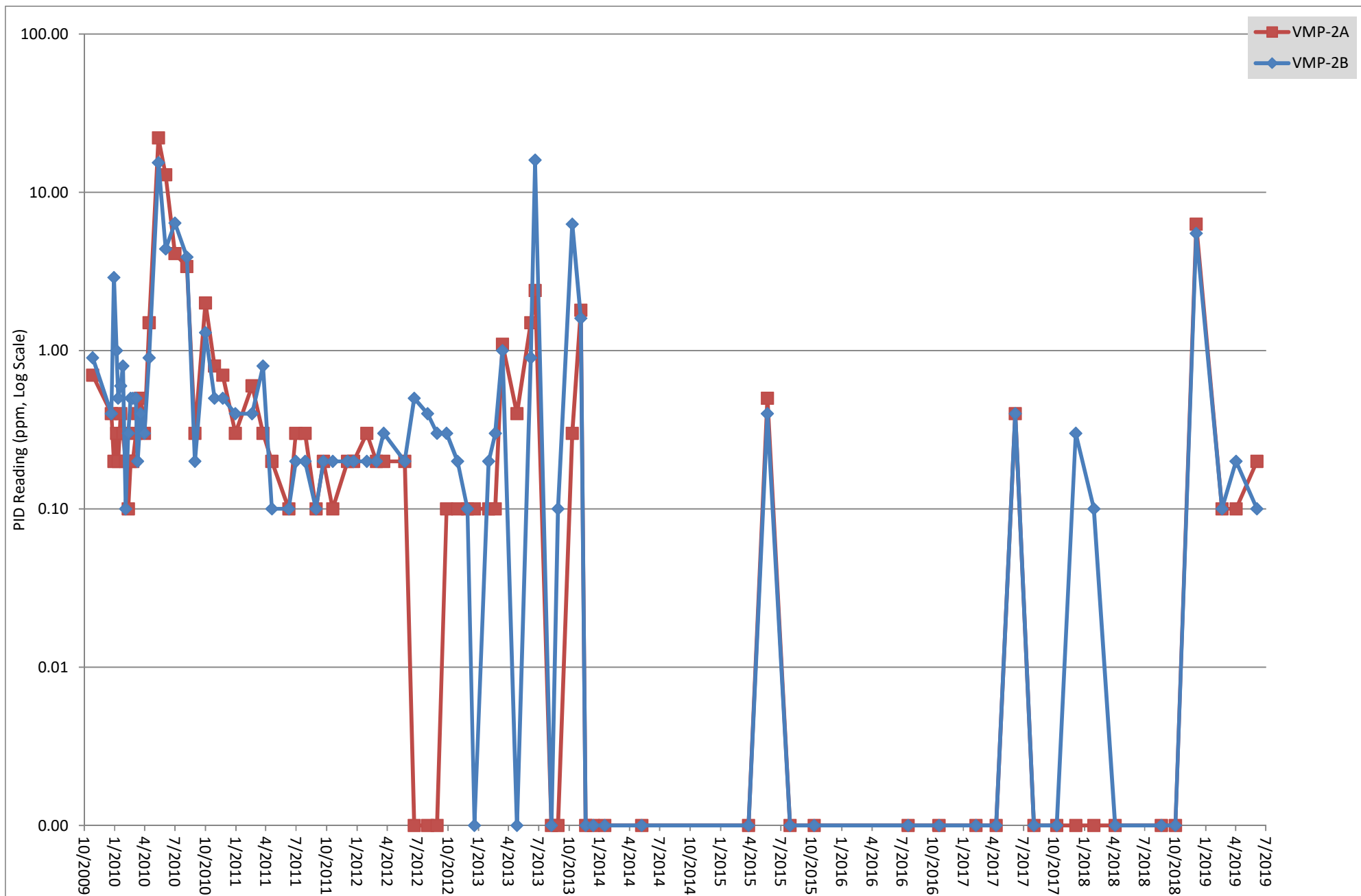
Figure 14

SVE Effluent Concentration Trend - Field PID Measurements
Off Depot AS/SVE System Annual Operations Report, Year Eight
Defense Depot Memphis, Tennessee

Appendix D-3 VMP Concentration Trends – Field PID Measurements



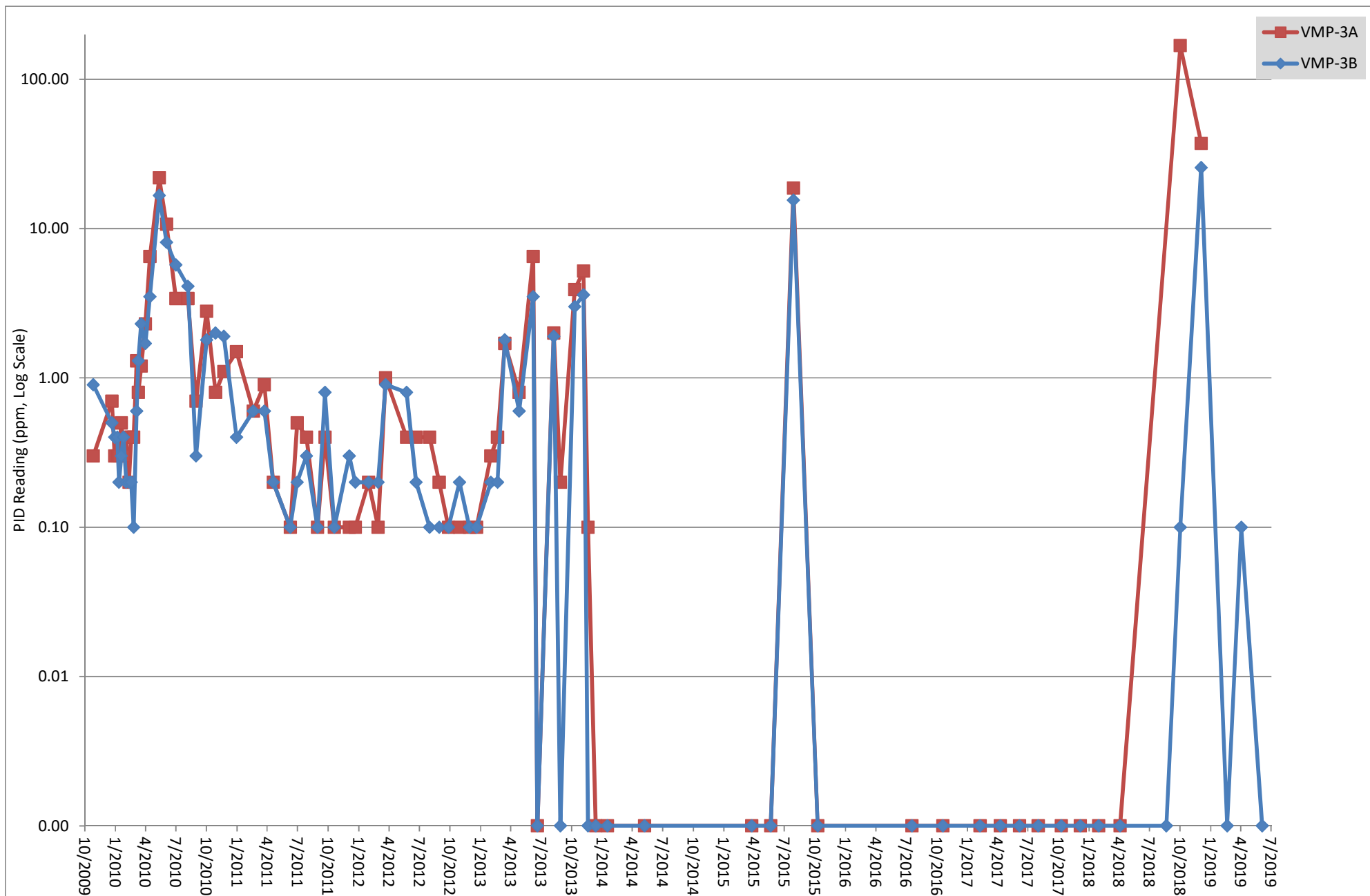
Appendix D-3
Figure 2
VMP-1A/B Concentration Trend - Field PID Measurements
Off Depot AS/SVE System Annual Operations Report, Year Eight
Defense Depot Memphis, Tennessee



Appendix D-3

Figure 3

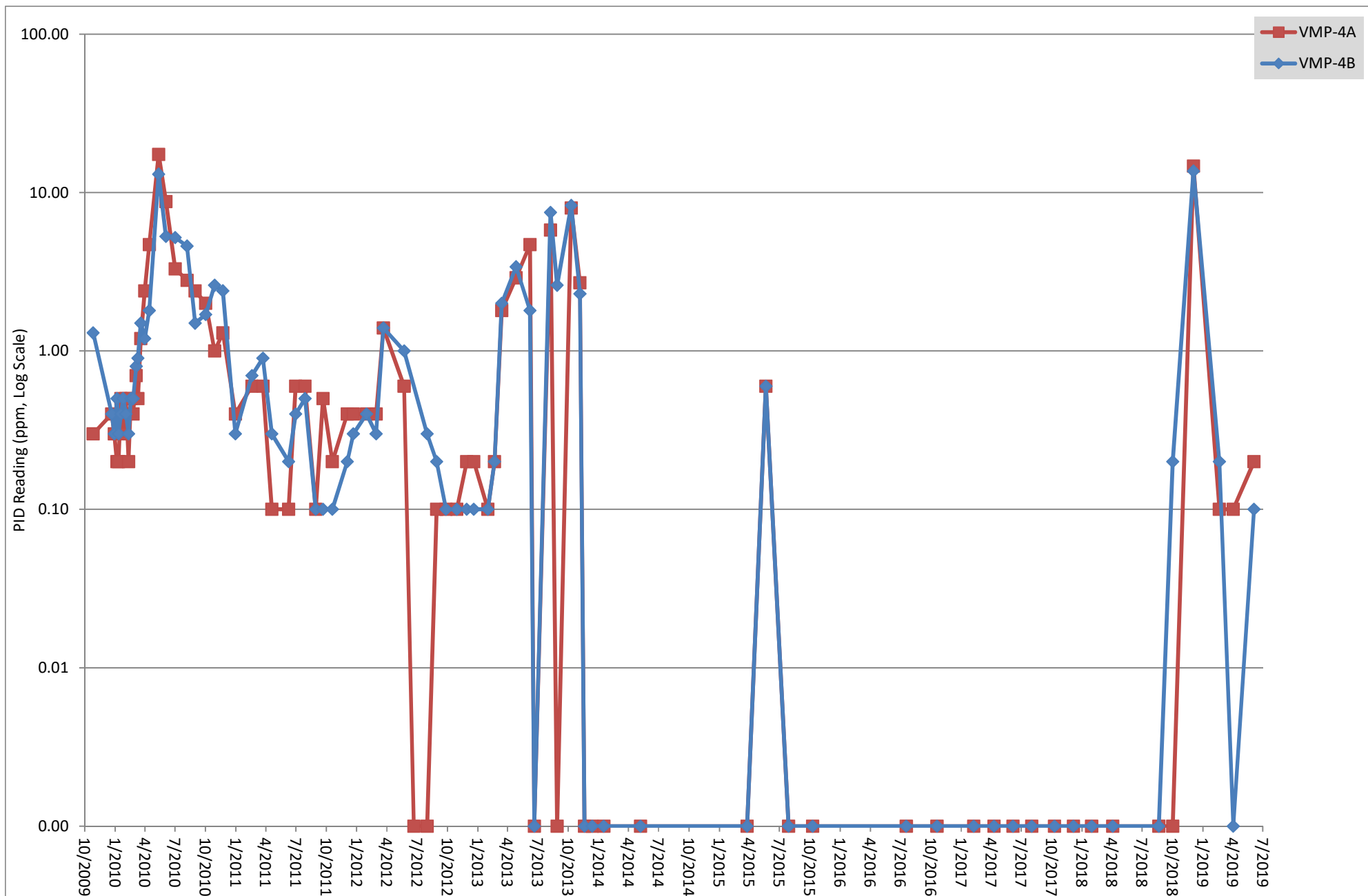
VMP-2A/B Concentration Trend - Field PID Measurements
Off Depot AS/SVE System Annual Operations Report, Year Eight
Defense Depot Memphis, Tennessee



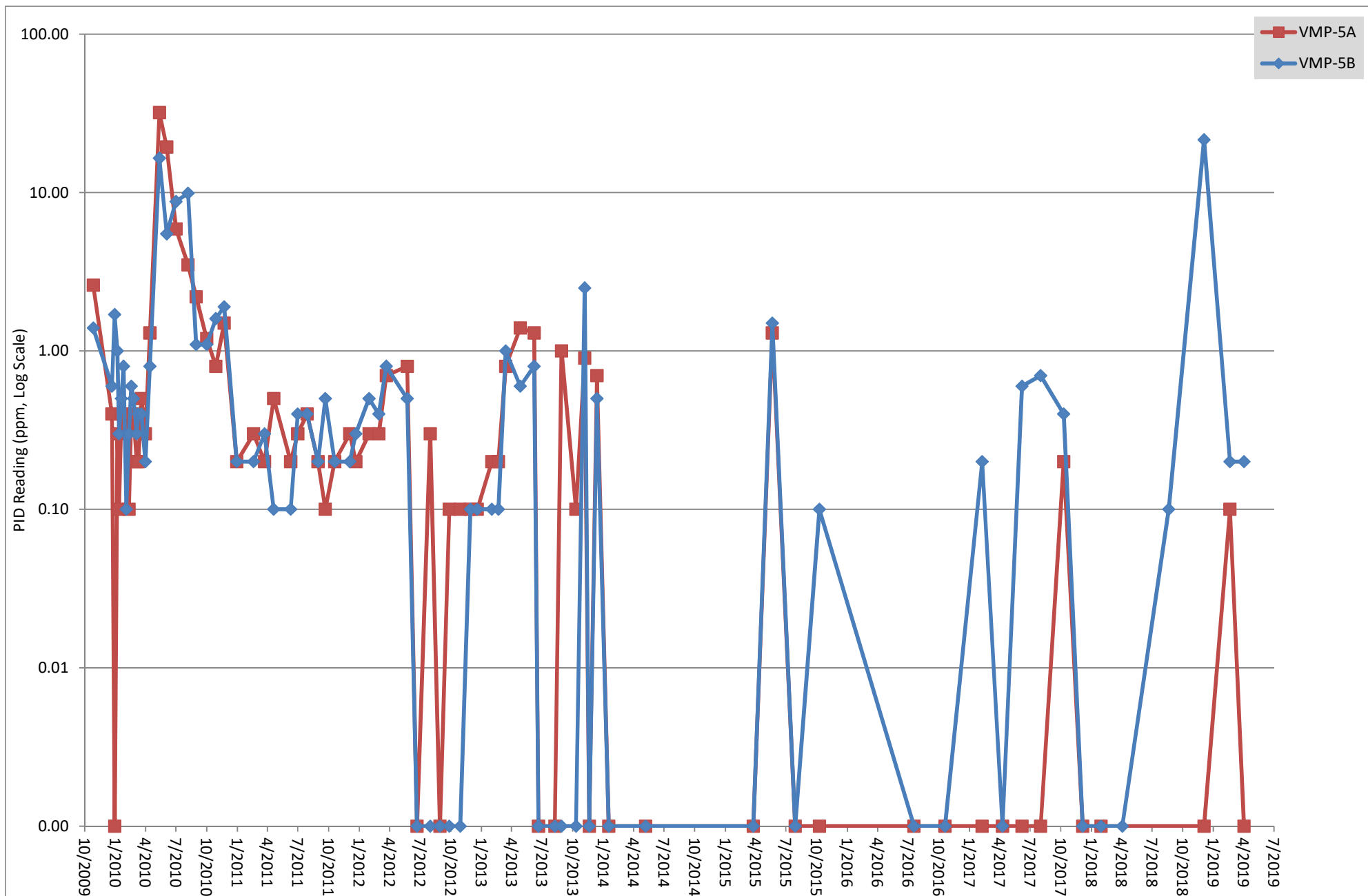
Appendix D-3

Figure 4

VMP-3A/B Concentration Trend - Field PID Measurements
Off Depot AS/SVE System Annual Operations Report, Year Eight
Defense Depot Memphis, Tennessee



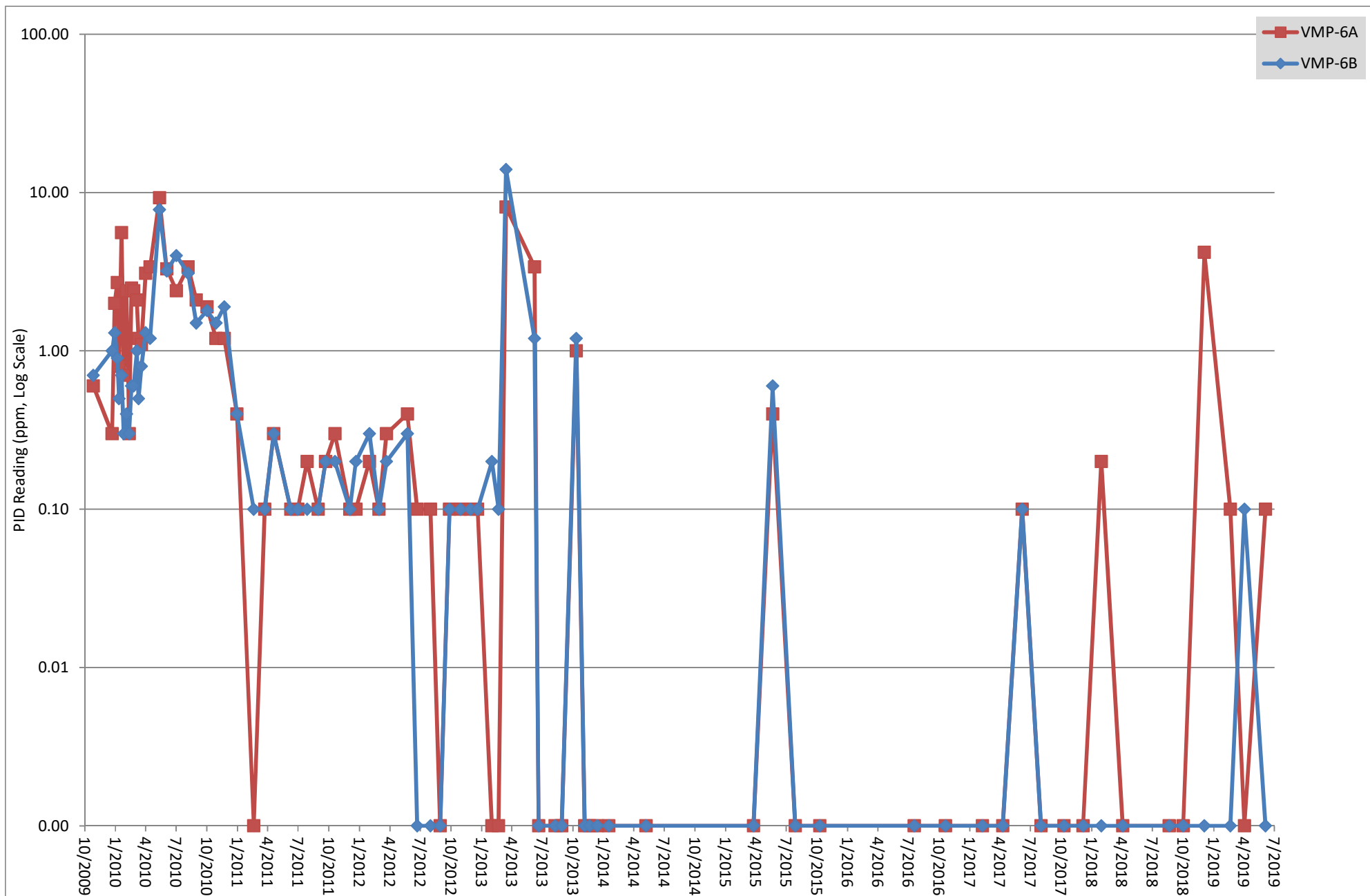
Appendix D-3
Figure 5
VMP-4A/B Concentration Trend - Field PID Measurements
Off Depot AS/SVE System Annual Operations Report, Year Eight
Defense Depot Memphis, Tennessee



Appendix D-3

Figure 6

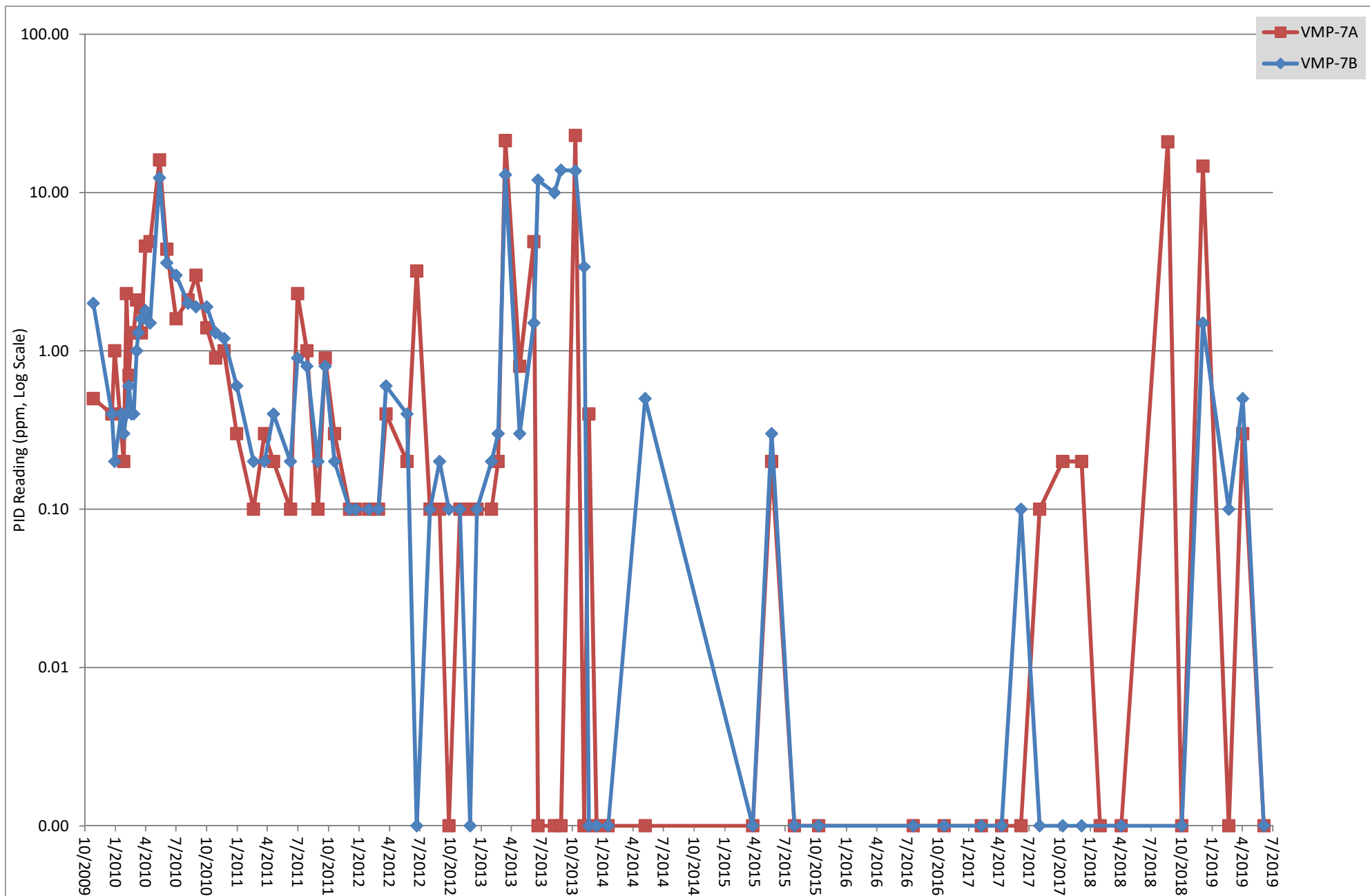
VMP-5A/B Concentration Trend - Field PID Measurements
Off Depot AS/SVE System Annual Operations Report, Year Eight
Defense Depot Memphis, Tennessee



Appendix D-3

Figure 7

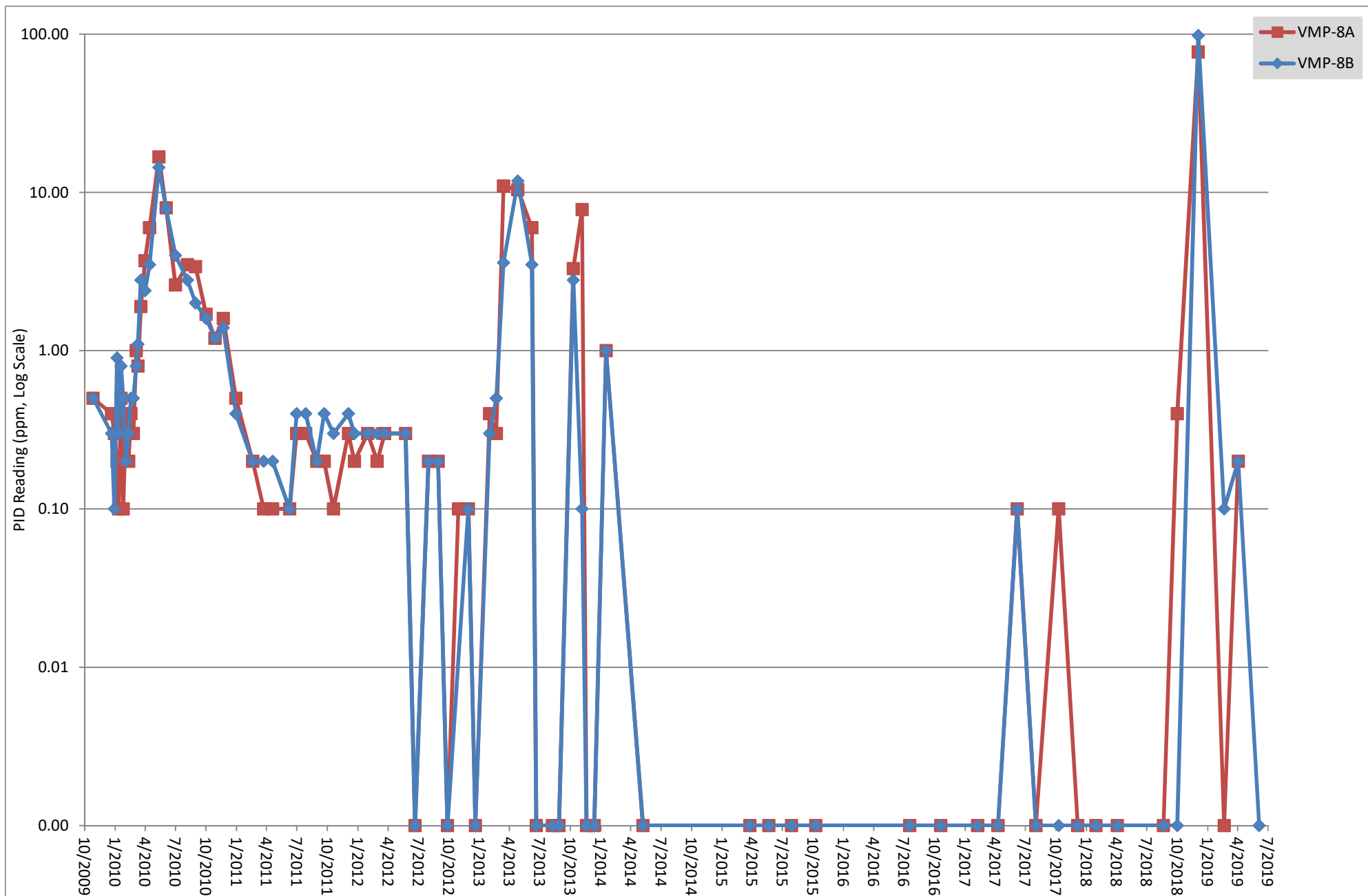
VMP-6A/B Concentration Trend - Field PID Measurements
Off Depot AS/SVE System Annual Operations Report, Year Eight
Defense Depot Memphis, Tennessee



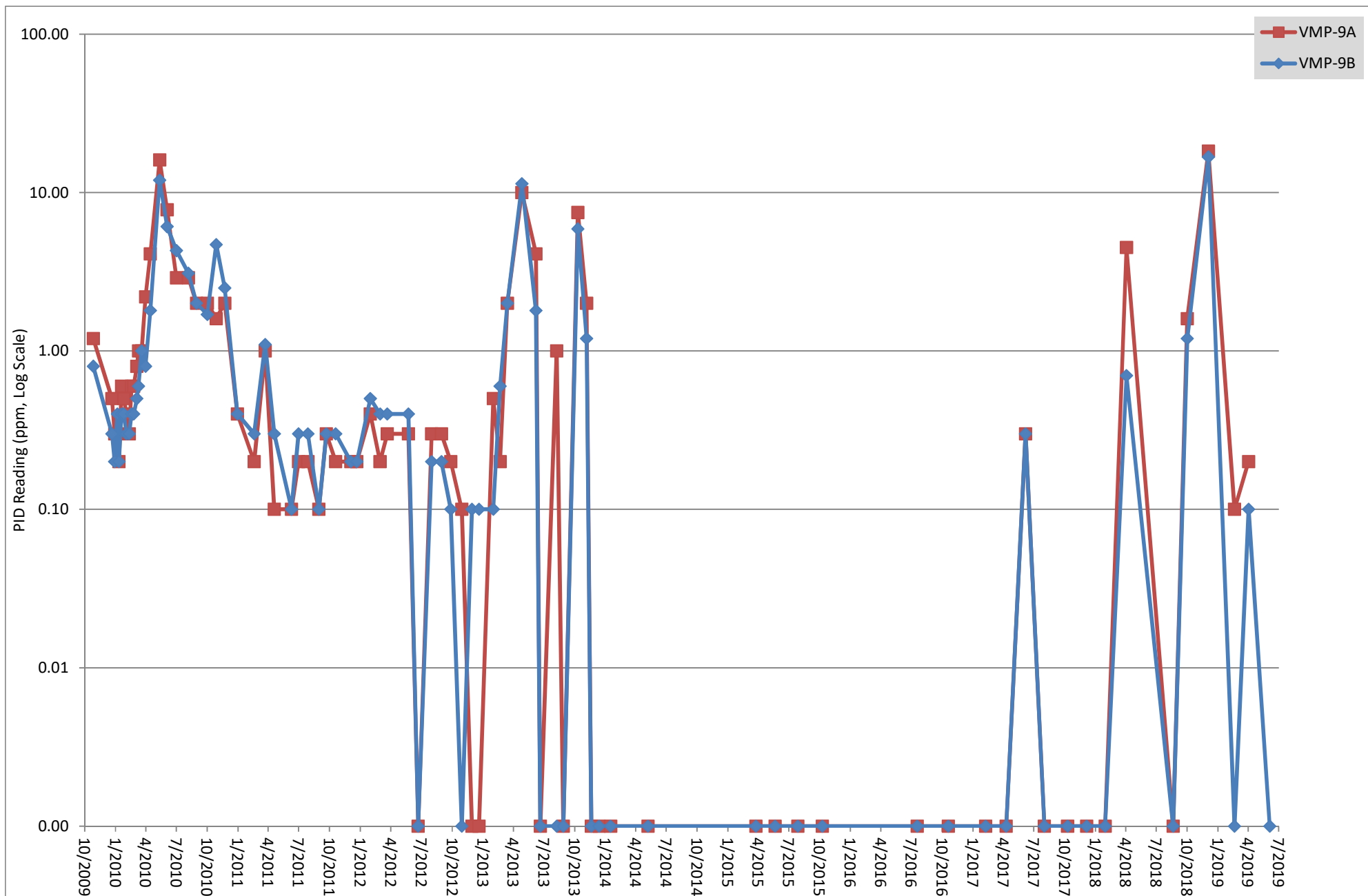
Appendix D-3

Figure 8

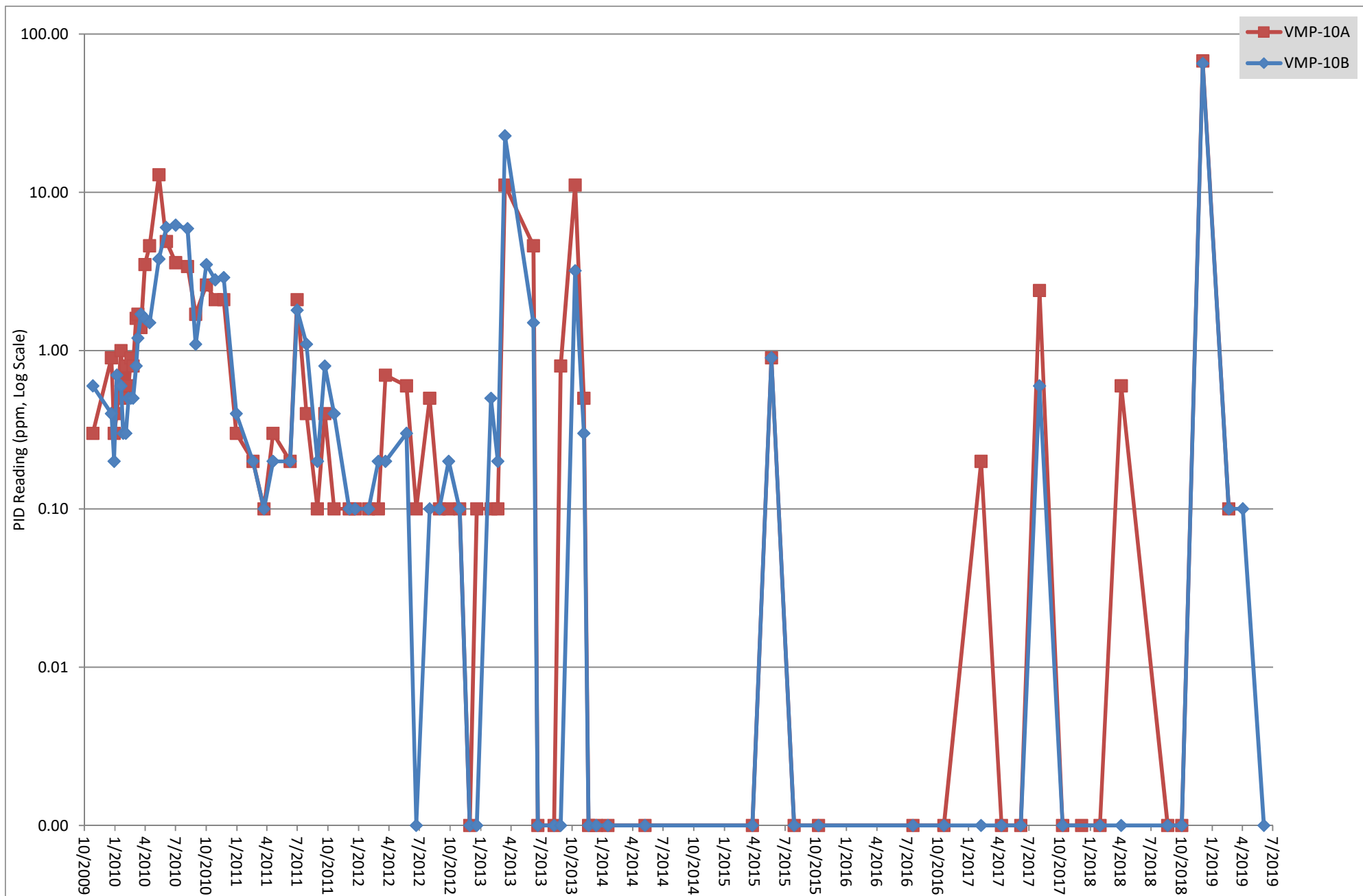
VMP-7A/B Concentration Trend - Field PID Measurements
Off Depot AS/SVE System Annual Operations Report, Year Eight
Defense Depot Memphis, Tennessee



Appendix D-3
Figure 9
VMP-8A/B Concentration Trend - Field PID Measurements
Off Depot AS/SVE System Annual Operations Report, Year Eight
Defense Depot Memphis, Tennessee



Appendix D-3
Figure 10
VMP-9A/B Concentration Trend - Field PID Measurements
Off Depot AS/SVE System Annual Operations Report, Year Eight
Defense Depot Memphis, Tennessee



Appendix D-3
 Figure 11
 VMP-10A/B Concentration Trend - Field PID Measurements
 Off Depot AS/SVE System Annual Operations Report, Year Eight
 Defense Depot Memphis, Tennessee

Appendix E Results of Laboratory Analyses

Table E-1
Analytical Results - SVE Effluent
Off Depot AS/SVE Annual Operations Report, Year Eight
Defense Depot Memphis, Tennessee

CAS Number	Analyte	SampleID Lab ID Date Event	ODSVE-EFF-Y8Q1	ODSVE-DUP1-Y8Q1	ODSVE-EFF-Y8Q2	ODSVE-EFF-Y8Q3	ODSVE-EFF-Y8Q4	ODSVE-EFF-Y8Q4A
			P1805277-001 10/1/2018 October 2018	P1805277-002 10/1/2018 October 2018	P1806708-001 12/3/2018 December 2018	P1901884-001 4/2/2019 April 2019	P1903275-001 6/4/2019 June 2019	P1904112-001 7/22/2019 July 2019
		Units						
79-34-5	1,1,2,2-Tetrachloroethane	ppbv	0.46	0.45	0.49	0.44	0.081	0.34
79-00-5	1,1,2-Trichloroethane	ppbv	0.043J	0.048J	0.05J	0.31U	0.1	0.031J
75-35-4	1,1-Dichloroethene	ppbv	0.84	0.84	0.7	0.73	0.24J	0.53
107-06-2	1,2-Dichloroethane	ppbv	0.064U	0.026J	0.078U	0.042U	0.14	0.056U
56-23-5	Carbon Tetrachloride	ppbv	0.4	0.39	0.36	0.49	0.24J	0.42
67-66-3	Chloroform	ppbv	4.8	5	5.1	4.7	2	4.9
156-59-2	cis-1,2-Dichloroethene	ppbv	29	29	34	28	13	28
124-48-1	Dibromochloromethane	ppbv	0.03U	0.029U	0.037U	0.02U	0.065U	0.027U
127-18-4	Tetrachloroethene	ppbv	3.2	3.2	2.5	2.8	1.7	2.1
156-60-5	trans-1,2-Dichloroethene	ppbv	0.39	0.4	0.44	0.37	0.28J	0.34
79-01-6	Trichloroethene	ppbv	28	28	27	25	9.4	19
75-01-4	Vinyl Chloride	ppbv	0.13J	0.14J	0.12J	0.16U	0.22U	0.18J
71-55-6	1,1,1-Trichloroethane	ppbv	0.32	0.31	0.31	0.34	0.11J	0.21
76-13-1	1,1,2-Trichlorotrifluoroethane	ppbv	3.1	3.1	2.7	3.3	1.5	4.1
75-34-3	1,1-Dichloroethane	ppbv	0.34	0.34	0.36	0.41	0.16J	0.31
95-63-6	1,2,4-Trimethylbenzene	ppbv	0.053U	0.05U	0.064U	0.039J	2.2	0.16
108-67-8	1,3,5-Trimethylbenzene	ppbv	0.024J	0.05U	0.064U	0.083U	0.67	0.032J
78-93-3	2-Butanone (MEK)	ppbv	0.45J	0.62	0.38J	0.25U	13	0.21J
591-78-6	2-Hexanone	ppbv	0.075J	0.061J	0.043J	0.1U	0.14U	0.056J
67-63-0	2-Propanol (Isopropyl Alcohol)	ppbv	0.39U	0.16J	0.47U	0.61U	20	0.34U
622-96-8	4-Ethyltoluene	ppbv	0.096U	0.091U	0.12U	0.16U	0.62	0.032J
108-10-1	4-Methyl-2-pentanone	ppbv	0.063U	0.038J	0.077U	0.1U	0.77	0.056U
67-64-1	Acetone	ppbv	2.8J	3.4	2.3J	2.7U	110	1.5U
75-05-8	Acetonitrile	ppbv	0.36J	0.22J	0.35U	0.45U	0.6U	0.25U
107-02-8	Acrolein	ppbv	0.58J	0.56J	0.31J	0.33U	3.5	0.14J
80-56-8	alpha-Pinene	ppbv	0.085U	0.081U	0.1U	0.13U	14	0.027J
71-43-2	Benzene	ppbv	0.053J	0.042J	0.058J	0.098J	1.4	0.042J
75-15-0	Carbon Disulfide	ppbv	0.16J	0.23J	1.1	0.42U	3.8	4.3
98-82-8	Cumene	ppbv	0.053U	0.05U	0.064U	0.083U	0.27J	0.046U
110-82-7	Cyclohexane	ppbv	0.15U	0.14U	0.18U	0.44J	5.3	0.13U
75-71-8	Dichlorodifluoromethane (CFC 12)	ppbv	0.58	0.59	1	16	4.1	5.1
75-09-2	Dichloromethane (Methylene Chloride)	ppbv	0.14U	0.13U	0.17U	0.22U	1.1	0.12U
5989-27-5	d-Limonene	ppbv	0.082U	0.078U	0.1U	0.13U	2.5	0.094J
64-17-5	Ethanol	ppbv	0.84J+	2J+	1.5J	0.99J+	46	5
141-78-6	Ethyl Acetate	ppbv	0.27U	0.26U	0.33U	0.43U	330D	0.24U
100-41-4	Ethylbenzene	ppbv	0.028J	0.057U	0.072U	0.094U	1.9	0.052U
179601-23-1	m,p-Xylenes	ppbv	0.12U	0.11U	0.14U	0.1J	4.6	0.076J
91-20-3	Naphthalene	ppbv	0.093U	0.089U	0.11U	0.15J	0.41	0.12J
123-86-4	n-Butyl Acetate	ppbv	0.028J	0.047J	0.066U	0.086U	3.8	0.037J
142-82-5	n-Heptane	ppbv	0.12U	0.11U	0.14U	0.19U	8.6	0.1U
110-54-3	n-Hexane	ppbv	0.14U	0.13U	0.17U	0.41	7.9	0.12U
111-84-2	n-Nonane	ppbv	0.093U	0.088U	0.11U	0.15U	3	0.082U
111-65-9	n-Octane	ppbv	0.1U	0.099U	0.13U	0.17U	3.2	0.092U
95-47-6	o-Xylene	ppbv	0.06U	0.057U	0.072U	0.043J	2.1	0.045J
115-07-1	Propene	ppbv	0.21J	0.25J	0.2J	0.43U	7.5	0.17J
100-42-5	Styrene	ppbv	0.11U	0.11U	0.14U	0.18U	2.9	0.1U
109-99-9	Tetrahydrofuran (THF)	ppbv	0.088U	0.084U	0.11U	0.14U	0.65	0.26
108-88-3	Toluene	ppbv	0.058J	0.12J	0.083U	0.18J	29	0.056J
75-69-4	Trichlorofluoromethane	ppbv	0.36	0.37	0.31	0.32	0.33	0.26
108-05-4	Vinyl Acetate	ppbv	0.99J	1.8J	1.4U	1.8U	2.4U	0.99U

DQE Flags:

U: Analyte not detected above Reporting Limit

J: Estimated

J+: Estimated with possible high bias

B: Analyte detected in both the sample and associated method blank

D: Reported result is from a dilution

Appendix F Laboratory Analytical Reports



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

LABORATORY REPORT

November 3, 2018

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

RE: DDMT

Dear Todd:

Your report number P1805277 has been amended for the samples submitted to our laboratory on October 4, 2018. The sample IDs have been corrected from "48Q1" to "Y8Q1". The revised pages have been indicated by the "Revised Page" footer located at the bottom right of each page.

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 12:38 pm, 11/03/18

Kate Kaneko
Laboratory Director



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

Service Request No: P1805277

CASE NARRATIVE

The samples were received intact under chain of custody on October 4, 2018 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Volatile Organic Compound Analysis

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

Manual integrations were performed on the following sample(s) and analyte(s). Refer to the raw data for additional information.

Sample Identification(s)	Analyte(s)
P1805277-001, -001DUP, -002	Propene
P1805277-001DUP	Ethanol

The containers were 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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 Simi Valley, CA 93065
 T: +1 805 526 7161
 F: +1 805 526 7270
www.alsglobal.com

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Alaska DEC	http://dec.alaska.gov/eh/lab.aspx	17-019
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/page/la-lab-accreditation	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml	2016036
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1347317
New Jersey DEP (NELAP)	http://www.nj.gov/dep/enforcement/oqa.html	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-005
Pennsylvania DEP	http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/agency/qa/env_lab_accreditation.html	T104704413-18-9
Utah DOH (NELAP)	http://health.utah.gov/lab/lab_cert_env	CA016272018-9
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

Service Request: P1805277

Date Received: 10/4/2018
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-Y8Q1	P1805277-001	Air	10/1/2018	13:51	SC01581	-2.59	3.68	X
ODSVE-DUP1-Y8Q1	P1805277-002	Air	10/1/2018	13:51	SC02200	-1.91	3.80	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 1 of 1

Company Name & Address (Reporting Information)				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 1805277	
Trinity ADC 1002 Eglon Plwy Shalimar, FL 32579				Project Name DDMT				ALS Contact:	
Project Manager Todd Calhoun				Project Number				Analysis Method	
Phone 850-613-6800				PO. # / Billing Information					
Fax				Sampler (Print & Sign) Clayton Meyer: <i>Clayton Meyer</i>				Comments e.g. Actual Preservative or specific instructions	
Email Address for Result Reporting Tcalhoun@trinityadc.com				Flow Controller ID (Bar code # - FC #)					
Client Sample ID		Laboratory ID Number	Date Collected	Time Collected	Canister ID (Bar code # - AC, SC, etc.)	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	Sample Volume	
ODSVE-EFF-48Q1			10/1/18	1351	#2325	-30	-4	6L	TO-15
ODSVE-DOP-1-48Q1			10/1/18	1351	#2642	-30	-3	6L	TO-15
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				EDD required YES / No Type: _____ Units: _____		Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT		Project Requirements (MRLs, QAPP)	
Relinquished by: (Signature) <i>Clayton Meyer</i>		Date: 10/1/18		Time: 1500		Received by: (Signature) <i>San Francisco</i>		Date: 10/1/18 Time: 0930	
Relinquished by: (Signature)		Date:		Time:		Received by: (Signature)		Date: Time:	
								Cooler / Blank Temperature °C	

ALS Environmental **Sample Acceptance Check Form**

Client: Trinity Analysis & Development Corp. Work order: P1805277
 Project: DDMT
 Sample(s) received on: 10/4/18 Date opened: 10/4/18 by: AARON GONZALEZ

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
P1805277-001.01	6.0 L Source Can					
P1805277-002.01	6.0 L Source Can					

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

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: Trinity Analysis & Development Corp.

Client Sample ID: ODSVE-EFF-Y8Q1

Client Project ID: DDMT

ALS Project ID: P1805277

ALS Sample ID: P1805277-001

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC01581

Date Collected: 10/1/18

Date Received: 10/4/18

Date Analyzed: 10/17/18

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.59

Final Pressure (psig): 3.68

Container Dilution Factor: 1.52

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	0.21	0.46	0.27	0.11	J
75-71-8	Dichlorodifluoromethane (CFC 12)	0.58	0.16	0.095	0.027	
74-87-3	Chloromethane	0.22	0.37	0.22	0.063	U
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	0.067	0.11	0.067	0.018	U
75-01-4	Vinyl Chloride	0.13	0.32	0.10	0.034	J
106-99-0	1,3-Butadiene	0.22	0.36	0.22	0.060	U
74-83-9	Bromomethane	0.063	0.20	0.063	0.029	U
75-00-3	Chloroethane	0.17	0.29	0.17	0.038	U
64-17-5	Ethanol	0.84	4.1	0.68	0.30	J, B
75-05-8	Acetonitrile	0.36	0.47	0.29	0.12	J
107-02-8	Acrolein	0.58	0.66	0.21	0.099	J, B
67-64-1	Acetone	2.8	3.5	1.7	0.77	J
75-69-4	Trichlorofluoromethane	0.36	0.14	0.087	0.022	
67-63-0	2-Propanol (Isopropyl Alcohol)	0.39	1.3	0.39	0.14	U
107-13-1	Acrylonitrile	0.22	0.36	0.22	0.077	U
75-35-4	1,1-Dichloroethene	0.84	0.21	0.065	0.028	
75-09-2	Methylene Chloride	0.14	0.24	0.14	0.066	U
107-05-1	3-Chloro-1-propene (Allyl Chloride)	0.083	0.26	0.083	0.035	U
76-13-1	Trichlorotrifluoroethane	3.1	0.11	0.034	0.015	
75-15-0	Carbon Disulfide	0.16	0.54	0.26	0.078	J
156-60-5	trans-1,2-Dichloroethene	0.39	0.20	0.065	0.028	
75-34-3	1,1-Dichloroethane	0.34	0.20	0.12	0.029	
1634-04-4	Methyl tert-Butyl Ether	0.072	0.23	0.072	0.027	U
108-05-4	Vinyl Acetate	0.99	2.3	1.1	0.52	J
78-93-3	2-Butanone (MEK)	0.45	0.52	0.16	0.057	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-Y8Q1

Client Project ID: DDMT

ALS Project ID: P1805277

ALS Sample ID: P1805277-001

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC01581

Date Collected: 10/1/18

Date Received: 10/4/18

Date Analyzed: 10/17/18

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.59 Final Pressure (psig): 3.68

Container Dilution Factor: 1.52

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	29	0.20	0.065	0.029	
141-78-6	Ethyl Acetate	0.27	0.46	0.27	0.12	U
110-54-3	n-Hexane	0.14	0.23	0.14	0.047	U
67-66-3	Chloroform	4.8	0.17	0.053	0.022	
109-99-9	Tetrahydrofuran (THF)	0.088	0.27	0.088	0.035	U
107-06-2	1,2-Dichloroethane	0.064	0.20	0.064	0.022	U
71-55-6	1,1,1-Trichloroethane	0.32	0.15	0.047	0.018	
71-43-2	Benzene	0.053	0.25	0.081	0.037	J
56-23-5	Carbon Tetrachloride	0.40	0.13	0.041	0.018	
110-82-7	Cyclohexane	0.15	0.44	0.15	0.066	U
78-87-5	1,2-Dichloropropane	0.056	0.18	0.056	0.022	U
75-27-4	Bromodichloromethane	0.040	0.12	0.039	0.017	J
79-01-6	Trichloroethene	28	0.15	0.048	0.020	
123-91-1	1,4-Dioxane	0.072	0.22	0.072	0.027	U
80-62-6	Methyl Methacrylate	0.23	0.41	0.23	0.071	U
142-82-5	n-Heptane	0.12	0.20	0.12	0.032	U
10061-01-5	cis-1,3-Dichloropropene	0.060	0.19	0.060	0.028	U
108-10-1	4-Methyl-2-pentanone	0.063	0.20	0.063	0.027	U
10061-02-6	trans-1,3-Dichloropropene	0.11	0.18	0.11	0.037	U
79-00-5	1,1,2-Trichloroethane	0.043	0.15	0.047	0.015	J
108-88-3	Toluene	0.058	0.21	0.069	0.026	J
591-78-6	2-Hexanone	0.075	0.20	0.063	0.024	J
124-48-1	Dibromochloromethane	0.030	0.096	0.030	0.012	U
106-93-4	1,2-Dibromoethane	0.034	0.11	0.034	0.012	U
123-86-4	n-Butyl Acetate	0.028	0.17	0.054	0.023	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 3 of 3

Client: Trinity Analysis & Development Corp.
Client Sample ID: ODSVE-EFF-Y8Q1
Client Project ID: DDMT

ALS Project ID: P1805277
 ALS Sample ID: P1805277-001

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9
Analyst: Simon Cao
Sampling Media: 6.0 L Summa Canister
Test Notes:
Container ID: SC01581

Date Collected: 10/1/18
Date Received: 10/4/18
Date Analyzed: 10/17/18
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.59 Final Pressure (psig): 3.68

Container Dilution Factor: 1.52

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	0.10	0.18	0.10	0.039	U
127-18-4	Tetrachloroethene	3.2	0.12	0.038	0.015	B
108-90-7	Chlorobenzene	0.056	0.17	0.056	0.023	U
100-41-4	Ethylbenzene	0.028	0.18	0.060	0.026	J
179601-23-1	m,p-Xylenes	0.12	0.39	0.12	0.049	U
75-25-2	Bromoform	0.047	0.078	0.047	0.016	U
100-42-5	Styrene	0.11	0.19	0.11	0.031	U
95-47-6	o-Xylene	0.060	0.19	0.060	0.027	U
111-84-2	n-Nonane	0.093	0.16	0.093	0.026	U
79-34-5	1,1,2,2-Tetrachloroethane	0.46	0.12	0.038	0.016	
98-82-8	Cumene	0.053	0.16	0.053	0.024	U
80-56-8	alpha-Pinene	0.085	0.14	0.085	0.022	U
103-65-1	n-Propylbenzene	0.038	0.17	0.053	0.024	J
622-96-8	4-Ethyltoluene	0.096	0.16	0.096	0.026	U
108-67-8	1,3,5-Trimethylbenzene	0.024	0.16	0.053	0.024	J
95-63-6	1,2,4-Trimethylbenzene	0.053	0.16	0.053	0.023	U
100-44-7	Benzyl Chloride	0.094	0.32	0.094	0.035	U
541-73-1	1,3-Dichlorobenzene	0.043	0.14	0.043	0.020	U
106-46-7	1,4-Dichlorobenzene	0.081	0.14	0.081	0.021	U
95-50-1	1,2-Dichlorobenzene	0.043	0.14	0.043	0.020	U
5989-27-5	d-Limonene	0.082	0.14	0.082	0.030	U
96-12-8	1,2-Dibromo-3-chloropropane	0.050	0.082	0.050	0.016	U
120-82-1	1,2,4-Trichlorobenzene	0.068	0.11	0.068	0.027	U
91-20-3	Naphthalene	0.093	0.15	0.093	0.038	U
87-68-3	Hexachlorobutadiene	0.046	0.076	0.046	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.
 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 1 of 3

Client: Trinity Analysis & Development Corp.

Client Sample ID: ODSVE-DUP1-Y8Q1

Client Project ID: DDMT

ALS Project ID: P1805277

ALS Sample ID: P1805277-002

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC02200

Date Collected: 10/1/18

Date Received: 10/4/18

Date Analyzed: 10/17/18

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.91

Final Pressure (psig): 3.80

Container Dilution Factor: 1.45

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	0.25	0.44	0.26	0.11	J
75-71-8	Dichlorodifluoromethane (CFC 12)	0.59	0.15	0.091	0.026	
74-87-3	Chloromethane	0.063	0.35	0.21	0.060	J
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	0.019	0.11	0.064	0.017	J
75-01-4	Vinyl Chloride	0.14	0.30	0.096	0.032	J
106-99-0	1,3-Butadiene	0.21	0.34	0.21	0.058	U
74-83-9	Bromomethane	0.028	0.19	0.060	0.028	J
75-00-3	Chloroethane	0.16	0.28	0.16	0.036	U
64-17-5	Ethanol	2.0	3.9	0.65	0.28	J, B
75-05-8	Acetonitrile	0.22	0.45	0.28	0.11	J
107-02-8	Acrolein	0.56	0.63	0.20	0.095	J, B
67-64-1	Acetone	3.4	3.3	1.6	0.73	
75-69-4	Trichlorofluoromethane	0.37	0.14	0.083	0.021	
67-63-0	2-Propanol (Isopropyl Alcohol)	0.16	1.2	0.37	0.13	J
107-13-1	Acrylonitrile	0.21	0.35	0.21	0.074	U
75-35-4	1,1-Dichloroethene	0.84	0.20	0.062	0.027	
75-09-2	Methylene Chloride	0.13	0.23	0.13	0.063	U
107-05-1	3-Chloro-1-propene (Allyl Chloride)	0.079	0.25	0.079	0.033	U
76-13-1	Trichlorotrifluoroethane	3.1	0.10	0.032	0.014	
75-15-0	Carbon Disulfide	0.23	0.51	0.25	0.075	J
156-60-5	trans-1,2-Dichloroethene	0.40	0.19	0.062	0.027	
75-34-3	1,1-Dichloroethane	0.34	0.19	0.11	0.028	
1634-04-4	Methyl tert-Butyl Ether	0.068	0.22	0.068	0.025	U
108-05-4	Vinyl Acetate	1.8	2.2	1.1	0.49	J
78-93-3	2-Butanone (MEK)	0.62	0.49	0.16	0.054	

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

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Client: Trinity Analysis & Development Corp.

Client Sample ID: ODSVE-DUP1-Y8Q1

Client Project ID: DDMT

ALS Project ID: P1805277

ALS Sample ID: P1805277-002

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC02200

Date Collected: 10/1/18

Date Received: 10/4/18

Date Analyzed: 10/17/18

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.91 Final Pressure (psig): 3.80

Container Dilution Factor: 1.45

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	29	0.19	0.062	0.027	
141-78-6	Ethyl Acetate	0.26	0.44	0.26	0.11	U
110-54-3	n-Hexane	0.13	0.22	0.13	0.045	U
67-66-3	Chloroform	5.0	0.16	0.050	0.021	
109-99-9	Tetrahydrofuran (THF)	0.084	0.26	0.084	0.033	U
107-06-2	1,2-Dichloroethane	0.026	0.19	0.061	0.021	J
71-55-6	1,1,1-Trichloroethane	0.31	0.14	0.045	0.018	
71-43-2	Benzene	0.042	0.24	0.077	0.035	J
56-23-5	Carbon Tetrachloride	0.39	0.12	0.039	0.017	
110-82-7	Cyclohexane	0.14	0.42	0.14	0.063	U
78-87-5	1,2-Dichloropropane	0.053	0.17	0.053	0.021	U
75-27-4	Bromodichloromethane	0.040	0.11	0.037	0.017	J
79-01-6	Trichloroethene	28	0.14	0.046	0.019	
123-91-1	1,4-Dioxane	0.068	0.21	0.068	0.025	U
80-62-6	Methyl Methacrylate	0.22	0.39	0.22	0.067	U
142-82-5	n-Heptane	0.11	0.19	0.11	0.030	U
10061-01-5	cis-1,3-Dichloropropene	0.058	0.18	0.058	0.027	U
108-10-1	4-Methyl-2-pentanone	0.038	0.19	0.060	0.026	J
10061-02-6	trans-1,3-Dichloropropene	0.10	0.17	0.10	0.035	U
79-00-5	1,1,2-Trichloroethane	0.048	0.14	0.045	0.014	J
108-88-3	Toluene	0.12	0.20	0.065	0.025	J
591-78-6	2-Hexanone	0.061	0.19	0.060	0.023	J
124-48-1	Dibromochloromethane	0.029	0.092	0.029	0.012	U
106-93-4	1,2-Dibromoethane	0.032	0.10	0.032	0.012	U
123-86-4	n-Butyl Acetate	0.047	0.16	0.052	0.022	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 3 of 3

Client: Trinity Analysis & Development Corp.
Client Sample ID: ODSVE-DUP1-Y8Q1
Client Project ID: DDMT

ALS Project ID: P1805277
 ALS Sample ID: P1805277-002

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9
Analyst: Simon Cao
Sampling Media: 6.0 L Summa Canister
Test Notes:
Container ID: SC02200

Date Collected: 10/1/18
Date Received: 10/4/18
Date Analyzed: 10/17/18
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.91 Final Pressure (psig): 3.80

Container Dilution Factor: 1.45

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	0.099	0.17	0.099	0.037	U
127-18-4	Tetrachloroethene	3.2	0.11	0.036	0.015	B
108-90-7	Chlorobenzene	0.054	0.17	0.054	0.022	U
100-41-4	Ethylbenzene	0.057	0.17	0.057	0.025	U
179601-23-1	m,p-Xylenes	0.11	0.37	0.11	0.047	U
75-25-2	Bromoform	0.045	0.074	0.045	0.015	U
100-42-5	Styrene	0.11	0.18	0.11	0.029	U
95-47-6	o-Xylene	0.057	0.18	0.057	0.026	U
111-84-2	n-Nonane	0.088	0.15	0.088	0.025	U
79-34-5	1,1,2,2-Tetrachloroethane	0.45	0.11	0.036	0.016	
98-82-8	Cumene	0.050	0.16	0.050	0.023	U
80-56-8	alpha-Pinene	0.081	0.14	0.081	0.021	U
103-65-1	n-Propylbenzene	0.050	0.16	0.050	0.023	U
622-96-8	4-Ethyltoluene	0.091	0.16	0.091	0.025	U
108-67-8	1,3,5-Trimethylbenzene	0.050	0.16	0.050	0.023	U
95-63-6	1,2,4-Trimethylbenzene	0.050	0.16	0.050	0.022	U
100-44-7	Benzyl Chloride	0.090	0.31	0.090	0.034	U
541-73-1	1,3-Dichlorobenzene	0.041	0.13	0.041	0.019	U
106-46-7	1,4-Dichlorobenzene	0.077	0.13	0.077	0.020	U
95-50-1	1,2-Dichlorobenzene	0.041	0.13	0.041	0.019	U
5989-27-5	d-Limonene	0.078	0.13	0.078	0.029	U
96-12-8	1,2-Dibromo-3-chloropropane	0.048	0.078	0.048	0.015	U
120-82-1	1,2,4-Trichlorobenzene	0.064	0.10	0.064	0.025	U
91-20-3	Naphthalene	0.089	0.14	0.089	0.036	U
87-68-3	Hexachlorobutadiene	0.044	0.072	0.044	0.015	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.
 B = Analyte detected in both the sample and associated method blank.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: Trinity Analysis & Development Corp.

Client Sample ID: Method Blank

Client Project ID: DDMT

ALS Project ID: P1805277

ALS Sample ID: P181016-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 10/16/18

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	0.18	0.30	0.18	0.076	U
75-71-8	Dichlorodifluoromethane (CFC 12)	0.063	0.11	0.063	0.018	U
74-87-3	Chloromethane	0.15	0.24	0.15	0.042	U
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	0.044	0.073	0.044	0.012	U
75-01-4	Vinyl Chloride	0.067	0.21	0.067	0.022	U
106-99-0	1,3-Butadiene	0.14	0.24	0.14	0.040	U
74-83-9	Bromomethane	0.041	0.13	0.041	0.019	U
75-00-3	Chloroethane	0.11	0.19	0.11	0.025	U
64-17-5	Ethanol	0.26	2.7	0.45	0.20	J
75-05-8	Acetonitrile	0.19	0.31	0.19	0.077	U
107-02-8	Acrolein	0.090	0.44	0.14	0.065	J
67-64-1	Acetone	1.1	2.3	1.1	0.51	U
75-69-4	Trichlorofluoromethane	0.057	0.094	0.057	0.014	U
67-63-0	2-Propanol (Isopropyl Alcohol)	0.26	0.85	0.26	0.090	U
107-13-1	Acrylonitrile	0.15	0.24	0.15	0.051	U
75-35-4	1,1-Dichloroethene	0.043	0.14	0.043	0.019	U
75-09-2	Methylene Chloride	0.092	0.16	0.092	0.043	U
107-05-1	3-Chloro-1-propene (Allyl Chloride)	0.054	0.17	0.054	0.023	U
76-13-1	Trichlorotrifluoroethane	0.022	0.069	0.022	0.0099	U
75-15-0	Carbon Disulfide	0.17	0.35	0.17	0.051	U
156-60-5	trans-1,2-Dichloroethene	0.043	0.13	0.043	0.019	U
75-34-3	1,1-Dichloroethane	0.077	0.13	0.077	0.019	U
1634-04-4	Methyl tert-Butyl Ether	0.047	0.15	0.047	0.017	U
108-05-4	Vinyl Acetate	0.74	1.5	0.74	0.34	U
78-93-3	2-Butanone (MEK)	0.11	0.34	0.11	0.037	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

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Client: Trinity Analysis & Development Corp.

Client Sample ID: Method Blank

Client Project ID: DDMT

ALS Project ID: P1805277

ALS Sample ID: P181016-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 10/16/18

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	0.043	0.13	0.043	0.019	U
141-78-6	Ethyl Acetate	0.18	0.31	0.18	0.078	U
110-54-3	n-Hexane	0.091	0.15	0.091	0.031	U
67-66-3	Chloroform	0.035	0.11	0.035	0.015	U
109-99-9	Tetrahydrofuran (THF)	0.058	0.18	0.058	0.023	U
107-06-2	1,2-Dichloroethane	0.042	0.13	0.042	0.015	U
71-55-6	1,1,1-Trichloroethane	0.031	0.099	0.031	0.012	U
71-43-2	Benzene	0.053	0.16	0.053	0.024	U
56-23-5	Carbon Tetrachloride	0.027	0.083	0.027	0.012	U
110-82-7	Cyclohexane	0.099	0.29	0.099	0.044	U
78-87-5	1,2-Dichloropropane	0.037	0.12	0.037	0.014	U
75-27-4	Bromodichloromethane	0.025	0.079	0.025	0.011	U
79-01-6	Trichloroethene	0.032	0.099	0.032	0.013	U
123-91-1	1,4-Dioxane	0.047	0.15	0.047	0.017	U
80-62-6	Methyl Methacrylate	0.15	0.27	0.15	0.046	U
142-82-5	n-Heptane	0.078	0.13	0.078	0.021	U
10061-01-5	cis-1,3-Dichloropropene	0.040	0.12	0.040	0.018	U
108-10-1	4-Methyl-2-pentanone	0.041	0.13	0.041	0.018	U
10061-02-6	trans-1,3-Dichloropropene	0.071	0.12	0.071	0.024	U
79-00-5	1,1,2-Trichloroethane	0.031	0.099	0.031	0.0099	U
108-88-3	Toluene	0.045	0.14	0.045	0.017	U
591-78-6	2-Hexanone	0.042	0.13	0.042	0.016	U
124-48-1	Dibromochloromethane	0.020	0.063	0.020	0.0082	U
106-93-4	1,2-Dibromoethane	0.022	0.070	0.022	0.0081	U
123-86-4	n-Butyl Acetate	0.036	0.11	0.036	0.015	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

ALS Project ID: P1805277
 ALS Sample ID: P181016-MB

Test Code: EPA TO-15
 Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9
 Analyst: Simon Cao
 Sampling Media: 6.0 L Summa Canister
 Test Notes:

Date Collected: NA
 Date Received: NA
 Date Analyzed: 10/16/18
 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	0.069	0.12	0.069	0.026	U
127-18-4	Tetrachloroethene	0.014	0.078	0.025	0.010	J
108-90-7	Chlorobenzene	0.037	0.12	0.037	0.015	U
100-41-4	Ethylbenzene	0.039	0.12	0.039	0.017	U
179601-23-1	m,p-Xylenes	0.078	0.25	0.078	0.032	U
75-25-2	Bromoform	0.031	0.051	0.031	0.011	U
100-42-5	Styrene	0.075	0.12	0.075	0.020	U
95-47-6	o-Xylene	0.039	0.12	0.039	0.018	U
111-84-2	n-Nonane	0.061	0.10	0.061	0.017	U
79-34-5	1,1,2,2-Tetrachloroethane	0.025	0.077	0.025	0.011	U
98-82-8	Cumene	0.035	0.11	0.035	0.016	U
80-56-8	alpha-Pinene	0.056	0.093	0.056	0.015	U
103-65-1	n-Propylbenzene	0.035	0.11	0.035	0.016	U
622-96-8	4-Ethyltoluene	0.063	0.11	0.063	0.017	U
108-67-8	1,3,5-Trimethylbenzene	0.035	0.11	0.035	0.016	U
95-63-6	1,2,4-Trimethylbenzene	0.035	0.11	0.035	0.015	U
100-44-7	Benzyl Chloride	0.062	0.21	0.062	0.023	U
541-73-1	1,3-Dichlorobenzene	0.028	0.090	0.028	0.013	U
106-46-7	1,4-Dichlorobenzene	0.053	0.090	0.053	0.014	U
95-50-1	1,2-Dichlorobenzene	0.028	0.090	0.028	0.013	U
5989-27-5	d-Limonene	0.054	0.092	0.054	0.020	U
96-12-8	1,2-Dibromo-3-chloropropane	0.033	0.054	0.033	0.010	U
120-82-1	1,2,4-Trichlorobenzene	0.044	0.071	0.044	0.018	U
91-20-3	Naphthalene	0.026	0.097	0.061	0.025	J
87-68-3	Hexachlorobutadiene	0.030	0.050	0.030	0.010	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

SURROGATE SPIKE RECOVERY RESULTS

Page 1 of 1

Client: Trinity Analysis & Development Corp.
Client Project ID: DDMT

ALS Project ID: P1805277

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9
Analyst: Simon Cao
Sampling Media: 6.0 L Summa Canister(s)
Test Notes:

Date(s) Collected: 10/1/18
Date(s) Received: 10/4/18
Date(s) Analyzed: 10/16 - 10/17/18

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	P181016-MB	108	99	97	70-130	
Lab Control Sample	P181016-LCS	97	99	100	70-130	
Duplicate Lab Control Sample	P181016-DLCS	97	99	100	70-130	
ODSVE-EFF-Y8Q1	P1805277-001	90	100	104	70-130	
ODSVE-EFF-Y8Q1	P1805277-001DUP	79	100	104	70-130	
ODSVE-DUP1-Y8Q1	P1805277-002	92	100	103	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: Trinity Analysis & Development Corp.
Client Sample ID: Duplicate Lab Control Sample
Client Project ID: DDMT

ALS Project ID: P1805277
 ALS Sample ID: P181016-DLCS

Test Code: EPA TO-15
 Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9
 Analyst: Simon Cao
 Sampling Media: 6.0 L Summa Canister
 Test Notes:

Date Collected: NA
 Date Received: NA
 Date Analyzed: 10/16/18
 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	123	98.7	96.2	80	78	57-136	3	25	
75-71-8	Dichlorodifluoromethane (CFC 12)	42.6	37.7	36.8	88	86	59-128	2	25	
74-87-3	Chloromethane	102	89.4	87.9	88	86	59-132	2	25	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	30.2	26.6	26.0	88	86	63-121	2	25	
75-01-4	Vinyl Chloride	83.7	66.8	67.2	80	80	64-127	0	25	
106-99-0	1,3-Butadiene	95.1	88.9	90.4	93	95	66-134	2	25	
74-83-9	Bromomethane	54.6	49.5	49.5	91	91	63-134	0	25	
75-00-3	Chloroethane	81.1	76.5	76.1	94	94	63-127	0	25	
64-17-5	Ethanol	544	484	482	89	89	59-125	0	25	
75-05-8	Acetonitrile	123	106	106	86	86	63-132	0	25	
107-02-8	Acrolein	89.4	69.1	69.0	77	77	62-126	0	25	
67-64-1	Acetone	446	380	372	85	83	58-128	2	25	
75-69-4	Trichlorofluoromethane	37.6	34.0	33.8	90	90	62-126	0	25	
67-63-0	2-Propanol (Isopropyl Alcohol)	168	168	166	100	99	52-125	1	25	
107-13-1	Acrylonitrile	95.4	84.7	83.3	89	87	71-137	2	25	
75-35-4	1,1-Dichloroethene	55.0	48.0	47.1	87	86	61-133	1	25	
75-09-2	Methylene Chloride	62.4	56.9	55.9	91	90	62-115	1	25	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	69.0	71.0	69.6	103	101	71-131	2	25	
76-13-1	Trichlorotrifluoroethane	28.1	26.9	26.4	96	94	66-126	2	25	
75-15-0	Carbon Disulfide	69.9	63.4	62.5	91	89	57-134	2	25	
156-60-5	trans-1,2-Dichloroethene	53.9	49.7	49.3	92	91	67-124	1	25	
75-34-3	1,1-Dichloroethane	53.3	49.4	48.4	93	91	68-126	2	25	
1634-04-4	Methyl tert-Butyl Ether	59.5	55.6	54.9	93	92	66-126	1	25	
108-05-4	Vinyl Acetate	302	358	352	119	117	56-139	2	25	
78-93-3	2-Butanone (MEK)	70.4	68.1	67.0	97	95	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: Trinity Analysis & Development Corp.

Client Sample ID: Duplicate Lab Control Sample

Client Project ID: DDMT

ALS Project ID: P1805277

ALS Sample ID: P181016-DLCS

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 10/16/18

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	53.2	48.8	48.1	92	90	70-121	2	25	
141-78-6	Ethyl Acetate	121	117	115	97	95	65-128	2	25	
110-54-3	n-Hexane	61.2	53.9	52.9	88	86	63-120	2	25	
67-66-3	Chloroform	44.4	40.5	39.7	91	89	68-123	2	25	
109-99-9	Tetrahydrofuran (THF)	73.3	65.4	65.1	89	89	64-123	0	25	
107-06-2	1,2-Dichloroethane	53.1	49.5	48.9	93	92	65-128	1	25	
71-55-6	1,1,1-Trichloroethane	39.5	39.2	39.1	99	99	68-125	0	25	
71-43-2	Benzene	66.1	61.1	60.3	92	91	69-119	1	25	
56-23-5	Carbon Tetrachloride	33.7	35.3	35.0	105	104	68-132	1	25	
110-82-7	Cyclohexane	121	114	113	94	93	70-117	1	25	
78-87-5	1,2-Dichloropropane	46.7	44.1	43.7	94	94	69-123	0	25	
75-27-4	Bromodichloromethane	32.0	32.2	32.0	101	100	72-128	1	25	
79-01-6	Trichloroethene	39.7	36.0	35.6	91	90	71-123	1	25	
123-91-1	1,4-Dioxane	59.4	59.2	58.2	100	98	71-122	2	25	
80-62-6	Methyl Methacrylate	105	104	104	99	99	70-128	0	25	
142-82-5	n-Heptane	52.5	50.4	49.9	96	95	69-123	1	25	
10061-01-5	cis-1,3-Dichloropropene	47.2	48.1	47.7	102	101	70-128	1	25	
108-10-1	4-Methyl-2-pentanone	51.1	53.0	52.3	104	102	67-130	2	25	
10061-02-6	trans-1,3-Dichloropropene	46.9	50.5	50.5	108	108	75-133	0	25	
79-00-5	1,1,2-Trichloroethane	39.4	38.0	37.5	96	95	73-119	1	25	
108-88-3	Toluene	56.3	56.4	55.8	100	99	66-119	1	25	
591-78-6	2-Hexanone	52.3	52.8	52.5	101	100	62-128	1	25	
124-48-1	Dibromochloromethane	25.0	26.2	25.9	105	104	70-130	1	25	
106-93-4	1,2-Dibromoethane	28.1	27.7	27.5	99	98	74-122	1	25	
123-86-4	n-Butyl Acetate	46.1	47.8	47.5	104	103	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: Trinity Analysis & Development Corp.

Client Sample ID: Duplicate Lab Control Sample

Client Project ID: DDMT

ALS Project ID: P1805277

ALS Sample ID: P181016-DLCS

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 10/16/18

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount	Result		DOD		RPD	RPD	Data
		LCS / DLCS ppbV	LCS ppbV	DLCS ppbV	% Recovery LCS DLCS	Acceptance Limits			
111-65-9	n-Octane	46.5	43.1	42.6	93 92	69-121	1	25	
127-18-4	Tetrachloroethene	31.4	30.7	30.5	98 97	66-124	1	25	
108-90-7	Chlorobenzene	46.6	43.4	42.8	93 92	70-119	1	25	
100-41-4	Ethylbenzene	48.9	45.6	45.1	93 92	70-124	1	25	
179601-23-1	m,p-Xylenes	98.2	92.2	91.4	94 93	61-134	1	25	
75-25-2	Bromoform	20.6	22.4	22.2	109 108	66-139	0.9	25	
100-42-5	Styrene	49.8	50.1	49.8	101 100	73-127	1	25	
95-47-6	o-Xylene	49.3	46.6	46.3	95 94	67-125	1	25	
111-84-2	n-Nonane	40.9	39.0	38.7	95 95	63-128	0	25	
79-34-5	1,1,2,2-Tetrachloroethane	31.2	31.7	31.4	102 101	65-127	1	25	
98-82-8	Cumene	43.6	40.9	40.7	94 93	68-124	1	25	
80-56-8	alpha-Pinene	37.9	37.3	37.1	98 98	69-122	0	25	
103-65-1	n-Propylbenzene	44.3	41.7	41.3	94 93	69-123	1	25	
622-96-8	4-Ethyltoluene	43.6	42.8	42.5	98 97	67-129	1	25	
108-67-8	1,3,5-Trimethylbenzene	43.5	41.8	41.4	96 95	67-130	1	25	
95-63-6	1,2,4-Trimethylbenzene	43.8	41.9	41.6	96 95	66-132	1	25	
100-44-7	Benzyl Chloride	41.9	51.7	51.7	123 123	50-147	0	25	
541-73-1	1,3-Dichlorobenzene	35.9	35.1	35.0	98 97	65-130	1	25	
106-46-7	1,4-Dichlorobenzene	35.9	34.8	34.8	97 97	60-131	0	25	
95-50-1	1,2-Dichlorobenzene	35.9	36.1	36.0	101 100	63-129	1	25	
5989-27-5	d-Limonene	37.9	39.5	39.1	104 103	64-135	1	25	
96-12-8	1,2-Dibromo-3-chloropropane	21.7	25.9	26.4	119 122	73-136	2	25	
120-82-1	1,2,4-Trichlorobenzene	28.9	29.8	30.7	103 106	55-142	3	25	
91-20-3	Naphthalene	38.7	39.6	41.0	102 106	57-138	4	25	
87-68-3	Hexachlorobutadiene	19.6	20.1	20.2	103 103	56-138	0	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 DUPLICATE SUMMARY RESULTS

Page 1 of 3

Client: Trinity Analysis & Development Corp.

Client Sample ID: ODSVE-EFF-Y8Q1

Client Project ID: DDMT

ALS Project ID: P1805277

ALS Sample ID: P1805277-001DUP

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC01581

Date Collected: 10/1/18

Date Received: 10/4/18

Date Analyzed: 10/17/18

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.59

Final Pressure (psig): 3.68

Container Dilution Factor: 1.52

Compound	Duplicate		Average	% RPD	RPD Limit	Data Qualifier
	Sample Result	Sample Result				
	ppbV	ppbV	ppbV			
Propene	0.207	0.217	0.212	5	25	J
Dichlorodifluoromethane (CFC 12)	0.577	0.581	0.579	0.7	25	
Chloromethane	ND	ND	-	-	25	
1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	ND	-	-	25	
Vinyl Chloride	0.134	0.142	0.138	6	25	J
1,3-Butadiene	ND	ND	-	-	25	
Bromomethane	ND	ND	-	-	25	
Chloroethane	ND	ND	-	-	25	
Ethanol	0.838	0.682	0.76	21	25	J, B
Acetonitrile	0.356	0.341	0.3485	4	25	J
Acrolein	0.576	0.604	0.59	5	25	J, B
Acetone	2.77	2.76	2.765	0.4	25	J
Trichlorofluoromethane	0.359	0.379	0.369	5	25	
2-Propanol (Isopropyl Alcohol)	ND	ND	-	-	25	
Acrylonitrile	ND	ND	-	-	25	
1,1-Dichloroethene	0.839	0.856	0.8475	2	25	
Methylene Chloride	ND	ND	-	-	25	
3-Chloro-1-propene (Allyl Chloride)	ND	ND	-	-	25	
Trichlorotrifluoroethane	3.06	3.11	3.085	2	25	
Carbon Disulfide	0.163	0.171	0.167	5	25	J
trans-1,2-Dichloroethene	0.393	0.393	0.393	0	25	
1,1-Dichloroethane	0.343	0.346	0.3445	0.9	25	
Methyl tert-Butyl Ether	ND	ND	-	-	25	
Vinyl Acetate	0.993	0.925	0.959	7	25	J
2-Butanone (MEK)	0.449	0.428	0.4385	5	25	J

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

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

LABORATORY DUPLICATE SUMMARY RESULTS

Page 2 of 3

Client: Trinity Analysis & Development Corp.

Client Sample ID: ODSVE-EFF-Y8Q1

Client Project ID: DDMT

ALS Project ID: P1805277

ALS Sample ID: P1805277-001DUP

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC01581

Date Collected: 10/1/18

Date Received: 10/4/18

Date Analyzed: 10/17/18

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.59

Final Pressure (psig): 3.68

Container Dilution Factor: 1.52

Compound	Duplicate		Average	% RPD	RPD Limit	Data Qualifier
	Sample Result	Sample Result				
	ppbV	ppbV	ppbV			
cis-1,2-Dichloroethene	28.6	28.6	28.6	0	25	
Ethyl Acetate	ND	ND	-	-	25	
n-Hexane	ND	ND	-	-	25	
Chloroform	4.84	4.83	4.835	0.2	25	
Tetrahydrofuran (THF)	ND	ND	-	-	25	
1,2-Dichloroethane	ND	ND	-	-	25	
1,1,1-Trichloroethane	0.322	0.304	0.313	6	25	
Benzene	0.0528	0.0524	0.0526	0.8	25	J
Carbon Tetrachloride	0.402	0.402	0.402	0	25	
Cyclohexane	ND	ND	-	-	25	
1,2-Dichloropropane	ND	ND	-	-	25	
Bromodichloromethane	0.0397	0.0427	0.0412	7	25	J
Trichloroethene	28.4	28.7	28.55	1	25	
1,4-Dioxane	ND	ND	-	-	25	
Methyl Methacrylate	ND	ND	-	-	25	
n-Heptane	ND	ND	-	-	25	
cis-1,3-Dichloropropene	ND	ND	-	-	25	
4-Methyl-2-pentanone	ND	ND	-	-	25	
trans-1,3-Dichloropropene	ND	ND	-	-	25	
1,1,2-Trichloroethane	0.0435	0.0474	0.04545	9	25	J
Toluene	0.0577	0.0525	0.0551	9	25	J
2-Hexanone	0.0754	0.0761	0.07575	0.9	25	J
Dibromochloromethane	ND	ND	-	-	25	
1,2-Dibromoethane	ND	ND	-	-	25	
n-Butyl Acetate	0.0278	0.0288	0.0283	4	25	J

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

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

ALS ENVIRONMENTAL

LABORATORY DUPLICATE SUMMARY RESULTS

Page 3 of 3

Client: Trinity Analysis & Development Corp.

Client Sample ID: ODSVE-EFF-Y8Q1

Client Project ID: DDMT

ALS Project ID: P1805277

ALS Sample ID: P1805277-001DUP

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC01581

Date Collected: 10/1/18

Date Received: 10/4/18

Date Analyzed: 10/17/18

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.59

Final Pressure (psig): 3.68

Container Dilution Factor: 1.52

Compound	Sample Result ppbV	Duplicate Sample Result ppbV	Average ppbV	% RPD	RPD Limit	Data Qualifier
n-Octane	ND	ND	-	-	25	
Tetrachloroethene	3.22	3.30	3.26	2	25	B
Chlorobenzene	ND	ND	-	-	25	
Ethylbenzene	0.0284	0.0263	0.02735	8	25	J
m,p-Xylenes	ND	ND	-	-	25	
Bromoform	ND	ND	-	-	25	
Styrene	ND	ND	-	-	25	
o-Xylene	ND	ND	-	-	25	
n-Nonane	ND	ND	-	-	25	
1,1,2,2-Tetrachloroethane	0.461	0.467	0.464	1	25	
Cumene	ND	ND	-	-	25	
alpha-Pinene	ND	ND	-	-	25	
n-Propylbenzene	0.0380	0.0350	0.0365	8	25	J
4-Ethyltoluene	ND	ND	-	-	25	
1,3,5-Trimethylbenzene	0.0238	ND	-	-	25	
1,2,4-Trimethylbenzene	ND	ND	-	-	25	
Benzyl Chloride	ND	ND	-	-	25	
1,3-Dichlorobenzene	ND	ND	-	-	25	
1,4-Dichlorobenzene	ND	ND	-	-	25	
1,2-Dichlorobenzene	ND	ND	-	-	25	
d-Limonene	ND	ND	-	-	25	
1,2-Dibromo-3-chloropropane	ND	ND	-	-	25	
1,2,4-Trichlorobenzene	ND	ND	-	-	25	
Naphthalene	ND	ND	-	-	25	
Hexachlorobutadiene	ND	ND	-	-	25	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

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 1 of 1

Client: Trinity Analysis & Development Corp.
Client Project ID: DDMT

ALS Project ID: P1805277

Method Blank Summary

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9
Analyst: Simon Cao
Sampling Media: 6.0 L Summa Canister(s)
Test Notes:

Lab File ID: 10161804.D
Date Analyzed: 10/16/18
Time Analyzed: 11:19

Client Sample ID	ALS Sample ID	Lab File ID	Time Analyzed
Lab Control Sample	P181016-LCS	10161805.D	11:53
Duplicate Lab Control Sample	P181016-DLCS	10161806.D	12:27
ODSVE-DUP1-Y8Q1	P1805277-002	10161825.D	00:15
ODSVE-EFF-Y8Q1	P1805277-001	10161826.D	00:48
ODSVE-EFF-Y8Q1 (Lab Duplicate)	P1805277-001DUP	10161827.D	01:22

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Trinity Analysis & Development Corp.
Client Project ID: DDMT

ALS Project ID: P1805277

Internal Standard Area and RT Summary

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9
Analyst: Simon Cao
Sampling Media: 6.0 L Summa Canister(s)
Test Notes:

Lab File ID: 10161802.D
Date Analyzed: 10/16/18
Time Analyzed: 10:10

	IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
	AREA	#	RT	#	AREA	#
24 Hour Standard	121842		9.28		417282	
Upper Limit	170579		9.61		584195	
Lower Limit	73105		8.95		250369	

Client Sample ID						
01	Method Blank	97668	9.24	639294	11.22	389722
02	Lab Control Sample	128409	9.28	680373	11.24	409705
03	Duplicate Lab Control Sample	129462	9.28	680562	11.24	409984
04	ODSVE-DUP1-Y8Q1	95379	9.25	641636	11.22	386563
05	ODSVE-EFF-Y8Q1	96733	9.26	635799	11.23	383216
06	ODSVE-EFF-Y8Q1 (Lab Duplicate)	94868	9.25	625536	11.23	373078
07						
08						
09						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

IS1 (BCM) = Bromochloromethane

IS2 (DFB) = 1,4-Difluorobenzene

IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = 140% of internal standard area

AREA LOWER LIMIT = 60% of internal standard area

RT UPPER LIMIT = 0.33 minutes of internal standard RT

RT LOWER LIMIT = 0.33 minutes of internal standard RT

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

I = Internal standard not within the specified limits.

Data File: I:\MS09\Data\2018 10\16\10161826.D

Acq On : 17 Oct 2018 00:48

Operator: SC

Sample : P1805277-001 (1000mL)

Misc : S31-10151806

ALS Vial : 13 Sample Multiplier: 1

 10/17/18

Quant Time: Oct 17 10:15:51 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Wed Oct 17 09:09:32 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.26	130	96733	12.500	ng	0.01
37) 1,4-Difluorobenzene (IS2)	11.23	114	635799	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	15.57	82	383216	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	10.04	65	225714	11.310	ng	0.03
Spiked Amount	12.500	Range	70 - 130	Recovery	=	90.48%
57) Toluene-d8 (SS2)	13.66	98	824789	12.459	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.68%
73) Bromofluorobenzene (SS3)	17.15	174	175958	12.987	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.92%

Target Compounds

						Qvalue
2) Propene	3.95	42	5865m	0.234	ng	
3) Dichlorodifluoromethan...	4.05	85	49640	1.875	ng	100
4) Chloromethane	4.25	50	1295	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	4.42	135	665	0.077	ng	79
6) Vinyl Chloride	4.53	62	5387	0.225	ng	99
7) 1,3-Butadiene	4.72	54	189	N.D.		
8) Bromomethane	5.02	94	576	0.067	ng	96
9) Chloroethane	5.24	64	305	N.D.		
10) Ethanol	5.45	45	17794	1.038	ng	87
11) Acetonitrile	5.67	41	18189	0.393	ng	82
12) Acrolein	5.82	56	10736	0.869	ng	96
13) Acetone	5.98	58	60715	4.323	ng	# 71
14) Trichlorofluoromethane	6.12	101	23634	1.325	ng	100
15) 2-Propanol (Isopropanol)	6.27	45	9995	0.175	ng	83
16) Acrylonitrile	6.48	53	440	N.D.		
17) 1,1-Dichloroethene	6.83	96	24505	2.188	ng	# 78
18) 2-Methyl-2-Propanol (t...	6.96	59	1671	N.D.		
19) Methylene Chloride	6.97	84	1531	0.105	ng	# 75
20) 3-Chloro-1-propene (Al...	7.03	41	1072	N.D.		
21) Trichlorotrifluoroethane	7.29	151	117927	15.409	ng	87
22) Carbon Disulfide	7.25	76	17217	0.333	ng	# 22
23) trans-1,2-Dichloroethene	7.99	61	28457	1.026	ng	88
24) 1,1-Dichloroethane	8.21	63	28878	0.913	ng	99
25) Methyl tert-Butyl Ether	8.24	73	168	N.D.		
26) Vinyl Acetate	8.37	86	5848	2.300	ng	# 84
27) 2-Butanone (MEK)	8.65	72	11025	0.870	ng	# 53
28) cis-1,2-Dichloroethene	9.09	61	2027386	74.452	ng	87
29) Diisopropyl Ether	0.00	87	0	N.D.	d	
30) Ethyl Acetate	0.00	61	0	N.D.	d	
31) n-Hexane	9.33	57	3365	0.099	ng	# 86
32) Chloroform	9.39	83	421312	15.543	ng	100
34) Tetrahydrofuran (THF)	0.00	72	0	N.D.	d	
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	10.15	62	1034	N.D.		
38) 1,1,1-Trichloroethane	10.42	97	27994	1.156	ng	92
39) Isopropyl Acetate	10.75	61	721	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	10.87	78	9415	0.111	ng	98
42) Carbon Tetrachloride	11.02	117	29941	1.665	ng	99
43) Cyclohexane	11.15	84	2221	0.075	ng	# 81
44) tert-Amyl Methyl Ether	11.42	73	101	N.D.		
45) 1,2-Dichloropropane	11.69	63	549	N.D.		
46) Bromodichloromethane	11.86	83	4345	0.175	ng	99
47) Trichloroethene	11.92	130	1657904	100.227	ng	100
48) 1,4-Dioxane	0.00	88	0	N.D.	d	
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d	

Data File: I:\MS09\Data\2018 10\16\10161826.D

Acq On : 17 Oct 2018 00:48

Operator: SC

Sample : P1805277-001 (1000mL)

Misc : S31-10151806

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Oct 17 10:15:51 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Wed Oct 17 09:09:32 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.10	100	103	N.D.		
51) n-Heptane	12.24	71	1580	0.071 ng		90
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	12.81	58	1520	0.065 ng	#	38
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	13.46	97	2713	0.156 ng		84
58) Toluene	13.76	91	10491	0.143 ng		90
59) 2-Hexanone	14.01	43	12582	0.203 ng		88
60) Dibromochloromethane	14.17	129	564	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	14.65	43	6019	0.087 ng		94
63) n-Octane	14.77	57	2120	0.091 ng	#	69
64) Tetrachloroethene	14.92	166	198561	14.361 ng		99
65) Chlorobenzene	15.61	112	945	N.D.		
66) Ethylbenzene	16.02	91	7333	0.081 ng		95
67) m- & p-Xylenes	16.20	91	8955	0.128 ng		89
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	16.58	104	947	N.D.		
70) o-Xylene	16.69	91	2570	N.D.		
71) n-Nonane	0.00	43	0	N.D. d		
72) 1,1,2,2-Tetrachloroethane	16.67	83	68517	2.083 ng		98
74) Cumene	17.29	105	3636	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	17.83	91	13140	0.123 ng		88
77) 3-Ethyltoluene	17.93	105	1767	N.D.		
78) 4-Ethyltoluene	17.98	105	3813	0.050 ng		90
79) 1,3,5-Trimethylbenzene	18.05	105	5157	0.077 ng		88
80) alpha-Methylstyrene	18.21	118	1377	N.D.		
81) 2-Ethyltoluene	0.00	105	0	N.D. d		
82) 1,2,4-Trimethylbenzene	18.47	105	4317	0.064 ng		83
83) n-Decane	18.68	58	121	N.D.		
84) Benzyl Chloride	18.61	91	472	N.D.		
85) 1,3-Dichlorobenzene	18.64	146	444	N.D.		
86) 1,4-Dichlorobenzene	18.70	146	967	N.D.		
87) sec-Butylbenzene	18.77	105	935	N.D.		
88) 4-Isopropyltoluene (p-...	18.92	119	2316	N.D.		
89) 1,2,3-Trimethylbenzene	18.92	105	1285	N.D.		
90) 1,2-Dichlorobenzene	19.06	146	360	N.D.		
91) d-Limonene	19.07	68	498	N.D.		
92) 1,2-Dibromo-3-Chloropr...	19.66	157	119	N.D.		
93) n-Undecane	19.92	57	2644	N.D.		
94) 1,2,4-Trichlorobenzene	20.86	180	300	N.D.		
95) Naphthalene	20.98	128	2609	N.D.		
96) n-Dodecane	0.00	57	0	N.D. d		
97) Hexachlorobutadiene	21.34	225	250	N.D.		
98) Cyclohexanone	0.00	55	0	N.D. d		
99) tert-Butylbenzene	18.48	119	589	N.D.		
100) n-Butylbenzene	0.00	91	0	N.D. d		

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

Data File: I:\MS09\Data\2018 10\16\10161826.D

Acq On : 17 Oct 2018 00:48

Operator: SC

Sample : P1805277-001 (1000mL)

Misc : S31-10151806

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Oct 17 10:15:51 2018

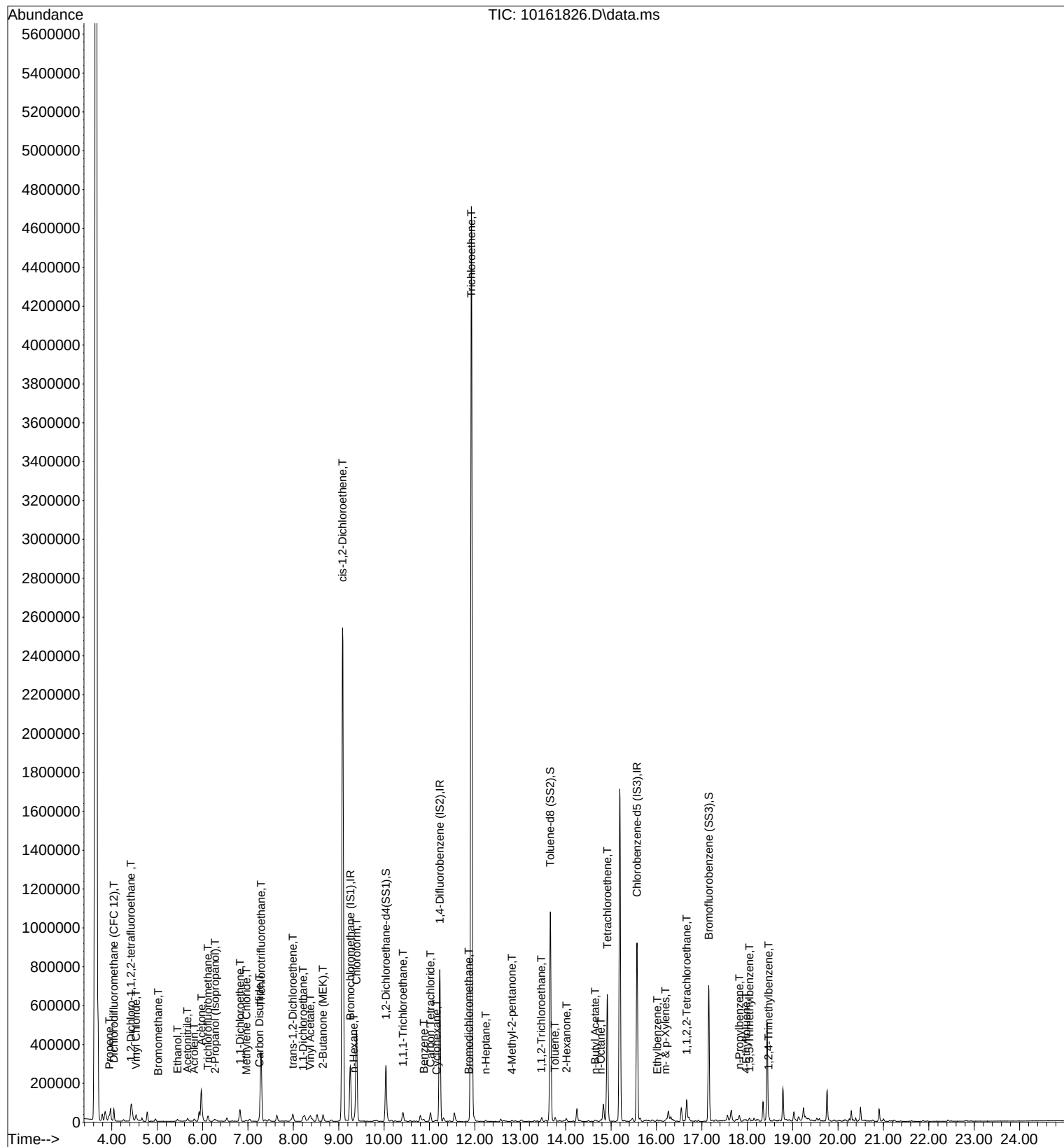
Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Wed Oct 17 09:09:32 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS09\Data\2018 10\16\10161826.D

Acq On : 17 Oct 2018 00:48

Operator: SC

Sample : P1805277-001 (1000mL)

Misc : S31-10151806

ALS Vial : 13 Sample Multiplier: 1

 10/17/18

Quant Time: Oct 17 10:15:51 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Wed Oct 17 09:09:32 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.26	130	96733	12.500	ng	0.01
37) 1,4-Difluorobenzene (IS2)	11.23	114	635799	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	15.57	82	383216	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	10.04	65	225714	11.310	ng	0.03
Spiked Amount	12.500	Range	70 - 130	Recovery	=	90.48%
57) Toluene-d8 (SS2)	13.66	98	824789	12.459	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.68%
73) Bromofluorobenzene (SS3)	17.15	174	175958	12.987	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.92%

Target Compounds

						Qvalue
2) Propene	3.95	42	5865m	0.234	ng	
3) Dichlorodifluoromethan...	4.05	85	49640	1.875	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.42	135	665	0.077	ng	79
6) Vinyl Chloride	4.53	62	5387	0.225	ng	99
8) Bromomethane	5.02	94	576	0.067	ng	96
10) Ethanol	5.45	45	17794	1.038	ng	87
11) Acetonitrile	5.67	41	18189	0.393	ng	82
12) Acrolein	5.82	56	10736	0.869	ng	96
13) Acetone	5.98	58	60715	4.323	ng	# 71
14) Trichlorofluoromethane	6.12	101	23634	1.325	ng	100
15) 2-Propanol (Isopropanol)	6.27	45	9995	0.175	ng	83
17) 1,1-Dichloroethene	6.83	96	24505	2.188	ng	# 78
19) Methylene Chloride	6.97	84	1531	0.105	ng	# 75
21) Trichlorotrifluoroethane	7.29	151	117927	15.409	ng	87
22) Carbon Disulfide	7.25	76	17217	0.333	ng	# 22
23) trans-1,2-Dichloroethene	7.99	61	28457	1.026	ng	88
24) 1,1-Dichloroethane	8.21	63	28878	0.913	ng	99
26) Vinyl Acetate	8.37	86	5848	2.300	ng	# 84
27) 2-Butanone (MEK)	8.65	72	11025	0.870	ng	# 53
28) cis-1,2-Dichloroethene	9.09	61	2027386	74.452	ng	87
31) n-Hexane	9.33	57	3365	0.099	ng	# 86
32) Chloroform	9.39	83	421312	15.543	ng	100
38) 1,1,1-Trichloroethane	10.42	97	27994	1.156	ng	92
41) Benzene	10.87	78	9415	0.111	ng	98
42) Carbon Tetrachloride	11.02	117	29941	1.665	ng	99
43) Cyclohexane	11.15	84	2221	0.075	ng	# 81
46) Bromodichloromethane	11.86	83	4345	0.175	ng	99
47) Trichloroethene	11.92	130	1657904	100.227	ng	100
51) n-Heptane	12.24	71	1580	0.071	ng	90
53) 4-Methyl-2-pentanone	12.81	58	1520	0.065	ng	# 38
55) 1,1,2-Trichloroethane	13.46	97	2713	0.156	ng	84
58) Toluene	13.76	91	10491	0.143	ng	90
59) 2-Hexanone	14.01	43	12582	0.203	ng	88
62) n-Butyl Acetate	14.65	43	6019	0.087	ng	94
63) n-Octane	14.77	57	2120	0.091	ng	# 69
64) Tetrachloroethene	14.92	166	198561	14.361	ng	99
66) Ethylbenzene	16.02	91	7333	0.081	ng	95
67) m- & p-Xylenes	16.20	91	8955	0.128	ng	89
72) 1,1,2,2-Tetrachloroethane	16.67	83	68517	2.083	ng	98
76) n-Propylbenzene	17.83	91	13140	0.123	ng	88
78) 4-Ethyltoluene	17.98	105	3813	0.050	ng	90
79) 1,3,5-Trimethylbenzene	18.05	105	5157	0.077	ng	88
82) 1,2,4-Trimethylbenzene	18.47	105	4317	0.064	ng	83

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

Data File: I:\MS09\Data\2018 10\16\10161826.D

Acq On : 17 Oct 2018 00:48

Operator: SC

Sample : P1805277-001 (1000mL)

Misc : S31-10151806

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Oct 17 10:15:51 2018

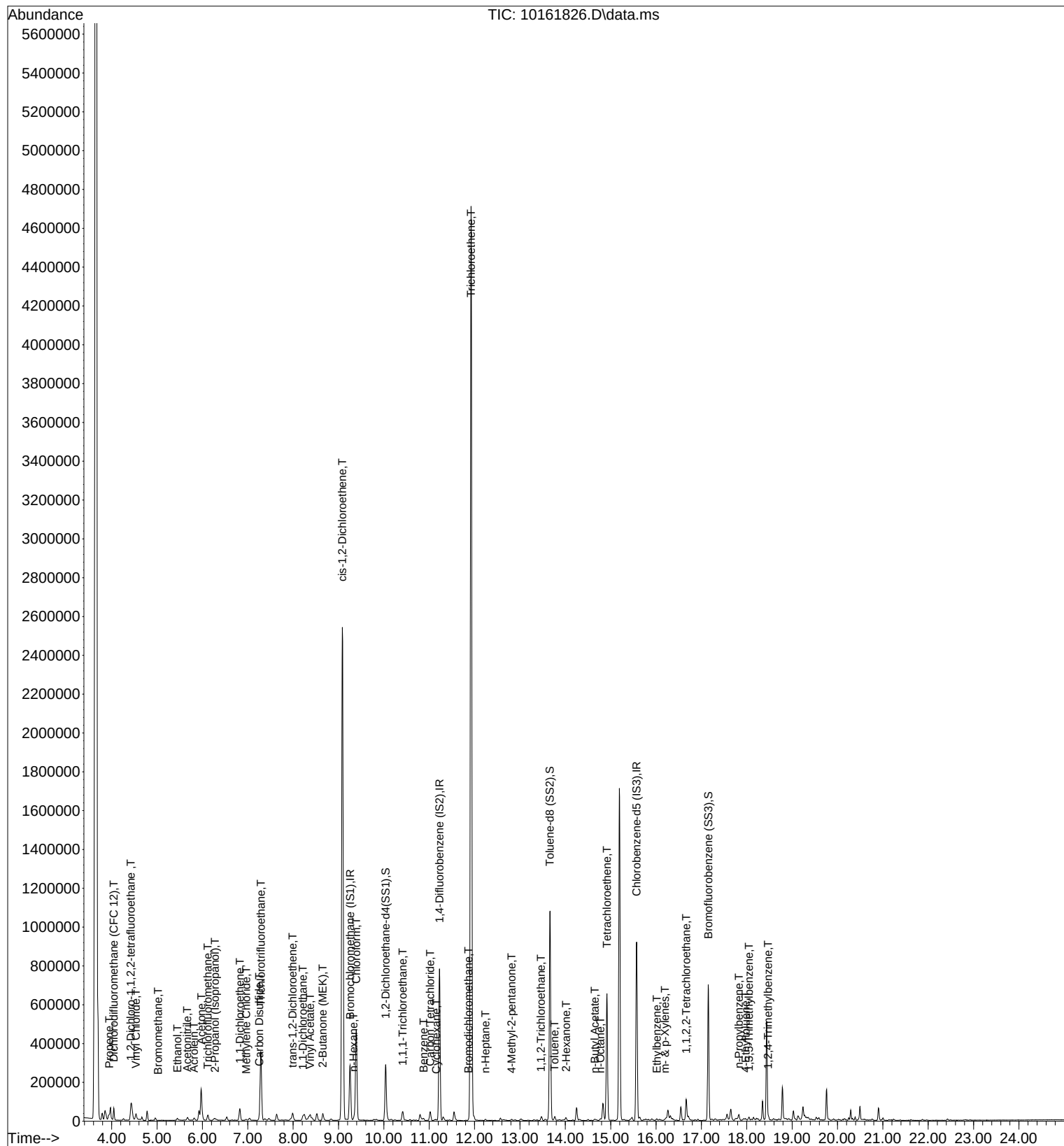
Quant Method : I:\MS09\Methods\R9101518.M

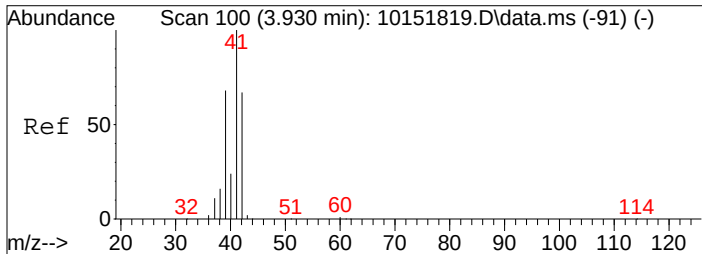
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Wed Oct 17 09:09:32 2018

Response via : Initial Calibration

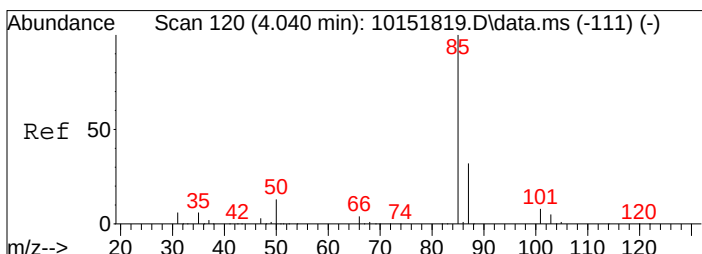
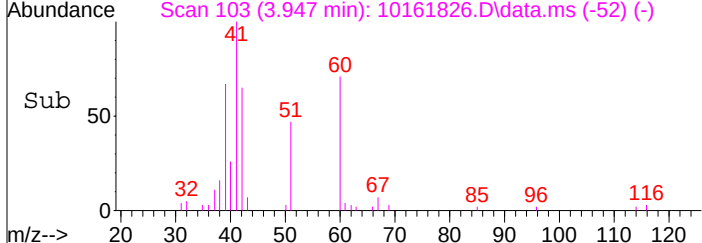
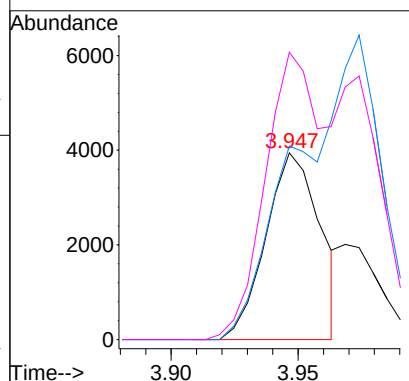
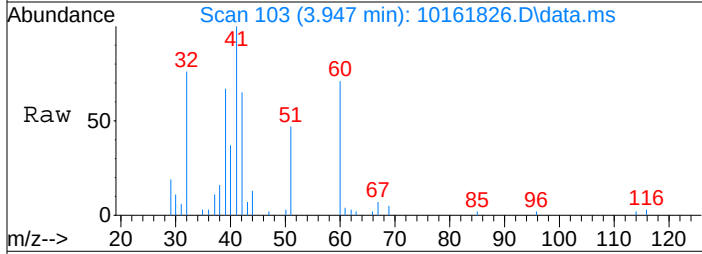
DataAcq Meth:TO15.M





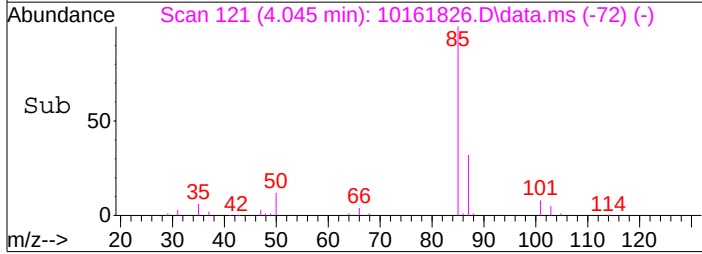
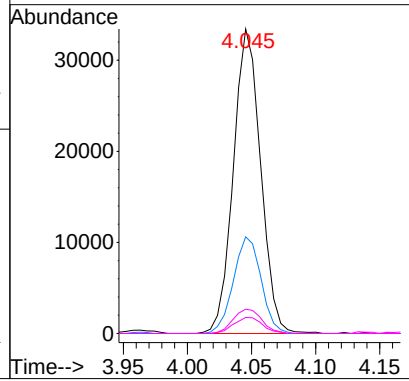
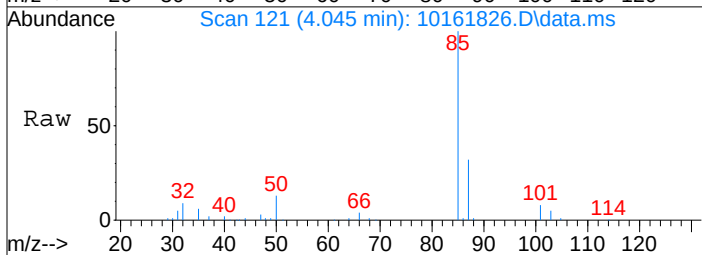
#2
 Propene
 Concen: 0.23 ng m
 RT: 3.95 min Scan# 103
 Delta R.T. 0.030 min
 Lab File: 10161826.D
 Acq: 17 Oct 2018 00:48

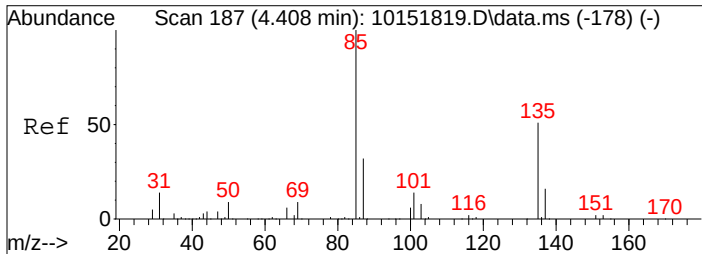
Tgt Ion:	42	Resp:	5865
Ion Ratio	Lower	Upper	
42	100		
39	248.9	78.4	118.4#
41	169.0	127.9	167.9#



#3
 Dichlorodifluoromethane (CFC 12)
 Concen: 1.88 ng
 RT: 4.05 min Scan# 121
 Delta R.T. 0.019 min
 Lab File: 10161826.D
 Acq: 17 Oct 2018 00:48

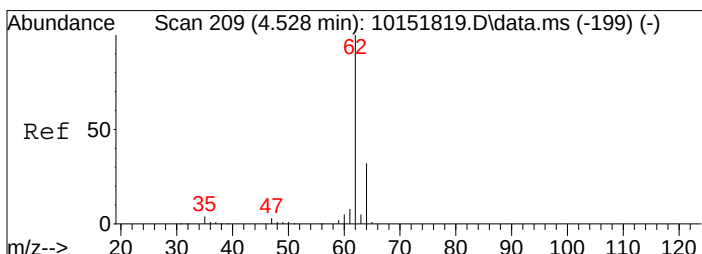
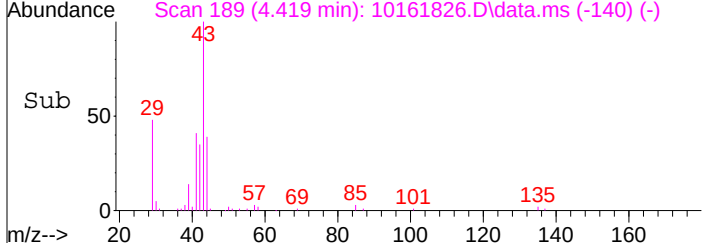
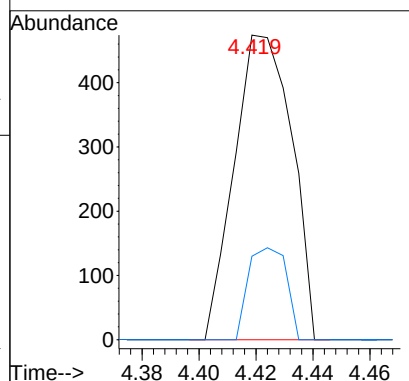
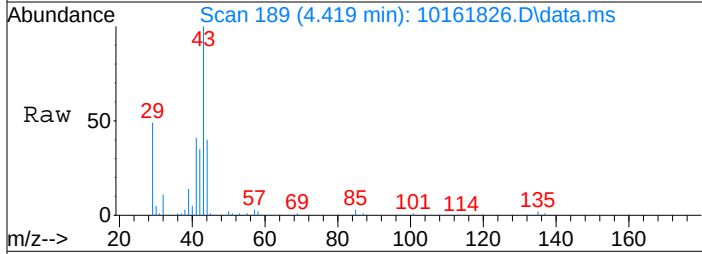
Tgt Ion:	85	Resp:	49640
Ion Ratio	Lower	Upper	
85	100		
87	32.1	12.2	52.2
101	8.4	0.0	28.3
103	5.5	0.0	25.4





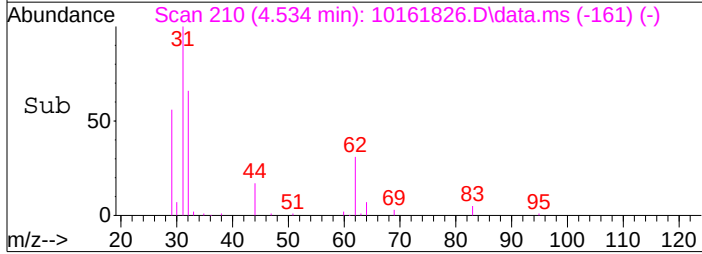
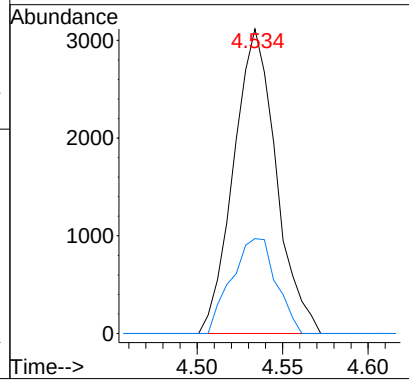
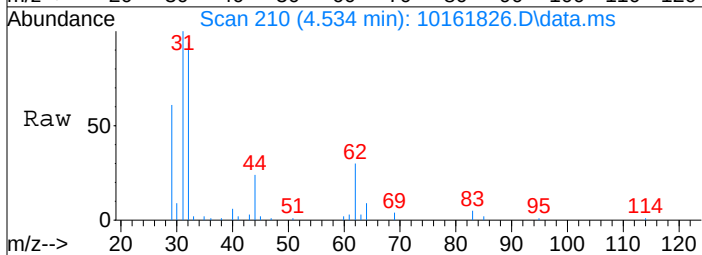
#5
 1,2-Dichloro-1,1,2,2-tetrafluoroethane
 Concen: 0.08 ng
 RT: 4.42 min Scan# 189
 Delta R.T. 0.022 min
 Lab File: 10161826.D
 Acq: 17 Oct 2018 00:48

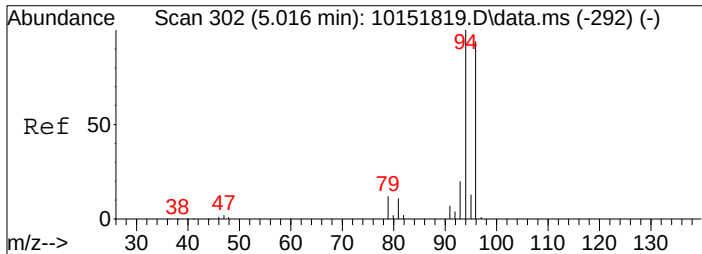
Tgt Ion: 135	Resp: 665
Ion Ratio	Lower Upper
135	100
137	20.0 11.7 51.7



#6
 Vinyl Chloride
 Concen: 0.22 ng
 RT: 4.53 min Scan# 210
 Delta R.T. 0.017 min
 Lab File: 10161826.D
 Acq: 17 Oct 2018 00:48

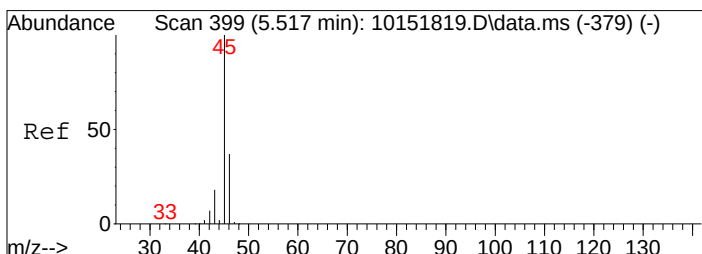
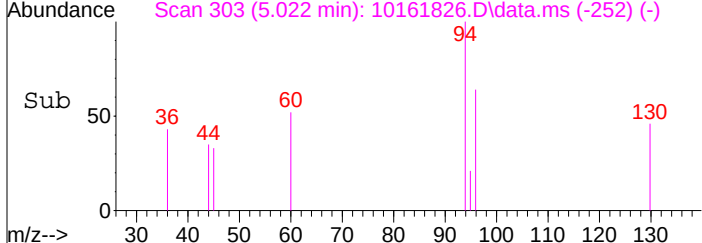
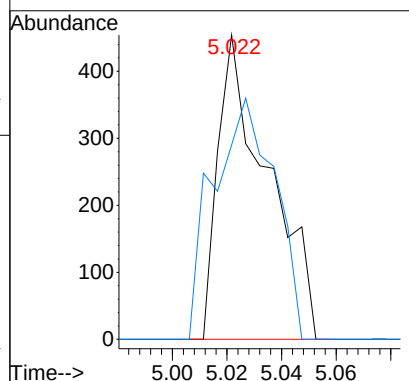
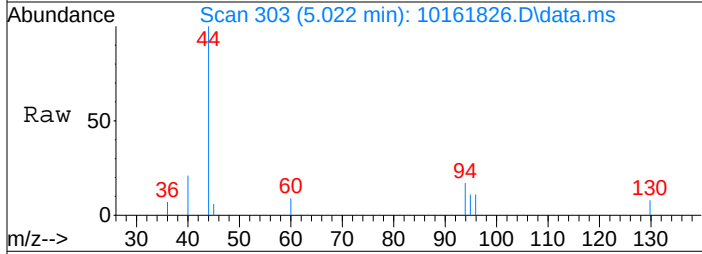
Tgt Ion: 62	Resp: 5387
Ion Ratio	Lower Upper
62	100
64	32.7 11.9 51.9





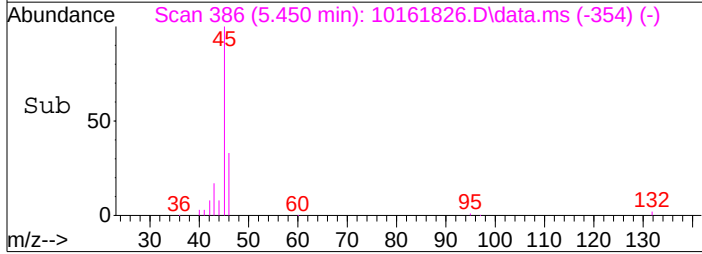
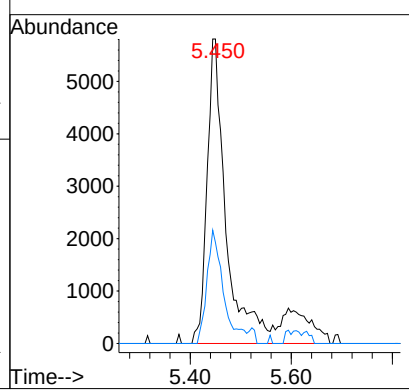
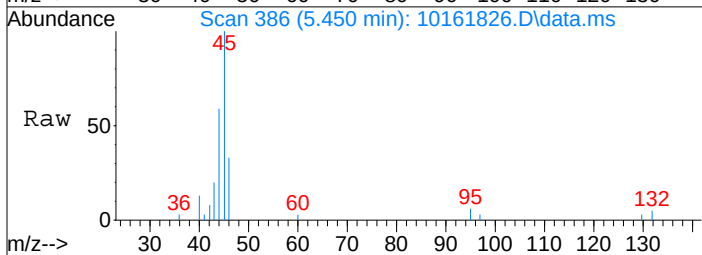
#8
 Bromomethane
 Concen: 0.07 ng
 RT: 5.02 min Scan# 303
 Delta R.T. 0.011 min
 Lab File: 10161826.D
 Acq: 17 Oct 2018 00:48

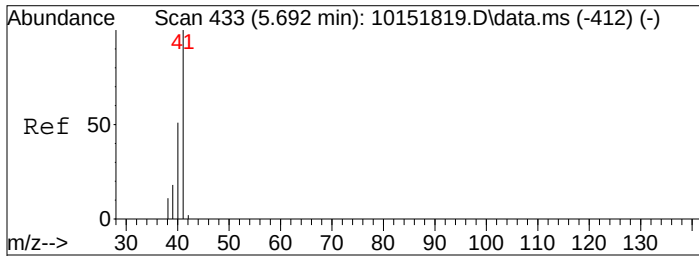
Tgt Ion: 94	Resp: 576
Ion Ratio	Lower Upper
94	100
96	97.7 73.6 113.6



#10
 Ethanol
 Concen: 1.04 ng
 RT: 5.45 min Scan# 386
 Delta R.T. -0.085 min
 Lab File: 10161826.D
 Acq: 17 Oct 2018 00:48

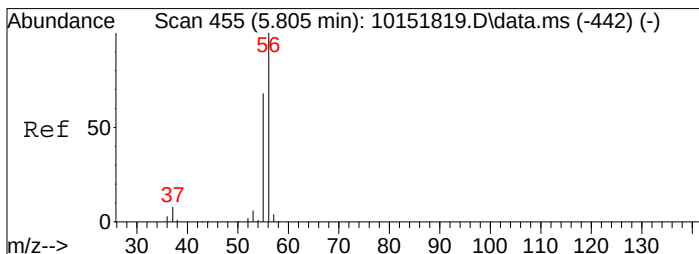
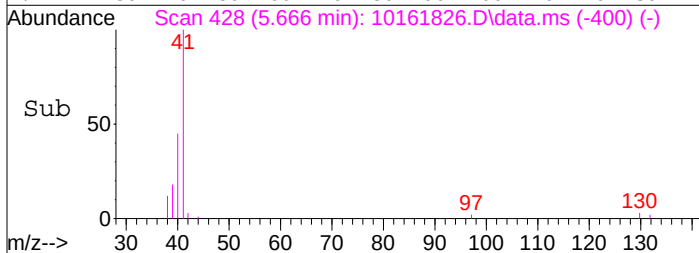
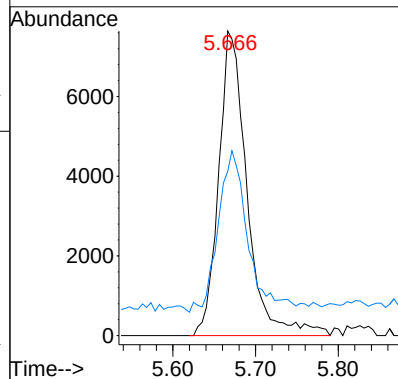
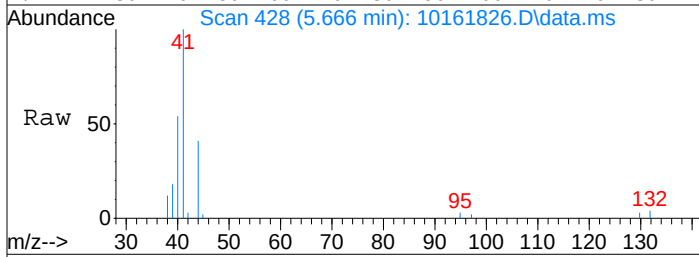
Tgt Ion: 45	Resp: 17794
Ion Ratio	Lower Upper
45	100
46	28.8 16.8 56.8





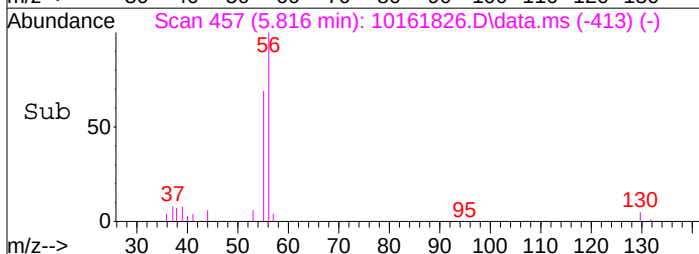
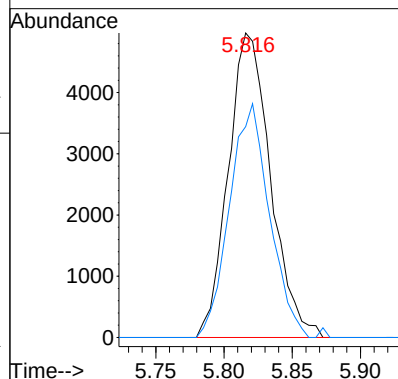
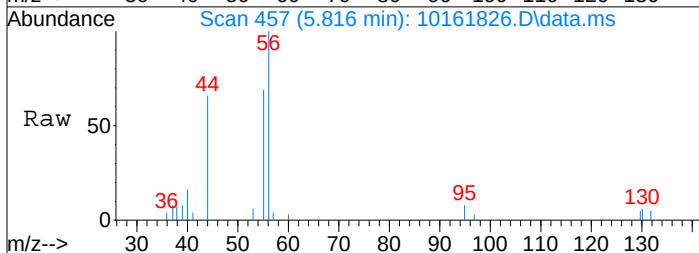
#11
Acetonitrile
Concen: 0.39 ng
RT: 5.67 min Scan# 428
Delta R.T. -0.058 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

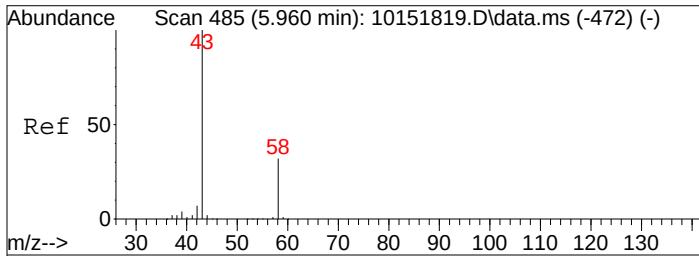
Tgt Ion: 41 Resp: 18189
Ion Ratio Lower Upper
41 100
40 64.3 31.6 71.6



#12
Acrolein
Concen: 0.87 ng
RT: 5.82 min Scan# 457
Delta R.T. -0.021 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

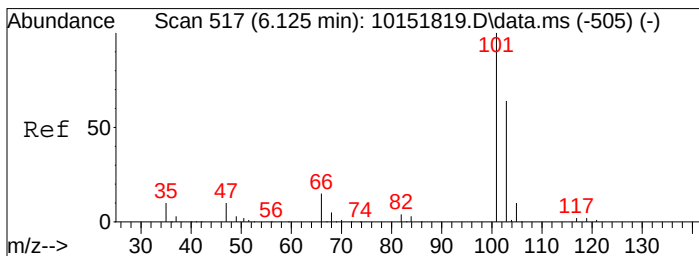
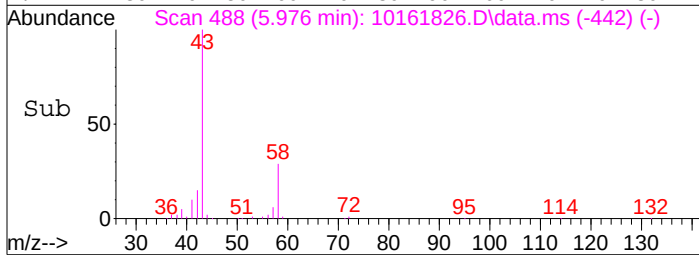
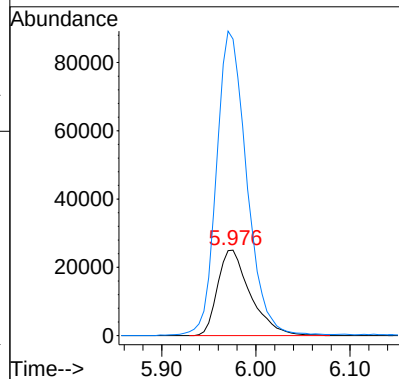
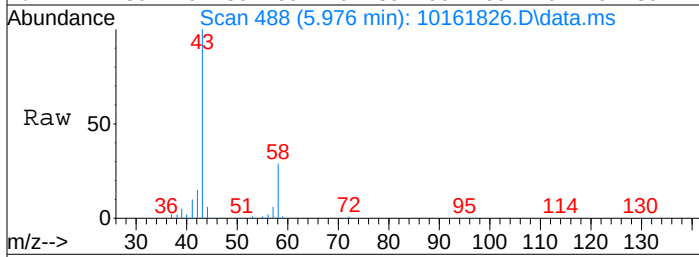
Tgt Ion: 56 Resp: 10736
Ion Ratio Lower Upper
56 100
55 72.5 49.3 89.3





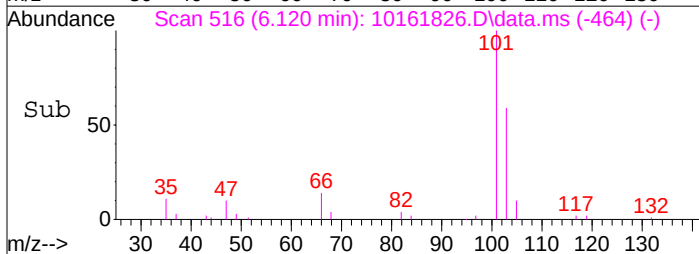
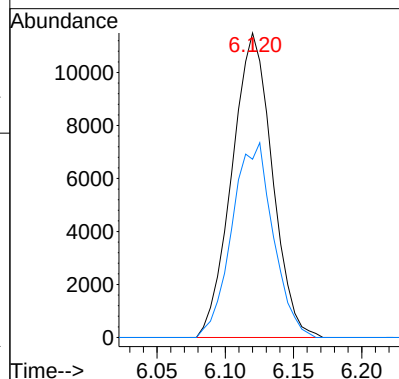
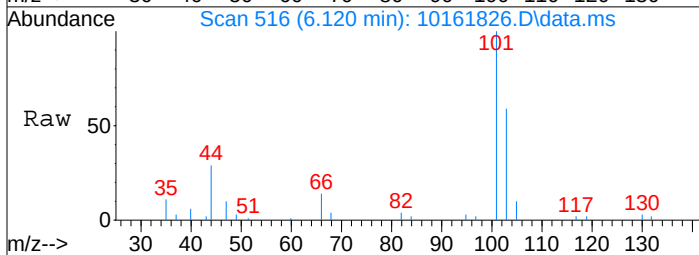
#13
Acetone
Concen: 4.32 ng
RT: 5.98 min Scan# 488
Delta R.T. -0.014 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

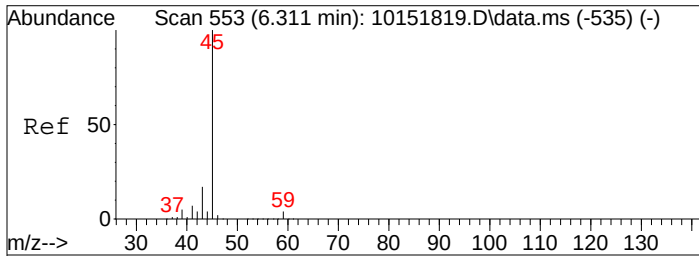
Tgt Ion: 58 Resp: 60715
Ion Ratio Lower Upper
58 100
43 329.9 246.0 306.0#



#14
Trichlorofluoromethane
Concen: 1.33 ng
RT: 6.12 min Scan# 516
Delta R.T. 0.017 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

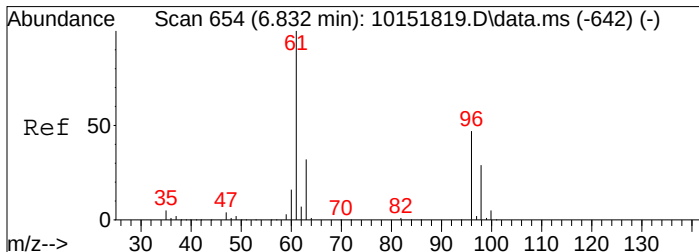
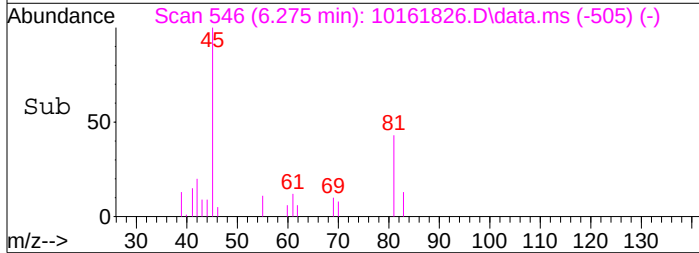
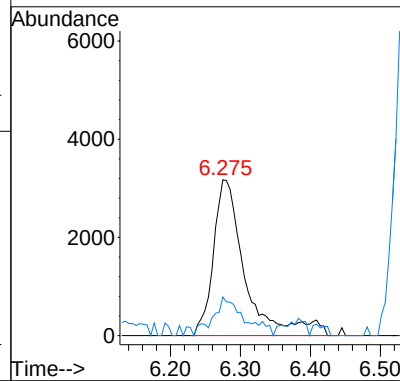
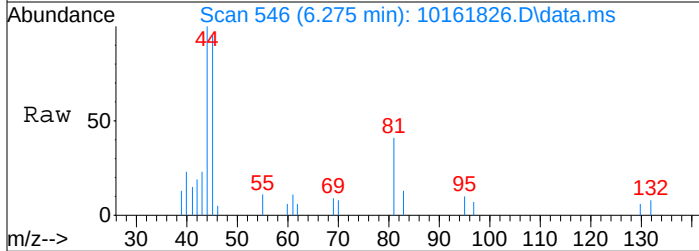
Tgt Ion: 101 Resp: 23634
Ion Ratio Lower Upper
101 100
103 65.3 45.1 85.1





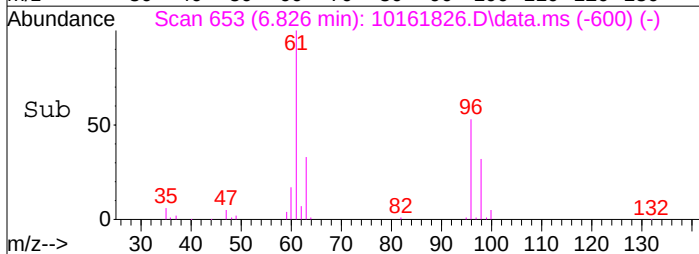
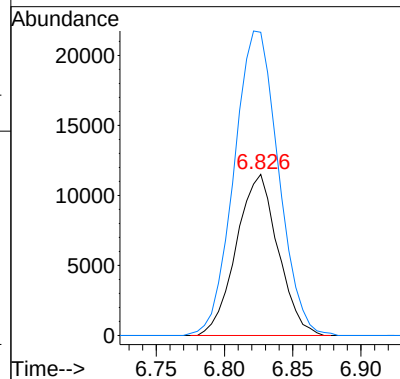
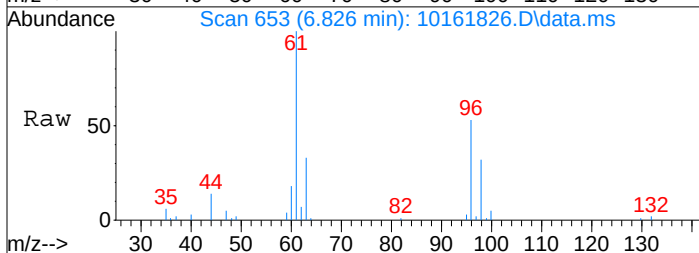
#15
2-Propanol (Isopropanol)
Concen: 0.17 ng
RT: 6.27 min Scan# 546
Delta R.T. -0.039 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

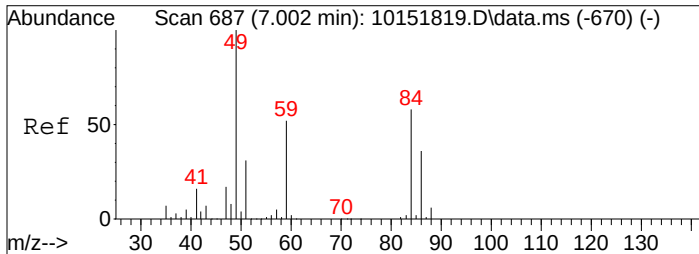
Tgt Ion: 45 Resp: 9995
Ion Ratio Lower Upper
45 100
43 24.0 0.0 36.6



#17
1,1-Dichloroethene
Concen: 2.19 ng
RT: 6.83 min Scan# 653
Delta R.T. 0.021 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

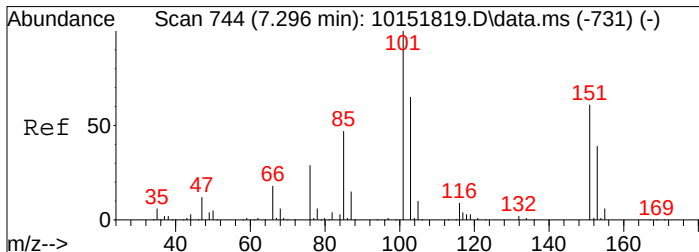
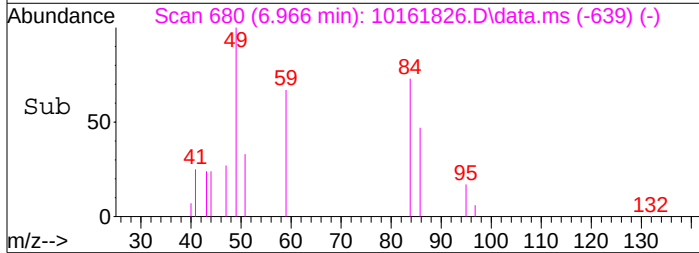
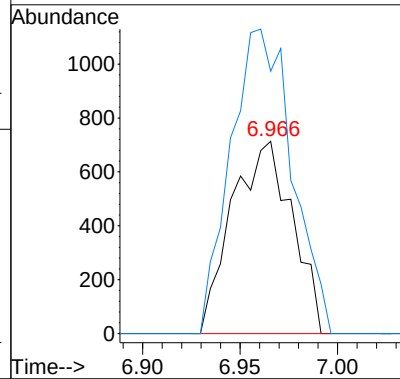
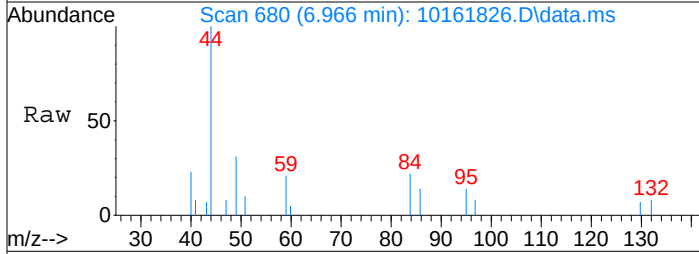
Tgt Ion: 96 Resp: 24505
Ion Ratio Lower Upper
96 100
61 200.9 150.6 190.6#





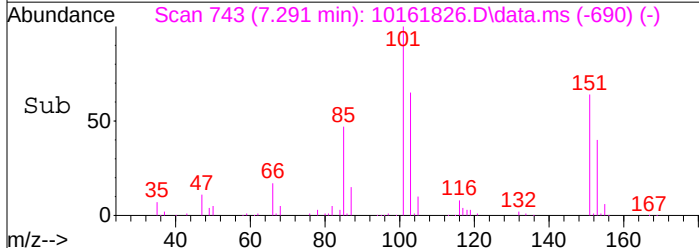
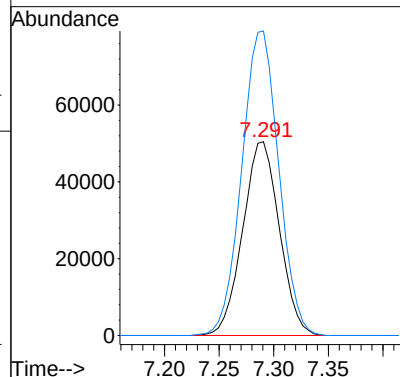
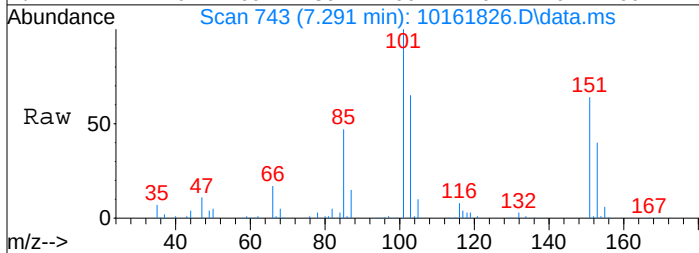
#19
Methylene Chloride
Concen: 0.11 ng
RT: 6.97 min Scan# 680
Delta R.T. -0.039 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

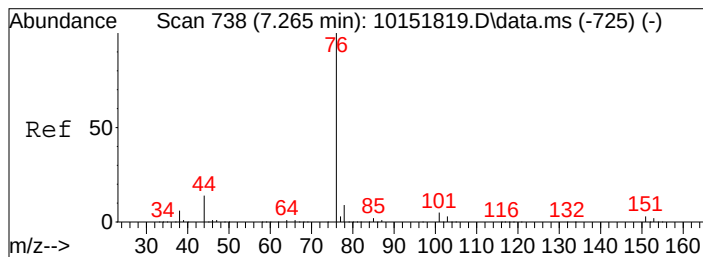
Tgt Ion: 84 Resp: 1531
Ion Ratio Lower Upper
84 100
49 162.2 107.7 157.7#



#21
Trichlorotrifluoroethane
Concen: 15.41 ng
RT: 7.29 min Scan# 743
Delta R.T. 0.024 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

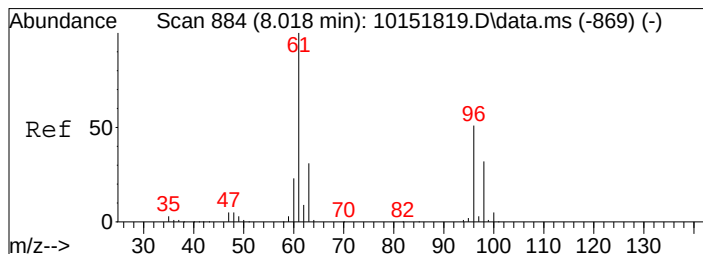
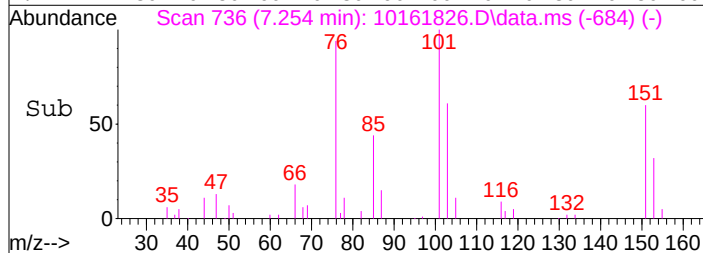
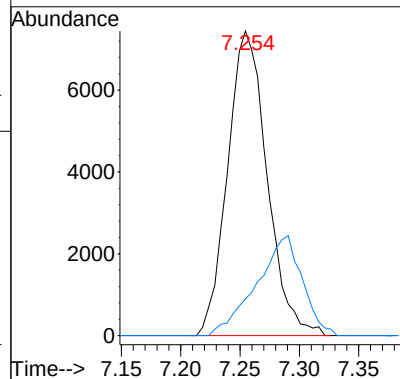
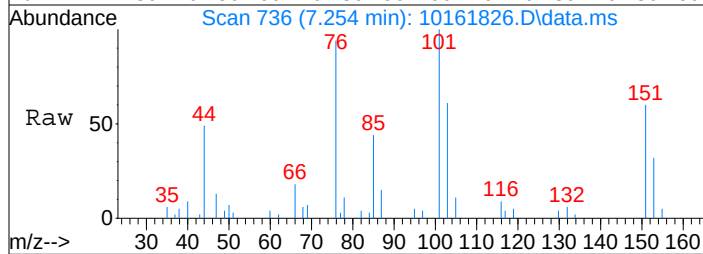
Tgt Ion: 151 Resp: 117927
Ion Ratio Lower Upper
151 100
101 158.5 122.3 162.3





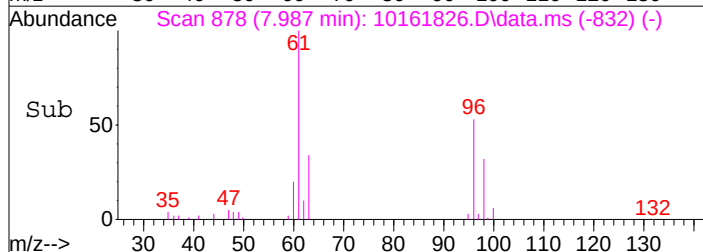
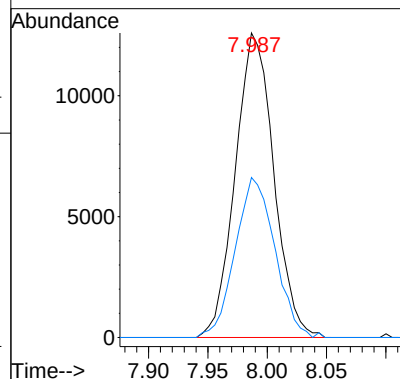
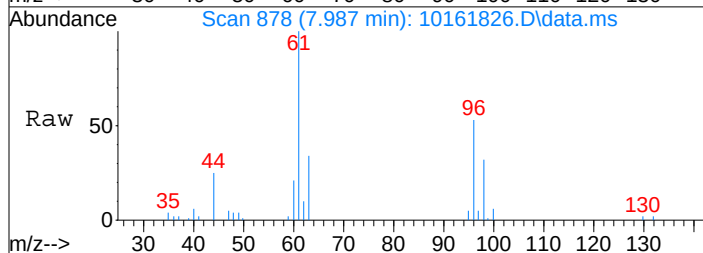
#22
Carbon Disulfide
Concen: 0.33 ng
RT: 7.25 min Scan# 736
Delta R.T. 0.019 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

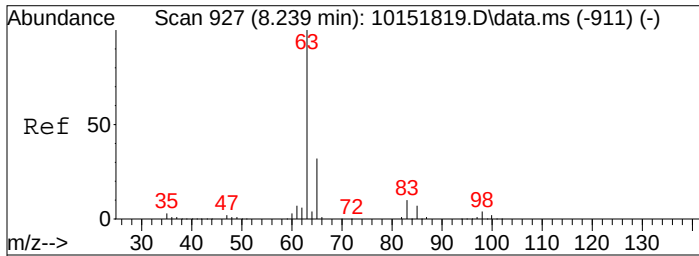
Tgt Ion: 76 Resp: 17217
Ion Ratio Lower Upper
76 100
78 38.1 0.0 29.6#



#23
trans-1,2-Dichloroethene
Concen: 1.03 ng
RT: 7.99 min Scan# 878
Delta R.T. -0.013 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

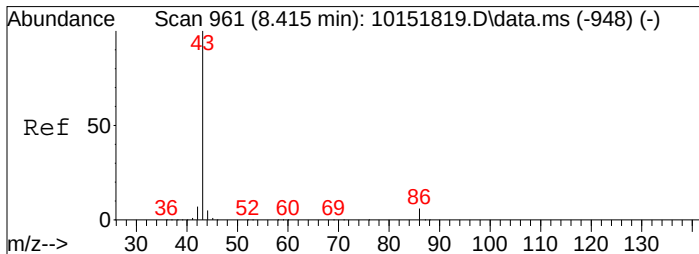
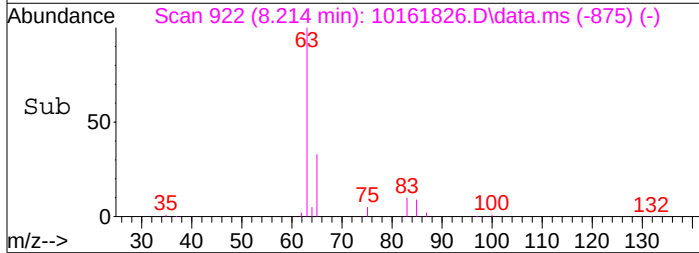
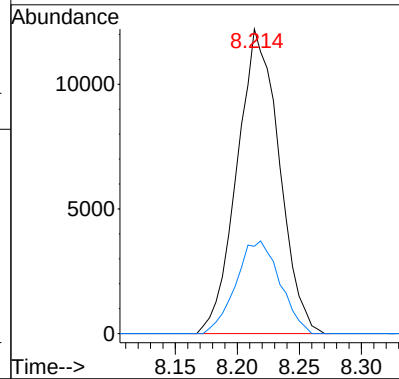
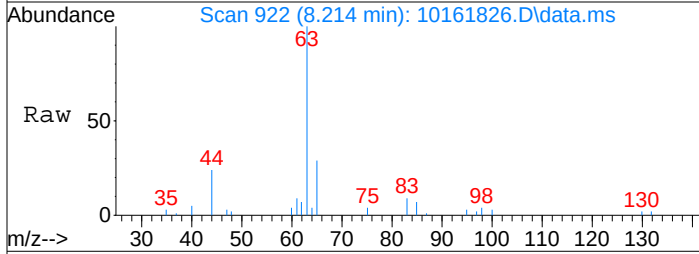
Tgt Ion: 61 Resp: 28457
Ion Ratio Lower Upper
61 100
96 54.0 43.2 83.2





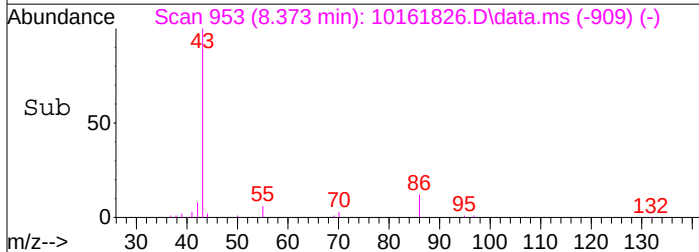
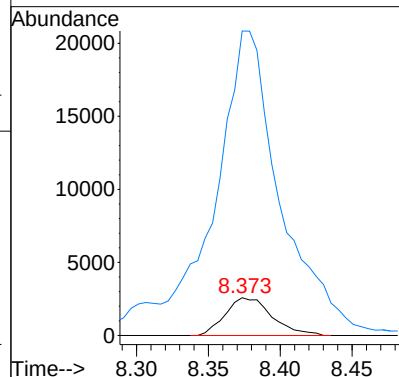
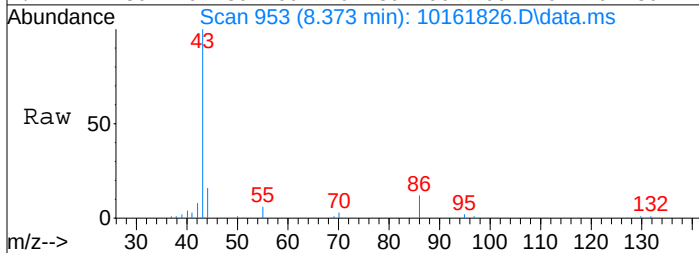
#24
1,1-Dichloroethane
Concen: 0.91 ng
RT: 8.21 min Scan# 922
Delta R.T. -0.006 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

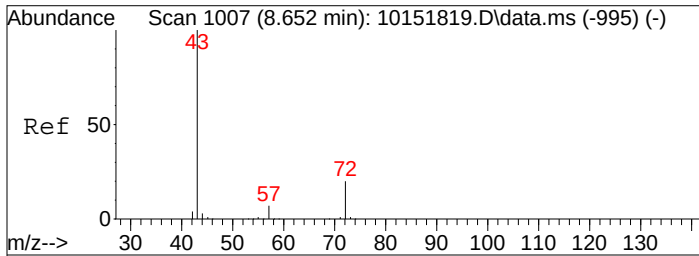
Tgt Ion: 63 Resp: 28878
Ion Ratio Lower Upper
63 100
65 31.7 12.0 52.0



#26
Vinyl Acetate
Concen: 2.30 ng
RT: 8.37 min Scan# 953
Delta R.T. -0.021 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

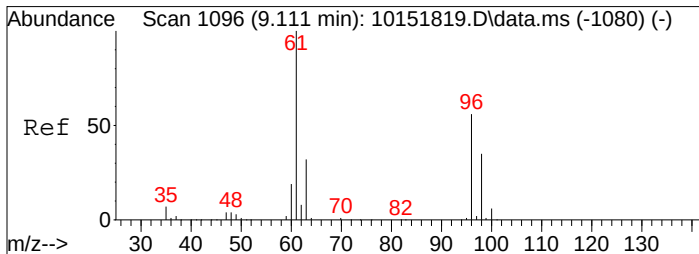
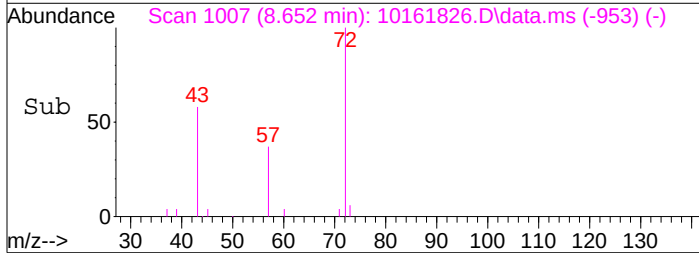
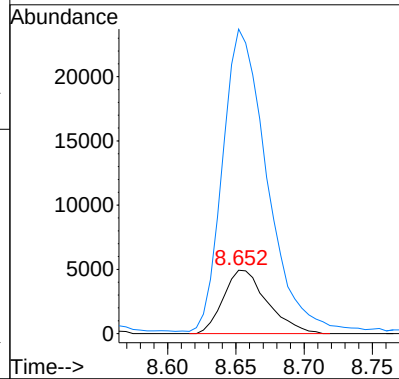
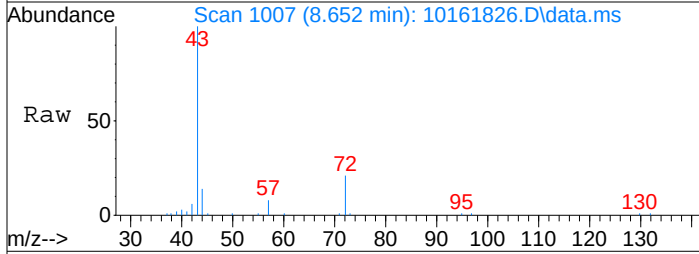
Tgt Ion: 86 Resp: 5848
Ion Ratio Lower Upper
86 100
43 1110.2 1172.7 1212.7#





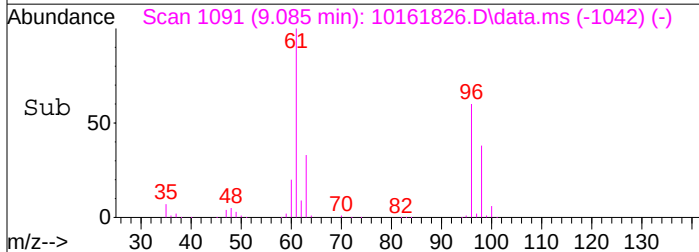
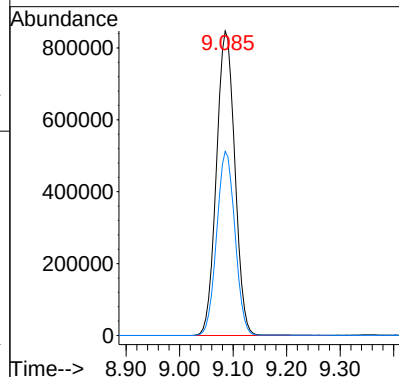
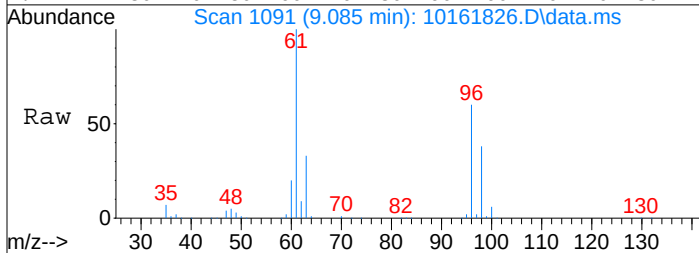
#27
2-Butanone (MEK)
Concen: 0.87 ng
RT: 8.65 min Scan# 1007
Delta R.T. 0.027 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

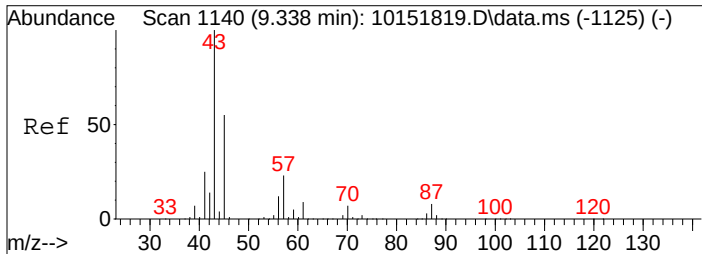
Tgt Ion: 72 Resp: 11025
Ion Ratio Lower Upper
72 100
43 501.6 371.5 411.5#



#28
cis-1,2-Dichloroethene
Concen: 74.45 ng
RT: 9.09 min Scan# 1091
Delta R.T. 0.004 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

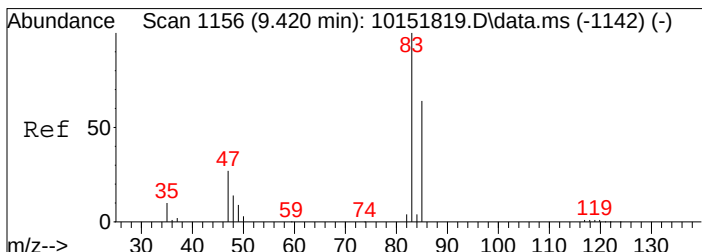
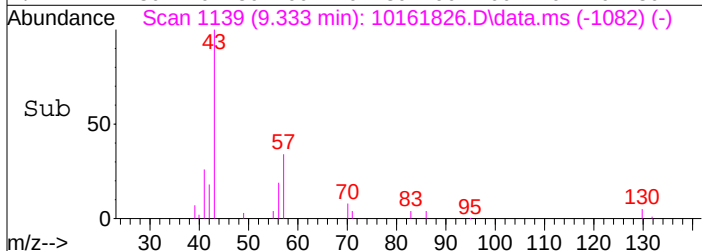
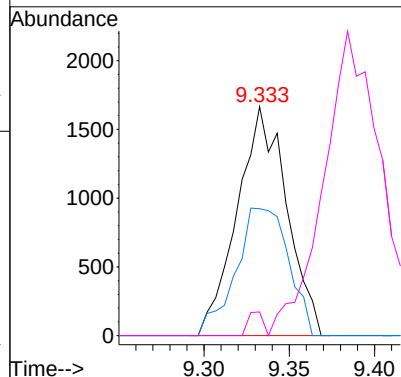
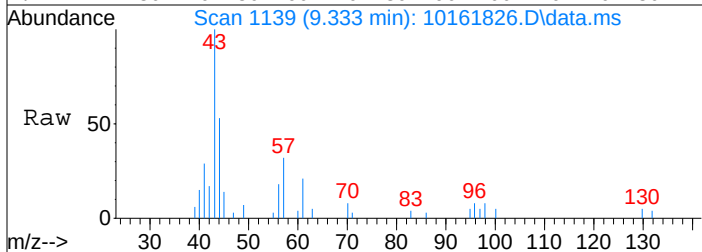
Tgt Ion: 61 Resp: 2027386
Ion Ratio Lower Upper
61 100
96 60.0 50.8 90.8





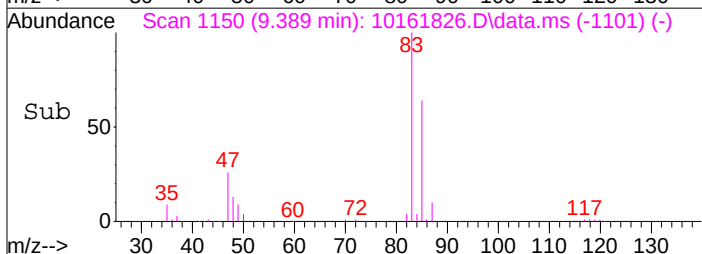
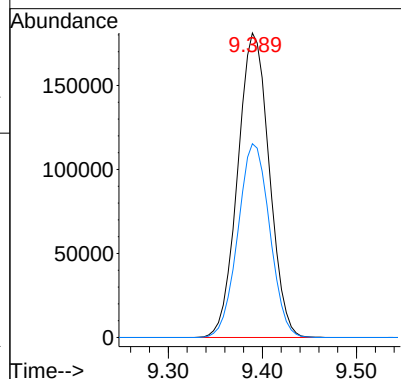
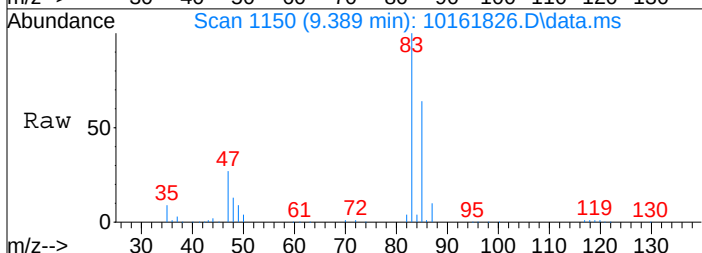
#31
n-Hexane
Concen: 0.10 ng
RT: 9.33 min Scan# 1139
Delta R.T. 0.042 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

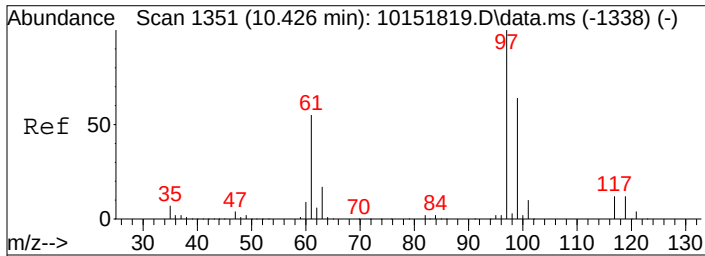
Tgt Ion: 57 Resp: 3365
Ion Ratio Lower Upper
57 100
56 59.3 41.2 61.8
86 3.2 10.8 16.2#



#32
Chloroform
Concen: 15.54 ng
RT: 9.39 min Scan# 1150
Delta R.T. 0.001 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

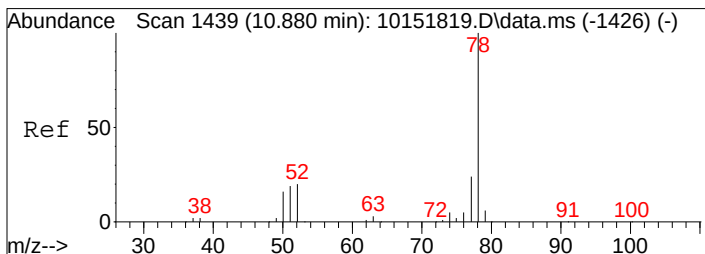
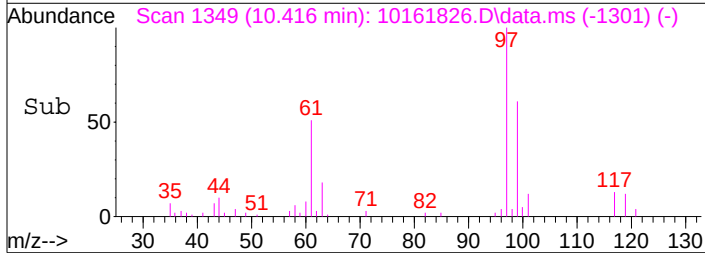
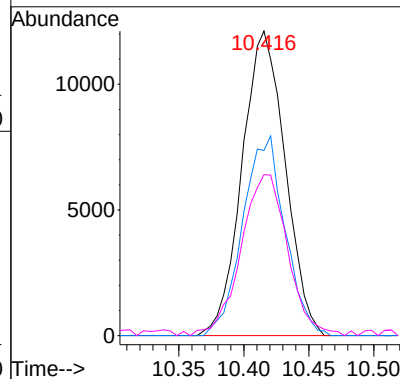
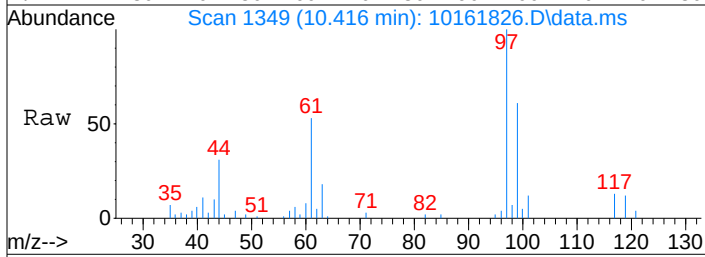
Tgt Ion: 83 Resp: 421312
Ion Ratio Lower Upper
83 100
85 64.2 44.5 84.5





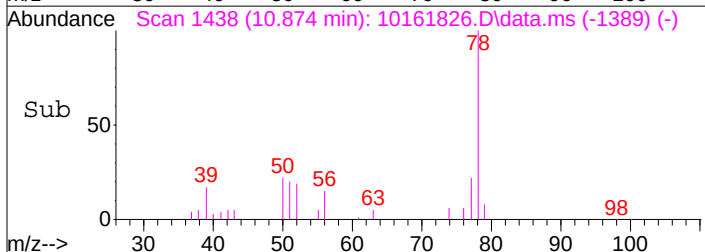
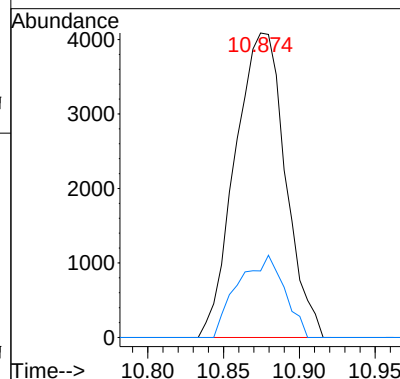
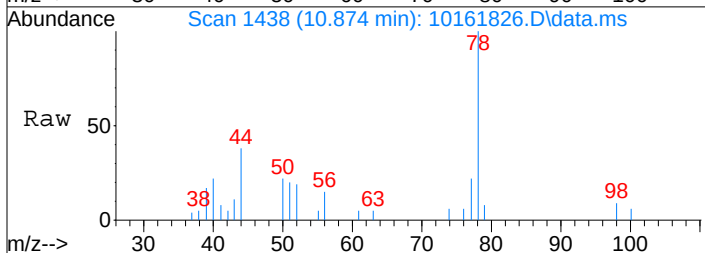
#38
 1,1,1-Trichloroethane
 Concen: 1.16 ng
 RT: 10.42 min Scan# 1349
 Delta R.T. -0.002 min
 Lab File: 10161826.D
 Acq: 17 Oct 2018 00:48

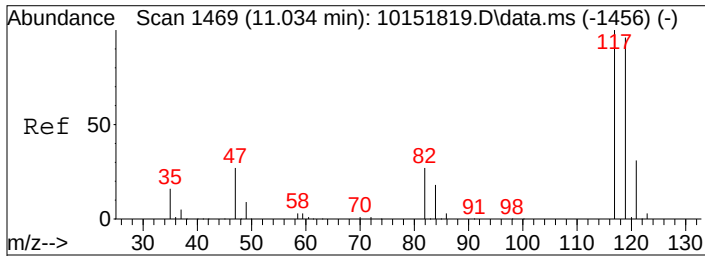
Tgt Ion: 97 Resp: 27994
 Ion Ratio Lower Upper
 97 100
 99 64.1 44.2 84.2
 61 57.2 24.9 64.9



#41
 Benzene
 Concen: 0.11 ng
 RT: 10.87 min Scan# 1438
 Delta R.T. 0.004 min
 Lab File: 10161826.D
 Acq: 17 Oct 2018 00:48

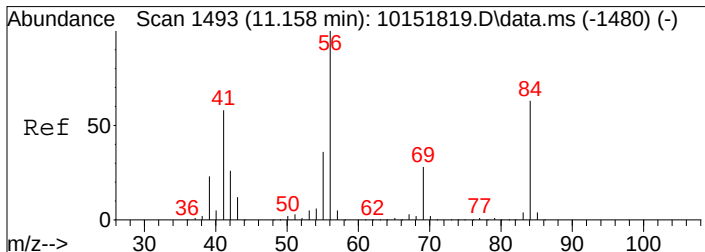
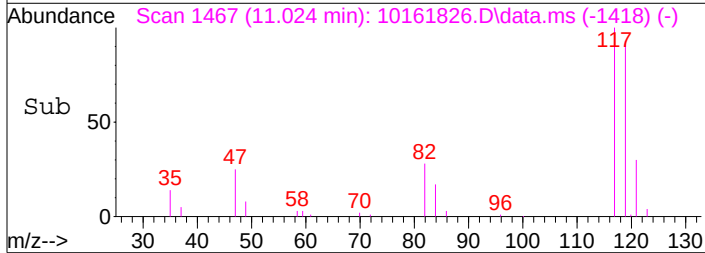
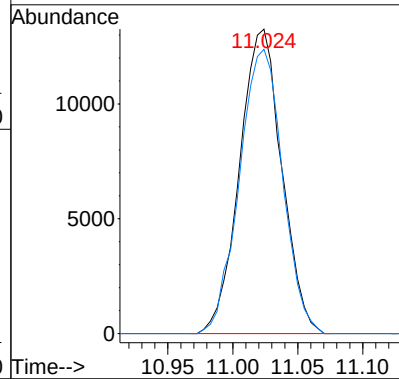
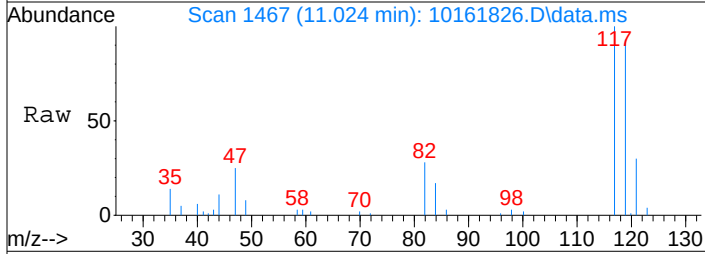
Tgt Ion: 78 Resp: 9415
 Ion Ratio Lower Upper
 78 100
 77 24.8 3.8 43.8





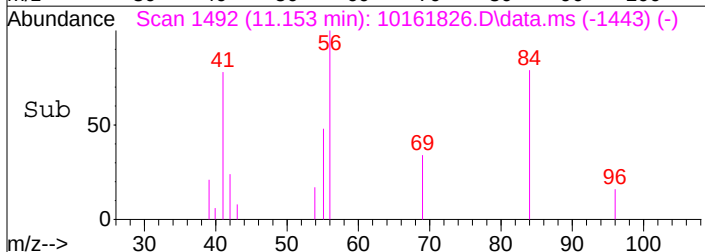
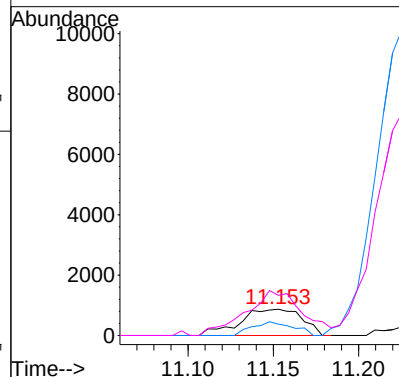
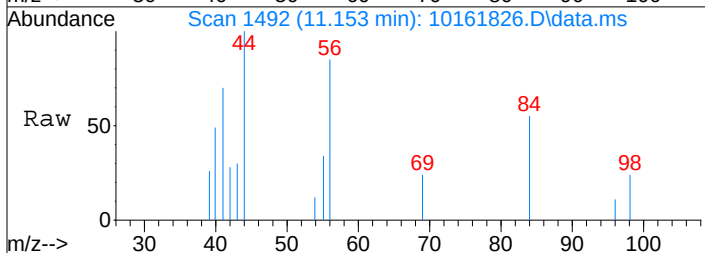
#42
Carbon Tetrachloride
Concen: 1.66 ng
RT: 11.02 min Scan# 1467
Delta R.T. 0.005 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

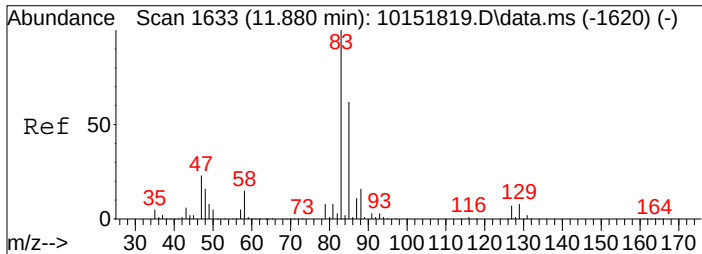
Tgt Ion: 117 Resp: 29941
Ion Ratio Lower Upper
117 100
119 95.7 76.6 116.6



#43
Cyclohexane
Concen: 0.07 ng
RT: 11.15 min Scan# 1492
Delta R.T. 0.005 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

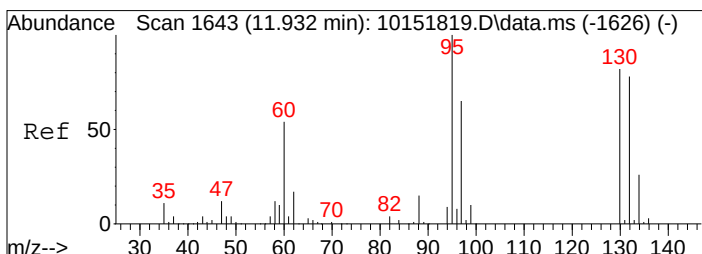
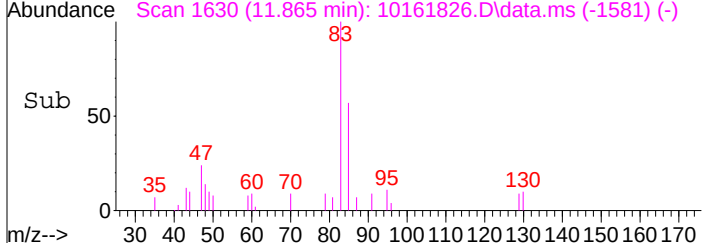
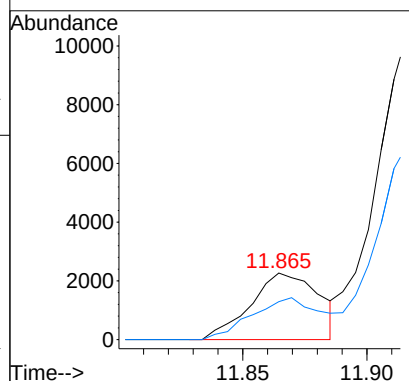
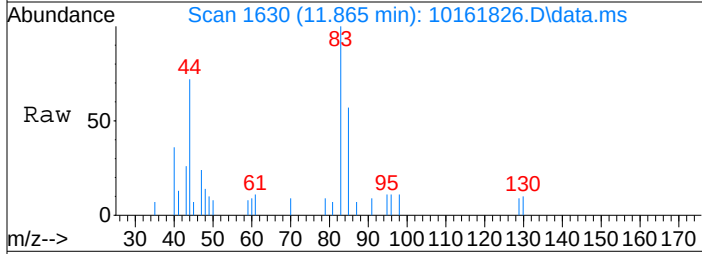
Tgt Ion: 84 Resp: 2221
Ion Ratio Lower Upper
84 100
69 34.2 19.8 59.8
56 154.8 109.3 149.3#





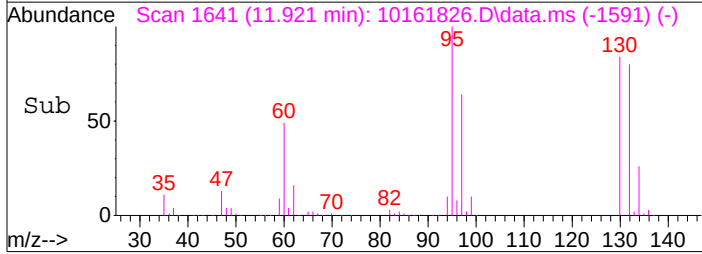
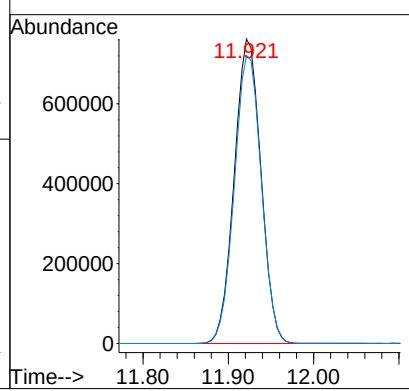
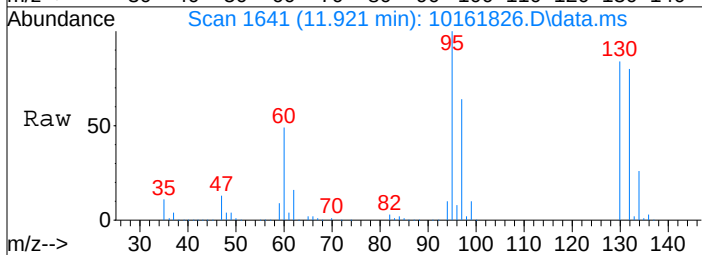
#46
 Bromodichloromethane
 Concen: 0.17 ng
 RT: 11.86 min Scan# 1630
 Delta R.T. 0.002 min
 Lab File: 10161826.D
 Acq: 17 Oct 2018 00:48

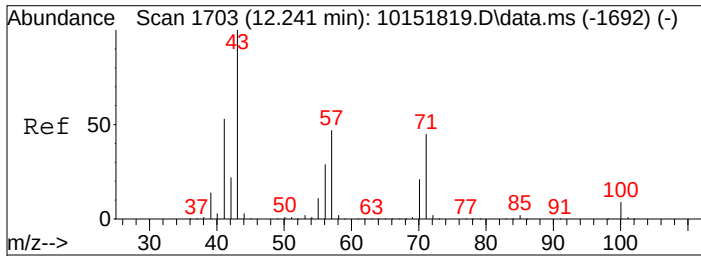
Tgt Ion:	83	Resp:	4345
Ion Ratio		Lower	Upper
83	100		
85	62.2	43.2	83.2



#47
 Trichloroethene
 Concen: 100.23 ng
 RT: 11.92 min Scan# 1641
 Delta R.T. 0.007 min
 Lab File: 10161826.D
 Acq: 17 Oct 2018 00:48

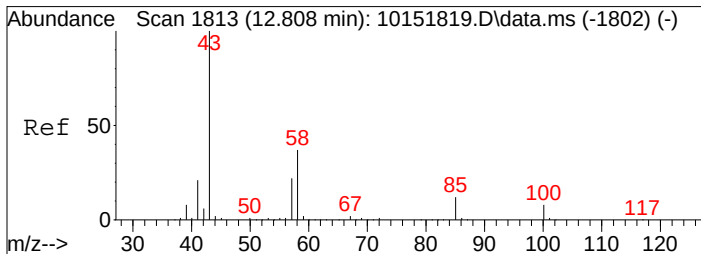
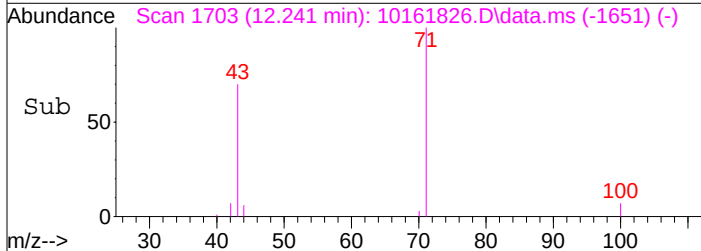
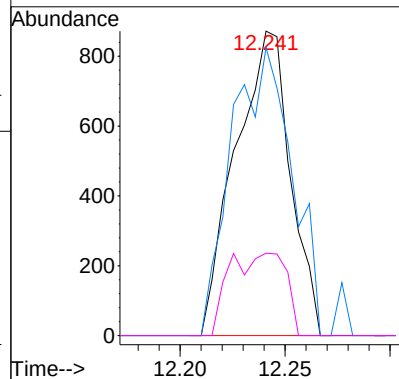
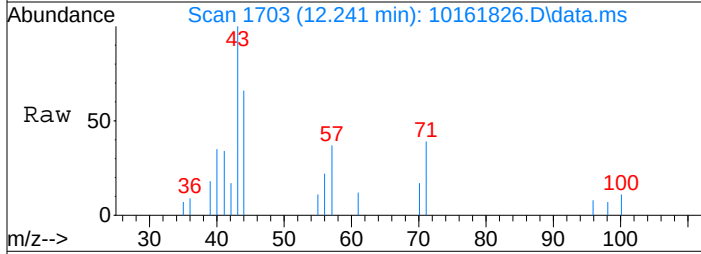
Tgt Ion:	130	Resp:	1657904
Ion Ratio		Lower	Upper
130	100		
132	95.7	75.3	115.3





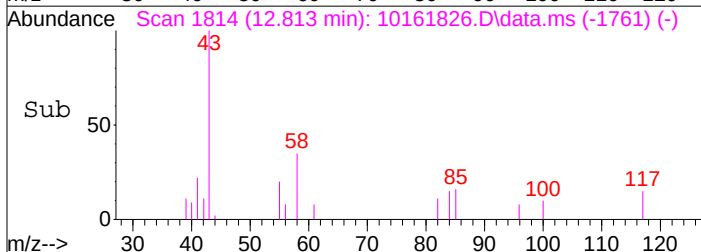
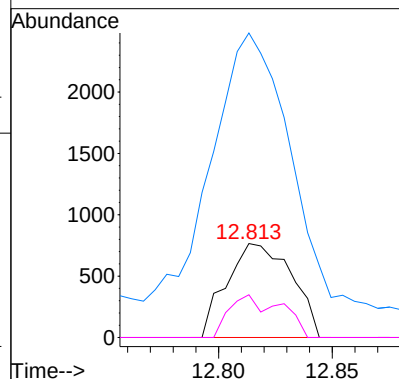
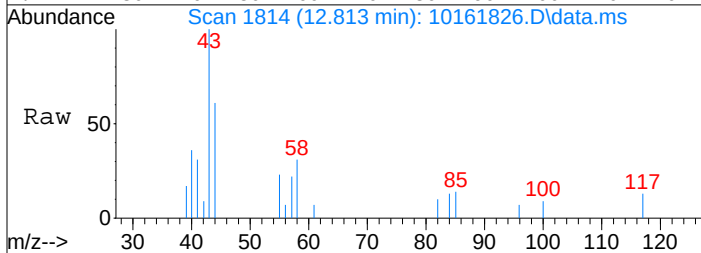
#51
n-Heptane
Concen: 0.07 ng
RT: 12.24 min Scan# 1703
Delta R.T. 0.018 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

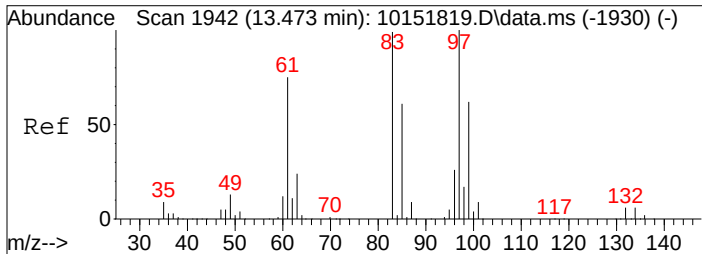
Tgt Ion: 71 Resp: 1580
Ion Ratio Lower Upper
71 100
57 104.3 74.0 114.0
100 28.1 3.7 43.7



#53
4-Methyl-2-pentanone
Concen: 0.06 ng
RT: 12.81 min Scan# 1814
Delta R.T. 0.024 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

Tgt Ion: 58 Resp: 1520
Ion Ratio Lower Upper
58 100
43 355.9 189.3 283.9#
85 36.1 33.6 50.4

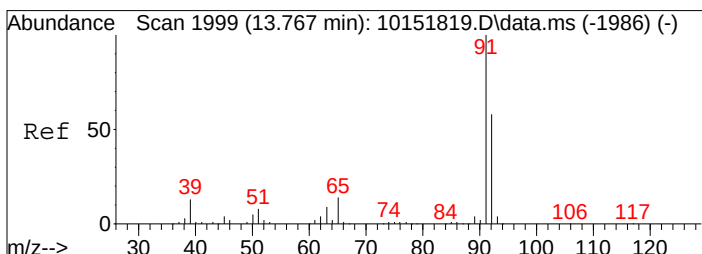
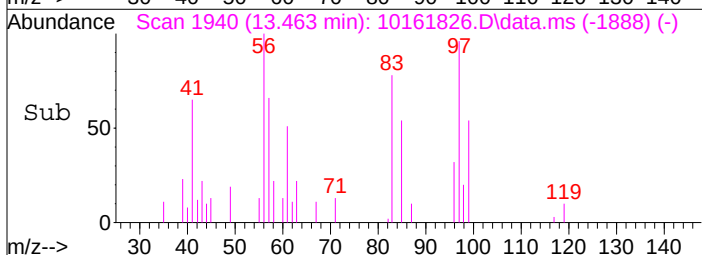
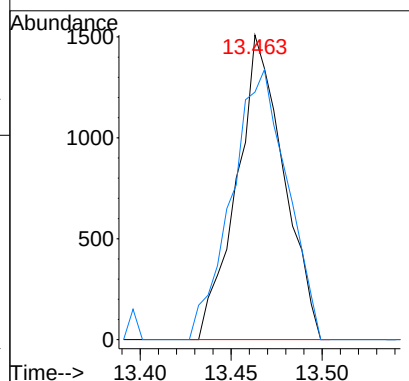
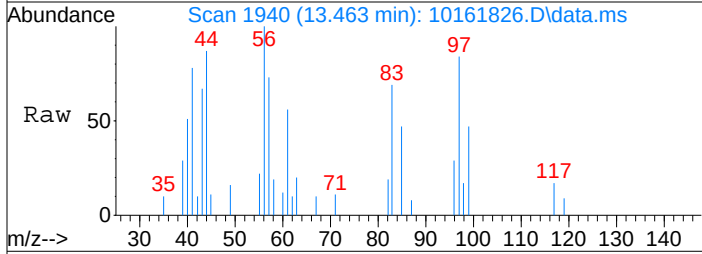




#55
 1,1,2-Trichloroethane
 Concen: 0.16 ng
 RT: 13.46 min Scan# 1940
 Delta R.T. 0.016 min
 Lab File: 10161826.D
 Acq: 17 Oct 2018 00:48

Tgt Ion: 97 Resp: 2713

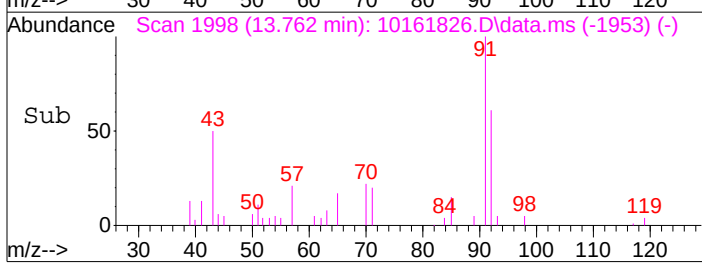
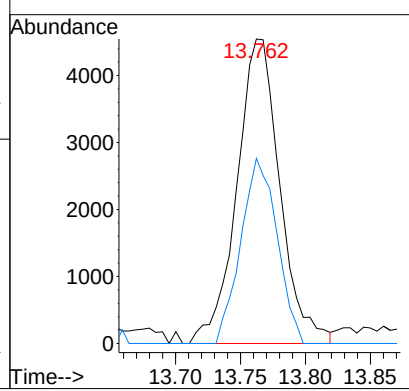
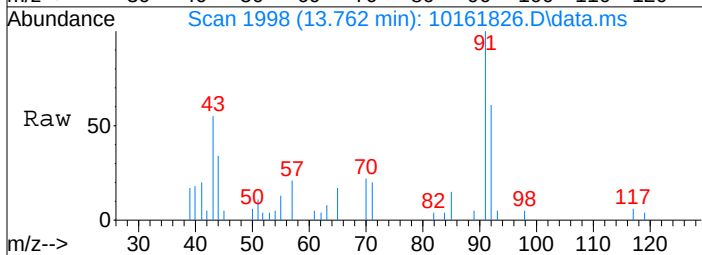
Ion	Ratio	Lower	Upper
97	100		
83	105.0	70.4	110.4

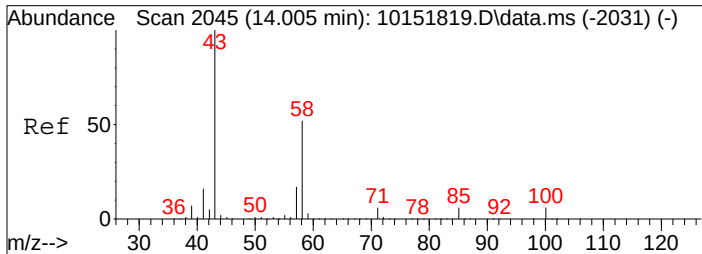


#58
 Toluene
 Concen: 0.14 ng
 RT: 13.76 min Scan# 1998
 Delta R.T. -0.016 min
 Lab File: 10161826.D
 Acq: 17 Oct 2018 00:48

Tgt Ion: 91 Resp: 10491

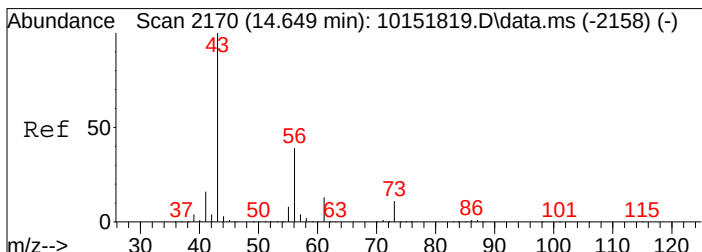
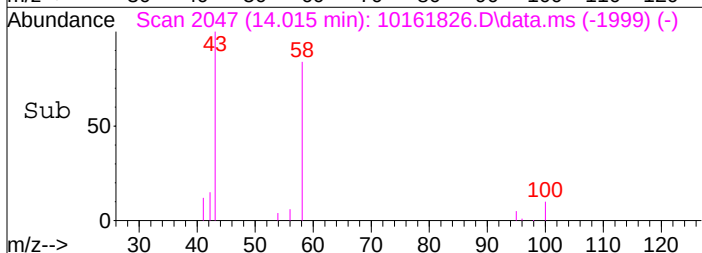
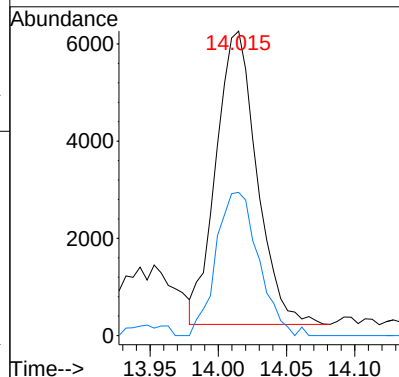
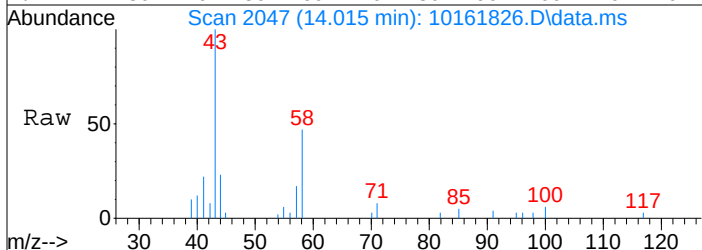
Ion	Ratio	Lower	Upper
91	100		
92	51.1	38.5	78.5





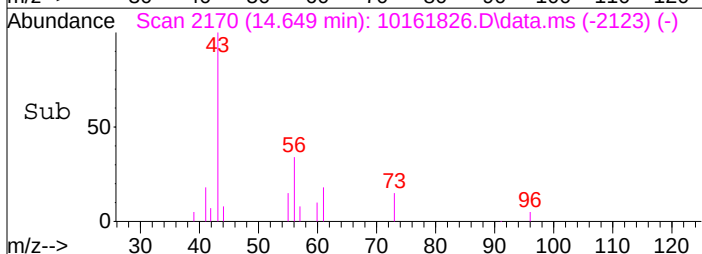
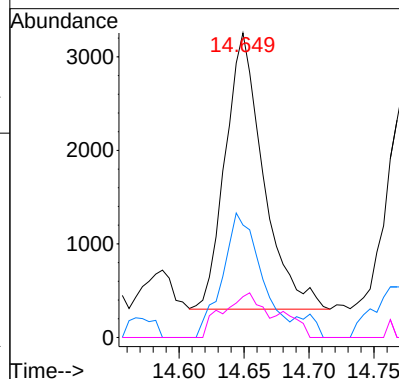
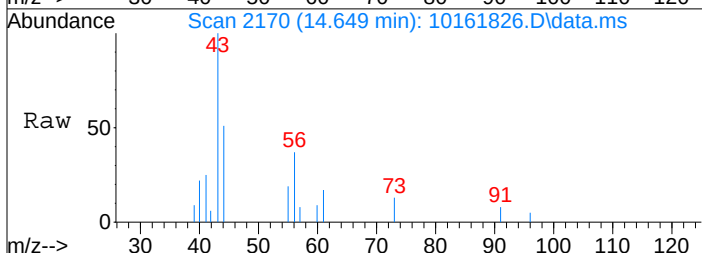
#59
2-Hexanone
Concen: 0.20 ng
RT: 14.01 min Scan# 2047
Delta R.T. -0.000 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

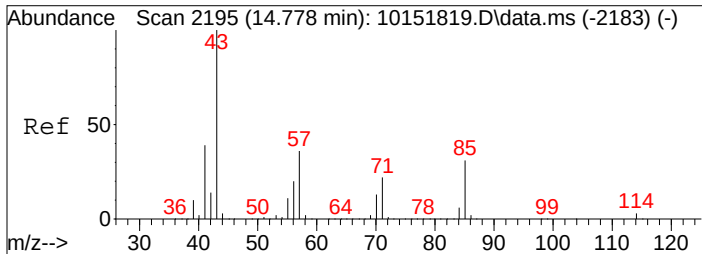
Tgt Ion: 43 Resp: 12582
Ion Ratio Lower Upper
43 100
58 50.6 39.4 79.4



#62
n-Butyl Acetate
Concen: 0.09 ng
RT: 14.65 min Scan# 2170
Delta R.T. -0.005 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

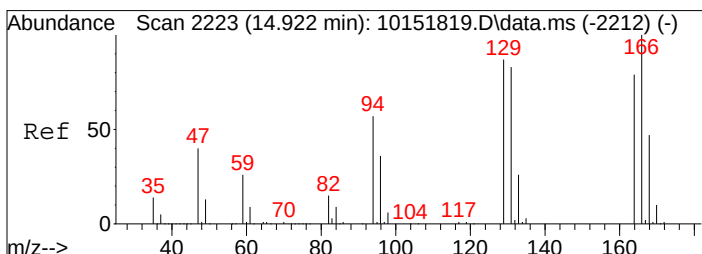
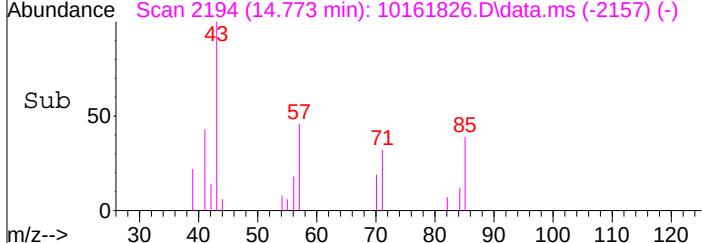
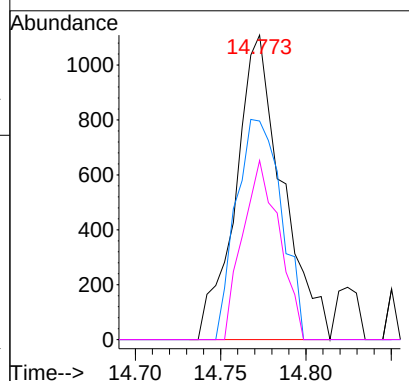
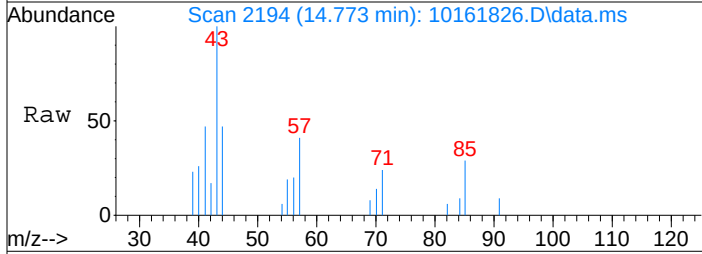
Tgt Ion: 43 Resp: 6019
Ion Ratio Lower Upper
43 100
56 45.5 24.3 64.3
73 22.3 0.0 34.7





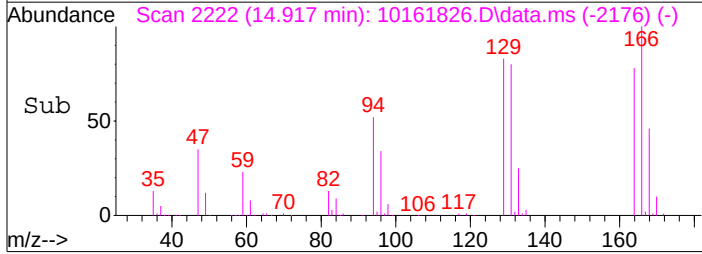
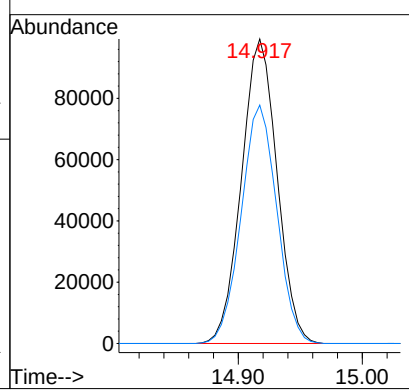
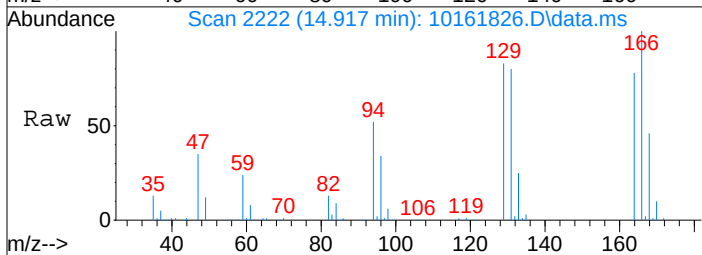
#63
n-Octane
Concen: 0.09 ng
RT: 14.77 min Scan# 2194
Delta R.T. -0.010 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

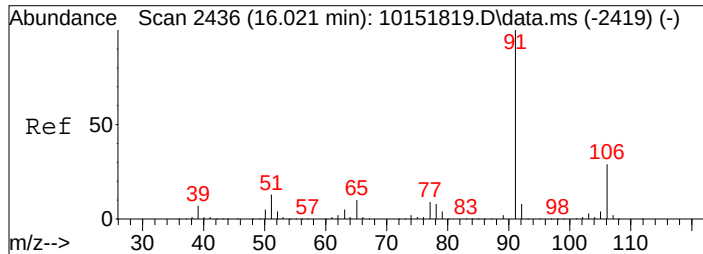
Tgt Ion: 57	Resp: 2120
Ion Ratio	Lower Upper
57	100
85	70.0 84.0 126.0#
71	46.1 53.8 80.6#



#64
Tetrachloroethene
Concen: 14.36 ng
RT: 14.92 min Scan# 2222
Delta R.T. -0.011 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

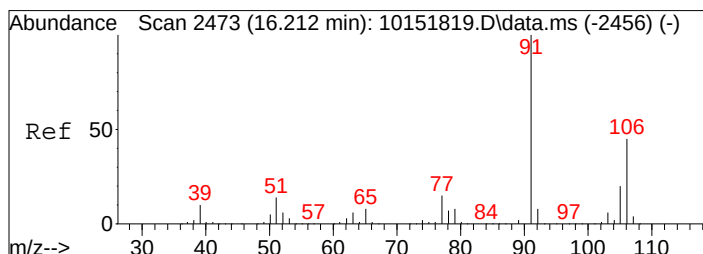
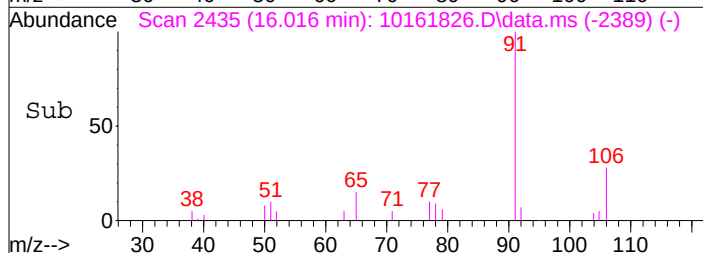
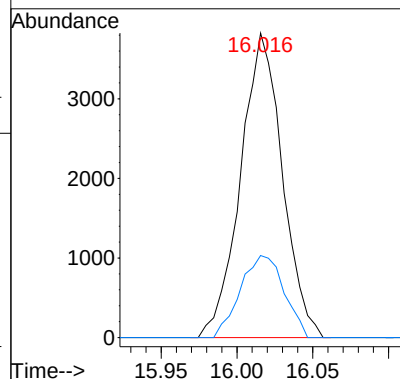
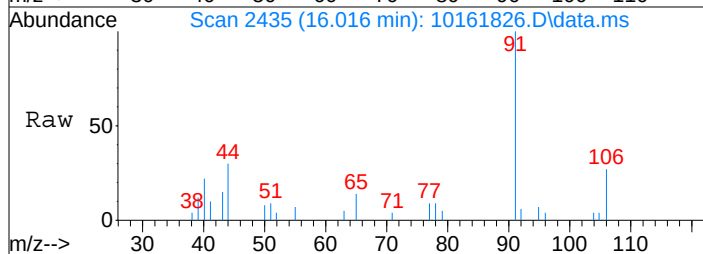
Tgt Ion: 166	Resp: 198561
Ion Ratio	Lower Upper
166	100
164	78.4 59.0 99.0





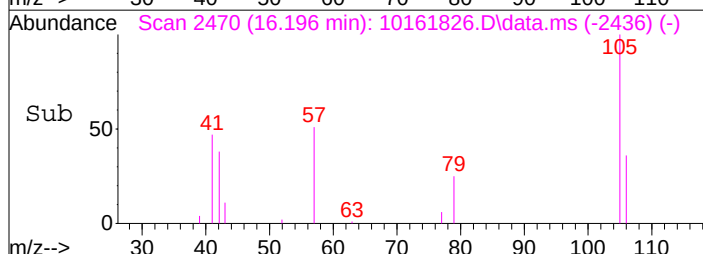
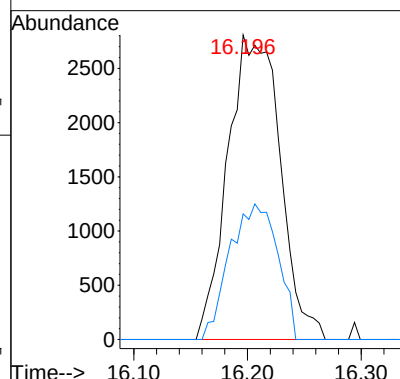
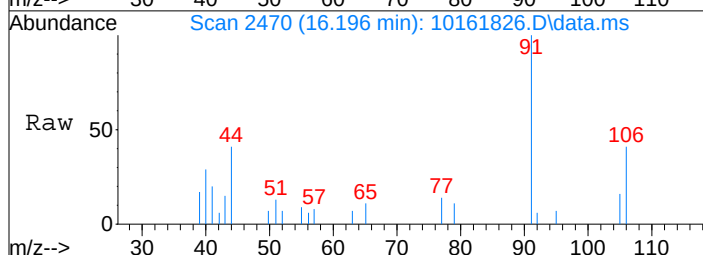
#66
Ethylbenzene
Concen: 0.08 ng
RT: 16.02 min Scan# 2435
Delta R.T. -0.010 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

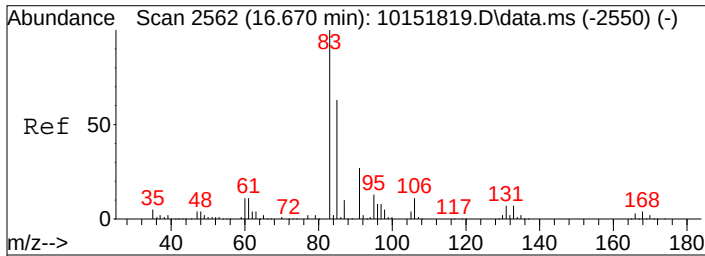
Tgt Ion: 91 Resp: 7333
Ion Ratio Lower Upper
91 100
106 28.1 10.8 50.8



#67
m- & p-Xylenes
Concen: 0.13 ng
RT: 16.20 min Scan# 2470
Delta R.T. -0.026 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

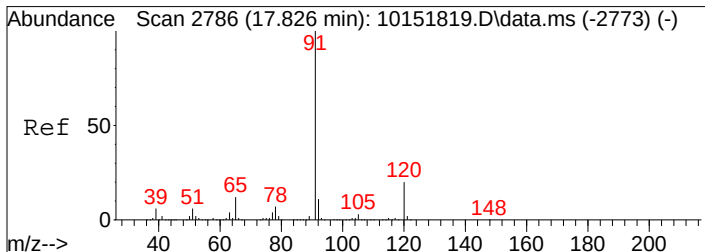
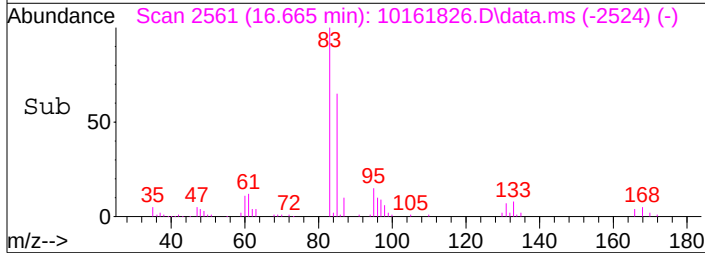
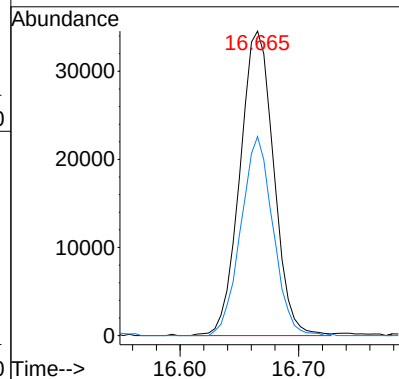
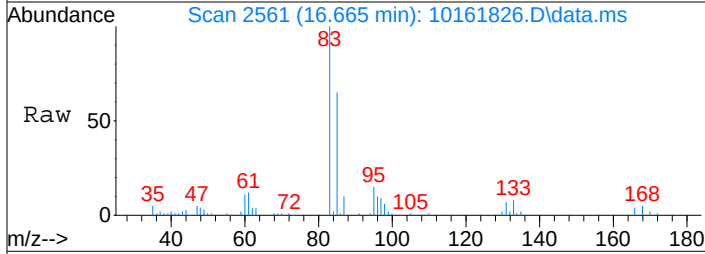
Tgt Ion: 91 Resp: 8955
Ion Ratio Lower Upper
91 100
106 40.9 28.7 68.7





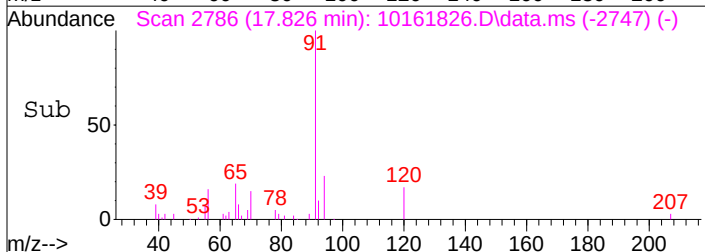
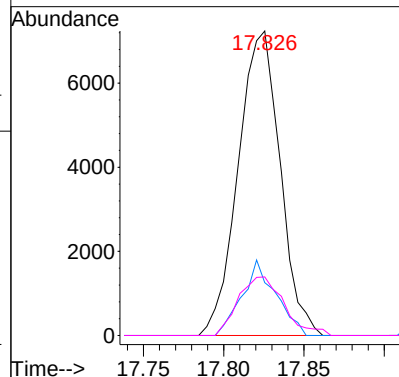
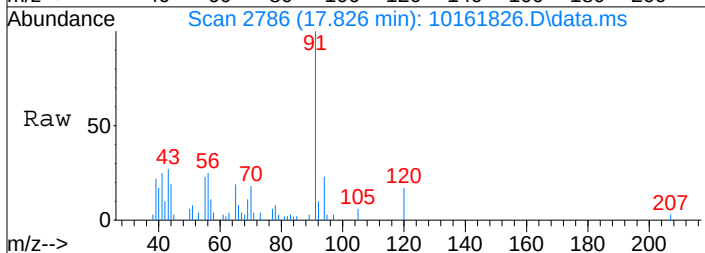
#72
 1,1,2,2-Tetrachloroethane
 Concen: 2.08 ng
 RT: 16.67 min Scan# 2561
 Delta R.T. -0.010 min
 Lab File: 10161826.D
 Acq: 17 Oct 2018 00:48

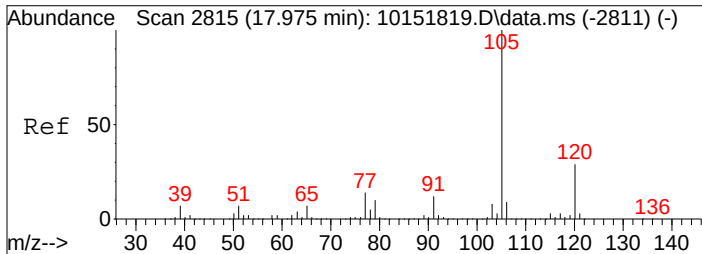
Tgt Ion: 83 Resp: 68517
 Ion Ratio Lower Upper
 83 100
 85 62.1 44.0 84.0



#76
 n-Propylbenzene
 Concen: 0.12 ng
 RT: 17.83 min Scan# 2786
 Delta R.T. -0.000 min
 Lab File: 10161826.D
 Acq: 17 Oct 2018 00:48

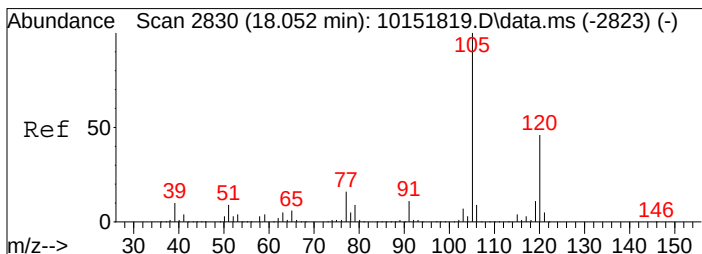
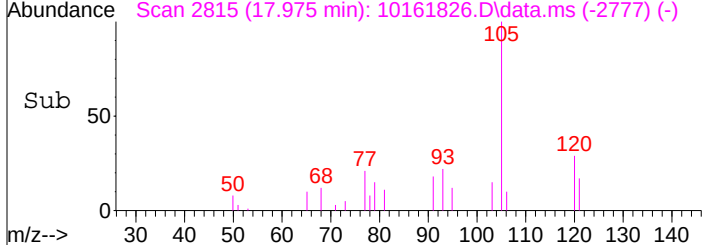
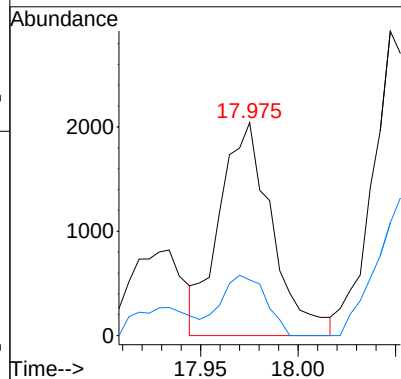
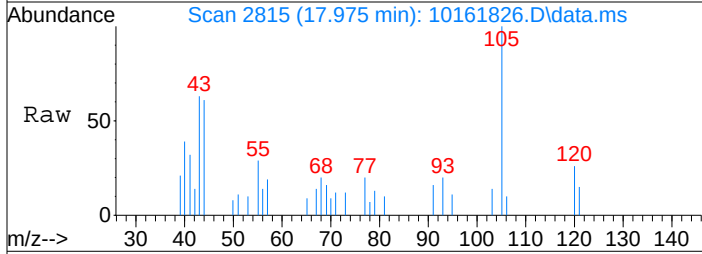
Tgt Ion: 91 Resp: 13140
 Ion Ratio Lower Upper
 91 100
 120 20.0 1.8 41.8
 65 21.0 0.0 30.4





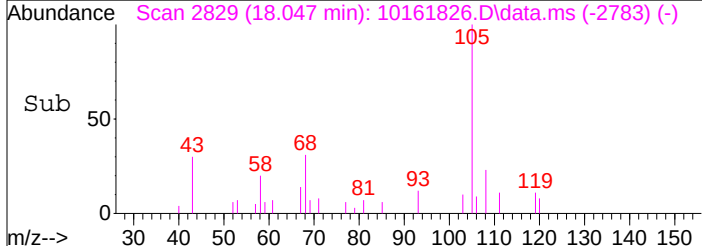
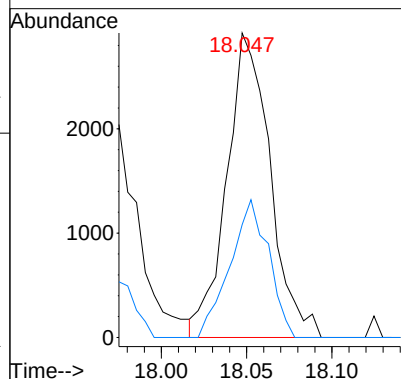
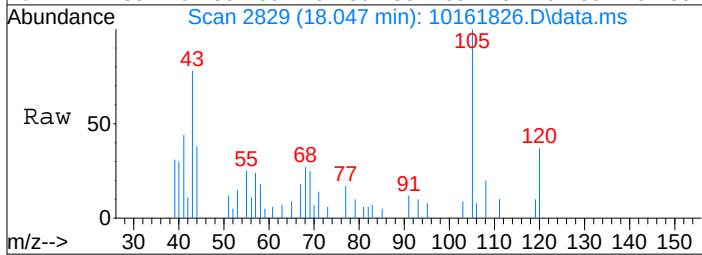
#78
4-Ethyltoluene
Concen: 0.05 ng
RT: 17.98 min Scan# 2815
Delta R.T. -0.005 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

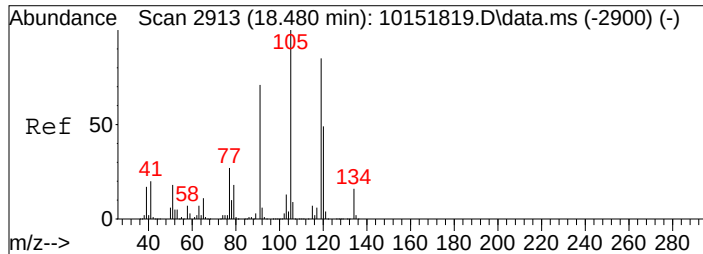
Tgt Ion:105	Resp:	3813
Ion Ratio	Lower	Upper
105	100	
120	24.4	9.6 49.6



#79
1,3,5-Trimethylbenzene
Concen: 0.08 ng
RT: 18.05 min Scan# 2829
Delta R.T. -0.010 min
Lab File: 10161826.D
Acq: 17 Oct 2018 00:48

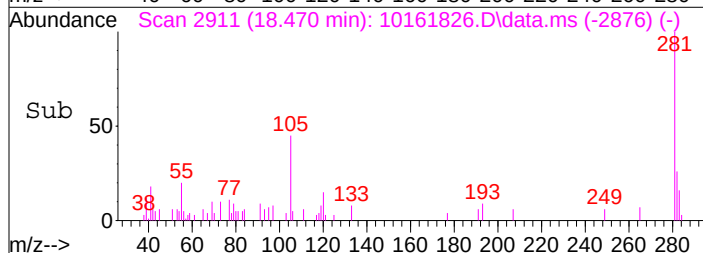
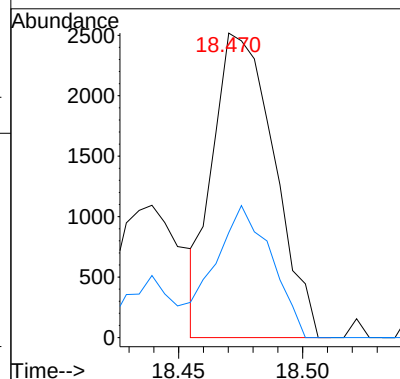
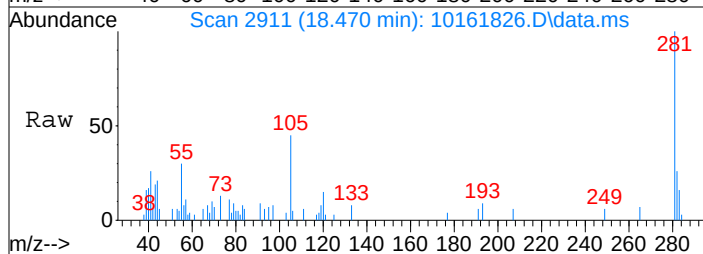
Tgt Ion:105	Resp:	5157
Ion Ratio	Lower	Upper
105	100	
120	40.2	28.3 68.3





#82
 1,2,4-Trimethylbenzene
 Concen: 0.06 ng
 RT: 18.47 min Scan# 2911
 Delta R.T. -0.021 min
 Lab File: 10161826.D
 Acq: 17 Oct 2018 00:48

Tgt Ion:105 Resp: 4317
 Ion Ratio Lower Upper
 105 100
 120 41.2 33.1 73.1



Data File: I:\MS09\Data\2018 10\16\10161826.D

Acq On : 17 Oct 2018 00:48

Operator: SC

Sample : P1805277-001 (1000mL)

Misc : S31-10151806

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Oct 17 10:11:44 2018

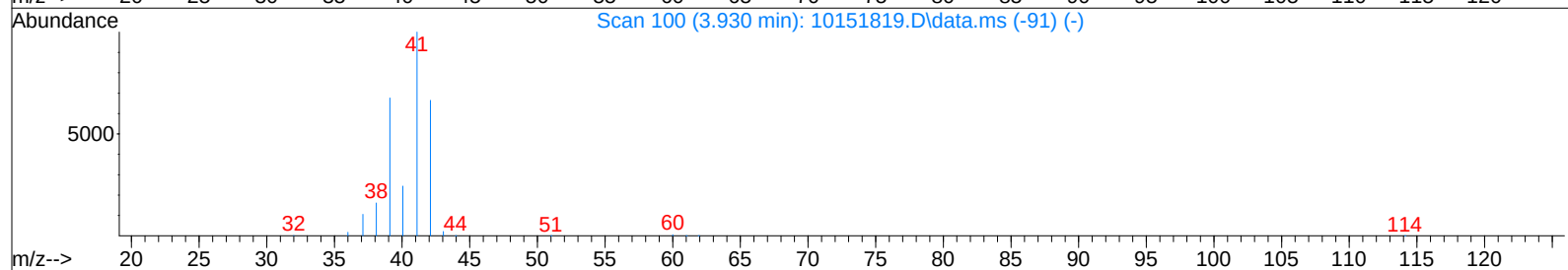
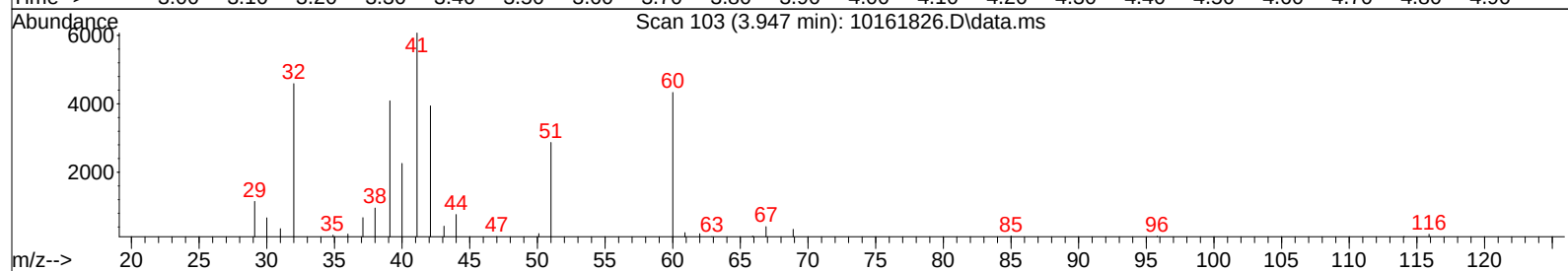
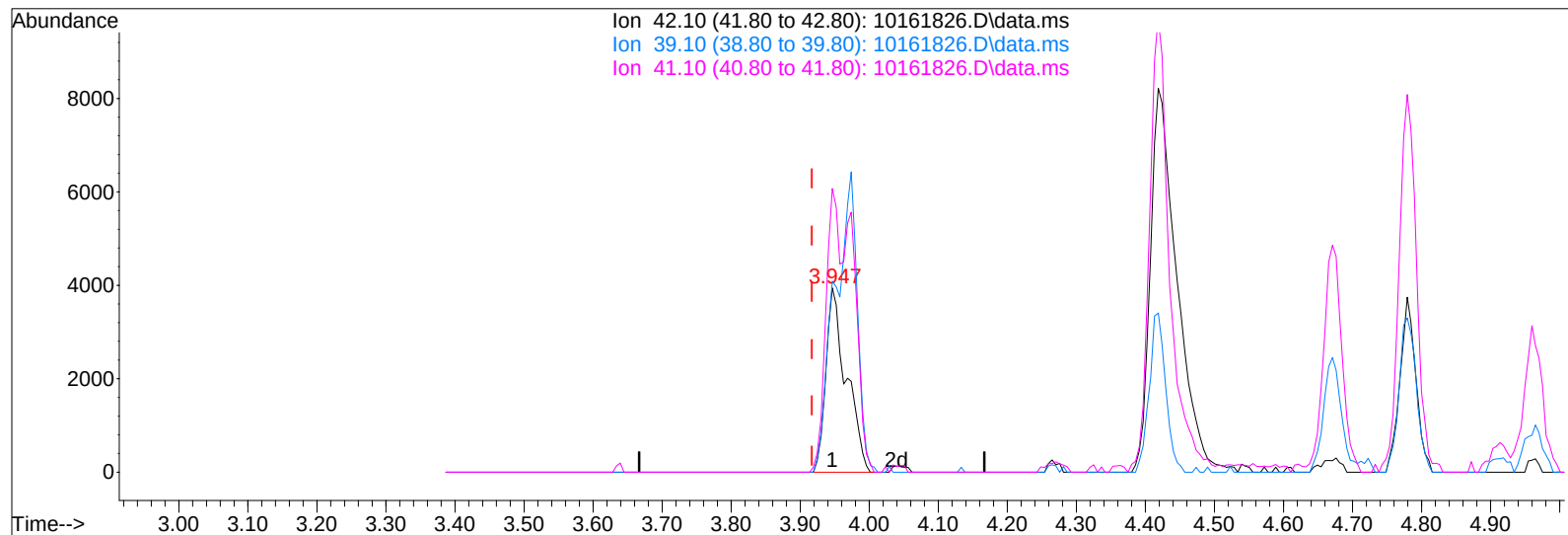
Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Wed Oct 17 09:09:32 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 10161826.D\data.ms

(2) Propene (T)

3.947min (+0.030) 0.32ng

response 8097

Ion	Exp%	Act%
42.10	100	100
39.10	98.40	180.28#
41.10	147.90	122.39#
0.00	0.00	0.00

Data File: I:\MS09\Data\2018 10\16\10161826.D

Acq On : 17 Oct 2018 00:48

Operator: SC

Sample : P1805277-001 (1000mL)

Misc : S31-10151806

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Oct 17 10:11:44 2018

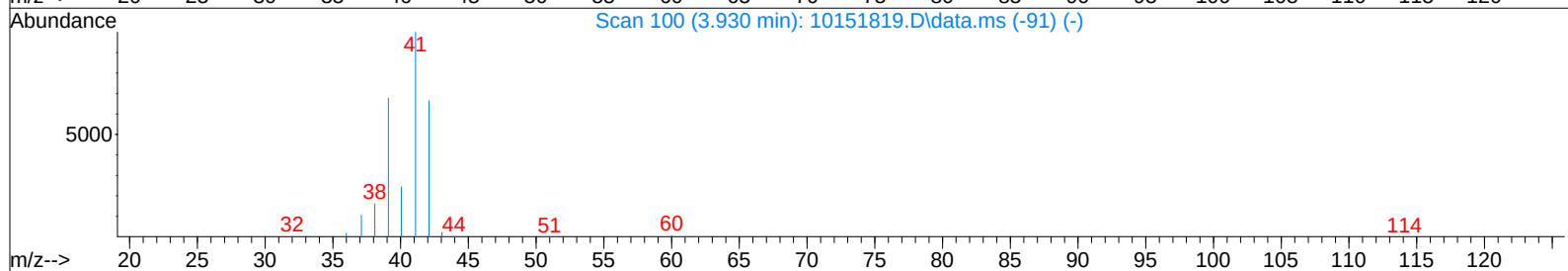
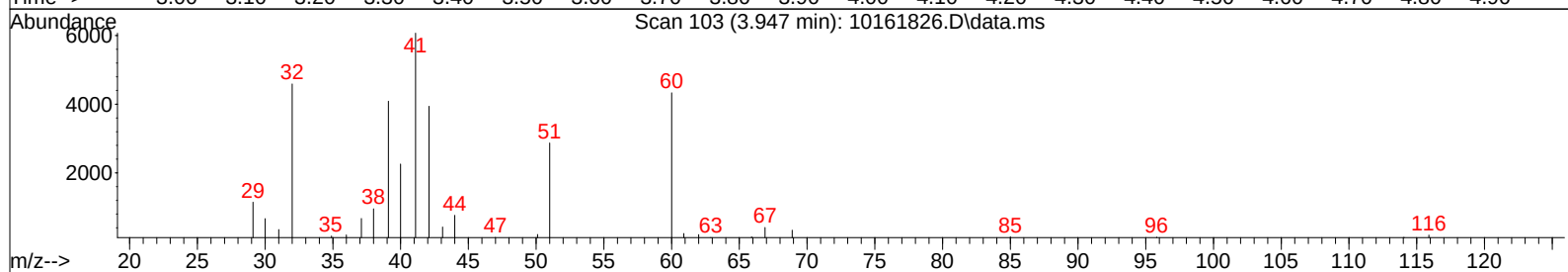
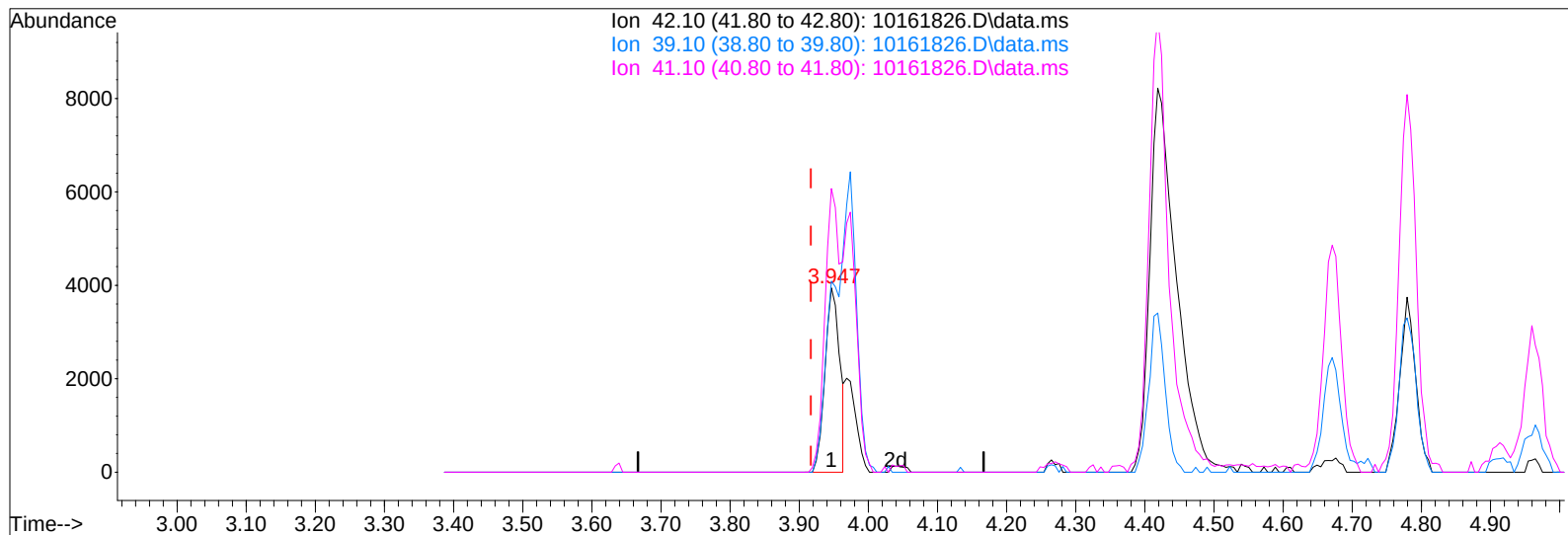
Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Wed Oct 17 09:09:32 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 10161826.D\data.ms

(2) Propene (T)

3.947min (+0.030) 0.23ng m

response 5865

Ion	Exp%	Act%
42.10	100	100
39.10	98.40	248.88#
41.10	147.90	168.97#
0.00	0.00	0.00

IPC

10/17/18

10/17/18

Data File: I:\MS09\Data\2018 10\16\10161825.D

Acq On : 17 Oct 2018 00:15

Operator: SC

Sample : P1805277-002 (1000mL)

Misc : S31-10151806

ALS Vial : 12 Sample Multiplier: 1

 10/17/18

Quant Time: Oct 17 10:02:53 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Wed Oct 17 09:09:32 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.25	130	95379	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	11.22	114	641636	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	15.57	82	386563	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	10.04	65	228243	11.600	ng	0.03
Spiked Amount	12.500	Range	70 - 130	Recovery	=	92.80%
57) Toluene-d8 (SS2)	13.66	98	834190	12.491	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.92%
73) Bromofluorobenzene (SS3)	17.15	174	176396	12.906	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.28%

Target Compounds

						Qvalue
2) Propene	3.95	42	7431m	0.301	ng	
3) Dichlorodifluoromethan...	4.04	85	52771	2.022	ng	100
4) Chloromethane	4.24	50	2817	0.089	ng	92
5) 1,2-Dichloro-1,1,2,2-t...	4.42	135	779	0.091	ng	85
6) Vinyl Chloride	4.53	62	5831	0.247	ng	99
7) 1,3-Butadiene	4.72	54	349	N.D.		
8) Bromomethane	5.02	94	649	0.076	ng	90
9) Chloroethane	5.24	64	269	N.D.		
10) Ethanol	5.45	45	43686	2.584	ng	98
11) Acetonitrile	5.67	41	11501	0.252	ng	83
12) Acrolein	5.82	56	10707	0.879	ng	100
13) Acetone	5.97	58	77161	5.572	ng	# 70
14) Trichlorofluoromethane	6.11	101	24922	1.417	ng	98
15) 2-Propanol (Isopropanol)	6.27	45	15002	0.266	ng	61
16) Acrylonitrile	6.53	53	47	N.D.		
17) 1,1-Dichloroethene	6.82	96	25299	2.291	ng	# 75
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.	d	
19) Methylene Chloride	6.96	84	1917	0.134	ng	# 61
20) 3-Chloro-1-propene (Al...	7.04	41	1272	N.D.		
21) Trichlorotrifluoroethane	7.29	151	124661	16.520	ng	86
22) Carbon Disulfide	7.25	76	24914	0.489	ng	46
23) trans-1,2-Dichloroethene	7.99	61	29786	1.089	ng	89
24) 1,1-Dichloroethane	8.21	63	30017	0.962	ng	98
25) Methyl tert-Butyl Ether	8.25	73	114	N.D.		
26) Vinyl Acetate	8.37	86	11165	4.453	ng	# 75
27) 2-Butanone (MEK)	8.65	72	15815	1.266	ng	# 55
28) cis-1,2-Dichloroethene	9.08	61	2134250	79.489	ng	87
29) Diisopropyl Ether	0.00	87	0	N.D.	d	
30) Ethyl Acetate	0.00	61	0	N.D.	d	
31) n-Hexane	9.33	57	3221	0.096	ng	# 18
32) Chloroform	9.39	83	446346	16.700	ng	99
34) Tetrahydrofuran (THF)	0.00	72	0	N.D.	d	
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	10.15	62	1643	0.073	ng	81
38) 1,1,1-Trichloroethane	10.42	97	28829	1.179	ng	90
39) Isopropyl Acetate	10.80	61	559	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	10.87	78	7998	0.093	ng	96
42) Carbon Tetrachloride	11.02	117	30616	1.687	ng	97
43) Cyclohexane	11.15	84	2430	0.081	ng	# 61
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	11.69	63	715	N.D.		
46) Bromodichloromethane	11.87	83	4619	0.184	ng	94
47) Trichloroethene	11.92	130	1737359	104.075	ng	100
48) 1,4-Dioxane	0.00	88	0	N.D.	d	
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d	

Data File: I:\MS09\Data\2018 10\16\10161825.D

Acq On : 17 Oct 2018 00:15

Operator: SC

Sample : P1805277-002 (1000mL)

Misc : S31-10151806

ALS Vial : 12 Sample Multiplier: 1

Quant Time: Oct 17 10:02:53 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Wed Oct 17 09:09:32 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	0.00	100	0	N.D.	d	
51) n-Heptane	12.24	71	1046	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	12.81	58	2517	0.107	ng	# 37
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	13.47	97	3151	0.179	ng	97
58) Toluene	13.76	91	23190	0.312	ng	96
59) 2-Hexanone	14.01	43	10828	0.173	ng	87
60) Dibromochloromethane	14.17	129	440	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	14.65	43	10770	0.155	ng	94
63) n-Octane	14.77	57	1533	0.066	ng	# 51
64) Tetrachloroethene	14.92	166	209293	15.006	ng	100
65) Chlorobenzene	15.61	112	889	N.D.		
66) Ethylbenzene	16.02	91	3963	N.D.		
67) m- & p-Xylenes	16.20	91	8982	0.128	ng	85
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	16.58	104	1398	N.D.		
70) o-Xylene	16.69	91	3547	0.050	ng	83
71) n-Nonane	16.92	43	2219	N.D.		
72) 1,1,2,2-Tetrachloroethane	16.67	83	71194	2.145	ng	99
74) Cumene	17.30	105	1240	N.D.		
75) alpha-Pinene	17.70	93	653	N.D.		
76) n-Propylbenzene	17.82	91	2136	N.D.		
77) 3-Ethyltoluene	17.93	105	2285	N.D.		
78) 4-Ethyltoluene	17.97	105	1377	N.D.		
79) 1,3,5-Trimethylbenzene	18.06	105	1454	N.D.		
80) alpha-Methylstyrene	18.21	118	578	N.D.		
81) 2-Ethyltoluene	18.25	105	1915	N.D.		
82) 1,2,4-Trimethylbenzene	18.48	105	3513	0.052	ng	73
83) n-Decane	0.00	58	0	N.D.	d	
84) Benzyl Chloride	18.61	91	1871	N.D.		
85) 1,3-Dichlorobenzene	18.64	146	378	N.D.		
86) 1,4-Dichlorobenzene	18.70	146	1577	0.050	ng	99
87) sec-Butylbenzene	18.76	105	703	N.D.		
88) 4-Isopropyltoluene (p-...	18.92	119	1470	N.D.		
89) 1,2,3-Trimethylbenzene	18.92	105	1192	N.D.		
90) 1,2-Dichlorobenzene	19.06	146	252	N.D.		
91) d-Limonene	19.07	68	1599	N.D.		
92) 1,2-Dibromo-3-Chloropr...	19.43	157	278	N.D.		
93) n-Undecane	19.92	57	2574	N.D.		
94) 1,2,4-Trichlorobenzene	20.86	180	119	N.D.		
95) Naphthalene	20.98	128	2636	N.D.		
96) n-Dodecane	0.00	57	0	N.D.	d	
97) Hexachlorobutadiene	21.34	225	195	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.	d	
99) tert-Butylbenzene	18.47	119	731	N.D.		
100) n-Butylbenzene	19.35	91	2054	N.D.		

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

Data File: I:\MS09\Data\2018 10\16\10161825.D

Acq On : 17 Oct 2018 00:15

Operator: SC

Sample : P1805277-002 (1000mL)

Misc : S31-10151806

ALS Vial : 12 Sample Multiplier: 1

Quant Time: Oct 17 10:02:53 2018

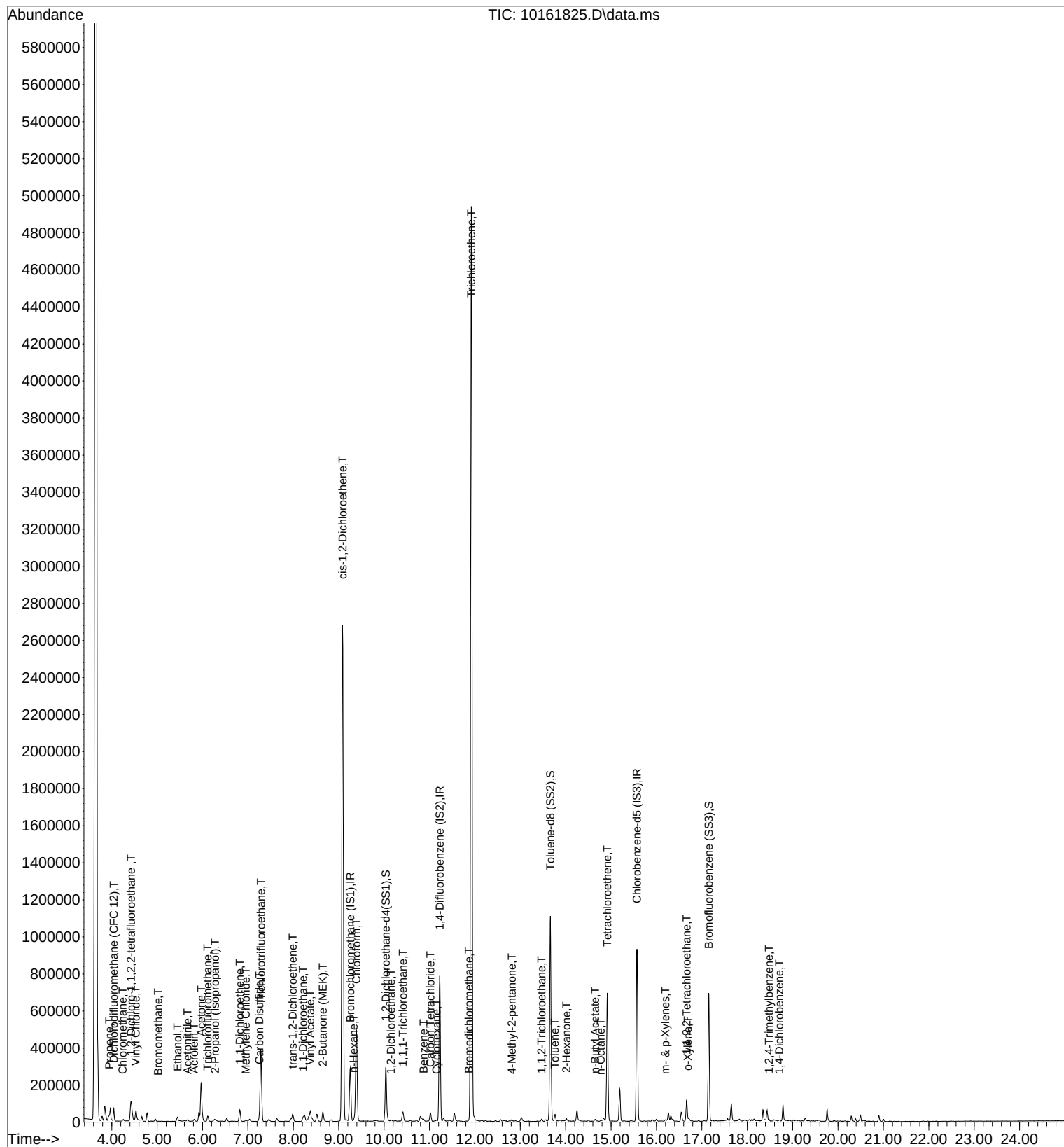
Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Wed Oct 17 09:09:32 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS09\Data\2018 10\16\10161825.D

Acq On : 17 Oct 2018 00:15

Operator: SC

Sample : P1805277-002 (1000mL)

Misc : S31-10151806

ALS Vial : 12 Sample Multiplier: 1

Quant Time: Oct 17 10:02:53 2018

 10/17/18

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Wed Oct 17 09:09:32 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.25	130	95379	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	11.22	114	641636	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	15.57	82	386563	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	10.04	65	228243	11.600	ng	0.03
Spiked Amount	12.500	Range	70 - 130	Recovery	=	92.80%
57) Toluene-d8 (SS2)	13.66	98	834190	12.491	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.92%
73) Bromofluorobenzene (SS3)	17.15	174	176396	12.906	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.28%

Target Compounds

						Qvalue
2) Propene	3.95	42	7431m	0.301	ng	
3) Dichlorodifluoromethan...	4.04	85	52771	2.022	ng	100
4) Chloromethane	4.24	50	2817	0.089	ng	92
5) 1,2-Dichloro-1,1,2,2-t...	4.42	135	779	0.091	ng	85
6) Vinyl Chloride	4.53	62	5831	0.247	ng	99
8) Bromomethane	5.02	94	649	0.076	ng	90
10) Ethanol	5.45	45	43686	2.584	ng	98
11) Acetonitrile	5.67	41	11501	0.252	ng	83
12) Acrolein	5.82	56	10707	0.879	ng	100
13) Acetone	5.97	58	77161	5.572	ng	# 70
14) Trichlorofluoromethane	6.11	101	24922	1.417	ng	98
15) 2-Propanol (Isopropanol)	6.27	45	15002	0.266	ng	61
17) 1,1-Dichloroethene	6.82	96	25299	2.291	ng	# 75
19) Methylene Chloride	6.96	84	1917	0.134	ng	# 61
21) Trichlorotrifluoroethane	7.29	151	124661	16.520	ng	86
22) Carbon Disulfide	7.25	76	24914	0.489	ng	46
23) trans-1,2-Dichloroethene	7.99	61	29786	1.089	ng	89
24) 1,1-Dichloroethane	8.21	63	30017	0.962	ng	98
26) Vinyl Acetate	8.37	86	11165	4.453	ng	# 75
27) 2-Butanone (MEK)	8.65	72	15815	1.266	ng	# 55
28) cis-1,2-Dichloroethene	9.08	61	2134250	79.489	ng	87
31) n-Hexane	9.33	57	3221	0.096	ng	# 18
32) Chloroform	9.39	83	446346	16.700	ng	99
36) 1,2-Dichloroethane	10.15	62	1643	0.073	ng	81
38) 1,1,1-Trichloroethane	10.42	97	28829	1.179	ng	90
41) Benzene	10.87	78	7998	0.093	ng	96
42) Carbon Tetrachloride	11.02	117	30616	1.687	ng	97
43) Cyclohexane	11.15	84	2430	0.081	ng	# 61
46) Bromodichloromethane	11.87	83	4619	0.184	ng	94
47) Trichloroethene	11.92	130	1737359	104.075	ng	100
53) 4-Methyl-2-pentanone	12.81	58	2517	0.107	ng	# 37
55) 1,1,2-Trichloroethane	13.47	97	3151	0.179	ng	97
58) Toluene	13.76	91	23190	0.312	ng	96
59) 2-Hexanone	14.01	43	10828	0.173	ng	87
62) n-Butyl Acetate	14.65	43	10770	0.155	ng	94
63) n-Octane	14.77	57	1533	0.066	ng	# 51
64) Tetrachloroethene	14.92	166	209293	15.006	ng	100
67) m- & p-Xylenes	16.20	91	8982	0.128	ng	85
70) o-Xylene	16.69	91	3547	0.050	ng	83
72) 1,1,2,2-Tetrachloroethane	16.67	83	71194	2.145	ng	99
82) 1,2,4-Trimethylbenzene	18.48	105	3513	0.052	ng	73
86) 1,4-Dichlorobenzene	18.70	146	1577	0.050	ng	99

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

Data File: I:\MS09\Data\2018 10\16\10161825.D

Acq On : 17 Oct 2018 00:15

Operator: SC

Sample : P1805277-002 (1000mL)

Misc : S31-10151806

ALS Vial : 12 Sample Multiplier: 1

Quant Time: Oct 17 10:02:53 2018

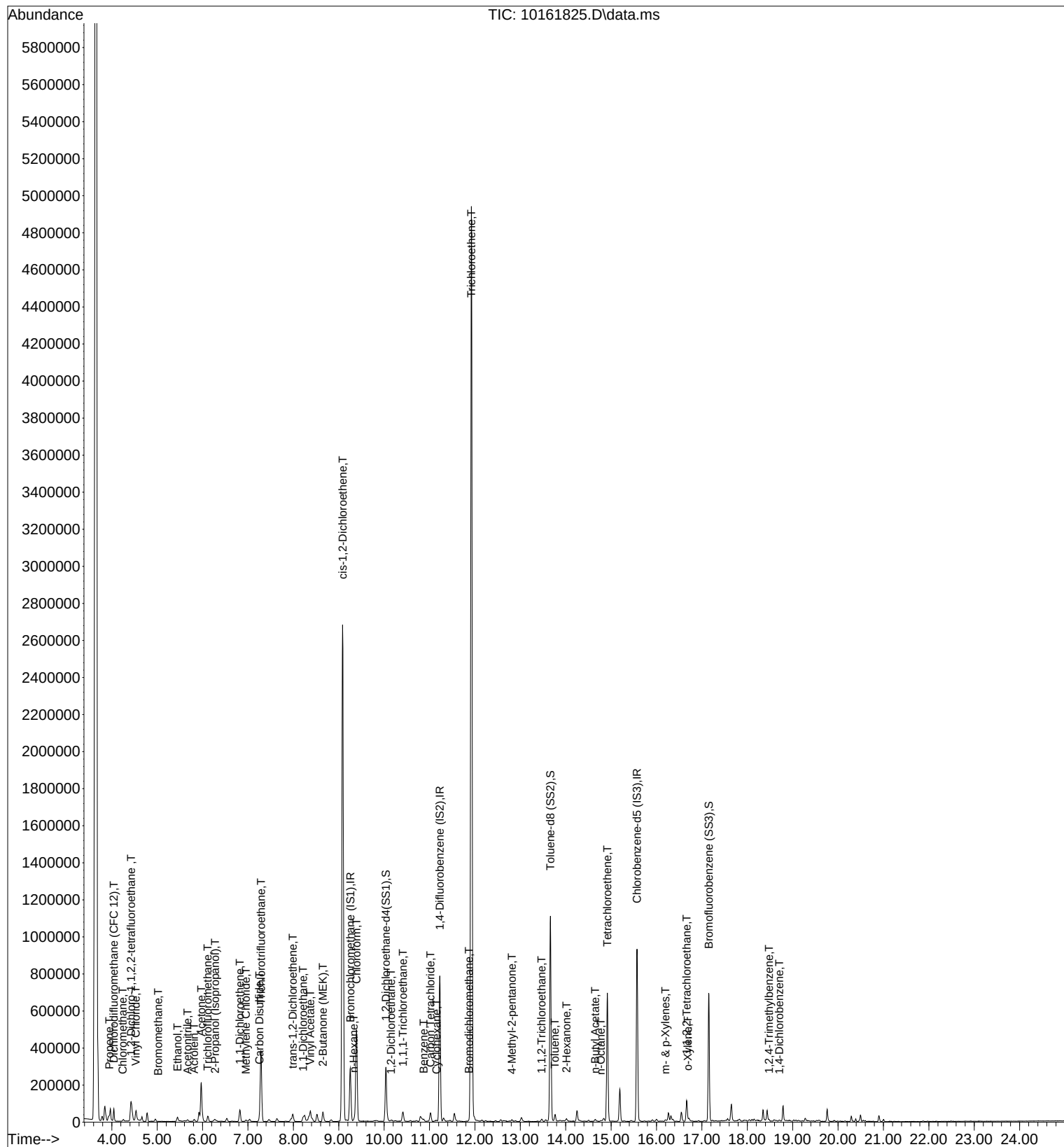
Quant Method : I:\MS09\Methods\R9101518.M

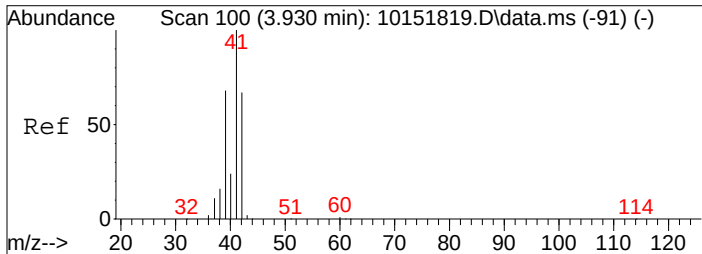
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Wed Oct 17 09:09:32 2018

Response via : Initial Calibration

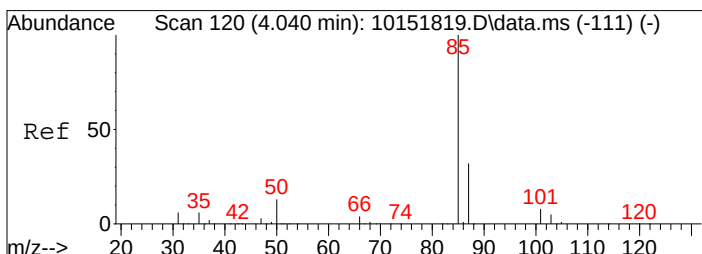
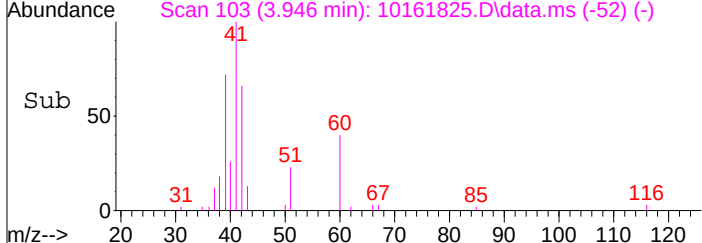
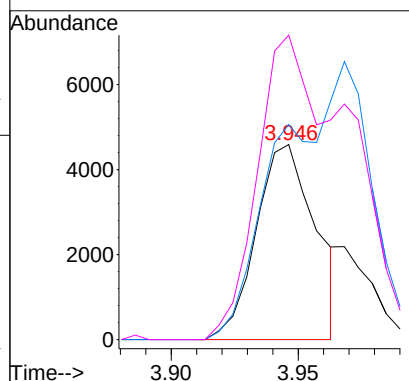
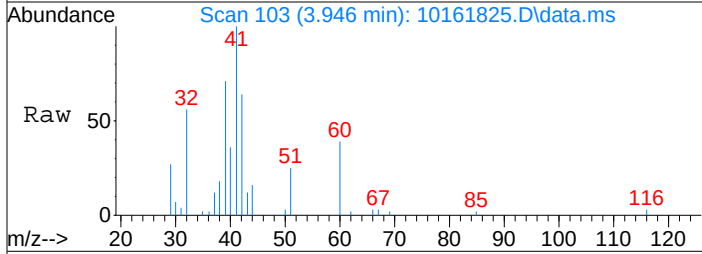
DataAcq Meth:TO15.M





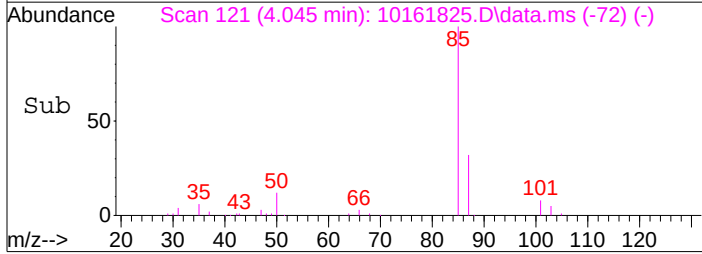
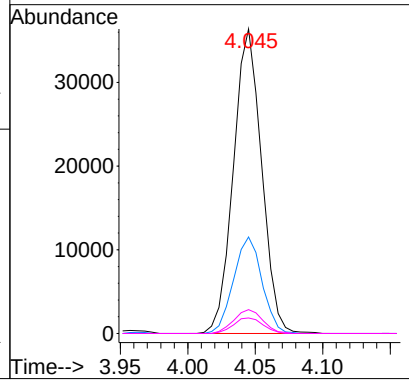
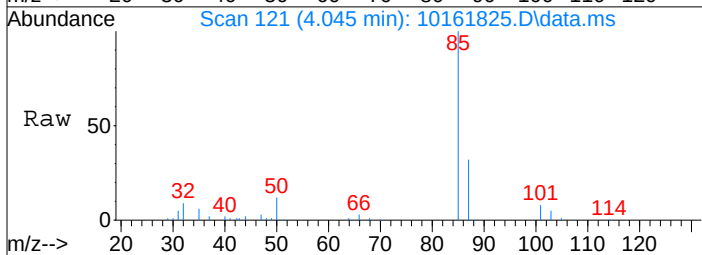
#2
 Propene
 Concen: 0.30 ng m
 RT: 3.95 min Scan# 103
 Delta R.T. 0.029 min
 Lab File: 10161825.D
 Acq: 17 Oct 2018 00:15

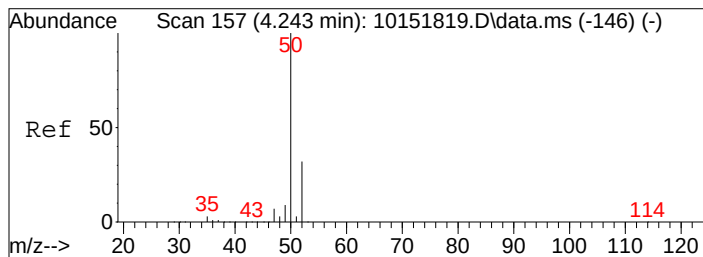
Tgt Ion:	42	Resp:	7431
Ion Ratio	Lower	Upper	
42	100		
39	217.8	78.4	118.4#
41	245.6	127.9	167.9#



#3
 Dichlorodifluoromethane (CFC 12)
 Concen: 2.02 ng
 RT: 4.04 min Scan# 121
 Delta R.T. 0.019 min
 Lab File: 10161825.D
 Acq: 17 Oct 2018 00:15

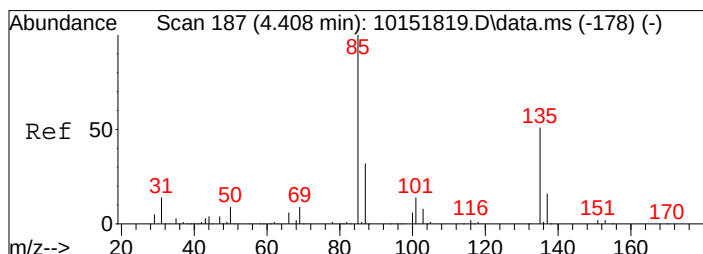
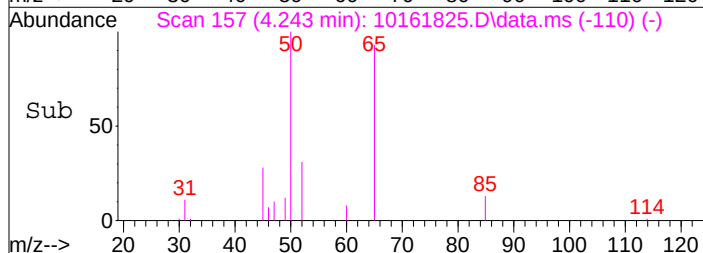
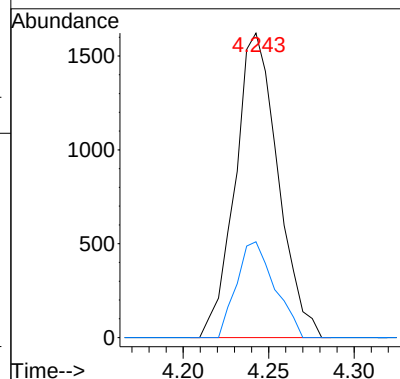
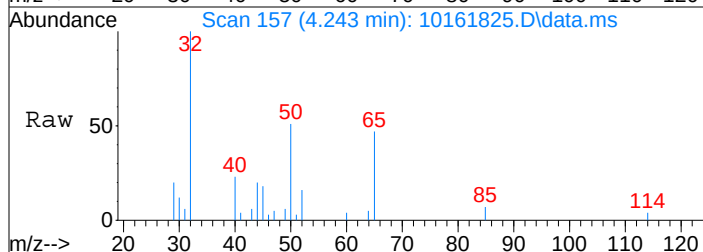
Tgt Ion:	85	Resp:	52771
Ion Ratio	Lower	Upper	
85	100		
87	31.9	12.2	52.2
101	8.1	0.0	28.3
103	5.3	0.0	25.4





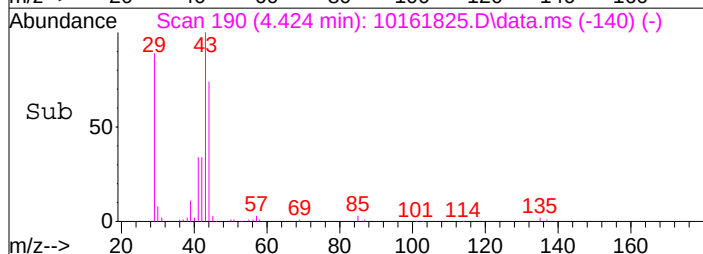
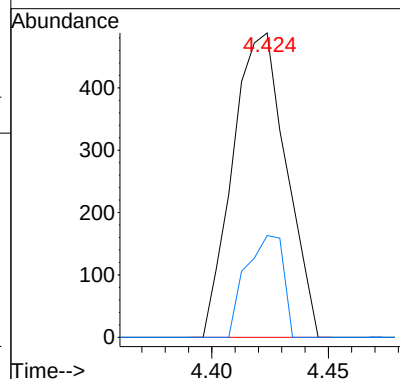
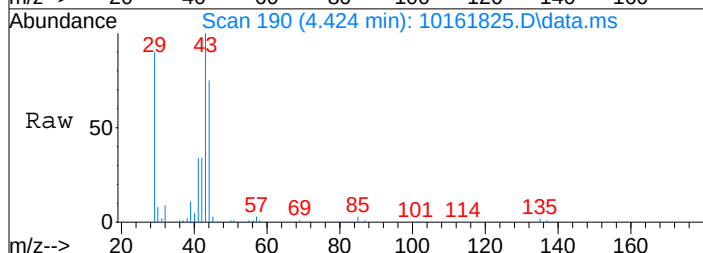
#4
Chloromethane
Concen: 0.09 ng
RT: 4.24 min Scan# 157
Delta R.T. 0.009 min
Lab File: 10161825.D
Acq: 17 Oct 2018 00:15

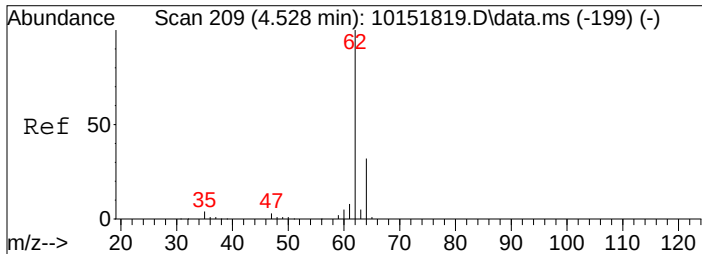
Tgt Ion: 50 Resp: 2817
Ion Ratio Lower Upper
50 100
52 28.0 12.7 52.7



#5
1,2-Dichloro-1,1,2,2-tetrafluoroethane
Concen: 0.09 ng
RT: 4.42 min Scan# 190
Delta R.T. 0.027 min
Lab File: 10161825.D
Acq: 17 Oct 2018 00:15

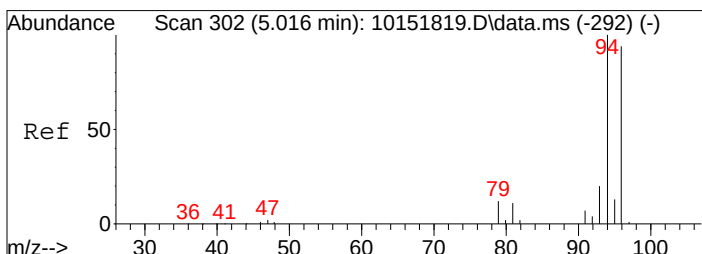
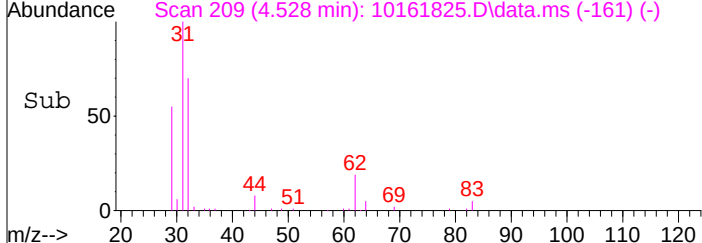
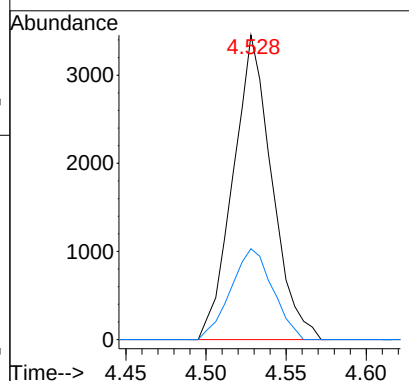
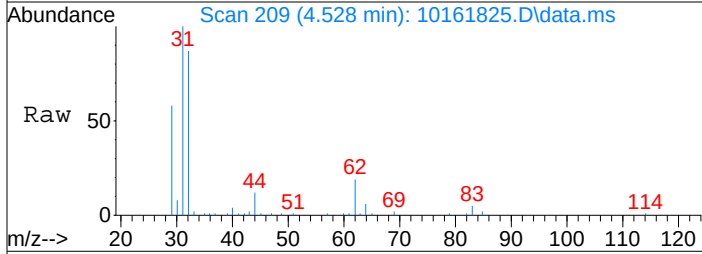
Tgt Ion: 135 Resp: 779
Ion Ratio Lower Upper
135 100
137 23.5 11.7 51.7





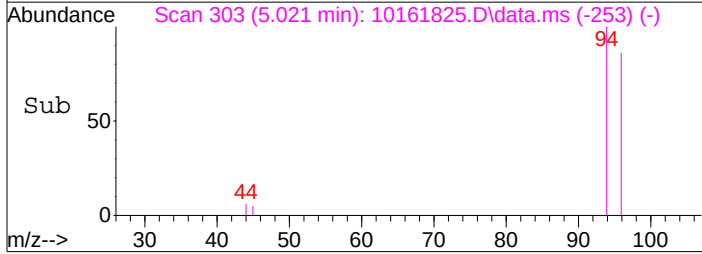
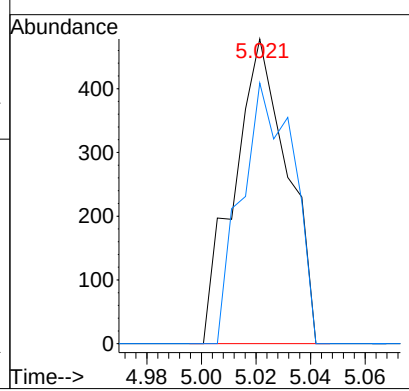
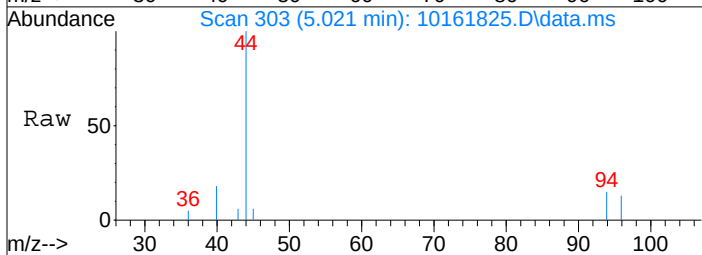
#6
 Vinyl Chloride
 Concen: 0.25 ng
 RT: 4.53 min Scan# 209
 Delta R.T. 0.011 min
 Lab File: 10161825.D
 Acq: 17 Oct 2018 00:15

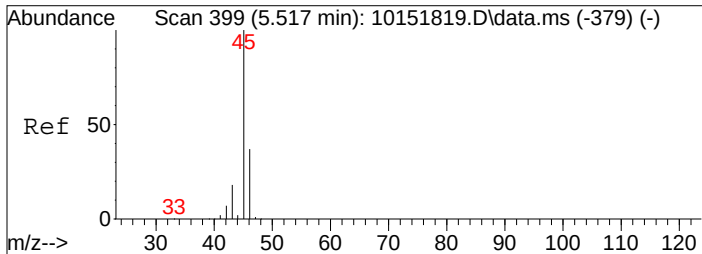
Tgt Ion: 62	Resp: 5831
Ion Ratio	Lower Upper
62	100
64	32.3 11.9 51.9



#8
 Bromomethane
 Concen: 0.08 ng
 RT: 5.02 min Scan# 303
 Delta R.T. 0.010 min
 Lab File: 10161825.D
 Acq: 17 Oct 2018 00:15

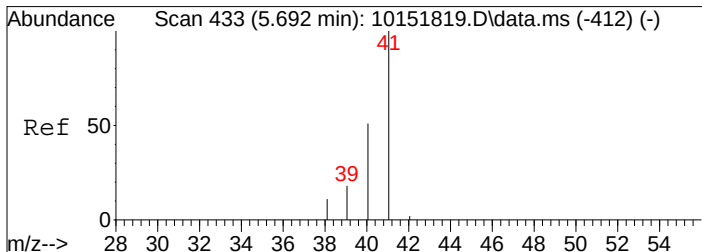
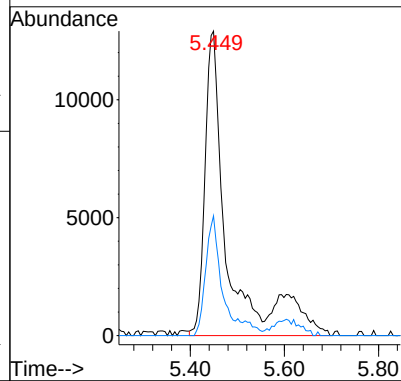
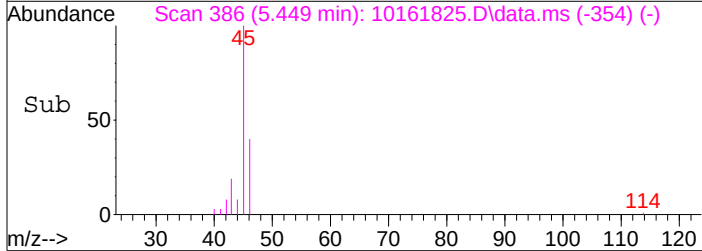
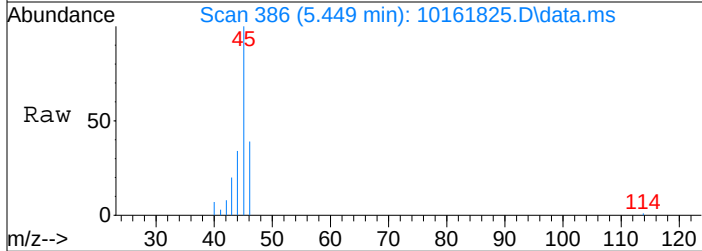
Tgt Ion: 94	Resp: 649
Ion Ratio	Lower Upper
94	100
96	83.5 73.6 113.6





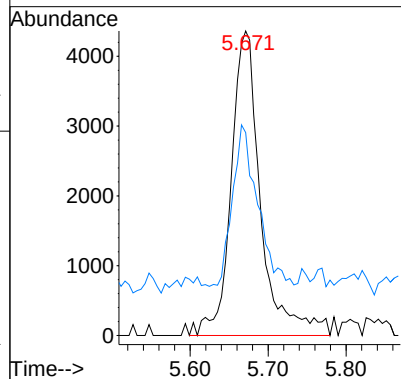
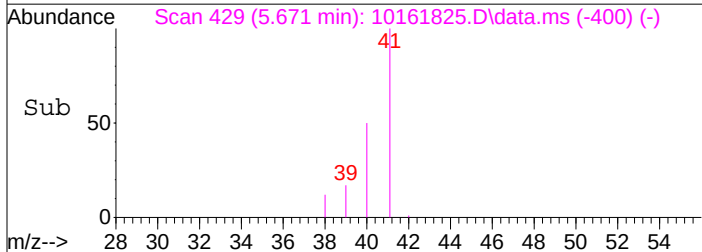
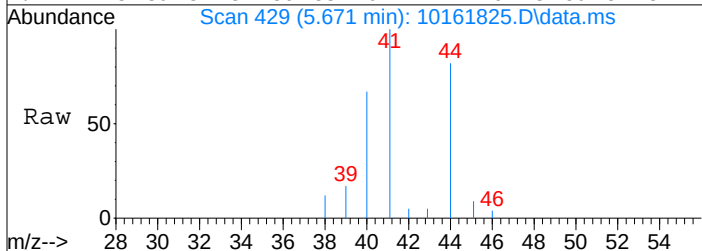
#10
Ethanol
Concen: 2.58 ng
RT: 5.45 min Scan# 386
Delta R.T. -0.085 min
Lab File: 10161825.D
Acq: 17 Oct 2018 00:15

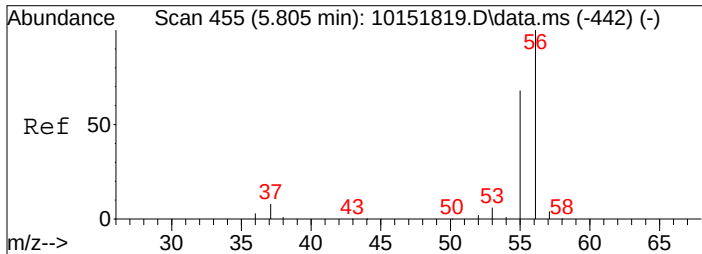
Tgt Ion: 45 Resp: 43686
Ion Ratio Lower Upper
45 100
46 35.4 16.8 56.8



#11
Acetonitrile
Concen: 0.25 ng
RT: 5.67 min Scan# 429
Delta R.T. -0.053 min
Lab File: 10161825.D
Acq: 17 Oct 2018 00:15

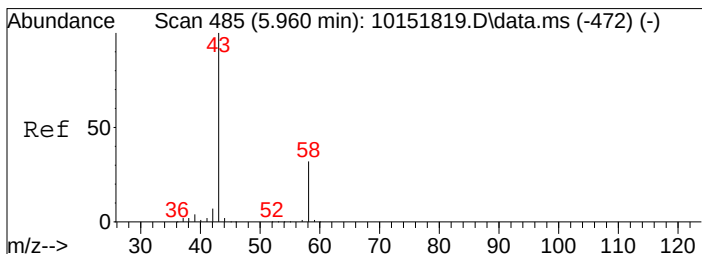
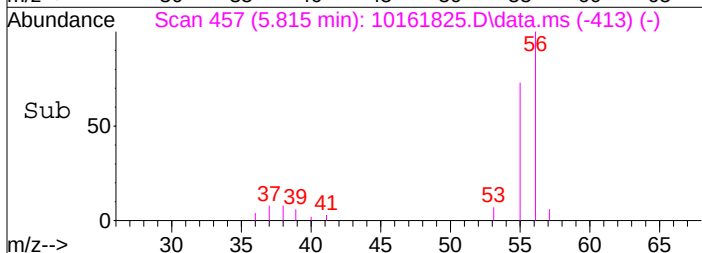
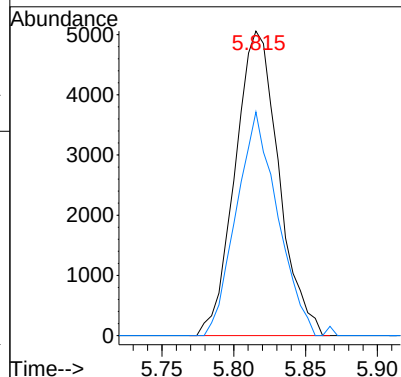
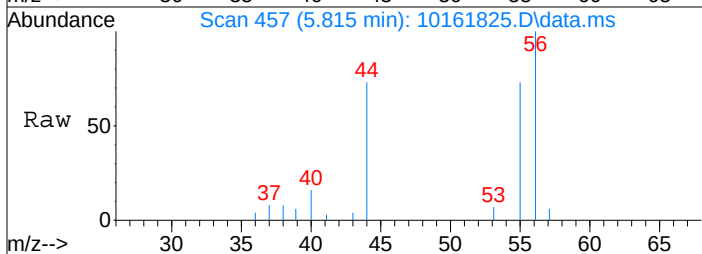
Tgt Ion: 41 Resp: 11501
Ion Ratio Lower Upper
41 100
40 63.7 31.6 71.6





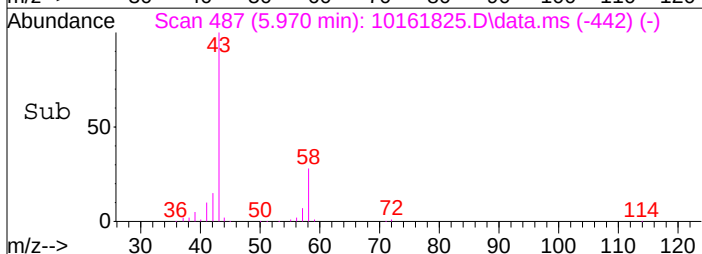
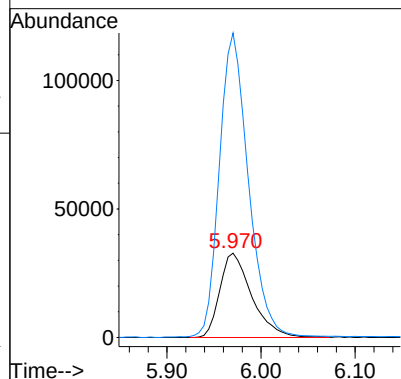
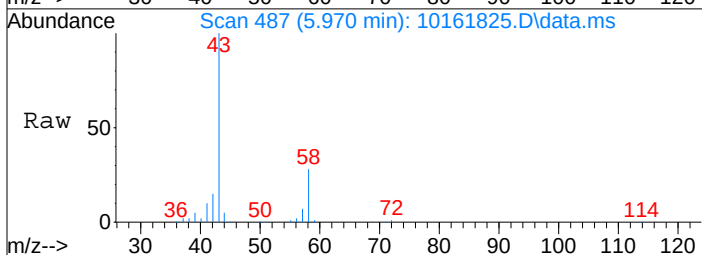
#12
Acrolein
Concen: 0.88 ng
RT: 5.82 min Scan# 457
Delta R.T. -0.021 min
Lab File: 10161825.D
Acq: 17 Oct 2018 00:15

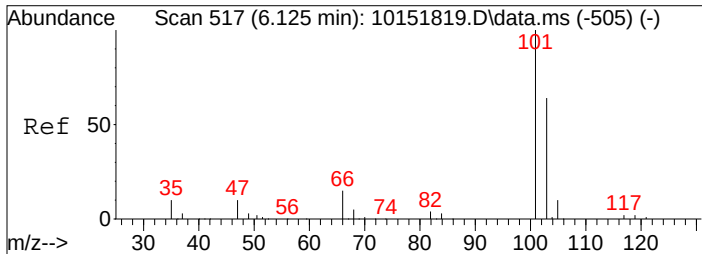
Tgt Ion	56	55	Resp	10707	Lower	Upper
Ion Ratio	100	69.3			49.3	89.3



#13
Acetone
Concen: 5.57 ng
RT: 5.97 min Scan# 487
Delta R.T. -0.020 min
Lab File: 10161825.D
Acq: 17 Oct 2018 00:15

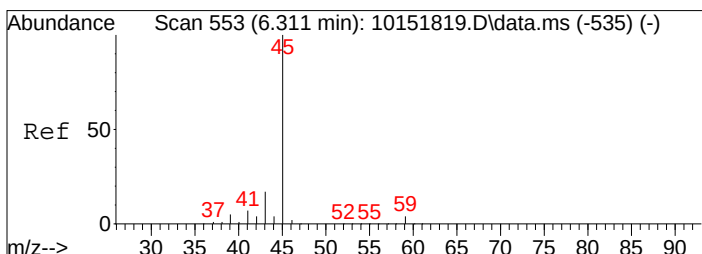
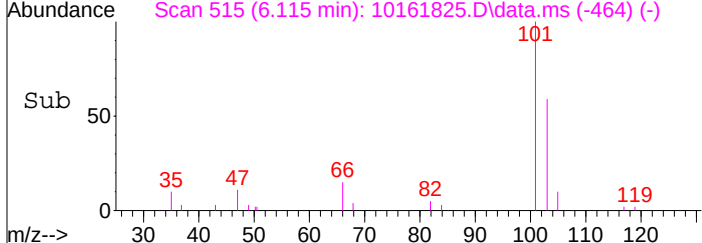
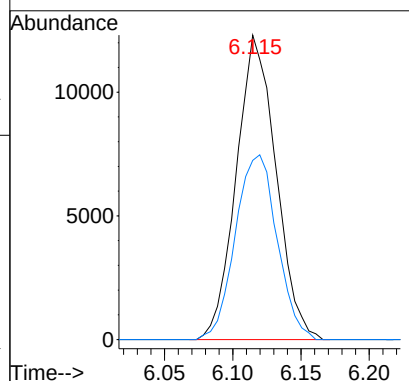
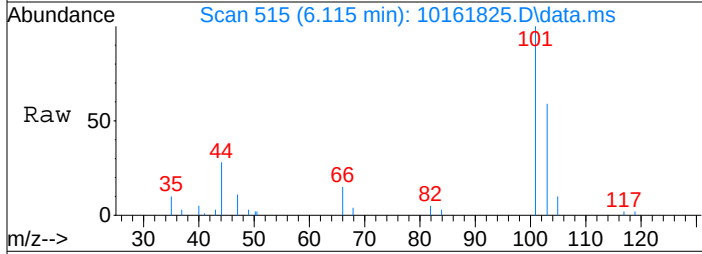
Tgt Ion	58	43	Resp	77161	Lower	Upper
Ion Ratio	100	332.4			246.0	306.0#





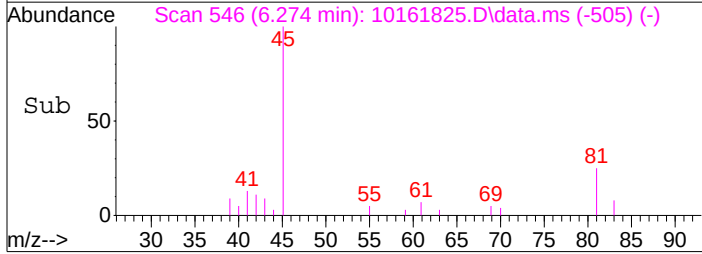
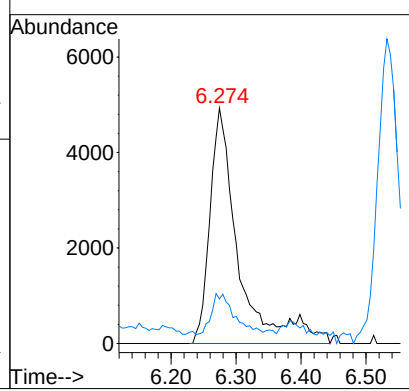
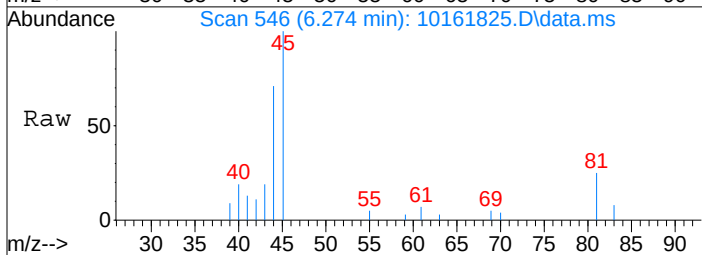
#14
 Trichlorofluoromethane
 Concen: 1.42 ng
 RT: 6.11 min Scan# 515
 Delta R.T. 0.011 min
 Lab File: 10161825.D
 Acq: 17 Oct 2018 00:15

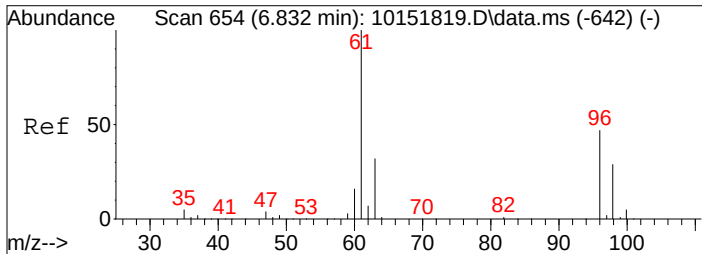
Tgt Ion: 101	Resp: 24922
Ion Ratio	Lower Upper
101	100
103	63.7 45.1 85.1



#15
 2-Propanol (Isopropanol)
 Concen: 0.27 ng
 RT: 6.27 min Scan# 546
 Delta R.T. -0.039 min
 Lab File: 10161825.D
 Acq: 17 Oct 2018 00:15

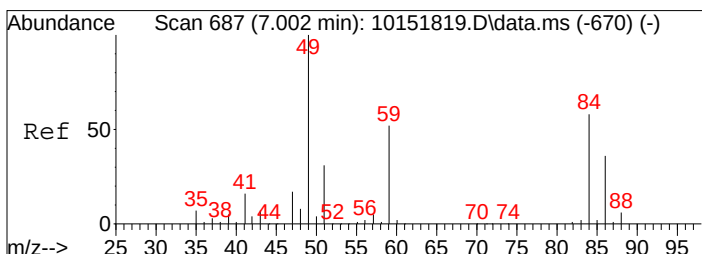
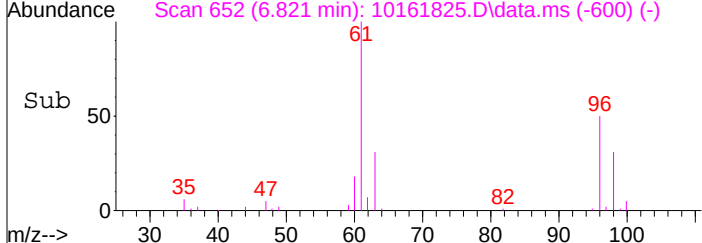
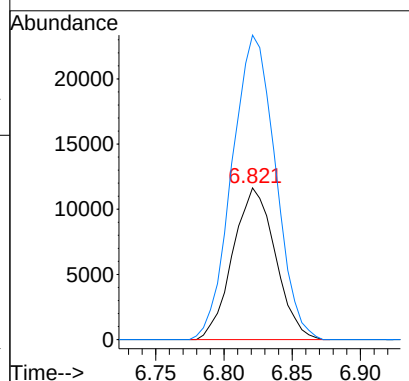
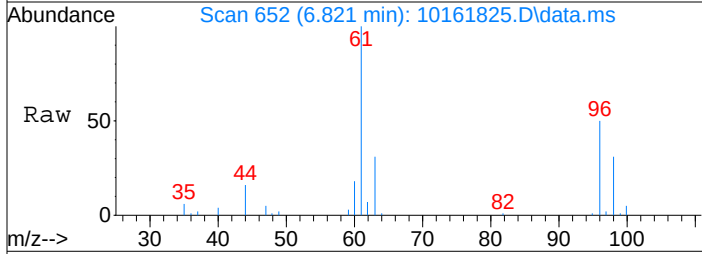
Tgt Ion: 45	Resp: 15002
Ion Ratio	Lower Upper
45	100
43	33.3 0.0 36.6





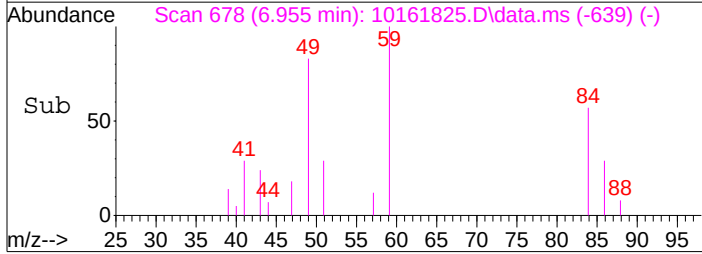
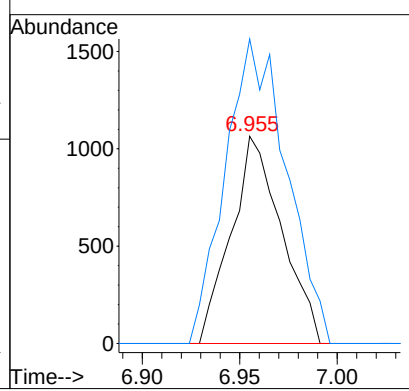
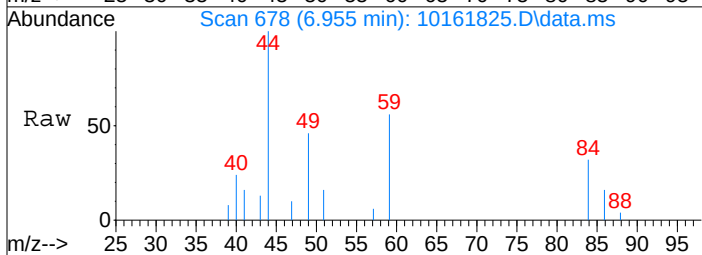
#17
1,1-Dichloroethene
Concen: 2.29 ng
RT: 6.82 min Scan# 652
Delta R.T. 0.016 min
Lab File: 10161825.D
Acq: 17 Oct 2018 00:15

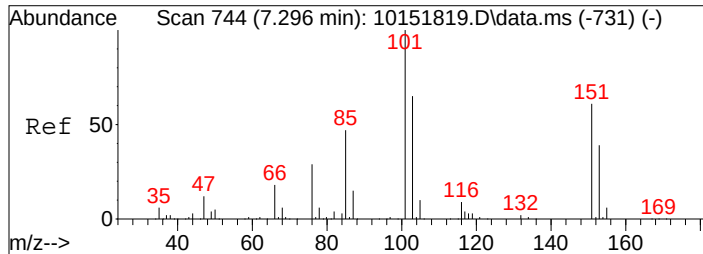
Tgt Ion: 96	Resp: 25299
Ion Ratio	Lower Upper
96	100
61	204.6 150.6 190.6#



#19
Methylene Chloride
Concen: 0.13 ng
RT: 6.96 min Scan# 678
Delta R.T. -0.050 min
Lab File: 10161825.D
Acq: 17 Oct 2018 00:15

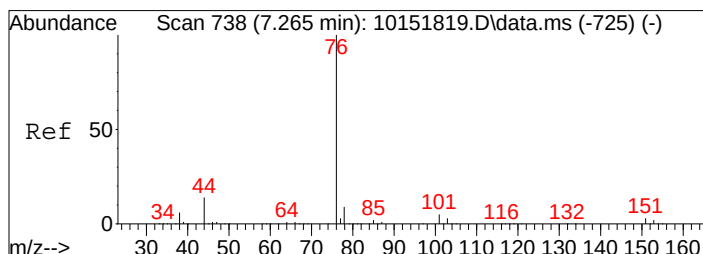
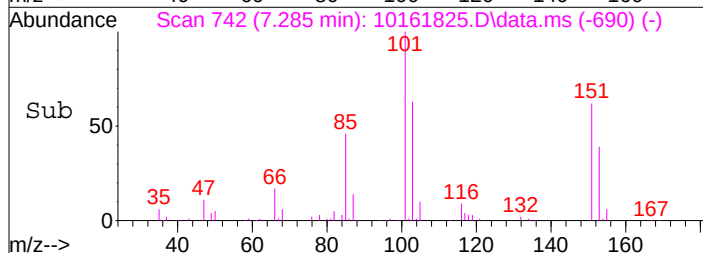
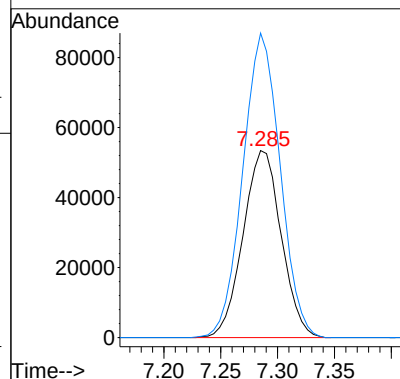
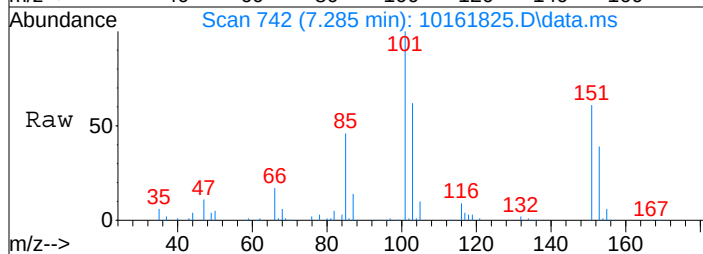
Tgt Ion: 84	Resp: 1917
Ion Ratio	Lower Upper
84	100
49	178.5 107.7 157.7#





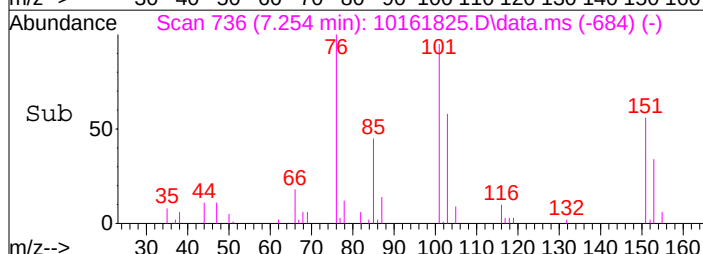
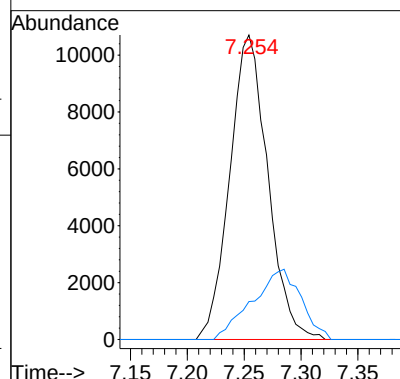
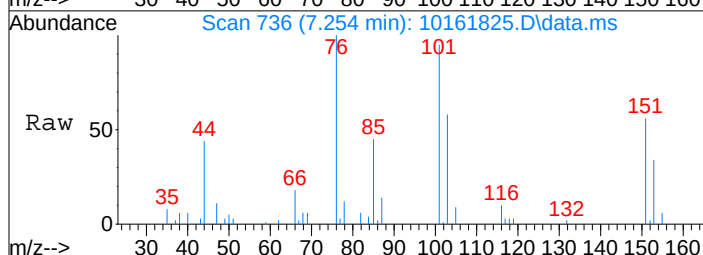
#21
Trichlorotrifluoroethane
Concen: 16.52 ng
RT: 7.29 min Scan# 742
Delta R.T. 0.019 min
Lab File: 10161825.D
Acq: 17 Oct 2018 00:15

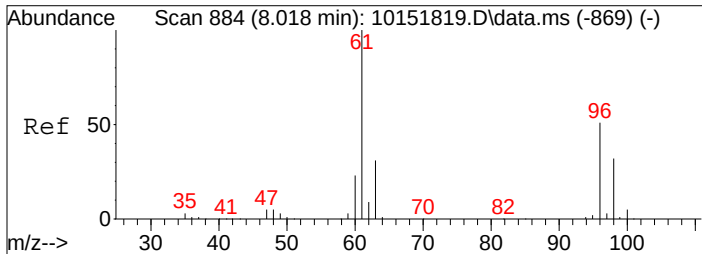
Tgt Ion: 151 Resp: 124661
Ion Ratio Lower Upper
151 100
101 159.4 122.3 162.3



#22
Carbon Disulfide
Concen: 0.49 ng
RT: 7.25 min Scan# 736
Delta R.T. 0.018 min
Lab File: 10161825.D
Acq: 17 Oct 2018 00:15

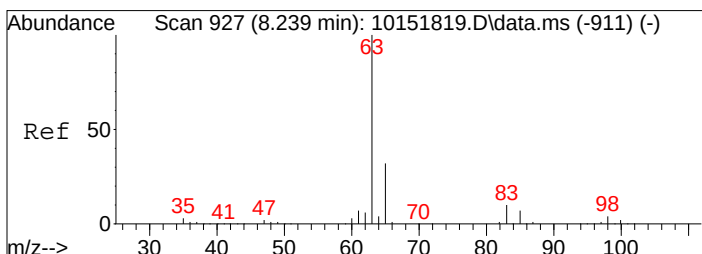
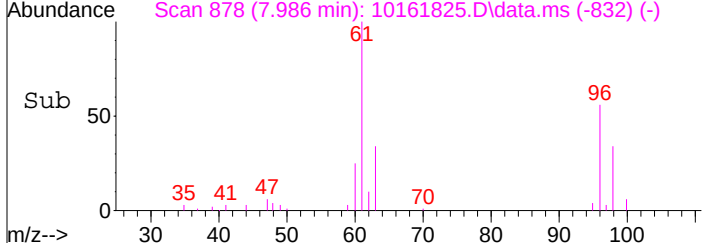
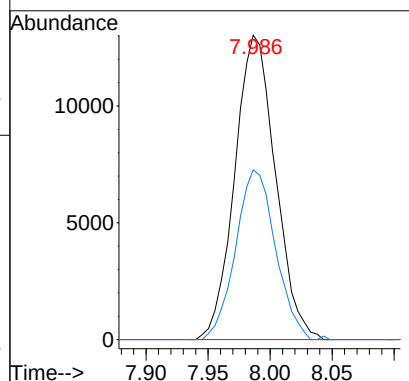
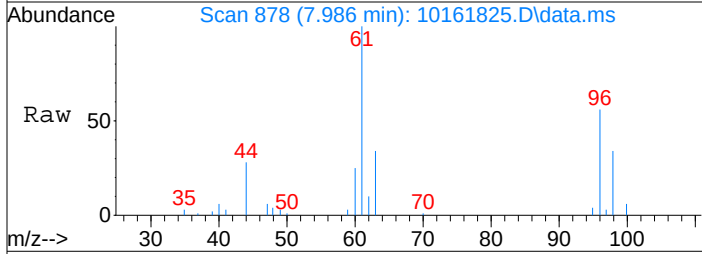
Tgt Ion: 76 Resp: 24914
Ion Ratio Lower Upper
76 100
78 29.5 0.0 29.6





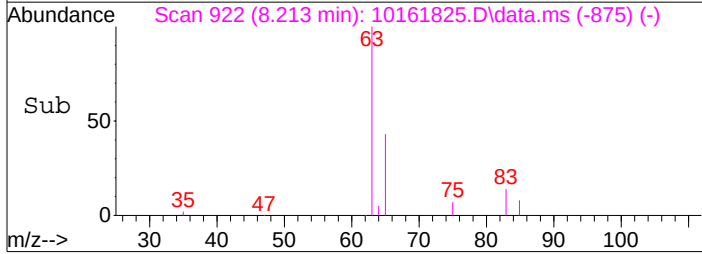
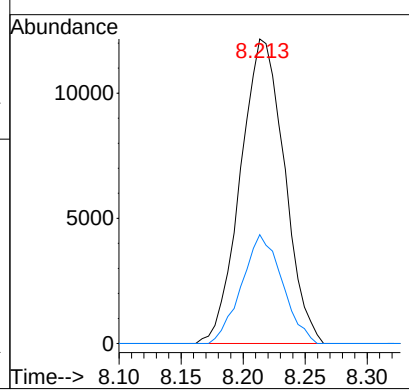
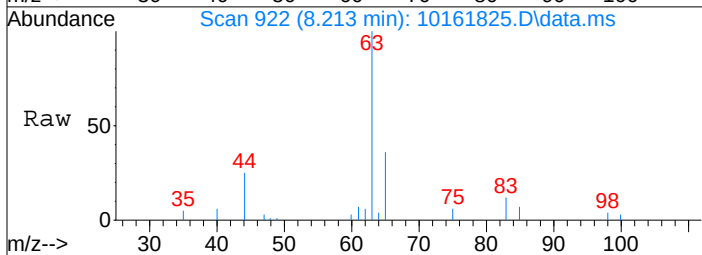
#23
trans-1,2-Dichloroethene
Concen: 1.09 ng
RT: 7.99 min Scan# 878
Delta R.T. -0.013 min
Lab File: 10161825.D
Acq: 17 Oct 2018 00:15

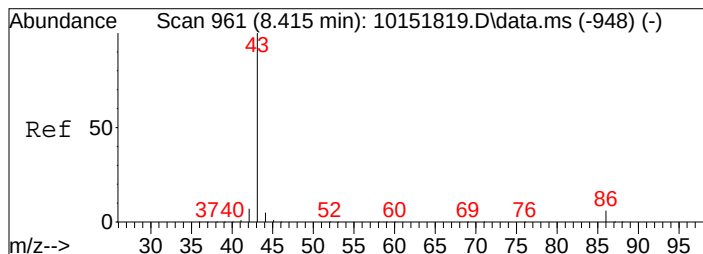
Tgt Ion:	61	Resp:	29786
Ion Ratio	Lower	Upper	
61	100		
96	54.5	43.2	83.2



#24
1,1-Dichloroethane
Concen: 0.96 ng
RT: 8.21 min Scan# 922
Delta R.T. -0.006 min
Lab File: 10161825.D
Acq: 17 Oct 2018 00:15

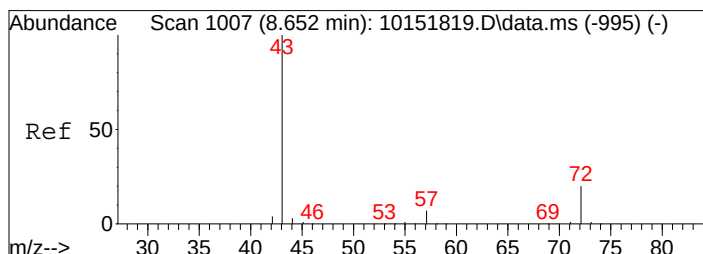
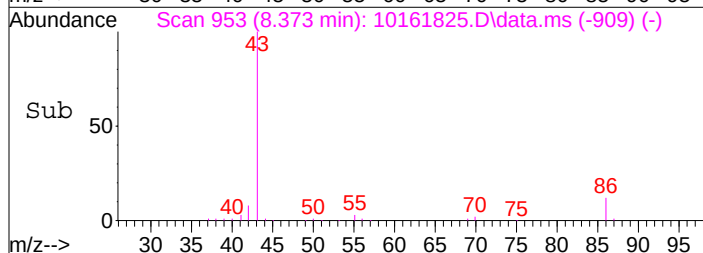
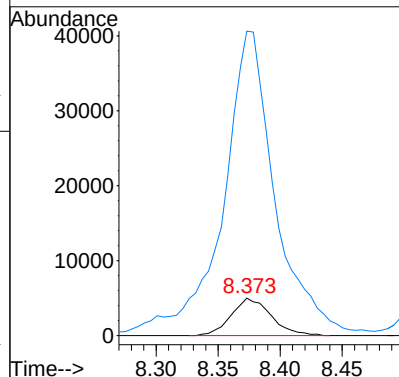
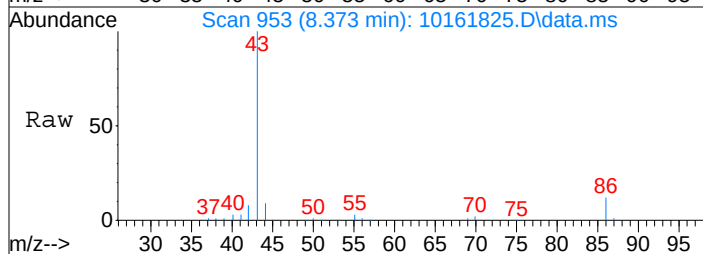
Tgt Ion:	63	Resp:	30017
Ion Ratio	Lower	Upper	
63	100		
65	33.0	12.0	52.0





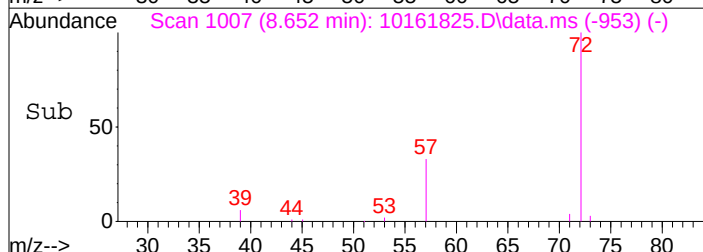
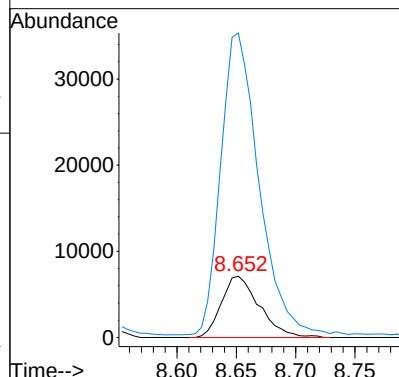
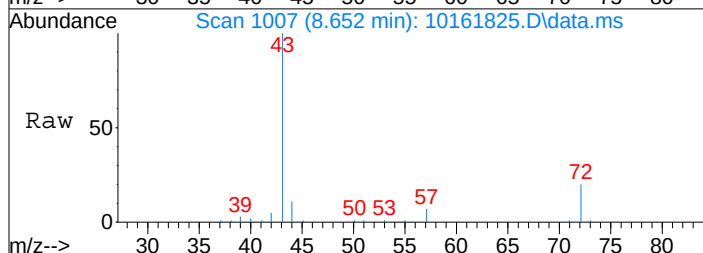
#26
 Vinyl Acetate
 Concen: 4.45 ng
 RT: 8.37 min Scan# 953
 Delta R.T. -0.021 min
 Lab File: 10161825.D
 Acq: 17 Oct 2018 00:15

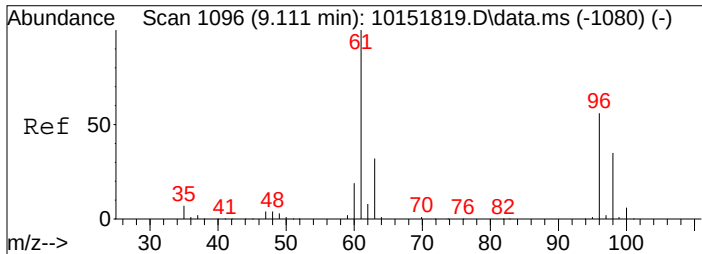
Tgt Ion: 86 Resp: 11165
 Ion Ratio Lower Upper
 86 100
 43 1065.5 1172.7 1212.7#



#27
 2-Butanone (MEK)
 Concen: 1.27 ng
 RT: 8.65 min Scan# 1007
 Delta R.T. 0.027 min
 Lab File: 10161825.D
 Acq: 17 Oct 2018 00:15

Tgt Ion: 72 Resp: 15815
 Ion Ratio Lower Upper
 72 100
 43 497.5 371.5 411.5#

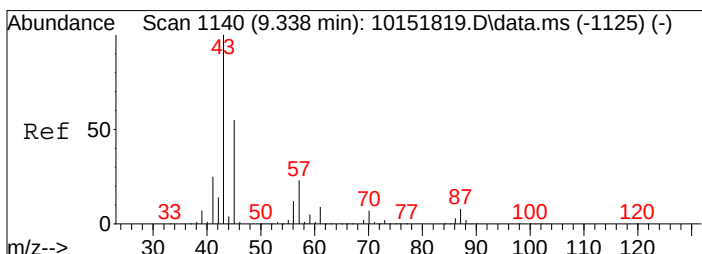
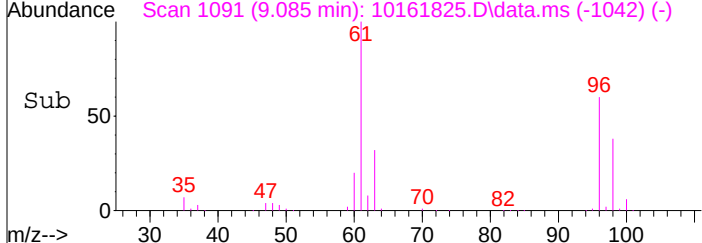
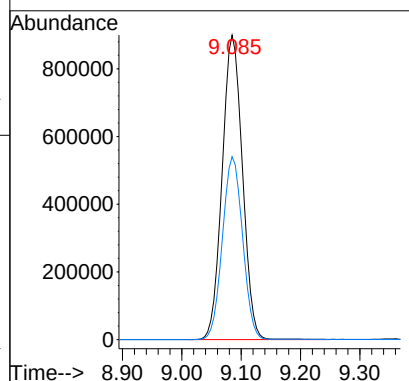
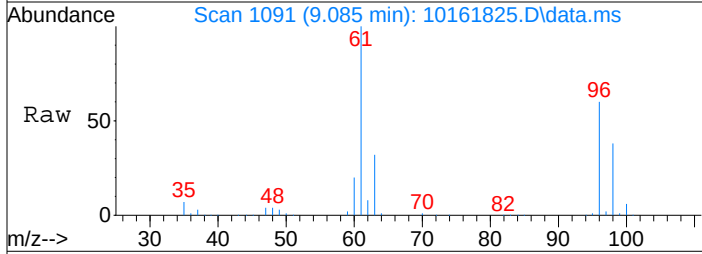




#28
 cis-1,2-Dichloroethene
 Concen: 79.49 ng
 RT: 9.08 min Scan# 1091
 Delta R.T. 0.004 min
 Lab File: 10161825.D
 Acq: 17 Oct 2018 00:15

Tgt Ion: 61 Resp: 2134250

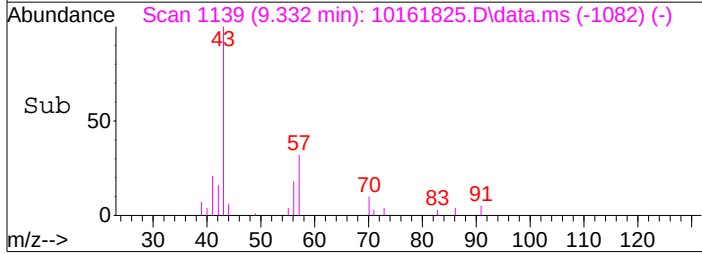
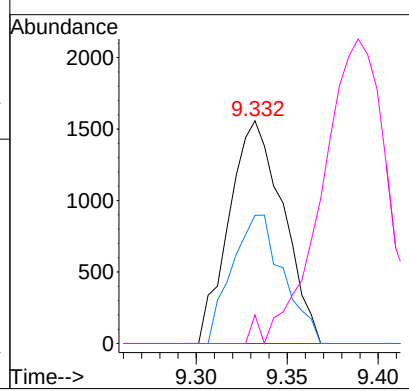
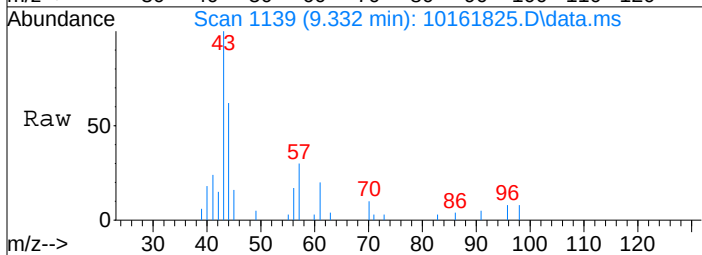
Ion	Ratio	Lower	Upper
61	100		
96	60.0	50.8	90.8

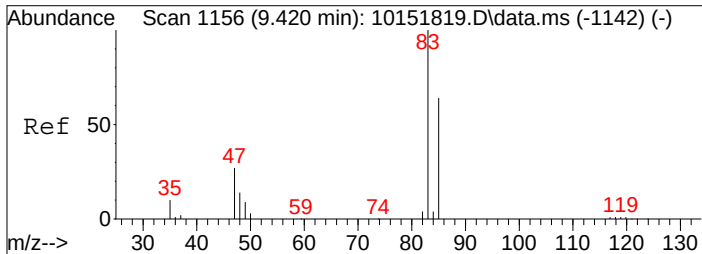


#31
 n-Hexane
 Concen: 0.10 ng
 RT: 9.33 min Scan# 1139
 Delta R.T. 0.041 min
 Lab File: 10161825.D
 Acq: 17 Oct 2018 00:15

Tgt Ion: 57 Resp: 3221

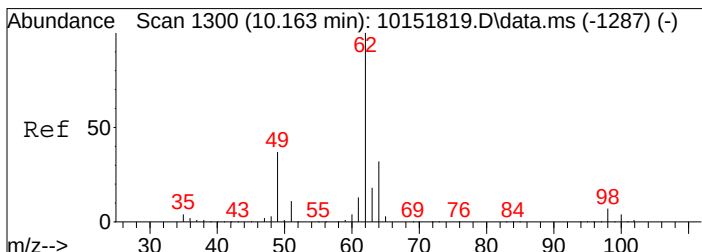
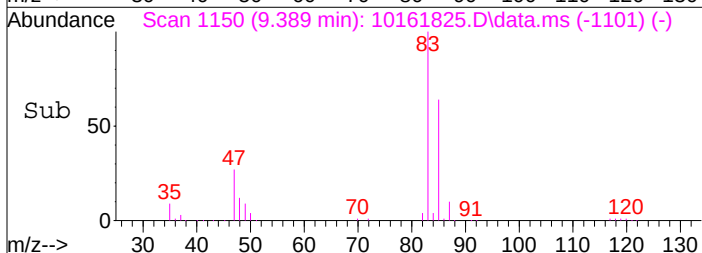
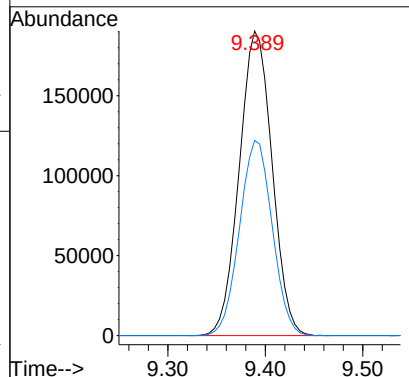
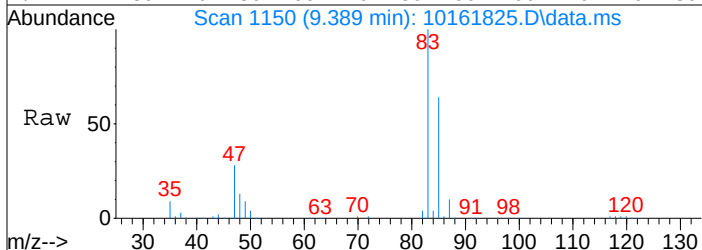
Ion	Ratio	Lower	Upper
57	100		
56	54.7	41.2	61.8
86	164.9	10.8	16.2#





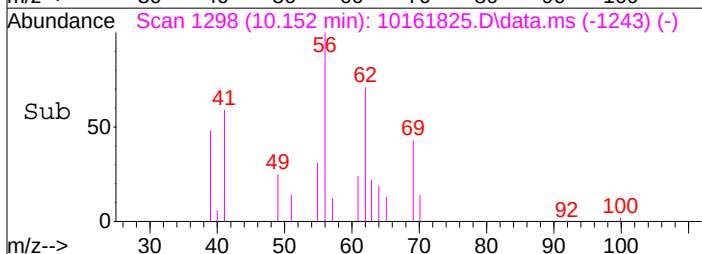
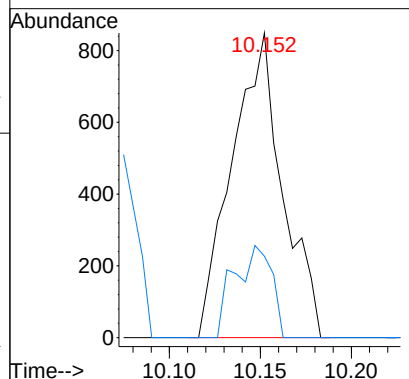
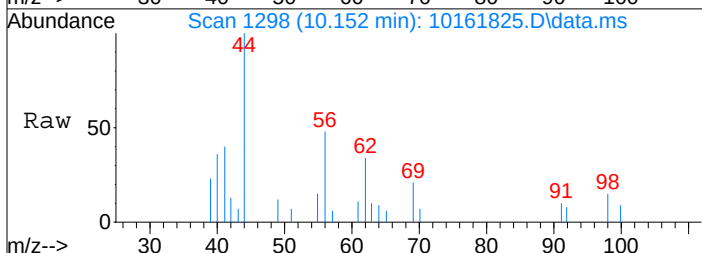
#32
 Chloroform
 Concen: 16.70 ng
 RT: 9.39 min Scan# 1150
 Delta R.T. 0.001 min
 Lab File: 10161825.D
 Acq: 17 Oct 2018 00:15

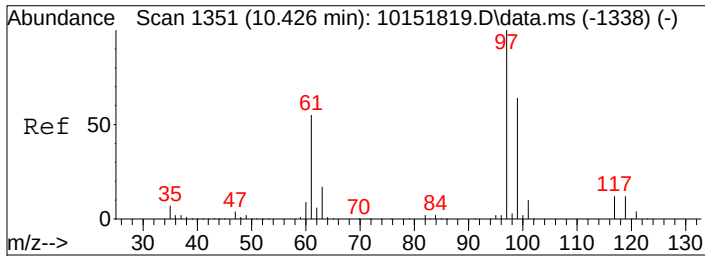
Tgt Ion	83	85	Resp	446346	Lower	Upper
Ion Ratio	100	63.8			44.5	84.5



#36
 1,2-Dichloroethane
 Concen: 0.07 ng
 RT: 10.15 min Scan# 1298
 Delta R.T. 0.036 min
 Lab File: 10161825.D
 Acq: 17 Oct 2018 00:15

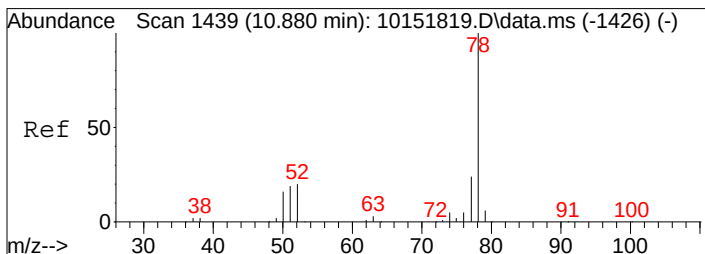
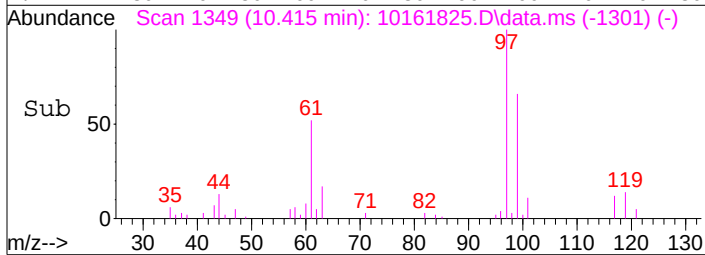
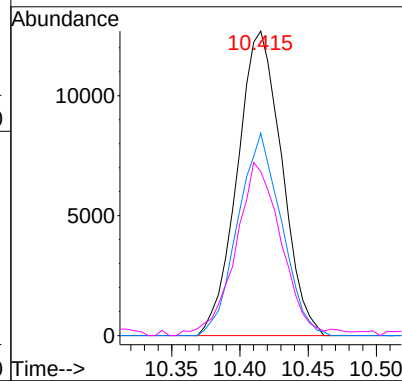
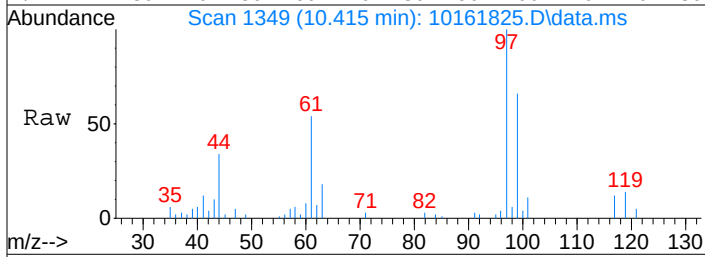
Tgt Ion	62	64	Resp	1643	Lower	Upper
Ion Ratio	100	22.3			12.7	52.7





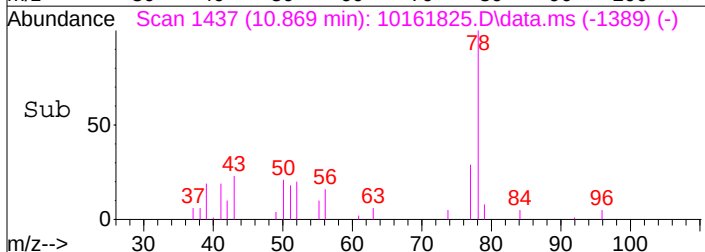
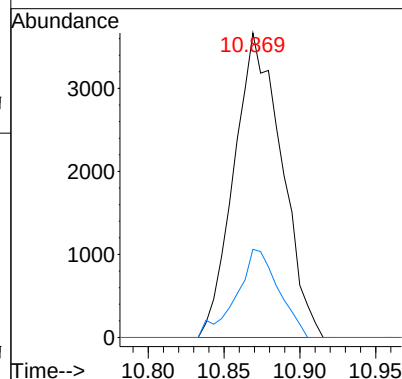
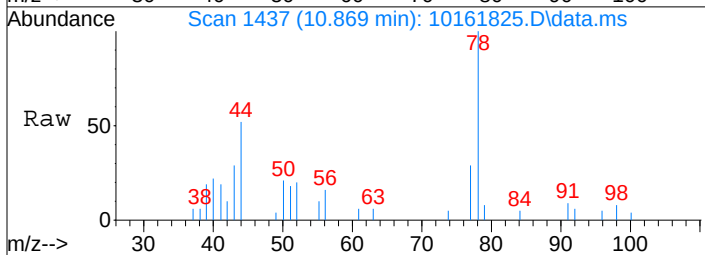
#38
1,1,1-Trichloroethane
Concen: 1.18 ng
RT: 10.42 min Scan# 1349
Delta R.T. -0.002 min
Lab File: 10161825.D
Acq: 17 Oct 2018 00:15

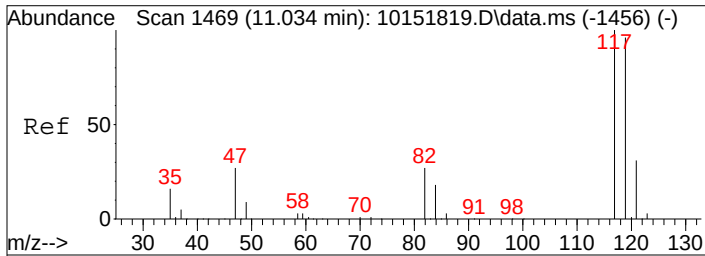
Tgt Ion: 97 Resp: 28829
Ion Ratio Lower Upper
97 100
99 65.0 44.2 84.2
61 59.4 24.9 64.9



#41
Benzene
Concen: 0.09 ng
RT: 10.87 min Scan# 1437
Delta R.T. -0.001 min
Lab File: 10161825.D
Acq: 17 Oct 2018 00:15

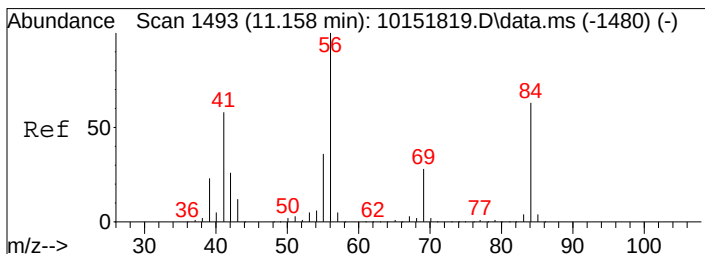
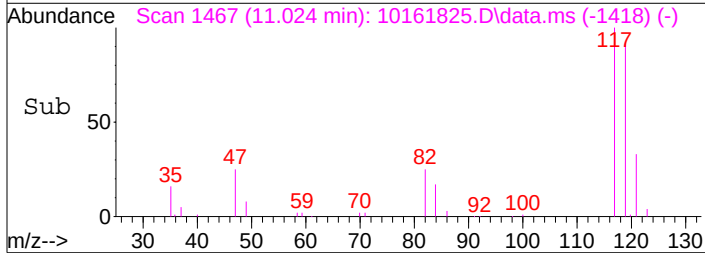
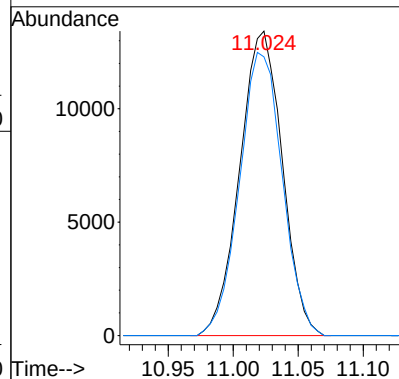
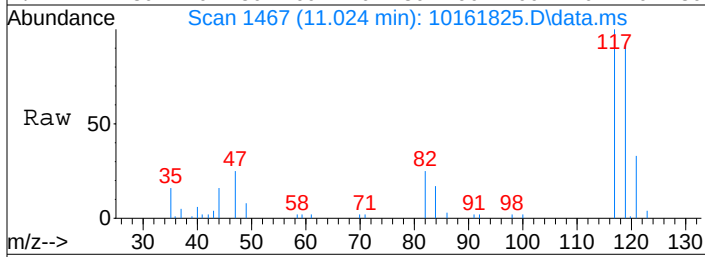
Tgt Ion: 78 Resp: 7998
Ion Ratio Lower Upper
78 100
77 25.8 3.8 43.8





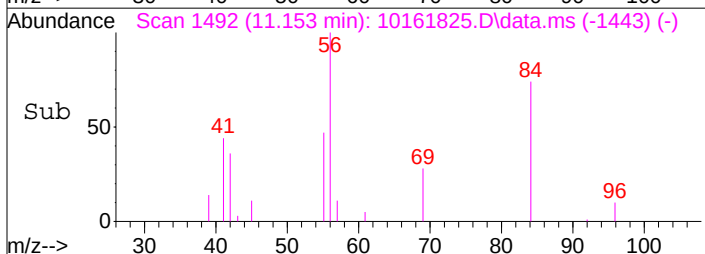
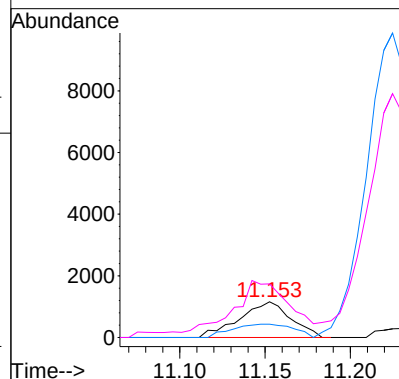
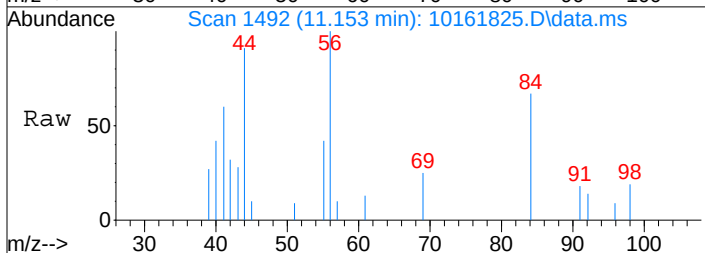
#42
Carbon Tetrachloride
Concen: 1.69 ng
RT: 11.02 min Scan# 1467
Delta R.T. 0.005 min
Lab File: 10161825.D
Acq: 17 Oct 2018 00:15

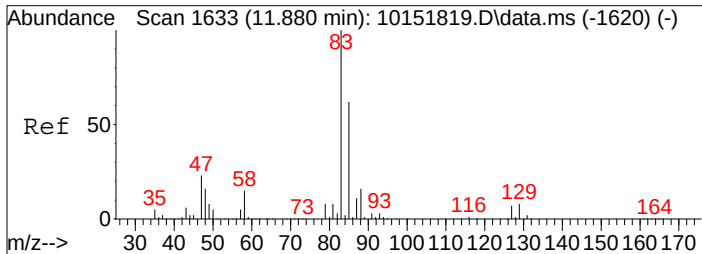
Tgt Ion: 117 Resp: 30616
Ion Ratio Lower Upper
117 100
119 93.6 76.6 116.6



#43
Cyclohexane
Concen: 0.08 ng
RT: 11.15 min Scan# 1492
Delta R.T. 0.005 min
Lab File: 10161825.D
Acq: 17 Oct 2018 00:15

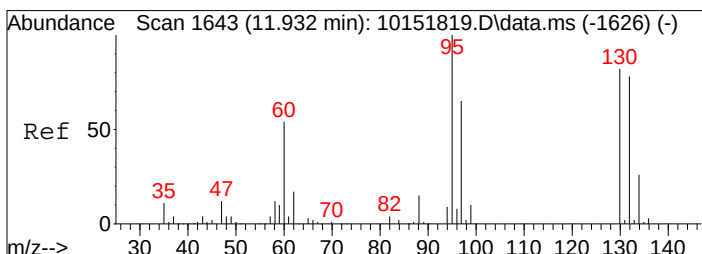
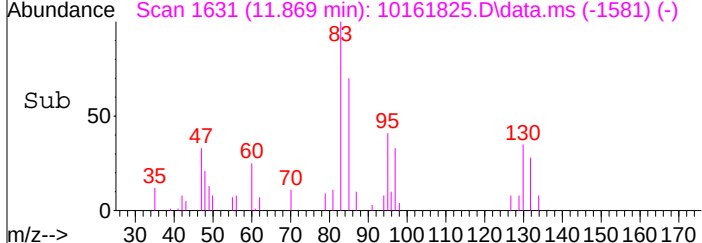
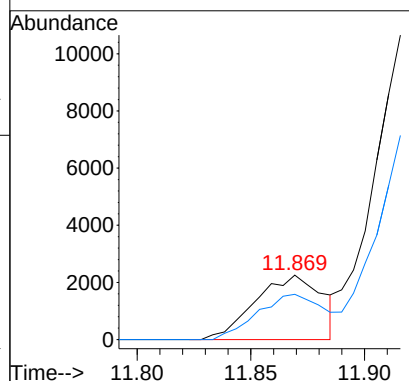
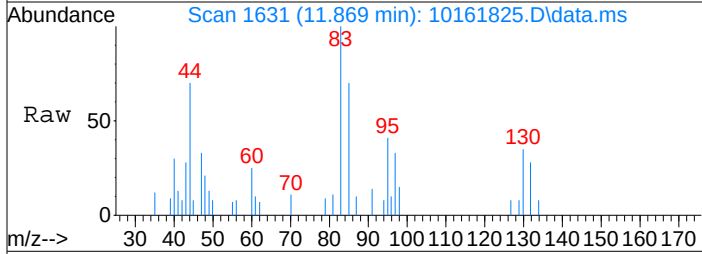
Tgt Ion: 84 Resp: 2430
Ion Ratio Lower Upper
84 100
69 44.4 19.8 59.8
56 186.0 109.3 149.3#





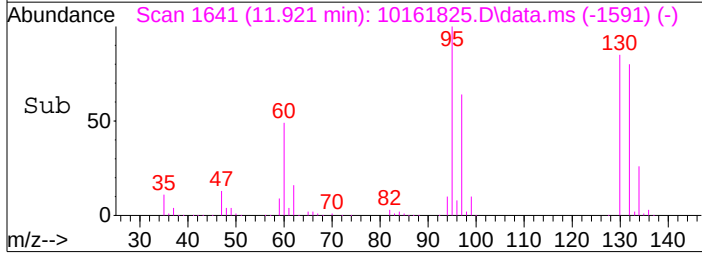
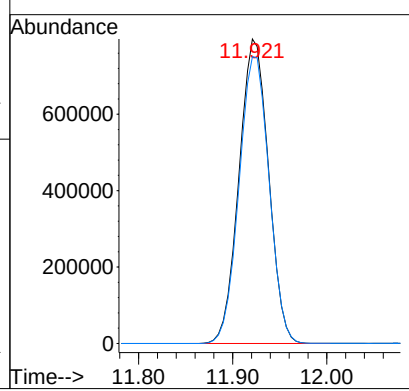
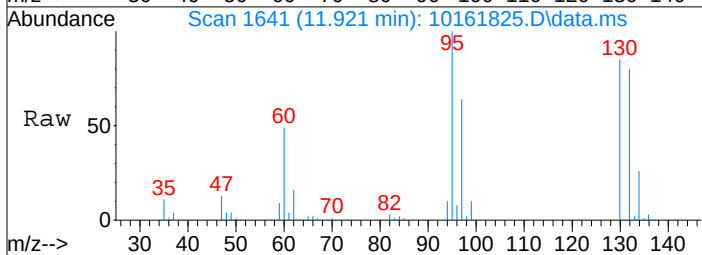
#46
 Bromodichloromethane
 Concen: 0.18 ng
 RT: 11.87 min Scan# 1631
 Delta R.T. 0.006 min
 Lab File: 10161825.D
 Acq: 17 Oct 2018 00:15

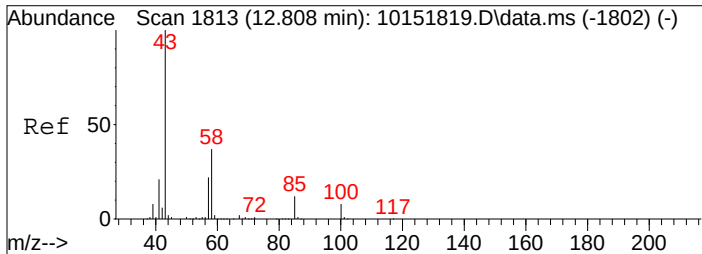
Tgt Ion:	83	Resp:	4619
Ion Ratio	Lower	Upper	
83	100		
85	67.7	43.2	83.2



#47
 Trichloroethene
 Concen: 104.08 ng
 RT: 11.92 min Scan# 1641
 Delta R.T. 0.007 min
 Lab File: 10161825.D
 Acq: 17 Oct 2018 00:15

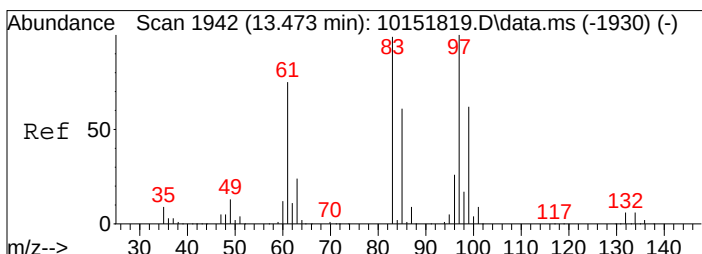
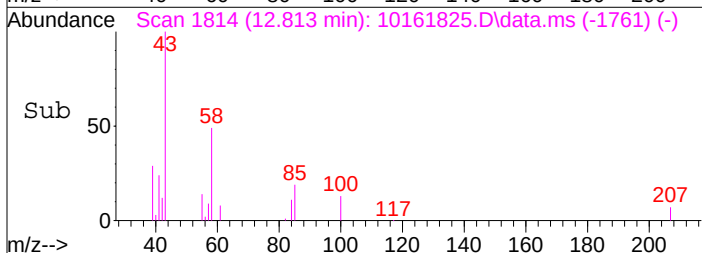
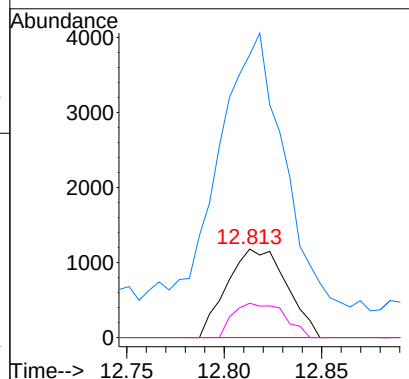
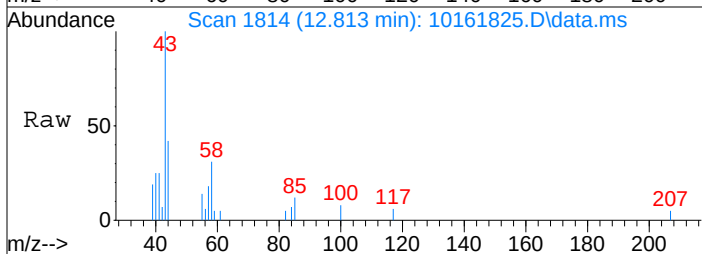
Tgt Ion:	130	Resp:	1737359
Ion Ratio	Lower	Upper	
130	100		
132	95.7	75.3	115.3





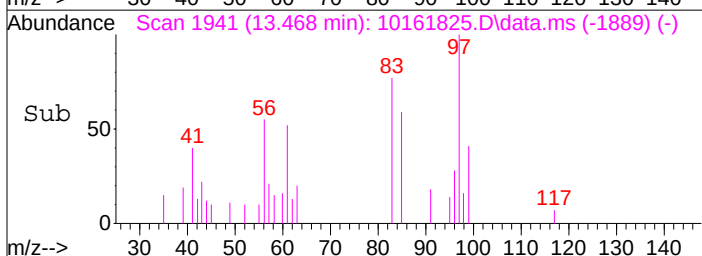
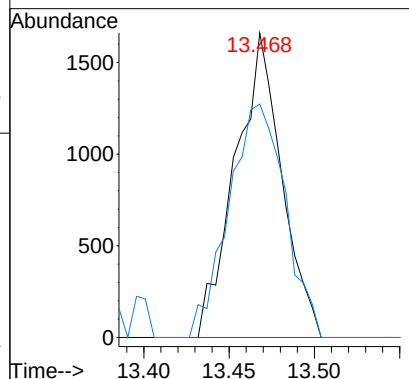
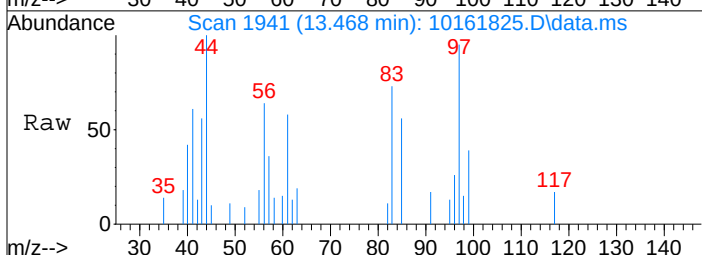
#53
 4-Methyl-2-pentanone
 Concen: 0.11 ng
 RT: 12.81 min Scan# 1814
 Delta R.T. 0.024 min
 Lab File: 10161825.D
 Acq: 17 Oct 2018 00:15

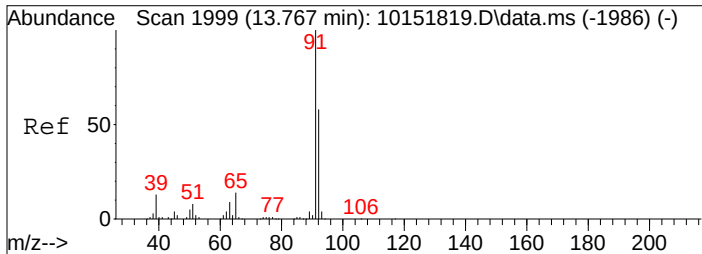
Tgt Ion: 58 Resp: 2517
 Ion Ratio Lower Upper
 58 100
 43 357.3 189.3 283.9#
 85 33.3 33.6 50.4#



#55
 1,1,2-Trichloroethane
 Concen: 0.18 ng
 RT: 13.47 min Scan# 1941
 Delta R.T. 0.020 min
 Lab File: 10161825.D
 Acq: 17 Oct 2018 00:15

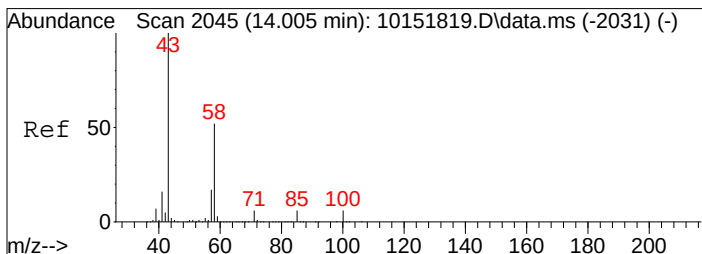
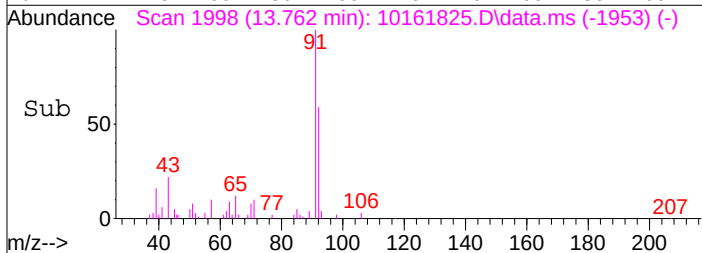
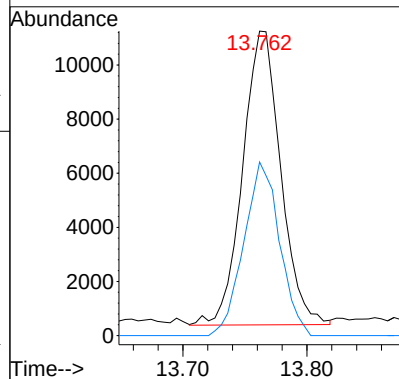
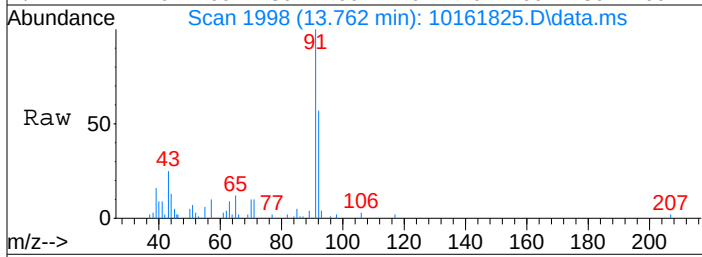
Tgt Ion: 97 Resp: 3151
 Ion Ratio Lower Upper
 97 100
 83 93.2 70.4 110.4





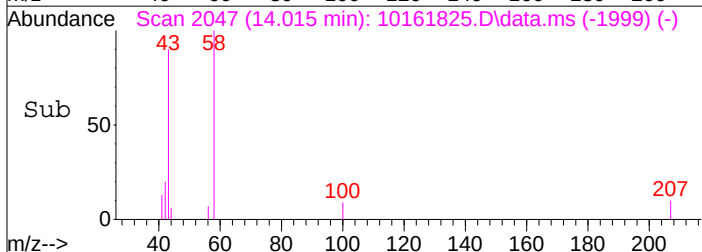
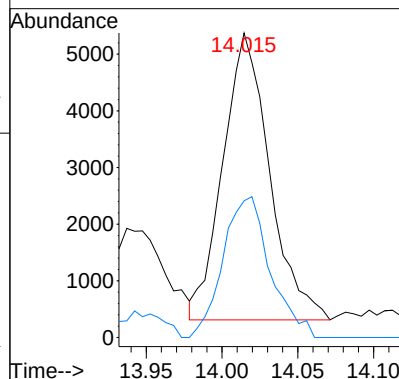
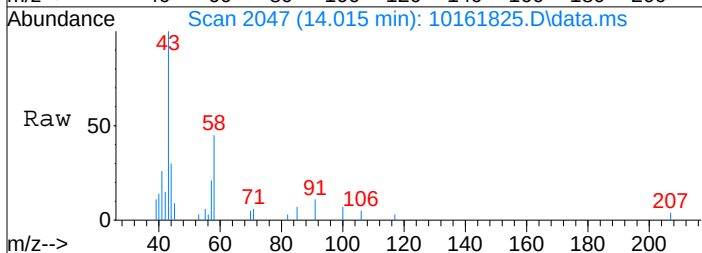
#58
Toluene
Concen: 0.31 ng
RT: 13.76 min Scan# 1998
Delta R.T. -0.016 min
Lab File: 10161825.D
Acq: 17 Oct 2018 00:15

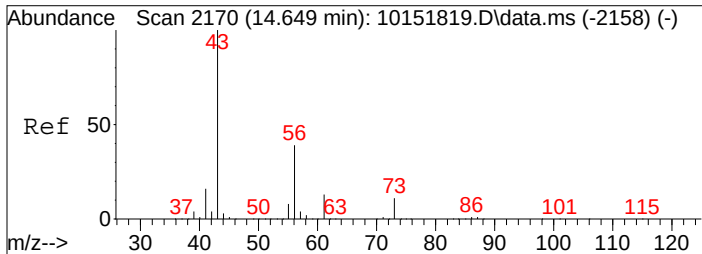
Tgt Ion: 91 Resp: 23190
Ion Ratio Lower Upper
91 100
92 55.3 38.5 78.5



#59
2-Hexanone
Concen: 0.17 ng
RT: 14.01 min Scan# 2047
Delta R.T. -0.000 min
Lab File: 10161825.D
Acq: 17 Oct 2018 00:15

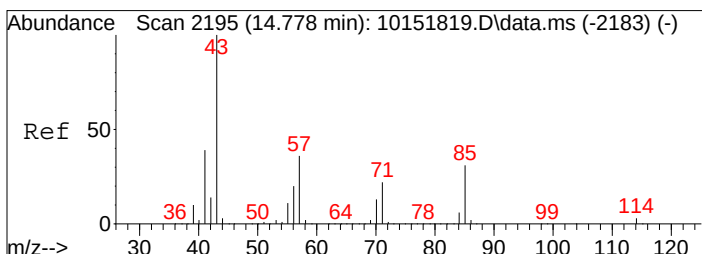
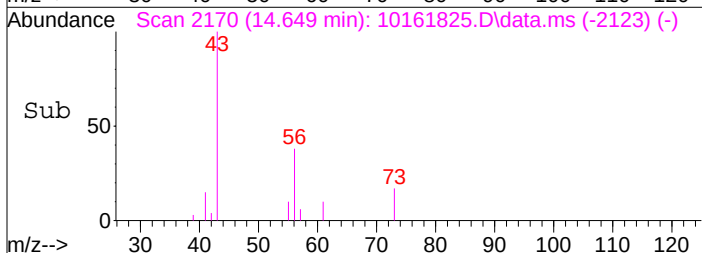
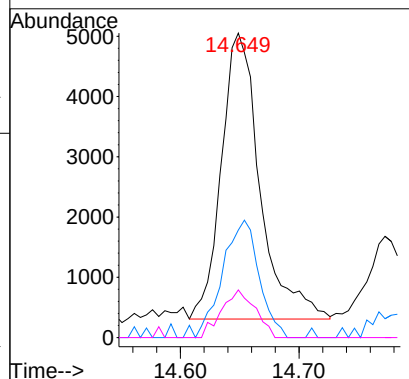
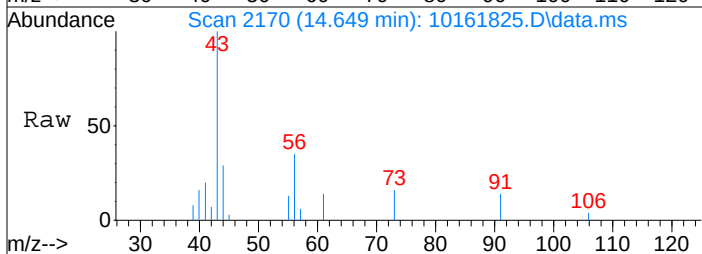
Tgt Ion: 43 Resp: 10828
Ion Ratio Lower Upper
43 100
58 49.4 39.4 79.4





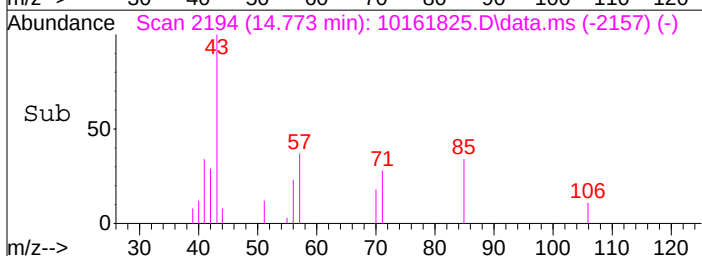
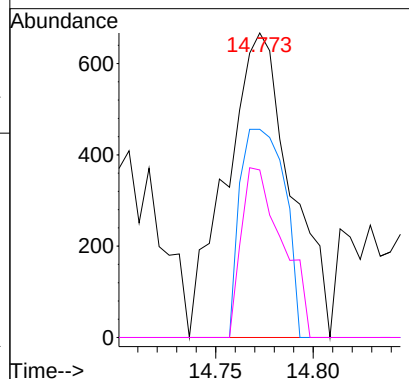
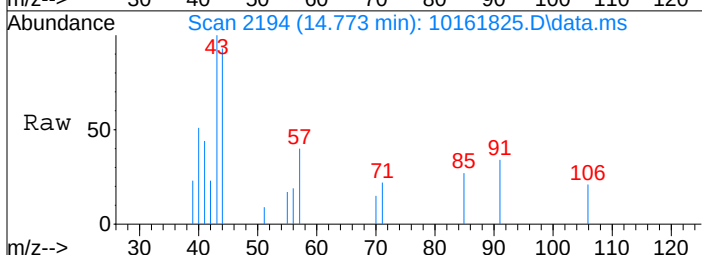
#62
n-Butyl Acetate
Concen: 0.15 ng
RT: 14.65 min Scan# 2170
Delta R.T. -0.006 min
Lab File: 10161825.D
Acq: 17 Oct 2018 00:15

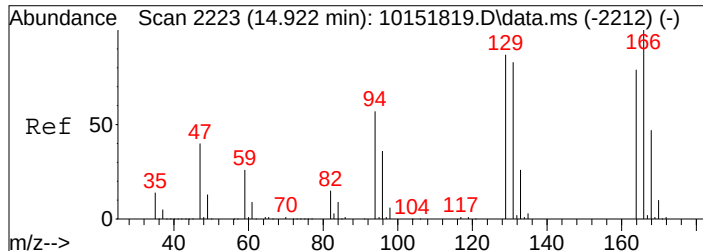
Tgt Ion: 43	Resp: 10770
Ion Ratio	Lower Upper
43	100
56	39.0 24.3 64.3
73	14.4 0.0 34.7



#63
n-Octane
Concen: 0.07 ng
RT: 14.77 min Scan# 2194
Delta R.T. -0.011 min
Lab File: 10161825.D
Acq: 17 Oct 2018 00:15

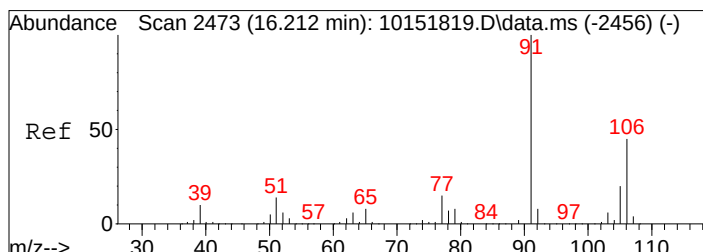
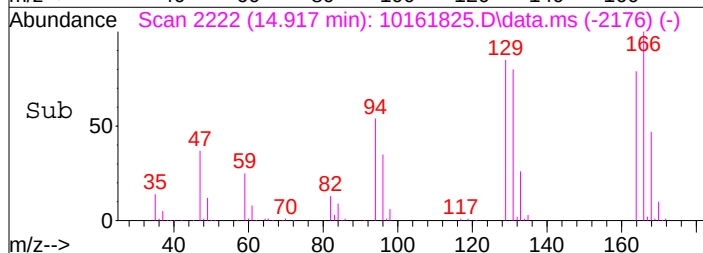
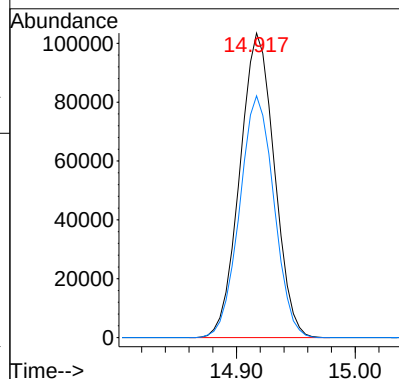
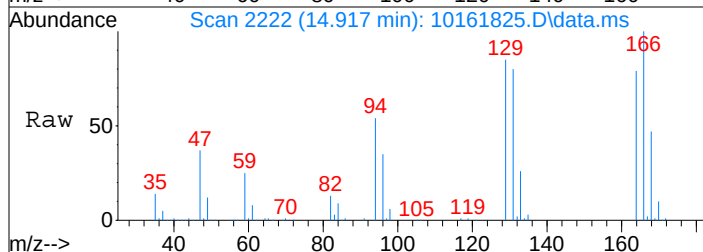
Tgt Ion: 57	Resp: 1533
Ion Ratio	Lower Upper
57	100
85	47.6 84.0 126.0#
71	35.7 53.8 80.6#





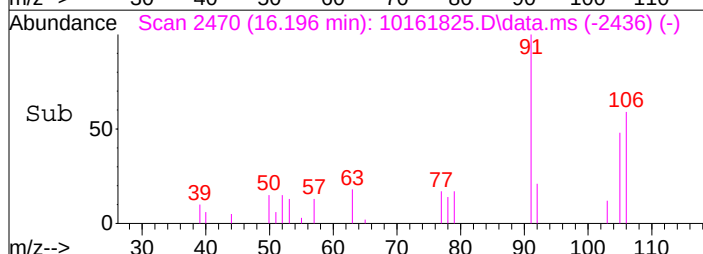
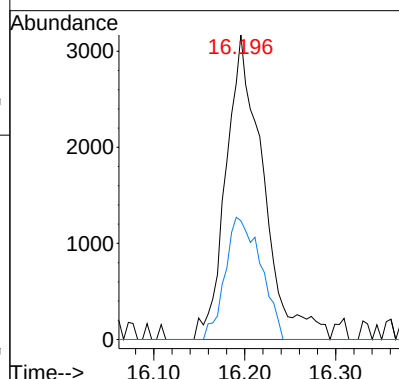
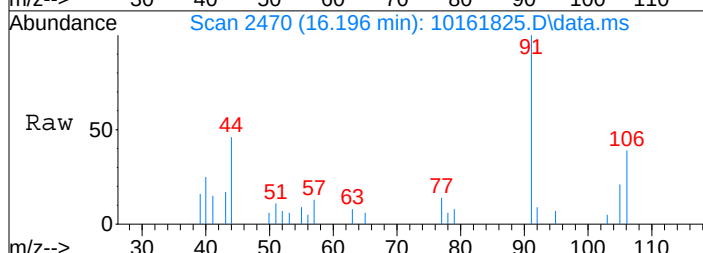
#64
Tetrachloroethene
Concen: 15.01 ng
RT: 14.92 min Scan# 2222
Delta R.T. -0.011 min
Lab File: 10161825.D
Acq: 17 Oct 2018 00:15

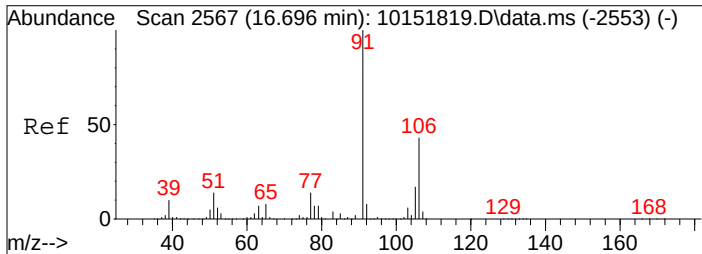
Tgt Ion: 166 Resp: 209293
Ion Ratio Lower Upper
166 100
164 78.8 59.0 99.0



#67
m- & p-Xylenes
Concen: 0.13 ng
RT: 16.20 min Scan# 2470
Delta R.T. -0.026 min
Lab File: 10161825.D
Acq: 17 Oct 2018 00:15

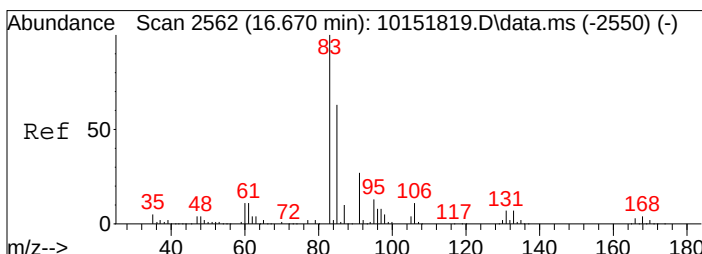
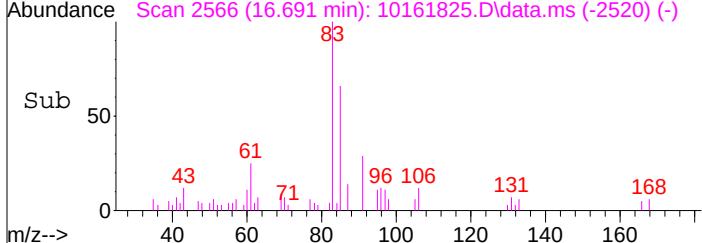
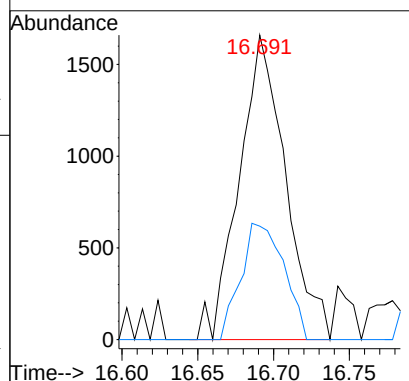
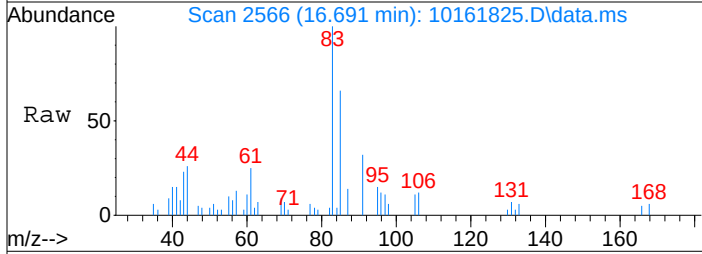
Tgt Ion: 91 Resp: 8982
Ion Ratio Lower Upper
91 100
106 38.7 28.7 68.7





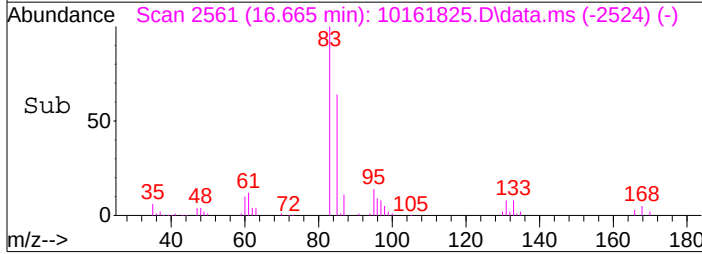
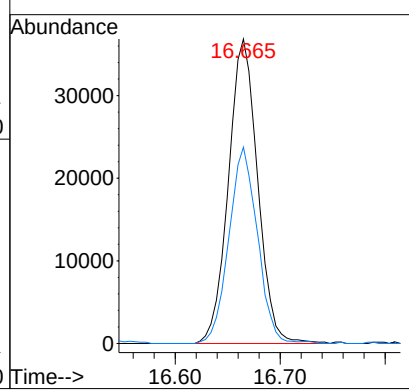
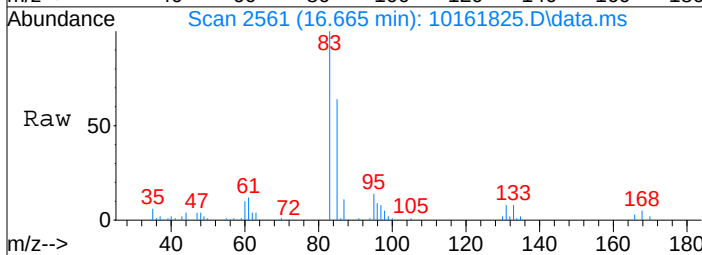
#70
o-Xylene
Concen: 0.05 ng
RT: 16.69 min Scan# 2566
Delta R.T. -0.011 min
Lab File: 10161825.D
Acq: 17 Oct 2018 00:15

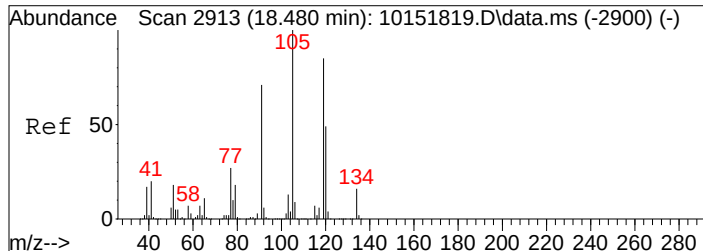
Tgt Ion:	91	Resp:	3547
Ion Ratio	Lower	Upper	
91	100		
106	35.3	26.3	66.3



#72
1,1,2,2-Tetrachloroethane
Concen: 2.15 ng
RT: 16.67 min Scan# 2561
Delta R.T. -0.011 min
Lab File: 10161825.D
Acq: 17 Oct 2018 00:15

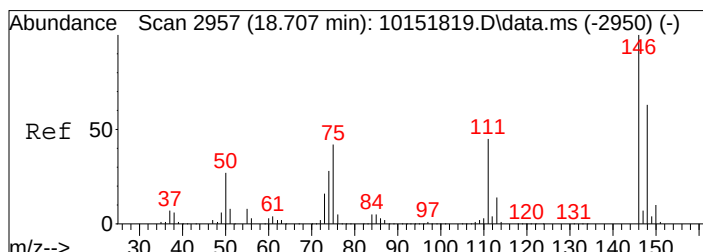
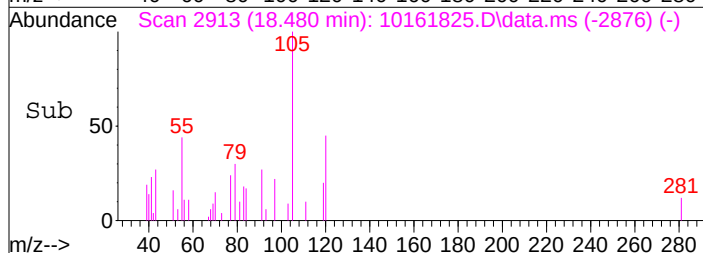
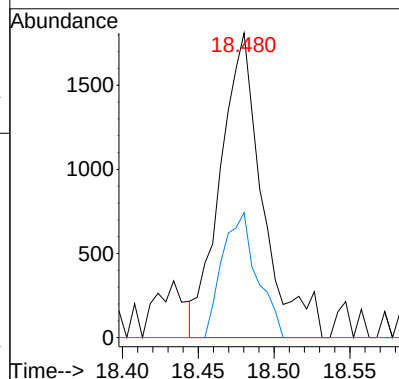
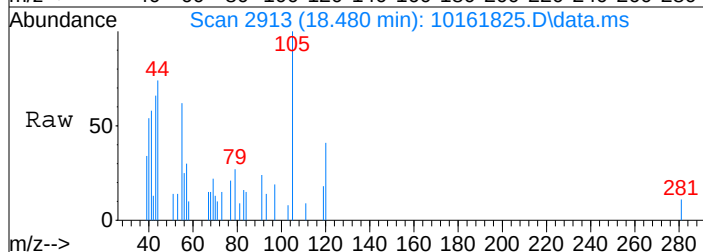
Tgt Ion:	83	Resp:	71194
Ion Ratio	Lower	Upper	
83	100		
85	63.0	44.0	84.0





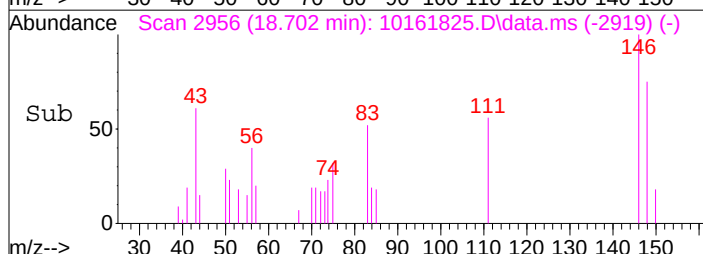
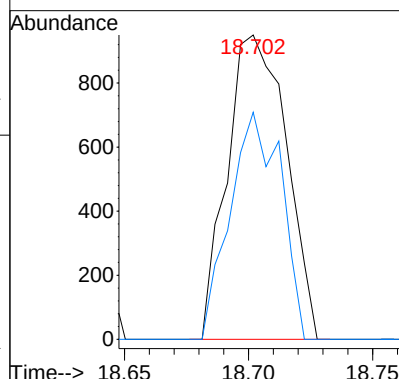
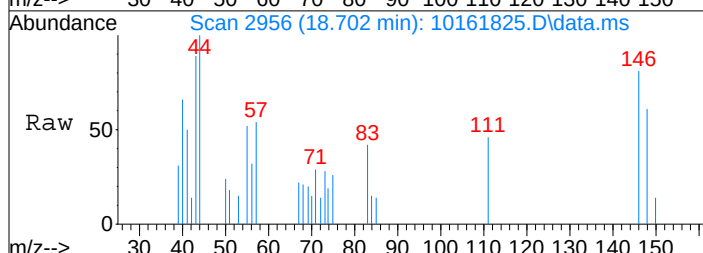
#82
1,2,4-Trimethylbenzene
Concen: 0.05 ng
RT: 18.48 min Scan# 2913
Delta R.T. -0.011 min
Lab File: 10161825.D
Acq: 17 Oct 2018 00:15

Tgt Ion:105 Resp: 3513
Ion Ratio Lower Upper
105 100
120 33.6 33.1 73.1



#86
1,4-Dichlorobenzene
Concen: 0.05 ng
RT: 18.70 min Scan# 2956
Delta R.T. -0.011 min
Lab File: 10161825.D
Acq: 17 Oct 2018 00:15

Tgt Ion:146 Resp: 1577
Ion Ratio Lower Upper
146 100
148 64.4 43.4 83.4



Data File: I:\MS09\Data\2018 10\16\10161825.D

Acq On : 17 Oct 2018 00:15

Operator: SC

Sample : P1805277-002 (1000mL)

Misc : S31-10151806

ALS Vial : 12 Sample Multiplier: 1

Quant Time: Oct 17 09:57:40 2018

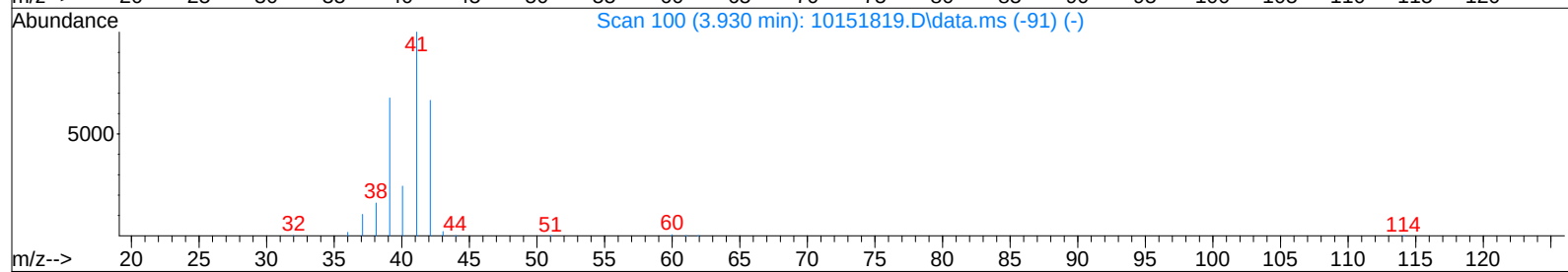
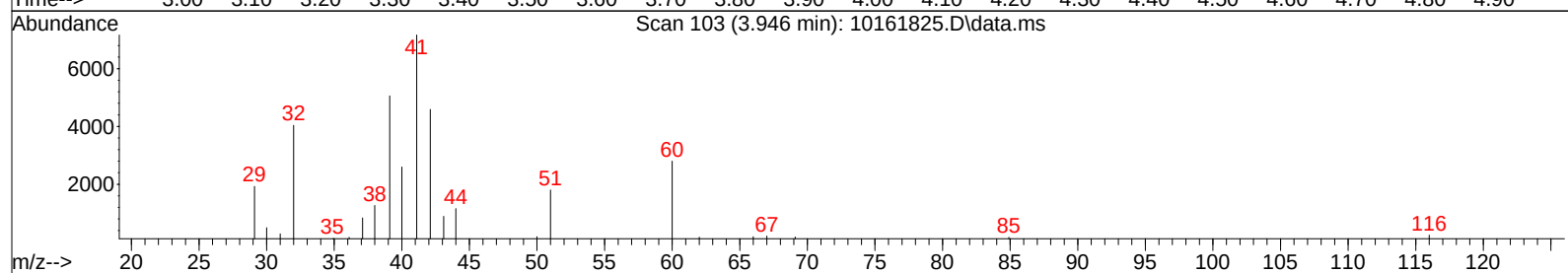
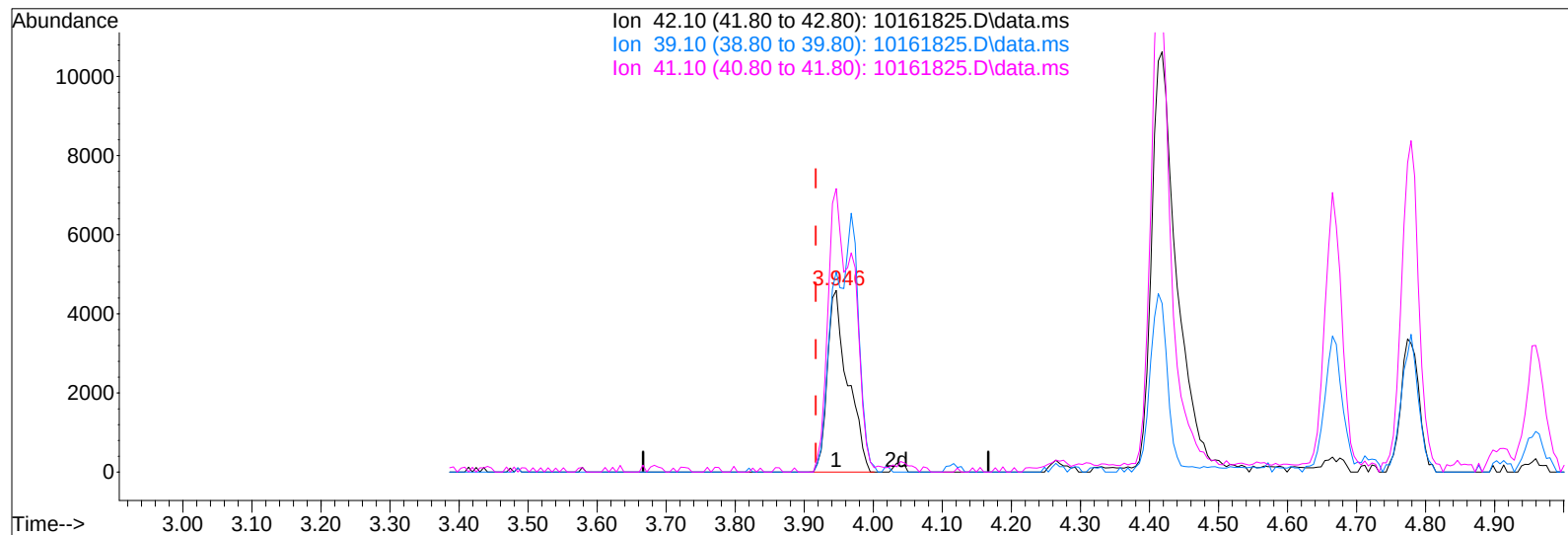
Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Wed Oct 17 09:09:32 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 10161825.D\data.ms

(2) Propene (T)

3.946min (+0.029) 0.38ng

response 9430

Ion	Exp%	Act%
42.10	100	100
39.10	98.40	171.62#
41.10	147.90	193.57#
0.00	0.00	0.00

Data File: I:\MS09\Data\2018 10\16\10161825.D

Acq On : 17 Oct 2018 00:15

Operator: SC

Sample : P1805277-002 (1000mL)

Misc : S31-10151806

ALS Vial : 12 Sample Multiplier: 1

Quant Time: Oct 17 09:57:40 2018

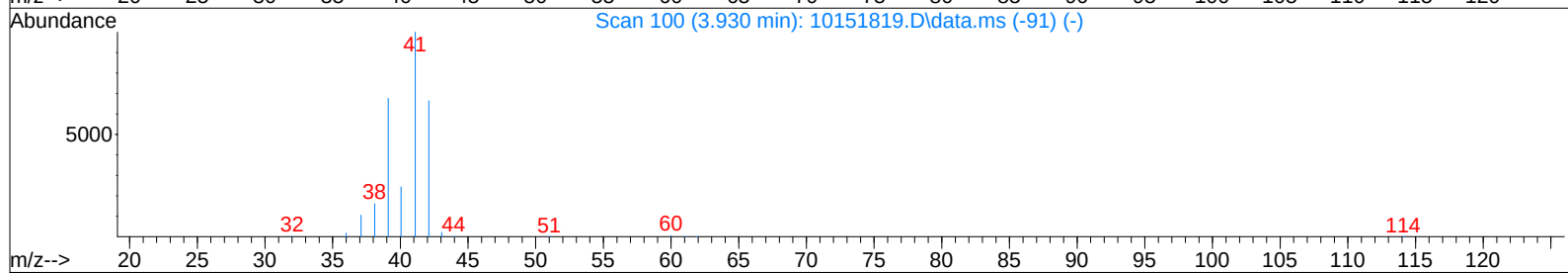
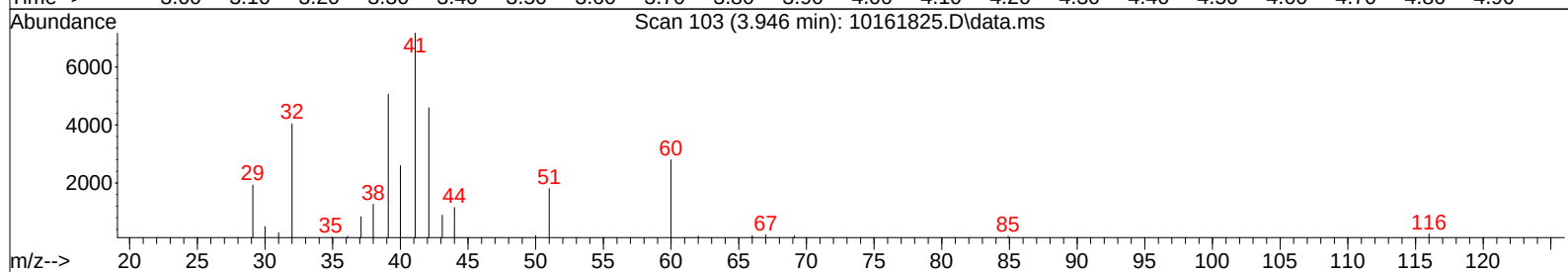
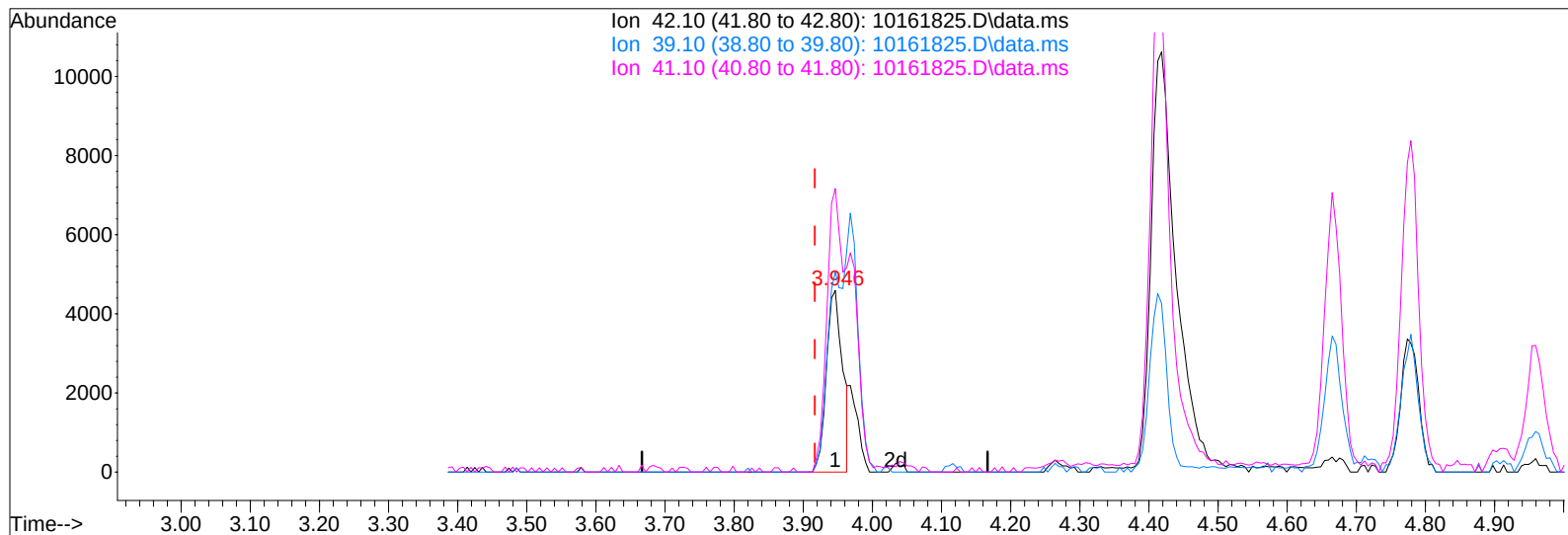
Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Wed Oct 17 09:09:32 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 10161825.D\data.ms

(2) Propene (T)

3.946min (+0.029) 0.30ng m

response 7431

IPC

Ion	Exp%	Act%
42.10	100	100
39.10	98.40	217.79#
41.10	147.90	245.65#
0.00	0.00	0.00

10/17/18

10/17/18

Data File: I:\MS09\Data\2018 10\16\10161804.D

Acq On : 16 Oct 2018 11:19

Operator: SC

Sample : MB R9101618 1000mL

Misc : S31-10151806 AC00463

 10/16/18

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 16 11:48:21 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 09:06:20 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.24	130	97668	12.500	ng	-0.06
37) 1,4-Difluorobenzene (IS2)	11.22	114	639294	12.500	ng	-0.03
56) Chlorobenzene-d5 (IS3)	15.57	82	389722	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	10.03	65	270508	13.425	ng	-0.05
Spiked Amount	12.500	Range	70 - 130	Recovery	=	107.44%
57) Toluene-d8 (SS2)	13.66	98	837156	12.434	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.44%
73) Bromofluorobenzene (SS3)	17.15	174	167386	12.148	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.20%

Target Compounds

						Qvalue
2) Propene	3.96	42	1963	0.078	ng	94
3) Dichlorodifluoromethan...	0.00	85	0	N.D.	d	
4) Chloromethane	0.00	50	0	N.D.	d	
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.		
6) Vinyl Chloride	4.56	62	456	0.019	ng	# 43
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	5.04	94	358	0.041	ng	96
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	5.45	45	8331m	0.481	ng	
11) Acetonitrile	5.67	41	3962	0.085	ng	81
12) Acrolein	5.82	56	2582	0.207	ng	# 46
13) Acetone	5.98	58	8046	0.567	ng	# 78
14) Trichlorofluoromethane	0.00	101	0	N.D.		
15) 2-Propanol (Isopropanol)	6.30	45	2388	0.041	ng	# 50
16) Acrylonitrile	6.48	53	804	0.028	ng	95
17) 1,1-Dichloroethene	0.00	96	0	N.D.		
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.	d	
19) Methylene Chloride	6.97	84	232	0.016	ng	# 10
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.	d	
21) Trichlorotrifluoroethane	0.00	151	0	N.D.		
22) Carbon Disulfide	0.00	76	0	N.D.	d	
23) trans-1,2-Dichloroethene	7.99	61	503	0.018	ng	# 57
24) 1,1-Dichloroethane	0.00	63	0	N.D.		
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.		
26) Vinyl Acetate	8.37	86	472	0.184	ng	# 34
27) 2-Butanone (MEK)	8.67	72	639	0.050	ng	# 1
28) cis-1,2-Dichloroethene	0.00	61	0	N.D.	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.	d	
32) Chloroform	0.00	83	0	N.D.	d	
34) Tetrahydrofuran (THF)	0.00	72	0	N.D.	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	0.00	97	0	N.D.		
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	10.82	56	7412	0.282	ng	# 72
41) Benzene	10.86	78	1897	0.022	ng	69
42) Carbon Tetrachloride	0.00	117	0	N.D.		
43) Cyclohexane	11.15	84	551	0.018	ng	# 21
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.	d	
47) Trichloroethene	11.91	130	139	0.008	ng	80
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	11.98	57	1276	0.012	ng	# 62

Data File: I:\MS09\Data\2018 10\16\10161804.D

Acq On : 16 Oct 2018 11:19

Operator: SC

Sample : MB R9101618 1000mL

Misc : S31-10151806 AC00463

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 16 11:48:21 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 09:06:20 2018

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.	d	
52) cis-1,3-Dichloropropene	12.77	75	247	0.007	ng	83
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	13.30	75	383	0.013	ng	73
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	13.77	91	2858	0.038	ng	# 70
59) 2-Hexanone	14.03	43	2509	0.040	ng	81
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	14.65	43	2932	0.042	ng	86
63) n-Octane	14.77	57	438	0.019	ng	# 26
64) Tetrachloroethene	14.92	166	1382	0.098	ng	99
65) Chlorobenzene	15.61	112	1046	0.023	ng	# 43
66) Ethylbenzene	0.00	91	0	N.D.	d	
67) m- & p-Xylenes	0.00	91	0	N.D.	d	
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	16.58	104	1152	0.024	ng	# 62
70) o-Xylene	0.00	91	0	N.D.	d	
71) n-Nonane	16.91	43	680	0.011	ng	# 76
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.		
74) Cumene	0.00	105	0	N.D.	d	
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	0.00	91	0	N.D.	d	
77) 3-Ethyltoluene	0.00	105	0	N.D.	d	
78) 4-Ethyltoluene	0.00	105	0	N.D.	d	
79) 1,3,5-Trimethylbenzene	0.00	105	0	N.D.	d	
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	0.00	105	0	N.D.	d	
83) n-Decane	0.00	58	0	N.D.	d	
84) Benzyl Chloride	0.00	91	0	N.D.	d	
85) 1,3-Dichlorobenzene	18.64	146	1713	0.055	ng	96
86) 1,4-Dichlorobenzene	18.70	146	2194	0.069	ng	96
87) sec-Butylbenzene	0.00	105	0	N.D.	d	
88) 4-Isopropyltoluene (p-...	0.00	119	0	N.D.	d	
89) 1,2,3-Trimethylbenzene	18.92	105	852	0.013	ng	73
90) 1,2-Dichlorobenzene	19.06	146	908	0.032	ng	94
91) d-Limonene	0.00	68	0	N.D.		
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.	d	
93) n-Undecane	19.91	57	765	0.013	ng	85
94) 1,2,4-Trichlorobenzene	20.86	180	1637	0.107	ng	# 88
95) Naphthalene	20.98	128	7551	0.138	ng	97
96) n-Dodecane	21.00	57	2445	0.045	ng	82
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	16.37	55	3322	0.084	ng	# 86
99) tert-Butylbenzene	0.00	119	0	N.D.	d	
100) n-Butylbenzene	19.36	91	1894	0.024	ng	# 76

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

Data File: I:\MS09\Data\2018 10\16\10161804.D

Acq On : 16 Oct 2018 11:19

Operator: SC

Sample : MB R9101618 1000mL

Misc : S31-10151806 AC00463

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 16 11:48:21 2018

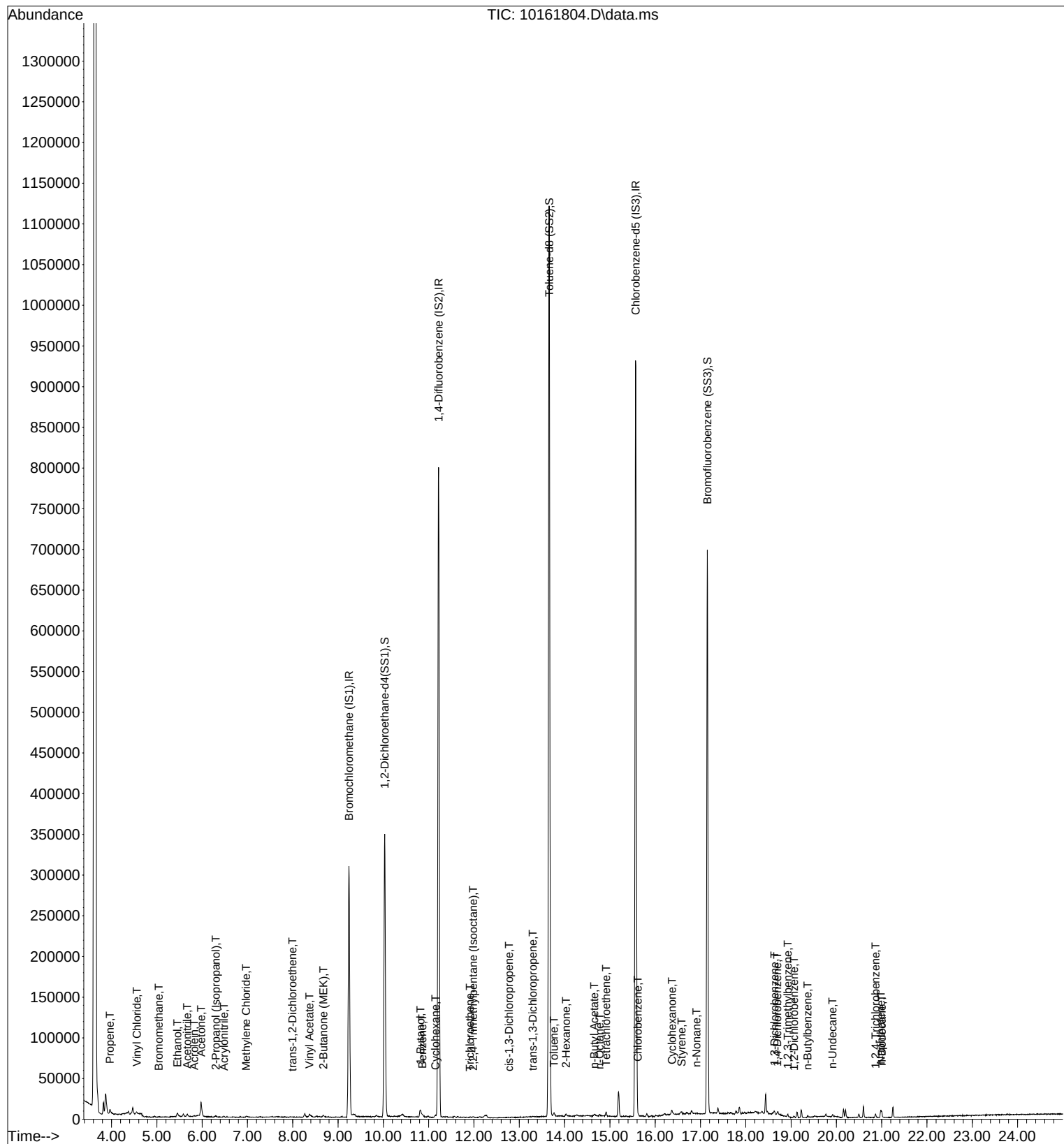
Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 09:06:20 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS09\Data\2018 10\16\10161804.D

Acq On : 16 Oct 2018 11:19

Operator: SC

Sample : MB R9101618 1000mL

Misc : S31-10151806 AC00463

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 16 11:48:21 2018

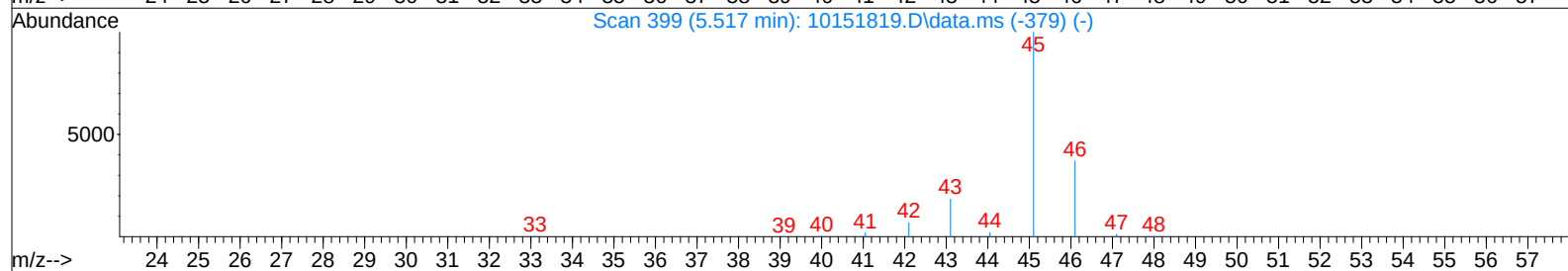
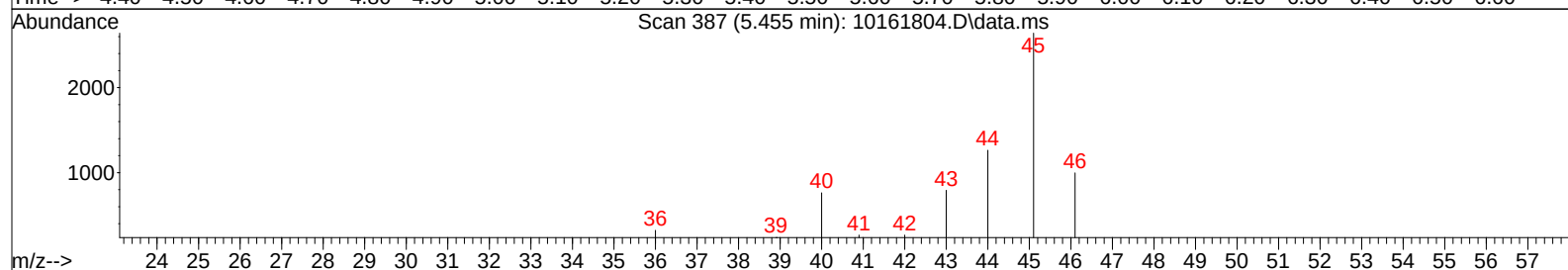
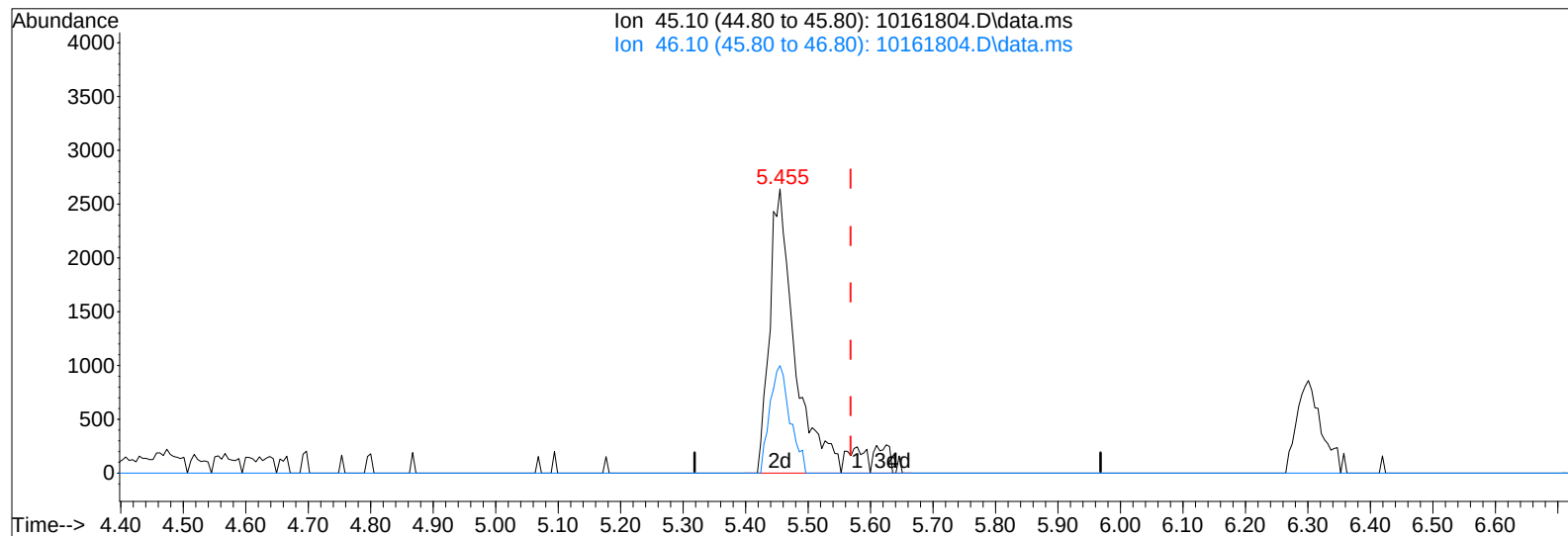
Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 09:06:20 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 10161804.D\data.ms

(10) Ethanol (T)

5.455min (-0.113) 0.48ng m

response 8331

Ion	Exp%	Act%
45.10	100	100
46.10	36.80	0.00#
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS09\Data\2018 10\16\10161804.D

Acq On : 16 Oct 2018 11:19

Operator: SC

Sample : MB R9101618 1000mL

Misc : S31-10151806 AC00463

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 16 11:48:21 2018

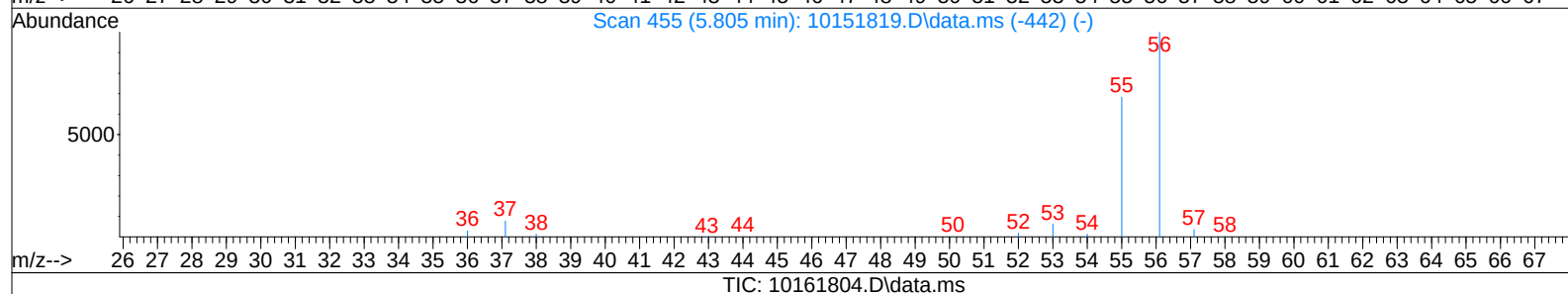
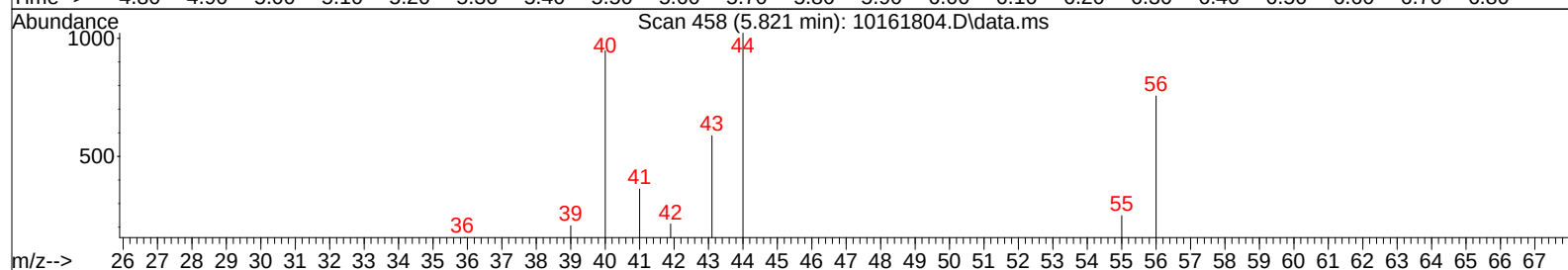
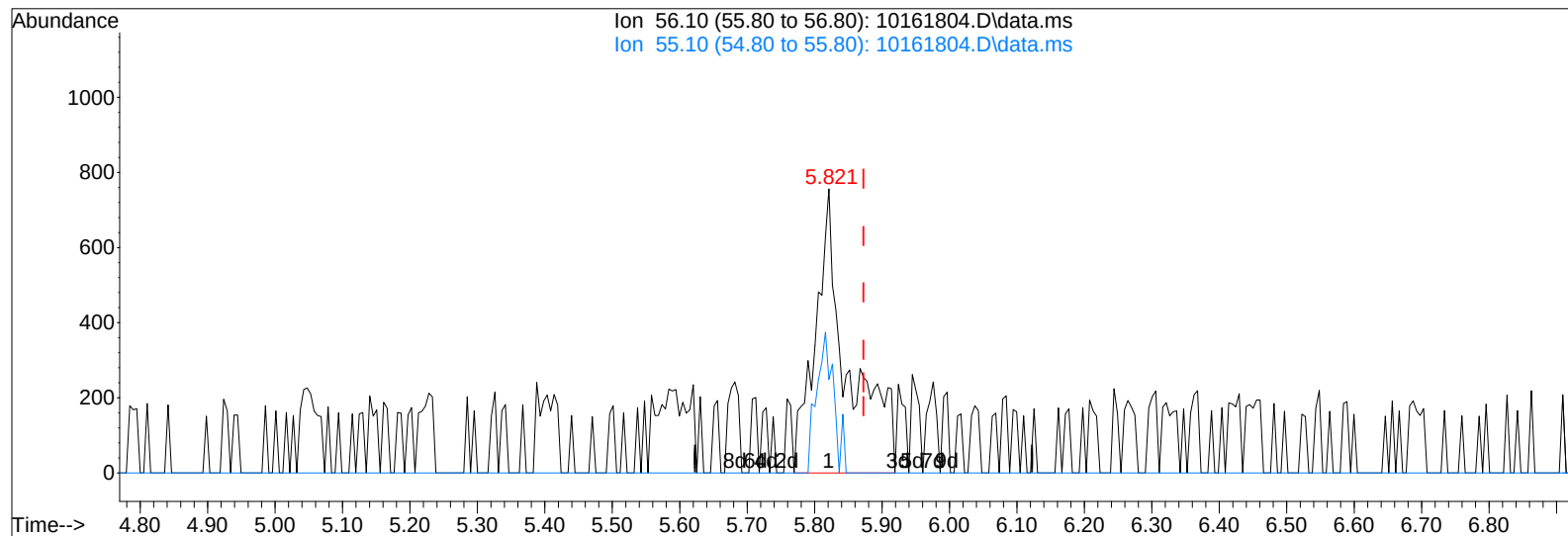
Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 09:06:20 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 10161804.D\data.ms

(12) Acrolein (T)

5.821min (-0.052) 0.21ng

response 2582

Ion	Exp%	Act%
56.10	100	100
55.10	69.30	25.52#
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS09\Data\2018 10\16\10161804.D

Acq On : 16 Oct 2018 11:19

Operator: SC

Sample : MB R9101618 1000mL

Misc : S31-10151806 AC00463

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 16 11:44:31 2018

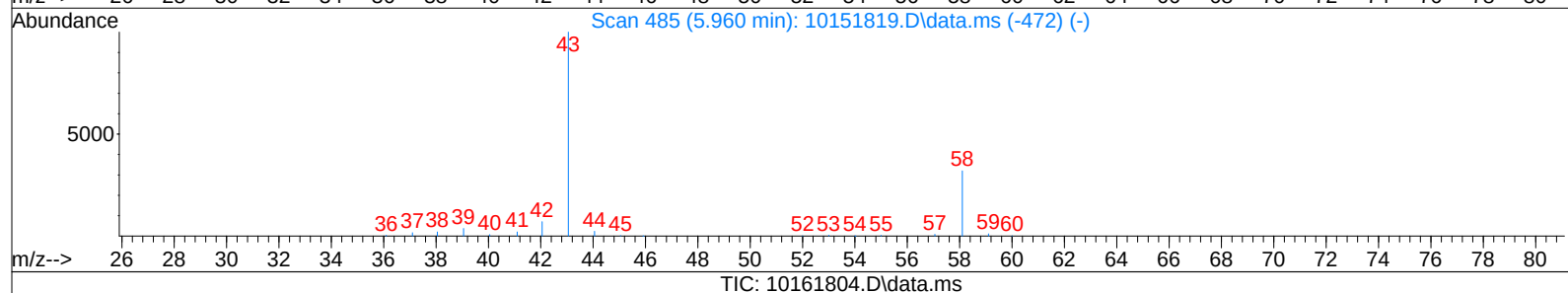
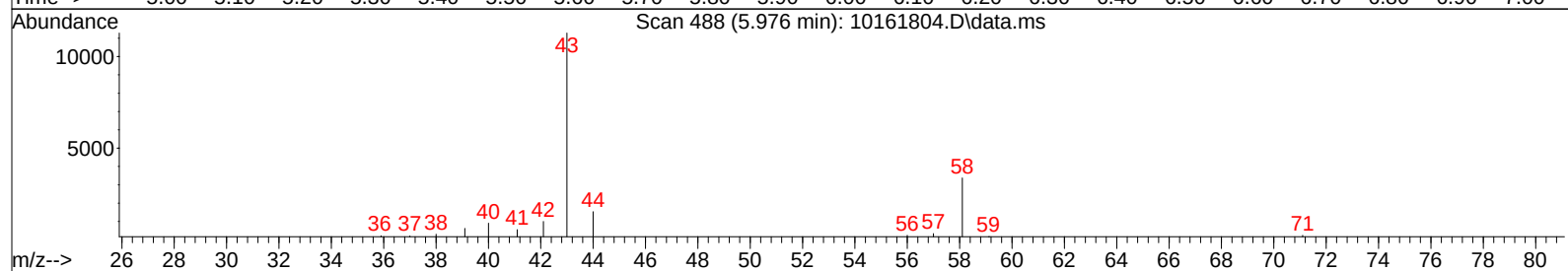
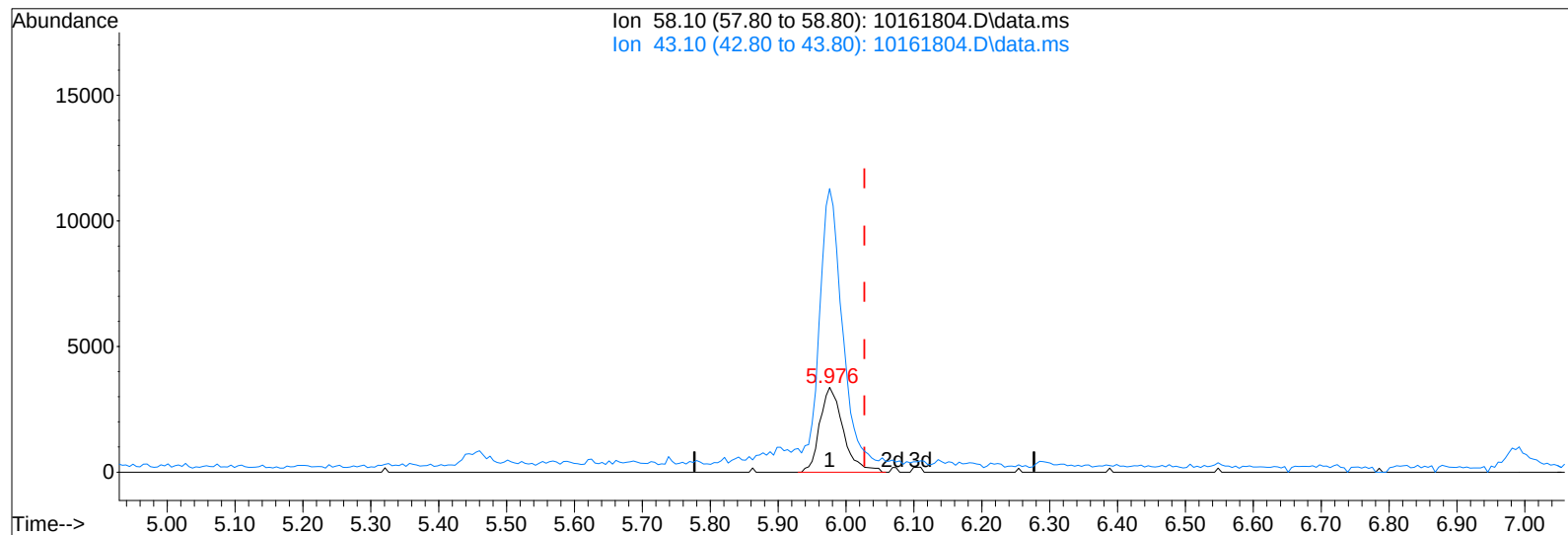
Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 09:06:20 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



(13) Acetone (T)

5.976min (-0.051) 0.57ng

response 8046

Ion	Exp%	Act%
58.10	100	100
43.10	276.00	316.36#
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS09\Data\2018 10\16\10161804.D

Acq On : 16 Oct 2018 11:19

Operator: SC

Sample : MB R9101618 1000mL

Misc : S31-10151806 AC00463

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 16 11:48:21 2018

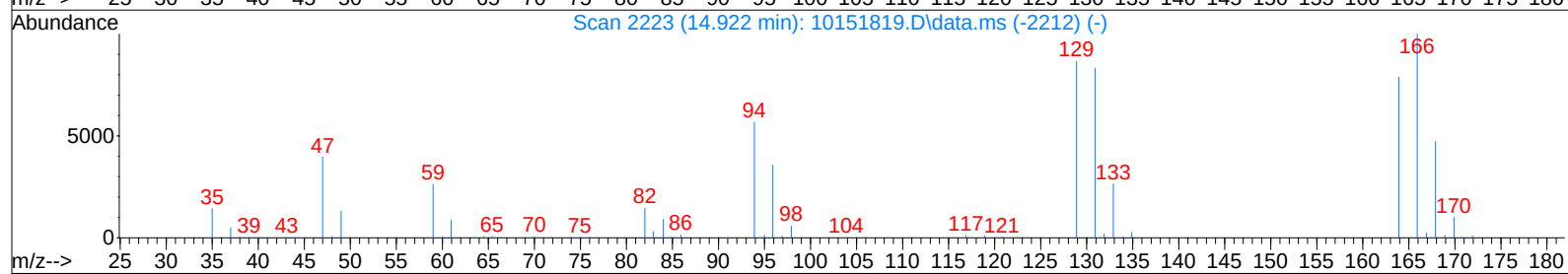
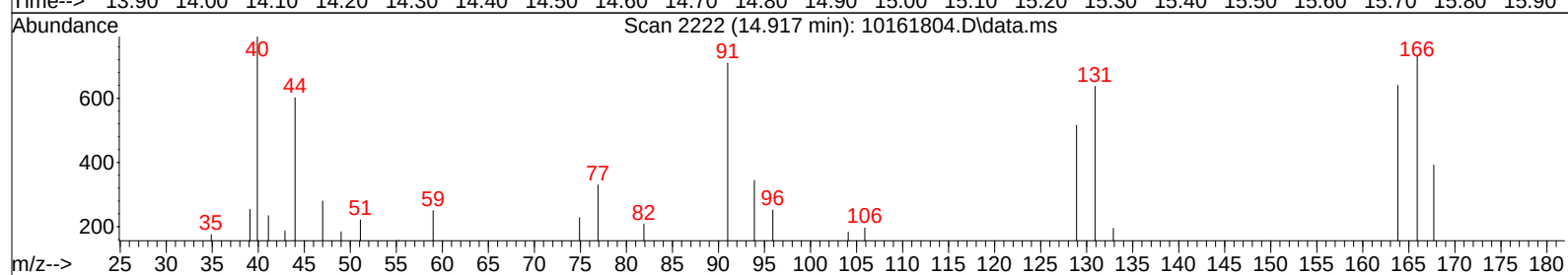
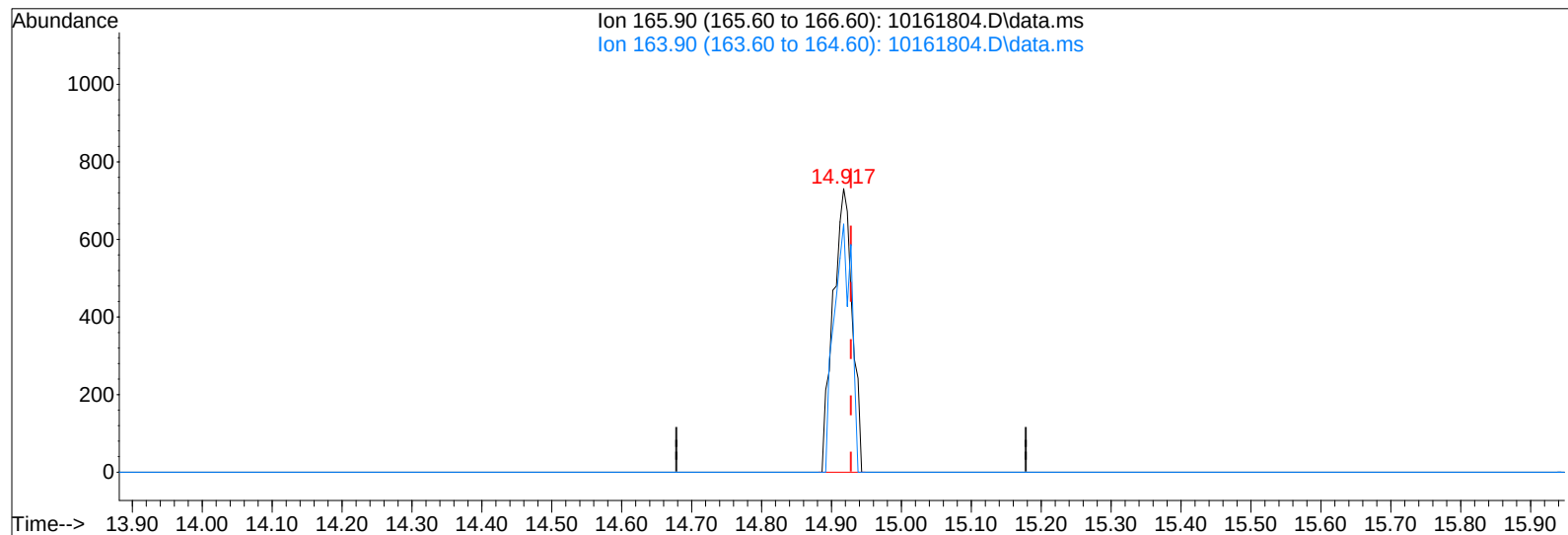
Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 09:06:20 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 10161804.D\data.ms

(64) Tetrachloroethene (T)

14.917min (-0.011) 0.10ng

response 1382

Ion	Exp%	Act%

165.90	100	100

163.90	79.00	80.25

0.00	0.00	0.00

0.00	0.00	0.00

Data File: I:\MS09\Data\2018 10\16\10161804.D

Acq On : 16 Oct 2018 11:19

Operator: SC

Sample : MB R9101618 1000mL

Misc : S31-10151806 AC00463

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 16 11:48:21 2018

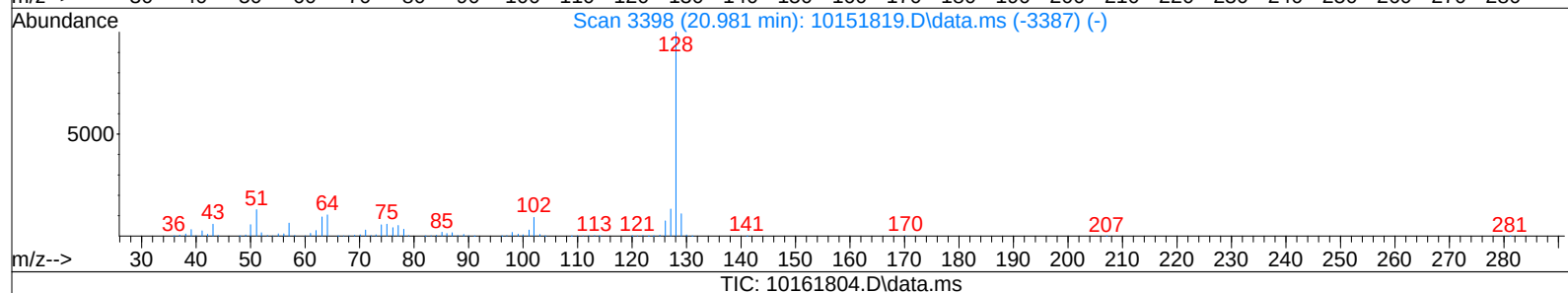
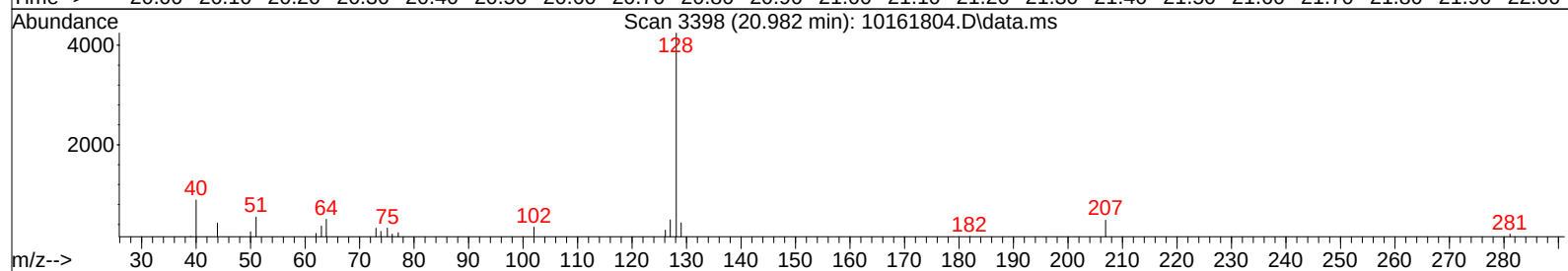
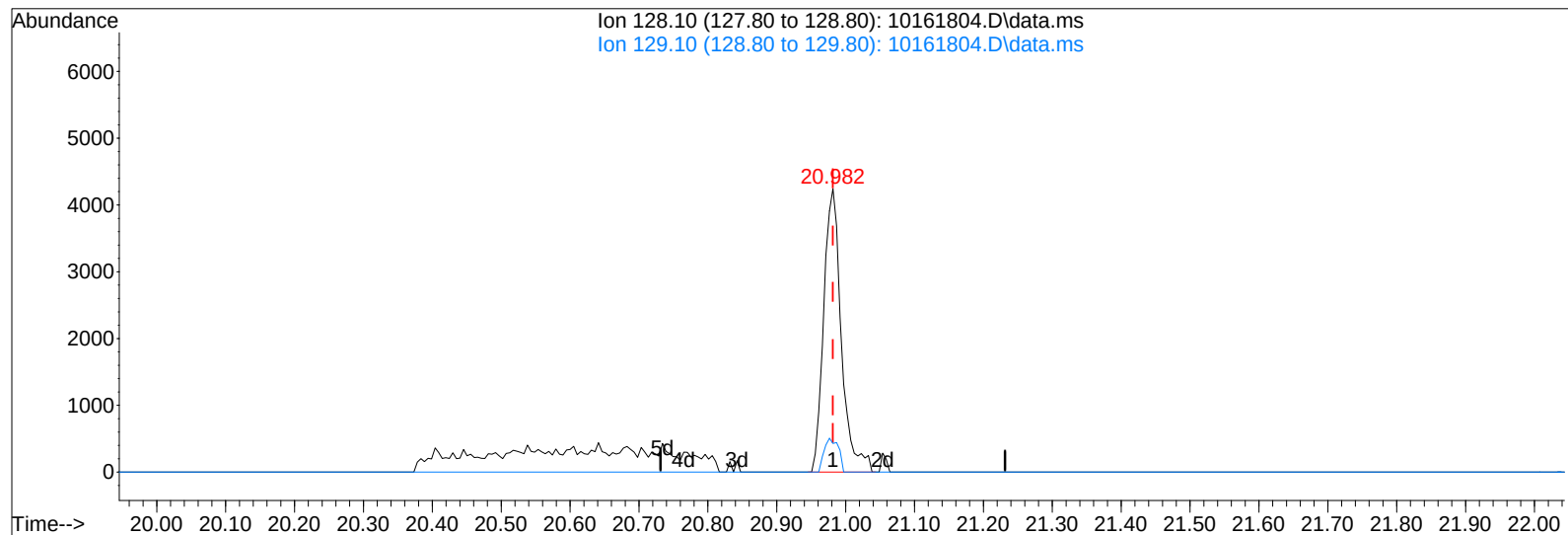
Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 09:06:20 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 10161804.D\data.ms

(95) Naphthalene (T)

20.982min (+0.000) 0.14ng

response 7551

Ion	Exp%	Act%
128.10	100	100
129.10	10.80	9.63
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS09\Data\2018 10\16\10161805.D

Acq On : 16 Oct 2018 11:53

Operator: SC

Sample : LCS R9101618 25ng

Misc : S31-10151806/S31-10151802 (11/13)

ALS Vial : 2 Sample Multiplier: 1

 10/16/18

Quant Time: Oct 16 12:18:43 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 09:06:20 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.28	130	128409	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	11.24	114	680373	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	15.58	82	409705	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	10.06	65	323208	12.201	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.60%
57) Toluene-d8 (SS2)	13.67	98	879396	12.425	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.36%
73) Bromofluorobenzene (SS3)	17.16	174	180235	12.442	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.52%

Target Compounds

						Qvalue
2) Propene	3.94	42	704730	21.219	ng	96
3) Dichlorodifluoromethan...	4.05	85	818652	23.300	ng	100
4) Chloromethane	4.25	50	978401	23.062	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.42	135	266142	23.208	ng	100
6) Vinyl Chloride	4.54	62	678990	21.343	ng	100
7) 1,3-Butadiene	4.72	54	384271	24.565	ng	90
8) Bromomethane	5.03	94	275953	24.040	ng	99
9) Chloroethane	5.25	64	399046	25.238	ng	99
10) Ethanol	5.53	45	2594970	113.998	ng	99
11) Acetonitrile	5.70	41	1368382	22.270	ng	99
12) Acrolein	5.82	56	324351	19.788	ng	100
13) Acetone	5.97	58	2103037	112.799	ng	# 77
14) Trichlorofluoromethane	6.14	101	565548	23.893	ng	99
15) 2-Propanol (Isopropanol)	6.32	45	3910662	51.549	ng	99
16) Acrylonitrile	6.52	53	857479	22.957	ng	99
17) 1,1-Dichloroethene	6.84	96	353795	23.802	ng	# 71
18) 2-Methyl-2-Propanol (t...	6.98	59	3401626	53.187	ng	95
19) Methylene Chloride	7.01	84	477072	24.694	ng	# 69
20) 3-Chloro-1-propene (Al...	7.12	41	975755	27.770	ng	85
21) Trichlorotrifluoroethane	7.30	151	261478	25.738	ng	# 83
22) Carbon Disulfide	7.27	76	1692300	24.681	ng	100
23) trans-1,2-Dichloroethene	8.02	61	906939	24.633	ng	85
24) 1,1-Dichloroethane	8.24	63	1049047	24.983	ng	99
25) Methyl tert-Butyl Ether	8.30	73	1678370	25.050	ng	94
26) Vinyl Acetate	8.42	86	532018	157.607	ng	# 11
27) 2-Butanone (MEK)	8.66	72	421860	25.088	ng	# 54
28) cis-1,2-Dichloroethene	9.12	61	874053	24.180	ng	84
29) Diisopropyl Ether	9.34	87	406355	22.999	ng	# 24
30) Ethyl Acetate	9.35	61	484735	52.854	ng	95
31) n-Hexane	9.34	57	1075869	23.743	ng	99
32) Chloroform	9.43	83	888878	24.703	ng	100
34) Tetrahydrofuran (THF)	9.80	72	400551	24.117	ng	# 70
35) Ethyl tert-Butyl Ether	9.89	87	610750	25.419	ng	# 75
36) 1,2-Dichloroethane	10.17	62	757396	25.050	ng	99
38) 1,1,1-Trichloroethane	10.43	97	693539	26.752	ng	94
39) Isopropyl Acetate	10.79	61	842790	51.085	ng	# 66
40) 1-Butanol	10.81	56	1462522	52.355	ng	85
41) Benzene	10.88	78	2212956	24.375	ng	100
42) Carbon Tetrachloride	11.03	117	534339	27.762	ng	99
43) Cyclohexane	11.16	84	1557645	48.961	ng	# 81
44) tert-Amyl Methyl Ether	11.48	73	1661238	26.255	ng	91
45) 1,2-Dichloropropane	11.70	63	659240	25.488	ng	100
46) Bromodichloromethane	11.88	83	718724	26.979	ng	100
47) Trichloroethene	11.93	130	428081	24.184	ng	99
48) 1,4-Dioxane	11.91	88	439902	26.647	ng	83
49) 2,2,4-Trimethylpentane...	11.99	57	2854642	24.812	ng	94

Data File: I:\MS09\Data\2018 10\16\10161805.D

Acq On : 16 Oct 2018 11:53

Operator: SC

Sample : LCS R9101618 25ng

Misc : S31-10151806/S31-10151802 (11/13)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 16 12:18:43 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 09:06:20 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.12	100	384563	53.073	ng	# 70
51) n-Heptane	12.25	71	617381	25.798	ng	90
52) cis-1,3-Dichloropropene	12.78	75	961302	27.303	ng	99
53) 4-Methyl-2-pentanone	12.81	58	678937	27.116	ng	80
54) trans-1,3-Dichloropropene	13.29	75	880013	28.653	ng	100
55) 1,1,2-Trichloroethane	13.47	97	483201	25.908	ng	94
58) Toluene	13.77	91	2090739	26.566	ng	99
59) 2-Hexanone	14.00	43	1788882	27.017	ng	89
60) Dibromochloromethane	14.18	129	477562	27.921	ng	99
61) 1,2-Dibromoethane	14.44	107	508619	26.558	ng	99
62) n-Butyl Acetate	14.65	43	2088480	28.350	ng	92
63) n-Octane	14.78	57	623454	25.146	ng	86
64) Tetrachloroethene	14.92	166	384789	26.031	ng	100
65) Chlorobenzene	15.62	112	1213148	24.952	ng	99
66) Ethylbenzene	16.02	91	2405787	24.746	ng	96
67) m- & p-Xylenes	16.21	91	3730547	50.021	ng	94
68) Bromoform	16.27	173	333451	28.876	ng	100
69) Styrene	16.58	104	1368541	26.638	ng	94
70) o-Xylene	16.70	91	1900204	25.282	ng	95
71) n-Nonane	16.92	43	1631923	25.544	ng	86
72) 1,1,2,2-Tetrachloroethane	16.67	83	957871	27.232	ng	100
74) Cumene	17.30	105	2184221	25.097	ng	97
75) alpha-Pinene	17.71	93	1242812	25.935	ng	94
76) n-Propylbenzene	17.83	91	2933978	25.638	ng	95
77) 3-Ethyltoluene	17.93	105	2207248	26.070	ng	97
78) 4-Ethyltoluene	17.98	105	2132602	26.318	ng	97
79) 1,3,5-Trimethylbenzene	18.05	105	1846359	25.666	ng	96
80) alpha-Methylstyrene	18.21	118	947888	28.085	ng	98
81) 2-Ethyltoluene	18.25	105	2174767	25.709	ng	97
82) 1,2,4-Trimethylbenzene	18.48	105	1845035	25.725	ng	96
83) n-Decane	18.59	58	70404	26.586	ng	# 74
84) Benzyl Chloride	18.61	91	1744284	33.462	ng	95
85) 1,3-Dichlorobenzene	18.64	146	869054	26.389	ng	100
86) 1,4-Dichlorobenzene	18.70	146	870598	26.106	ng	100
87) sec-Butylbenzene	18.76	105	2478142	25.800	ng	97
88) 4-Isopropyltoluene (p-...	18.93	119	2094228	26.442	ng	97
89) 1,2,3-Trimethylbenzene	18.92	105	1899568	26.860	ng	95
90) 1,2-Dichlorobenzene	19.06	146	821821	27.145	ng	100
91) d-Limonene	19.08	68	1022728	27.484	ng	90
92) 1,2-Dibromo-3-Chloropr...	19.52	157	266911	31.307	ng	# 59
93) n-Undecane	19.91	57	1689384	26.697	ng	92
94) 1,2,4-Trichlorobenzene	20.86	180	445100	27.661	ng	100
95) Naphthalene	20.98	128	1491881	25.916	ng	100
96) n-Dodecane	21.00	57	1517537	26.628	ng	92
97) Hexachlorobutadiene	21.35	225	300110	26.800	ng	100
98) Cyclohexanone	16.36	55	1023880	24.692	ng	# 88
99) tert-Butylbenzene	18.48	119	1622260	28.352	ng	98
100) n-Butylbenzene	19.37	91	2239706	26.539	ng	97

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

Data File: I:\MS09\Data\2018 10\16\10161805.D

Acq On : 16 Oct 2018 11:53

Operator: SC

Sample : LCS R9101618 25ng

Misc : S31-10151806/S31-10151802 (11/13)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 16 12:18:43 2018

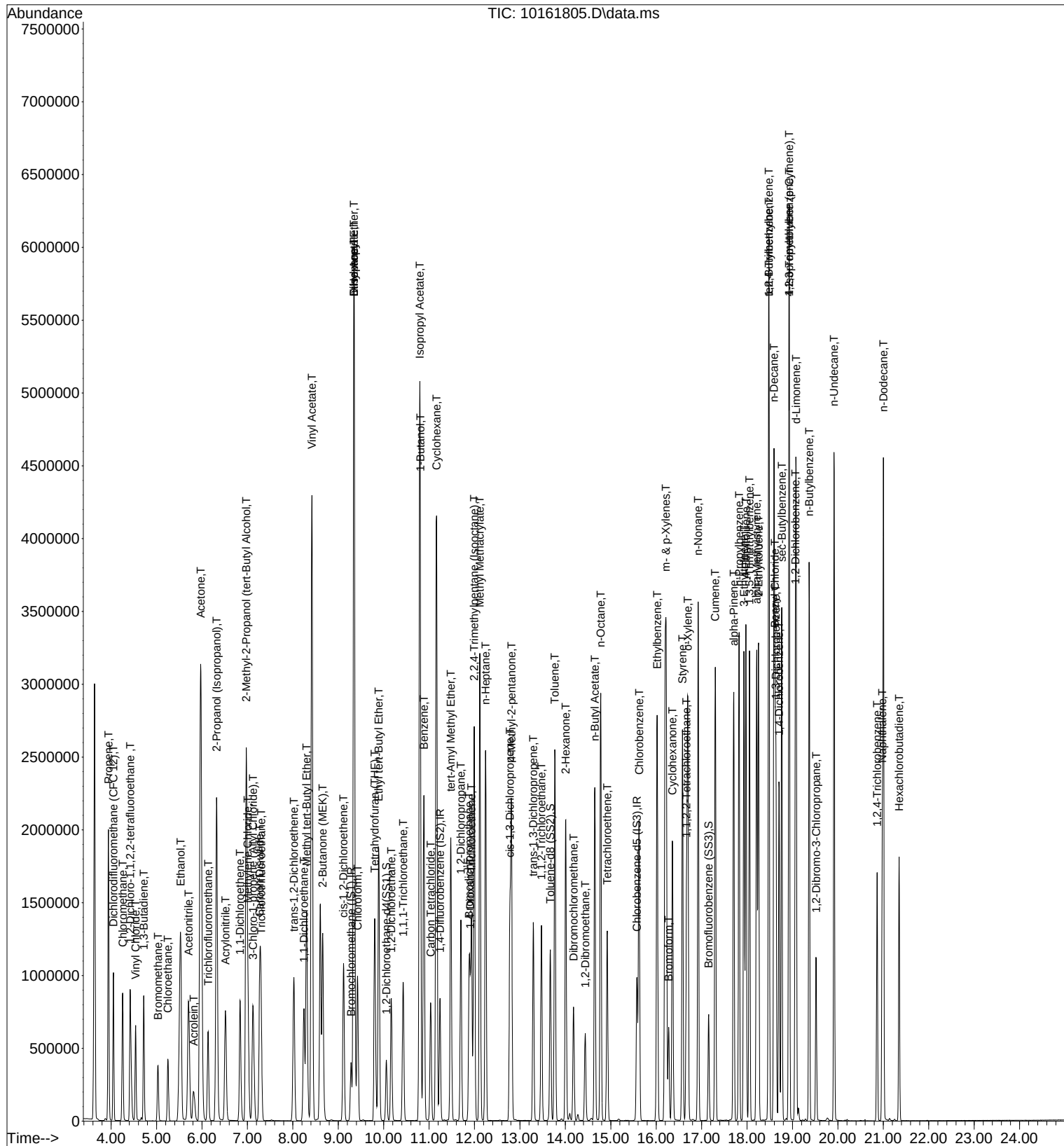
Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 09:06:20 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS09\Data\2018 10\16\10161806.D

Acq On : 16 Oct 2018 12:27

Operator: SC

Sample : LCSD R9101618 25ng

Misc : S31-10151806/S31-10151802 (11/13)

ALS Vial : 2 Sample Multiplier: 1

 10/16/18

Quant Time: Oct 16 12:53:05 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 09:06:20 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.28	130	129462	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	11.24	114	680562	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	15.57	82	409984	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	10.06	65	322451	12.073	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	96.56%
57) Toluene-d8 (SS2)	13.67	98	876834	12.380	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.04%
73) Bromofluorobenzene (SS3)	17.16	174	180809	12.474	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.76%

Target Compounds

						Qvalue
2) Propene	3.93	42	692679	20.687	ng	96
3) Dichlorodifluoromethan...	4.04	85	805900	22.750	ng	100
4) Chloromethane	4.24	50	969784	22.673	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.41	135	262882	22.737	ng	100
6) Vinyl Chloride	4.53	62	688323	21.460	ng	100
7) 1,3-Butadiene	4.71	54	394102	24.988	ng	89
8) Bromomethane	5.02	94	278146	24.034	ng	99
9) Chloroethane	5.24	64	400088	25.098	ng	100
10) Ethanol	5.52	45	2605302	113.521	ng	100
11) Acetonitrile	5.70	41	1379931	22.276	ng	99
12) Acrolein	5.81	56	326877	19.779	ng	100
13) Acetone	5.97	58	2073379	110.304	ng	# 76
14) Trichlorofluoromethane	6.13	101	566732	23.748	ng	99
15) 2-Propanol (Isopropanol)	6.32	45	3905836	51.067	ng	99
16) Acrylonitrile	6.51	53	850399	22.582	ng	99
17) 1,1-Dichloroethene	6.84	96	349674	23.333	ng	# 70
18) 2-Methyl-2-Propanol (t...	6.97	59	3388430	52.550	ng	95
19) Methylene Chloride	7.01	84	472383	24.252	ng	# 67
20) 3-Chloro-1-propene (Al...	7.12	41	964137	27.216	ng	85
21) Trichlorotrifluoroethane	7.30	151	259425	25.328	ng	# 83
22) Carbon Disulfide	7.27	76	1681759	24.328	ng	100
23) trans-1,2-Dichloroethene	8.02	61	906298	24.415	ng	85
24) 1,1-Dichloroethane	8.24	63	1035640	24.463	ng	99
25) Methyl tert-Butyl Ether	8.30	73	1670872	24.735	ng	95
26) Vinyl Acetate	8.42	86	526590	154.730	ng	# 11
27) 2-Butanone (MEK)	8.66	72	418645	24.695	ng	# 53
28) cis-1,2-Dichloroethene	9.12	61	869051	23.846	ng	84
29) Diisopropyl Ether	9.34	87	400866	22.503	ng	# 22
30) Ethyl Acetate	9.35	61	479435	51.851	ng	95
31) n-Hexane	9.34	57	1065181	23.316	ng	99
32) Chloroform	9.43	83	879809	24.252	ng	100
34) Tetrahydrofuran (THF)	9.80	72	401407	23.972	ng	# 71
35) Ethyl tert-Butyl Ether	9.89	87	607697	25.086	ng	# 75
36) 1,2-Dichloroethane	10.16	62	753483	24.718	ng	99
38) 1,1,1-Trichloroethane	10.43	97	690868	26.642	ng	94
39) Isopropyl Acetate	10.79	61	834869	50.591	ng	# 64
40) 1-Butanol	10.81	56	1458712	52.204	ng	85
41) Benzene	10.88	78	2186690	24.079	ng	100
42) Carbon Tetrachloride	11.03	117	529373	27.496	ng	99
43) Cyclohexane	11.16	84	1541218	48.432	ng	# 81
44) tert-Amyl Methyl Ether	11.48	73	1651751	26.098	ng	91
45) 1,2-Dichloropropane	11.70	63	652525	25.221	ng	99
46) Bromodichloromethane	11.88	83	714298	26.805	ng	100
47) Trichloroethene	11.93	130	423804	23.936	ng	99
48) 1,4-Dioxane	11.91	88	432758	26.207	ng	81
49) 2,2,4-Trimethylpentane...	11.99	57	2822482	24.526	ng	94

Data File: I:\MS09\Data\2018 10\16\10161806.D

Acq On : 16 Oct 2018 12:27

Operator: SC

Sample : LCSD R9101618 25ng

Misc : S31-10151806/S31-10151802 (11/13)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 16 12:53:05 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 09:06:20 2018

Response via : Initial Calibration

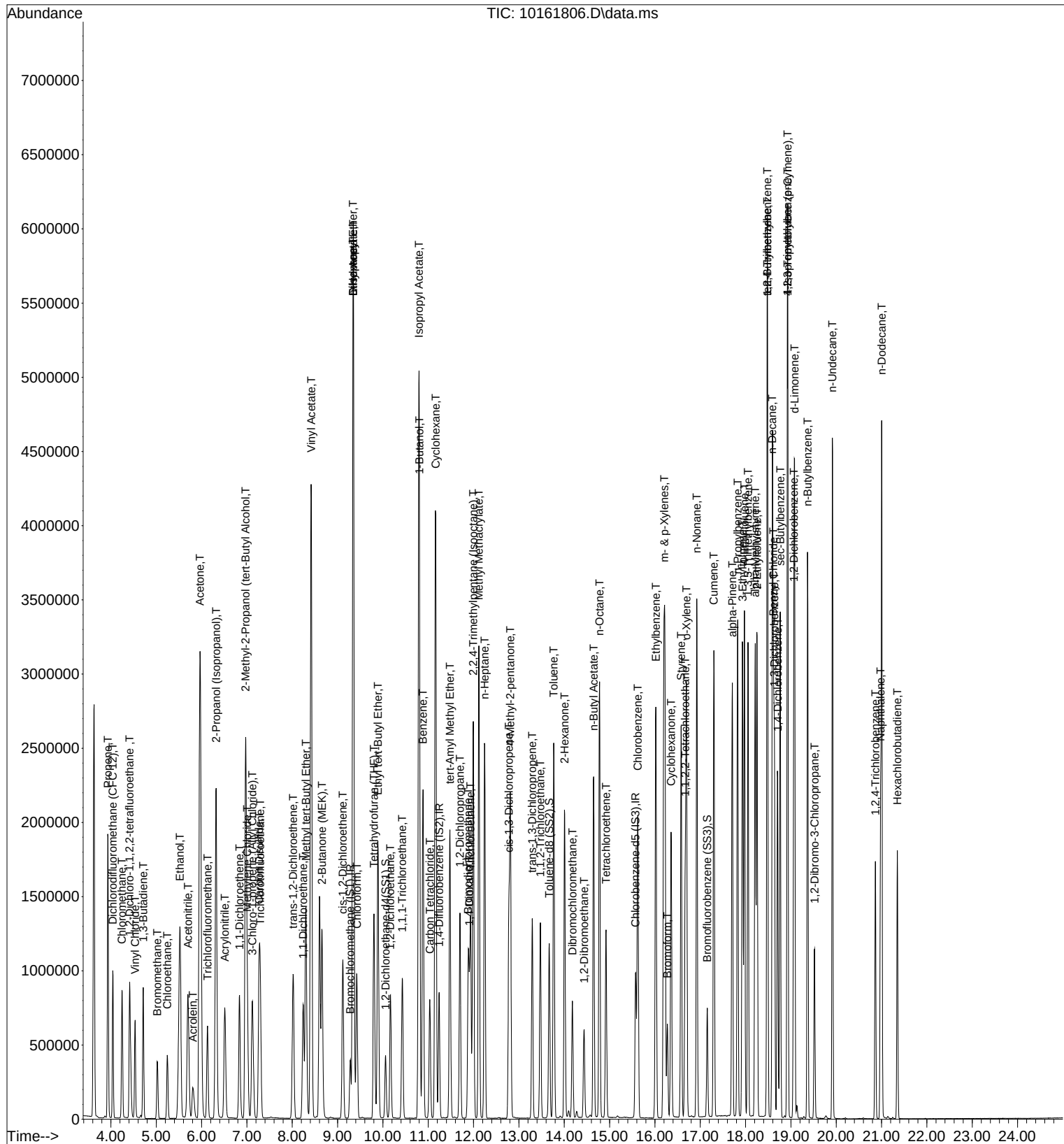
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.12	100	384192	53.007	ng	# 72
51) n-Heptane	12.25	71	611286	25.536	ng	90
52) cis-1,3-Dichloropropene	12.78	75	953944	27.086	ng	99
53) 4-Methyl-2-pentanone	12.81	58	671003	26.792	ng	79
54) trans-1,3-Dichloropropene	13.29	75	880906	28.674	ng	99
55) 1,1,2-Trichloroethane	13.47	97	477176	25.578	ng	94
58) Toluene	13.77	91	2068778	26.270	ng	99
59) 2-Hexanone	14.00	43	1781655	26.889	ng	89
60) Dibromochloromethane	14.18	129	472441	27.603	ng	99
61) 1,2-Dibromoethane	14.44	107	506119	26.410	ng	99
62) n-Butyl Acetate	14.65	43	2078311	28.193	ng	91
63) n-Octane	14.78	57	616776	24.860	ng	87
64) Tetrachloroethene	14.92	166	382823	25.880	ng	99
65) Chlorobenzene	15.62	112	1198588	24.636	ng	100
66) Ethylbenzene	16.02	91	2379925	24.463	ng	96
67) m- & p-Xylenes	16.21	91	3700017	49.578	ng	94
68) Bromoform	16.27	173	330669	28.616	ng	100
69) Styrene	16.58	104	1361926	26.492	ng	94
70) o-Xylene	16.70	91	1890940	25.142	ng	95
71) n-Nonane	16.92	43	1621098	25.357	ng	86
72) 1,1,2,2-Tetrachloroethane	16.67	83	949472	26.975	ng	99
74) Cumene	17.30	105	2175171	24.976	ng	97
75) alpha-Pinene	17.71	93	1239011	25.838	ng	94
76) n-Propylbenzene	17.83	91	2907681	25.391	ng	95
77) 3-Ethyltoluene	17.93	105	2196962	25.931	ng	97
78) 4-Ethyltoluene	17.98	105	2117164	26.109	ng	97
79) 1,3,5-Trimethylbenzene	18.05	105	1830304	25.425	ng	96
80) alpha-Methylstyrene	18.21	118	940375	27.843	ng	98
81) 2-Ethyltoluene	18.25	105	2155460	25.463	ng	97
82) 1,2,4-Trimethylbenzene	18.48	105	1832672	25.536	ng	96
83) n-Decane	18.59	58	69908	26.381	ng	# 73
84) Benzyl Chloride	18.61	91	1745705	33.466	ng	95
85) 1,3-Dichlorobenzene	18.64	146	867016	26.309	ng	99
86) 1,4-Dichlorobenzene	18.71	146	871687	26.121	ng	100
87) sec-Butylbenzene	18.76	105	2460139	25.595	ng	97
88) 4-Isopropyltoluene (p-...	18.93	119	2067192	26.083	ng	97
89) 1,2,3-Trimethylbenzene	18.92	105	1886577	26.658	ng	95
90) 1,2-Dichlorobenzene	19.06	146	818370	27.013	ng	100
91) d-Limonene	19.08	68	1013533	27.218	ng	90
92) 1,2-Dibromo-3-Chloropr...	19.52	157	271844	31.864	ng	# 61
93) n-Undecane	19.91	57	1678473	26.506	ng	93
94) 1,2,4-Trichlorobenzene	20.86	180	458781	28.492	ng	99
95) Naphthalene	20.98	128	1548844	26.887	ng	100
96) n-Dodecane	21.00	57	1541125	27.023	ng	92
97) Hexachlorobutadiene	21.35	225	302209	26.969	ng	99
98) Cyclohexanone	16.36	55	1031330	24.854	ng	# 88
99) tert-Butylbenzene	18.48	119	1610628	28.130	ng	98
100) n-Butylbenzene	19.37	91	2216571	26.247	ng	98

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

ALS Vial : 2 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS09\Data\2018 10\16\10161827.D

Acq On : 17 Oct 2018 1:22

Operator: SC

Sample : P1805277-001dup (1000mL)

Misc : S31-10151806

ALS Vial : 13 Sample Multiplier: 1

 10/17/18

Quant Time: Oct 17 10:21:20 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Wed Oct 17 09:09:32 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.25	130	94868	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	11.23	114	625536	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	15.57	82	373078	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	10.04	65	193693	9.897	ng	0.03
Spiked Amount	12.500	Range	70 - 130	Recovery	=	79.20%
57) Toluene-d8 (SS2)	13.66	98	806130	12.508	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.08%
73) Bromofluorobenzene (SS3)	17.15	174	170721	12.943	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.52%

Target Compounds

						Qvalue
2) Propene	3.95	42	6033m	0.246	ng	
3) Dichlorodifluoromethan...	4.05	85	49047	1.889	ng	99
4) Chloromethane	4.25	50	1177	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	4.42	135	704	0.083	ng	81
6) Vinyl Chloride	4.53	62	5595	0.238	ng	99
7) 1,3-Butadiene	4.72	54	239	N.D.		
8) Bromomethane	5.03	94	454	0.054	ng	# 38
9) Chloroethane	5.23	64	257	N.D.		
10) Ethanol	5.44	45	14212m	0.845	ng	
11) Acetonitrile	5.67	41	17092	0.377	ng	87
12) Acrolein	5.82	56	11019	0.910	ng	100
13) Acetone	5.98	58	59487	4.319	ng	# 72
14) Trichlorofluoromethane	6.12	101	24478	1.400	ng	99
15) 2-Propanol (Isopropanol)	6.29	45	8453	0.151	ng	87
16) Acrylonitrile	6.48	53	447	N.D.		
17) 1,1-Dichloroethene	6.82	96	24502	2.231	ng	# 77
18) 2-Methyl-2-Propanol (t...	6.96	59	1570	N.D.		
19) Methylene Chloride	6.97	84	1420	0.099	ng	# 68
20) 3-Chloro-1-propene (Al...	7.03	41	774	N.D.		
21) Trichlorotrifluoroethane	7.29	151	117758	15.690	ng	87
22) Carbon Disulfide	7.25	76	17724	0.350	ng	# 29
23) trans-1,2-Dichloroethene	7.99	61	27875	1.025	ng	88
24) 1,1-Dichloroethane	8.22	63	28526	0.920	ng	99
25) Methyl tert-Butyl Ether	8.33	73	224	N.D.		
26) Vinyl Acetate	8.38	86	5341	2.142	ng	# 95
27) 2-Butanone (MEK)	8.65	72	10328	0.831	ng	# 60
28) cis-1,2-Dichloroethene	9.09	61	1991348	74.566	ng	88
29) Diisopropyl Ether	0.00	87	0	N.D.	d	
30) Ethyl Acetate	0.00	61	0	N.D.	d	
31) n-Hexane	9.33	57	3352	0.100	ng	# 95
32) Chloroform	9.39	83	412080	15.501	ng	99
34) Tetrahydrofuran (THF)	0.00	72	0	N.D.	d	
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	10.15	62	1188	0.053	ng	# 42
38) 1,1,1-Trichloroethane	10.42	97	25973	1.090	ng	91
39) Isopropyl Acetate	10.77	61	364	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	10.87	78	9198	0.110	ng	99
42) Carbon Tetrachloride	11.02	117	29428	1.663	ng	95
43) Cyclohexane	11.16	84	2099	0.072	ng	# 81
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	11.68	63	496	N.D.		
46) Bromodichloromethane	11.87	83	4610	0.188	ng	97
47) Trichloroethene	11.92	130	1652528	101.541	ng	100
48) 1,4-Dioxane	0.00	88	0	N.D.	d	
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d	

Data File: I:\MS09\Data\2018 10\16\10161827.D

Acq On : 17 Oct 2018 1:22

Operator: SC

Sample : P1805277-001dup (1000mL)

Misc : S31-10151806

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Oct 17 10:21:20 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Wed Oct 17 09:09:32 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.06	100	330	N.D.		
51) n-Heptane	12.24	71	1565	0.071 ng		83
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	12.81	58	1590	0.069 ng	#	29
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	13.47	97	2915	0.170 ng		95
58) Toluene	13.76	91	9345	0.130 ng		93
59) 2-Hexanone	14.01	43	12379	0.205 ng		85
60) Dibromochloromethane	14.17	129	471	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	14.65	43	6027	0.090 ng		92
63) n-Octane	14.77	57	1731	0.077 ng	#	80
64) Tetrachloroethene	14.92	166	198273	14.730 ng		99
65) Chlorobenzene	15.61	112	949	N.D.		
66) Ethylbenzene	16.02	91	6635	0.075 ng		91
67) m- & p-Xylenes	16.22	91	7813	0.115 ng		93
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	16.58	104	885	N.D.		
70) o-Xylene	16.69	91	2268	N.D.		
71) n-Nonane	0.00	43	0	N.D. d		
72) 1,1,2,2-Tetrachloroethane	16.67	83	67569	2.110 ng		99
74) Cumene	17.30	105	2897	N.D.		
75) alpha-Pinene	17.70	93	101	N.D.		
76) n-Propylbenzene	17.82	91	11747	0.113 ng		86
77) 3-Ethyltoluene	17.93	105	1435	N.D.		
78) 4-Ethyltoluene	17.97	105	3153	N.D.		
79) 1,3,5-Trimethylbenzene	18.05	105	4291	0.066 ng		86
80) alpha-Methylstyrene	18.21	118	1253	N.D.		
81) 2-Ethyltoluene	18.25	105	3337	N.D.		
82) 1,2,4-Trimethylbenzene	18.48	105	4160	0.064 ng		78
83) n-Decane	0.00	58	0	N.D. d		
84) Benzyl Chloride	18.61	91	425	N.D.		
85) 1,3-Dichlorobenzene	18.63	146	449	N.D.		
86) 1,4-Dichlorobenzene	18.70	146	780	N.D.		
87) sec-Butylbenzene	18.76	105	857	N.D.		
88) 4-Isopropyltoluene (p-...	18.92	119	2010	N.D.		
89) 1,2,3-Trimethylbenzene	18.92	105	1255	N.D.		
90) 1,2-Dichlorobenzene	19.06	146	260	N.D.		
91) d-Limonene	19.07	68	450	N.D.		
92) 1,2-Dibromo-3-Chloropr...	19.66	157	170	N.D.		
93) n-Undecane	19.91	57	2319	N.D.		
94) 1,2,4-Trichlorobenzene	20.86	180	123	N.D.		
95) Naphthalene	20.98	128	2413	N.D.		
96) n-Dodecane	0.00	57	0	N.D. d		
97) Hexachlorobutadiene	21.35	225	137	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:\MS09\Data\2018 10\16\10161827.D

Acq On : 17 Oct 2018 1:22

Operator: SC

Sample : P1805277-001dup (1000mL)

Misc : S31-10151806

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Oct 17 10:21:20 2018

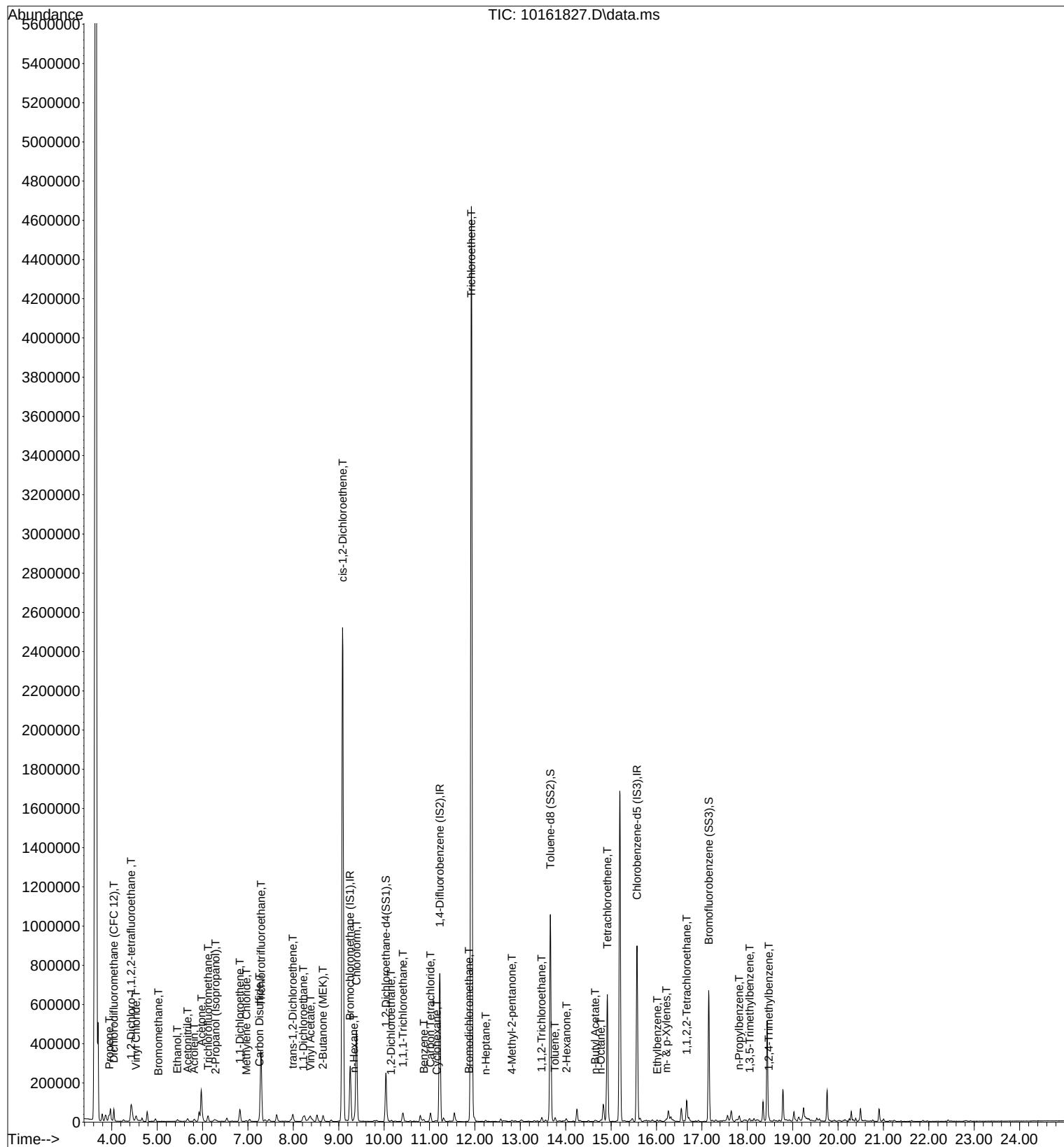
Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Wed Oct 17 09:09:32 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS09\Data\2018 10\16\10161827.D

Acq On : 17 Oct 2018 1:22

Operator: SC

Sample : P1805277-001dup (1000mL)

Misc : S31-10151806

ALS Vial : 13 Sample Multiplier: 1

 10/17/18

Quant Time: Oct 17 10:21:20 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Wed Oct 17 09:09:32 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

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1) Bromochloromethane (IS1)	9.25	130	94868	12.500	ng	0.00
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56) Chlorobenzene-d5 (IS3)	15.57	82	373078	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	10.04	65	193693	9.897	ng	0.03
Spiked Amount	12.500	Range	70 - 130	Recovery	=	79.20%
57) Toluene-d8 (SS2)	13.66	98	806130	12.508	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.08%
73) Bromofluorobenzene (SS3)	17.15	174	170721	12.943	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.52%

Target Compounds

						Qvalue
2) Propene	3.95	42	6033m	0.246	ng	
3) Dichlorodifluoromethan...	4.05	85	49047	1.889	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.42	135	704	0.083	ng	81
6) Vinyl Chloride	4.53	62	5595	0.238	ng	99
8) Bromomethane	5.03	94	454	0.054	ng	# 38
10) Ethanol	5.44	45	14212m	0.845	ng	
11) Acetonitrile	5.67	41	17092	0.377	ng	87
12) Acrolein	5.82	56	11019	0.910	ng	100
13) Acetone	5.98	58	59487	4.319	ng	# 72
14) Trichlorofluoromethane	6.12	101	24478	1.400	ng	99
15) 2-Propanol (Isopropanol)	6.29	45	8453	0.151	ng	87
17) 1,1-Dichloroethene	6.82	96	24502	2.231	ng	# 77
19) Methylene Chloride	6.97	84	1420	0.099	ng	# 68
21) Trichlorotrifluoroethane	7.29	151	117758	15.690	ng	87
22) Carbon Disulfide	7.25	76	17724	0.350	ng	# 29
23) trans-1,2-Dichloroethene	7.99	61	27875	1.025	ng	88
24) 1,1-Dichloroethane	8.22	63	28526	0.920	ng	99
26) Vinyl Acetate	8.38	86	5341	2.142	ng	# 95
27) 2-Butanone (MEK)	8.65	72	10328	0.831	ng	# 60
28) cis-1,2-Dichloroethene	9.09	61	1991348	74.566	ng	88
31) n-Hexane	9.33	57	3352	0.100	ng	# 95
32) Chloroform	9.39	83	412080	15.501	ng	99
36) 1,2-Dichloroethane	10.15	62	1188	0.053	ng	# 42
38) 1,1,1-Trichloroethane	10.42	97	25973	1.090	ng	91
41) Benzene	10.87	78	9198	0.110	ng	99
42) Carbon Tetrachloride	11.02	117	29428	1.663	ng	95
43) Cyclohexane	11.16	84	2099	0.072	ng	# 81
46) Bromodichloromethane	11.87	83	4610	0.188	ng	97
47) Trichloroethene	11.92	130	1652528	101.541	ng	100
51) n-Heptane	12.24	71	1565	0.071	ng	83
53) 4-Methyl-2-pentanone	12.81	58	1590	0.069	ng	# 29
55) 1,1,2-Trichloroethane	13.47	97	2915	0.170	ng	95
58) Toluene	13.76	91	9345	0.130	ng	93
59) 2-Hexanone	14.01	43	12379	0.205	ng	85
62) n-Butyl Acetate	14.65	43	6027	0.090	ng	92
63) n-Octane	14.77	57	1731	0.077	ng	# 80
64) Tetrachloroethene	14.92	166	198273	14.730	ng	99
66) Ethylbenzene	16.02	91	6635	0.075	ng	91
67) m- & p-Xylenes	16.22	91	7813	0.115	ng	93
72) 1,1,2,2-Tetrachloroethane	16.67	83	67569	2.110	ng	99
76) n-Propylbenzene	17.82	91	11747	0.113	ng	86
79) 1,3,5-Trimethylbenzene	18.05	105	4291	0.066	ng	86
82) 1,2,4-Trimethylbenzene	18.48	105	4160	0.064	ng	78

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

Data File: I:\MS09\Data\2018 10\16\10161827.D

Acq On : 17 Oct 2018 1:22

Operator: SC

Sample : P1805277-001dup (1000mL)

Misc : S31-10151806

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Oct 17 10:21:20 2018

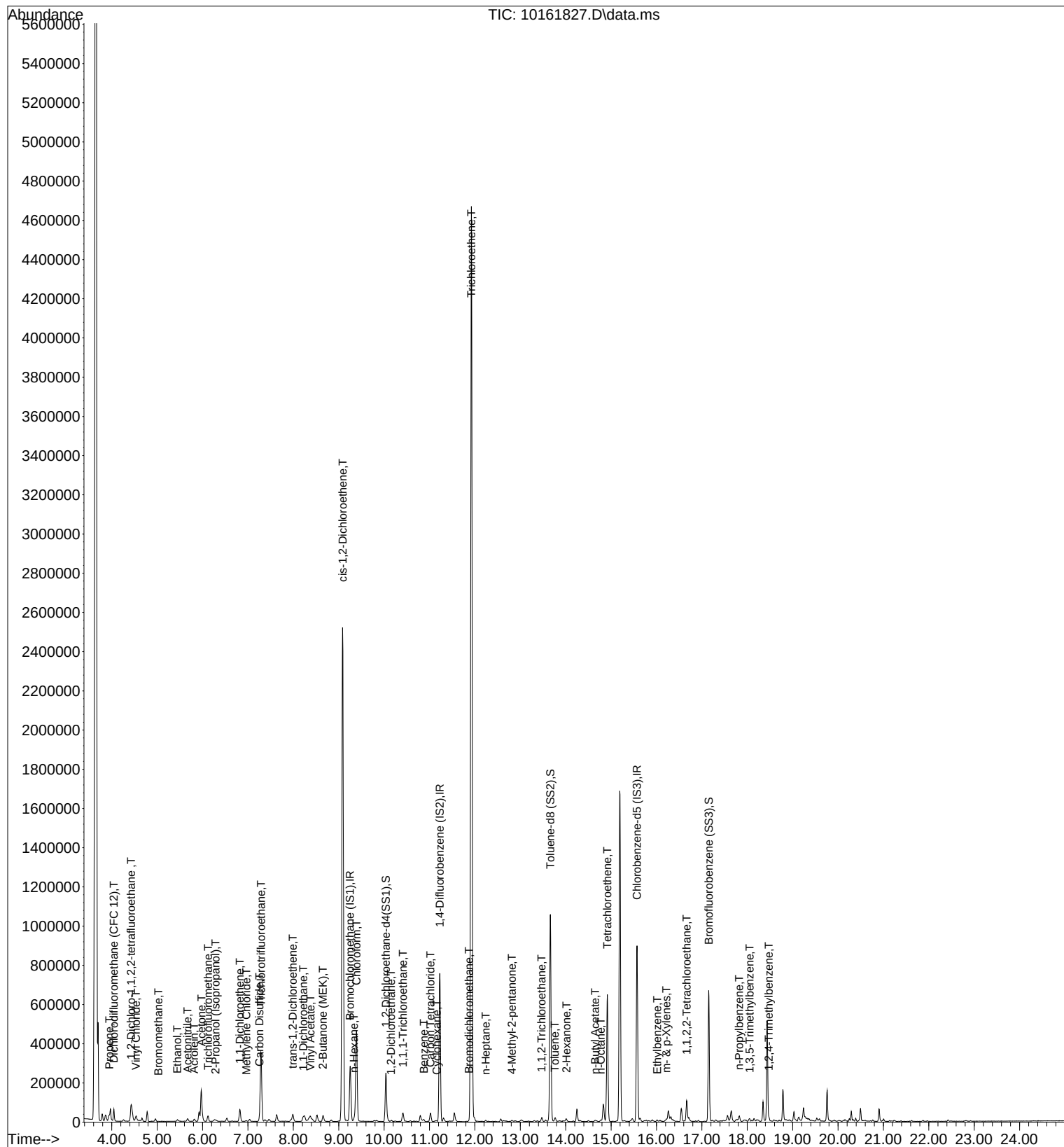
Quant Method : I:\MS09\Methods\R9101518.M

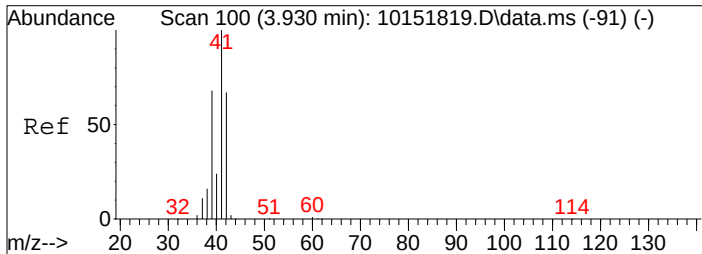
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Wed Oct 17 09:09:32 2018

Response via : Initial Calibration

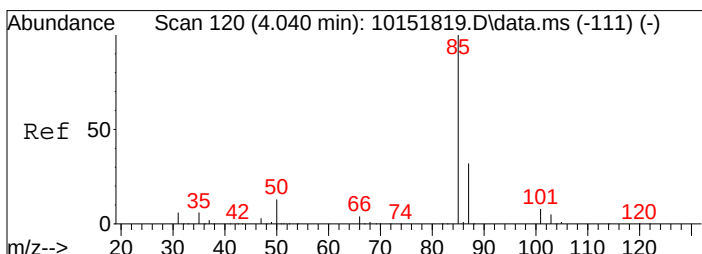
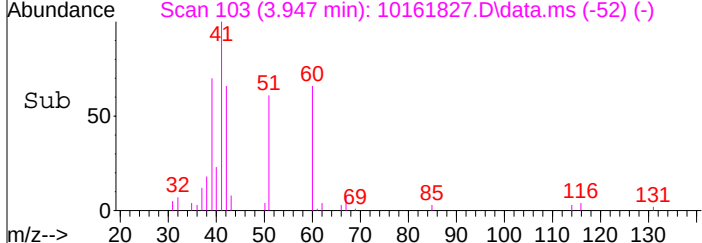
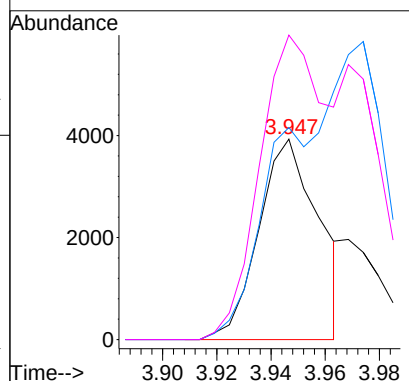
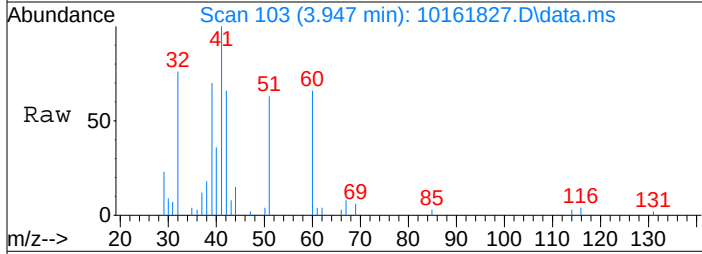
DataAcq Meth:TO15.M





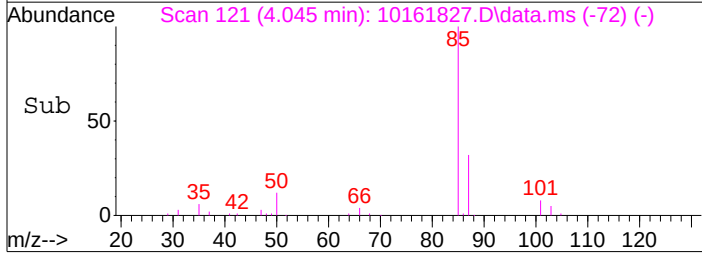
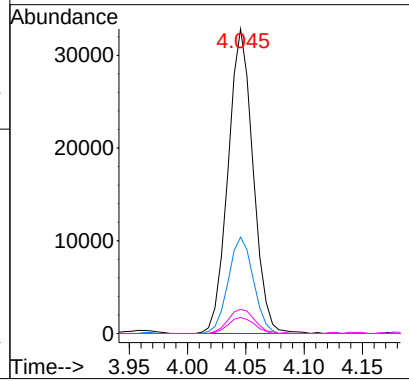
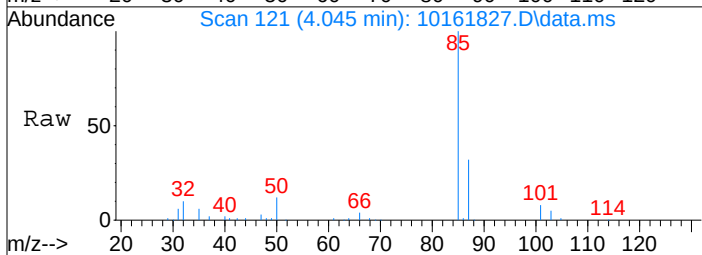
#2
Propene
Concen: 0.25 ng m
RT: 3.95 min Scan# 103
Delta R.T. 0.030 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

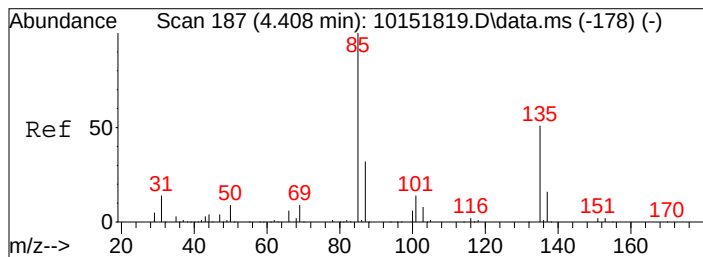
Tgt Ion: 42	Resp: 6033
Ion Ratio	Lower Upper
42	100
39	240.3 78.4 118.4#
41	267.3 127.9 167.9#



#3
Dichlorodifluoromethane (CFC 12)
Concen: 1.89 ng
RT: 4.05 min Scan# 121
Delta R.T. 0.019 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

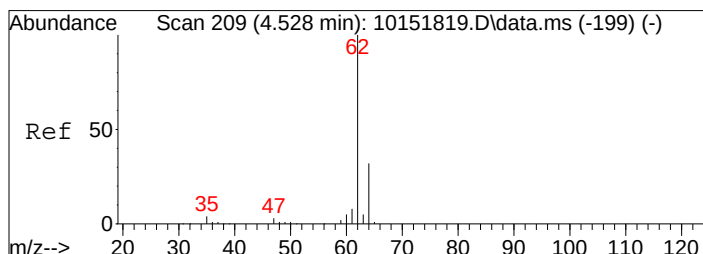
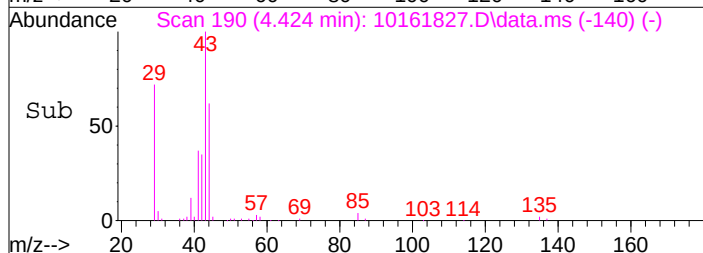
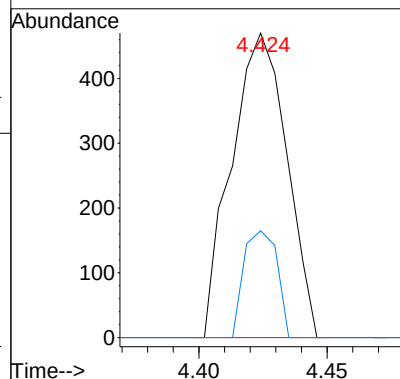
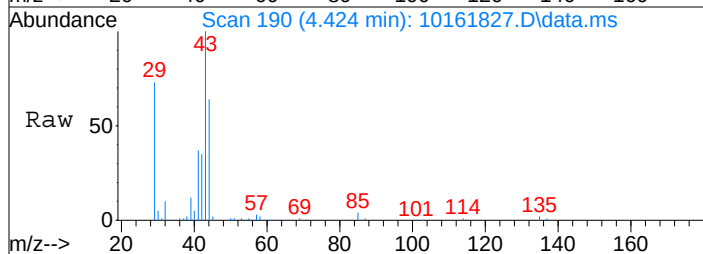
Tgt Ion: 85	Resp: 49047
Ion Ratio	Lower Upper
85	100
87	31.6 12.2 52.2
101	8.5 0.0 28.3
103	5.4 0.0 25.4





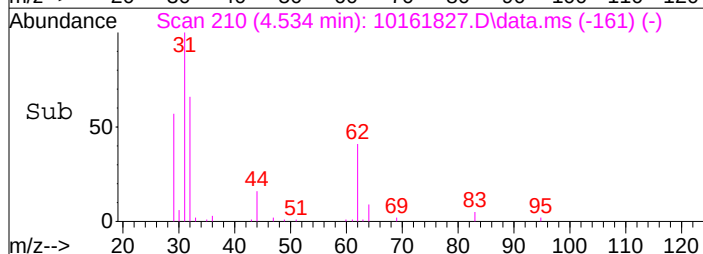
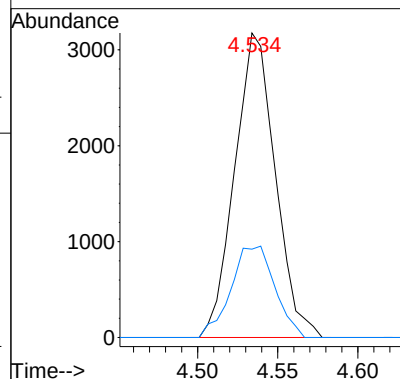
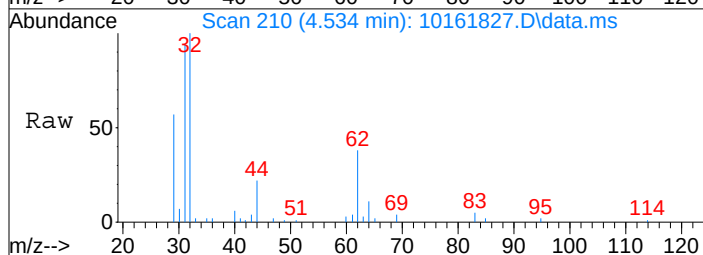
#5
 1,2-Dichloro-1,1,2,2-tetrafluoroethane
 Concen: 0.08 ng
 RT: 4.42 min Scan# 190
 Delta R.T. 0.027 min
 Lab File: 10161827.D
 Acq: 17 Oct 2018 1:22

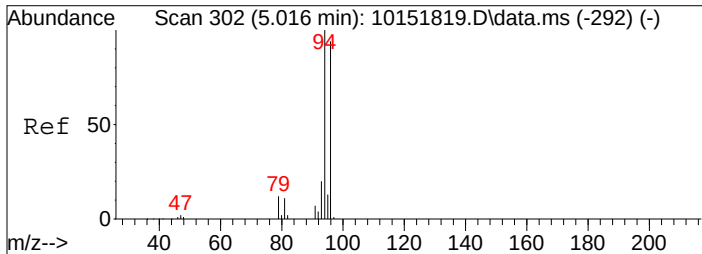
Tgt Ion: 135 Resp: 704
 Ion Ratio Lower Upper
 135 100
 137 21.2 11.7 51.7



#6
 Vinyl Chloride
 Concen: 0.24 ng
 RT: 4.53 min Scan# 210
 Delta R.T. 0.017 min
 Lab File: 10161827.D
 Acq: 17 Oct 2018 1:22

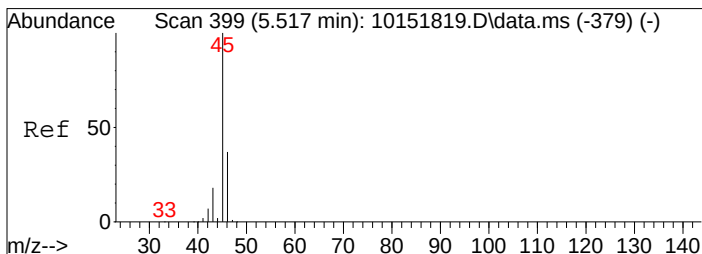
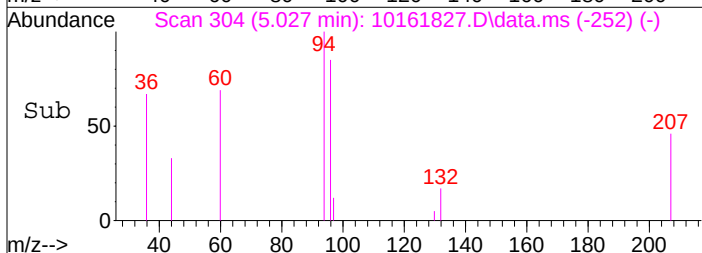
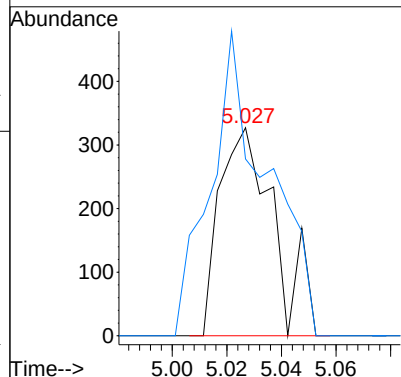
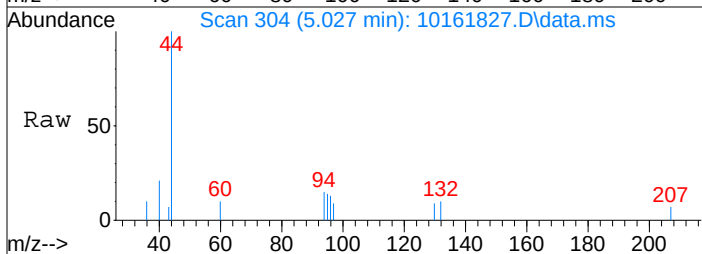
Tgt Ion: 62 Resp: 5595
 Ion Ratio Lower Upper
 62 100
 64 32.5 11.9 51.9





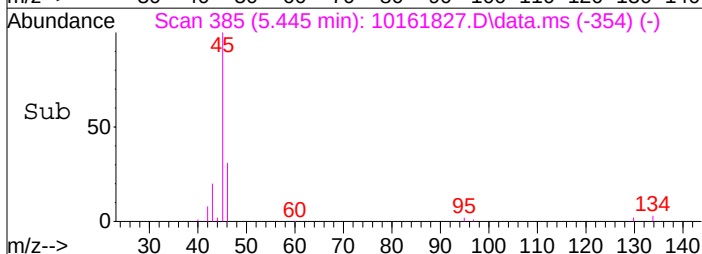
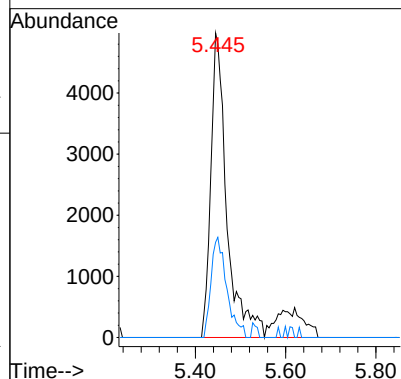
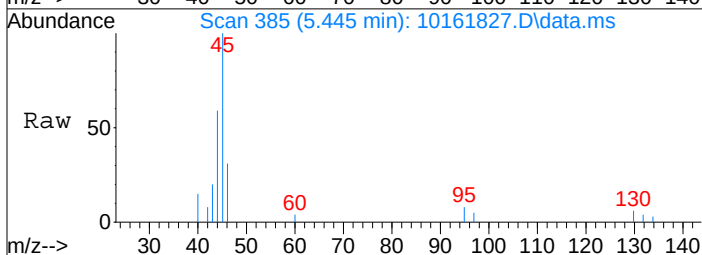
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Bromomethane
Concen: 0.05 ng
RT: 5.03 min Scan# 304
Delta R.T. 0.016 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

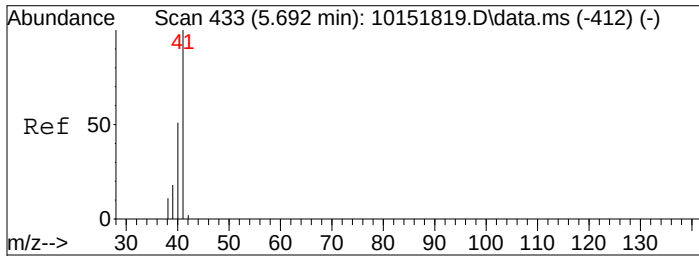
Tgt Ion: 94 Resp: 454
Ion Ratio Lower Upper
94 100
96 152.9 73.6 113.6#



#10
Ethanol
Concen: 0.85 ng m
RT: 5.44 min Scan# 385
Delta R.T. -0.090 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

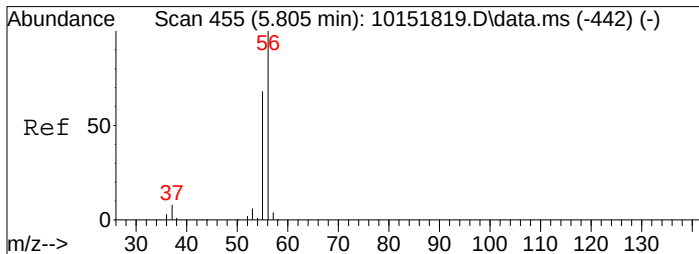
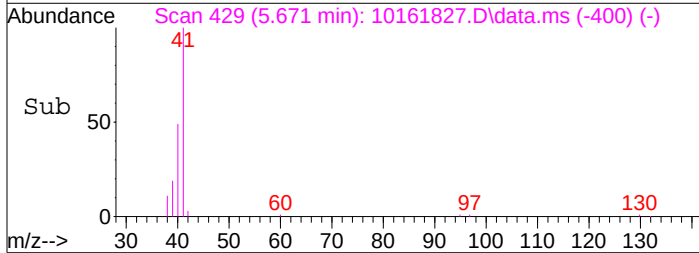
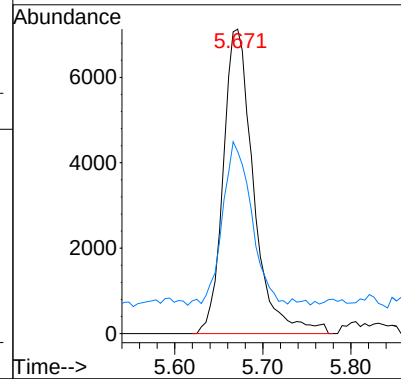
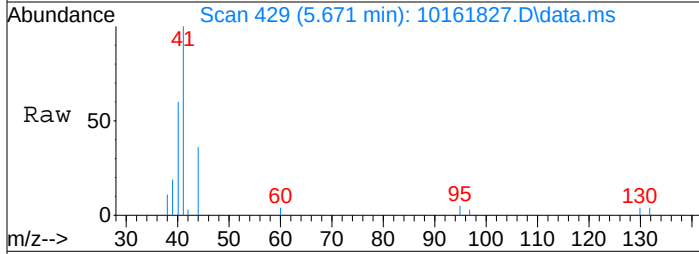
Tgt Ion: 45 Resp: 14212
Ion Ratio Lower Upper
45 100
46 0.4 16.8 56.8#





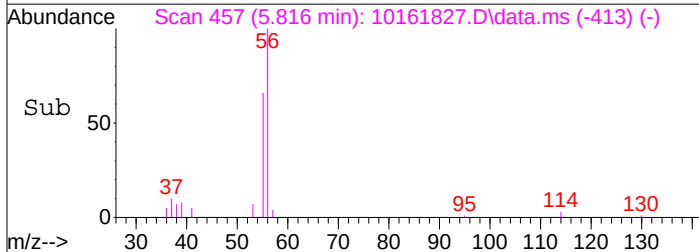
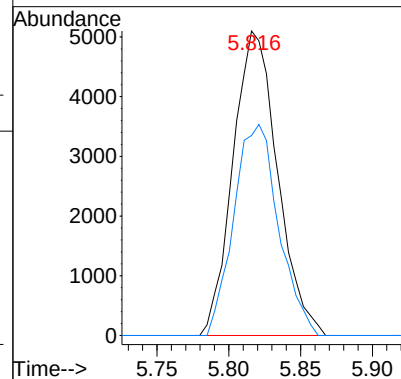
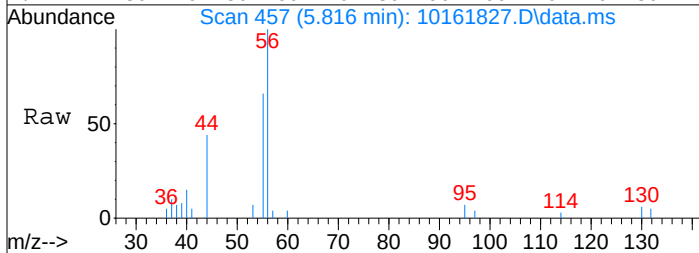
#11
Acetonitrile
Concen: 0.38 ng
RT: 5.67 min Scan# 429
Delta R.T. -0.052 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

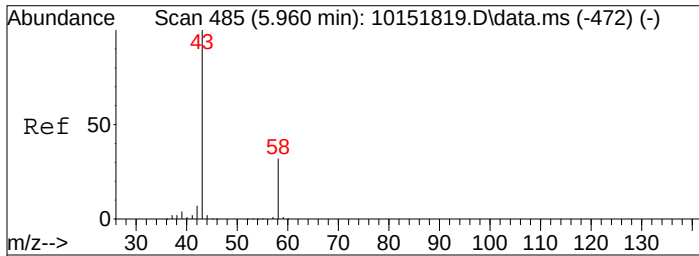
Tgt Ion: 41 Resp: 17092
Ion Ratio Lower Upper
41 100
40 60.5 31.6 71.6



#12
Acrolein
Concen: 0.91 ng
RT: 5.82 min Scan# 457
Delta R.T. -0.021 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

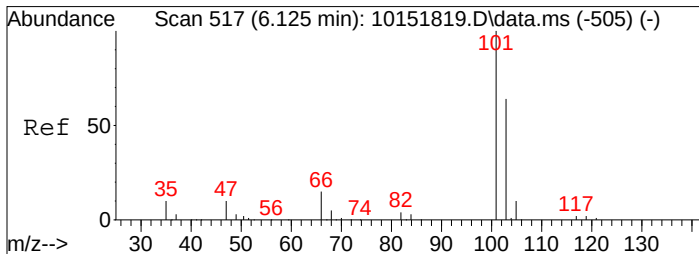
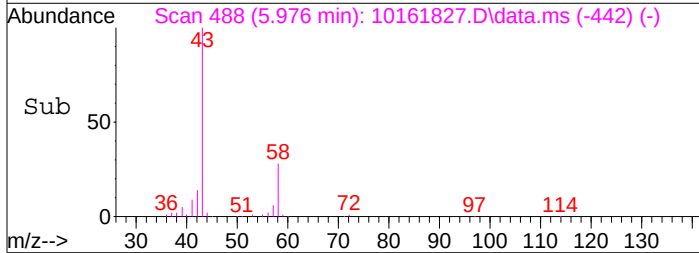
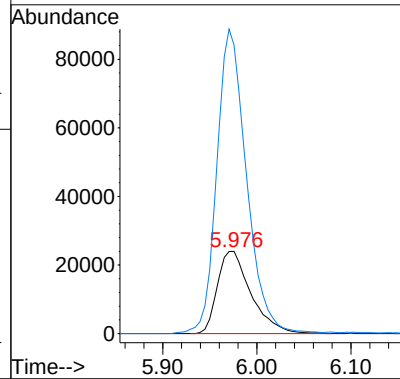
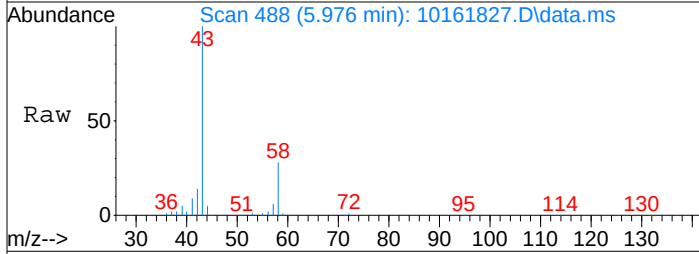
Tgt Ion: 56 Resp: 11019
Ion Ratio Lower Upper
56 100
55 69.6 49.3 89.3





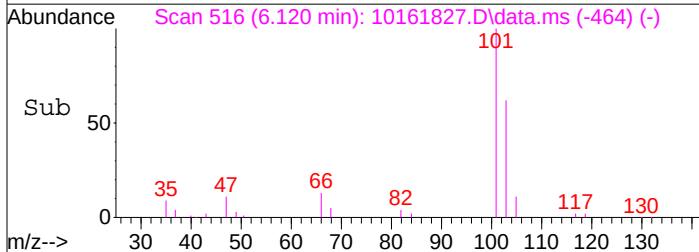
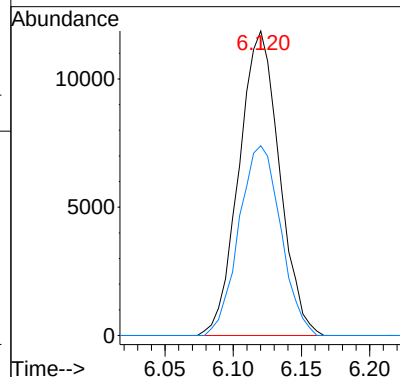
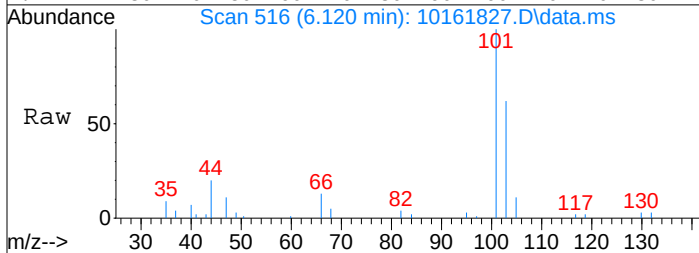
#13
Acetone
Concen: 4.32 ng
RT: 5.98 min Scan# 488
Delta R.T. -0.014 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

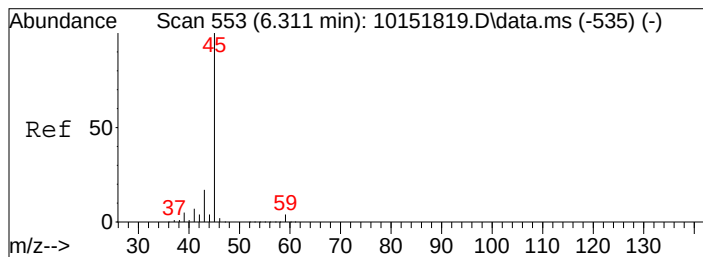
Tgt Ion: 58 Resp: 59487
Ion Ratio Lower Upper
58 100
43 328.2 246.0 306.0#



#14
Trichlorofluoromethane
Concen: 1.40 ng
RT: 6.12 min Scan# 516
Delta R.T. 0.017 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

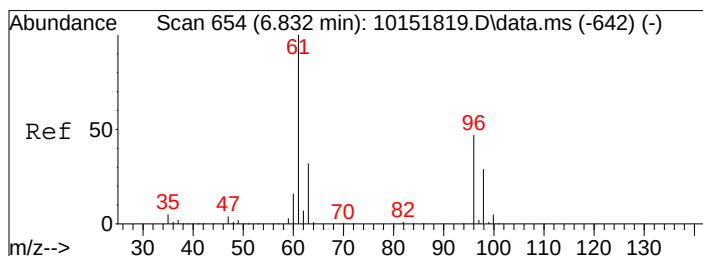
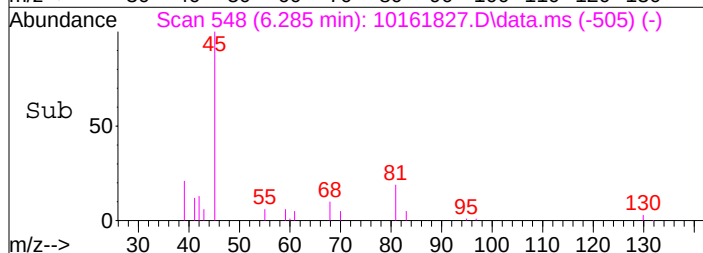
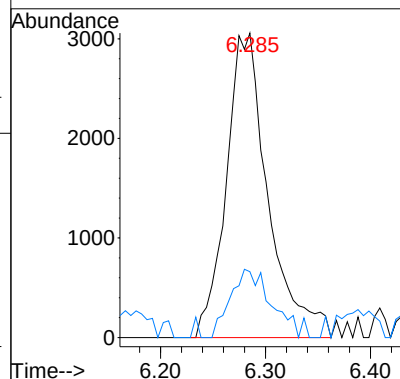
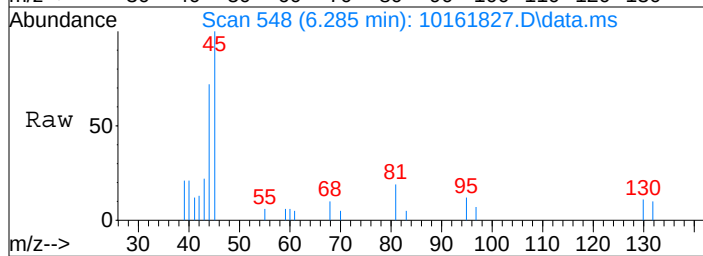
Tgt Ion: 101 Resp: 24478
Ion Ratio Lower Upper
101 100
103 64.3 45.1 85.1





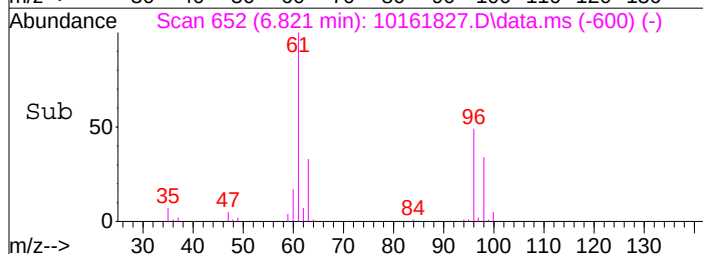
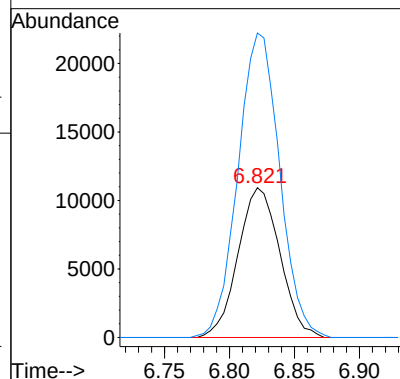
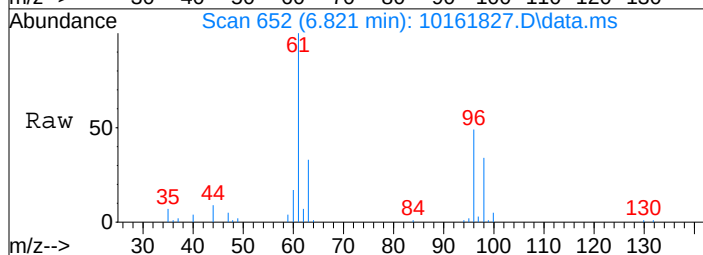
#15
2-Propanol (Isopropanol)
Concen: 0.15 ng
RT: 6.29 min Scan# 548
Delta R.T. -0.028 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

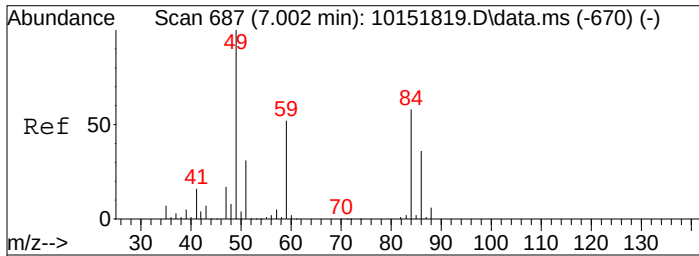
Tgt Ion: 45 Resp: 8453
Ion Ratio Lower Upper
45 100
43 22.4 0.0 36.6



#17
1,1-Dichloroethene
Concen: 2.23 ng
RT: 6.82 min Scan# 652
Delta R.T. 0.016 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

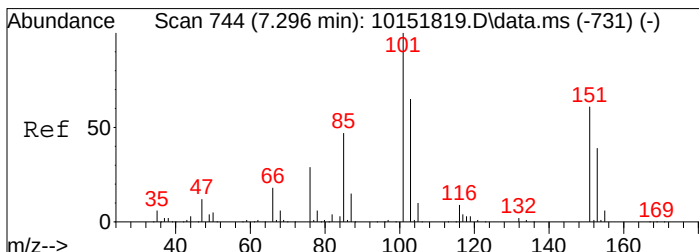
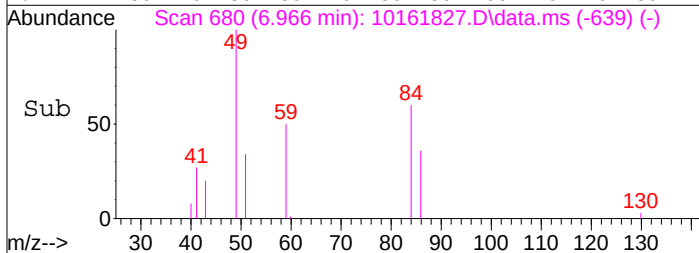
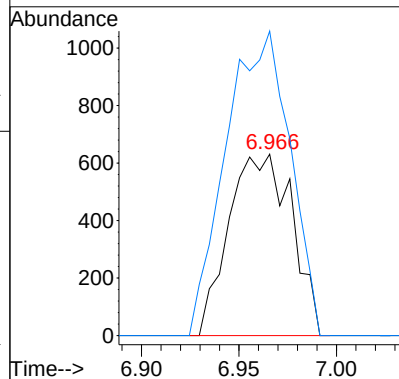
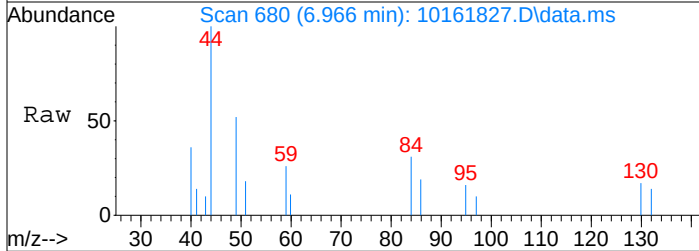
Tgt Ion: 96 Resp: 24502
Ion Ratio Lower Upper
96 100
61 202.3 150.6 190.6#





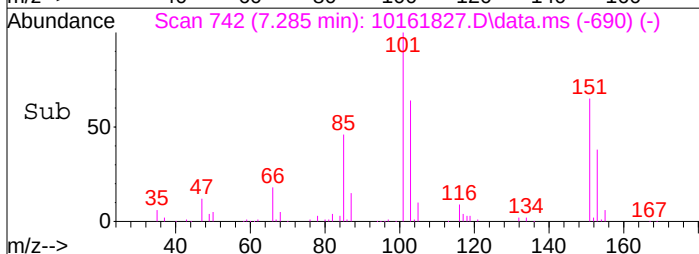
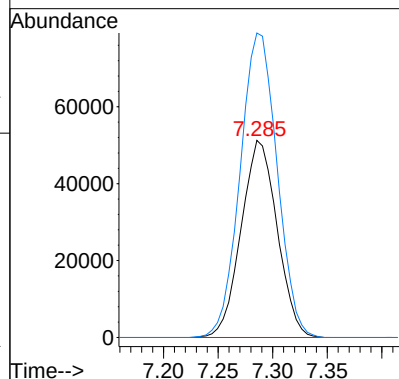
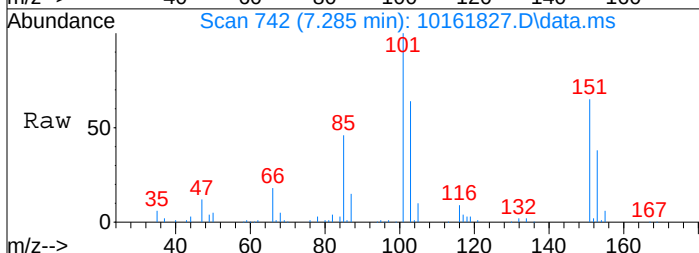
#19
Methylene Chloride
Concen: 0.10 ng
RT: 6.97 min Scan# 680
Delta R.T. -0.039 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

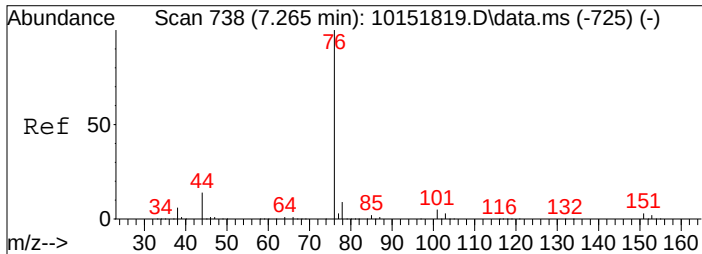
Tgt Ion: 84 Resp: 1420
Ion Ratio Lower Upper
84 100
49 170.6 107.7 157.7#



#21
Trichlorotrifluoroethane
Concen: 15.69 ng
RT: 7.29 min Scan# 742
Delta R.T. 0.019 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

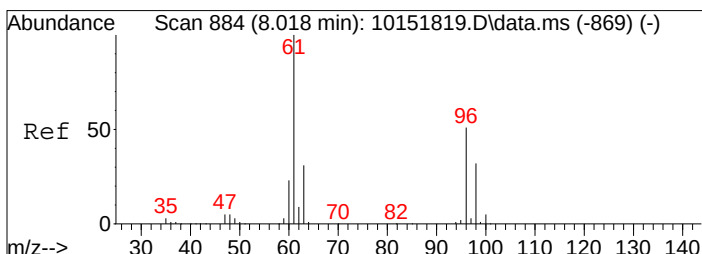
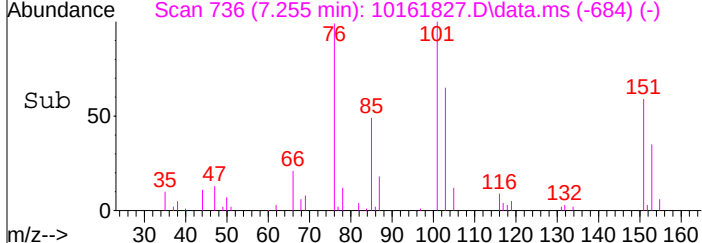
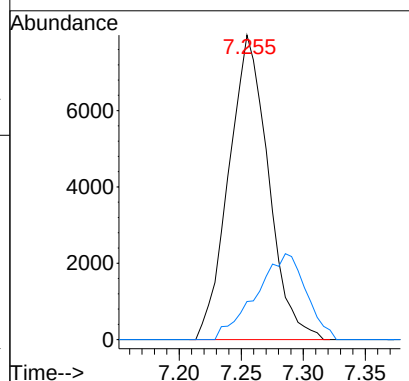
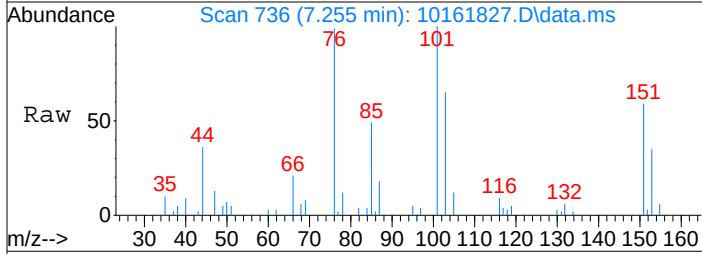
Tgt Ion: 151 Resp: 117758
Ion Ratio Lower Upper
151 100
101 158.5 122.3 162.3





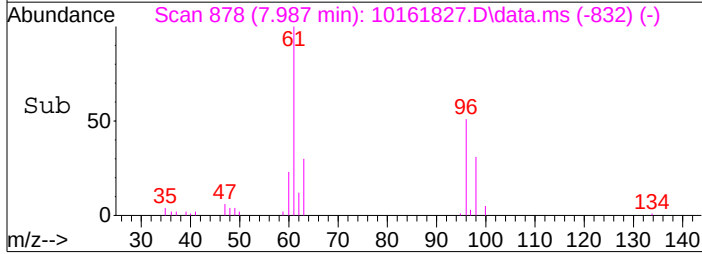
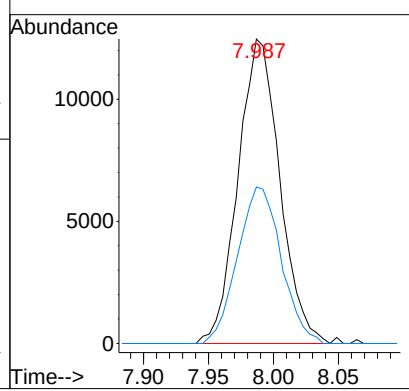
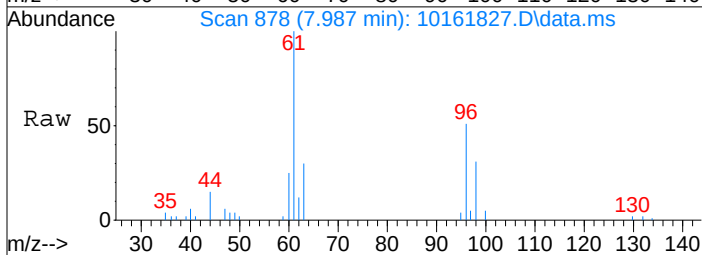
#22
Carbon Disulfide
Concen: 0.35 ng
RT: 7.25 min Scan# 736
Delta R.T. 0.019 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

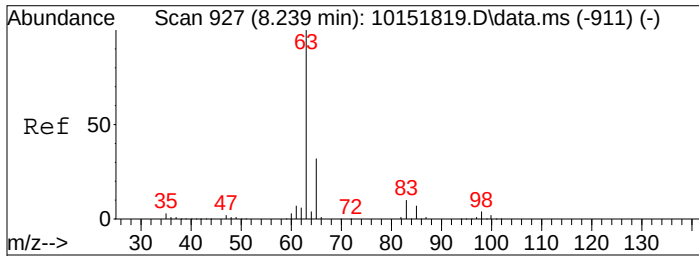
Tgt Ion:	76	Resp:	17724
Ion Ratio	Lower	Upper	
76	100		
78	35.8	0.0	29.6#



#23
trans-1,2-Dichloroethene
Concen: 1.02 ng
RT: 7.99 min Scan# 878
Delta R.T. -0.013 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

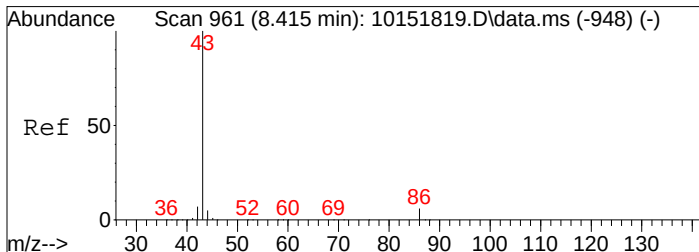
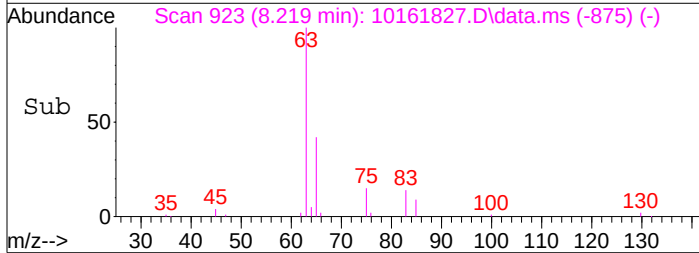
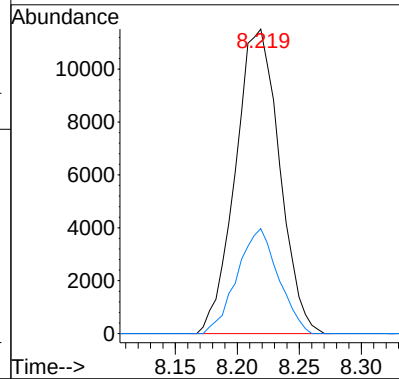
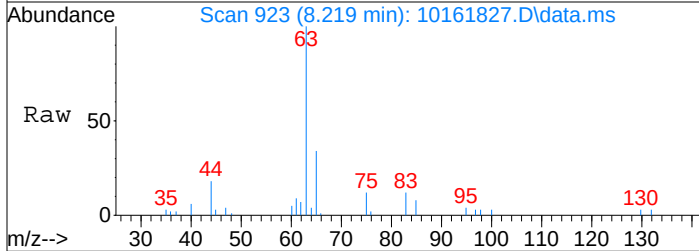
Tgt Ion:	61	Resp:	27875
Ion Ratio	Lower	Upper	
61	100		
96	53.7	43.2	83.2





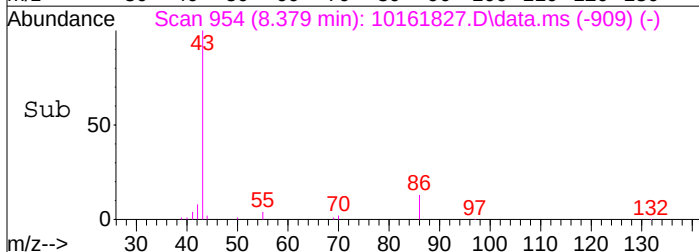
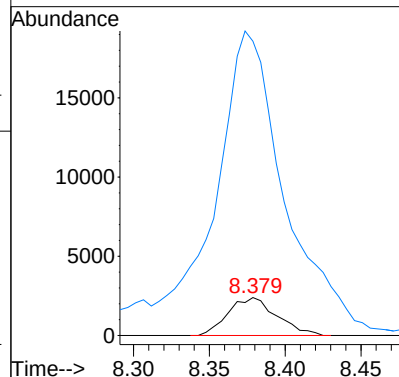
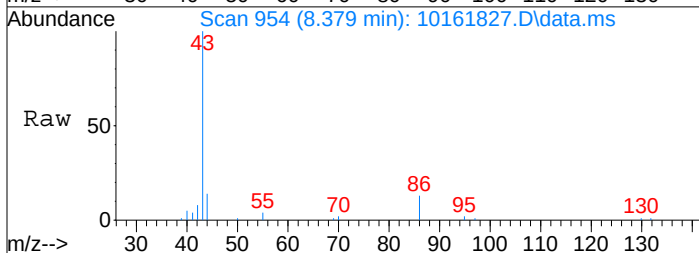
#24
1,1-Dichloroethane
Concen: 0.92 ng
RT: 8.22 min Scan# 923
Delta R.T. -0.001 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

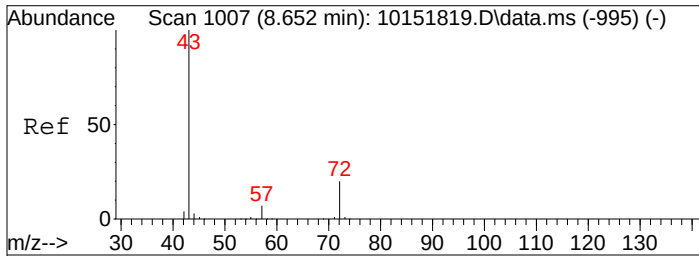
Tgt Ion: 63 Resp: 28526
Ion Ratio Lower Upper
63 100
65 32.3 12.0 52.0



#26
Vinyl Acetate
Concen: 2.14 ng
RT: 8.38 min Scan# 954
Delta R.T. -0.016 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

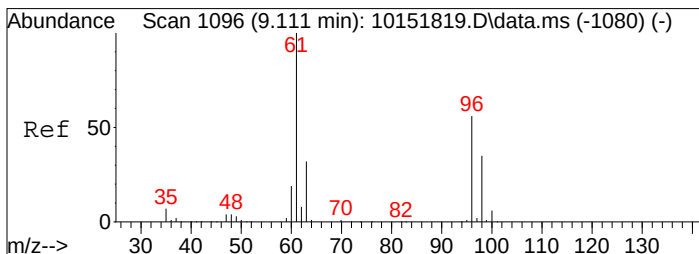
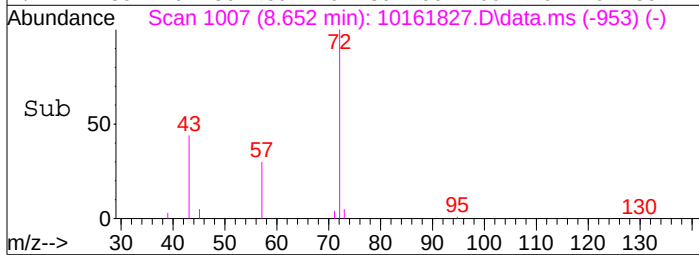
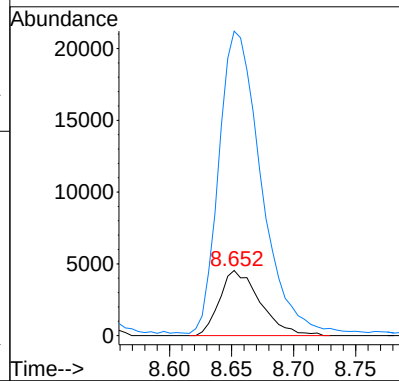
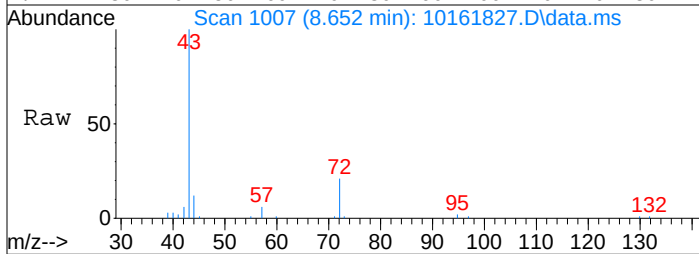
Tgt Ion: 86 Resp: 5341
Ion Ratio Lower Upper
86 100
43 1167.7 1172.7 1212.7#





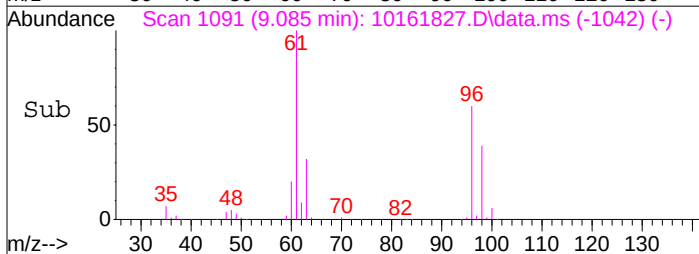
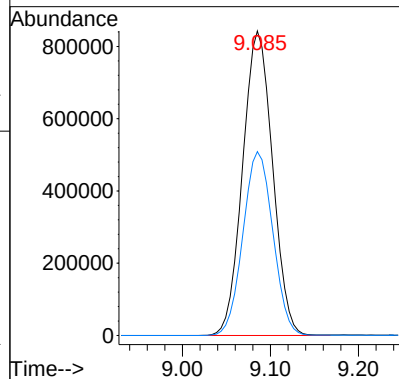
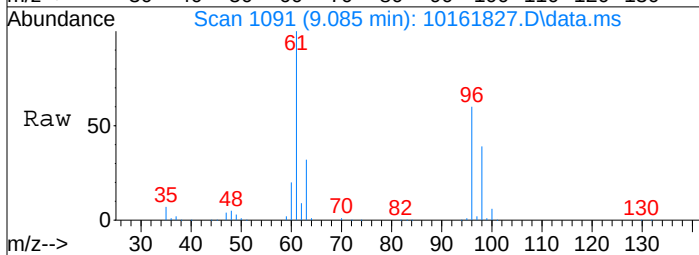
#27
2-Butanone (MEK)
Concen: 0.83 ng
RT: 8.65 min Scan# 1007
Delta R.T. 0.027 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

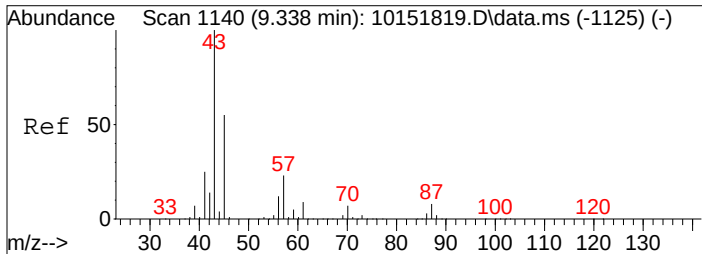
Tgt Ion: 72 Resp: 10328
Ion Ratio Lower Upper
72 100
43 484.7 371.5 411.5#



#28
cis-1,2-Dichloroethene
Concen: 74.57 ng
RT: 9.09 min Scan# 1091
Delta R.T. 0.004 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

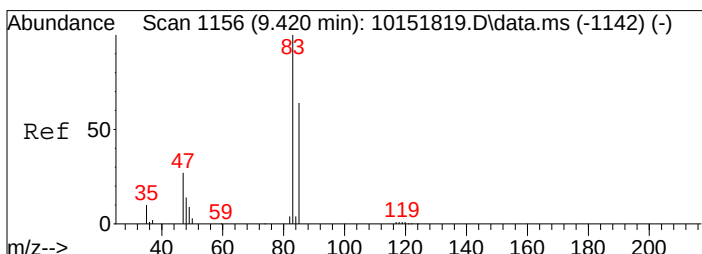
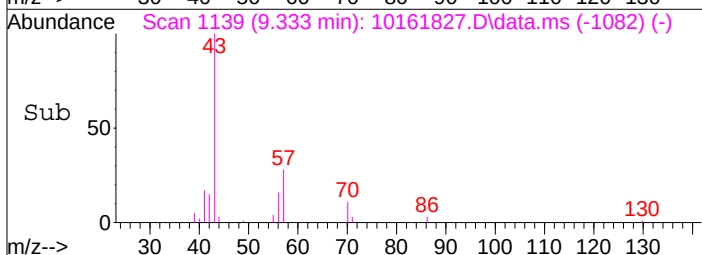
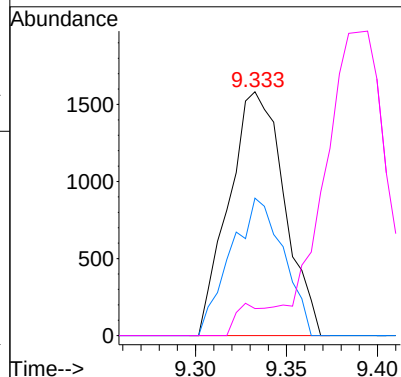
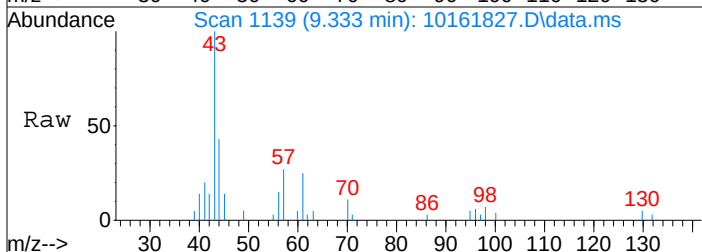
Tgt Ion: 61 Resp: 1991348
Ion Ratio Lower Upper
61 100
96 60.5 50.8 90.8





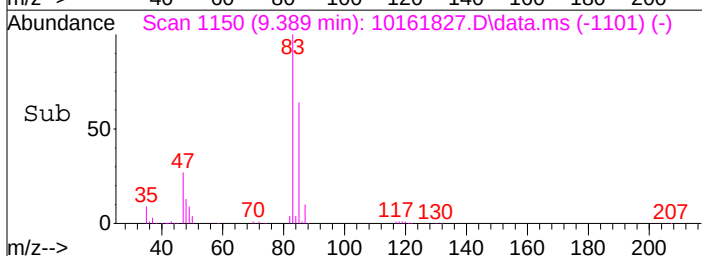
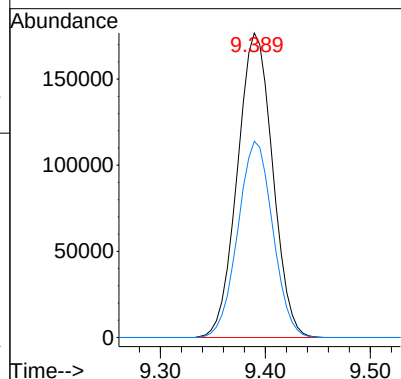
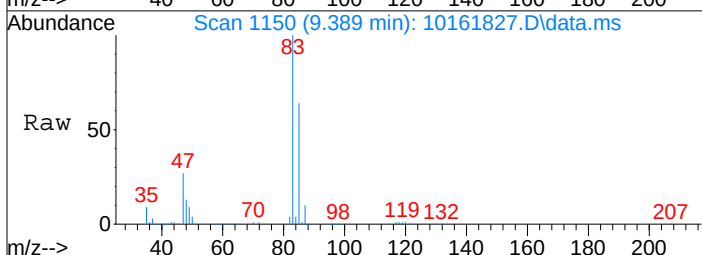
#31
n-Hexane
Concen: 0.10 ng
RT: 9.33 min Scan# 1139
Delta R.T. 0.042 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

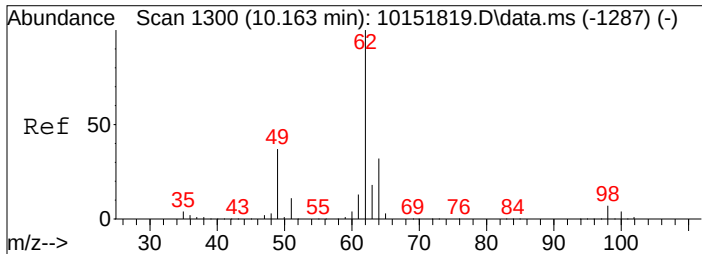
Tgt Ion:	57	Resp:	3352
Ion Ratio	Lower	Upper	
57	100		
56	53.6	41.2	61.8
86	8.3	10.8	16.2#



#32
Chloroform
Concen: 15.50 ng
RT: 9.39 min Scan# 1150
Delta R.T. 0.001 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

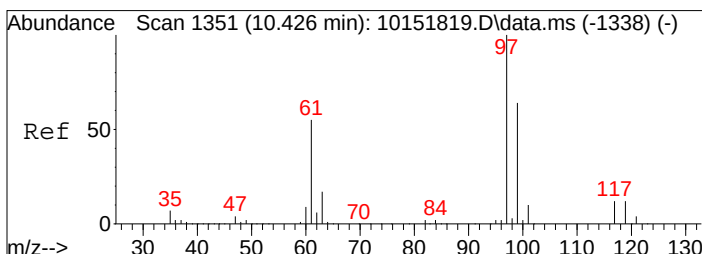
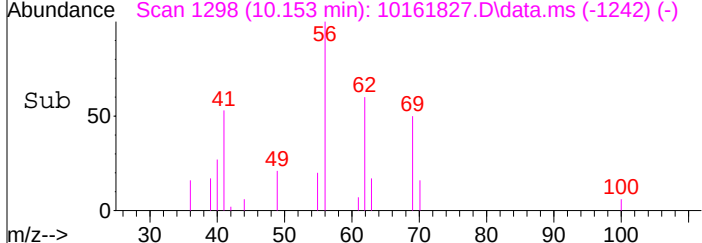
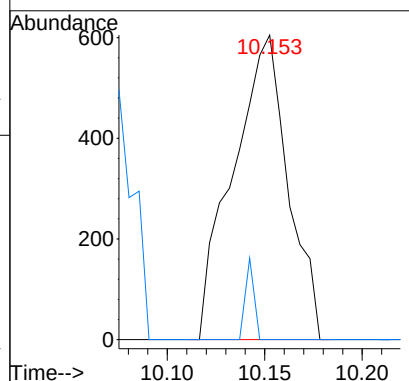
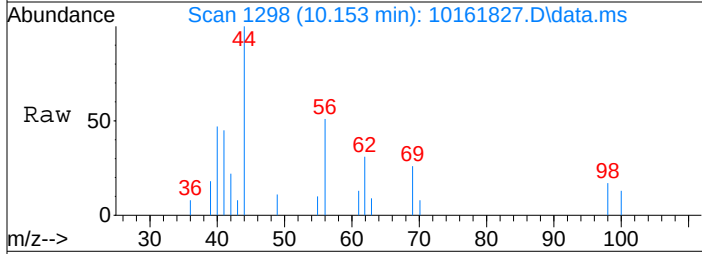
Tgt Ion:	83	Resp:	412080
Ion Ratio	Lower	Upper	
83	100		
85	63.9	44.5	84.5





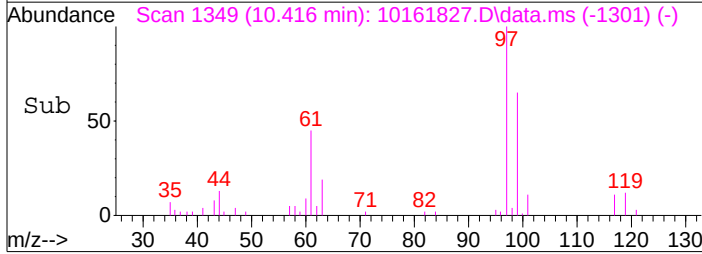
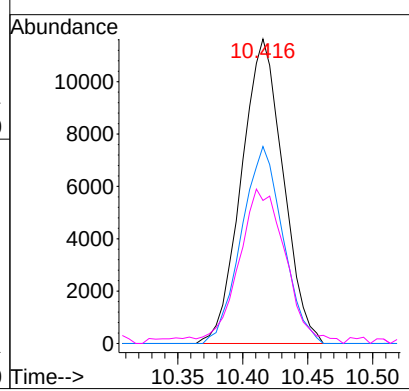
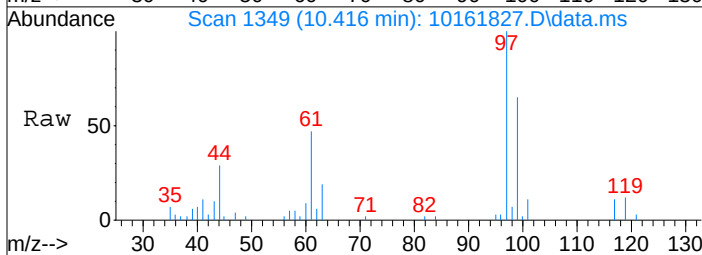
#36
 1,2-Dichloroethane
 Concen: 0.05 ng
 RT: 10.15 min Scan# 1298
 Delta R.T. 0.037 min
 Lab File: 10161827.D
 Acq: 17 Oct 2018 1:22

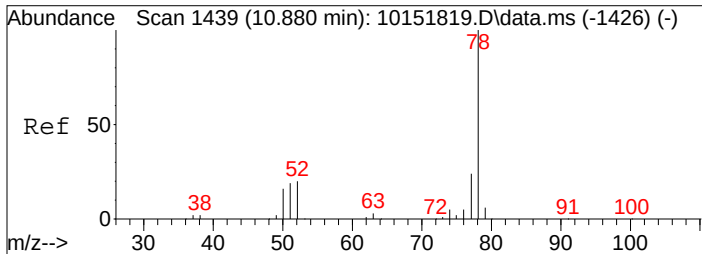
Tgt Ion:	62	Resp:	1188
Ion Ratio	Lower	Upper	
62	100		
64	0.0	12.7	52.7#



#38
 1,1,1-Trichloroethane
 Concen: 1.09 ng
 RT: 10.42 min Scan# 1349
 Delta R.T. -0.002 min
 Lab File: 10161827.D
 Acq: 17 Oct 2018 1:22

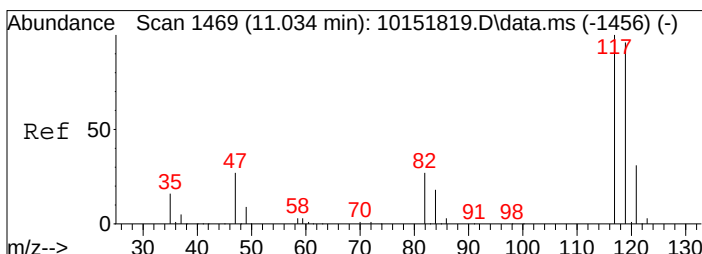
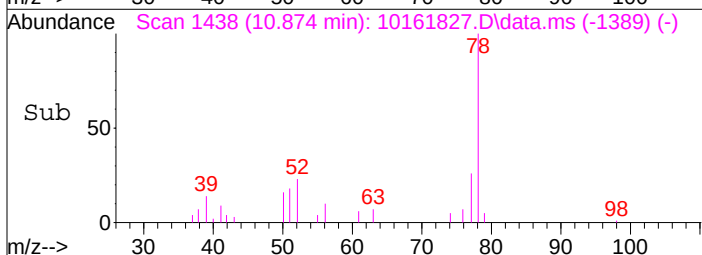
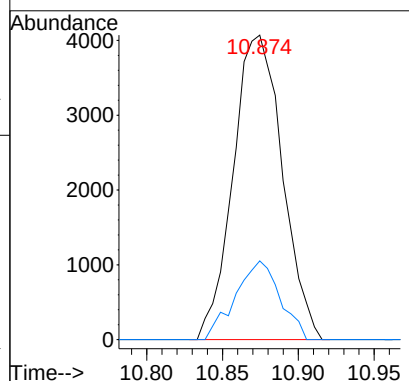
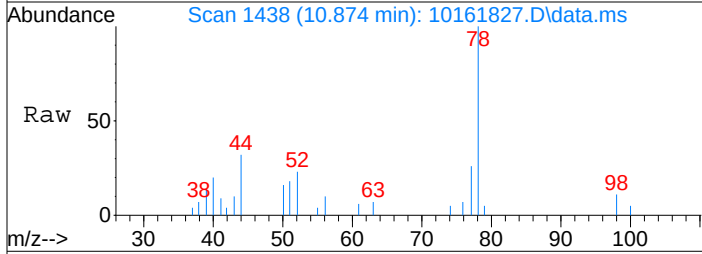
Tgt Ion:	97	Resp:	25973
Ion Ratio	Lower	Upper	
97	100		
99	64.4	44.2	84.2
61	58.2	24.9	64.9





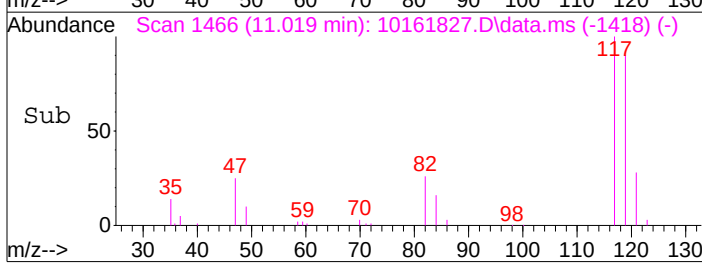
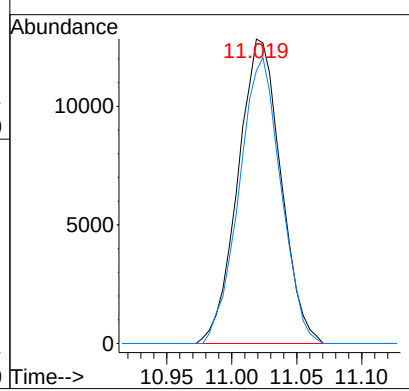
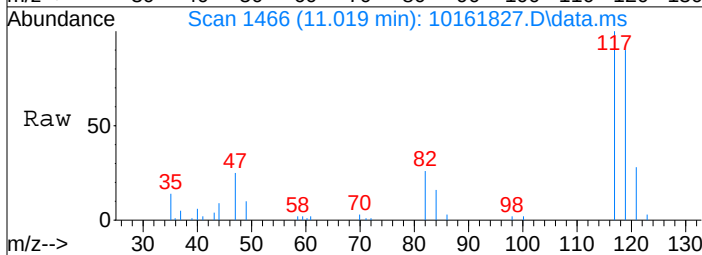
#41
Benzene
Concen: 0.11 ng
RT: 10.87 min Scan# 1438
Delta R.T. 0.005 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

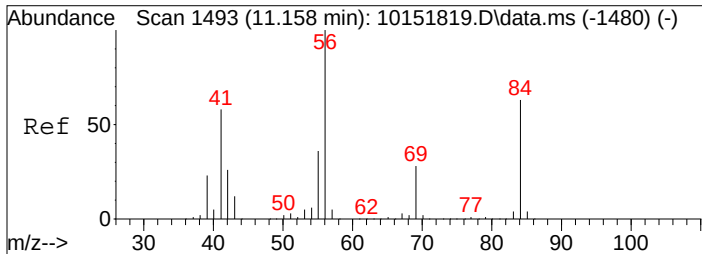
Tgt Ion: 78	Resp: 9198
Ion Ratio	Lower Upper
78	100
77	23.4 3.8 43.8



#42
Carbon Tetrachloride
Concen: 1.66 ng
RT: 11.02 min Scan# 1466
Delta R.T. -0.000 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

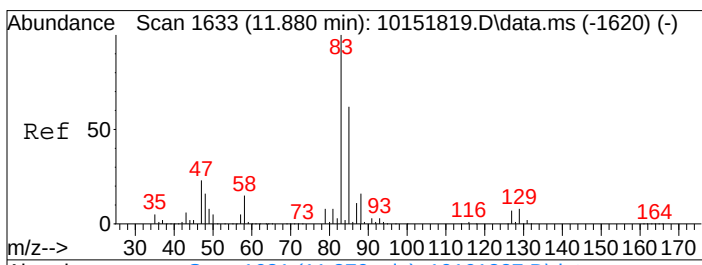
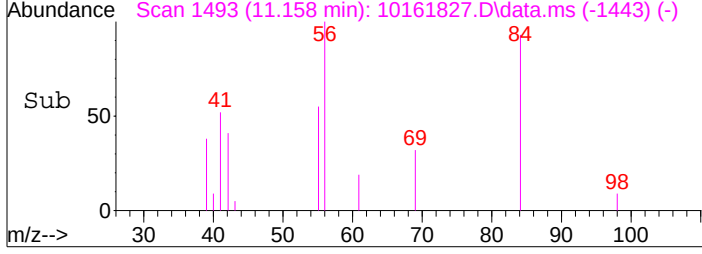
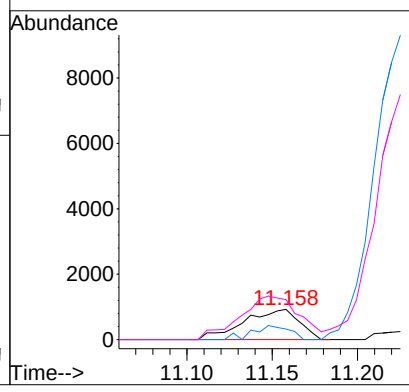
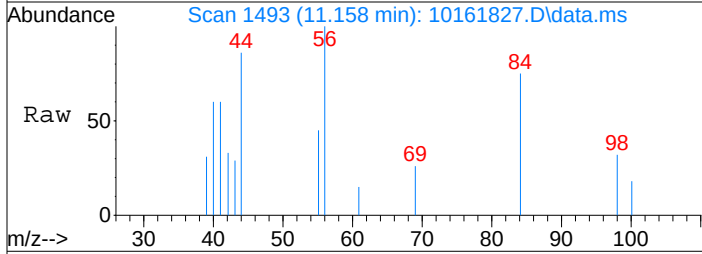
Tgt Ion: 117	Resp: 29428
Ion Ratio	Lower Upper
117	100
119	91.5 76.6 116.6





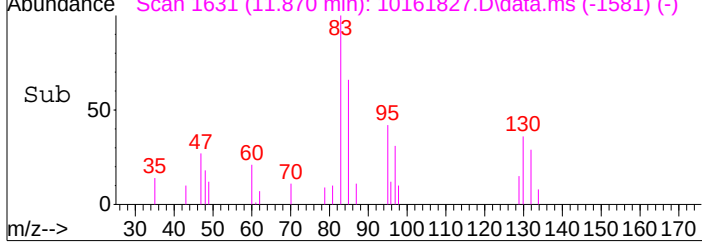
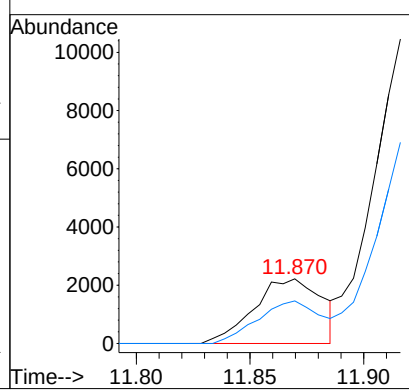
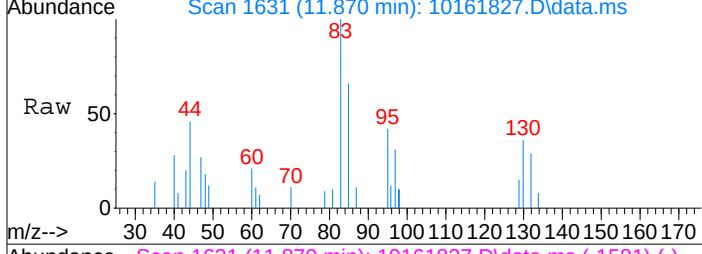
#43
Cyclohexane
Concen: 0.07 ng
RT: 11.16 min Scan# 1493
Delta R.T. 0.010 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

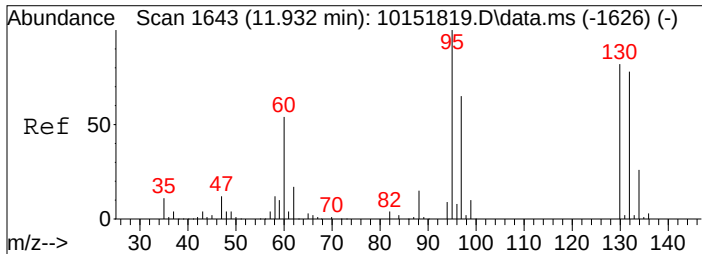
Tgt Ion:	84	Resp:	2099
Ion Ratio	Lower	Upper	
84	100		
69	30.9	19.8	59.8
56	153.1	109.3	149.3#



#46
Bromodichloromethane
Concen: 0.19 ng
RT: 11.87 min Scan# 1631
Delta R.T. 0.007 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

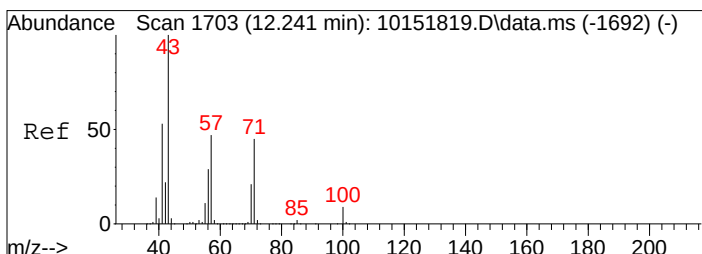
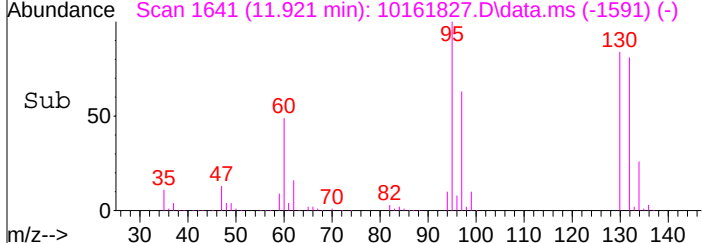
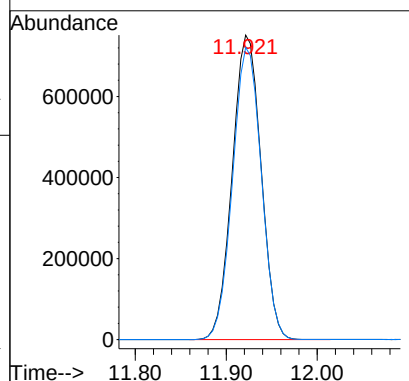
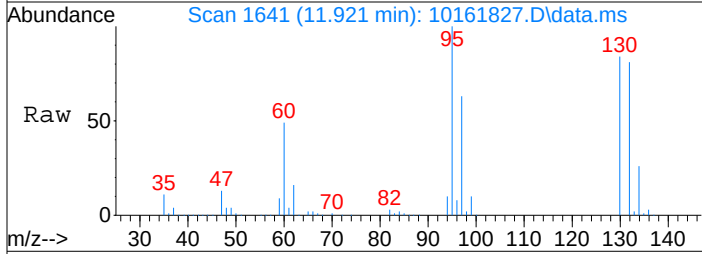
Tgt Ion:	83	Resp:	4610
Ion Ratio	Lower	Upper	
83	100		
85	60.8	43.2	83.2





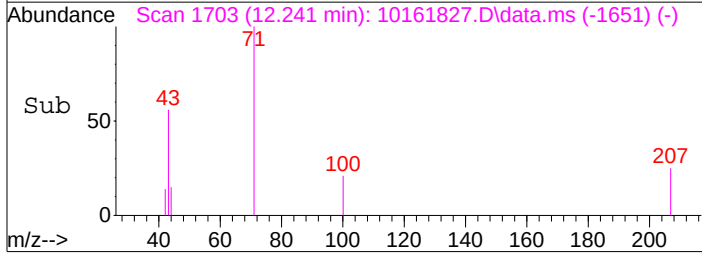
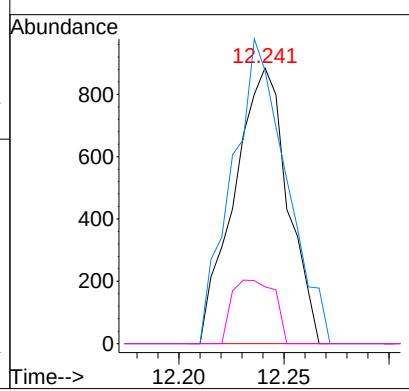
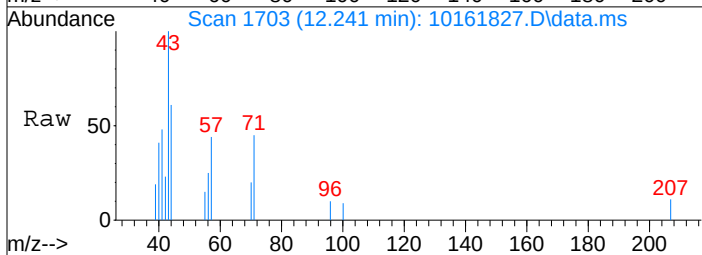
#47
 Trichloroethene
 Concen: 101.54 ng
 RT: 11.92 min Scan# 1641
 Delta R.T. 0.007 min
 Lab File: 10161827.D
 Acq: 17 Oct 2018 1:22

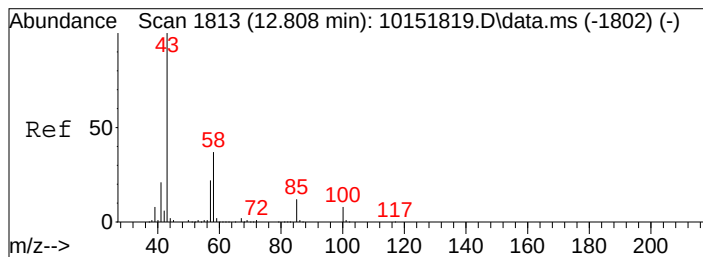
Tgt Ion:	130	Resp:	1652528
Ion Ratio	Lower	Upper	
130	100		
132	95.7	75.3	115.3



#51
 n-Heptane
 Concen: 0.07 ng
 RT: 12.24 min Scan# 1703
 Delta R.T. 0.018 min
 Lab File: 10161827.D
 Acq: 17 Oct 2018 1:22

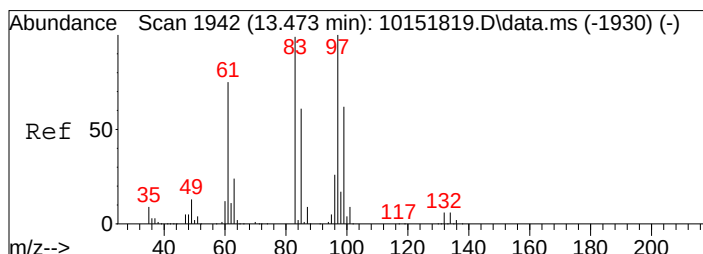
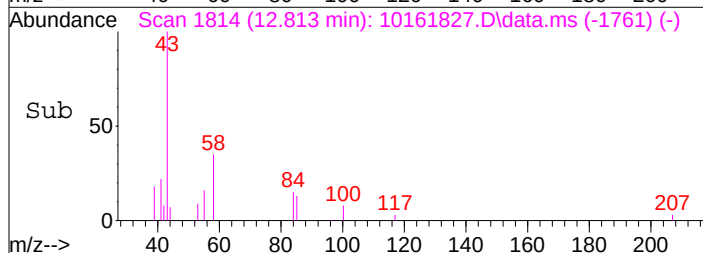
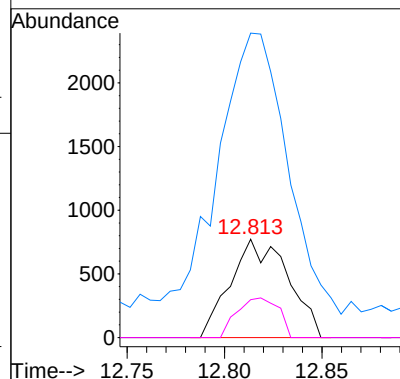
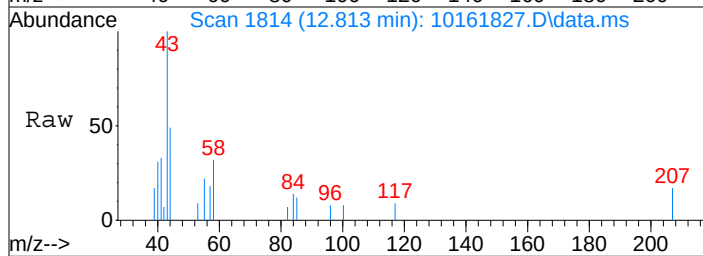
Tgt Ion:	71	Resp:	1565
Ion Ratio	Lower	Upper	
71	100		
57	112.3	74.0	114.0
100	18.4	3.7	43.7





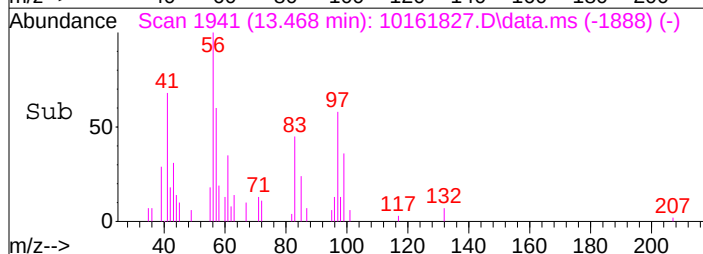
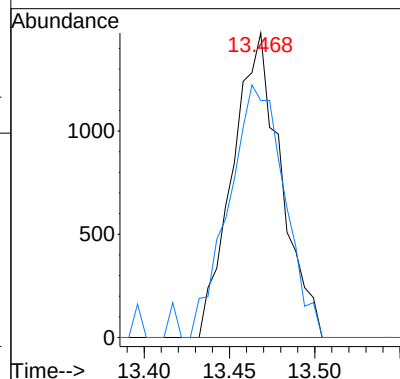
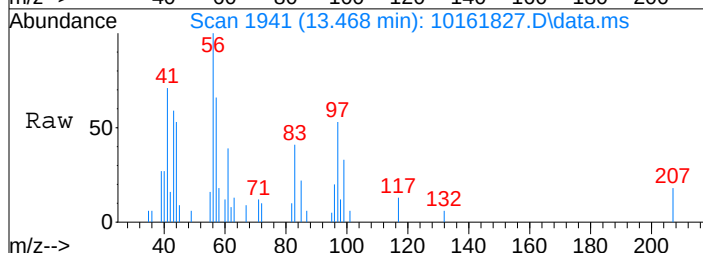
#53
4-Methyl-2-pentanone
Concen: 0.07 ng
RT: 12.81 min Scan# 1814
Delta R.T. 0.024 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

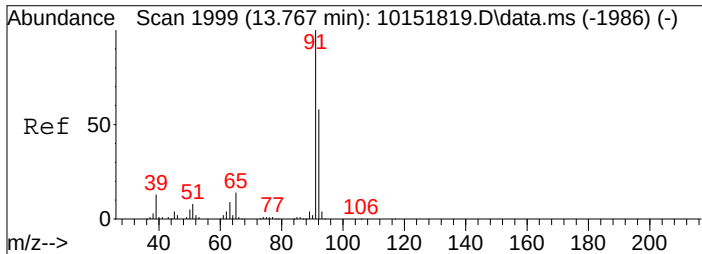
Tgt Ion: 58 Resp: 1590
Ion Ratio Lower Upper
58 100
43 370.4 189.3 283.9#
85 29.1 33.6 50.4#



#55
1,1,2-Trichloroethane
Concen: 0.17 ng
RT: 13.47 min Scan# 1941
Delta R.T. 0.021 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

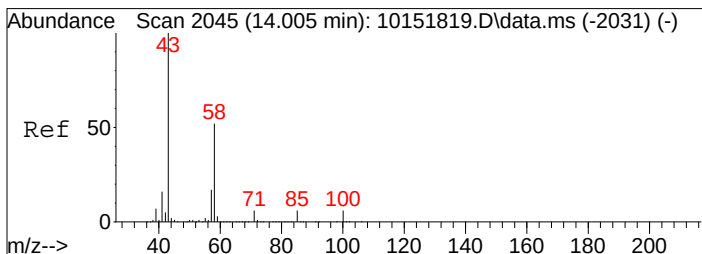
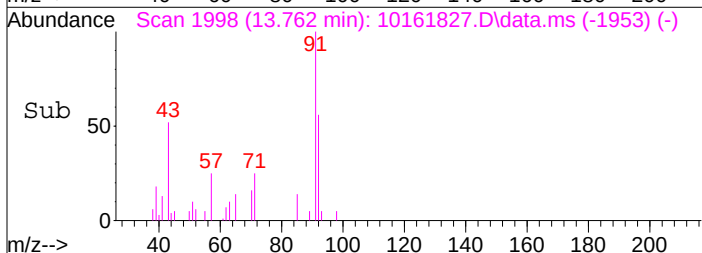
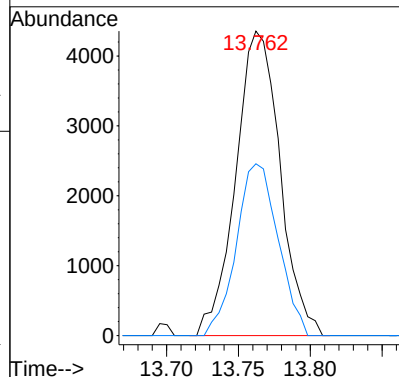
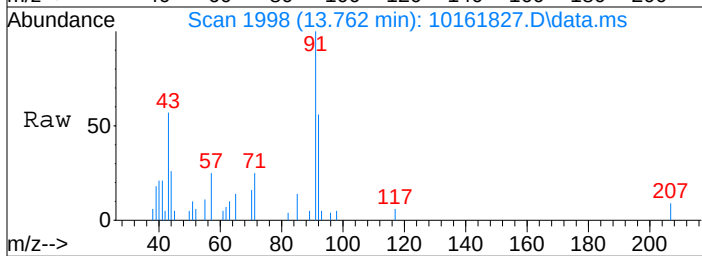
Tgt Ion: 97 Resp: 2915
Ion Ratio Lower Upper
97 100
83 95.5 70.4 110.4





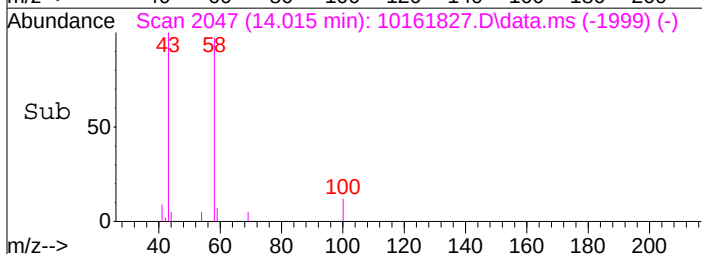
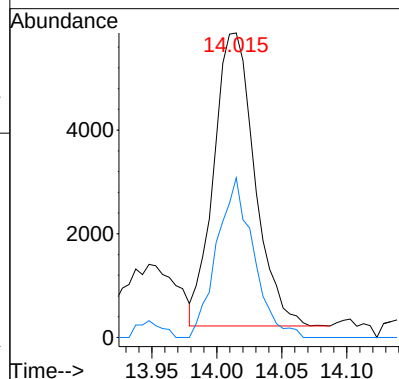
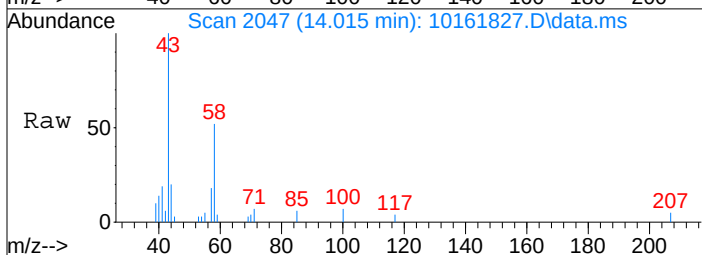
#58
Toluene
Concen: 0.13 ng
RT: 13.76 min Scan# 1998
Delta R.T. -0.016 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

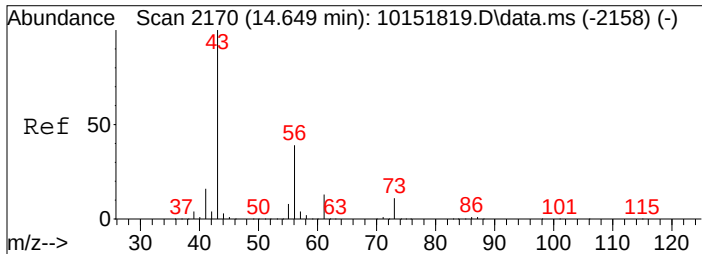
Tgt Ion: 91 Resp: 9345
Ion Ratio Lower Upper
91 100
92 53.2 38.5 78.5



#59
2-Hexanone
Concen: 0.21 ng
RT: 14.01 min Scan# 2047
Delta R.T. -0.000 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

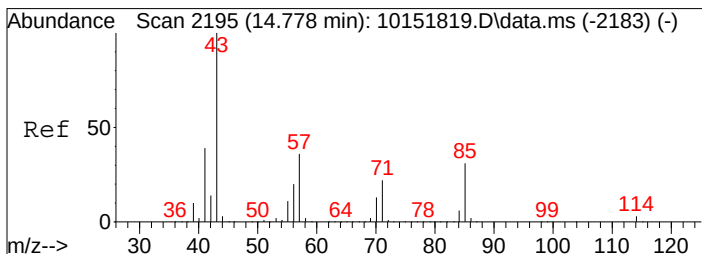
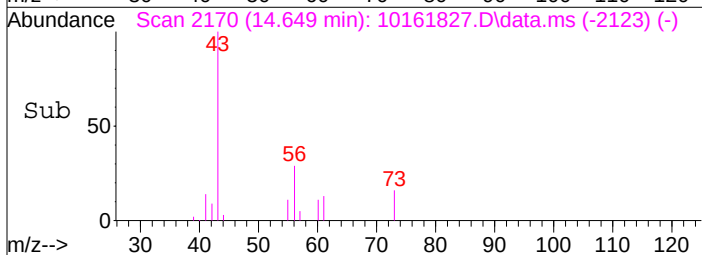
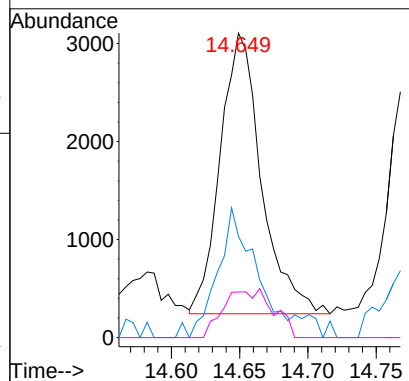
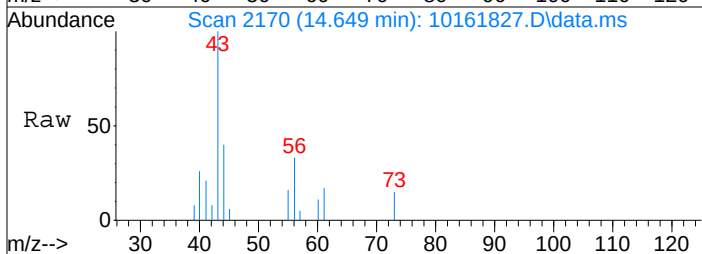
Tgt Ion: 43 Resp: 12379
Ion Ratio Lower Upper
43 100
58 48.5 39.4 79.4





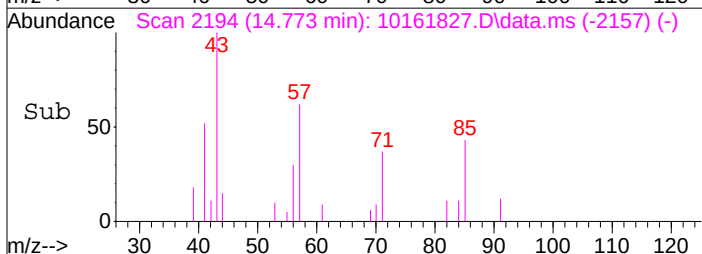
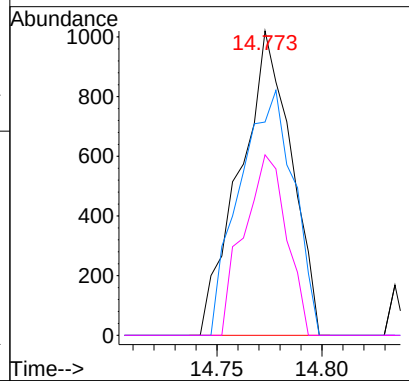
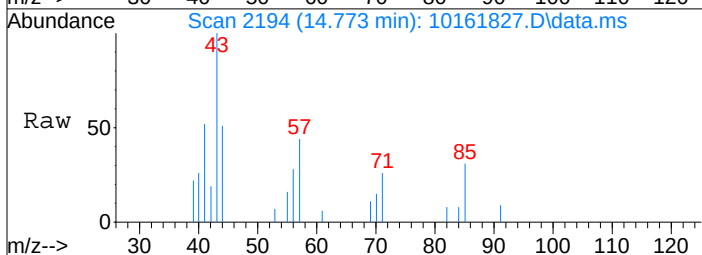
#62
n-Butyl Acetate
Concen: 0.09 ng
RT: 14.65 min Scan# 2170
Delta R.T. -0.005 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

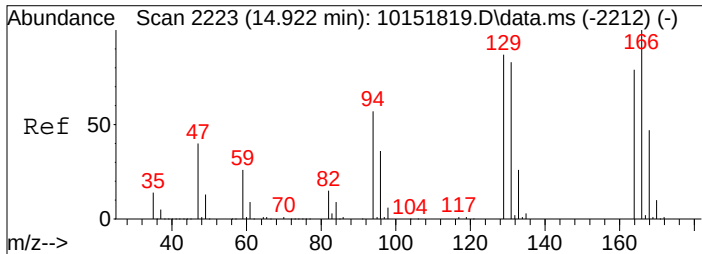
Tgt Ion: 43	Resp: 6027
Ion Ratio	Lower Upper
43	100
56	48.2 24.3 64.3
73	20.8 0.0 34.7



#63
n-Octane
Concen: 0.08 ng
RT: 14.77 min Scan# 2194
Delta R.T. -0.010 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

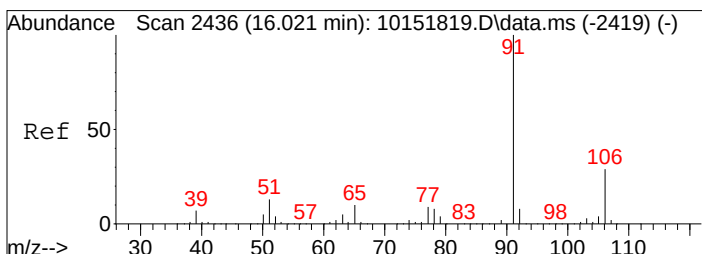
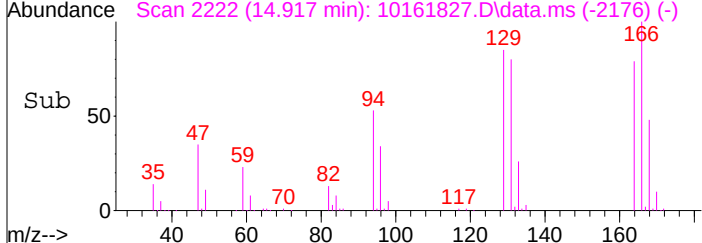
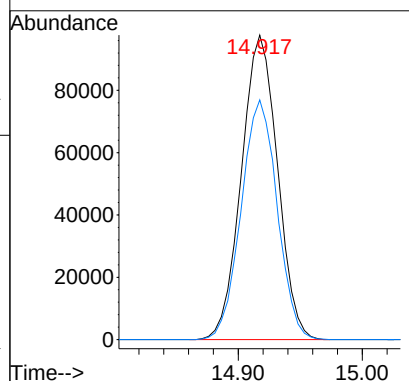
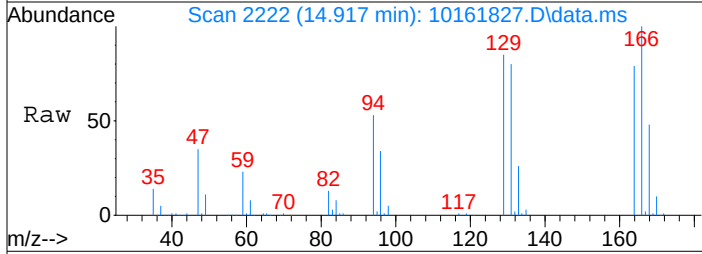
Tgt Ion: 57	Resp: 1731
Ion Ratio	Lower Upper
57	100
85	85.2 84.0 126.0
71	49.5 53.8 80.6#





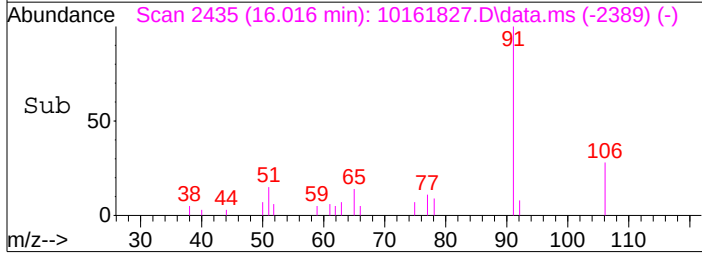
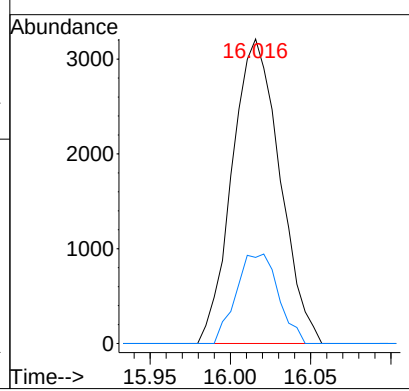
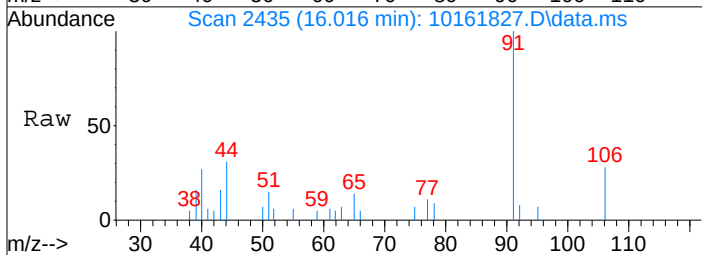
#64
Tetrachloroethene
Concen: 14.73 ng
RT: 14.92 min Scan# 2222
Delta R.T. -0.011 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

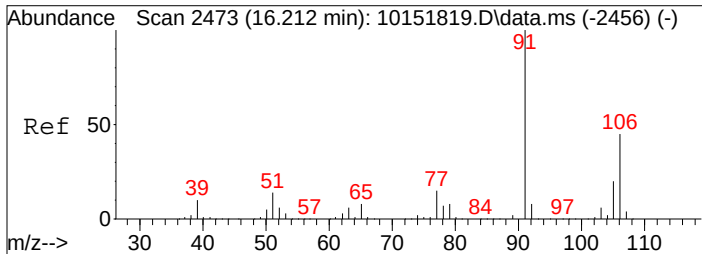
Tgt Ion:166	Resp:	198273
Ion Ratio	Lower	Upper
166	100	
164	78.4	59.0 99.0



#66
Ethylbenzene
Concen: 0.07 ng
RT: 16.02 min Scan# 2435
Delta R.T. -0.010 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

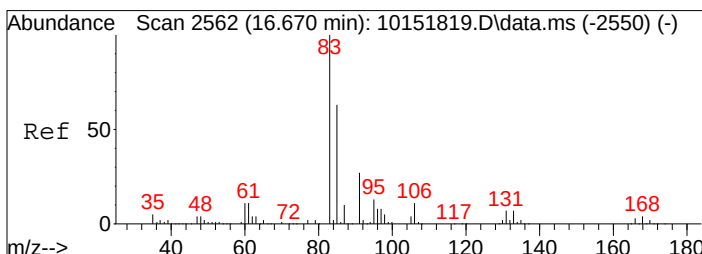
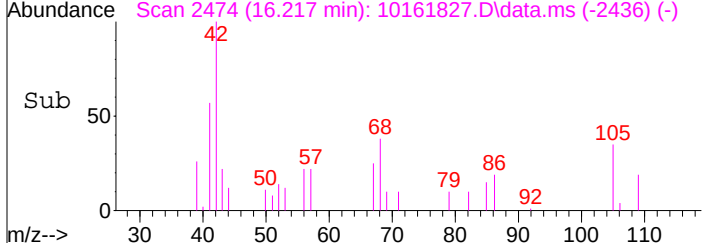
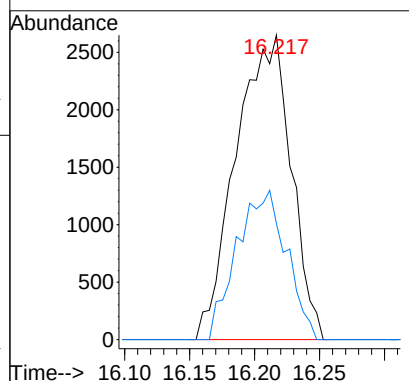
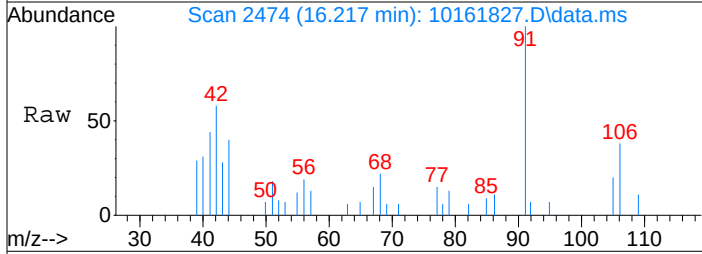
Tgt Ion: 91	Resp:	6635
Ion Ratio	Lower	Upper
91	100	
106	26.0	10.8 50.8





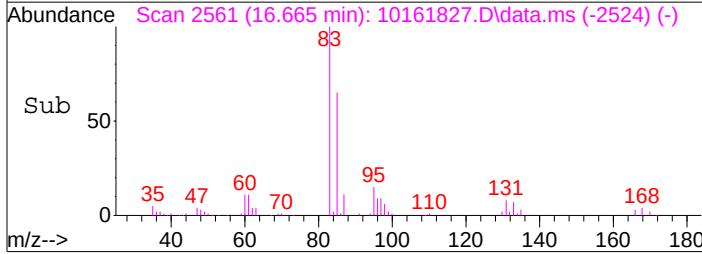
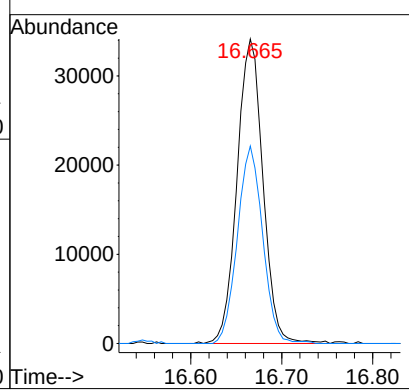
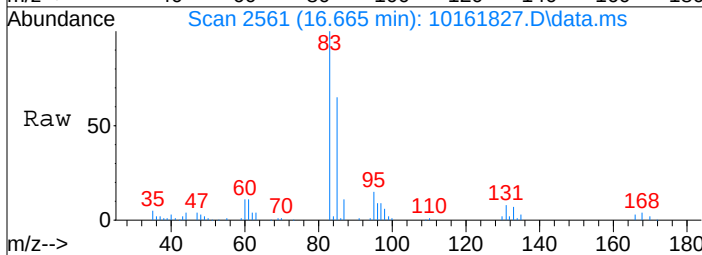
#67
 m- & p-Xylenes
 Concen: 0.12 ng
 RT: 16.22 min Scan# 2474
 Delta R.T. -0.005 min
 Lab File: 10161827.D
 Acq: 17 Oct 2018 1:22

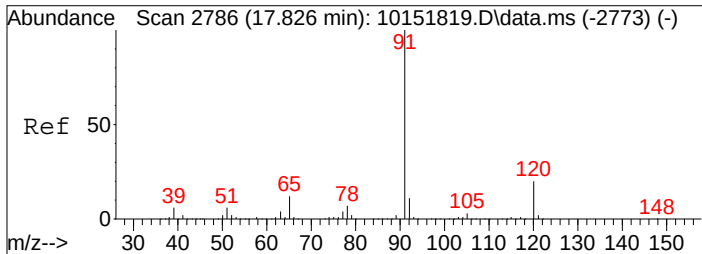
Tgt Ion:	91	Resp:	7813
Ion Ratio	Lower	Upper	
91	100		
106	44.0	28.7	68.7



#72
 1,1,2,2-Tetrachloroethane
 Concen: 2.11 ng
 RT: 16.67 min Scan# 2561
 Delta R.T. -0.010 min
 Lab File: 10161827.D
 Acq: 17 Oct 2018 1:22

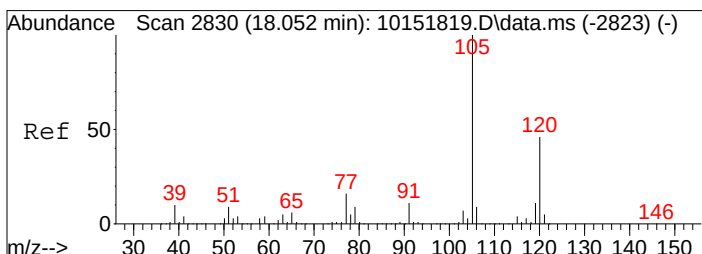
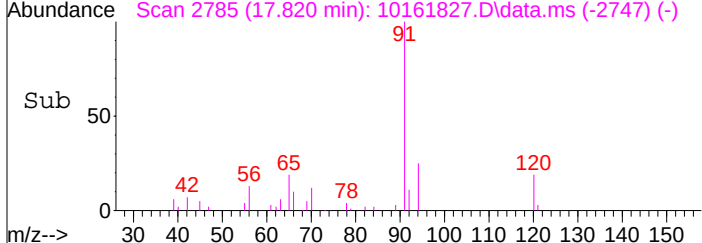
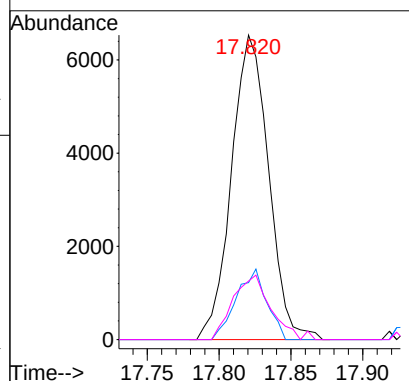
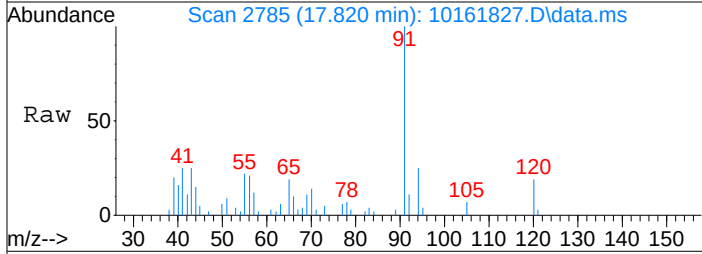
Tgt Ion:	83	Resp:	67569
Ion Ratio	Lower	Upper	
83	100		
85	63.2	44.0	84.0





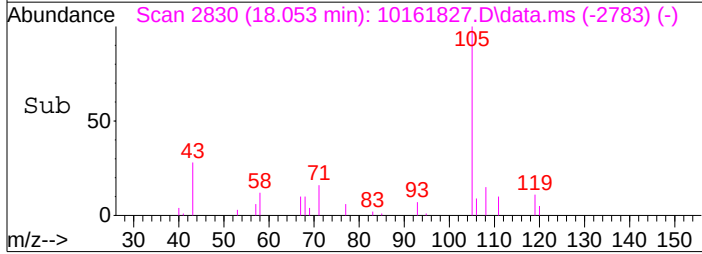
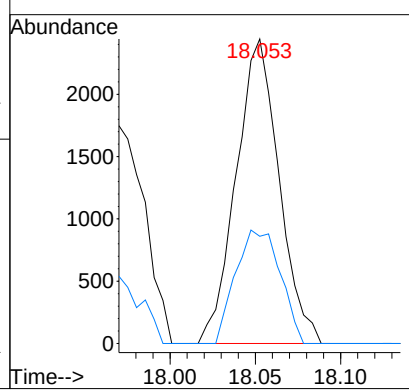
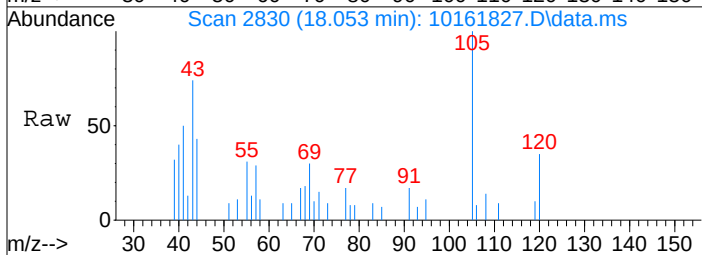
#76
n-Propylbenzene
Concen: 0.11 ng
RT: 17.82 min Scan# 2785
Delta R.T. -0.005 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

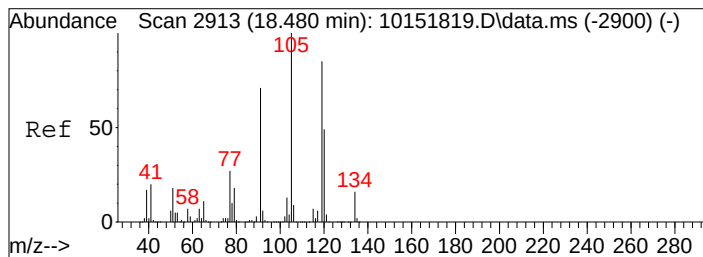
Tgt Ion:	91	Resp:	11747
Ion Ratio	Lower	Upper	
91	100		
120	19.1	1.8	41.8
65	21.6	0.0	30.4



#79
1,3,5-Trimethylbenzene
Concen: 0.07 ng
RT: 18.05 min Scan# 2830
Delta R.T. -0.005 min
Lab File: 10161827.D
Acq: 17 Oct 2018 1:22

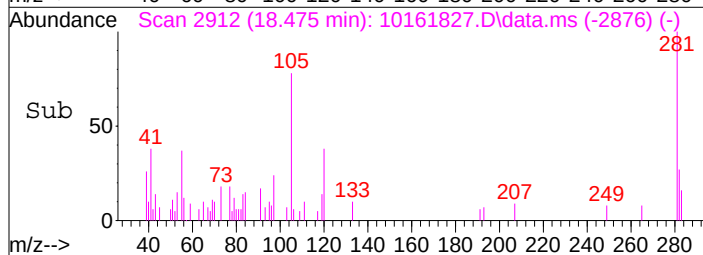
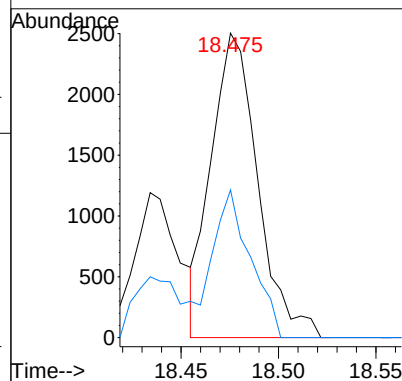
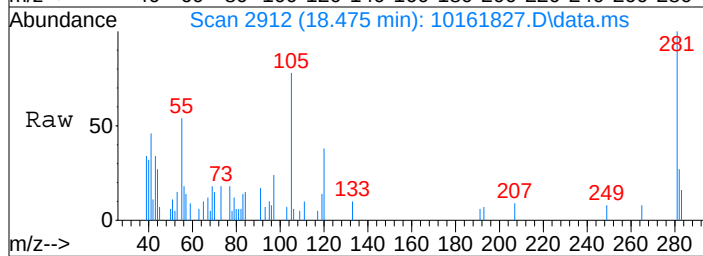
Tgt Ion:	105	Resp:	4291
Ion Ratio	Lower	Upper	
105	100		
120	38.8	28.3	68.3





#82
 1,2,4-Trimethylbenzene
 Concen: 0.06 ng
 RT: 18.48 min Scan# 2912
 Delta R.T. -0.016 min
 Lab File: 10161827.D
 Acq: 17 Oct 2018 1:22

Tgt Ion:105 Resp: 4160
 Ion Ratio Lower Upper
 105 100
 120 37.6 33.1 73.1



Data File: I:\MS09\Data\2018 10\16\10161827.D

Acq On : 17 Oct 2018 1:22

Operator: SC

Sample : P1805277-001dup (1000mL)

Misc : S31-10151806

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Oct 17 10:17:19 2018

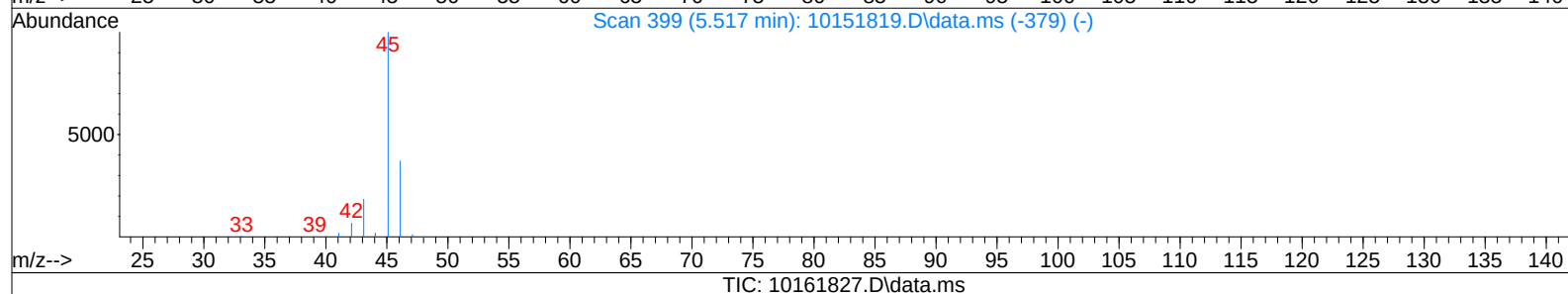
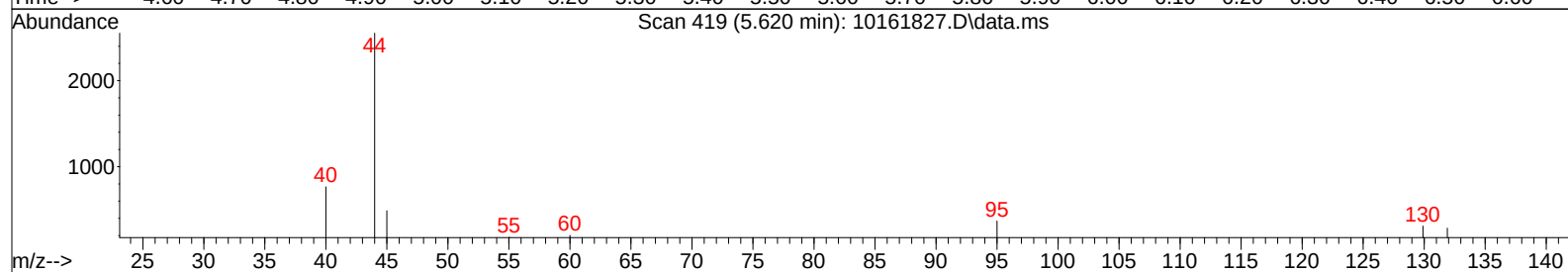
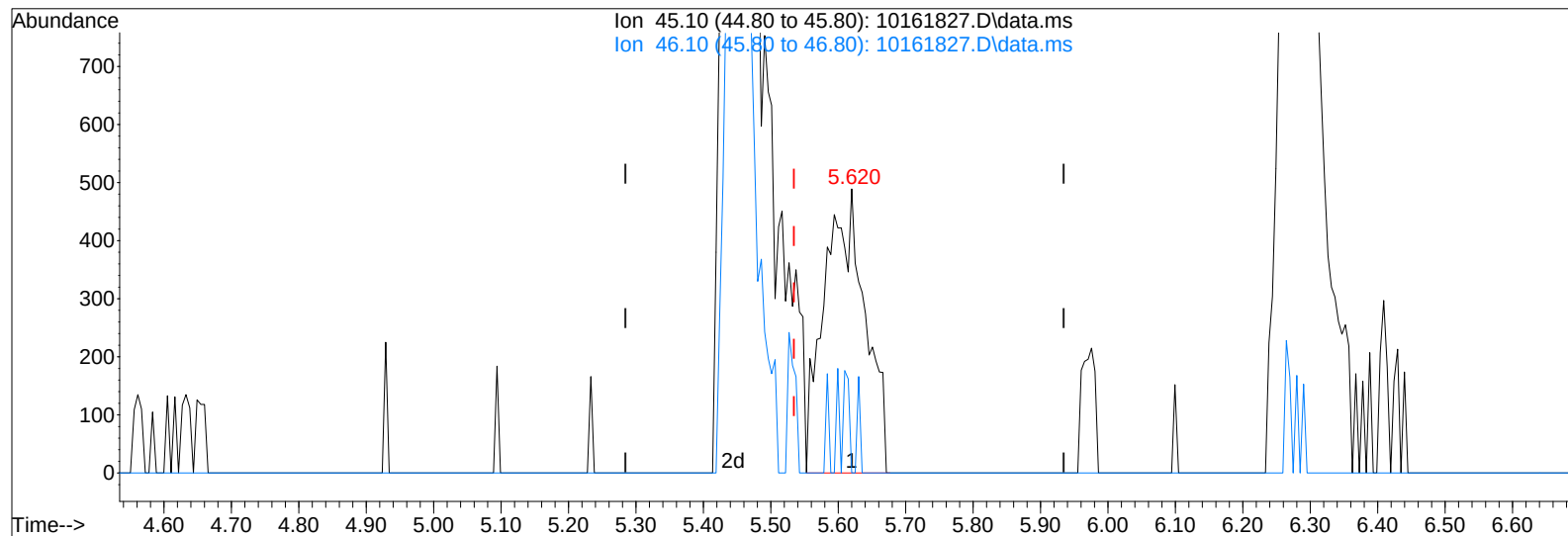
Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Wed Oct 17 09:09:32 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



(10) Ethanol (T)

5.620min (+0.086) 0.12ng

response 2047

Ion	Exp%	Act%
45.10	100	100
46.10	36.80	2.49#
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS09\Data\2018 10\16\10161827.D

Acq On : 17 Oct 2018 1:22

Operator: SC

Sample : P1805277-001dup (1000mL)

Misc : S31-10151806

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Oct 17 10:17:19 2018

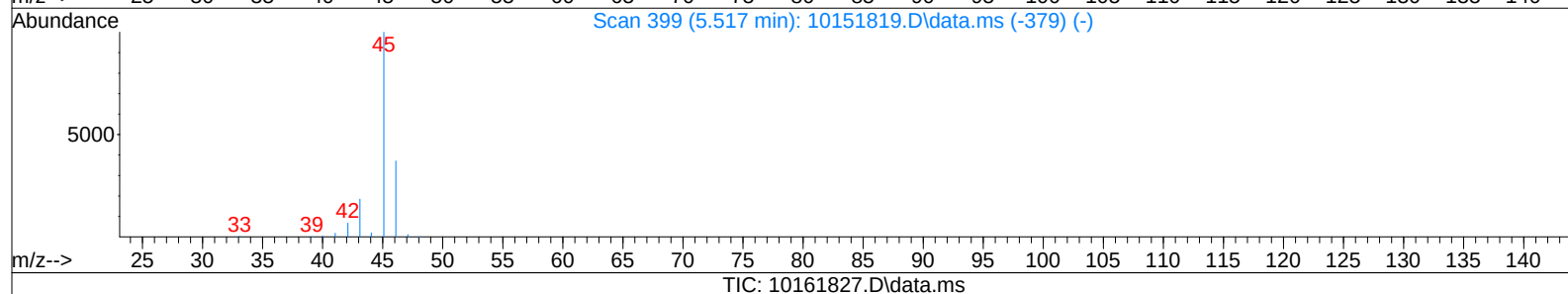
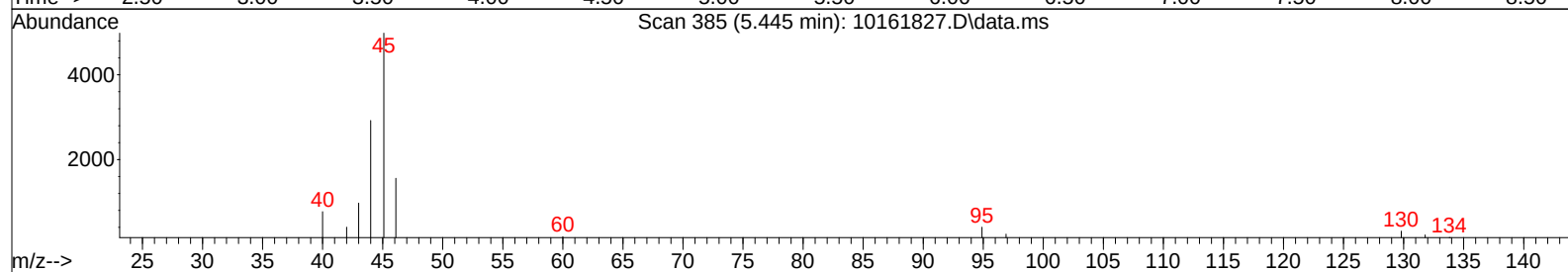
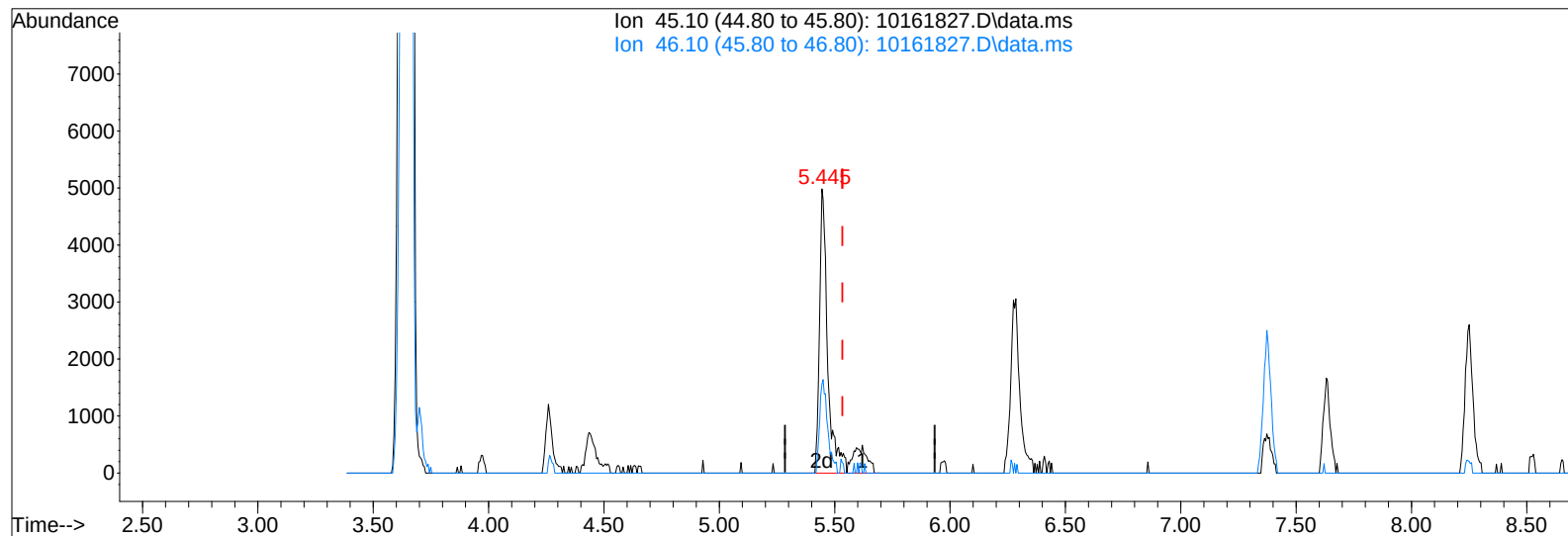
Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Wed Oct 17 09:09:32 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



(10) Ethanol (T)

5.445min (-0.090) 0.85ng m

response 14212

MP

10/17/18

10/17/18

Ion	Exp%	Act%
45.10	100	100
46.10	36.80	0.36#
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS09\Data\2018 10\16\10161827.D

Acq On : 17 Oct 2018 1:22

Operator: SC

Sample : P1805277-001dup (1000mL)

Misc : S31-10151806

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Oct 17 10:17:19 2018

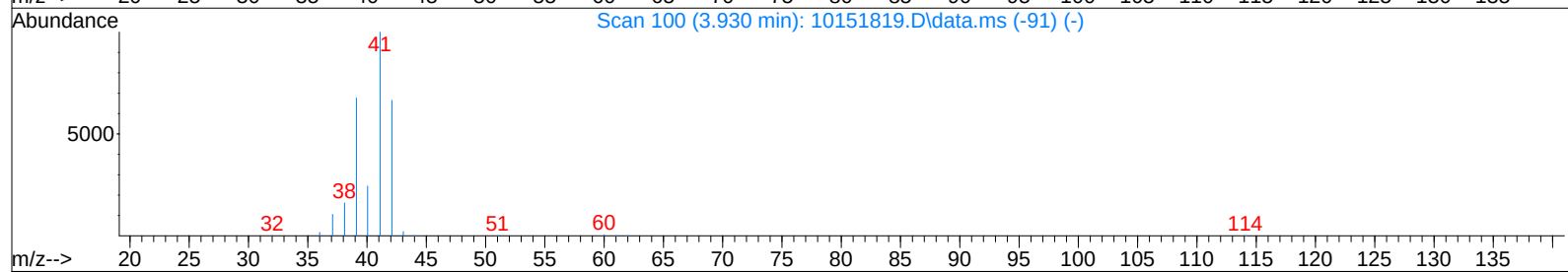
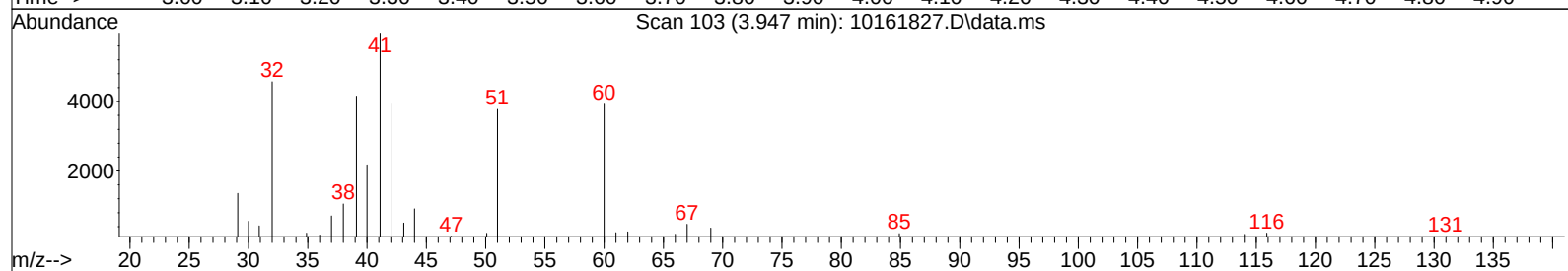
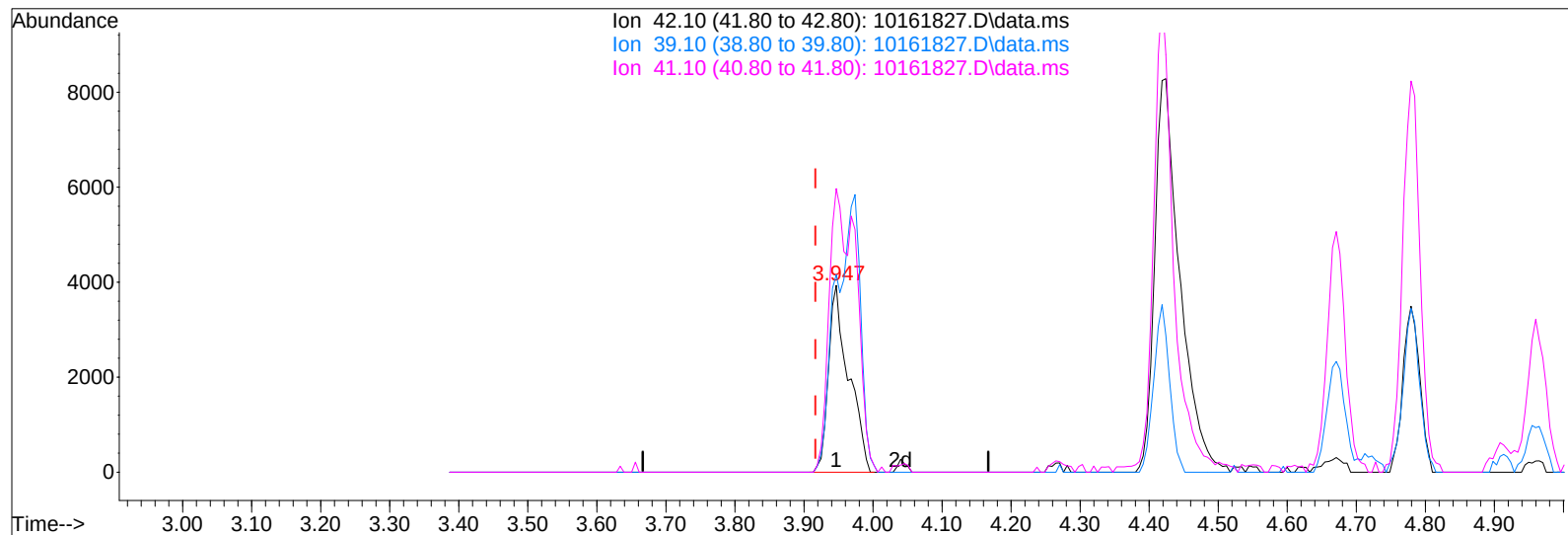
Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Wed Oct 17 09:09:32 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 10161827.D\data.ms

(2) Propene (T)

3.947min (+0.030) 0.33ng

response 7984

Ion	Exp%	Act%
42.10	100	100
39.10	98.40	181.61#
41.10	147.90	201.97#
0.00	0.00	0.00

Data File: I:\MS09\Data\2018 10\16\10161827.D

Acq On : 17 Oct 2018 1:22

Operator: SC

Sample : P1805277-001dup (1000mL)

Misc : S31-10151806

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Oct 17 10:17:19 2018

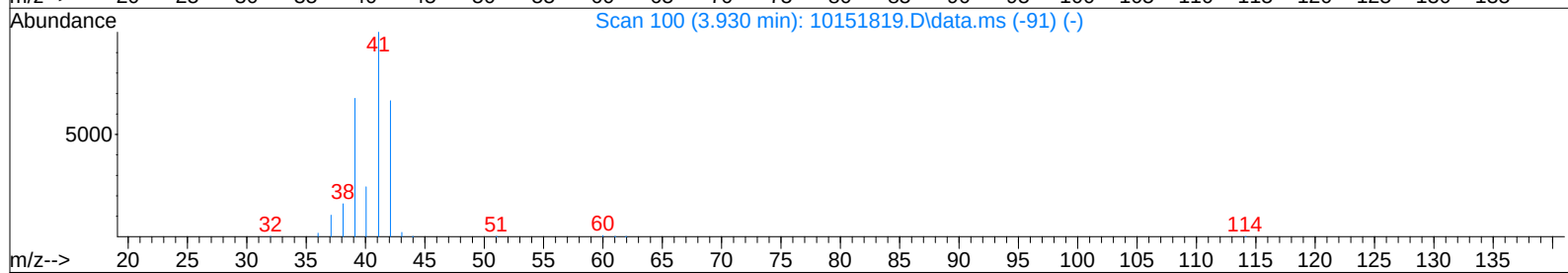
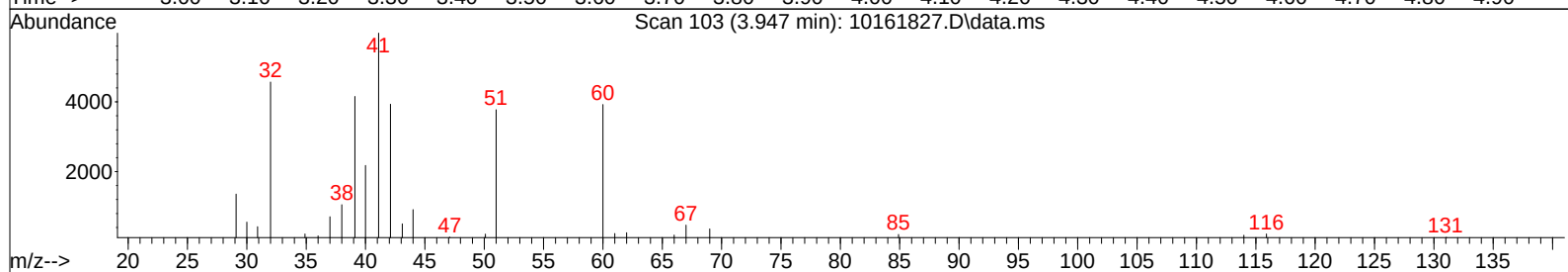
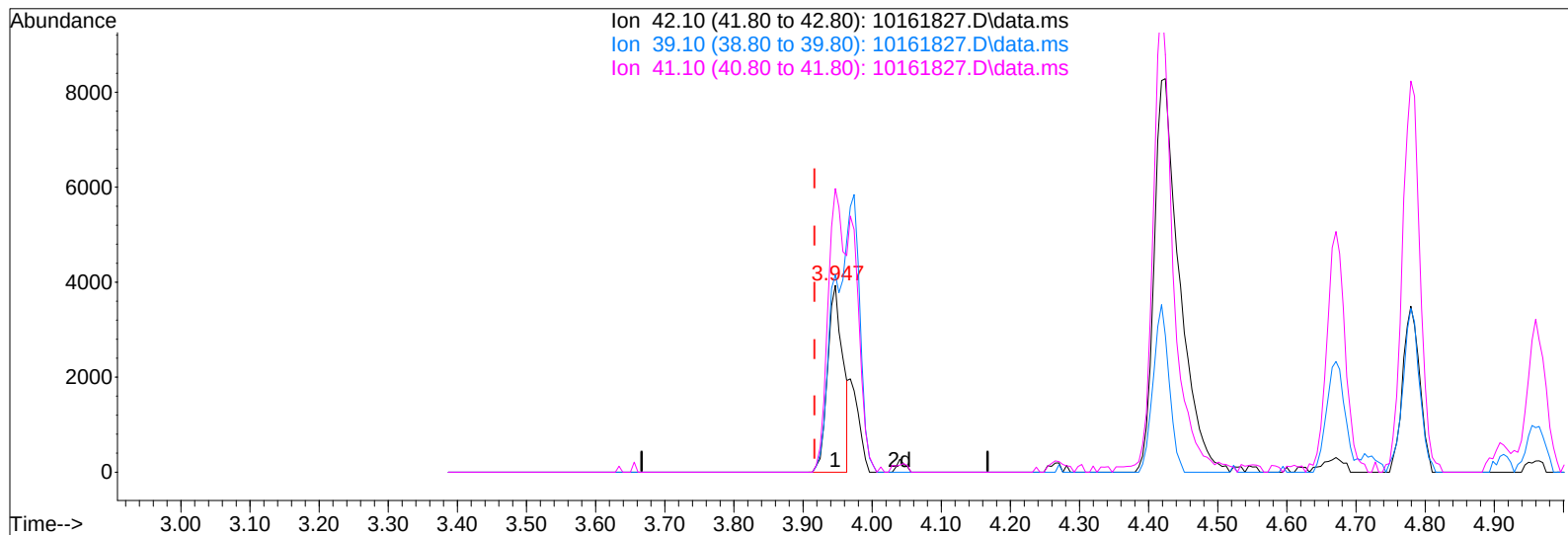
Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Wed Oct 17 09:09:32 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 10161827.D\data.ms

(2) Propene (T)

3.947min (+0.030) 0.25ng m

response 6033

Ion	Exp%	Act%
42.10	100	100
39.10	98.40	240.34#
41.10	147.90	267.28#
0.00	0.00	0.00

IPC

10/17/18

10/17/18

Method Path : I:\MS09\Methods\
 Method File : R9101518.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Tue Oct 16 09:06:20 2018
 Response Via : Initial Calibration

Calibration Files

0.1 =10151814.D 0.2 =10151815.D 0.5 =10151816.D 1.0 =10151817.D 5.0 =10151818.D 25 =10151819.D 50 =10151820.D
 100 =10151821.D

Compound	0.1	0.2	0.5	1.0	5.0	25	50	100	Avg	%RSD
1) IR Bromochloromethane...										
2) T Propene	4.397	3.533	3.230	3.073	3.099	2.536	2.795	3.201	3.233	17.21
3) T Dichlorodifluo...	4.435	3.890	3.727	3.514	3.346	2.884	2.837	2.730	3.420	17.34
4) T Chloromethane	5.447	4.701	4.622	4.424	3.953	3.581	3.431	2.880	4.130	20.00
5) T 1,2-Dichloro-1...	1.479	1.181	1.259	1.172	1.060	0.939	0.922	0.918	1.116	17.63
6) T Vinyl Chloride	4.172	3.413	3.353	3.232	3.073	2.556	2.528	2.448	3.097	18.82
7) T 1,3-Butadiene	1.739	1.415	1.563	1.457	1.523	1.478	1.489	1.518	1.523	6.45
8) T Bromomethane			1.468	1.270	1.075	0.987	0.971	0.932	1.117	18.81
9) T Chloroethane	1.996	1.781	1.851	1.729	1.287	1.433	1.182	1.053	1.539	22.50
10) T Ethanol	2.775	2.410	2.577	2.441	2.113	1.919	1.828	1.664	2.216	17.77
11) T Acetonitrile	7.575	6.800	6.260	6.012	5.784	5.138	5.177	5.106	5.981	14.76
12) T Acrolein	2.174	1.819	1.888	1.795	1.545	1.203	1.157	1.183	1.596	24.03
13) T Acetone			2.465	2.296	2.060	1.504	1.338	1.227	1.815	28.99
14) T Trichlorofluor...	3.035	2.501	2.470	2.347	2.212	1.960	1.941	1.967	2.304	16.20
15) T 2-Propanol (Is...	8.956	7.866	8.239	8.185	7.567	7.184	6.417	4.666	7.385	18.07
16) T Acrylonitrile	4.316	3.853	4.027	3.858	3.691	3.180	3.108	3.054	3.636	12.90
17) T 1,1-Dichloroet...	1.959	1.584	1.548	1.423	1.354	1.228	1.223	1.256	1.447	17.23
18) T 2-Methyl-2-Pro...	7.293	6.578	6.683	6.682	6.674	5.974	5.783	4.140	6.226	15.47
19) T Methylene Chlo...	2.345	1.948	2.001	1.925	1.851	1.656	1.660	1.660	1.881	12.47
20) T 3-Chloro-1-pro...	4.034	3.361	3.405	3.261	3.491	3.406	3.230	3.175	3.420	7.87
21) T Trichlorotrifl...	1.257	1.068	1.075	1.012	0.951	0.898	0.862	0.789	0.989	14.89
22) T Carbon Disulfide	8.712	7.184	6.864	6.633	6.571	5.950	5.798	5.685	6.675	14.69
23) T trans-1,2-Dich...	4.198	3.734	3.833	3.659	3.636	3.198	3.234	3.181	3.584	10.03
24) T 1,1-Dichloroet...	4.939	4.503	4.321	4.153	4.135	3.708	3.607	3.336	4.088	12.74
25) T Methyl tert-Bu...	7.976	6.964	6.947	6.657	6.509	5.679	5.762	5.683	6.522	12.30
26) T Vinyl Acetate			0.260	0.263	0.353	0.374	0.376	0.346	0.329	16.25
27) T 2-Butanone (MEK)	1.708	1.562	1.832	1.709	1.722	1.516	1.543	1.502	1.637	7.40
28) T cis-1,2-Dichlo...	4.414	3.786	3.702	3.522	3.528	3.121	3.123	2.955	3.519	13.33
29) T Diisopropyl Ether	2.536	2.130	1.853	1.711	1.628	1.402	1.332	1.166	1.720	26.17
30) T Ethyl Acetate			1.039	1.019	1.013	0.861	0.788	0.637	0.893	18.02
31) T n-Hexane	5.748	5.089	4.946	4.779	4.621	3.819	3.473	2.812	4.411	21.85
32) T Chloroform	4.425	3.914	3.699	3.494	3.435	3.036	3.068	2.952	3.503	14.37
33) S 1,2-Dichloroet...	2.428	2.502	2.466	2.622	2.745	2.487	2.644	2.737	2.579	4.83
34) T Tetrahydrofura...	1.961	1.656	1.804	1.668	1.609	1.405	1.428	1.404	1.617	12.45
35) T Ethyl tert-But...	2.745	2.413	2.457	2.375	2.368	2.106	2.143	2.105	2.339	9.34
36) T 1,2-Dichloroet...	3.482	3.181	3.089	3.036	2.958	2.604	2.624	2.571	2.943	10.99
37) IR 1,4-Difluorobenzen...										
38) T 1,1,1-Trichlor...	0.590	0.500	0.516	0.480	0.457	0.439	0.424	0.403	0.476	12.59
39) T Isopropyl Acetate	0.355	0.328	0.344	0.324	0.315	0.291	0.257	0.212	0.303	15.81
40) T 1-Butanol	0.620	0.499	0.534	0.535	0.543	0.520	0.465	0.390	0.513	12.91
41) T Benzene	2.226	1.890	1.852	1.714	1.581	1.462	1.371	1.248	1.668	19.11
42) T Carbon Tetrach...	0.388	0.360	0.377	0.352	0.346	0.343	0.337	0.325	0.354	5.90

 10/16/18

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Method Path : I:\MS09\Methods\
Method File : R9101518.M

Title		EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)														
95)	T	Naphthalene	2.032	1.648	1.616	1.730	1.828	1.839	1.800	1.557	1.756					8.65
96)	T	n-Dodecane	2.053	1.824	1.734	1.793	1.826	1.820	1.628	1.233	1.739					13.59
97)	T	Hexachlorobuta...	0.399	0.352	0.369	0.334	0.325	0.327	0.326	0.300	0.342					9.05
98)	T	Cyclohexanone	1.498	1.297	1.333	1.264	1.262	1.228	1.176	1.062	1.265					9.93
99)	T	tert-Butylbenzene			2.163	1.969	1.856	1.724	1.545	1.217	1.746					19.11
100)	T	n-Butylbenzene	3.134	2.741	2.860	2.723	2.591	2.422	2.236	1.891	2.575					15.04

(#) = Out of Range

1ng/L Std. ID:

4ng/L Std. ID: S31-10151812

20ng/L Std. ID: S31-10151810

200ng/L Std. ID: S31-10151808

Dilution Factors:

Compounds	Source Std. mg/m ³	Primary Working Standards					Working STD Conc.(ng/L):					Injection (L):					ICAL Points:				
		200ng/L	20ng/L	2ng/L	4ng/L	1ng/L	0.025	0.050	0.125	4	20	0.025	0.050	0.125	200	250	200	250	200	200	200
Propene	1.031	206.2	20.62	2.062	4.124	1.031	0.1031	0.2062	0.5155	1.031	5.155	0.1031	0.2062	0.5155	25.775	50ng	25.775	50ng	50ng	100ng	103.1
Dichlorodifluoromethane	1.045	209.0	20.90	2.090	4.180	1.045	0.1045	0.2090	0.5225	1.045	5.225	0.1045	0.2090	0.5225	26.125	52.25	26.125	52.25	52.25	104.5	104.5
Chloromethane	1.008	201.6	20.16	2.016	4.032	1.008	0.1008	0.2016	0.5040	1.008	5.040	0.1008	0.2016	0.5040	25.200	50.40	25.200	50.40	50.40	100.8	100.8
Freon-114	1.028	205.6	20.56	2.056	4.112	1.028	0.1028	0.2056	0.5140	1.028	5.140	0.1028	0.2056	0.5140	25.700	51.40	25.700	51.40	51.40	102.8	102.8
Vinyl Chloride	1.051	210.2	21.02	2.102	4.204	1.051	0.1051	0.2102	0.5255	1.051	5.255	0.1051	0.2102	0.5255	26.275	52.55	26.275	52.55	52.55	105.1	105.1
1,3-Butadiene	1.049	209.8	20.98	2.098	4.196	1.049	0.1049	0.2098	0.5245	1.049	5.245	0.1049	0.2098	0.5245	26.225	52.45	26.225	52.45	52.45	104.9	104.9
Bromomethane	1.009	201.8	20.18	2.018	4.036	1.009	0.1009	0.2018	0.5045	1.009	5.045	0.1009	0.2018	0.5045	25.225	50.45	25.225	50.45	50.45	100.9	100.9
Chloroethane	1.022	204.4	20.44	2.044	4.088	1.022	0.1022	0.2044	0.5110	1.022	5.110	0.1022	0.2044	0.5110	25.550	51.10	25.550	51.10	51.10	102.2	102.2
Ethanol	5.140	1028.0	102.80	20.560	5.140		0.5140	1.0280	2.5700	5.140	25.700	0.5140	1.0280	2.5700	128.500	257.00	128.500	257.00	257.00	514.0	514.0
Acetonitrile	1.033	206.6	20.66	2.066	4.132	1.033	0.1033	0.2066	0.5165	1.033	5.165	0.1033	0.2066	0.5165	25.825	51.65	25.825	51.65	51.65	103.3	103.3
Acrolein	1.028	205.6	20.56	2.056	4.112	1.028	0.1028	0.2056	0.5140	1.028	5.140	0.1028	0.2056	0.5140	25.700	51.40	25.700	51.40	51.40	102.8	102.8
Acetone	5.370	1074.0	107.40	21.480	5.370		0.5370	1.0740	2.6850	5.370	26.850	0.5370	1.0740	2.6850	134.250	268.50	134.250	268.50	268.50	537.0	537.0
Trichlorofluoromethane	1.060	212.0	21.20	2.120	4.240	1.060	0.1060	0.2120	0.5300	1.060	5.300	0.1060	0.2120	0.5300	26.500	53.00	26.500	53.00	53.00	106.0	106.0
Isopropanol	2.063	412.6	41.26	8.252	2.063		0.2063	0.4126	1.0315	2.063	10.315	0.2063	0.4126	1.0315	51.575	103.15	51.575	103.15	103.15	206.3	206.3
Acrylonitrile	1.034	206.8	20.68	2.068	4.136	1.034	0.1034	0.2068	0.5170	1.034	5.170	0.1034	0.2068	0.5170	25.850	51.70	25.850	51.70	51.70	103.4	103.4
1,1-Dichloroethene	1.074	214.8	21.48	2.148	4.296	1.074	0.1074	0.2148	0.5370	1.074	5.370	0.1074	0.2148	0.5370	26.850	53.70	26.850	53.70	53.70	107.4	107.4
tert-Butanol	2.144	428.8	42.88	8.576	2.144		0.2144	0.4288	1.0720	2.144	10.720	0.2144	0.4288	1.0720	53.600	107.20	53.600	107.20	107.20	214.4	214.4
Methylene Chloride	1.070	214.0	21.40	2.140	4.280	1.070	0.1070	0.2140	0.5350	1.070	5.350	0.1070	0.2140	0.5350	26.750	53.50	26.750	53.50	53.50	107.0	107.0
Allyl Chloride	1.067	213.4	21.34	2.134	4.268	1.067	0.1067	0.2134	0.5335	1.067	5.335	0.1067	0.2134	0.5335	26.675	53.35	26.675	53.35	53.35	106.7	106.7
Trichlorotrifluoroethane	1.065	213.0	21.30	2.130	4.260	1.065	0.1065	0.2130	0.5325	1.065	5.325	0.1065	0.2130	0.5325	26.625	53.25	26.625	53.25	53.25	106.5	106.5
Carbon Disulfide	1.075	215.0	21.50	2.150	4.300	1.075	0.1075	0.2150	0.5375	1.075	5.375	0.1075	0.2150	0.5375	26.875	53.75	26.875	53.75	53.75	107.5	107.5
trans-1,2-Dichloroethene	1.062	212.4	21.24	2.124	4.248	1.062	0.1062	0.2124	0.5310	1.062	5.310	0.1062	0.2124	0.5310	26.550	53.10	26.550	53.10	53.10	106.2	106.2
1,1-Dichloroethane	1.030	206.0	20.60	2.060	4.120	1.030	0.1030	0.2060	0.5150	1.030	5.150	0.1030	0.2060	0.5150	25.750	51.50	25.750	51.50	51.50	103.0	103.0
Methyl tert-Butyl Ether	1.089	217.8	21.78	2.178	4.356	1.089	0.1089	0.2178	0.5445	1.089	5.445	0.1089	0.2178	0.5445	27.225	54.45	27.225	54.45	54.45	108.9	108.9
Vinyl Acetate	5.252	1050.4	105.04	21.008	5.252		0.5252	1.0504	2.6260	5.252	26.260	0.5252	1.0504	2.6260	131.300	262.60	131.300	262.60	262.60	525.2	525.2
2-Butanone	1.027	205.4	20.54	2.054	4.108	1.027	0.1027	0.2054	0.5135	1.027	5.135	0.1027	0.2054	0.5135	25.675	51.35	25.675	51.35	51.35	102.7	102.7
cis-1,2-Dichloroethene	1.054	210.8	21.08	2.108	4.216	1.054	0.1054	0.2108	0.5270	1.054	5.270	0.1054	0.2108	0.5270	26.350	52.70	26.350	52.70	52.70	105.4	105.4
Diisopropyl Ether	1.081	216.2	21.62	2.162	4.324	1.081	0.1081	0.2162	0.5405	1.081	5.405	0.1081	0.2162	0.5405	27.025	54.05	27.025	54.05	54.05	108.1	108.1
Ethyl Acetate	2.166	433.2	43.32	8.664	2.166		0.2166	0.4332	1.0830	2.166	10.830	0.2166	0.4332	1.0830	54.150	108.30	54.150	108.30	108.30	216.6	216.6
n-Hexane	1.082	216.4	21.64	2.164	4.328	1.082	0.1082	0.2164	0.5410	1.082	5.410	0.1082	0.2164	0.5410	27.050	54.10	27.050	54.10	54.10	108.2	108.2
Chloroform	1.077	215.4	21.54	2.154	4.308	1.077	0.1077	0.2154	0.5385	1.077	5.385	0.1077	0.2154	0.5385	26.925	53.85	26.925	53.85	53.85	107.7	107.7
Tetrahydrofuran	1.068	213.6	21.36	2.136	4.272	1.068	0.1068	0.2136	0.5340	1.068	5.340	0.1068	0.2136	0.5340	26.700	53.40	26.700	53.40	53.40	106.8	106.8
Ethyl tert-Butyl Ether	1.060	212.0	21.20	2.120	4.240	1.060	0.1060	0.2120	0.5300	1.060	5.300	0.1060	0.2120	0.5300	26.500	53.00	26.500	53.00	53.00	106.0	106.0
1,2-Dichloroethane	1.061	212.2	21.22	2.122	4.244	1.061	0.1061	0.2122	0.5305	1.061	5.305	0.1061	0.2122	0.5305	26.525	53.05	26.525	53.05	53.05	106.1	106.1
1,1,1-Trichloroethane	1.081	216.2	21.62	2.162	4.324	1.081	0.1081	0.2162	0.5405	1.081	5.405	0.1081	0.2162	0.5405	27.025	54.05	27.025	54.05	54.05	108.1	108.1
Isopropyl Acetate	2.066	413.2	41.32	8.264	2.066		0.2066	0.4132	1.0330	2.066	10.330	0.2066	0.4132	1.0330	51.650	103.30	51.650	103.30	103.30	206.6	206.6
1-Butanol	2.067	413.4	41.34	8.268	2.067		0.2067	0.4134	1.0335	2.067	10.335	0.2067	0.4134	1.0335	51.675	103.35	51.675	103.35	103.35	206.7	206.7
Benzene	1.033	206.6	20.66	2.066	4.132	1.033	0.1033	0.2066	0.5165	1.033	5.165	0.1033	0.2066	0.5165	25.825	51.65	25.825	51.65	51.65	103.3	103.3
Carbon Tetrachloride	1.036	207.2	20.72	2.072	4.144	1.036	0.1036	0.2072	0.5180	1.036	5.180	0.1036	0.2072	0.5180	25.900	51.80	25.900	51.80	51.80	103.6	103.6
Cyclohexane	2.087	417.4	41.74	8.348	2.087		0.2087	0.4174	1.0435	2.087	10.435	0.2087	0.4174	1.0435	52.175	104.35	52.175	104.35	104.35	208.7	208.7
tert-Amyl Methyl Ether	1.074	214.8	21.48	2.148	4.296	1.074	0.1074	0.2148	0.5370	1.074	5.370	0.1074	0.2148	0.5370	26.850	53.70	26.850	53.70	53.70	107.4	107.4
1,2-Dichloropropane	1.073	214.6	21.46	2.146	4.292	1.073	0.1073	0.2146	0.5365	1.073	5.365	0.1073	0.2146	0.5365	26.825	53.65	26.825	53.65	53.65	107.3	107.3
Bromodichloromethane	1.068	213.6	21.36	2.136	4.272	1.068	0.1068	0.2136	0.5340	1.068	5.340	0.1068	0.2136	0.5340	26.700	53.40	26.700	53.40	53.40	106.8	106.8
Trichloroethene	1.062	212.4	21.24	2.124	4.248	1.062	0.1062	0.2124	0.5310	1.062	5.310	0.1062	0.2124	0.5310	26.550	53.10	26.550	53.10	53.10	106.2	106.2
1,4-Dioxane	1.064	212.8	21.28	2.128	4.256	1.064	0.1064	0.2128	0.5320	1.064	5.320	0.1064	0.2128	0.5320	26.600	53.20	26.600	53.20	53.20	106.4	106.4
Isocetane	1.061	212.2	21.22	2.122	4.244	1.061	0.1061	0.2122	0.5305	1.061	5.305	0.1061	0.2122	0.5305	26.525	53.05	26.525	53.05	53.05	106.1	106.1
Methyl Methacrylate	2.135	427.0	42.70	8.540	2.135		0.2135	0.4270	1.0675	2.135	10.675	0.2135	0.4270	1.0675	53.375	106.75	53.375	106.75	106.75	213.5	213.5
n-Heptane	1.076	215.2	21.52	2.152	4.304	1.076	0.1076	0.2152	0.5380	1.076	5.380	0.1076	0.2152	0.5380	26.900	53.80	26.900	53.80	53.80	107.6	107.6

Primary Source Standards Concentrations (Working & Initial Calibration)

1ng/L Std. ID:
4ng/L Std. ID: S31-10151812
20ng/L Std. ID: S31-10151810
200ng/L Std. ID: S31-10151808

200ng/L Std. ID: S31-10151808													
Dilution Factors:			5	50	250	1000	Working STD Conc.(ng/L):						
Compounds	Source Std. mg/m³	Primary Working Standards					Injection (L):						
		200ng/L	20ng/L	4ng/L	1ng/L	1ng/L	0.025	4	4	20	200	200	200
cis-1,3-Dichloropropene	1.120	224.0	22.40	4.480	1.120	0.1120	0.2240	0.5600	1.120	5.600	28.000	56.00	112.0
4-Methyl-2-pentanone	1.060	212.0	21.20	4.240	1.060	0.1060	0.2120	0.5300	1.060	5.300	26.500	53.00	106.0
trans-1,3-Dichloropropene	1.055	211.0	21.10	4.220	1.055	0.1055	0.2110	0.5275	1.055	5.275	26.375	52.75	105.5
1,1,2-Trichloroethane	1.076	215.2	21.52	4.304	1.076	0.1076	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6
Toluene	1.052	210.4	21.04	4.208	1.052	0.1052	0.2104	0.5260	1.052	5.260	26.300	52.60	105.2
2-Hexanone	1.074	214.8	21.48	4.296	1.074	0.1074	0.2148	0.5370	1.074	5.370	26.850	53.70	107.4
Dibromochloromethane	1.075	215.0	21.50	4.300	1.075	0.1075	0.2150	0.5375	1.075	5.375	26.875	53.75	107.5
1,1,2-Dibromoethane	1.076	215.2	21.52	4.304	1.076	0.1076	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6
n-Butyl Acetate	1.085	217.0	21.70	4.340	1.085	0.1085	0.2170	0.5425	1.085	5.425	27.125	54.25	108.5
n-Octane	1.076	215.2	21.52	4.304	1.076	0.1076	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6
Tetrachloroethene	1.058	211.6	21.16	4.232	1.058	0.1058	0.2116	0.5290	1.058	5.290	26.450	52.90	105.8
Chlorobenzene	1.066	213.2	21.32	4.264	1.066	0.1066	0.2132	0.5330	1.066	5.330	26.650	53.30	106.6
Ethylbenzene	1.033	206.6	20.66	4.132	1.033	0.1033	0.2066	0.5165	1.033	5.165	25.825	51.65	103.3
m- & p-Xylene	2.123	424.6	42.46	8.492	2.123	0.2123	0.4246	1.0615	2.123	10.615	53.075	106.15	212.3
Bromoform	1.063	212.6	21.26	4.252	1.063	0.1063	0.2126	0.5315	1.063	5.315	26.575	53.15	106.3
Styrene	1.060	212.0	21.20	4.240	1.060	0.1060	0.2120	0.5300	1.060	5.300	26.500	53.00	106.0
o-Xylene	1.062	212.4	21.24	4.248	1.062	0.1062	0.2124	0.5310	1.062	5.310	26.550	53.10	106.2
n-Nonane	1.071	214.2	21.42	4.284	1.071	0.1071	0.2142	0.5355	1.071	5.355	26.775	53.55	107.1
1,1,2,2-Tetrachloroethane	1.064	212.8	21.28	4.256	1.064	0.1064	0.2128	0.5320	1.064	5.320	26.600	53.20	106.4
Cumene	1.057	211.4	21.14	4.228	1.057	0.1057	0.2114	0.5285	1.057	5.285	26.425	52.85	105.7
alpha-Phene	1.035	207.0	20.70	4.140	1.035	0.1035	0.2070	0.5175	1.035	5.175	25.875	51.75	103.5
n-Propylbenzene	1.076	215.2	21.52	4.304	1.076	0.1076	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6
3-Ethyltoluene	1.062	212.4	21.24	4.248	1.062	0.1062	0.2124	0.5310	1.062	5.310	26.550	53.10	106.2
4-Ethyltoluene	1.061	212.2	21.22	4.244	1.061	0.1061	0.2122	0.5305	1.061	5.305	26.525	53.05	106.1
1,3,5-Trimethylbenzene	1.057	211.4	21.14	4.228	1.057	0.1057	0.2114	0.5285	1.057	5.285	26.425	52.85	105.7
alpha-Methylstyrene	1.058	211.6	21.16	4.232	1.058	0.1058	0.2116	0.5290	1.058	5.290	26.450	52.90	105.8
2-Ethyltoluene	1.072	214.4	21.44	4.288	1.072	0.1072	0.2144	0.5360	1.072	5.360	26.800	53.60	107.2
1,2,4-Trimethylbenzene	1.068	213.6	21.36	4.272	1.068	0.1068	0.2136	0.5340	1.068	5.340	26.700	53.40	106.8
n-Decane	1.076	215.2	21.52	4.304	1.076	0.1076	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6
Benzyl Chloride	1.051	210.2	21.02	4.204	1.051	0.1051	0.2102	0.5255	1.051	5.255	26.275	52.55	105.1
1,3-Dichlorobenzene	1.080	216.0	21.60	4.320	1.080	0.1080	0.2160	0.5400	1.080	5.400	27.000	54.00	108.0
1,4-Dichlorobenzene	1.081	216.2	21.62	4.324	1.081	0.1081	0.2162	0.5405	1.081	5.405	27.025	54.05	108.1
sec-Butylbenzene	1.063	212.6	21.26	4.252	1.063	0.1063	0.2126	0.5315	1.063	5.315	26.575	53.15	106.3
p-Isopropyltoluene	1.042	208.4	20.84	4.168	1.042	0.1042	0.2084	0.5210	1.042	5.210	26.050	52.10	104.2
1,2,3-Trimethylbenzene	1.042	208.4	20.84	4.168	1.042	0.1042	0.2084	0.5210	1.042	5.210	26.050	52.10	104.2
1,2-Dichlorobenzene	1.089	217.8	21.78	4.356	1.089	0.1089	0.2178	0.5445	1.089	5.445	27.225	54.45	108.9
d-Limonene	1.010	202.0	20.20	4.040	1.010	0.1010	0.2020	0.5050	1.010	5.050	25.250	50.50	101.0
1,2-Dibromo-3-chloropropane	1.042	208.4	20.84	4.168	1.042	0.1042	0.2084	0.5210	1.042	5.210	26.050	52.10	104.2
n-Undecane	1.057	211.4	21.14	4.228	1.057	0.1057	0.2114	0.5285	1.057	5.285	26.425	52.85	105.7
1,1,2,4-Trichlorobenzene	1.064	212.8	21.28	4.256	1.064	0.1064	0.2128	0.5320	1.064	5.320	26.600	53.20	106.4
Naphthalene	1.025	205.0	20.50	4.100	1.025	0.1025	0.2050	0.5125	1.025	5.125	25.625	51.25	102.5
n-Dodecane	1.031	206.2	20.62	4.124	1.031	0.1031	0.2062	0.5155	1.031	5.155	25.775	51.55	103.1
Hexachloro-1,3-butadiene	1.053	210.6	21.06	4.212	1.053	0.1053	0.2106	0.5265	1.053	5.265	26.325	52.65	105.3
Methacrylonitrile	1.041	208.2	20.82	4.164	1.041	0.1041	0.2082	0.5205	1.041	5.205	26.025	52.05	104.1
Cyclohexanone	0.982	196.4	19.64	3.928	0.982	0.0982	0.1964	0.4910	0.982	4.910	24.550	49.10	98.2
tert-Butylbenzene	1.067	213.4	21.34	4.268	1.067	0.1067	0.2134	0.5335	1.067	5.335	26.675	53.35	106.7
n-Butylbenzene	1.064	212.8	21.28	4.256	1.064	0.1064	0.2128	0.5320	1.064	5.320	26.600	53.20	106.4

Method : I:\MS09\Methods\R9101518.M (RTE Integrator)
 Title : EPA T0-15 per SOP VOA-T015 (CASS T0-15/GC-MS)
 Last Update : Tue Oct 16 09:06:20 2018
 Response via : Initial Calibration

 **10/16/18**

#	ID	Conc	ISTD Conc	Path\File
1	0.1	0	13	I:\MS09\Data\2018_10\15\10151814.D
2	0.2	0	13	I:\MS09\Data\2018_10\15\10151815.D
3	0.5	1	13	I:\MS09\Data\2018_10\15\10151816.D
4	1.0	1	13	I:\MS09\Data\2018_10\15\10151817.D
5	5.0	5	13	I:\MS09\Data\2018_10\15\10151818.D
6	25	26	13	I:\MS09\Data\2018_10\15\10151819.D
7	50	52	13	I:\MS09\Data\2018_10\15\10151820.D
8	100	103	13	I:\MS09\Data\2018_10\15\10151821.D

#	ID	Update Time	Quant Time	Acquisition Time
1	0.1	Oct 16 09:04 2018	Oct 16 08:59 2018	15 Oct 2018 17:43
2	0.2	Oct 16 09:05 2018	Oct 16 08:58 2018	15 Oct 2018 18:17
3	0.5	Oct 16 09:05 2018	Oct 16 08:57 2018	15 Oct 2018 18:51
4	1.0	Oct 16 09:05 2018	Oct 16 08:56 2018	15 Oct 2018 19:25
5	5.0	Oct 16 09:05 2018	Oct 16 08:55 2018	15 Oct 2018 19:59
6	25	Oct 16 09:05 2018	Oct 16 08:52 2018	15 Oct 2018 20:33
7	50	Oct 16 09:06 2018	Oct 16 09:01 2018	15 Oct 2018 21:07
8	100	Oct 16 09:06 2018	Oct 16 09:02 2018	15 Oct 2018 21:41

R9101518.M

Tue Oct 16 10:52:28 2018

Data File: I:\MS09\Data\2018 10\15\10151814.D

Acq On : 15 Oct 2018 17:43

Operator: SC

Sample : 0.1ng TO-15 ICAL STD

Misc : S31-10151806/S31-10151812 (11/13)

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Oct 16 08:59:53 2018

Quant Method : I:\MS09\Methods\R9101518.M

 10/16/18

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

QLast Update : Tue Oct 16 08:54:50 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.24	130	124204	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	11.22	114	658963	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	15.57	82	386466	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	10.03	65	301538	14.669	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	117.36%
57) Toluene-d8 (SS2)	13.66	98	847784	11.864	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	94.88%
73) Bromofluorobenzene (SS3)	17.15	174	167986	9.793	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	78.32%

Target Compounds

						Qvalue
2) Propene	3.98	42	4504	0.247	ng	95
3) Dichlorodifluoromethan...	4.08	85	4605	0.176	ng	97
4) Chloromethane	4.28	50	5456	0.224	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.44	135	1511	0.145	ng	97
6) Vinyl Chloride	4.56	62	4357	0.212	ng	98
7) 1,3-Butadiene	4.74	54	1813	0.164	ng	# 81
8) Bromomethane	5.04	94	1899	0.181	ng	99
9) Chloroethane	5.26	64	2027	0.175	ng	100
10) Ethanol	5.45	45	14174	1.109	ng	96
11) Acetonitrile	5.67	41	7775	0.235	ng	92
12) Acrolein	5.82	56	2221	0.218	ng	94
13) Acetone	5.97	58	18534	1.510	ng	# 82
14) Trichlorofluoromethane	6.14	101	3197	0.165	ng	98
15) 2-Propanol (Isopropanol)	6.29	45	18358	0.406	ng	88
16) Acrylonitrile	6.49	53	4434	0.190	ng	97
17) 1,1-Dichloroethene	6.85	96	2091	0.174	ng	89
18) 2-Methyl-2-Propanol (t...	6.96	59	15536	0.347	ng	88
19) Methylene Chloride	6.97	84	2493	0.164	ng	# 58
20) 3-Chloro-1-propene (Al...	7.12	41	4277	0.205	ng	81
21) Trichlorotrifluoroethane	7.31	151	1330	0.127	ng	# 72
22) Carbon Disulfide	7.27	76	9306	0.179	ng	95
23) trans-1,2-Dichloroethene	8.00	61	4430	0.176	ng	88
24) 1,1-Dichloroethane	8.21	63	5055	0.167	ng	95
25) Methyl tert-Butyl Ether	8.33	73	8631	0.175	ng	95
26) Vinyl Acetate	8.40	86	926	0.340	ng	# 1
27) 2-Butanone (MEK)	8.68	72	1743	0.142	ng	# 1
28) cis-1,2-Dichloroethene	9.09	61	4623	0.191	ng	87
29) Diisopropyl Ether	9.35	87	2724	0.191	ng	# 75
30) Ethyl Acetate	9.35	61	2261	0.355	ng	99
31) n-Hexane	9.34	57	6180	0.210	ng	# 96
32) Chloroform	9.38	83	4735	0.172	ng	96
34) Tetrahydrofuran (THF)	9.83	72	2081	0.177	ng	# 48
35) Ethyl tert-Butyl Ether	9.89	87	2891	0.152	ng	# 66
36) 1,2-Dichloroethane	10.14	62	3671	0.173	ng	98
38) 1,1,1-Trichloroethane	10.41	97	3365	0.154	ng	91
39) Isopropyl Acetate	10.80	61	3862	0.335	ng	# 49
40) 1-Butanol	10.82	56	6751	0.386	ng	# 73
41) Benzene	10.86	78	12121	0.174	ng	100
42) Carbon Tetrachloride	11.02	117	2119	0.128	ng	95
43) Cyclohexane	11.15	84	8784	0.357	ng	# 83
44) tert-Amyl Methyl Ether	11.48	73	8257	0.174	ng	82
45) 1,2-Dichloropropane	11.68	63	3261	0.179	ng	98
46) Bromodichloromethane	11.87	83	3260	0.159	ng	96
47) Trichloroethene	11.92	130	2506	0.159	ng	97
48) 1,4-Dioxane	11.93	88	1968	0.149	ng	# 74
49) 2,2,4-Trimethylpentane...	11.98	57	15525	0.200	ng	84

Data File: I:\MS09\Data\2018 10\15\10151814.D

Acq On : 15 Oct 2018 17:43

Operator: SC

Sample : 0.1ng TO-15 ICAL STD

Misc : S31-10151806/S31-10151812 (11/13)

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Oct 16 08:59:53 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 08:54:50 2018

Response via : Initial Calibration

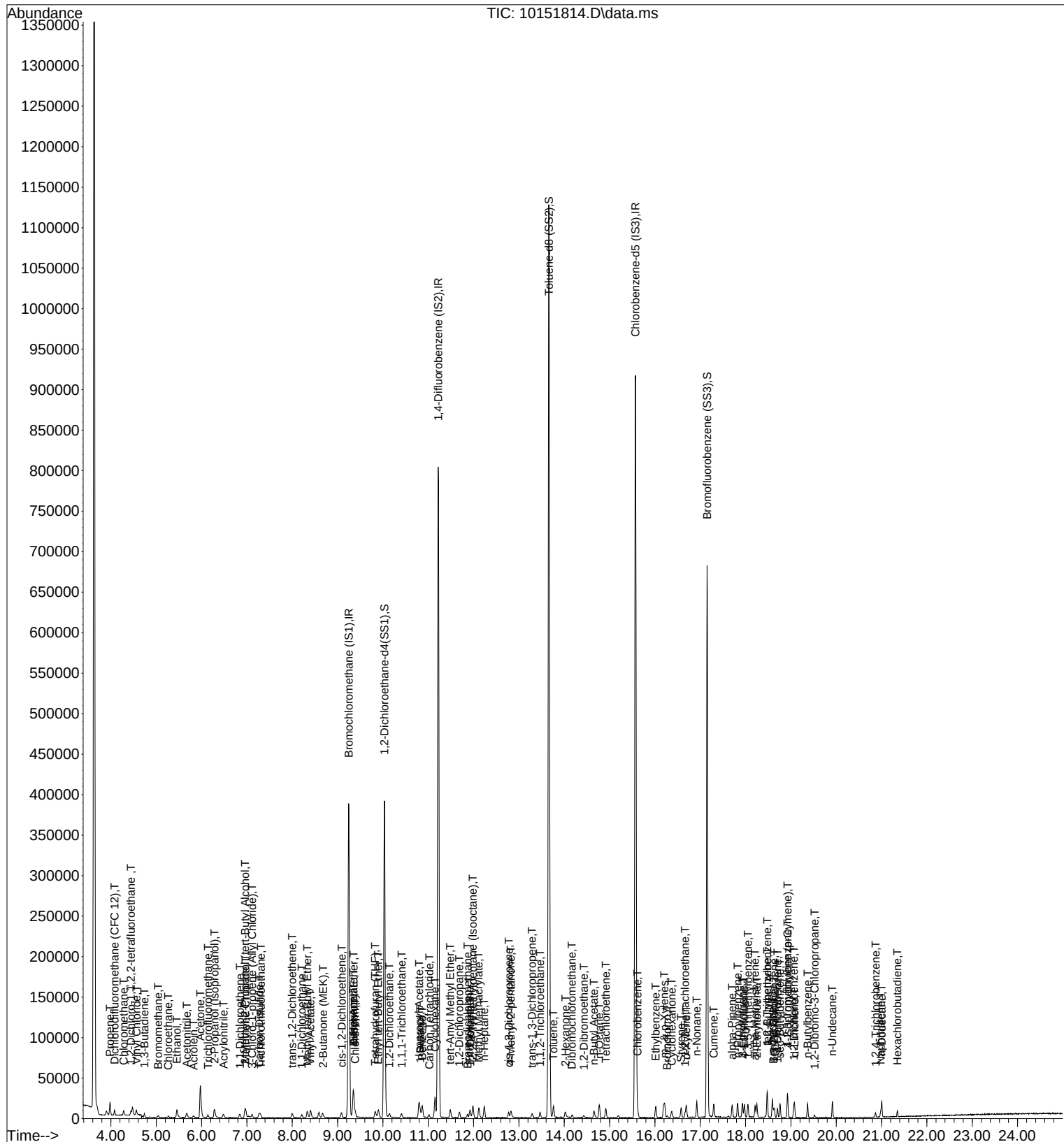
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.11	100	1917	0.312	ng	97
51) n-Heptane	12.24	71	3082	0.175	ng	83
52) cis-1,3-Dichloropropene	12.78	75	4491	0.167	ng	99
53) 4-Methyl-2-pentanone	12.82	58	2767	0.162	ng	# 54
54) trans-1,3-Dichloropropene	13.29	75	3292	0.137	ng	95
55) 1,1,2-Trichloroethane	13.47	97	2537	0.166	ng	99
58) Toluene	13.76	91	13150	0.168	ng	92
59) 2-Hexanone	14.03	43	8054	0.181	ng	83
60) Dibromochloromethane	14.17	129	2063	0.122	ng	98
61) 1,2-Dibromoethane	14.43	107	2421	0.133	ng	95
62) n-Butyl Acetate	14.65	43	8731	0.177	ng	89
63) n-Octane	14.77	57	3419	0.194	ng	82
64) Tetrachloroethene	14.92	166	3433	0.211	ng	95
65) Chlorobenzene	15.61	112	6768	0.146	ng	98
66) Ethylbenzene	16.02	91	13040	0.152	ng	96
67) m- & p-Xylenes	16.21	91	20865	0.321	ng	90
68) Bromoform	16.27	173	1315	0.108	ng	83
69) Styrene	16.58	104	6356	0.135	ng	97
70) o-Xylene	16.69	91	10284	0.156	ng	92
71) n-Nonane	16.92	43	8469	0.206	ng	85
72) 1,1,2,2-Tetrachloroethane	16.67	83	3999	0.130	ng	97
74) Cumene	17.30	105	11734	0.144	ng	91
75) alpha-Pinene	17.70	93	6031	0.148	ng	86
76) n-Propylbenzene	17.83	91	16164	0.162	ng	99
77) 3-Ethyltoluene	17.93	105	10856	0.134	ng	95
78) 4-Ethyltoluene	17.97	105	10450	0.139	ng	97
79) 1,3,5-Trimethylbenzene	18.05	105	9304	0.138	ng	98
80) alpha-Methylstyrene	18.21	118	3958	0.129	ng	88
81) 2-Ethyltoluene	18.25	105	11553	0.147	ng	97
82) 1,2,4-Trimethylbenzene	18.48	105	10436	0.159	ng	87
83) n-Decane	18.59	58	323	0.179	ng	# 76
84) Benzyl Chloride	18.61	91	4715	0.097	ng	86
85) 1,3-Dichlorobenzene	18.63	146	4589	0.139	ng	97
86) 1,4-Dichlorobenzene	18.70	146	4633	0.139	ng	97
87) sec-Butylbenzene	18.76	105	12440	0.138	ng	88
88) 4-Isopropyltoluene (p-...	18.92	119	9790	0.125	ng	93
89) 1,2,3-Trimethylbenzene	18.92	105	9225	0.141	ng	89
90) 1,2-Dichlorobenzene	19.06	146	3756	0.120	ng	94
91) d-Limonene	19.08	68	4015	0.144	ng	90
92) 1,2-Dibromo-3-Chloropr...	19.52	157	751	0.081	ng	# 20
93) n-Undecane	19.91	57	7608	0.179	ng	92
94) 1,2,4-Trichlorobenzene	20.87	180	1845	0.110	ng	# 89
95) Naphthalene	20.98	128	6440	0.117	ng	97
96) n-Dodecane	21.00	57	6543	0.182	ng	90
97) Hexachlorobutadiene	21.35	225	1300	0.096	ng	100
98) Cyclohexanone	16.37	55	4548	0.153	ng	# 90
99) tert-Butylbenzene	18.48	119	9061	0.163	ng	92
100) n-Butylbenzene	19.37	91	10310	0.146	ng	96

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

ALS Vial : 15 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS09\Data\2018 10\15\10151815.D

Acq On : 15 Oct 2018 18:17

Operator: SC

Sample : 0.2ng TO-15 ICAL STD

Misc : S31-10151806/S31-10151812 (11/13)

ALS Vial : 15 Sample Multiplier: 1

 10/16/18

Quant Time: Oct 16 08:58:40 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 08:54:50 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.24	130	120059	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	11.22	114	646639	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	15.57	82	383069	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	10.03	65	300405	15.119	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	120.96%
57) Toluene-d8 (SS2)	13.66	98	841593	11.881	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.04%
73) Bromofluorobenzene (SS3)	17.15	174	165372	9.726	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	77.84%

Target Compounds

						Qvalue
2) Propene	3.97	42	6998	0.396	ng	98
3) Dichlorodifluoromethan...	4.07	85	7808	0.308	ng	98
4) Chloromethane	4.28	50	9103	0.386	ng	96
5) 1,2-Dichloro-1,1,2,2-t...	4.44	135	2333	0.231	ng	98
6) Vinyl Chloride	4.56	62	6891	0.347	ng	95
7) 1,3-Butadiene	4.73	54	2852	0.267	ng	# 83
8) Bromomethane	5.04	94	2927	0.289	ng	96
9) Chloroethane	5.26	64	3497	0.312	ng	95
10) Ethanol	5.45	45	23793	1.925	ng	98
11) Acetonitrile	5.67	41	13494	0.421	ng	98
12) Acrolein	5.82	56	3593	0.364	ng	100
13) Acetone	5.97	58	27150	2.288	ng	# 79
14) Trichlorofluoromethane	6.14	101	5092	0.272	ng	96
15) 2-Propanol (Isopropanol)	6.27	45	31172	0.713	ng	96
16) Acrylonitrile	6.48	53	7654	0.339	ng	99
17) 1,1-Dichloroethene	6.84	96	3267	0.281	ng	# 77
18) 2-Methyl-2-Propanol (t...	6.95	59	27091	0.627	ng	88
19) Methylene Chloride	6.97	84	4004	0.272	ng	# 60
20) 3-Chloro-1-propene (Al...	7.11	41	6888	0.342	ng	80
21) Trichlorotrifluoroethane	7.30	151	2185	0.215	ng	# 74
22) Carbon Disulfide	7.26	76	14836	0.296	ng	95
23) trans-1,2-Dichloroethene	8.00	61	7618	0.314	ng	88
24) 1,1-Dichloroethane	8.21	63	8909	0.304	ng	99
25) Methyl tert-Butyl Ether	8.32	73	14569	0.305	ng	95
26) Vinyl Acetate	8.39	86	2003	0.760	ng	# 4
27) 2-Butanone (MEK)	8.66	72	3082	0.260	ng	# 17
28) cis-1,2-Dichloroethene	9.09	61	7665	0.327	ng	85
29) Diisopropyl Ether	9.34	87	4423	0.322	ng	# 69
30) Ethyl Acetate	9.34	61	4121	0.670	ng	98
31) n-Hexane	9.34	57	10577	0.371	ng	# 97
32) Chloroform	9.39	83	8097	0.304	ng	97
34) Tetrahydrofuran (THF)	9.83	72	3397	0.298	ng	# 56
35) Ethyl tert-Butyl Ether	9.89	87	4913	0.268	ng	# 67
36) 1,2-Dichloroethane	10.15	62	6484	0.317	ng	97
38) 1,1,1-Trichloroethane	10.41	97	5596	0.261	ng	89
39) Isopropyl Acetate	10.79	61	7005	0.619	ng	# 68
40) 1-Butanol	10.81	56	10671	0.621	ng	# 69
41) Benzene	10.86	78	20200	0.295	ng	100
42) Carbon Tetrachloride	11.01	117	3862	0.238	ng	94
43) Cyclohexane	11.15	84	13993	0.579	ng	# 74
44) tert-Amyl Methyl Ether	11.48	73	14326	0.308	ng	88
45) 1,2-Dichloropropane	11.68	63	5871	0.327	ng	96
46) Bromodichloromethane	11.86	83	5862	0.291	ng	98
47) Trichloroethene	11.92	130	4314	0.280	ng	99
48) 1,4-Dioxane	11.92	88	3400	0.262	ng	87
49) 2,2,4-Trimethylpentane...	11.98	57	26121	0.343	ng	92

Data File: I:\MS09\Data\2018 10\15\10151815.D

Acq On : 15 Oct 2018 18:17

Operator: SC

Sample : 0.2ng TO-15 ICAL STD

Misc : S31-10151806/S31-10151812 (11/13)

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Oct 16 08:58:40 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 08:54:50 2018

Response via : Initial Calibration

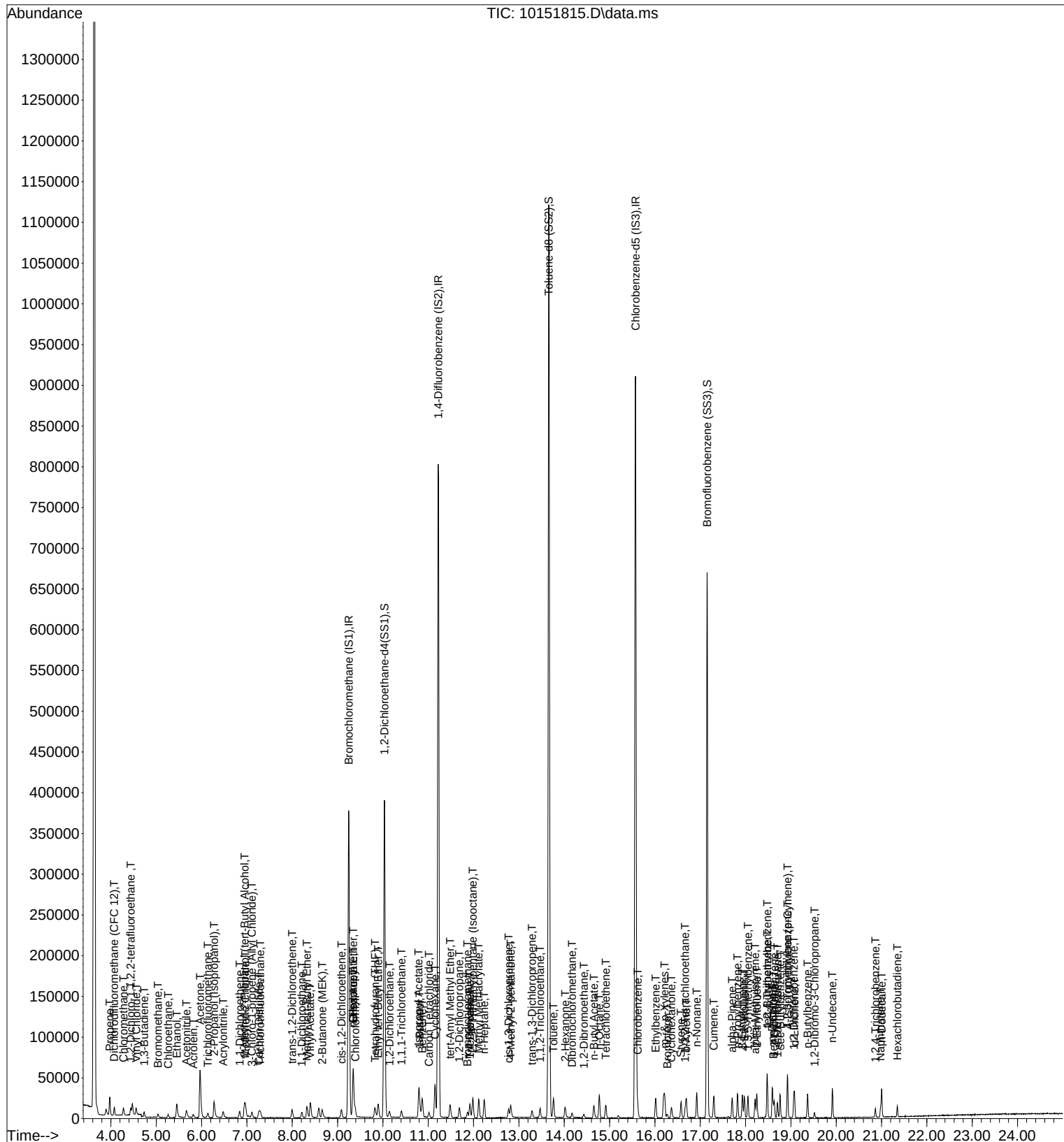
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.11	100	3159	0.524	ng	# 83
51) n-Heptane	12.24	71	5494	0.317	ng	92
52) cis-1,3-Dichloropropene	12.77	75	7620	0.288	ng	100
53) 4-Methyl-2-pentanone	12.82	58	5312	0.316	ng	# 75
54) trans-1,3-Dichloropropene	13.29	75	5940	0.252	ng	98
55) 1,1,2-Trichloroethane	13.47	97	4095	0.274	ng	93
58) Toluene	13.76	91	19970	0.258	ng	97
59) 2-Hexanone	14.02	43	13426	0.304	ng	85
60) Dibromochloromethane	14.17	129	3524	0.210	ng	97
61) 1,2-Dibromoethane	14.43	107	4036	0.224	ng	100
62) n-Butyl Acetate	14.65	43	15337	0.314	ng	91
63) n-Octane	14.77	57	5644	0.323	ng	84
64) Tetrachloroethene	14.92	166	5039	0.313	ng	97
65) Chlorobenzene	15.62	112	10878	0.237	ng	100
66) Ethylbenzene	16.02	91	20676	0.243	ng	96
67) m- & p-Xylenes	16.21	91	33571	0.522	ng	93
68) Bromoform	16.27	173	2281	0.189	ng	100
69) Styrene	16.57	104	10624	0.227	ng	96
70) o-Xylene	16.69	91	17193	0.263	ng	92
71) n-Nonane	16.92	43	14198	0.348	ng	84
72) 1,1,2,2-Tetrachloroethane	16.67	83	7220	0.237	ng	94
74) Cumene	17.30	105	20243	0.251	ng	94
75) alpha-Pinene	17.70	93	9942	0.246	ng	85
76) n-Propylbenzene	17.82	91	25069	0.253	ng	94
77) 3-Ethyltoluene	17.93	105	18417	0.230	ng	95
78) 4-Ethyltoluene	17.98	105	18015	0.242	ng	98
79) 1,3,5-Trimethylbenzene	18.05	105	15736	0.235	ng	95
80) alpha-Methylstyrene	18.21	118	6795	0.223	ng	93
81) 2-Ethyltoluene	18.25	105	19103	0.245	ng	98
82) 1,2,4-Trimethylbenzene	18.48	105	15813	0.243	ng	93
83) n-Decane	18.59	58	586	0.327	ng	# 75
84) Benzyl Chloride	18.61	91	8829	0.183	ng	87
85) 1,3-Dichlorobenzene	18.64	146	7148	0.219	ng	98
86) 1,4-Dichlorobenzene	18.70	146	7272	0.220	ng	97
87) sec-Butylbenzene	18.76	105	20780	0.233	ng	92
88) 4-Isopropyltoluene (p-...	18.92	119	17186	0.222	ng	97
89) 1,2,3-Trimethylbenzene	18.92	105	15222	0.234	ng	96
90) 1,2-Dichlorobenzene	19.06	146	7091	0.229	ng	97
91) d-Limonene	19.08	68	7568	0.273	ng	85
92) 1,2-Dibromo-3-Chloropr...	19.52	157	1315	0.143	ng	# 16
93) n-Undecane	19.91	57	13315	0.316	ng	90
94) 1,2,4-Trichlorobenzene	20.86	180	3350	0.202	ng	# 95
95) Naphthalene	20.98	128	10356	0.189	ng	97
96) n-Dodecane	21.00	57	11524	0.323	ng	90
97) Hexachlorobutadiene	21.35	225	2274	0.170	ng	95
98) Cyclohexanone	16.36	55	7805	0.264	ng	# 87
99) tert-Butylbenzene	18.48	119	14098	0.256	ng	96
100) n-Butylbenzene	19.37	91	17877	0.256	ng	95

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

ALS Vial : 15 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS09\Data\2018 10\15\10151816.D

Acq On : 15 Oct 2018 18:51

Operator: SC

Sample : 0.5ng TO-15 ICAL STD

Misc : S31-10151806/S31-10151810 (11/13)

ALS Vial : 16 Sample Multiplier: 1

 10/16/18

Quant Time: Oct 16 08:57:23 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 08:54:50 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.24	130	121962	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	11.22	114	647073	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	15.57	82	385661	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	10.03	65	300702	14.898	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	119.20%
57) Toluene-d8 (SS2)	13.66	98	839302	11.769	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	94.16%
73) Bromofluorobenzene (SS3)	17.15	174	164979	9.637	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	77.12%

Target Compounds

						Qvalue
2) Propene	3.96	42	16246	0.906	ng	98
3) Dichlorodifluoromethan...	4.06	85	18999	0.738	ng	100
4) Chloromethane	4.26	50	22728	0.949	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.42	135	6316	0.617	ng	100
6) Vinyl Chloride	4.54	62	17192	0.851	ng	100
7) 1,3-Butadiene	4.72	54	7998	0.737	ng	91
8) Bromomethane	5.03	94	7228	0.702	ng	99
9) Chloroethane	5.25	64	9230	0.810	ng	99
10) Ethanol	5.45	45	64611	5.147	ng	100
11) Acetonitrile	5.66	41	31545	0.969	ng	99
12) Acrolein	5.80	56	9470	0.945	ng	99
13) Acetone	5.95	58	64570	5.357	ng	# 76
14) Trichlorofluoromethane	6.13	101	12771	0.671	ng	99
15) 2-Propanol (Isopropanol)	6.26	45	82915	1.867	ng	93
16) Acrylonitrile	6.47	53	20314	0.884	ng	98
17) 1,1-Dichloroethene	6.83	96	8109	0.686	ng	# 76
18) 2-Methyl-2-Propanol (t...	6.92	59	69900	1.592	ng	91
19) Methylene Chloride	6.96	84	10443	0.699	ng	# 67
20) 3-Chloro-1-propene (Al...	7.11	41	17726	0.866	ng	83
21) Trichlorotrifluoroethane	7.30	151	5584	0.542	ng	# 76
22) Carbon Disulfide	7.25	76	35997	0.706	ng	99
23) trans-1,2-Dichloroethene	7.99	61	19860	0.806	ng	86
24) 1,1-Dichloroethane	8.21	63	21710	0.729	ng	98
25) Methyl tert-Butyl Ether	8.31	73	36906	0.761	ng	94
26) Vinyl Acetate	8.39	86	6652	2.486	ng	# 9
27) 2-Butanone (MEK)	8.65	72	9177	0.761	ng	# 46
28) cis-1,2-Dichloroethene	9.08	61	19035	0.800	ng	85
29) Diisopropyl Ether	9.33	87	9774	0.700	ng	# 26
30) Ethyl Acetate	9.34	61	10977	1.756	ng	97
31) n-Hexane	9.34	57	26106	0.902	ng	98
32) Chloroform	9.38	83	19436	0.718	ng	100
34) Tetrahydrofuran (THF)	9.81	72	9398	0.812	ng	# 72
35) Ethyl tert-Butyl Ether	9.89	87	12706	0.682	ng	# 69
36) 1,2-Dichloroethane	10.14	62	15987	0.769	ng	100
38) 1,1,1-Trichloroethane	10.41	97	14443	0.674	ng	93
39) Isopropyl Acetate	10.78	61	18388	1.624	ng	# 65
40) 1-Butanol	10.80	56	28585	1.663	ng	# 75
41) Benzene	10.86	78	49514	0.723	ng	100
42) Carbon Tetrachloride	11.01	117	10120	0.624	ng	98
43) Cyclohexane	11.15	84	35264	1.459	ng	# 79
44) tert-Amyl Methyl Ether	11.47	73	34887	0.749	ng	88
45) 1,2-Dichloropropane	11.69	63	14711	0.820	ng	99
46) Bromodichloromethane	11.86	83	14747	0.731	ng	99
47) Trichloroethene	11.92	130	9946	0.645	ng	99
48) 1,4-Dioxane	11.91	88	9635	0.741	ng	80
49) 2,2,4-Trimethylpentane...	11.98	57	65050	0.853	ng	92

Data File: I:\MS09\Data\2018 10\15\10151816.D

Acq On : 15 Oct 2018 18:51

Operator: SC

Sample : 0.5ng TO-15 ICAL STD

Misc : S31-10151806/S31-10151810 (11/13)

ALS Vial : 16 Sample Multiplier: 1

Quant Time: Oct 16 08:57:23 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 08:54:50 2018

Response via : Initial Calibration

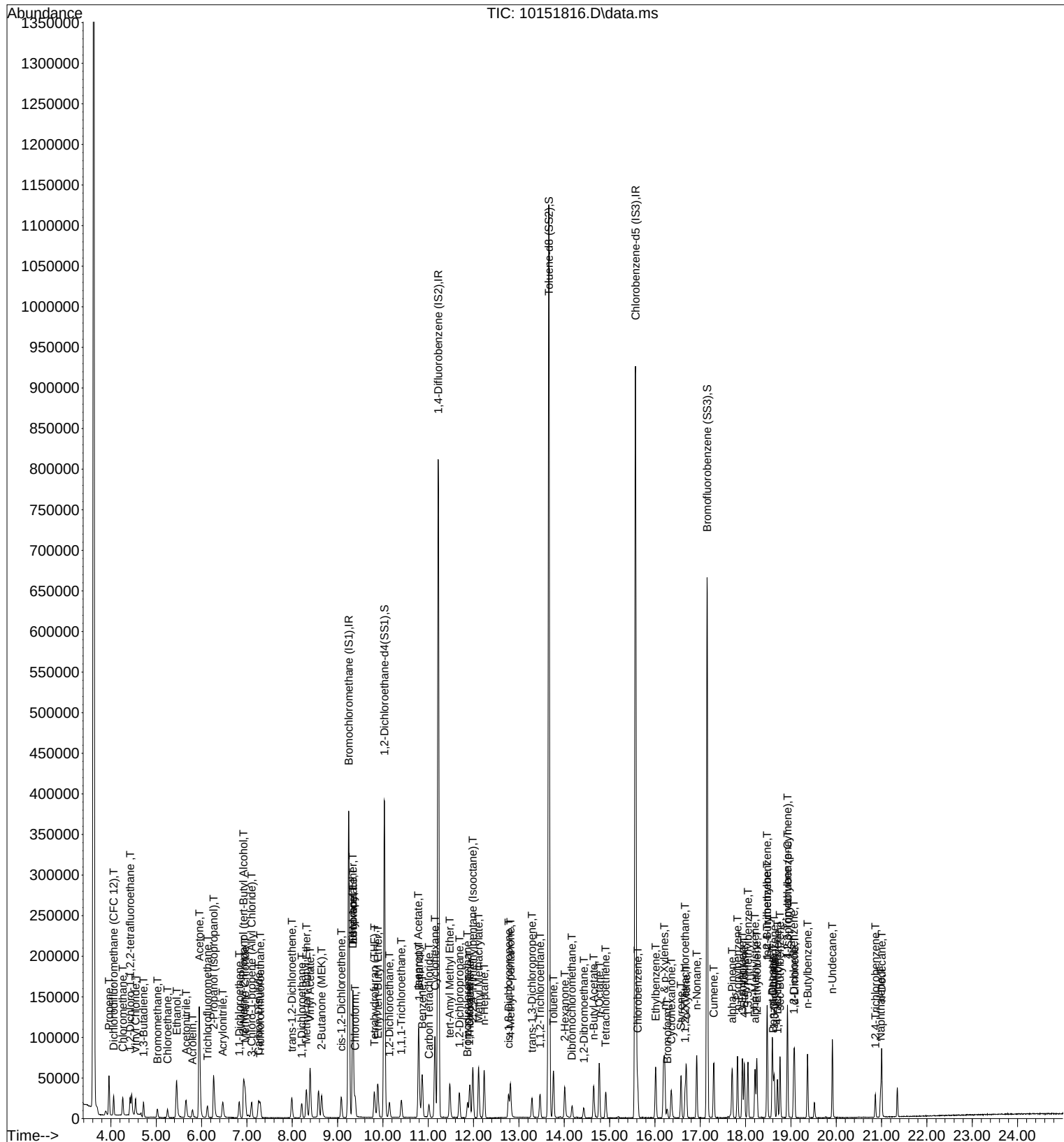
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.11	100	7957	1.319	ng	# 74
51) n-Heptane	12.23	71	13790	0.796	ng	90
52) cis-1,3-Dichloropropene	12.77	75	20192	0.763	ng	99
53) 4-Methyl-2-pentanone	12.81	58	13830	0.823	ng	# 74
54) trans-1,3-Dichloropropene	13.29	75	16085	0.683	ng	99
55) 1,1,2-Trichloroethane	13.47	97	10511	0.702	ng	90
58) Toluene	13.76	91	47806	0.613	ng	99
59) 2-Hexanone	14.01	43	36485	0.820	ng	87
60) Dibromochloromethane	14.17	129	9233	0.546	ng	99
61) 1,2-Dibromoethane	14.43	107	10680	0.588	ng	100
62) n-Butyl Acetate	14.65	43	39234	0.797	ng	93
63) n-Octane	14.77	57	13999	0.795	ng	85
64) Tetrachloroethene	14.91	166	9740	0.601	ng	99
65) Chlorobenzene	15.62	112	27372	0.593	ng	99
66) Ethylbenzene	16.02	91	52564	0.613	ng	95
67) m- & p-Xylenes	16.21	91	83221	1.285	ng	93
68) Bromoform	16.27	173	5788	0.476	ng	99
69) Styrene	16.57	104	27341	0.581	ng	95
70) o-Xylene	16.69	91	40852	0.621	ng	96
71) n-Nonane	16.92	43	36492	0.888	ng	83
72) 1,1,2,2-Tetrachloroethane	16.67	83	19157	0.624	ng	100
74) Cumene	17.30	105	47949	0.591	ng	96
75) alpha-Pinene	17.70	93	25527	0.628	ng	80
76) n-Propylbenzene	17.82	91	65204	0.654	ng	95
77) 3-Ethyltoluene	17.93	105	46431	0.575	ng	98
78) 4-Ethyltoluene	17.97	105	45278	0.604	ng	98
79) 1,3,5-Trimethylbenzene	18.05	105	39155	0.581	ng	96
80) alpha-Methylstyrene	18.21	118	17286	0.564	ng	93
81) 2-Ethyltoluene	18.25	105	46710	0.595	ng	97
82) 1,2,4-Trimethylbenzene	18.48	105	39973	0.611	ng	95
83) n-Decane	18.58	58	1570	0.871	ng	# 70
84) Benzyl Chloride	18.61	91	23311	0.479	ng	91
85) 1,3-Dichlorobenzene	18.63	146	17790	0.541	ng	100
86) 1,4-Dichlorobenzene	18.70	146	18000	0.542	ng	99
87) sec-Butylbenzene	18.76	105	54859	0.612	ng	96
88) 4-Isopropyltoluene (p-...	18.92	119	45151	0.580	ng	96
89) 1,2,3-Trimethylbenzene	18.92	105	39889	0.610	ng	94
90) 1,2-Dichlorobenzene	19.06	146	16993	0.544	ng	96
91) d-Limonene	19.08	68	19624	0.704	ng	86
92) 1,2-Dibromo-3-Chloropr...	19.52	157	3991	N.D.		
93) n-Undecane	19.91	57	34134	0.804	ng	91
94) 1,2,4-Trichlorobenzene	20.86	180	7594	0.454	ng	98
95) Naphthalene	20.98	128	25553	0.464	ng	100
96) n-Dodecane	21.00	57	27582	0.768	ng	90
97) Hexachlorobutadiene	21.35	225	5994	N.D.		
98) Cyclohexanone	16.36	55	20200	0.679	ng	# 88
99) tert-Butylbenzene	18.48	119	35600	0.643	ng	97
100) n-Butylbenzene	19.37	91	46949	0.668	ng	# 95

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

ALS Vial : 16 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS09\Data\2018 10\15\10151817.D

Acq On : 15 Oct 2018 19:25

Operator: SC

Sample : 1.0ng TO-15 ICAL STD

Misc : S31-10151806/S31-10151810 (11/13)

ALS Vial : 16 Sample Multiplier: 1

 10/16/18

Quant Time: Oct 16 08:56:15 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 08:54:50 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.25	130	115078	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	11.22	114	635909	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	15.57	82	383809	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	10.03	65	301688	15.841	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	126.72%
57) Toluene-d8 (SS2)	13.66	98	834158	11.754	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	94.00%
73) Bromofluorobenzene (SS3)	17.15	174	163116	9.575	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	76.56%

Target Compounds

						Qvalue
2) Propene	3.95	42	29172	1.724	ng	97
3) Dichlorodifluoromethan...	4.05	85	33804	1.391	ng	99
4) Chloromethane	4.25	50	41057	1.817	ng	98
5) 1,2-Dichloro-1,1,2,2-t...	4.42	135	11091	1.148	ng	100
6) Vinyl Chloride	4.53	62	31269	1.641	ng	99
7) 1,3-Butadiene	4.71	54	14066	1.374	ng	# 87
8) Bromomethane	5.02	94	11797	1.214	ng	99
9) Chloroethane	5.24	64	16272	1.514	ng	98
10) Ethanol	5.45	45	115524	9.753	ng	100
11) Acetonitrile	5.65	41	57172	1.862	ng	98
12) Acrolein	5.79	56	16986	1.797	ng	99
13) Acetone	5.94	58	113509	9.981	ng	# 76
14) Trichlorofluoromethane	6.13	101	22905	1.276	ng	99
15) 2-Propanol (Isopropanol)	6.26	45	155458	3.710	ng	94
16) Acrylonitrile	6.47	53	36723	1.695	ng	98
17) 1,1-Dichloroethene	6.83	96	14072	1.262	ng	# 70
18) 2-Methyl-2-Propanol (t...	6.93	59	131897	3.184	ng	92
19) Methylene Chloride	6.96	84	18958	1.345	ng	# 66
20) 3-Chloro-1-propene (Al...	7.10	41	32037	1.659	ng	84
21) Trichlorotrifluoroethane	7.29	151	9923	1.021	ng	# 83
22) Carbon Disulfide	7.25	76	65641	1.365	ng	100
23) trans-1,2-Dichloroethene	7.99	61	35777	1.538	ng	85
24) 1,1-Dichloroethane	8.21	63	39380	1.402	ng	98
25) Methyl tert-Butyl Ether	8.30	73	66743	1.460	ng	94
26) Vinyl Acetate	8.39	86	12714	5.035	ng	# 1
27) 2-Butanone (MEK)	8.64	72	16161	1.420	ng	# 45
28) cis-1,2-Dichloroethene	9.09	61	34178	1.522	ng	85
29) Diisopropyl Ether	9.33	87	17032	1.292	ng	# 9
30) Ethyl Acetate	9.33	61	20329	3.446	ng	96
31) n-Hexane	9.33	57	47604	1.743	ng	# 98
32) Chloroform	9.38	83	34643	1.356	ng	100
34) Tetrahydrofuran (THF)	9.80	72	16396	1.502	ng	# 61
35) Ethyl tert-Butyl Ether	9.88	87	23181	1.318	ng	# 71
36) 1,2-Dichloroethane	10.14	62	29653	1.511	ng	99
38) 1,1,1-Trichloroethane	10.41	97	26419	1.255	ng	95
39) Isopropyl Acetate	10.78	61	34060	3.060	ng	# 59
40) 1-Butanol	10.79	56	56295	3.333	ng	# 79
41) Benzene	10.86	78	90055	1.338	ng	99
42) Carbon Tetrachloride	11.02	117	18544	1.164	ng	100
43) Cyclohexane	11.15	84	64117	2.699	ng	# 79
44) tert-Amyl Methyl Ether	11.47	73	64404	1.407	ng	90
45) 1,2-Dichloropropane	11.69	63	27210	1.543	ng	99
46) Bromodichloromethane	11.87	83	27448	1.384	ng	99
47) Trichloroethene	11.92	130	17746	1.170	ng	99
48) 1,4-Dioxane	11.90	88	16944	1.327	ng	79
49) 2,2,4-Trimethylpentane...	11.98	57	119381	1.594	ng	93

Data File: I:\MS09\Data\2018 10\15\10151817.D

Acq On : 15 Oct 2018 19:25

Operator: SC

Sample : 1.0ng TO-15 ICAL STD

Misc : S31-10151806/S31-10151810 (11/13)

ALS Vial : 16 Sample Multiplier: 1

Quant Time: Oct 16 08:56:15 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 08:54:50 2018

Response via : Initial Calibration

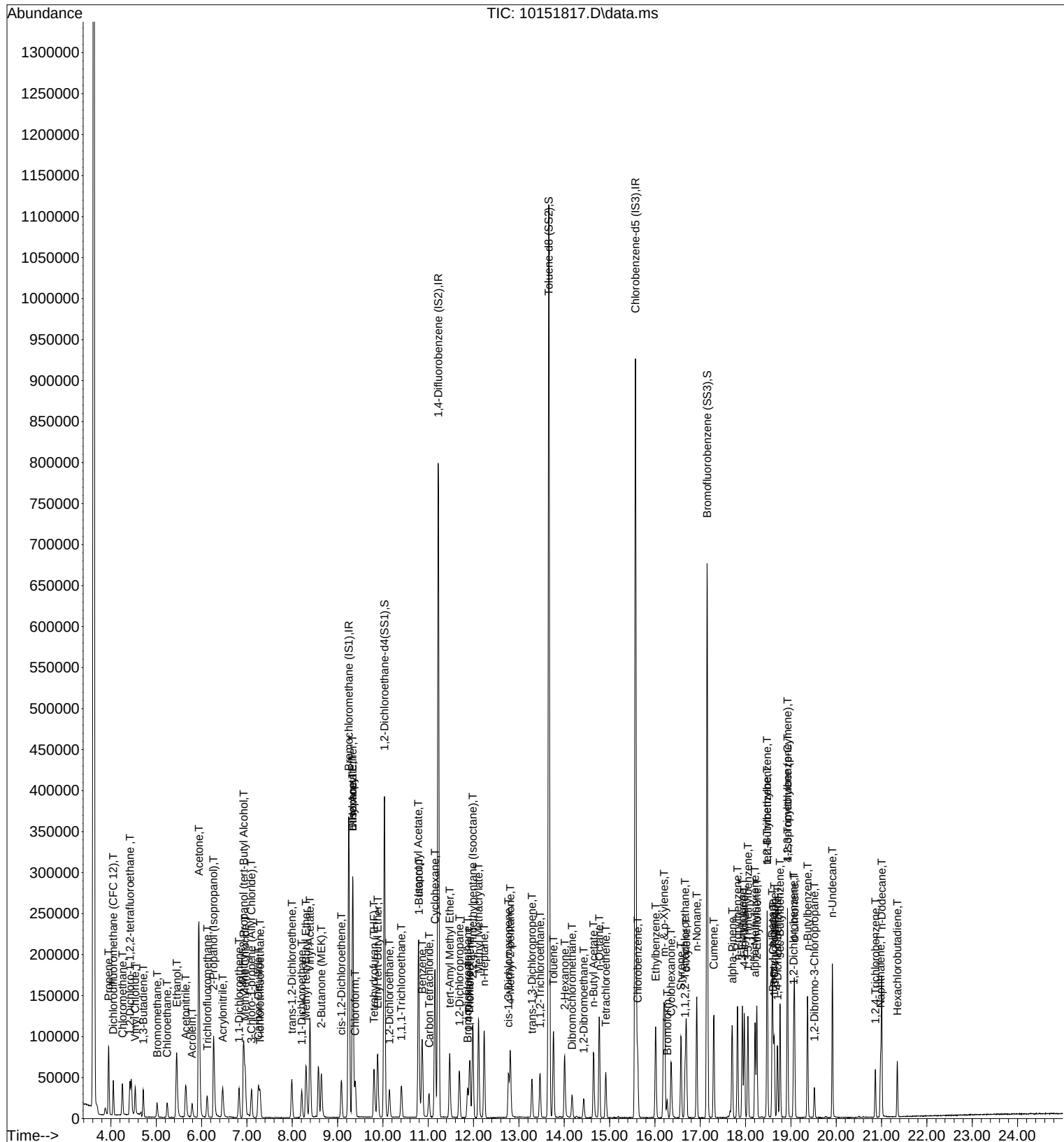
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.11	100	14716	2.482	ng	# 71
51) n-Heptane	12.23	71	25054	1.471	ng	89
52) cis-1,3-Dichloropropene	12.77	75	37318	1.435	ng	99
53) 4-Methyl-2-pentanone	12.81	58	26061	1.579	ng	# 72
54) trans-1,3-Dichloropropene	13.29	75	30863	1.333	ng	97
55) 1,1,2-Trichloroethane	13.47	97	19274	1.310	ng	96
58) Toluene	13.76	91	86924	1.120	ng	97
59) 2-Hexanone	14.01	43	68336	1.542	ng	89
60) Dibromochloromethane	14.17	129	17096	1.016	ng	100
61) 1,2-Dibromoethane	14.43	107	19574	1.084	ng	100
62) n-Butyl Acetate	14.64	43	75337	1.538	ng	93
63) n-Octane	14.77	57	25392	1.450	ng	84
64) Tetrachloroethene	14.92	166	16478	1.022	ng	98
65) Chlorobenzene	15.62	112	48314	1.052	ng	100
66) Ethylbenzene	16.02	91	93670	1.098	ng	97
67) m- & p-Xylenes	16.20	91	151565	2.352	ng	92
68) Bromoform	16.27	173	10667	0.882	ng	98
69) Styrene	16.57	104	51561	1.101	ng	97
70) o-Xylene	16.69	91	75200	1.148	ng	95
71) n-Nonane	16.92	43	68044	1.664	ng	83
72) 1,1,2,2-Tetrachloroethane	16.67	83	35460	1.161	ng	100
74) Cumene	17.30	105	86878	1.076	ng	96
75) alpha-Pinene	17.71	93	47043	1.162	ng	89
76) n-Propylbenzene	17.82	91	117091	1.181	ng	94
77) 3-Ethyltoluene	17.93	105	86320	1.075	ng	96
78) 4-Ethyltoluene	17.97	105	81998	1.099	ng	96
79) 1,3,5-Trimethylbenzene	18.05	105	74345	1.108	ng	93
80) alpha-Methylstyrene	18.21	118	33607	1.102	ng	98
81) 2-Ethyltoluene	18.25	105	86282	1.104	ng	96
82) 1,2,4-Trimethylbenzene	18.48	105	73780	1.134	ng	93
83) n-Decane	18.58	58	2877	1.603	ng	# 72
84) Benzyl Chloride	18.61	91	46378	0.958	ng	92
85) 1,3-Dichlorobenzene	18.64	146	32328	0.988	ng	98
86) 1,4-Dichlorobenzene	18.70	146	32316	0.977	ng	98
87) sec-Butylbenzene	18.76	105	98650	1.106	ng	96
88) 4-Isopropyltoluene (p-...	18.92	119	82170	1.060	ng	96
89) 1,2,3-Trimethylbenzene	18.92	105	71733	1.102	ng	95
90) 1,2-Dichlorobenzene	19.06	146	31204	1.004	ng	99
91) d-Limonene	19.08	68	37119	1.337	ng	87
92) 1,2-Dibromo-3-Chloropr...	19.52	157	8044	0.871	ng	# 42
93) n-Undecane	19.91	57	66345	1.570	ng	90
94) 1,2,4-Trichlorobenzene	20.86	180	14895	0.896	ng	100
95) Naphthalene	20.98	128	54432	0.993	ng	98
96) n-Dodecane	21.00	57	56762	1.589	ng	90
97) Hexachlorobutadiene	21.35	225	10813	0.805	ng	97
98) Cyclohexanone	16.36	55	38117	1.288	ng	# 87
99) tert-Butylbenzene	18.48	119	64513	1.171	ng	97
100) n-Butylbenzene	19.37	91	88944	1.272	ng	95

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

ALS Vial : 16 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS09\Data\2018 10\15\10151818.D

Acq On : 15 Oct 2018 19:59

Operator: SC

Sample : 5.0ng TO-15 ICAL STD

Misc : S31-10151806/S31-10151810 (11/13)

ALS Vial : 16 Sample Multiplier: 1

 10/16/18

Quant Time: Oct 16 08:55:06 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 08:54:50 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.26	130	112554	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	11.23	114	642044	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	15.57	82	390540	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	10.04	65	308950	16.586	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	132.72%#
57) Toluene-d8 (SS2)	13.66	98	835717	11.573	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	92.56%
73) Bromofluorobenzene (SS3)	17.16	174	168661	9.730	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	77.84%

Target Compounds

						Qvalue
2) Propene	3.94	42	143845	8.689	ng	97
3) Dichlorodifluoromethan...	4.05	85	157425	6.623	ng	99
4) Chloromethane	4.24	50	179388	8.117	ng	98
5) 1,2-Dichloro-1,1,2,2-t...	4.42	135	49042	5.189	ng	98
6) Vinyl Chloride	4.53	62	145384	7.800	ng	99
7) 1,3-Butadiene	4.71	54	71950	7.186	ng	88
8) Bromomethane	5.02	94	48854	5.139	ng	99
9) Chloroethane	5.24	64	59223	5.633	ng	98
10) Ethanol	5.48	45	488861	42.199	ng	99
11) Acetonitrile	5.67	41	268980	8.954	ng	99
12) Acrolein	5.80	56	71499	7.734	ng	98
13) Acetone	5.94	58	498011	44.773	ng	# 77
14) Trichlorofluoromethane	6.12	101	105581	6.013	ng	97
15) 2-Propanol (Isopropanol)	6.29	45	702809	17.150	ng	99
16) Acrylonitrile	6.48	53	171831	8.107	ng	99
17) 1,1-Dichloroethene	6.83	96	65494	6.006	ng	# 66
18) 2-Methyl-2-Propanol (t...	6.94	59	644226	15.899	ng	94
19) Methylene Chloride	6.98	84	89179	6.468	ng	# 63
20) 3-Chloro-1-propene (Al...	7.11	41	167720	8.879	ng	84
21) Trichlorotrifluoroethane	7.29	151	45609	4.798	ng	# 78
22) Carbon Disulfide	7.25	76	318026	6.760	ng	100
23) trans-1,2-Dichloroethene	8.00	61	173833	7.642	ng	83
24) 1,1-Dichloroethane	8.22	63	191748	6.979	ng	98
25) Methyl tert-Butyl Ether	8.29	73	319135	7.135	ng	95
26) Vinyl Acetate	8.40	86	83424	33.779	ng	# 1
27) 2-Butanone (MEK)	8.64	72	79639	7.157	ng	# 48
28) cis-1,2-Dichloroethene	9.10	61	167408	7.623	ng	83
29) Diisopropyl Ether	9.33	87	79256	6.147	ng	# 2
30) Ethyl Acetate	9.34	61	98766	17.116	ng	93
31) n-Hexane	9.34	57	225111	8.429	ng	# 98
32) Chloroform	9.40	83	166554	6.667	ng	99
34) Tetrahydrofuran (THF)	9.80	72	77368	7.246	ng	# 69
35) Ethyl tert-Butyl Ether	9.88	87	112986	6.567	ng	# 70
36) 1,2-Dichloroethane	10.15	62	141319	7.362	ng	99
38) 1,1,1-Trichloroethane	10.42	97	126944	5.972	ng	93
39) Isopropyl Acetate	10.78	61	167032	14.865	ng	# 61
40) 1-Butanol	10.79	56	288008	16.890	ng	84
41) Benzene	10.87	78	419520	6.172	ng	99
42) Carbon Tetrachloride	11.02	117	92088	5.726	ng	98
43) Cyclohexane	11.15	84	302139	12.598	ng	# 78
44) tert-Amyl Methyl Ether	11.47	73	314286	6.798	ng	91
45) 1,2-Dichloropropane	11.69	63	127652	7.172	ng	100
46) Bromodichloromethane	11.87	83	130589	6.520	ng	99
47) Trichloroethene	11.93	130	79787	5.211	ng	100
48) 1,4-Dioxane	11.90	88	83062	6.442	ng	80
49) 2,2,4-Trimethylpentane...	11.98	57	562650	7.440	ng	95

Data File: I:\MS09\Data\2018 10\15\10151818.D

Acq On : 15 Oct 2018 19:59

Operator: SC

Sample : 5.0ng TO-15 ICAL STD

Misc : S31-10151806/S31-10151810 (11/13)

ALS Vial : 16 Sample Multiplier: 1

Quant Time: Oct 16 08:55:06 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 08:54:50 2018

Response via : Initial Calibration

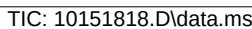
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.11	100	70344	11.752	ng	# 63
51) n-Heptane	12.24	71	117722	6.847	ng	88
52) cis-1,3-Dichloropropene	12.77	75	187581	7.146	ng	98
53) 4-Methyl-2-pentanone	12.81	58	130628	7.838	ng	# 77
54) trans-1,3-Dichloropropene	13.29	75	158302	6.770	ng	99
55) 1,1,2-Trichloroethane	13.47	97	89975	6.056	ng	93
58) Toluene	13.76	91	402331	5.094	ng	99
59) 2-Hexanone	14.00	43	343469	7.619	ng	90
60) Dibromochloromethane	14.17	129	83625	4.882	ng	99
61) 1,2-Dibromoethane	14.43	107	93161	5.069	ng	100
62) n-Butyl Acetate	14.64	43	387636	7.778	ng	91
63) n-Octane	14.77	57	121466	6.816	ng	84
64) Tetrachloroethene	14.92	166	69279	4.222	ng	100
65) Chlorobenzene	15.62	112	227216	4.860	ng	98
66) Ethylbenzene	16.02	91	453810	5.227	ng	95
67) m- & p-Xylenes	16.20	91	706626	10.774	ng	94
68) Bromoform	16.27	173	55955	4.545	ng	100
69) Styrene	16.58	104	254294	5.337	ng	95
70) o-Xylene	16.69	91	360143	5.404	ng	94
71) n-Nonane	16.92	43	323386	7.774	ng	85
72) 1,1,2,2-Tetrachloroethane	16.67	83	180701	5.812	ng	98
74) Cumene	17.30	105	409766	4.987	ng	96
75) alpha-Pinene	17.70	93	231332	5.616	ng	94
76) n-Propylbenzene	17.82	91	564951	5.598	ng	94
77) 3-Ethyltoluene	17.93	105	411398	5.035	ng	96
78) 4-Ethyltoluene	17.98	105	398221	5.246	ng	96
79) 1,3,5-Trimethylbenzene	18.05	105	346248	5.072	ng	96
80) alpha-Methylstyrene	18.21	118	170769	5.503	ng	99
81) 2-Ethyltoluene	18.25	105	411418	5.176	ng	96
82) 1,2,4-Trimethylbenzene	18.48	105	355284	5.366	ng	95
83) n-Decane	18.59	58	13918	7.622	ng	# 68
84) Benzyl Chloride	18.61	91	286168	5.811	ng	94
85) 1,3-Dichlorobenzene	18.64	146	156804	4.710	ng	99
86) 1,4-Dichlorobenzene	18.70	146	156925	4.663	ng	99
87) sec-Butylbenzene	18.76	105	473219	5.212	ng	96
88) 4-Isopropyltoluene (p-...	18.92	119	397336	5.038	ng	97
89) 1,2,3-Trimethylbenzene	18.92	105	345525	5.216	ng	95
90) 1,2-Dichlorobenzene	19.06	146	150103	4.746	ng	100
91) d-Limonene	19.08	68	191025	6.763	ng	87
92) 1,2-Dibromo-3-Chloropr...	19.52	157	44983	4.787	ng	# 54
93) n-Undecane	19.91	57	333674	7.758	ng	90
94) 1,2,4-Trichlorobenzene	20.86	180	78132	4.617	ng	99
95) Naphthalene	20.98	128	292661	5.250	ng	99
96) n-Dodecane	21.00	57	294133	8.092	ng	90
97) Hexachlorobutadiene	21.35	225	53446	3.908	ng	100
98) Cyclohexanone	16.36	55	193614	6.428	ng	# 87
99) tert-Butylbenzene	18.48	119	309362	5.519	ng	97
100) n-Butylbenzene	19.37	91	430714	6.053	ng	96

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

ALS Vial : 16 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS09\Data\2018 10\15\10151819.D

Acq On : 15 Oct 2018 20:33

Operator: SC

Sample : 25ng TO-15 ICAL STD

Misc : S31-10151806/S31-10151808 (11/13)

ALS Vial : 2 Sample Multiplier: 1

 10/16/18

Quant Time: Oct 16 08:52:57 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Fri Aug 24 15:09:24 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.28	130	132983	12.500	ng	0.02
37) 1,4-Difluorobenzene (IS2)	11.24	114	712813	12.500	ng	0.01
56) Chlorobenzene-d5 (IS3)	15.57	82	432919	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	10.05	65	330767	15.642	ng	0.03
Spiked Amount	12.500	Range	70 - 130	Recovery	=	125.12%
57) Toluene-d8 (SS2)	13.67	98	919699	11.360	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	90.88%
73) Bromofluorobenzene (SS3)	17.16	174	196270	9.943	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	79.52%

Target Compounds

						Qvalue
2) Propene	3.93	42	695486	38.473	ng	97
3) Dichlorodifluoromethan...	4.04	85	801453	29.349	ng	100
4) Chloromethane	4.24	50	960070	39.695	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.41	135	256712	22.984	ng	100
6) Vinyl Chloride	4.53	62	714609	34.000	ng	99
7) 1,3-Butadiene	4.71	54	412351	36.443	ng	90
8) Bromomethane	5.02	94	264983	23.701	ng	100
9) Chloroethane	5.24	64	389578	32.796	ng	100
10) Ethanol	5.52	45	2623783	206.578	ng	99
11) Acetonitrile	5.69	41	1411684	43.450	ng	100
12) Acrolein	5.81	56	328909	31.450	ng	99
13) Acetone	5.96	58	2148123	172.254	ng	# 79
14) Trichlorofluoromethane	6.13	101	552660	27.000	ng	99
15) 2-Propanol (Isopropanol)	6.31	45	3941903	88.070	ng	99
16) Acrylonitrile	6.51	53	874625	37.167	ng	99
17) 1,1-Dichloroethene	6.83	96	350787	27.523	ng	# 68
18) 2-Methyl-2-Propanol (t...	6.97	59	3406649	74.811	ng	95
19) Methylene Chloride	7.00	84	471269	29.612	ng	# 64
20) 3-Chloro-1-propene (Al...	7.12	41	966546	46.892	ng	85
21) Trichlorotrifluoroethane	7.30	151	254339	22.398	ng	# 80
22) Carbon Disulfide	7.26	76	1701240	31.501	ng	100
23) trans-1,2-Dichloroethene	8.02	61	903163	35.178	ng	84
24) 1,1-Dichloroethane	8.24	63	1015764	32.551	ng	99
25) Methyl tert-Butyl Ether	8.30	73	1644849	32.096	ng	93
26) Vinyl Acetate	8.41	86	522743	188.149	ng	# 4
27) 2-Butanone (MEK)	8.65	72	414144	32.657	ng	# 51
28) cis-1,2-Dichloroethene	9.11	61	874929	35.342	ng	83
29) Diisopropyl Ether	9.34	87	403090	26.920	ng	# 15
30) Ethyl Acetate	9.35	61	496015	76.370	ng	93
31) n-Hexane	9.34	57	1099134	36.609	ng	98
32) Chloroform	9.42	83	869668	30.173	ng	99
34) Tetrahydrofuran (THF)	9.80	72	399092	32.701	ng	# 68
35) Ethyl tert-Butyl Ether	9.89	87	593625	29.795	ng	# 72
36) 1,2-Dichloroethane	10.16	62	734909	33.782	ng	99
38) 1,1,1-Trichloroethane	10.43	97	677056	28.880	ng	93
39) Isopropyl Acetate	10.79	61	856263	71.297	ng	# 65
40) 1-Butanol	10.80	56	1531378	87.358	ng	87
41) Benzene	10.88	78	2153663	29.003	ng	100
42) Carbon Tetrachloride	11.03	117	507253	28.358	ng	99
43) Cyclohexane	11.16	84	1546353	58.727	ng	# 79
44) tert-Amyl Methyl Ether	11.48	73	1632903	32.551	ng	91
45) 1,2-Dichloropropane	11.70	63	664724	34.836	ng	100
46) Bromodichloromethane	11.88	83	697091	31.829	ng	99
47) Trichloroethene	11.93	130	412334	24.014	ng	99
48) 1,4-Dioxane	11.90	88	433945	30.661	ng	80
49) 2,2,4-Trimethylpentane...	11.99	57	2857425	35.405	ng	94

Data File: I:\MS09\Data\2018 10\15\10151819.D

Acq On : 15 Oct 2018 20:33

Operator: SC

Sample : 25ng TO-15 ICAL STD

Misc : S31-10151806/S31-10151808 (11/13)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 16 08:52:57 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Fri Aug 24 15:09:24 2018

Response via : Initial Calibration

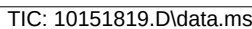
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.12	100	374510	56.346	ng	# 66
51) n-Heptane	12.24	71	611142	32.786	ng	89
52) cis-1,3-Dichloropropene	12.78	75	1003744	35.204	ng	100
53) 4-Methyl-2-pentanone	12.81	58	682071	38.552	ng	80
54) trans-1,3-Dichloropropene	13.29	75	862364	33.976	ng	100
55) 1,1,2-Trichloroethane	13.47	97	471622	28.716	ng	93
58) Toluene	13.77	91	2060947	23.301	ng	99
59) 2-Hexanone	14.00	43	1801738	37.650	ng	90
60) Dibromochloromethane	14.18	129	458080	23.515	ng	99
61) 1,2-Dibromoethane	14.44	107	495021	23.854	ng	99
62) n-Butyl Acetate	14.65	43	2098580	39.733	ng	91
63) n-Octane	14.78	57	624231	32.218	ng	85
64) Tetrachloroethene	14.92	166	367987	19.581	ng	100
65) Chlorobenzene	15.62	112	1180028	22.321	ng	100
66) Ethylbenzene	16.02	91	2348324	24.152	ng	96
67) m- & p-Xylenes	16.21	91	3663777	49.910	ng	94
68) Bromoform	16.27	173	320412	22.630	ng	100
69) Styrene	16.58	104	1354505	25.205	ng	95
70) o-Xylene	16.70	91	1862313	24.973	ng	95
71) n-Nonane	16.92	43	1648051	37.316	ng	85
72) 1,1,2,2-Tetrachloroethane	16.67	83	965507	27.917	ng	99
74) Cumene	17.30	105	2129593	22.998	ng	97
75) alpha-Pinene	17.71	93	1207170	26.237	ng	94
76) n-Propylbenzene	17.83	91	2894182	25.636	ng	95
77) 3-Ethyltoluene	17.93	105	2197805	23.813	ng	97
78) 4-Ethyltoluene	17.98	105	2030819	23.820	ng	97
79) 1,3,5-Trimethylbenzene	18.05	105	1809660	23.540	ng	96
80) alpha-Methylstyrene	18.21	118	923111	26.402	ng	98
81) 2-Ethyltoluene	18.25	105	2134551	23.866	ng	97
82) 1,2,4-Trimethylbenzene	18.48	105	1832361	24.614	ng	95
83) n-Decane	18.59	58	71103	36.418	ng	# 72
84) Benzyl Chloride	18.61	91	1737892	31.382	ng	95
85) 1,3-Dichlorobenzene	18.64	146	852065	22.445	ng	100
86) 1,4-Dichlorobenzene	18.71	146	858502	22.365	ng	100
87) sec-Butylbenzene	18.76	105	2437787	23.853	ng	97
88) 4-Isopropyltoluene (p-...	18.93	119	2035805	22.839	ng	97
89) 1,2,3-Trimethylbenzene	18.92	105	1814073	24.379	ng	95
90) 1,2-Dichlorobenzene	19.06	146	809008	22.427	ng	100
91) d-Limonene	19.08	68	998364	32.556	ng	89
92) 1,2-Dibromo-3-Chloropr...	19.52	157	263236	24.390	ng	# 59
93) n-Undecane	19.91	57	1738380	37.533	ng	92
94) 1,2,4-Trichlorobenzene	20.86	180	453690	23.293	ng	100
95) Naphthalene	20.98	128	1632299	25.834	ng	100
96) n-Dodecane	21.00	57	1624292	42.831	ng	92
97) Hexachlorobutadiene	21.35	225	297741	18.913	ng	100
98) Cyclohexanone	16.36	55	1044520	32.216	ng	# 88
99) tert-Butylbenzene	18.48	119	1593005	24.898	ng	98
100) n-Butylbenzene	19.37	91	2231356	28.014	ng	97

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

ALS Vial : 2 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS09\Data\2018 10\15\10151820.D

Acq On : 15 Oct 2018 21:07

Operator: SC

Sample : 50ng TO-15 ICAL STD

Misc : S31-10151806/S31-10151808 (11/13)

ALS Vial : 2 Sample Multiplier: 1

10/16/18

Quant Time: Oct 16 09:01:35 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 08:54:50 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.29	130	128672	12.500	ng	0.02
37) 1,4-Difluorobenzene (IS2)	11.24	114	736237	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	15.58	82	440419	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	10.06	65	340256	15.978	ng	0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	127.84%
57) Toluene-d8 (SS2)	13.67	98	941249	11.558	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	92.48%
73) Bromofluorobenzene (SS3)	17.16	174	203410	10.405	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	83.28%

Target Compounds

						Qvalue
2) Propene	3.94	42	1483123	78.369	ng	97
3) Dichlorodifluoromethan...	4.05	85	1526067	56.163	ng	100
4) Chloromethane	4.25	50	1779860	70.445	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.41	135	487791	45.151	ng	100
6) Vinyl Chloride	4.53	62	1367484	64.175	ng	100
7) 1,3-Butadiene	4.72	54	804034	70.248	ng	90
8) Bromomethane	5.03	94	504217	46.393	ng	99
9) Chloroethane	5.25	64	621699	51.728	ng	99
10) Ethanol	5.54	45	4836362	365.185	ng	99
11) Acetonitrile	5.72	41	2752267	80.147	ng	99
12) Acrolein	5.82	56	612250	57.930	ng	99
13) Acetone	5.99	58	3697403	290.773	ng	# 79
14) Trichlorofluoromethane	6.13	101	1058978	52.758	ng	99
15) 2-Propanol (Isopropanol)	6.33	45	6813394	145.432	ng	99
16) Acrylonitrile	6.53	53	1654301	68.273	ng	98
17) 1,1-Dichloroethene	6.84	96	676068	54.233	ng	# 70
18) 2-Methyl-2-Propanol (t...	6.99	59	6381084	137.756	ng	95
19) Methylene Chloride	7.02	84	914031	57.985	ng	# 67
20) 3-Chloro-1-propene (Al...	7.13	41	1774077	82.155	ng	86
21) Trichlorotrifluoroethane	7.30	151	472382	43.465	ng	# 82
22) Carbon Disulfide	7.28	76	3208095	59.650	ng	100
23) trans-1,2-Dichloroethene	8.03	61	1767463	67.966	ng	85
24) 1,1-Dichloroethane	8.25	63	1912060	60.871	ng	99
25) Methyl tert-Butyl Ether	8.31	73	3229547	63.161	ng	94
26) Vinyl Acetate	8.43	86	1015127	359.550	ng	# 24
27) 2-Butanone (MEK)	8.66	72	815728	64.122	ng	# 56
28) cis-1,2-Dichloroethene	9.12	61	1694052	67.478	ng	84
29) Diisopropyl Ether	9.35	87	741162	50.283	ng	# 33
30) Ethyl Acetate	9.36	61	878379	133.157	ng	97
31) n-Hexane	9.34	57	1934310	63.354	ng	98
32) Chloroform	9.43	83	1700460	59.542	ng	99
34) Tetrahydrofuran (THF)	9.81	72	784960	64.309	ng	# 71
35) Ethyl tert-Butyl Ether	9.89	87	1169121	59.439	ng	# 75
36) 1,2-Dichloroethane	10.17	62	1433176	65.309	ng	100
38) 1,1,1-Trichloroethane	10.43	97	1348906	55.343	ng	94
39) Isopropyl Acetate	10.79	61	1564249	121.401	ng	# 69
40) 1-Butanol	10.82	56	2830165	144.736	ng	88
41) Benzene	10.89	78	4169887	53.501	ng	99
42) Carbon Tetrachloride	11.04	117	1026663	55.666	ng	98
43) Cyclohexane	11.16	84	2933598	106.669	ng	# 82
44) tert-Amyl Methyl Ether	11.48	73	3175917	59.908	ng	91
45) 1,2-Dichloropropane	11.70	63	1278176	62.621	ng	99
46) Bromodichloromethane	11.89	83	1367313	59.537	ng	100
47) Trichloroethene	11.94	130	817579	46.563	ng	99
48) 1,4-Dioxane	11.91	88	847239	57.306	ng	82
49) 2,2,4-Trimethylpentane...	12.00	57	5404813	62.324	ng	93

Data File: I:\MS09\Data\2018 10\15\10151820.D

Acq On : 15 Oct 2018 21:07

Operator: SC

Sample : 50ng TO-15 ICAL STD

Misc : S31-10151806/S31-10151808 (11/13)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 16 09:01:35 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 08:54:50 2018

Response via : Initial Calibration

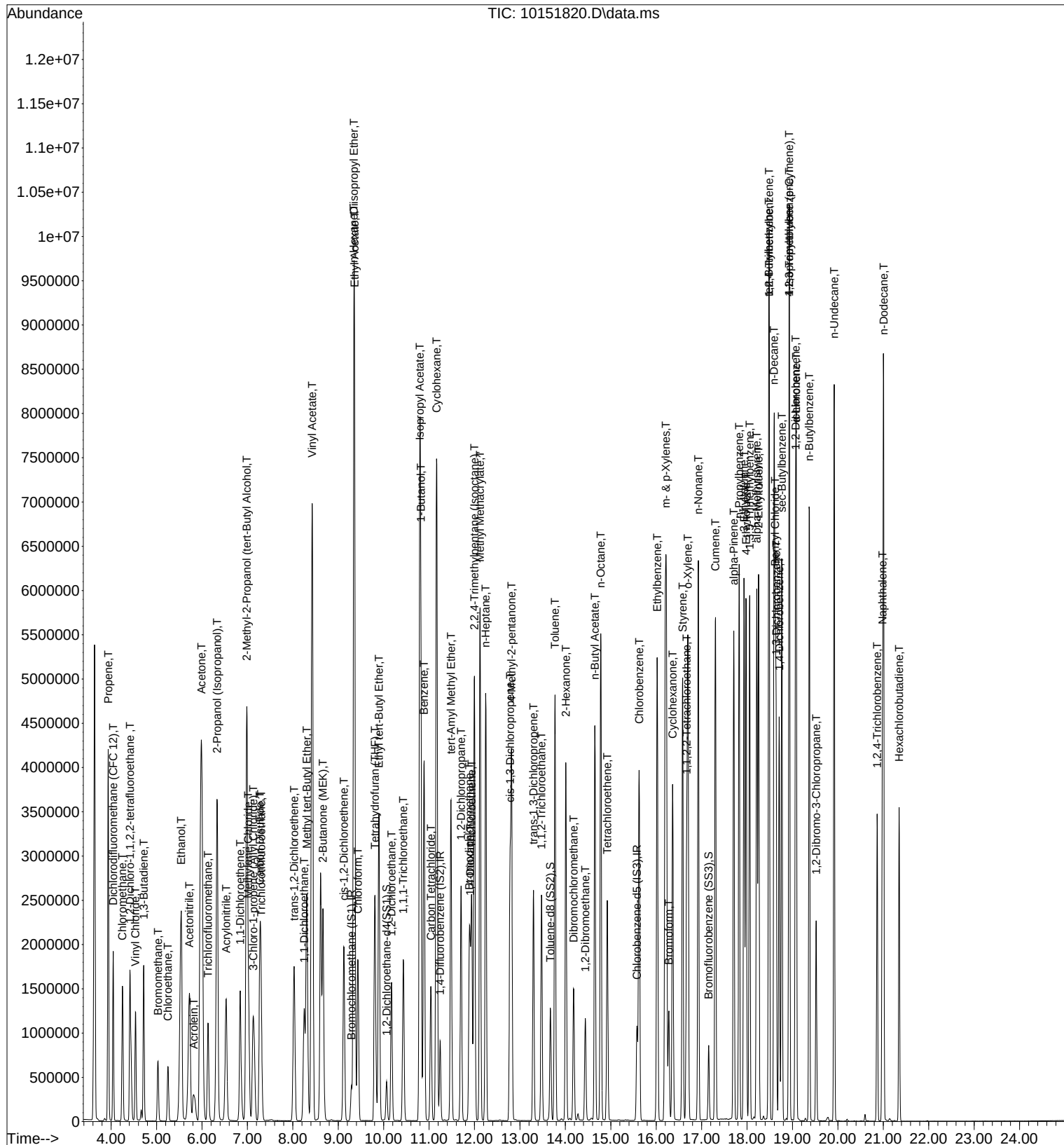
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.12	100	730209	106.383	ng	# 71
51) n-Heptane	12.25	71	1178223	59.764	ng	90
52) cis-1,3-Dichloropropene	12.78	75	1948479	64.736	ng	100
53) 4-Methyl-2-pentanone	12.81	58	1300906	68.072	ng	81
54) trans-1,3-Dichloropropene	13.30	75	1706717	63.656	ng	100
55) 1,1,2-Trichloroethane	13.47	97	926577	54.382	ng	94
58) Toluene	13.77	91	3964032	44.507	ng	100
59) 2-Hexanone	14.01	43	3446119	67.788	ng	90
60) Dibromochloromethane	14.18	129	918447	47.543	ng	99
61) 1,2-Dibromoethane	14.44	107	980389	47.303	ng	99
62) n-Butyl Acetate	14.65	43	4012535	71.389	ng	92
63) n-Octane	14.78	57	1181857	58.807	ng	86
64) Tetrachloroethene	14.92	166	737769	39.872	ng	100
65) Chlorobenzene	15.62	112	2306376	43.744	ng	100
66) Ethylbenzene	16.02	91	4512230	46.083	ng	97
67) m- & p-Xylenes	16.21	91	6964597	94.166	ng	95
68) Bromoform	16.28	173	660928	47.600	ng	100
69) Styrene	16.58	104	2631717	48.979	ng	94
70) o-Xylene	16.70	91	3569405	47.494	ng	96
71) n-Nonane	16.93	43	2997154	63.889	ng	87
72) 1,1,2,2-Tetrachloroethane	16.67	83	1858845	53.019	ng	99
74) Cumene	17.30	105	4063437	43.848	ng	98
75) alpha-Pinene	17.71	93	2316552	49.873	ng	94
76) n-Propylbenzene	17.83	91	5424360	47.659	ng	96
77) 3-Ethyltoluene	17.93	105	4118127	44.697	ng	98
78) 4-Ethyltoluene	17.98	105	3960121	46.258	ng	98
79) 1,3,5-Trimethylbenzene	18.06	105	3475354	45.146	ng	97
80) alpha-Methylstyrene	18.21	118	1803006	51.522	ng	97
81) 2-Ethyltoluene	18.25	105	4077914	45.491	ng	98
82) 1,2,4-Trimethylbenzene	18.49	105	3324500	44.522	ng	96
83) n-Decane	18.59	58	127503	61.915	ng	# 76
84) Benzyl Chloride	18.62	91	3400819	61.233	ng	97
85) 1,3-Dichlorobenzene	18.64	146	1693897	45.119	ng	100
86) 1,4-Dichlorobenzene	18.71	146	1728023	45.532	ng	100
87) sec-Butylbenzene	18.76	105	4632421	45.244	ng	97
88) 4-Isopropyltoluene (p-...	18.93	119	3668354	41.246	ng	97
89) 1,2,3-Trimethylbenzene	18.93	105	3278912	43.892	ng	96
90) 1,2-Dichlorobenzene	19.07	146	1578751	44.269	ng	100
91) d-Limonene	19.08	68	1796207	56.389	ng	93
92) 1,2-Dibromo-3-Chloropr...	19.52	157	537102	50.681	ng	# 64
93) n-Undecane	19.92	57	3139894	64.739	ng	94
94) 1,2,4-Trichlorobenzene	20.86	180	938099	49.156	ng	99
95) Naphthalene	20.98	128	3250812	51.708	ng	99
96) n-Dodecane	21.01	57	2956638	72.133	ng	94
97) Hexachlorobutadiene	21.35	225	605431	39.260	ng	99
98) Cyclohexanone	16.36	55	2034713	59.906	ng	# 88
99) tert-Butylbenzene	18.48	119	2904700	45.951	ng	99
100) n-Butylbenzene	19.37	91	4190460	52.223	ng	98

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

ALS Vial : 2 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS09\Data\2018 10\15\10151821.D

Acq On : 15 Oct 2018 21:41

Operator: SC

Sample : 100ng TO-15 ICAL STD

Misc : S31-10151806/S31-10151808 (11/13)

ALS Vial : 2 Sample Multiplier: 1

 10/16/18

Quant Time: Oct 16 09:02:49 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 08:54:50 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.30	130	126014	12.500	ng	0.03
37) 1,4-Difluorobenzene (IS2)	11.25	114	757208	12.500	ng	0.01
56) Chlorobenzene-d5 (IS3)	15.58	82	447599	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	10.08	65	344844	16.535	ng	0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	132.32%#
57) Toluene-d8 (SS2)	13.67	98	955074	11.540	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	92.32%
73) Bromofluorobenzene (SS3)	17.16	174	210082	10.574	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	84.56%

Target Compounds

						Qvalue
2) Propene	3.94	42	3326594	179.486	ng	97
3) Dichlorodifluoromethan...	4.05	85	2876102	108.080	ng	100
4) Chloromethane	4.26	50	2926561	118.273	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.42	135	951630	89.943	ng	100
6) Vinyl Chloride	4.54	62	2594001	124.302	ng	100
7) 1,3-Butadiene	4.73	54	1604957	143.181	ng	88
8) Bromomethane	5.04	94	948445	89.107	ng	99
9) Chloroethane	5.26	64	1084883	92.171	ng	99
10) Ethanol	5.57	45	8623712	664.897	ng	99
11) Acetonitrile	5.76	41	5316968	158.097	ng	99
12) Acrolein	5.87	56	1226283	118.477	ng	94
13) Acetone	6.03	58	6642465	533.399	ng	# 81
14) Trichlorofluoromethane	6.14	101	2101814	106.921	ng	99
15) 2-Propanol (Isopropanol)	6.35	45	9703797	211.497	ng	99
16) Acrylonitrile	6.56	53	3183578	134.157	ng	99
17) 1,1-Dichloroethene	6.85	96	1360219	111.416	ng	# 72
18) 2-Methyl-2-Propanol (t...	7.00	59	8947100	197.226	ng	94
19) Methylene Chloride	7.05	84	1790911	116.010	ng	# 71
20) 3-Chloro-1-propene (Al...	7.17	41	3414727	161.466	ng	86
21) Trichlorotrifluoroethane	7.31	151	847007	79.579	ng	85
22) Carbon Disulfide	7.28	76	6160564	116.963	ng	100
23) trans-1,2-Dichloroethene	8.05	61	3405813	133.730	ng	86
24) 1,1-Dichloroethane	8.27	63	3463830	112.599	ng	99
25) Methyl tert-Butyl Ether	8.32	73	6238581	124.584	ng	94
26) Vinyl Acetate	8.45	86	1834262	663.385	ng	# 51
27) 2-Butanone (MEK)	8.68	72	1554824	124.797	ng	# 61
28) cis-1,2-Dichloroethene	9.14	61	3139415	127.688	ng	85
29) Diisopropyl Ether	9.35	87	1270968	88.045	ng	# 60
30) Ethyl Acetate	9.37	61	1389994	215.160	ng	99
31) n-Hexane	9.35	57	3066915	102.568	ng	98
32) Chloroform	9.45	83	3205046	114.592	ng	100
34) Tetrahydrofuran (THF)	9.81	72	1511410	126.435	ng	# 74
35) Ethyl tert-Butyl Ether	9.91	87	2249755	116.793	ng	# 80
36) 1,2-Dichloroethane	10.18	62	2749520	127.936	ng	100
38) 1,1,1-Trichloroethane	10.44	97	2636232	105.163	ng	95
39) Isopropyl Acetate	10.80	61	2652620	200.168	ng	# 74
40) 1-Butanol	10.84	56	4888938	243.098	ng	88
41) Benzene	10.90	78	7809026	97.418	ng	99
42) Carbon Tetrachloride	11.04	117	2041431	107.621	ng	98
43) Cyclohexane	11.17	84	5208618	184.147	ng	86
44) tert-Amyl Methyl Ether	11.49	73	5910271	108.399	ng	91
45) 1,2-Dichloropropane	11.71	63	2377634	113.261	ng	99
46) Bromodichloromethane	11.89	83	2579270	109.198	ng	100
47) Trichloroethene	11.94	130	1575166	87.225	ng	99
48) 1,4-Dioxane	11.92	88	1568483	103.152	ng	85
49) 2,2,4-Trimethylpentane...	12.00	57	9579265	107.401	ng	93

Data File: I:\MS09\Data\2018 10\15\10151821.D

Acq On : 15 Oct 2018 21:41

Operator: SC

Sample : 100ng TO-15 ICAL STD

Misc : S31-10151806/S31-10151808 (11/13)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 16 09:02:49 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 08:54:50 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.13	100	1354244	191.834	ng	# 81
51) n-Heptane	12.25	71	2160662	106.561	ng	93
52) cis-1,3-Dichloropropene	12.78	75	3621231	116.979	ng	100
53) 4-Methyl-2-pentanone	12.82	58	2344880	119.302	ng	84
54) trans-1,3-Dichloropropene	13.30	75	3240021	117.497	ng	100
55) 1,1,2-Trichloroethane	13.48	97	1767548	100.867	ng	94
58) Toluene	13.78	91	7232115	79.897	ng	100
59) 2-Hexanone	14.01	43	6214002	120.274	ng	91
60) Dibromochloromethane	14.19	129	1806537	92.015	ng	99
61) 1,2-Dibromoethane	14.44	107	1911016	90.725	ng	99
62) n-Butyl Acetate	14.65	43	7172385	125.561	ng	93
63) n-Octane	14.78	57	2080276	101.851	ng	89
64) Tetrachloroethene	14.93	166	1459684	77.622	ng	100
65) Chlorobenzene	15.62	112	4339686	80.989	ng	99
66) Ethylbenzene	16.03	91	8179949	82.201	ng	99
67) m- & p-Xylenes	16.22	91	12103400	161.021	ng	97
68) Bromoform	16.28	173	1334152	94.545	ng	100
69) Styrene	16.58	104	4887478	89.501	ng	94
70) o-Xylene	16.70	91	6341623	83.028	ng	97
71) n-Nonane	16.93	43	4970673	104.258	ng	89
72) 1,1,2,2-Tetrachloroethane	16.68	83	3364705	94.431	ng	100
74) Cumene	17.30	105	7264077	77.129	ng	100
75) alpha-Pinene	17.71	93	4139992	87.700	ng	93
76) n-Propylbenzene	17.83	91	9517692	82.282	ng	97
77) 3-Ethyltoluene	17.94	105	7518197	80.291	ng	100
78) 4-Ethyltoluene	17.98	105	6866256	78.919	ng	100
79) 1,3,5-Trimethylbenzene	18.06	105	6245490	79.830	ng	98
80) alpha-Methylstyrene	18.22	118	3326274	93.526	ng	97
81) 2-Ethyltoluene	18.26	105	7263882	79.733	ng	100
82) 1,2,4-Trimethylbenzene	18.49	105	5258573	69.294	ng	97
83) n-Decane	18.59	58	201750	96.397	ng	# 83
84) Benzyl Chloride	18.62	91	5784613	102.483	ng	99
85) 1,3-Dichlorobenzene	18.65	146	3133945	82.138	ng	100
86) 1,4-Dichlorobenzene	18.71	146	3285698	85.187	ng	100
87) sec-Butylbenzene	18.77	105	8106627	77.905	ng	98
88) 4-Isopropyltoluene (p-...	18.93	119	5701125	63.073	ng	96
89) 1,2,3-Trimethylbenzene	18.93	105	5116002	67.385	ng	96
90) 1,2-Dichlorobenzene	19.07	146	2743263	75.688	ng	99
91) d-Limonene	19.09	68	2734402	84.465	ng	98
92) 1,2-Dibromo-3-Chloropr...	19.52	157	1050168	97.503	ng	# 69
93) n-Undecane	19.92	57	4988854	101.211	ng	97
94) 1,2,4-Trichlorobenzene	20.87	180	1795938	92.597	ng	99
95) Naphthalene	20.98	128	5714967	89.444	ng	98
96) n-Dodecane	21.01	57	4551712	109.266	ng	97
97) Hexachlorobutadiene	21.35	225	1132209	72.242	ng	100
98) Cyclohexanone	16.37	55	3734351	108.183	ng	90
99) tert-Butylbenzene	18.49	119	4648974	72.365	ng	100
100) n-Butylbenzene	19.37	91	7204122	88.340	ng	99

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

Data File: I:\MS09\Data\2018 10\15\10151821.D

Acq On : 15 Oct 2018 21:41

Operator: SC

Sample : 100ng TO-15 ICAL STD

Misc : S31-10151806/S31-10151808 (11/13)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 16 09:02:49 2018

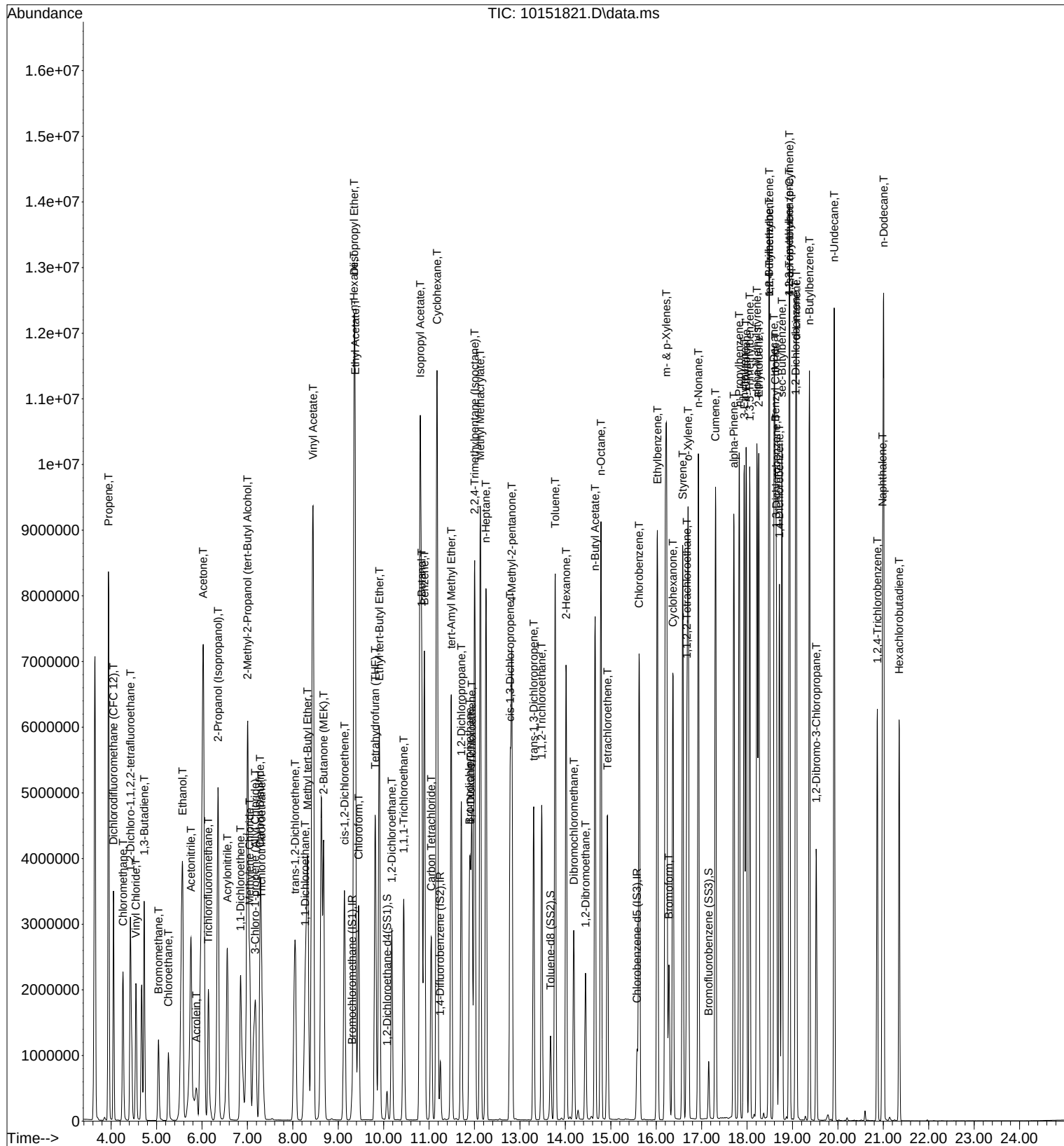
Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 08:54:50 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS09\Data\2018 10\15\10151823.D

Acq On : 15 Oct 2018 22:49

Operator: SC

Sample : 25ng TO-15 ICV STD

Misc : S31-10151806/S31-10151802 (11/13)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 16 09:17:36 2018

 10/16/18

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 09:06:20 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.28	130	131148	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	11.24	114	682694	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	15.57	82	413671	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	10.05	65	322745	11.929	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.44%
57) Toluene-d8 (SS2)	13.67	98	882047	12.343	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.72%
73) Bromofluorobenzene (SS3)	17.16	174	183080	12.518	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.16%

Target Compounds

						Qvalue
2) Propene	3.92	42	692136	20.405	ng	96
3) Dichlorodifluoromethan...	4.03	85	814128	22.687	ng	99
4) Chloromethane	4.24	50	971750	22.426	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.41	135	267049	22.800	ng	100
6) Vinyl Chloride	4.53	62	733485	22.574	ng	100
7) 1,3-Butadiene	4.71	54	420768	26.336	ng	88
8) Bromomethane	5.02	94	288125	24.576	ng	99
9) Chloroethane	5.24	64	404003	25.018	ng	99
10) Ethanol	5.52	45	2637314	113.438	ng	100
11) Acetonitrile	5.69	41	1391562	22.174	ng	99
12) Acrolein	5.80	56	335104	20.017	ng	99
13) Acetone	5.96	58	2136307	112.191	ng	# 77
14) Trichlorofluoromethane	6.13	101	570668	23.605	ng	99
15) 2-Propanol (Isopropanol)	6.31	45	3952424	51.011	ng	100
16) Acrylonitrile	6.51	53	868553	22.768	ng	99
17) 1,1-Dichloroethene	6.83	96	361119	23.787	ng	# 72
18) 2-Methyl-2-Propanol (t...	6.97	59	3422109	52.390	ng	95
19) Methylene Chloride	7.00	84	482156	24.436	ng	# 69
20) 3-Chloro-1-propene (Al...	7.12	41	996040	27.755	ng	86
21) Trichlorotrifluoroethane	7.29	151	271337	26.151	ng	85
22) Carbon Disulfide	7.26	76	1713044	24.462	ng	100
23) trans-1,2-Dichloroethene	8.02	61	916686	24.377	ng	85
24) 1,1-Dichloroethane	8.24	63	1060636	24.731	ng	99
25) Methyl tert-Butyl Ether	8.30	73	1684411	24.615	ng	94
26) Vinyl Acetate	8.41	86	534709	155.096	ng	# 12
27) 2-Butanone (MEK)	8.65	72	425395	24.770	ng	# 55
28) cis-1,2-Dichloroethene	9.11	61	878987	23.809	ng	84
29) Diisopropyl Ether	9.34	87	406621	22.533	ng	# 23
30) Ethyl Acetate	9.35	61	484971	51.776	ng	97
31) n-Hexane	9.34	57	1075179	23.233	ng	99
32) Chloroform	9.42	83	891650	24.262	ng	100
34) Tetrahydrofuran (THF)	9.80	72	406307	23.953	ng	# 72
35) Ethyl tert-Butyl Ether	9.89	87	611331	24.912	ng	# 74
36) 1,2-Dichloroethane	10.16	62	758875	24.575	ng	99
38) 1,1,1-Trichloroethane	10.43	97	695256	26.727	ng	94
39) Isopropyl Acetate	10.79	61	845899	51.099	ng	# 65
40) 1-Butanol	10.80	56	1473308	52.562	ng	85
41) Benzene	10.88	78	2220125	24.371	ng	100
42) Carbon Tetrachloride	11.03	117	535372	27.721	ng	99
43) Cyclohexane	11.16	84	1562742	48.955	ng	# 81
44) tert-Amyl Methyl Ether	11.47	73	1671799	26.332	ng	91
45) 1,2-Dichloropropane	11.70	63	665414	25.639	ng	100
46) Bromodichloromethane	11.88	83	721014	26.973	ng	100
47) Trichloroethene	11.93	130	430385	24.231	ng	99
48) 1,4-Dioxane	11.90	88	439541	26.534	ng	82
49) 2,2,4-Trimethylpentane...	11.99	57	2857575	24.753	ng	94

Data File: I:\MS09\Data\2018 10\15\10151823.D

Acq On : 15 Oct 2018 22:49

Operator: SC

Sample : 25ng TO-15 ICV STD

Misc : S31-10151806/S31-10151802 (11/13)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 16 09:17:36 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 09:06:20 2018

Response via : Initial Calibration

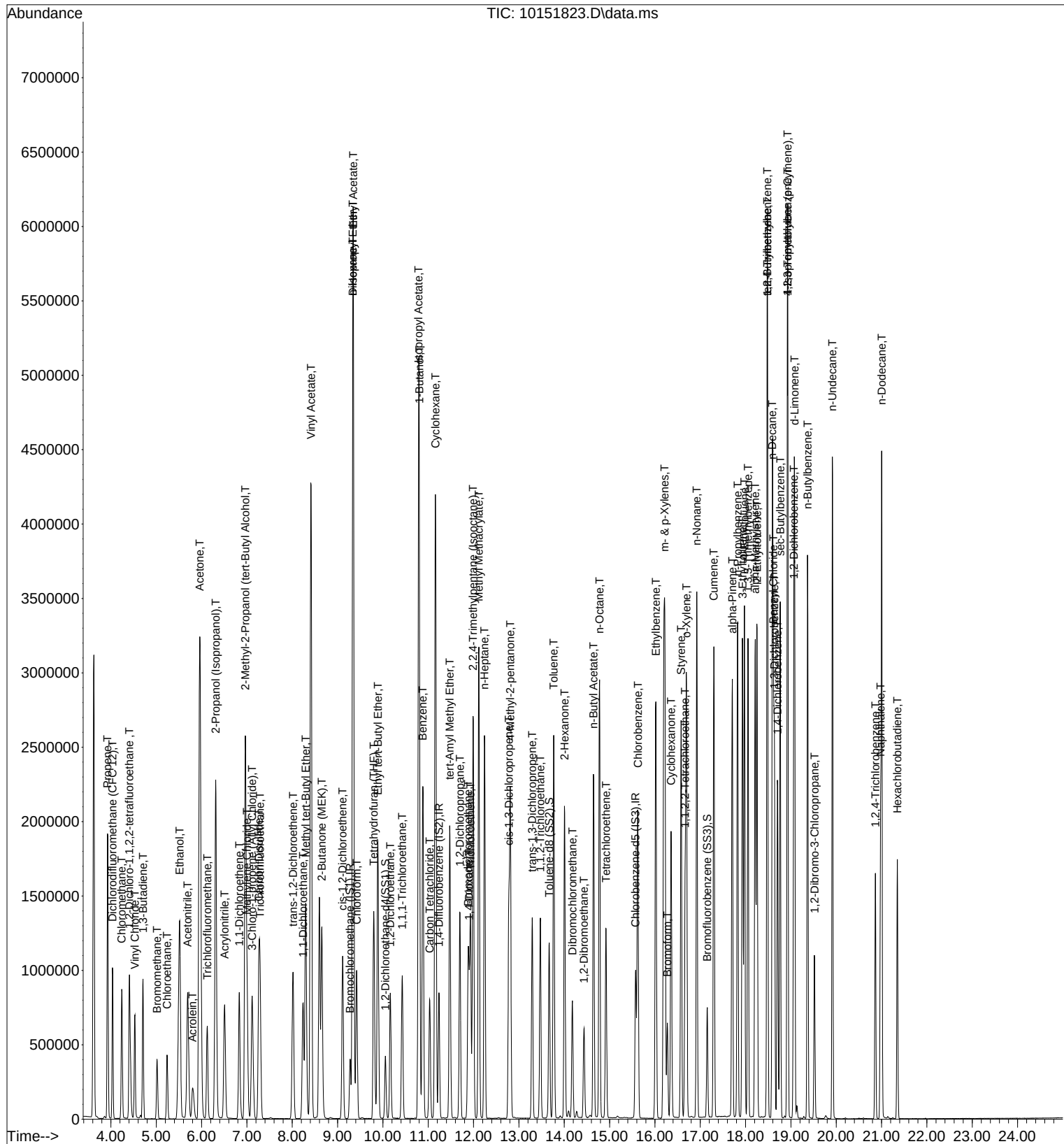
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.12	100	387874	53.348	ng	# 71
51) n-Heptane	12.24	71	620307	25.832	ng	91
52) cis-1,3-Dichloropropene	12.78	75	964380	27.297	ng	100
53) 4-Methyl-2-pentanone	12.81	58	682527	27.167	ng	80
54) trans-1,3-Dichloropropene	13.29	75	885997	28.750	ng	100
55) 1,1,2-Trichloroethane	13.47	97	485205	25.927	ng	94
58) Toluene	13.77	91	2101667	26.449	ng	99
59) 2-Hexanone	14.00	43	1789988	26.774	ng	90
60) Dibromochloromethane	14.18	129	478223	27.692	ng	99
61) 1,2-Dibromoethane	14.43	107	512833	26.521	ng	99
62) n-Butyl Acetate	14.64	43	2099124	28.221	ng	91
63) n-Octane	14.78	57	627059	25.049	ng	86
64) Tetrachloroethene	14.92	166	389315	26.084	ng	100
65) Chlorobenzene	15.62	112	1220964	24.872	ng	99
66) Ethylbenzene	16.02	91	2413170	24.584	ng	96
67) m- & p-Xylenes	16.21	91	3746459	49.753	ng	94
68) Bromoform	16.27	173	334322	28.674	ng	100
69) Styrene	16.58	104	1380087	26.606	ng	94
70) o-Xylene	16.70	91	1906659	25.125	ng	95
71) n-Nonane	16.92	43	1641788	25.452	ng	86
72) 1,1,2,2-Tetrachloroethane	16.67	83	952152	26.810	ng	100
74) Cumene	17.30	105	2194635	24.974	ng	97
75) alpha-Pinene	17.71	93	1250399	25.843	ng	94
76) n-Propylbenzene	17.83	91	2934681	25.398	ng	95
77) 3-Ethyltoluene	17.93	105	2212743	25.884	ng	97
78) 4-Ethyltoluene	17.98	105	2129151	26.023	ng	97
79) 1,3,5-Trimethylbenzene	18.05	105	1838041	25.305	ng	96
80) alpha-Methylstyrene	18.21	118	945496	27.746	ng	97
81) 2-Ethyltoluene	18.25	105	2168585	25.390	ng	97
82) 1,2,4-Trimethylbenzene	18.48	105	1828480	25.250	ng	96
83) n-Decane	18.59	58	68935	25.781	ng	# 77
84) Benzyl Chloride	18.61	91	1716623	32.616	ng	95
85) 1,3-Dichlorobenzene	18.64	146	859860	25.859	ng	100
86) 1,4-Dichlorobenzene	18.70	146	868861	25.804	ng	100
87) sec-Butylbenzene	18.76	105	2459958	25.365	ng	97
88) 4-Isopropyltoluene (p-...	18.93	119	2056515	25.717	ng	97
89) 1,2,3-Trimethylbenzene	18.92	105	1870459	26.195	ng	95
90) 1,2-Dichlorobenzene	19.06	146	812260	26.572	ng	100
91) d-Limonene	19.08	68	1009708	26.874	ng	90
92) 1,2-Dibromo-3-Chloropr...	19.52	157	262923	30.544	ng	# 63
93) n-Undecane	19.91	57	1644444	25.737	ng	93
94) 1,2,4-Trichlorobenzene	20.86	180	435236	26.789	ng	99
95) Naphthalene	20.98	128	1461720	25.149	ng	100
96) n-Dodecane	21.00	57	1491094	25.913	ng	92
97) Hexachlorobutadiene	21.35	225	293413	25.951	ng	99
98) Cyclohexanone	16.36	55	1027596	24.544	ng	# 88
99) tert-Butylbenzene	18.48	119	1611124	27.887	ng	98
100) n-Butylbenzene	19.37	91	2190600	25.709	ng	98

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

ALS Vial : 2 Sample Multiplier: 1

DataAcq Meth:T015.M



Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: 10151823.D

Acq. Method File: TO15.M

10/16/18

Data File Path: I:\MS09\Data\2018_10\15\

Sample Name: 25ng TO-15 ICV STD

Operator: SC

Misc Info: S31-10151806/S31-10151802 (

Date Acquired: 10/15/18

22:49

Instrument Name: MS09

#	Compound Name	Ret. Time	Amt. (ng)	Spike Amt.(ng)	% Rec.	Lower Limit	Upper Limit	* OR Fail	ICV/AZ 70-130%
2)	Propene	3.92	20.4	26.43	77	54	133	*	*
3)	Dichlorodifluoromethane (CFC 1	4.03	22.7	26.30	86	64	115	*	*
4)	Chloromethane	4.24	22.4	26.38	85	47	140	*	*
5)	1,2-Dichloro-1,1,2,2-tetrafluoroet	4.41	22.8	26.38	86	60	112	*	*
6)	Vinyl Chloride	4.53	22.6	26.73	85	63	127	*	*
7)	1,3-Butadiene	4.71	26.3	26.28	100	57	149	*	*
8)	Bromomethane	5.02	24.6	26.48	93	63	132	*	*
9)	Chloroethane	5.24	25.0	26.75	93	68	129	*	*
10)	Ethanol	5.52	113	128.10	88	62	131	*	*
11)	Acetonitrile	5.69	22.2	25.73	86	56	136	*	*
12)	Acrolein	5.80	20.0	25.63	78	60	132	*	*
13)	Acetone	5.96	112	132.33	85	63	124	*	*
14)	Trichlorofluoromethane	6.13	23.6	26.40	89	65	113	*	*
15)	2-Propanol (Isopropanol)	6.31	51.0	51.60	99	62	135	*	*
16)	Acrylonitrile	6.51	22.8	25.88	88	68	138	*	*
17)	1,1-Dichloroethene	6.83	23.8	27.23	87	72	118	*	*
18)	2-Methyl-2-Propanol (tert-Butyl Alco	6.97	52.4	54.25	97	61	128	*	*
19)	Methylene Chloride	7.00	24.4	27.08	90	67	116	*	*
20)	3-Chloro-1-propene (Allyl Chloride)	7.12	27.8	27.00	103	61	143	*	*
21)	Trichlorotrifluoroethane	7.29	26.2	26.95	97	68	113	*	*
22)	Carbon Disulfide	7.26	24.5	27.20	90	68	120	*	*
23)	trans-1,2-Dichloroethene	8.02	24.4	26.73	91	71	125	*	*
24)	1,1-Dichloroethane	8.24	24.7	26.95	92	68	118	*	*
25)	Methyl tert-Butyl Ether	8.30	24.6	26.80	92	60	123	*	*
26)	Vinyl Acetate	8.41	155	133.03	117	73	135	*	*
27)	2-Butanone (MEK)	8.65	24.8	25.95	96	70	129	*	*
28)	cis-1,2-Dichloroethene	9.11	23.8	26.35	90	69	121	*	*
29)	Diisopropyl Ether	9.34	22.5	27.18	83	65	117	*	*
30)	Ethyl Acetate	9.35	51.8	54.45	95	66	140	*	*
31)	n-Hexane	9.34	23.2	26.95	86	61	124	*	*
32)	Chloroform	9.42	24.3	27.08	90	69	113	*	*
34)	Tetrahydrofuran (THF)	9.80	24.0	27.00	89	66	121	*	*
35)	Ethyl tert-Butyl Ether	9.89	24.9	26.80	93	69	120	*	*
36)	1,2-Dichloroethane	10.16	24.6	26.85	92	62	120	*	*
38)	1,1,1-Trichloroethane	10.43	26.7	26.90	99	65	116	*	*
39)	Isopropyl Acetate	10.79	51.1	51.55	99	70	126	*	*
40)	1-Butanol	10.80	52.6	51.58	102	62	141	*	*
41)	Benzene	10.88	24.4	26.38	93	66	111	*	*
42)	Carbon Tetrachloride	11.03	27.7	26.45	105	64	122	*	*
43)	Cyclohexane	11.16	49.0	52.05	94	69	115	*	*
44)	tert-Amyl Methyl Ether	11.47	26.3	27.08	97	68	119	*	*
45)	1,2-Dichloropropane	11.70	25.6	26.98	95	69	121	*	*
46)	Bromodichloromethane	11.88	27.0	26.83	101	69	123	*	*
47)	Trichloroethene	11.93	24.2	26.68	91	69	112	*	*
48)	1,4-Dioxane	11.90	26.5	26.73	99	74	123	*	*
49)	2,2,4-Trimethylpentane (Isooctane)	11.99	24.8	26.65	93	67	120	*	*

Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: 10151823.D

TO15.M

Data File Path: I:\MS09\Data\2018_10\15\

Sample Name: 25ng TO-15 ICV STD

Operator: SC

Misc Info: S31-10151806/S31-10151802 (

Date Acquired: 10/15/18

22:49

Instrument Name: MS09

#	Compound Name	Ret. Time	Amt. (ng)	Spike Amt.(ng)	% Rec.	Lower Limit	Upper Limit	* OR Fail	ICV/AZ 70-130%
50)	Methyl Methacrylate	12.12	53.3	53.88	99	75	125	*	*
51)	n-Heptane	12.24	25.8	26.90	96	68	118	*	*
52)	cis-1,3-Dichloropropene	12.78	27.3	26.78	102	74	129	*	*
53)	4-Methyl-2-pentanone	12.81	27.2	26.15	104	66	138	*	*
54)	trans-1,3-Dichloropropene	13.29	28.7	26.60	108	75	130	*	*
55)	1,1,2-Trichloroethane	13.47	25.9	26.85	96	73	117	*	*
58)	Toluene	13.77	26.4	26.50	100	66	114	*	*
59)	2-Hexanone	14.00	26.8	26.78	100	58	146	*	*
60)	Dibromochloromethane	14.18	27.7	26.60	104	67	130	*	*
61)	1,2-Dibromoethane	14.43	26.5	27.03	98	70	127	*	*
62)	n-Butyl Acetate	14.64	28.2	27.35	103	62	140	*	*
63)	n-Octane	14.78	25.0	27.13	92	65	121	*	*
64)	Tetrachloroethene	14.92	26.1	26.60	98	62	119	*	*
65)	Chlorobenzene	15.62	24.9	26.83	93	66	115	*	*
66)	Ethylbenzene	16.02	24.6	26.53	93	69	117	*	*
67)	m- & p-Xylenes	16.21	49.8	53.28	93	67	117	*	*
68)	Bromoform	16.27	28.7	26.68	108	67	135	*	*
69)	Styrene	16.58	26.6	26.50	100	70	128	*	*
70)	o-Xylene	16.70	25.1	26.75	94	67	118	*	*
71)	n-Nonane	16.92	25.5	26.83	95	61	127	*	*
72)	1,1,2,2-Tetrachloroethane	16.67	26.8	26.80	100	70	125	*	*
74)	Cumene	17.30	25.0	26.80	93	68	116	*	*
75)	alpha-Pinene	17.71	25.8	26.40	98	69	122	*	*
76)	n-Propylbenzene	17.83	25.4	27.23	93	70	118	*	*
77)	3-Ethyltoluene	17.93	25.9	26.83	97	68	117	*	*
78)	4-Ethyltoluene	17.98	26.0	26.80	97	69	124	*	*
79)	1,3,5-Trimethylbenzene	18.05	25.3	26.73	95	65	117	*	*
80)	alpha-Methylstyrene	18.21	27.7	26.75	104	71	132	*	*
81)	2-Ethyltoluene	18.25	25.4	27.08	94	67	119	*	*
82)	1,2,4-Trimethylbenzene	18.48	25.3	26.90	94	67	124	*	*
83)	n-Decane	18.59	25.8	26.88	96	63	129	*	*
84)	Benzyl Chloride	18.61	32.6	27.08	120	75	142	*	*
85)	1,3-Dichlorobenzene	18.64	25.9	26.98	96	70	124	*	*
86)	1,4-Dichlorobenzene	18.70	25.8	27.00	96	63	124	*	*
87)	sec-Butylbenzene	18.76	25.4	26.55	96	68	119	*	*
88)	4-Isopropyltoluene (p-Cymene)	18.93	25.7	26.95	95	65	122	*	*
89)	1,2,3-Trimethylbenzene	18.92	26.2	26.95	97	66	128	*	*
90)	1,2-Dichlorobenzene	19.06	26.6	26.95	99	66	125	*	*
91)	d-Limonene	19.08	26.9	26.38	102	64	135	*	*
92)	1,2-Dibromo-3-Chloropropane	19.52	30.5	26.15	117	73	136	*	*
93)	n-Undecane	19.91	25.7	27.03	95	67	135	*	*
94)	1,2,4-Trichlorobenzene	20.86	26.8	26.78	100	70	141	*	*
95)	Naphthalene	20.98	25.1	25.38	99	71	146	*	*
96)	n-Dodecane	21.00	25.9	25.63	101	69	152	*	*
97)	Hexachlorobutadiene	21.35	26.0	26.13	100	63	126	*	*
98)	Cyclohexanone	16.36	24.5	24.45	100	58	138	*	*
99)	tert-Butylbenzene	18.48	27.9	26.88	104	65	121	*	*
100)	n-Butylbenzene	19.37	25.7	27.00	95	71	125	*	*

Bold = 75 Compound List
*** = Pass**

Data File: I:\MS09\Data\2018 10\16\10161802.D

Acq On : 16 Oct 2018 10:10

Operator: SC

Sample : CCV R9101618 25ng

Misc : S31-10151806/S31-10151808 (11/13)

ALS Vial : 2 Sample Multiplier: 1

 10/16/18

Quant Time: Oct 16 10:36:24 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 09:06:20 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	92	-0.02
2 T	Propene	3.233	2.760	14.6	100	0.00
3 T	Dichlorodifluoromethane (CF	3.420	3.134	8.4	100	0.00
4 T	Chloromethane	4.130	3.740	9.4	96	-0.01
5 T	1,2-Dichloro-1,1,2,2-tetra	1.116	0.990	11.3	97	-0.01
6 T	Vinyl Chloride	3.097	2.631	15.0	94	-0.01
7 T	1,3-Butadiene	1.523	1.567	-2.9	97	-0.02
8 T	Bromomethane	1.117	1.068	4.4	99	-0.02
9 T	Chloroethane	1.539	1.528	0.7	98	-0.01
10 T	Ethanol	2.216	2.030	8.4	97	-0.05
11 T	Acetonitrile	5.981	5.337	10.8	95	-0.06
12 T	Acrolein	1.596	1.290	19.2	98	-0.07
13 T	Acetone	1.815	1.580	12.9	96	-0.06
14 T	Trichlorofluoromethane	2.304	2.114	8.2	99	-0.01
15 T	2-Propanol (Isopropanol)	7.385	7.710	-4.4	98	-0.03
16 T	Acrylonitrile	3.636	3.296	9.4	95	-0.05
17 T	1,1-Dichloroethene	1.447	1.302	10.0	97	-0.01
18 T	2-Methyl-2-Propanol (tert-B	6.226	6.556	-5.3	101	-0.03
19 T	Methylene Chloride	1.881	1.772	5.8	98	-0.04
20 T	3-Chloro-1-propene (Allyl C	3.420	3.507	-2.5	94	-0.05
21 T	Trichlorotrifluoroethane	0.989	0.971	1.8	99	-0.02
22 T	Carbon Disulfide	6.675	6.305	5.5	97	-0.01
23 T	trans-1,2-Dichloroethene	3.584	3.498	2.4	100	-0.03
24 T	1,1-Dichloroethane	4.088	3.958	3.2	98	-0.03
25 T	Methyl tert-Butyl Ether	6.522	6.310	3.3	102	-0.02
26 T	Vinyl Acetate	0.329	0.405	-23.1	99	-0.03
27 T	2-Butanone (MEK)	1.637	1.666	-1.8	101	-0.02
28 T	cis-1,2-Dichloroethene	3.519	3.402	3.3	100	-0.02
29 T	Diisopropyl Ether	1.720	1.520	11.6	99	-0.01
30 T	Ethyl Acetate	0.893	0.916	-2.6	97	-0.03
31 T	n-Hexane	4.411	4.078	7.5	98	0.00
32 T	Chloroform	3.503	3.365	3.9	102	-0.03
33 S	1,2-Dichloroethane-d4 (SS1)	2.579	2.710	-5.1	100	-0.02
34 T	Tetrahydrofuran (THF)	1.617	1.542	4.6	101	-0.01
35 T	Ethyl tert-Butyl Ether	2.339	2.331	0.3	101	-0.02
36 T	1,2-Dichloroethane	2.943	2.902	1.4	102	-0.02
37 IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	98	0.00
38 T	1,1,1-Trichloroethane	0.476	0.461	3.2	103	-0.02
39 T	Isopropyl Acetate	0.303	0.290	4.3	98	-0.01
40 T	1-Butanol	0.513	0.515	-0.4	98	-0.04
41 T	Benzene	1.668	1.490	10.7	100	-0.01
42 T	Carbon Tetrachloride	0.354	0.363	-2.5	104	-0.01
43 T	Cyclohexane	0.584	0.528	9.6	100	-0.02
44 T	tert-Amyl Methyl Ether	1.162	1.090	6.2	101	-0.01
45 T	1,2-Dichloropropane	0.475	0.436	8.2	99	-0.01
46 T	Bromodichloromethane	0.489	0.471	3.7	101	-0.01
47 T	Trichloroethene	0.325	0.282	13.2	102	-0.01
48 T	1,4-Dioxane	0.303	0.292	3.6	100	-0.02
49 T	2,2,4-Trimethylpentane (Iso	2.114	1.900	10.1	99	-0.01
50 T	Methyl Methacrylate	0.133	0.127	4.5	101	-0.01
51 T	n-Heptane	0.440	0.405	8.0	100	-0.01
52 T	cis-1,3-Dichloropropene	0.647	0.642	0.8	100	0.00
53 T	4-Methyl-2-pentanone	0.460	0.454	1.3	99	-0.01
54 T	trans-1,3-Dichloropropene	0.564	0.592	-5.0	102	-0.01

Data File: I:\MS09\Data\2018 10\16\10161802.D

Acq On : 16 Oct 2018 10:10

Operator: SC

Sample : CCV R9101618 25ng

Misc : S31-10151806/S31-10151808 (11/13)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 16 10:36:24 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 09:06:20 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)
55 T	1,1,2-Trichloroethane	0.343	0.317	7.6	102	0.00
56 IR	Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	96	0.00
57 S	Toluene-d8 (SS2)	2.159	2.147	0.6	97	0.00
58 T	Toluene	2.401	2.358	1.8	100	-0.01
59 T	2-Hexanone	2.020	1.991	1.4	99	-0.01
60 T	Dibromochloromethane	0.522	0.526	-0.8	103	0.00
61 T	1,2-Dibromoethane	0.584	0.562	3.8	102	-0.01
62 T	n-Butyl Acetate	2.248	2.286	-1.7	99	-0.01
63 T	n-Octane	0.756	0.690	8.7	99	0.00
64 T	Tetrachloroethene	0.451	0.431	4.4	103	0.00
65 T	Chlorobenzene	1.483	1.345	9.3	101	0.00
66 T	Ethylbenzene	2.966	2.753	7.2	101	0.00
67 T	m- & p-Xylenes	2.275	2.083	8.4	101	-0.02
68 T	Bromoform	0.352	0.374	-6.3	104	0.00
69 T	Styrene	1.567	1.536	2.0	100	0.00
70 T	o-Xylene	2.293	2.120	7.5	101	0.00
71 T	n-Nonane	1.949	1.818	6.7	99	0.00
72 T	1,1,2,2-Tetrachloroethane	1.073	1.083	-0.9	100	-0.01
73 S	Bromofluorobenzene (SS3)	0.442	0.448	-1.4	95	0.00
74 T	Cumene	2.655	2.429	8.5	101	0.00
75 T	alpha-Pinene	1.462	1.400	4.2	100	0.00
76 T	n-Propylbenzene	3.491	3.210	8.0	100	0.00
77 T	3-Ethyltoluene	2.583	2.517	2.6	102	-0.01
78 T	4-Ethyltoluene	2.472	2.289	7.4	100	0.00
79 T	1,3,5-Trimethylbenzene	2.195	2.067	5.8	101	0.00
80 T	alpha-Methylstyrene	1.030	1.046	-1.6	100	0.00
81 T	2-Ethyltoluene	2.581	2.402	6.9	101	-0.01
82 T	1,2,4-Trimethylbenzene	2.188	2.055	6.1	100	-0.01
83 T	n-Decane	0.081	0.077	4.9	97	0.00
84 T	Benzyl Chloride	1.590	1.988	-25.0	100	-0.01
85 T	1,3-Dichlorobenzene	1.005	0.952	5.3	101	-0.01
86 T	1,4-Dichlorobenzene	1.017	0.962	5.4	101	-0.01
87 T	sec-Butylbenzene	2.931	2.754	6.0	100	0.00
88 T	4-Isopropyltoluene (p-Cymen	2.416	2.330	3.6	100	0.00
89 T	1,2,3-Trimethylbenzene	2.158	2.075	3.8	99	0.00
90 T	1,2-Dichlorobenzene	0.924	0.892	3.5	100	0.00
91 T	d-Limonene	1.135	1.162	-2.4	98	-0.01
92 T	1,2-Dibromo-3-Chloropropane	0.260	0.308	-18.5	102	0.00
93 T	n-Undecane	1.931	1.935	-0.2	98	0.00
94 T	1,2,4-Trichlorobenzene	0.491	0.522	-6.3	102	0.00
95 T	Naphthalene	1.756	1.894	-7.9	99	0.00
96 T	n-Dodecane	1.739	1.874	-7.8	99	0.00
97 T	Hexachlorobutadiene	0.342	0.349	-2.0	103	0.00
98 T	Cyclohexanone	1.265	1.256	0.7	99	-0.01
99 T	tert-Butylbenzene	1.746	1.789	-2.5	100	0.00
100 T	n-Butylbenzene	2.575	2.505	2.7	100	0.00

(#) = Out of Range

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

Data File: I:\MS09\Data\2018 10\16\10161802.D

Acq On : 16 Oct 2018 10:10

Operator: SC

Sample : CCV R9101618 25ng

Misc : S31-10151806/S31-10151808 (11/13)

ALS Vial : 2 Sample Multiplier: 1

 10/16/18

Quant Time: Oct 16 10:36:24 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 09:06:20 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.28	130	121842	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	11.24	114	701708	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	15.57	82	417282	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	10.05	65	330182	13.136	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	105.12%
57) Toluene-d8 (SS2)	13.67	98	895983	12.429	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.44%
73) Bromofluorobenzene (SS3)	17.16	174	186926	12.670	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.36%

Target Compounds

						Qvalue
2) Propene	3.94	42	693310	22.000	ng	96
3) Dichlorodifluoromethan...	4.05	85	798028	23.937	ng	99
4) Chloromethane	4.25	50	918788	22.824	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.41	135	248091	22.800	ng	100
6) Vinyl Chloride	4.53	62	673789	22.321	ng	100
7) 1,3-Butadiene	4.71	54	400447	26.978	ng	89
8) Bromomethane	5.03	94	262645	24.114	ng	99
9) Chloroethane	5.25	64	380594	25.368	ng	99
10) Ethanol	5.52	45	2542558	117.715	ng	100
11) Acetonitrile	5.70	41	1343440	23.043	ng	99
12) Acrolein	5.81	56	323193	20.780	ng	99
13) Acetone	5.97	58	2066973	116.840	ng	# 76
14) Trichlorofluoromethane	6.13	101	546175	24.318	ng	98
15) 2-Propanol (Isopropanol)	6.32	45	3876121	53.847	ng	99
16) Acrylonitrile	6.51	53	830422	23.431	ng	99
17) 1,1-Dichloroethene	6.84	96	340711	24.157	ng	# 70
18) 2-Methyl-2-Propanol (t...	6.97	59	3425209	56.442	ng	95
19) Methylene Chloride	7.01	84	461964	25.201	ng	# 67
20) 3-Chloro-1-propene (Al...	7.12	41	911894	27.351	ng	85
21) Trichlorotrifluoroethane	7.30	151	252073	26.150	ng	# 83
22) Carbon Disulfide	7.27	76	1651719	25.387	ng	100
23) trans-1,2-Dichloroethene	8.02	61	905289	25.913	ng	85
24) 1,1-Dichloroethane	8.24	63	993376	24.932	ng	99
25) Methyl tert-Butyl Ether	8.30	73	1674404	26.338	ng	95
26) Vinyl Acetate	8.41	86	518775	161.967	ng	# 8
27) 2-Butanone (MEK)	8.66	72	416973	26.134	ng	# 54
28) cis-1,2-Dichloroethene	9.12	61	873857	25.477	ng	83
29) Diisopropyl Ether	9.34	87	400404	23.883	ng	# 19
30) Ethyl Acetate	9.35	61	483317	55.540	ng	95
31) n-Hexane	9.34	57	1075332	25.011	ng	98
32) Chloroform	9.42	83	883155	25.867	ng	99
34) Tetrahydrofuran (THF)	9.80	72	401263	25.462	ng	# 71
35) Ethyl tert-Butyl Ether	9.89	87	602204	26.414	ng	# 74
36) 1,2-Dichloroethane	10.16	62	750203	26.150	ng	99
38) 1,1,1-Trichloroethane	10.43	97	699197	26.151	ng	94
39) Isopropyl Acetate	10.79	61	839878	49.361	ng	# 64
40) 1-Butanol	10.80	56	1494861	51.885	ng	85
41) Benzene	10.88	78	2159444	23.062	ng	100
42) Carbon Tetrachloride	11.03	117	528185	26.608	ng	98
43) Cyclohexane	11.16	84	1546180	47.123	ng	# 81
44) tert-Amyl Methyl Ether	11.48	73	1642918	25.176	ng	91
45) 1,2-Dichloropropane	11.70	63	657293	24.640	ng	100
46) Bromodichloromethane	11.88	83	705854	25.690	ng	100
47) Trichloroethene	11.93	130	419659	22.987	ng	100
48) 1,4-Dioxane	11.90	88	435585	25.583	ng	82
49) 2,2,4-Trimethylpentane...	11.99	57	2829662	23.847	ng	94

Data File: I:\MS09\Data\2018 10\16\10161802.D

Acq On : 16 Oct 2018 10:10

Operator: SC

Sample : CCV R9101618 25ng

Misc : S31-10151806/S31-10151808 (11/13)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 16 10:36:24 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Tue Oct 16 09:06:20 2018

Response via : Initial Calibration

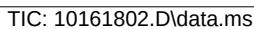
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.12	100	379433	50.772	ng	# 70
51) n-Heptane	12.24	71	611636	24.781	ng	90
52) cis-1,3-Dichloropropene	12.78	75	1008582	27.774	ng	100
53) 4-Methyl-2-pentanone	12.81	58	675864	26.173	ng	80
54) trans-1,3-Dichloropropene	13.29	75	876036	27.656	ng	100
55) 1,1,2-Trichloroethane	13.47	97	478944	24.899	ng	94
58) Toluene	13.77	91	2070390	25.830	ng	99
59) 2-Hexanone	14.00	43	1784764	26.465	ng	89
60) Dibromochloromethane	14.18	129	472185	27.106	ng	99
61) 1,2-Dibromoethane	14.43	107	504708	25.875	ng	99
62) n-Butyl Acetate	14.64	43	2070106	27.590	ng	92
63) n-Octane	14.78	57	619324	24.526	ng	86
64) Tetrachloroethene	14.92	166	380549	25.276	ng	99
65) Chlorobenzene	15.62	112	1196884	24.170	ng	100
66) Ethylbenzene	16.02	91	2373511	23.971	ng	96
67) m- & p-Xylenes	16.21	91	3690695	48.588	ng	94
68) Bromoform	16.27	173	332206	28.246	ng	100
69) Styrene	16.58	104	1358526	25.963	ng	94
70) o-Xylene	16.70	91	1878941	24.545	ng	95
71) n-Nonane	16.92	43	1624741	24.970	ng	86
72) 1,1,2,2-Tetrachloroethane	16.67	83	962057	26.854	ng	99
74) Cumene	17.30	105	2142802	24.174	ng	97
75) alpha-Pinene	17.71	93	1208952	24.770	ng	93
76) n-Propylbenzene	17.83	91	2882632	24.732	ng	95
77) 3-Ethyltoluene	17.93	105	2231273	25.875	ng	97
78) 4-Ethyltoluene	17.98	105	2026472	24.554	ng	97
79) 1,3,5-Trimethylbenzene	18.05	105	1823076	24.882	ng	96
80) alpha-Methylstyrene	18.21	118	923327	26.861	ng	98
81) 2-Ethyltoluene	18.25	105	2149049	24.943	ng	97
82) 1,2,4-Trimethylbenzene	18.48	105	1831363	25.071	ng	95
83) n-Decane	18.59	58	68909	25.549	ng	# 76
84) Benzyl Chloride	18.61	91	1743336	32.836	ng	95
85) 1,3-Dichlorobenzene	18.64	146	857881	25.577	ng	100
86) 1,4-Dichlorobenzene	18.70	146	868087	25.558	ng	100
87) sec-Butylbenzene	18.76	105	2443203	24.974	ng	97
88) 4-Isopropyltoluene (p-...	18.93	119	2026270	25.120	ng	96
89) 1,2,3-Trimethylbenzene	18.92	105	1804395	25.051	ng	95
90) 1,2-Dichlorobenzene	19.06	146	810959	26.300	ng	99
91) d-Limonene	19.08	68	979755	25.851	ng	90
92) 1,2-Dibromo-3-Chloropr...	19.52	157	267947	30.858	ng	# 60
93) n-Undecane	19.91	57	1707128	26.487	ng	92
94) 1,2,4-Trichlorobenzene	20.86	180	463671	28.292	ng	99
95) Naphthalene	20.98	128	1620481	27.639	ng	100
96) n-Dodecane	21.00	57	1612338	27.778	ng	92
97) Hexachlorobutadiene	21.35	225	306483	26.872	ng	100
98) Cyclohexanone	16.36	55	1029054	24.366	ng	# 88
99) tert-Butylbenzene	18.48	119	1592979	27.335	ng	98
100) n-Butylbenzene	19.37	91	2224755	25.884	ng	98

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

ALS Vial : 2 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS09\Data\2018 10\16\10161834.D

Acq On : 17 Oct 2018 9:11

Operator: SC

Sample : CCV END R9101618 5.0ng

Misc : S31-10151806/S31-10151808 (11/13)

ALS Vial : 2 Sample Multiplier: 1

 10/17/18

Quant Time: Oct 17 09:38:45 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Wed Oct 17 09:09:32 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	109	0.02
2 T	Propene	3.233	2.435	24.7	86	0.02
3 T	Dichlorodifluoromethane (CF	3.420	3.094	9.5	101	0.02
4 T	Chloromethane	4.130	3.504	15.2	97	0.00
5 T	1,2-Dichloro-1,1,2,2-tetra	1.116	1.056	5.4	109	0.02
6 T	Vinyl Chloride	3.097	2.771	10.5	99	0.01
7 T	1,3-Butadiene	1.523	1.568	-3.0	112	0.00
8 T	Bromomethane	1.117	1.265	-13.2	128	0.00
9 T	Chloroethane	1.539	1.452	5.7	123	0.01
10 T	Ethanol	2.216	2.109	4.8	109	-0.05
11 T	Acetonitrile	5.981	4.820	19.4	91	-0.06
12 T	Acrolein	1.596	1.229	23.0	87	-0.04
13 T	Acetone	1.815	1.782	1.8	94	-0.05
14 T	Trichlorofluoromethane	2.304	2.132	7.5	105	0.02
15 T	2-Propanol (Isopropanol)	7.385	7.181	2.8	104	-0.03
16 T	Acrylonitrile	3.636	3.000	17.5	89	-0.04
17 T	1,1-Dichloroethene	1.447	1.287	11.1	104	0.02
18 T	2-Methyl-2-Propanol (tert-B	6.226	6.190	0.6	101	-0.02
19 T	Methylene Chloride	1.881	1.719	8.6	101	-0.02
20 T	3-Chloro-1-propene (Allyl C	3.420	2.844	16.8	89	-0.02
21 T	Trichlorotrifluoroethane	0.989	0.976	1.3	112	0.02
22 T	Carbon Disulfide	6.675	5.936	11.1	99	0.02
23 T	trans-1,2-Dichloroethene	3.584	3.232	9.8	97	0.00
24 T	1,1-Dichloroethane	4.088	3.534	13.6	93	0.00
25 T	Methyl tert-Butyl Ether	6.522	6.013	7.8	101	0.02
26 T	Vinyl Acetate	0.329	0.333	-1.2	103	0.00
27 T	2-Butanone (MEK)	1.637	1.538	6.0	98	0.01
28 T	cis-1,2-Dichloroethene	3.519	3.086	12.3	96	0.01
29 T	Diisopropyl Ether	1.720	1.519	11.7	102	0.04
30 T	Ethyl Acetate	0.893	0.870	2.6	94	0.02
31 T	n-Hexane	4.411	3.948	10.5	93	0.04
32 T	Chloroform	3.503	3.198	8.7	102	0.01
33 S	1,2-Dichloroethane-d4 (SS1)	2.579	2.339	9.3	93	0.03
34 T	Tetrahydrofuran (THF)	1.617	1.423	12.0	97	0.04
35 T	Ethyl tert-Butyl Ether	2.339	2.244	4.1	104	0.03
36 T	1,2-Dichloroethane	2.943	2.658	9.7	98	0.03
37 IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	102	0.00
38 T	1,1,1-Trichloroethane	0.476	0.469	1.5	105	0.00
39 T	Isopropyl Acetate	0.303	0.295	2.6	96	0.00
40 T	1-Butanol	0.513	0.512	0.2	97	-0.03
41 T	Benzene	1.668	1.546	7.3	100	0.00
42 T	Carbon Tetrachloride	0.354	0.367	-3.7	108	0.00
43 T	Cyclohexane	0.584	0.557	4.6	101	0.00
44 T	tert-Amyl Methyl Ether	1.162	1.114	4.1	100	0.00
45 T	1,2-Dichloropropane	0.475	0.432	9.1	95	0.00
46 T	Bromodichloromethane	0.489	0.483	1.2	104	0.00
47 T	Trichloroethene	0.325	0.309	4.9	108	0.00
48 T	1,4-Dioxane	0.303	0.304	-0.3	102	0.00
49 T	2,2,4-Trimethylpentane (Iso	2.114	1.906	9.8	94	0.00
50 T	Methyl Methacrylate	0.133	0.133	0.0	106	0.00
51 T	n-Heptane	0.440	0.411	6.6	99	0.01
52 T	cis-1,3-Dichloropropene	0.647	0.643	0.6	101	0.02
53 T	4-Methyl-2-pentanone	0.460	0.444	3.5	95	0.01
54 T	trans-1,3-Dichloropropene	0.564	0.582	-3.2	102	0.02

Data File: I:\MS09\Data\2018 10\16\10161834.D

Acq On : 17 Oct 2018 9:11

Operator: SC

Sample : CCV END R9101618 5.0ng

Misc : S31-10151806/S31-10151808 (11/13)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 17 09:38:45 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Wed Oct 17 09:09:32 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)
55 T	1,1,2-Trichloroethane	0.343	0.331	3.5	104	0.02
56 IR	Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	97	0.00
57 S	Toluene-d8 (SS2)	2.159	2.195	-1.7	100	-0.02
58 T	Toluene	2.401	2.583	-7.6	103	-0.02
59 T	2-Hexanone	2.020	1.937	4.1	92	-0.01
60 T	Dibromochloromethane	0.522	0.561	-7.5	110	-0.01
61 T	1,2-Dibromoethane	0.584	0.609	-4.3	107	-0.02
62 T	n-Butyl Acetate	2.248	2.193	2.4	93	-0.01
63 T	n-Octane	0.756	0.706	6.6	95	-0.01
64 T	Tetrachloroethene	0.451	0.488	-8.2	113	-0.01
65 T	Chlorobenzene	1.483	1.505	-1.5	107	0.00
66 T	Ethylbenzene	2.966	3.005	-1.3	104	-0.01
67 T	m- & p-Xylenes	2.275	2.279	-0.2	104	-0.02
68 T	Bromoform	0.352	0.392	-11.4	113	0.00
69 T	Styrene	1.567	1.685	-7.5	107	-0.01
70 T	o-Xylene	2.293	2.303	-0.4	103	-0.01
71 T	n-Nonane	1.949	1.815	6.9	91	0.00
72 T	1,1,2,2-Tetrachloroethane	1.073	1.126	-4.9	101	-0.01
73 S	Bromofluorobenzene (SS3)	0.442	0.480	-8.6	108	0.00
74 T	Cumene	2.655	2.739	-3.2	107	0.00
75 T	alpha-Pinene	1.462	1.491	-2.0	101	0.00
76 T	n-Propylbenzene	3.491	3.541	-1.4	103	0.00
77 T	3-Ethyltoluene	2.583	2.730	-5.7	107	-0.01
78 T	4-Ethyltoluene	2.472	2.607	-5.5	106	-0.01
79 T	1,3,5-Trimethylbenzene	2.195	2.301	-4.8	107	0.00
80 T	alpha-Methylstyrene	1.030	1.143	-11.0	108	-0.01
81 T	2-Ethyltoluene	2.581	2.669	-3.4	106	-0.01
82 T	1,2,4-Trimethylbenzene	2.188	2.304	-5.3	105	-0.02
83 T	n-Decane	0.081	0.081	0.0	95	0.00
84 T	Benzyl Chloride	1.590	1.944	-22.3	109	-0.02
85 T	1,3-Dichlorobenzene	1.005	1.064	-5.9	112	-0.01
86 T	1,4-Dichlorobenzene	1.017	1.075	-5.7	113	-0.01
87 T	sec-Butylbenzene	2.931	3.069	-4.7	105	-0.01
88 T	4-Isopropyltoluene (p-Cymen	2.416	2.705	-12.0	108	-0.01
89 T	1,2,3-Trimethylbenzene	2.158	2.337	-8.3	107	-0.01
90 T	1,2-Dichlorobenzene	0.924	1.013	-9.6	112	-0.01
91 T	d-Limonene	1.135	1.188	-4.7	96	-0.01
92 T	1,2-Dibromo-3-Chloropropane	0.260	0.328	-26.2	115	0.00
93 T	n-Undecane	1.931	2.028	-5.0	98	0.00
94 T	1,2,4-Trichlorobenzene	0.491	0.581	-18.3	120	0.00
95 T	Naphthalene	1.756	2.058	-17.2	110	0.00
96 T	n-Dodecane	1.739	1.953	-12.3	104	0.00
97 T	Hexachlorobutadiene	0.342	0.400	-17.0	120	0.00
98 T	Cyclohexanone	1.265	1.236	2.3	95	-0.01
99 T	tert-Butylbenzene	1.746	2.069	-18.5	109	-0.01
100 T	n-Butylbenzene	2.575	2.741	-6.4	103	0.00

(#) = Out of Range

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

Data File: I:\MS09\Data\2018 10\16\10161834.D

Acq On : 17 Oct 2018 9:11

Operator: SC

Sample : CCV END R9101618 5.0ng

Misc : S31-10151806/S31-10151808 (11/13)

ALS Vial : 2 Sample Multiplier: 1

 10/17/18

Quant Time: Oct 17 09:38:45 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Wed Oct 17 09:09:32 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.26	130	122922	12.500	ng	0.02
37) 1,4-Difluorobenzene (IS2)	11.23	114	656612	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	15.57	82	380255	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	10.04	65	287576	11.340	ng	0.03
Spiked Amount	12.500	Range	70 - 130	Recovery	=	90.72%
57) Toluene-d8 (SS2)	13.66	98	834573	12.704	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.60%
73) Bromofluorobenzene (SS3)	17.15	174	182505	13.575	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	108.56%

Target Compounds

						Qvalue
2) Propene	3.94	42	123441	3.883	ng	97
3) Dichlorodifluoromethan...	4.05	85	158969	4.726	ng	99
4) Chloromethane	4.24	50	173683	4.277	ng	98
5) 1,2-Dichloro-1,1,2,2-t...	4.41	135	53367	4.861	ng	100
6) Vinyl Chloride	4.53	62	143206	4.702	ng	99
7) 1,3-Butadiene	4.71	54	80863	5.400	ng	# 86
8) Bromomethane	5.02	94	62741	5.710	ng	99
9) Chloroethane	5.24	64	72954	4.820	ng	100
10) Ethanol	5.48	45	533096	24.464	ng	100
11) Acetonitrile	5.67	41	244833	4.162	ng	99
12) Acrolein	5.80	56	62119	3.959	ng	99
13) Acetone	5.94	58	470405	26.357	ng	# 81
14) Trichlorofluoromethane	6.12	101	111134	4.905	ng	99
15) 2-Propanol (Isopropanol)	6.29	45	728373	10.030	ng	100
16) Acrylonitrile	6.48	53	152546	4.266	ng	99
17) 1,1-Dichloroethene	6.83	96	67943	4.775	ng	# 76
18) 2-Methyl-2-Propanol (t...	6.94	59	652587	10.659	ng	96
19) Methylene Chloride	6.98	84	90433	4.890	ng	# 75
20) 3-Chloro-1-propene (Al...	7.11	41	149184	4.435	ng	87
21) Trichlorotrifluoroethane	7.29	151	51109	5.255	ng	90
22) Carbon Disulfide	7.25	76	313741	4.780	ng	100
23) trans-1,2-Dichloroethene	8.00	61	168788	4.789	ng	88
24) 1,1-Dichloroethane	8.22	63	178997	4.453	ng	99
25) Methyl tert-Butyl Ether	8.29	73	321961	5.020	ng	97
26) Vinyl Acetate	8.39	86	86089	26.642	ng	# 21
27) 2-Butanone (MEK)	8.64	72	77677	4.826	ng	# 62
28) cis-1,2-Dichloroethene	9.10	61	159916	4.621	ng	87
29) Diisopropyl Ether	9.33	87	80725	4.773	ng	# 34
30) Ethyl Acetate	9.33	61	92611	10.549	ng	97
31) n-Hexane	9.33	57	210049	4.843	ng	99
32) Chloroform	9.40	83	169339	4.916	ng	98
34) Tetrahydrofuran (THF)	9.79	72	74712	4.699	ng	# 77
35) Ethyl tert-Butyl Ether	9.88	87	116947	5.084	ng	# 81
36) 1,2-Dichloroethane	10.15	62	138681	4.792	ng	99
38) 1,1,1-Trichloroethane	10.42	97	133113	5.320	ng	96
39) Isopropyl Acetate	10.78	61	160287	10.067	ng	# 69
40) 1-Butanol	10.79	56	278014	10.312	ng	86
41) Benzene	10.87	78	419452	4.787	ng	100
42) Carbon Tetrachloride	11.02	117	99851	5.376	ng	99
43) Cyclohexane	11.15	84	305259	9.942	ng	# 86
44) tert-Amyl Methyl Ether	11.47	73	314224	5.146	ng	93
45) 1,2-Dichloropropane	11.69	63	121810	4.880	ng	100
46) Bromodichloromethane	11.87	83	135402	5.267	ng	99
47) Trichloroethene	11.92	130	86210	5.047	ng	100
48) 1,4-Dioxane	11.90	88	84951	5.332	ng	90
49) 2,2,4-Trimethylpentane...	11.98	57	531103	4.783	ng	96

Data File: I:\MS09\Data\2018 10\16\10161834.D

Acq On : 17 Oct 2018 9:11

Operator: SC

Sample : CCV END R9101618 5.0ng

Misc : S31-10151806/S31-10151808 (11/13)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 17 09:38:45 2018

Quant Method : I:\MS09\Methods\R9101518.M

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

QLast Update : Wed Oct 17 09:09:32 2018

Response via : Initial Calibration

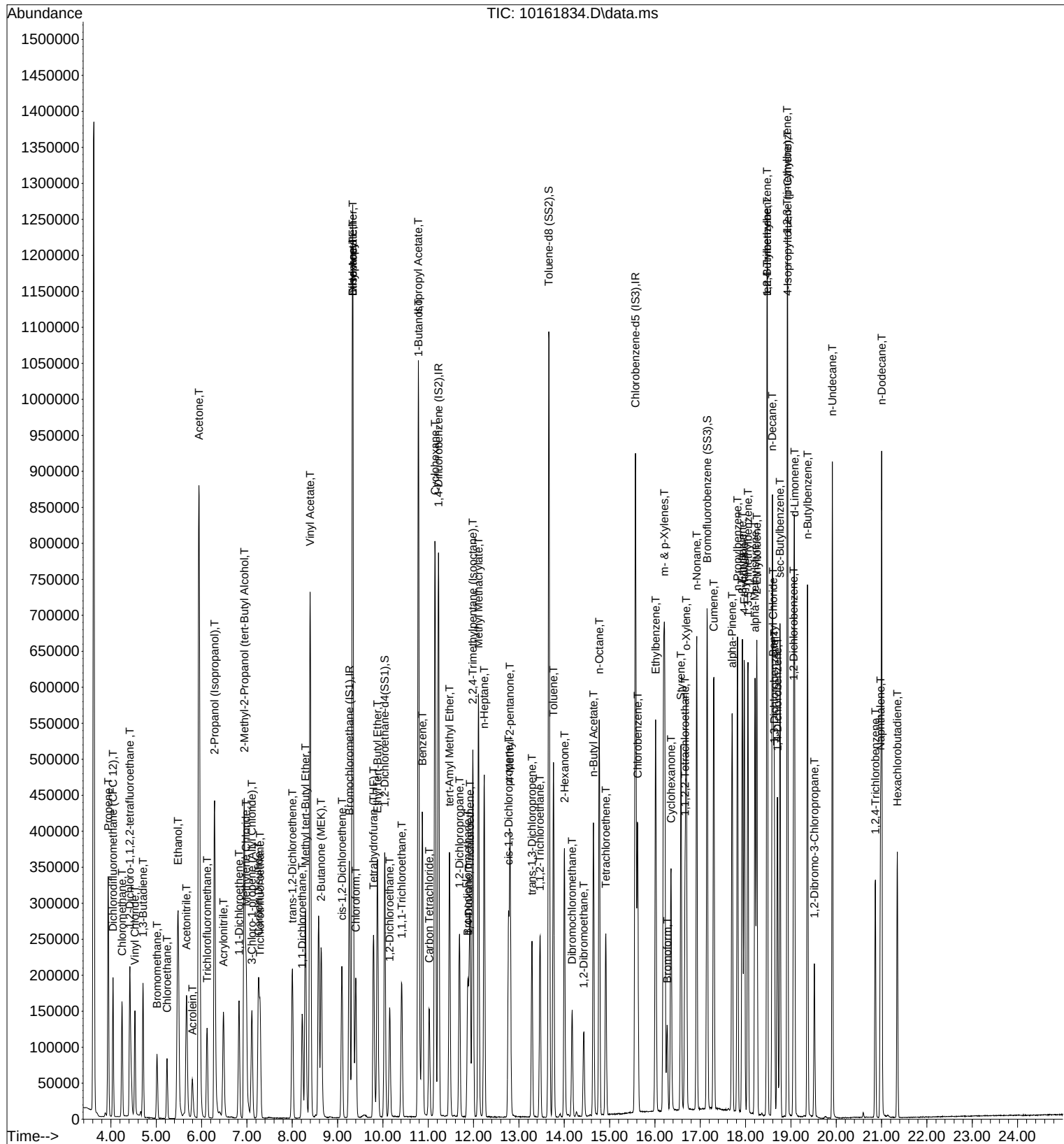
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.11	100	74664	10.677	ng	# 77
51) n-Heptane	12.24	71	116045	5.024	ng	92
52) cis-1,3-Dichloropropene	12.77	75	189278	5.570	ng	100
53) 4-Methyl-2-pentanone	12.80	58	123727	5.120	ng	84
54) trans-1,3-Dichloropropene	13.29	75	161313	5.442	ng	100
55) 1,1,2-Trichloroethane	13.46	97	93635	5.202	ng	96
58) Toluene	13.76	91	413236	5.658	ng	99
59) 2-Hexanone	14.00	43	316405	5.149	ng	92
60) Dibromochloromethane	14.17	129	91792	5.782	ng	100
61) 1,2-Dibromoethane	14.43	107	99605	5.604	ng	99
62) n-Butyl Acetate	14.64	43	361871	5.293	ng	93
63) n-Octane	14.77	57	115504	5.019	ng	89
64) Tetrachloroethene	14.92	166	78580	5.728	ng	99
65) Chlorobenzene	15.62	112	243942	5.406	ng	99
66) Ethylbenzene	16.02	91	472212	5.233	ng	97
67) m- & p-Xylenes	16.21	91	735802	10.630	ng	96
68) Bromoform	16.27	173	63322	5.908	ng	99
69) Styrene	16.57	104	271670	5.698	ng	97
70) o-Xylene	16.69	91	372017	5.333	ng	96
71) n-Nonane	16.92	43	295720	4.987	ng	89
72) 1,1,2,2-Tetrachloroethane	16.67	83	182250	5.583	ng	99
74) Cumene	17.30	105	440383	5.452	ng	96
75) alpha-Pinene	17.70	93	234793	5.279	ng	95
76) n-Propylbenzene	17.82	91	579461	5.456	ng	96
77) 3-Ethyltoluene	17.93	105	441018	5.612	ng	97
78) 4-Ethyltoluene	17.97	105	420667	5.593	ng	97
79) 1,3,5-Trimethylbenzene	18.05	105	369901	5.540	ng	97
80) alpha-Methylstyrene	18.21	118	183878	5.870	ng	99
81) 2-Ethyltoluene	18.25	105	435238	5.544	ng	97
82) 1,2,4-Trimethylbenzene	18.48	105	374345	5.624	ng	97
83) n-Decane	18.59	58	13287	5.406	ng	# 78
84) Benzyl Chloride	18.61	91	310741	6.423	ng	95
85) 1,3-Dichlorobenzene	18.64	146	174846	5.720	ng	100
86) 1,4-Dichlorobenzene	18.70	146	176715	5.710	ng	100
87) sec-Butylbenzene	18.76	105	496276	5.567	ng	98
88) 4-Isopropyltoluene (p-...	18.92	119	428640	5.831	ng	97
89) 1,2,3-Trimethylbenzene	18.92	105	370382	5.643	ng	96
90) 1,2-Dichlorobenzene	19.06	146	167749	5.970	ng	99
91) d-Limonene	19.08	68	182571	5.286	ng	92
92) 1,2-Dibromo-3-Chloropr...	19.52	157	51913	6.561	ng	# 70
93) n-Undecane	19.91	57	326086	5.552	ng	94
94) 1,2,4-Trichlorobenzene	20.86	180	93964	6.292	ng	98
95) Naphthalene	20.98	128	320843	6.005	ng	99
96) n-Dodecane	21.00	57	306210	5.789	ng	93
97) Hexachlorobutadiene	21.35	225	64135	6.171	ng	99
98) Cyclohexanone	16.36	55	184671	4.798	ng	90
99) tert-Butylbenzene	18.48	119	335755	6.322	ng	98
100) n-Butylbenzene	19.37	91	443608	5.664	ng	98

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

ALS Vial : 2 Sample Multiplier: 1

DataAcq Meth:T015.M

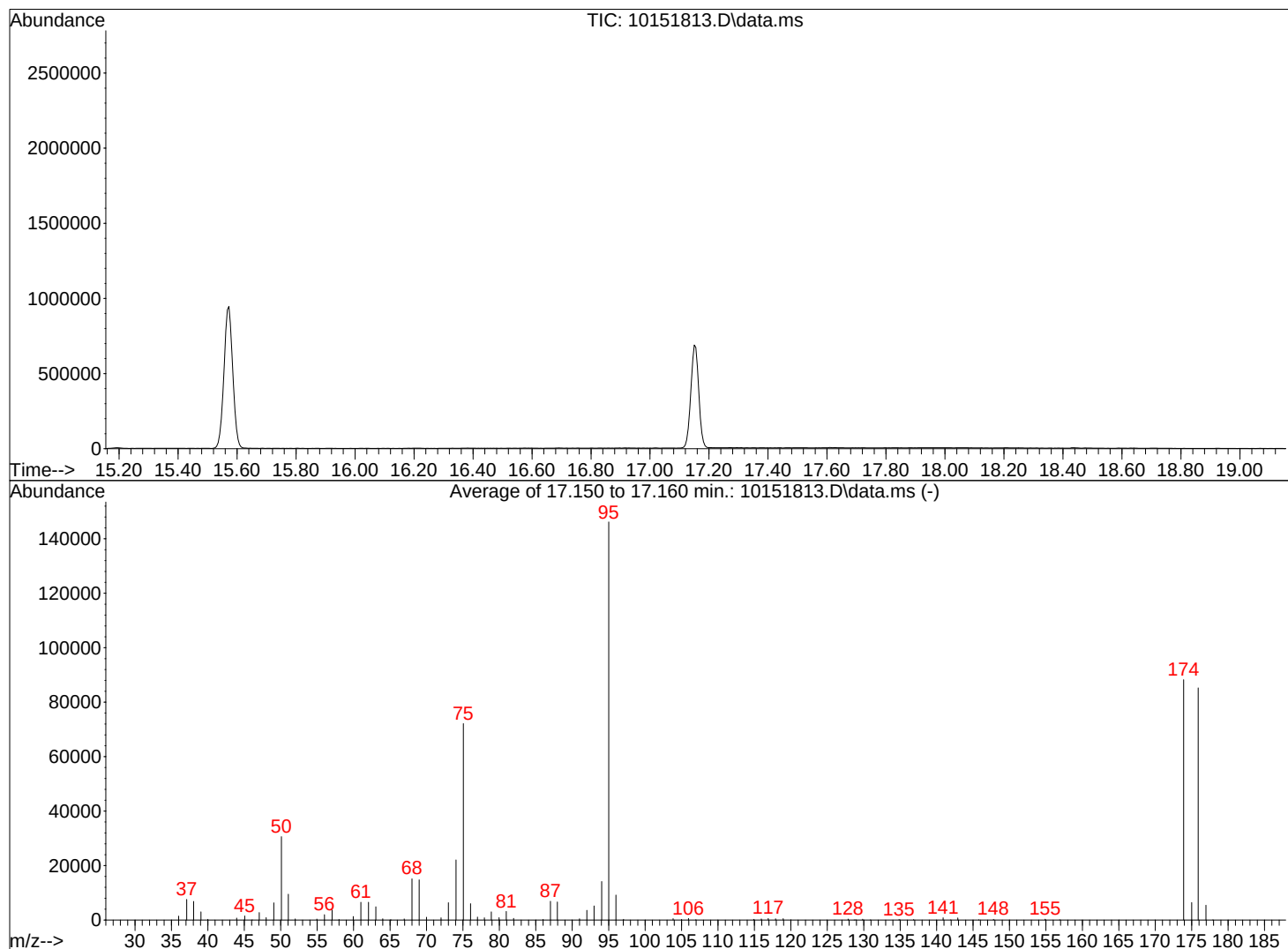


Data Path : I:\MS09\Data\2018 10\15\
 Data File : 10151813.D
 Acq On : 15 Oct 2018 17:09
 Operator : SC
 Sample : 12.5ng TO-15 BFB STD
 Misc : S31-10151806
 ALS Vial : 2 Sample Multiplier: 1

10/16/18

Integration File: LSCINT.P

Method : I:\MS09\Methods\R9101518.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Tue Oct 16 08:54:50 2018



AutoFind: Scans 2655, 2656, 2657; Background Corrected with Scan 2646

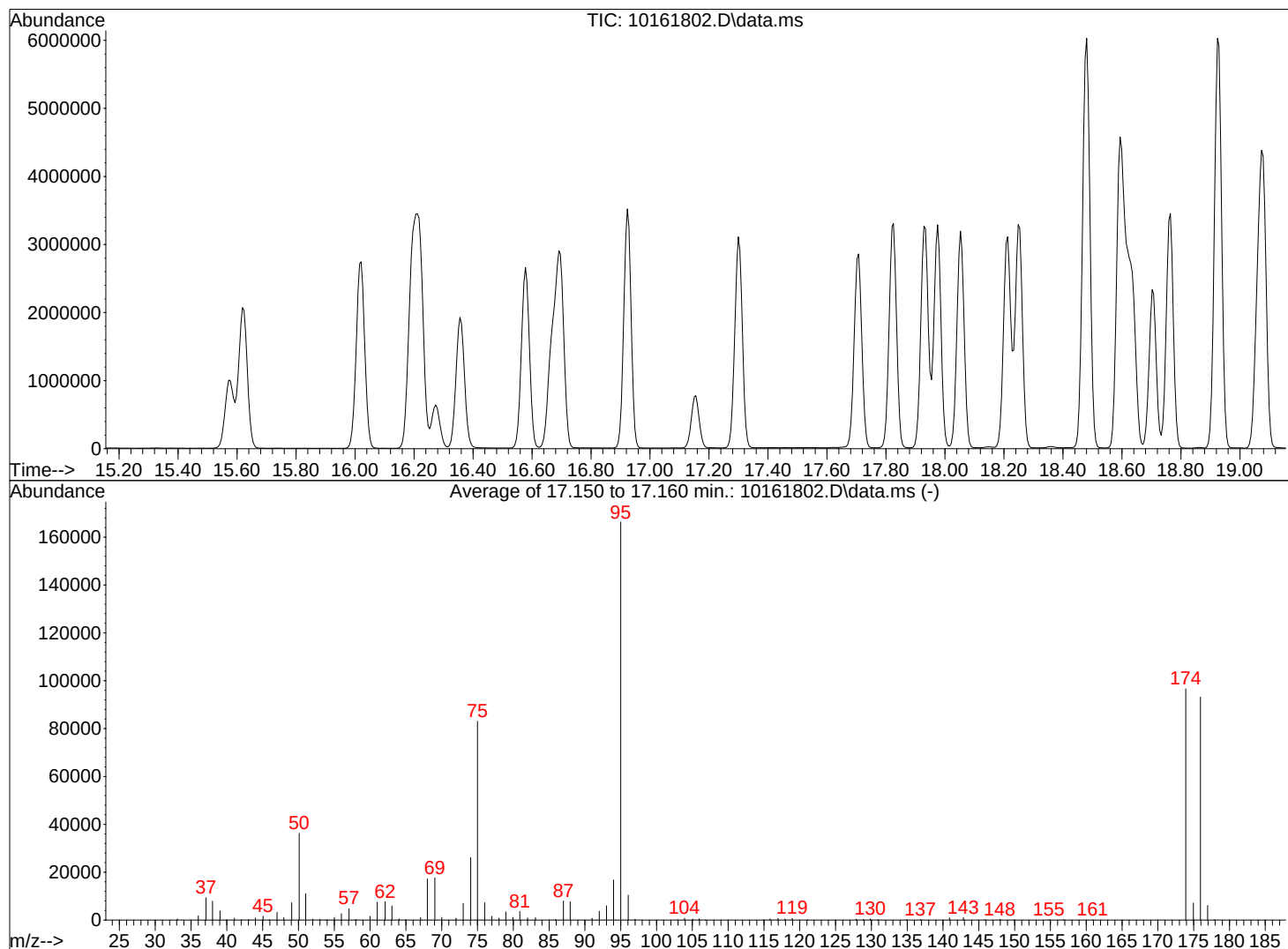
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	20.9	30621	PASS
75	95	30	66	49.3	72117	PASS
95	95	100	100	100.0	146187	PASS
96	95	5	9	6.3	9199	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	60.4	88261	PASS
175	174	4	9	7.3	6433	PASS
176	174	93	101	96.6	85269	PASS
177	176	5	9	6.4	5458	PASS

Data Path : I:\MS09\Data\2018 10\16\
 Data File : 10161802.D
 Acq On : 16 Oct 2018 10:10
 Operator : SC
 Sample : CCV R9101618 25ng
 Misc : S31-10151806/S31-10151808 (11/13)
 ALS Vial : 2 Sample Multiplier: 1

10/16/18

Integration File: LSCINT.P

Method : I:\MS09\Methods\R9101518.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Tue Oct 16 09:06:20 2018



AutoFind: Scans 2655, 2656, 2657; Background Corrected with Scan 2646

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	21.8	36240	PASS
75	95	30	66	50.0	83117	PASS
95	95	100	100	100.0	166357	PASS
96	95	5	9	6.3	10442	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	58.1	96603	PASS
175	174	4	9	7.4	7118	PASS
176	174	93	101	96.5	93179	PASS
177	176	5	9	6.5	6059	PASS

Injection Log

Directory: J:\MS09\Data\2018_10\15\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
13	10/15/18 17:09	10151813.D	12.5ng TO-15 BFB STD	S31-10151806	SC	2	pass
14	10/15/18 17:43	10151814.D	0.1ng TO-15 ICAL STD	S31-10151806/S31-10151812 (11/13)	SC	15	
15	10/15/18 18:17	10151815.D	0.2ng TO-15 ICAL STD	S31-10151806/S31-10151812 (11/13)	SC	15	
16	10/15/18 18:51	10151816.D	0.5ng TO-15 ICAL STD	S31-10151806/S31-10151810 (11/13)	SC	16	
17	10/15/18 19:25	10151817.D	1.0ng TO-15 ICAL STD	S31-10151806/S31-10151810 (11/13)	SC	16	
18	10/15/18 19:59	10151818.D	5.0ng TO-15 ICAL STD	S31-10151806/S31-10151810 (11/13)	SC	16	
19	10/15/18 20:33	10151819.D	25ng TO-15 ICAL STD	S31-10151806/S31-10151808 (11/13)	SC	2	
20	10/15/18 21:07	10151820.D	50ng TO-15 ICAL STD	S31-10151806/S31-10151808 (11/13)	SC	2	
21	10/15/18 21:41	10151821.D	100ng TO-15 ICAL STD	S31-10151806/S31-10151808 (11/13)	SC	2	
22	10/15/18 22:15	10151822.D	Blank (100mL)	S31-10151806	SC	2	
23	10/15/18 22:49	10151823.D	25ng TO-15 ICV STD	S31-10151806/S31-10151802 (11/13)	SC	2	pass
24	10/15/18 23:23	10151824.D	25ng TO-15 ICV STD	S31-10151806/S31-10151802 (11/13)	SC	2	cf
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 10/16/18

Injection Log

Directory: I:\MS09\Data\2018_10\16\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	10/16/18 9:36	10161801.D	Blank (100mL)	S31-10151806	SC	2	
2	10/16/18 10:10	10161802.D	CCV R9101618_25ng	S31-10151806/S31-10151808 (11/13)	SC	2	pass
3	10/16/18 10:45	10161803.D	CCV C9101618_25ng	S31-10151806/S31-09241802 (10/23)	SC	3	pass
4	10/16/18 11:19	10161804.D	MB R9101618_1000mL	S31-10151806_AC00463	SC	2	pass
5	10/16/18 11:53	10161805.D	LCS R9101618_25ng	S31-10151806/S31-10151802 (11/13)	SC	2	pass
6	10/16/18 12:27	10161806.D	LCSD R9101618_25ng	S31-10151806/S31-10151802 (11/13)	SC	2	pass
7	10/16/18 13:12	10161807.D	P1805290-001 (2.0mL)	S31-10151806	SC	3	
8	10/16/18 14:16	10161808.D	P1805290-001Dil (0.5mL)	S31-10151806	SC	3	
9	10/16/18 14:50	10161809.D	P1805294-001 (2.0mL)	S31-10151806	SC	1	IS failed
10	10/16/18 15:24	10161810.D	P1805514-001Dil (40mL)	S31-10151806	SC	7	
11	10/16/18 15:57	10161811.D	P1805294-001 (1.0mL)	S31-10151806	SC	1	
12	10/16/18 16:31	10161812.D	P1805514-001 (200mL)	S31-10151806	SC	7	
13	10/16/18 17:29	10161813.D	P1804529-001 (5.0mL)	S31-10151806	SC	1	
14	10/16/18 18:03	10161814.D	P1805335-001 (400mL)	S31-10151806	SC	3	
15	10/16/18 18:37	10161815.D	P1805335-001Dil (40mL)	S31-10151806	SC	3	
16	10/16/18 19:10	10161816.D	P1805335-002 (400mL)	S31-10151806	SC	4	
17	10/16/18 19:44	10161817.D	J1807061-005 (1000mL)	S31-10151806	SC	5	
18	10/16/18 20:18	10161818.D	J1807061-005Dil (100mL)	S31-10151806	SC	5	
19	10/16/18 20:52	10161819.D	J1807061-006 (1000mL)	S31-10151806	SC	6	
20	10/16/18 21:26	10161820.D	J1807061-006Dil (100mL)	S31-10151806	SC	6	
21	10/16/18 22:00	10161821.D	P1805494-001 (1000mL)	S31-10151806	SC	8	
22	10/16/18 22:34	10161822.D	P1805494-002 (1000mL)	S31-10151806	SC	9	
23	10/16/18 23:07	10161823.D	P1805430-001 (400mL)	S31-10151806	SC	10	
24	10/16/18 23:41	10161824.D	P1805430-002 (1000mL)	S31-10151806	SC	11	
25	10/17/18 0:15	10161825.D	P1805277-002 (1000mL)	S31-10151806	SC	12	
26	10/17/18 0:48	10161826.D	P1805277-001 (1000mL)	S31-10151806	SC	13	
27	10/17/18 1:22	10161827.D	P1805277-001dup (1000mL)	S31-10151806	SC	13	pass
28	10/17/18 1:56	10161828.D	P1805429-002 (100mL)	S31-10151806	SC	14	
29	10/17/18 2:29	10161829.D	P1805335-003 (400mL)	S31-10151806	SC	15	
30	10/17/18 3:03	10161830.D	P1805335-003Dil (40mL)	S31-10151806	SC	15	
31	10/17/18 3:36	10161831.D	P1805335-004 (400mL)	S31-10151806	SC	16	
32	10/17/18 4:10	10161832.D	P1805335-004Dil (40mL)	S31-10151806	SC	16	
33	10/17/18 4:44	10161833.D	System check	S31-10151806/S31-10151808 (11/13)	SC	2	
34	10/17/18 9:11	10161834.D	CCV END R9101618_5.0ng	S31-10151806/S31-10151808 (11/13)	SC	2	pass
							 10/17/18

SIMIVALLEY QC Certification

Conditioner: P-Conditioner-08

Cycles: 55

Batch: 22561

Batch Started By: HAYDEN.AKERS on 9/14/18 0847
Finished Cleaning By: HAYDEN.AKERS on 9/14/18 0848

Container IDs	Cleaned Date	QC Date Analyzed	QC Results	Initial Vacuum			Final Vacuum			Comments
				Vacuum	Date/Time	User	Vacuum	Date/Time	User	
SC01652	9/14/18	9/18/18	Pass w/ Conditions	-14.3	9/14/18 0848	HAYDEN.AKERS	-14.0	9/26/18 1244	JHULETTE	MS21_09/18/18
SC01730	9/14/18	9/18/18	Pass w/ Conditions	-14.3	9/14/18 0848	HAYDEN.AKERS	-14.0	9/26/18 0347	JHULETTE	
SC01827	9/14/18	9/18/18	Pass w/ Conditions	-14.3	9/14/18 0848	HAYDEN.AKERS	-14.0	9/26/18 0347	JHULETTE	
SC02066	9/14/18	9/18/18	Pass w/ Conditions	-14.3	9/14/18 0848	HAYDEN.AKERS	-14.0	9/26/18 0233	JHULETTE	
SC01581	9/14/18	9/18/18	Pass w/ Conditions	-14.3	9/14/18 0848	HAYDEN.AKERS	-14.0	9/26/18 0925	JHULETTE	MS21_09/18/18
SC01513	9/14/18	9/18/18	Pass w/ Conditions	-14.3	9/14/18 0848	HAYDEN.AKERS	-14.0	9/20/18 0832	JHULETTE	
SC02228	9/14/18	9/18/18	Pass w/ Conditions	-14.3	9/14/18 0848	HAYDEN.AKERS	-14.0	9/20/18 0832	JHULETTE	
SC01760	9/14/18	9/18/18	Pass w/ Conditions	-14.3	9/14/18 0848	HAYDEN.AKERS	-14.0	9/26/18 1244	JHULETTE	
SSC00096	9/14/18	9/18/18	Pass w/ Conditions	-14.3	9/14/18 0848	HAYDEN.AKERS	-14.0	9/26/18 0233	JHULETTE	MS21_09/18/18
SC02200	9/14/18	9/18/18	Pass w/ Conditions	-14.3	9/14/18 0848	HAYDEN.AKERS	-14.0	9/26/18 0925	JHULETTE	

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 09\18\
 Data File : 09181808.D
 Acq On : 18 Sep 2018 12:51 pm
 Operator : RVT
 Sample : 091818 SC01730 22561
 Misc : LL+TICS (Sig #1); S31-09041802 (Sig #2)
 ALS Vial : 4 Sample Multiplier: 1

RVT 9/18/18

Quant Time: Sep 18 14:07:12 2018
 Quant Method : I:\MS21\Methods\F21082718.M
 Quant Title : EPA TO-15
 QLast Update : Wed Aug 29 11:05:41 2018
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	7.54	130	39857	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.78	114	100995	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.71	117	116458	1000.000	pg	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4 ...	8.36	65	53615	979.809	pg	0.00
Spiked Amount 1000.000			Recovery	=	97.98%	
57) Toluene-d8 (SS2)	12.61	98	170632	1321.587	pg	0.00
Spiked Amount 1000.000			Recovery	=	132.16%	
74) Bromofluorobenzene (SS3)	16.17	174	48110	981.152	pg	0.03
Spiked Amount 1000.000			Recovery	=	98.11%	

Target Compounds

						Qvalue
2) * Propene	3.52	42	1387	25.240	pg	# 63
3) * Dichlorodifluoromethane	3.59	85	98	0.367	pg	# 42
4) * Chloromethane	3.71	50	513	4.148	pg	# 94
7) * 1,3-Butadiene	4.01	54	57	0.591	pg	# 8
8) * Bromomethane	4.21	94	54	0.487	pg	# 81
9) * Chloroethane	4.34	64	168	2.584	pg	# 42
10) * Ethanol	4.43	45	32199	721.150	pg	# 99
11) * Acetonitrile	4.60	41	551	5.697	pg	# 90
12) * Acrolein	4.71	56	3638	64.822	pg	# 94
13) * Acetone	4.82	58	75356	721.197	pg	# 55
15) * 2-Propanol (Isopropa...	5.02	45	7735	65.111	pg	# 93
16) * Acrylonitrile	5.17	53	303	4.226	pg	# 100
18) tert-Butanol	5.54	59	1650	19.293	pg	# 89
19) * Methylene Chloride	5.56	84	75	1.043	pg	# 17
22) * Carbon Disulfide	5.84	76	8057	35.262	pg	# 98
26) * Vinyl Acetate	6.69	86	4802	448.502	pg	# 21
27) * 2-Butanone (MEK)	6.96	72	4676	121.000	pg	# 100
29) DIPE	7.62	45	75	0.544	pg	# 43
30) * Ethyl Acetate	7.63	61	58	3.858	pg	# 90
31) * n-Hexane	7.63	57	349	5.141	pg	# 91
34) * Tetrahydrofuran	8.13	71	73	3.387	pg	# 97
39) * Benzene	9.33	78	682	4.128	pg	# 97
41) 1-Butanol	9.28	56	12300	636.848	pg	# 38
48) * 1,4-Dioxane	10.63	88	2580	89.431	pg	# 95
49) Isooctane	10.69	56	97	1.763	pg	# 82
51) * n-Heptane	11.02	71	815	10.279	pg	# 97
53) * 4-Methyl-2-pentanone	11.70	58	3604	145.974	pg	# 99
58) * Toluene	12.73	91	593	3.044	pg	# 97
59) * 2-Hexanone	13.05	58	2737	136.976	pg	# 95
63) * n-Octane	13.92	85	140	6.873	pg	# 85
66) * Ethylbenzene	15.14	91	153	1.028	pg	# 96
67) * m- & p-Xylenes	15.30	91	311	2.812	pg	# 100
69) Cyclohexanone	15.45	98	1297	83.285	pg	# 1
70) * Styrene	15.65	104	129	2.009	pg	# 95
71) * o-Xylene	15.75	91	140	1.226	pg	# 99
72) * n-Nonane	16.00	57	152	3.418	pg	# 94
75) * Cumene	16.30	105	119	0.763	pg	# 49
76) * alpha-Pinene	16.62	93	398	5.756	pg	# 1
77) * n-Propylbenzene	16.75	91	413	2.643	pg	# 55
78) 3-Ethyltoluene	16.84	105	69	0.587	pg	# 43
79) * 4-Ethyltoluene	16.84	105	69	0.633	pg	# 44
80) * 1,3,5-Trimethylbenzene	16.94	105	105	1.001	pg	# 28
81) alpha-Methylstyrene	17.07	118	76	1.672	pg	# 26
82) 2-Ethyltoluene	17.11	105	484	3.810	pg	# 87
83) tert-Butylbenzene	17.31	134	122	4.968	pg	# 1

Data Path : I:\MS21\DATA\2018 09\18\
 Data File : 09181808.D
 Acq On : 18 Sep 2018 12:51 pm
 Operator : RVT
 Sample : 091818 SC01730 22561
 Misc : LL+TICS (Sig #1); S31-09041802 (Sig #2)
 ALS Vial : 4 Sample Multiplier: 1

Quant Time: Sep 18 14:07:12 2018
 Quant Method : I:\MS21\Methods\F21082718.M
 Quant Title : EPA TO-15
 QLast Update : Wed Aug 29 11:05:41 2018
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
84) * 1,2,4-Trimethylbenzene	17.29	105	216	2.334	pg	# 72
88) n-Decane	17.40	85	78	5.015	pg	# 64
90) 1,2,3-Trimethylbenzene	17.64	105	149	1.498	pg	98
91) p-Isopropyltoluene	17.65	134	65	2.209	pg	87
93) * D-Limonene	17.77	68	370	10.978	pg	94
98) * Naphthalene	19.30	128	255	10.860	pg	# 66

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

Data Path : I:\MS21\DATA\2018 09\18\

Data File : 09181808.D

Acq On : 18 Sep 2018 12:51 pm

Operator : RVT

Sample : 091818 SC01730 22561

Misc : LL+TICS (Sig #1); S31-09041802 (Sig #2)

ALS Vial : 4 Sample Multiplier: 1

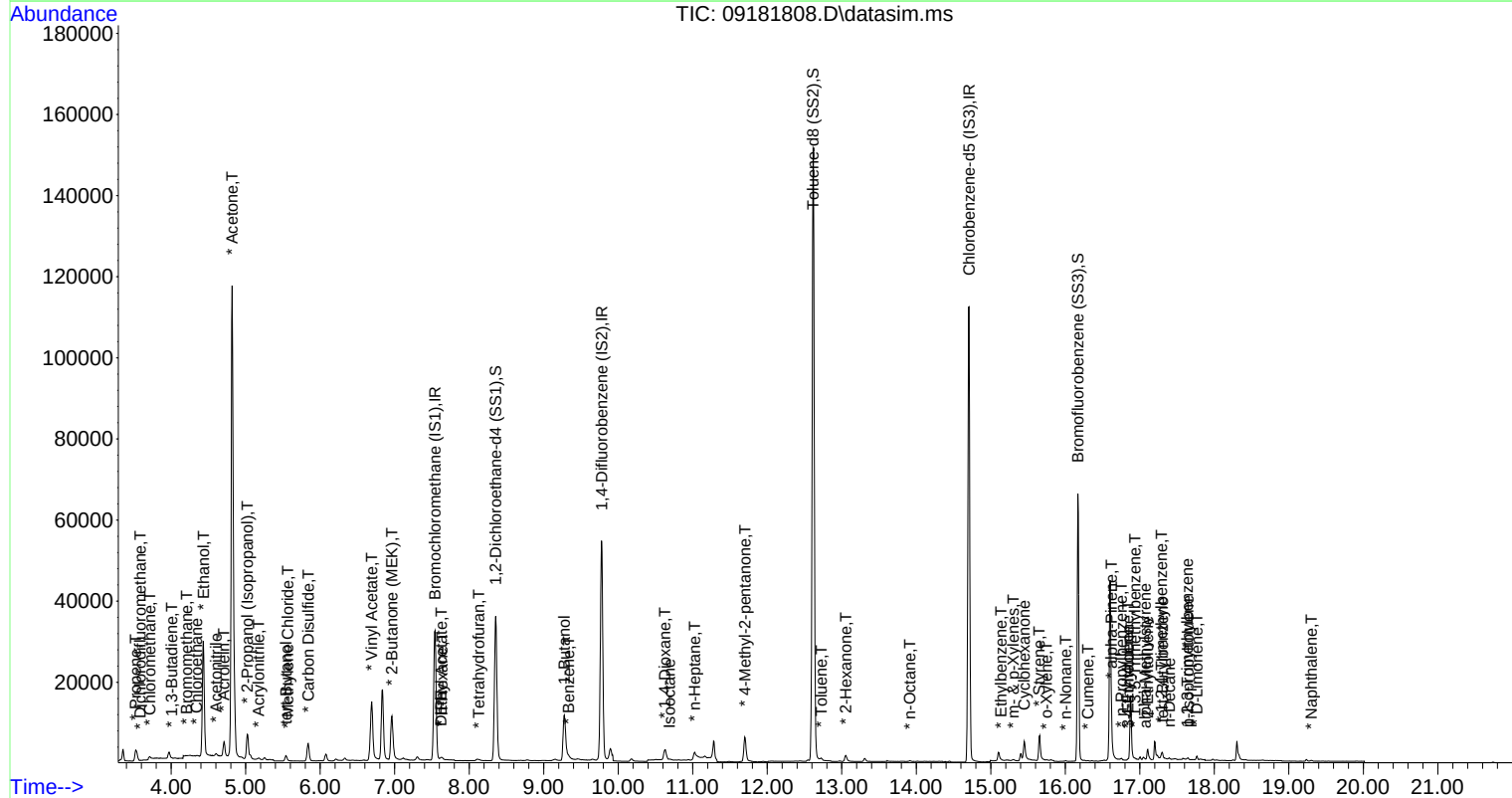
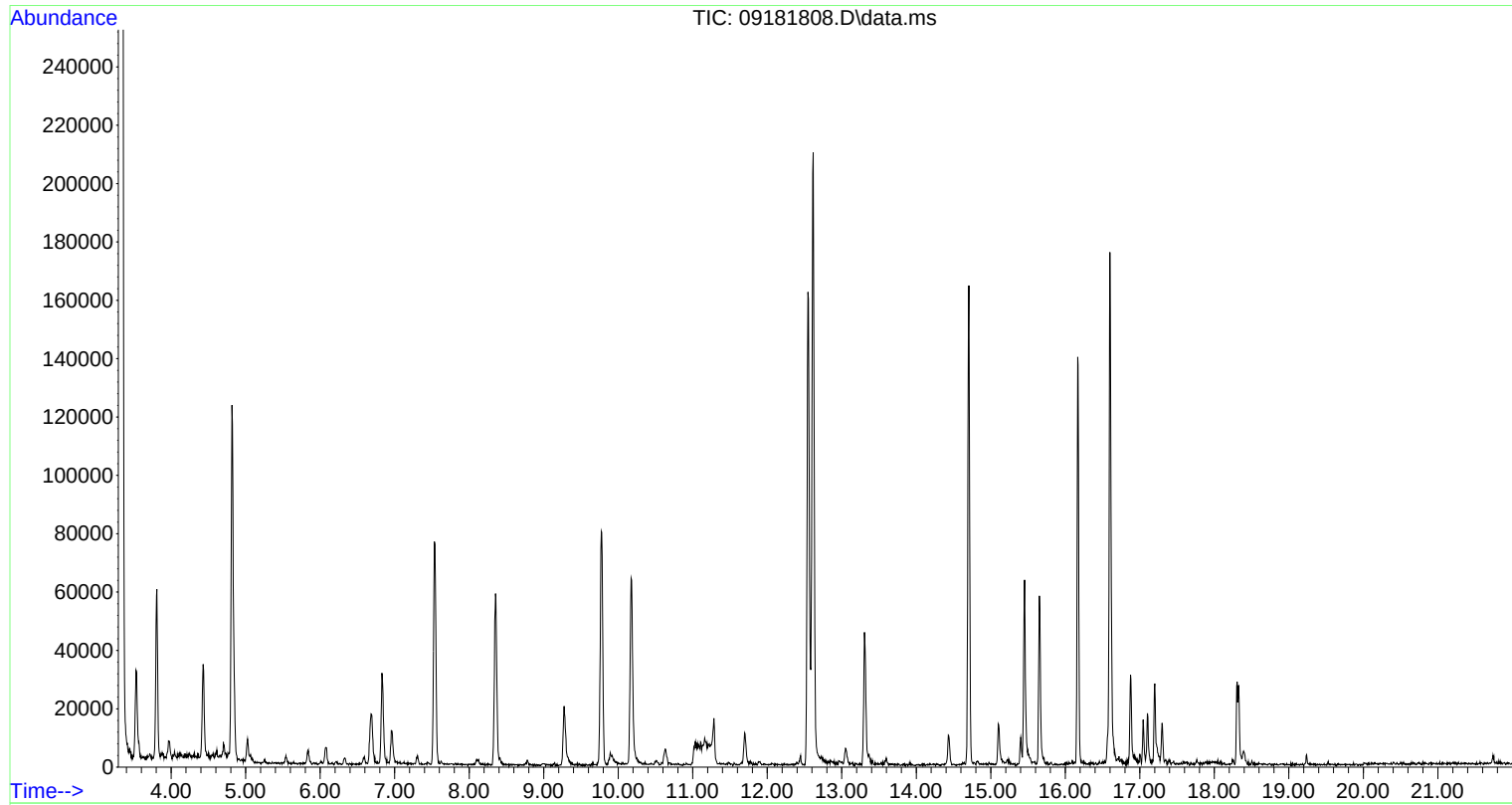
Quant Time: Sep 18 14:07:12 2018

Quant Method : I:\MS21\Methods\F21082718.M

Quant Title : EPA T0-15

QLast Update : Wed Aug 29 11:05:41 2018

Response via : Initial Calibration





2655 Park Center Dr., Suite A
Simi Valley, CA 93065
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www.alsglobal.com

LABORATORY REPORT

December 24, 2018

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

RE: DDMT / 10A023.002.330

Dear Todd:

Enclosed are the results of the sample submitted to our laboratory on December 6, 2018. For your reference, this analysis has been assigned our service request number P1806708.

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 4:14 pm, 12/27/18

Kate Kaneko
Laboratory Director



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

Client: Trinity Analysis & Development Corp.
Project: DDMT / 10A023.002.330

Service Request No: P1806708

CASE NARRATIVE

The sample was received intact under chain of custody on December 6, 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.

Manual integrations were performed on the following sample(s) and analyte(s). Refer to the raw data for additional information.

Sample Identification(s)	Analyte(s)
P1806708-001	Acetone, 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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 Simi Valley, CA 93065
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www.alsglobal.com

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Alaska DEC	http://dec.alaska.gov/eh/lab.aspx	17-019
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/page/la-lab-accreditation	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml	2018027
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1521096
New Jersey DEP (NELAP)	http://www.nj.gov/dep/enforcement/oqa.html	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-005
Pennsylvania DEP	http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/agency/qa/env_lab_accreditation.html	T104704413-18-9
Utah DOH (NELAP)	http://health.utah.gov/lab/lab_cert_env	CA016272018-9
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 / 10A023.002.330

Service Request: P1806708

Date Received: 12/6/2018
Time Received: 10:30

TO-15 - VOC Cans

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	
ODSVE-EFF-Y8Q2	P1806708-001	Air	12/3/2018	00:00	SC01924	-4.71	3.76	X



Page 1 of 1

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ALS Environmental Sample Acceptance Check Form

Client: Trinity Analysis & Development Corp.

Work order: P1806708

Project: DDMT / 10A023.002.330

Sample(s) received on: 12/6/18

Date opened: 12/6/18

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.

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

[illegible]

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

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

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: Trinity Analysis & Development Corp.

Client Sample ID: ODSVE-EFF-Y8Q2

Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1806708

ALS Sample ID: P1806708-001

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: SC01924

Date Collected: 12/3/18

Date Received: 12/6/18

Date Analyzed: 12/22/18

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -4.71

Final Pressure (psig): 3.76

Container Dilution Factor: 1.85

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	0.20	0.56	0.33	0.14	J
75-71-8	Dichlorodifluoromethane (CFC 12)	1.0	0.19	0.12	0.033	
74-87-3	Chloromethane	0.27	0.45	0.27	0.077	U
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	0.082	0.14	0.082	0.022	U
75-01-4	Vinyl Chloride	0.12	0.38	0.12	0.041	J
106-99-0	1,3-Butadiene	0.27	0.44	0.27	0.074	U
74-83-9	Bromomethane	0.076	0.24	0.076	0.035	U
75-00-3	Chloroethane	0.21	0.36	0.21	0.046	U
64-17-5	Ethanol	1.5	5.0	0.83	0.36	J, B
75-05-8	Acetonitrile	0.35	0.57	0.35	0.14	U
107-02-8	Acrolein	0.31	0.81	0.26	0.12	J
67-64-1	Acetone	2.3	4.2	2.1	0.93	J
75-69-4	Trichlorofluoromethane	0.31	0.17	0.11	0.027	
67-63-0	2-Propanol (Isopropyl Alcohol)	0.47	1.6	0.47	0.17	U
107-13-1	Acrylonitrile	0.27	0.44	0.27	0.094	U
75-35-4	1,1-Dichloroethene	0.70	0.25	0.079	0.035	
75-09-2	Methylene Chloride	0.17	0.29	0.17	0.080	U
107-05-1	3-Chloro-1-propene (Allyl Chloride)	0.10	0.31	0.10	0.043	U
76-13-1	Trichlorotrifluoroethane	2.7	0.13	0.041	0.018	
75-15-0	Carbon Disulfide	1.1	0.65	0.31	0.095	
156-60-5	trans-1,2-Dichloroethene	0.44	0.25	0.079	0.035	
75-34-3	1,1-Dichloroethane	0.36	0.24	0.14	0.036	
1634-04-4	Methyl tert-Butyl Ether	0.087	0.28	0.087	0.032	U
108-05-4	Vinyl Acetate	1.4	2.8	1.4	0.63	U
78-93-3	2-Butanone (MEK)	0.38	0.63	0.20	0.069	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-Y8Q2

Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1806708

ALS Sample ID: P1806708-001

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: SC01924

Date Collected: 12/3/18

Date Received: 12/6/18

Date Analyzed: 12/22/18

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -4.71 Final Pressure (psig): 3.76

Container Dilution Factor: 1.85

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	34	0.25	0.079	0.035	
141-78-6	Ethyl Acetate	0.33	0.56	0.33	0.14	U
110-54-3	n-Hexane	0.17	0.28	0.17	0.058	U
67-66-3	Chloroform	5.1	0.20	0.064	0.027	
109-99-9	Tetrahydrofuran (THF)	0.11	0.33	0.11	0.042	U
107-06-2	1,2-Dichloroethane	0.078	0.24	0.078	0.027	U
71-55-6	1,1,1-Trichloroethane	0.31	0.18	0.058	0.022	
71-43-2	Benzene	0.058	0.30	0.098	0.045	J
56-23-5	Carbon Tetrachloride	0.36	0.15	0.050	0.022	
110-82-7	Cyclohexane	0.18	0.54	0.18	0.081	U
78-87-5	1,2-Dichloropropane	0.068	0.22	0.068	0.026	U
75-27-4	Bromodichloromethane	0.027	0.15	0.047	0.021	J
79-01-6	Trichloroethene	27	0.18	0.059	0.025	
123-91-1	1,4-Dioxane	0.087	0.27	0.087	0.032	U
80-62-6	Methyl Methacrylate	0.28	0.50	0.28	0.086	U
142-82-5	n-Heptane	0.14	0.24	0.14	0.038	U
10061-01-5	cis-1,3-Dichloropropene	0.073	0.23	0.073	0.034	U
108-10-1	4-Methyl-2-pentanone	0.077	0.24	0.077	0.033	U
10061-02-6	trans-1,3-Dichloropropene	0.13	0.22	0.13	0.045	U
79-00-5	1,1,2-Trichloroethane	0.050	0.18	0.058	0.018	J
108-88-3	Toluene	0.083	0.26	0.083	0.032	U
591-78-6	2-Hexanone	0.043	0.24	0.077	0.030	J
124-48-1	Dibromochloromethane	0.037	0.12	0.037	0.015	U
106-93-4	1,2-Dibromoethane	0.041	0.13	0.041	0.015	U
123-86-4	n-Butyl Acetate	0.066	0.21	0.066	0.028	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-Y8Q2
Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1806708
 ALS Sample ID: P1806708-001

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: SC01924

Date Collected: 12/3/18
Date Received: 12/6/18
Date Analyzed: 12/22/18
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -4.71 Final Pressure (psig): 3.76

Container Dilution Factor: 1.85

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	0.13	0.21	0.13	0.048	U
127-18-4	Tetrachloroethene	2.5	0.14	0.046	0.019	
108-90-7	Chlorobenzene	0.068	0.21	0.068	0.029	U
100-41-4	Ethylbenzene	0.072	0.22	0.072	0.032	U
179601-23-1	m,p-Xylenes	0.14	0.47	0.14	0.060	U
75-25-2	Bromoform	0.057	0.095	0.057	0.020	U
100-42-5	Styrene	0.14	0.23	0.14	0.037	U
95-47-6	o-Xylene	0.072	0.23	0.072	0.033	U
111-84-2	n-Nonane	0.11	0.19	0.11	0.031	U
79-34-5	1,1,2,2-Tetrachloroethane	0.49	0.14	0.046	0.020	
98-82-8	Cumene	0.064	0.20	0.064	0.029	U
80-56-8	alpha-Pinene	0.10	0.17	0.10	0.027	U
103-65-1	n-Propylbenzene	0.064	0.20	0.064	0.029	U
622-96-8	4-Ethyltoluene	0.12	0.20	0.12	0.032	U
108-67-8	1,3,5-Trimethylbenzene	0.064	0.20	0.064	0.029	U
95-63-6	1,2,4-Trimethylbenzene	0.064	0.20	0.064	0.028	U
100-44-7	Benzyl Chloride	0.11	0.39	0.11	0.043	U
541-73-1	1,3-Dichlorobenzene	0.052	0.17	0.052	0.025	U
106-46-7	1,4-Dichlorobenzene	0.099	0.17	0.099	0.025	U
95-50-1	1,2-Dichlorobenzene	0.052	0.17	0.052	0.024	U
5989-27-5	d-Limonene	0.10	0.17	0.10	0.037	U
96-12-8	1,2-Dibromo-3-chloropropane	0.061	0.10	0.061	0.019	U
120-82-1	1,2,4-Trichlorobenzene	0.082	0.13	0.082	0.032	U
91-20-3	Naphthalene	0.11	0.18	0.11	0.046	U
87-68-3	Hexachlorobutadiene	0.056	0.092	0.056	0.019	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 / 10A023.002.330

ALS Project ID: P1806708

ALS Sample ID: P181221-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: 12/21/18

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	0.18	0.30	0.18	0.076	U
75-71-8	Dichlorodifluoromethane (CFC 12)	0.063	0.11	0.063	0.018	U
74-87-3	Chloromethane	0.15	0.24	0.15	0.042	U
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	0.044	0.073	0.044	0.012	U
75-01-4	Vinyl Chloride	0.067	0.21	0.067	0.022	U
106-99-0	1,3-Butadiene	0.14	0.24	0.14	0.040	U
74-83-9	Bromomethane	0.041	0.13	0.041	0.019	U
75-00-3	Chloroethane	0.11	0.19	0.11	0.025	U
64-17-5	Ethanol	0.25	2.7	0.45	0.20	J
75-05-8	Acetonitrile	0.19	0.31	0.19	0.077	U
107-02-8	Acrolein	0.14	0.44	0.14	0.065	U
67-64-1	Acetone	1.1	2.3	1.1	0.51	U
75-69-4	Trichlorofluoromethane	0.057	0.094	0.057	0.014	U
67-63-0	2-Propanol (Isopropyl Alcohol)	0.26	0.85	0.26	0.090	U
107-13-1	Acrylonitrile	0.15	0.24	0.15	0.051	U
75-35-4	1,1-Dichloroethene	0.043	0.14	0.043	0.019	U
75-09-2	Methylene Chloride	0.092	0.16	0.092	0.043	U
107-05-1	3-Chloro-1-propene (Allyl Chloride)	0.054	0.17	0.054	0.023	U
76-13-1	Trichlorotrifluoroethane	0.022	0.069	0.022	0.0099	U
75-15-0	Carbon Disulfide	0.17	0.35	0.17	0.051	U
156-60-5	trans-1,2-Dichloroethene	0.043	0.13	0.043	0.019	U
75-34-3	1,1-Dichloroethane	0.077	0.13	0.077	0.019	U
1634-04-4	Methyl tert-Butyl Ether	0.047	0.15	0.047	0.017	U
108-05-4	Vinyl Acetate	0.74	1.5	0.74	0.34	U
78-93-3	2-Butanone (MEK)	0.11	0.34	0.11	0.037	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 / 10A023.002.330

ALS Project ID: P1806708

ALS Sample ID: P181221-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: 12/21/18

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	0.043	0.13	0.043	0.019	U
141-78-6	Ethyl Acetate	0.18	0.31	0.18	0.078	U
110-54-3	n-Hexane	0.091	0.15	0.091	0.031	U
67-66-3	Chloroform	0.035	0.11	0.035	0.015	U
109-99-9	Tetrahydrofuran (THF)	0.058	0.18	0.058	0.023	U
107-06-2	1,2-Dichloroethane	0.042	0.13	0.042	0.015	U
71-55-6	1,1,1-Trichloroethane	0.031	0.099	0.031	0.012	U
71-43-2	Benzene	0.053	0.16	0.053	0.024	U
56-23-5	Carbon Tetrachloride	0.027	0.083	0.027	0.012	U
110-82-7	Cyclohexane	0.099	0.29	0.099	0.044	U
78-87-5	1,2-Dichloropropane	0.037	0.12	0.037	0.014	U
75-27-4	Bromodichloromethane	0.025	0.079	0.025	0.011	U
79-01-6	Trichloroethene	0.032	0.099	0.032	0.013	U
123-91-1	1,4-Dioxane	0.047	0.15	0.047	0.017	U
80-62-6	Methyl Methacrylate	0.15	0.27	0.15	0.046	U
142-82-5	n-Heptane	0.078	0.13	0.078	0.021	U
10061-01-5	cis-1,3-Dichloropropene	0.040	0.12	0.040	0.018	U
108-10-1	4-Methyl-2-pentanone	0.041	0.13	0.041	0.018	U
10061-02-6	trans-1,3-Dichloropropene	0.071	0.12	0.071	0.024	U
79-00-5	1,1,2-Trichloroethane	0.031	0.099	0.031	0.0099	U
108-88-3	Toluene	0.045	0.14	0.045	0.017	U
591-78-6	2-Hexanone	0.042	0.13	0.042	0.016	U
124-48-1	Dibromochloromethane	0.020	0.063	0.020	0.0082	U
106-93-4	1,2-Dibromoethane	0.022	0.070	0.022	0.0081	U
123-86-4	n-Butyl Acetate	0.036	0.11	0.036	0.015	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 3 of 3

Client: Trinity Analysis & Development Corp.
Client Sample ID: Method Blank
Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1806708
 ALS Sample ID: P181221-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: 12/21/18
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	0.069	0.12	0.069	0.026	U
127-18-4	Tetrachloroethene	0.025	0.078	0.025	0.010	U
108-90-7	Chlorobenzene	0.037	0.12	0.037	0.015	U
100-41-4	Ethylbenzene	0.039	0.12	0.039	0.017	U
179601-23-1	m,p-Xylenes	0.078	0.25	0.078	0.032	U
75-25-2	Bromoform	0.031	0.051	0.031	0.011	U
100-42-5	Styrene	0.075	0.12	0.075	0.020	U
95-47-6	o-Xylene	0.039	0.12	0.039	0.018	U
111-84-2	n-Nonane	0.061	0.10	0.061	0.017	U
79-34-5	1,1,2,2-Tetrachloroethane	0.025	0.077	0.025	0.011	U
98-82-8	Cumene	0.035	0.11	0.035	0.016	U
80-56-8	alpha-Pinene	0.056	0.093	0.056	0.015	U
103-65-1	n-Propylbenzene	0.035	0.11	0.035	0.016	U
622-96-8	4-Ethyltoluene	0.063	0.11	0.063	0.017	U
108-67-8	1,3,5-Trimethylbenzene	0.035	0.11	0.035	0.016	U
95-63-6	1,2,4-Trimethylbenzene	0.035	0.11	0.035	0.015	U
100-44-7	Benzyl Chloride	0.062	0.21	0.062	0.023	U
541-73-1	1,3-Dichlorobenzene	0.028	0.090	0.028	0.013	U
106-46-7	1,4-Dichlorobenzene	0.053	0.090	0.053	0.014	U
95-50-1	1,2-Dichlorobenzene	0.028	0.090	0.028	0.013	U
5989-27-5	d-Limonene	0.054	0.092	0.054	0.020	U
96-12-8	1,2-Dibromo-3-chloropropane	0.033	0.054	0.033	0.010	U
120-82-1	1,2,4-Trichlorobenzene	0.044	0.071	0.044	0.018	U
91-20-3	Naphthalene	0.061	0.097	0.061	0.025	U
87-68-3	Hexachlorobutadiene	0.030	0.050	0.030	0.010	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 / 10A023.002.330

ALS Project ID: P1806708

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: 12/3/18
Date(s) Received: 12/6/18
Date(s) Analyzed: 12/21 - 12/22/18

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	P181221-MB	103	95	88	70-130	
Lab Control Sample	P181221-LCS	102	94	90	70-130	
Duplicate Lab Control Sample	P181221-DLCS	101	84	86	70-130	
ODSVE-EFF-Y8Q2	P1806708-001	99	93	87	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: Trinity Analysis & Development Corp.

Client Sample ID: Duplicate Lab Control Sample

Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1806708

ALS Sample ID: P181221-DLCS

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: 12/22/18

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount		Result		% Recovery		DOD		RPD	RPD	Data
		LCS / DLCS		LCS	DLCS	LCS	DLCS	Acceptance				
		ppbV		ppbV	ppbV			Limits			Limit	Qualifier
115-07-1	Propene	123		114	126	93	102	57-136		9	25	
75-71-8	Dichlorodifluoromethane (CFC 12)	42.6		34.3	37.5	81	88	59-128		8	25	
74-87-3	Chloromethane	102		94.6	103	93	101	59-132		8	25	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	30.2		23.3	24.8	77	82	63-121		6	25	
75-01-4	Vinyl Chloride	83.7		77.6	82.9	93	99	64-127		6	25	
106-99-0	1,3-Butadiene	95.1		89.5	98.3	94	103	66-134		9	25	
74-83-9	Bromomethane	54.6		47.1	51.5	86	94	63-134		9	25	
75-00-3	Chloroethane	81.1		71.4	77.8	88	96	63-127		9	25	
64-17-5	Ethanol	544		603	660	111	121	59-125		9	25	
75-05-8	Acetonitrile	123		116	129	94	105	63-132		11	25	
107-02-8	Acrolein	89.4		87.3	95.7	98	107	62-126		9	25	
67-64-1	Acetone	446		405	441	91	99	58-128		8	25	
75-69-4	Trichlorofluoromethane	37.6		31.3	33.2	83	88	62-126		6	25	
67-63-0	2-Propanol (Isopropyl Alcohol)	168		154	165	92	98	52-125		6	25	
107-13-1	Acrylonitrile	95.4		98.1	107	103	112	71-137		8	25	
75-35-4	1,1-Dichloroethene	55.0		45.4	48.5	83	88	61-133		6	25	
75-09-2	Methylene Chloride	62.4		53.0	56.9	85	91	62-115		7	25	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	69.0		63.5	68.1	92	99	71-131		7	25	
76-13-1	Trichlorotrifluoroethane	28.1		21.7	23.1	77	82	66-126		6	25	
75-15-0	Carbon Disulfide	69.9		60.8	64.5	87	92	57-134		6	25	
156-60-5	trans-1,2-Dichloroethene	53.9		48.7	52.1	90	97	67-124		7	25	
75-34-3	1,1-Dichloroethane	53.3		46.5	49.8	87	93	68-126		7	25	
1634-04-4	Methyl tert-Butyl Ether	59.5		49.8	52.6	84	88	66-126		5	25	
108-05-4	Vinyl Acetate	302		274	289	91	96	56-139		5	25	
78-93-3	2-Butanone (MEK)	70.4		73.9	72.1	105	102	67-130		3	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: Trinity Analysis & Development Corp.

Client Sample ID: Duplicate Lab Control Sample

Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1806708

ALS Sample ID: P181221-DLCS

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: 12/22/18

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	53.2	51.5	51.3	97	96	70-121	1	25	
141-78-6	Ethyl Acetate	121	129	128	107	106	65-128	0.9	25	
110-54-3	n-Hexane	61.2	61.8	60.6	101	99	63-120	2	25	
67-66-3	Chloroform	44.4	40.2	39.5	91	89	68-123	2	25	
109-99-9	Tetrahydrofuran (THF)	73.3	70.1	68.1	96	93	64-123	3	25	
107-06-2	1,2-Dichloroethane	53.1	46.7	47.3	88	89	65-128	1	25	
71-55-6	1,1,1-Trichloroethane	39.5	33.2	34.1	84	86	68-125	2	25	
71-43-2	Benzene	66.1	59.6	59.2	90	90	69-119	0	25	
56-23-5	Carbon Tetrachloride	33.7	29.1	29.5	86	88	68-132	2	25	
110-82-7	Cyclohexane	121	111	110	92	91	70-117	1	25	
78-87-5	1,2-Dichloropropane	46.7	46.4	45.1	99	97	69-123	2	25	
75-27-4	Bromodichloromethane	32.0	29.7	29.8	93	93	72-128	0	25	
79-01-6	Trichloroethene	39.7	33.9	34.3	85	86	71-123	1	25	
123-91-1	1,4-Dioxane	59.4	60.1	59.4	101	100	71-122	1	25	
80-62-6	Methyl Methacrylate	105	93.9	95.2	89	91	70-128	2	25	
142-82-5	n-Heptane	52.5	46.9	47.4	89	90	69-123	1	25	
10061-01-5	cis-1,3-Dichloropropene	47.2	44.0	45.5	93	96	70-128	3	25	
108-10-1	4-Methyl-2-pentanone	51.1	54.5	54.4	107	106	67-130	0.9	25	
10061-02-6	trans-1,3-Dichloropropene	46.9	47.0	46.8	100	100	75-133	0	25	
79-00-5	1,1,2-Trichloroethane	39.4	35.7	35.7	91	91	73-119	0	25	
108-88-3	Toluene	56.3	48.4	43.5	86	77	66-119	11	25	
591-78-6	2-Hexanone	52.3	54.6	49.6	104	95	62-128	9	25	
124-48-1	Dibromochloromethane	25.0	23.7	22.4	95	90	70-130	5	25	
106-93-4	1,2-Dibromoethane	28.1	26.1	25.6	93	91	74-122	2	25	
123-86-4	n-Butyl Acetate	46.1	50.1	48.0	109	104	64-128	5	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: Trinity Analysis & Development Corp.

Client Sample ID: Duplicate Lab Control Sample

Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1806708

ALS Sample ID: P181221-DLCS

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: 12/22/18

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	46.5	44.3	41.5	95	89	69-121	7	25	
127-18-4	Tetrachloroethene	31.4	26.6	25.0	85	80	66-124	6	25	
108-90-7	Chlorobenzene	46.6	40.7	40.5	87	87	70-119	0	25	
100-41-4	Ethylbenzene	48.9	42.8	43.5	88	89	70-124	1	25	
179601-23-1	m,p-Xylenes	98.2	90.7	89.0	92	91	61-134	1	25	
75-25-2	Bromoform	20.6	19.2	18.9	93	92	66-139	1	25	
100-42-5	Styrene	49.8	46.4	45.9	93	92	73-127	1	25	
95-47-6	o-Xylene	49.3	44.9	44.9	91	91	67-125	0	25	
111-84-2	n-Nonane	40.9	44.9	42.0	110	103	63-128	7	25	
79-34-5	1,1,2,2-Tetrachloroethane	31.2	30.5	30.5	98	98	65-127	0	25	
98-82-8	Cumene	43.6	38.7	38.1	89	87	68-124	2	25	
80-56-8	alpha-Pinene	37.9	33.9	33.3	89	88	65-120	1	25	
103-65-1	n-Propylbenzene	44.3	42.1	40.6	95	92	69-123	3	25	
622-96-8	4-Ethyltoluene	43.6	42.1	41.5	97	95	67-129	2	25	
108-67-8	1,3,5-Trimethylbenzene	43.5	38.3	37.4	88	86	67-130	2	25	
95-63-6	1,2,4-Trimethylbenzene	43.8	42.0	40.6	96	93	66-132	3	25	
100-44-7	Benzyl Chloride	41.9	38.2	37.0	91	88	50-147	3	25	
541-73-1	1,3-Dichlorobenzene	35.9	32.4	30.9	90	86	65-130	5	25	
106-46-7	1,4-Dichlorobenzene	35.9	31.7	30.7	88	86	60-131	2	25	
95-50-1	1,2-Dichlorobenzene	35.9	33.5	32.6	93	91	63-129	2	25	
5989-27-5	d-Limonene	37.9	41.3	40.3	109	106	66-124	3	25	
96-12-8	1,2-Dibromo-3-chloropropane	21.7	21.7	20.5	100	94	67-138	6	25	
120-82-1	1,2,4-Trichlorobenzene	28.9	25.2	26.0	87	90	55-142	3	25	
91-20-3	Naphthalene	38.7	34.0	36.3	88	94	57-138	7	25	
87-68-3	Hexachlorobutadiene	19.6	16.3	16.9	83	86	56-138	4	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: Trinity Analysis & Development Corp.
Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1806708

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: 12211835.D
Date Analyzed: 12/21/18
Time Analyzed: 23:29

Client Sample ID	ALS Sample ID	Lab File ID	Time Analyzed
Lab Control Sample	P181221-LCS	12211837.D	00:36
Duplicate Lab Control Sample	P181221-DLCS	12211838.D	01:09
ODSVE-EFF-Y8Q2	P1806708-001	12211851.D	09:57

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Trinity Analysis & Development Corp.
Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1806708

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: 12211833.D
Date Analyzed: 12/21/18
Time Analyzed: 22:23

	IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
	AREA	#	RT	#	AREA	#
24 Hour Standard	237644	11.33	976391	13.43	468942	17.72
Upper Limit	332702	11.66	1366947	13.76	656519	18.05
Lower Limit	142586	11.00	585835	13.10	281365	17.39

Client Sample ID						
01	Method Blank	214823	11.32	909947	13.43	391552
02	Lab Control Sample	239221	11.33	1020000	13.43	435498
03	Duplicate Lab Control Sample	232941	11.33	965836	13.43	460603
04	ODSVE-EFF-Y8Q2	254175	11.31	1059843	13.43	466456
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\2018 12\21\12211851.D

Acq On : 22 Dec 2018 9:57

Operator: LH

Sample : P1806708-001 (1000mL)

Misc : S31-09141801

ALS Vial : 4 Sample Multiplier: 1

Quant Time: Dec 22 12:23:27 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:23:27 2018

LH 12/22/18

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.31	130	254175	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.43	114	1059843	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.72	82	466456	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.17	65	379206	12.402	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.20%
57) Toluene-d8 (SS2)	15.87	98	858965	11.564	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	92.48%
73) Bromofluorobenzene (SS3)	19.09	174	365888	10.836	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	86.72%

Target Compounds

						Qvalue
2) Propene	4.07	42	4457	0.188	ng	90
3) Dichlorodifluoromethan...	4.22	85	144529	2.720	ng	99
4) Chloromethane	4.54	50	2706	0.080	ng	87
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	1451	N.D.		
6) Vinyl Chloride	4.98	62	6353	0.172	ng	95
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	5.71	94	1086	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.43	45	21424	1.499	ng	98
11) Acetonitrile	6.74	41	3095	0.083	ng	# 45
12) Acrolein	6.92	56	4809	0.381	ng	96
13) Acetone	7.12	58	50305m	2.949	ng	
14) Trichlorofluoromethane	7.35	101	42893	0.932	ng	100
15) 2-Propanol (Isopropanol)	7.67	45	7074	0.129	ng	58
16) Acrylonitrile	0.00	53	0	N.D.		
17) 1,1-Dichloroethene	8.34	96	35138	1.500	ng	94
18) 2-Methyl-2-Propanol (t...	8.61	59	1270	N.D.		
19) Methylene Chloride	8.58	84	1568	0.066	ng	98
20) 3-Chloro-1-propene (Al...	8.65	41	357	N.D.		
21) Trichlorotrifluoroethane	8.99	151	275657	11.255	ng	95
22) Carbon Disulfide	8.85	76	159133	1.871	ng	100
23) trans-1,2-Dichloroethene	9.85	61	30567	0.953	ng	94
24) 1,1-Dichloroethane	10.11	63	31559	0.791	ng	99
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.		
26) Vinyl Acetate	10.35	86	5416	0.906	ng	# 48
27) 2-Butanone (MEK)	10.64	72	9065	0.601	ng	93
28) cis-1,2-Dichloroethene	11.13	61	2327908	73.838	ng	95
29) Diisopropyl Ether	0.00	87	0	N.D.	d	
30) Ethyl Acetate	11.53	61	178	N.D.		
31) n-Hexane	11.40	57	1293	N.D.		
32) Chloroform	11.48	83	581974	13.579	ng	99
34) Tetrahydrofuran (THF)	11.96	72	483	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.29	62	960	N.D.		
38) 1,1,1-Trichloroethane	12.56	97	36661	0.920	ng	98
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	13.04	78	9709	0.100	ng	100
42) Carbon Tetrachloride	13.19	117	45084	1.221	ng	99
43) Cyclohexane	13.30	84	1742	N.D.		
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.	d	
45) 1,2-Dichloropropane	13.89	63	206	N.D.		
46) Bromodichloromethane	14.08	83	3330m	0.098	ng	
47) Trichloroethene	14.13	130	2230155	77.867	ng	99
48) 1,4-Dioxane	0.00	88	0	N.D.	d	
49) 2,2,4-Trimethylpentane...	14.18	57	2784	N.D.		

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Data File: I:\MS16\DATA\2018 12\21\12211851.D

Acq On : 22 Dec 2018 9:57

Operator: LH

Sample : P1806708-001 (1000mL)

Misc : S31-09141801

ALS Vial : 4 Sample Multiplier: 1

Quant Time: Dec 22 12:23:27 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:23:27 2018

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	14.44	71	668	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	15.04	58	676	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	15.68	97	3434	0.146	ng	92
58) Toluene	15.97	91	5646	0.055	ng	88
59) 2-Hexanone	16.21	43	4553	0.096	ng	92
60) Dibromochloromethane	16.39	129	560	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.85	43	1968	N.D.		
63) n-Octane	16.95	57	794	N.D.		
64) Tetrachloroethene	17.11	166	296395	9.338	ng	99
65) Chlorobenzene	17.77	112	816	N.D.		
66) Ethylbenzene	18.11	91	1474	N.D.		
67) m- & p-Xylenes	18.26	91	3149	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.59	104	710	N.D.		
70) o-Xylene	18.70	91	1534	N.D.		
71) n-Nonane	18.87	43	1163	N.D.		
72) 1,1,2,2-Tetrachloroethane	18.68	83	77482	1.818	ng	97
74) Cumene	19.20	105	1311	N.D.		
75) alpha-Pinene	19.54	93	525	N.D.		
76) n-Propylbenzene	19.64	91	1718	N.D.		
77) 3-Ethyltoluene	19.74	105	754	N.D.		
78) 4-Ethyltoluene	19.77	105	642	N.D.		
79) 1,3,5-Trimethylbenzene	19.84	105	1216	N.D.		
80) alpha-Methylstyrene	19.97	118	946	N.D.		
81) 2-Ethyltoluene	20.00	105	2968	N.D.		
82) 1,2,4-Trimethylbenzene	20.19	105	1993	N.D.		
83) n-Decane	0.00	58	0	N.D.	d	
84) Benzyl Chloride	20.31	91	652	N.D.		
85) 1,3-Dichlorobenzene	20.32	146	224	N.D.		
86) 1,4-Dichlorobenzene	20.39	146	375	N.D.		
87) sec-Butylbenzene	20.43	105	2229	N.D.		
88) 4-Isopropyltoluene (p-...	0.00	119	0	N.D.	d	
89) 1,2,3-Trimethylbenzene	20.56	105	1456	N.D.		
90) 1,2-Dichlorobenzene	20.68	146	139	N.D.		
91) d-Limonene	20.68	68	1388	N.D.		
92) 1,2-Dibromo-3-Chloropr...	21.15	157	267	N.D.		
93) n-Undecane	21.34	57	1174	N.D.		
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	22.28	128	1733	N.D.		
96) n-Dodecane	22.24	57	1024	N.D.		
97) Hexachlorobutadiene	22.59	225	368	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.	d	
99) tert-Butylbenzene	20.18	119	310	N.D.		
100) n-Butylbenzene	20.92	91	2869	N.D.		

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

Data File: I:\MS16\DATA\2018 12\21\12211851.D

Acq On : 22 Dec 2018 9:57

Operator: LH

Sample : P1806708-001 (1000mL)

Misc : S31-09141801

ALS Vial : 4 Sample Multiplier: 1

Quant Time: Dec 22 12:23:27 2018

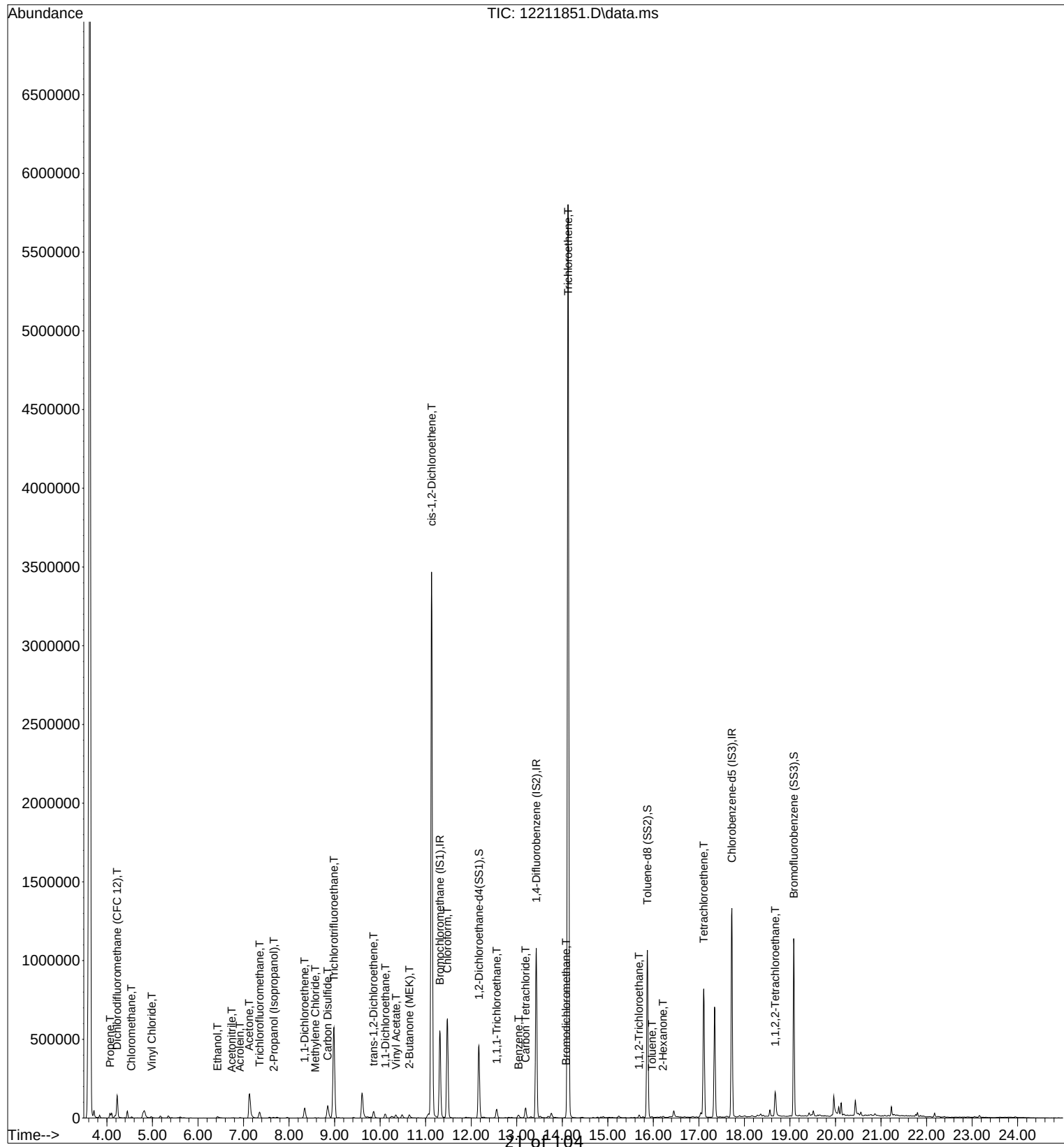
Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:23:27 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



21-01-104

Data File: I:\MS16\DATA\2018 12\21\12211851.D

Acq On : 22 Dec 2018 9:57

Operator: LH

Sample : P1806708-001 (1000mL)

Misc : S31-09141801

ALS Vial : 4 Sample Multiplier: 1

Quant Time: Dec 22 12:23:27 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:23:27 2018

Response via : Initial Calibration

LH 12/22/18

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.31	130	254175	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.43	114	1059843	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.72	82	466456	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.17	65	379206	12.402	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.20%
57) Toluene-d8 (SS2)	15.87	98	858965	11.564	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	92.48%
73) Bromofluorobenzene (SS3)	19.09	174	365888	10.836	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	86.72%

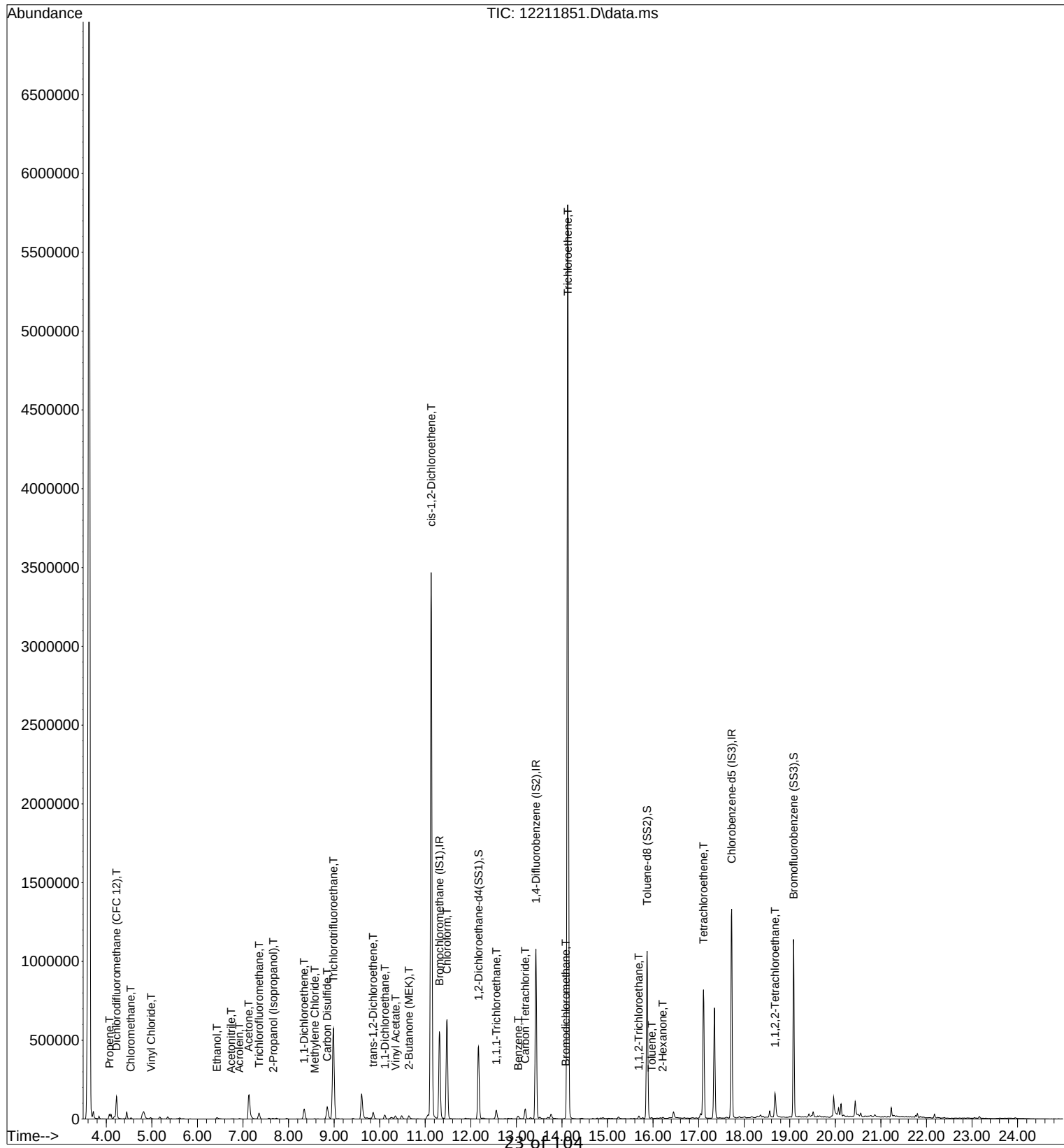
Target Compounds

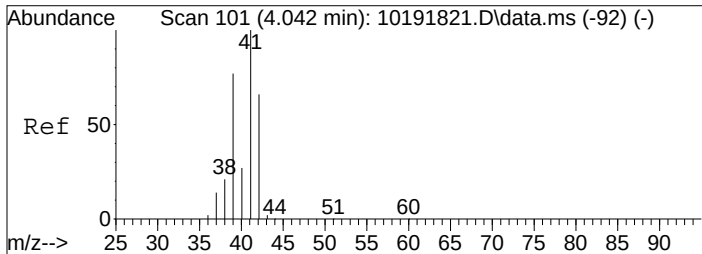
						Qvalue
2) Propene	4.07	42	4457	0.188	ng	90
3) Dichlorodifluoromethan...	4.22	85	144529	2.720	ng	99
4) Chloromethane	4.54	50	2706	0.080	ng	87
6) Vinyl Chloride	4.98	62	6353	0.172	ng	95
10) Ethanol	6.43	45	21424	1.499	ng	98
11) Acetonitrile	6.74	41	3095	0.083	ng	# 45
12) Acrolein	6.92	56	4809	0.381	ng	96
13) Acetone	7.12	58	50305m	2.949	ng	
14) Trichlorofluoromethane	7.35	101	42893	0.932	ng	100
15) 2-Propanol (Isopropanol)	7.67	45	7074	0.129	ng	58
17) 1,1-Dichloroethene	8.34	96	35138	1.500	ng	94
19) Methylene Chloride	8.58	84	1568	0.066	ng	98
21) Trichlorotrifluoroethane	8.99	151	275657	11.255	ng	95
22) Carbon Disulfide	8.85	76	159133	1.871	ng	100
23) trans-1,2-Dichloroethene	9.85	61	30567	0.953	ng	94
24) 1,1-Dichloroethane	10.11	63	31559	0.791	ng	99
26) Vinyl Acetate	10.35	86	5416	0.906	ng	# 48
27) 2-Butanone (MEK)	10.64	72	9065	0.601	ng	93
28) cis-1,2-Dichloroethene	11.13	61	2327908	73.838	ng	95
32) Chloroform	11.48	83	581974	13.579	ng	99
38) 1,1,1-Trichloroethane	12.56	97	36661	0.920	ng	98
41) Benzene	13.04	78	9709	0.100	ng	100
42) Carbon Tetrachloride	13.19	117	45084	1.221	ng	99
46) Bromodichloromethane	14.08	83	3330m	0.098	ng	
47) Trichloroethene	14.13	130	2230155	77.867	ng	99
55) 1,1,2-Trichloroethane	15.68	97	3434	0.146	ng	92
58) Toluene	15.97	91	5646	0.055	ng	88
59) 2-Hexanone	16.21	43	4553	0.096	ng	92
64) Tetrachloroethene	17.11	166	296395	9.338	ng	99
72) 1,1,2,2-Tetrachloroethane	18.68	83	77482	1.818	ng	97

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

Operator: LH

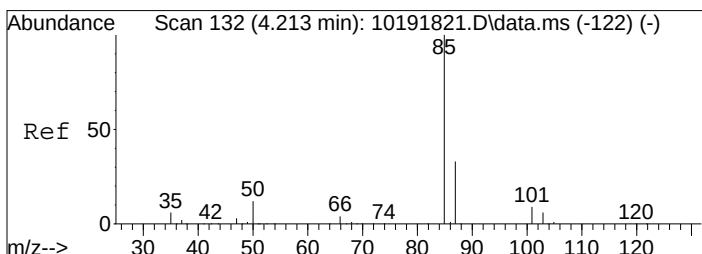
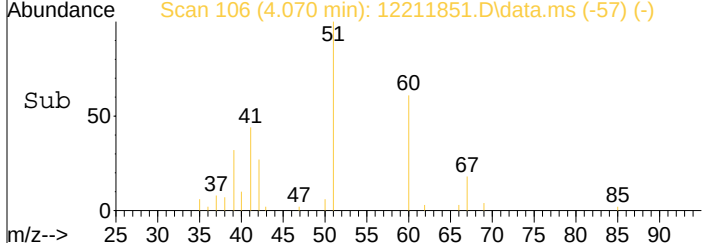
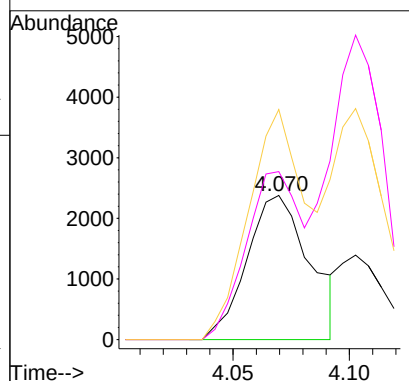
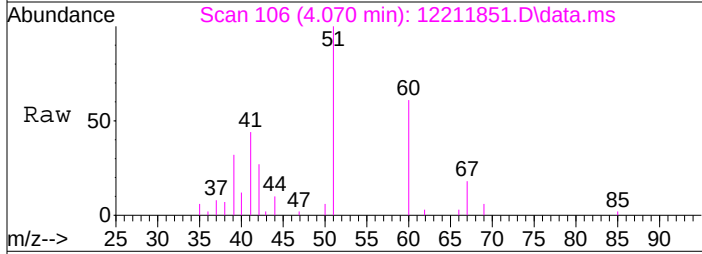
DataAcq Meth:T015.M





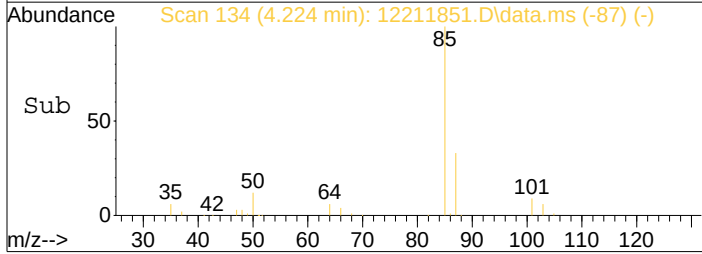
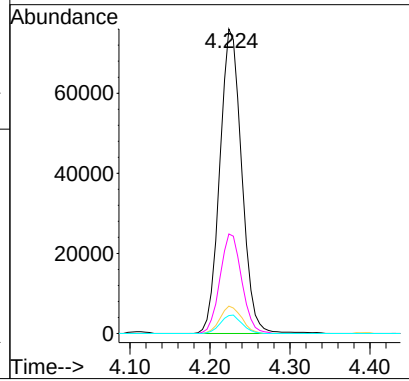
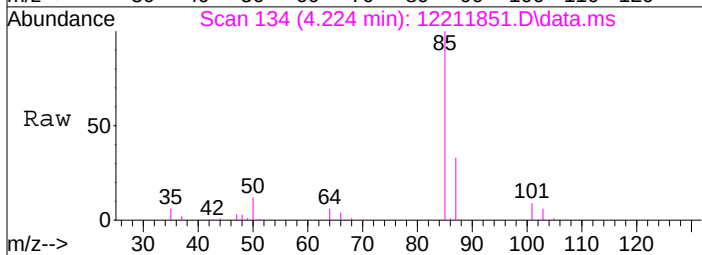
#2
 Propene
 Concen: 0.19 ng
 RT: 4.07 min Scan# 106
 Delta R.T. 0.022 min
 Lab File: 12211851.D
 Acq: 22 Dec 2018 9:57

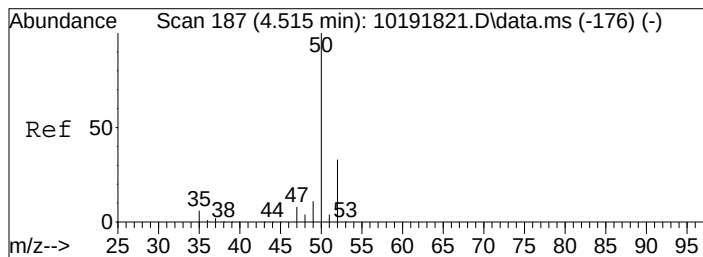
Tgt Ion:	42	Resp:	4457
Ion Ratio	Lower	Upper	
42	100		
39	101.3	98.5	138.5
41	144.5	131.9	171.9



#3
 Dichlorodifluoromethane (CFC 12)
 Concen: 2.72 ng
 RT: 4.22 min Scan# 134
 Delta R.T. 0.011 min
 Lab File: 12211851.D
 Acq: 22 Dec 2018 9:57

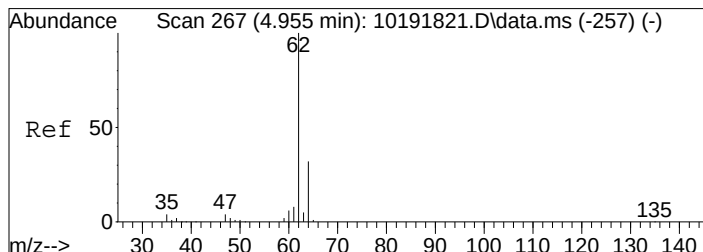
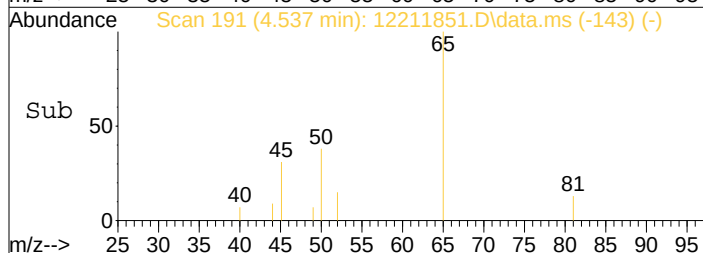
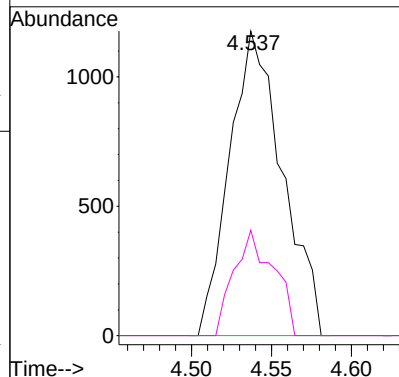
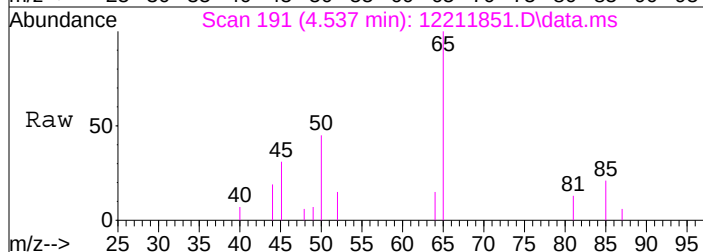
Tgt Ion:	85	Resp:	144529
Ion Ratio	Lower	Upper	
85	100		
87	32.4	12.6	52.6
101	8.8	0.0	29.4
103	5.9	0.0	26.0





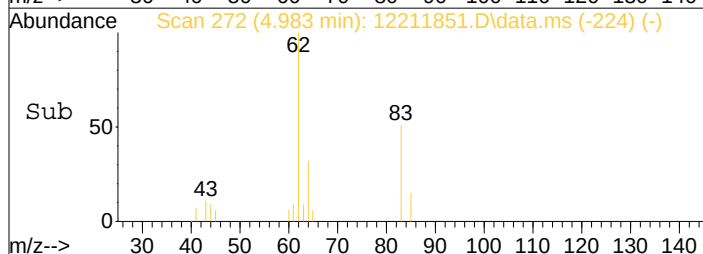
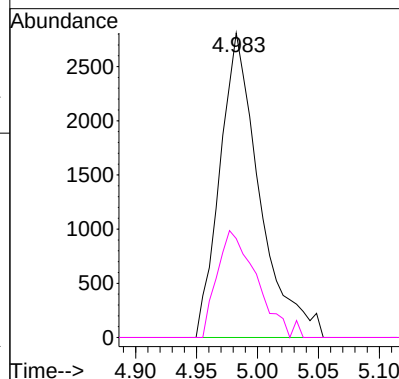
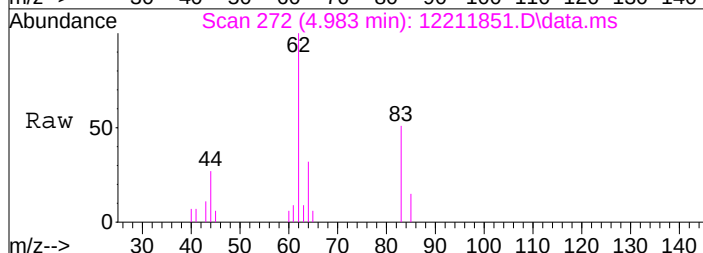
#4
Chloromethane
Concen: 0.08 ng
RT: 4.54 min Scan# 191
Delta R.T. 0.016 min
Lab File: 12211851.D
Acq: 22 Dec 2018 9:57

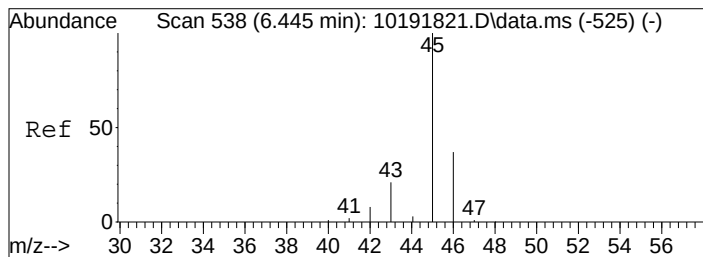
Tgt Ion: 50 Resp: 2706
Ion Ratio Lower Upper
50 100
52 26.1 13.2 53.2



#6
Vinyl Chloride
Concen: 0.17 ng
RT: 4.98 min Scan# 272
Delta R.T. 0.016 min
Lab File: 12211851.D
Acq: 22 Dec 2018 9:57

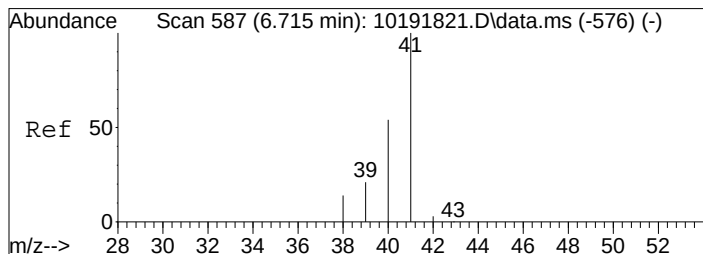
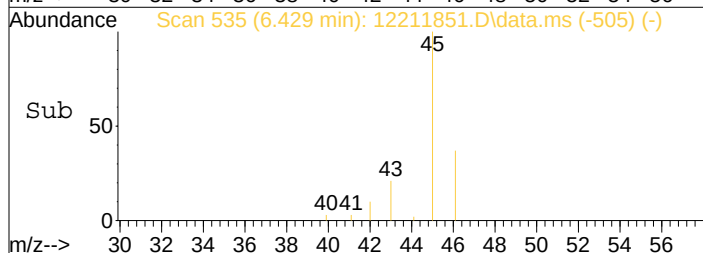
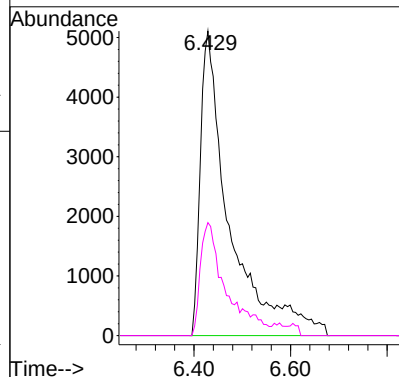
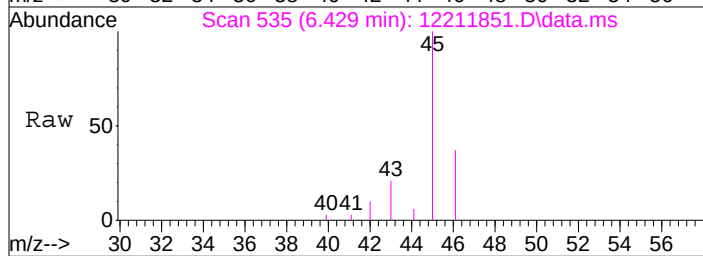
Tgt Ion: 62 Resp: 6353
Ion Ratio Lower Upper
62 100
64 35.2 12.2 52.2





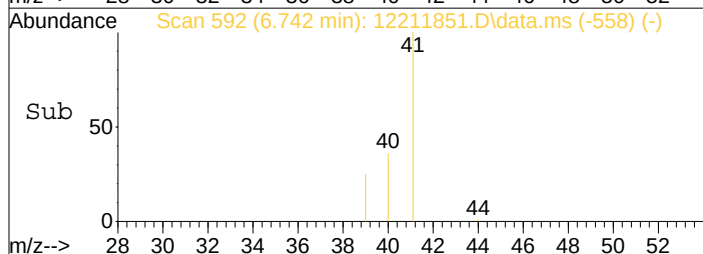
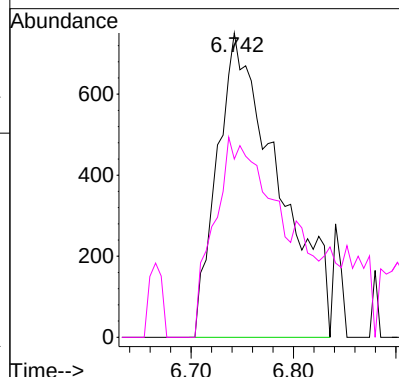
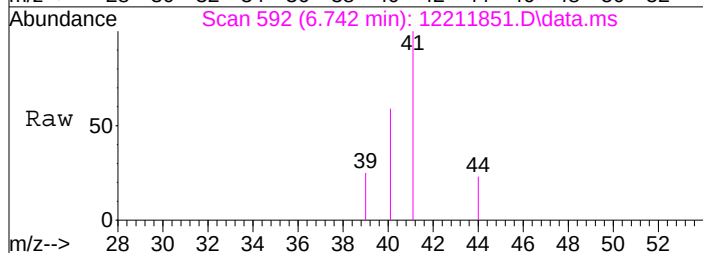
#10
Ethanol
Concen: 1.50 ng
RT: 6.43 min Scan# 535
Delta R.T. -0.083 min
Lab File: 12211851.D
Acq: 22 Dec 2018 9:57

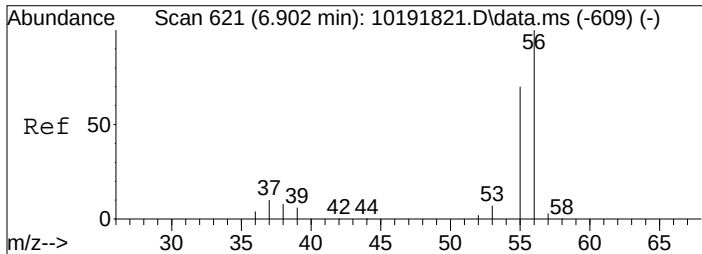
Tgt Ion: 45 Resp: 21424
Ion Ratio Lower Upper
45 100
46 35.6 16.6 56.6



#11
Acetonitrile
Concen: 0.08 ng
RT: 6.74 min Scan# 592
Delta R.T. -0.011 min
Lab File: 12211851.D
Acq: 22 Dec 2018 9:57

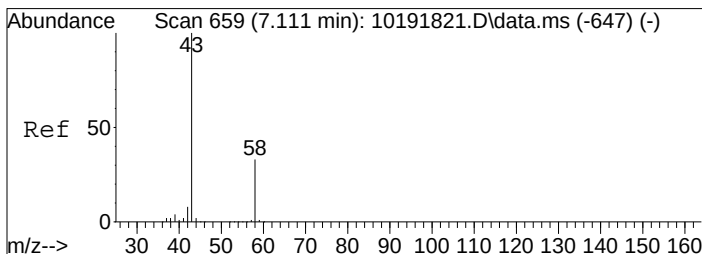
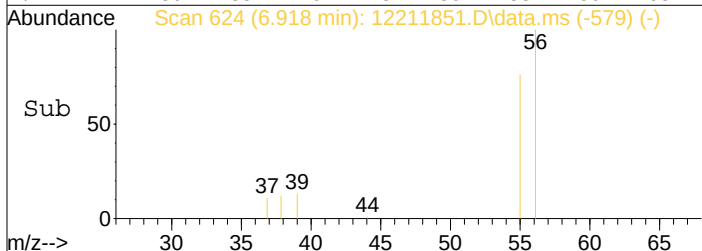
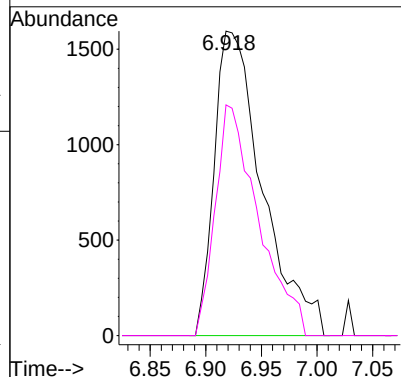
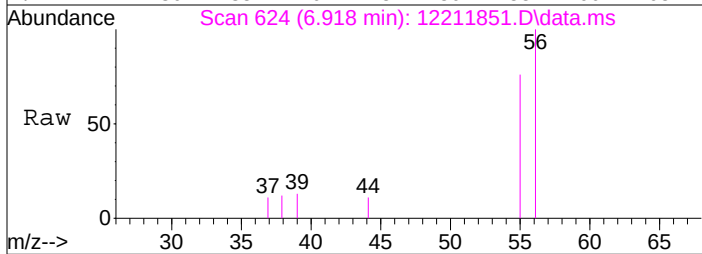
Tgt Ion: 41 Resp: 3095
Ion Ratio Lower Upper
41 100
40 93.8 34.2 74.2#





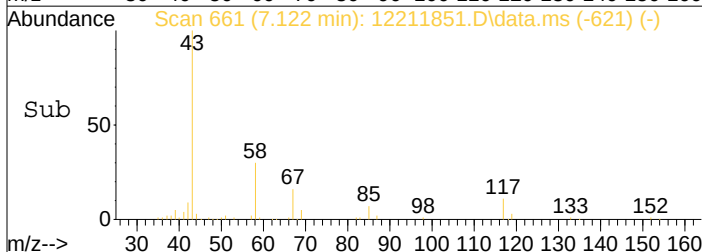
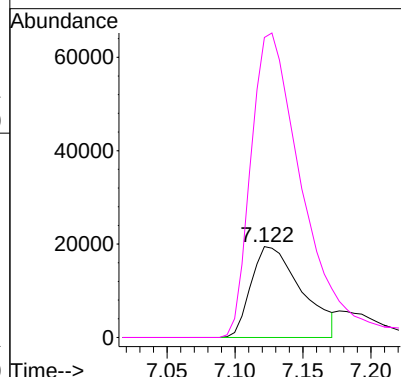
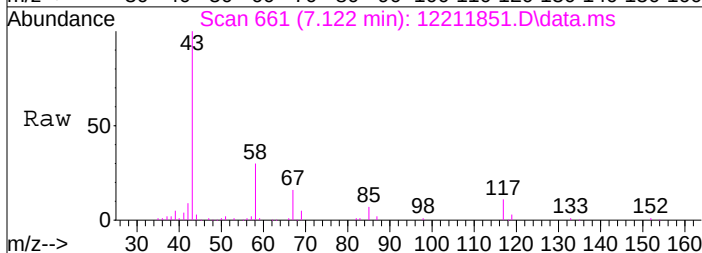
#12
Acrolein
Concen: 0.38 ng
RT: 6.92 min Scan# 624
Delta R.T. -0.000 min
Lab File: 12211851.D
Acq: 22 Dec 2018 9:57

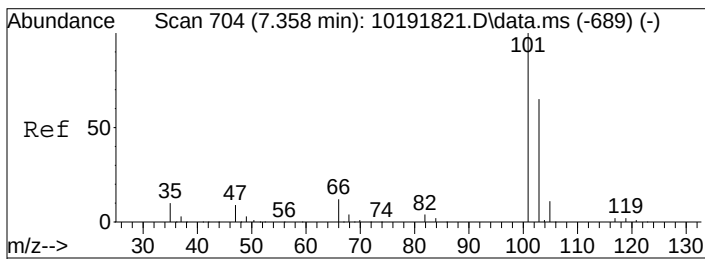
Tgt Ion: 56 Resp: 4809
Ion Ratio Lower Upper
56 100
55 67.8 51.0 91.0



#13
Acetone
Concen: 2.95 ng m
RT: 7.12 min Scan# 661
Delta R.T. -0.028 min
Lab File: 12211851.D
Acq: 22 Dec 2018 9:57

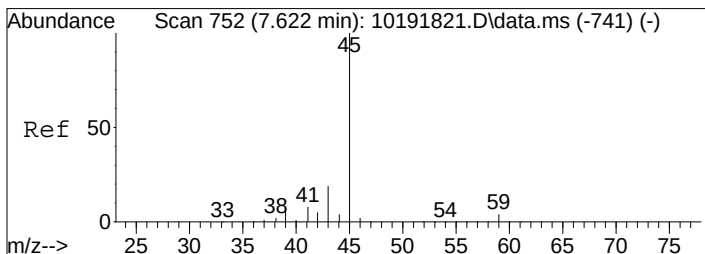
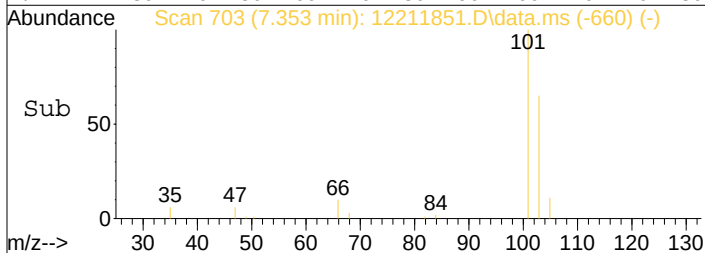
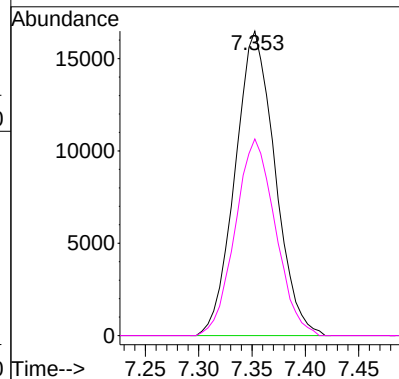
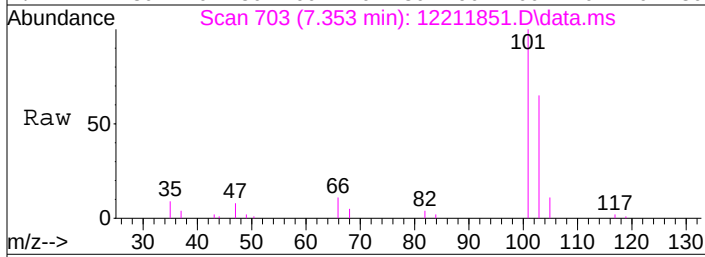
Tgt Ion: 58 Resp: 50305
Ion Ratio Lower Upper
58 100
43 357.7 283.4 343.4#





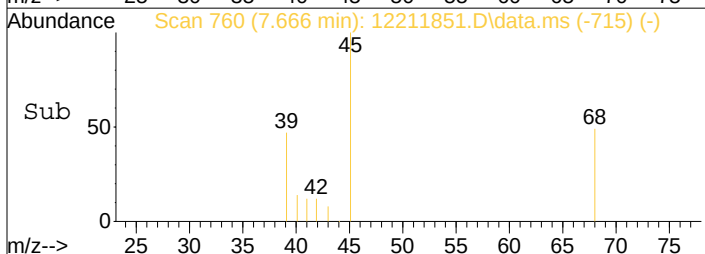
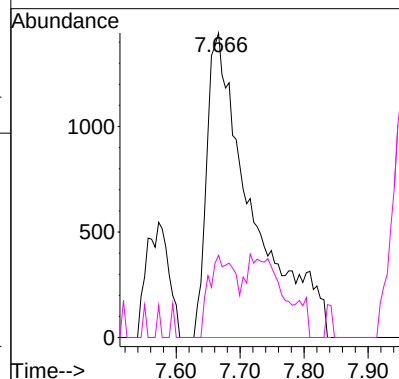
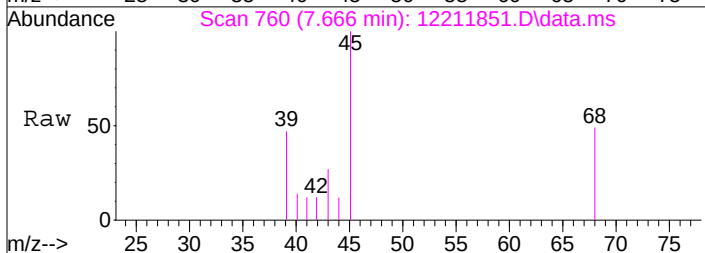
#14
 Trichlorofluoromethane
 Concen: 0.93 ng
 RT: 7.35 min Scan# 703
 Delta R.T. -0.011 min
 Lab File: 12211851.D
 Acq: 22 Dec 2018 9:57

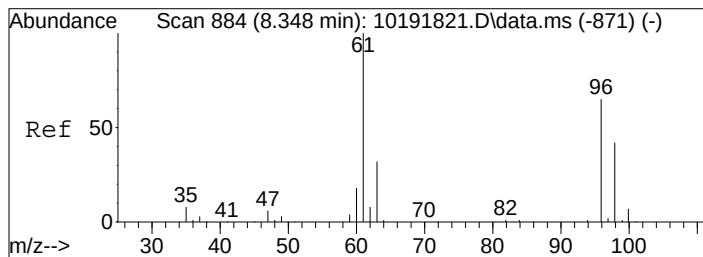
Tgt Ion: 101 Resp: 42893
 Ion Ratio Lower Upper
 101 100
 103 65.2 44.8 84.8



#15
 2-Propanol (Isopropanol)
 Concen: 0.13 ng
 RT: 7.67 min Scan# 760
 Delta R.T. -0.000 min
 Lab File: 12211851.D
 Acq: 22 Dec 2018 9:57

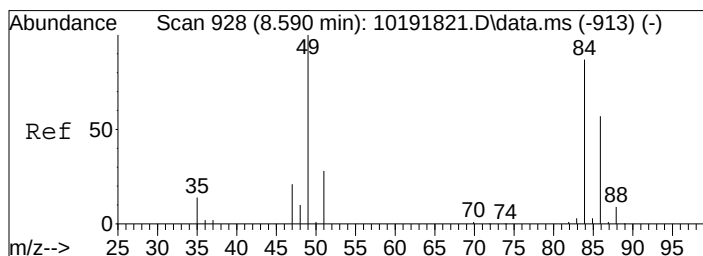
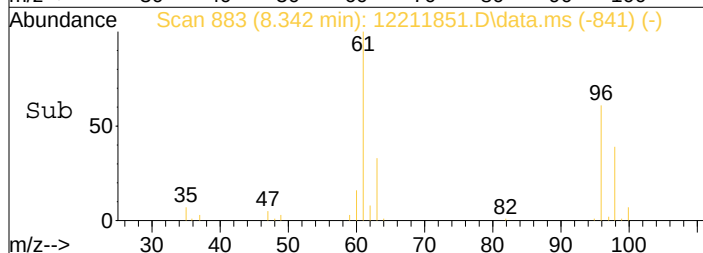
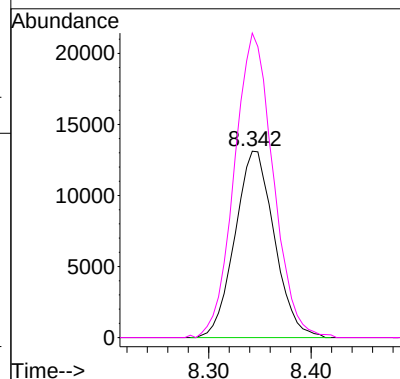
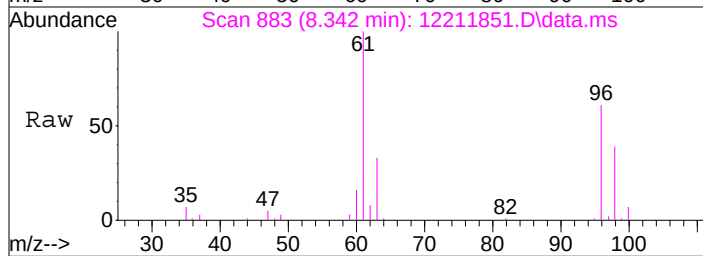
Tgt Ion: 45 Resp: 7074
 Ion Ratio Lower Upper
 45 100
 43 38.9 0.0 39.6





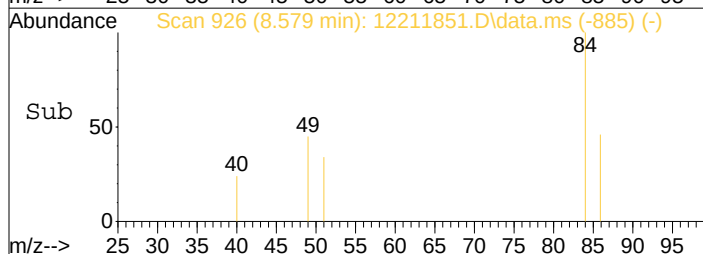
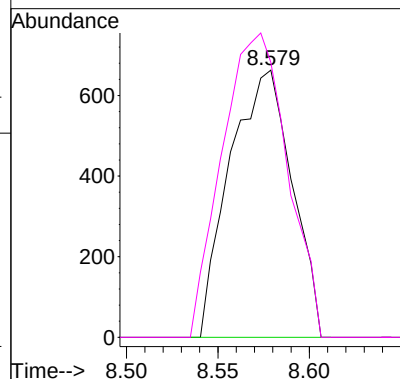
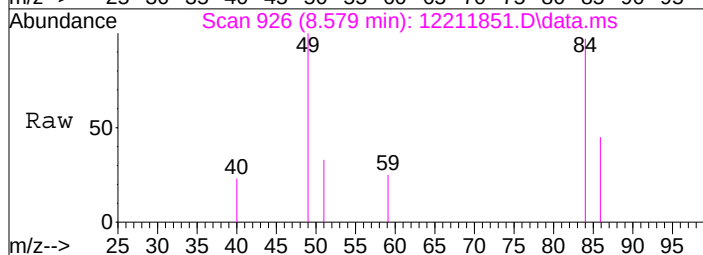
#17
1,1-Dichloroethene
Concen: 1.50 ng
RT: 8.34 min Scan# 883
Delta R.T. -0.017 min
Lab File: 12211851.D
Acq: 22 Dec 2018 9:57

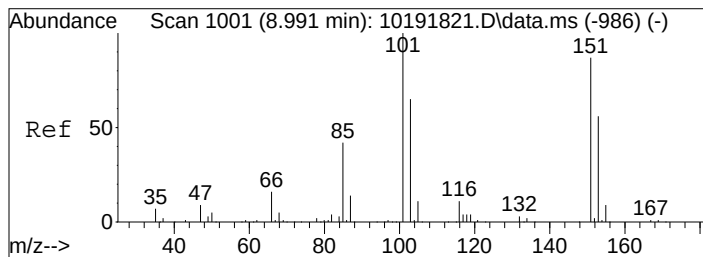
Tgt Ion: 96 Resp: 35138
Ion Ratio Lower Upper
96 100
61 161.1 132.8 172.8



#19
Methylene Chloride
Concen: 0.07 ng
RT: 8.58 min Scan# 926
Delta R.T. -0.022 min
Lab File: 12211851.D
Acq: 22 Dec 2018 9:57

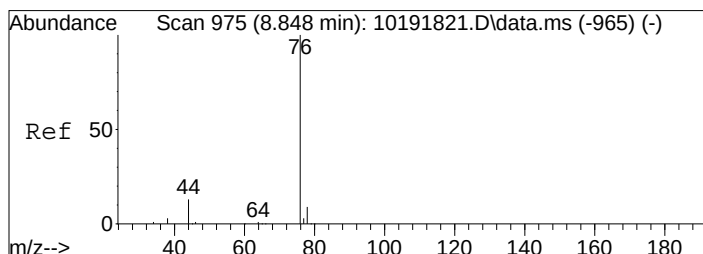
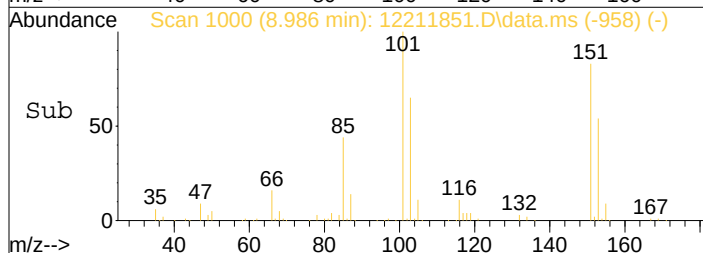
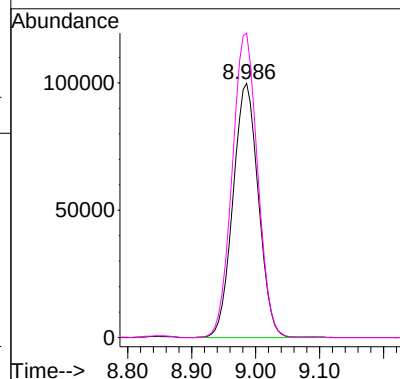
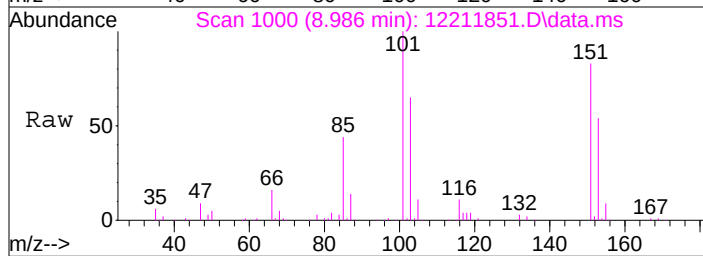
Tgt Ion: 84 Resp: 1568
Ion Ratio Lower Upper
84 100
49 119.7 92.1 142.1





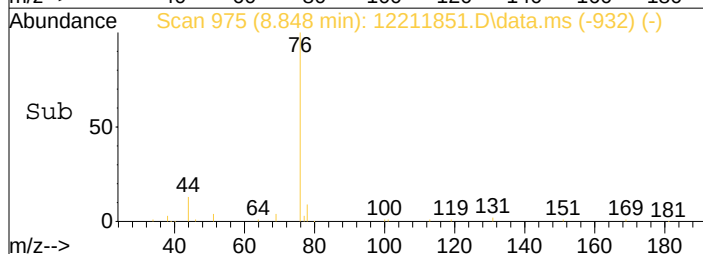
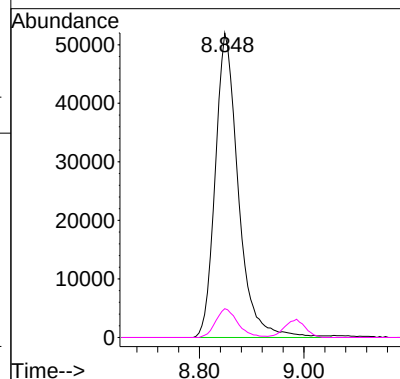
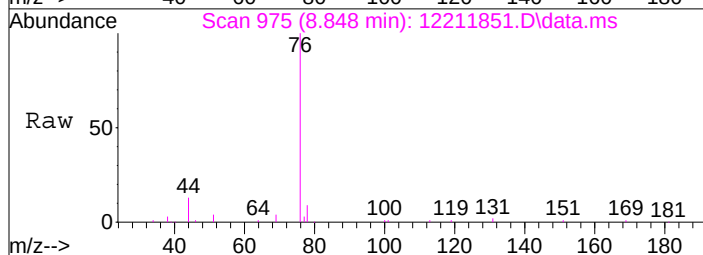
#21
Trichlorotrifluoroethane
Concen: 11.25 ng
RT: 8.99 min Scan# 1000
Delta R.T. -0.017 min
Lab File: 12211851.D
Acq: 22 Dec 2018 9:57

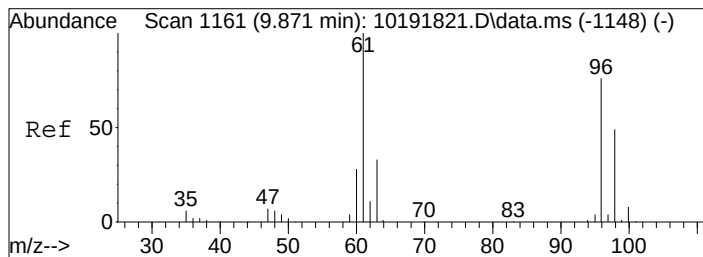
Tgt Ion: 151 Resp: 275657
Ion Ratio Lower Upper
151 100
101 120.1 94.4 134.4



#22
Carbon Disulfide
Concen: 1.87 ng
RT: 8.85 min Scan# 975
Delta R.T. -0.011 min
Lab File: 12211851.D
Acq: 22 Dec 2018 9:57

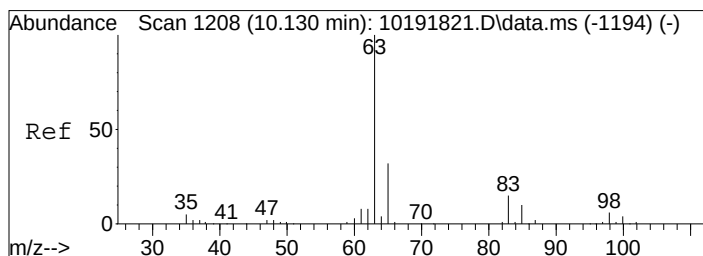
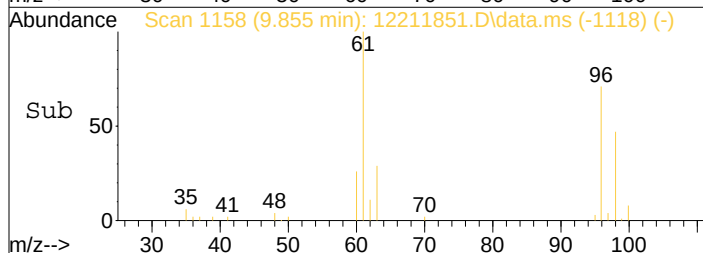
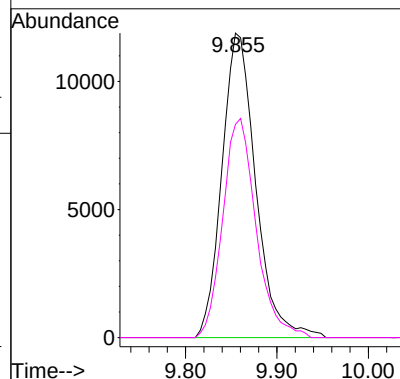
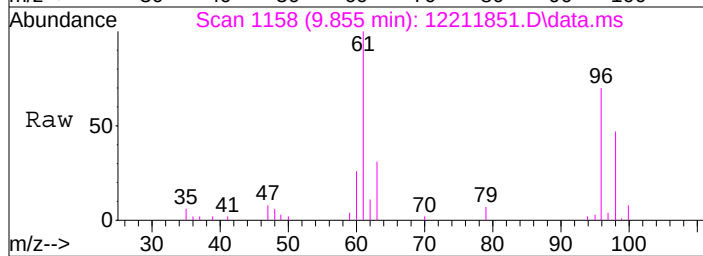
Tgt Ion: 76 Resp: 159133
Ion Ratio Lower Upper
76 100
78 9.1 0.0 29.3





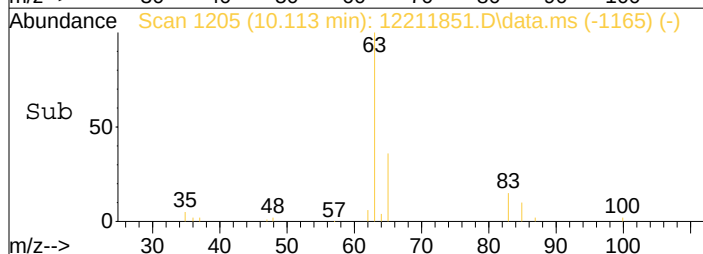
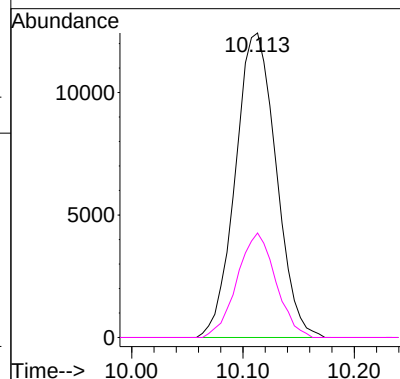
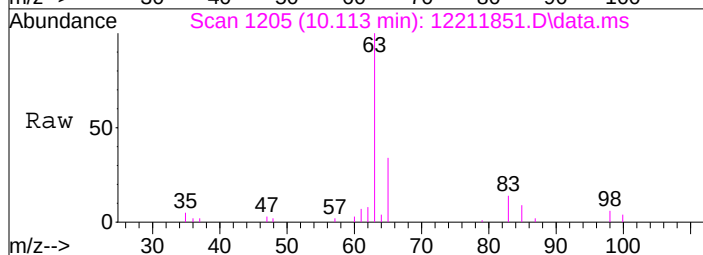
#23
trans-1,2-Dichloroethene
Concen: 0.95 ng
RT: 9.85 min Scan# 1158
Delta R.T. -0.028 min
Lab File: 12211851.D
Acq: 22 Dec 2018 9:57

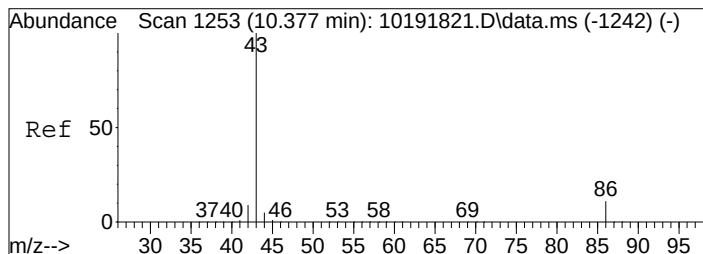
Tgt Ion: 61 Resp: 30567
Ion Ratio Lower Upper
61 100
96 71.0 56.4 96.4



#24
1,1-Dichloroethane
Concen: 0.79 ng
RT: 10.11 min Scan# 1205
Delta R.T. -0.028 min
Lab File: 12211851.D
Acq: 22 Dec 2018 9:57

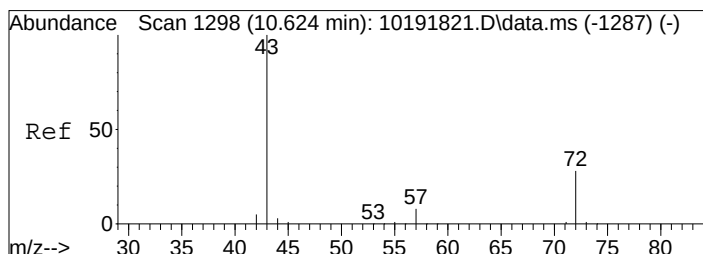
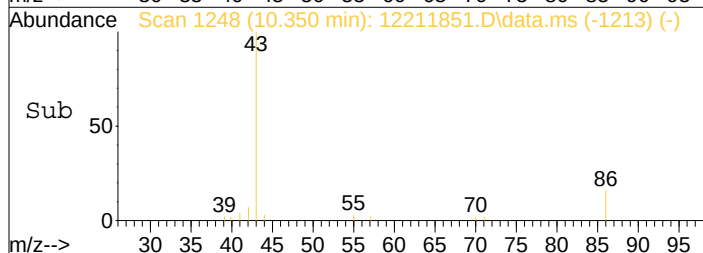
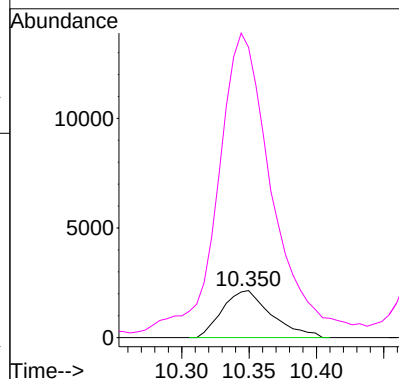
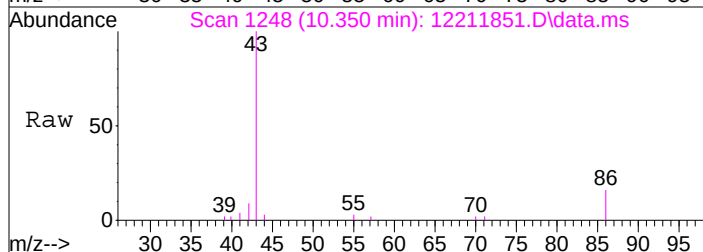
Tgt Ion: 63 Resp: 31559
Ion Ratio Lower Upper
63 100
65 32.6 12.2 52.2





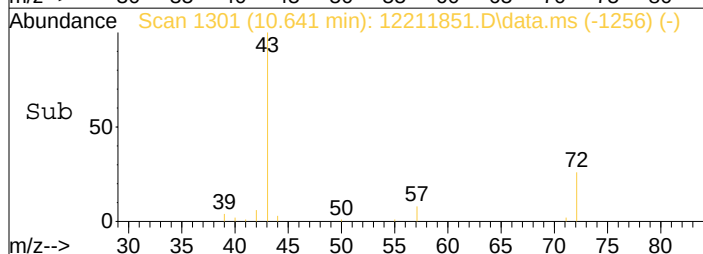
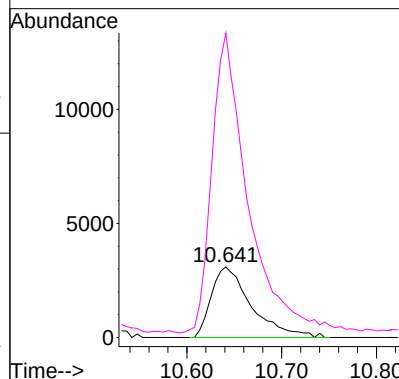
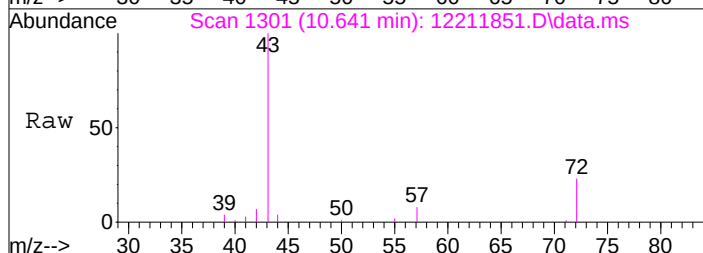
#26
Vinyl Acetate
Concen: 0.91 ng
RT: 10.35 min Scan# 1248
Delta R.T. -0.055 min
Lab File: 12211851.D
Acq: 22 Dec 2018 9:57

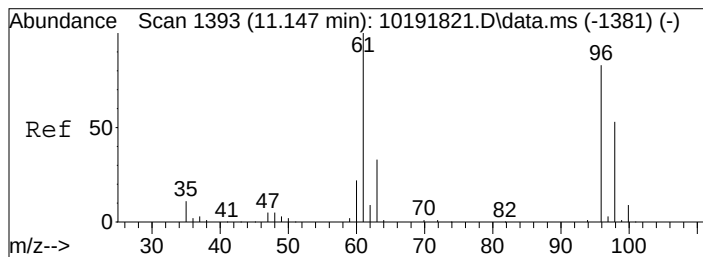
Tgt Ion:	86	Resp:	5416
Ion Ratio	Lower	Upper	
86	100		
43	725.1	927.6	967.6#



#27
2-Butanone (MEK)
Concen: 0.60 ng
RT: 10.64 min Scan# 1301
Delta R.T. -0.000 min
Lab File: 12211851.D
Acq: 22 Dec 2018 9:57

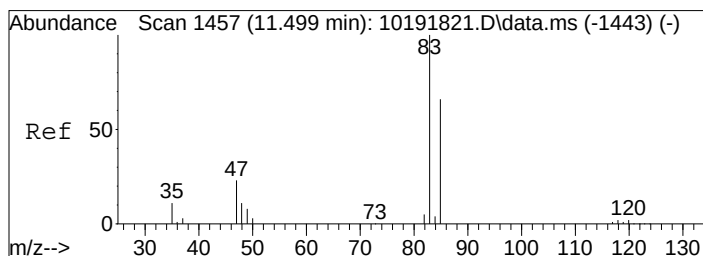
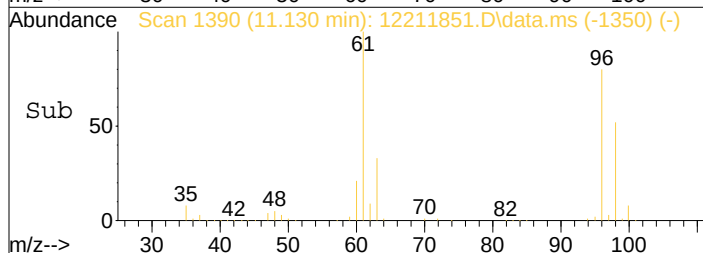
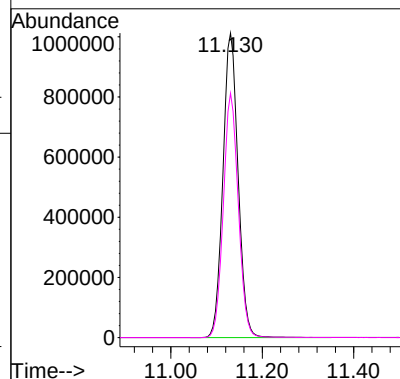
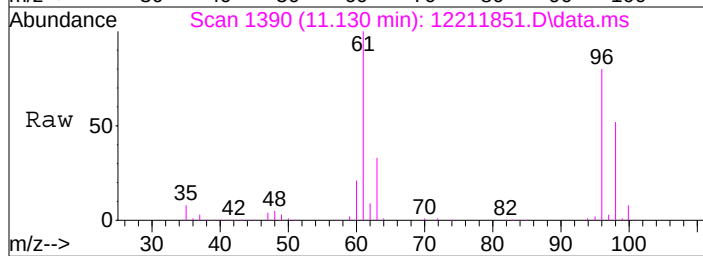
Tgt Ion:	72	Resp:	9065
Ion Ratio	Lower	Upper	
72	100		
43	386.5	350.1	390.1





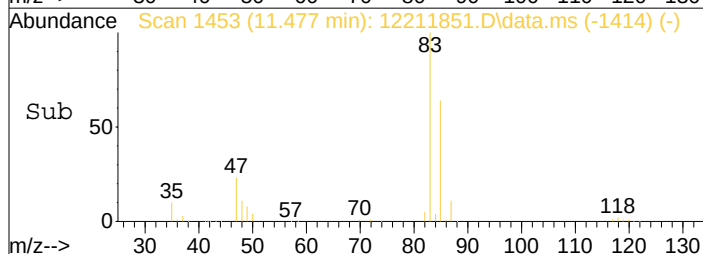
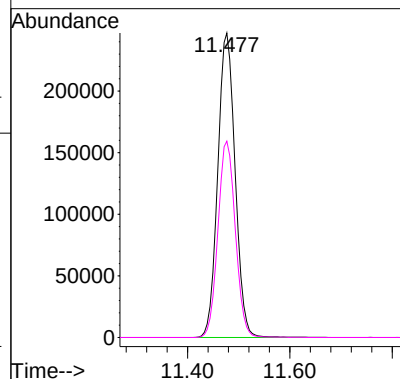
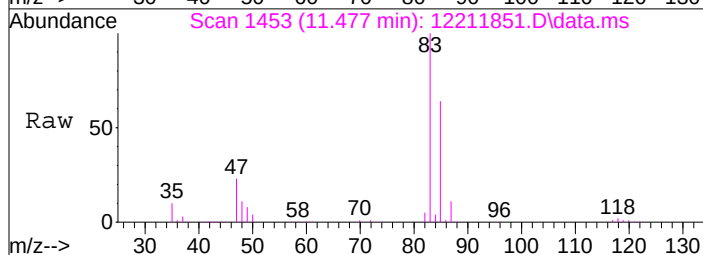
#28
 cis-1,2-Dichloroethene
 Concen: 73.84 ng
 RT: 11.13 min Scan# 1390
 Delta R.T. -0.028 min
 Lab File: 12211851.D
 Acq: 22 Dec 2018 9:57

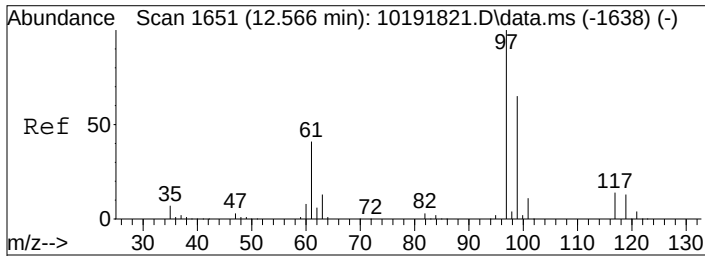
Tgt Ion: 61 Resp: 2327908
 Ion Ratio Lower Upper
 61 100
 96 79.4 64.1 104.1



#32
 Chloroform
 Concen: 13.58 ng
 RT: 11.48 min Scan# 1453
 Delta R.T. -0.033 min
 Lab File: 12211851.D
 Acq: 22 Dec 2018 9:57

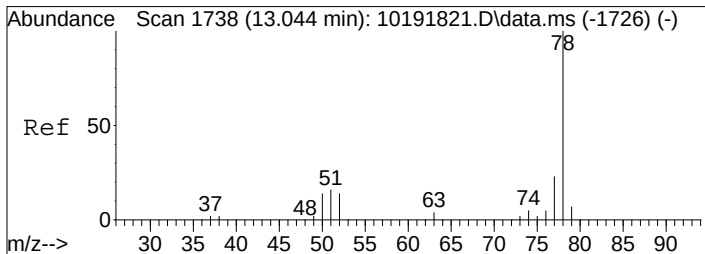
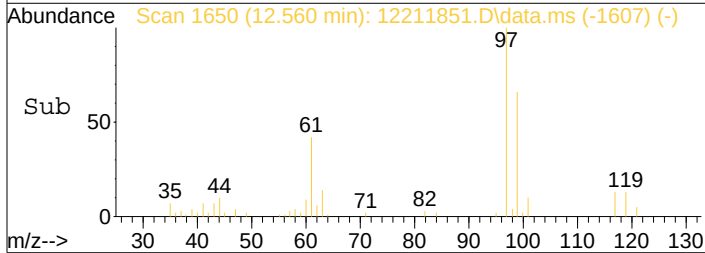
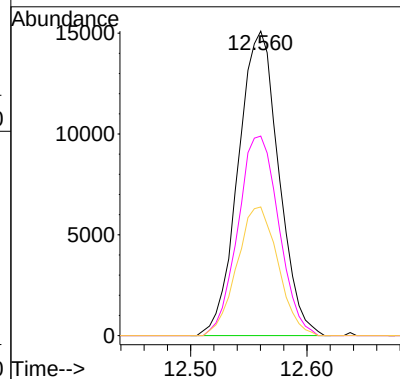
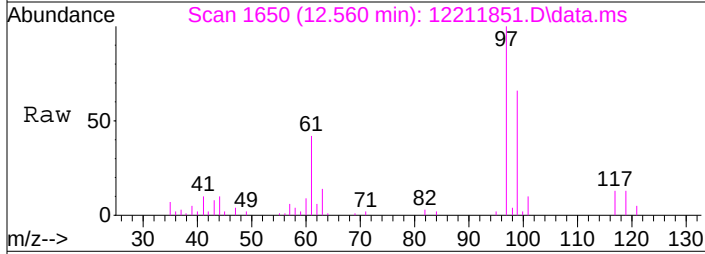
Tgt Ion: 83 Resp: 581974
 Ion Ratio Lower Upper
 83 100
 85 64.7 45.5 85.5





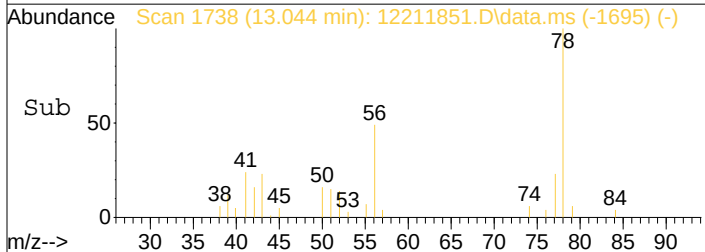
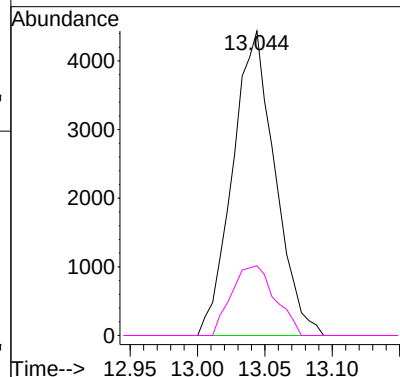
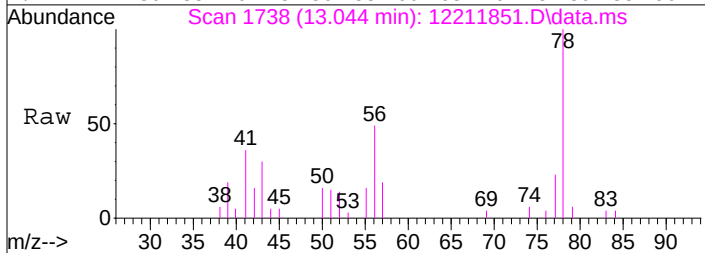
#38
1,1,1-Trichloroethane
Concen: 0.92 ng
RT: 12.56 min Scan# 1650
Delta R.T. -0.011 min
Lab File: 12211851.D
Acq: 22 Dec 2018 9:57

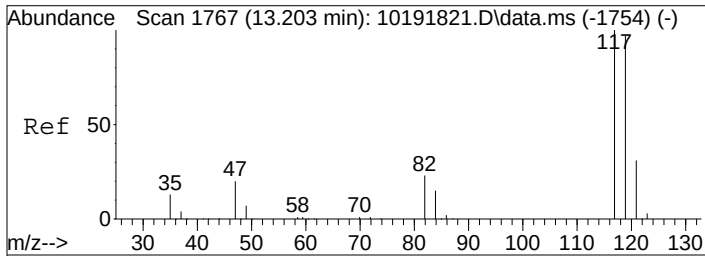
Tgt Ion	Ratio	Lower	Upper
97	100		
99	66.0	44.9	84.9
61	42.7	21.3	61.3



#41
Benzene
Concen: 0.10 ng
RT: 13.04 min Scan# 1738
Delta R.T. -0.011 min
Lab File: 12211851.D
Acq: 22 Dec 2018 9:57

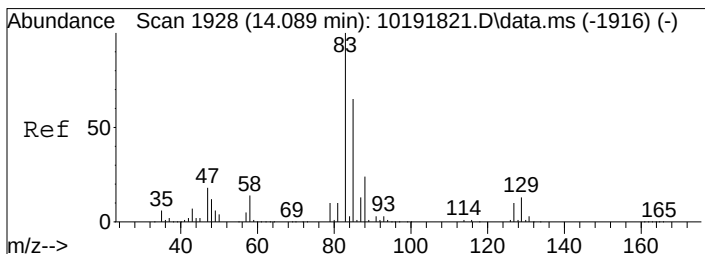
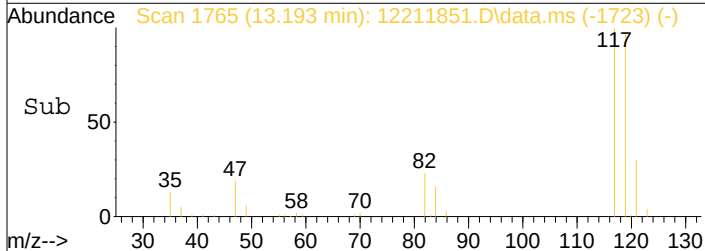
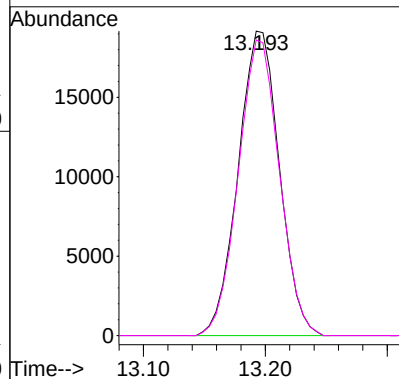
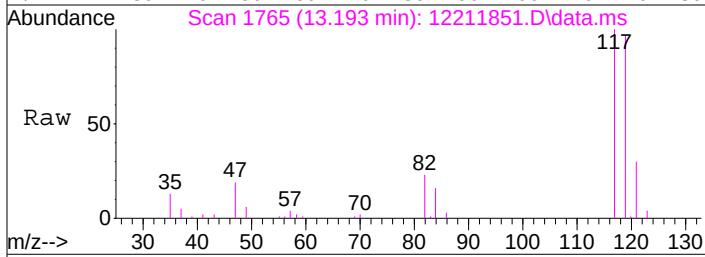
Tgt Ion	Ratio	Lower	Upper
78	100		
77	23.6	3.5	43.5





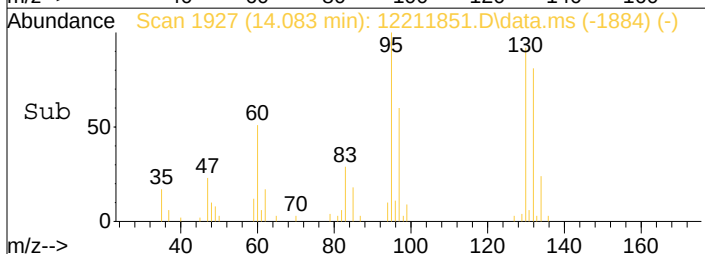
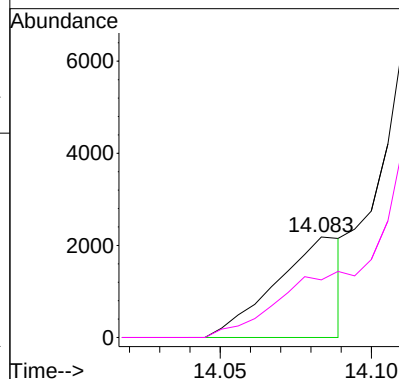
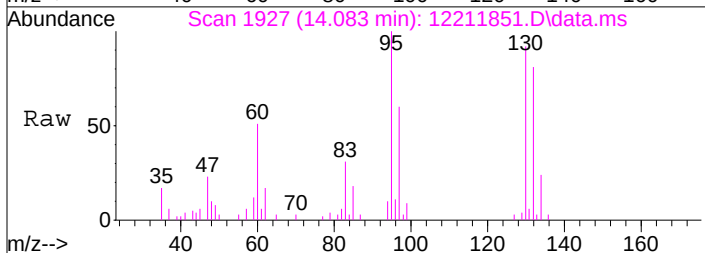
#42
Carbon Tetrachloride
Concen: 1.22 ng
RT: 13.19 min Scan# 1765
Delta R.T. -0.017 min
Lab File: 12211851.D
Acq: 22 Dec 2018 9:57

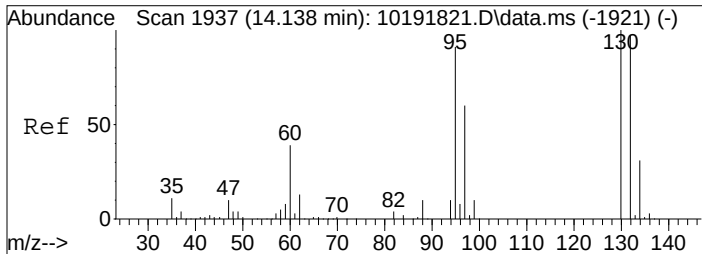
Tgt Ion: 117 Resp: 45084
Ion Ratio Lower Upper
117 100
119 96.6 76.0 116.0



#46
Bromodichloromethane
Concen: 0.10 ng m
RT: 14.08 min Scan# 1927
Delta R.T. -0.011 min
Lab File: 12211851.D
Acq: 22 Dec 2018 9:57

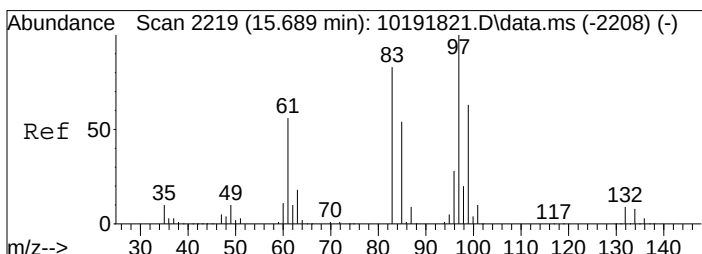
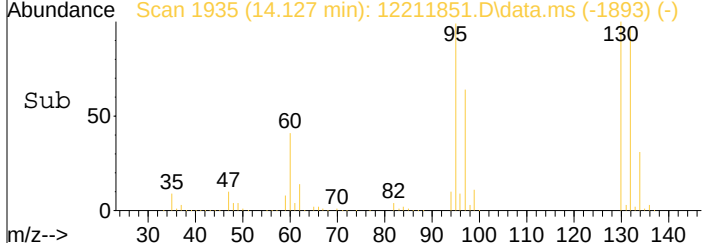
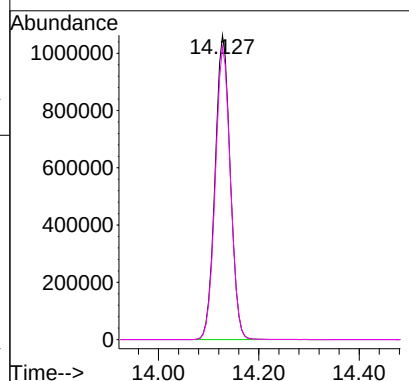
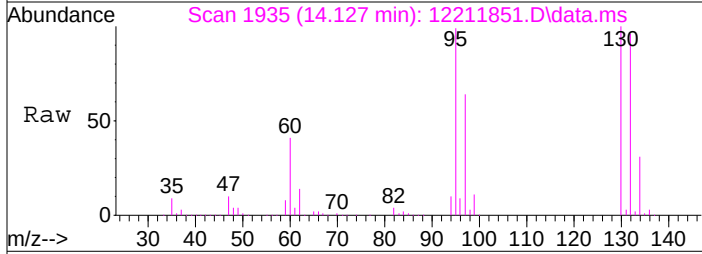
Tgt Ion: 83 Resp: 3330
Ion Ratio Lower Upper
83 100
85 595.5 45.0 85.0#





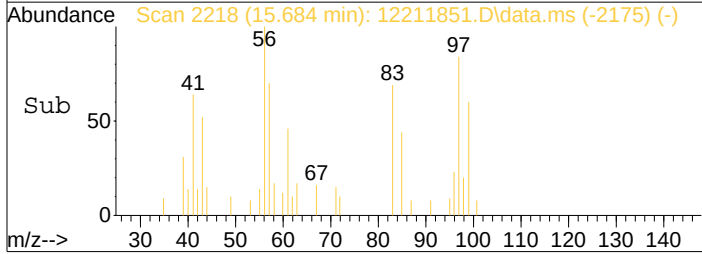
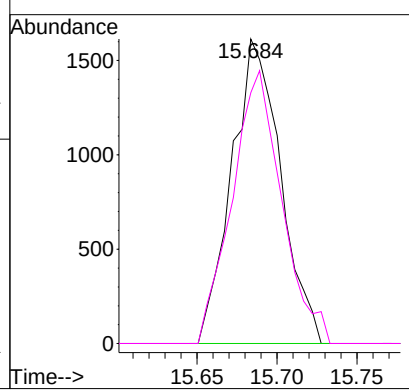
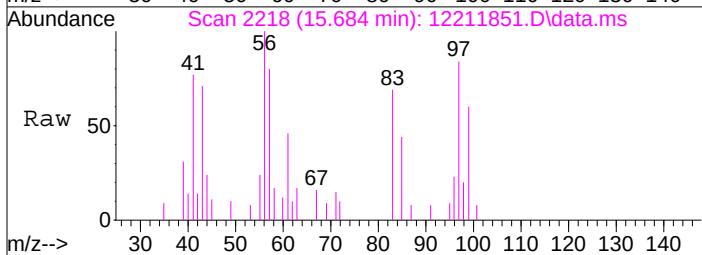
#47
 Trichloroethene
 Concen: 77.87 ng
 RT: 14.13 min Scan# 1935
 Delta R.T. -0.017 min
 Lab File: 12211851.D
 Acq: 22 Dec 2018 9:57

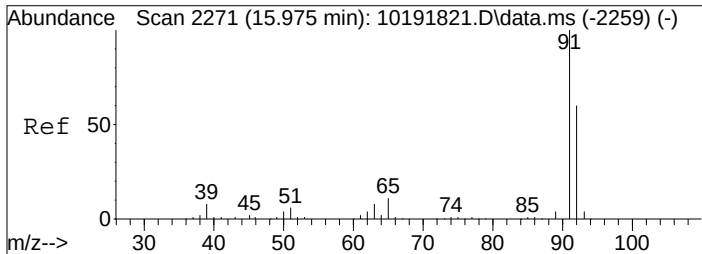
Tgt Ion:130	Resp: 2230155
Ion Ratio	Lower Upper
130	100
132	96.3 75.7 115.7



#55
 1,1,2-Trichloroethane
 Concen: 0.15 ng
 RT: 15.68 min Scan# 2218
 Delta R.T. -0.011 min
 Lab File: 12211851.D
 Acq: 22 Dec 2018 9:57

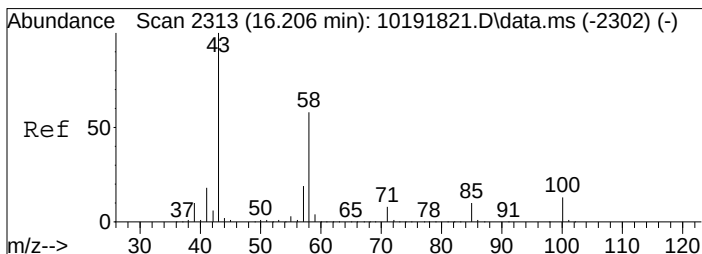
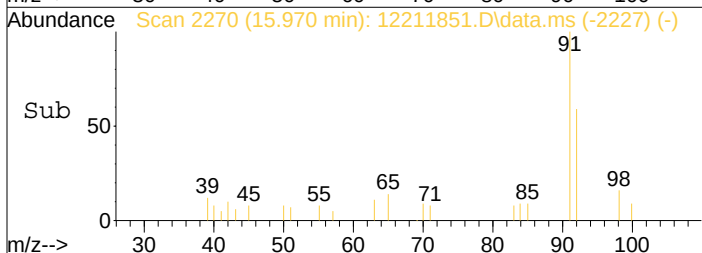
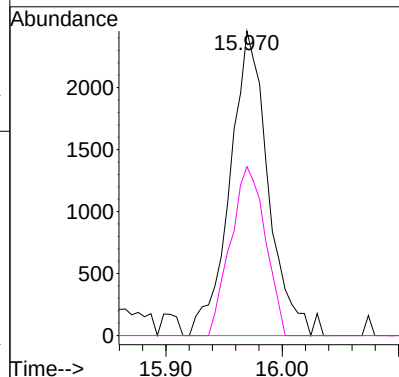
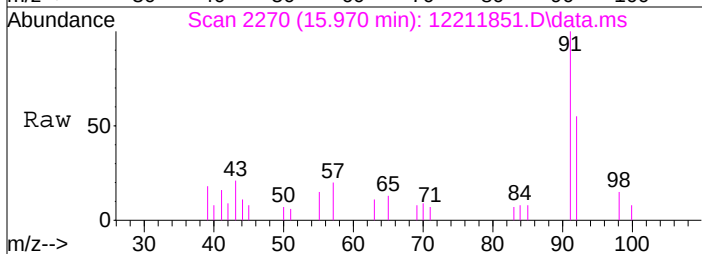
Tgt Ion: 97	Resp: 3434
Ion Ratio	Lower Upper
97	100
83	91.0 63.9 103.9





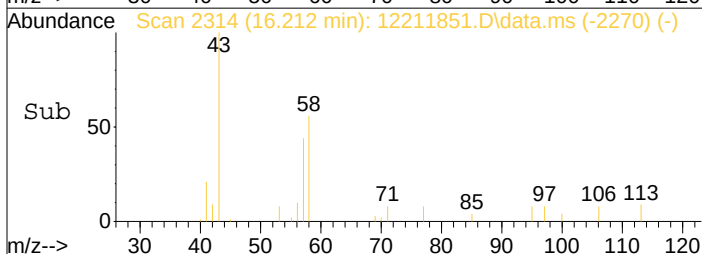
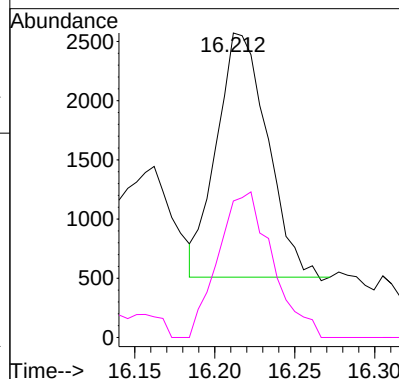
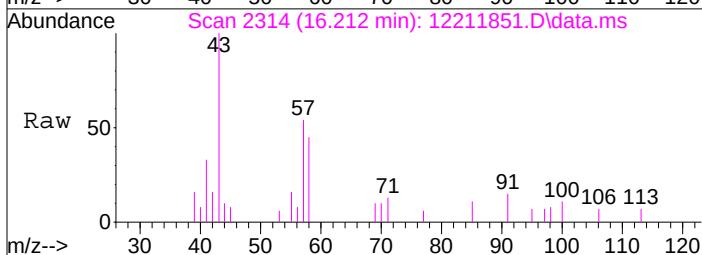
#58
Toluene
Concen: 0.05 ng
RT: 15.97 min Scan# 2270
Delta R.T. -0.011 min
Lab File: 12211851.D
Acq: 22 Dec 2018 9:57

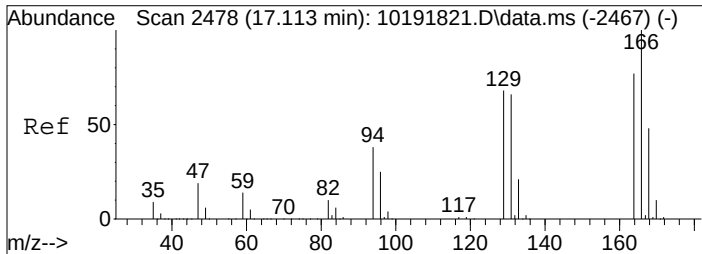
Tgt Ion: 91 Resp: 5646
Ion Ratio Lower Upper
91 100
92 50.2 39.4 79.4



#59
2-Hexanone
Concen: 0.10 ng
RT: 16.21 min Scan# 2314
Delta R.T. -0.006 min
Lab File: 12211851.D
Acq: 22 Dec 2018 9:57

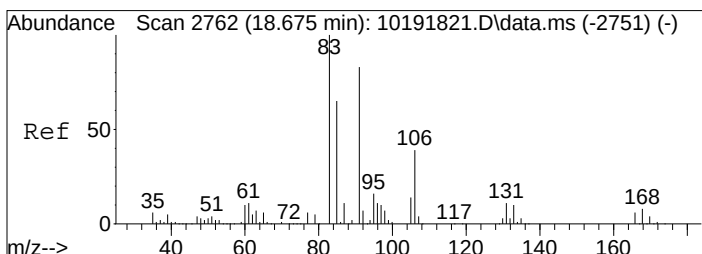
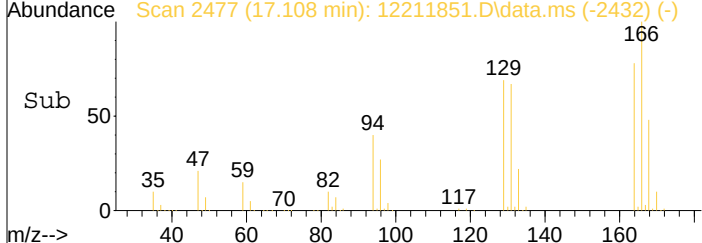
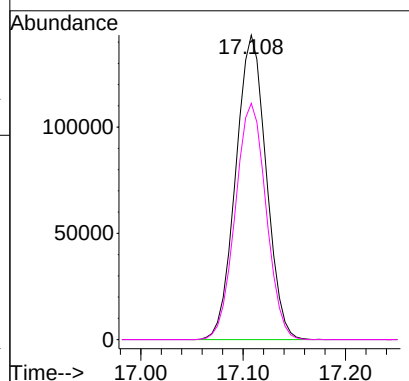
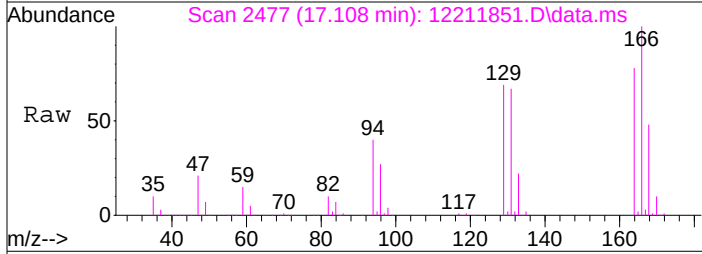
Tgt Ion: 43 Resp: 4553
Ion Ratio Lower Upper
43 100
58 63.5 37.4 77.4





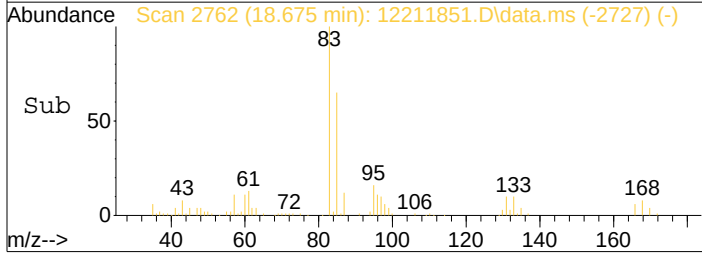
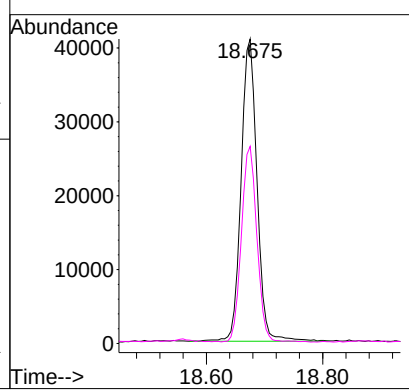
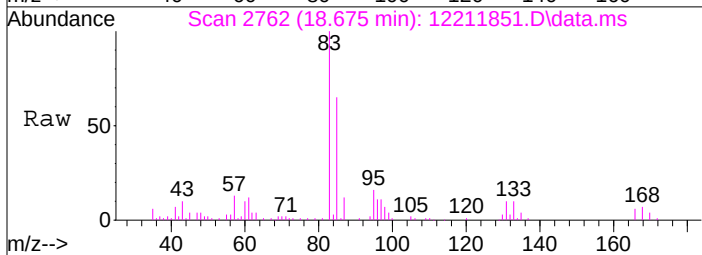
#64
Tetrachloroethene
Concen: 9.34 ng
RT: 17.11 min Scan# 2477
Delta R.T. -0.005 min
Lab File: 12211851.D
Acq: 22 Dec 2018 9:57

Tgt Ion:	166	Resp:	296395
Ion Ratio	Lower	Upper	
166	100		
164	78.4	57.8	97.8



#72
1,1,2,2-Tetrachloroethane
Concen: 1.82 ng
RT: 18.68 min Scan# 2762
Delta R.T. -0.006 min
Lab File: 12211851.D
Acq: 22 Dec 2018 9:57

Tgt Ion:	83	Resp:	77482
Ion Ratio	Lower	Upper	
83	100		
85	63.3	45.5	85.5



Data File: I:\MS16\DATA\2018 12\21\12211851.D

Acq On : 22 Dec 2018 9:57

Operator: LH

Sample : P1806708-001 (1000mL)

Misc : S31-09141801

ALS Vial : 4 Sample Multiplier: 1

Quant Time: Dec 22 12:21:00 2018

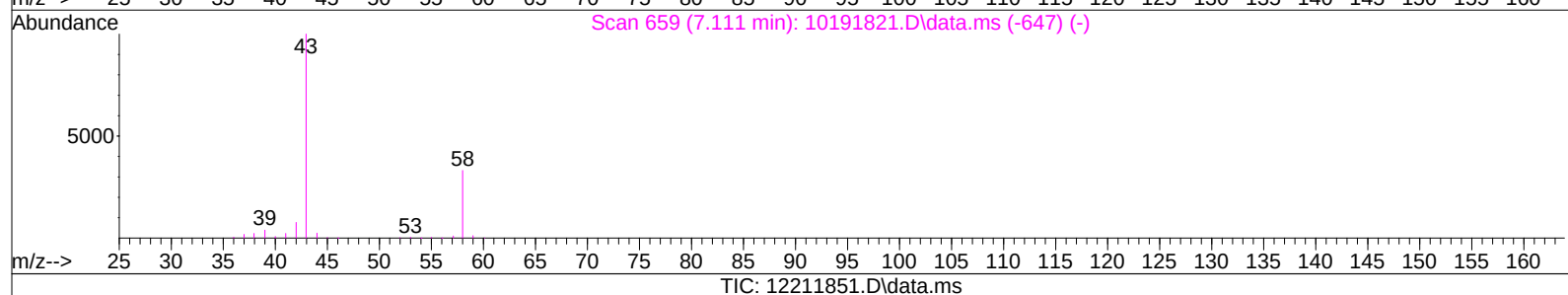
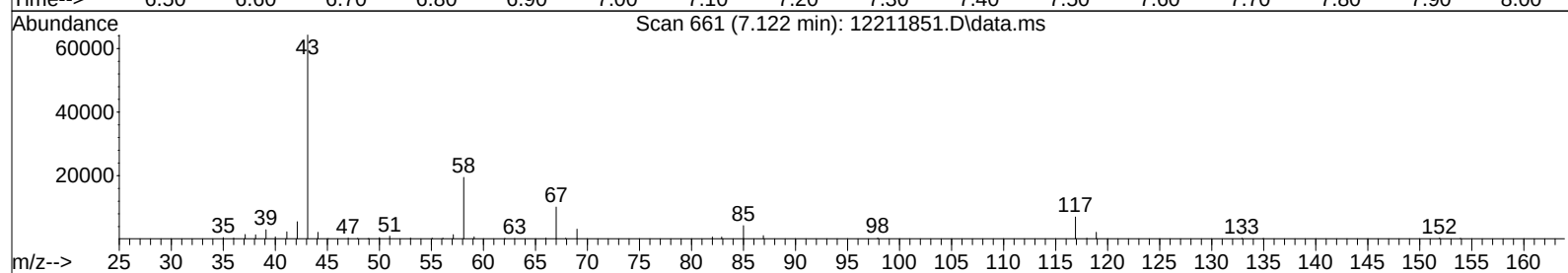
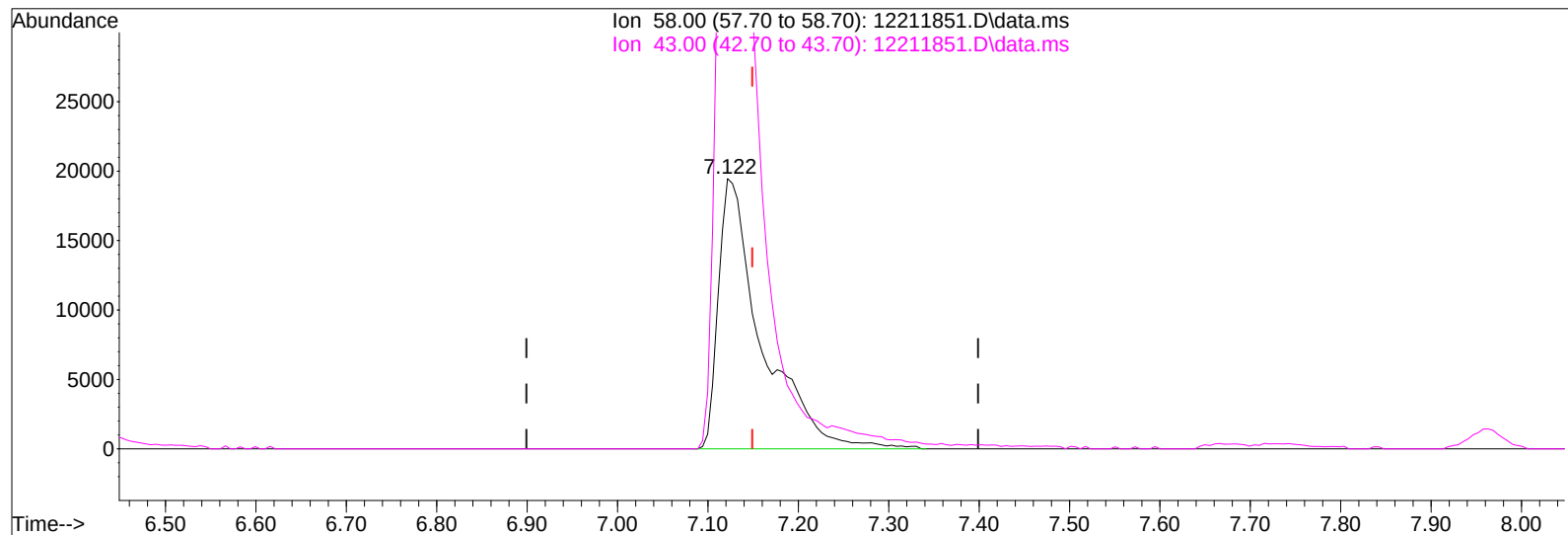
Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:23:27 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 12211851.D\data.ms

(13) Acetone (T)

7.122min (-0.028) 3.80ng

response 64885

Ion	Exp%	Act%
58.00	100	100
43.00	313.40	277.32#
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS16\DATA\2018 12\21\12211851.D

Acq On : 22 Dec 2018 9:57

Operator: LH

Sample : P1806708-001 (1000mL)

Misc : S31-09141801

ALS Vial : 4 Sample Multiplier: 1

Quant Time: Dec 22 12:21:00 2018

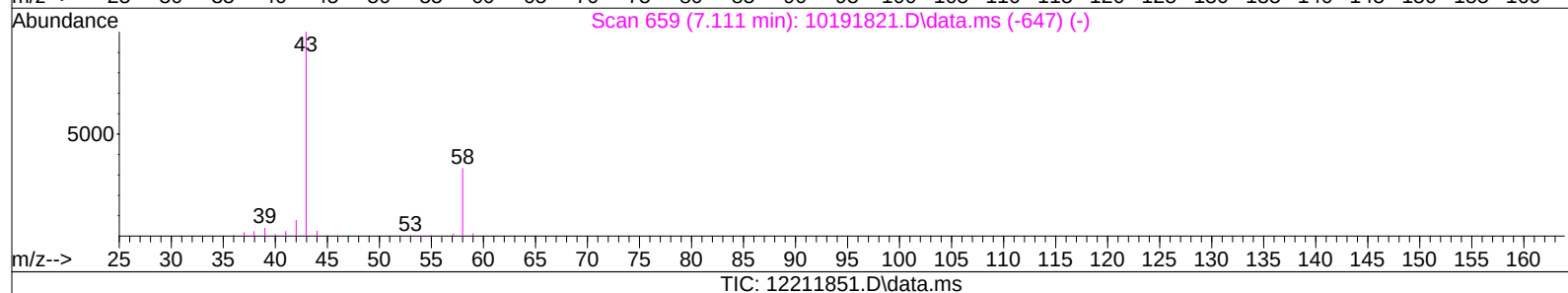
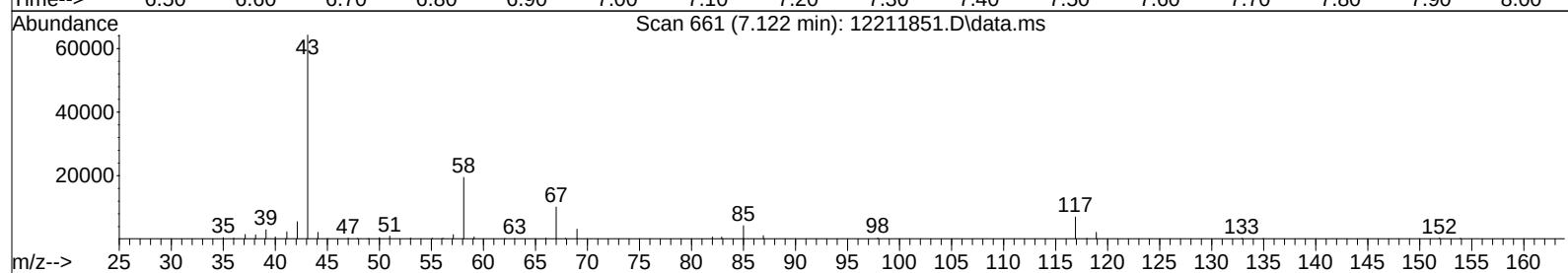
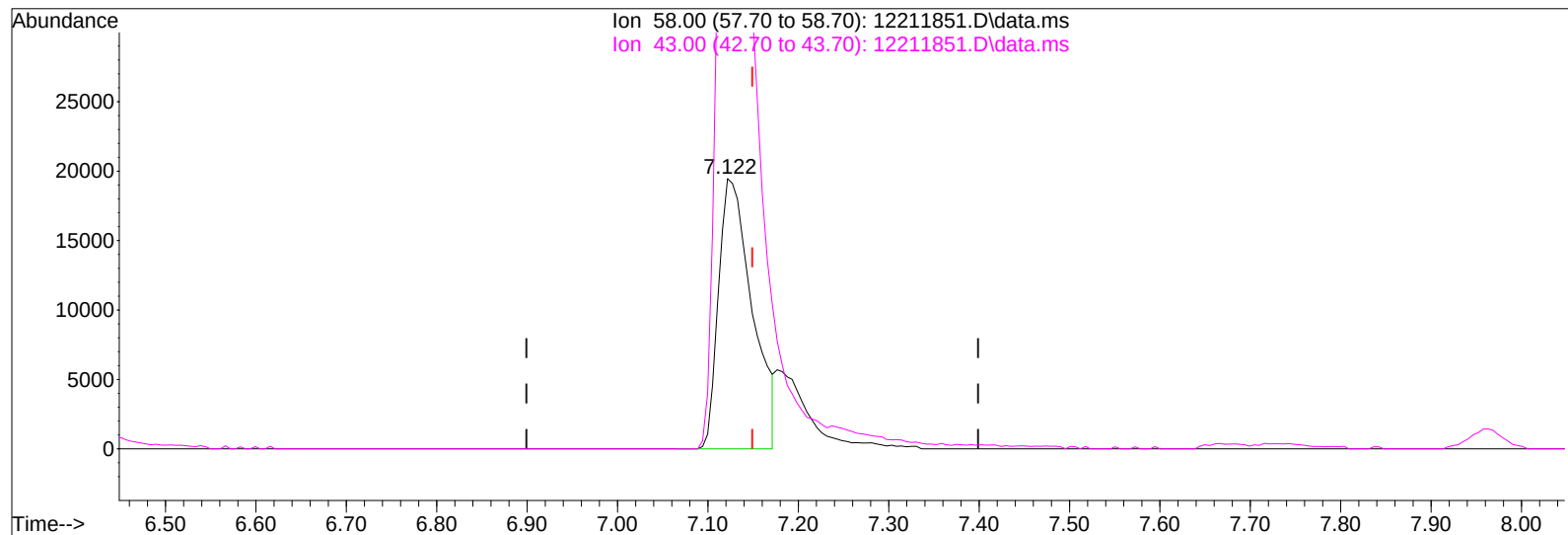
Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:23:27 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 12211851.D\data.ms

(13) Acetone (T)

7.122min (-0.028) 2.95ng m

response 50305

IPC

LH 12/22/18

12/23/18

Ion	Exp%	Act%
58.00	100	100
43.00	313.40	357.70#
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS16\DATA\2018 12\21\12211851.D

Acq On : 22 Dec 2018 9:57

Operator: LH

Sample : P1806708-001 (1000mL)

Misc : S31-09141801

ALS Vial : 4 Sample Multiplier: 1

Quant Time: Dec 22 12:22:09 2018

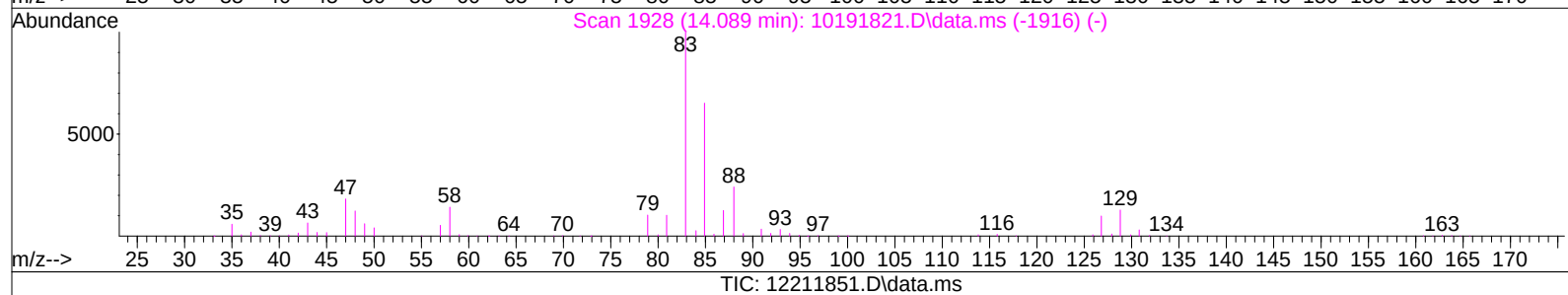
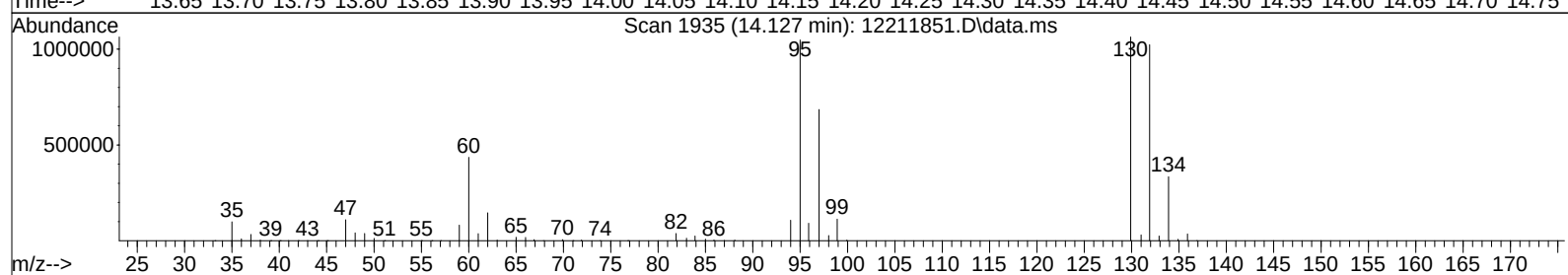
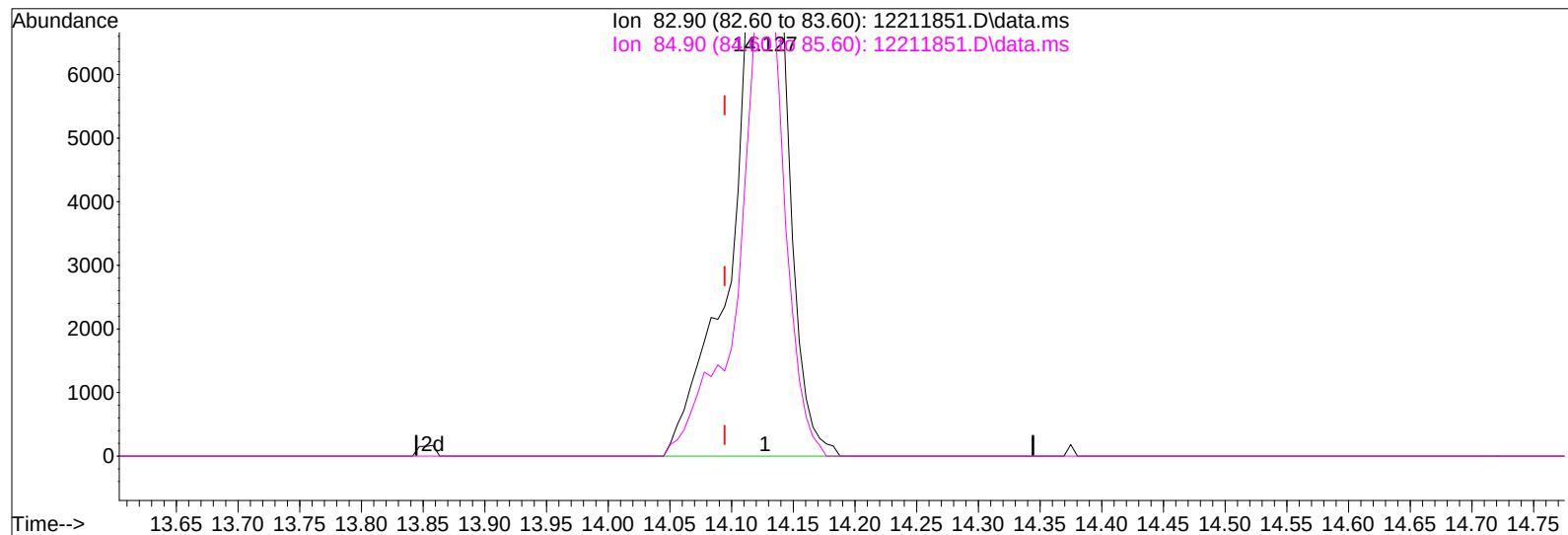
Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:23:27 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 12211851.D\data.ms

(46) Bromodichloromethane (T)

14.127min (+0.033) 0.92ng

response 31216

Ion	Exp%	Act%
82.90	100	100
84.90	65.00	63.52
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS16\DATA\2018 12\21\12211851.D

Acq On : 22 Dec 2018 9:57

Operator: LH

Sample : P1806708-001 (1000mL)

Misc : S31-09141801

ALS Vial : 4 Sample Multiplier: 1

Quant Time: Dec 22 12:22:09 2018

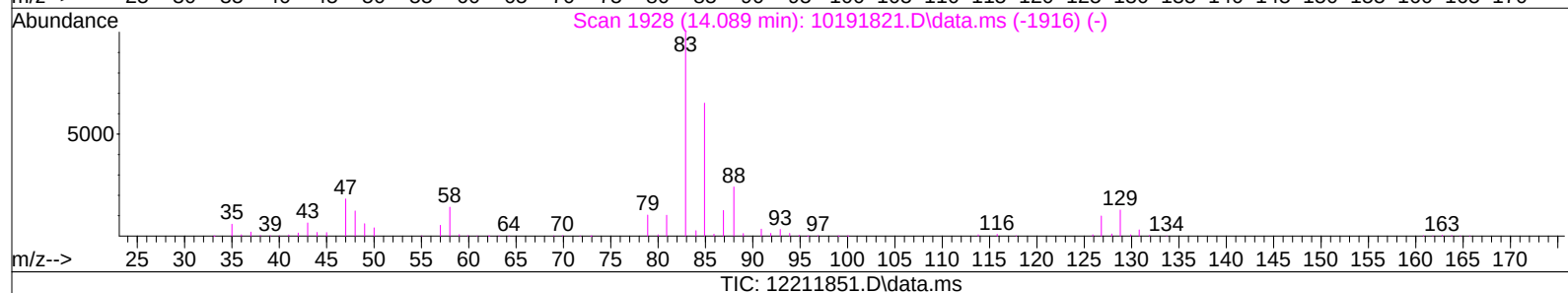
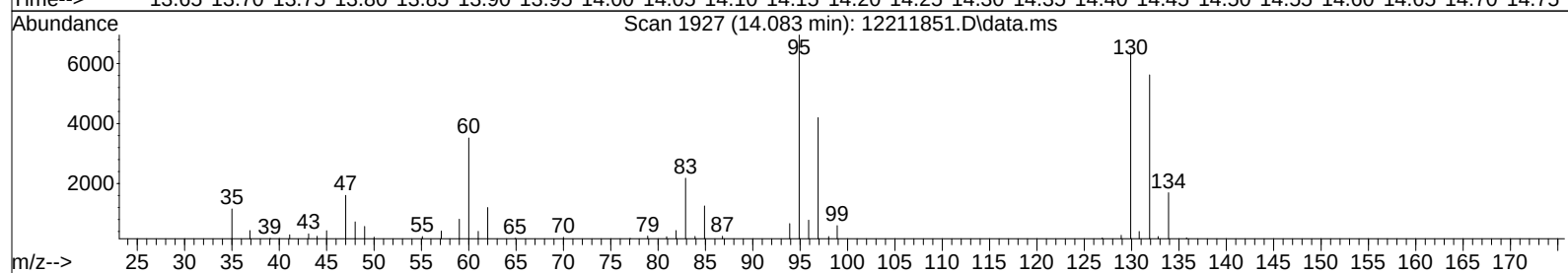
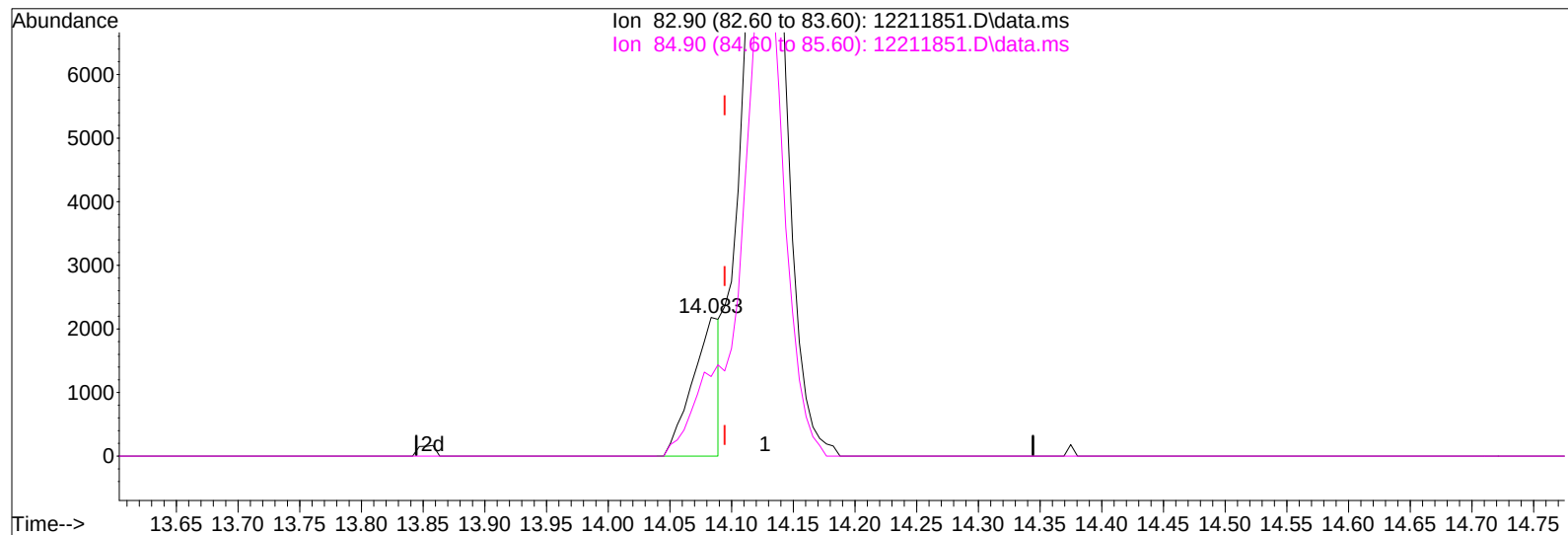
Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:23:27 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 12211851.D\data.ms

(46) Bromodichloromethane (T)

14.083min (-0.011) 0.10ng m

response 3330

IPC

LH 12/22/18

WA 12/23/18

Ion	Exp%	Act%
82.90	100	100
84.90	65.00	595.47#
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS16\DATA\2018 12\21\12211835.D

Acq On : 21 Dec 2018 23:29

Operator: LH

Sample : MB2 R16122118 1000mL

Misc : S31-09141801/AC00442

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 22 08:53:43 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:23:27 2018

LH 12/22/18

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.32	130	214823	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.43	114	909947	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.72	82	391552	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.17	65	335638	12.988	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.92%
57) Toluene-d8 (SS2)	15.87	98	739769	11.864	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	94.88%
73) Bromofluorobenzene (SS3)	19.09	174	310219	10.945	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	87.52%

Target Compounds

						Qvalue
2) Propene	4.11	42	739	0.037	ng	# 33
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	6.46	45	5803	0.480	ng	92
11) Acetonitrile	6.79	41	2225	0.070	ng	# 47
12) Acrolein	0.00	56	0	N.D.	d	
13) Acetone	7.18	58	4894	0.339	ng	98
14) Trichlorofluoromethane	0.00	101	0	N.D.		
15) 2-Propanol (Isopropanol)	0.00	45	0	N.D.	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.	d	
19) Methylene Chloride	0.00	84	0	N.D.		
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.		
21) Trichlorotrifluoroethane	0.00	151	0	N.D.		
22) Carbon Disulfide	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)	10.51	72	497	0.039	ng	# 48
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	13.08	56	1554	0.084	ng	99
41) Benzene	13.04	78	2228	0.027	ng	90
42) Carbon Tetrachloride	0.00	117	0	N.D.		
43) Cyclohexane	0.00	84	0	N.D.	d	
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.	d	
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D.		
47) Trichloroethene	0.00	130	0	N.D.		
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.		

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Data File: I:\MS16\DATA\2018 12\21\12211835.D

Acq On : 21 Dec 2018 23:29

Operator: LH

Sample : MB2 R16122118 1000mL

Misc : S31-09141801/AC00442

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 22 08:53:43 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:23:27 2018

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	2120	0.024	ng	76
59) 2-Hexanone	0.00	43	0	N.D.	d	
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	0.00	43	0	N.D.	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.	d	
66) Ethylbenzene	0.00	91	0	N.D.	d	
67) m- & p-Xylenes	0.00	91	0	N.D.	d	
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.61	104	290	0.005	ng	# 62
70) o-Xylene	0.00	91	0	N.D.	d	
71) n-Nonane	0.00	43	0	N.D.		
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.		
74) Cumene	0.00	105	0	N.D.	d	
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	0.00	91	0	N.D.	d	
77) 3-Ethyltoluene	0.00	105	0	N.D.	d	
78) 4-Ethyltoluene	0.00	105	0	N.D.	d	
79) 1,3,5-Trimethylbenzene	0.00	105	0	N.D.	d	
80) alpha-Methylstyrene	19.98	118	780	0.018	ng	# 36
81) 2-Ethyltoluene	0.00	105	0	N.D.	d	
82) 1,2,4-Trimethylbenzene	0.00	105	0	N.D.	d	
83) n-Decane	0.00	58	0	N.D.		
84) Benzyl Chloride	0.00	91	0	N.D.	d	
85) 1,3-Dichlorobenzene	20.34	146	780	0.016	ng	80
86) 1,4-Dichlorobenzene	20.40	146	1162	0.023	ng	81
87) sec-Butylbenzene	0.00	105	0	N.D.	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	20.69	146	487	0.010	ng	# 65
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	22.18	180	1273	0.034	ng	# 85
95) Naphthalene	22.29	128	5396	0.047	ng	81
96) n-Dodecane	22.25	57	336	0.009	ng	# 71
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.	d	
99) tert-Butylbenzene	0.00	119	0	N.D.	d	
100) n-Butylbenzene	0.00	91	0	N.D.	d	

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

Data File: I:\MS16\DATA\2018 12\21\12211835.D

Acq On : 21 Dec 2018 23:29

Operator: LH

Sample : MB2 R16122118 1000mL

Misc : S31-09141801/AC00442

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 22 08:53:43 2018

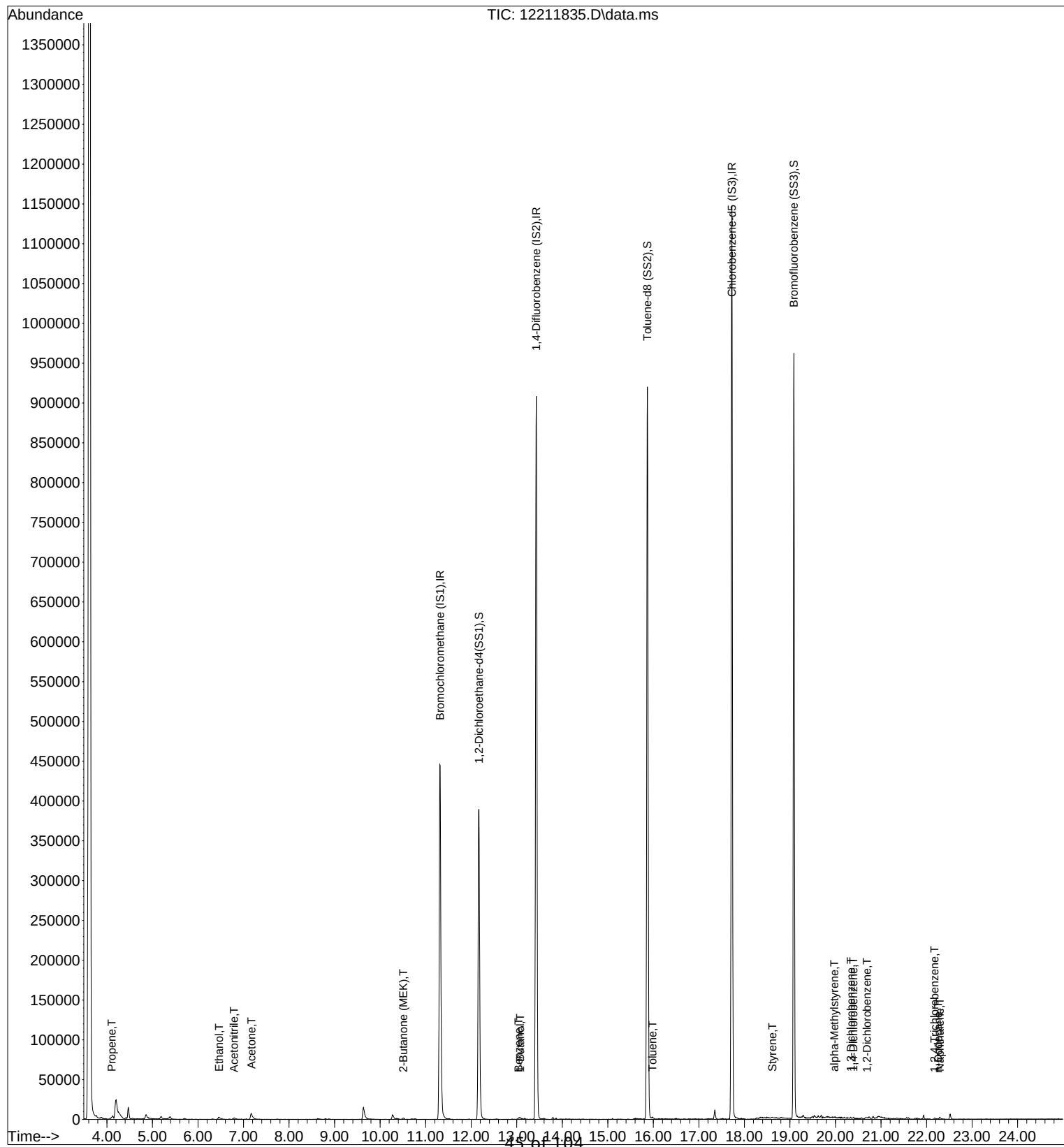
Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:23:27 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS16\DATA\2018 12\21\12211835.D

Acq On : 21 Dec 2018 23:29

Operator: LH

Sample : MB2 R16122118 1000mL

Misc : S31-09141801/AC00442

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 22 08:00:41 2018

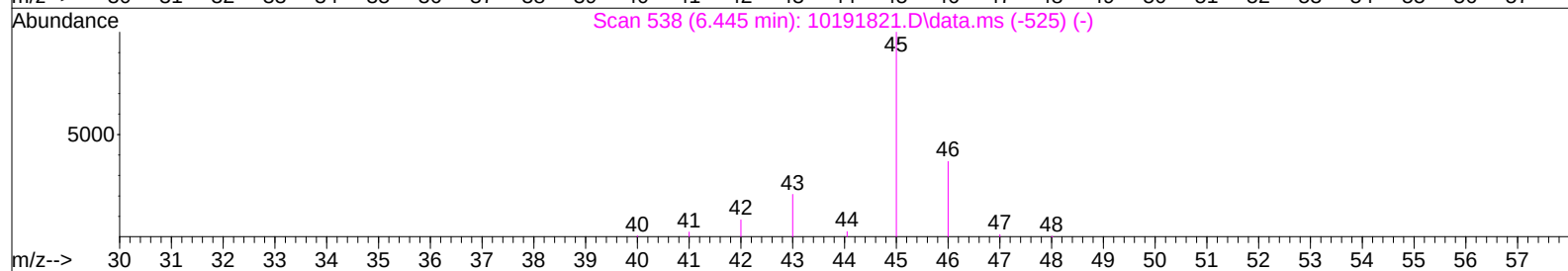
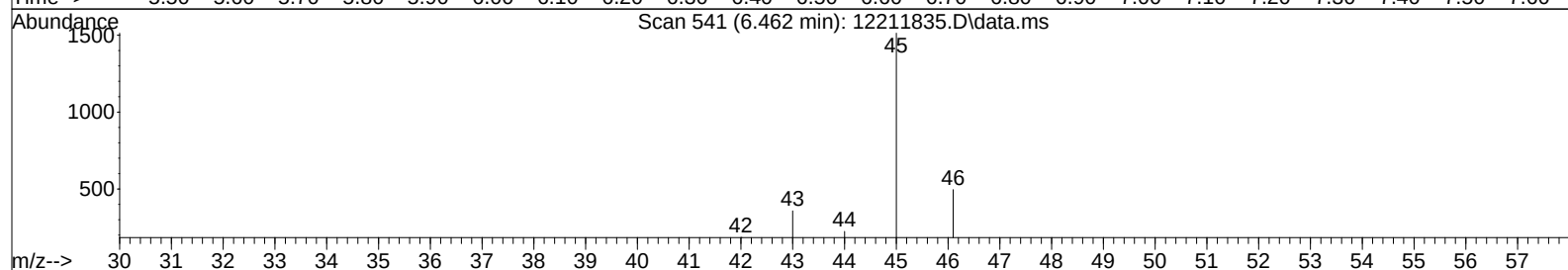
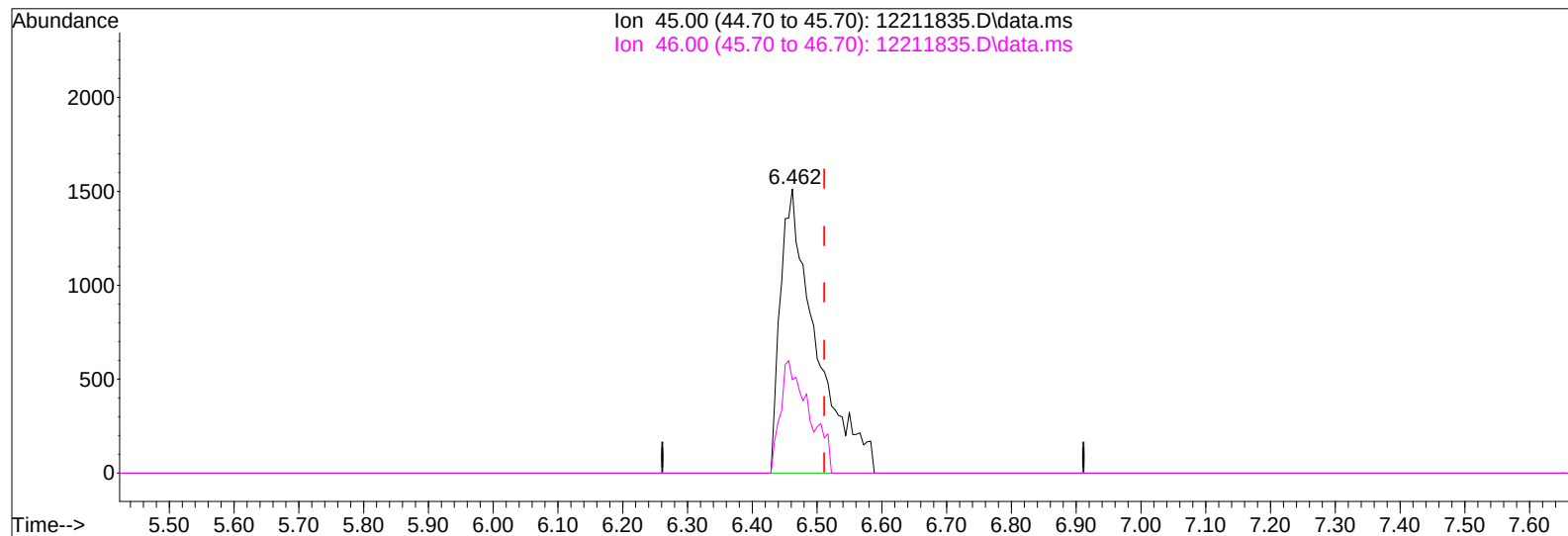
Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:23:27 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 12211835.D\data.ms

(10) Ethanol (T)

6.462min (-0.050) 0.48ng

response 5803

Ion	Exp%	Act%
45.00	100	100
46.00	36.60	31.86
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS16\DATA\2018 12\21\12211837.D

Acq On : 22 Dec 2018 00:36

Operator: LH

Sample : LCS2 R16122118 25ng

Misc : S31-09141801/S31-11281807 (12/27)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 22 08:01:20 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:23:27 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 12/22/18

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.33	130	239221	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.43	114	1020000	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.72	82	435498	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.18	65	366577	12.739	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.92%
57) Toluene-d8 (SS2)	15.87	98	817233	11.784	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	94.24%
73) Bromofluorobenzene (SS3)	19.09	174	354690	11.251	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	90.00%

Target Compounds

						Qvalue
2) Propene	4.04	42	545757	24.515	ng	98
3) Dichlorodifluoromethan...	4.21	85	1058304	21.162	ng	100
4) Chloromethane	4.52	50	776967	24.409	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.79	135	606154	20.389	ng	100
6) Vinyl Chloride	4.96	62	859983	24.771	ng	100
7) 1,3-Butadiene	5.24	54	555759	24.746	ng	99
8) Bromomethane	5.70	94	478566	22.873	ng	99
9) Chloroethane	6.04	64	351020	23.547	ng	100
10) Ethanol	6.44	45	1910165	141.963	ng	99
11) Acetonitrile	6.71	41	860072	24.425	ng	99
12) Acrolein	6.90	56	297269	25.020	ng	99
13) Acetone	7.11	58	1929845	120.211	ng	99
14) Trichlorofluoromethane	7.35	101	951449	21.968	ng	100
15) 2-Propanol (Isopropanol)	7.62	45	2437719	47.349	ng	98
16) Acrylonitrile	7.90	53	648213	26.598	ng	100
17) 1,1-Dichloroethene	8.35	96	495800	22.487	ng	92
18) 2-Methyl-2-Propanol (t...	8.51	59	2267485	41.828	ng	99
19) Methylene Chloride	8.58	84	515874	23.005	ng	92
20) 3-Chloro-1-propene (Al...	8.74	41	692707	24.841	ng	95
21) Trichlorotrifluoroethane	8.99	151	479046	20.782	ng	94
22) Carbon Disulfide	8.85	76	1893137	23.648	ng	100
23) trans-1,2-Dichloroethene	9.87	61	728807	24.148	ng	94
24) 1,1-Dichloroethane	10.12	63	882221	23.504	ng	99
25) Methyl tert-Butyl Ether	10.21	73	1488389	22.423	ng	98
26) Vinyl Acetate	10.38	86	678190	120.516	ng	# 63
27) 2-Butanone (MEK)	10.62	72	386514	27.217	ng	# 90
28) cis-1,2-Dichloroethene	11.15	61	757161	25.517	ng	93
29) Diisopropyl Ether	11.42	87	471976	23.786	ng	# 72
30) Ethyl Acetate	11.43	61	442983	58.197	ng	94
31) n-Hexane	11.42	57	944220	27.224	ng	98
32) Chloroform	11.49	83	990111	24.545	ng	99
34) Tetrahydrofuran (THF)	11.89	72	369395	25.817	ng	91
35) Ethyl tert-Butyl Ether	12.02	87	649178	23.378	ng	91
36) 1,2-Dichloroethane	12.30	62	736629	23.599	ng	100
38) 1,1,1-Trichloroethane	12.57	97	866860	22.602	ng	99
39) Isopropyl Acetate	12.98	61	727541	50.543	ng	# 91
40) 1-Butanol	13.00	56	1234153	59.841	ng	95
41) Benzene	13.04	78	2230311	23.784	ng	100
42) Carbon Tetrachloride	13.20	117	812081	22.858	ng	100
43) Cyclohexane	13.33	84	1738452	47.832	ng	90
44) tert-Amyl Methyl Ether	13.67	73	1578012	24.430	ng	99
45) 1,2-Dichloropropane	13.90	63	558384	26.812	ng	99
46) Bromodichloromethane	14.09	83	814425	24.827	ng	99
47) Trichloroethene	14.13	130	628257	22.793	ng	100
48) 1,4-Dioxane	14.11	88	479910	27.044	ng	92
49) 2,2,4-Trimethylpentane...	14.19	57	2294889	26.368	ng	100

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Data File: I:\MS16\DATA\2018 12\21\12211837.D

Acq On : 22 Dec 2018 00:36

Operator: LH

Sample : LCS2 R16122118 25ng

Misc : S31-09141801/S31-11281807 (12/27)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 22 08:01:20 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:23:27 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.33	100	466729	48.044	ng	# 84
51) n-Heptane	14.45	71	518589	24.038	ng	94
52) cis-1,3-Dichloropropene	15.00	75	918432	24.963	ng	100
53) 4-Methyl-2-pentanone	15.02	58	528954	27.928	ng	98
54) trans-1,3-Dichloropropene	15.51	75	867871	26.675	ng	100
55) 1,1,2-Trichloroethane	15.69	97	550115	24.344	ng	97
58) Toluene	15.97	91	2194607	22.790	ng	100
59) 2-Hexanone	16.21	43	1232275	27.927	ng	99
60) Dibromochloromethane	16.39	129	710075	25.240	ng	100
61) 1,2-Dibromoethane	16.64	107	645982	25.040	ng	100
62) n-Butyl Acetate	16.83	43	1422284	29.742	ng	99
63) n-Octane	16.95	57	474093	25.856	ng	90
64) Tetrachloroethene	17.11	166	667575	22.526	ng	99
65) Chlorobenzene	17.76	112	1529104	23.447	ng	100
66) Ethylbenzene	18.11	91	2547259	23.228	ng	98
67) m- & p-Xylenes	18.27	91	4031307	49.229	ng	98
68) Bromoform	18.35	173	621342	24.824	ng	100
69) Styrene	18.59	104	1643403	24.673	ng	99
70) o-Xylene	18.69	91	2024881	24.360	ng	98
71) n-Nonane	18.87	43	1123896	29.424	ng	96
72) 1,1,2,2-Tetrachloroethane	18.68	83	1040478	26.143	ng	99
74) Cumene	19.20	105	2594866	23.786	ng	98
75) alpha-Pinene	19.54	93	1335111	23.595	ng	99
76) n-Propylbenzene	19.64	91	3225837	25.845	ng	98
77) 3-Ethyltoluene	19.73	105	2559586	23.277	ng	98
78) 4-Ethyltoluene	19.77	105	2563892	25.845	ng	98
79) 1,3,5-Trimethylbenzene	19.83	105	2147272	23.523	ng	98
80) alpha-Methylstyrene	19.97	118	1237599	25.078	ng	99
81) 2-Ethyltoluene	20.00	105	2635227	24.583	ng	98
82) 1,2,4-Trimethylbenzene	20.19	105	2312025	25.816	ng	97
83) n-Decane	20.26	58	52363	27.105	ng	# 89
84) Benzyl Chloride	20.31	91	1950460	24.706	ng	97
85) 1,3-Dichlorobenzene	20.32	146	1352237	24.362	ng	100
86) 1,4-Dichlorobenzene	20.39	146	1339977	23.809	ng	100
87) sec-Butylbenzene	20.42	105	2922083	25.020	ng	98
88) 4-Isopropyltoluene (p-...	20.56	119	2806473	25.225	ng	81
89) 1,2,3-Trimethylbenzene	20.56	105	2354838	26.227	ng	97
90) 1,2-Dichlorobenzene	20.68	146	1316038	25.149	ng	100
91) d-Limonene	20.68	68	936469	28.783	ng	91
92) 1,2-Dibromo-3-Chloropr...	21.06	157	512512	26.262	ng	96
93) n-Undecane	21.34	57	1242561	28.888	ng	95
94) 1,2,4-Trichlorobenzene	22.17	180	979328	23.349	ng	99
95) Naphthalene	22.28	128	2871041	22.301	ng	100
96) n-Dodecane	22.24	57	1047946	25.870	ng	94
97) Hexachlorobutadiene	22.58	225	611859	21.672	ng	99
98) Cyclohexanone	18.41	55	801777	28.477	ng	96
99) tert-Butylbenzene	20.19	119	2206545	25.208	ng	98
100) n-Butylbenzene	20.92	91	2437928	26.315	ng	98

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

Data File: I:\MS16\DATA\2018 12\21\12211838.D

Acq On : 22 Dec 2018 1:09

Operator: LH

Sample : LCSD2 R16122118 25ng

Misc : S31-09141801/S31-11281807 (12/27)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 22 08:01:25 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

LH 12/22/18

QLast Update : Sat Oct 20 10:23:27 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.33	130	232941	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.43	114	965836	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.72	82	460603	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.18	65	353532	12.616	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.96%
57) Toluene-d8 (SS2)	15.87	98	774961	10.565	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	84.56%
73) Bromofluorobenzene (SS3)	19.09	174	359541	10.783	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	86.24%

Target Compounds

						Qvalue
2) Propene	4.05	42	586923	27.075	ng	97
3) Dichlorodifluoromethan...	4.22	85	1127784	23.160	ng	100
4) Chloromethane	4.52	50	822874	26.548	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.79	135	626871	21.655	ng	100
6) Vinyl Chloride	4.96	62	895599	26.492	ng	100
7) 1,3-Butadiene	5.24	54	594487	27.184	ng	98
8) Bromomethane	5.70	94	508891	24.978	ng	100
9) Chloroethane	6.05	64	372163	25.638	ng	100
10) Ethanol	6.44	45	2036051	155.398	ng	99
11) Acetonitrile	6.71	41	927808	27.059	ng	99
12) Acrolein	6.90	56	317060	27.405	ng	99
13) Acetone	7.11	58	2046668	130.925	ng	96
14) Trichlorofluoromethane	7.36	101	984564	23.346	ng	99
15) 2-Propanol (Isopropanol)	7.62	45	2534498	50.556	ng	97
16) Acrylonitrile	7.91	53	685948	28.906	ng	100
17) 1,1-Dichloroethene	8.35	96	515394	24.006	ng	92
18) 2-Methyl-2-Propanol (t...	8.51	59	2305458	43.675	ng	99
19) Methylene Chloride	8.58	84	539283	24.697	ng	93
20) 3-Chloro-1-propene (Al...	8.75	41	723626	26.649	ng	95
21) Trichlorotrifluoroethane	9.00	151	497152	22.149	ng	94
22) Carbon Disulfide	8.85	76	1955182	25.082	ng	100
23) trans-1,2-Dichloroethene	9.87	61	758807	25.820	ng	94
24) 1,1-Dichloroethane	10.12	63	920380	25.182	ng	99
25) Methyl tert-Butyl Ether	10.21	73	1530613	23.680	ng	97
26) Vinyl Acetate	10.38	86	697689	127.324	ng	# 65
27) 2-Butanone (MEK)	10.62	72	367649	26.586	ng	# 89
28) cis-1,2-Dichloroethene	11.15	61	733800	25.397	ng	93
29) Diisopropyl Ether	11.42	87	456490	23.626	ng	# 73
30) Ethyl Acetate	11.43	61	427924	57.734	ng	93
31) n-Hexane	11.42	57	901037	26.680	ng	98
32) Chloroform	11.49	83	947558	24.124	ng	99
34) Tetrahydrofuran (THF)	11.89	72	349791	25.106	ng	92
35) Ethyl tert-Butyl Ether	12.02	87	626559	23.172	ng	92
36) 1,2-Dichloroethane	12.30	62	727830	23.946	ng	100
38) 1,1,1-Trichloroethane	12.57	97	844200	23.246	ng	99
39) Isopropyl Acetate	12.98	61	710882	52.156	ng	# 90
40) 1-Butanol	13.00	56	1187732	60.820	ng	97
41) Benzene	13.04	78	2098223	23.630	ng	100
42) Carbon Tetrachloride	13.20	117	780661	23.206	ng	100
43) Cyclohexane	13.33	84	1623310	47.169	ng	91
44) tert-Amyl Methyl Ether	13.67	73	1491410	24.384	ng	99
45) 1,2-Dichloropropane	13.90	63	514124	26.071	ng	100
46) Bromodichloromethane	14.09	83	775321	24.960	ng	99
47) Trichloroethene	14.13	130	601286	23.038	ng	100
48) 1,4-Dioxane	14.11	88	449045	26.724	ng	93
49) 2,2,4-Trimethylpentane...	14.19	57	2098020	25.458	ng	100

50 of 104

Data File: I:\MS16\DATA\2018 12\21\12211838.D

Acq On : 22 Dec 2018 1:09

Operator: LH

Sample : LCSD2 R16122118 25ng

Misc : S31-09141801/S31-11281807 (12/27)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 22 08:01:25 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:23:27 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.33	100	448175	48.722	ng	# 86
51) n-Heptane	14.45	71	496298	24.295	ng	95
52) cis-1,3-Dichloropropene	15.00	75	898374	25.787	ng	100
53) 4-Methyl-2-pentanone	15.02	58	499187	27.834	ng	96
54) trans-1,3-Dichloropropene	15.51	75	817505	26.536	ng	99
55) 1,1,2-Trichloroethane	15.69	97	520943	24.346	ng	97
58) Toluene	15.98	91	2086843	20.490	ng	100
59) 2-Hexanone	16.21	43	1185972	25.413	ng	99
60) Dibromochloromethane	16.39	129	707912	23.792	ng	100
61) 1,2-Dibromoethane	16.64	107	670401	24.570	ng	100
62) n-Butyl Acetate	16.83	43	1442299	28.516	ng	99
63) n-Octane	16.95	57	469384	24.204	ng	91
64) Tetrachloroethene	17.11	166	664428	21.198	ng	99
65) Chlorobenzene	17.77	112	1608274	23.317	ng	99
66) Ethylbenzene	18.11	91	2738522	23.611	ng	99
67) m- & p-Xylenes	18.27	91	4184898	48.320	ng	98
68) Bromoform	18.35	173	646088	24.406	ng	99
69) Styrene	18.59	104	1719857	24.413	ng	99
70) o-Xylene	18.69	91	2143700	24.384	ng	98
71) n-Nonane	18.87	43	1112227	27.531	ng	96
72) 1,1,2,2-Tetrachloroethane	18.68	83	1100124	26.136	ng	99
74) Cumene	19.20	105	2700753	23.407	ng	98
75) alpha-Pinene	19.54	93	1387405	23.182	ng	100
76) n-Propylbenzene	19.64	91	3291287	24.933	ng	98
77) 3-Ethyltoluene	19.73	105	2630563	22.619	ng	98
78) 4-Ethyltoluene	19.77	105	2673763	25.484	ng	98
79) 1,3,5-Trimethylbenzene	19.83	105	2215748	22.950	ng	98
80) alpha-Methylstyrene	19.97	118	1255880	24.061	ng	99
81) 2-Ethyltoluene	20.00	105	2698952	23.805	ng	98
82) 1,2,4-Trimethylbenzene	20.19	105	2361997	24.937	ng	97
83) n-Decane	20.26	58	54528	26.687	ng	# 85
84) Benzyl Chloride	20.31	91	1996701	23.913	ng	97
85) 1,3-Dichlorobenzene	20.32	146	1361722	23.196	ng	100
86) 1,4-Dichlorobenzene	20.39	146	1371106	23.034	ng	100
87) sec-Butylbenzene	20.42	105	3004096	24.321	ng	98
88) 4-Isopropyltoluene (p-...	20.56	119	2872125	24.408	ng	81
89) 1,2,3-Trimethylbenzene	20.56	105	2418463	25.468	ng	97
90) 1,2-Dichlorobenzene	20.68	146	1356572	24.510	ng	100
91) d-Limonene	20.68	68	965351	28.054	ng	91
92) 1,2-Dibromo-3-Chloropr...	21.06	157	510432	24.730	ng	96
93) n-Undecane	21.34	57	1236873	27.189	ng	95
94) 1,2,4-Trichlorobenzene	22.17	180	1070315	24.127	ng	100
95) Naphthalene	22.28	128	3238024	23.781	ng	100
96) n-Dodecane	22.24	57	1221041	28.501	ng	94
97) Hexachlorobutadiene	22.58	225	673411	22.552	ng	99
98) Cyclohexanone	18.41	55	858772	28.838	ng	94
99) tert-Butylbenzene	20.19	119	2247658	24.278	ng	98
100) n-Butylbenzene	20.92	91	2464425	25.151	ng	98

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

Method Path : I:\MS16\METHODS\
 Method File : R16101918.M
 Title : EPA T0-15 per SOP VOA-T015 (CASS T0-15/GC-MS)
 Last Update : Sat Oct 20 10:34:51 2018
 Response Via : Initial Calibration

LH 10/20/18

Calibration Files

0.1 =10191816.D 0.2 =10191817.D 0.5 =10191818.D 1.0 =10191819.D 5.0 =10191820.D 25 =10191821.D
 100 =10191823.D

	Compound	0.1	0.2	0.5	1.0	5.0	25	50	100	Avg	%RSD
1) IR	Bromochloromethane...	-----ISTD-----									
2) T	Propene	1.201	1.058	1.133	1.147	1.082	1.083	1.203	1.399	1.163	9.42
3) T	Dichlorodifluo...	2.763	2.575	2.705	2.579	2.615	2.607	2.582	2.479	2.613	3.31
4) T	Chloromethane	1.925	1.817	1.839	1.624	1.741	1.720	1.582	1.058	1.663	16.17
5) T	1,2-Dichloro-1...	1.623	1.511	1.596	1.567	1.552	1.552	1.536	1.491	1.553	2.75
6) T	Vinyl Chloride	1.779	1.722	1.869	1.822	1.836	1.842	1.831	1.811	1.814	2.50
7) T	1,3-Butadiene	1.118	1.078	1.084	1.099	1.157	1.230	1.275	1.346	1.174	8.48
8) T	Bromomethane	1.057	1.018	1.115	1.083	1.100	1.130	1.132	1.110	1.093	3.59
9) T	Chloroethane	0.780	0.747	0.757	0.779	0.782	0.792	0.796	0.799	0.779	2.36
10) T	Ethanol	0.747	0.658	0.639	0.614	0.609	0.765	0.794	0.799	0.703	11.56
11) T	Acetonitrile	2.203	1.879	1.834	1.694	1.626	1.817	1.845	1.822	1.840	9.22
12) T	Acrolein	0.555	0.531	0.624	0.602	0.621	0.666	0.683	0.686	0.621	9.20
13) T	Acetone	0.893	0.812	0.840	0.804	0.761	0.850	0.888	0.863	0.839	5.33
14) T	Trichlorofluor...	2.274	2.190	2.363	2.272	2.268	2.278	2.265	2.195	2.263	2.39
15) T	2-Propanol (Is...	2.896	2.688	2.855	2.613	2.625	2.868	2.699	2.278	2.690	7.45
16) T	Acrylonitrile	0.970	1.086	1.248	1.235	1.300	1.436	1.457	1.456	1.273	14.05
17) T	1,1-Dichloroet...	1.145	1.127	1.140	1.114	1.142	1.183	1.186	1.180	1.152	2.37
18) T	2-Methyl-2-Pro...	2.985	2.838	2.989	2.861	2.968	3.054	2.981	1.985	2.833	12.35
19) T	Methylene Chlo...	1.224	1.127	1.176	1.125	1.153	1.186	1.191	1.192	1.172	2.94
20) T	3-Chloro-1-pro...	1.876	1.353	1.377	1.332	1.359	1.454	1.459	1.447	1.457	12.11
21) T	Trichlorotrifl...	1.232	1.132	1.234	1.205	1.205	1.227	1.217	1.184	1.204	2.81
22) T	Carbon Disulfide	4.561	4.046	4.216	4.055	4.054	4.235	4.199	4.098	4.183	4.10
23) T	trans-1,2-Dich...	1.509	1.410	1.583	1.564	1.604	1.666	1.657	1.623	1.577	5.36
24) T	1,1-Dichloroet...	2.043	1.857	1.994	1.933	1.964	1.999	1.978	1.922	1.961	2.90
25) T	Methyl tert-Bu...	3.456	3.390	3.563	3.456	3.454	3.488	3.484	3.456	3.468	1.39
26) T	Vinyl Acetate			0.245	0.240	0.276	0.335	0.351	0.317	0.294	16.13
27) T	2-Butanone (MEK)	0.581	0.596	0.711	0.729	0.759	0.835	0.853	0.873	0.742	15.04
28) T	cis-1,2-Dichlo...	1.463	1.442	1.571	1.546	1.576	1.622	1.611	1.573	1.550	4.21
29) T	Diisopropyl Ether	1.138	1.073	0.994	0.952	0.952	1.036	1.104	1.045	1.037	6.55
30) T	Ethyl Acetate	0.326	0.326	0.370	0.381	0.398	0.446	0.478	0.456	0.398	14.60
31) T	n-Hexane	1.896	1.743	1.811	1.761	1.724	1.798	1.917	1.849	1.812	3.89
32) T	Chloroform	2.115	2.022	2.187	2.084	2.124	2.161	2.127	2.042	2.108	2.66
33) S	1,2-Dichloroet...	1.518	1.508	1.540	1.526	1.508	1.495	1.483	1.451	1.504	1.83
34) T	Tetrahydrofura...	0.780	0.695	0.740	0.713	0.725	0.768	0.773	0.786	0.748	4.56
35) T	Ethyl tert-But...	1.466	1.340	1.428	1.390	1.429	1.483	1.521	1.551	1.451	4.74
36) T	1,2-Dichloroet...	1.666	1.558	1.655	1.621	1.645	1.683	1.653	1.567	1.631	2.82

37) IR	1,4-Difluorobenzen...	-----ISTD-----									
38) T	1,1,1-Trichlor...	0.487	0.449	0.467	0.457	0.468	0.484	0.479	0.468	0.470	2.81
39) T	Isopropyl Acetate	0.156	0.159	0.170	0.163	0.172	0.188	0.202	0.201	0.176	10.35
40) T	1-Butanol				0.185	0.194	0.284	0.302	0.298	0.253	23.00
41) T	Benzene	1.245	1.103	1.113	1.065	1.096	1.166	1.204	1.202	1.149	5.57
42) T	Carbon Tetrach...	0.430	0.409	0.420	0.415	0.435	0.462	0.460	0.453	0.435	4.73
43) T	Cyclohexane	0.454	0.417	0.432	0.419	0.431	0.463	0.480	0.467	0.445	5.33
44) T	tert-Amyl Meth...	0.809	0.732	0.773	0.751	0.777	0.822	0.832	0.837	0.792	4.95
45) T	1,2-Dichloropr...	0.251	0.246	0.253	0.251	0.251	0.261	0.262	0.266	0.255	2.77
46) T	Bromodichlorom...	0.407	0.366	0.393	0.376	0.402	0.426	0.429	0.418	0.402	5.65
47) T	Trichloroethene	0.336	0.314	0.327	0.321	0.331	0.353	0.359	0.361	0.338	5.28
48) T	1,4-Dioxane	0.188	0.183	0.194	0.197	0.203	0.251	0.257	0.268	0.217	16.03
49) T	2,2,4-Trimethy...	1.143	1.054	1.063	1.017	1.039	1.072	1.075	1.070	1.067	3.43
50) T	Methyl Methacr...	0.099	0.099	0.112	0.111	0.120	0.133	0.139	0.140	0.119	14.06
51) T	n-Heptane	0.277	0.258	0.259	0.253	0.255	0.261	0.271	0.282	0.264	4.07
52) T	cis-1,3-Dichlo...	0.430	0.386	0.418	0.436	0.441	0.494	0.505	0.511	0.451	10.44
53) T	4-Methyl-2-pen...	0.196	0.203	0.216	0.219	0.236	0.257	0.262	0.268	0.232	12.01
54) T	trans-1,3-Dich...	0.343	0.329	0.357	0.361	0.408	0.459	0.467	0.466	0.399	14.69

55)	T	1,1,2-Trichlor...	0.261	0.256	0.273	0.268	0.278	0.292	0.293	0.295	0.277	5.51
56)	IR	Chlorobenzene-d5 (... -ISTD-										
57)	S	Toluene-d8 (SS2)	2.003	2.015	2.000	1.997	1.991	1.982	1.967	1.969	1.991	0.84
58)	T	Toluene	3.054	2.809	2.769	2.669	2.643	2.745	2.763	2.660	2.764	4.76
59)	T	2-Hexanone	1.530	1.004	1.229	1.186	1.235	1.344	1.328	1.276	1.266	11.82
60)	T	Dibromochlorom...	0.745	0.726	0.751	0.753	0.820	0.885	0.896	0.884	0.807	8.96
61)	T	1,2-Dibromoethane	0.709	0.666	0.713	0.705	0.754	0.802	0.793	0.782	0.740	6.66
62)	T	n-Butyl Acetate	1.443	1.250	1.266	1.299	1.397	1.480	1.449	1.397	1.373	6.48
63)	T	n-Octane	0.750	0.497	0.488	0.471	0.473	0.499	0.512	0.520	0.526	17.49
64)	T	Tetrachloroethene	0.879	0.804	0.837	0.808	0.837	0.885	0.883	0.871	0.851	3.91
65)	T	Chlorobenzene	1.926	1.803	1.804	1.763	1.825	1.952	1.975	1.927	1.872	4.35
66)	T	Ethylbenzene	3.404	2.982	3.024	2.966	3.093	3.313	3.323	3.077	3.148	5.47
67)	T	m- & p-Xylenes	2.344	2.202	2.288	2.239	2.345	2.580	2.576	2.230	2.350	6.36
68)	T	Bromoform	0.614	0.594	0.643	0.657	0.742	0.841	0.840	0.816	0.718	14.46
69)	T	Styrene	1.821	1.684	1.754	1.768	1.921	2.147	2.162	2.038	1.912	9.69
70)	T	o-Xylene	2.485	2.233	2.292	2.243	2.386	2.587	2.577	2.283	2.386	6.14
71)	T	n-Nonane	1.163	1.089	1.095	1.059	1.084	1.135	1.123	1.023	1.096	4.02
72)	T	1,1,2,2-Tetrac...	1.108	1.020	1.083	1.075	1.149	1.270	1.273	1.160	1.142	7.96
73)	S	Bromofluoroben...	0.894	0.902	0.901	0.903	0.921	0.923	0.896	0.898	0.905	1.23
74)	T	Cumene	3.219	3.066	3.045	2.937	3.114	3.359	3.348	2.963	3.131	5.19
75)	T	alpha-Pinene	1.621	1.458	1.541	1.507	1.613	1.757	1.808	1.688	1.624	7.50
76)	T	n-Propylbenzene	3.782	3.328	3.459	3.402	3.616	3.939	3.856	3.278	3.582	7.05
77)	T	3-Ethyltoluene	3.284	3.064	2.895	2.863	3.069	3.619	3.521	2.936	3.156	9.14
78)	T	4-Ethyltoluene	2.771	2.471	2.829	2.785	2.969	3.070	3.090	2.794	2.847	6.99
79)	T	1,3,5-Trimethy...	2.818	2.513	2.513	2.416	2.571	2.835	2.808	2.487	2.620	6.53
80)	T	alpha-Methylst...	1.311	1.204	1.312	1.309	1.438	1.624	1.639	1.495	1.416	11.27
81)	T	2-Ethyltoluene	3.465	2.840	2.922	2.865	3.058	3.339	3.285	2.841	3.077	8.19
82)	T	1,2,4-Trimethy...	2.752	2.339	2.452	2.411	2.646	3.018	2.820	2.126	2.571	11.31
83)	T	n-Decane	0.076	0.044	0.047	0.052	0.052	0.059	0.059	0.055	0.055	17.41
84)	T	Benzyl Chloride				1.696	2.040	2.617	2.652	2.326	2.266	17.81
85)	T	1,3-Dichlorobe...	1.605	1.404	1.508	1.480	1.603	1.796	1.780	1.568	1.593	8.65
86)	T	1,4-Dichlorobe...	1.746	1.463	1.504	1.495	1.589	1.760	1.762	1.604	1.615	7.77
87)	T	sec-Butylbenzene	3.333	3.125	3.266	3.234	3.459	3.723	3.629	3.047	3.352	7.06
88)	T	4-Isopropyltol...	3.338	2.998	3.112	3.079	3.355	3.770	3.411	2.485	3.193	11.76
89)	T	1,2,3-Trimethy...	2.734	2.417	2.448	2.434	2.665	3.013	2.808	2.097	2.577	11.07
90)	T	1,2-Dichlorobe...	1.512	1.358	1.413	1.414	1.541	1.763	1.688	1.327	1.502	10.42
91)	T	d-Limonene	0.871	0.798	0.882	0.880	0.978	1.128	1.093	0.841	0.934	12.89
92)	T	1,2-Dibromo-3-...	0.495	0.450	0.486	0.514	0.571	0.659	0.660	0.646	0.560	15.26
93)	T	n-Undecane	1.283	1.125	1.180	1.116	1.242	1.335	1.359	1.237	1.235	7.32
94)	T	1,2,4-Trichlor...	1.257	1.067	1.074	1.103	1.154	1.326	1.361	1.289	1.204	9.81
95)	T	Naphthalene	4.049	3.354	3.439	3.406	3.548	4.119	4.118	3.528	3.695	9.15
96)	T	n-Dodecane	1.245	1.082	1.139	1.124	1.222	1.139	1.196	1.155	1.163	4.68
97)	T	Hexachlorobuta...	0.788	0.717	0.769	0.754	0.802	0.888	0.902	0.863	0.810	8.25
98)	T	Cyclohexanone	0.839	0.724	0.705	0.686	0.712	0.945	0.935	0.920	0.808	14.04
99)	T	tert-Butylbenzene	2.599	2.357	2.441	2.407	2.604	2.926	2.704	2.060	2.512	10.31
100)	T	n-Butylbenzene	2.656	2.408	2.548	2.519	2.758	2.984	2.910	2.489	2.659	7.81

(#) = Out of Range

R16101918.M Sat Oct 20 11:02:54 2018

Primary Source Standards Concentrations (Working & Initial Calibration)

1ng/L Std. ID: S31-10181802
4ng/L Std. ID: S31-10181801
20ng/L Std. ID: S31-10181801
200ng/L Std. ID: S31-10181803

Dilution Factors:										Working STD Conc.(ng/L):	
Compounds	Source Std. mg/m ³	Primary Working Standards								Injection (L):	ICAL Points:
		200ng/L	20ng/L	2ng/L	4ng/L	1ng/L	4	0.050	0.125	4	
Propene	1.031	206.2	20.62	4.124	1.031	0.1031	0.025	0.025	0.125	4	20
Dichlorodifluoromethane	1.045	209.0	20.90	4.180	1.045	0.1045	0.025	0.025	0.125	4	20
Chloromethane	1.008	201.6	20.16	4.032	1.008	0.1008	0.025	0.025	0.125	4	20
Freon-114	1.028	205.6	20.56	4.112	1.028	0.1028	0.025	0.025	0.125	4	20
Vinyl Chloride	1.051	210.2	21.02	4.204	1.051	0.1051	0.025	0.025	0.125	4	20
1,3-Butadiene	1.049	209.8	20.98	4.196	1.049	0.1049	0.025	0.025	0.125	4	20
Bromomethane	1.009	201.8	20.18	4.036	1.009	0.1009	0.025	0.025	0.125	4	20
Chloroethane	1.022	204.4	20.44	4.088	1.022	0.1022	0.025	0.025	0.125	4	20
Ethanol	5.140	1028.0	102.80	20.560	5.140	0.5140	0.1033	0.1033	5.165	5.165	51.65
Acetonitrile	1.033	206.6	20.66	4.132	1.033	0.1033	0.025	0.025	0.125	4	20
Acrolein	1.028	205.6	20.56	4.112	1.028	0.1028	0.025	0.025	0.125	4	20
Acetone	5.370	1074.0	107.40	21.480	5.370	0.5370	0.1060	0.1060	5.300	5.300	53.00
Trichlorofluoromethane	1.060	212.0	21.20	4.240	1.060	0.1060	0.025	0.025	0.125	4	20
Isopropanol	2.063	412.6	41.26	8.252	2.063	0.2063	0.050	0.050	0.250	0.250	2.500
Acrylonitrile	1.034	206.8	20.68	4.136	1.034	0.1034	0.025	0.025	0.125	4	20
1,1-Dichloroethene	1.074	214.8	21.48	4.296	1.074	0.1074	0.025	0.025	0.125	4	20
tert-Butanol	2.144	428.8	42.88	8.576	2.144	0.2144	0.050	0.050	0.250	0.250	2.500
Methylene Chloride	1.070	214.0	21.40	4.280	1.070	0.1070	0.025	0.025	0.125	4	20
Allyl Chloride	1.067	213.4	21.34	4.268	1.067	0.1067	0.025	0.025	0.125	4	20
Trichlorotrifluoroethane	1.065	213.0	21.30	4.260	1.065	0.1065	0.025	0.025	0.125	4	20
Carbon Disulfide	1.075	215.0	21.50	4.300	1.075	0.1075	0.025	0.025	0.125	4	20
trans-1,2-Dichloroethene	1.062	212.4	21.24	4.248	1.062	0.1062	0.025	0.025	0.125	4	20
1,1-Dichloroethane	1.030	206.0	20.60	4.120	1.030	0.1030	0.025	0.025	0.125	4	20
Methyl tert-Butyl Ether	1.089	217.8	21.78	4.356	1.089	0.1089	0.025	0.025	0.125	4	20
Vinyl Acetate	5.252	1050.4	105.04	21.008	5.252	0.5252	0.1027	0.1027	5.135	5.135	51.35
2-Butanone	1.027	205.4	20.54	4.108	1.027	0.1027	0.025	0.025	0.125	4	20
cis-1,2-Dichloroethene	1.054	210.8	21.08	4.216	1.054	0.1054	0.025	0.025	0.125	4	20
Diisopropyl Ether	1.081	216.2	21.62	4.324	1.081	0.1081	0.025	0.025	0.125	4	20
Ethyl Acetate	2.166	433.2	43.32	8.664	2.166	0.2166	0.050	0.050	0.250	0.250	2.500
n-Hexane	1.082	216.4	21.64	4.328	1.082	0.1082	0.025	0.025	0.125	4	20
Chloroform	1.077	215.4	21.54	4.308	1.077	0.1077	0.025	0.025	0.125	4	20
Tetrahydrofuran	1.068	213.6	21.36	4.272	1.068	0.1068	0.025	0.025	0.125	4	20
Ethyl tert-Butyl Ether	1.060	212.0	21.20	4.240	1.060	0.1060	0.025	0.025	0.125	4	20
1,2-Dichloroethane	1.061	212.2	21.22	4.244	1.061	0.1061	0.025	0.025	0.125	4	20
1,1,1-Trichloroethane	1.081	216.2	21.62	4.324	1.081	0.1081	0.025	0.025	0.125	4	20
Isopropyl Acetate	2.066	413.2	41.32	8.264	2.066	0.2066	0.050	0.050	0.250	0.250	2.500
1-Butanol	2.067	413.4	41.34	8.268	2.067	0.2067	0.050	0.050	0.250	0.250	2.500
Benzene	1.033	206.6	20.66	4.132	1.033	0.1033	0.025	0.025	0.125	4	20
Carbon Tetrachloride	1.036	207.2	20.72	4.144	1.036	0.1036	0.025	0.025	0.125	4	20
Cyclohexane	2.087	417.4	41.74	8.348	2.087	0.2087	0.050	0.050	0.250	0.250	2.500
tert-Amyl Methyl Ether	1.074	214.8	21.48	4.296	1.074	0.1074	0.025	0.025	0.125	4	20
1,2-Dichloropropane	1.073	214.6	21.46	4.292	1.073	0.1073	0.025	0.025	0.125	4	20
Bromodichloromethane	1.068	213.6	21.36	4.272	1.068	0.1068	0.025	0.025	0.125	4	20
Trichloroethene	1.062	212.4	21.24	4.248	1.062	0.1062	0.025	0.025	0.125	4	20
1,4-Dioxane	1.064	212.8	21.28	4.256	1.064	0.1064	0.025	0.025	0.125	4	20
Isocetane	1.061	212.2	21.22	4.244	1.061	0.1061	0.025	0.025	0.125	4	20
Methyl Methacrylate	2.135	427.0	42.70	8.540	2.135	0.2135	0.050	0.050	0.250	0.250	2.500
n-Heptane	1.076	215.2	21.52	4.304	1.076	0.1076	0.025	0.025	0.125	4	20

Primary Source Standards Concentrations (Working & Initial Calibration)

1ng/L Std. ID: S31-10181802
 4ng/L Std. ID: S31-10181802
 20ng/L Std. ID: S31-10181801
 200ng/L Std. ID: S31-10181803

200ng/L Std. ID: S31-10181803									
Dilution Factors:		5		50		250		1000	
		Source Std. mg/m³	200ng/L	Primary Working Standards 20ng/L	4ng/L	1ng/L			
Compounds		1.120	224.0	22.40	4.480	1.120			
cis-1,3-Dichloropropene		1.120	224.0	22.40	4.480	1.120			
4-Methyl-2-pentanone		1.060	212.0	21.20	4.240	1.060			
trans-1,3-Dichloropropene		1.055	211.0	21.10	4.220	1.055			
1,1,2-Trichloroethane		1.076	215.2	21.52	4.304	1.076			
Toluene		1.052	210.4	21.04	4.208	1.052			
2-Hexanone		1.074	214.8	21.48	4.296	1.074			
Dibromochloromethane		1.075	215.0	21.50	4.300	1.075			
1,1,2-Dibromoethane		1.076	215.2	21.52	4.304	1.076			
n-Butyl Acetate		1.085	217.0	21.70	4.340	1.085			
n-Octane		1.076	215.2	21.52	4.304	1.076			
Tetrachloroethene		1.058	211.6	21.16	4.232	1.058			
Chlorobenzene		1.066	213.2	21.32	4.264	1.066			
Ethylbenzene		1.033	206.6	20.66	4.132	1.033			
m- & p-Xylene		2.123	424.6	42.46	8.492	2.123			
Bromoform		1.063	212.6	21.26	4.252	1.063			
Styrene		1.060	212.0	21.20	4.240	1.060			
o-Xylene		1.062	212.4	21.24	4.248	1.062			
n-Nonane		1.071	214.2	21.42	4.284	1.071			
1,1,2,2-Tetrachloroethane		1.064	212.8	21.28	4.256	1.064			
Cumene		1.057	211.4	21.14	4.228	1.057			
alpha-Pinene		1.035	207.0	20.70	4.140	1.035			
n-Propylbenzene		1.076	215.2	21.52	4.304	1.076			
3-Ethyltoluene		1.062	212.4	21.24	4.248	1.062			
4-Ethyltoluene		1.061	212.2	21.22	4.244	1.061			
1,3,5-Trimethylbenzene		1.057	211.4	21.14	4.228	1.057			
alpha-Methylstyrene		1.058	211.6	21.16	4.232	1.058			
2-Ethyltoluene		1.072	214.4	21.44	4.288	1.072			
1,2,4-Trimethylbenzene		1.068	213.6	21.36	4.272	1.068			
n-Decane		1.076	215.2	21.52	4.304	1.076			
Benzyl Chloride		1.051	210.2	21.02	4.204	1.051			
1,3-Dichlorobenzene		1.080	216.0	21.60	4.320	1.080			
1,4-Dichlorobenzene		1.081	216.2	21.62	4.324	1.081			
sec-Butylbenzene		1.063	212.6	21.26	4.252	1.063			
p-Isopropyltoluene		1.042	208.4	20.84	4.168	1.042			
1,2,3-Trimethylbenzene		1.042	208.4	20.84	4.168	1.042			
1,2-Dichlorobenzene		1.089	217.8	21.78	4.356	1.089			
d-Limonene		1.010	202.0	20.20	4.040	1.010			
1,2-Dibromo-3-chloropropane		1.042	208.4	20.84	4.168	1.042			
n-Undecane		1.057	211.4	21.14	4.228	1.057			
1,1,2,4-Trichlorobenzene		1.064	212.8	21.28	4.256	1.064			
Naphthalene		1.025	205.0	20.50	4.100	1.025			
n-Dodecane		1.031	206.2	20.62	4.124	1.031			
Hexachloro-1,3-butadiene		1.053	210.6	21.06	4.212	1.053			
Methacrylonitrile		1.041	208.2	20.82	4.164	1.041			
Cyclohexanone		0.982	196.4	19.64	3.928	0.982			
tert-Butylbenzene		1.067	213.4	21.34	4.268	1.067			
n-Butylbenzene		1.064	212.8	21.28	4.256	1.064			

Working STD Conc.(ng/L): Injection (L): ICAL Points:	4		4		4		20		200		200		200				
	0.025	0.1ng	0.050	0.2ng	0.125	0.5ng	0.250	1ng	0.125	25ng	0.125	200	0.25	50ng	100ng	200	0.50
	0.1120	0.2240	0.2240	0.5600	1.120	5.600	1.120	5.600	28.000	28.000	56.00	112.0	56.00	112.0	112.0	112.0	112.0
	0.1060	0.2120	0.2120	0.5300	1.060	5.300	1.060	5.300	26.500	26.500	53.00	106.0	53.00	106.0	106.0	106.0	106.0
	0.1055	0.2110	0.2110	0.5275	1.055	5.275	1.055	5.275	26.375	26.375	52.75	105.5	52.75	105.5	105.5	105.5	105.5
	0.1076	0.2152	0.2152	0.5380	1.076	5.380	1.076	5.380	26.900	26.900	53.80	107.6	53.80	107.6	107.6	107.6	107.6
	0.1052	0.2104	0.2104	0.5260	1.052	5.260	1.052	5.260	26.300	26.300	52.60	105.2	52.60	105.2	105.2	105.2	105.2
	0.1074	0.2148	0.2148	0.5370	1.074	5.370	1.074	5.370	26.850	26.850	53.70	107.4	53.70	107.4	107.4	107.4	107.4
	0.1075	0.2150	0.2150	0.5375	1.075	5.375	1.075	5.375	26.875	26.875	53.75	107.5	53.75	107.5	107.5	107.5	107.5
	0.1076	0.2152	0.2152	0.5380	1.076	5.380	1.076	5.380	26.900	26.900	53.80	107.6	53.80	107.6	107.6	107.6	107.6
	0.1085	0.2170	0.2170	0.5425	1.085	5.425	1.085	5.425	27.125	27.125	54.25	108.5	54.25	108.5	108.5	108.5	108.5
	0.1076	0.2152	0.2152	0.5380	1.076	5.380	1.076	5.380	26.900	26.900	53.80	107.6	53.80	107.6	107.6	107.6	107.6
	0.1058	0.2116	0.2116	0.5290	1.058	5.290	1.058	5.290	26.450	26.450	52.90	105.8	52.90	105.8	105.8	105.8	105.8
	0.1066	0.2132	0.2132	0.5330	1.066	5.330	1.066	5.330	26.650	26.650	53.30	106.6	53.30	106.6	106.6	106.6	106.6
	0.1033	0.2066	0.2066	0.5165	1.033	5.165	1.033	5.165	25.825	25.825	51.65	103.3	51.65	103.3	103.3	103.3	103.3
	0.2123	0.4246	0.4246	1.0615	2.123	10.615	2.123	10.615	53.075	53.075	106.15	212.3	106.15	212.3	212.3	212.3	212.3
	0.1063	0.2126	0.2126	0.5315	1.063	5.315	1.063	5.315	26.575	26.575	53.15	106.3	53.15	106.3	106.3	106.3	106.3
	0.1060	0.2120	0.2120	0.5300	1.060	5.300	1.060	5.300	26.500	26.500	53.00	106.0	53.00	106.0	106.0	106.0	106.0
	0.1062	0.2124	0.2124	0.5310	1.062	5.310	1.062	5.310	26.550	26.550	53.10	106.2	53.10	106.2	106.2	106.2	106.2
	0.1071	0.2142	0.2142	0.5355	1.071	5.355	1.071	5.355	26.775	26.775	53.55	107.1	53.55	107.1	107.1	107.1	107.1
	0.1064	0.2128	0.2128	0.5320	1.064	5.320	1.064	5.320	26.600	26.600	53.20	106.4	53.20	106.4	106.4	106.4	106.4
	0.1057	0.2114	0.2114	0.5285	1.057	5.285	1.057	5.285	26.425	26.425	52.85	105.7	52.85	105.7	105.7	105.7	105.7
	0.1035	0.2070	0.2070	0.5175	1.035	5.175	1.035	5.175	25.875	25.875	51.75	103.5	51.75	103.5	103.5	103.5	103.5
	0.1076	0.2152	0.2152	0.5380	1.076	5.380	1.076	5.380	26.900	26.900	53.80	107.6	53.80	107.6	107.6	107.6	107.6
	0.1062	0.2124	0.2124	0.5310	1.062	5.310	1.062	5.310	26.550	26.550	53.10	106.2	53.10	106.2	106.2	106.2	106.2
	0.1061	0.2122	0.2122	0.5305	1.061	5.305	1.061	5.305	26.525	26.525	53.05	106.1	53.05	106.1	106.1	106.1	106.1
	0.1057	0.2114	0.2114	0.5285	1.057	5.285	1.057	5.285	26.425	26.425	52.85	105.7	52.85	105.7	105.7	105.7	105.7
	0.1058	0.2116	0.2116	0.5290	1.058	5.290	1.058	5.290	26.450	26.450	52.90	105.8	52.90	105.8	105.8	105.8	105.8
	0.1072	0.2144	0.2144	0.5360	1.072	5.360	1.072	5.360	26.800	26.800	53.60	107.2	53.60	107.2	107.2	107.2	107.2
	0.1068	0.2136	0.2136	0.5340	1.068	5.340	1.068	5.340	26.700	26.700	53.40	106.8	53.40	106.8	106.8	106.8	106.8
	0.1076	0.2152	0.2152	0.5380	1.076	5.380	1.076	5.380	26.900	26.900	53.80	107.6	53.80	107.6	107.6	107.6	107.6
	0.1051	0.2102	0.2102	0.5255	1.051	5.255	1.051	5.255	26.275	26.275	52.55	105.1	52.55	105.1	105.1	105.1	105.1
	0.1080	0.2160	0.2160	0.5400	1.080	5.400	1.080	5.400	27.000	27.000	54.00	108.0	54.00	108.0	108.0	108.0	108.0
	0.1081	0.2162	0.2162	0.5405	1.081	5.405	1.081	5.405	27.025	27.025	54.05	108.1	54.05	108.1	108.1	108.1	108.1
	0.1063	0.2126	0.2126	0.5315	1.063	5.315	1.063	5.315	26.575	26.575	53.15	106.3	53.15	106.3	106.3	106.3	106.3
	0.1042	0.2084	0.2084	0.5210	1.042	5.210	1.042	5.210	26.050	26.050	52.10	104.2	52.10	104.2	104.2	104.2	104.2
	0.1042	0.2084	0.2084	0.5210	1.042	5.210	1.042	5.210	26.050	26.050	52.10	104.2	52.10	104.2	104.2	104.2	104.2
	0.1089	0.2178	0.2178	0.5445	1.089	5.445	1.089	5.445	27.225	27.225	54.45	108.9	54.45	108.9	108.9	108.9	108.9
	0.1010	0.2020	0.2020	0.5050	1.010	5.050	1.010	5.050	25.250	25.250	50.50	101.0	50.50	101.0	101.0	101.0	101.0
	0.1042	0.2084	0.2084	0.5210	1.042	5.210	1.042	5.210	26.050	26.050	52.10	104.2	52.10	104.2	104.2	104.2	104.2
	0.1057	0.2114	0.2114	0.5285	1.057	5.285	1.057	5.285	26.425	26.425	52.85	105.7	52.85	105.7	105.7	105.7	105.7
	0.1064	0.2128	0.2128	0.5320	1.064	5.320	1.064	5.320	26.600	26.600	53.20	106.4	53.20	106.4	106.4	106.4	106.4
	0.1025	0.2050	0.2050	0.5125	1.025	5.125	1.025	5.125	25.625	25.625	51.25	102.5	51.25	102.5	102.5	102.5	102.5
	0.1031	0.2062	0.2062	0.5155	1.031	5.155	1.031	5.155	25.775	25.775	51						

Method : I:\MS16\METHODS\R16101918.M (RTE Integrator)
 Title : EPA T0-15 per SOP VOA-T015 (CASS T0-15/GC-MS)
 Last Update : Sat Oct 20 10:34:51 2018
 Response via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	0.1	0	13	I:\MS16\DATA\2018_10\19\10191816.D
2	0.2	0	13	I:\MS16\DATA\2018_10\19\10191817.D
3	0.5	1	13	I:\MS16\DATA\2018_10\19\10191818.D
4	1.0	1	13	I:\MS16\DATA\2018_10\19\10191819.D
5	5.0	5	13	I:\MS16\DATA\2018_10\19\10191820.D
6	25	26	13	I:\MS16\DATA\2018_10\19\10191821.D
7	50	52	13	I:\MS16\DATA\2018_10\19\10191822.D
8	100	103	13	I:\MS16\DATA\2018_10\19\10191823.D

#	ID	Update Time	Quant Time	Acquisition Time
1	0.1	Oct 20 10:22 2018	Oct 20 10:15 2018	19 Oct 2018 20:11
2	0.2	Oct 20 10:22 2018	Oct 20 10:15 2018	19 Oct 2018 20:45
3	0.5	Oct 20 10:22 2018	Oct 20 10:15 2018	19 Oct 2018 21:18
4	1.0	Oct 20 10:22 2018	Oct 20 10:15 2018	19 Oct 2018 21:52
5	5.0	Oct 20 10:23 2018	Oct 20 10:15 2018	19 Oct 2018 22:26
6	25	Oct 20 10:23 2018	Oct 20 10:14 2018	19 Oct 2018 22:59
7	50	Oct 20 10:23 2018	Oct 20 10:15 2018	19 Oct 2018 23:33
8	100	Oct 20 10:23 2018	Oct 20 10:15 2018	20 Oct 2018 00:06

R16101918.M

Sat Oct 20 11:02:20 2018

LH 10/20/18

Data File: I:\MS16\DATA\2018 10\19\10191816.D

Acq On : 19 Oct 2018 20:11

Operator: LH/TD

Sample : 0.1ng TO15 ICAL STD

Misc : S31-09141801/S31-10181802 (11/16)

ALS Vial : 6 Sample Multiplier: 1

Quant Time: Oct 20 10:15:10 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:14:30 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 10/20/18

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.31	130	259926	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.43	114	1100773	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.72	82	483658	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.16	65	394652	15.347	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	122.80%
57) Toluene-d8 (SS2)	15.87	98	968660	13.093	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	104.72%
73) Bromofluorobenzene (SS3)	19.09	174	432353	14.379	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	115.04%

Target Compounds

						Qvalue
2) Propene	4.09	42	2575	0.087	ng	93
3) Dichlorodifluoromethan...	4.25	85	6003	0.124	ng	95
4) Chloromethane	4.55	50	4035	0.111	ng	94
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	3469	0.124	ng	95
6) Vinyl Chloride	4.99	62	3888	0.102	ng	97
7) 1,3-Butadiene	5.27	54	2439	0.086	ng	# 86
8) Bromomethane	5.73	94	2218	0.086	ng	99
9) Chloroethane	6.07	64	1657	0.082	ng	80
10) Ethanol	6.45	45	7982	0.441	ng	90
11) Acetonitrile	6.76	41	4733	0.098	ng	96
12) Acrolein	6.93	56	1187	0.068	ng	92
13) Acetone	7.14	58	9971	0.490	ng	# 80
14) Trichlorofluoromethane	7.37	101	5012	0.120	ng	97
15) 2-Propanol (Isopropanol)	7.69	45	12423	0.199	ng	71
16) Acrylonitrile	7.95	53	2085	0.057	ng	97
17) 1,1-Dichloroethene	8.36	96	2557	0.094	ng	99
18) 2-Methyl-2-Propanol (t...	8.58	59	13308	0.214	ng	79
19) Methylene Chloride	8.57	84	2723	0.095	ng	97
20) 3-Chloro-1-propene (Al...	8.74	41	4162	0.118	ng	70
21) Trichlorotrifluoroethane	9.00	151	2728	0.108	ng	97
22) Carbon Disulfide	8.87	76	10195	0.097	ng	98
23) trans-1,2-Dichloroethene	9.87	61	3332	0.087	ng	99
24) 1,1-Dichloroethane	10.12	63	4376	0.093	ng	96
25) Methyl tert-Butyl Ether	10.24	73	7826	0.104	ng	97
26) Vinyl Acetate	10.38	86	2297	0.391	ng	# 34
27) 2-Butanone (MEK)	10.67	72	1240	0.066	ng	# 53
28) cis-1,2-Dichloroethene	11.14	61	3206	0.087	ng	100
29) Diisopropyl Ether	11.43	87	2558	0.114	ng	# 93
30) Ethyl Acetate	11.45	61	1470	0.151	ng	93
31) n-Hexane	11.42	57	4265	0.098	ng	98
32) Chloroform	11.48	83	4736	0.106	ng	96
34) Tetrahydrofuran (THF)	11.93	72	1733	0.092	ng	# 80
35) Ethyl tert-Butyl Ether	12.02	87	3232	0.104	ng	98
36) 1,2-Dichloroethane	12.29	62	3676	0.119	ng	97
38) 1,1,1-Trichloroethane	12.56	97	4640	0.126	ng	97
39) Isopropyl Acetate	12.99	61	2833	0.158	ng	# 52
40) 1-Butanol	13.06	56	2971	0.115	ng	92
41) Benzene	13.04	78	11323	0.098	ng	100
42) Carbon Tetrachloride	13.20	117	3923	0.116	ng	96
43) Cyclohexane	13.32	84	8341	0.199	ng	96
44) tert-Amyl Methyl Ether	13.68	73	7649	0.099	ng	# 73
45) 1,2-Dichloropropane	13.90	63	2369	0.087	ng	99
46) Bromodichloromethane	14.09	83	3824	0.113	ng	99
47) Trichloroethene	14.13	130	3141	0.101	ng	97
48) 1,4-Dioxane	14.14	88	1757	0.077	ng	99
49) 2,2,4-Trimethylpentane...	14.19	57	10681	0.093	ng	91

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Data File: I:\MS16\DATA\2018 10\19\10191816.D

Acq On : 19 Oct 2018 20:11

Operator: LH/TD

Sample : 0.1ng TO15 ICAL STD

Misc : S31-09141801/S31-10181802 (11/16)

ALS Vial : 6 Sample Multiplier: 1

Quant Time: Oct 20 10:15:10 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:14:30 2018

Response via : Initial Calibration

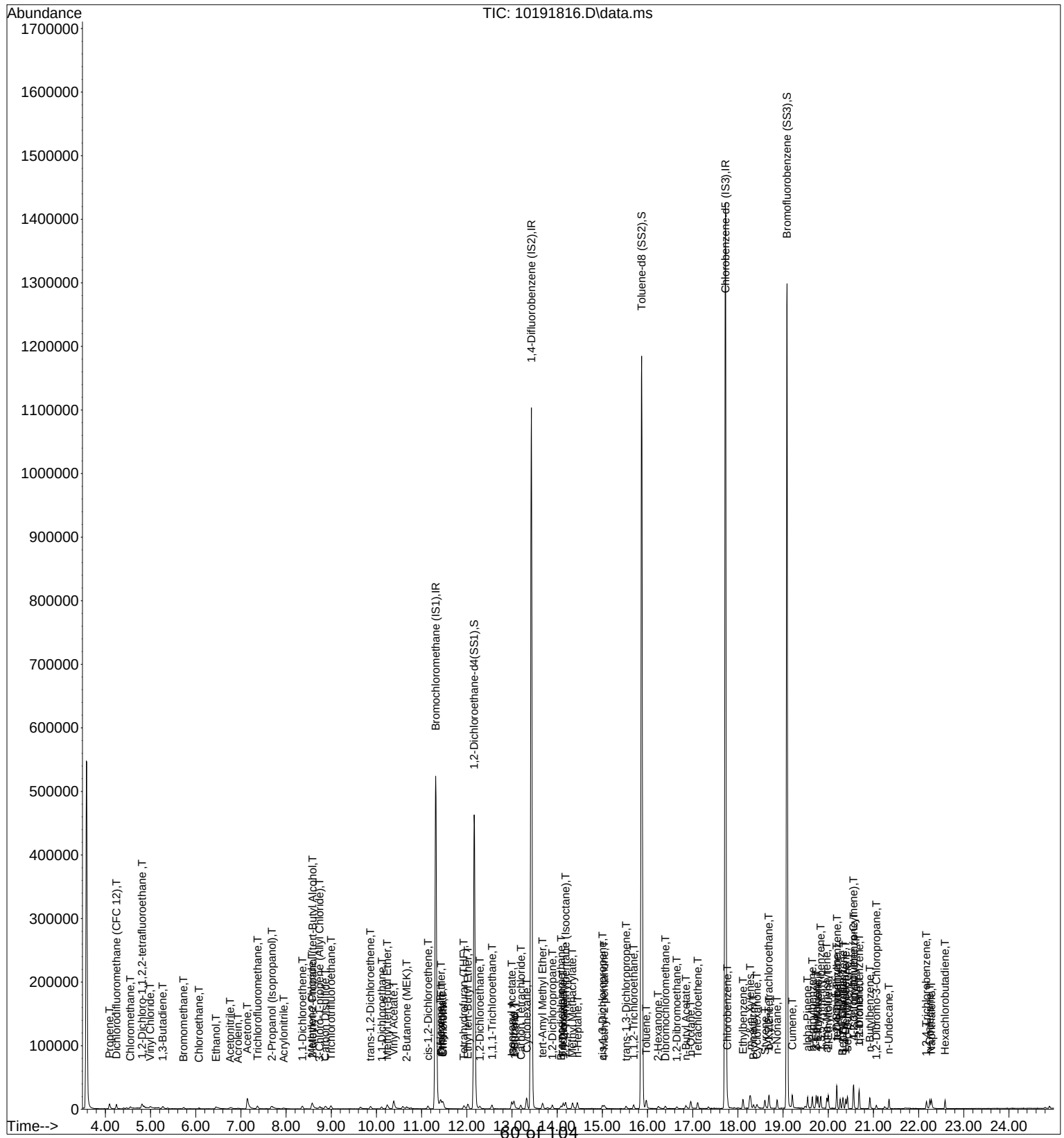
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.34	100	1862	0.162	ng	# 85
51) n-Heptane	14.45	71	2621	0.097	ng	94
52) cis-1,3-Dichloropropene	15.01	75	4237	0.099	ng	98
53) 4-Methyl-2-pentanone	15.04	58	1828	0.072	ng	# 58
54) trans-1,3-Dichloropropene	15.52	75	3183	0.085	ng	98
55) 1,1,2-Trichloroethane	15.69	97	2470	0.092	ng	94
58) Toluene	15.97	91	12432	0.098	ng	96
59) 2-Hexanone	16.23	43	6356	0.106	ng	# 65
60) Dibromochloromethane	16.39	129	3098	0.095	ng	99
61) 1,2-Dibromoethane	16.65	107	2953	0.091	ng	98
62) n-Butyl Acetate	16.85	43	6057	0.090	ng	86
63) n-Octane	16.96	57	3123	0.126	ng	# 74
64) Tetrachloroethene	17.11	166	3597	0.099	ng	97
65) Chlorobenzene	17.77	112	7946	0.096	ng	96
66) Ethylbenzene	18.11	91	13604	0.097	ng	95
67) m- & p-Xylenes	18.27	91	19254	0.185	ng	99
68) Bromoform	18.35	173	2526	0.088	ng	100
69) Styrene	18.60	104	7469	0.089	ng	96
70) o-Xylene	18.69	91	10213	0.097	ng	100
71) n-Nonane	18.87	43	4821	0.091	ng	90
72) 1,1,2,2-Tetrachloroethane	18.68	83	4563	0.089	ng	97
74) Cumene	19.20	105	13164	0.096	ng	90
75) alpha-Pinene	19.54	93	6492	0.092	ng	# 63
76) n-Propylbenzene	19.65	91	15744	0.098	ng	98
77) 3-Ethyltoluene	19.73	105	13494	0.099	ng	98
78) 4-Ethyltoluene	19.77	105	11376	0.090	ng	96
79) 1,3,5-Trimethylbenzene	19.84	105	11524	0.103	ng	100
80) alpha-Methylstyrene	19.97	118	5365	0.095	ng	93
81) 2-Ethyltoluene	20.00	105	14373	0.109	ng	92
82) 1,2,4-Trimethylbenzene	20.19	105	11372	0.105	ng	93
83) n-Decane	20.19	58	315	0.127	ng	# 24
84) Benzyl Chloride	20.31	91	7204	0.081	ng	89
85) 1,3-Dichlorobenzene	20.33	146	6709	0.099	ng	99
86) 1,4-Dichlorobenzene	20.39	146	7302	0.108	ng	94
87) sec-Butylbenzene	20.42	105	13710	0.092	ng	96
88) 4-Isopropyltoluene (p-...	20.56	119	13457	0.099	ng	96
89) 1,2,3-Trimethylbenzene	20.56	105	11024	0.102	ng	96
90) 1,2-Dichlorobenzene	20.69	146	6370	0.100	ng	99
91) d-Limonene	20.68	68	3402	0.083	ng	99
92) 1,2-Dibromo-3-Chloropr...	21.07	157	1996	0.086	ng	# 81
93) n-Undecane	21.34	57	5247	0.094	ng	91
94) 1,2,4-Trichlorobenzene	22.17	180	5176	0.118	ng	97
95) Naphthalene	22.28	128	16060	0.129	ng	94
96) n-Dodecane	22.25	57	4967	0.113	ng	90
97) Hexachlorobutadiene	22.58	225	3212	0.100	ng	99
98) Cyclohexanone	18.42	55	3189	0.074	ng	92
99) tert-Butylbenzene	20.19	119	10732	0.100	ng	98
100) n-Butylbenzene	20.92	91	10935	0.094	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\2018 10\19\10191817.D

Acq On : 19 Oct 2018 20:45

Operator: LH/TD

Sample : 0.2ng TO15 ICAL STD

Misc : S31-09141801/S31-10181802 (11/16)

ALS Vial : 6 Sample Multiplier: 1

Quant Time: Oct 20 10:15:13 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:14:30 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 10/20/18

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.31	130	257161	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.43	114	1084550	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.72	82	477241	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.16	65	387674	15.238	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	121.92%
57) Toluene-d8 (SS2)	15.87	98	961586	13.172	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	105.36%
73) Bromofluorobenzene (SS3)	19.09	174	430660	14.515	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	116.08%

Target Compounds

						Qvalue
2) Propene	4.08	42	4487	0.153	ng	93
3) Dichlorodifluoromethan...	4.23	85	11073	0.232	ng	99
4) Chloromethane	4.54	50	7536	0.210	ng	95
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	6390	0.231	ng	97
6) Vinyl Chloride	4.98	62	7446	0.198	ng	98
7) 1,3-Butadiene	5.26	54	4654	0.167	ng	# 88
8) Bromomethane	5.71	94	4227	0.166	ng	98
9) Chloroethane	6.06	64	3142	0.157	ng	93
10) Ethanol	6.42	45	13922	0.778	ng	93
11) Acetonitrile	6.74	41	7985	0.167	ng	98
12) Acrolein	6.93	56	2246	0.130	ng	95
13) Acetone	7.12	58	17943	0.892	ng	# 84
14) Trichlorofluoromethane	7.36	101	9551	0.231	ng	99
15) 2-Propanol (Isopropanol)	7.65	45	22819	0.369	ng	82
16) Acrylonitrile	7.92	53	4620	0.129	ng	93
17) 1,1-Dichloroethene	8.35	96	4982	0.185	ng	95
18) 2-Methyl-2-Propanol (t...	8.56	59	25037	0.406	ng	92
19) Methylene Chloride	8.57	84	4960	0.175	ng	100
20) 3-Chloro-1-propene (Al...	8.74	41	5940	0.170	ng	90
21) Trichlorotrifluoroethane	8.99	151	4959	0.198	ng	95
22) Carbon Disulfide	8.86	76	17898	0.172	ng	98
23) trans-1,2-Dichloroethene	9.87	61	6160	0.163	ng	100
24) 1,1-Dichloroethane	10.11	63	7869	0.169	ng	99
25) Methyl tert-Butyl Ether	10.23	73	15191	0.205	ng	100
26) Vinyl Acetate	10.37	86	4664	0.802	ng	# 48
27) 2-Butanone (MEK)	10.65	72	2517	0.134	ng	# 84
28) cis-1,2-Dichloroethene	11.14	61	6253	0.171	ng	98
29) Diisopropyl Ether	11.42	87	4772	0.216	ng	# 84
30) Ethyl Acetate	11.45	61	2903	0.302	ng	99
31) n-Hexane	11.41	57	7761	0.180	ng	97
32) Chloroform	11.48	83	8960	0.203	ng	99
34) Tetrahydrofuran (THF)	11.93	72	3056	0.164	ng	# 91
35) Ethyl tert-Butyl Ether	12.02	87	5844	0.190	ng	95
36) 1,2-Dichloroethane	12.29	62	6800	0.223	ng	99
38) 1,1,1-Trichloroethane	12.55	97	8414	0.232	ng	99
39) Isopropyl Acetate	12.99	61	5697	0.322	ng	# 87
40) 1-Butanol	13.04	56	5712	0.224	ng	84
41) Benzene	13.04	78	19779	0.174	ng	100
42) Carbon Tetrachloride	13.19	117	7359	0.222	ng	98
43) Cyclohexane	13.32	84	15105	0.365	ng	97
44) tert-Amyl Methyl Ether	13.67	73	13643	0.180	ng	87
45) 1,2-Dichloropropane	13.89	63	4577	0.170	ng	93
46) Bromodichloromethane	14.08	83	6782	0.203	ng	98
47) Trichloroethene	14.13	130	5792	0.189	ng	99
48) 1,4-Dioxane	14.13	88	3376	0.150	ng	95
49) 2,2,4-Trimethylpentane...	14.19	57	19399	0.171	ng	90

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Data File: I:\MS16\DATA\2018 10\19\10191817.D

Acq On : 19 Oct 2018 20:45

Operator: LH/TD

Sample : 0.2ng TO15 ICAL STD

Misc : S31-09141801/S31-10181802 (11/16)

ALS Vial : 6 Sample Multiplier: 1

Quant Time: Oct 20 10:15:13 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:14:30 2018

Response via : Initial Calibration

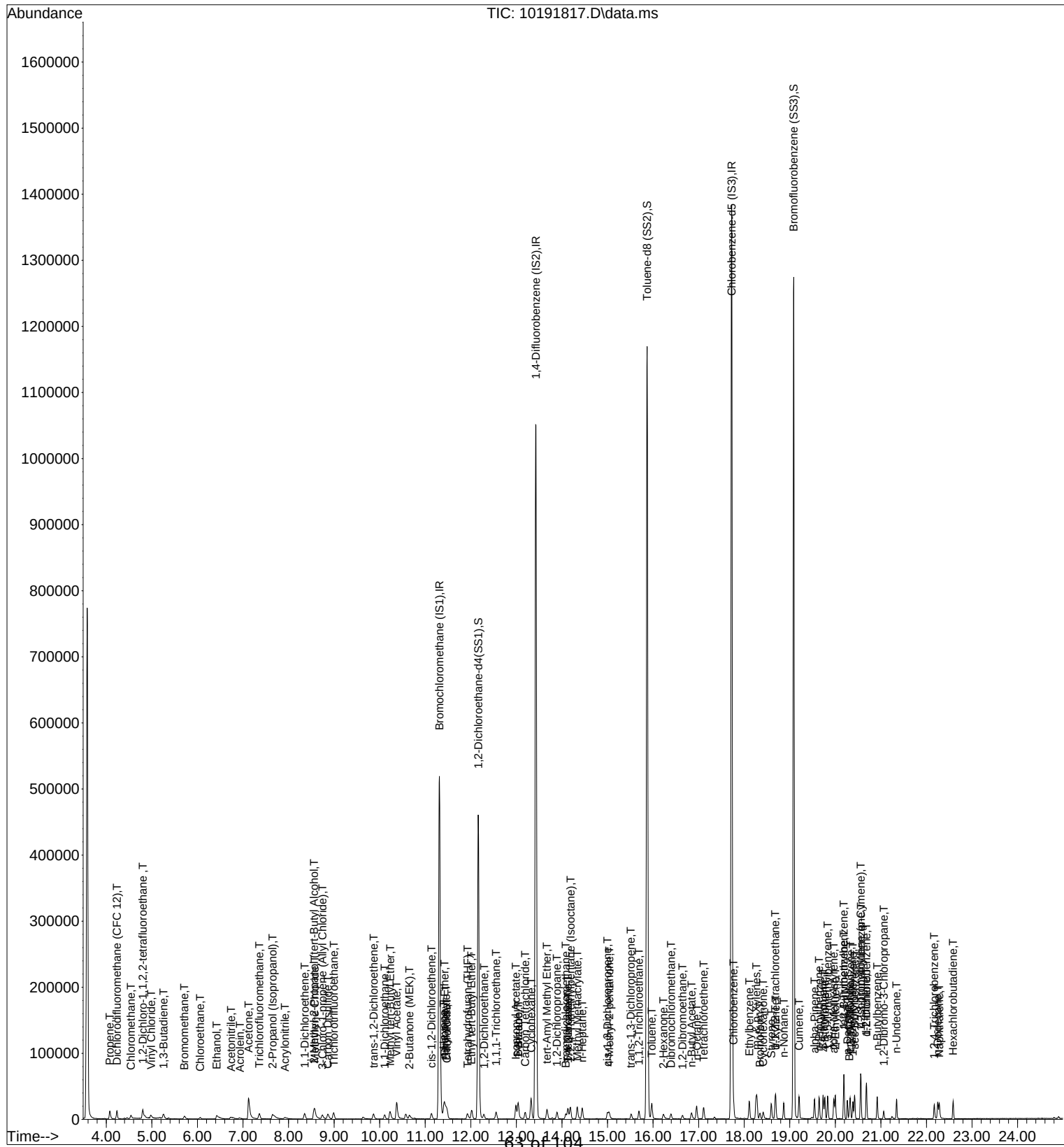
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.34	100	3658	0.323	ng	# 87
51) n-Heptane	14.45	71	4815	0.181	ng	98
52) cis-1,3-Dichloropropene	15.00	75	7493	0.177	ng	99
53) 4-Methyl-2-pentanone	15.04	58	3729	0.148	ng	# 73
54) trans-1,3-Dichloropropene	15.51	75	6026	0.163	ng	99
55) 1,1,2-Trichloroethane	15.69	97	4775	0.181	ng	100
58) Toluene	15.97	91	22567	0.181	ng	95
59) 2-Hexanone	16.23	43	8234	0.139	ng	100
60) Dibromochloromethane	16.39	129	5960	0.184	ng	96
61) 1,2-Dibromoethane	16.65	107	5470	0.171	ng	99
62) n-Butyl Acetate	16.84	43	10357	0.156	ng	95
63) n-Octane	16.96	57	4085	0.167	ng	93
64) Tetrachloroethene	17.11	166	6498	0.181	ng	99
65) Chlorobenzene	17.76	112	14677	0.180	ng	99
66) Ethylbenzene	18.11	91	23522	0.170	ng	98
67) m- & p-Xylenes	18.27	91	35704	0.349	ng	97
68) Bromoform	18.35	173	4824	0.170	ng	99
69) Styrene	18.59	104	13627	0.165	ng	99
70) o-Xylene	18.69	91	18107	0.175	ng	97
71) n-Nonane	18.87	43	8903	0.170	ng	91
72) 1,1,2,2-Tetrachloroethane	18.68	83	8288	0.163	ng	100
74) Cumene	19.20	105	24744	0.183	ng	98
75) alpha-Pinene	19.54	93	11525	0.165	ng	81
76) n-Propylbenzene	19.64	91	27347	0.173	ng	99
77) 3-Ethyltoluene	19.73	105	24845	0.184	ng	99
78) 4-Ethyltoluene	19.77	105	20021	0.161	ng	99
79) 1,3,5-Trimethylbenzene	19.83	105	20283	0.184	ng	93
80) alpha-Methylstyrene	19.97	118	9729	0.174	ng	96
81) 2-Ethyltoluene	20.00	105	23246	0.179	ng	97
82) 1,2,4-Trimethylbenzene	20.19	105	19075	0.178	ng	99
83) n-Decane	20.26	58	362	0.147	ng	# 89
84) Benzyl Chloride	20.31	91	12102	0.139	ng	94
85) 1,3-Dichlorobenzene	20.33	146	11577	0.174	ng	97
86) 1,4-Dichlorobenzene	20.39	146	12078	0.181	ng	100
87) sec-Butylbenzene	20.42	105	25369	0.172	ng	97
88) 4-Isopropyltoluene (p-...	20.56	119	23853	0.177	ng	97
89) 1,2,3-Trimethylbenzene	20.56	105	19232	0.181	ng	97
90) 1,2-Dichlorobenzene	20.68	146	11296	0.181	ng	99
91) d-Limonene	20.68	68	6157	0.152	ng	97
92) 1,2-Dibromo-3-Chloropr...	21.06	157	3578	0.156	ng	# 82
93) n-Undecane	21.34	57	9077	0.165	ng	96
94) 1,2,4-Trichlorobenzene	22.17	180	8672	0.200	ng	99
95) Naphthalene	22.28	128	26249	0.213	ng	95
96) n-Dodecane	22.25	57	8516	0.196	ng	94
97) Hexachlorobutadiene	22.58	225	5767	0.182	ng	96
98) Cyclohexanone	18.42	55	5431	0.127	ng	95
99) tert-Butylbenzene	20.19	119	19200	0.181	ng	99
100) n-Butylbenzene	20.92	91	19566	0.171	ng	96

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

ALS Vial : 6 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS16\DATA\2018 10\19\10191818.D

Acq On : 19 Oct 2018 21:18

Operator: LH/TD

Sample : 0.5ng TO15 ICAL STD

Misc : S31-09141801/S31-10181802 (11/16)

ALS Vial : 6 Sample Multiplier: 1

Quant Time: Oct 20 10:15:16 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

LH 10/20/18

QLast Update : Sat Oct 20 10:14:30 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.32	130	225635	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.43	114	973886	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.72	82	429711	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.16	65	347374	15.561	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	124.48%
57) Toluene-d8 (SS2)	15.87	98	859289	13.073	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	104.56%
73) Bromofluorobenzene (SS3)	19.09	174	387238	14.495	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	116.00%

Target Compounds

						Qvalue
2) Propene	4.08	42	10541	0.410	ng	99
3) Dichlorodifluoromethan...	4.24	85	25510	0.608	ng	100
4) Chloromethane	4.54	50	16734	0.532	ng	97
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	14808	0.609	ng	99
6) Vinyl Chloride	4.98	62	17732	0.536	ng	99
7) 1,3-Butadiene	5.26	54	10262	0.419	ng	95
8) Bromomethane	5.71	94	10153	0.453	ng	98
9) Chloroethane	6.06	64	6983	0.397	ng	97
10) Ethanol	6.42	45	29635	1.887	ng	96
11) Acetonitrile	6.73	41	17102	0.409	ng	94
12) Acrolein	6.92	56	5787	0.381	ng	99
13) Acetone	7.12	58	40735	2.308	ng	86
14) Trichlorofluoromethane	7.36	101	22609	0.622	ng	99
15) 2-Propanol (Isopropanol)	7.63	45	53151	0.980	ng	89
16) Acrylonitrile	7.91	53	11644	0.370	ng	97
17) 1,1-Dichloroethene	8.36	96	11055	0.468	ng	97
18) 2-Methyl-2-Propanol (t...	8.54	59	57832	1.069	ng	95
19) Methylene Chloride	8.57	84	11356	0.456	ng	99
20) 3-Chloro-1-propene (Al...	8.74	41	13258	0.431	ng	94
21) Trichlorotrifluoroethane	9.00	151	11866	0.539	ng	98
22) Carbon Disulfide	8.86	76	40904	0.447	ng	98
23) trans-1,2-Dichloroethene	9.87	61	15175	0.456	ng	99
24) 1,1-Dichloroethane	10.11	63	18533	0.454	ng	100
25) Methyl tert-Butyl Ether	10.22	73	35015	0.538	ng	100
26) Vinyl Acetate	10.37	86	11599	2.273	ng	# 64
27) 2-Butanone (MEK)	10.65	72	6589	0.401	ng	# 90
28) cis-1,2-Dichloroethene	11.14	61	14946	0.466	ng	98
29) Diisopropyl Ether	11.43	87	9698	0.500	ng	# 93
30) Ethyl Acetate	11.44	61	7230	0.858	ng	98
31) n-Hexane	11.41	57	17684	0.467	ng	98
32) Chloroform	11.48	83	21257	0.550	ng	100
34) Tetrahydrofuran (THF)	11.91	72	7135	0.438	ng	96
35) Ethyl tert-Butyl Ether	12.02	87	13660	0.505	ng	96
36) 1,2-Dichloroethane	12.29	62	15847	0.592	ng	99
38) 1,1,1-Trichloroethane	12.56	97	19675	0.603	ng	99
39) Isopropyl Acetate	12.98	61	13719	0.863	ng	# 96
40) 1-Butanol	13.03	56	14427	0.630	ng	# 76
41) Benzene	13.04	78	44790	0.438	ng	99
42) Carbon Tetrachloride	13.20	117	16951	0.569	ng	98
43) Cyclohexane	13.32	84	35112	0.946	ng	97
44) tert-Amyl Methyl Ether	13.67	73	32334	0.475	ng	94
45) 1,2-Dichloropropane	13.89	63	10588	0.439	ng	99
46) Bromodichloromethane	14.09	83	16335	0.545	ng	99
47) Trichloroethene	14.13	130	13518	0.491	ng	98
48) 1,4-Dioxane	14.12	88	8034	0.398	ng	93
49) 2,2,4-Trimethylpentane...	14.19	57	43919	0.432	ng	95

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Data File: I:\MS16\DATA\2018 10\19\10191818.D

Acq On : 19 Oct 2018 21:18

Operator: LH/TD

Sample : 0.5ng TO15 ICAL STD

Misc : S31-09141801/S31-10181802 (11/16)

ALS Vial : 6 Sample Multiplier: 1

Quant Time: Oct 20 10:15:16 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:14:30 2018

Response via : Initial Calibration

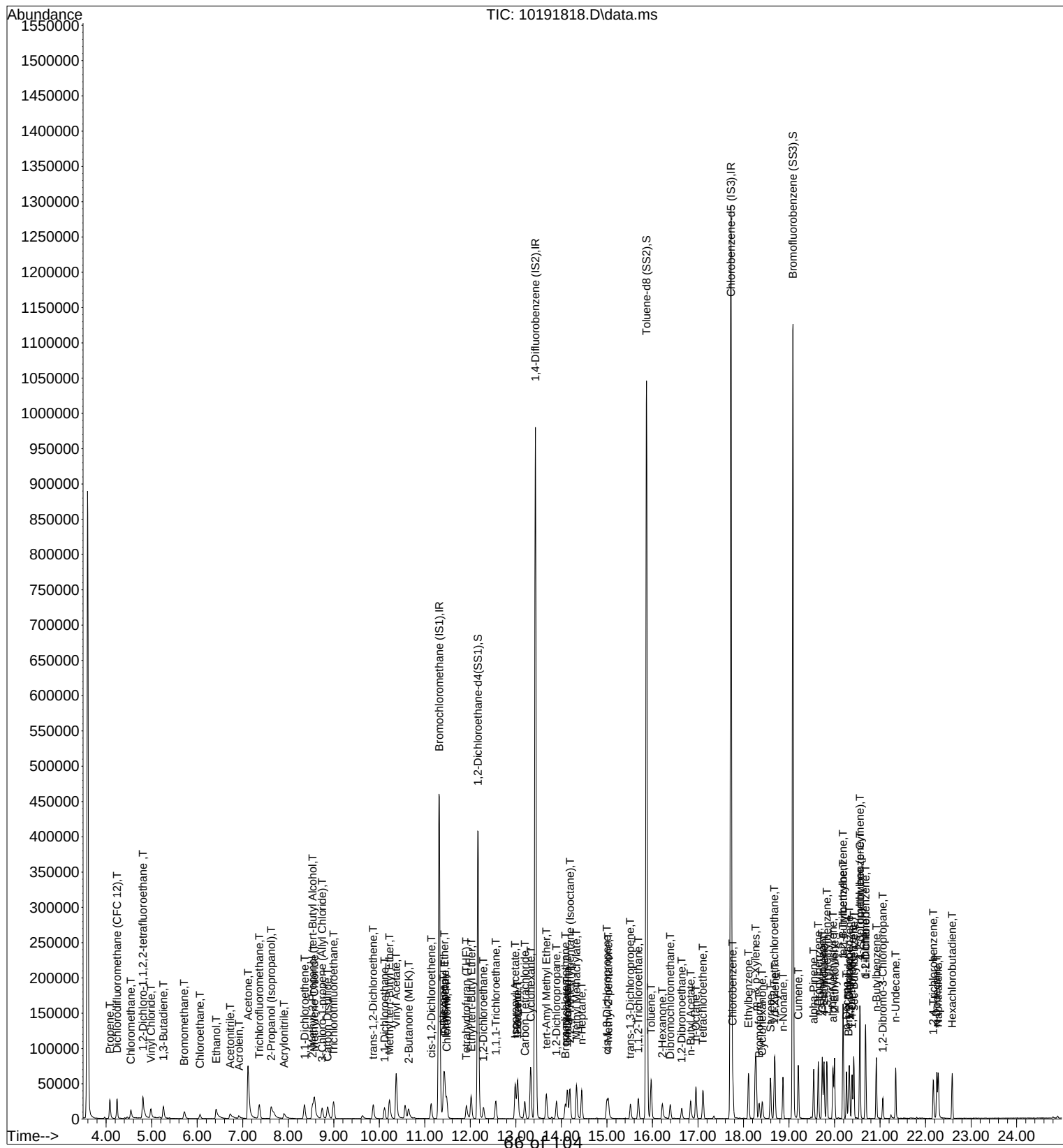
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.33	100	9281	0.912	ng	98
51) n-Heptane	14.45	71	10836	0.453	ng	97
52) cis-1,3-Dichloropropene	15.00	75	18237	0.481	ng	98
53) 4-Methyl-2-pentanone	15.03	58	8918	0.395	ng	81
54) trans-1,3-Dichloropropene	15.51	75	14670	0.442	ng	98
55) 1,1,2-Trichloroethane	15.69	97	11444	0.482	ng	99
58) Toluene	15.97	91	50062	0.445	ng	99
59) 2-Hexanone	16.22	43	22684	0.424	ng	90
60) Dibromochloromethane	16.39	129	13871	0.476	ng	97
61) 1,2-Dibromoethane	16.64	107	13196	0.459	ng	99
62) n-Butyl Acetate	16.84	43	23614	0.396	ng	99
63) n-Octane	16.95	57	9031	0.410	ng	97
64) Tetrachloroethene	17.11	166	15226	0.470	ng	98
65) Chlorobenzene	17.76	112	33049	0.449	ng	100
66) Ethylbenzene	18.11	91	53687	0.432	ng	99
67) m- & p-Xylenes	18.27	91	83480	0.905	ng	98
68) Bromoform	18.35	173	11745	0.459	ng	99
69) Styrene	18.59	104	31949	0.428	ng	99
70) o-Xylene	18.69	91	41839	0.449	ng	98
71) n-Nonane	18.87	43	20160	0.427	ng	93
72) 1,1,2,2-Tetrachloroethane	18.68	83	19807	0.433	ng	98
74) Cumene	19.20	105	55328	0.453	ng	98
75) alpha-Pinene	19.54	93	27411	0.436	ng	91
76) n-Propylbenzene	19.64	91	63970	0.449	ng	98
77) 3-Ethyltoluene	19.73	105	52839	0.435	ng	99
78) 4-Ethyltoluene	19.77	105	51597	0.460	ng	98
79) 1,3,5-Trimethylbenzene	19.83	105	45663	0.460	ng	98
80) alpha-Methylstyrene	19.97	118	23857	0.473	ng	98
81) 2-Ethyltoluene	20.00	105	53837	0.460	ng	98
82) 1,2,4-Trimethylbenzene	20.19	105	45011	0.466	ng	99
83) n-Decane	20.26	58	875	0.396	ng	# 94
84) Benzyl Chloride	20.31	91	29371	0.374	ng	95
85) 1,3-Dichlorobenzene	20.32	146	27996	0.467	ng	98
86) 1,4-Dichlorobenzene	20.39	146	27951	0.464	ng	99
87) sec-Butylbenzene	20.42	105	59665	0.448	ng	98
88) 4-Isopropyltoluene (p-...	20.56	119	55732	0.459	ng	97
89) 1,2,3-Trimethylbenzene	20.56	105	43842	0.459	ng	99
90) 1,2-Dichlorobenzene	20.68	146	26449	0.470	ng	100
91) d-Limonene	20.68	68	15317	0.421	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.06	157	8712	0.422	ng	86
93) n-Undecane	21.34	57	21430	0.432	ng	96
94) 1,2,4-Trichlorobenzene	22.17	180	19639	0.503	ng	98
95) Naphthalene	22.28	128	60589	0.547	ng	98
96) n-Dodecane	22.24	57	20181	0.515	ng	95
97) Hexachlorobutadiene	22.59	225	13910	0.489	ng	99
98) Cyclohexanone	18.41	55	11901	0.309	ng	96
99) tert-Butylbenzene	20.19	119	44776	0.470	ng	98
100) n-Butylbenzene	20.92	91	46601	0.451	ng	97

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

ALS Vial : 6 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS16\DATA\2018 10\19\10191819.D

Acq On : 19 Oct 2018 21:52

Operator: LH/TD

Sample : 1.0ng TO15 ICAL STD

Misc : S31-09141801/S31-10181801 (11/16)

ALS Vial : 6 Sample Multiplier: 1

Quant Time: Oct 20 10:15:19 2018

Quant Method : I:\MS16\METHODS\R16101918.M

LH 10/20/18

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

QLast Update : Sat Oct 20 10:14:30 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.31	130	224987	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.43	114	965252	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.72	82	426875	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.17	65	343361	15.426	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	123.44%
57) Toluene-d8 (SS2)	15.87	98	852640	13.058	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	104.48%
73) Bromofluorobenzene (SS3)	19.09	174	385450	14.524	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	116.16%

Target Compounds

						Qvalue
2) Propene	4.06	42	21283	0.831	ng	99
3) Dichlorodifluoromethan...	4.22	85	48499	1.159	ng	99
4) Chloromethane	4.53	50	29457	0.938	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	28994	1.197	ng	100
6) Vinyl Chloride	4.96	62	34476	1.046	ng	100
7) 1,3-Butadiene	5.24	54	20758	0.850	ng	96
8) Bromomethane	5.70	94	19671	0.881	ng	100
9) Chloroethane	6.04	64	14325	0.817	ng	96
10) Ethanol	6.40	45	56772	3.625	ng	99
11) Acetonitrile	6.70	41	31490	0.755	ng	100
12) Acrolein	6.90	56	11132	0.735	ng	100
13) Acetone	7.10	58	77729	4.416	ng	86
14) Trichlorofluoromethane	7.35	101	43352	1.196	ng	100
15) 2-Propanol (Isopropanol)	7.61	45	97012	1.793	ng	91
16) Acrylonitrile	7.89	53	22976	0.732	ng	98
17) 1,1-Dichloroethene	8.35	96	21529	0.914	ng	97
18) 2-Methyl-2-Propanol (t...	8.51	59	110398	2.047	ng	96
19) Methylene Chloride	8.57	84	21669	0.872	ng	97
20) 3-Chloro-1-propene (Al...	8.73	41	25573	0.834	ng	95
21) Trichlorotrifluoroethane	8.99	151	23091	1.051	ng	99
22) Carbon Disulfide	8.85	76	78459	0.861	ng	99
23) trans-1,2-Dichloroethene	9.86	61	29899	0.902	ng	98
24) 1,1-Dichloroethane	10.11	63	35845	0.881	ng	100
25) Methyl tert-Butyl Ether	10.21	73	67748	1.043	ng	99
26) Vinyl Acetate	10.37	86	22653	4.451	ng	# 69
27) 2-Butanone (MEK)	10.63	72	13467	0.822	ng	95
28) cis-1,2-Dichloroethene	11.14	61	29329	0.918	ng	98
29) Diisopropyl Ether	11.42	87	18522	0.957	ng	# 90
30) Ethyl Acetate	11.44	61	14844	1.767	ng	99
31) n-Hexane	11.41	57	34290	0.908	ng	100
32) Chloroform	11.48	83	40401	1.048	ng	100
34) Tetrahydrofuran (THF)	11.90	72	13703	0.843	ng	97
35) Ethyl tert-Butyl Ether	12.01	87	26527	0.984	ng	95
36) 1,2-Dichloroethane	12.29	62	30947	1.159	ng	99
38) 1,1,1-Trichloroethane	12.56	97	38172	1.181	ng	99
39) Isopropyl Acetate	12.98	61	26073	1.655	ng	# 92
40) 1-Butanol	13.02	56	29513	1.301	ng	# 75
41) Benzene	13.04	78	84925	0.838	ng	100
42) Carbon Tetrachloride	13.19	117	33183	1.123	ng	99
43) Cyclohexane	13.32	84	67512	1.835	ng	98
44) tert-Amyl Methyl Ether	13.67	73	62277	0.924	ng	97
45) 1,2-Dichloropropane	13.89	63	20805	0.870	ng	98
46) Bromodichloromethane	14.08	83	31050	1.045	ng	99
47) Trichloroethene	14.13	130	26317	0.965	ng	99
48) 1,4-Dioxane	14.12	88	16159	0.807	ng	97
49) 2,2,4-Trimethylpentane...	14.19	57	83311	0.827	ng	97

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Data File: I:\MS16\DATA\2018 10\19\10191819.D

Acq On : 19 Oct 2018 21:52

Operator: LH/TD

Sample : 1.0ng TO15 ICAL STD

Misc : S31-09141801/S31-10181801 (11/16)

ALS Vial : 6 Sample Multiplier: 1

Quant Time: Oct 20 10:15:19 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:14:30 2018

Response via : Initial Calibration

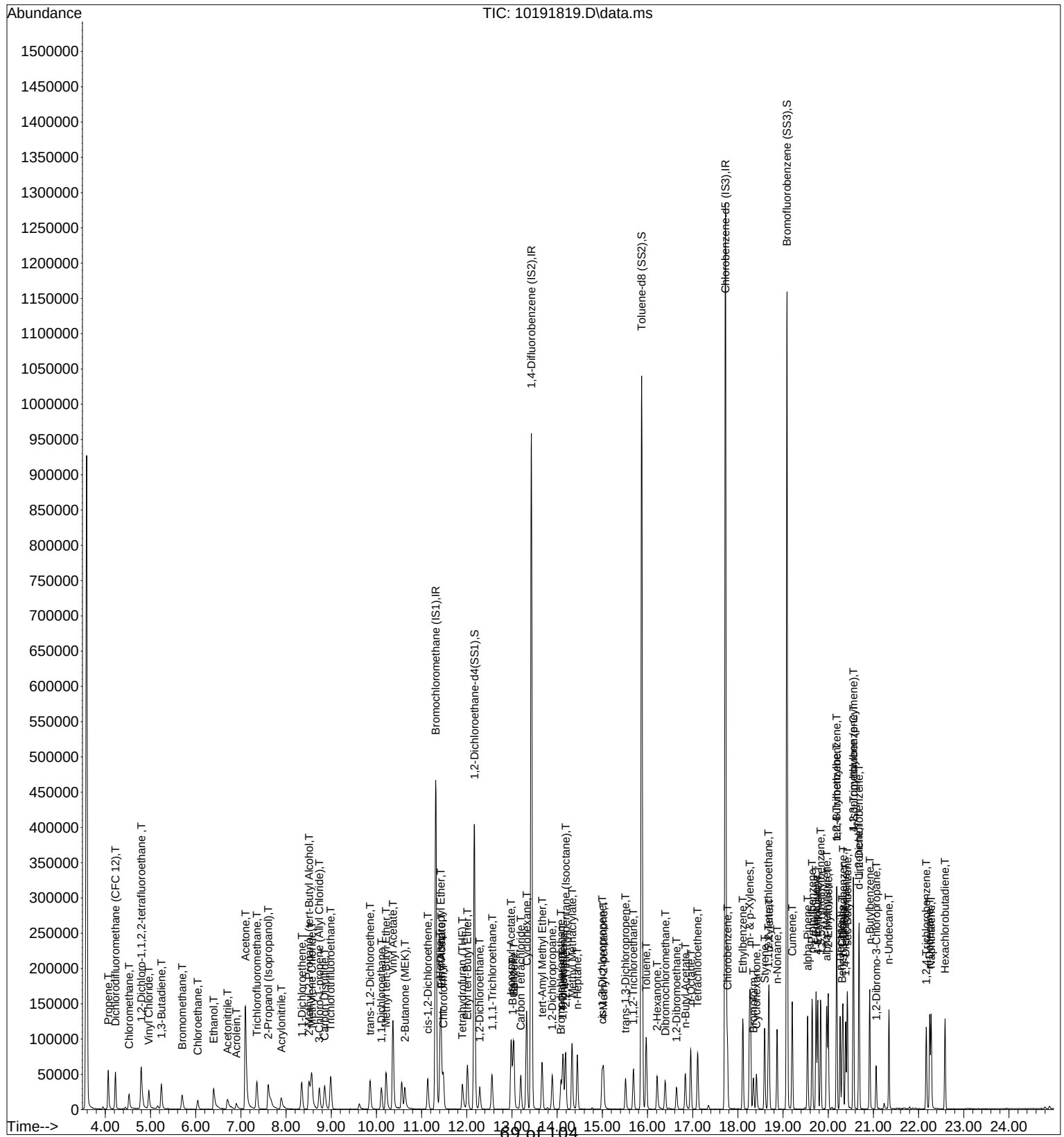
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.33	100	18333	1.818	ng	97
51) n-Heptane	14.45	71	21058	0.888	ng	99
52) cis-1,3-Dichloropropene	15.00	75	35947	0.957	ng	98
53) 4-Methyl-2-pentanone	15.02	58	17931	0.802	ng	89
54) trans-1,3-Dichloropropene	15.51	75	29427	0.894	ng	99
55) 1,1,2-Trichloroethane	15.68	97	22263	0.946	ng	100
58) Toluene	15.97	91	95872	0.858	ng	99
59) 2-Hexanone	16.21	43	43507	0.819	ng	93
60) Dibromochloromethane	16.39	129	27643	0.956	ng	99
61) 1,2-Dibromoethane	16.64	107	25890	0.906	ng	99
62) n-Butyl Acetate	16.84	43	48116	0.813	ng	97
63) n-Octane	16.96	57	17310	0.792	ng	98
64) Tetrachloroethene	17.11	166	29202	0.908	ng	100
65) Chlorobenzene	17.77	112	64179	0.878	ng	100
66) Ethylbenzene	18.11	91	104622	0.847	ng	98
67) m- & p-Xylenes	18.26	91	162352	1.772	ng	98
68) Bromoform	18.35	173	23860	0.939	ng	99
69) Styrene	18.59	104	63992	0.864	ng	99
70) o-Xylene	18.69	91	81354	0.879	ng	99
71) n-Nonane	18.87	43	38738	0.825	ng	95
72) 1,1,2,2-Tetrachloroethane	18.68	83	39068	0.861	ng	99
74) Cumene	19.20	105	105998	0.875	ng	98
75) alpha-Pinene	19.54	93	53269	0.854	ng	94
76) n-Propylbenzene	19.64	91	125025	0.884	ng	98
77) 3-Ethyltoluene	19.73	105	103817	0.861	ng	99
78) 4-Ethyltoluene	19.77	105	100902	0.905	ng	98
79) 1,3,5-Trimethylbenzene	19.83	105	87207	0.885	ng	98
80) alpha-Methylstyrene	19.97	118	47279	0.945	ng	99
81) 2-Ethyltoluene	20.00	105	104889	0.903	ng	97
82) 1,2,4-Trimethylbenzene	20.19	105	87919	0.917	ng	99
83) n-Decane	20.26	58	1906	0.868	ng	# 85
84) Benzyl Chloride	20.31	91	60859	0.779	ng	97
85) 1,3-Dichlorobenzene	20.32	146	54578	0.917	ng	100
86) 1,4-Dichlorobenzene	20.39	146	55188	0.922	ng	100
87) sec-Butylbenzene	20.42	105	117383	0.888	ng	98
88) 4-Isopropyltoluene (p-...	20.56	119	109563	0.909	ng	98
89) 1,2,3-Trimethylbenzene	20.56	105	86602	0.912	ng	100
90) 1,2-Dichlorobenzene	20.68	146	52570	0.939	ng	100
91) d-Limonene	20.68	68	30347	0.840	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.06	157	18306	0.893	ng	93
93) n-Undecane	21.34	57	40281	0.818	ng	99
94) 1,2,4-Trichlorobenzene	22.17	180	40089	1.034	ng	99
95) Naphthalene	22.28	128	119229	1.083	ng	99
96) n-Dodecane	22.24	57	39563	1.015	ng	98
97) Hexachlorobutadiene	22.59	225	27131	0.959	ng	100
98) Cyclohexanone	18.41	55	22989	0.601	ng	97
99) tert-Butylbenzene	20.19	119	87695	0.927	ng	98
100) n-Butylbenzene	20.92	91	91546	0.892	ng	98

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

ALS Vial : 6 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS16\DATA\2018 10\19\10191820.D

Acq On : 19 Oct 2018 22:26

Operator: LH/TD

Sample : 5.0ng TO15 ICAL STD

Misc : S31-09141801/S31-10181801 (11/16)

ALS Vial : 7 Sample Multiplier: 1

Quant Time: Oct 20 10:15:22 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

LH 10/20/18

QLast Update : Sat Oct 20 10:14:30 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.32	130	226819	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.43	114	957857	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.72	82	421774	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.17	65	342140	15.247	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	122.00%
57) Toluene-d8 (SS2)	15.87	98	839917	13.018	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	104.16%
73) Bromofluorobenzene (SS3)	19.09	174	388522	14.817	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	118.56%

Target Compounds

						Qvalue
2) Propene	4.05	42	101200	3.919	ng	100
3) Dichlorodifluoromethan...	4.22	85	247896	5.878	ng	100
4) Chloromethane	4.52	50	159178	5.030	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.79	135	144746	5.925	ng	99
6) Vinyl Chloride	4.96	62	175036	5.268	ng	100
7) 1,3-Butadiene	5.24	54	110093	4.473	ng	98
8) Bromomethane	5.70	94	100678	4.470	ng	100
9) Chloroethane	6.04	64	72520	4.102	ng	99
10) Ethanol	6.41	45	283980	17.986	ng	100
11) Acetonitrile	6.69	41	152420	3.625	ng	100
12) Acrolein	6.89	56	57894	3.793	ng	99
13) Acetone	7.09	58	370672	20.891	ng	87
14) Trichlorofluoromethane	7.35	101	218077	5.970	ng	100
15) 2-Propanol (Isopropanol)	7.60	45	491389	9.010	ng	98
16) Acrylonitrile	7.89	53	121955	3.854	ng	99
17) 1,1-Dichloroethene	8.35	96	111254	4.686	ng	99
18) 2-Methyl-2-Propanol (t...	8.50	59	577334	10.617	ng	98
19) Methylene Chloride	8.57	84	111943	4.468	ng	100
20) 3-Chloro-1-propene (Al...	8.74	41	131587	4.259	ng	99
21) Trichlorotrifluoroethane	8.99	151	116399	5.257	ng	99
22) Carbon Disulfide	8.85	76	395407	4.302	ng	100
23) trans-1,2-Dichloroethene	9.86	61	154571	4.623	ng	100
24) 1,1-Dichloroethane	10.12	63	183544	4.476	ng	100
25) Methyl tert-Butyl Ether	10.21	73	341288	5.213	ng	100
26) Vinyl Acetate	10.37	86	131530	25.636	ng	# 78
27) 2-Butanone (MEK)	10.62	72	70732	4.283	ng	96
28) cis-1,2-Dichloroethene	11.14	61	150735	4.679	ng	99
29) Diisopropyl Ether	11.42	87	93397	4.787	ng	# 89
30) Ethyl Acetate	11.43	61	78309	9.247	ng	99
31) n-Hexane	11.41	57	169215	4.446	ng	100
32) Chloroform	11.48	83	207535	5.341	ng	100
34) Tetrahydrofuran (THF)	11.89	72	70225	4.284	ng	99
35) Ethyl tert-Butyl Ether	12.01	87	137443	5.060	ng	98
36) 1,2-Dichloroethane	12.29	62	158384	5.882	ng	100
38) 1,1,1-Trichloroethane	12.56	97	193828	6.043	ng	100
39) Isopropyl Acetate	12.98	61	136171	8.709	ng	# 97
40) 1-Butanol	13.00	56	153865	6.836	ng	# 78
41) Benzene	13.04	78	433586	4.313	ng	100
42) Carbon Tetrachloride	13.20	117	172504	5.886	ng	100
43) Cyclohexane	13.32	84	344832	9.447	ng	99
44) tert-Amyl Methyl Ether	13.67	73	319579	4.777	ng	98
45) 1,2-Dichloropropane	13.89	63	103285	4.351	ng	100
46) Bromodichloromethane	14.08	83	164399	5.578	ng	99
47) Trichloroethene	14.13	130	134864	4.985	ng	99
48) 1,4-Dioxane	14.11	88	82830	4.170	ng	99
49) 2,2,4-Trimethylpentane...	14.19	57	422546	4.229	ng	99

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Data File: I:\MS16\DATA\2018 10\19\10191820.D

Acq On : 19 Oct 2018 22:26

Operator: LH/TD

Sample : 5.0ng TO15 ICAL STD

Misc : S31-09141801/S31-10181801 (11/16)

ALS Vial : 7 Sample Multiplier: 1

Quant Time: Oct 20 10:15:22 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:14:30 2018

Response via : Initial Calibration

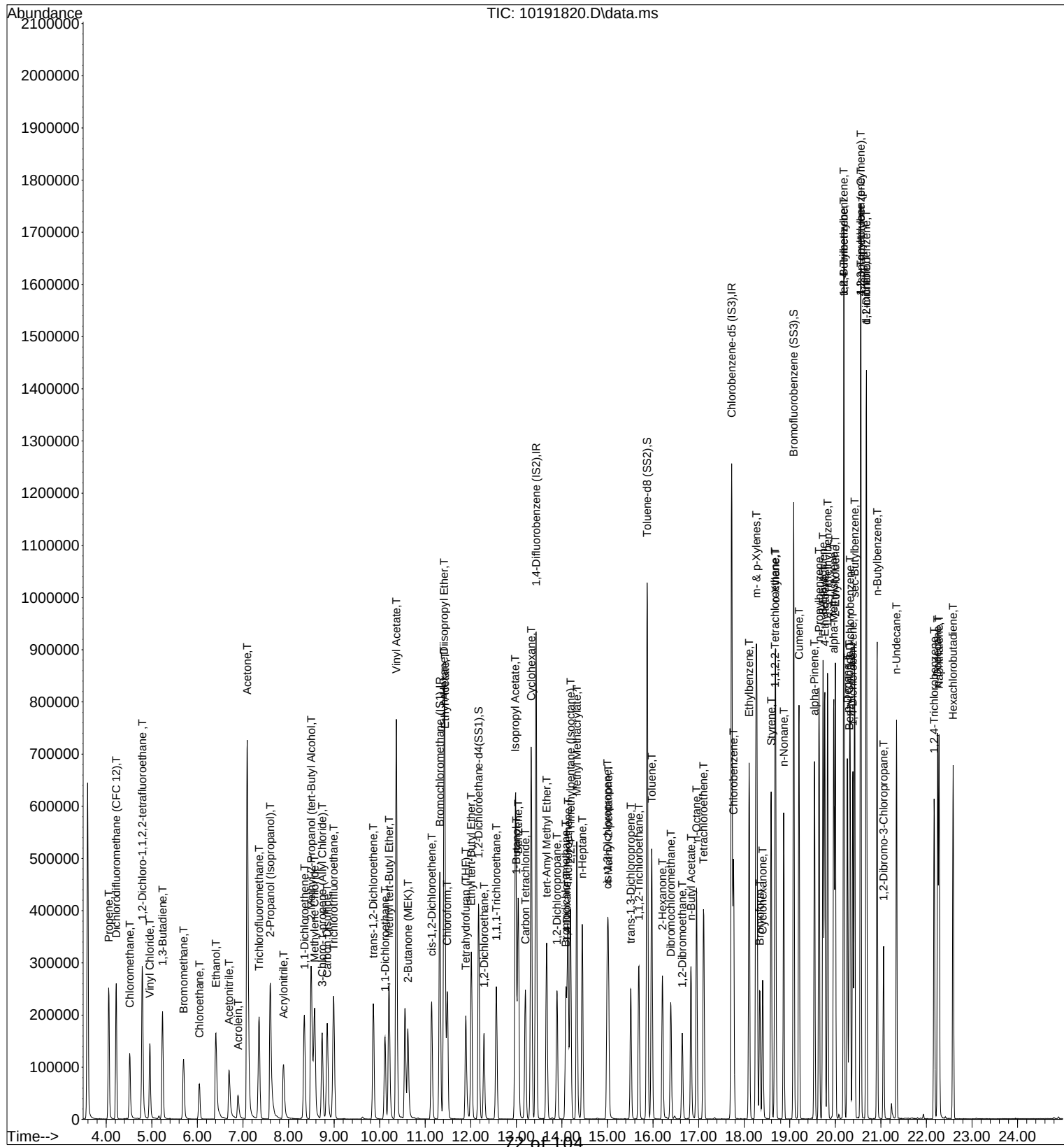
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.33	100	98071	9.799	ng	99
51) n-Heptane	14.45	71	105087	4.468	ng	99
52) cis-1,3-Dichloropropene	15.00	75	192165	5.153	ng	99
53) 4-Methyl-2-pentanone	15.02	58	95813	4.318	ng	94
54) trans-1,3-Dichloropropene	15.51	75	164963	5.049	ng	100
55) 1,1,2-Trichloroethane	15.69	97	114546	4.905	ng	99
58) Toluene	15.97	91	469105	4.249	ng	99
59) 2-Hexanone	16.21	43	223802	4.266	ng	97
60) Dibromochloromethane	16.39	129	148692	5.203	ng	99
61) 1,2-Dibromoethane	16.64	107	136852	4.846	ng	100
62) n-Butyl Acetate	16.83	43	255653	4.370	ng	98
63) n-Octane	16.95	57	85876	3.977	ng	99
64) Tetrachloroethene	17.11	166	149468	4.701	ng	100
65) Chlorobenzene	17.77	112	328197	4.546	ng	99
66) Ethylbenzene	18.11	91	538985	4.419	ng	99
67) m- & p-Xylenes	18.27	91	839857	9.278	ng	99
68) Bromoform	18.35	173	133090	5.301	ng	100
69) Styrene	18.59	104	343621	4.695	ng	100
70) o-Xylene	18.69	91	427551	4.676	ng	98
71) n-Nonane	18.87	43	195891	4.223	ng	97
72) 1,1,2,2-Tetrachloroethane	18.68	83	206226	4.597	ng	100
74) Cumene	19.20	105	555278	4.637	ng	98
75) alpha-Pinene	19.54	93	281568	4.566	ng	99
76) n-Propylbenzene	19.64	91	656340	4.697	ng	98
77) 3-Ethyltoluene	19.73	105	549817	4.615	ng	99
78) 4-Ethyltoluene	19.77	105	531428	4.827	ng	98
79) 1,3,5-Trimethylbenzene	19.83	105	458454	4.710	ng	99
80) alpha-Methylstyrene	19.97	118	256718	5.191	ng	92
81) 2-Ethyltoluene	20.00	105	553107	4.817	ng	98
82) 1,2,4-Trimethylbenzene	20.19	105	476729	5.032	ng	100
83) n-Decane	20.26	58	9501	4.380	ng	98
84) Benzyl Chloride	20.31	91	361699	4.688	ng	98
85) 1,3-Dichlorobenzene	20.32	146	292124	4.966	ng	100
86) 1,4-Dichlorobenzene	20.39	146	289746	4.900	ng	100
87) sec-Butylbenzene	20.42	105	620406	4.748	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	589834	4.954	ng	99
89) 1,2,3-Trimethylbenzene	20.56	105	468540	4.994	ng	99
90) 1,2-Dichlorobenzene	20.68	146	283167	5.122	ng	100
91) d-Limonene	20.68	68	166646	4.669	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.06	157	100340	4.951	ng	94
93) n-Undecane	21.34	57	221545	4.551	ng	98
94) 1,2,4-Trichlorobenzene	22.17	180	207115	5.405	ng	100
95) Naphthalene	22.28	128	613466	5.638	ng	100
96) n-Dodecane	22.24	57	212577	5.522	ng	98
97) Hexachlorobutadiene	22.58	225	142390	5.095	ng	100
98) Cyclohexanone	18.41	55	117911	3.122	ng	98
99) tert-Butylbenzene	20.19	119	468803	5.014	ng	99
100) n-Butylbenzene	20.92	91	494995	4.881	ng	98

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

Operator: LH/TD

DataAcq Meth:T015.M



Data File: I:\MS16\DATA\2018 10\19\10191821.D

Acq On : 19 Oct 2018 22:59

Operator: LH/TD

Sample : 25ng TO15 ICAL STD

Misc : S31-09141801/S31-10181803 (11/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 20 10:14:38 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

LH 10/20/18

QLast Update : Sat Oct 20 10:14:30 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.33	130	236491	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.44	114	984745	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.72	82	436280	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.18	65	353620	15.114	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	120.88%
57) Toluene-d8 (SS2)	15.88	98	864756	12.958	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.68%
73) Bromofluorobenzene (SS3)	19.09	174	402742	14.848	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	118.80%

Target Compounds

						Qvalue
2) Propene	4.04	42	528292	19.621	ng	100
3) Dichlorodifluoromethan...	4.21	85	1288786	29.308	ng	100
4) Chloromethane	4.51	50	820237	24.858	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.78	135	754602	29.626	ng	100
6) Vinyl Chloride	4.95	62	915784	26.435	ng	100
7) 1,3-Butadiene	5.24	54	610474	23.787	ng	100
8) Bromomethane	5.70	94	539427	22.972	ng	100
9) Chloroethane	6.04	64	382854	20.770	ng	100
10) Ethanol	6.45	45	1859869	112.977	ng	100
11) Acetonitrile	6.71	41	887674	20.247	ng	100
12) Acrolein	6.90	56	323640	20.338	ng	100
13) Acetone	7.11	58	2159165	116.712	ng	100
14) Trichlorofluoromethane	7.36	101	1142096	29.988	ng	100
15) 2-Propanol (Isopropanol)	7.62	45	2798694	49.220	ng	100
16) Acrylonitrile	7.91	53	702475	21.291	ng	100
17) 1,1-Dichloroethene	8.35	96	600788	24.271	ng	100
18) 2-Methyl-2-Propanol (t...	8.52	59	3097346	54.632	ng	100
19) Methylene Chloride	8.59	84	600009	22.968	ng	100
20) 3-Chloro-1-propene (Al...	8.75	41	734021	22.786	ng	100
21) Trichlorotrifluoroethane	8.99	151	618215	26.777	ng	100
22) Carbon Disulfide	8.85	76	2153481	22.472	ng	100
23) trans-1,2-Dichloroethene	9.87	61	836865	24.008	ng	100
24) 1,1-Dichloroethane	10.13	63	973880	22.777	ng	100
25) Methyl tert-Butyl Ether	10.21	73	1796784	26.324	ng	100
26) Vinyl Acetate	10.38	86	833062	155.730	ng	100
27) 2-Butanone (MEK)	10.62	72	405773	23.568	ng	100
28) cis-1,2-Dichloroethene	11.15	61	808819	24.081	ng	100
29) Diisopropyl Ether	11.42	87	529934	26.053	ng	100
30) Ethyl Acetate	11.44	61	457145	51.775	ng	100
31) n-Hexane	11.42	57	920145	23.187	ng	100
32) Chloroform	11.50	83	1101034	27.176	ng	100
34) Tetrahydrofuran (THF)	11.89	72	388004	22.703	ng	100
35) Ethyl tert-Butyl Ether	12.02	87	743580	26.253	ng	100
36) 1,2-Dichloroethane	12.30	62	844764	30.091	ng	100
38) 1,1,1-Trichloroethane	12.57	97	1030406	31.250	ng	100
39) Isopropyl Acetate	12.98	61	765017	47.594	ng	# 100
40) 1-Butanol	13.01	56	1156629	49.986	ng	100
41) Benzene	13.04	78	2372887	22.961	ng	100
42) Carbon Tetrachloride	13.20	117	941774	31.255	ng	100
43) Cyclohexane	13.33	84	1904101	50.738	ng	100
44) tert-Amyl Methyl Ether	13.67	73	1738536	25.279	ng	100
45) 1,2-Dichloropropane	13.90	63	551771	22.611	ng	100
46) Bromodichloromethane	14.09	83	896844	29.599	ng	100
47) Trichloroethene	14.14	130	737904	26.533	ng	100
48) 1,4-Dioxane	14.11	88	525147	25.716	ng	100
49) 2,2,4-Trimethylpentane...	14.19	57	2240836	21.813	ng	100

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Data File: I:\MS16\DATA\2018 10\19\10191821.D

Acq On : 19 Oct 2018 22:59

Operator: LH/TD

Sample : 25ng TO15 ICAL STD

Misc : S31-09141801/S31-10181803 (11/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 20 10:14:38 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:14:30 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.33	100	559191	54.350	ng	100
51) n-Heptane	14.45	71	552088	22.831	ng	100
52) cis-1,3-Dichloropropene	15.00	75	1089189	28.412	ng	100
53) 4-Methyl-2-pentanone	15.02	58	536960	23.536	ng	100
54) trans-1,3-Dichloropropene	15.51	75	952693	28.362	ng	100
55) 1,1,2-Trichloroethane	15.69	97	618290	25.751	ng	100
58) Toluene	15.97	91	2519980	22.066	ng	100
59) 2-Hexanone	16.21	43	1259865	23.219	ng	100
60) Dibromochloromethane	16.39	129	830592	28.099	ng	100
61) 1,2-Dibromoethane	16.64	107	752663	25.767	ng	100
62) n-Butyl Acetate	16.83	43	1401583	23.161	ng	100
63) n-Octane	16.96	57	468102	20.957	ng	100
64) Tetrachloroethene	17.11	166	816673	24.834	ng	100
65) Chlorobenzene	17.77	112	1815558	24.313	ng	100
66) Ethylbenzene	18.11	91	2986106	23.667	ng	100
67) m- & p-Xylenes	18.27	91	4779224	51.041	ng	100
68) Bromoform	18.35	173	779955	30.032	ng	100
69) Styrene	18.59	104	1986077	26.233	ng	100
70) o-Xylene	18.69	91	2397334	25.348	ng	100
71) n-Nonane	18.87	43	1060273	22.097	ng	100
72) 1,1,2,2-Tetrachloroethane	18.68	83	1178785	25.405	ng	100
74) Cumene	19.20	105	3098104	25.011	ng	100
75) alpha-Pinene	19.54	93	1586985	24.880	ng	100
76) n-Propylbenzene	19.64	91	3698063	25.583	ng	100
77) 3-Ethyltoluene	19.73	105	3354023	27.216	ng	100
78) 4-Ethyltoluene	19.77	105	2842235	24.956	ng	100
79) 1,3,5-Trimethylbenzene	19.84	105	2614484	25.965	ng	100
80) alpha-Methylstyrene	19.97	118	1499551	29.313	ng	100
81) 2-Ethyltoluene	20.00	105	3122893	26.294	ng	100
82) 1,2,4-Trimethylbenzene	20.19	105	2812912	28.706	ng	100
83) n-Decane	20.26	58	54927	24.481	ng	100
84) Benzyl Chloride	20.31	91	2399563	30.064	ng	100
85) 1,3-Dichlorobenzene	20.33	146	1692519	27.817	ng	100
86) 1,4-Dichlorobenzene	20.39	146	1660530	27.148	ng	100
87) sec-Butylbenzene	20.42	105	3453453	25.552	ng	100
88) 4-Isopropyltoluene (p-...	20.56	119	3427419	27.829	ng	100
89) 1,2,3-Trimethylbenzene	20.56	105	2739799	28.231	ng	100
90) 1,2-Dichlorobenzene	20.68	146	1675558	29.298	ng	100
91) d-Limonene	20.68	68	993867	26.921	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.06	157	599025	28.577	ng	100
93) n-Undecane	21.34	57	1231359	24.454	ng	100
94) 1,2,4-Trichlorobenzene	22.17	180	1230879	31.052	ng	100
95) Naphthalene	22.28	128	3684023	32.730	ng	100
96) n-Dodecane	22.24	57	1024742	25.734	ng	100
97) Hexachlorobutadiene	22.58	225	815847	28.223	ng	100
98) Cyclohexanone	18.41	55	809597	20.723	ng	100
99) tert-Butylbenzene	20.19	119	2724476	28.168	ng	100
100) n-Butylbenzene	20.92	91	2770522	26.412	ng	100

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

Data File: I:\MS16\DATA\2018 10\19\10191821.D

Acq On : 19 Oct 2018 22:59

Operator: LH/TD

Sample : 25ng TO15 ICAL STD

Misc : S31-09141801/S31-10181803 (11/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 20 10:14:38 2018

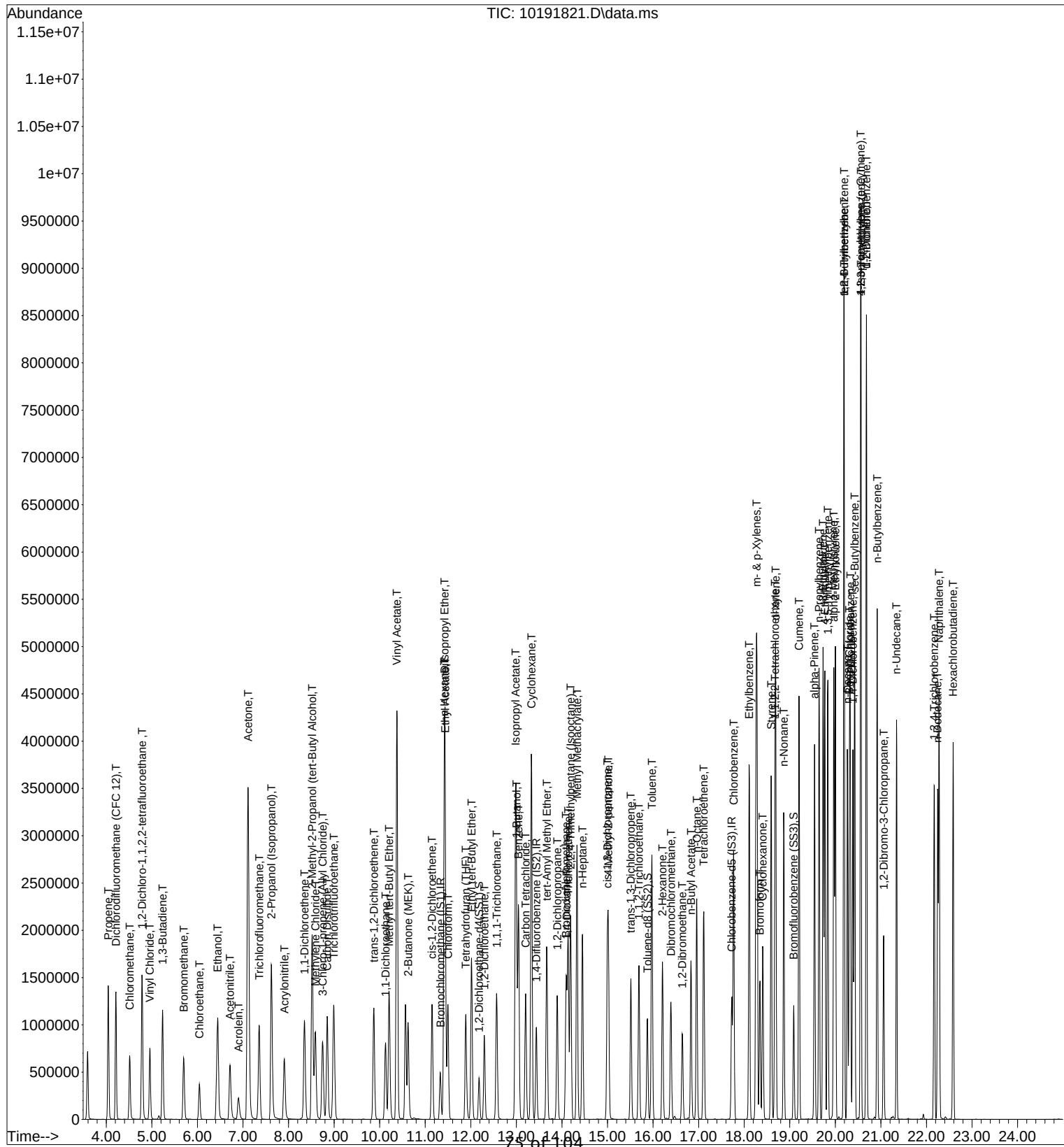
Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:14:30 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



7501104

Data File: I:\MS16\DATA\2018 10\19\10191822.D

Acq On : 19 Oct 2018 23:33

Operator: LH/TD

Sample : 50ng TO15 ICAL STD

Misc : S31-09141801/S31-10181803 (11/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 20 10:15:25 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

LH 10/20/18

QLast Update : Sat Oct 20 10:14:30 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.33	130	240049	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.44	114	1001501	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.72	82	447467	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.19	65	355974	14.989	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	119.92%
57) Toluene-d8 (SS2)	15.88	98	880215	12.860	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.88%
73) Bromofluorobenzene (SS3)	19.09	174	401063	14.417	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	115.36%

Target Compounds

						Qvalue
2) Propene	4.04	42	1191112	43.583	ng	98
3) Dichlorodifluoromethan...	4.21	85	2590877	58.045	ng	100
4) Chloromethane	4.52	50	1531165	45.715	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.78	135	1515692	58.624	ng	100
6) Vinyl Chloride	4.95	62	1848024	52.554	ng	100
7) 1,3-Butadiene	5.24	54	1284454	49.306	ng	98
8) Bromomethane	5.70	94	1097170	46.032	ng	100
9) Chloroethane	6.04	64	780919	41.738	ng	100
10) Ethanol	6.47	45	3917825	234.460	ng	100
11) Acetonitrile	6.73	41	1829720	41.116	ng	100
12) Acrolein	6.91	56	674020	41.730	ng	100
13) Acetone	7.13	58	4576836	243.730	ng	86
14) Trichlorofluoromethane	7.36	101	2305432	59.637	ng	100
15) 2-Propanol (Isopropanol)	7.64	45	5345877	92.623	ng	99
16) Acrylonitrile	7.92	53	1446547	43.192	ng	100
17) 1,1-Dichloroethene	8.35	96	1223157	48.681	ng	98
18) 2-Methyl-2-Propanol (t...	8.53	59	6137194	106.645	ng	99
19) Methylene Chloride	8.60	84	1223896	46.156	ng	98
20) 3-Chloro-1-propene (Al...	8.75	41	1494802	45.716	ng	99
21) Trichlorotrifluoroethane	9.00	151	1244462	53.102	ng	100
22) Carbon Disulfide	8.85	76	4334007	44.556	ng	100
23) trans-1,2-Dichloroethene	9.88	61	1689769	47.758	ng	99
24) 1,1-Dichloroethane	10.14	63	1955840	45.065	ng	100
25) Methyl tert-Butyl Ether	10.21	73	3643238	52.585	ng	100
26) Vinyl Acetate	10.39	86	1772269	326.392	ng	# 76
27) 2-Butanone (MEK)	10.63	72	841599	48.157	ng	96
28) cis-1,2-Dichloroethene	11.15	61	1630004	47.811	ng	99
29) Diisopropyl Ether	11.43	87	1146198	55.515	ng	# 86
30) Ethyl Acetate	11.44	61	994233	110.936	ng	100
31) n-Hexane	11.42	57	1991768	49.448	ng	100
32) Chloroform	11.50	83	2199586	53.487	ng	100
34) Tetrahydrofuran (THF)	11.89	72	793155	45.722	ng	99
35) Ethyl tert-Butyl Ether	12.02	87	1547723	53.834	ng	98
36) 1,2-Dichloroethane	12.30	62	1684165	59.101	ng	100
38) 1,1,1-Trichloroethane	12.57	97	2075687	61.897	ng	99
39) Isopropyl Acetate	12.98	61	1668417	102.061	ng	# 84
40) 1-Butanol	13.02	56	2502875	106.356	ng	92
41) Benzene	13.05	78	4982920	47.410	ng	100
42) Carbon Tetrachloride	13.20	117	1909836	62.322	ng	100
43) Cyclohexane	13.34	84	4013488	105.157	ng	99
44) tert-Amyl Methyl Ether	13.67	73	3580625	51.192	ng	99
45) 1,2-Dichloropropane	13.90	63	1127756	45.441	ng	100
46) Bromodichloromethane	14.09	83	1834387	59.529	ng	100
47) Trichloroethene	14.14	130	1526858	53.983	ng	100
48) 1,4-Dioxane	14.11	88	1097257	52.834	ng	100
49) 2,2,4-Trimethylpentane...	14.19	57	4567940	43.722	ng	99

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Data File: I:\MS16\DATA\2018 10\19\10191822.D

Acq On : 19 Oct 2018 23:33

Operator: LH/TD

Sample : 50ng TO15 ICAL STD

Misc : S31-09141801/S31-10181803 (11/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 20 10:15:25 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:14:30 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.33	100	1191885	113.906	ng	99
51) n-Heptane	14.45	71	1168666	47.521	ng	100
52) cis-1,3-Dichloropropene	15.00	75	2267485	58.159	ng	100
53) 4-Methyl-2-pentanone	15.02	58	1114134	48.018	ng	96
54) trans-1,3-Dichloropropene	15.51	75	1974033	57.785	ng	99
55) 1,1,2-Trichloroethane	15.69	97	1262893	51.718	ng	100
58) Toluene	15.98	91	5201961	44.411	ng	99
59) 2-Hexanone	16.21	43	2553328	45.880	ng	97
60) Dibromochloromethane	16.39	129	1724151	56.869	ng	100
61) 1,2-Dibromoethane	16.65	107	1528059	51.005	ng	100
62) n-Butyl Acetate	16.83	43	2813756	45.335	ng	97
63) n-Octane	16.96	57	986237	43.049	ng	99
64) Tetrachloroethene	17.11	166	1672972	49.601	ng	100
65) Chlorobenzene	17.77	112	3767816	49.194	ng	100
66) Ethylbenzene	18.11	91	6144899	47.484	ng	98
67) m- & p-Xylenes	18.27	91	9787049	101.910	ng	99
68) Bromoform	18.35	173	1597899	59.988	ng	100
69) Styrene	18.59	104	4101831	52.824	ng	100
70) o-Xylene	18.69	91	4898413	50.498	ng	98
71) n-Nonane	18.87	43	2152007	43.729	ng	96
72) 1,1,2,2-Tetrachloroethane	18.68	83	2424655	50.949	ng	100
74) Cumene	19.20	105	6333539	49.852	ng	99
75) alpha-Pinene	19.54	93	3349302	51.197	ng	98
76) n-Propylbenzene	19.64	91	7425623	50.086	ng	99
77) 3-Ethyltoluene	19.73	105	6691946	52.943	ng	99
78) 4-Ethyltoluene	19.77	105	5867912	50.235	ng	99
79) 1,3,5-Trimethylbenzene	19.84	105	5311879	51.434	ng	99
80) alpha-Methylstyrene	19.97	118	3104005	59.160	ng	99
81) 2-Ethyltoluene	20.00	105	6303781	51.750	ng	99
82) 1,2,4-Trimethylbenzene	20.19	105	5390369	53.633	ng	100
83) n-Decane	20.27	58	114276	49.659	ng	97
84) Benzyl Chloride	20.31	91	4988481	60.938	ng	99
85) 1,3-Dichlorobenzene	20.33	146	3441743	55.152	ng	100
86) 1,4-Dichlorobenzene	20.39	146	3408689	54.335	ng	100
87) sec-Butylbenzene	20.42	105	6905092	49.813	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	6362366	50.367	ng	99
89) 1,2,3-Trimethylbenzene	20.56	105	5237795	52.622	ng	99
90) 1,2-Dichlorobenzene	20.69	146	3289758	56.085	ng	100
91) d-Limonene	20.68	68	1975759	52.179	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.06	157	1231729	57.291	ng	96
93) n-Undecane	21.34	57	2570415	49.772	ng	99
94) 1,2,4-Trichlorobenzene	22.17	180	2591008	63.731	ng	100
95) Naphthalene	22.28	128	7555463	65.446	ng	99
96) n-Dodecane	22.24	57	2206985	54.037	ng	99
97) Hexachlorobutadiene	22.58	225	1699618	57.325	ng	100
98) Cyclohexanone	18.41	55	1642693	40.996	ng	98
99) tert-Butylbenzene	20.19	119	5164894	52.065	ng	99
100) n-Butylbenzene	20.92	91	5542287	51.514	ng	99

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

Data File: I:\MS16\DATA\2018 10\19\10191822.D

Acq On : 19 Oct 2018 23:33

Operator: LH/TD

Sample : 50ng TO15 ICAL STD

Misc : S31-09141801/S31-10181803 (11/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 20 10:15:25 2018

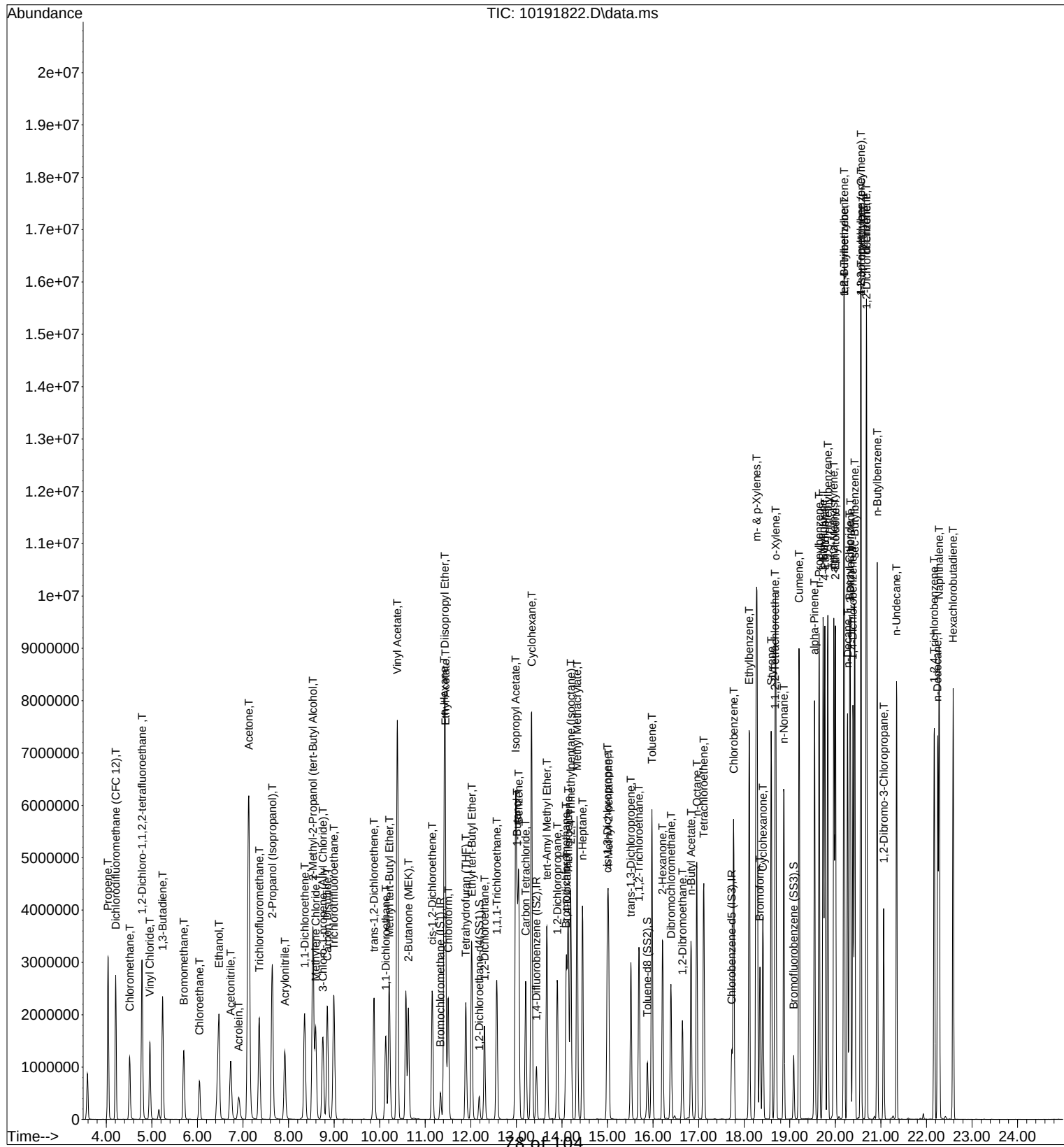
Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:14:30 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS16\DATA\2018 10\19\10191823.D

Acq On : 20 Oct 2018 00:06

Operator: LH/TD

Sample : 100ng TO15 ICAL STD

Misc : S31-09141801/S31-10181803 (11/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 20 10:15:28 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

LH 10/20/18

QLast Update : Sat Oct 20 10:14:30 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.34	130	251166	12.500	ng	0.01
37) 1,4-Difluorobenzene (IS2)	13.45	114	1041205	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.73	82	466865	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.19	65	364512	14.669	ng	0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	117.36%
57) Toluene-d8 (SS2)	15.88	98	919290	12.872	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.96%
73) Bromofluorobenzene (SS3)	19.09	174	419191	14.442	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	115.52%

Target Compounds

						Qvalue
2) Propene	4.05	42	2898597	101.366	ng	94
3) Dichlorodifluoromethan...	4.21	85	5206237	111.476	ng	99
4) Chloromethane	4.52	50	2143539	61.165	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.79	135	3080656	113.880	ng	100
6) Vinyl Chloride	4.97	62	3824000	103.934	ng	99
7) 1,3-Butadiene	5.25	54	2837121	104.088	ng	93
8) Bromomethane	5.71	94	2250793	90.253	ng	100
9) Chloroethane	6.05	64	1640924	83.821	ng	100
10) Ethanol	6.51	45	8255289	472.165	ng	99
11) Acetonitrile	6.75	41	3782092	81.227	ng	99
12) Acrolein	6.92	56	1416737	83.830	ng	100
13) Acetone	7.15	58	9308158	473.746	ng	# 71
14) Trichlorofluoromethane	7.36	101	4674275	115.562	ng	99
15) 2-Propanol (Isopropanol)	7.67	45	9441759	156.348	ng	97
16) Acrylonitrile	7.94	53	3025442	86.338	ng	99
17) 1,1-Dichloroethene	8.36	96	2545633	96.830	ng	96
18) 2-Methyl-2-Propanol (t...	8.56	59	8550129	141.998	ng	98
19) Methylene Chloride	8.60	84	2563731	92.405	ng	95
20) 3-Chloro-1-propene (Al...	8.76	41	3102250	90.677	ng	97
21) Trichlorotrifluoroethane	9.00	151	2534749	103.372	ng	98
22) Carbon Disulfide	8.86	76	8851477	86.971	ng	100
23) trans-1,2-Dichloroethene	9.88	61	3463302	93.551	ng	98
24) 1,1-Dichloroethane	10.14	63	3978792	87.619	ng	99
25) Methyl tert-Butyl Ether	10.21	73	7562143	104.317	ng	99
26) Vinyl Acetate	10.40	86	3346588	589.048	ng	# 50
27) 2-Butanone (MEK)	10.64	72	1801308	98.511	ng	# 87
28) cis-1,2-Dichloroethene	11.16	61	3330552	93.366	ng	98
29) Diisopropyl Ether	11.43	87	2269601	105.061	ng	# 74
30) Ethyl Acetate	11.45	61	1986517	211.843	ng	98
31) n-Hexane	11.42	57	4019878	95.381	ng	99
32) Chloroform	11.51	83	4419396	102.709	ng	99
34) Tetrahydrofuran (THF)	11.89	72	1686845	92.936	ng	97
35) Ethyl tert-Butyl Ether	12.02	87	3302599	109.789	ng	94
36) 1,2-Dichloroethane	12.31	62	3341400	112.068	ng	99
38) 1,1,1-Trichloroethane	12.57	97	4217033	120.958	ng	99
39) Isopropyl Acetate	12.99	61	3460338	203.604	ng	# 69
40) 1-Butanol	13.03	56	5133211	209.811	ng	84
41) Benzene	13.06	78	10340964	94.638	ng	100
42) Carbon Tetrachloride	13.21	117	3905959	122.599	ng	100
43) Cyclohexane	13.34	84	8117219	204.569	ng	98
44) tert-Amyl Methyl Ether	13.67	73	7491506	103.022	ng	97
45) 1,2-Dichloropropane	13.90	63	2378814	92.196	ng	100
46) Bromodichloromethane	14.09	83	3714901	115.958	ng	100
47) Trichloroethene	14.14	130	3196840	108.716	ng	100
48) 1,4-Dioxane	14.12	88	2372238	109.869	ng	100
49) 2,2,4-Trimethylpentane...	14.20	57	9454201	87.040	ng	98

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Data File: I:\MS16\DATA\2018 10\19\10191823.D

Acq On : 20 Oct 2018 00:06

Operator: LH/TD

Sample : 100ng TO15 ICAL STD

Misc : S31-09141801/S31-10181803 (11/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 20 10:15:28 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:14:30 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.34	100	2482847	228.232	ng	97
51) n-Heptane	14.46	71	2528090	98.879	ng	99
52) cis-1,3-Dichloropropene	15.00	75	4770191	117.685	ng	99
53) 4-Methyl-2-pentanone	15.03	58	2364221	98.010	ng	88
54) trans-1,3-Dichloropropene	15.52	75	4096287	115.337	ng	99
55) 1,1,2-Trichloroethane	15.69	97	2648441	104.323	ng	100
58) Toluene	15.98	91	10451841	85.524	ng	98
59) 2-Hexanone	16.22	43	5116590	88.119	ng	93
60) Dibromochloromethane	16.39	129	3548945	112.194	ng	99
61) 1,2-Dibromoethane	16.65	107	3141734	100.510	ng	100
62) n-Butyl Acetate	16.84	43	5661983	87.436	ng	94
63) n-Octane	16.96	57	2089130	87.402	ng	98
64) Tetrachloroethene	17.11	166	3441696	97.800	ng	99
65) Chlorobenzene	17.77	112	7672586	96.014	ng	99
66) Ethylbenzene	18.11	91	11870795	87.920	ng	95
67) m- & p-Xylenes	18.28	91	17678456	176.433	ng	97
68) Bromoform	18.35	173	3239416	116.560	ng	99
69) Styrene	18.60	104	8068201	99.585	ng	99
70) o-Xylene	18.70	91	9054658	89.467	ng	97
71) n-Nonane	18.87	43	4092735	79.709	ng	90
72) 1,1,2,2-Tetrachloroethane	18.68	83	4610831	92.861	ng	100
74) Cumene	19.21	105	11696787	88.242	ng	95
75) alpha-Pinene	19.54	93	6525869	95.609	ng	99
76) n-Propylbenzene	19.65	91	13174860	85.172	ng	94
77) 3-Ethyltoluene	19.74	105	11645718	88.307	ng	95
78) 4-Ethyltoluene	19.77	105	11070996	90.840	ng	95
79) 1,3,5-Trimethylbenzene	19.84	105	9819555	91.131	ng	97
80) alpha-Methylstyrene	19.97	118	5906834	107.902	ng	100
81) 2-Ethyltoluene	20.01	105	11373408	89.488	ng	96
82) 1,2,4-Trimethylbenzene	20.20	105	8482164	80.889	ng	100
83) n-Decane	20.27	58	219108	91.258	ng	# 93
84) Benzyl Chloride	20.31	91	9131137	106.909	ng	96
85) 1,3-Dichlorobenzene	20.34	146	6325539	97.152	ng	100
86) 1,4-Dichlorobenzene	20.39	146	6476529	98.948	ng	100
87) sec-Butylbenzene	20.43	105	12098623	83.652	ng	95
88) 4-Isopropyltoluene (p-...	20.56	119	9669556	73.368	ng	97
89) 1,2,3-Trimethylbenzene	20.57	105	8159576	78.569	ng	99
90) 1,2-Dichlorobenzene	20.69	146	5397590	88.197	ng	100
91) d-Limonene	20.68	68	3172845	80.312	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.07	157	2512298	111.998	ng	91
93) n-Undecane	21.35	57	4885228	90.663	ng	97
94) 1,2,4-Trichlorobenzene	22.17	180	5122924	120.773	ng	99
95) Naphthalene	22.28	128	13505825	112.128	ng	97
96) n-Dodecane	22.25	57	4447191	104.364	ng	97
97) Hexachlorobutadiene	22.58	225	3394311	109.727	ng	100
98) Cyclohexanone	18.42	55	3373661	80.696	ng	94
99) tert-Butylbenzene	20.19	119	8209986	79.322	ng	98
100) n-Butylbenzene	20.92	91	9891411	88.118	ng	95

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

Operator: LH/TD

Sample : 100ng TO15 ICAL STD

Misc : S31-09141801/S31-10181803 (11/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 20 10:15:28 2018

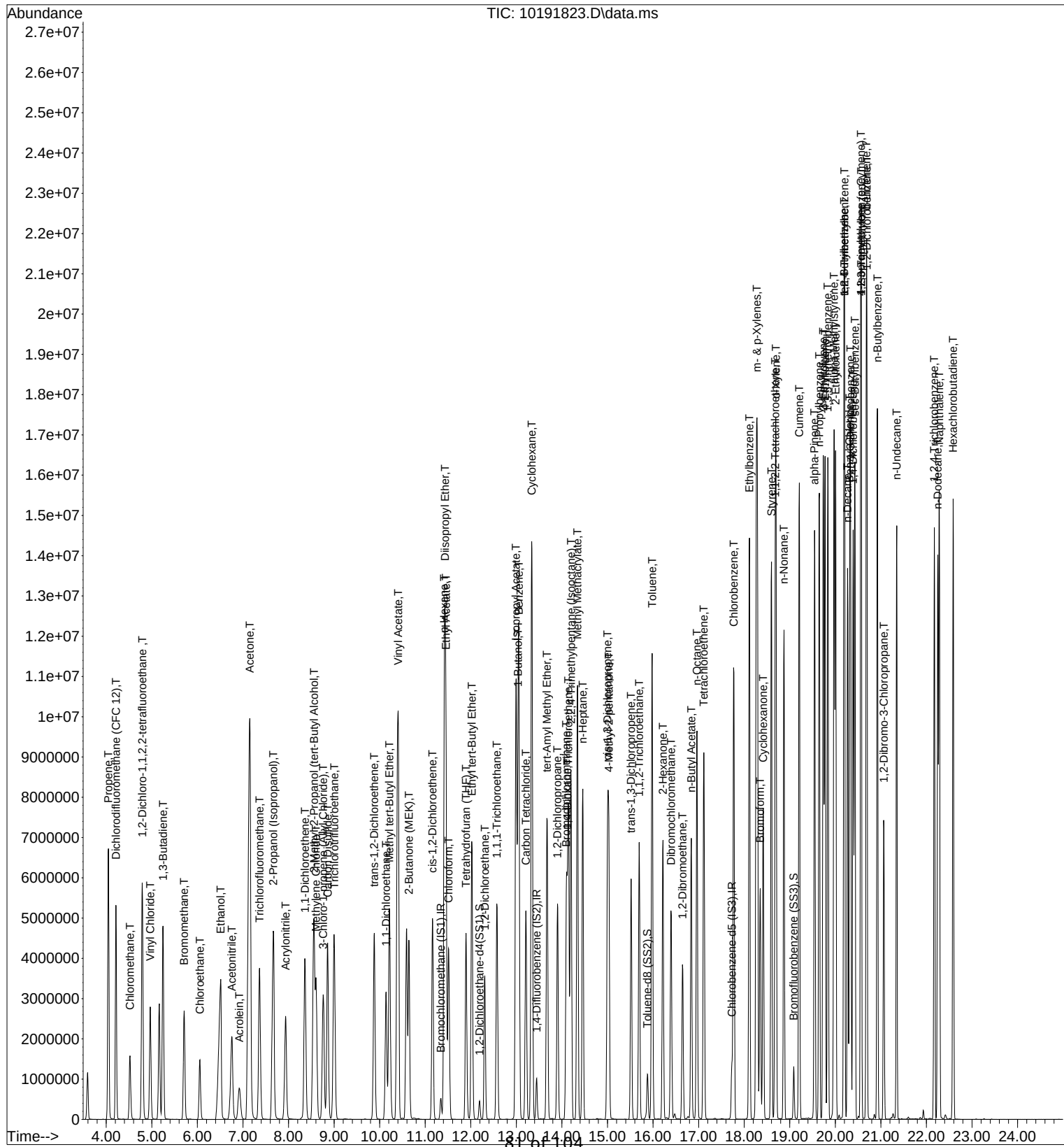
Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:14:30 2018

Response via : Initial Calibration

DataAcq Meth:T015.M



Data File: I:\MS16\DATA\2018 10\19\10191824.D

Acq On : 20 Oct 2018 00:39

Operator: LH/TD

Sample : 25ng TO15 ICV STD

Misc : S31-09141801/S31-10191803 (11/17)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 20 10:35:01 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

LH 10/20/18

QLast Update : Sat Oct 20 10:34:51 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.33	130	256606	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.43	114	1063772	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.72	82	460848	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.18	65	372680	12.073	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	96.56%
57) Toluene-d8 (SS2)	15.88	98	925101	12.606	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.88%
73) Bromofluorobenzene (SS3)	19.09	174	421922	12.647	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.20%

Target Compounds

						Qvalue
2) Propene	4.05	42	595069	24.919	ng	98
3) Dichlorodifluoromethan...	4.21	85	1385360	25.826	ng	100
4) Chloromethane	4.52	50	933315	27.334	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.78	135	839793	26.335	ng	100
6) Vinyl Chloride	4.96	62	1021454	27.429	ng	99
7) 1,3-Butadiene	5.24	54	681705	28.298	ng	98
8) Bromomethane	5.70	94	634060	28.252	ng	100
9) Chloroethane	6.04	64	442705	27.685	ng	100
10) Ethanol	6.44	45	2124266	147.179	ng	100
11) Acetonitrile	6.71	41	984549	26.065	ng	100
12) Acrolein	6.90	56	365806	28.702	ng	99
13) Acetone	7.11	58	2365977	137.393	ng	94
14) Trichlorofluoromethane	7.35	101	1235147	26.587	ng	100
15) 2-Propanol (Isopropanol)	7.62	45	3056064	55.338	ng	98
16) Acrylonitrile	7.90	53	771738	29.522	ng	100
17) 1,1-Dichloroethene	8.35	96	657370	27.795	ng	98
18) 2-Methyl-2-Propanol (t...	8.51	59	3355089	57.698	ng	99
19) Methylene Chloride	8.58	84	658222	27.364	ng	97
20) 3-Chloro-1-propene (Al...	8.74	41	825683	27.603	ng	98
21) Trichlorotrifluoroethane	8.99	151	674083	27.262	ng	100
22) Carbon Disulfide	8.85	76	2358336	27.464	ng	100
23) trans-1,2-Dichloroethene	9.87	61	893109	27.587	ng	99
24) 1,1-Dichloroethane	10.13	63	1085664	26.965	ng	100
25) Methyl tert-Butyl Ether	10.21	73	1917212	26.926	ng	100
26) Vinyl Acetate	10.38	86	895575	148.364	ng	# 95
27) 2-Butanone (MEK)	10.62	72	440289	28.903	ng	97
28) cis-1,2-Dichloroethene	11.15	61	856203	26.900	ng	99
29) Diisopropyl Ether	11.42	87	565325	26.560	ng	96
30) Ethyl Acetate	11.44	61	490444	60.067	ng	100
31) n-Hexane	11.42	57	970431	26.084	ng	100
32) Chloroform	11.49	83	1167815	26.989	ng	100
34) Tetrahydrofuran (THF)	11.89	72	415022	27.041	ng	99
35) Ethyl tert-Butyl Ether	12.02	87	798257	26.799	ng	99
36) 1,2-Dichloroethane	12.30	62	886016	26.462	ng	100
38) 1,1,1-Trichloroethane	12.57	97	1070173	26.755	ng	100
39) Isopropyl Acetate	12.98	61	813849	54.213	ng	# 97
40) 1-Butanol	13.00	56	1270306	59.060	ng	96
41) Benzene	13.04	78	2563827	26.215	ng	100
42) Carbon Tetrachloride	13.20	117	1000669	27.007	ng	99
43) Cyclohexane	13.33	84	2013806	53.128	ng	100
44) tert-Amyl Methyl Ether	13.67	73	1854570	27.530	ng	100
45) 1,2-Dichloropropane	13.90	63	583870	26.882	ng	100
46) Bromodichloromethane	14.09	83	961720	28.110	ng	100
47) Trichloroethene	14.13	130	784986	27.307	ng	100
48) 1,4-Dioxane	14.11	88	555568	30.019	ng	100
49) 2,2,4-Trimethylpentane...	14.19	57	2368330	26.093	ng	99

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Data File: I:\MS16\DATA\2018 10\19\10191824.D

Acq On : 20 Oct 2018 00:39

Operator: LH/TD

Sample : 25ng TO15 ICV STD

Misc : S31-09141801/S31-10191803 (11/17)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 20 10:35:01 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:34:51 2018

Response via : Initial Calibration

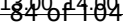
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.33	100	600700	59.291	ng	99
51) n-Heptane	14.45	71	587768	26.124	ng	100
52) cis-1,3-Dichloropropene	15.00	75	1090674	28.425	ng	100
53) 4-Methyl-2-pentanone	15.02	58	568904	28.801	ng	98
54) trans-1,3-Dichloropropene	15.51	75	1013609	29.872	ng	100
55) 1,1,2-Trichloroethane	15.69	97	656774	27.868	ng	99
58) Toluene	15.98	91	2672708	26.228	ng	100
59) 2-Hexanone	16.21	43	1336029	28.613	ng	99
60) Dibromochloromethane	16.39	129	886647	29.783	ng	100
61) 1,2-Dibromoethane	16.64	107	801489	29.359	ng	100
62) n-Butyl Acetate	16.83	43	1488818	29.420	ng	99
63) n-Octane	16.95	57	498205	25.677	ng	100
64) Tetrachloroethene	17.11	166	868081	27.681	ng	100
65) Chlorobenzene	17.77	112	1927319	27.928	ng	100
66) Ethylbenzene	18.11	91	3165590	27.279	ng	100
67) m- & p-Xylenes	18.27	91	4996416	57.659	ng	100
68) Bromoform	18.35	173	820481	30.977	ng	100
69) Styrene	18.59	104	2069842	29.366	ng	100
70) o-Xylene	18.69	91	2521250	28.663	ng	99
71) n-Nonane	18.87	43	1104320	27.321	ng	99
72) 1,1,2,2-Tetrachloroethane	18.68	83	1223533	29.052	ng	100
74) Cumene	19.20	105	3291859	28.515	ng	100
75) alpha-Pinene	19.54	93	1705263	28.478	ng	99
76) n-Propylbenzene	19.64	91	3877008	29.354	ng	100
77) 3-Ethyltoluene	19.73	105	3189882	27.413	ng	95
78) 4-Ethyltoluene	19.77	105	3369688	32.099	ng	95
79) 1,3,5-Trimethylbenzene	19.83	105	2744474	28.412	ng	100
80) alpha-Methylstyrene	19.97	118	1597839	30.597	ng	99
81) 2-Ethyltoluene	20.00	105	3287978	28.985	ng	100
82) 1,2,4-Trimethylbenzene	20.19	105	2937029	30.991	ng	100
83) n-Decane	20.26	58	57643	28.197	ng	98
84) Benzyl Chloride	20.31	91	2515660	30.112	ng	100
85) 1,3-Dichlorobenzene	20.33	146	1773448	30.194	ng	100
86) 1,4-Dichlorobenzene	20.39	146	1748160	29.353	ng	99
87) sec-Butylbenzene	20.42	105	3641483	29.465	ng	100
88) 4-Isopropyltoluene (p-...	20.56	119	3643795	30.949	ng	99
89) 1,2,3-Trimethylbenzene	20.56	105	2985449	31.422	ng	100
90) 1,2-Dichlorobenzene	20.68	146	1753565	31.666	ng	100
91) d-Limonene	20.68	68	1060573	30.805	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.06	157	647693	31.363	ng	98
93) n-Undecane	21.34	57	1316157	28.916	ng	99
94) 1,2,4-Trichlorobenzene	22.17	180	1321725	29.779	ng	100
95) Naphthalene	22.28	128	3809873	27.966	ng	100
96) n-Dodecane	22.24	57	1186732	27.685	ng	100
97) Hexachlorobutadiene	22.58	225	873629	29.242	ng	100
98) Cyclohexanone	18.41	55	860014	28.865	ng	99
99) tert-Butylbenzene	20.19	119	2871839	31.004	ng	100
100) n-Butylbenzene	20.92	91	2898536	29.566	ng	100

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

ALS Vial : 2 Sample Multiplier: 1

DataAcq Meth:T015.M



Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: 10191824.D

Acq. Method File: TO15.M

Data File Path: I:\MS16\DATA\2018_10\19\

Sample Name: 25ng TO15 ICV STD

Operator: LH/TD

Misc Info: S31-09141801/S31-10191803 (

Date Acquired: 10/20/18

0:39

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	24.9	26.43	94	54	133	*	*
3)	Dichlorodifluoromethane (CFC 1	4.21	25.8	26.30	98	64	115	*	*
4)	Chloromethane	4.52	27.3	26.38	104	47	140	*	*
5)	1,2-Dichloro-1,1,2,2-tetrafluoroet	4.78	26.3	26.38	100	60	112	*	*
6)	Vinyl Chloride	4.96	27.4	26.73	103	63	127	*	*
7)	1,3-Butadiene	5.24	28.3	26.28	108	57	149	*	*
8)	Bromomethane	5.70	28.3	26.48	107	63	132	*	*
9)	Chloroethane	6.04	27.7	26.75	104	68	129	*	*
10)	Ethanol	6.44	147	128.10	115	62	131	*	*
11)	Acetonitrile	6.71	26.1	25.73	101	56	136	*	*
12)	Acrolein	6.90	28.7	25.63	112	60	132	*	*
13)	Acetone	7.11	137	132.33	104	63	124	*	*
14)	Trichlorofluoromethane	7.35	26.6	26.40	101	65	113	*	*
15)	2-Propanol (Isopropanol)	7.62	55.3	51.60	107	62	135	*	*
16)	Acrylonitrile	7.90	29.5	25.88	114	68	138	*	*
17)	1,1-Dichloroethene	8.35	27.8	27.23	102	72	118	*	*
18)	2-Methyl-2-Propanol (tert-Butyl Alco	8.51	57.7	54.25	106	61	128	*	*
19)	Methylene Chloride	8.58	27.4	27.08	101	67	116	*	*
20)	3-Chloro-1-propene (Allyl Chloride)	8.74	27.6	27.00	102	61	143	*	*
21)	Trichlorotrifluoroethane	8.99	27.3	26.95	101	68	113	*	*
22)	Carbon Disulfide	8.85	27.5	27.20	101	68	120	*	*
23)	trans-1,2-Dichloroethene	9.87	27.6	26.73	103	71	125	*	*
24)	1,1-Dichloroethane	10.13	27.0	26.95	100	68	118	*	*
25)	Methyl tert-Butyl Ether	10.21	26.9	26.80	100	60	123	*	*
26)	Vinyl Acetate	10.38	148	133.03	111	73	135	*	*
27)	2-Butanone (MEK)	10.62	28.9	25.95	111	70	129	*	*
28)	cis-1,2-Dichloroethene	11.15	26.9	26.35	102	69	121	*	*
29)	Diisopropyl Ether	11.42	26.6	27.18	98	65	117	*	*
30)	Ethyl Acetate	11.44	60.1	54.45	110	66	140	*	*
31)	n-Hexane	11.42	26.1	26.95	97	61	124	*	*
32)	Chloroform	11.49	27.0	27.08	100	69	113	*	*
34)	Tetrahydrofuran (THF)	11.89	27.0	27.00	100	66	121	*	*
35)	Ethyl tert-Butyl Ether	12.02	26.8	26.80	100	69	120	*	*
36)	1,2-Dichloroethane	12.30	26.5	26.85	99	62	120	*	*
38)	1,1,1-Trichloroethane	12.57	26.8	26.90	100	65	116	*	*
39)	Isopropyl Acetate	12.98	54.2	51.55	105	70	126	*	*
40)	1-Butanol	13.00	59.1	51.58	115	62	141	*	*
41)	Benzene	13.04	26.2	26.38	99	66	111	*	*
42)	Carbon Tetrachloride	13.20	27.0	26.45	102	64	122	*	*
43)	Cyclohexane	13.33	53.1	52.05	102	69	115	*	*
44)	tert-Amyl Methyl Ether	13.67	27.5	27.08	102	68	119	*	*
45)	1,2-Dichloropropane	13.90	26.9	26.98	100	69	121	*	*
46)	Bromodichloromethane	14.09	28.1	26.83	105	69	123	*	*
47)	Trichloroethene	14.13	27.3	26.68	102	69	112	*	*
48)	1,4-Dioxane	14.11	30.0	26.73	112	74	123	*	*
49)	2,2,4-Trimethylpentane (Isooctane)	14.19	26.1	26.65	98	67	120	*	*

Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: 10191824.D

Data File Path: I:\MS16\DATA\2018_10\19\

Operator: LH/TD

Date Acquired: 10/20/18

0:39

TO15.M

Sample Name: 25ng TO15 ICV STD

Misc Info: S31-09141801/S31-10191803 (

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	14.33	59.3	53.88	110	75	125	*	*
51)	n-Heptane	14.45	26.1	26.90	97	68	118	*	*
52)	cis-1,3-Dichloropropene	15.00	28.4	26.78	106	74	129	*	*
53)	4-Methyl-2-pentanone	15.02	28.8	26.15	110	66	138	*	*
54)	trans-1,3-Dichloropropene	15.51	29.9	26.60	112	75	130	*	*
55)	1,1,2-Trichloroethane	15.69	27.9	26.85	104	73	117	*	*
58)	Toluene	15.98	26.2	26.50	99	66	114	*	*
59)	2-Hexanone	16.21	28.6	26.78	107	58	146	*	*
60)	Dibromochloromethane	16.39	29.8	26.60	112	67	130	*	*
61)	1,2-Dibromoethane	16.64	29.4	27.03	109	70	127	*	*
62)	n-Butyl Acetate	16.83	29.4	27.35	107	62	140	*	*
63)	n-Octane	16.95	25.7	27.13	95	65	121	*	*
64)	Tetrachloroethene	17.11	27.7	26.60	104	62	119	*	*
65)	Chlorobenzene	17.77	27.9	26.83	104	66	115	*	*
66)	Ethylbenzene	18.11	27.3	26.53	103	69	117	*	*
67)	m- & p-Xylenes	18.27	57.7	53.28	108	67	117	*	*
68)	Bromoform	18.35	31.0	26.68	116	67	135	*	*
69)	Styrene	18.59	29.4	26.50	111	70	128	*	*
70)	o-Xylene	18.69	28.7	26.75	107	67	118	*	*
71)	n-Nonane	18.87	27.3	26.83	102	61	127	*	*
72)	1,1,2,2-Tetrachloroethane	18.68	29.1	26.80	109	70	125	*	*
74)	Cumene	19.20	28.5	26.80	106	68	116	*	*
75)	alpha-Pinene	19.54	28.5	26.40	108	69	122	*	*
76)	n-Propylbenzene	19.64	29.4	27.23	108	70	118	*	*
77)	3-Ethyltoluene	19.73	27.4	26.83	102	68	117	*	*
78)	4-Ethyltoluene	19.77	32.1	26.80	120	69	124	*	*
79)	1,3,5-Trimethylbenzene	19.83	28.4	26.73	106	65	117	*	*
80)	alpha-Methylstyrene	19.97	30.6	26.75	114	71	132	*	*
81)	2-Ethyltoluene	20.00	29.0	27.08	107	67	119	*	*
82)	1,2,4-Trimethylbenzene	20.19	31.0	26.90	115	67	124	*	*
83)	n-Decane	20.26	28.2	26.88	105	63	129	*	*
84)	Benzyl Chloride	20.31	30.1	27.08	111	75	142	*	*
85)	1,3-Dichlorobenzene	20.33	30.2	26.98	112	70	124	*	*
86)	1,4-Dichlorobenzene	20.39	29.4	27.00	109	63	124	*	*
87)	sec-Butylbenzene	20.42	29.5	26.55	111	68	119	*	*
88)	4-Isopropyltoluene (p-Cymene)	20.56	30.9	26.95	115	65	122	*	*
89)	1,2,3-Trimethylbenzene	20.56	31.4	26.95	117	66	128	*	*
90)	1,2-Dichlorobenzene	20.68	31.7	26.95	118	66	125	*	*
91)	d-Limonene	20.68	30.8	26.38	117	64	135	*	*
92)	1,2-Dibromo-3-Chloropropane	21.06	31.4	26.15	120	73	136	*	*
93)	n-Undecane	21.34	28.9	27.03	107	67	135	*	*
94)	1,2,4-Trichlorobenzene	22.17	29.8	26.78	111	70	141	*	*
95)	Naphthalene	22.28	28.0	25.38	110	71	146	*	*
96)	n-Dodecane	22.24	27.7	25.63	108	69	152	*	*
97)	Hexachlorobutadiene	22.58	29.2	26.13	112	63	126	*	*
98)	Cyclohexanone	18.41	28.9	24.45	118	58	138	*	*
99)	tert-Butylbenzene	20.19	31.0	26.88	115	65	121	*	*
100)	n-Butylbenzene	20.92	29.6	27.00	110	71	125	*	*

Bold = 75 Compound List
*** = Pass**

Data File: I:\MS16\DATA\2018 12\21\12211833.D

Acq On : 21 Dec 2018 22:23

Operator: LH

Sample : CCV2 R16122118 25ng

Misc : S31-09141801/S31-12031803 (1/1)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 22 08:00:25 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

LH 12/22/18

QLast Update : Sat Oct 20 10:23:27 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	100	-0.02
2 T	Propene	1.163	1.190	-2.3	110	0.00
3 T	Dichlorodifluoromethane (CF	2.613	2.347	10.2	90	0.00
4 T	Chloromethane	1.663	1.799	-8.2	105	0.00
5 T	1,2-Dichloro-1,1,2,2-tetra	1.553	1.300	16.3	84	0.00
6 T	Vinyl Chloride	1.814	1.841	-1.5	100	-0.01
7 T	1,3-Butadiene	1.174	1.275	-8.6	104	-0.01
8 T	Bromomethane	1.093	1.050	3.9	93	-0.01
9 T	Chloroethane	0.779	0.781	-0.3	99	-0.01
10 T	Ethanol	0.703	0.867	-23.3	114	-0.07
11 T	Acetonitrile	1.840	2.007	-9.1	111	-0.04
12 T	Acrolein	0.621	0.688	-10.8	104	-0.02
13 T	Acetone	0.839	0.849	-1.2	100	-0.04
14 T	Trichlorofluoromethane	2.263	2.031	10.3	90	-0.01
15 T	2-Propanol (Isopropanol)	2.690	2.860	-6.3	100	-0.05
16 T	Acrylonitrile	1.273	1.479	-16.2	103	-0.03
17 T	1,1-Dichloroethene	1.152	1.063	7.7	90	-0.01
18 T	2-Methyl-2-Propanol (tert-B	2.833	2.757	2.7	91	-0.04
19 T	Methylene Chloride	1.172	1.099	6.2	93	-0.02
20 T	3-Chloro-1-propene (Allyl C	1.457	1.447	0.7	100	-0.02
21 T	Trichlorotrifluoroethane	1.204	1.014	15.8	83	-0.01
22 T	Carbon Disulfide	4.183	3.966	5.2	94	-0.01
23 T	trans-1,2-Dichloroethene	1.577	1.588	-0.7	96	-0.02
24 T	1,1-Dichloroethane	1.961	1.910	2.6	96	-0.02
25 T	Methyl tert-Butyl Ether	3.468	3.168	8.7	91	0.00
26 T	Vinyl Acetate	0.294	0.294	0.0	88	-0.03
27 T	2-Butanone (MEK)	0.742	0.784	-5.7	94	-0.02
28 T	cis-1,2-Dichloroethene	1.550	1.551	-0.1	96	-0.01
29 T	Diisopropyl Ether	1.037	0.919	11.4	89	-0.01
30 T	Ethyl Acetate	0.398	0.436	-9.5	98	-0.02
31 T	n-Hexane	1.812	1.816	-0.2	102	0.00
32 T	Chloroform	2.108	1.948	7.6	91	-0.02
33 S	1,2-Dichloroethane-d4 (SS1)	1.504	1.532	-1.9	103	-0.01
34 T	Tetrahydrofuran (THF)	0.748	0.722	3.5	95	-0.01
35 T	Ethyl tert-Butyl Ether	1.451	1.302	10.3	88	0.00
36 T	1,2-Dichloroethane	1.631	1.503	7.8	90	-0.01
37 IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	99	-0.01
38 T	1,1,1-Trichloroethane	0.470	0.424	9.8	87	0.00
39 T	Isopropyl Acetate	0.176	0.183	-4.0	96	-0.01
40 T	1-Butanol	0.253	0.313	-23.7	109	-0.03
41 T	Benzene	1.149	1.066	7.2	91	-0.01
42 T	Carbon Tetrachloride	0.435	0.402	7.6	86	0.00
43 T	Cyclohexane	0.445	0.416	6.5	89	0.00
44 T	tert-Amyl Methyl Ether	0.792	0.745	5.9	90	0.00
45 T	1,2-Dichloropropane	0.255	0.256	-0.4	97	0.00
46 T	Bromodichloromethane	0.402	0.384	4.5	89	0.00
47 T	Trichloroethene	0.338	0.299	11.5	84	-0.01
48 T	1,4-Dioxane	0.217	0.227	-4.6	90	-0.01
49 T	2,2,4-Trimethylpentane (Iso	1.067	1.062	0.5	98	-0.01
50 T	Methyl Methacrylate	0.119	0.112	5.9	83	-0.01
51 T	n-Heptane	0.264	0.247	6.4	94	-0.01
52 T	cis-1,3-Dichloropropene	0.451	0.482	-6.9	97	-0.01
53 T	4-Methyl-2-pentanone	0.232	0.274	-18.1	106	-0.01
54 T	trans-1,3-Dichloropropene	0.399	0.437	-9.5	94	-0.01

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Data File: I:\MS16\DATA\2018 12\21\12211833.D

Acq On : 21 Dec 2018 22:23

Operator: LH

Sample : CCV2 R16122118 25ng

Misc : S31-09141801/S31-12031803 (1/1)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 22 08:00:25 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:23:27 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)
55 T	1,1,2-Trichloroethane	0.277	0.275	0.7	93	0.00
56 IR	Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	107	0.00
57 S	Toluene-d8 (SS2)	1.991	1.808	9.2	98	0.00
58 T	Toluene	2.764	2.348	15.1	92	-0.01
59 T	2-Hexanone	1.266	1.363	-7.7	109	-0.01
60 T	Dibromochloromethane	0.807	0.749	7.2	91	0.00
61 T	1,2-Dibromoethane	0.740	0.692	6.5	93	0.00
62 T	n-Butyl Acetate	1.373	1.503	-9.5	109	-0.01
63 T	n-Octane	0.526	0.487	7.4	105	-0.01
64 T	Tetrachloroethene	0.851	0.690	18.9	84	0.00
65 T	Chlorobenzene	1.872	1.650	11.9	91	-0.01
66 T	Ethylbenzene	3.148	2.784	11.6	90	0.00
67 T	m- & p-Xylenes	2.350	2.156	8.3	90	0.00
68 T	Bromoform	0.718	0.675	6.0	86	0.00
69 T	Styrene	1.912	1.743	8.8	87	0.00
70 T	o-Xylene	2.386	2.181	8.6	91	0.00
71 T	n-Nonane	1.096	1.149	-4.8	109	0.00
72 T	1,1,2,2-Tetrachloroethane	1.142	1.124	1.6	95	0.00
73 S	Bromofluorobenzene (SS3)	0.905	0.825	8.8	96	0.00
74 T	Cumene	3.131	2.883	7.9	92	0.00
75 T	alpha-Pinene	1.624	1.442	11.2	88	0.00
76 T	n-Propylbenzene	3.582	3.346	6.6	91	0.00
77 T	3-Ethyltoluene	3.156	2.847	9.8	85	0.00
78 T	4-Ethyltoluene	2.847	2.660	6.6	93	0.00
79 T	1,3,5-Trimethylbenzene	2.620	2.324	11.3	88	0.00
80 T	alpha-Methylstyrene	1.416	1.276	9.9	84	0.00
81 T	2-Ethyltoluene	3.077	2.717	11.7	87	0.00
82 T	1,2,4-Trimethylbenzene	2.571	2.420	5.9	86	-0.01
83 T	n-Decane	0.055	0.055	0.0	102	0.00
84 T	Benzyl Chloride	2.266	2.124	6.3	87	0.00
85 T	1,3-Dichlorobenzene	1.593	1.410	11.5	84	-0.01
86 T	1,4-Dichlorobenzene	1.615	1.372	15.0	84	0.00
87 T	sec-Butylbenzene	3.352	3.097	7.6	89	0.00
88 T	4-Isopropyltoluene (p-Cymen	3.193	2.948	7.7	84	0.00
89 T	1,2,3-Trimethylbenzene	2.577	2.438	5.4	87	-0.01
90 T	1,2-Dichlorobenzene	1.502	1.338	10.9	82	-0.01
91 T	d-Limonene	0.934	1.008	-7.9	96	0.00
92 T	1,2-Dibromo-3-Chloropropane	0.560	0.516	7.9	84	-0.01
93 T	n-Undecane	1.235	1.311	-6.2	106	0.00
94 T	1,2,4-Trichlorobenzene	1.204	1.057	12.2	86	0.00
95 T	Naphthalene	3.695	3.360	9.1	88	0.00
96 T	n-Dodecane	1.163	1.321	-13.6	125	0.00
97 T	Hexachlorobutadiene	0.810	0.688	15.1	83	0.00
98 T	Cyclohexanone	0.808	1.009	-24.9	115	-0.01
99 T	tert-Butylbenzene	2.512	2.278	9.3	84	0.00
100 T	n-Butylbenzene	2.659	2.525	5.0	91	0.00

(#)= Out of Range

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

Data File: I:\MS16\DATA\2018 12\21\12211833.D

Acq On : 21 Dec 2018 22:23

Operator: LH

Sample : CCV2 R16122118 25ng

Misc : S31-09141801/S31-12031803 (1/1)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 22 08:00:25 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

LH 12/22/18

QLast Update : Sat Oct 20 10:23:27 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.33	130	237644	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.43	114	976391	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.72	82	468942	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.18	65	364054	12.735	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.84%
57) Toluene-d8 (SS2)	15.87	98	847620	11.351	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	90.80%
73) Bromofluorobenzene (SS3)	19.09	174	387093	11.403	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	91.20%

Target Compounds

						Qvalue
2) Propene	4.04	42	582954	26.359	ng	97
3) Dichlorodifluoromethan...	4.21	85	1165569	23.462	ng	100
4) Chloromethane	4.52	50	861950	27.258	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.78	135	635060	21.503	ng	100
6) Vinyl Chloride	4.96	62	919762	26.669	ng	100
7) 1,3-Butadiene	5.24	54	635519	28.485	ng	98
8) Bromomethane	5.70	94	503427	24.221	ng	99
9) Chloroethane	6.04	64	379547	25.629	ng	100
10) Ethanol	6.44	45	2118456	158.488	ng	99
11) Acetonitrile	6.71	41	985573	28.174	ng	99
12) Acrolein	6.90	56	336117	28.477	ng	99
13) Acetone	7.11	58	2168127	135.950	ng	96
14) Trichlorofluoromethane	7.35	101	1023327	23.785	ng	99
15) 2-Propanol (Isopropanol)	7.62	45	2804212	54.829	ng	97
16) Acrylonitrile	7.90	53	726647	30.015	ng	100
17) 1,1-Dichloroethene	8.35	96	542595	24.773	ng	93
18) 2-Methyl-2-Propanol (t...	8.51	59	2809807	52.176	ng	99
19) Methylene Chloride	8.58	84	558814	25.085	ng	91
20) 3-Chloro-1-propene (Al...	8.74	41	733993	26.496	ng	96
21) Trichlorotrifluoroethane	8.99	151	513067	22.405	ng	93
22) Carbon Disulfide	8.85	76	2026296	25.480	ng	100
23) trans-1,2-Dichloroethene	9.87	61	801718	26.740	ng	94
24) 1,1-Dichloroethane	10.12	63	934952	25.075	ng	100
25) Methyl tert-Butyl Ether	10.21	73	1639487	24.863	ng	98
26) Vinyl Acetate	10.38	86	734686	131.422	ng	# 65
27) 2-Butanone (MEK)	10.62	72	382742	27.130	ng	# 89
28) cis-1,2-Dichloroethene	11.15	61	777165	26.365	ng	93
29) Diisopropyl Ether	11.42	87	472404	23.965	ng	# 71
30) Ethyl Acetate	11.43	61	449138	59.397	ng	93
31) n-Hexane	11.42	57	934001	27.108	ng	98
32) Chloroform	11.49	83	996998	24.880	ng	99
34) Tetrahydrofuran (THF)	11.88	72	366675	25.797	ng	91
35) Ethyl tert-Butyl Ether	12.02	87	655949	23.779	ng	92
36) 1,2-Dichloroethane	12.30	62	757735	24.436	ng	100
38) 1,1,1-Trichloroethane	12.57	97	895267	24.385	ng	99
39) Isopropyl Acetate	12.98	61	736586	53.457	ng	# 89
40) 1-Butanol	13.00	56	1264843	64.069	ng	96
41) Benzene	13.04	78	2150354	23.955	ng	100
42) Carbon Tetrachloride	13.20	117	813121	23.909	ng	100
43) Cyclohexane	13.33	84	1695431	48.732	ng	91
44) tert-Amyl Methyl Ether	13.67	73	1562207	25.265	ng	99
45) 1,2-Dichloropropane	13.90	63	535792	26.876	ng	100
46) Bromodichloromethane	14.09	83	801690	25.530	ng	99
47) Trichloroethene	14.13	130	619833	23.492	ng	100
48) 1,4-Dioxane	14.11	88	471877	27.779	ng	92
49) 2,2,4-Trimethylpentane...	14.19	57	2201250	26.422	ng	99

90 of 104

Data File: I:\MS16\DATA\2018 12\21\12211833.D

Acq On : 21 Dec 2018 22:23

Operator: LH

Sample : CCV2 R16122118 25ng

Misc : S31-09141801/S31-12031803 (1/1)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 22 08:00:25 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:23:27 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.33	100	465260	50.032	ng	# 84
51) n-Heptane	14.45	71	518397	25.102	ng	94
52) cis-1,3-Dichloropropene	14.99	75	1054455	29.940	ng	100
53) 4-Methyl-2-pentanone	15.02	58	567196	31.285	ng	98
54) trans-1,3-Dichloropropene	15.51	75	900032	28.899	ng	100
55) 1,1,2-Trichloroethane	15.69	97	577367	26.691	ng	96
58) Toluene	15.97	91	2316179	22.337	ng	100
59) 2-Hexanone	16.21	43	1372685	28.891	ng	99
60) Dibromochloromethane	16.39	129	755421	24.937	ng	100
61) 1,2-Dibromoethane	16.64	107	698460	25.143	ng	100
62) n-Butyl Acetate	16.83	43	1529865	29.710	ng	99
63) n-Octane	16.95	57	491103	24.874	ng	90
64) Tetrachloroethene	17.11	166	684507	21.450	ng	99
65) Chlorobenzene	17.76	112	1649696	23.492	ng	99
66) Ethylbenzene	18.11	91	2697214	22.842	ng	99
67) m- & p-Xylenes	18.27	91	4292749	48.683	ng	97
68) Bromoform	18.35	173	673210	24.978	ng	100
69) Styrene	18.59	104	1733111	24.164	ng	99
70) o-Xylene	18.69	91	2172681	24.274	ng	98
71) n-Nonane	18.87	43	1154310	28.065	ng	95
72) 1,1,2,2-Tetrachloroethane	18.68	83	1122102	26.184	ng	99
74) Cumene	19.20	105	2858500	24.334	ng	98
75) alpha-Pinene	19.54	93	1399584	22.970	ng	100
76) n-Propylbenzene	19.64	91	3377039	25.127	ng	98
77) 3-Ethyltoluene	19.73	105	2836092	23.952	ng	98
78) 4-Ethyltoluene	19.77	105	2646841	24.778	ng	98
79) 1,3,5-Trimethylbenzene	19.83	105	2304362	23.444	ng	97
80) alpha-Methylstyrene	19.97	118	1266352	23.831	ng	93
81) 2-Ethyltoluene	20.00	105	2731656	23.665	ng	98
82) 1,2,4-Trimethylbenzene	20.19	105	2423727	25.134	ng	97
83) n-Decane	20.26	58	55773	26.811	ng	# 82
84) Benzyl Chloride	20.31	91	2094069	24.633	ng	96
85) 1,3-Dichlorobenzene	20.32	146	1428272	23.897	ng	100
86) 1,4-Dichlorobenzene	20.39	146	1390679	22.947	ng	100
87) sec-Butylbenzene	20.42	105	3088090	24.556	ng	98
88) 4-Isopropyltoluene (p-...	20.56	119	2880958	24.048	ng	81
89) 1,2,3-Trimethylbenzene	20.56	105	2382688	24.645	ng	96
90) 1,2-Dichlorobenzene	20.68	146	1367061	24.261	ng	100
91) d-Limonene	20.68	68	954627	27.249	ng	91
92) 1,2-Dibromo-3-Chloropr...	21.06	157	504515	24.008	ng	95
93) n-Undecane	21.34	57	1299311	28.053	ng	95
94) 1,2,4-Trichlorobenzene	22.17	180	1054625	23.351	ng	100
95) Naphthalene	22.28	128	3230519	23.304	ng	100
96) n-Dodecane	22.24	57	1277413	29.286	ng	94
97) Hexachlorobutadiene	22.59	225	679499	22.351	ng	99
98) Cyclohexanone	18.41	55	928963	30.641	ng	94
99) tert-Butylbenzene	20.19	119	2279544	24.185	ng	98
100) n-Butylbenzene	20.92	91	2519416	25.255	ng	98

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

Data File: I:\MS16\DATA\2018 12\21\12211833.D

Acq On : 21 Dec 2018 22:23

Operator: LH

Sample : CCV2 R16122118 25ng

Misc : S31-09141801/S31-12031803 (1/1)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 22 08:00:25 2018

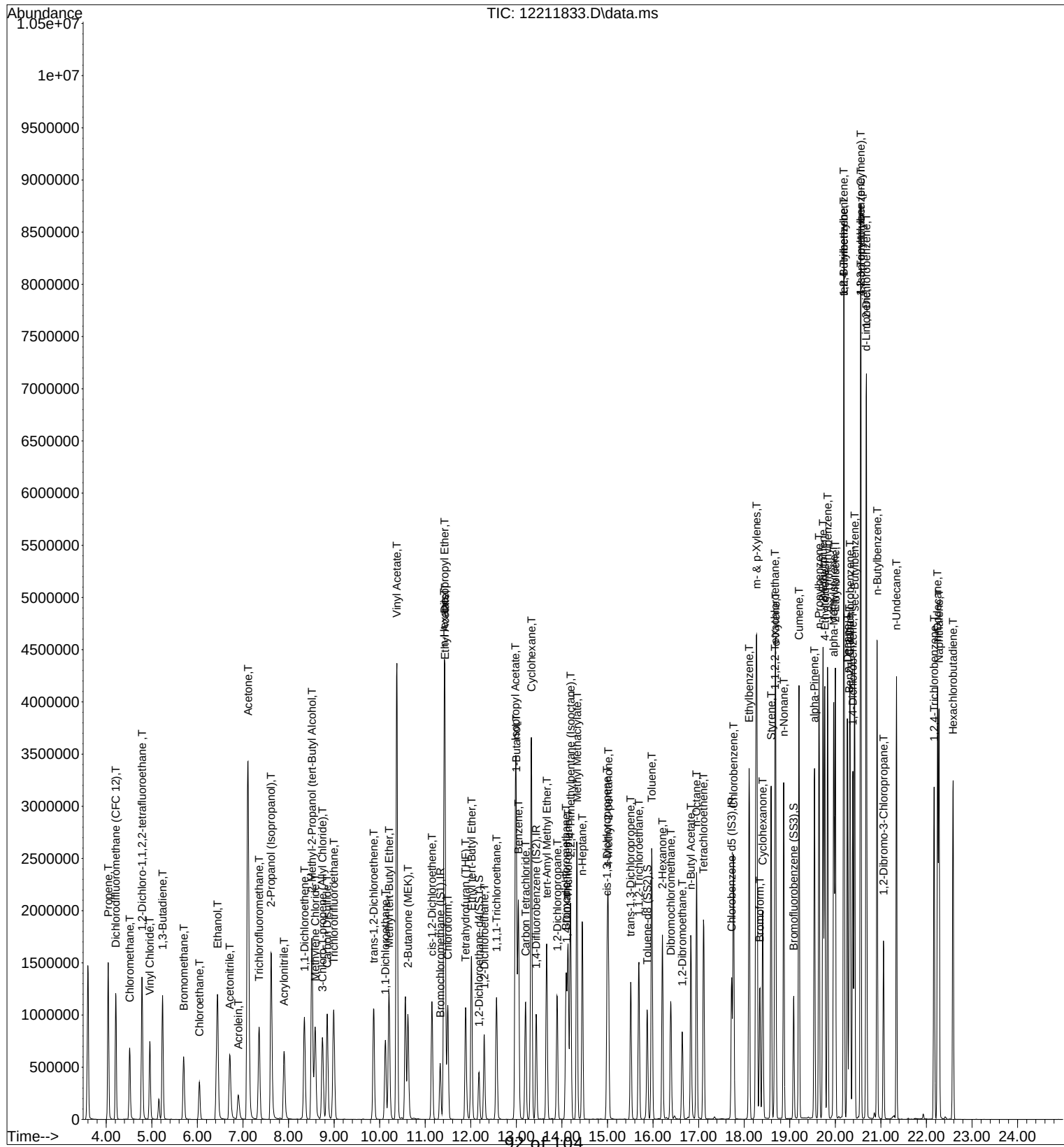
Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:23:27 2018

Response via : Initial Calibration

DataAcq Meth:T015.M



Data File: I:\MS16\DATA\2018 12\21\12211858.D

Acq On : 22 Dec 2018 13:55

Operator: LH

Sample : CCVend R16122118 25ng

Misc : S31-09141801/S31-12031803 (1/1)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 24 10:10:18 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

LH 12/24/18

QLast Update : Sat Oct 20 10:23:27 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	109	-0.02
2 T	Propene	1.163	1.022	12.1	103	0.00
3 T	Dichlorodifluoromethane (CF	2.613	2.096	19.8	88	0.00
4 T	Chloromethane	1.663	1.555	6.5	99	0.00
5 T	1,2-Dichloro-1,1,2,2-tetra	1.553	1.188	23.5	84	0.00
6 T	Vinyl Chloride	1.814	1.703	6.1	101	0.00
7 T	1,3-Butadiene	1.174	1.103	6.0	98	-0.01
8 T	Bromomethane	1.093	0.931	14.8	90	-0.01
9 T	Chloroethane	0.779	0.678	13.0	93	-0.01
10 T	Ethanol	0.703	0.751	-6.8	107	-0.07
11 T	Acetonitrile	1.840	1.706	7.3	102	-0.04
12 T	Acrolein	0.621	0.593	4.5	97	-0.02
13 T	Acetone	0.839	0.741	11.7	95	-0.04
14 T	Trichlorofluoromethane	2.263	1.826	19.3	87	-0.01
15 T	2-Propanol (Isopropanol)	2.690	2.496	7.2	95	-0.04
16 T	Acrylonitrile	1.273	1.281	-0.6	97	-0.03
17 T	1,1-Dichloroethene	1.152	0.942	18.2	87	-0.01
18 T	2-Methyl-2-Propanol (tert-B	2.833	2.451	13.5	88	-0.04
19 T	Methylene Chloride	1.172	0.979	16.5	90	-0.02
20 T	3-Chloro-1-propene (Allyl C	1.457	1.261	13.5	95	-0.02
21 T	Trichlorotrifluoroethane	1.204	0.920	23.6	82	-0.01
22 T	Carbon Disulfide	4.183	3.525	15.7	91	-0.01
23 T	trans-1,2-Dichloroethene	1.577	1.416	10.2	93	-0.02
24 T	1,1-Dichloroethane	1.961	1.698	13.4	93	-0.02
25 T	Methyl tert-Butyl Ether	3.468	2.841	18.1	89	0.00
26 T	Vinyl Acetate	0.294	0.264	10.2	86	-0.03
27 T	2-Butanone (MEK)	0.742	0.718	3.2	94	-0.02
28 T	cis-1,2-Dichloroethene	1.550	1.477	4.7	99	-0.01
29 T	Diisopropyl Ether	1.037	0.878	15.3	92	-0.01
30 T	Ethyl Acetate	0.398	0.418	-5.0	102	-0.02
31 T	n-Hexane	1.812	1.730	4.5	105	0.00
32 T	Chloroform	2.108	1.869	11.3	94	-0.02
33 S	1,2-Dichloroethane-d4 (SS1)	1.504	1.491	0.9	109	-0.01
34 T	Tetrahydrofuran (THF)	0.748	0.704	5.9	100	0.00
35 T	Ethyl tert-Butyl Ether	1.451	1.252	13.7	92	0.00
36 T	1,2-Dichloroethane	1.631	1.411	13.5	91	-0.01
37 IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	107	-0.01
38 T	1,1,1-Trichloroethane	0.470	0.405	13.8	90	0.00
39 T	Isopropyl Acetate	0.176	0.177	-0.6	101	-0.01
40 T	1-Butanol	0.253	0.300	-18.6	113	-0.03
41 T	Benzene	1.149	1.038	9.7	95	-0.01
42 T	Carbon Tetrachloride	0.435	0.384	11.7	89	0.00
43 T	Cyclohexane	0.445	0.405	9.0	94	0.00
44 T	tert-Amyl Methyl Ether	0.792	0.721	9.0	94	0.00
45 T	1,2-Dichloropropane	0.255	0.249	2.4	102	0.00
46 T	Bromodichloromethane	0.402	0.365	9.2	92	0.00
47 T	Trichloroethene	0.338	0.288	14.8	87	-0.01
48 T	1,4-Dioxane	0.217	0.220	-1.4	94	-0.01
49 T	2,2,4-Trimethylpentane (Iso	1.067	1.004	5.9	100	-0.01
50 T	Methyl Methacrylate	0.119	0.107	10.1	86	-0.01
51 T	n-Heptane	0.264	0.226	14.4	93	0.00
52 T	cis-1,3-Dichloropropene	0.451	0.409	9.3	89	0.00
53 T	4-Methyl-2-pentanone	0.232	0.228	1.7	95	-0.01
54 T	trans-1,3-Dichloropropene	0.399	0.371	7.0	87	0.00

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Data File: I:\MS16\DATA\2018 12\21\12211858.D

Acq On : 22 Dec 2018 13:55

Operator: LH

Sample : CCVend R16122118 25ng

Misc : S31-09141801/S31-12031803 (1/1)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 24 10:10:18 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:23:27 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)
55 T	1,1,2-Trichloroethane	0.277	0.234	15.5	86	0.00
56 IR	Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	102	0.00
57 S	Toluene-d8 (SS2)	1.991	1.800	9.6	93	0.00
58 T	Toluene	2.764	2.265	18.1	84	0.00
59 T	2-Hexanone	1.266	1.270	-0.3	97	-0.01
60 T	Dibromochloromethane	0.807	0.735	8.9	85	0.00
61 T	1,2-Dibromoethane	0.740	0.665	10.1	85	0.00
62 T	n-Butyl Acetate	1.373	1.403	-2.2	97	0.00
63 T	n-Octane	0.526	0.454	13.7	93	-0.01
64 T	Tetrachloroethene	0.851	0.682	19.9	79	0.00
65 T	Chlorobenzene	1.872	1.578	15.7	83	0.00
66 T	Ethylbenzene	3.148	2.719	13.6	84	0.00
67 T	m- & p-Xylenes	2.350	2.088	11.1	83	-0.01
68 T	Bromoform	0.718	0.657	8.5	80	0.00
69 T	Styrene	1.912	1.683	12.0	80	0.00
70 T	o-Xylene	2.386	2.151	9.8	85	-0.01
71 T	n-Nonane	1.096	1.097	-0.1	99	0.00
72 T	1,1,2,2-Tetrachloroethane	1.142	1.112	2.6	90	0.00
73 S	Bromofluorobenzene (SS3)	0.905	0.876	3.2	97	0.00
74 T	Cumene	3.131	2.879	8.0	88	0.00
75 T	alpha-Pinene	1.624	1.500	7.6	87	0.00
76 T	n-Propylbenzene	3.582	3.428	4.3	89	0.00
77 T	3-Ethyltoluene	3.156	2.910	7.8	82	0.00
78 T	4-Ethyltoluene	2.847	2.765	2.9	92	0.00
79 T	1,3,5-Trimethylbenzene	2.620	2.415	7.8	87	0.00
80 T	alpha-Methylstyrene	1.416	1.277	9.8	80	0.00
81 T	2-Ethyltoluene	3.077	2.816	8.5	86	0.00
82 T	1,2,4-Trimethylbenzene	2.571	2.508	2.5	85	-0.01
83 T	n-Decane	0.055	0.056	-1.8	98	0.00
84 T	Benzyl Chloride	2.266	2.134	5.8	83	0.00
85 T	1,3-Dichlorobenzene	1.593	1.438	9.7	82	-0.01
86 T	1,4-Dichlorobenzene	1.615	1.402	13.2	81	0.00
87 T	sec-Butylbenzene	3.352	3.155	5.9	87	0.00
88 T	4-Isopropyltoluene (p-Cymen	3.193	3.045	4.6	83	0.00
89 T	1,2,3-Trimethylbenzene	2.577	2.510	2.6	85	-0.01
90 T	1,2-Dichlorobenzene	1.502	1.374	8.5	80	-0.01
91 T	d-Limonene	0.934	1.008	-7.9	91	0.00
92 T	1,2-Dibromo-3-Chloropropane	0.560	0.553	1.3	86	-0.01
93 T	n-Undecane	1.235	1.316	-6.6	101	0.00
94 T	1,2,4-Trichlorobenzene	1.204	1.086	9.8	84	0.00
95 T	Naphthalene	3.695	3.556	3.8	88	0.00
96 T	n-Dodecane	1.163	1.322	-13.7	119	0.00
97 T	Hexachlorobutadiene	0.810	0.726	10.4	84	0.00
98 T	Cyclohexanone	0.808	0.914	-13.1	99	-0.01
99 T	tert-Butylbenzene	2.512	2.377	5.4	83	0.00
100 T	n-Butylbenzene	2.659	2.591	2.6	89	0.00

(#)= Out of Range

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

Data File: I:\MS16\DATA\2018 12\21\12211858.D

Acq On : 22 Dec 2018 13:55

Operator: LH

Sample : CCVend R16122118 25ng

Misc : S31-09141801/S31-12031803 (1/1)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 24 10:10:18 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

LH 12/24/18

QLast Update : Sat Oct 20 10:23:27 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.33	130	257939	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.43	114	1053486	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.72	82	446374	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.18	65	384532	12.393	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.12%
57) Toluene-d8 (SS2)	15.87	98	803433	11.303	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	90.40%
73) Bromofluorobenzene (SS3)	19.09	174	390977	12.100	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	96.80%

Target Compounds

						Qvalue
2) Propene	4.04	42	543709	22.651	ng	98
3) Dichlorodifluoromethan...	4.21	85	1129733	20.951	ng	100
4) Chloromethane	4.52	50	808473	23.555	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.78	135	630276	19.662	ng	100
6) Vinyl Chloride	4.96	62	923220	24.663	ng	100
7) 1,3-Butadiene	5.24	54	596909	24.650	ng	99
8) Bromomethane	5.70	94	484854	21.492	ng	99
9) Chloroethane	6.04	64	357244	22.225	ng	100
10) Ethanol	6.45	45	1990828	137.221	ng	100
11) Acetonitrile	6.71	41	909296	23.949	ng	99
12) Acrolein	6.90	56	314532	24.552	ng	99
13) Acetone	7.11	58	2051888	118.538	ng	99
14) Trichlorofluoromethane	7.35	101	998273	21.377	ng	99
15) 2-Propanol (Isopropanol)	7.62	45	2655914	47.844	ng	98
16) Acrylonitrile	7.90	53	683455	26.009	ng	100
17) 1,1-Dichloroethene	8.35	96	522105	21.962	ng	93
18) 2-Methyl-2-Propanol (t...	8.51	59	2711404	46.387	ng	99
19) Methylene Chloride	8.58	84	540515	22.355	ng	91
20) 3-Chloro-1-propene (Al...	8.74	41	694281	23.091	ng	97
21) Trichlorotrifluoroethane	8.99	151	505594	20.342	ng	95
22) Carbon Disulfide	8.85	76	1954859	22.647	ng	100
23) trans-1,2-Dichloroethene	9.87	61	776039	23.847	ng	95
24) 1,1-Dichloroethane	10.12	63	901976	22.287	ng	99
25) Methyl tert-Butyl Ether	10.21	73	1595876	22.297	ng	98
26) Vinyl Acetate	10.38	86	714087	117.687	ng	# 67
27) 2-Butanone (MEK)	10.62	72	380164	24.827	ng	# 89
28) cis-1,2-Dichloroethene	11.15	61	803295	25.108	ng	94
29) Diisopropyl Ether	11.42	87	489424	22.875	ng	# 73
30) Ethyl Acetate	11.44	61	467340	56.942	ng	93
31) n-Hexane	11.42	57	965799	25.826	ng	98
32) Chloroform	11.49	83	1038635	23.880	ng	99
34) Tetrahydrofuran (THF)	11.89	72	387871	25.141	ng	92
35) Ethyl tert-Butyl Ether	12.02	87	684428	22.859	ng	92
36) 1,2-Dichloroethane	12.30	62	772574	22.954	ng	100
38) 1,1,1-Trichloroethane	12.57	97	922744	23.295	ng	99
39) Isopropyl Acetate	12.98	61	769431	51.754	ng	# 93
40) 1-Butanol	13.01	56	1305220	61.276	ng	95
41) Benzene	13.04	78	2259562	23.330	ng	100
42) Carbon Tetrachloride	13.20	117	837956	22.836	ng	100
43) Cyclohexane	13.33	84	1781274	47.453	ng	91
44) tert-Amyl Methyl Ether	13.67	73	1632640	24.472	ng	99
45) 1,2-Dichloropropane	13.90	63	562712	26.161	ng	99
46) Bromodichloromethane	14.09	83	822373	24.272	ng	99
47) Trichloroethene	14.13	130	644222	22.629	ng	100
48) 1,4-Dioxane	14.11	88	492185	26.854	ng	93
49) 2,2,4-Trimethylpentane...	14.19	57	2243551	24.959	ng	100

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Data File: I:\MS16\DATA\2018 12\21\12211858.D

Acq On : 22 Dec 2018 13:55

Operator: LH

Sample : CCVend R16122118 25ng

Misc : S31-09141801/S31-12031803 (1/1)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 24 10:10:18 2018

Quant Method : I:\MS16\METHODS\R16101918.M

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

QLast Update : Sat Oct 20 10:23:27 2018

Response via : Initial Calibration

DataAcq Meth:TO15.M

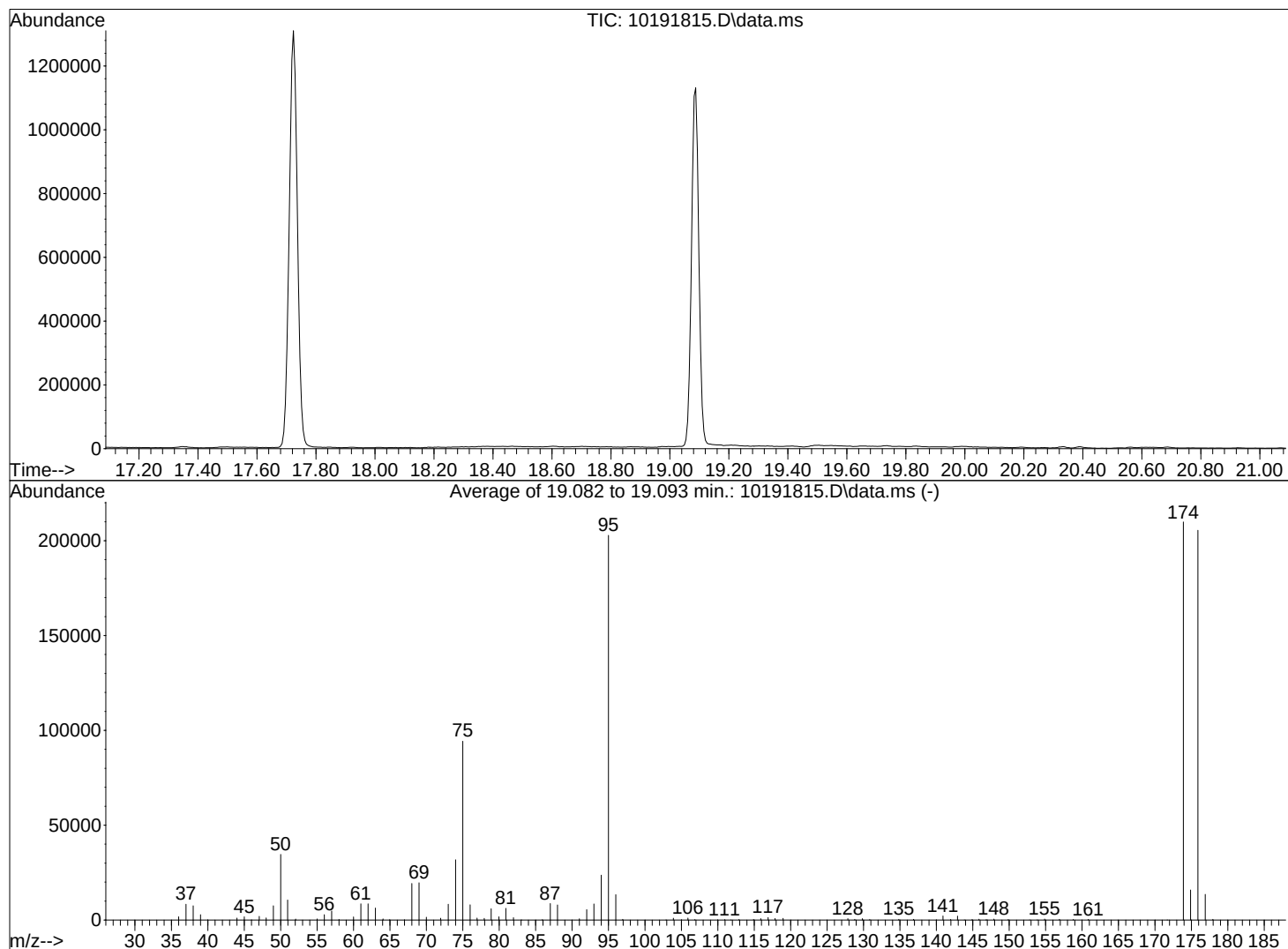
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.33	100	480355	47.875	ng	# 84
51) n-Heptane	14.45	71	511492	22.956	ng	95
52) cis-1,3-Dichloropropene	15.00	75	965731	25.414	ng	100
53) 4-Methyl-2-pentanone	15.02	58	509571	26.049	ng	96
54) trans-1,3-Dichloropropene	15.51	75	824129	24.525	ng	100
55) 1,1,2-Trichloroethane	15.69	97	530960	22.749	ng	97
58) Toluene	15.98	91	2126984	21.550	ng	100
59) 2-Hexanone	16.21	43	1217742	26.926	ng	98
60) Dibromochloromethane	16.39	129	705018	24.450	ng	100
61) 1,2-Dibromoethane	16.64	107	639067	24.168	ng	100
62) n-Butyl Acetate	16.83	43	1358857	27.723	ng	99
63) n-Octane	16.95	57	435996	23.199	ng	92
64) Tetrachloroethene	17.11	166	643777	21.194	ng	99
65) Chlorobenzene	17.77	112	1501847	22.468	ng	100
66) Ethylbenzene	18.11	91	2507079	22.305	ng	99
67) m- & p-Xylenes	18.27	91	3957186	47.147	ng	98
68) Bromoform	18.35	173	623458	24.302	ng	100
69) Styrene	18.59	104	1592206	23.322	ng	98
70) o-Xylene	18.69	91	2038959	23.932	ng	98
71) n-Nonane	18.87	43	1048458	26.780	ng	95
72) 1,1,2,2-Tetrachloroethane	18.68	83	1056450	25.898	ng	99
74) Cumene	19.20	105	2716446	24.294	ng	98
75) alpha-Pinene	19.54	93	1385575	23.890	ng	99
76) n-Propylbenzene	19.64	91	3293017	25.741	ng	98
77) 3-Ethyltoluene	19.73	105	2758810	24.478	ng	98
78) 4-Ethyltoluene	19.77	105	2619338	25.761	ng	98
79) 1,3,5-Trimethylbenzene	19.83	105	2278587	24.353	ng	98
80) alpha-Methylstyrene	19.97	118	1205723	23.837	ng	99
81) 2-Ethyltoluene	20.00	105	2695244	24.530	ng	98
82) 1,2,4-Trimethylbenzene	20.19	105	2391190	26.050	ng	97
83) n-Decane	20.26	58	53905	27.223	ng	# 85
84) Benzyl Chloride	20.31	91	2002037	24.741	ng	97
85) 1,3-Dichlorobenzene	20.32	146	1386779	24.376	ng	100
86) 1,4-Dichlorobenzene	20.39	146	1353196	23.458	ng	100
87) sec-Butylbenzene	20.42	105	2994333	25.014	ng	98
88) 4-Isopropyltoluene (p-...	20.56	119	2832865	24.842	ng	81
89) 1,2,3-Trimethylbenzene	20.56	105	2334898	25.372	ng	97
90) 1,2-Dichlorobenzene	20.68	146	1335450	24.898	ng	100
91) d-Limonene	20.68	68	908798	27.252	ng	92
92) 1,2-Dibromo-3-Chloropr...	21.06	157	514014	25.697	ng	96
93) n-Undecane	21.34	57	1242062	28.173	ng	95
94) 1,2,4-Trichlorobenzene	22.17	180	1031285	23.989	ng	100
95) Naphthalene	22.28	128	3254185	24.662	ng	100
96) n-Dodecane	22.24	57	1217097	29.314	ng	94
97) Hexachlorobutadiene	22.58	225	682339	23.579	ng	99
98) Cyclohexanone	18.41	55	801126	27.760	ng	97
99) tert-Butylbenzene	20.19	119	2264673	25.242	ng	98
100) n-Butylbenzene	20.92	91	2461361	25.921	ng	99

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

Data Path : I:\MS16\DATA\2018 10\19\
 Data File : 10191815.D
 Acq On : 19 Oct 2018 19:38
 Operator : LH/TD
 Sample : 12.5ng TO15 BFB
 Misc : S31-09141801
 ALS Vial : 2 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS16\METHODS\R16101918.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Sat Oct 20 10:14:30 2018



AutoFind: Scans 2836, 2837, 2838; Background Corrected with Scan 2828

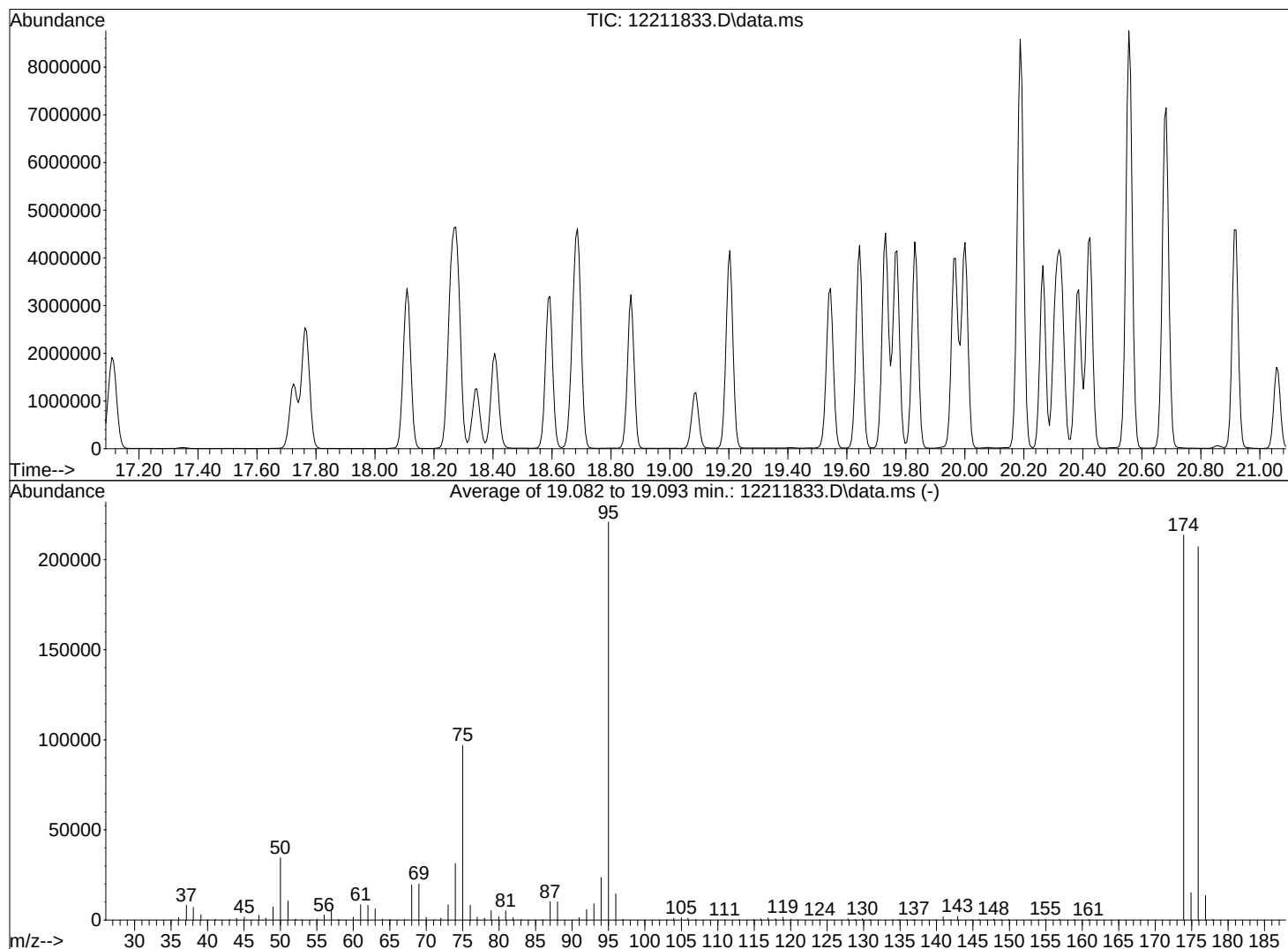
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	17.0	34573	PASS
75	95	30	66	46.5	94304	PASS
95	95	100	100	100.0	202816	PASS
96	95	5	9	6.6	13417	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	103.5	209899	PASS
175	174	4	9	7.6	15867	PASS
176	174	93	101	97.9	205504	PASS
177	176	5	9	6.6	13542	PASS

LH 10/20/18

Data Path : I:\MS16\DATA\2018 12\21\
 Data File : 12211833.D
 Acq On : 21 Dec 2018 22:23
 Operator : LH
 Sample : CCV2 R16122118 25ng
 Misc : S31-09141801/S31-12031803 (1/1)
 ALS Vial : 2 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS16\METHODS\R16101918.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Sat Oct 20 10:23:27 2018



AutoFind: Scans 2836, 2837, 2838; Background Corrected with Scan 2827

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	15.6	34567	PASS
75	95	30	66	43.9	96973	PASS
95	95	100	100	100.0	220885	PASS
96	95	5	9	6.6	14537	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	96.7	213611	PASS
175	174	4	9	7.2	15311	PASS
176	174	93	101	97.0	207211	PASS
177	176	5	9	6.5	13547	PASS

LH 12/22/18

Injection Log

Directory: J:\MS16\DATA\2018_10\19\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	10/19/18 9:22	10191801.D	0.1ng std check	S31-09141801/S31-09251801 (10/23)	LH/TD	5	
2	10/19/18 9:55	10191802.D	0.5ng std check	S31-09141801/S31-10181802 (11/16)	LH/TD	6	
3	10/19/18 10:28	10191803.D	5.0ng std check	S31-09141801/S31-10181801 (11/16)	LH/TD	7	
4	10/19/18 11:37	10191804.D	25ng std check	S31-09141801/S31-10181803 (11/16)	LH/TD	2	
5	10/19/18 12:10	10191805.D	25ng std check	S31-09141801/S31-10191803 (11/17)	LH/TD	2	
6	10/19/18 14:38	10191806.D	Screen (20mL)	S31-09141801	LH/TD	5	
7	10/19/18 15:11	10191807.D	12.5ng TO15 BFB	S31-09141801	LH/TD	2	passed
8	10/19/18 15:45	10191808.D	0.5ng MAPH ICAL STD	S31-09141801/S31-10121805 (12/9)	LH/TD	1	
9	10/19/18 16:18	10191809.D	1.0ng MAPH ICAL STD	S31-09141801/S31-10121805 (12/9)	LH/TD	1	
10	10/19/18 16:51	10191810.D	5.0ng MAPH ICAL STD	S31-09141801/S31-10121805 (12/9)	LH/TD	1	
11	10/19/18 17:24	10191811.D	25ng MAPH ICAL STD	S31-09141801/S31-10121803 (12/9)	LH/TD	4	M16101918.M
12	10/19/18 17:58	10191812.D	50ng MAPH ICAL STD	S31-09141801/S31-10121803 (12/9)	LH/TD	4	
13	10/19/18 18:31	10191813.D	100ng MAPH ICAL STD	S31-09141801/S31-10121803 (12/9)	LH/TD	4	
14	10/19/18 19:04	10191814.D	25ng MAPH ICV STD	S31-09141801/S31-10191803 (11/17)	LH/TD	2	passed
15	10/19/18 19:38	10191815.D	12.5ng TO15 BFB	S31-09141801	LH/TD	2	passed
16	10/19/18 20:11	10191816.D	0.1ng TO15 ICAL STD	S31-09141801/S31-10181802 (11/16)	LH/TD	6	
17	10/19/18 20:45	10191817.D	0.2ng TO15 ICAL STD	S31-09141801/S31-10181802 (11/16)	LH/TD	6	
18	10/19/18 21:18	10191818.D	0.5ng TO15 ICAL STD	S31-09141801/S31-10181802 (11/16)	LH/TD	6	
19	10/19/18 21:52	10191819.D	1.0ng TO15 ICAL STD	S31-09141801/S31-10181801 (11/16)	LH/TD	6	
20	10/19/18 22:26	10191820.D	5.0ng TO15 ICAL STD	S31-09141801/S31-10181801 (11/16)	LH/TD	7	
21	10/19/18 22:59	10191821.D	25ng TO15 ICAL STD	S31-09141801/S31-10181803 (11/16)	LH/TD	2	R16101918.M
22	10/19/18 23:33	10191822.D	50ng TO15 ICAL STD	S31-09141801/S31-10181803 (11/16)	LH/TD	2	
23	10/20/18 0:06	10191823.D	100ng TO15 ICAL STD	S31-09141801/S31-10181803 (11/16)	LH/TD	2	
24	10/20/18 0:39	10191824.D	25ng TO15 ICV STD	S31-09141801/S31-10191803 (11/17)	LH/TD	2	passed
25							
26							
27				LH 10/20/18			
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							

Injection Log

Directory: I:\MS16\DATA\2018_12\21\

[illegible]

SIMIVALLEY QC Certification

Conditioner: P-Conditioner-07

Cycles: 35

Batch: 22856

Batch Started By: HAYDEN.AKERS on 11/20/18 0903
Finished Cleaning By: HAYDEN.AKERS on 11/20/18 0903

Container IDs	Cleaned Date	QC Date Analyzed	QC Results	Initial Vacuum			Final Vacuum			Comments
				Vacuum	Date/Time	User	Vacuum	Date/Time	User	
SSC00483	11/20/18	1/1/01	Pass w/ Conditions	-14.3	11/20/18 0903	HAYDEN.AKERS	-14.0	11/27/18 0830	JHULETTE	MS21_11/21/18
SC00542	11/20/18	1/1/01	Pass w/ Conditions	-14.3	11/20/18 0903	HAYDEN.AKERS	-14.0	11/27/18 0830	JHULETTE	
SC00891	11/20/18	1/1/01	Pass w/ Conditions	-14.3	11/20/18 0903	HAYDEN.AKERS	-14.0	11/26/18 0924	JHULETTE	
SC01527	11/20/18	1/1/01	Pass w/ Conditions	-14.3	11/20/18 0903	HAYDEN.AKERS	-14.0	11/27/18 0828	JHULETTE	
SC00928	11/20/18	11/21/18	Pass w/ Conditions	-14.3	11/20/18 0903	HAYDEN.AKERS	-14.0	11/27/18 0828	JHULETTE	
SC01950	11/20/18	1/1/01	Pass w/ Conditions	-14.3	11/20/18 0903	HAYDEN.AKERS	-14.0	11/26/18 0921	JHULETTE	
SC01924	11/20/18	1/1/01	Pass w/ Conditions	-14.3	11/20/18 0903	HAYDEN.AKERS	-14.0	11/26/18 0921	JHULETTE	
SC00167	11/20/18	1/1/01	Pass w/ Conditions	-14.3	11/20/18 0903	HAYDEN.AKERS	-14.0	11/26/18 0924	JHULETTE	
SSC00159	11/20/18	1/1/01	Pass w/ Conditions	-14.3	11/20/18 0903	HAYDEN.AKERS	-14.0	11/27/18 0824	JHULETTE	
SC01522	11/20/18	1/1/01	Pass w/ Conditions	-14.3	11/20/18 0903	HAYDEN.AKERS	-14.0	11/27/18 0828	JHULETTE	

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 11\20\
 Data File : 11201814.D
 Acq On : 20 Nov 2018 3:44 pm
 Operator : RVT
 Sample : 112018 SC00928 22856
 Misc : LL+TICS (Sig #1); S31-10301802 (Sig #2)
 ALS Vial : 209 Sample Multiplier: 1

RVT 11/21/18

Quant Time: Nov 21 07:28:49 2018
 Quant Method : I:\MS21\Methods\F21111318.M
 Quant Title : EPA TO-15
 QLast Update : Tue Nov 13 11:29:56 2018
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	7.54	130	54618	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.78	114	153412	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.70	117	96015	1000.000	pg	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4 ...	8.36	65	81424	1015.023	pg	0.00
Spiked Amount 1000.000			Recovery	=	101.50%	
57) Toluene-d8 (SS2)	12.61	98	105914	991.574	pg	0.00
Spiked Amount 1000.000			Recovery	=	99.16%	
74) Bromofluorobenzene (SS3)	16.14	174	31993	1040.902	pg	0.00
Spiked Amount 1000.000			Recovery	=	104.09%	

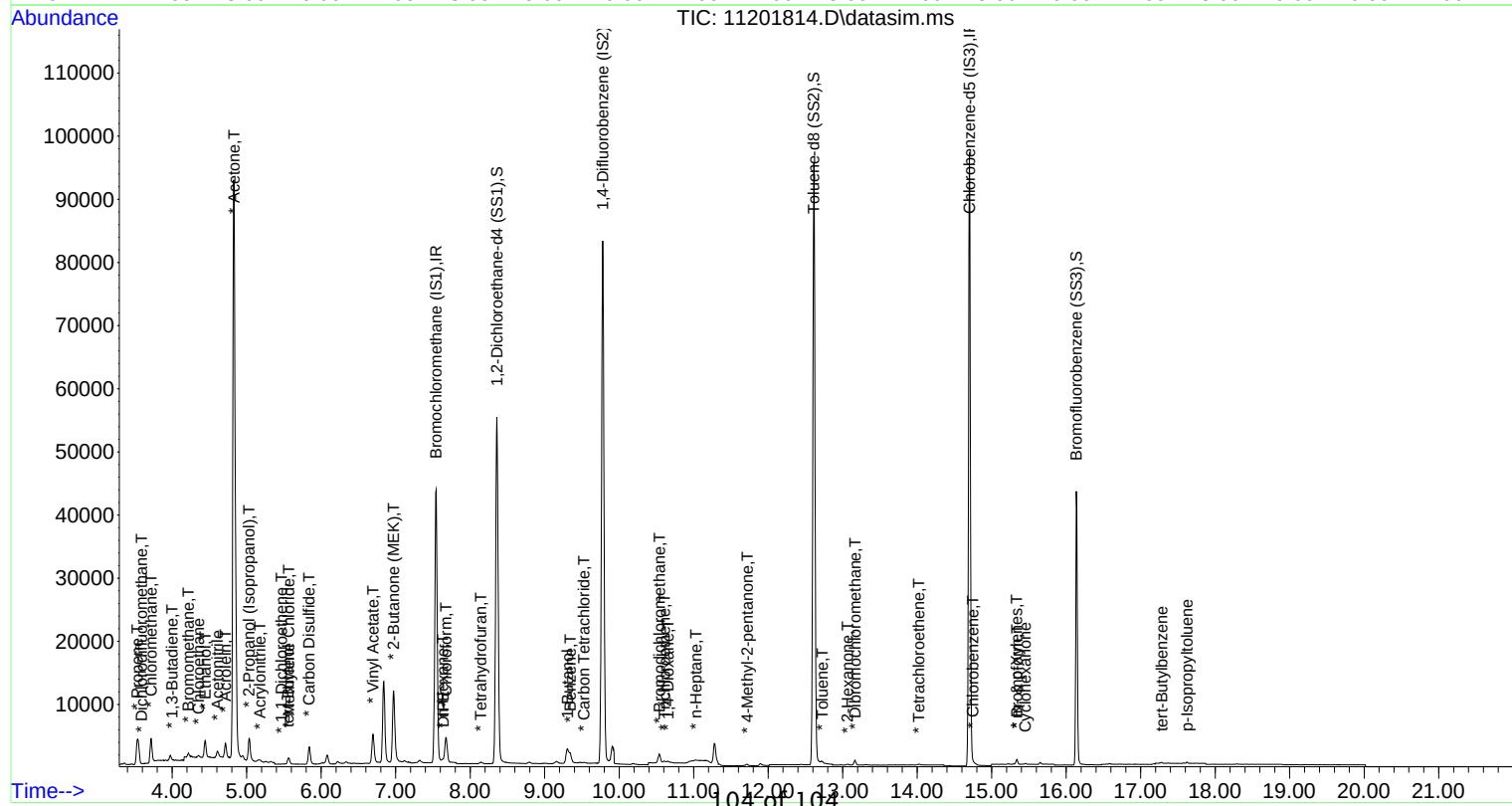
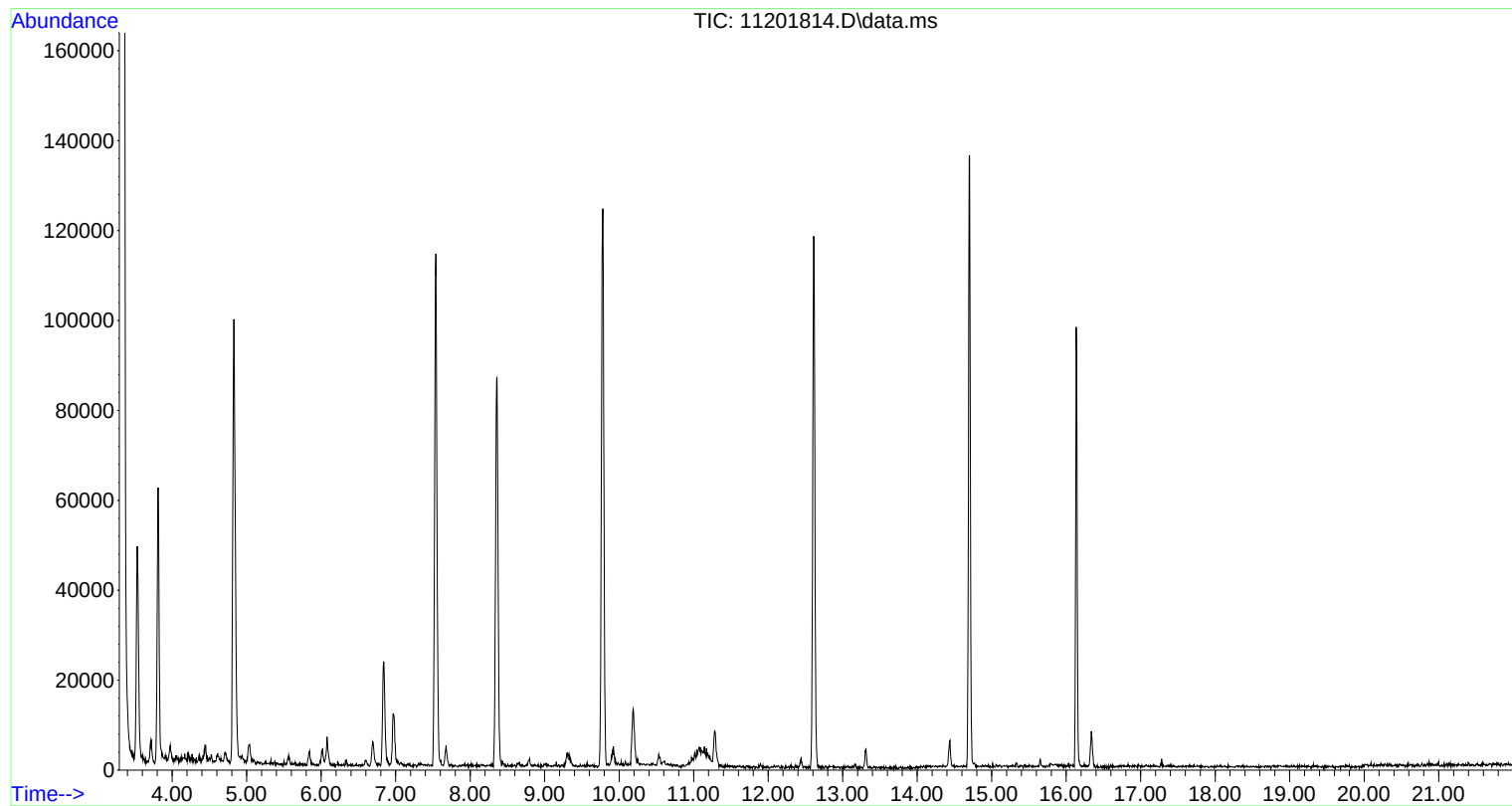
Target Compounds

						Qvalue
2) * Propene	3.53	42	2191	34.114	pg	# 60
3) * Dichlorodifluoromethane	3.59	85	74	0.400	pg	# 42
4) * Chloromethane	3.72	50	4620	48.794	pg	# 98
7) * 1,3-Butadiene	4.00	54	61	1.133	pg	# 1
8) * Bromomethane	4.22	94	581	10.194	pg	# 88
9) * Chloroethane	4.35	64	403	11.020	pg	# 89
10) * Ethanol	4.44	45	3093	101.648	pg	# 95
11) * Acetonitrile	4.61	41	1167	8.373	pg	# 87
12) * Acrolein	4.71	56	2494	50.709	pg	# 100
13) * Acetone	4.83	58	72661	835.779	pg	# 54
15) * 2-Propanol (Isopropa...	5.03	45	4069	39.022	pg	# 99
16) * Acrylonitrile	5.18	53	293	3.156	pg	# 94
17) * 1,1-Dichloroethene	5.47	96	522	8.610	pg	# 47
18) tert-Butanol	5.56	59	918	14.507	pg	# 99
19) * Methylene Chloride	5.57	84	386	4.482	pg	# 97
22) * Carbon Disulfide	5.84	76	5256	16.676	pg	# 99
26) * Vinyl Acetate	6.70	86	1540	154.814	pg	# 17
27) * 2-Butanone (MEK)	6.97	72	4821	105.284	pg	# 95
29) DIPE	7.64	45	68	0.576	pg	# 1
31) * n-Hexane	7.63	57	156	2.612	pg	# 30
32) * Chloroform	7.67	83	4792	37.242	pg	# 99
34) * Tetrahydrofuran	8.14	71	68	3.407	pg	# 82
39) * Benzene	9.35	78	2122	9.346	pg	# 99
41) 1-Butanol	9.31	56	1546	54.722	pg	# 46
42) * Carbon Tetrachloride	9.53	117	93	1.083	pg	# 96
46) * Bromodichloromethane	10.54	83	1858	18.833	pg	# 96
47) * Trichloroethene	10.61	130	66	1.028	pg	# 82
48) * 1,4-Dioxane	10.66	88	295	8.635	pg	# 98
51) * n-Heptane	11.03	71	89	1.272	pg	# 47
53) * 4-Methyl-2-pentanone	11.72	58	143	5.319	pg	# 43
58) * Toluene	12.73	91	362	2.744	pg	# 99
59) * 2-Hexanone	13.06	58	222	14.058	pg	# 61
60) * Dibromochloromethane	13.17	129	757	17.865	pg	# 97
64) * Tetrachloroethene	14.02	166	143	3.122	pg	# 94
65) * Chlorobenzene	14.75	112	53	0.558	pg	# 42
67) * m- & p-Xylenes	15.33	91	233	3.340	pg	# 30
68) * Bromoform	15.34	173	739	27.454	pg	# 99
69) Cyclohexanone	15.45	98	78	7.799	pg	# 87
83) tert-Butylbenzene	17.28	134	74	4.592	pg	# 1
91) p-Isopropyltoluene	17.62	134	51	2.892	pg	# 50

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

Data Path : I:\MS21\DATA\2018 11\20\
 Data File : 11201814.D
 Acq On : 20 Nov 2018 3:44 pm
 Operator : RVT
 Sample : 112018 SC00928 22856
 Misc : LL+TICS (Sig #1); S31-10301802 (Sig #2)
 ALS Vial : 209 Sample Multiplier: 1

Quant Time: Nov 21 07:28:49 2018
 Quant Method : I:\MS21\Methods\F21111318.M
 Quant Title : EPA TO-15
 QLast Update : Tue Nov 13 11:29:56 2018
 Response via : Initial Calibration



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

LABORATORY REPORT

April 29, 2019

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

RE: DDMT / 10A023.002.330

Dear Todd:

Your report number P1901884 has been amended for the sample submitted to our laboratory on April 5, 2019. The original data report pages generated included ug/m3 concentration units. The data report pages have been generated in ppbV concentration units and included at the end of the report. The additional pages have been indicated by the "Added Page" footer located at the bottom right of the page. (pages 97-106)

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 8:55 am, 04/29/19

Kate Kaneko
Laboratory Director



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

Client: Trinity Analysis & Development Corp.
Project: DDMT / 10A023.002.330

Service Request No: P1901884

CASE NARRATIVE

The sample was received intact under chain of custody on April 5, 2019 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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 Simi Valley, CA 93065
 T: +1 805 526 7161
www.alsglobal.com

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Alaska DEC	http://dec.alaska.gov/eh/lab.aspx	17-019
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/page/la-lab-accreditation	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml	2018027
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1521096
New Jersey DEP (NELAP)	http://www.nj.gov/dep/enforcement/oqa.html	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-006
Pennsylvania DEP	http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/agency/qa/env_lab_accreditation.html	T104704413-18-9
Utah DOH (NELAP)	http://health.utah.gov/lab/lab_cert_env	CA016272018-9
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

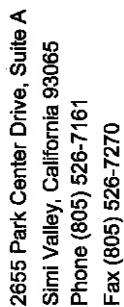
Client: Trinity Analysis & Development Corp.
Project ID: DDMT / 10A023.002.330

Service Request: P1901884

Date Received: 4/5/2019
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-Y8Q3	P1901884-001	Air	4/2/2019	11:07	SC01807	-6.94	4.00	X



ALS Environmental **Sample Acceptance Check Form**

Client: Trinity Analysis & Development Corp. Work order: P1901884
 Project: DDMT / 10A023.002.330
 Sample(s) received on: 4/5/19 Date opened: 4/5/19 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
P1901884-001.01	6.0 L Source Can					
P1901884-002.01	6.0 L Source Can					

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

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: Trinity Analysis & Development Corp.

Client Sample ID: ODSVE-EFF-Y8Q3

Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1901884

ALS Sample ID: P1901884-001

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: SC01807

Date Collected: 4/2/19

Date Received: 4/5/19

Date Analyzed: 4/15/19

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -6.94

Final Pressure (psig): 4.00

Container Dilution Factor: 2.41

CAS #	Compound	Result µg/m ³	LOQ µg/m ³	LOD µg/m ³	MDL µg/m ³	Data Qualifier
115-07-1	Propene	0.75	1.3	0.75	0.31	U
75-71-8	Dichlorodifluoromethane (CFC 12)	77	1.3	0.75	0.21	
74-87-3	Chloromethane	0.72	1.2	0.72	0.21	U
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	0.75	1.2	0.75	0.20	U
75-01-4	Vinyl Chloride	0.41	1.3	0.41	0.14	U
106-99-0	1,3-Butadiene	0.75	1.3	0.75	0.21	U
74-83-9	Bromomethane	0.39	1.2	0.39	0.18	U
75-00-3	Chloroethane	0.75	1.2	0.75	0.16	U
64-17-5	Ethanol	1.9	12	2.0	0.89	J
75-05-8	Acetonitrile	0.75	1.3	0.75	0.31	U
107-02-8	Acrolein	0.75	2.4	0.75	0.36	U
67-64-1	Acetone	6.5	13	6.5	2.9	U
75-69-4	Trichlorofluoromethane	1.8	1.3	0.77	0.20	
67-63-0	2-Propanol (Isopropyl Alcohol)	1.5	5.1	1.5	0.53	U
107-13-1	Acrylonitrile	0.75	1.3	0.75	0.27	U
75-35-4	1,1-Dichloroethene	2.9	1.3	0.41	0.18	
75-09-2	Methylene Chloride	0.77	1.3	0.77	0.36	U
107-05-1	3-Chloro-1-propene (Allyl Chloride)	0.41	1.3	0.41	0.17	U
76-13-1	Trichlorotrifluoroethane	25	1.3	0.41	0.18	
75-15-0	Carbon Disulfide	1.3	2.7	1.3	0.39	U
156-60-5	trans-1,2-Dichloroethene	1.5	1.3	0.41	0.18	
75-34-3	1,1-Dichloroethane	1.6	1.3	0.75	0.19	
1634-04-4	Methyl tert-Butyl Ether	0.41	1.3	0.41	0.15	U
108-05-4	Vinyl Acetate	6.3	13	6.3	2.9	U
78-93-3	2-Butanone (MEK)	0.75	2.4	0.75	0.27	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: ODSVE-EFF-Y8Q3

Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1901884

ALS Sample ID: P1901884-001

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: SC01807

Date Collected: 4/2/19

Date Received: 4/5/19

Date Analyzed: 4/15/19

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -6.94

Final Pressure (psig): 4.00

Container Dilution Factor: 2.41

CAS #	Compound	Result µg/m ³	LOQ µg/m ³	LOD µg/m ³	MDL µg/m ³	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	110	1.3	0.41	0.18	
141-78-6	Ethyl Acetate	1.6	2.7	1.6	0.67	U
110-54-3	n-Hexane	1.5	1.3	0.77	0.27	
67-66-3	Chloroform	23	1.3	0.41	0.17	
109-99-9	Tetrahydrofuran (THF)	0.41	1.3	0.41	0.16	U
107-06-2	1,2-Dichloroethane	0.41	1.3	0.41	0.14	U
71-55-6	1,1,1-Trichloroethane	1.8	1.3	0.41	0.16	
71-43-2	Benzene	0.31	1.3	0.41	0.19	J
56-23-5	Carbon Tetrachloride	3.1	1.3	0.41	0.18	
110-82-7	Cyclohexane	1.5	2.4	0.80	0.36	J
78-87-5	1,2-Dichloropropane	0.41	1.3	0.41	0.16	U
75-27-4	Bromodichloromethane	0.41	1.3	0.41	0.19	U
79-01-6	Trichloroethene	130	1.3	0.41	0.17	
123-91-1	1,4-Dioxane	0.41	1.3	0.41	0.15	U
80-62-6	Methyl Methacrylate	1.5	2.7	1.5	0.46	U
142-82-5	n-Heptane	0.77	1.3	0.77	0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.43	1.3	0.43	0.20	U
108-10-1	4-Methyl-2-pentanone	0.41	1.3	0.41	0.18	U
10061-02-6	trans-1,3-Dichloropropene	0.77	1.3	0.77	0.27	U
79-00-5	1,1,2-Trichloroethane	0.41	1.3	0.41	0.13	U
108-88-3	Toluene	0.68	1.3	0.41	0.16	J
591-78-6	2-Hexanone	0.41	1.3	0.41	0.16	U
124-48-1	Dibromochloromethane	0.41	1.3	0.41	0.17	U
106-93-4	1,2-Dibromoethane	0.41	1.3	0.41	0.15	U
123-86-4	n-Butyl Acetate	0.41	1.3	0.41	0.18	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-Y8Q3
Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1901884
 ALS Sample ID: P1901884-001

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: SC01807

Date Collected: 4/2/19
Date Received: 4/5/19
Date Analyzed: 4/15/19
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -6.94

Final Pressure (psig): 4.00

Container Dilution Factor: 2.41

CAS #	Compound	Result µg/m³	LOQ µg/m³	LOD µg/m³	MDL µg/m³	Data Qualifier
111-65-9	n-Octane	0.77	1.3	0.77	0.29	U
127-18-4	Tetrachloroethene	19	1.3	0.41	0.17	
108-90-7	Chlorobenzene	0.41	1.3	0.41	0.17	U
100-41-4	Ethylbenzene	0.41	1.3	0.41	0.18	U
179601-23-1	m,p-Xylenes	0.44	2.7	0.82	0.34	J
75-25-2	Bromoform	0.77	1.3	0.77	0.27	U
100-42-5	Styrene	0.77	1.3	0.77	0.21	U
95-47-6	o-Xylene	0.19	1.3	0.41	0.19	J
111-84-2	n-Nonane	0.77	1.3	0.77	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	3.0	1.3	0.41	0.18	
98-82-8	Cumene	0.41	1.3	0.41	0.19	U
80-56-8	alpha-Pinene	0.75	1.3	0.75	0.20	U
103-65-1	n-Propylbenzene	0.41	1.3	0.41	0.19	U
622-96-8	4-Ethyltoluene	0.77	1.3	0.77	0.20	U
108-67-8	1,3,5-Trimethylbenzene	0.41	1.3	0.41	0.19	U
95-63-6	1,2,4-Trimethylbenzene	0.19	1.3	0.41	0.18	J
100-44-7	Benzyl Chloride	0.77	2.7	0.77	0.29	U
541-73-1	1,3-Dichlorobenzene	0.41	1.3	0.41	0.19	U
106-46-7	1,4-Dichlorobenzene	0.77	1.3	0.77	0.20	U
95-50-1	1,2-Dichlorobenzene	0.41	1.3	0.41	0.19	U
5989-27-5	d-Limonene	0.72	1.2	0.72	0.27	U
96-12-8	1,2-Dibromo-3-chloropropane	0.75	1.3	0.75	0.24	U
120-82-1	1,2,4-Trichlorobenzene	0.77	1.3	0.77	0.31	U
91-20-3	Naphthalene	0.78	1.2	0.75	0.31	J
87-68-3	Hexachlorobutadiene	0.77	1.3	0.77	0.27	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 / 10A023.002.330

ALS Project ID: P1901884

ALS Sample ID: P190415-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: 4/15/19

Volume(s) Analyzed: 1.00 Liter(s)

Container Dilution Factor: 1.00

CAS #	Compound	Result µg/m ³	LOQ µg/m ³	LOD µg/m ³	MDL µg/m ³	Data Qualifier
115-07-1	Propene	0.31	0.52	0.31	0.13	U
75-71-8	Dichlorodifluoromethane (CFC 12)	0.31	0.52	0.31	0.087	U
74-87-3	Chloromethane	0.30	0.50	0.30	0.086	U
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	0.31	0.51	0.31	0.084	U
75-01-4	Vinyl Chloride	0.17	0.53	0.17	0.057	U
106-99-0	1,3-Butadiene	0.31	0.52	0.31	0.088	U
74-83-9	Bromomethane	0.16	0.50	0.16	0.074	U
75-00-3	Chloroethane	0.31	0.51	0.31	0.066	U
64-17-5	Ethanol	0.82	5.1	0.82	0.37	U
75-05-8	Acetonitrile	0.31	0.52	0.31	0.13	U
107-02-8	Acrolein	0.31	1.0	0.31	0.15	U
67-64-1	Acetone	2.7	5.4	2.7	1.2	U
75-69-4	Trichlorofluoromethane	0.32	0.53	0.32	0.081	U
67-63-0	2-Propanol (Isopropyl Alcohol)	0.62	2.1	0.62	0.22	U
107-13-1	Acrylonitrile	0.31	0.52	0.31	0.11	U
75-35-4	1,1-Dichloroethene	0.17	0.54	0.17	0.074	U
75-09-2	Methylene Chloride	0.32	0.54	0.32	0.15	U
107-05-1	3-Chloro-1-propene (Allyl Chloride)	0.17	0.53	0.17	0.072	U
76-13-1	Trichlorotrifluoroethane	0.17	0.53	0.17	0.076	U
75-15-0	Carbon Disulfide	0.54	1.1	0.54	0.16	U
156-60-5	trans-1,2-Dichloroethene	0.17	0.53	0.17	0.074	U
75-34-3	1,1-Dichloroethane	0.31	0.52	0.31	0.078	U
1634-04-4	Methyl tert-Butyl Ether	0.17	0.54	0.17	0.063	U
108-05-4	Vinyl Acetate	2.6	5.3	2.6	1.2	U
78-93-3	2-Butanone (MEK)	0.31	1.0	0.31	0.11	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 / 10A023.002.330

ALS Project ID: P1901884

ALS Sample ID: P190415-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: 4/15/19

Volume(s) Analyzed: 1.00 Liter(s)

Container Dilution Factor: 1.00

CAS #	Compound	Result µg/m ³	LOQ µg/m ³	LOD µg/m ³	MDL µg/m ³	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	0.17	0.53	0.17	0.075	U
141-78-6	Ethyl Acetate	0.65	1.1	0.65	0.28	U
110-54-3	n-Hexane	0.32	0.54	0.32	0.11	U
67-66-3	Chloroform	0.17	0.54	0.17	0.071	U
109-99-9	Tetrahydrofuran (THF)	0.17	0.53	0.17	0.067	U
107-06-2	1,2-Dichloroethane	0.17	0.53	0.17	0.059	U
71-55-6	1,1,1-Trichloroethane	0.17	0.54	0.17	0.066	U
71-43-2	Benzene	0.17	0.52	0.17	0.077	U
56-23-5	Carbon Tetrachloride	0.17	0.52	0.17	0.074	U
110-82-7	Cyclohexane	0.33	1.0	0.33	0.15	U
78-87-5	1,2-Dichloropropane	0.17	0.54	0.17	0.066	U
75-27-4	Bromodichloromethane	0.17	0.53	0.17	0.077	U
79-01-6	Trichloroethene	0.17	0.53	0.17	0.072	U
123-91-1	1,4-Dioxane	0.17	0.53	0.17	0.063	U
80-62-6	Methyl Methacrylate	0.64	1.1	0.64	0.19	U
142-82-5	n-Heptane	0.32	0.54	0.32	0.085	U
10061-01-5	cis-1,3-Dichloropropene	0.18	0.56	0.18	0.083	U
108-10-1	4-Methyl-2-pentanone	0.17	0.53	0.17	0.073	U
10061-02-6	trans-1,3-Dichloropropene	0.32	0.53	0.32	0.11	U
79-00-5	1,1,2-Trichloroethane	0.17	0.54	0.17	0.054	U
108-88-3	Toluene	0.17	0.53	0.17	0.065	U
591-78-6	2-Hexanone	0.17	0.54	0.17	0.066	U
124-48-1	Dibromochloromethane	0.17	0.54	0.17	0.070	U
106-93-4	1,2-Dibromoethane	0.17	0.54	0.17	0.062	U
123-86-4	n-Butyl Acetate	0.17	0.54	0.17	0.073	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 3 of 3

Client: Trinity Analysis & Development Corp.
Client Sample ID: Method Blank
Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1901884
 ALS Sample ID: P190415-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: 4/15/19
Volume(s) Analyzed: 1.00 Liter(s)

Container Dilution Factor: 1.00

CAS #	Compound	Result µg/m ³	LOQ µg/m ³	LOD µg/m ³	MDL µg/m ³	Data Qualifier
111-65-9	n-Octane	0.32	0.54	0.32	0.12	U
127-18-4	Tetrachloroethene	0.17	0.53	0.17	0.069	U
108-90-7	Chlorobenzene	0.17	0.53	0.17	0.071	U
100-41-4	Ethylbenzene	0.17	0.52	0.17	0.075	U
179601-23-1	m,p-Xylenes	0.34	1.1	0.34	0.14	U
75-25-2	Bromoform	0.32	0.53	0.32	0.11	U
100-42-5	Styrene	0.32	0.53	0.32	0.086	U
95-47-6	o-Xylene	0.17	0.53	0.17	0.077	U
111-84-2	n-Nonane	0.32	0.54	0.32	0.089	U
79-34-5	1,1,2,2-Tetrachloroethane	0.17	0.53	0.17	0.074	U
98-82-8	Cumene	0.17	0.53	0.17	0.077	U
80-56-8	alpha-Pinene	0.31	0.52	0.31	0.082	U
103-65-1	n-Propylbenzene	0.17	0.54	0.17	0.077	U
622-96-8	4-Ethyltoluene	0.32	0.53	0.32	0.085	U
108-67-8	1,3,5-Trimethylbenzene	0.17	0.53	0.17	0.077	U
95-63-6	1,2,4-Trimethylbenzene	0.17	0.53	0.17	0.074	U
100-44-7	Benzyl Chloride	0.32	1.1	0.32	0.12	U
541-73-1	1,3-Dichlorobenzene	0.17	0.54	0.17	0.080	U
106-46-7	1,4-Dichlorobenzene	0.32	0.54	0.32	0.082	U
95-50-1	1,2-Dichlorobenzene	0.17	0.54	0.17	0.079	U
5989-27-5	d-Limonene	0.30	0.51	0.30	0.11	U
96-12-8	1,2-Dibromo-3-chloropropane	0.31	0.52	0.31	0.10	U
120-82-1	1,2,4-Trichlorobenzene	0.32	0.53	0.32	0.13	U
91-20-3	Naphthalene	0.31	0.51	0.31	0.13	U
87-68-3	Hexachlorobutadiene	0.32	0.53	0.32	0.11	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 / 10A023.002.330

ALS Project ID: P1901884

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: 4/2/19
Date(s) Received: 4/5/19
Date(s) Analyzed: 4/15/19

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	P190415-MB	103	97	110	70-130	
Lab Control Sample	P190415-LCS	102	96	113	70-130	
ODSVE-EFF-Y8Q3	P1901884-001	102	98	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 / 10A023.002.330

ALS Project ID: P1901884

ALS Sample ID: P190415-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: 4/15/19

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount µg/m ³	Result µg/m ³	% Recovery	DOD Acceptance Limits	Data Qualifier
115-07-1	Propene	211	176	83	57-136	
75-71-8	Dichlorodifluoromethane (CFC 12)	210	188	90	59-128	
74-87-3	Chloromethane	211	186	88	59-132	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	211	198	94	63-121	
75-01-4	Vinyl Chloride	214	204	95	64-127	
106-99-0	1,3-Butadiene	210	210	100	66-134	
74-83-9	Bromomethane	212	199	94	63-134	
75-00-3	Chloroethane	214	186	87	63-127	
64-17-5	Ethanol	1,020	896	88	59-125	
75-05-8	Acetonitrile	206	185	90	63-132	
107-02-8	Acrolein	205	194	95	62-126	
67-64-1	Acetone	1,060	877	83	58-128	
75-69-4	Trichlorofluoromethane	211	191	91	62-126	
67-63-0	2-Propanol (Isopropyl Alcohol)	413	371	90	52-125	
107-13-1	Acrylonitrile	207	215	104	71-137	
75-35-4	1,1-Dichloroethene	218	198	91	61-133	
75-09-2	Methylene Chloride	217	202	93	62-115	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	216	201	93	71-131	
76-13-1	Trichlorotrifluoroethane	216	196	91	66-126	
75-15-0	Carbon Disulfide	218	179	82	57-134	
156-60-5	trans-1,2-Dichloroethene	214	207	97	67-124	
75-34-3	1,1-Dichloroethane	216	184	85	68-126	
1634-04-4	Methyl tert-Butyl Ether	214	189	88	66-126	
108-05-4	Vinyl Acetate	1,060	981	93	56-139	
78-93-3	2-Butanone (MEK)	208	185	89	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 / 10A023.002.330

ALS Project ID: P1901884

ALS Sample ID: P190415-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: 4/15/19

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount µg/m ³	Result µg/m ³	% Recovery	DOD Acceptance Limits	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	211	190	90	70-121	
141-78-6	Ethyl Acetate	436	383	88	65-128	
110-54-3	n-Hexane	216	166	77	63-120	
67-66-3	Chloroform	217	191	88	68-123	
109-99-9	Tetrahydrofuran (THF)	216	179	83	64-123	
107-06-2	1,2-Dichloroethane	215	199	93	65-128	
71-55-6	1,1,1-Trichloroethane	215	198	92	68-125	
71-43-2	Benzene	211	178	84	69-119	
56-23-5	Carbon Tetrachloride	212	204	96	68-132	
110-82-7	Cyclohexane	416	358	86	70-117	
78-87-5	1,2-Dichloropropane	216	186	86	69-123	
75-27-4	Bromodichloromethane	215	207	96	72-128	
79-01-6	Trichloroethene	213	197	92	71-123	
123-91-1	1,4-Dioxane	214	199	93	71-122	
80-62-6	Methyl Methacrylate	431	428	99	70-128	
142-82-5	n-Heptane	215	181	84	69-123	
10061-01-5	cis-1,3-Dichloropropene	214	198	93	70-128	
108-10-1	4-Methyl-2-pentanone	209	196	94	67-130	
10061-02-6	trans-1,3-Dichloropropene	213	209	98	75-133	
79-00-5	1,1,2-Trichloroethane	215	198	92	73-119	
108-88-3	Toluene	212	165	78	66-119	
591-78-6	2-Hexanone	214	198	93	62-128	
124-48-1	Dibromochloromethane	213	212	100	70-130	
106-93-4	1,2-Dibromoethane	216	210	97	74-122	
123-86-4	n-Butyl Acetate	219	193	88	64-128	

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 / 10A023.002.330

ALS Project ID: P1901884

ALS Sample ID: P190415-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: 4/15/19

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount µg/m ³	Result µg/m ³	% Recovery	DOD Acceptance Limits	Data Qualifier
111-65-9	n-Octane	217	171	79	69-121	
127-18-4	Tetrachloroethene	213	189	89	66-124	
108-90-7	Chlorobenzene	215	182	85	70-119	
100-41-4	Ethylbenzene	212	173	82	70-124	
179601-23-1	m,p-Xylenes	426	350	82	61-134	
75-25-2	Bromoform	213	225	106	66-139	
100-42-5	Styrene	212	193	91	73-127	
95-47-6	o-Xylene	214	175	82	67-125	
111-84-2	n-Nonane	215	169	79	63-128	
79-34-5	1,1,2,2-Tetrachloroethane	214	184	86	65-127	
98-82-8	Cumene	214	175	82	68-124	
80-56-8	alpha-Pinene	211	183	87	65-120	
103-65-1	n-Propylbenzene	218	180	83	69-123	
622-96-8	4-Ethyltoluene	214	172	80	67-129	
108-67-8	1,3,5-Trimethylbenzene	214	172	80	67-130	
95-63-6	1,2,4-Trimethylbenzene	215	180	84	66-132	
100-44-7	Benzyl Chloride	217	206	95	50-147	
541-73-1	1,3-Dichlorobenzene	216	191	88	65-130	
106-46-7	1,4-Dichlorobenzene	216	183	85	60-131	
95-50-1	1,2-Dichlorobenzene	216	192	89	63-129	
5989-27-5	d-Limonene	211	184	87	66-124	
96-12-8	1,2-Dibromo-3-chloropropane	209	205	98	67-138	
120-82-1	1,2,4-Trichlorobenzene	214	199	93	55-142	
91-20-3	Naphthalene	203	196	97	57-138	
87-68-3	Hexachlorobutadiene	209	180	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 / 10A023.002.330

ALS Project ID: P1901884

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: 04151904.D
Date Analyzed: 4/15/19
Time Analyzed: 08:56

Client Sample ID	ALS Sample ID	Lab File ID	Time Analyzed
Lab Control Sample	P190415-LCS	04151905.D	09:29
ODSVE-EFF-Y8Q3	P1901884-001	04151920.D	18:32

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Trinity Analysis & Development Corp.
Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1901884

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: 04151902.D
Date Analyzed: 4/15/19
Time Analyzed: 07:42

	IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
	AREA	#	RT	#	AREA	#
24 Hour Standard	95730		10.98		393328	13.10
Upper Limit	134022		11.31		550659	13.43
Lower Limit	57438		10.65		235997	12.77

Client Sample ID		IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
		AREA	#	RT	#	AREA	#
01	Method Blank	89776		10.96		388754	13.10
02	Lab Control Sample	91776		10.98		384174	13.11
03	ODSVE-EFF-Y8Q3	84784		10.97		363495	13.10
04							
05							
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							

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\2019 04\15\04151920.D
 Acq On : 15 Apr 2019 18:32
 Sample : P1901884-001 (1000mL)
 Misc : S31-03201909

Vial: 4
 Operator: WA
 Inst : MS13

Quant Time: Apr 16 12:11:59 2019

Quant Method : I:\MS13\METHODS\R13012319.M

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

QLast Update : Wed Jan 23 11:21:29 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

4/16/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.97	130	84784	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.10	114	363495	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.42	82	148264	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.82	65	92522	12.799	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.40%
57) Toluene-d8 (SS2)	15.55	98	390807	12.309	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.48%
73) Bromofluorobenzene (SS3)	18.83	174	162022	14.173	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	113.36%

Target Compounds

						Qvalue
2) Propene	0.00	42	0	N.D.	d	
3) Dichlorodifluoromethan...	4.13	85	403281	31.998	ng	100
4) Chloromethane	0.00	50	0	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	4.67	135	225	N.D.		
6) Vinyl Chloride	0.00	62	0	N.D.	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	6.23	45	3877	0.771	ng	88
11) Acetonitrile	0.00	41	0	N.D.		
12) Acrolein	0.00	56	0	N.D.	d	
13) Acetone	0.00	58	0	N.D.	d	
14) Trichlorofluoromethane	7.07	101	7824	0.741	ng	97
15) 2-Propanol (Isopropanol)	0.00	45	0	N.D.	d	
16) Acrylonitrile	7.66	53	58	N.D.		
17) 1,1-Dichloroethene	8.02	96	8512	1.208	ng	85
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.		
19) Methylene Chloride	8.25	84	117	N.D.		
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.	d	
21) Trichlorotrifluoroethane	8.66	151	77827	10.443	ng	91
22) Carbon Disulfide	0.00	76	0	N.D.	d	
23) trans-1,2-Dichloroethene	9.53	61	4969	0.602	ng	95
24) 1,1-Dichloroethane	9.77	63	7984	0.680	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)	0.00	72	0	N.D.		
28) cis-1,2-Dichloroethene	10.79	61	398041	46.658	ng	90
29) Diisopropyl Ether	0.00	87	0	N.D.	d	
30) Ethyl Acetate	0.00	61	0	N.D.	d	
31) n-Hexane	11.08	57	6781	0.602	ng	# 100
32) Chloroform	11.13	83	106038	9.613	ng	100
34) Tetrahydrofuran (THF)	0.00	72	0	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	0.00	62	0	N.D.		
38) 1,1,1-Trichloroethane	12.22	97	7353	0.766	ng	96
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	12.79	56	114	N.D.		
41) Benzene	12.71	78	3901	0.130	ng	94
42) Carbon Tetrachloride	12.86	117	11285	1.278	ng	99
43) Cyclohexane	12.99	84	7495	0.635	ng	99
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D.	d	
47) Trichloroethene	13.80	130	478241	55.121	ng	100
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d	
50) Methyl Methacrylate	0.00	100	0	N.D.	d	

Data File : I:\MS13\DATA\2019 04\15\04151920.D
 Acq On : 15 Apr 2019 18:32
 Sample : P1901884-001 (1000mL)
 Misc : S31-03201909

Vial: 4
 Operator: WA
 Inst : MS13

Quant Time: Apr 16 12:11:59 2019

Quant Method : I:\MS13\METHODS\R13012319.M

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

QLast Update : Wed Jan 23 11:21:29 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

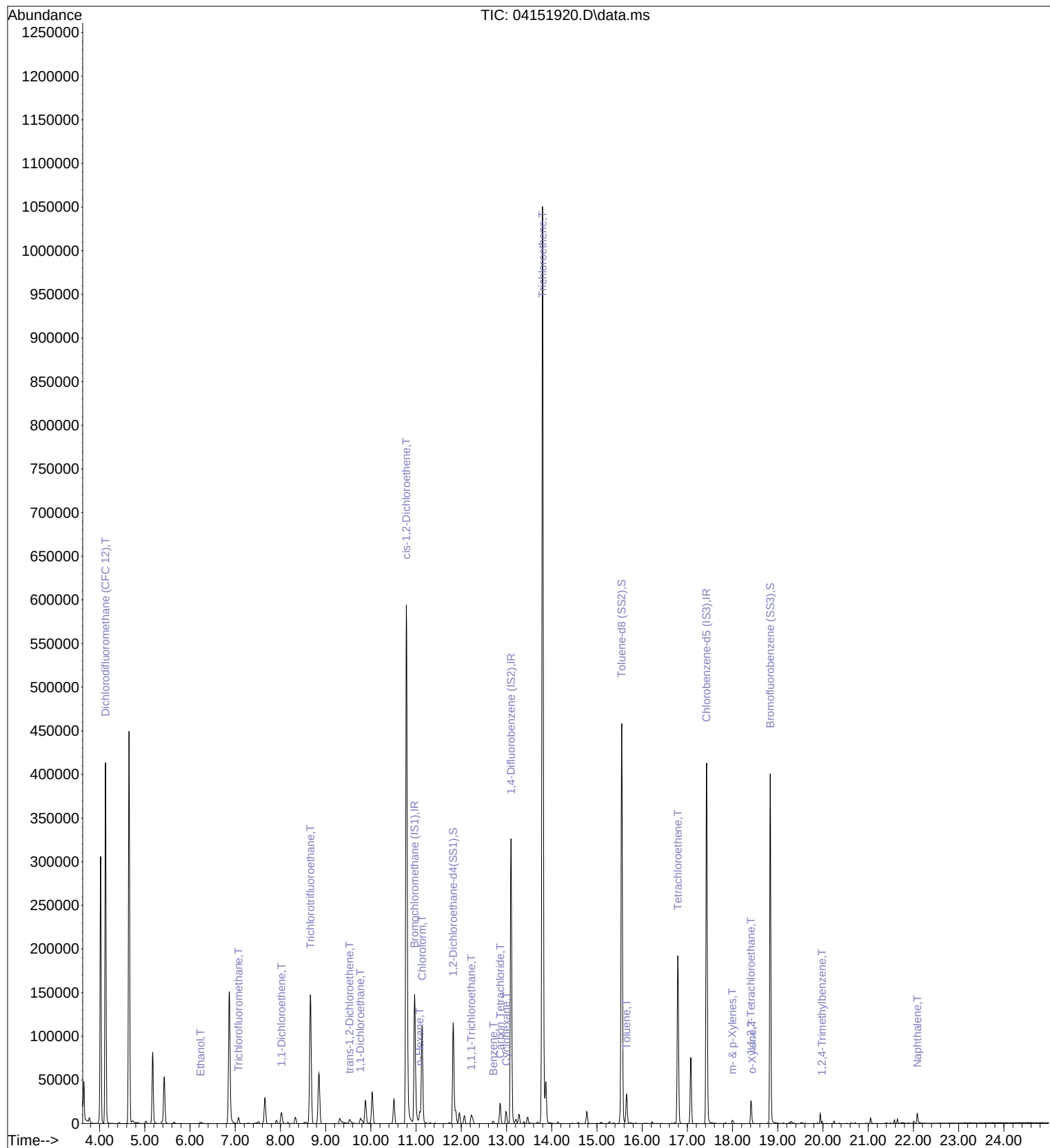
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	0.00	71	0	N.D.	d	
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.	d	
58) Toluene	15.65	91	9578	0.284	ng	100
59) 2-Hexanone	15.86	43	335	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.66	43	429	N.D.		
63) n-Octane	0.00	57	0	N.D.		
64) Tetrachloroethene	16.79	166	81621	7.902	ng	99
65) Chlorobenzene	0.00	112	0	N.D.		
66) Ethylbenzene	17.84	91	1395	N.D.		
67) m- & p-Xylenes	18.00	91	5071	0.181	ng	99
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	0.00	104	0	N.D.		
70) o-Xylene	18.43	91	2159	0.077	ng	98
71) n-Nonane	18.63	43	229	N.D.		
72) 1,1,2,2-Tetrachloroethane	18.41	83	16568	1.265	ng	99
74) Cumene	0.00	105	0	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	19.42	91	303	N.D.		
77) 3-Ethyltoluene	19.51	105	1423	N.D.		
78) 4-Ethyltoluene	19.54	105	993	N.D.		
79) 1,3,5-Trimethylbenzene	19.62	105	473	N.D.		
80) alpha-Methylstyrene	19.94	118	116	N.D.		
81) 2-Ethyltoluene	19.78	105	607	N.D.		
82) 1,2,4-Trimethylbenzene	19.98	105	2450	0.079	ng	85
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	20.36	105	583	N.D.		
88) 4-Isopropyltoluene (p-...	0.00	119	0	N.D.		
89) 1,2,3-Trimethylbenzene	20.36	105	583	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	21.18	57	115	N.D.		
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	22.09	128	12713	0.324	ng	96
96) n-Dodecane	22.08	57	397	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.		
99) tert-Butylbenzene	19.98	119	209	N.D.		
100) n-Butylbenzene	20.72	91	115	N.D.		

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

Data File : I:\MS13\DATA\2019 04\15\04151920.D
Acq On : 15 Apr 2019 18:32
Sample : P1901884-001 (1000mL)
Misc : S31-03201909

Vial: 4
Operator: WA
Inst : MS13

Quant Time: Apr 16 12:11:59 2019
Quant Method : I:\MS13\METHODS\R13012319.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Wed Jan 23 11:21:29 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019 04\15\04151920.D
 Acq On : 15 Apr 2019 18:32
 Sample : P1901884-001 (1000mL)
 Misc : S31-03201909

Vial: 4
 Operator: WA
 Inst : MS13

Quant Time: Apr 16 12:11:59 2019

Quant Method : I:\MS13\METHODS\R13012319.M

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

QLast Update : Wed Jan 23 11:21:29 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

4/16/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.97	130	84784	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.10	114	363495	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.42	82	148264	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.82	65	92522	12.799	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.40%
57) Toluene-d8 (SS2)	15.55	98	390807	12.309	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.48%
73) Bromofluorobenzene (SS3)	18.83	174	162022	14.173	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	113.36%

Target Compounds

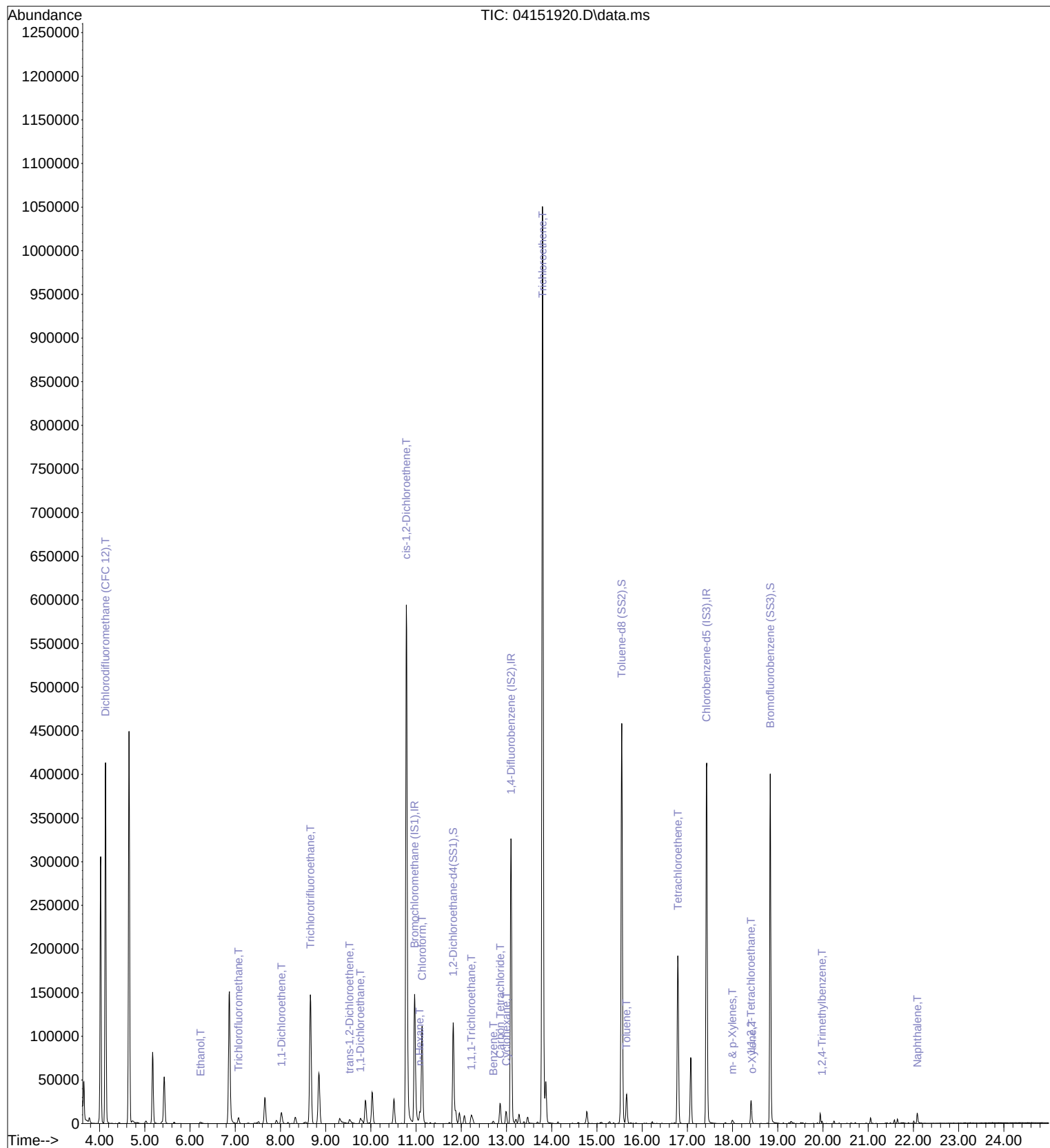
						Qvalue
3) Dichlorodifluoromethan...	4.13	85	403281	31.998	ng	100
10) Ethanol	6.23	45	3877	0.771	ng	88
14) Trichlorofluoromethane	7.07	101	7824	0.741	ng	97
17) 1,1-Dichloroethene	8.02	96	8512	1.208	ng	85
21) Trichlorotrifluoroethane	8.66	151	77827	10.443	ng	91
23) trans-1,2-Dichloroethene	9.53	61	4969	0.602	ng	95
24) 1,1-Dichloroethane	9.77	63	7984	0.680	ng	98
28) cis-1,2-Dichloroethene	10.79	61	398041	46.658	ng	90
31) n-Hexane	11.08	57	6781	0.602	ng	# 100
32) Chloroform	11.13	83	106038	9.613	ng	100
38) 1,1,1-Trichloroethane	12.22	97	7353	0.766	ng	96
41) Benzene	12.71	78	3901	0.130	ng	94
42) Carbon Tetrachloride	12.86	117	11285	1.278	ng	99
43) Cyclohexane	12.99	84	7495	0.635	ng	99
47) Trichloroethene	13.80	130	478241	55.121	ng	100
58) Toluene	15.65	91	9578	0.284	ng	100
64) Tetrachloroethene	16.79	166	81621	7.902	ng	99
67) m- & p-Xylenes	18.00	91	5071	0.181	ng	99
70) o-Xylene	18.43	91	2159	0.077	ng	98
72) 1,1,2,2-Tetrachloroethane	18.41	83	16568	1.265	ng	99
82) 1,2,4-Trimethylbenzene	19.98	105	2450	0.079	ng	85
95) Naphthalene	22.09	128	12713	0.324	ng	96

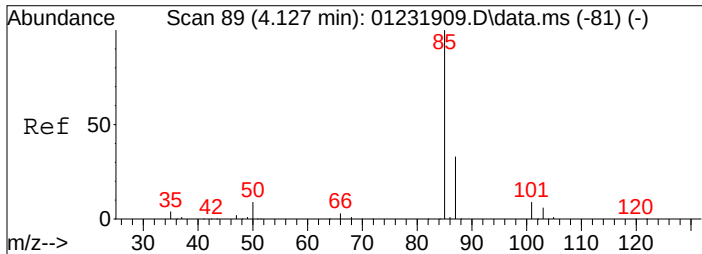
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2019 04\15\04151920.D
Acq On : 15 Apr 2019 18:32
Sample : P1901884-001 (1000mL)
Misc : S31-03201909

Vial: 4
Operator: WA
Inst : MS13

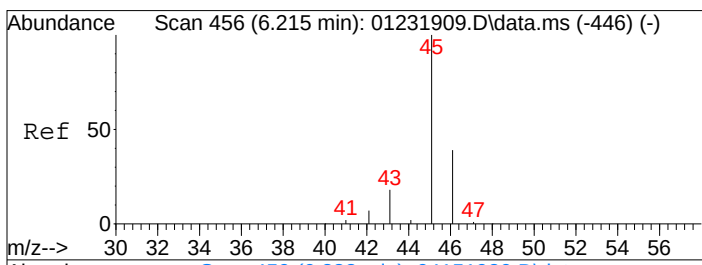
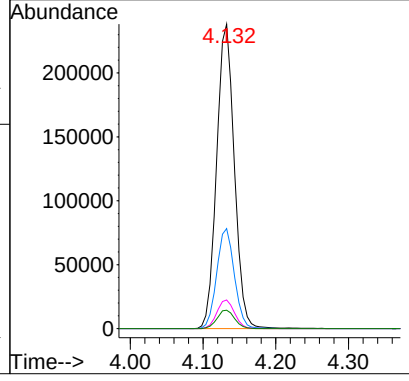
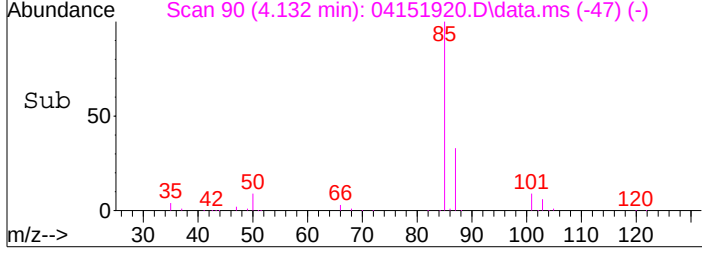
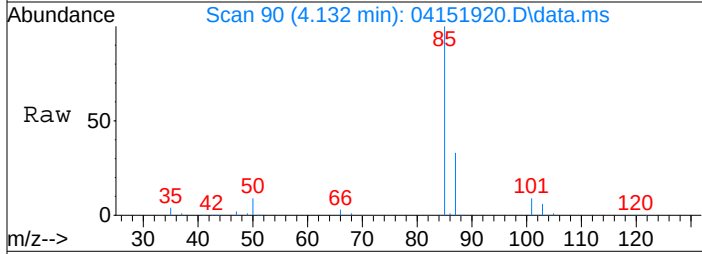
Quant Time: Apr 16 12:11:59 2019
Quant Method : I:\MS13\METHODS\R13012319.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Wed Jan 23 11:21:29 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M





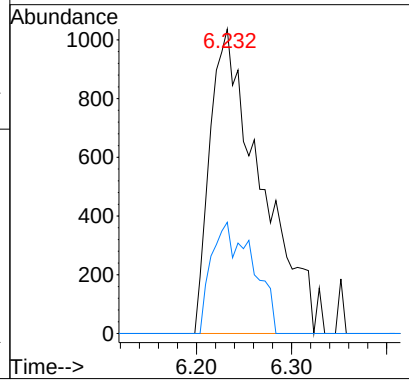
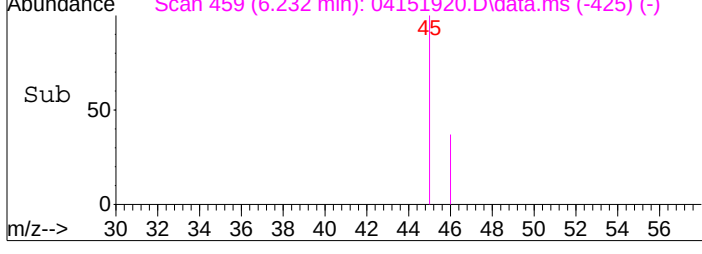
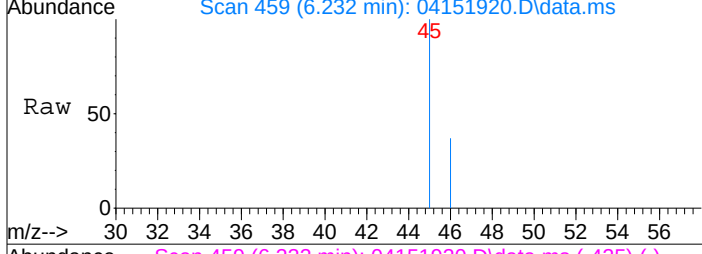
#3
 Dichlorodifluoromethane (CFC 12)
 Concen: 32.00 ng
 RT: 4.13 min Scan# 90
 Delta R.T. -0.006 min
 Lab File: 04151920.D
 Acq: 15 Apr 2019 18:32

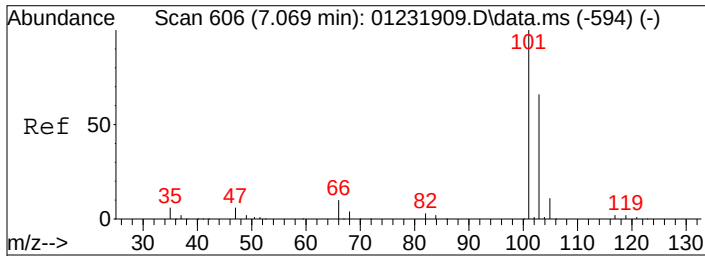
Tgt Ion:	85	Resp:	403281
Ion Ratio	Lower	Upper	
85	100		
87	32.7	12.6	52.6
101	9.3	0.0	29.5
103	6.0	0.0	26.1



#10
 Ethanol
 Concen: 0.77 ng
 RT: 6.23 min Scan# 459
 Delta R.T. -0.057 min
 Lab File: 04151920.D
 Acq: 15 Apr 2019 18:32

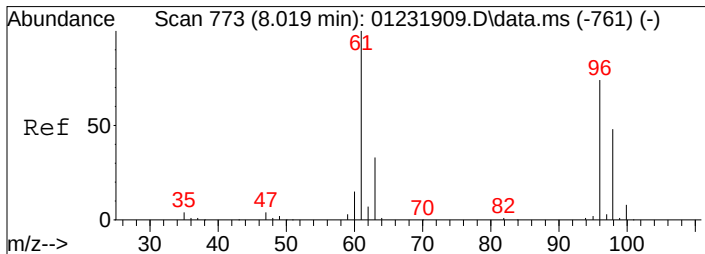
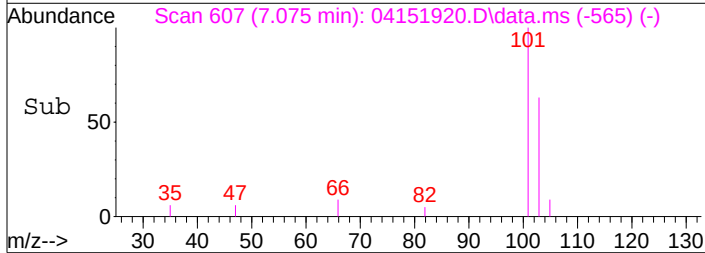
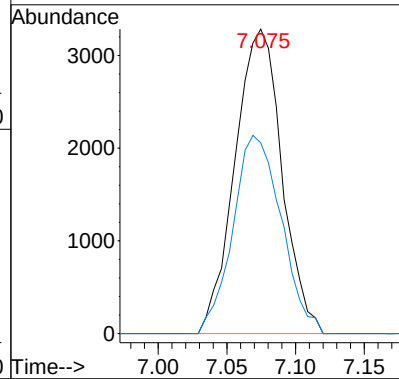
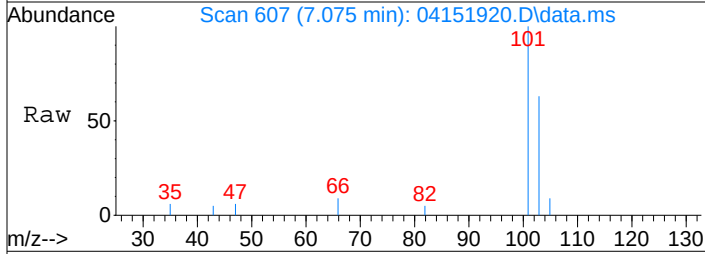
Tgt Ion:	45	Resp:	3877
Ion Ratio	Lower	Upper	
45	100		
46	29.5	16.8	56.8





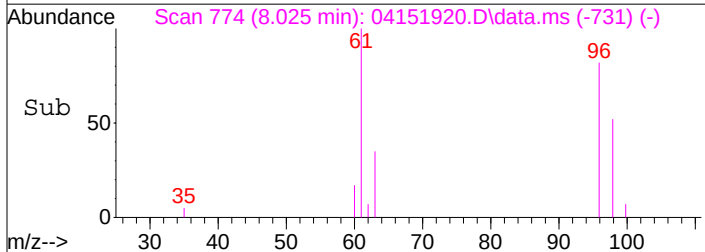
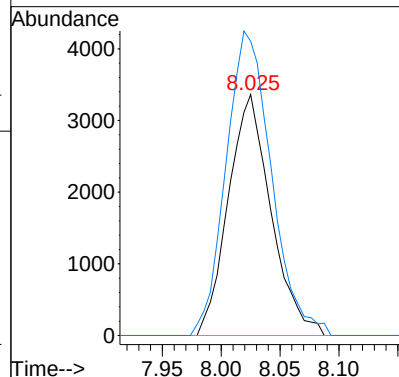
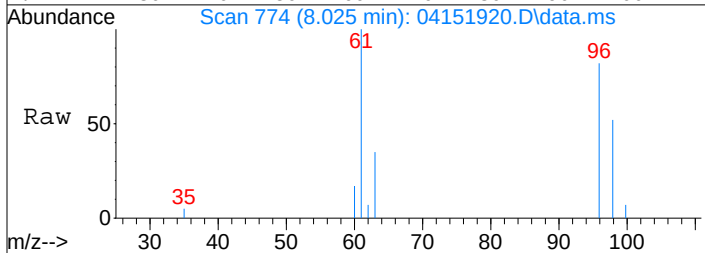
#14
Trichlorofluoromethane
Concen: 0.74 ng
RT: 7.07 min Scan# 607
Delta R.T. -0.012 min
Lab File: 04151920.D
Acq: 15 Apr 2019 18:32

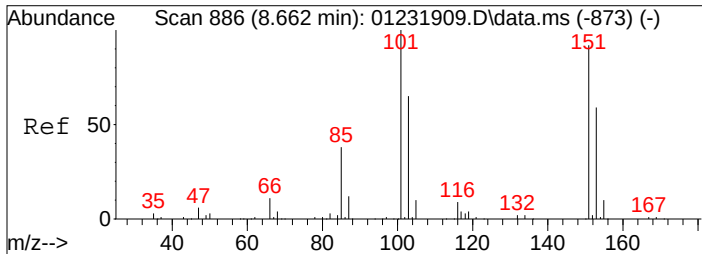
Tgt Ion: 101 Resp: 7824
Ion Ratio Lower Upper
101 100
103 66.9 44.6 84.6



#17
1,1-Dichloroethene
Concen: 1.21 ng
RT: 8.02 min Scan# 774
Delta R.T. -0.006 min
Lab File: 04151920.D
Acq: 15 Apr 2019 18:32

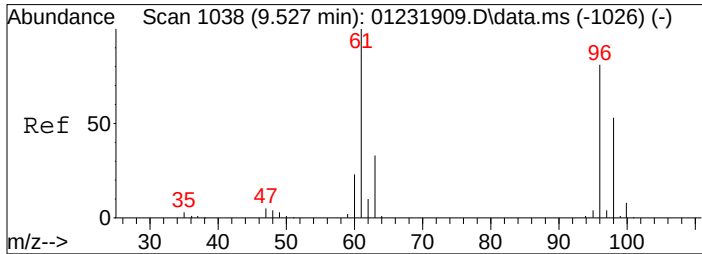
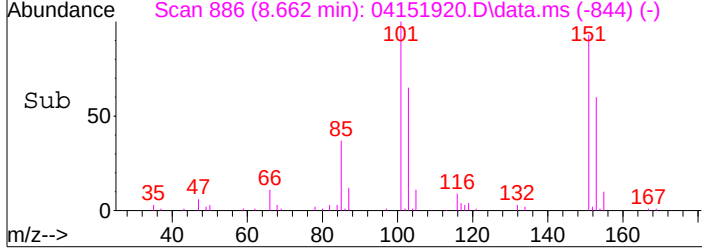
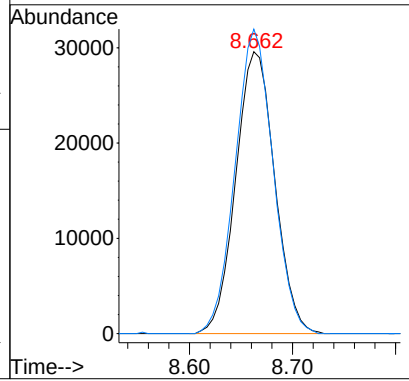
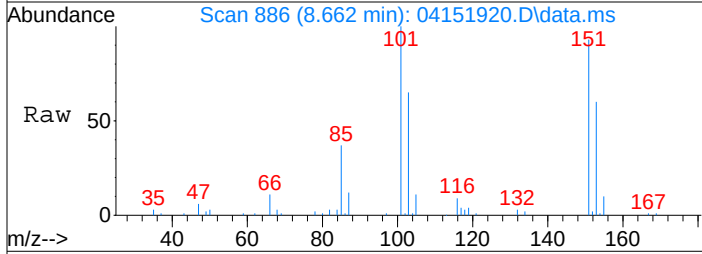
Tgt Ion: 96 Resp: 8512
Ion Ratio Lower Upper
96 100
61 134.0 132.9 172.9





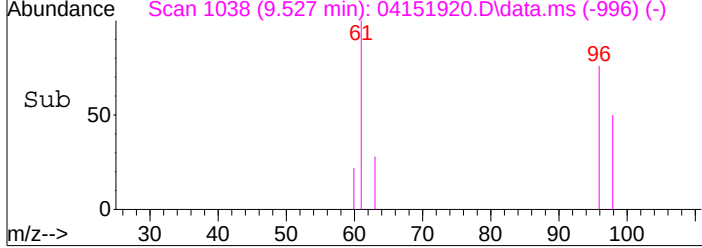
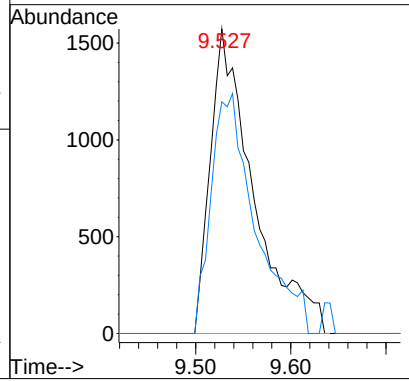
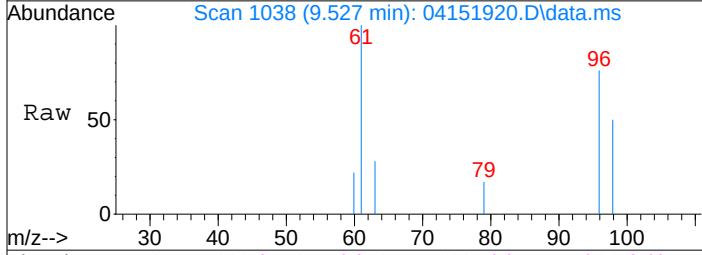
#21
 Trichlorotrifluoroethane
 Concen: 10.44 ng
 RT: 8.66 min Scan# 886
 Delta R.T. -0.012 min
 Lab File: 04151920.D
 Acq: 15 Apr 2019 18:32

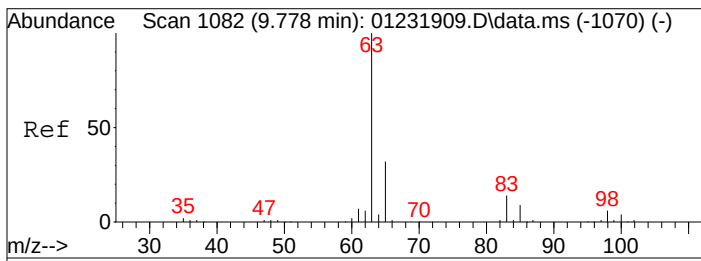
Tgt Ion: 151 Resp: 77827
 Ion Ratio Lower Upper
 151 100
 101 105.2 95.1 135.1



#23
 trans-1,2-Dichloroethene
 Concen: 0.60 ng
 RT: 9.53 min Scan# 1038
 Delta R.T. -0.012 min
 Lab File: 04151920.D
 Acq: 15 Apr 2019 18:32

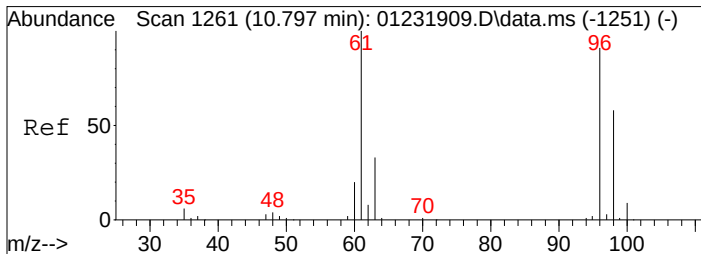
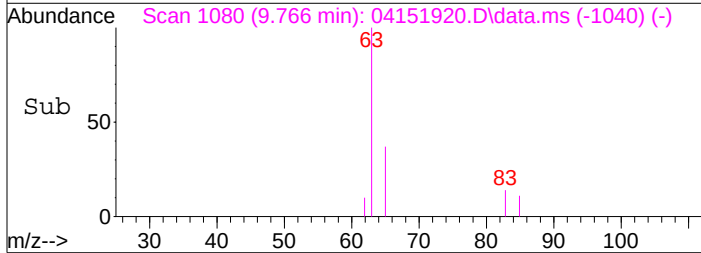
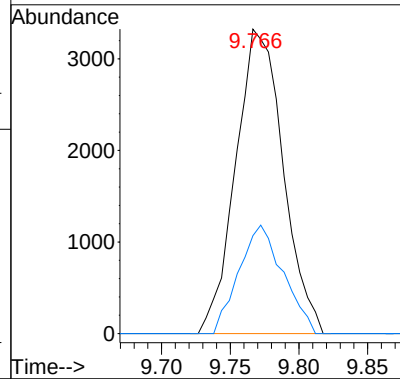
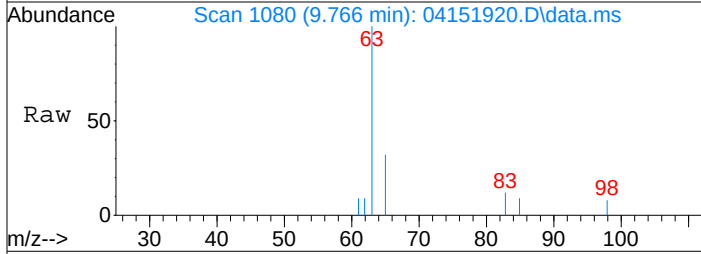
Tgt Ion: 61 Resp: 4969
 Ion Ratio Lower Upper
 61 100
 96 80.7 56.4 96.4





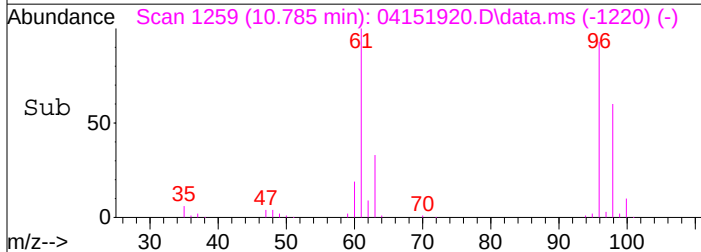
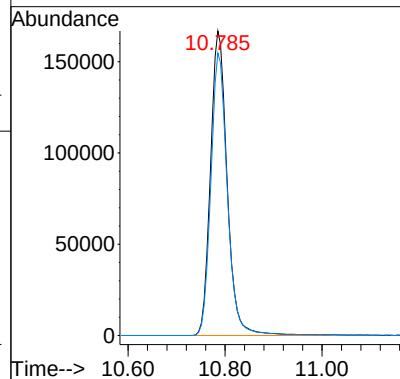
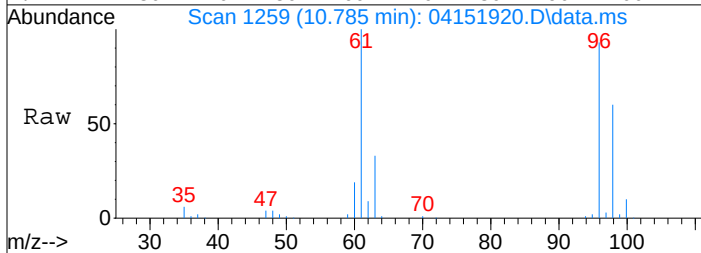
#24
1,1-Dichloroethane
Concen: 0.68 ng
RT: 9.77 min Scan# 1080
Delta R.T. -0.023 min
Lab File: 04151920.D
Acq: 15 Apr 2019 18:32

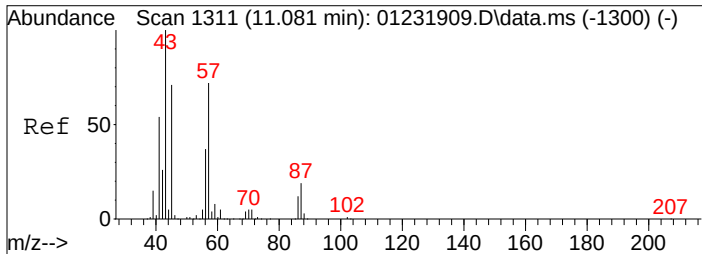
Tgt Ion: 63 Resp: 7984
Ion Ratio Lower Upper
63 100
65 33.2 12.3 52.3



#28
cis-1,2-Dichloroethene
Concen: 46.66 ng
RT: 10.79 min Scan# 1259
Delta R.T. -0.029 min
Lab File: 04151920.D
Acq: 15 Apr 2019 18:32

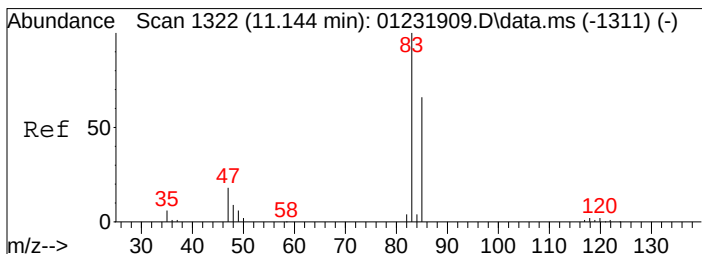
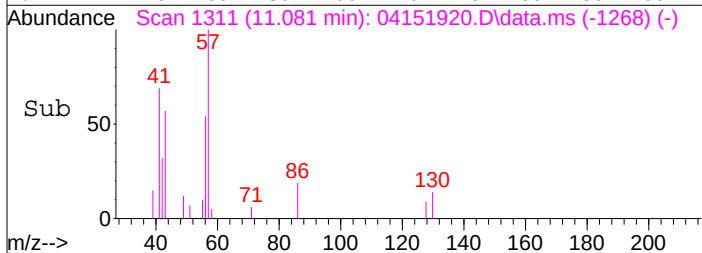
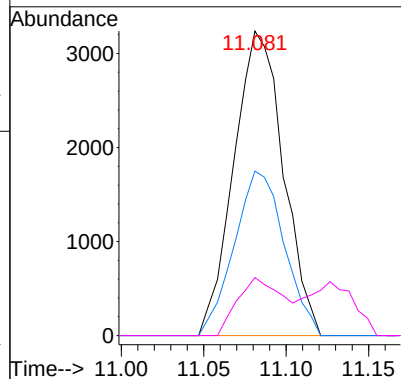
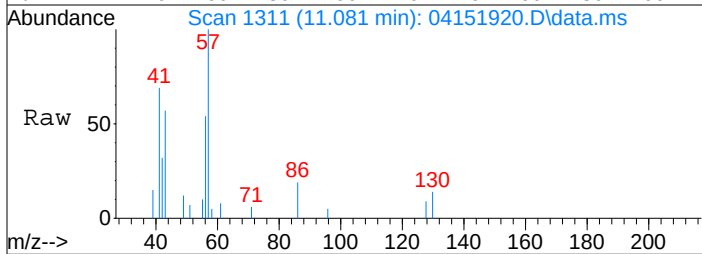
Tgt Ion: 61 Resp: 398041
Ion Ratio Lower Upper
61 100
96 92.3 63.3 103.3





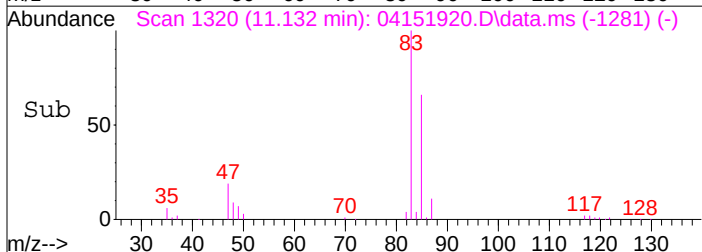
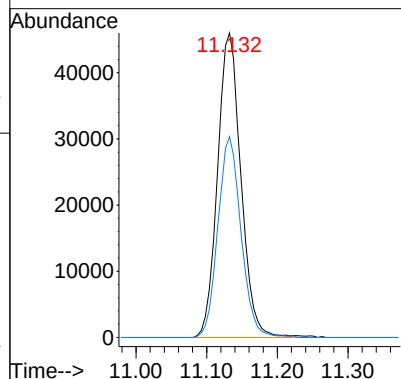
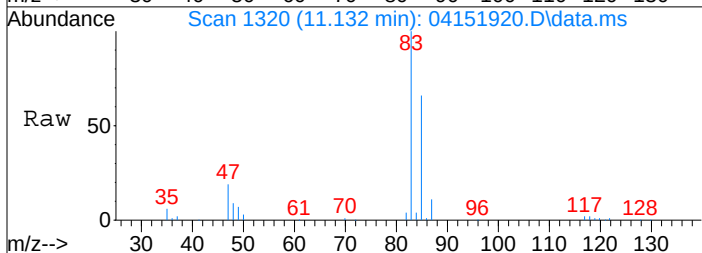
#31
n-Hexane
Concen: 0.60 ng
RT: 11.08 min Scan# 1311
Delta R.T. -0.006 min
Lab File: 04151920.D
Acq: 15 Apr 2019 18:32

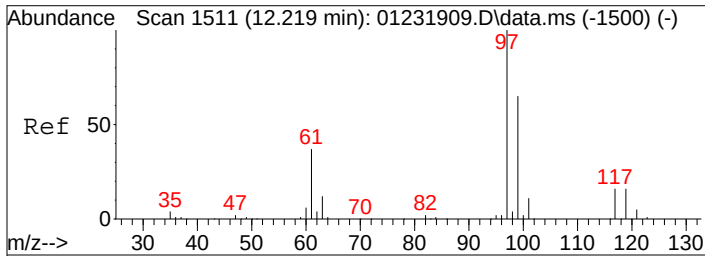
Tgt Ion: 57 Resp: 6781
Ion Ratio Lower Upper
57 100
56 54.6 0.0 0.0#
86 17.4 0.0 0.0#



#32
Chloroform
Concen: 9.61 ng
RT: 11.13 min Scan# 1320
Delta R.T. -0.029 min
Lab File: 04151920.D
Acq: 15 Apr 2019 18:32

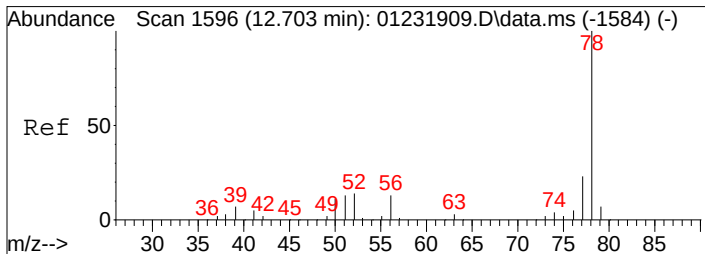
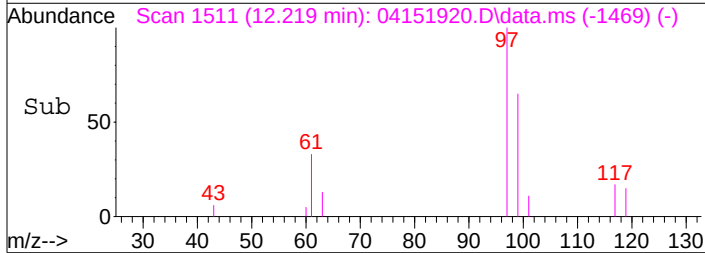
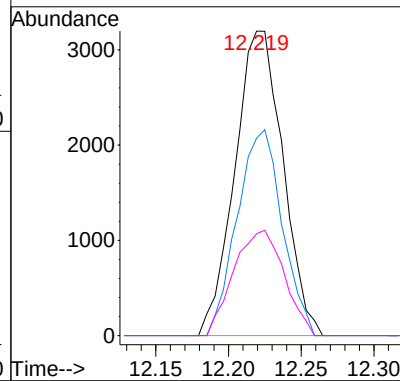
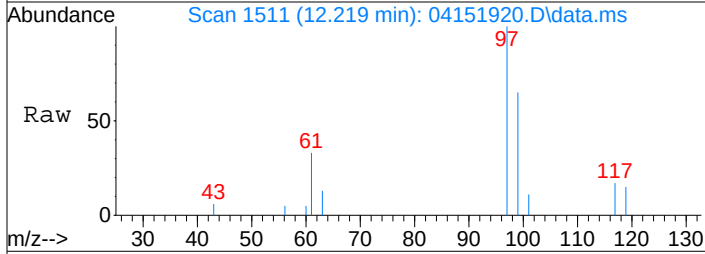
Tgt Ion: 83 Resp: 106038
Ion Ratio Lower Upper
83 100
85 65.1 45.0 85.0





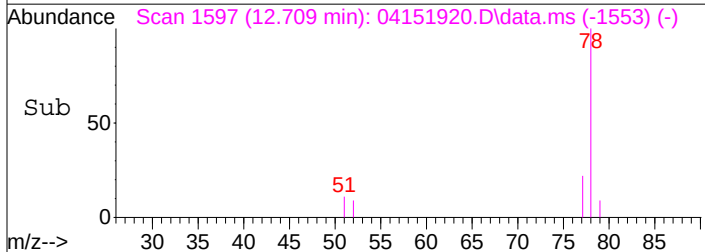
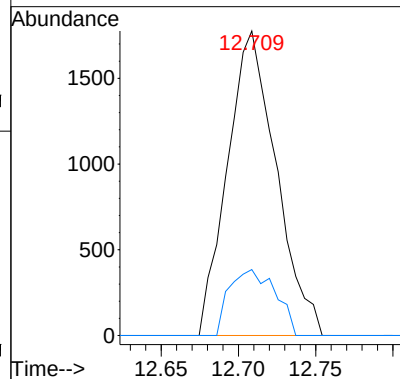
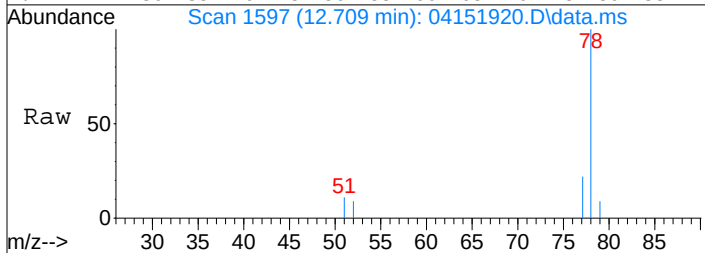
#38
 1,1,1-Trichloroethane
 Concen: 0.77 ng
 RT: 12.22 min Scan# 1511
 Delta R.T. -0.012 min
 Lab File: 04151920.D
 Acq: 15 Apr 2019 18:32

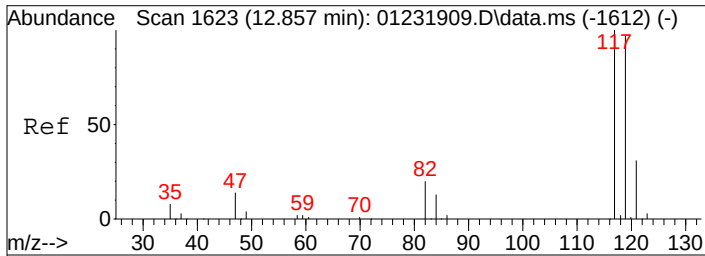
Tgt Ion: 97 Resp: 7353
 Ion Ratio Lower Upper
 97 100
 99 63.4 44.9 84.9
 61 36.2 21.1 61.1



#41
 Benzene
 Concen: 0.13 ng
 RT: 12.71 min Scan# 1597
 Delta R.T. -0.000 min
 Lab File: 04151920.D
 Acq: 15 Apr 2019 18:32

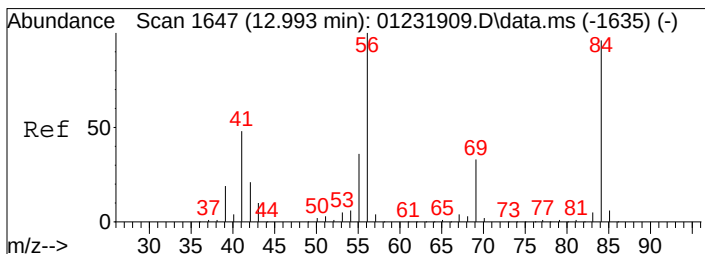
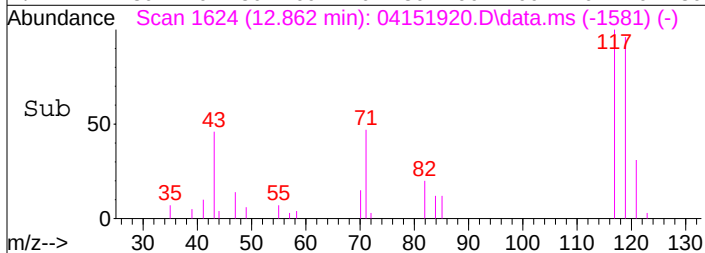
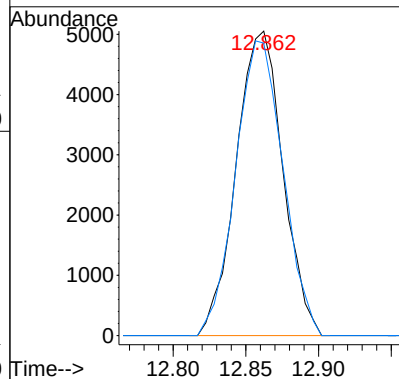
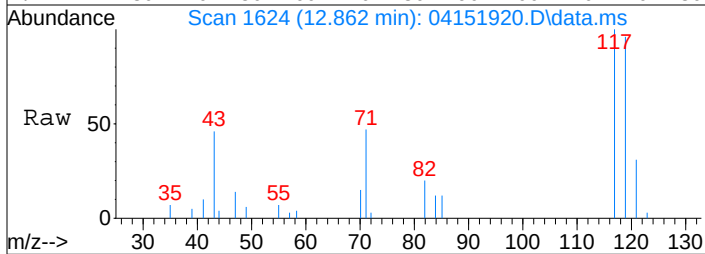
Tgt Ion: 78 Resp: 3901
 Ion Ratio Lower Upper
 78 100
 77 20.5 3.5 43.5





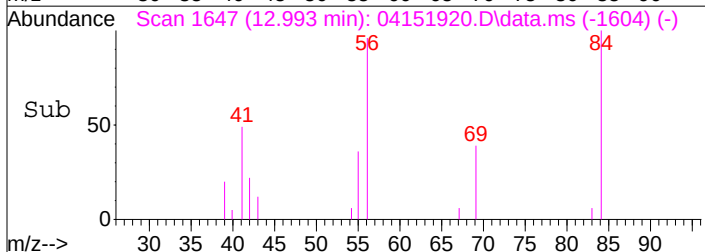
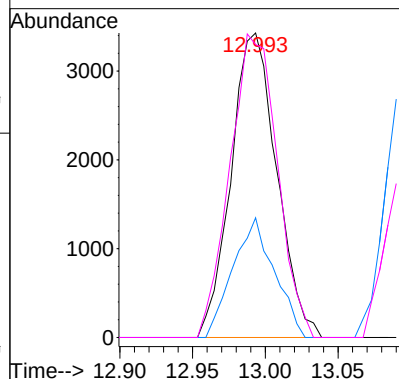
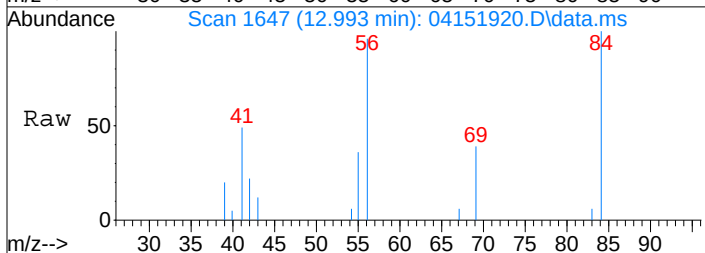
#42
Carbon Tetrachloride
Concen: 1.28 ng
RT: 12.86 min Scan# 1624
Delta R.T. -0.006 min
Lab File: 04151920.D
Acq: 15 Apr 2019 18:32

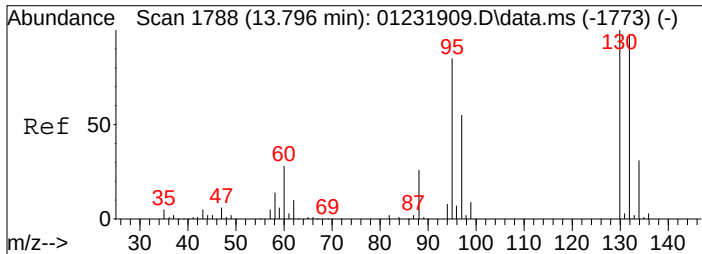
Tgt Ion: 117 Resp: 11285
Ion Ratio Lower Upper
117 100
119 98.3 76.9 116.9



#43
Cyclohexane
Concen: 0.64 ng
RT: 12.99 min Scan# 1647
Delta R.T. -0.006 min
Lab File: 04151920.D
Acq: 15 Apr 2019 18:32

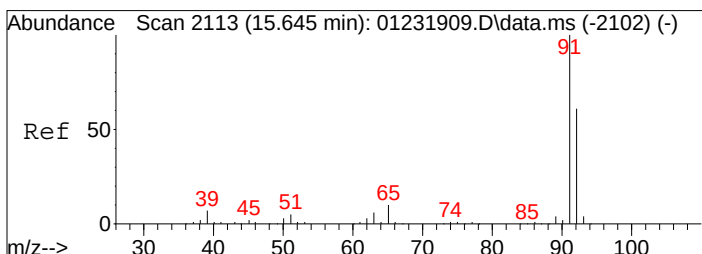
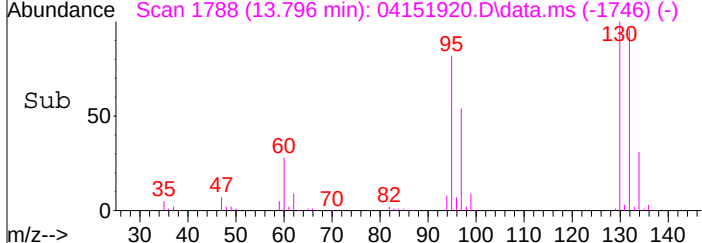
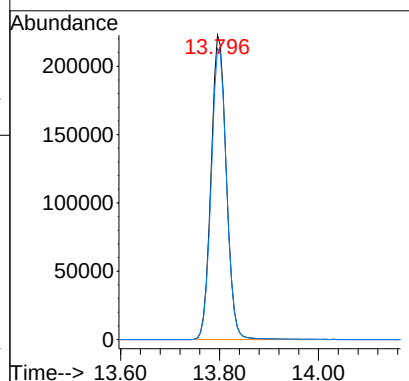
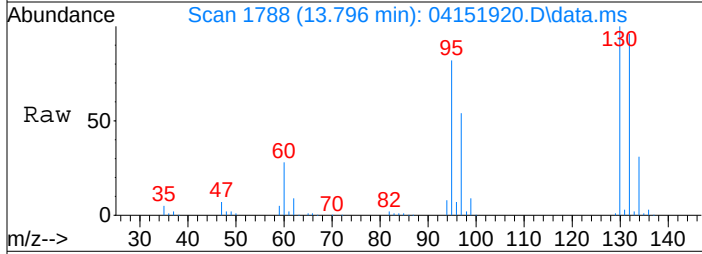
Tgt Ion: 84 Resp: 7495
Ion Ratio Lower Upper
84 100
69 35.6 14.9 54.9
56 103.3 83.7 123.7





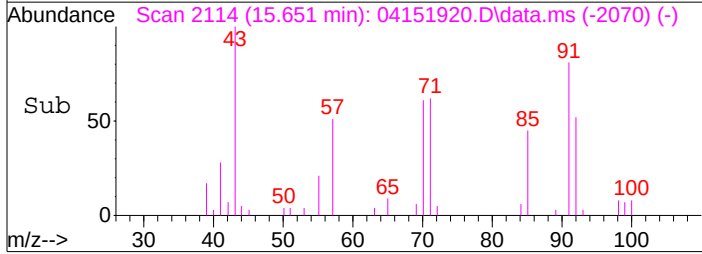
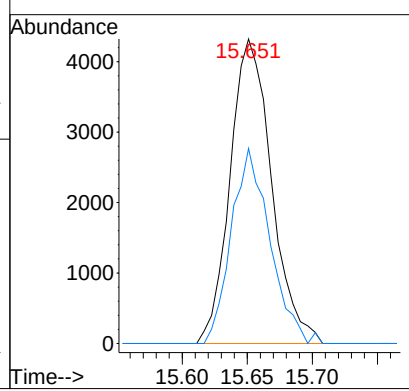
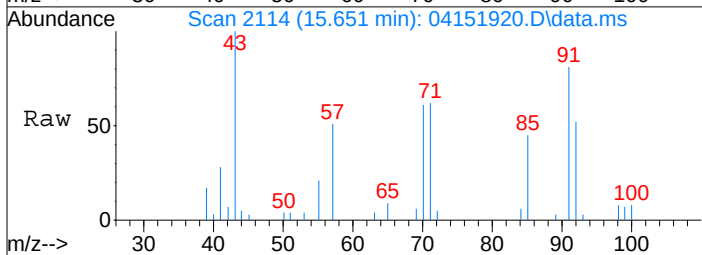
#47
 Trichloroethene
 Concen: 55.12 ng
 RT: 13.80 min Scan# 1788
 Delta R.T. -0.012 min
 Lab File: 04151920.D
 Acq: 15 Apr 2019 18:32

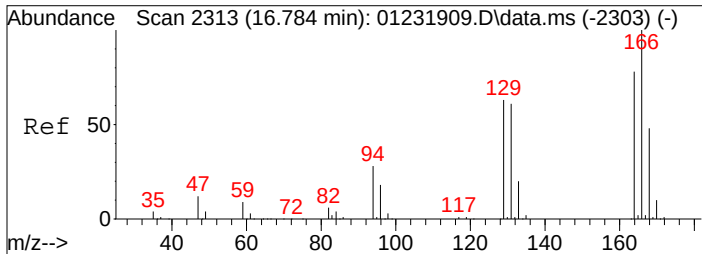
Tgt Ion:	130	Resp:	478241
Ion Ratio	Lower	Upper	
130	100		
132	96.5	76.7	116.7



#58
 Toluene
 Concen: 0.28 ng
 RT: 15.65 min Scan# 2114
 Delta R.T. -0.000 min
 Lab File: 04151920.D
 Acq: 15 Apr 2019 18:32

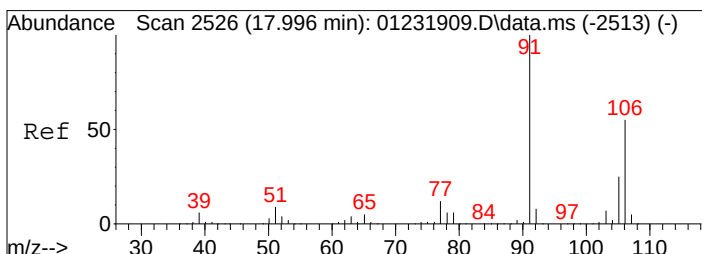
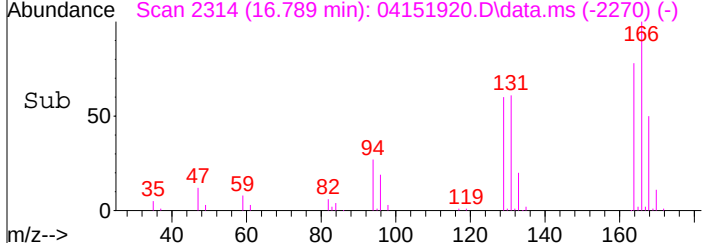
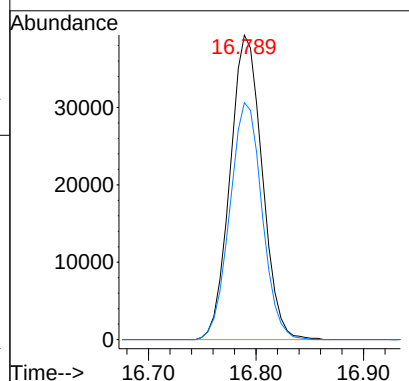
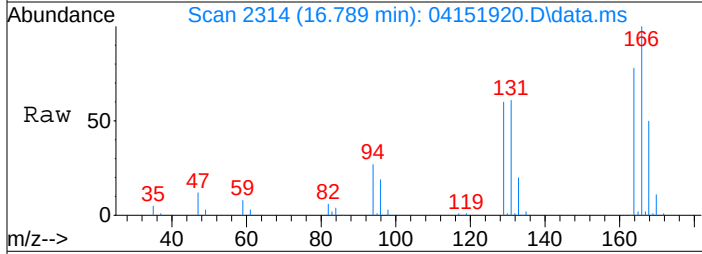
Tgt Ion:	91	Resp:	9578
Ion Ratio	Lower	Upper	
91	100		
92	59.5	39.5	79.5





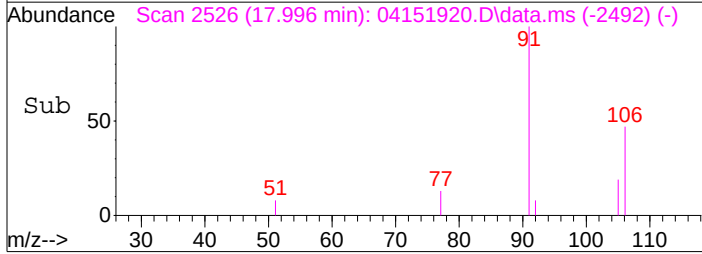
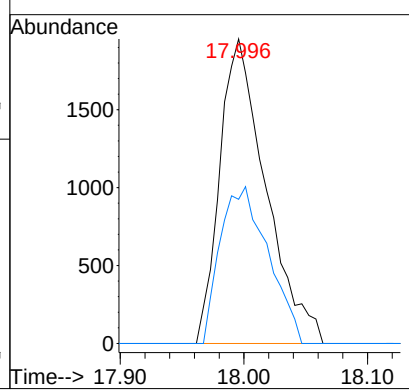
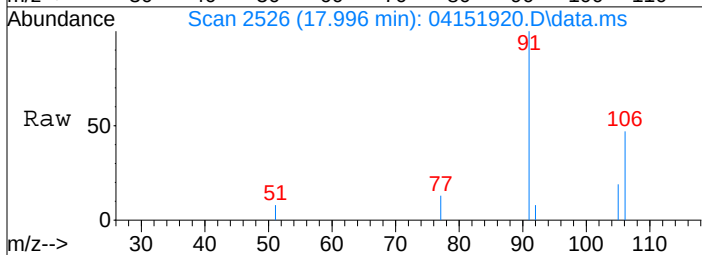
#64
Tetrachloroethene
Concen: 7.90 ng
RT: 16.79 min Scan# 2314
Delta R.T. -0.000 min
Lab File: 04151920.D
Acq: 15 Apr 2019 18:32

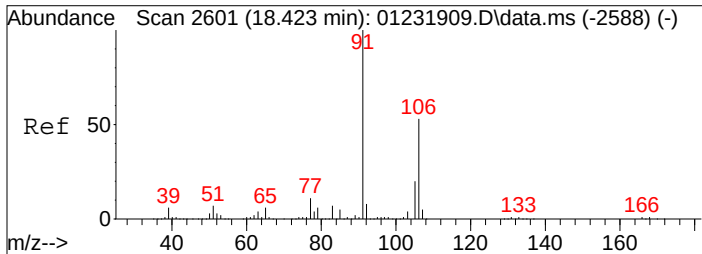
Tgt Ion:166	Resp:	81621
Ion Ratio	Lower	Upper
166	100	
164	78.1	57.1 97.1



#67
m- & p-Xylenes
Concen: 0.18 ng
RT: 18.00 min Scan# 2526
Delta R.T. -0.006 min
Lab File: 04151920.D
Acq: 15 Apr 2019 18:32

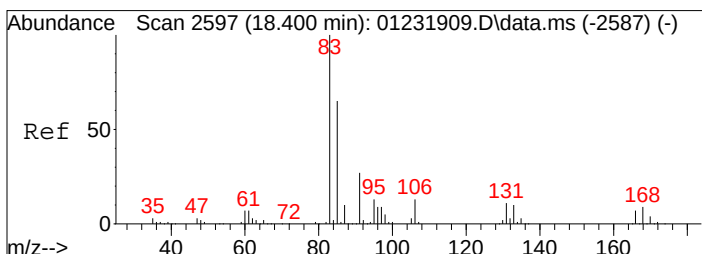
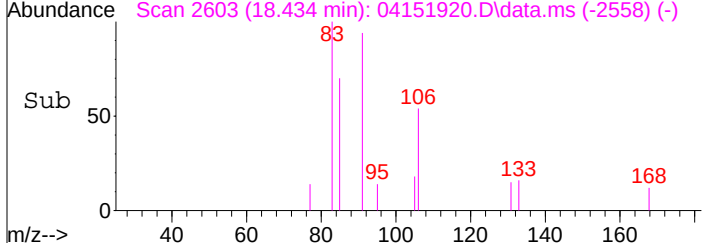
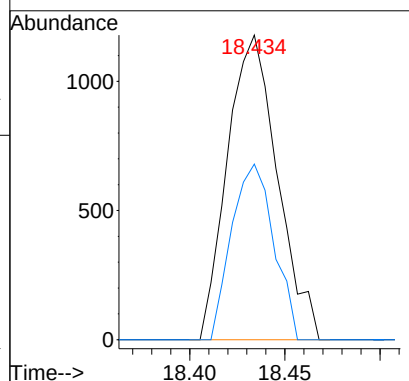
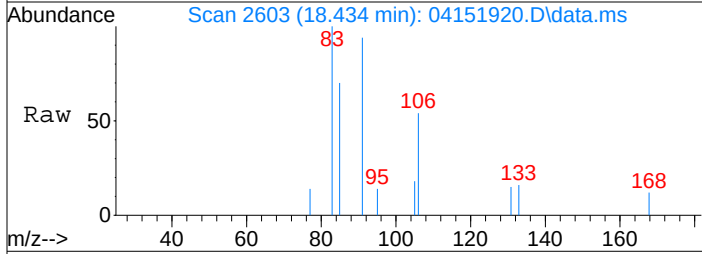
Tgt Ion: 91	Resp:	5071
Ion Ratio	Lower	Upper
91	100	
106	53.4	32.9 72.9





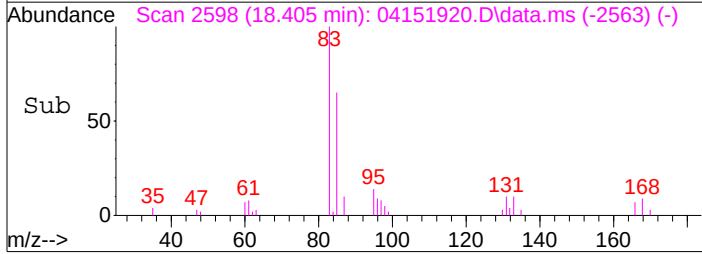
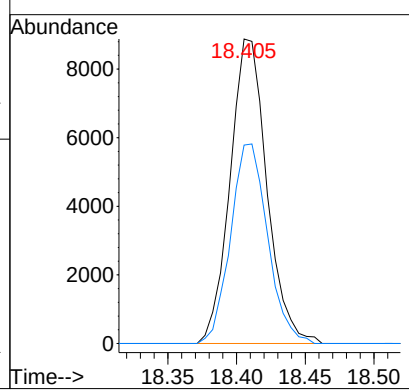
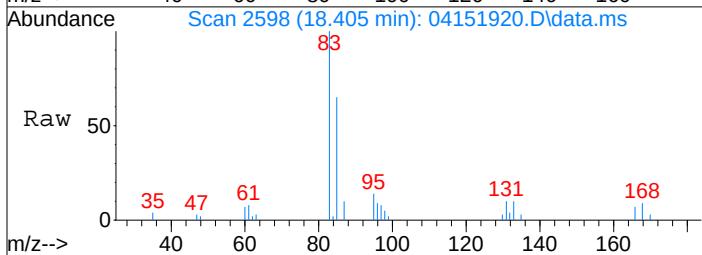
#70
o-Xylene
Concen: 0.08 ng
RT: 18.43 min Scan# 2603
Delta R.T. 0.006 min
Lab File: 04151920.D
Acq: 15 Apr 2019 18:32

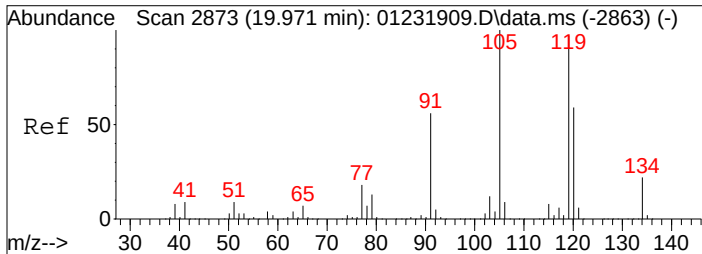
Tgt Ion:	91	Resp:	2159
Ion Ratio	Lower	Upper	
91	100		
106	48.6	30.0	70.0



#72
1,1,2,2-Tetrachloroethane
Concen: 1.27 ng
RT: 18.41 min Scan# 2598
Delta R.T. -0.000 min
Lab File: 04151920.D
Acq: 15 Apr 2019 18:32

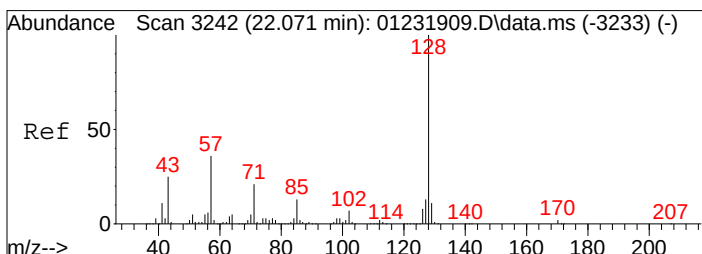
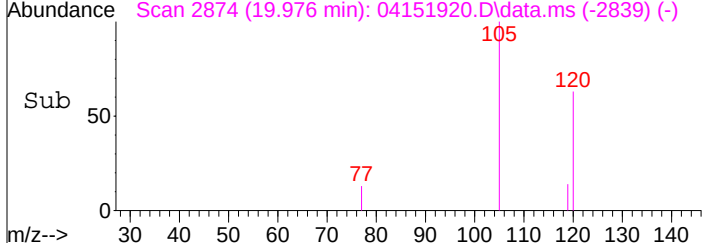
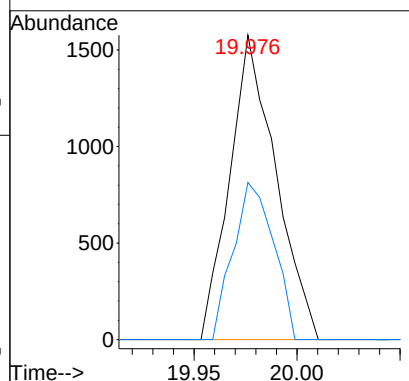
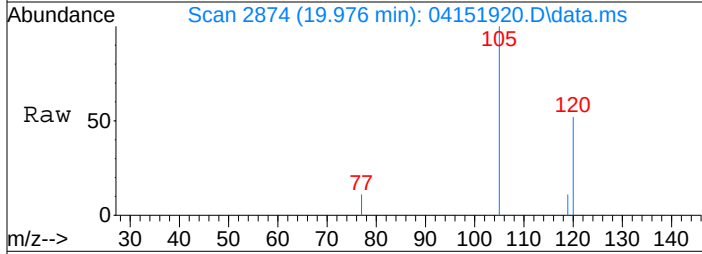
Tgt Ion:	83	Resp:	16568
Ion Ratio	Lower	Upper	
83	100		
85	65.9	45.3	85.3





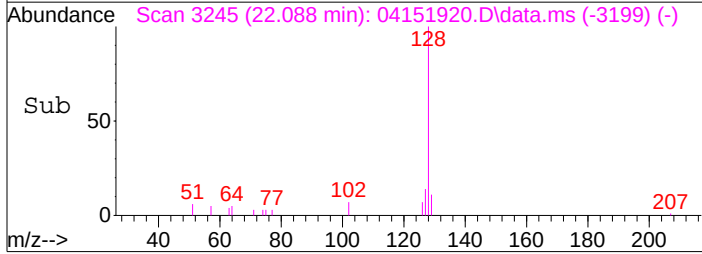
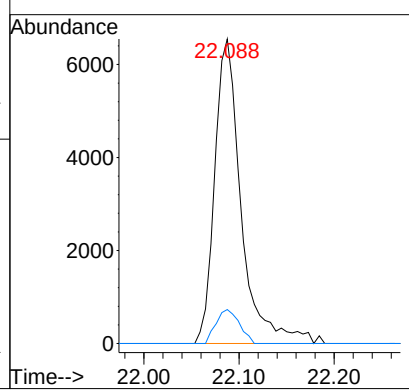
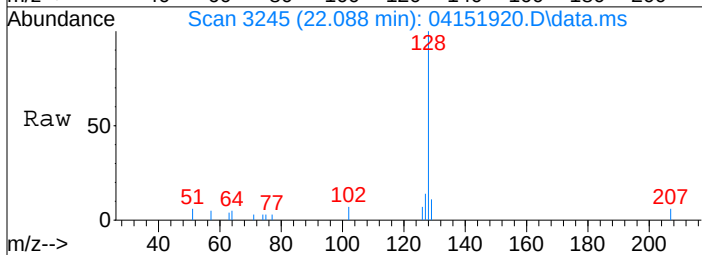
#82
 1,2,4-Trimethylbenzene
 Concen: 0.08 ng
 RT: 19.98 min Scan# 2874
 Delta R.T. -0.000 min
 Lab File: 04151920.D
 Acq: 15 Apr 2019 18:32

Tgt Ion:105	Resp:	2450
Ion Ratio	Lower	Upper
105	100	
120	45.4	36.4 76.4



#95
 Naphthalene
 Concen: 0.32 ng
 RT: 22.09 min Scan# 3245
 Delta R.T. 0.012 min
 Lab File: 04151920.D
 Acq: 15 Apr 2019 18:32

Tgt Ion:128	Resp:	12713
Ion Ratio	Lower	Upper
128	100	
129	9.8	0.0 31.2



Data File : I:\MS13\DATA\2019 04\15\04151904.D
 Acq On : 15 Apr 2019 8:56
 Sample : MB R13041519 1000mL
 Misc : S31-03201909/AC00880

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Apr 15 14:19:33 2019

Quant Method : I:\MS13\METHODS\R13012319.M

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

QLast Update : Wed Jan 23 11:21:29 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

4/15/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.96	130	89776	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.10	114	388754	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.42	82	157661	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.82	65	98854	12.915	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.28%
57) Toluene-d8 (SS2)	15.54	98	407942	12.083	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	96.64%
73) Bromofluorobenzene (SS3)	18.83	174	167343	13.766	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	110.16%

Target Compounds

						Qvalue
2) Propene	0.00	42	0	N.D.		
3) Dichlorodifluoromethan...	0.00	85	0	N.D.		
4) Chloromethane	0.00	50	0	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.		
6) Vinyl Chloride	0.00	62	0	N.D.		
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	0.00	45	0	N.D.	d	
11) Acetonitrile	0.00	41	0	N.D.		
12) Acrolein	0.00	56	0	N.D.		
13) Acetone	6.92	58	4570	0.808	ng	# 60
14) Trichlorofluoromethane	0.00	101	0	N.D.		
15) 2-Propanol (Isopropanol)	0.00	45	0	N.D.		
16) Acrylonitrile	0.00	53	0	N.D.		
17) 1,1-Dichloroethene	0.00	96	0	N.D.		
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.		
19) Methylene Chloride	0.00	84	0	N.D.		
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.		
21) Trichlorotrifluoroethane	0.00	151	0	N.D.		
22) Carbon Disulfide	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)	10.16	72	311	0.060	ng	100
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	0.00	78	0	N.D.		
42) Carbon Tetrachloride	0.00	117	0	N.D.		
43) Cyclohexane	0.00	84	0	N.D.		
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D.		
47) Trichloroethene	0.00	130	0	N.D.		
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.		
50) Methyl Methacrylate	0.00	100	0	N.D.		

Data File : I:\MS13\DATA\2019 04\15\04151904.D
 Acq On : 15 Apr 2019 8:56
 Sample : MB R13041519 1000mL
 Misc : S31-03201909/AC00880

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Apr 15 14:19:33 2019
 Quant Method : I:\MS13\METHODS\R13012319.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Wed Jan 23 11:21:29 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

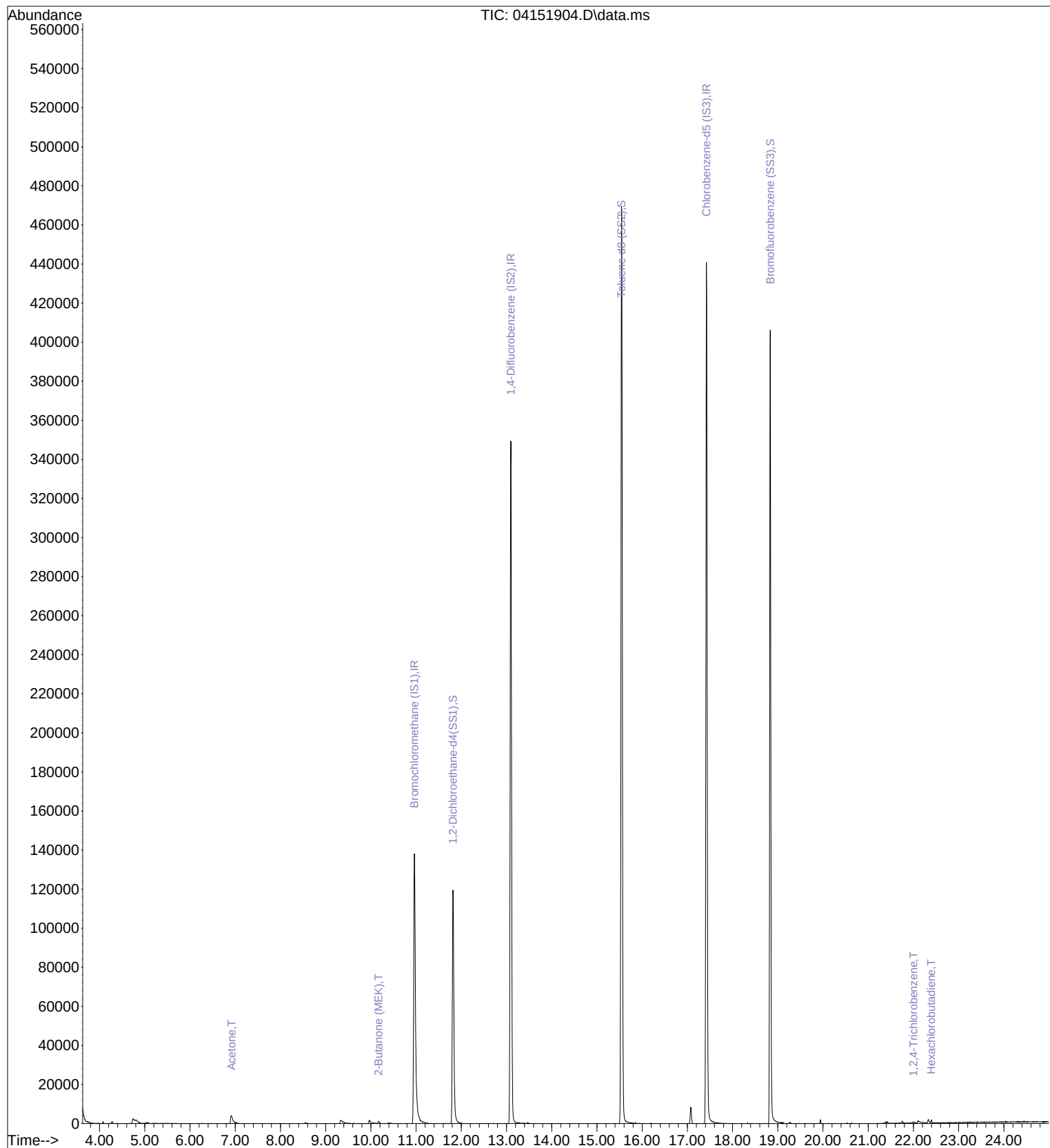
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	0.00	71	0	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	0.00	91	0	N.D.		
59) 2-Hexanone	0.00	43	0	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	0.00	43	0	N.D.		
63) n-Octane	0.00	57	0	N.D.		
64) Tetrachloroethene	0.00	166	0	N.D.		
65) Chlorobenzene	0.00	112	0	N.D.		
66) Ethylbenzene	0.00	91	0	N.D.		
67) m- & p-Xylenes	0.00	91	0	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	0.00	104	0	N.D.		
70) o-Xylene	0.00	91	0	N.D.		
71) n-Nonane	0.00	43	0	N.D.		
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.		
74) Cumene	0.00	105	0	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	0.00	91	0	N.D.		
77) 3-Ethyltoluene	0.00	105	0	N.D.	d	
78) 4-Ethyltoluene	0.00	105	0	N.D.	d	
79) 1,3,5-Trimethylbenzene	0.00	105	0	N.D.	d	
80) alpha-Methylstyrene	0.00	118	0	N.D.		
81) 2-Ethyltoluene	0.00	105	0	N.D.	d	
82) 1,2,4-Trimethylbenzene	0.00	105	0	N.D.		
83) n-Decane	0.00	57	0	N.D.		
84) Benzyl Chloride	0.00	91	0	N.D.		
85) 1,3-Dichlorobenzene	0.00	146	0	N.D.		
86) 1,4-Dichlorobenzene	0.00	146	0	N.D.		
87) sec-Butylbenzene	0.00	105	0	N.D.		
88) 4-Isopropyltoluene (p-...	0.00	119	0	N.D.		
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	0.00	68	0	N.D.		
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	0.00	57	0	N.D.		
94) 1,2,4-Trichlorobenzene	22.00	180	565	0.037 ng	#	77
95) Naphthalene	0.00	128	0	N.D.	d	
96) n-Dodecane	0.00	57	0	N.D.	d	
97) Hexachlorobutadiene	22.39	225	682	0.060 ng		77
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\2019 04\15\04151904.D
Acq On : 15 Apr 2019 8:56
Sample : MB R13041519 1000mL
Misc : S31-03201909/AC00880

Vial: 2
Operator: WA
Inst : MS13

Quant Time: Apr 15 14:19:33 2019
Quant Method : I:\MS13\METHODS\R13012319.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Wed Jan 23 11:21:29 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019 04\15\04151905.D
 Acq On : 15 Apr 2019 9:29
 Sample : LCS R13041519 25ng
 Misc : S31-03201909/S31-03181913 (4/16)

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Apr 15 10:24:56 2019

Quant Method : I:\MS13\METHODS\R13012319.M

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

QLast Update : Wed Jan 23 11:21:29 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

4/15/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.98	130	91776	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.11	114	384174	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.43	82	157875	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.83	65	99392	12.702	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.60%
57) Toluene-d8 (SS2)	15.55	98	404985	11.979	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.84%
73) Bromofluorobenzene (SS3)	18.83	174	171675	14.104	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	112.80%

Target Compounds

						Qvalue
2) Propene	3.98	42	175295	21.952	ng	96
3) Dichlorodifluoromethan...	4.13	85	319983	23.454	ng	100
4) Chloromethane	4.41	50	246722	23.294	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.67	135	217713	24.761	ng	100
6) Vinyl Chloride	4.82	62	259427	25.549	ng	100
7) 1,3-Butadiene	5.08	54	200657	26.269	ng	93
8) Bromomethane	5.51	94	181269	24.880	ng	99
9) Chloroethane	5.83	64	129609	23.192	ng	100
10) Ethanol	6.22	45	609998	112.052	ng	98
11) Acetonitrile	6.47	41	305233	23.172	ng	97
12) Acrolein	6.64	56	109022	24.230	ng	98
13) Acetone	6.85	58	633974	109.605	ng	# 84
14) Trichlorofluoromethane	7.07	101	273353	23.911	ng	98
15) 2-Propanol (Isopropanol)	7.34	45	816737	46.366	ng	95
16) Acrylonitrile	7.60	53	226943	26.911	ng	97
17) 1,1-Dichloroethene	8.02	96	188574	24.713	ng	# 83
18) 2-Methyl-2-Propanol (t...	8.21	59	840540	48.545	ng	97
19) Methylene Chloride	8.26	84	185356	25.278	ng	92
20) 3-Chloro-1-propene (Al...	8.41	41	246686	25.103	ng	99
21) Trichlorotrifluoroethane	8.67	151	197757	24.515	ng	90
22) Carbon Disulfide	8.51	76	670400	22.382	ng	99
23) trans-1,2-Dichloroethene	9.53	61	231292	25.903	ng	92
24) 1,1-Dichloroethane	9.78	63	291502	22.948	ng	99
25) Methyl tert-Butyl Ether	9.88	73	513350	23.659	ng	99
26) Vinyl Acetate	10.05	86	228216	122.651	ng	97
27) 2-Butanone (MEK)	10.29	72	122812	23.162	ng	# 89
28) cis-1,2-Dichloroethene	10.80	61	219236	23.741	ng	90
29) Diisopropyl Ether	11.10	87	180034	24.188	ng	# 75
30) Ethyl Acetate	11.12	61	125739	47.884	ng	97
31) n-Hexane	11.09	57	252821	20.743	ng	# 100
32) Chloroform	11.15	83	285243	23.889	ng	99
34) Tetrahydrofuran (THF)	11.55	72	120294	22.355	ng	99
35) Ethyl tert-Butyl Ether	11.70	87	217312	23.512	ng	94
36) 1,2-Dichloroethane	11.95	62	188113	24.818	ng	100
38) 1,1,1-Trichloroethane	12.22	97	250642	24.713	ng	97
39) Isopropyl Acetate	12.66	61	218737	44.894	ng	# 92
40) 1-Butanol	12.69	56	346714	52.257	ng	# 75
41) Benzene	12.71	78	704910	22.220	ng	99
42) Carbon Tetrachloride	12.86	117	237490	25.447	ng	100
43) Cyclohexane	12.99	84	558581	44.810	ng	100
44) tert-Amyl Methyl Ether	13.35	73	497922	24.048	ng	96
45) 1,2-Dichloropropane	13.56	63	168935	23.283	ng	100
46) Bromodichloromethane	13.75	83	226968	25.844	ng	99
47) Trichloroethene	13.80	130	225609	24.604	ng	99
48) 1,4-Dioxane	13.78	88	158902	24.860	ng	98
49) 2,2,4-Trimethylpentane...	13.87	57	680489	21.807	ng	90
50) Methyl Methacrylate	14.02	100	164118	53.506	ng	94

Data File : I:\MS13\DATA\2019 04\15\04151905.D
 Acq On : 15 Apr 2019 9:29
 Sample : LCS R13041519 25ng
 Misc : S31-03201909/S31-03181913 (4/16)

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Apr 15 10:24:56 2019
 Quant Method : I:\MS13\METHODS\R13012319.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Wed Jan 23 11:21:29 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

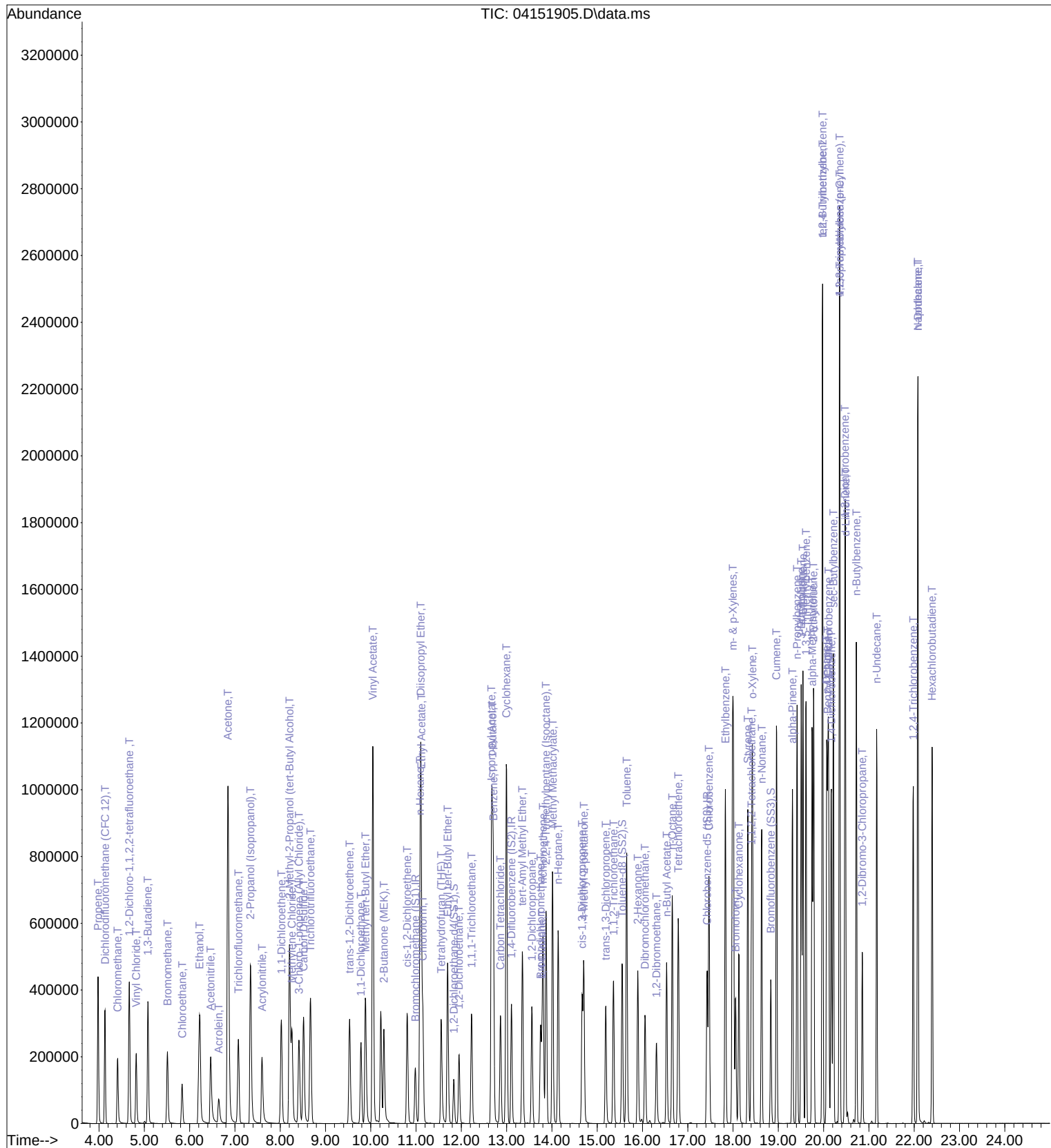
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.14	71	172866	22.607	ng	99
52) cis-1,3-Dichloropropene	14.67	75	284723	24.757	ng	100
53) 4-Methyl-2-pentanone	14.71	58	160017	24.479	ng	93
54) trans-1,3-Dichloropropene	15.19	75	252569	26.140	ng	100
55) 1,1,2-Trichloroethane	15.36	97	182470	24.750	ng	99
58) Toluene	15.65	91	741978	20.647	ng	98
59) 2-Hexanone	15.90	43	349056	24.718	ng	94
60) Dibromochloromethane	16.05	129	232549	26.562	ng	100
61) 1,2-Dibromoethane	16.31	107	213845	26.284	ng	100
62) n-Butyl Acetate	16.53	43	394563	24.077	ng	95
63) n-Octane	16.66	57	140840	21.329	ng	99
64) Tetrachloroethene	16.79	166	260031	23.643	ng	98
65) Chlorobenzene	17.47	112	542956	22.779	ng	100
66) Ethylbenzene	17.83	91	836943	21.638	ng	100
67) m- & p-Xylenes	18.00	91	1305101	43.711	ng	97
68) Bromoform	18.06	173	225151	28.152	ng	100
69) Styrene	18.33	104	562547	24.102	ng	96
70) o-Xylene	18.43	91	652332	21.922	ng	95
71) n-Nonane	18.63	43	306656	21.082	ng	99
72) 1,1,2,2-Tetrachloroethane	18.41	83	321199	23.035	ng	100
74) Cumene	18.96	105	888677	21.886	ng	99
75) alpha-Pinene	19.31	93	443591	22.821	ng	94
76) n-Propylbenzene	19.41	91	1025107	22.509	ng	97
77) 3-Ethyltoluene	19.50	105	916391	23.744	ng	98
78) 4-Ethyltoluene	19.54	105	828559	21.485	ng	98
79) 1,3,5-Trimethylbenzene	19.61	105	727597	21.496	ng	95
80) alpha-Methylstyrene	19.75	118	424273	25.393	ng	92
81) 2-Ethyltoluene	19.78	105	874653	21.777	ng	97
82) 1,2,4-Trimethylbenzene	19.98	105	739494	22.521	ng	94
83) n-Decane	20.07	57	353922	22.149	ng	99
84) Benzyl Chloride	20.09	91	618274	25.746	ng	96
85) 1,3-Dichlorobenzene	20.11	146	492972	23.925	ng	99
86) 1,4-Dichlorobenzene	20.17	146	493981	22.837	ng	100
87) sec-Butylbenzene	20.22	105	1009587	22.148	ng	98
88) 4-Isopropyltoluene (p-...	20.35	119	980758	23.050	ng	100
89) 1,2,3-Trimethylbenzene	20.35	105	760940	23.426	ng	94
90) 1,2-Dichlorobenzene	20.47	146	482283	23.980	ng	100
91) d-Limonene	20.48	68	263976	23.033	ng	98
92) 1,2-Dibromo-3-Chloropr...	20.85	157	186504	25.651	ng	83
93) n-Undecane	21.17	57	369619	25.084	ng	99
94) 1,2,4-Trichlorobenzene	21.98	180	381669	24.927	ng	100
95) Naphthalene	22.08	128	1021023	24.444	ng	100
96) n-Dodecane	22.08	57	342917	24.884	ng	99
97) Hexachlorobutadiene	22.39	225	255445	22.440	ng	99
98) Cyclohexanone	18.13	55	238053	21.874	ng	92
99) tert-Butylbenzene	19.98	119	757930	22.641	ng	99
100) n-Butylbenzene	20.72	91	768851	23.019	ng	98

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

Data File : I:\MS13\DATA\2019 04\15\04151905.D
Acq On : 15 Apr 2019 9:29
Sample : LCS R13041519 25ng
Misc : S31-03201909/S31-03181913 (4/16)

Vial: 2
Operator: WA
Inst : MS13

Quant Time: Apr 15 10:24:56 2019
Quant Method : I:\MS13\METHODS\R13012319.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Wed Jan 23 11:21:29 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019 04\15\04151934.D
 Acq On : 16 Apr 2019 2:22
 Sample : LCSD R13041519 25ng
 Misc : S31-03201909/S31-03181913 (4/16)

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Apr 16 06:19:59 2019

Quant Method : I:\MS13\METHODS\R13012319.M

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

QLast Update : Wed Jan 23 11:21:29 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

4/16/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.98	130	88155	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.11	114	369004	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.43	82	149368	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.83	65	94229	12.537	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.32%
57) Toluene-d8 (SS2)	15.55	98	386746	12.091	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	96.72%
73) Bromofluorobenzene (SS3)	18.83	174	164998	14.327	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	114.64%

Target Compounds

						Qvalue
2) Propene	3.98	42	166411	21.695	ng	95
3) Dichlorodifluoromethan...	4.13	85	311923	23.803	ng	100
4) Chloromethane	4.41	50	244610	24.043	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.67	135	217515	25.755	ng	100
6) Vinyl Chloride	4.82	62	256359	26.283	ng	100
7) 1,3-Butadiene	5.08	54	173028	23.583	ng	94
8) Bromomethane	5.50	94	175198	25.034	ng	99
9) Chloroethane	5.83	64	127001	23.658	ng	99
10) Ethanol	6.22	45	586677	112.195	ng	99
11) Acetonitrile	6.46	41	295808	23.379	ng	99
12) Acrolein	6.64	56	104637	24.211	ng	98
13) Acetone	6.84	58	614439	110.591	ng	87
14) Trichlorofluoromethane	7.07	101	273217	24.880	ng	99
15) 2-Propanol (Isopropanol)	7.34	45	800280	47.298	ng	96
16) Acrylonitrile	7.59	53	221627	27.360	ng	98
17) 1,1-Dichloroethene	8.03	96	183992	25.103	ng	# 84
18) 2-Methyl-2-Propanol (t...	8.20	59	828829	49.835	ng	97
19) Methylene Chloride	8.26	84	181575	25.779	ng	92
20) 3-Chloro-1-propene (Al...	8.41	41	240361	25.464	ng	99
21) Trichlorotrifluoroethane	8.67	151	194266	25.071	ng	90
22) Carbon Disulfide	8.51	76	653226	22.705	ng	100
23) trans-1,2-Dichloroethene	9.53	61	226492	26.407	ng	91
24) 1,1-Dichloroethane	9.78	63	283779	23.258	ng	100
25) Methyl tert-Butyl Ether	9.88	73	504500	24.206	ng	99
26) Vinyl Acetate	10.05	86	222308	124.383	ng	96
27) 2-Butanone (MEK)	10.28	72	119543	23.472	ng	91
28) cis-1,2-Dichloroethene	10.80	61	212884	24.000	ng	90
29) Diisopropyl Ether	11.10	87	176344	24.666	ng	# 75
30) Ethyl Acetate	11.11	61	122394	48.525	ng	97
31) n-Hexane	11.09	57	245249	20.948	ng	# 100
32) Chloroform	11.14	83	278708	24.300	ng	98
34) Tetrahydrofuran (THF)	11.55	72	114729	22.197	ng	98
35) Ethyl tert-Butyl Ether	11.70	87	208238	23.456	ng	94
36) 1,2-Dichloroethane	11.95	62	182979	25.133	ng	100
38) 1,1,1-Trichloroethane	12.23	97	244446	25.093	ng	97
39) Isopropyl Acetate	12.66	61	212006	45.301	ng	# 93
40) 1-Butanol	12.69	56	333749	52.371	ng	# 74
41) Benzene	12.70	78	681988	22.381	ng	99
42) Carbon Tetrachloride	12.86	117	233880	26.090	ng	100
43) Cyclohexane	12.99	84	540121	45.110	ng	100
44) tert-Amyl Methyl Ether	13.35	73	484666	24.370	ng	96
45) 1,2-Dichloropropane	13.56	63	163627	23.478	ng	100
46) Bromodichloromethane	13.75	83	222090	26.328	ng	100
47) Trichloroethene	13.80	130	220946	25.086	ng	99
48) 1,4-Dioxane	13.78	88	153667	25.029	ng	98
49) 2,2,4-Trimethylpentane...	13.87	57	654980	21.852	ng	91
50) Methyl Methacrylate	14.02	100	161075	54.673	ng	94

Data File : I:\MS13\DATA\2019 04\15\04151934.D
 Acq On : 16 Apr 2019 2:22
 Sample : LCSD R13041519 25ng
 Misc : S31-03201909/S31-03181913 (4/16)

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Apr 16 06:19:59 2019
 Quant Method : I:\MS13\METHODS\R13012319.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Wed Jan 23 11:21:29 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.14	71	168371	22.925	ng	99
52) cis-1,3-Dichloropropene	14.67	75	276204	25.003	ng	100
53) 4-Methyl-2-pentanone	14.70	58	154202	24.559	ng	94
54) trans-1,3-Dichloropropene	15.19	75	246946	26.609	ng	100
55) 1,1,2-Trichloroethane	15.36	97	178564	25.216	ng	99
58) Toluene	15.65	91	732725	21.551	ng	98
59) 2-Hexanone	15.90	43	338856	25.363	ng	95
60) Dibromochloromethane	16.06	129	228910	27.635	ng	99
61) 1,2-Dibromoethane	16.31	107	208273	27.057	ng	100
62) n-Butyl Acetate	16.53	43	379498	24.476	ng	95
63) n-Octane	16.66	57	137201	21.961	ng	98
64) Tetrachloroethene	16.79	166	254174	24.426	ng	99
65) Chlorobenzene	17.47	112	526682	23.355	ng	100
66) Ethylbenzene	17.83	91	809747	22.128	ng	99
67) m- & p-Xylenes	18.00	91	1265491	44.798	ng	97
68) Bromoform	18.06	173	220809	29.182	ng	100
69) Styrene	18.33	104	544636	24.664	ng	96
70) o-Xylene	18.43	91	633521	22.502	ng	96
71) n-Nonane	18.63	43	297503	21.618	ng	100
72) 1,1,2,2-Tetrachloroethane	18.41	83	310973	23.572	ng	100
74) Cumene	18.96	105	847376	22.057	ng	99
75) alpha-Pinene	19.31	93	413734	22.498	ng	95
76) n-Propylbenzene	19.41	91	992632	23.037	ng	98
77) 3-Ethyltoluene	19.50	105	885057	24.239	ng	99
78) 4-Ethyltoluene	19.54	105	798850	21.894	ng	99
79) 1,3,5-Trimethylbenzene	19.61	105	708688	22.130	ng	96
80) alpha-Methylstyrene	19.75	118	412912	26.120	ng	91
81) 2-Ethyltoluene	19.78	105	848547	22.331	ng	97
82) 1,2,4-Trimethylbenzene	19.98	105	720627	23.196	ng	95
83) n-Decane	20.07	57	344160	22.765	ng	99
84) Benzyl Chloride	20.09	91	603783	26.575	ng	97
85) 1,3-Dichlorobenzene	20.11	146	481343	24.691	ng	99
86) 1,4-Dichlorobenzene	20.17	146	478424	23.377	ng	99
87) sec-Butylbenzene	20.22	105	976665	22.646	ng	98
88) 4-Isopropyltoluene (p-...	20.35	119	934392	23.211	ng	100
89) 1,2,3-Trimethylbenzene	20.35	105	738879	24.042	ng	96
90) 1,2-Dichlorobenzene	20.47	146	468558	24.624	ng	99
91) d-Limonene	20.48	68	220329	20.319	ng	98
92) 1,2-Dibromo-3-Chloropr...	20.85	157	181489	26.383	ng	83
93) n-Undecane	21.17	57	358734	25.732	ng	99
94) 1,2,4-Trichlorobenzene	21.98	180	371187	25.623	ng	100
95) Naphthalene	22.08	128	982104	24.851	ng	99
96) n-Dodecane	22.08	57	331280	25.408	ng	99
97) Hexachlorobutadiene	22.40	225	248289	23.054	ng	99
98) Cyclohexanone	18.13	55	229528	22.292	ng	93
99) tert-Butylbenzene	19.98	119	741719	23.418	ng	100
100) n-Butylbenzene	20.72	91	743431	23.525	ng	98

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

TIC: 04151934.D\data.ms

The chromatogram displays a complex mixture of compounds. Key features include:

- Abundance Scale:** Ranges from 0 to 3,200,000.
- Time Scale:** Ranges from 4.00 to 24.00 minutes.
- Labeled Compounds:** A large number of peaks are identified, including:
 - Propene, I
 - Dichlorodifluoromethane (CFC-12), T
 - Chloromethane, 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-Dichloroethane, T
 - ethyl-2-Propanol (tert-Butyl Alcohol), T
 - 3-Chloropentane, T
 - 1,1,1-Trichloroethane, T
 - trans-1,2-Dichloroethene, T
 - 1,1-Dichloroethane, T
 - 1,1,1-Trichloroethane, T
 - Carbon Tetrachloride, T
 - 1,4-Dibromobenzene (SS2), IR
 - Cyclohexane, T
 - tert-Amyl Methyl Ether, T
 - 1,2-Dichloropropane, T
 - 1,2-Dichloroethane, T
 - Methyl Methacrylate, T
 - n-Heptane, T
 - cis-1,3-Dichloropropene, T
 - trans-1,3-Dichloropropene, T
 - 1,1-Toluene-d8 (SS2), S
 - Toluene, T
 - Hexanone, T
 - Dibromochloromethane, T
 - 1,2-Dibromoethane, T
 - n-Butyl Acetate, T
 - Tetrachloroethene, T
 - Chlorobenzene-d5 (SS2), T
 - Ethylbenzene, T
 - m- & p-Xylenes, T
 - Bromocyclohexanone, T
 - trans-1,2-Dichloroethane, T
 - To-Xylene, T
 - n-Nonane, T
 - Bromofluorobenzene (SS3), S
 - Cumene, T
 - alpha-Pinene, T
 - n-Propylacetate, T
 - alpha-Vinylstyrene, T
 - n-Butylbenzene, T
 - 1,2-Dichlorobenzene, T
 - 1,2-Dibromo-3-Chloropropane, T
 - n-Undecane, T
 - 1,2,4-Trichlorobenzene, T
 - Hexachlorobutadiene, T

Method Path : I:\MS13\METHODS\
 Method File : R13012319.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Wed Jan 23 11:21:29 2019
 Response Via : Initial Calibration

Calibration Files

0.1 =01231906.D 0.2 =01231907.D 0.5 =01231904.D 1.0 =01231905.D 5.0 =01231908.D 25 =01231909.D 50 =01231910.D
 100 =01231911.D

Compound	0.1	0.2	0.5	1.0	5.0	25	50	100	Avg	%RSD
-----ISTD-----										
1) IR Bromochloromethane...										
2) T Propene	1.086	1.026	1.144	1.076	1.116	1.075	1.030	1.147	1.088	4.25
3) T Dichlorodifluo...	1.809	1.904	1.983	1.928	1.929	1.844	1.767	1.701	1.858	5.11
4) T Chloromethane	1.367	1.297	1.705	1.481	1.555	1.501	1.434	1.201	1.443	10.85
5) T 1,2-Dichloro-1...	1.133	1.207	1.294	1.236	1.216	1.182	1.162	1.150	1.198	4.37
6) T Vinyl Chloride	1.155	1.181	1.541	1.425	1.493	1.456	1.420	1.394	1.383	10.16
7) T 1,3-Butadiene	0.839	0.766	1.099	1.063	1.193	1.139	1.130	1.094	1.040	14.71
8) T Bromomethane	0.974	0.896	1.022	1.000	1.047	1.027	0.990	0.981	0.992	4.64
9) T Chloroethane	0.661	0.806	0.783	0.799	0.786	0.755	0.739	0.761	0.761	6.58
10) T Ethanol	0.911	0.684	0.807	0.723	0.751	0.725	0.683	0.649	0.741	11.27
11) T Acetonitrile			1.720	1.655	1.785	1.902	1.857	1.846	1.794	5.19
12) T Acrolein			0.478	0.578	0.638	0.674	0.656	0.654	0.613	12.08
13) T Acetone	0.982	0.849	0.832	0.785	0.777	0.745	0.696	0.636	0.788	13.31
14) T Trichlorofluor...	1.578	1.534	1.687	1.609	1.592	1.510	1.479	1.468	1.557	4.73
15) T 2-Propanol (Is...	2.391	2.376	2.589	2.458	2.558	2.520	2.371	1.931	2.399	8.63
16) T Acrylonitrile			0.607	0.939	1.196	1.397	1.378	1.374	1.149	27.66
17) T 1,1-Dichloroet...	0.916	0.965	1.102	1.059	1.091	1.081	1.057	1.042	1.039	6.27
18) T 2-Methyl-2-Pro...	2.156	2.284	2.524	2.464	2.470	2.451	2.336	2.181	2.358	5.95
19) T Methylene Chlo...	0.813	0.834	1.045	1.041	1.089	1.092	1.059	1.016	0.999	11.11
20) T 3-Chloro-1-pro...	1.150	1.232	1.363	1.307	1.435	1.433	1.410	1.377	1.338	7.65
21) T Trichlorotrifl...	1.080	1.074	1.186	1.111	1.119	1.090	1.067	1.062	1.099	3.70
22) T Carbon Disulfide			4.632	4.512	4.217	3.870	3.906	3.766	3.653	4.079
23) T trans-1,2-Dich...	0.797	0.909	1.278	1.306	1.364	1.394	1.357	1.323	1.216	18.81
24) T 1,1-Dichloroet...	1.655	1.724	1.814	1.782	1.815	1.738	1.683	1.631	1.730	4.07
25) T Methyl tert-Bu...	2.784	2.946	3.175	3.042	3.063	2.981	2.866	2.785	2.955	4.70
26) T Vinyl Acetate			0.227	0.242	0.266	0.276	0.263	0.247	0.253	7.11
27) T 2-Butanone (MEK)			0.655	0.676	0.731	0.772	0.757	0.743	0.722	6.47
28) T cis-1,2-Dichlo...	0.980	1.145	1.394	1.307	1.349	1.337	1.291	1.259	1.258	10.69
29) T Diisopropyl Ether	0.828	1.007	1.104	1.080	1.089	1.048	1.001	0.953	1.014	8.96
30) T Ethyl Acetate			0.354	0.361	0.386	0.376	0.352	0.317	0.358	6.66
31) T n-Hexane	1.711	1.805	1.894	1.762	1.738	1.540	1.477	1.354	1.660	11.07
32) T Chloroform	1.574	1.527	1.735	1.661	1.672	1.656	1.611	1.575	1.626	4.12
33) S 1,2-Dichloroet...	1.071	1.072	1.080	1.077	1.066	1.048	1.051	1.061	1.066	1.09
34) T Tetrahydrofura...	0.744	0.728	0.765	0.749	0.745	0.731	0.707	0.695	0.733	3.15
35) T Ethyl tert-But...	1.153	1.191	1.333	1.335	1.301	1.285	1.248	1.225	1.259	5.27
36) T 1,2-Dichloroet...	0.877	0.970	1.089	1.066	1.085	1.092	1.051	1.028	1.032	7.24
-----ISTD-----										
37) IR 1,4-Difluorobenzen...										
38) T 1,1,1-Trichlor...	0.312	0.333	0.341	0.331	0.341	0.340	0.328	0.315	0.330	3.42
39) T Isopropyl Acetate	0.156	0.166	0.173	0.164	0.164	0.160	0.149	0.135	0.159	7.45
40) T 1-Butanol	0.226	0.166	0.225	0.207	0.226	0.243	0.227	0.207	0.216	10.78
41) T Benzene	1.172	1.072	1.088	1.054	1.046	1.017	0.954	0.856	1.032	9.16
42) T Carbon Tetrach...	0.273	0.287	0.314	0.310	0.310	0.321	0.311	0.302	0.304	5.24

Title	: EPA TO-15 per SOP VOA-T015	(CASS TO-15/GC-MS)
Cyclohexane	0.426 0.420 0.439 0.416 0.413 0.403	0.380 0.348 0.406
tert-Amyl Meth...	0.678 0.651 0.721 0.679 0.685 0.690	0.660 0.625 0.674
1,2-Dichloropr...	0.231 0.230 0.253 0.241 0.245 0.241	0.230 0.218 0.236
Bromodichlorom...	0.259 0.263 0.291 0.282 0.299 0.307	0.298 0.287 0.286
Trichloroethene	0.276 0.295 0.318 0.297 0.306 0.308	0.299 0.288 0.298
1,4-Dioxane	0.174 0.209 0.215 0.213 0.219 0.212	0.203 0.208
2,2,4-Trimethy...	1.112 1.075 1.125 1.030 1.029 0.979	0.925 0.847 1.015
Methyl Methacr...	0.066 0.083 0.103 0.104 0.110 0.115	0.112 0.106 0.100
n-Heptane	0.253 0.254 0.268 0.250 0.257 0.248	0.238 0.223 0.249
cis-1,3-Dichlo...	0.351 0.354 0.379 0.402 0.388 0.370	0.374
4-Methyl-2-pen...	0.190 0.198 0.219 0.223 0.218 0.230	0.218 0.206 0.213
trans-1,3-Dich...	0.265 0.263 0.325 0.355 0.345 0.333	0.314
1,1,2-Trichlor...	0.212 0.228 0.255 0.243 0.251 0.252	0.244 0.235 0.240
1,1,2-Trichlor...	0.212 0.228 0.255 0.243 0.251 0.252	0.244 0.235 0.240

IR	Chlorobenzene-d5 (...)	ISTD
56) S	Toluene-d8 (SS2)	2.709 2.667 2.686 2.684 2.659 2.667 2.697 2.647 2.677
57) S	Toluene	3.569 3.054 3.117 2.710 2.713 2.647 2.581 2.371 2.845
58) T	2-Hexanone	1.016 0.984 1.177 1.131 1.162 1.212 1.175 1.087 1.118
59) T	Dibromochloromethane	0.567 0.610 0.682 0.676 0.736 0.771 0.764 0.740 0.693
60) T	1,2-Dibromoethane	0.500 0.541 0.666 0.643 0.687 0.721 0.710 0.684 0.644
61) T	n-Butyl Acetate	1.351 1.230 1.328 1.275 1.299 1.371 1.315 1.212 1.298
62) T	n-Octane	0.639 0.526 0.539 0.516 0.521 0.507 0.488 0.446 0.523
63) T	Tetrachloroethene	0.899 0.856 0.899 0.866 0.877 0.872 0.862 0.836 0.871
64) T	Chlorobenzene	2.099 1.980 1.951 1.847 1.858 1.871 1.804 1.687 1.887
65) T	Ethylbenzene	3.471 3.201 3.189 2.987 3.071 3.034 2.893 2.653 3.062
66) T	m- & p-Xylenes	2.904 2.484 2.444 2.292 2.308 2.288 2.200 1.993 2.364
67) T	Bromoform	0.510 0.516 0.587 0.587 0.587 0.669 0.737 0.736 0.724
68) T	Styrene	1.735 1.728 1.842 1.842 1.740 1.943 2.016 1.956 1.824
69) T	o-Xylene	2.815 2.470 2.499 2.262 2.304 2.281 2.196 2.020 2.356
70) T	n-Nonane	1.296 1.341 1.217 1.136 1.168 1.110 1.035 0.910 1.152
71) T	1,1,2,2-Tetrachloroethane	1.151 1.109 1.120 1.089 1.120 1.137 1.092 1.014 1.104
72) T	Bromofluorobenzene	0.951 0.952 0.964 0.966 0.975 0.968 0.971 0.963 0.964
73) S	Cumene	4.039 3.577 3.252 3.091 3.121 3.070 2.928 2.641 3.215
74) T	alpha-Pinene	1.583 1.666 1.507 1.443 1.553 1.590 1.545 1.425 1.539
75) T	n-Propylbenzene	4.309 3.923 3.746 3.483 3.571 3.520 3.335 2.961 3.606
76) T	3-Ethyltoluene	3.393 3.262 3.058 2.956 3.092 3.023 3.040 2.621 3.056
77) T	4-Ethyltoluene	3.821 3.378 3.085 2.892 2.962 3.011 2.714 2.565 3.053
78) T	1,3,5-Trimethylbenzene	3.551 3.021 2.644 2.458 2.558 2.529 2.437 2.241 2.680
79) T	alpha-Methylstyrene	1.239 1.204 1.192 1.141 1.458 1.514 1.472 1.364 1.323
80) T	2-Ethyltoluene	4.069 3.458 3.397 2.986 3.033 3.007 2.883 2.606 3.180
81) T	1,2,4-Trimethylbenzene	3.299 2.774 2.702 2.437 2.554 2.535 2.395 2.102 2.600
82) T	n-Decane	1.426 1.437 1.289 1.214 1.301 1.262 1.176 1.016 1.265
83) T	Benzyl Chloride	1.612 1.503 1.912 2.206 2.171 2.005 1.901 1.522
84) T	1,3-Dichlorobenzene	1.822 1.622 1.645 1.478 1.603 1.674 1.651 1.557 1.631
85) T	1,4-Dichlorobenzene	2.044 1.716 1.776 1.575 1.653 1.699 1.670 1.568 1.713
86) T	sec-Butylbenzene	4.377 4.182 3.654 3.422 3.532 3.473 3.303 2.930 3.609
87) T	4-Isopropyltoluene	3.963 3.909 3.479 3.234 3.401 3.315 3.076 2.574 3.369
88) T	1,2,3-Trimethylbenzene	3.027 2.856 2.585 2.417 2.580 2.563 2.431 2.117 2.572
89) T	1,2-Dichlorobenzene	1.866 1.629 1.643 1.471 1.553 1.601 1.552 1.425 1.592
90) T	d-Limonene	0.921 0.995 0.823 0.795 0.987 1.001 0.938 0.799 0.907
91) T	1,2-Dibromocyclohexane	0.588 0.498 0.569 0.501 0.584 0.630 0.626 0.609 0.576
92) T	1,2-Dibromo-3-methylbutane	1.106 1.062 1.086 1.030 1.352 1.349 1.256 1.092 1.167
93) T	n-Undecane	1.429 0.899 1.295 0.974 1.227 1.320 1.301 1.254 1.212
94) T	1,2,4-Trichlorobenzene	1.429 0.899 1.295 0.974 1.227 1.320 1.301 1.254 1.212

Method Path : I:\MS13\METHODS\
Method File : R13012319.M

Title		EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)														
95)	T	Naphthalene	2.338	3.658	2.347	3.720	4.006	3.800	3.281	3.307						20.98
96)	T	n-Dodecane		1.159	0.696	1.263	1.298	1.178	0.952	1.091						20.92
97)	T	Hexachlorobuta...		1.262	0.980	0.893	0.755	0.816	0.834	0.840	0.829	0.901				17.74
98)	T	Cyclohexanone		1.010	0.860	0.896	0.836	0.762	0.872	0.854	0.802	0.862				8.50
99)	T	tert-Butylbenzene	3.242	3.109	2.704	2.543	2.601	2.548	2.391	2.067	2.651					14.23
100)	T	n-Butylbenzene	2.961	2.833	2.655	2.498	2.706	2.682	2.550	2.272	2.645					7.96

(#) = Out of Range

1ng/L Std. ID: S31-01221902 (2ng/L)
4ng/L Std. ID: S31-01161906
20ng/L Std. ID: S31-01161906
200ng/L Std. ID: S31-01161903

Dilution Factors:

Compounds	Source Std. mg/m ³	Primary Working Standards					Working STD Conc.(ng/L):					Injection (L):					ICAL Points:				
		200ng/L	20ng/L	2ng/L	4ng/L	1ng/L	0.025	0.050	0.100	0.200	0.400	0.025	0.050	0.100	0.200	0.400	0.025	0.050	0.100	0.200	0.400
Propene	1.031	206.2	20.62	2.062	4.124	1.031	0.1031	0.2062	0.5155	1.031	5.155	0.1031	0.2062	0.5155	1.031	5.155	0.1031	0.2062	0.5155	1.031	5.155
Dichlorodifluoromethane	1.045	209.0	20.90	2.090	4.180	1.045	0.1045	0.2090	0.5225	1.045	5.225	0.1045	0.2090	0.5225	1.045	5.225	0.1045	0.2090	0.5225	1.045	5.225
Chloromethane	1.008	201.6	20.16	2.016	4.032	1.008	0.1008	0.2016	0.5040	1.008	5.040	0.1008	0.2016	0.5040	1.008	5.040	0.1008	0.2016	0.5040	1.008	5.040
Freon-114	1.028	205.6	20.56	2.056	4.112	1.028	0.1028	0.2056	0.5140	1.028	5.140	0.1028	0.2056	0.5140	1.028	5.140	0.1028	0.2056	0.5140	1.028	5.140
Vinyl Chloride	1.051	210.2	21.02	2.102	4.204	1.051	0.1051	0.2102	0.5255	1.051	5.255	0.1051	0.2102	0.5255	1.051	5.255	0.1051	0.2102	0.5255	1.051	5.255
1,3-Butadiene	1.049	209.8	20.98	2.098	4.196	1.049	0.1049	0.2098	0.5245	1.049	5.245	0.1049	0.2098	0.5245	1.049	5.245	0.1049	0.2098	0.5245	1.049	5.245
Bromomethane	1.009	201.8	20.18	2.018	4.036	1.009	0.1009	0.2018	0.5045	1.009	5.045	0.1009	0.2018	0.5045	1.009	5.045	0.1009	0.2018	0.5045	1.009	5.045
Chloroethane	1.022	204.4	20.44	2.044	4.088	1.022	0.1022	0.2044	0.5110	1.022	5.110	0.1022	0.2044	0.5110	1.022	5.110	0.1022	0.2044	0.5110	1.022	5.110
Ethanol	5.140	1028.0	102.80	20.560	5.140	5.140	0.5140	1.0280	2.5700	5.140	25.700	0.5140	1.0280	2.5700	5.140	25.700	0.5140	1.0280	2.5700	5.140	25.700
Acetonitrile	1.033	206.6	20.66	2.066	4.132	1.033	0.1033	0.2066	0.5165	1.033	5.165	0.1033	0.2066	0.5165	1.033	5.165	0.1033	0.2066	0.5165	1.033	5.165
Acrolein	1.028	205.6	20.56	2.056	4.112	1.028	0.1028	0.2056	0.5140	1.028	5.140	0.1028	0.2056	0.5140	1.028	5.140	0.1028	0.2056	0.5140	1.028	5.140
Acetone	5.370	1074.0	107.40	21.480	5.370	5.370	0.5370	1.0740	2.6850	5.370	26.850	0.5370	1.0740	2.6850	5.370	26.850	0.5370	1.0740	2.6850	5.370	26.850
Trichlorofluoromethane	1.060	212.0	21.20	2.120	4.240	1.060	0.1060	0.2120	0.5300	1.060	5.300	0.1060	0.2120	0.5300	1.060	5.300	0.1060	0.2120	0.5300	1.060	5.300
Isopropanol	2.063	412.6	41.26	8.252	2.063	2.063	0.2063	0.4126	1.0315	2.063	10.315	0.2063	0.4126	1.0315	2.063	10.315	0.2063	0.4126	1.0315	2.063	10.315
Acrylonitrile	1.034	206.8	20.68	2.068	4.136	1.034	0.1034	0.2068	0.5170	1.034	5.170	0.1034	0.2068	0.5170	1.034	5.170	0.1034	0.2068	0.5170	1.034	5.170
1,1-Dichloroethene	1.074	214.8	21.48	2.148	4.296	1.074	0.1074	0.2148	0.5370	1.074	5.370	0.1074	0.2148	0.5370	1.074	5.370	0.1074	0.2148	0.5370	1.074	5.370
tert-Butanol	2.144	428.8	42.88	8.576	2.144	2.144	0.2144	0.4288	1.0720	2.144	10.720	0.2144	0.4288	1.0720	2.144	10.720	0.2144	0.4288	1.0720	2.144	10.720
Methylene Chloride	1.070	214.0	21.40	2.140	4.280	1.070	0.1070	0.2140	0.5350	1.070	5.350	0.1070	0.2140	0.5350	1.070	5.350	0.1070	0.2140	0.5350	1.070	5.350
Allyl Chloride	1.067	213.4	21.34	2.134	4.268	1.067	0.1067	0.2134	0.5335	1.067	5.335	0.1067	0.2134	0.5335	1.067	5.335	0.1067	0.2134	0.5335	1.067	5.335
Trichlorotrifluoroethane	1.065	213.0	21.30	2.130	4.260	1.065	0.1065	0.2130	0.5325	1.065	5.325	0.1065	0.2130	0.5325	1.065	5.325	0.1065	0.2130	0.5325	1.065	5.325
Carbon Disulfide	1.075	215.0	21.50	2.150	4.300	1.075	0.1075	0.2150	0.5375	1.075	5.375	0.1075	0.2150	0.5375	1.075	5.375	0.1075	0.2150	0.5375	1.075	5.375
trans-1,2-Dichloroethene	1.062	212.4	21.24	2.124	4.248	1.062	0.1062	0.2124	0.5310	1.062	5.310	0.1062	0.2124	0.5310	1.062	5.310	0.1062	0.2124	0.5310	1.062	5.310
1,1-Dichloroethane	1.030	206.0	20.60	2.060	4.120	1.030	0.1030	0.2060	0.5150	1.030	5.150	0.1030	0.2060	0.5150	1.030	5.150	0.1030	0.2060	0.5150	1.030	5.150
Methyl tert-Butyl Ether	1.089	217.8	21.78	2.178	4.356	1.089	0.1089	0.2178	0.5445	1.089	5.445	0.1089	0.2178	0.5445	1.089	5.445	0.1089	0.2178	0.5445	1.089	5.445
Vinyl Acetate	5.252	1050.4	105.04	21.008	5.252	5.252	0.5252	1.0504	2.6260	5.252	26.260	0.5252	1.0504	2.6260	5.252	26.260	0.5252	1.0504	2.6260	5.252	26.260
2-Butanone	1.027	205.4	20.54	2.054	4.108	1.027	0.1027	0.2054	0.5135	1.027	5.135	0.1027	0.2054	0.5135	1.027	5.135	0.1027	0.2054	0.5135	1.027	5.135
cis-1,2-Dichloroethene	1.054	210.8	21.08	2.108	4.216	1.054	0.1054	0.2108	0.5270	1.054	5.270	0.1054	0.2108	0.5270	1.054	5.270	0.1054	0.2108	0.5270	1.054	5.270
Diisopropyl Ether	1.081	216.2	21.62	2.162	4.324	1.081	0.1081	0.2162	0.5405	1.081	5.405	0.1081	0.2162	0.5405	1.081	5.405	0.1081	0.2162	0.5405	1.081	5.405
Ethyl Acetate	2.166	433.2	43.32	8.664	2.166	2.166	0.2166	0.4332	1.0830	2.166	10.830	0.2166	0.4332	1.0830	2.166	10.830	0.2166	0.4332	1.0830	2.166	10.830
n-Hexane	1.082	216.4	21.64	2.164	4.328	1.082	0.1082	0.2164	0.5410	1.082	5.410	0.1082	0.2164	0.5410	1.082	5.410	0.1082	0.2164	0.5410	1.082	5.410
Chloroform	1.077	215.4	21.54	2.154	4.308	1.077	0.1077	0.2154	0.5385	1.077	5.385	0.1077	0.2154	0.5385	1.077	5.385	0.1077	0.2154	0.5385	1.077	5.385
Tetrahydrofuran	1.068	213.6	21.36	2.136	4.272	1.068	0.1068	0.2136	0.5340	1.068	5.340	0.1068	0.2136	0.5340	1.068	5.340	0.1068	0.2136	0.5340	1.068	5.340
Ethyl tert-Butyl Ether	1.060	212.0	21.20	2.120	4.240	1.060	0.1060	0.2120	0.5300	1.060	5.300	0.1060	0.2120	0.5300	1.060	5.300	0.1060	0.2120	0.5300	1.060	5.300
1,2-Dichloroethane	1.061	212.2	21.22	2.122	4.244	1.061	0.1061	0.2122	0.5305	1.061	5.305	0.1061	0.2122	0.5305	1.061	5.305	0.1061	0.2122	0.5305	1.061	5.305
1,1,1-Trichloroethane	1.081	216.2	21.62	2.162	4.324	1.081	0.1081	0.2162	0.5405	1.081	5.405	0.1081	0.2162	0.5405	1.081	5.405	0.1081	0.2162	0.5405	1.081	5.405
Isopropyl Acetate	2.066	413.2	41.32	8.264	2.066	2.066	0.2066	0.4132	1.0330	2.066	10.330	0.2066	0.4132	1.0330	2.066	10.330	0.2066	0.4132	1.0330	2.066	10.330
1-Butanol	2.067	413.4	41.34	8.268	2.067	2.067	0.2067	0.4134	1.0335	2.067	10.335	0.2067	0.4134	1.0335	2.067	10.335	0.2067	0.4134	1.0335	2.067	10.335
Benzene	1.033	206.6	20.66	2.066	4.132	1.033	0.1033	0.2066	0.5165	1.033	5.165	0.1033	0.2066	0.5165	1.033	5.165	0.1033	0.2066	0.5165	1.033	5.165
Carbon Tetrachloride	1.036	207.2	20.72	2.072	4.144	1.036	0.1036	0.2072	0.5180	1.036	5.180	0.1036	0.2072	0.5180	1.036	5.180	0.1036	0.2072	0.5180	1.036	5.180
Cyclohexane	2.087	417.4	41.74	8.348	2.087	2.087	0.2087	0.4174	1.0435	2.087	10.435	0.2087	0.4174	1.0435	2.087	10.435	0.2087	0.4174	1.0435	2.087	10.435
tert-Amyl Methyl Ether	1.074	214.8	21.48	2.148	4.296	1.074	0.1074	0.2148	0.5370	1.074	5.370	0.1074	0.2148	0.5370	1.074	5.370	0.1074	0.2148	0.5370	1.074	5.370
1,2-Dichloropropane	1.073	214.6	21.46	2.146	4.292	1.073	0.1073	0.2146	0.5365	1.073	5.365	0.1073	0.2146	0.5365	1.073	5.365	0.1073	0.2146	0.5365	1.073	5.365
Bromodichloromethane	1.068	213.6	21.36	2.136	4.272	1.068	0.1068	0.2136	0.5340	1.068	5.340	0.1068	0.2136	0.5340	1.068	5.340	0.1068	0.2136	0.5340	1.068	5.340
Trichloroethene	1.062	212.4	21.24	2.124	4.248	1.062	0.1062	0.2124	0.5310	1.062	5.310	0.1062	0.2124	0.5310	1.062	5.310	0.1062	0.2124	0.5310	1.062	5.310
1,4-Dioxane	1.064	212.8	21.28	2.128	4.256	1.064	0.1064	0.2128	0.5320	1.064	5.320	0.1064	0.2128	0.5320	1.064	5.320	0.1064	0.2128	0.5320	1.064	5.320
Isocetane	1.061	212.2	21.22	2.122	4.244	1.061	0.1061	0.2122	0.5305	1.061	5.305	0.1061	0.2122	0.5305	1.061	5.305	0.1061	0.2122	0.5305	1.061	5.305
Methyl Methacrylate	2.135	427.0	42.70	8.540	2.135	2.135	0.2135	0.4270	1.0675	2.135	10.675	0.2135	0.4270	1.0675	2.135	10.675	0.2135	0.4270	1.0675	2.135	10.675
n-Heptane	1.076	215.2	21.52	2.152	4.304	1.076	0.1076	0.2152	0.5380	1.076	5.380	0.1076	0.2152	0.5380	1.076	5.380	0.1076	0.2152	0.5380	1.076	5.380

Primary Source Standards Concentrations (Working & Initial Calibration)

1ng/L Std. ID:
4ng/L Std. ID: S31-01221902 (2ng/L)
20ng/L Std. ID: S31-01161906
200ng/L Std. ID: S31-01161903

200ng/L Std. ID: S31-01161903														
Dilution Factors:			5	50	250	1000	Working STD Conc.(ng/L):							
Source Std.		Primary Working Standards					Injection (L):							
Compounds	mg/m³	200ng/L	20ng/L	4ng/L	1ng/L	ICAL Points:	4	4	20	20	200	200	200	200
cis-1,3-Dichloropropene	1.120	224.0	22.40	4.480	1.120		0.025	0.050	0.025	0.050	0.025	0.025	0.25	0.50
4-Methyl-2-pentanone	1.060	212.0	21.20	4.240	1.060		0.1120	0.2240	0.5600	1.120	5.600	28.000	56.00	112.0
trans-1,3-Dichloropropene	1.055	211.0	21.10	4.220	1.055		0.1060	0.2120	0.5300	1.060	5.300	26.500	53.00	106.0
1,1,1,2-Trichloroethane	1.076	215.2	21.52	4.304	1.076		0.1055	0.2110	0.5275	1.055	5.275	26.375	52.75	105.5
Toluene	1.052	210.4	21.04	4.208	1.052		0.1076	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6
2-Hexanone	1.074	214.8	21.48	4.296	1.074		0.1052	0.2104	0.5260	1.052	5.260	26.300	52.60	105.2
Dibromochloromethane	1.075	215.0	21.50	4.300	1.075		0.1074	0.2148	0.5370	1.074	5.370	26.850	53.70	107.4
1,2-Dibromoethane	1.076	215.2	21.52	4.304	1.076		0.1075	0.2150	0.5375	1.075	5.375	26.875	53.75	107.5
n-Butyl Acetate	1.085	217.0	21.70	4.340	1.085		0.1076	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6
n-Octane	1.076	215.2	21.52	4.304	1.076		0.1085	0.2170	0.5425	1.085	5.425	27.125	54.25	108.5
Tetrachloroethene	1.058	211.6	21.16	4.232	1.058		0.1076	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6
Chlorobenzene	1.066	213.2	21.32	4.264	1.066		0.1058	0.2116	0.5290	1.058	5.290	26.450	52.90	105.8
Ethylbenzene	1.033	206.6	20.66	4.132	1.033		0.1066	0.2132	0.5330	1.066	5.330	26.650	53.30	106.6
m- & p-Xylene	2.123	424.6	42.46	8.492	2.123		0.1033	0.2066	0.5165	1.033	5.165	25.825	51.65	103.3
Bromoform	1.063	212.6	21.26	4.252	1.063		0.2123	0.4246	1.0615	2.123	10.615	53.075	106.15	212.3
Styrene	1.060	212.0	21.20	4.240	1.060		0.1063	0.2126	0.5315	1.063	5.315	26.575	53.15	106.3
o-Xylene	1.062	212.4	21.24	4.248	1.062		0.1060	0.2120	0.5300	1.060	5.300	26.500	53.00	106.0
n-Nonane	1.071	214.2	21.42	4.284	1.071		0.1062	0.2124	0.5310	1.062	5.310	26.550	53.10	106.2
1,1,2,2-Tetrachloroethane	1.064	212.8	21.28	4.256	1.064		0.1071	0.2142	0.5355	1.071	5.355	26.775	53.55	107.1
Cumene	1.057	211.4	21.14	4.228	1.057		0.1064	0.2128	0.5320	1.064	5.320	26.600	53.20	106.4
alpha-Phene	1.035	207.0	20.70	4.140	1.035		0.1057	0.2114	0.5285	1.057	5.285	26.425	52.85	105.7
n-Propylbenzene	1.076	215.2	21.52	4.304	1.076		0.1035	0.2070	0.5175	1.035	5.175	25.875	51.75	103.5
3-Ethyltoluene	1.062	212.4	21.24	4.248	1.062		0.1076	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6
4-Ethyltoluene	1.061	212.2	21.22	4.244	1.061		0.1062	0.2124	0.5310	1.062	5.310	26.550	53.10	106.2
1,3,5-Trimethylbenzene	1.057	211.4	21.14	4.228	1.057		0.1061	0.2122	0.5305	1.061	5.305	26.525	53.05	106.1
alpha-Methylstyrene	1.058	211.6	21.16	4.232	1.058		0.1057	0.2114	0.5285	1.057	5.285	26.425	52.85	105.7
2-Ethyltoluene	1.072	214.4	21.44	4.288	1.072		0.1058	0.2116	0.5290	1.058	5.290	26.450	52.90	105.8
1,2,4-Trimethylbenzene	1.068	213.6	21.36	4.272	1.068		0.1072	0.2144	0.5360	1.072	5.360	26.800	53.60	107.2
n-Decane	1.076	215.2	21.52	4.304	1.076		0.1068	0.2136	0.5340	1.068	5.340	26.700	53.40	106.8
Benzyl Chloride	1.051	210.2	21.02	4.204	1.051		0.1076	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6
1,3-Dichlorobenzene	1.080	216.0	21.60	4.320	1.080	0.1051	0.2102	0.5255	1.051	5.255	26.275	52.55	105.1	
1,4-Dichlorobenzene	1.081	216.2	21.62	4.324	1.081	0.1080	0.2160	0.5400	1.080	5.400	27.000	54.00	108.0	
sec-Butylbenzene	1.063	212.6	21.26	4.252	1.063	0.1081	0.2162	0.5405	1.081	5.405	27.025	54.05	108.1	
p-Isopropyltoluene	1.042	208.4	20.84	4.168	1.042	0.1063	0.2126	0.5315	1.063	5.315	26.575	53.15	106.3	
1,2,3-Trimethylbenzene	1.042	208.4	20.84	4.168	1.042	0.1042	0.2084	0.5210	1.042	5.210	26.050	52.10	104.2	
1,2-Dichlorobenzene	1.089	217.8	21.78	4.356	1.089	0.1042	0.2084	0.5210	1.042	5.210	26.050	52.10	104.2	
d-Limonene	1.010	202.0	20.20	4.040	1.010	0.1089	0.2178	0.5445	1.089	5.445	27.225	54.45	108.9	
1,2-Dibromo-3-chloropropane	1.042	208.4	20.84	4.168	1.042	0.1010	0.2020	0.5050	1.010	5.050	25.250	50.50	101.0	
n-Undecane	1.057	211.4	21.14	4.228	1.057	0.1042	0.2084	0.5210	1.042	5.210	26.050	52.10	104.2	
1,2,4-Trichlorobenzene	1.064	212.8	21.28	4.256	1.064	0.1057	0.2114	0.5285	1.057	5.285	26.425	52.85	105.7	
Naphthalene	1.025	205.0	20.50	4.100	1.025	0.1064	0.2128	0.5320	1.064	5.320	26.600	53.20	106.4	
n-Dodecane	1.031	206.2	20.62	4.124	1.031	0.1025	0.2050	0.5125	1.025	5.125	25.625	51.25	102.5	
Hexachloro-1,3-butadiene	1.053	210.6	21.06	4.212	1.053	0.1031	0.2062	0.5155	1.031	5.155	25.775	51.55	103.1	
Methacrylonitrile	1.041	208.2	20.82	4.164	1.041	0.1053	0.2106	0.5265	1.053	5.265	26.325	52.65	105.3	
Cyclohexanone	0.982	196.4	19.64	3.928	0.982	0.1041	0.2082	0.5205	1.041	5.205	26.025	52.05	104.1	
tert-Butylbenzene	1.067	213.4	21.34	4.268	1.067	0.0982	0.1964	0.4910	0.982	4.910	24.550	49.10	98.2	
n-Butylbenzene	1.064	212.8	21.28	4.256	1.064	0.1067	0.2134	0.5335	1.067	5.335	26.675	53.35	106.7	
						0.1064	0.2128	0.5320	1.064	5.320	26.600	53.20	106.4	

Method : I:\MS13\METHODS\R13012319.M (RTE Integrator)
 Title : EPA T0-15 per SOP VOA-T015 (CASS T0-15/GC-MS)
 Last Update : Wed Jan 23 11:21:29 2019
 Response via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	0.1	0	13	I:\MS13\DATA\2019_01\23\01231906.D
2	0.2	0	13	I:\MS13\DATA\2019_01\23\01231907.D
3	0.5	1	13	I:\MS13\DATA\2019_01\23\01231904.D
4	1.0	1	13	I:\MS13\DATA\2019_01\23\01231905.D
5	5.0	5	13	I:\MS13\DATA\2019_01\23\01231908.D
6	25	26	13	I:\MS13\DATA\2019_01\23\01231909.D
7	50	52	13	I:\MS13\DATA\2019_01\23\01231910.D
8	100	103	13	I:\MS13\DATA\2019_01\23\01231911.D



#	ID	Update Time	Quant Time	Acquisition Time
1	0.1	Jan 23 11:19 2019	Jan 23 10:33 2019	23 Jan 2019 8:07
2	0.2	Jan 23 11:20 2019	Jan 23 10:34 2019	23 Jan 2019 8:40
3	0.5	Jan 23 11:20 2019	Jan 23 10:31 2019	23 Jan 2019 6:01
4	1.0	Jan 23 11:20 2019	Jan 23 10:39 2019	23 Jan 2019 6:35
5	5.0	Jan 23 11:20 2019	Jan 23 10:31 2019	23 Jan 2019 9:13
6	25	Jan 23 11:21 2019	Jan 23 10:31 2019	23 Jan 2019 9:46
7	50	Jan 23 11:21 2019	Jan 23 10:54 2019	23 Jan 2019 10:20
8	100	Jan 23 11:21 2019	Jan 23 11:18 2019	23 Jan 2019 10:53

R13012319.M

Wed Jan 23 13:58:22 2019

Data File : I:\MS13\DATA\2019 01\23\01231906.D
 Acq On : 23 Jan 2019 8:07
 Sample : 0.1ng TO-15 ICAL Std
 Misc : S31-01231908/S31-01221902 (2/20)

Vial: 14
 Operator: WA
 Inst : MS13

Quant Time: Jan 23 10:33:34 2019

Quant Method : I:\MS13\METHODS\R13012319.M

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

QLast Update : Wed Jan 23 10:31:09 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

1/23/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.96	130	133128	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.09	114	584644	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.42	82	230658	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.81	65	142619	12.206	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.68%
57) Toluene-d8 (SS2)	15.54	98	624855	13.133	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	105.04%
73) Bromofluorobenzene (SS3)	18.83	174	219273	11.184	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	89.44%

Target Compounds

						Qvalue
2) Propene	4.04	42	1193	0.095	ng	89
3) Dichlorodifluoromethan...	4.18	85	2013	0.090	ng	# 92
4) Chloromethane	4.47	50	1467	0.086	ng	80
5) 1,2-Dichloro-1,1,2,2-t...	4.70	135	1241	0.087	ng	86
6) Vinyl Chloride	4.88	62	1293	0.078	ng	69
7) 1,3-Butadiene	5.12	54	937	0.077	ng	94
8) Bromomethane	5.55	94	1047	0.091	ng	92
9) Chloroethane	0.00	64	0	N.D.	d	
10) Ethanol	6.24	45	4985	0.593	ng	79
11) Acetonitrile	6.60	41	970	0.046	ng	# 42
12) Acrolein	0.00	56	0	N.D.		
13) Acetone	6.90	58	5619	0.595	ng	# 83
14) Trichlorofluoromethane	7.09	101	1782	0.095	ng	96
15) 2-Propanol (Isopropanol)	7.44	45	5253	0.186	ng	85
16) Acrylonitrile	0.00	53	0	N.D.		
17) 1,1-Dichloroethene	8.03	96	1048	0.084	ng	99
18) 2-Methyl-2-Propanol (t...	8.32	59	4924	0.173	ng	# 77
19) Methylene Chloride	8.25	84	927	0.074	ng	100
20) 3-Chloro-1-propene (Al...	8.42	41	1307	0.082	ng	# 54
21) Trichlorotrifluoroethane	8.67	151	1225	0.093	ng	98
22) Carbon Disulfide	8.53	76	7486	0.162	ng	79
23) trans-1,2-Dichloroethene	9.53	61	902	0.061	ng	99
24) 1,1-Dichloroethane	9.76	63	1815	0.088	ng	83
25) Methyl tert-Butyl Ether	9.97	73	3229	0.091	ng	89
26) Vinyl Acetate	10.07	86	465	0.156	ng	# 1
27) 2-Butanone (MEK)	0.00	72	0	N.D.		
28) cis-1,2-Dichloroethene	10.79	61	1100	0.072	ng	79
29) Diisopropyl Ether	11.14	87	953	0.078	ng	# 51
30) Ethyl Acetate	11.17	61	189	0.047	ng	# 11
31) n-Hexane	11.08	57	1972	0.098	ng	# 100
32) Chloroform	11.13	83	1805	0.092	ng	96
34) Tetrahydrofuran (THF)	11.64	72	846	0.095	ng	# 87
35) Ethyl tert-Butyl Ether	11.74	87	1302	0.087	ng	94
36) 1,2-Dichloroethane	11.94	62	991	0.079	ng	# 42
38) 1,1,1-Trichloroethane	12.21	97	1576	0.092	ng	94
39) Isopropyl Acetate	12.69	61	1511	0.191	ng	# 68
40) 1-Butanol	12.75	56	2184	0.199	ng	87
41) Benzene	12.70	78	5663	0.107	ng	93
42) Carbon Tetrachloride	12.85	117	1323	0.085	ng	97
43) Cyclohexane	12.99	84	4162	0.200	ng	92
44) tert-Amyl Methyl Ether	13.37	73	3404	0.098	ng	89
45) 1,2-Dichloropropane	13.55	63	1158	0.095	ng	90
46) Bromodichloromethane	13.74	83	1295	0.088	ng	94
47) Trichloroethene	13.80	130	1371	0.090	ng	100
48) 1,4-Dioxane	13.84	88	865	0.081	ng	# 66
49) 2,2,4-Trimethylpentane...	13.86	57	5519	0.104	ng	87
50) Methyl Methacrylate	14.03	100	656	0.123	ng	# 55

Data File : I:\MS13\DATA\2019 01\23\01231906.D
 Acq On : 23 Jan 2019 8:07
 Sample : 0.1ng TO-15 ICAL Std
 Misc : S31-01231908/S31-01221902 (2/20)

Vial: 14
 Operator: WA
 Inst : MS13

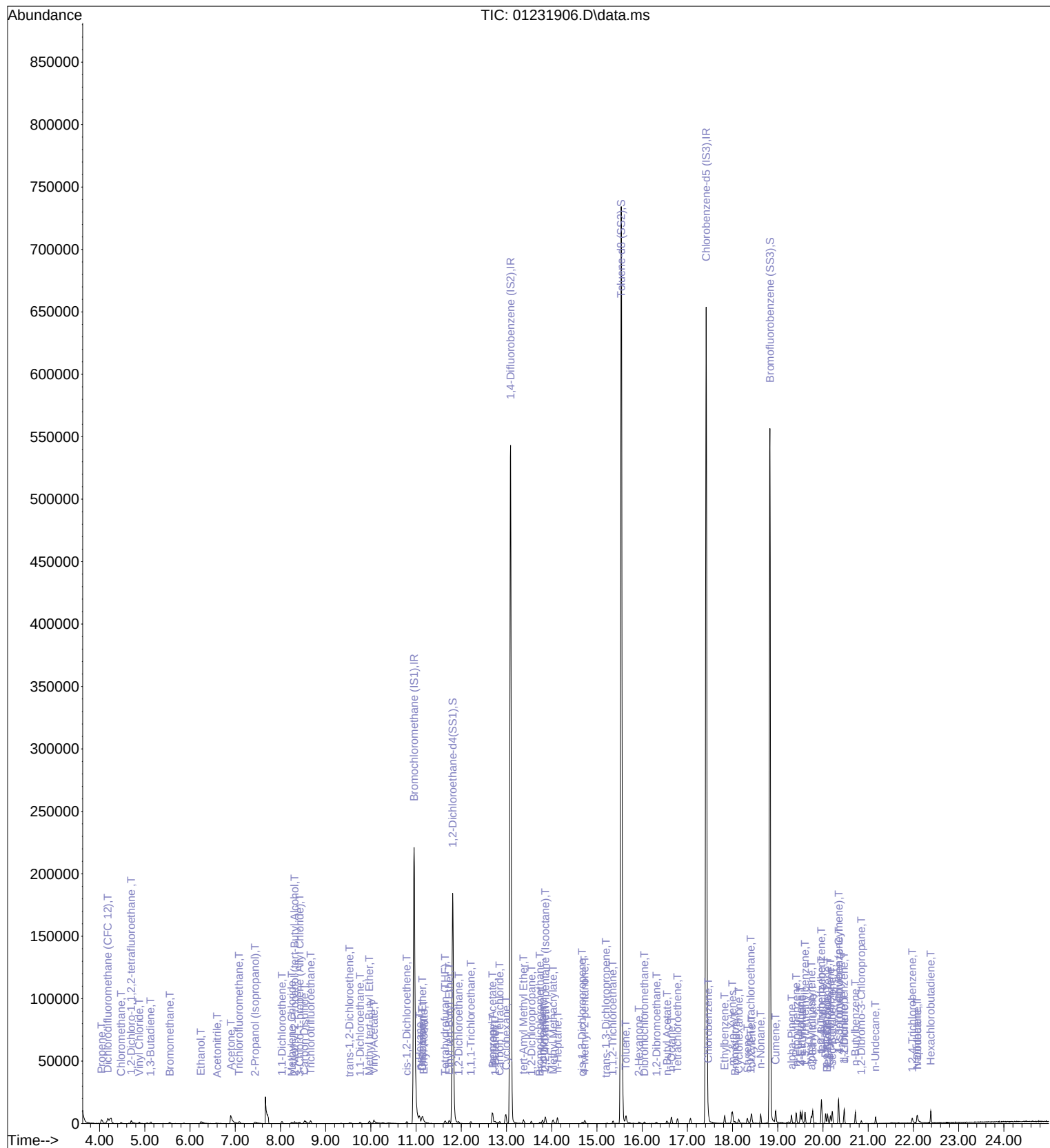
Quant Time: Jan 23 10:33:34 2019
 Quant Method : I:\MS13\METHODS\R13012319.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Wed Jan 23 10:31:09 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.13	71	1274	0.098	ng	96
52) cis-1,3-Dichloropropene	14.67	75	1281	0.068	ng	76
53) 4-Methyl-2-pentanone	14.73	58	940	0.085	ng	80
54) trans-1,3-Dichloropropene	15.20	75	438	0.027	ng	# 43
55) 1,1,2-Trichloroethane	15.35	97	1066	0.085	ng	98
58) Toluene	15.64	91	6928	0.129	ng	88
59) 2-Hexanone	15.92	43	2014	0.093	ng	91
60) Dibromochloromethane	16.05	129	1124	0.083	ng	94
61) 1,2-Dibromoethane	16.32	107	993	0.080	ng	97
62) n-Butyl Acetate	16.55	43	2705	0.108	ng	88
63) n-Octane	16.65	57	1269	0.128	ng	# 78
64) Tetrachloroethene	16.78	166	1755	0.104	ng	96
65) Chlorobenzene	17.46	112	4129	0.114	ng	97
66) Ethylbenzene	17.83	91	6617	0.113	ng	96
67) m- & p-Xylenes	18.00	91	11376	0.254	ng	92
68) Bromoform	18.06	173	1000	0.076	ng	79
69) Styrene	18.33	104	3393	0.096	ng	96
70) o-Xylene	18.42	91	5517	0.123	ng	98
71) n-Nonane	18.62	43	2562	0.114	ng	99
72) 1,1,2,2-Tetrachloroethane	18.40	83	2260	0.105	ng	100
74) Cumene	18.95	105	7878	0.129	ng	99
75) alpha-Pinene	19.30	93	3024	0.102	ng	98
76) n-Propylbenzene	19.41	91	8556	0.123	ng	97
77) 3-Ethyltoluene	19.50	105	6650	0.111	ng	98
78) 4-Ethyltoluene	19.54	105	7480	0.129	ng	99
79) 1,3,5-Trimethylbenzene	19.60	105	6926	0.136	ng	92
80) alpha-Methylstyrene	19.74	118	2418	0.096	ng	# 83
81) 2-Ethyltoluene	19.77	105	8049	0.133	ng	95
82) 1,2,4-Trimethylbenzene	19.96	105	6501	0.132	ng	97
83) n-Decane	20.06	57	2832	0.116	ng	96
84) Benzyl Chloride	20.09	91	2863	0.079	ng	80
85) 1,3-Dichlorobenzene	20.10	146	3631	0.116	ng	99
86) 1,4-Dichlorobenzene	20.16	146	4078	0.125	ng	95
87) sec-Butylbenzene	20.20	105	8586	0.124	ng	98
88) 4-Isopropyltoluene (p-...	20.35	119	7620	0.117	ng	96
89) 1,2,3-Trimethylbenzene	20.35	105	5820	0.117	ng	97
90) 1,2-Dichlorobenzene	20.47	146	3749	0.122	ng	95
91) d-Limonene	20.47	68	1717	0.098	ng	99
92) 1,2-Dibromo-3-Chloropr...	20.85	157	1130	0.103	ng	88
93) n-Undecane	21.16	57	2158	0.097	ng	94
94) 1,2,4-Trichlorobenzene	21.97	180	2805	0.131	ng	# 94
95) Naphthalene	22.08	128	11176	0.191	ng	82
96) n-Dodecane	22.09	57	1465	0.076	ng	81
97) Hexachlorobutadiene	22.38	225	2453	0.148	ng	94
98) Cyclohexanone	18.14	55	1831	0.108	ng	90
99) tert-Butylbenzene	19.96	119	6384	0.125	ng	100
100) n-Butylbenzene	20.72	91	5814	0.115	ng	99

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

Vial: 14
Operator: WA
Inst : MS13

Quant Time: Jan 23 10:33:34 2019



Data File : I:\MS13\DATA\2019 01\23\01231907.D
 Acq On : 23 Jan 2019 8:40
 Sample : 0.2ng TO-15 ICAL Std
 Misc : S31-01231908/S31-01221902 (2/20)

Vial: 14
 Operator: WA
 Inst : MS13

Quant Time: Jan 23 10:34:52 2019

Quant Method : I:\MS13\METHODS\R13012319.M

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

QLast Update : Wed Jan 23 10:31:09 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

1/23/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.96	130	127975	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.09	114	556534	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.42	82	222857	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.82	65	137251	12.219	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.76%
57) Toluene-d8 (SS2)	15.54	98	594339	12.929	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.44%
73) Bromofluorobenzene (SS3)	18.83	174	212177	11.201	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	89.60%

Target Compounds

						Qvalue
2) Propene	4.02	42	2166	0.180	ng	89
3) Dichlorodifluoromethan...	4.17	85	4073	0.190	ng	# 96
4) Chloromethane	4.46	50	2677	0.163	ng	88
5) 1,2-Dichloro-1,1,2,2-t...	4.69	135	2540	0.184	ng	92
6) Vinyl Chloride	4.86	62	2541	0.159	ng	93
7) 1,3-Butadiene	5.12	54	1645	0.141	ng	95
8) Bromomethane	5.54	94	1852	0.168	ng	91
9) Chloroethane	5.86	64	1383	0.159	ng	87
10) Ethanol	6.22	45	7199	0.892	ng	86
11) Acetonitrile	6.52	41	2519	0.125	ng	90
12) Acrolein	0.00	56	0	N.D.	d	
13) Acetone	6.88	58	9332	1.028	ng	87
14) Trichlorofluoromethane	7.09	101	3329	0.185	ng	96
15) 2-Propanol (Isopropanol)	7.40	45	10035	0.370	ng	92
16) Acrylonitrile	0.00	53	0	N.D.		
17) 1,1-Dichloroethene	8.04	96	2122	0.176	ng	86
18) 2-Methyl-2-Propanol (t...	8.28	59	10027	0.367	ng	87
19) Methylene Chloride	8.25	84	1827	0.152	ng	91
20) 3-Chloro-1-propene (Al...	8.41	41	2691	0.176	ng	72
21) Trichlorotrifluoroethane	8.67	151	2342	0.185	ng	96
22) Carbon Disulfide	8.53	76	10196	0.229	ng	92
23) trans-1,2-Dichloroethene	9.54	61	1977	0.140	ng	85
24) 1,1-Dichloroethane	9.76	63	3636	0.184	ng	95
25) Methyl tert-Butyl Ether	9.94	73	6568	0.192	ng	96
26) Vinyl Acetate	10.06	86	1473	0.514	ng	# 1
27) 2-Butanone (MEK)	10.38	72	624	0.077	ng	# 1
28) cis-1,2-Dichloroethene	10.79	61	2471	0.169	ng	90
29) Diisopropyl Ether	11.13	87	2229	0.191	ng	94
30) Ethyl Acetate	11.14	61	994	0.256	ng	96
31) n-Hexane	11.08	57	3998	0.207	ng	# 100
32) Chloroform	11.13	83	3368	0.179	ng	95
34) Tetrahydrofuran (THF)	11.63	72	1591	0.187	ng	# 84
35) Ethyl tert-Butyl Ether	11.72	87	2584	0.180	ng	93
36) 1,2-Dichloroethane	11.94	62	2108	0.175	ng	88
38) 1,1,1-Trichloroethane	12.21	97	3203	0.197	ng	91
39) Isopropyl Acetate	12.68	61	3060	0.407	ng	95
40) 1-Butanol	12.74	56	3053	0.292	ng	99
41) Benzene	12.70	78	9863	0.196	ng	98
42) Carbon Tetrachloride	12.85	117	2651	0.178	ng	100
43) Cyclohexane	12.99	84	7799	0.394	ng	98
44) tert-Amyl Methyl Ether	13.37	73	6226	0.188	ng	97
45) 1,2-Dichloropropane	13.55	63	2196	0.189	ng	96
46) Bromodichloromethane	13.74	83	2497	0.177	ng	98
47) Trichloroethene	13.80	130	2785	0.191	ng	96
48) 1,4-Dioxane	13.82	88	1983	0.196	ng	78
49) 2,2,4-Trimethylpentane...	13.86	57	10156	0.201	ng	89
50) Methyl Methacrylate	14.02	100	1574	0.310	ng	92

Data File : I:\MS13\DATA\2019 01\23\01231907.D
 Acq On : 23 Jan 2019 8:40
 Sample : 0.2ng TO-15 ICAL Std
 Misc : S31-01231908/S31-01221902 (2/20)

Vial: 14
 Operator: WA
 Inst : MS13

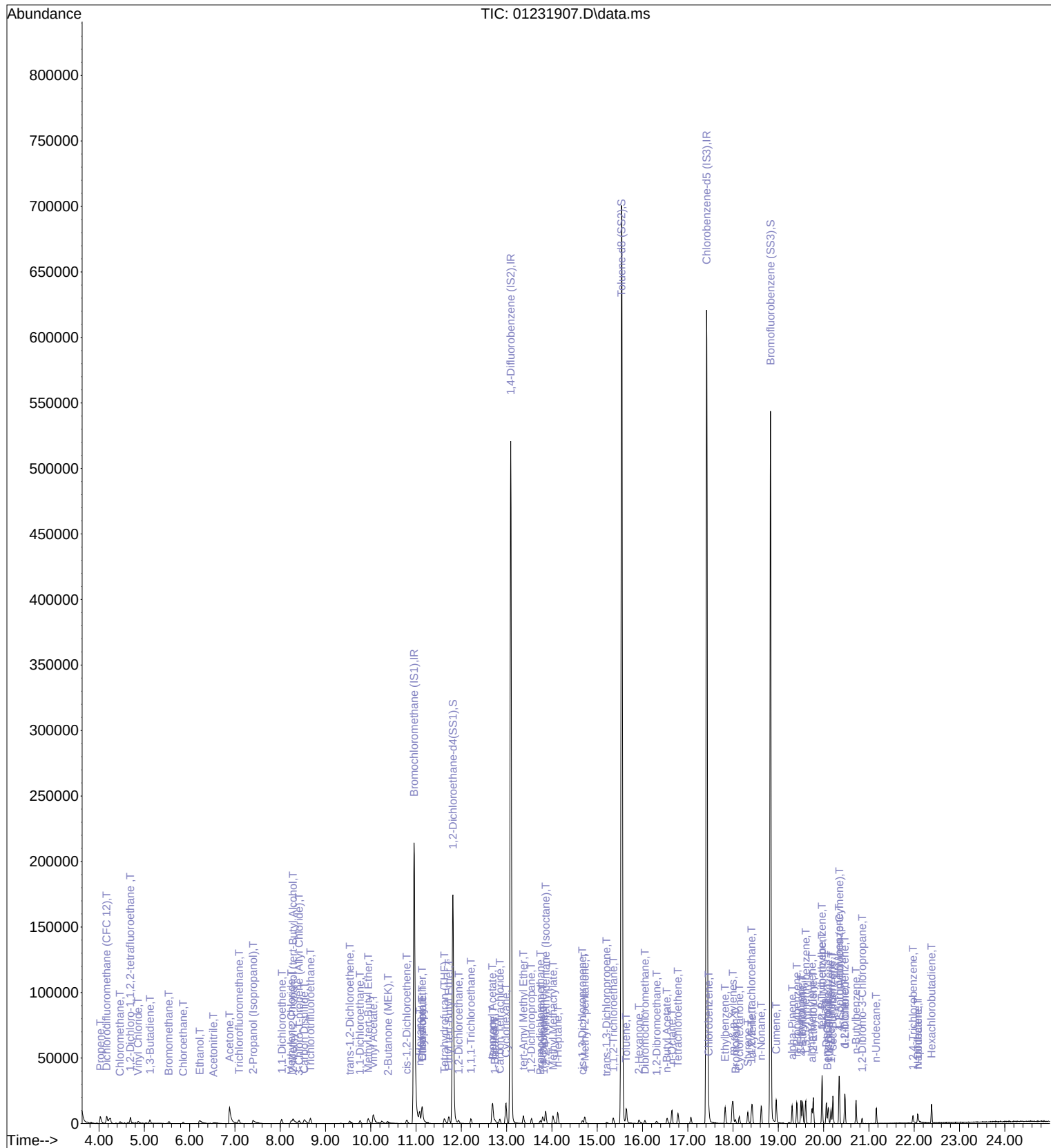
Quant Time: Jan 23 10:34:52 2019
 Quant Method : I:\MS13\METHODS\R13012319.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Wed Jan 23 10:31:09 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.13	71	2430	0.197	ng	100
52) cis-1,3-Dichloropropene	14.67	75	2723	0.151	ng	95
53) 4-Methyl-2-pentanone	14.73	58	1867	0.178	ng	93
54) trans-1,3-Dichloropropene	15.21	75	1375	0.091	ng	74
55) 1,1,2-Trichloroethane	15.36	97	2184	0.182	ng	99
58) Toluene	15.64	91	11456	0.221	ng	98
59) 2-Hexanone	15.92	43	3767	0.180	ng	97
60) Dibromochloromethane	16.06	129	2339	0.179	ng	93
61) 1,2-Dibromoethane	16.31	107	2077	0.172	ng	98
62) n-Butyl Acetate	16.54	43	4757	0.197	ng	95
63) n-Octane	16.65	57	2019	0.210	ng	97
64) Tetrachloroethene	16.78	166	3229	0.198	ng	94
65) Chlorobenzene	17.46	112	7527	0.215	ng	97
66) Ethylbenzene	17.83	91	11792	0.209	ng	96
67) m- & p-Xylenes	18.00	91	18801	0.434	ng	99
68) Bromoform	18.05	173	1957	0.155	ng	88
69) Styrene	18.33	104	6533	0.192	ng	93
70) o-Xylene	18.42	91	9354	0.215	ng	98
71) n-Nonane	18.62	43	5123	0.237	ng	95
72) 1,1,2,2-Tetrachloroethane	18.41	83	4209	0.202	ng	97
74) Cumene	18.95	105	13483	0.228	ng	99
75) alpha-Pinene	19.30	93	6149	0.214	ng	98
76) n-Propylbenzene	19.41	91	15052	0.224	ng	96
77) 3-Ethyltoluene	19.50	105	12352	0.214	ng	98
78) 4-Ethyltoluene	19.54	105	12780	0.228	ng	99
79) 1,3,5-Trimethylbenzene	19.61	105	11386	0.232	ng	99
80) alpha-Methylstyrene	19.74	118	4544	0.187	ng	82
81) 2-Ethyltoluene	19.77	105	13219	0.226	ng	99
82) 1,2,4-Trimethylbenzene	19.96	105	10564	0.222	ng	96
83) n-Decane	20.06	57	5512	0.235	ng	96
84) Benzyl Chloride	20.08	91	4457	0.128	ng	93
85) 1,3-Dichlorobenzene	20.11	146	6246	0.206	ng	99
86) 1,4-Dichlorobenzene	20.16	146	6614	0.209	ng	99
87) sec-Butylbenzene	20.20	105	15852	0.236	ng	97
88) 4-Isopropyltoluene (p-...	20.35	119	14524	0.230	ng	98
89) 1,2,3-Trimethylbenzene	20.34	105	10612	0.221	ng	95
90) 1,2-Dichlorobenzene	20.47	146	6325	0.213	ng	98
91) d-Limonene	20.47	68	3584	0.213	ng	92
92) 1,2-Dibromo-3-Chloropr...	20.85	157	1852	0.174	ng	92
93) n-Undecane	21.16	57	4003	0.187	ng	97
94) 1,2,4-Trichlorobenzene	21.97	180	3412	0.164	ng	97
95) Naphthalene	22.08	128	8545	0.151	ng	85
96) n-Dodecane	22.08	57	1808	0.097	ng	85
97) Hexachlorobutadiene	22.38	225	3681	0.230	ng	99
98) Cyclohexanone	18.14	55	3011	0.183	ng	95
99) tert-Butylbenzene	19.96	119	11829	0.240	ng	98
100) n-Butylbenzene	20.72	91	10747	0.219	ng	97

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

Vial: 14
Operator: WA
Inst : MS13

Quant Time: Jan 23 10:34:52 2019
Quant Method : I:\MS13\METHODS\R13012319.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Wed Jan 23 10:31:09 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019 01\23\01231904.D
 Acq On : 23 Jan 2019 6:01
 Sample : 0.5ng R13012319 ICAL Std
 Misc : S31-01231908/S31-01161906 (2/14)

Vial: 15
 Operator: WA
 Inst : MS13

Quant Time: Jan 23 10:31:37 2019

Quant Method : I:\MS13\METHODS\R13012319.M

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

QLast Update : Wed Jan 23 10:31:09 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

1/23/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.96	130	131127	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.09	114	573396	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.42	82	228390	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.82	65	141581	12.302	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.40%
57) Toluene-d8 (SS2)	15.54	98	613470	13.022	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	104.16%
73) Bromofluorobenzene (SS3)	18.83	174	220128	11.339	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	90.72%

Target Compounds

						Qvalue
2) Propene	4.02	42	6188	0.502	ng	95
3) Dichlorodifluoromethan...	4.16	85	10871	0.494	ng	98
4) Chloromethane	4.45	50	9013	0.535	ng	93
5) 1,2-Dichloro-1,1,2,2-t...	4.68	135	6979	0.495	ng	97
6) Vinyl Chloride	4.85	62	8493	0.518	ng	94
7) 1,3-Butadiene	5.11	54	6048	0.504	ng	91
8) Bromomethane	5.53	94	5409	0.478	ng	96
9) Chloroethane	5.85	64	4318	0.486	ng	97
10) Ethanol	6.19	45	21756	2.630	ng	98
11) Acetonitrile	6.55	41	9317	0.452	ng	94
12) Acrolein	6.69	56	2575	0.364	ng	# 69
13) Acetone	6.86	58	23437	2.519	ng	85
14) Trichlorofluoromethane	7.09	101	9377	0.508	ng	98
15) 2-Propanol (Isopropanol)	7.36	45	28011	1.008	ng	100
16) Acrylonitrile	7.66	53	3291	0.250	ng	89
17) 1,1-Dichloroethene	8.03	96	6206	0.504	ng	86
18) 2-Methyl-2-Propanol (t...	8.24	59	28382	1.015	ng	93
19) Methylene Chloride	8.25	84	5865	0.478	ng	99
20) 3-Chloro-1-propene (Al...	8.41	41	7627	0.487	ng	88
21) Trichlorotrifluoroethane	8.67	151	6625	0.510	ng	97
22) Carbon Disulfide	8.53	76	25443	0.557	ng	97
23) trans-1,2-Dichloroethene	9.53	61	7120	0.491	ng	96
24) 1,1-Dichloroethane	9.76	63	9802	0.483	ng	100
25) Methyl tert-Butyl Ether	9.92	73	18137	0.519	ng	98
26) Vinyl Acetate	10.04	86	6248	2.129	ng	# 73
27) 2-Butanone (MEK)	10.33	72	3527	0.423	ng	93
28) cis-1,2-Dichloroethene	10.79	61	7706	0.514	ng	94
29) Diisopropyl Ether	11.12	87	6258	0.523	ng	# 94
30) Ethyl Acetate	11.13	61	4017	1.010	ng	99
31) n-Hexane	11.08	57	10750	0.542	ng	# 100
32) Chloroform	11.13	83	9799	0.507	ng	97
34) Tetrahydrofuran (THF)	11.60	72	4287	0.491	ng	92
35) Ethyl tert-Butyl Ether	11.71	87	7410	0.505	ng	98
36) 1,2-Dichloroethane	11.94	62	6063	0.490	ng	100
38) 1,1,1-Trichloroethane	12.21	97	8450	0.505	ng	95
39) Isopropyl Acetate	12.67	61	8208	1.061	ng	# 86
40) 1-Butanol	12.72	56	10664	0.990	ng	96
41) Benzene	12.69	78	25778	0.498	ng	98
42) Carbon Tetrachloride	12.85	117	7473	0.488	ng	99
43) Cyclohexane	12.98	84	20992	1.030	ng	96
44) tert-Amyl Methyl Ether	13.36	73	17772	0.520	ng	97
45) 1,2-Dichloropropane	13.55	63	6221	0.519	ng	97
46) Bromodichloromethane	13.74	83	7128	0.491	ng	100
47) Trichloroethene	13.80	130	7746	0.516	ng	96
48) 1,4-Dioxane	13.81	88	5254	0.503	ng	97
49) 2,2,4-Trimethylpentane...	13.86	57	27384	0.526	ng	88
50) Methyl Methacrylate	14.02	100	5039	0.962	ng	94

Data File : I:\MS13\DATA\2019 01\23\01231904.D
 Acq On : 23 Jan 2019 6:01
 Sample : 0.5ng R13012319 ICAL Std
 Misc : S31-01231908/S31-01161906 (2/14)

Vial: 15
 Operator: WA
 Inst : MS13

Quant Time: Jan 23 10:31:37 2019

Quant Method : I:\MS13\METHODS\R13012319.M

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

QLast Update : Wed Jan 23 10:31:09 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.13	71	6608	0.519	ng	97
52) cis-1,3-Dichloropropene	14.67	75	9016	0.485	ng	98
53) 4-Methyl-2-pentanone	14.71	58	5334	0.495	ng	94
54) trans-1,3-Dichloropropene	15.19	75	6421	0.410	ng	89
55) 1,1,2-Trichloroethane	15.35	97	6286	0.510	ng	96
58) Toluene	15.65	91	29958	0.563	ng	94
59) 2-Hexanone	15.91	43	11552	0.540	ng	99
60) Dibromochloromethane	16.06	129	6694	0.500	ng	98
61) 1,2-Dibromoethane	16.31	107	6547	0.530	ng	98
62) n-Butyl Acetate	16.53	43	13162	0.533	ng	97
63) n-Octane	16.65	57	5295	0.538	ng	98
64) Tetrachloroethene	16.78	166	8693	0.520	ng	97
65) Chlorobenzene	17.46	112	18999	0.529	ng	100
66) Ethylbenzene	17.82	91	30091	0.520	ng	96
67) m- & p-Xylenes	17.99	91	47400	1.068	ng	100
68) Bromoform	18.05	173	5699	0.439	ng	96
69) Styrene	18.32	104	17838	0.510	ng	95
70) o-Xylene	18.42	91	24248	0.545	ng	100
71) n-Nonane	18.62	43	11903	0.536	ng	96
72) 1,1,2,2-Tetrachloroethane	18.40	83	10891	0.510	ng	99
74) Cumene	18.95	105	31404	0.518	ng	97
75) alpha-Pinene	19.30	93	14253	0.484	ng	96
76) n-Propylbenzene	19.41	91	36823	0.535	ng	98
77) 3-Ethyltoluene	19.50	105	29671	0.501	ng	97
78) 4-Ethyltoluene	19.54	105	29904	0.521	ng	97
79) 1,3,5-Trimethylbenzene	19.60	105	25536	0.507	ng	96
80) alpha-Methylstyrene	19.74	118	11519	0.461	ng	86
81) 2-Ethyltoluene	19.77	105	33268	0.554	ng	97
82) 1,2,4-Trimethylbenzene	19.96	105	26360	0.540	ng	98
83) n-Decane	20.06	57	12669	0.526	ng	97
84) Benzyl Chloride	20.08	91	15479	0.434	ng	92
85) 1,3-Dichlorobenzene	20.10	146	16227	0.521	ng	98
86) 1,4-Dichlorobenzene	20.16	146	17542	0.542	ng	99
87) sec-Butylbenzene	20.20	105	35482	0.516	ng	98
88) 4-Isopropyltoluene (p-...	20.35	119	33120	0.512	ng	99
89) 1,2,3-Trimethylbenzene	20.34	105	24606	0.500	ng	96
90) 1,2-Dichlorobenzene	20.47	146	16347	0.537	ng	100
91) d-Limonene	20.47	68	7596	0.440	ng	96
92) 1,2-Dibromo-3-Chloropr...	20.85	157	5415	0.497	ng	92
93) n-Undecane	21.17	57	10484	0.478	ng	97
94) 1,2,4-Trichlorobenzene	21.97	180	12589	0.592	ng	98
95) Naphthalene	22.08	128	34258	0.592	ng	96
96) n-Dodecane	22.07	57	10916	0.574	ng	94
97) Hexachlorobutadiene	22.38	225	8594	0.523	ng	99
98) Cyclohexanone	18.13	55	8038	0.477	ng	95
99) tert-Butylbenzene	19.96	119	26354	0.522	ng	99
100) n-Butylbenzene	20.72	91	25806	0.514	ng	99

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

Data File : I:\MS13\DATA\2019 01\23\01231904.D
Acq On : 23 Jan 2019 6:01
Sample : 0.5ng R13012319 ICAL Std
Misc : S31-01231908/S31-01161906 (2/14)

Vial: 15
Operator: WA
Inst : MS13

Quant Time: Jan 23 10:31:37 2019

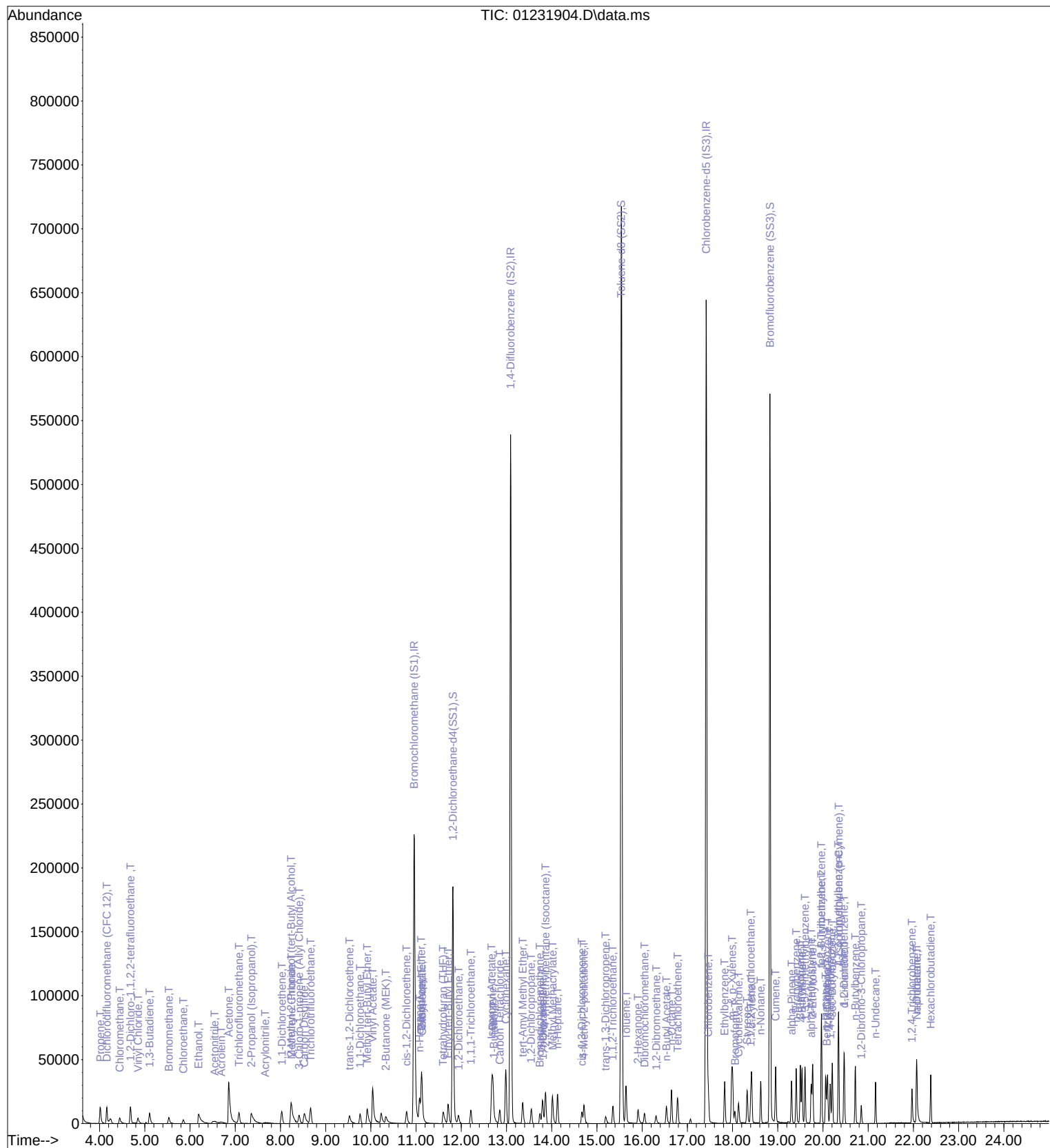
Quant Method : I:\MS13\METHODS\R13012319.M

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

QLast Update : Wed Jan 23 10:31:09 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019 01\23\01231905.D
 Acq On : 23 Jan 2019 6:35
 Sample : 1.0ng R13012319 ICAL Std
 Misc : S31-01231908/S31-01161906 (2/14)

Vial: 15
 Operator: WA
 Inst : MS13

Quant Time: Jan 23 10:39:30 2019

Quant Method : I:\MS13\METHODS\R13012319.M

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

QLast Update : Wed Jan 23 10:31:09 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

1/23/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.96	130	131496	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.09	114	571699	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.42	82	228613	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.82	65	141593	12.268	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.16%
57) Toluene-d8 (SS2)	15.54	98	613490	13.010	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	104.08%
73) Bromofluorobenzene (SS3)	18.83	174	220895	11.367	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	90.96%

Target Compounds

						Qvalue
2) Propene	4.01	42	11670	0.945	ng	93
3) Dichlorodifluoromethan...	4.16	85	21192	0.961	ng	99
4) Chloromethane	4.43	50	15705	0.929	ng	98
5) 1,2-Dichloro-1,1,2,2-t...	4.68	135	13367	0.945	ng	98
6) Vinyl Chloride	4.84	62	15750	0.958	ng	99
7) 1,3-Butadiene	5.09	54	11730	0.975	ng	95
8) Bromomethane	5.52	94	10617	0.936	ng	98
9) Chloroethane	5.85	64	8417	0.945	ng	94
10) Ethanol	6.18	45	39097	4.712	ng	99
11) Acetonitrile	6.49	41	17982	0.871	ng	98
12) Acrolein	6.66	56	6251	0.880	ng	84
13) Acetone	6.84	58	44350	4.754	ng	# 83
14) Trichlorofluoromethane	7.08	101	17946	0.969	ng	99
15) 2-Propanol (Isopropanol)	7.34	45	53344	1.914	ng	99
16) Acrylonitrile	7.63	53	10218	0.774	ng	95
17) 1,1-Dichloroethene	8.03	96	11968	0.968	ng	86
18) 2-Methyl-2-Propanol (t...	8.21	59	55574	1.981	ng	95
19) Methylene Chloride	8.24	84	11720	0.952	ng	97
20) 3-Chloro-1-propene (Al...	8.41	41	14670	0.934	ng	92
21) Trichlorotrifluoroethane	8.67	151	12451	0.955	ng	96
22) Carbon Disulfide	8.53	76	47691	1.042	ng	98
23) trans-1,2-Dichloroethene	9.52	61	14596	1.004	ng	97
24) 1,1-Dichloroethane	9.77	63	19304	0.949	ng	98
25) Methyl tert-Butyl Ether	9.91	73	34852	0.994	ng	100
26) Vinyl Acetate	10.04	86	13368	4.543	ng	# 83
27) 2-Butanone (MEK)	10.31	72	7298	0.873	ng	# 85
28) cis-1,2-Dichloroethene	10.79	61	14491	0.964	ng	94
29) Diisopropyl Ether	11.11	87	12277	1.023	ng	# 71
30) Ethyl Acetate	11.12	61	8220	2.061	ng	97
31) n-Hexane	11.08	57	20050	1.009	ng	# 100
32) Chloroform	11.13	83	18816	0.971	ng	97
34) Tetrahydrofuran (THF)	11.59	72	8419	0.961	ng	91
35) Ethyl tert-Butyl Ether	11.70	87	14886	1.011	ng	96
36) 1,2-Dichloroethane	11.93	62	11902	0.960	ng	99
38) 1,1,1-Trichloroethane	12.21	97	16351	0.980	ng	97
39) Isopropyl Acetate	12.67	61	15466	2.004	ng	# 91
40) 1-Butanol	12.70	56	19560	1.822	ng	# 63
41) Benzene	12.70	78	49801	0.965	ng	98
42) Carbon Tetrachloride	12.85	117	14697	0.962	ng	98
43) Cyclohexane	12.99	84	39673	1.952	ng	96
44) tert-Amyl Methyl Ether	13.35	73	33347	0.979	ng	98
45) 1,2-Dichloropropane	13.55	63	11849	0.992	ng	99
46) Bromodichloromethane	13.74	83	13766	0.951	ng	98
47) Trichloroethene	13.80	130	14446	0.965	ng	99
48) 1,4-Dioxane	13.80	88	10388	0.998	ng	98
49) 2,2,4-Trimethylpentane...	13.86	57	49978	0.963	ng	89
50) Methyl Methacrylate	14.01	100	10158	1.945	ng	99

Data File : I:\MS13\DATA\2019 01\23\01231905.D
 Acq On : 23 Jan 2019 6:35
 Sample : 1.0ng R13012319 ICAL Std
 Misc : S31-01231908/S31-01161906 (2/14)

Vial: 15
 Operator: WA
 Inst : MS13

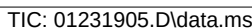
Quant Time: Jan 23 10:39:30 2019
 Quant Method : I:\MS13\METHODS\R13012319.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Wed Jan 23 10:31:09 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.13	71	12314	0.969	ng	94
52) cis-1,3-Dichloropropene	14.67	75	18150	0.979	ng	97
53) 4-Methyl-2-pentanone	14.71	58	10810	1.005	ng	95
54) trans-1,3-Dichloropropene	15.19	75	12705	0.814	ng	98
55) 1,1,2-Trichloroethane	15.36	97	11944	0.972	ng	100
58) Toluene	15.64	91	52134	0.979	ng	99
59) 2-Hexanone	15.90	43	22209	1.037	ng	97
60) Dibromochloromethane	16.05	129	13288	0.991	ng	100
61) 1,2-Dibromoethane	16.31	107	12663	1.024	ng	99
62) n-Butyl Acetate	16.53	43	25297	1.023	ng	96
63) n-Octane	16.65	57	10159	1.031	ng	96
64) Tetrachloroethene	16.79	166	16751	1.001	ng	99
65) Chlorobenzene	17.46	112	36012	1.001	ng	99
66) Ethylbenzene	17.83	91	56440	0.974	ng	96
67) m- & p-Xylenes	17.99	91	88976	2.002	ng	99
68) Bromoform	18.05	173	11408	0.879	ng	99
69) Styrene	18.32	104	33724	0.964	ng	95
70) o-Xylene	18.42	91	43939	0.986	ng	97
71) n-Nonane	18.62	43	22251	1.002	ng	98
72) 1,1,2,2-Tetrachloroethane	18.40	83	21186	0.990	ng	99
74) Cumene	18.95	105	59749	0.985	ng	99
75) alpha-Pinene	19.30	93	27308	0.925	ng	95
76) n-Propylbenzene	19.41	91	68547	0.995	ng	98
77) 3-Ethyltoluene	19.50	105	57418	0.969	ng	99
78) 4-Ethyltoluene	19.53	105	56124	0.977	ng	99
79) 1,3,5-Trimethylbenzene	19.60	105	47516	0.942	ng	97
80) alpha-Methylstyrene	19.74	118	22075	0.883	ng	87
81) 2-Ethyltoluene	19.77	105	58546	0.975	ng	99
82) 1,2,4-Trimethylbenzene	19.96	105	47609	0.975	ng	95
83) n-Decane	20.06	57	23892	0.991	ng	98
84) Benzyl Chloride	20.08	91	28882	0.809	ng	96
85) 1,3-Dichlorobenzene	20.10	146	29202	0.937	ng	100
86) 1,4-Dichlorobenzene	20.16	146	31131	0.961	ng	99
87) sec-Butylbenzene	20.20	105	66519	0.966	ng	100
88) 4-Isopropyltoluene (p-...	20.35	119	61624	0.951	ng	99
89) 1,2,3-Trimethylbenzene	20.34	105	46052	0.935	ng	96
90) 1,2-Dichlorobenzene	20.46	146	29303	0.961	ng	97
91) d-Limonene	20.47	68	14686	0.849	ng	96
92) 1,2-Dibromo-3-Chloropr...	20.85	157	9546	0.875	ng	89
93) n-Undecane	21.16	57	19919	0.908	ng	97
94) 1,2,4-Trichlorobenzene	21.97	180	18948	0.890	ng	98
95) Naphthalene	22.07	128	43994	0.759	ng	97
96) n-Dodecane	22.07	57	13115	0.689	ng	96
97) Hexachlorobutadiene	22.38	225	14537	0.884	ng	100
98) Cyclohexanone	18.13	55	15018	0.890	ng	96
99) tert-Butylbenzene	19.96	119	49631	0.981	ng	100
100) n-Butylbenzene	20.72	91	48604	0.966	ng	99

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

Vial: 15
Operator: WA
Inst : MS13

Quant Time: Jan 23 10:39:30 2019



Data File : I:\MS13\DATA\2019 01\23\01231908.D
 Acq On : 23 Jan 2019 9:13
 Sample : 5.0ng TO-15 ICAL Std
 Misc : S31-01221908/S31-01161903 (2/14)

Vial: 16
 Operator: WA
 Inst : MS13

Quant Time: Jan 23 10:31:46 2019

Quant Method : I:\MS13\METHODS\R13012319.M

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

QLast Update : Wed Jan 23 10:31:09 2019

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)	10.97	130	133163	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.10	114	573427	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.42	82	228793	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.82	65	141973	12.147	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.20%
57) Toluene-d8 (SS2)	15.54	98	608275	12.889	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.12%
73) Bromofluorobenzene (SS3)	18.83	174	223121	11.473	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	91.76%

Target Compounds

						Qvalue
2) Propene	3.98	42	61288	4.900	ng	95
3) Dichlorodifluoromethan...	4.13	85	107398	4.808	ng	100
4) Chloromethane	4.40	50	83501	4.876	ng	98
5) 1,2-Dichloro-1,1,2,2-t...	4.66	135	66573	4.647	ng	99
6) Vinyl Chloride	4.81	62	83594	5.022	ng	98
7) 1,3-Butadiene	5.07	54	66679	5.475	ng	93
8) Bromomethane	5.50	94	56285	4.900	ng	99
9) Chloroethane	5.82	64	43477	4.818	ng	99
10) Ethanol	6.18	45	205480	24.456	ng	98
11) Acetonitrile	6.44	41	98230	4.696	ng	99
12) Acrolein	6.63	56	34941	4.860	ng	96
13) Acetone	6.82	58	222256	23.524	ng	# 82
14) Trichlorofluoromethane	7.06	101	89880	4.791	ng	99
15) 2-Propanol (Isopropanol)	7.31	45	281104	9.961	ng	96
16) Acrylonitrile	7.58	53	65893	4.932	ng	99
17) 1,1-Dichloroethene	8.01	96	62403	4.987	ng	86
18) 2-Methyl-2-Propanol (t...	8.18	59	282060	9.931	ng	95
19) Methylene Chloride	8.24	84	62044	4.977	ng	95
20) 3-Chloro-1-propene (Al...	8.40	41	81576	5.131	ng	93
21) Trichlorotrifluoroethane	8.66	151	63461	4.806	ng	94
22) Carbon Disulfide	8.50	76	221593	4.781	ng	100
23) trans-1,2-Dichloroethene	9.52	61	77142	5.241	ng	93
24) 1,1-Dichloroethane	9.77	63	99552	4.833	ng	99
25) Methyl tert-Butyl Ether	9.88	73	177677	5.003	ng	97
26) Vinyl Acetate	10.03	86	74341	24.950	ng	# 91
27) 2-Butanone (MEK)	10.29	72	39968	4.721	ng	# 90
28) cis-1,2-Dichloroethene	10.79	61	75760	4.977	ng	93
29) Diisopropyl Ether	11.10	87	62727	5.160	ng	# 72
30) Ethyl Acetate	11.10	61	44547	11.030	ng	99
31) n-Hexane	11.08	57	100179	4.977	ng	# 100
32) Chloroform	11.13	83	95915	4.890	ng	98
34) Tetrahydrofuran (THF)	11.56	72	42364	4.775	ng	97
35) Ethyl tert-Butyl Ether	11.69	87	73478	4.929	ng	98
36) 1,2-Dichloroethane	11.94	62	61320	4.884	ng	99
38) 1,1,1-Trichloroethane	12.21	97	84505	5.047	ng	97
39) Isopropyl Acetate	12.66	61	77927	10.069	ng	# 90
40) 1-Butanol	12.67	56	107106	9.945	ng	# 68
41) Benzene	12.70	78	247723	4.786	ng	98
42) Carbon Tetrachloride	12.86	117	73653	4.808	ng	99
43) Cyclohexane	12.99	84	197718	9.700	ng	97
44) tert-Amyl Methyl Ether	13.35	73	168842	4.941	ng	97
45) 1,2-Dichloropropane	13.55	63	60275	5.029	ng	100
46) Bromodichloromethane	13.74	83	73195	5.043	ng	100
47) Trichloroethene	13.80	130	74501	4.961	ng	100
48) 1,4-Dioxane	13.78	88	53416	5.117	ng	98
49) 2,2,4-Trimethylpentane...	13.86	57	250397	4.812	ng	89
50) Methyl Methacrylate	14.01	100	54065	10.321	ng	99

Data File : I:\MS13\DATA\2019 01\23\01231908.D
 Acq On : 23 Jan 2019 9:13
 Sample : 5.0ng TO-15 ICAL Std
 Misc : S31-01221908/S31-01161903 (2/14)

Vial: 16
 Operator: WA
 Inst : MS13

Quant Time: Jan 23 10:31:46 2019

Quant Method : I:\MS13\METHODS\R13012319.M

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

QLast Update : Wed Jan 23 10:31:09 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.13	71	63371	4.974	ng	98
52) cis-1,3-Dichloropropene	14.66	75	97452	5.243	ng	100
53) 4-Methyl-2-pentanone	14.70	58	52931	4.908	ng	98
54) trans-1,3-Dichloropropene	15.18	75	78615	5.024	ng	99
55) 1,1,2-Trichloroethane	15.35	97	61981	5.026	ng	99
58) Toluene	15.64	91	261216	4.900	ng	99
59) 2-Hexanone	15.89	43	114253	5.332	ng	95
60) Dibromochloromethane	16.05	129	72456	5.401	ng	99
61) 1,2-Dibromoethane	16.30	107	67683	5.471	ng	99
62) n-Butyl Acetate	16.53	43	129007	5.215	ng	95
63) n-Octane	16.65	57	51306	5.203	ng	96
64) Tetrachloroethene	16.78	166	84886	5.067	ng	99
65) Chlorobenzene	17.46	112	181298	5.037	ng	99
66) Ethylbenzene	17.82	91	290291	5.005	ng	98
67) m- & p-Xylenes	17.99	91	448511	10.086	ng	98
68) Bromoform	18.05	173	65088	5.010	ng	99
69) Styrene	18.32	104	188503	5.384	ng	96
70) o-Xylene	18.42	91	223971	5.022	ng	97
71) n-Nonane	18.62	43	114495	5.151	ng	98
72) 1,1,2,2-Tetrachloroethane	18.40	83	109049	5.093	ng	100
74) Cumene	18.95	105	301863	4.970	ng	100
75) alpha-Pinene	19.30	93	147094	4.981	ng	95
76) n-Propylbenzene	19.41	91	351635	5.100	ng	99
77) 3-Ethyltoluene	19.50	105	300539	5.069	ng	99
78) 4-Ethyltoluene	19.54	105	287582	5.001	ng	100
79) 1,3,5-Trimethylbenzene	19.60	105	247436	4.903	ng	97
80) alpha-Methylstyrene	19.74	118	141128	5.643	ng	92
81) 2-Ethyltoluene	19.77	105	297586	4.951	ng	99
82) 1,2,4-Trimethylbenzene	19.96	105	249668	5.107	ng	96
83) n-Decane	20.06	57	128094	5.311	ng	99
84) Benzyl Chloride	20.08	91	183861	5.145	ng	100
85) 1,3-Dichlorobenzene	20.10	146	158457	5.082	ng	100
86) 1,4-Dichlorobenzene	20.16	146	163491	5.041	ng	99
87) sec-Butylbenzene	20.20	105	343634	4.985	ng	99
88) 4-Isopropyltoluene (p-...	20.35	119	324342	5.001	ng	99
89) 1,2,3-Trimethylbenzene	20.34	105	246057	4.990	ng	95
90) 1,2-Dichlorobenzene	20.46	146	154769	5.073	ng	100
91) d-Limonene	20.47	68	91243	5.271	ng	95
92) 1,2-Dibromo-3-Chloropr...	20.85	157	55738	5.106	ng	86
93) n-Undecane	21.16	57	130753	5.954	ng	97
94) 1,2,4-Trichlorobenzene	21.97	180	119437	5.606	ng	100
95) Naphthalene	22.07	128	348909	6.016	ng	99
96) n-Dodecane	22.06	57	119194	6.256	ng	98
97) Hexachlorobutadiene	22.38	225	78626	4.775	ng	100
98) Cyclohexanone	18.12	55	68504	4.059	ng	95
99) tert-Butylbenzene	19.96	119	253961	5.018	ng	100
100) n-Butylbenzene	20.72	91	263504	5.235	ng	99

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

Vial: 16
Operator: WA
Inst : MS13

Data File : I:\MS13\DATA\2019 01\23\01231909.D
 Acq On : 23 Jan 2019 9:46
 Sample : 25ng TO-15 ICAL Std
 Misc : S31-01221908/S31-01161903 (2/14)

Vial: 16
 Operator: WA
 Inst : MS13

Quant Time: Jan 23 10:31:48 2019

Quant Method : I:\MS13\METHODS\R13012319.M

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

QLast Update : Wed Jan 23 10:31:09 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

1/23/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.98	130	127070	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.10	114	539066	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.42	82	215185	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.83	65	133196	11.943	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.52%
57) Toluene-d8 (SS2)	15.54	98	573807	12.928	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.44%
73) Bromofluorobenzene (SS3)	18.83	174	208213	11.383	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	91.04%

Target Compounds

						Qvalue
2) Propene	3.98	42	281611	23.596	ng	96
3) Dichlorodifluoromethan...	4.13	85	489775	22.976	ng	100
4) Chloromethane	4.41	50	384457	23.528	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.66	135	308779	22.585	ng	100
6) Vinyl Chloride	4.82	62	388805	24.478	ng	100
7) 1,3-Butadiene	5.08	54	303557	26.122	ng	93
8) Bromomethane	5.50	94	263398	24.029	ng	100
9) Chloroethane	5.83	64	204130	23.707	ng	100
10) Ethanol	6.22	45	946677	118.074	ng	97
11) Acetonitrile	6.45	41	499297	25.015	ng	97
12) Acrolein	6.64	56	176118	25.669	ng	97
13) Acetone	6.84	58	1016443	112.739	ng	# 82
14) Trichlorofluoromethane	7.07	101	406680	22.718	ng	99
15) 2-Propanol (Isopropanol)	7.34	45	1321330	49.064	ng	94
16) Acrylonitrile	7.59	53	367028	28.789	ng	97
17) 1,1-Dichloroethene	8.02	96	295186	24.719	ng	85
18) 2-Methyl-2-Propanol (t...	8.20	59	1335425	49.272	ng	96
19) Methylene Chloride	8.25	84	297023	24.969	ng	94
20) 3-Chloro-1-propene (Al...	8.41	41	388603	25.614	ng	98
21) Trichlorotrifluoroethane	8.66	151	295105	23.422	ng	94
22) Carbon Disulfide	8.51	76	1067121	24.127	ng	99
23) trans-1,2-Dichloroethene	9.53	61	376216	26.786	ng	94
24) 1,1-Dichloroethane	9.78	63	454839	23.140	ng	100
25) Methyl tert-Butyl Ether	9.88	73	825111	24.346	ng	98
26) Vinyl Acetate	10.04	86	368175	129.489	ng	96
27) 2-Butanone (MEK)	10.28	72	201439	24.934	ng	# 89
28) cis-1,2-Dichloroethene	10.80	61	358155	24.655	ng	92
29) Diisopropyl Ether	11.10	87	287847	24.816	ng	# 74
30) Ethyl Acetate	11.10	61	206917	53.689	ng	97
31) n-Hexane	11.08	57	423508	22.049	ng	# 100
32) Chloroform	11.14	83	453309	24.220	ng	99
34) Tetrahydrofuran (THF)	11.55	72	198310	23.422	ng	98
35) Ethyl tert-Butyl Ether	11.69	87	346238	24.338	ng	96
36) 1,2-Dichloroethane	11.95	62	294430	24.577	ng	100
38) 1,1,1-Trichloroethane	12.22	97	395934	25.156	ng	98
39) Isopropyl Acetate	12.66	61	355718	48.891	ng	# 92
40) 1-Butanol	12.68	56	541210	53.456	ng	# 74
41) Benzene	12.70	78	1132300	23.271	ng	99
42) Carbon Tetrachloride	12.86	117	359014	24.929	ng	100
43) Cyclohexane	12.99	84	907672	47.366	ng	98
44) tert-Amyl Methyl Ether	13.35	73	799357	24.886	ng	97
45) 1,2-Dichloropropane	13.55	63	278453	24.711	ng	100
46) Bromodichloromethane	13.74	83	354046	25.950	ng	99
47) Trichloroethene	13.80	130	352521	24.972	ng	100
48) 1,4-Dioxane	13.77	88	250996	25.577	ng	100
49) 2,2,4-Trimethylpentane...	13.86	57	1120282	22.901	ng	90
50) Methyl Methacrylate	14.01	100	264403	53.689	ng	96

Data File : I:\MS13\DATA\2019 01\23\01231909.D
 Acq On : 23 Jan 2019 9:46
 Sample : 25ng TO-15 ICAL Std
 Misc : S31-01221908/S31-01161903 (2/14)

Vial: 16
 Operator: WA
 Inst : MS13

Quant Time: Jan 23 10:31:48 2019

Quant Method : I:\MS13\METHODS\R13012319.M

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

QLast Update : Wed Jan 23 10:31:09 2019

Response via : Initial Calibration

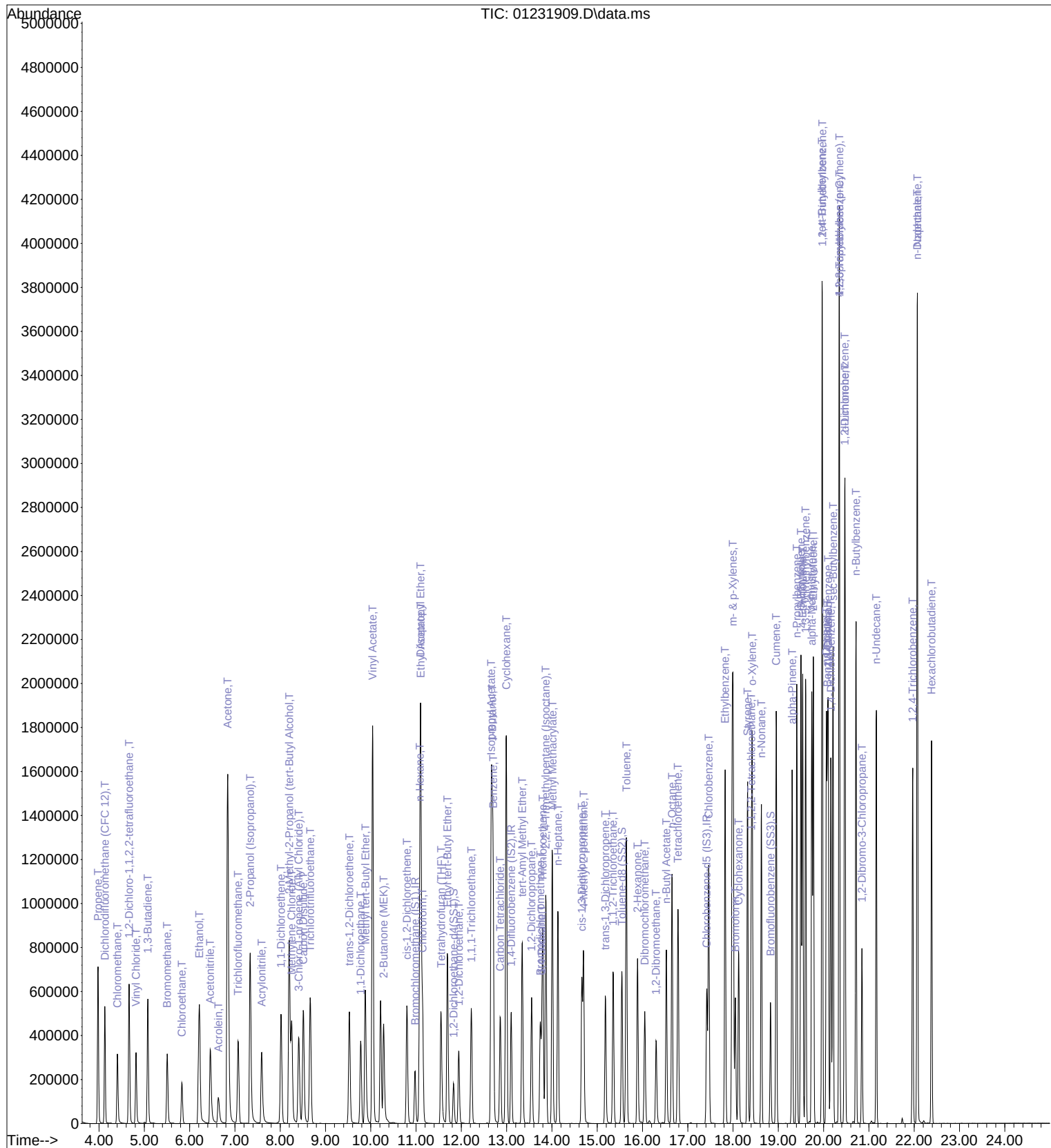
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.13	71	288030	24.050	ng	99
52) cis-1,3-Dichloropropene	14.66	75	485798	27.800	ng	100
53) 4-Methyl-2-pentanone	14.70	58	262607	25.904	ng	93
54) trans-1,3-Dichloropropene	15.18	75	404339	27.486	ng	100
55) 1,1,2-Trichloroethane	15.35	97	292085	25.197	ng	99
58) Toluene	15.65	91	1198602	23.905	ng	98
59) 2-Hexanone	15.89	43	560414	27.807	ng	93
60) Dibromochloromethane	16.05	129	356574	28.260	ng	100
61) 1,2-Dibromoethane	16.30	107	333858	28.692	ng	100
62) n-Butyl Acetate	16.53	43	640396	27.524	ng	95
63) n-Octane	16.65	57	235009	25.338	ng	97
64) Tetrachloroethene	16.78	166	396955	25.195	ng	99
65) Chlorobenzene	17.46	112	858357	25.358	ng	99
66) Ethylbenzene	17.83	91	1348824	24.725	ng	98
67) m- & p-Xylenes	18.00	91	2090753	49.990	ng	98
68) Bromoform	18.05	173	337172	27.594	ng	100
69) Styrene	18.32	104	919722	27.931	ng	96
70) o-Xylene	18.42	91	1042553	24.856	ng	96
71) n-Nonane	18.63	43	511403	24.463	ng	100
72) 1,1,2,2-Tetrachloroethane	18.40	83	520505	25.845	ng	99
74) Cumene	18.95	105	1396703	24.452	ng	99
75) alpha-Pinene	19.30	93	708141	25.497	ng	94
76) n-Propylbenzene	19.41	91	1629806	25.134	ng	98
77) 3-Ethyltoluene	19.50	105	1381613	24.774	ng	94
78) 4-Ethyltoluene	19.54	105	1374888	25.419	ng	95
79) 1,3,5-Trimethylbenzene	19.60	105	1150663	24.242	ng	96
80) alpha-Methylstyrene	19.74	118	689186	29.302	ng	92
81) 2-Ethyltoluene	19.77	105	1387145	24.536	ng	98
82) 1,2,4-Trimethylbenzene	19.97	105	1165280	25.344	ng	96
83) n-Decane	20.06	57	584605	25.770	ng	99
84) Benzyl Chloride	20.08	91	997797	29.686	ng	98
85) 1,3-Dichlorobenzene	20.10	146	777844	26.527	ng	100
86) 1,4-Dichlorobenzene	20.16	146	790407	25.911	ng	100
87) sec-Butylbenzene	20.21	105	1588997	24.509	ng	99
88) 4-Isopropyltoluene (p-...	20.35	119	1486568	24.371	ng	100
89) 1,2,3-Trimethylbenzene	20.35	105	1149185	24.778	ng	95
90) 1,2-Dichlorobenzene	20.47	146	750207	26.147	ng	100
91) d-Limonene	20.47	68	434969	26.719	ng	97
92) 1,2-Dibromo-3-Chloropr...	20.85	157	282742	27.538	ng	85
93) n-Undecane	21.17	57	613692	29.713	ng	98
94) 1,2,4-Trichlorobenzene	21.97	180	604264	30.156	ng	100
95) Naphthalene	22.07	128	1767201	32.400	ng	100
96) n-Dodecane	22.06	57	576084	32.148	ng	99
97) Hexachlorobutadiene	22.38	225	377819	24.397	ng	100
98) Cyclohexanone	18.12	55	368619	23.221	ng	94
99) tert-Butylbenzene	19.96	119	1169859	24.579	ng	99
100) n-Butylbenzene	20.72	91	1228352	25.948	ng	98

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

Vial: 16
Operator: WA
Inst : MS13

Quant Time: Jan 23 10:31:48 2019
Quant Method : I:\MS13\METHODS\R13012319.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Wed Jan 23 10:31:09 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019 01\23\01231910.D
 Acq On : 23 Jan 2019 10:20
 Sample : 50ng TO-15 ICAL Std
 Misc : S31-01221908/S31-01161903 (2/14)

Vial: 16
 Operator: WA
 Inst : MS13

Quant Time: Jan 23 10:54:36 2019

Quant Method : I:\MS13\METHODS\R13012319.M

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

QLast Update : Wed Jan 23 10:31:09 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

WA 1/23/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.98	130	129676	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.10	114	554115	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.42	82	217596	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.83	65	136294	11.975	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.76%
57) Toluene-d8 (SS2)	15.55	98	586897	13.076	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	104.64%
73) Bromofluorobenzene (SS3)	18.83	174	211351	11.427	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	91.44%

Target Compounds

						Qvalue
2) Propene	3.98	42	550963	45.236	ng	96
3) Dichlorodifluoromethan...	4.13	85	958014	44.038	ng	99
4) Chloromethane	4.41	50	749838	44.966	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.67	135	619578	44.407	ng	99
6) Vinyl Chloride	4.82	62	774206	47.762	ng	100
7) 1,3-Butadiene	5.08	54	615017	51.861	ng	93
8) Bromomethane	5.51	94	518382	46.340	ng	99
9) Chloroethane	5.83	64	400255	45.550	ng	100
10) Ethanol	6.24	45	1820404	222.486	ng	97
11) Acetonitrile	6.47	41	995157	48.855	ng	98
12) Acrolein	6.65	56	349588	49.928	ng	97
13) Acetone	6.85	58	1938708	210.711	ng	# 80
14) Trichlorofluoromethane	7.07	101	813055	44.506	ng	99
15) 2-Propanol (Isopropanol)	7.36	45	2536963	92.311	ng	94
16) Acrylonitrile	7.60	53	739164	56.813	ng	98
17) 1,1-Dichloroethene	8.03	96	589118	48.342	ng	# 84
18) 2-Methyl-2-Propanol (t...	8.22	59	2597364	93.906	ng	96
19) Methylene Chloride	8.26	84	587709	48.411	ng	94
20) 3-Chloro-1-propene (Al...	8.42	41	780458	50.409	ng	98
21) Trichlorotrifluoroethane	8.67	151	589650	45.859	ng	93
22) Carbon Disulfide	8.51	76	2099717	46.519	ng	99
23) trans-1,2-Dichloroethene	9.53	61	747632	52.161	ng	93
24) 1,1-Dichloroethane	9.78	63	899332	44.833	ng	100
25) Methyl tert-Butyl Ether	9.88	73	1619009	46.810	ng	98
26) Vinyl Acetate	10.05	86	716439	246.912	ng	# 84
27) 2-Butanone (MEK)	10.29	72	403390	48.927	ng	# 88
28) cis-1,2-Dichloroethene	10.80	61	705591	47.597	ng	92
29) Diisopropyl Ether	11.10	87	561552	47.440	ng	# 75
30) Ethyl Acetate	11.11	61	395905	100.662	ng	95
31) n-Hexane	11.08	57	828858	42.286	ng	# 100
32) Chloroform	11.15	83	900170	47.128	ng	100
34) Tetrahydrofuran (THF)	11.55	72	391881	45.354	ng	99
35) Ethyl tert-Butyl Ether	11.70	87	685968	47.249	ng	95
36) 1,2-Dichloroethane	11.95	62	578293	47.302	ng	99
38) 1,1,1-Trichloroethane	12.23	97	786422	48.609	ng	97
39) Isopropyl Acetate	12.66	61	684341	91.504	ng	96
40) 1-Butanol	12.69	56	1041001	100.029	ng	# 75
41) Benzene	12.70	78	2183231	43.651	ng	99
42) Carbon Tetrachloride	12.86	117	714110	48.239	ng	100
43) Cyclohexane	12.99	84	1758366	89.267	ng	99
44) tert-Amyl Methyl Ether	13.35	73	1571599	47.598	ng	97
45) 1,2-Dichloropropane	13.56	63	547191	47.242	ng	100
46) Bromodichloromethane	13.74	83	706028	50.344	ng	99
47) Trichloroethene	13.80	130	704224	48.531	ng	99
48) 1,4-Dioxane	13.78	88	499338	49.502	ng	99
49) 2,2,4-Trimethylpentane...	13.87	57	2175437	43.264	ng	90
50) Methyl Methacrylate	14.01	100	528051	104.313	ng	93

Data File : I:\MS13\DATA\2019 01\23\01231910.D
 Acq On : 23 Jan 2019 10:20
 Sample : 50ng TO-15 ICAL Std
 Misc : S31-01221908/S31-01161903 (2/14)

Vial: 16
 Operator: WA
 Inst : MS13

Quant Time: Jan 23 10:54:36 2019
 Quant Method : I:\MS13\METHODS\R13012319.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Wed Jan 23 10:31:09 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.14	71	566594	46.024	ng	99
52) cis-1,3-Dichloropropene	14.66	75	963259	53.626	ng	100
53) 4-Methyl-2-pentanone	14.70	58	512957	49.224	ng	92
54) trans-1,3-Dichloropropene	15.18	75	805902	53.295	ng	99
55) 1,1,2-Trichloroethane	15.36	97	582332	48.870	ng	98
58) Toluene	15.65	91	2363408	46.614	ng	98
59) 2-Hexanone	15.90	43	1097984	53.877	ng	93
60) Dibromochloromethane	16.05	129	714941	56.034	ng	100
61) 1,2-Dibromoethane	16.31	107	664969	56.514	ng	100
62) n-Butyl Acetate	16.53	43	1241427	52.766	ng	94
63) n-Octane	16.65	57	456775	48.703	ng	98
64) Tetrachloroethene	16.79	166	794176	49.849	ng	99
65) Chlorobenzene	17.46	112	1673750	48.899	ng	99
66) Ethylbenzene	17.82	91	2601402	47.157	ng	99
67) m- & p-Xylenes	18.00	91	4065083	96.120	ng	98
68) Bromoform	18.05	173	680568	55.080	ng	99
69) Styrene	18.32	104	1804766	54.201	ng	97
70) o-Xylene	18.43	91	2029602	47.852	ng	96
71) n-Nonane	18.63	43	964989	45.649	ng	99
72) 1,1,2,2-Tetrachloroethane	18.40	83	1011065	49.647	ng	100
74) Cumene	18.96	105	2694136	46.644	ng	98
75) alpha-Pinene	19.30	93	1391956	49.562	ng	94
76) n-Propylbenzene	19.41	91	3123059	47.628	ng	97
77) 3-Ethyltoluene	19.50	105	2810434	49.837	ng	99
78) 4-Ethyltoluene	19.54	105	2506081	45.820	ng	98
79) 1,3,5-Trimethylbenzene	19.61	105	2241971	46.711	ng	96
80) alpha-Methylstyrene	19.74	118	1355760	57.003	ng	92
81) 2-Ethyltoluene	19.78	105	2690410	47.062	ng	97
82) 1,2,4-Trimethylbenzene	19.97	105	2226342	47.884	ng	96
83) n-Decane	20.06	57	1101364	48.012	ng	99
84) Benzyl Chloride	20.08	91	1985624	58.420	ng	96
85) 1,3-Dichlorobenzene	20.11	146	1551652	52.330	ng	99
86) 1,4-Dichlorobenzene	20.16	146	1571568	50.949	ng	100
87) sec-Butylbenzene	20.21	105	3056416	46.620	ng	98
88) 4-Isopropyltoluene (p-...	20.35	119	2789874	45.230	ng	98
89) 1,2,3-Trimethylbenzene	20.35	105	2205069	47.017	ng	96
90) 1,2-Dichlorobenzene	20.47	146	1470738	50.692	ng	99
91) d-Limonene	20.48	68	824220	50.068	ng	99
92) 1,2-Dibromo-3-Chloropr...	20.85	157	567508	54.662	ng	84
93) n-Undecane	21.17	57	1155291	55.316	ng	100
94) 1,2,4-Trichlorobenzene	21.97	180	1205152	59.477	ng	100
95) Naphthalene	22.07	128	3390515	61.472	ng	99
96) n-Dodecane	22.07	57	1057288	58.347	ng	97
97) Hexachlorobutadiene	22.38	225	770156	49.181	ng	100
98) Cyclohexanone	18.13	55	729990	45.476	ng	93
99) tert-Butylbenzene	19.97	119	2220306	46.132	ng	99
100) n-Butylbenzene	20.72	91	2361092	49.324	ng	97

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

Data File : I:\MS13\DATA\2019 01\23\01231910.D
Acq On : 23 Jan 2019 10:20
Sample : 50ng TO-15 ICAL Std
Misc : S31-01221908/S31-01161903 (2/14)

Vial: 16
Operator: WA
Inst : MS13

Quant Time: Jan 23 10:54:36 2019

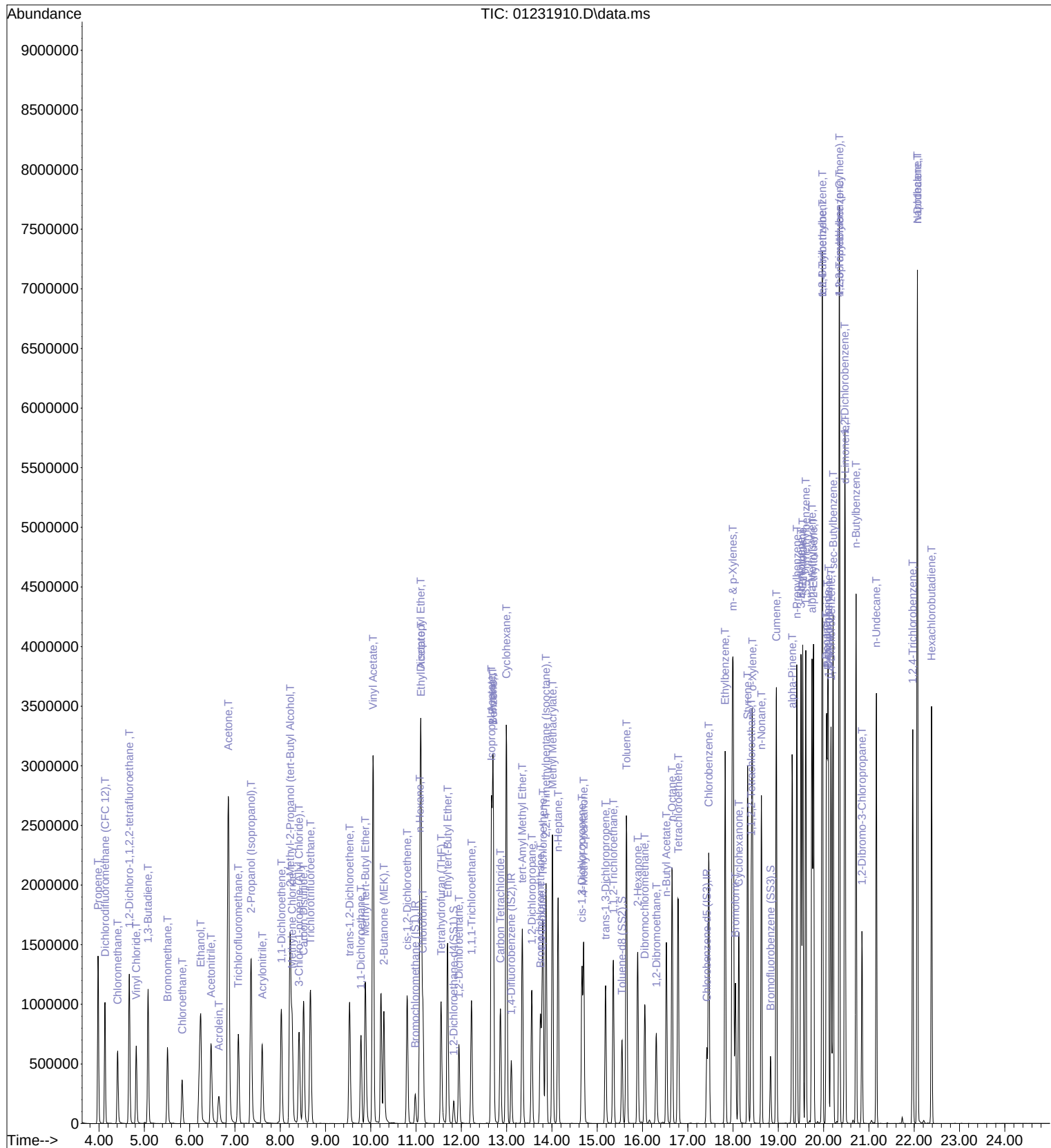
Quant Method : I:\MS13\METHODS\R13012319.M

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

QLast Update : Wed Jan 23 10:31:09 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019 01\23\01231911.D
 Acq On : 23 Jan 2019 10:53
 Sample : 100ng TO-15 ICAL Std
 Misc : S31-01221908/S31-01161903 (2/14)

Vial: 16
 Operator: WA
 Inst : MS13

Quant Time: Jan 23 11:18:52 2019

Quant Method : I:\MS13\METHODS\R13012319.M

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

QLast Update : Wed Jan 23 10:31:09 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

1/23/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.99	130	130622	12.500	ng	0.01
37) 1,4-Difluorobenzene (IS2)	13.11	114	567955	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.42	82	224304	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.84	65	138527	12.083	ng	0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	96.64%
57) Toluene-d8 (SS2)	15.55	98	593656	12.831	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.64%
73) Bromofluorobenzene (SS3)	18.83	174	216071	11.333	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	90.64%

Target Compounds

						Qvalue
2) Propene	3.98	42	1235949	100.742	ng	96
3) Dichlorodifluoromethan...	4.14	85	1857522	84.768	ng	99
4) Chloromethane	4.42	50	1265365	75.331	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.67	135	1235486	87.909	ng	100
6) Vinyl Chloride	4.83	62	1531085	93.771	ng	100
7) 1,3-Butadiene	5.09	54	1199165	100.388	ng	93
8) Bromomethane	5.52	94	1034074	91.771	ng	99
9) Chloroethane	5.85	64	789553	89.203	ng	99
10) Ethanol	6.29	45	3485746	422.935	ng	97
11) Acetonitrile	6.50	41	1992641	97.116	ng	97
12) Acrolein	6.66	56	702088	99.545	ng	98
13) Acetone	6.88	58	3570661	385.272	ng	# 77
14) Trichlorofluoromethane	7.09	101	1626310	88.379	ng	99
15) 2-Propanol (Isopropanol)	7.39	45	4163038	150.381	ng	94
16) Acrylonitrile	7.62	53	1484683	113.287	ng	98
17) 1,1-Dichloroethene	8.03	96	1169842	95.299	ng	# 83
18) 2-Methyl-2-Propanol (t...	8.25	59	4887273	175.417	ng	97
19) Methylene Chloride	8.28	84	1136520	92.941	ng	89
20) 3-Chloro-1-propene (Al...	8.42	41	1535540	98.462	ng	99
21) Trichlorotrifluoroethane	8.67	151	1181859	91.252	ng	93
22) Carbon Disulfide	8.53	76	4103868	90.262	ng	99
23) trans-1,2-Dichloroethene	9.54	61	1468459	101.711	ng	92
24) 1,1-Dichloroethane	9.79	63	1755345	86.873	ng	99
25) Methyl tert-Butyl Ether	9.89	73	3168796	90.956	ng	98
26) Vinyl Acetate	10.07	86	1356871	464.242	ng	# 64
27) 2-Butanone (MEK)	10.30	72	797486	96.026	ng	# 86
28) cis-1,2-Dichloroethene	10.81	61	1387029	92.887	ng	90
29) Diisopropyl Ether	11.11	87	1076818	90.311	ng	# 79
30) Ethyl Acetate	11.13	61	717888	181.208	ng	91
31) n-Hexane	11.09	57	1530523	77.518	ng	# 100
32) Chloroform	11.16	83	1772093	92.105	ng	99
34) Tetrahydrofuran (THF)	11.55	72	775181	89.065	ng	98
35) Ethyl tert-Butyl Ether	11.70	87	1356833	92.781	ng	93
36) 1,2-Dichloroethane	11.95	62	1139631	92.541	ng	99
38) 1,1,1-Trichloroethane	12.23	97	1548462	93.379	ng	97
39) Isopropyl Acetate	12.67	61	1268000	165.413	ng	99
40) 1-Butanol	12.71	56	1948054	182.625	ng	# 76
41) Benzene	12.71	78	4015436	78.328	ng	100
42) Carbon Tetrachloride	12.87	117	1421053	93.655	ng	100
43) Cyclohexane	13.00	84	3299631	163.431	ng	98
44) tert-Amyl Methyl Ether	13.35	73	3048509	90.079	ng	97
45) 1,2-Dichloropropane	13.56	63	1063738	89.600	ng	99
46) Bromodichloromethane	13.75	83	1392144	96.849	ng	100
47) Trichloroethene	13.81	130	1389814	93.443	ng	100
48) 1,4-Dioxane	13.78	88	979074	94.696	ng	97
49) 2,2,4-Trimethylpentane...	13.88	57	4083483	79.231	ng	91
50) Methyl Methacrylate	14.02	100	1029562	198.428	ng	90

Data File : I:\MS13\DATA\2019 01\23\01231911.D
 Acq On : 23 Jan 2019 10:53
 Sample : 100ng TO-15 ICAL Std
 Misc : S31-01221908/S31-01161903 (2/14)

Vial: 16
 Operator: WA
 Inst : MS13

Quant Time: Jan 23 11:18:52 2019
 Quant Method : I:\MS13\METHODS\R13012319.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Wed Jan 23 10:31:09 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.14	71	1090107	86.391	ng	99
52) cis-1,3-Dichloropropene	14.67	75	1884084	102.334	ng	99
53) 4-Methyl-2-pentanone	14.71	58	992068	92.881	ng	89
54) trans-1,3-Dichloropropene	15.19	75	1594371	102.868	ng	99
55) 1,1,2-Trichloroethane	15.36	97	1147869	93.984	ng	98
58) Toluene	15.65	91	4475365	85.628	ng	97
59) 2-Hexanone	15.90	43	2095409	99.745	ng	92
60) Dibromochloromethane	16.06	129	1427371	108.526	ng	100
61) 1,2-Dibromoethane	16.31	107	1320897	108.902	ng	100
62) n-Butyl Acetate	16.53	43	2358975	97.268	ng	93
63) n-Octane	16.66	57	861202	89.078	ng	99
64) Tetrachloroethene	16.79	166	1586409	96.598	ng	98
65) Chlorobenzene	17.47	112	3227442	91.470	ng	98
66) Ethylbenzene	17.83	91	4917151	86.470	ng	99
67) m- & p-Xylenes	18.00	91	7590877	174.120	ng	98
68) Bromoform	18.06	173	1381752	108.485	ng	99
69) Styrene	18.33	104	3469181	101.072	ng	97
70) o-Xylene	18.43	91	3850302	88.064	ng	95
71) n-Nonane	18.63	43	1749023	80.263	ng	96
72) 1,1,2,2-Tetrachloroethane	18.41	83	1936312	92.237	ng	100
74) Cumene	18.96	105	5008946	84.128	ng	96
75) alpha-Pinene	19.31	93	2645675	91.386	ng	95
76) n-Propylbenzene	19.41	91	5716632	84.573	ng	95
77) 3-Ethyltoluene	19.50	105	4994193	85.913	ng	91
78) 4-Ethyltoluene	19.54	105	4883267	86.612	ng	98
79) 1,3,5-Trimethylbenzene	19.61	105	4250628	85.912	ng	95
80) alpha-Methylstyrene	19.75	118	2590177	105.647	ng	90
81) 2-Ethyltoluene	19.78	105	5013066	85.068	ng	96
82) 1,2,4-Trimethylbenzene	19.98	105	4028708	84.058	ng	97
83) n-Decane	20.07	57	1961905	82.968	ng	96
84) Benzyl Chloride	20.09	91	3781785	107.939	ng	94
85) 1,3-Dichlorobenzene	20.11	146	3017833	98.733	ng	99
86) 1,4-Dichlorobenzene	20.16	146	3041985	95.669	ng	99
87) sec-Butylbenzene	20.21	105	5588775	82.698	ng	95
88) 4-Isopropyltoluene (p-...	20.35	119	4811990	75.680	ng	95
89) 1,2,3-Trimethylbenzene	20.35	105	3957709	81.864	ng	98
90) 1,2-Dichlorobenzene	20.47	146	2784546	93.105	ng	99
91) d-Limonene	20.48	68	1448812	85.378	ng	96
92) 1,2-Dibromo-3-Chloropr...	20.85	157	1138300	106.361	ng	83
93) n-Undecane	21.17	57	2071611	96.224	ng	97
94) 1,2,4-Trichlorobenzene	21.97	180	2394698	114.649	ng	99
95) Naphthalene	22.08	128	6034979	106.146	ng	98
96) n-Dodecane	22.07	57	1761991	94.328	ng	93
97) Hexachlorobutadiene	22.38	225	1567243	97.089	ng	100
98) Cyclohexanone	18.13	55	1413902	85.447	ng	92
99) tert-Butylbenzene	19.98	119	3957503	79.767	ng	97
100) n-Butylbenzene	20.72	91	4337953	87.911	ng	95

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

Data File : I:\MS13\DATA\2019 01\23\01231911.D
Acq On : 23 Jan 2019 10:53
Sample : 100ng TO-15 ICAL Std
Misc : S31-01221908/S31-01161903 (2/14)

Vial: 16
Operator: WA
Inst : MS13

Quant Time: Jan 23 11:18:52 2019

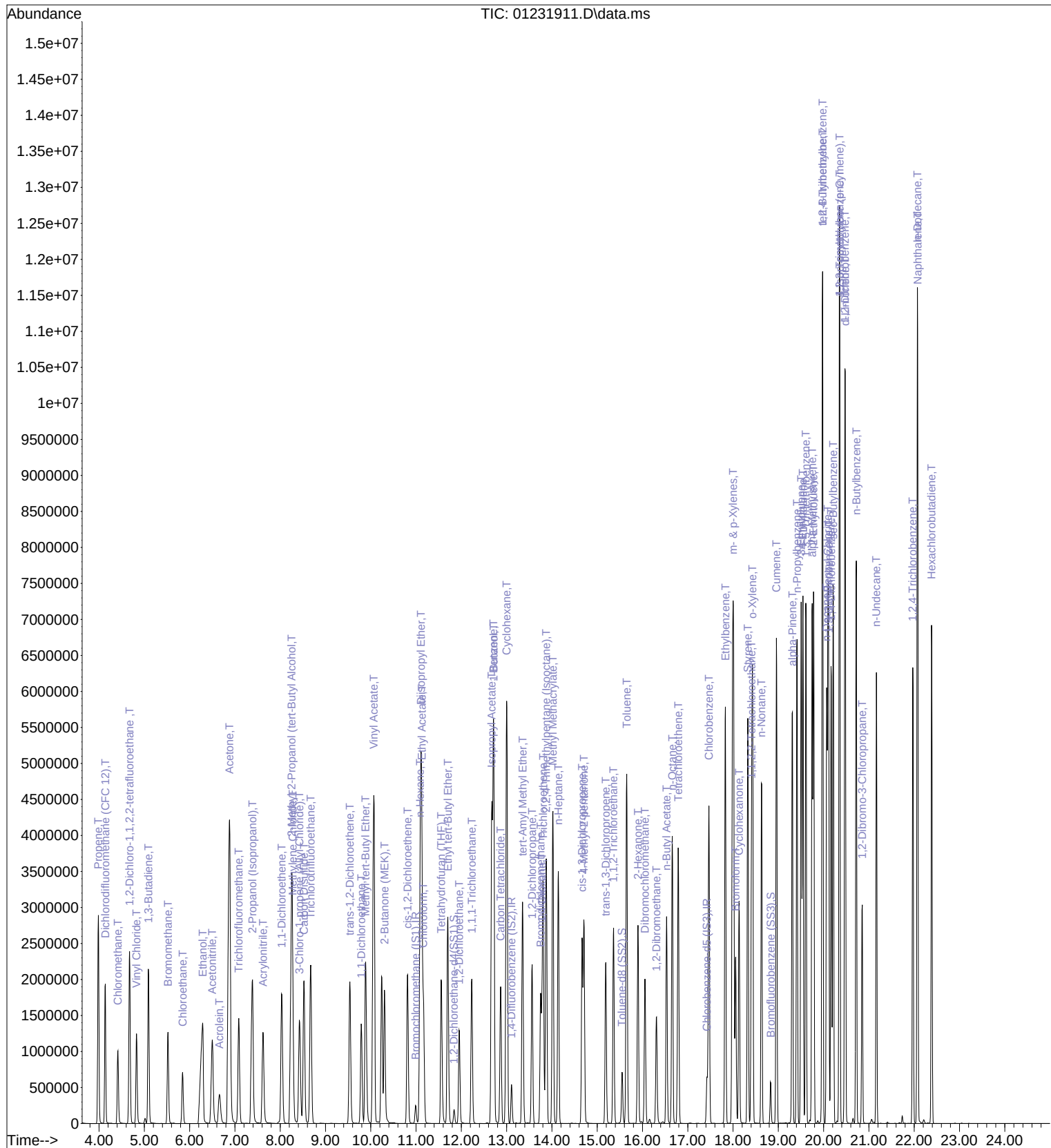
Quant Method : I:\MS13\METHODS\R13012319.M

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

QLast Update : Wed Jan 23 10:31:09 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019 01\23\01231912.D
 Acq On : 23 Jan 2019 11:31
 Sample : 25ng TO-15 ICV Std
 Misc : S31-01221908/S31-12271803 (1/25)

Vial: 13
 Operator: WA
 Inst : MS13

Quant Time: Jan 23 11:53:59 2019

Quant Method : I:\MS13\METHODS\R13012319.M

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

QLast Update : Wed Jan 23 11:21:29 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

1/23/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.97	130	131810	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.10	114	562964	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.42	82	224891	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.83	65	137705	12.253	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.00%
57) Toluene-d8 (SS2)	15.54	98	595617	12.368	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.96%
73) Bromofluorobenzene (SS3)	18.83	174	216386	12.479	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.84%

Target Compounds

						Qvalue
2) Propene	3.97	42	290238	25.307	ng	95
3) Dichlorodifluoromethan...	4.13	85	493642	25.193	ng	100
4) Chloromethane	4.41	50	413687	27.195	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.66	135	326224	25.834	ng	100
6) Vinyl Chloride	4.82	62	414491	28.421	ng	100
7) 1,3-Butadiene	5.08	54	320393	29.205	ng	92
8) Bromomethane	5.50	94	282739	27.020	ng	99
9) Chloroethane	5.83	64	213940	26.654	ng	99
10) Ethanol	6.22	45	1011763	129.405	ng	98
11) Acetonitrile	6.45	41	513663	27.151	ng	97
12) Acrolein	6.63	56	175696	27.188	ng	98
13) Acetone	6.84	58	1042912	125.541	ng	# 81
14) Trichlorofluoromethane	7.07	101	417709	25.440	ng	99
15) 2-Propanol (Isopropanol)	7.34	45	1342639	53.071	ng	93
16) Acrylonitrile	7.59	53	378092	31.217	ng	98
17) 1,1-Dichloroethene	8.02	96	301396	27.502	ng	# 84
18) 2-Methyl-2-Propanol (t...	8.20	59	1312557	52.782	ng	96
19) Methylene Chloride	8.25	84	302373	28.711	ng	94
20) 3-Chloro-1-propene (Al...	8.41	41	415896	29.468	ng	97
21) Trichlorotrifluoroethane	8.66	151	301621	26.034	ng	93
22) Carbon Disulfide	8.51	76	1087556	25.282	ng	99
23) trans-1,2-Dichloroethene	9.52	61	379244	29.572	ng	93
24) 1,1-Dichloroethane	9.78	63	478565	26.232	ng	100
25) Methyl tert-Butyl Ether	9.87	73	825622	26.494	ng	98
26) Vinyl Acetate	10.04	86	372308	139.318	ng	96
27) 2-Butanone (MEK)	10.28	72	207861	27.296	ng	# 90
28) cis-1,2-Dichloroethene	10.80	61	359087	27.074	ng	92
29) Diisopropyl Ether	11.10	87	294686	27.567	ng	# 73
30) Ethyl Acetate	11.10	61	210958	55.937	ng	97
31) n-Hexane	11.08	57	447408	25.559	ng	# 100
32) Chloroform	11.14	83	456008	26.591	ng	99
34) Tetrahydrofuran (THF)	11.55	72	200595	25.956	ng	99
35) Ethyl tert-Butyl Ether	11.69	87	349375	26.320	ng	96
36) 1,2-Dichloroethane	11.94	62	294048	27.012	ng	99
38) 1,1,1-Trichloroethane	12.22	97	391363	26.333	ng	97
39) Isopropyl Acetate	12.66	61	359720	50.382	ng	93
40) 1-Butanol	12.68	56	538707	55.408	ng	# 73
41) Benzene	12.70	78	1163976	25.038	ng	99
42) Carbon Tetrachloride	12.86	117	362977	26.541	ng	100
43) Cyclohexane	12.99	84	917901	50.250	ng	98
44) tert-Amyl Methyl Ether	13.34	73	800206	26.373	ng	97
45) 1,2-Dichloropropane	13.55	63	280406	26.372	ng	100
46) Bromodichloromethane	13.74	83	360643	28.023	ng	99
47) Trichloroethene	13.80	130	359395	26.746	ng	100
48) 1,4-Dioxane	13.77	88	256432	27.377	ng	99
49) 2,2,4-Trimethylpentane...	13.86	57	1140295	24.936	ng	90
50) Methyl Methacrylate	14.01	100	270630	60.210	ng	95

Data File : I:\MS13\DATA\2019 01\23\01231912.D
 Acq On : 23 Jan 2019 11:31
 Sample : 25ng TO-15 ICV Std
 Misc : S31-01221908/S31-12271803 (1/25)

Vial: 13
 Operator: WA
 Inst : MS13

Quant Time: Jan 23 11:53:59 2019

Quant Method : I:\MS13\METHODS\R13012319.M

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

QLast Update : Wed Jan 23 11:21:29 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

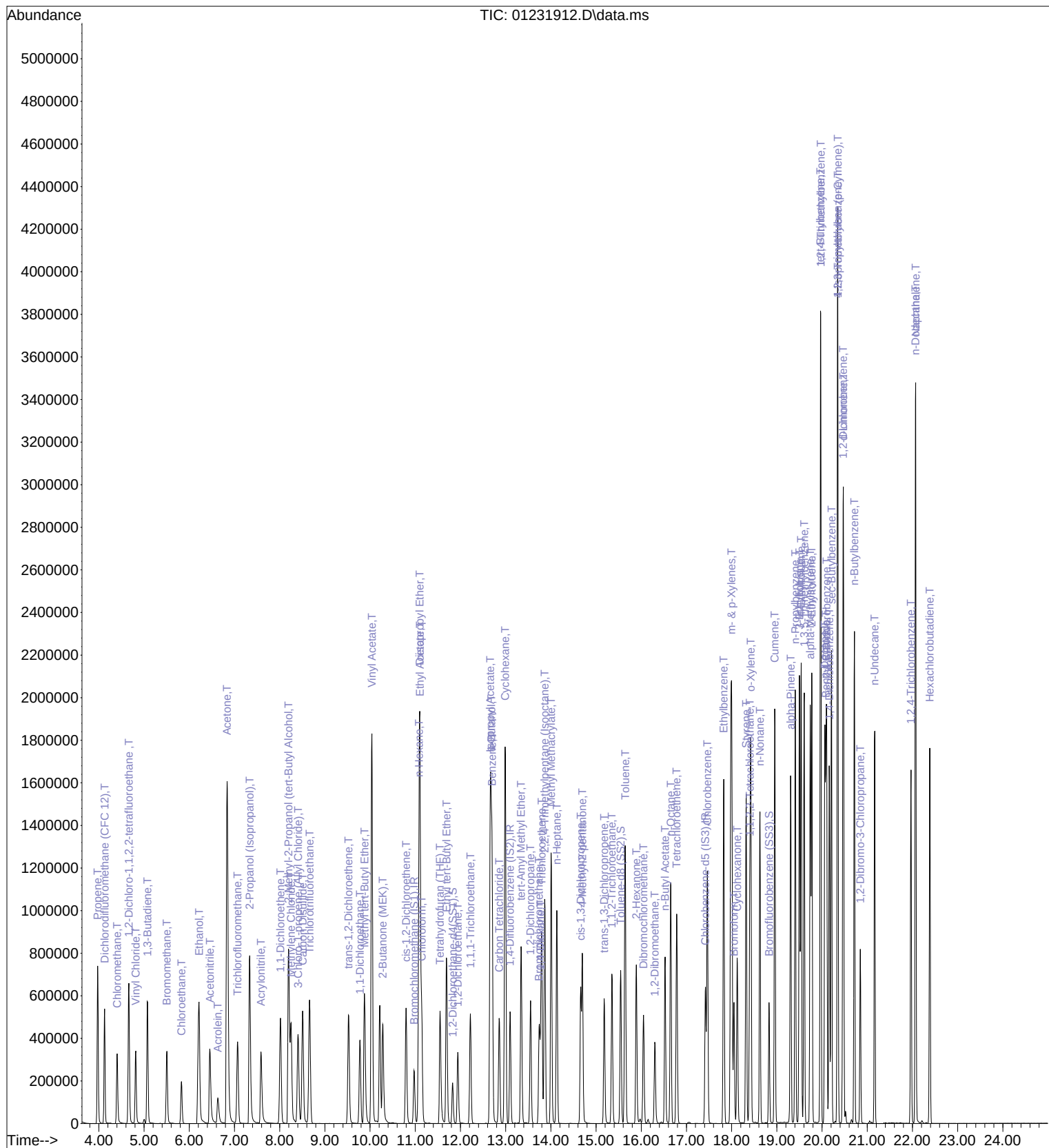
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.13	71	294825	26.312	ng	99
52) cis-1,3-Dichloropropene	14.66	75	466898	27.704	ng	100
53) 4-Methyl-2-pentanone	14.69	58	263484	27.506	ng	92
54) trans-1,3-Dichloropropene	15.18	75	409912	28.951	ng	100
55) 1,1,2-Trichloroethane	15.35	97	296327	27.429	ng	98
58) Toluene	15.65	91	1214741	23.730	ng	98
59) 2-Hexanone	15.89	43	564646	28.070	ng	93
60) Dibromochloromethane	16.05	129	360060	28.871	ng	100
61) 1,2-Dibromoethane	16.30	107	337840	29.150	ng	100
62) n-Butyl Acetate	16.53	43	638988	27.373	ng	94
63) n-Octane	16.65	57	238507	25.357	ng	97
64) Tetrachloroethene	16.78	166	403400	25.748	ng	99
65) Chlorobenzene	17.46	112	864555	25.463	ng	100
66) Ethylbenzene	17.82	91	1360808	24.698	ng	99
67) m- & p-Xylenes	18.00	91	2113341	49.688	ng	98
68) Bromoform	18.05	173	336959	29.577	ng	100
69) Styrene	18.32	104	919763	27.664	ng	96
70) o-Xylene	18.42	91	1055135	24.892	ng	96
71) n-Nonane	18.63	43	520296	25.111	ng	100
72) 1,1,2,2-Tetrachloroethane	18.40	83	519389	26.149	ng	99
74) Cumene	18.95	105	1421080	24.569	ng	99
75) alpha-Pinene	19.30	93	717581	25.916	ng	94
76) n-Propylbenzene	19.41	91	1653750	25.491	ng	98
77) 3-Ethyltoluene	19.50	105	1365282	24.834	ng	94
78) 4-Ethyltoluene	19.54	105	1440290	26.218	ng	96
79) 1,3,5-Trimethylbenzene	19.61	105	1160035	24.059	ng	97
80) alpha-Methylstyrene	19.74	118	687603	28.890	ng	92
81) 2-Ethyltoluene	19.77	105	1401382	24.495	ng	98
82) 1,2,4-Trimethylbenzene	19.97	105	1175021	25.121	ng	95
83) n-Decane	20.06	57	586875	25.783	ng	99
84) Benzyl Chloride	20.08	91	1001220	29.269	ng	98
85) 1,3-Dichlorobenzene	20.10	146	788851	26.876	ng	100
86) 1,4-Dichlorobenzene	20.16	146	804355	26.104	ng	100
87) sec-Butylbenzene	20.21	105	1609639	24.789	ng	99
88) 4-Isopropyltoluene (p-...	20.35	119	1532048	25.277	ng	100
89) 1,2,3-Trimethylbenzene	20.35	105	1204084	26.022	ng	96
90) 1,2-Dichlorobenzene	20.47	146	758450	26.474	ng	100
91) d-Limonene	20.47	68	444284	27.213	ng	96
92) 1,2-Dibromo-3-Chloropr...	20.85	157	290539	28.052	ng	85
93) n-Undecane	21.17	57	595406	28.366	ng	98
94) 1,2,4-Trichlorobenzene	21.97	180	613462	28.126	ng	100
95) Naphthalene	22.07	128	1732271	29.113	ng	100
96) n-Dodecane	22.06	57	483693	24.640	ng	99
97) Hexachlorobutadiene	22.38	225	384807	23.731	ng	100
98) Cyclohexanone	18.12	55	363308	23.435	ng	94
99) tert-Butylbenzene	19.96	119	1190104	24.957	ng	99
100) n-Butylbenzene	20.72	91	1235644	25.970	ng	98

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

Data File : I:\MS13\DATA\2019 01\23\01231912.D
Acq On : 23 Jan 2019 11:31
Sample : 25ng TO-15 ICV Std
Misc : S31-01221908/S31-12271803 (1/25)

Vial: 13
Operator: WA
Inst : MS13

Quant Time: Jan 23 11:53:59 2019
Quant Method : I:\MS13\METHODS\R13012319.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Wed Jan 23 11:21:29 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: 01231912.D

Acq. Method File: TO15.M

1/23/19

Data File Path: I:\MS13\DATA\2019_01\23\

Sample Name: 25ng TO-15 ICV Std

Operator: WA

Misc Info: S31-01221908/S31-12271803 (

Date Acquired: 1/23/2019

11:31

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	3.97	25.3	26.43	96	53	112	*	*
3)	Dichlorodifluoromethane (CFC 12)	4.13	25.2	26.30	96	62	103	*	*
4)	Chloromethane	4.41	27.2	26.38	103	51	121	*	*
5)	1,2-Dichloro-1,1,2,2-tetrafluoroethane	4.66	25.8	26.38	98	56	111	*	*
6)	Vinyl Chloride	4.82	28.4	26.73	106	57	117	*	*
7)	1,3-Butadiene	5.08	29.2	26.28	111	53	134	*	*
8)	Bromomethane	5.50	27.0	26.48	102	65	110	*	*
9)	Chloroethane	5.83	26.7	26.75	100	64	111	*	*
10)	Ethanol	6.22	129	128.10	101	57	124	*	*
11)	Acetonitrile	6.45	27.2	25.73	106	57	126	*	*
12)	Acrolein	6.63	27.2	25.63	106	62	121	*	*
13)	Acetone	6.84	126	132.33	95	60	113	*	*
14)	Trichlorofluoromethane	7.07	25.4	26.40	96	63	104	*	*
15)	2-Propanol (Isopropanol)	7.34	53.1	51.60	103	60	124	*	*
16)	Acrylonitrile	7.59	31.2	25.88	121	66	125	*	*
17)	1,1-Dichloroethene	8.02	27.5	27.23	101	68	107	*	*
18)	2-Methyl-2-Propanol (tert-Butyl Alcohol)	8.20	52.8	54.25	97	64	114	*	*
19)	Methylene Chloride	8.25	28.7	27.08	106	66	105	FAIL	*
20)	3-Chloro-1-propene (Allyl Chloride)	8.41	29.5	27.00	109	63	127	*	*
21)	Trichlorotrifluoroethane	8.66	26.0	26.95	96	59	109	*	*
22)	Carbon Disulfide	8.51	25.3	27.20	93	67	109	*	*
23)	trans-1,2-Dichloroethene	9.52	29.6	26.73	111	70	115	*	*
24)	1,1-Dichloroethane	9.78	26.2	26.95	97	66	106	*	*
25)	Methyl tert-Butyl Ether	9.87	26.5	26.80	99	67	109	*	*
26)	Vinyl Acetate	10.04	139	133.03	104	68	136	*	*
27)	2-Butanone (MEK)	10.28	27.3	25.95	105	71	116	*	*
28)	cis-1,2-Dichloroethene	10.80	27.1	26.35	103	67	110	*	*
29)	Diisopropyl Ether	11.10	27.6	27.18	102	62	109	*	*
30)	Ethyl Acetate	11.10	55.9	54.45	103	64	127	*	*
31)	n-Hexane	11.08	25.6	26.95	95	60	115	*	*
32)	Chloroform	11.14	26.6	27.08	98	66	105	*	*
34)	Tetrahydrofuran (THF)	11.55	26.0	27.00	96	65	110	*	*
35)	Ethyl tert-Butyl Ether	11.69	26.3	26.80	98	69	109	*	*
36)	1,2-Dichloroethane	11.94	27.0	26.85	101	60	110	*	*
38)	1,1,1-Trichloroethane	12.22	26.3	26.90	98	64	108	*	*
39)	Isopropyl Acetate	12.66	50.4	51.55	98	66	119	*	*
40)	1-Butanol	12.68	55.4	51.58	107	54	143	*	*
41)	Benzene	12.70	25.0	26.38	95	67	106	*	*
42)	Carbon Tetrachloride	12.86	26.5	26.45	100	64	112	*	*
43)	Cyclohexane	12.99	50.2	52.05	96	67	110	*	*
44)	tert-Amyl Methyl Ether	13.34	26.4	27.08	98	68	112	*	*
45)	1,2-Dichloropropane	13.55	26.4	26.98	98	66	112	*	*
46)	Bromodichloromethane	13.74	28.0	26.83	104	67	113	*	*
47)	Trichloroethene	13.80	26.7	26.68	100	66	108	*	*
48)	1,4-Dioxane	13.77	27.4	26.73	103	70	116	*	*
49)	2,2,4-Trimethylpentane (Isooctane)	13.86	24.9	26.65	93	64	113	*	*

Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: **01231912.D**

Data File Path: I:\MS13\DATA\2019_01\23\

Operator: **WA**

Date Acquired: **1/23/2019**

11:31

TO15.M

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

Misc Info: **S31-01221908/S31-12271803 (**

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	14.01	60.2	53.88	112	73	118	*	*
51)	n-Heptane	14.13	26.3	26.90	98	66	110	*	*
52)	cis-1,3-Dichloropropene	14.66	27.7	26.78	103	75	120	*	*
53)	4-Methyl-2-pentanone	14.69	27.5	26.15	105	65	124	*	*
54)	trans-1,3-Dichloropropene	15.18	29.0	26.60	109	77	123	*	*
55)	1,1,2-Trichloroethane	15.35	27.4	26.85	102	68	112	*	*
58)	Toluene	15.65	23.7	26.50	89	62	111	*	*
59)	2-Hexanone	15.89	28.1	26.78	105	59	128	*	*
60)	Dibromochloromethane	16.05	28.9	26.60	109	67	123	*	*
61)	1,2-Dibromoethane	16.30	29.2	27.03	108	66	122	*	*
62)	n-Butyl Acetate	16.53	27.4	27.35	100	64	128	*	*
63)	n-Octane	16.65	25.4	27.13	94	65	114	*	*
64)	Tetrachloroethene	16.78	25.7	26.60	97	55	120	*	*
65)	Chlorobenzene	17.46	25.5	26.83	95	61	114	*	*
66)	Ethylbenzene	17.82	24.7	26.53	93	64	113	*	*
67)	m- & p-Xylenes	18.00	49.7	53.28	93	64	114	*	*
68)	Bromoform	18.05	29.6	26.68	111	65	132	*	*
69)	Styrene	18.32	27.7	26.50	105	67	124	*	*
70)	o-Xylene	18.42	24.9	26.75	93	65	114	*	*
71)	n-Nonane	18.63	25.1	26.83	94	64	117	*	*
72)	1,1,2,2-Tetrachloroethane	18.40	26.1	26.80	97	66	119	*	*
74)	Cumene	18.95	24.6	26.80	92	61	116	*	*
75)	alpha-Pinene	19.30	25.9	26.40	98	65	120	*	*
76)	n-Propylbenzene	19.41	25.5	27.23	94	63	117	*	*
77)	3-Ethyltoluene	19.50	24.8	26.83	92	60	117	*	*
78)	4-Ethyltoluene	19.54	26.2	26.80	98	63	124	*	*
79)	1,3,5-Trimethylbenzene	19.61	24.1	26.73	90	60	117	*	*
80)	alpha-Methylstyrene	19.74	28.9	26.75	108	64	131	*	*
81)	2-Ethyltoluene	19.77	24.5	27.08	90	62	116	*	*
82)	1,2,4-Trimethylbenzene	19.97	25.1	26.90	93	61	122	*	*
83)	n-Decane	20.06	25.8	26.88	96	67	120	*	*
84)	Benzyl Chloride	20.08	29.3	27.08	108	77	142	*	*
85)	1,3-Dichlorobenzene	20.10	26.9	26.98	100	61	125	*	*
86)	1,4-Dichlorobenzene	20.16	26.1	27.00	97	59	123	*	*
87)	sec-Butylbenzene	20.21	24.8	26.55	93	62	117	*	*
88)	4-Isopropyltoluene (p-Cymene)	20.35	25.3	26.95	94	58	122	*	*
89)	1,2,3-Trimethylbenzene	20.35	26.0	26.95	96	62	124	*	*
90)	1,2-Dichlorobenzene	20.47	26.5	26.95	98	61	126	*	*
91)	d-Limonene	20.47	27.2	26.38	103	66	124	*	*
92)	1,2-Dibromo-3-Chloropropane	20.85	28.1	26.15	107	67	138	*	*
93)	n-Undecane	21.17	28.4	27.03	105	68	127	*	*
94)	1,2,4-Trichlorobenzene	21.97	28.1	26.78	105	62	141	*	*
95)	Naphthalene	22.07	29.1	25.38	115	62	145	*	*
96)	n-Dodecane	22.06	24.6	25.63	96	64	152	*	*
97)	Hexachlorobutadiene	22.38	23.7	26.13	91	49	131	*	*
98)	Cyclohexanone	18.13	23.4	24.45	96	61	127	*	*
99)	tert-Butylbenzene	19.96	25.0	26.88	93	58	122	*	*
100)	n-Butylbenzene	20.72	26.0	27.00	96	64	121	*	*

Bold = 75 Compound List

Data File : I:\MS13\DATA\2019 04\15\04151902.D

Vial: 2

Acq On : 15 Apr 2019 7:42

Operator: WA

Sample : CCV R13041519 25ng

Inst : MS13

Misc : S31-03201909/S31-03291903 (4/27)

Quant Time: Apr 15 09:34:03 2019

Quant Method : I:\MS13\METHODS\R13012319.M

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

QLast Update : Wed Jan 23 11:21:29 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

WA 4/15/19

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	75	-0.01
2 T	Propene	1.088	0.962	11.6	67	0.00
3 T	Dichlorodifluoromethane (CF	1.858	1.737	6.5	71	0.00
4 T	Chloromethane	1.443	1.384	4.1	69	0.00
5 T	1,2-Dichloro-1,1,2,2-tetra	1.198	1.179	1.6	75	0.00
6 T	Vinyl Chloride	1.383	1.402	-1.4	73	0.00
7 T	1,3-Butadiene	1.040	1.135	-9.1	75	-0.01
8 T	Bromomethane	0.992	0.957	3.5	70	-0.01
9 T	Chloroethane	0.761	0.672	11.7	64	-0.01
10 T	Ethanol	0.741	0.679	8.4	71	-0.06
11 T	Acetonitrile	1.794	1.727	3.7	68	-0.03
12 T	Acrolein	0.613	0.627	-2.3	70	-0.02
13 T	Acetone	0.788	0.672	14.7	68	-0.03
14 T	Trichlorofluoromethane	1.557	1.426	8.4	71	-0.01
15 T	2-Propanol (Isopropanol)	2.399	2.267	5.5	68	-0.04
16 T	Acrylonitrile	1.149	1.271	-10.6	69	-0.02
17 T	1,1-Dichloroethene	1.039	0.994	4.3	69	-0.01
18 T	2-Methyl-2-Propanol (tert-B	2.358	2.260	4.2	69	-0.04
19 T	Methylene Chloride	0.999	0.984	1.5	68	-0.02
20 T	3-Chloro-1-propene (Allyl C	1.338	1.243	7.1	65	-0.01
21 T	Trichlorotrifluoroethane	1.099	1.039	5.5	72	0.00
22 T	Carbon Disulfide	4.079	3.552	12.9	69	-0.01
23 T	trans-1,2-Dichloroethene	1.216	1.224	-0.7	66	-0.01
24 T	1,1-Dichloroethane	1.730	1.499	13.4	65	0.00
25 T	Methyl tert-Butyl Ether	2.955	2.647	10.4	67	0.00
26 T	Vinyl Acetate	0.253	0.242	4.3	66	-0.02
27 T	2-Butanone (MEK)	0.722	0.663	8.2	65	-0.01
28 T	cis-1,2-Dichloroethene	1.258	1.172	6.8	66	-0.01
29 T	Diisopropyl Ether	1.014	0.920	9.3	66	0.00
30 T	Ethyl Acetate	0.358	0.319	10.9	64	-0.02
31 T	n-Hexane	1.660	1.207	27.3	59	0.00
32 T	Chloroform	1.626	1.491	8.3	68	-0.01
33 S	1,2-Dichloroethane-d4 (SS1)	1.066	1.071	-0.5	77	0.00
34 T	Tetrahydrofuran (THF)	0.733	0.631	13.9	65	0.00
35 T	Ethyl tert-Butyl Ether	1.259	1.147	8.9	67	0.00
36 T	1,2-Dichloroethane	1.032	0.989	4.2	68	0.00
37 IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	73	0.00
38 T	1,1,1-Trichloroethane	0.330	0.320	3.0	69	0.00
39 T	Isopropyl Acetate	0.159	0.142	10.7	65	0.00
40 T	1-Butanol	0.216	0.233	-7.9	70	-0.03
41 T	Benzene	1.032	0.908	12.0	65	0.00
42 T	Carbon Tetrachloride	0.304	0.309	-1.6	70	0.00
43 T	Cyclohexane	0.406	0.364	10.3	66	0.00
44 T	tert-Amyl Methyl Ether	0.674	0.628	6.8	66	0.00
45 T	1,2-Dichloropropane	0.236	0.211	10.6	64	0.00
46 T	Bromodichloromethane	0.286	0.285	0.3	68	0.00
47 T	Trichloroethene	0.298	0.286	4.0	68	0.00
48 T	1,4-Dioxane	0.208	0.205	1.4	68	0.00
49 T	2,2,4-Trimethylpentane (Iso	1.015	0.854	15.9	64	0.00
50 T	Methyl Methacrylate	0.100	0.103	-3.0	66	-0.01
51 T	n-Heptane	0.249	0.211	15.3	62	0.00
52 T	cis-1,3-Dichloropropene	0.374	0.364	2.7	66	0.00
53 T	4-Methyl-2-pentanone	0.213	0.201	5.6	64	0.00
54 T	trans-1,3-Dichloropropene	0.314	0.329	-4.8	68	0.00
55 T	1,1,2-Trichloroethane	0.240	0.230	4.2	67	0.00

Data File : I:\MS13\DATA\2019 04\15\04151902.D
 Acq On : 15 Apr 2019 7:42
 Sample : CCV R13041519 25ng
 Misc : S31-03201909/S31-03291903 (4/27)

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Apr 15 09:34:03 2019
 Quant Method : I:\MS13\METHODS\R13012319.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Wed Jan 23 11:21:29 2019
 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	75	0.00
57	S Toluene-d8 (SS2)	2.677	2.574	3.8	72	0.00
58	T Toluene	2.845	2.320	18.5	66	0.00
59	T 2-Hexanone	1.118	1.079	3.5	67	0.00
60	T Dibromochloromethane	0.693	0.717	-3.5	70	0.00
61	T 1,2-Dibromoethane	0.644	0.660	-2.5	69	0.00
62	T n-Butyl Acetate	1.298	1.198	7.7	66	0.00
63	T n-Octane	0.523	0.422	19.3	62	0.00
64	T Tetrachloroethene	0.871	0.803	7.8	69	0.00
65	T Chlorobenzene	1.887	1.694	10.2	68	0.00
66	T Ethylbenzene	3.062	2.683	12.4	66	0.00
67	T m- & p-Xylenes	2.364	2.050	13.3	67	0.00
68	T Bromoform	0.633	0.716	-13.1	73	0.00
69	T Styrene	1.848	1.802	2.5	67	0.00
70	T o-Xylene	2.356	2.044	13.2	67	0.00
71	T n-Nonane	1.152	0.944	18.1	64	0.00
72	T 1,1,2,2-Tetrachloroethane	1.104	1.010	8.5	67	0.00
73	S Bromofluorobenzene (SS3)	0.964	1.069	-10.9	83	0.00
74	T Cumene	3.215	2.767	13.9	68	0.00
75	T alpha-Pinene	1.539	1.399	9.1	66	0.00
76	T n-Propylbenzene	3.606	3.118	13.5	66	0.00
77	T 3-Ethyltoluene	3.056	2.908	4.8	72	0.00
78	T 4-Ethyltoluene	3.053	2.484	18.6	62	0.00
79	T 1,3,5-Trimethylbenzene	2.680	2.275	15.1	68	0.00
80	T alpha-Methylstyrene	1.323	1.340	-1.3	66	0.00
81	T 2-Ethyltoluene	3.180	2.698	15.2	67	0.00
82	T 1,2,4-Trimethylbenzene	2.600	2.296	11.7	68	0.00
83	T n-Decane	1.265	1.070	15.4	64	0.00
84	T Benzyl Chloride	1.901	2.029	-6.7	69	0.00
85	T 1,3-Dichlorobenzene	1.631	1.551	4.9	70	0.00
86	T 1,4-Dichlorobenzene	1.713	1.563	8.8	69	0.00
87	T sec-Butylbenzene	3.609	3.113	13.7	67	0.00
88	T 4-Isopropyltoluene (p-Cymen	3.369	3.014	10.5	68	0.00
89	T 1,2,3-Trimethylbenzene	2.572	2.305	10.4	68	0.00
90	T 1,2-Dichlorobenzene	1.592	1.481	7.0	69	0.00
91	T d-Limonene	0.907	0.854	5.8	64	0.00
92	T 1,2-Dibromo-3-Chloropropane	0.576	0.593	-3.0	71	0.00
93	T n-Undecane	1.167	1.141	2.2	64	0.00
94	T 1,2,4-Trichlorobenzene	1.212	1.221	-0.7	69	0.01
95	T Naphthalene	3.307	3.549	-7.3	67	0.00
96	T n-Dodecane	1.091	1.044	4.3	60	0.01
97	T Hexachlorobutadiene	0.901	0.800	11.2	72	0.01
98	T Cyclohexanone	0.862	0.805	6.6	69	0.00
99	T tert-Butylbenzene	2.651	2.323	12.4	68	0.00
100	T n-Butylbenzene	2.645	2.366	10.5	66	0.00

(#) = Out of Range

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

Data File : I:\MS13\DATA\2019 04\15\04151902.D
 Acq On : 15 Apr 2019 7:42
 Sample : CCV R13041519 25ng
 Misc : S31-03201909/S31-03291903 (4/27)

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Apr 15 09:34:03 2019

Quant Method : I:\MS13\METHODS\R13012319.M

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

QLast Update : Wed Jan 23 11:21:29 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

4/15/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.98	130	95730	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.10	114	393328	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.43	82	161545	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.83	65	102567	12.566	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.56%
57) Toluene-d8 (SS2)	15.55	98	415785	12.019	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	96.16%
73) Bromofluorobenzene (SS3)	18.83	174	172747	13.869	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	110.96%

Target Compounds

						Qvalue
2) Propene	3.98	42	189945	22.804	ng	96
3) Dichlorodifluoromethan...	4.13	85	347504	24.419	ng	100
4) Chloromethane	4.41	50	267119	24.178	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.67	135	232009	25.297	ng	100
6) Vinyl Chloride	4.82	62	282125	26.636	ng	100
7) 1,3-Butadiene	5.08	54	227902	28.604	ng	93
8) Bromomethane	5.51	94	184857	24.324	ng	100
9) Chloroethane	5.83	64	131396	22.540	ng	99
10) Ethanol	6.23	45	668658	117.755	ng	98
11) Acetonitrile	6.47	41	341512	24.855	ng	98
12) Acrolein	6.64	56	123431	26.299	ng	98
13) Acetone	6.85	58	690822	114.500	ng	# 85
14) Trichlorofluoromethane	7.07	101	289383	24.267	ng	99
15) 2-Propanol (Isopropanol)	7.35	45	895398	48.732	ng	94
16) Acrylonitrile	7.60	53	251706	28.615	ng	97
17) 1,1-Dichloroethene	8.02	96	204472	25.690	ng	# 83
18) 2-Methyl-2-Propanol (t...	8.21	59	927531	51.357	ng	97
19) Methylene Chloride	8.26	84	201533	26.349	ng	93
20) 3-Chloro-1-propene (Al...	8.41	41	253951	24.775	ng	100
21) Trichlorotrifluoroethane	8.67	151	211793	25.170	ng	90
22) Carbon Disulfide	8.51	76	731067	23.400	ng	99
23) trans-1,2-Dichloroethene	9.53	61	248845	26.717	ng	90
24) 1,1-Dichloroethane	9.78	63	295564	22.307	ng	100
25) Methyl tert-Butyl Ether	9.88	73	551925	24.386	ng	99
26) Vinyl Acetate	10.05	86	242977	125.191	ng	# 94
27) 2-Butanone (MEK)	10.29	72	130451	23.587	ng	# 91
28) cis-1,2-Dichloroethene	10.80	61	236463	24.548	ng	89
29) Diisopropyl Ether	11.10	87	190350	24.518	ng	# 76
30) Ethyl Acetate	11.11	61	132453	48.358	ng	97
31) n-Hexane	11.08	57	250001	19.664	ng	# 100
32) Chloroform	11.15	83	307469	24.687	ng	99
34) Tetrahydrofuran (THF)	11.55	72	129104	23.001	ng	100
35) Ethyl tert-Butyl Ether	11.70	87	232727	24.140	ng	94
36) 1,2-Dichloroethane	11.95	62	200916	25.413	ng	99
38) 1,1,1-Trichloroethane	12.23	97	272081	26.202	ng	97
39) Isopropyl Acetate	12.66	61	230412	46.189	ng	# 91
40) 1-Butanol	12.69	56	378760	55.758	ng	76
41) Benzene	12.70	78	737621	22.710	ng	99
42) Carbon Tetrachloride	12.86	117	252031	26.376	ng	99
43) Cyclohexane	12.99	84	598357	46.884	ng	99
44) tert-Amyl Methyl Ether	13.35	73	530892	25.043	ng	96
45) 1,2-Dichloropropane	13.56	63	178505	24.029	ng	99
46) Bromodichloromethane	13.74	83	239592	26.646	ng	100
47) Trichloroethene	13.80	130	239042	25.462	ng	100
48) 1,4-Dioxane	13.78	88	171174	26.156	ng	97
49) 2,2,4-Trimethylpentane...	13.87	57	713123	22.321	ng	91
50) Methyl Methacrylate	14.01	100	173365	55.205	ng	94

Data File : I:\MS13\DATA\2019 04\15\04151902.D
 Acq On : 15 Apr 2019 7:42
 Sample : CCV R13041519 25ng
 Misc : S31-03201909/S31-03291903 (4/27)

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Apr 15 09:34:03 2019
 Quant Method : I:\MS13\METHODS\R13012319.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Wed Jan 23 11:21:29 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.14	71	178392	22.787	ng	99
52) cis-1,3-Dichloropropene	14.67	75	320747	27.240	ng	100
53) 4-Methyl-2-pentanone	14.70	58	167972	25.097	ng	94
54) trans-1,3-Dichloropropene	15.18	75	273313	27.629	ng	99
55) 1,1,2-Trichloroethane	15.36	97	195076	25.844	ng	98
58) Toluene	15.65	91	788406	21.441	ng	98
59) 2-Hexanone	15.90	43	374397	25.910	ng	94
60) Dibromochloromethane	16.06	129	249140	27.810	ng	100
61) 1,2-Dibromoethane	16.31	107	229403	27.556	ng	100
62) n-Butyl Acetate	16.53	43	419971	25.045	ng	95
63) n-Octane	16.66	57	146542	21.688	ng	99
64) Tetrachloroethene	16.79	166	274349	24.378	ng	99
65) Chlorobenzene	17.47	112	583521	23.925	ng	100
66) Ethylbenzene	17.83	91	895364	22.623	ng	99
67) m- & p-Xylenes	18.00	91	1406181	46.026	ng	97
68) Bromoform	18.05	173	245766	30.032	ng	100
69) Styrene	18.33	104	617222	25.844	ng	96
70) o-Xylene	18.43	91	701251	23.030	ng	95
71) n-Nonane	18.63	43	326532	21.939	ng	100
72) 1,1,2,2-Tetrachloroethane	18.41	83	347098	24.327	ng	100
74) Cumene	18.96	105	945092	22.747	ng	99
75) alpha-Pinene	19.31	93	467877	23.524	ng	94
76) n-Propylbenzene	19.41	91	1083784	23.256	ng	97
77) 3-Ethyltoluene	19.50	105	997712	25.264	ng	98
78) 4-Ethyltoluene	19.54	105	851357	21.574	ng	99
79) 1,3,5-Trimethylbenzene	19.61	105	776915	22.432	ng	95
80) alpha-Methylstyrene	19.74	118	458081	26.793	ng	92
81) 2-Ethyltoluene	19.78	105	934367	22.736	ng	97
82) 1,2,4-Trimethylbenzene	19.98	105	792121	23.576	ng	95
83) n-Decane	20.07	57	371881	22.745	ng	99
84) Benzyl Chloride	20.09	91	688864	28.034	ng	96
85) 1,3-Dichlorobenzene	20.11	146	541185	25.668	ng	99
86) 1,4-Dichlorobenzene	20.17	146	545978	24.667	ng	100
87) sec-Butylbenzene	20.22	105	1068973	22.918	ng	98
88) 4-Isopropyltoluene (p-...	20.35	119	1014761	23.308	ng	100
89) 1,2,3-Trimethylbenzene	20.35	105	776050	23.348	ng	94
90) 1,2-Dichlorobenzene	20.47	146	521145	25.324	ng	100
91) d-Limonene	20.48	68	278518	23.749	ng	99
92) 1,2-Dibromo-3-Chloropr...	20.85	157	199561	26.823	ng	83
93) n-Undecane	21.17	57	389825	25.855	ng	99
94) 1,2,4-Trichlorobenzene	21.98	180	419812	26.795	ng	99
95) Naphthalene	22.08	128	1175447	27.502	ng	100
96) n-Dodecane	22.08	57	347893	24.671	ng	99
97) Hexachlorobutadiene	22.39	225	272020	23.353	ng	100
98) Cyclohexanone	18.13	55	255379	22.933	ng	93
99) tert-Butylbenzene	19.98	119	800713	23.375	ng	100
100) n-Butylbenzene	20.72	91	813415	23.800	ng	98

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

[illegible]

Data File : I:\MS13\DATA\2019 04\15\04151936.D
 Acq On : 16 Apr 2019 3:30
 Sample : CCVend R13041519 25ng
 Misc : S31-03201909/S31-03291903 (4/27)

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Apr 16 06:20:03 2019
 Quant Method : I:\MS13\METHODS\R13012319.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Wed Jan 23 11:21:29 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

1071 4/16/19

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	70	-0.01
2	T Propene	1.088	0.954	12.3	62	-0.01
3	T Dichlorodifluoromethane (CF	1.858	1.802	3.0	69	-0.01
4	T Chloromethane	1.443	1.444	-0.1	68	-0.01
5	T 1,2-Dichloro-1,1,2,2-tetra	1.198	1.250	-4.3	74	-0.01
6	T Vinyl Chloride	1.383	1.446	-4.6	70	-0.01
7	T 1,3-Butadiene	1.040	1.066	-2.5	66	-0.01
8	T Bromomethane	0.992	0.990	0.2	68	-0.02
9	T Chloroethane	0.761	0.712	6.4	64	-0.02
10	T Ethanol	0.741	0.672	9.3	65	-0.07
11	T Acetonitrile	1.794	1.715	4.4	64	-0.04
12	T Acrolein	0.613	0.613	0.0	64	-0.02
13	T Acetone	0.788	0.675	14.3	64	-0.04
14	T Trichlorofluoromethane	1.557	1.498	3.8	70	-0.02
15	T 2-Propanol (Isopropanol)	2.399	2.290	4.5	64	-0.05
16	T Acrylonitrile	1.149	1.262	-9.8	64	-0.03
17	T 1,1-Dichloroethene	1.039	1.003	3.5	65	-0.01
18	T 2-Methyl-2-Propanol (tert-B	2.358	2.279	3.4	65	-0.05
19	T Methylene Chloride	0.999	0.993	0.6	64	-0.02
20	T 3-Chloro-1-propene (Allyl C	1.338	1.250	6.6	61	-0.02
21	T Trichlorotrifluoroethane	1.099	1.065	3.1	69	-0.01
22	T Carbon Disulfide	4.079	3.560	12.7	64	-0.01
23	T trans-1,2-Dichloroethene	1.216	1.250	-2.8	63	-0.01
24	T 1,1-Dichloroethane	1.730	1.558	9.9	63	-0.01
25	T Methyl tert-Butyl Ether	2.955	2.714	8.2	64	0.00
26	T Vinyl Acetate	0.253	0.250	1.2	64	-0.02
27	T 2-Butanone (MEK)	0.722	0.677	6.2	62	-0.02
28	T cis-1,2-Dichloroethene	1.258	1.198	4.8	63	-0.01
29	T Diisopropyl Ether	1.014	0.949	6.4	64	0.00
30	T Ethyl Acetate	0.358	0.334	6.7	63	-0.02
31	T n-Hexane	1.660	1.299	21.7	59	0.00
32	T Chloroform	1.626	1.535	5.6	65	-0.02
33	S 1,2-Dichloroethane-d4 (SS1)	1.066	1.073	-0.7	72	0.00
34	T Tetrahydrofuran (THF)	0.733	0.642	12.4	62	0.00
35	T Ethyl tert-Butyl Ether	1.259	1.179	6.4	65	0.00
36	T 1,2-Dichloroethane	1.032	1.023	0.9	66	0.00
37	IR 1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	70	0.00
38	T 1,1,1-Trichloroethane	0.330	0.327	0.9	67	0.00
39	T Isopropyl Acetate	0.159	0.144	9.4	63	0.00
40	T 1-Butanol	0.216	0.230	-6.5	66	-0.03
41	T Benzene	1.032	0.919	10.9	63	0.00
42	T Carbon Tetrachloride	0.304	0.315	-3.6	68	0.00
43	T Cyclohexane	0.406	0.366	9.9	63	0.00
44	T tert-Amyl Methyl Ether	0.674	0.632	6.2	64	0.00
45	T 1,2-Dichloropropane	0.236	0.214	9.3	62	0.00
46	T Bromodichloromethane	0.286	0.291	-1.7	66	0.00
47	T Trichloroethene	0.298	0.292	2.0	66	0.00
48	T 1,4-Dioxane	0.208	0.205	1.4	65	0.00
49	T 2,2,4-Trimethylpentane (Iso	1.015	0.866	14.7	62	0.00
50	T Methyl Methacrylate	0.100	0.106	-6.0	64	-0.01
51	T n-Heptane	0.249	0.218	12.4	61	0.00
52	T cis-1,3-Dichloropropene	0.374	0.370	1.1	64	0.00
53	T 4-Methyl-2-pentanone	0.213	0.206	3.3	62	0.00
54	T trans-1,3-Dichloropropene	0.314	0.333	-6.1	65	0.00
55	T 1,1,2-Trichloroethane	0.240	0.234	2.5	65	0.00

Data File : I:\MS13\DATA\2019 04\15\04151936.D
 Acq On : 16 Apr 2019 3:30
 Sample : CCVend R13041519 25ng
 Misc : S31-03201909/S31-03291903 (4/27)

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Apr 16 06:20:03 2019
 Quant Method : I:\MS13\METHODS\R13012319.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Wed Jan 23 11:21:29 2019
 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	71	0.00
57	S Toluene-d8 (SS2)	2.677	2.595	3.1	69	0.00
58	T Toluene	2.845	2.420	14.9	65	0.00
59	T 2-Hexanone	1.118	1.104	1.3	64	0.00
60	T Dibromochloromethane	0.693	0.739	-6.6	68	0.00
61	T 1,2-Dibromoethane	0.644	0.682	-5.9	67	0.00
62	T n-Butyl Acetate	1.298	1.224	5.7	63	0.00
63	T n-Octane	0.523	0.441	15.7	61	0.00
64	T Tetrachloroethene	0.871	0.836	4.0	68	0.00
65	T Chlorobenzene	1.887	1.735	8.1	66	0.00
66	T Ethylbenzene	3.062	2.744	10.4	64	0.00
67	T m- & p-Xylenes	2.364	2.107	10.9	65	0.00
68	T Bromoform	0.633	0.731	-15.5	70	0.00
69	T Styrene	1.848	1.828	1.1	64	0.00
70	T o-Xylene	2.356	2.087	11.4	65	0.00
71	T n-Nonane	1.152	0.968	16.0	62	0.00
72	T 1,1,2,2-Tetrachloroethane	1.104	1.029	6.8	64	0.00
73	S Bromofluorobenzene (SS3)	0.964	1.106	-14.7	81	0.00
74	T Cumene	3.215	2.833	11.9	65	0.00
75	T alpha-Pinene	1.539	1.422	7.6	63	0.00
76	T n-Propylbenzene	3.606	3.201	11.2	64	0.00
77	T 3-Ethyltoluene	3.056	2.977	2.6	70	0.00
78	T 4-Ethyltoluene	3.053	2.543	16.7	60	0.00
79	T 1,3,5-Trimethylbenzene	2.680	2.325	13.2	65	0.00
80	T alpha-Methylstyrene	1.323	1.363	-3.0	64	0.00
81	T 2-Ethyltoluene	3.180	2.760	13.2	65	0.00
82	T 1,2,4-Trimethylbenzene	2.600	2.359	9.3	66	0.00
83	T n-Decane	1.265	1.102	12.9	62	0.00
84	T Benzyl Chloride	1.901	2.070	-8.9	66	0.00
85	T 1,3-Dichlorobenzene	1.631	1.583	2.9	67	0.00
86	T 1,4-Dichlorobenzene	1.713	1.596	6.8	67	0.00
87	T sec-Butylbenzene	3.609	3.192	11.6	65	0.00
88	T 4-Isopropyltoluene (p-Cymen	3.369	3.091	8.3	66	0.00
89	T 1,2,3-Trimethylbenzene	2.572	2.377	7.6	66	0.00
90	T 1,2-Dichlorobenzene	1.592	1.517	4.7	67	0.00
91	T d-Limonene	0.907	0.817	9.9	58	0.00
92	T 1,2-Dibromo-3-Chloropropane	0.576	0.602	-4.5	68	0.00
93	T n-Undecane	1.167	1.166	0.1	61	0.00
94	T 1,2,4-Trichlorobenzene	1.212	1.259	-3.9	68	0.01
95	T Naphthalene	3.307	3.623	-9.6	64	0.00
96	T n-Dodecane	1.091	1.077	1.3	59	0.01
97	T Hexachlorobutadiene	0.901	0.820	9.0	70	0.01
98	T Cyclohexanone	0.862	0.821	4.8	67	0.00
99	T tert-Butylbenzene	2.651	2.395	9.7	67	0.00
100	T n-Butylbenzene	2.645	2.436	7.9	64	0.00

(#) = Out of Range

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

Data File : I:\MS13\DATA\2019 04\15\04151936.D
 Acq On : 16 Apr 2019 3:30
 Sample : CCVend R13041519 25ng
 Misc : S31-03201909/S31-03291903 (4/27)

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Apr 16 06:20:03 2019

Quant Method : I:\MS13\METHODS\R13012319.M

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

QLast Update : Wed Jan 23 11:21:29 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

4/16/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.98	130	89470	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.11	114	375238	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.43	82	152319	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.83	65	96026	12.588	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.72%
57) Toluene-d8 (SS2)	15.55	98	395265	12.118	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	96.96%
73) Bromofluorobenzene (SS3)	18.83	174	168495	14.347	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	114.80%

Target Compounds

						Qvalue
2) Propene	3.97	42	175911	22.597	ng	96
3) Dichlorodifluoromethan...	4.13	85	336970	25.336	ng	100
4) Chloromethane	4.41	50	260470	25.226	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.66	135	229986	26.831	ng	100
6) Vinyl Chloride	4.82	62	271912	27.468	ng	100
7) 1,3-Butadiene	5.08	54	200175	26.881	ng	94
8) Bromomethane	5.50	94	178813	25.175	ng	100
9) Chloroethane	5.83	64	130124	23.884	ng	99
10) Ethanol	6.22	45	618249	116.495	ng	98
11) Acetonitrile	6.46	41	317099	24.693	ng	98
12) Acrolein	6.64	56	112685	25.689	ng	99
13) Acetone	6.84	58	648328	114.975	ng	87
14) Trichlorofluoromethane	7.07	101	284217	25.502	ng	99
15) 2-Propanol (Isopropanol)	7.34	45	845432	49.232	ng	95
16) Acrylonitrile	7.59	53	233479	28.400	ng	98
17) 1,1-Dichloroethene	8.02	96	192724	25.908	ng	# 84
18) 2-Methyl-2-Propanol (t...	8.20	59	874155	51.788	ng	97
19) Methylene Chloride	8.26	84	190070	26.589	ng	92
20) 3-Chloro-1-propene (Al...	8.41	41	238688	24.916	ng	100
21) Trichlorotrifluoroethane	8.66	151	203028	25.817	ng	90
22) Carbon Disulfide	8.51	76	684831	23.454	ng	99
23) trans-1,2-Dichloroethene	9.53	61	237624	27.298	ng	91
24) 1,1-Dichloroethane	9.78	63	287075	23.182	ng	99
25) Methyl tert-Butyl Ether	9.88	73	528896	25.004	ng	100
26) Vinyl Acetate	10.05	86	234734	129.406	ng	# 94
27) 2-Butanone (MEK)	10.28	72	124486	24.083	ng	# 90
28) cis-1,2-Dichloroethene	10.80	61	225986	25.102	ng	90
29) Diisopropyl Ether	11.10	87	183619	25.306	ng	# 75
30) Ethyl Acetate	11.11	61	129330	50.521	ng	98
31) n-Hexane	11.08	57	251572	21.173	ng	# 100
32) Chloroform	11.14	83	295863	25.417	ng	98
34) Tetrahydrofuran (THF)	11.55	72	122602	23.371	ng	99
35) Ethyl tert-Butyl Ether	11.70	87	223706	24.828	ng	94
36) 1,2-Dichloroethane	11.95	62	194259	26.290	ng	99
38) 1,1,1-Trichloroethane	12.23	97	265078	26.758	ng	97
39) Isopropyl Acetate	12.66	61	222692	46.794	ng	# 91
40) 1-Butanol	12.69	56	357016	55.091	ng	# 74
41) Benzene	12.70	78	712090	22.981	ng	99
42) Carbon Tetrachloride	12.86	117	245176	26.896	ng	99
43) Cyclohexane	12.99	84	573167	47.075	ng	99
44) tert-Amyl Methyl Ether	13.35	73	509186	25.177	ng	97
45) 1,2-Dichloropropane	13.56	63	172187	24.296	ng	99
46) Bromodichloromethane	13.74	83	233213	27.187	ng	100
47) Trichloroethene	13.80	130	233021	26.017	ng	100
48) 1,4-Dioxane	13.78	88	163743	26.227	ng	96
49) 2,2,4-Trimethylpentane...	13.87	57	689888	22.634	ng	91
50) Methyl Methacrylate	14.01	100	169420	56.550	ng	94

Data File : I:\MS13\DATA\2019 04\15\04151936.D
 Acq On : 16 Apr 2019 3:30
 Sample : CCVend R13041519 25ng
 Misc : S31-03201909/S31-03291903 (4/27)

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Apr 16 06:20:03 2019
 Quant Method : I:\MS13\METHODS\R13012319.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Wed Jan 23 11:21:29 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.14	71	176146	23.585	ng	99
52) cis-1,3-Dichloropropene	14.67	75	311267	27.709	ng	100
53) 4-Methyl-2-pentanone	14.71	58	163525	25.611	ng	94
54) trans-1,3-Dichloropropene	15.18	75	263889	27.962	ng	100
55) 1,1,2-Trichloroethane	15.36	97	189137	26.265	ng	98
58) Toluene	15.65	91	775695	22.373	ng	99
59) 2-Hexanone	15.90	43	361208	26.512	ng	95
60) Dibromochloromethane	16.06	129	242173	28.670	ng	100
61) 1,2-Dibromoethane	16.31	107	223479	28.470	ng	100
62) n-Butyl Acetate	16.53	43	404445	25.580	ng	95
63) n-Octane	16.66	57	144515	22.684	ng	99
64) Tetrachloroethene	16.79	166	269297	25.378	ng	99
65) Chlorobenzene	17.47	112	563345	24.497	ng	100
66) Ethylbenzene	17.83	91	863356	23.136	ng	99
67) m- & p-Xylenes	18.00	91	1362943	47.313	ng	98
68) Bromoform	18.06	173	236753	30.683	ng	100
69) Styrene	18.33	104	590367	26.216	ng	96
70) o-Xylene	18.43	91	675350	23.523	ng	96
71) n-Nonane	18.63	43	315860	22.507	ng	99
72) 1,1,2,2-Tetrachloroethane	18.41	83	333390	24.782	ng	99
74) Cumene	18.96	105	912368	23.289	ng	99
75) alpha-Pinene	19.31	93	448348	23.907	ng	94
76) n-Propylbenzene	19.41	91	1049153	23.877	ng	97
77) 3-Ethyltoluene	19.50	105	963151	25.866	ng	99
78) 4-Ethyltoluene	19.54	105	822019	22.093	ng	99
79) 1,3,5-Trimethylbenzene	19.61	105	748793	22.929	ng	96
80) alpha-Methylstyrene	19.75	118	439360	27.255	ng	92
81) 2-Ethyltoluene	19.78	105	901332	23.260	ng	97
82) 1,2,4-Trimethylbenzene	19.98	105	767528	24.227	ng	95
83) n-Decane	20.07	57	361084	23.422	ng	99
84) Benzyl Chloride	20.09	91	662768	28.606	ng	97
85) 1,3-Dichlorobenzene	20.11	146	520904	26.202	ng	99
86) 1,4-Dichlorobenzene	20.17	146	525738	25.192	ng	99
87) sec-Butylbenzene	20.22	105	1033647	23.503	ng	98
88) 4-Isopropyltoluene (p-...	20.35	119	981209	23.902	ng	100
89) 1,2,3-Trimethylbenzene	20.35	105	754693	24.081	ng	95
90) 1,2-Dichlorobenzene	20.47	146	503107	25.928	ng	100
91) d-Limonene	20.48	68	251461	22.741	ng	99
92) 1,2-Dibromo-3-Chloropr...	20.85	157	191187	27.254	ng	83
93) n-Undecane	21.17	57	375324	26.401	ng	99
94) 1,2,4-Trichlorobenzene	21.98	180	408062	27.622	ng	100
95) Naphthalene	22.08	128	1131291	28.072	ng	100
96) n-Dodecane	22.08	57	338249	25.440	ng	99
97) Hexachlorobutadiene	22.40	225	263100	23.956	ng	100
98) Cyclohexanone	18.13	55	245628	23.393	ng	93
99) tert-Butylbenzene	19.98	119	778591	24.106	ng	100
100) n-Butylbenzene	20.72	91	789735	24.506	ng	98

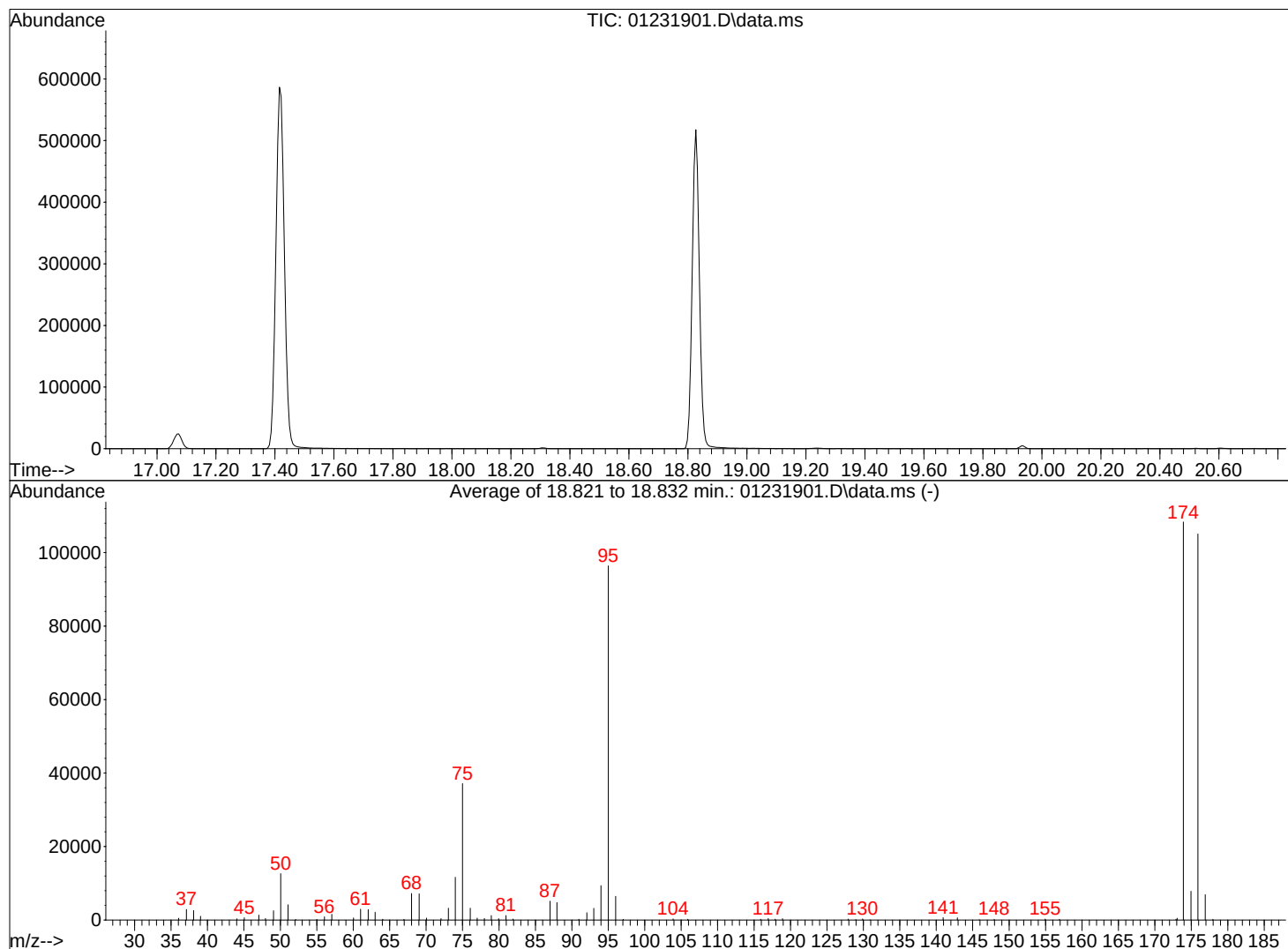
(#) = qualifier out of range (m) = manual integration (+) = signals summed

[illegible]

Data Path : I:\MS13\DATA\2019 01\23\
 Data File : 01231901.D
 Acq On : 23 Jan 2019 4:21
 Operator : WA
 Sample : BFB Std
 Misc : S31-01221908
 ALS Vial : 2 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS13\METHODS\R13012319.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Wed Jan 23 11:21:29 2019



AutoFind: Scans 2671, 2672, 2673; Background Corrected with Scan 2664

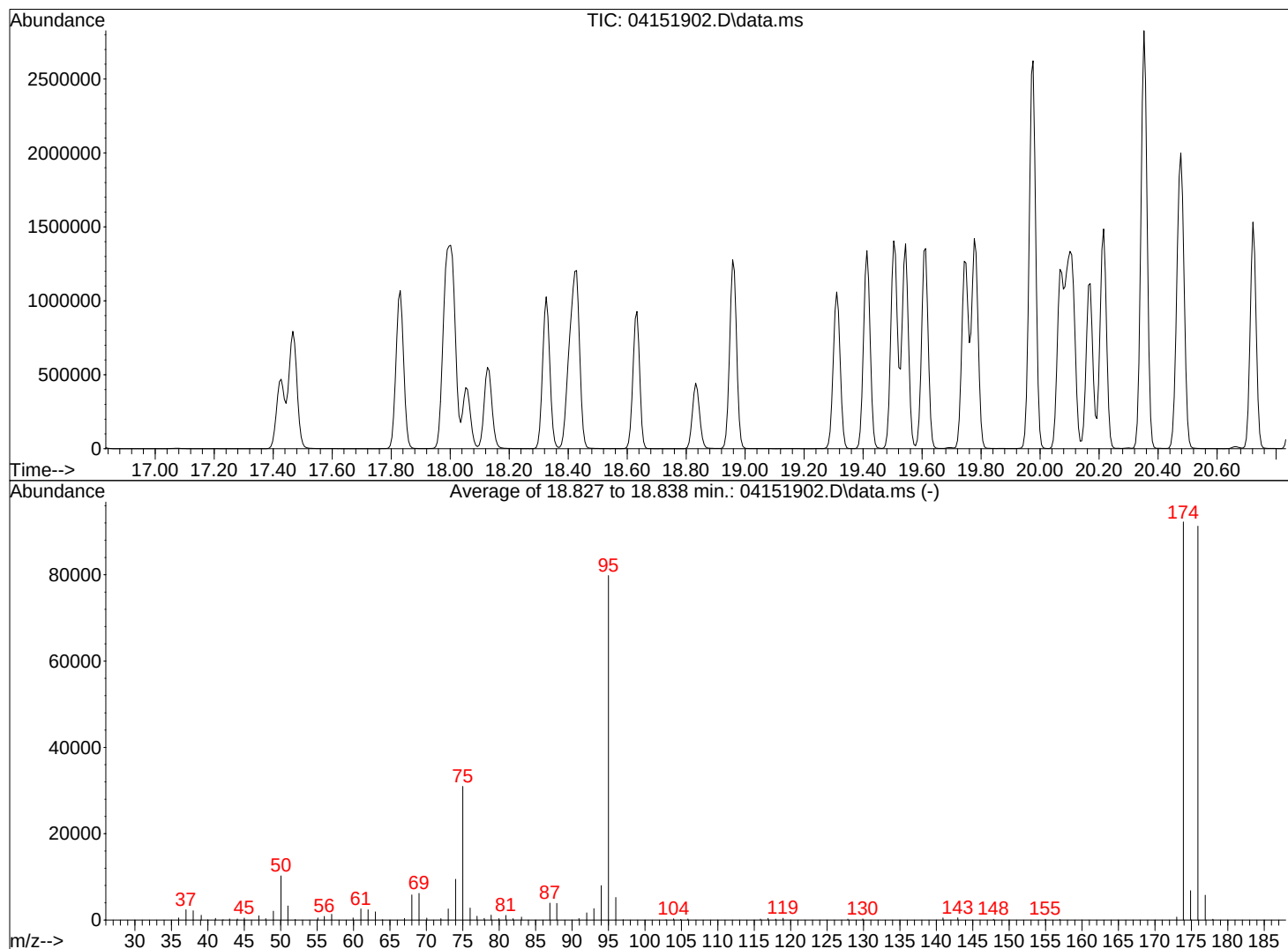
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	13.1	12653	PASS
75	95	30	66	38.5	37123	PASS
95	95	100	100	100.0	96387	PASS
96	95	5	9	6.7	6460	PASS
173	174	0.00	2	0.5	489	PASS
174	95	50	120	112.4	108333	PASS
175	174	4	9	7.2	7833	PASS
176	174	93	101	97.0	105085	PASS
177	176	5	9	6.6	6896	PASS

WA 1/23/19

Data Path : I:\MS13\DATA\2019 04\15\
 Data File : 04151902.D
 Acq On : 15 Apr 2019 7:42
 Operator : WA
 Sample : CCV R13041519 25ng
 Misc : S31-03201909/S31-03291903 (4/27)
 ALS Vial : 2 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS13\METHODS\R13012319.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Wed Jan 23 11:21:29 2019



AutoFind: Scans 2672, 2673, 2674; Background Corrected with Scan 2665

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	12.8	10222	PASS
75	95	30	66	38.8	30971	PASS
95	95	100	100	100.0	79819	PASS
96	95	5	9	6.6	5231	PASS
173	174	0.00	2	0.8	701	PASS
174	95	50	120	115.6	92237	PASS
175	174	4	9	7.4	6816	PASS
176	174	93	101	98.9	91251	PASS
177	176	5	9	6.3	5767	PASS

WA 4/15/19

Injection Log

Directory: I:\MS13\DATA\2019_01\23\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	1/23/19 4:21	01231901.D	BFB Std	S31-01221908	WA	2	Pass
2	1/23/19 4:55	01231902.D	Std check	S31-1212181/S31-01181901 (2/16)	WA	2	
3	1/23/19 5:28	01231903.D	Std check	S31-1212181/S31-01181901 (2/16)	WA	2	
4	1/23/19 6:01	01231904.D	0.5ng R13012319 ICAL Std	S31-01231908/S31-01161906 (2/14)	WA	15	R13012319.M
5	1/23/19 6:35	01231905.D	1.0ng R13012319 ICAL Std	S31-01231908/S31-01161906 (2/14)	WA	15	
6	1/23/19 8:07	01231906.D	0.1ng R13012319 ICAL Std	S31-01231908/S31-01221902 (2/20)	WA	14	
7	1/23/19 8:40	01231907.D	0.2ng R13012319 ICAL Std	S31-01231908/S31-01221902 (2/20)	WA	14	
8	1/23/19 9:13	01231908.D	5.0ng R13012319 ICAL Std	S31-01221908/S31-01161903 (2/14)	WA	16	
9	1/23/19 9:46	01231909.D	25ng R13012319 ICAL Std	S31-01221908/S31-01161903 (2/14)	WA	16	
10	1/23/19 10:20	01231910.D	50ng R13012319 ICAL Std	S31-01221908/S31-01161903 (2/14)	WA	16	
11	1/23/19 10:53	01231911.D	100ng R13012319 ICAL Std	S31-01221908/S31-01161903 (2/14)	WA	16	
12	1/23/19 11:31	01231912.D	25ng TO-15 ICV Std	S31-01221908/S31-12271803 (1/25)	WA	13	Pass all compds
	R13012319.M:good for low level compounds; ranges from 0.1ng -->100ng (except: chloroethane, CS2, Naphthalene: 0.2ng --> 100ng; Acetonitrile,						
	Acrolein, Acrylonitrile, MEK, cis/trans-1,3-DCP, Benzyl-Cl, n-Dodecane: 0.5ng --> 100ng; Ethyl Ac.: 1.0ng --> 200ng; Vinyl Ac.: 2.5ng --> 500ng						

 1/29/19

Injection Log

Directory: I:\MS13\DATA\2019_04\15\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	4/15/19 7:03	04151901.D	System	S31-03201909/S31-04031902 (5/2)	WA	2	
2	4/15/19 7:42	04151902.D	CCV R13041519_25ng	S31-03201909/S31-03291903 (4/27)	WA	2	Pass
3	4/15/19 8:16	04151903.D	CCV C13041519_5ng	S31-03201909/S31-03201904 (4/18)	WA	16	Pass
4	4/15/19 8:56	04151904.D	MB R13041519_1000mL	S31-03201909/AC00880	WA	2	Pass
5	4/15/19 9:29	04151905.D	LCS R13041519_25ng	S31-03201909/S31-03181913 (4/16)	WA	2	Pass
6	4/15/19 10:02	04151906.D	P1901858-005 (15mL)	S31-03201909	WA	12	
7	4/15/19 10:35	04151907.D	P1901859-003dil (40mL)	S31-03201909	WA	11	
8	4/15/19 11:08	04151908.D	P1901858-005dup (15mL)	S31-03201909	WA	12	Pass
9	4/15/19 11:41	04151909.D	Blank	S31-03201909	WA	3	
10	4/15/19 12:15	04151910.D	P1901859-004 (400mL)	S31-03201909	WA	13	
11	4/15/19 12:48	04151911.D	P1901859-004dil (20mL)	S31-03201909	WA	13	
12	4/15/19 13:21	04151912.D	P1901859-005 (400mL)	S31-03201909	WA	14	
13	4/15/19 14:26	04151913.D	P1901926-001 (3.0mL)	S31-03201909	WA	3	over diluted
14	4/15/19 15:01	04151914.D	P1901926-001 (5.0mL)	S31-03201909	WA	3	
15	4/15/19 15:35	04151915.D	P1901945-001dil (5.0mL)	S31-03201909	WA	3	over diluted
16	4/15/19 16:18	04151916.D	P1901945-001 (10mL)	S31-03201909	WA	3	
17	4/15/19 16:52	04151917.D	P1901859-005dil (40mL)	S31-03201909	WA	14	
18	4/15/19 17:25	04151918.D	P1901859-006 (400mL)	S31-03201909	WA	15	
19	4/15/19 17:58	04151919.D	P1901859-006dil (40mL)	S31-03201909	WA	15	
20	4/15/19 18:32	04151920.D	P1901884-001 (1000mL)	S31-03201909	WA	4	
21	4/15/19 19:05	04151921.D	P1901884-001dil (100mL)	S31-03201909	WA	4	not needed
22	4/15/19 19:39	04151922.D	CCV2 R19041519_25ng	S31-03201909/S31-03291903 (4/27)	WA	2	Pass
23	4/15/19 20:13	04151923.D	P1901926-002 (400mL)	S31-03201909	WA	1	
24	4/15/19 20:46	04151924.D	P1901950-001 (400mL) Pf2.	S31-03201909	WA	7	
25	4/15/19 21:20	04151925.D	P1901982-001 (400mL) Pf2.	S31-03201909	WA	5	
26	4/15/19 21:54	04151926.D	P1901944-001 (400mL) Pf2.	S31-03201909	WA	6	
27	4/15/19 22:27	04151927.D	P1901954-001 (400mL)	S31-03201909	WA	10	
28	4/15/19 23:01	04151928.D	P1901963-001 (400mL)	S31-03201909	WA	11	
29	4/15/19 23:34	04151929.D	P1901857-008 (200mL)	S31-03201909	WA	8	
30	4/16/19 0:08	04151930.D	P1901857-009 (20mL)	S31-03201909	WA	9	
31	4/16/19 0:42	04151931.D	Blank	S31-03201909	WA	3	
32	4/16/19 1:15	04151932.D	P1901983-001 (400mL)	S31-03201909	WA	12	
33	4/16/19 1:49	04151933.D	P1901983-002 (400mL)	S31-03201909	WA	13	need dil
34	4/16/19 2:22	04151934.D	LCSD R13041519_25ng	S31-03201909/S31-03181913 (4/16)	WA	2	Pass
35	4/16/19 2:56	04151935.D	Blank	S31-03201909	WA	3	
36	4/16/19 3:30	04151936.D	CCVend R13041519_25ng	S31-03201909/S31-03291903 (4/27)	WA	2	Pass

4/16/19

SIMIVALLEY QC Certification

Conditioner: P-Conditioner-02

Cycles: 30

Batch: 23340

Batch Started By: JUSTIN.FREEMAN on 3/21/19 1104
Finished Cleaning By: JUSTIN.FREEMAN on 3/21/19 1109

Container IDs	Cleaned Date	QC Date Analyzed	QC Results	Initial Vacuum			Final Vacuum			Comments
				Vacuum	Date/Time	User	Vacuum	Date/Time	User	
SC00265	3/21/19	3/25/19	Pass w/ Conditions	-14.3	3/21/19 1109	JUSTIN.FREEMAN	-14.0	3/26/19 0746	JHULETTE	MS21_03/25/19
SC01891	3/21/19	3/25/19	Pass w/ Conditions	-14.3	3/21/19 1109	JUSTIN.FREEMAN	-14.0	3/26/19 0131	JHULETTE	
SC00571	3/21/19	3/25/19	Pass w/ Conditions	-14.3	3/21/19 1109	JUSTIN.FREEMAN	-14.0	4/4/19 0106	JHULETTE	
SC00292	3/21/19	3/25/19	Pass w/ Conditions	-14.3	3/21/19 1109	JUSTIN.FREEMAN	-14.0	3/26/19 0132	JHULETTE	
SSC00130	3/21/19	3/25/19	Pass w/ Conditions	-14.3	3/21/19 1109	JUSTIN.FREEMAN	-14.0	3/26/19 0140	JHULETTE	GC22_03/26/2019
SC01807	3/21/19	3/25/19	Pass w/ Conditions	-14.3	3/21/19 1109	JUSTIN.FREEMAN	-14.0	3/26/19 0746	JHULETTE	
SSC00322	3/21/19	3/25/19	Pass w/ Conditions	-14.3	3/21/19 1109	JUSTIN.FREEMAN	-14.0	3/26/19 0131	JHULETTE	
SSC00056	3/21/19	3/25/19	Pass w/ Conditions	-14.3	3/21/19 1109	JUSTIN.FREEMAN	-14.0	3/26/19 0130	JHULETTE	
SC01088	3/21/19	3/25/19	Pass w/ Conditions	-14.3	3/21/19 1109	JUSTIN.FREEMAN	-14.0	3/26/19 0131	JHULETTE	GC22_03/26/2019
SSC00362	3/21/19	3/25/19	Pass w/ Conditions	-14.3	3/21/19 1109	JUSTIN.FREEMAN	-14.0	3/25/19 0311	JHULETTE	

Passed For: TO-15 (75 Comp 0.1 ug/m3)

Exceptions:

COMPONENTID Date / Time MODULE USER COMMENTS

Batch Comment:

* QC Canister

Data Path : I:\MS21\DATA\2019 03\25\
 Data File : 03251907.D
 Acq On : 25 Mar 2019 11:41
 Operator : RVT
 Sample : 032519 SC00571 23340
 Misc : LL ONLY (Sig #1); S31-03221903 (Sig #2)
 ALS Vial : 4 Sample Multiplier: 1

RVT 3/26/19

Quant Time: Mar 25 13:00:03 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	7.54	130	36484	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.77	114	128946	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.70	117	96189	1000.000	pg	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4 ...	8.35	65	49262	841.028	pg	0.00
Spiked Amount 1000.000			Recovery	=	84.10%	
57) Toluene-d8 (SS2)	12.61	98	117016	910.422	pg	0.00
Spiked Amount 1000.000			Recovery	=	91.04%	
74) Bromofluorobenzene (SS3)	16.14	174	34530	1400.839	pg	0.00
Spiked Amount 1000.000			Recovery	=	140.08%	

Target Compounds

						Qvalue
2) * Propene	3.51	42	4441	71.151	pg	# 78
3) * Dichlorodifluoromethane	3.57	85	314	2.325	pg	89
4) * Chloromethane	3.70	50	1196	16.962	pg	98
7) * 1,3-Butadiene	3.99	54	167	3.329	pg	# 1
8) * Bromomethane	4.20	94	98	1.815	pg	86
9) * Chloroethane	4.34	64	606	18.046	pg	99
10) * Ethanol	4.42	45	4563	160.677	pg	100
11) * Acetonitrile	4.59	41	1114	17.608	pg	95
12) * Acrolein	4.70	56	4011	111.377	pg	95
13) * Acetone	4.81	58	55644	1136.014	pg	# 49
14) * Trichlorofluoromethane	4.95	101	185	2.044	pg	96
15) * 2-Propanol (Isopropa...	5.01	45	5808	61.271	pg	92
16) * Acrylonitrile	5.17	53	641	10.371	pg	97
18) tert-Butanol	5.53	59	2064	37.453	pg	86
19) * Methylene Chloride	5.56	84	246	4.646	pg	94
22) * Carbon Disulfide	5.83	76	4344	29.532	pg	98
26) * Vinyl Acetate	6.69	86	974	122.367	pg	# 5
27) * 2-Butanone (MEK)	6.95	72	6363	214.655	pg	72
29) DIPE	7.62	45	73	0.521	pg	# 49
30) * Ethyl Acetate	7.63	61	112	10.248	pg	82
31) * n-Hexane	7.63	57	397	5.786	pg	# 60
39) * Benzene	9.32	78	305	1.696	pg	# 34
41) 1-Butanol	9.27	56	62915	174.358	pg	81
48) * 1,4-Dioxane	10.63	88	627	19.011	pg	97
49) Isooctane	10.71	56	516	7.211	pg	# 24
51) * n-Heptane	11.01	71	266	4.646	pg	# 79
53) * 4-Methyl-2-pentanone	11.70	58	293	10.916	pg	99
58) * Toluene	12.72	91	1154	6.864	pg	97
59) * 2-Hexanone	13.06	58	506	28.725	pg	95
63) * n-Octane	13.93	85	100	4.004	pg	98
66) * Ethylbenzene	15.14	91	208	1.530	pg	96
67) * m- & p-Xylenes	15.30	91	547	5.346	pg	96
69) Cyclohexanone	15.45	98	88	7.687	pg	91
70) * Styrene	15.65	104	69	1.273	pg	# 29
71) * o-Xylene	15.74	91	232	2.156	pg	88
72) * n-Nonane	15.98	57	168	3.732	pg	95
77) * n-Propylbenzene	16.72	91	231	1.812	pg	# 55
78) 3-Ethyltoluene	16.85	105	65	0.657	pg	# 44
79) * 4-Ethyltoluene	16.85	105	65	0.728	pg	# 46
83) tert-Butylbenzene	17.28	134	98	4.920	pg	# 1
84) * 1,2,4-Trimethylbenzene	17.26	105	208	2.437	pg	86
86) * 1,3-Dichlorobenzene	17.44	146	54	1.369	pg	# 62
87) * 1,4-Dichlorobenzene	17.44	146	54	1.594	pg	# 60
88) n-Decane	17.37	85	81	5.991	pg	# 54
90) 1,2,3-Trimethylbenzene	17.62	105	85	0.979	pg	# 62

Data Path : I:\MS21\DATA\2019 03\25\
 Data File : 03251907.D
 Acq On : 25 Mar 2019 11:41
 Operator : RVT
 Sample : 032519 SC00571 23340
 Misc : LL ONLY (Sig #1); S31-03221903 (Sig #2)
 ALS Vial : 4 Sample Multiplier: 1

Quant Time: Mar 25 13:00:03 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
91) p-Isopropyltoluene	17.62	134	91	3.405	pg	79
93) * D-Limonene	17.74	68	99	3.166	pg #	59
96) n-Undecane	18.42	85	244	31.169	pg #	1
98) * Naphthalene	19.29	128	73	3.822	pg #	67
99) n-Dodecane	19.30	85	53	30.370	pg #	1

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

Data Path : I:\MS21\DATA\2019 03\25\

Data File : 03251907.D

Acq On : 25 Mar 2019 11:41

Operator : RVT

Sample : 032519 SC00571 23340

Misc : LL ONLY (Sig #1); S31-03221903 (Sig #2)

ALS Vial : 4 Sample Multiplier: 1

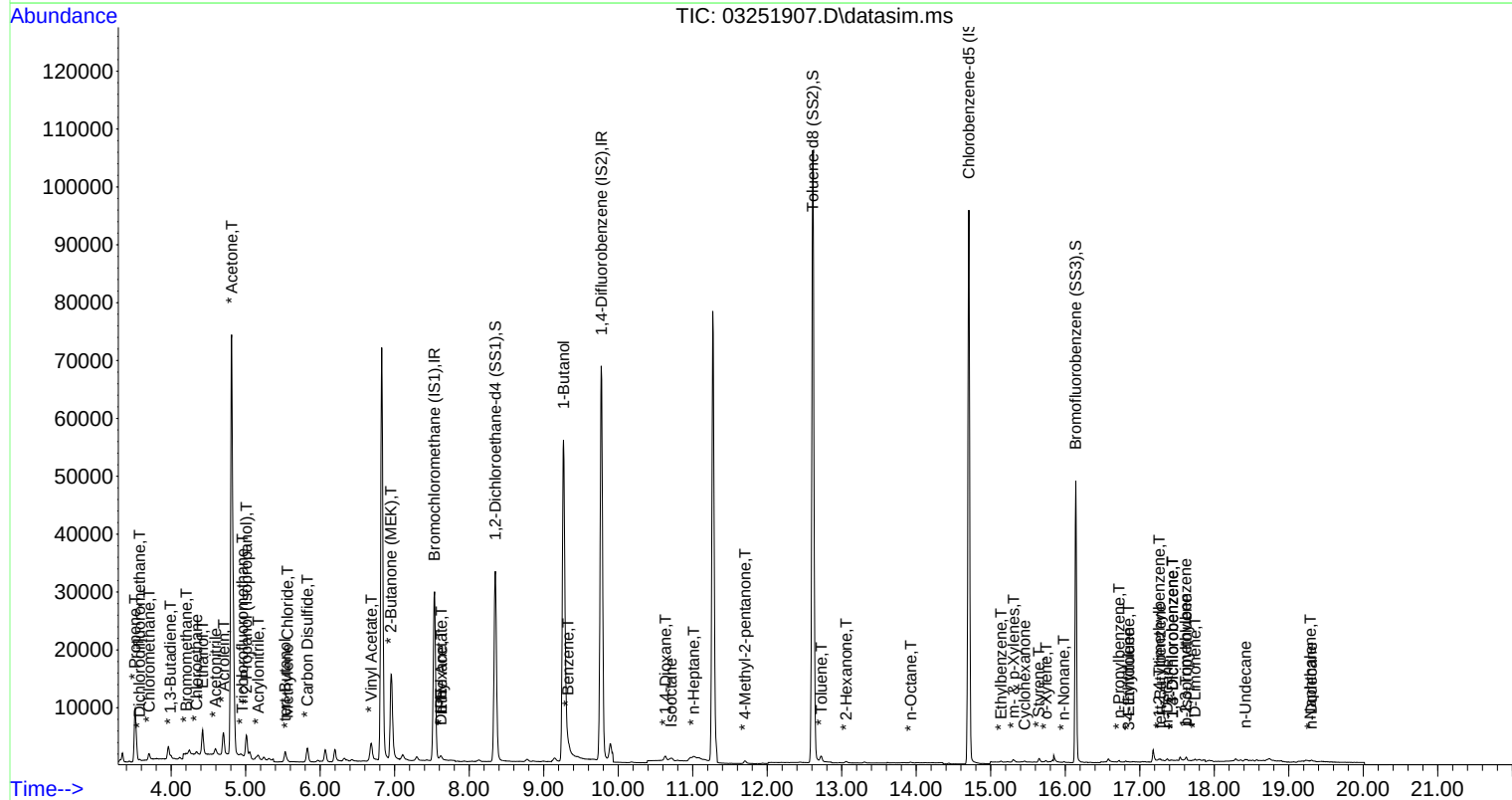
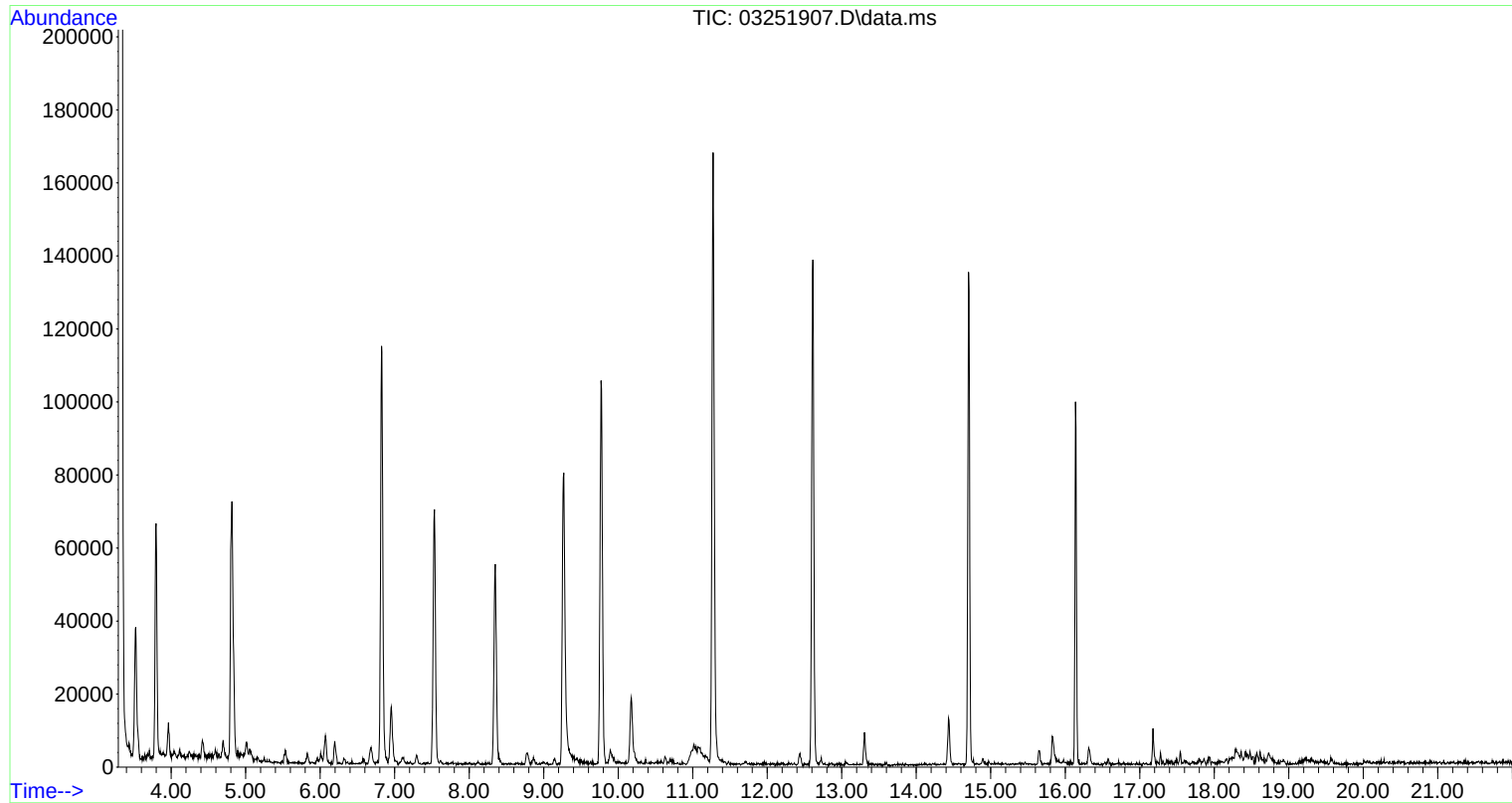
Quant Time: Mar 25 13:00:03 2019

Quant Method : I:\MS21\Methods\F21030819.M

Quant Title : EPA TO-15

QLast Update : Mon Mar 11 09:36:38 2019

Response via : Initial Calibration



ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: Trinity Analysis & Development Corp.

Client Sample ID: ODSVE-EFF-Y8Q3

Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1901884

ALS Sample ID: P1901884-001

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: SC01807

Date Collected: 4/2/19

Date Received: 4/5/19

Date Analyzed: 4/15/19

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -6.94

Final Pressure (psig): 4.00

Container Dilution Factor: 2.41

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	0.43	0.73	0.43	0.18	U
75-71-8	Dichlorodifluoromethane (CFC 12)	16	0.25	0.15	0.042	
74-87-3	Chloromethane	0.35	0.58	0.35	0.10	U
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	0.11	0.18	0.11	0.029	U
75-01-4	Vinyl Chloride	0.16	0.50	0.16	0.054	U
106-99-0	1,3-Butadiene	0.34	0.57	0.34	0.096	U
74-83-9	Bromomethane	0.099	0.31	0.099	0.046	U
75-00-3	Chloroethane	0.28	0.47	0.28	0.060	U
64-17-5	Ethanol	0.99	6.5	1.0	0.47	J
75-05-8	Acetonitrile	0.45	0.75	0.45	0.19	U
107-02-8	Acrolein	0.33	1.1	0.33	0.16	U
67-64-1	Acetone	2.7	5.5	2.7	1.2	U
75-69-4	Trichlorofluoromethane	0.32	0.23	0.14	0.035	
67-63-0	2-Propanol (Isopropyl Alcohol)	0.61	2.1	0.61	0.22	U
107-13-1	Acrylonitrile	0.34	0.58	0.34	0.12	U
75-35-4	1,1-Dichloroethene	0.73	0.33	0.10	0.045	
75-09-2	Methylene Chloride	0.22	0.37	0.22	0.10	U
107-05-1	3-Chloro-1-propene (Allyl Chloride)	0.13	0.41	0.13	0.055	U
76-13-1	Trichlorotrifluoroethane	3.3	0.17	0.053	0.024	
75-15-0	Carbon Disulfide	0.42	0.85	0.42	0.12	U
156-60-5	trans-1,2-Dichloroethene	0.37	0.32	0.10	0.045	
75-34-3	1,1-Dichloroethane	0.41	0.31	0.18	0.046	
1634-04-4	Methyl tert-Butyl Ether	0.11	0.36	0.11	0.042	U
108-05-4	Vinyl Acetate	1.8	3.6	1.8	0.82	U
78-93-3	2-Butanone (MEK)	0.25	0.82	0.25	0.090	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: ODSVE-EFF-Y8Q3

Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1901884

ALS Sample ID: P1901884-001

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: SC01807

Date Collected: 4/2/19

Date Received: 4/5/19

Date Analyzed: 4/15/19

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -6.94

Final Pressure (psig): 4.00

Container Dilution Factor: 2.41

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	28	0.32	0.10	0.046	
141-78-6	Ethyl Acetate	0.43	0.74	0.43	0.19	U
110-54-3	n-Hexane	0.41	0.37	0.22	0.075	
67-66-3	Chloroform	4.7	0.27	0.084	0.035	
109-99-9	Tetrahydrofuran (THF)	0.14	0.43	0.14	0.055	U
107-06-2	1,2-Dichloroethane	0.10	0.32	0.10	0.035	U
71-55-6	1,1,1-Trichloroethane	0.34	0.24	0.075	0.029	
71-43-2	Benzene	0.098	0.39	0.13	0.058	J
56-23-5	Carbon Tetrachloride	0.49	0.20	0.065	0.028	
110-82-7	Cyclohexane	0.44	0.70	0.23	0.11	J
78-87-5	1,2-Dichloropropane	0.089	0.28	0.089	0.034	U
75-27-4	Bromodichloromethane	0.061	0.19	0.061	0.028	U
79-01-6	Trichloroethene	25	0.24	0.076	0.032	
123-91-1	1,4-Dioxane	0.11	0.35	0.11	0.042	U
80-62-6	Methyl Methacrylate	0.38	0.65	0.38	0.11	U
142-82-5	n-Heptane	0.19	0.32	0.19	0.050	U
10061-01-5	cis-1,3-Dichloropropene	0.096	0.30	0.096	0.044	U
108-10-1	4-Methyl-2-pentanone	0.10	0.31	0.10	0.043	U
10061-02-6	trans-1,3-Dichloropropene	0.17	0.28	0.17	0.058	U
79-00-5	1,1,2-Trichloroethane	0.075	0.24	0.075	0.024	U
108-88-3	Toluene	0.18	0.34	0.11	0.042	J
591-78-6	2-Hexanone	0.10	0.32	0.10	0.039	U
124-48-1	Dibromochloromethane	0.048	0.15	0.048	0.020	U
106-93-4	1,2-Dibromoethane	0.053	0.17	0.053	0.019	U
123-86-4	n-Butyl Acetate	0.086	0.27	0.086	0.037	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.

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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-Y8Q3
Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1901884
 ALS Sample ID: P1901884-001

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: SC01807

Date Collected: 4/2/19
Date Received: 4/5/19
Date Analyzed: 4/15/19
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -6.94

Final Pressure (psig): 4.00

Container Dilution Factor: 2.41

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	0.17	0.28	0.17	0.062	U
127-18-4	Tetrachloroethene	2.8	0.19	0.060	0.025	
108-90-7	Chlorobenzene	0.089	0.28	0.089	0.037	U
100-41-4	Ethylbenzene	0.094	0.29	0.094	0.042	U
179601-23-1	m,p-Xylenes	0.10	0.61	0.19	0.078	J
75-25-2	Bromoform	0.075	0.12	0.075	0.026	U
100-42-5	Styrene	0.18	0.30	0.18	0.049	U
95-47-6	o-Xylene	0.043	0.29	0.094	0.043	J
111-84-2	n-Nonane	0.15	0.25	0.15	0.041	U
79-34-5	1,1,2,2-Tetrachloroethane	0.44	0.19	0.060	0.026	
98-82-8	Cumene	0.083	0.26	0.083	0.038	U
80-56-8	alpha-Pinene	0.13	0.22	0.13	0.035	U
103-65-1	n-Propylbenzene	0.083	0.26	0.083	0.038	U
622-96-8	4-Ethyltoluene	0.16	0.26	0.16	0.042	U
108-67-8	1,3,5-Trimethylbenzene	0.083	0.26	0.083	0.038	U
95-63-6	1,2,4-Trimethylbenzene	0.039	0.26	0.083	0.036	J
100-44-7	Benzyl Chloride	0.15	0.51	0.15	0.056	U
541-73-1	1,3-Dichlorobenzene	0.068	0.22	0.068	0.032	U
106-46-7	1,4-Dichlorobenzene	0.13	0.22	0.13	0.033	U
95-50-1	1,2-Dichlorobenzene	0.068	0.22	0.068	0.032	U
5989-27-5	d-Limonene	0.13	0.22	0.13	0.048	U
96-12-8	1,2-Dibromo-3-chloropropane	0.077	0.13	0.077	0.025	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.17	0.10	0.042	U
91-20-3	Naphthalene	0.15	0.23	0.14	0.060	J
87-68-3	Hexachlorobutadiene	0.072	0.12	0.072	0.025	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 / 10A023.002.330

ALS Project ID: P1901884

ALS Sample ID: P190415-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: 4/15/19

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	0.18	0.30	0.18	0.076	U
75-71-8	Dichlorodifluoromethane (CFC 12)	0.063	0.11	0.063	0.018	U
74-87-3	Chloromethane	0.15	0.24	0.15	0.042	U
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	0.044	0.073	0.044	0.012	U
75-01-4	Vinyl Chloride	0.067	0.21	0.067	0.022	U
106-99-0	1,3-Butadiene	0.14	0.24	0.14	0.040	U
74-83-9	Bromomethane	0.041	0.13	0.041	0.019	U
75-00-3	Chloroethane	0.12	0.19	0.12	0.025	U
64-17-5	Ethanol	0.44	2.7	0.44	0.20	U
75-05-8	Acetonitrile	0.18	0.31	0.18	0.077	U
107-02-8	Acrolein	0.14	0.44	0.14	0.065	U
67-64-1	Acetone	1.1	2.3	1.1	0.51	U
75-69-4	Trichlorofluoromethane	0.057	0.094	0.057	0.014	U
67-63-0	2-Propanol (Isopropyl Alcohol)	0.25	0.85	0.25	0.090	U
107-13-1	Acrylonitrile	0.14	0.24	0.14	0.051	U
75-35-4	1,1-Dichloroethene	0.043	0.14	0.043	0.019	U
75-09-2	Methylene Chloride	0.092	0.16	0.092	0.043	U
107-05-1	3-Chloro-1-propene (Allyl Chloride)	0.054	0.17	0.054	0.023	U
76-13-1	Trichlorotrifluoroethane	0.022	0.069	0.022	0.0099	U
75-15-0	Carbon Disulfide	0.17	0.35	0.17	0.051	U
156-60-5	trans-1,2-Dichloroethene	0.043	0.13	0.043	0.019	U
75-34-3	1,1-Dichloroethane	0.077	0.13	0.077	0.019	U
1634-04-4	Methyl tert-Butyl Ether	0.047	0.15	0.047	0.017	U
108-05-4	Vinyl Acetate	0.74	1.5	0.74	0.34	U
78-93-3	2-Butanone (MEK)	0.11	0.34	0.11	0.037	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 / 10A023.002.330

ALS Project ID: P1901884

ALS Sample ID: P190415-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: 4/15/19

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	0.043	0.13	0.043	0.019	U
141-78-6	Ethyl Acetate	0.18	0.31	0.18	0.078	U
110-54-3	n-Hexane	0.091	0.15	0.091	0.031	U
67-66-3	Chloroform	0.035	0.11	0.035	0.015	U
109-99-9	Tetrahydrofuran (THF)	0.058	0.18	0.058	0.023	U
107-06-2	1,2-Dichloroethane	0.042	0.13	0.042	0.015	U
71-55-6	1,1,1-Trichloroethane	0.031	0.099	0.031	0.012	U
71-43-2	Benzene	0.053	0.16	0.053	0.024	U
56-23-5	Carbon Tetrachloride	0.027	0.083	0.027	0.012	U
110-82-7	Cyclohexane	0.096	0.29	0.096	0.044	U
78-87-5	1,2-Dichloropropane	0.037	0.12	0.037	0.014	U
75-27-4	Bromodichloromethane	0.025	0.079	0.025	0.011	U
79-01-6	Trichloroethene	0.032	0.099	0.032	0.013	U
123-91-1	1,4-Dioxane	0.047	0.15	0.047	0.017	U
80-62-6	Methyl Methacrylate	0.16	0.27	0.16	0.046	U
142-82-5	n-Heptane	0.078	0.13	0.078	0.021	U
10061-01-5	cis-1,3-Dichloropropene	0.040	0.12	0.040	0.018	U
108-10-1	4-Methyl-2-pentanone	0.041	0.13	0.041	0.018	U
10061-02-6	trans-1,3-Dichloropropene	0.071	0.12	0.071	0.024	U
79-00-5	1,1,2-Trichloroethane	0.031	0.099	0.031	0.0099	U
108-88-3	Toluene	0.045	0.14	0.045	0.017	U
591-78-6	2-Hexanone	0.042	0.13	0.042	0.016	U
124-48-1	Dibromochloromethane	0.020	0.063	0.020	0.0082	U
106-93-4	1,2-Dibromoethane	0.022	0.070	0.022	0.0081	U
123-86-4	n-Butyl Acetate	0.036	0.11	0.036	0.015	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 / 10A023.002.330

ALS Project ID: P1901884
 ALS Sample ID: P190415-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: 4/15/19
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	0.069	0.12	0.069	0.026	U
127-18-4	Tetrachloroethene	0.025	0.078	0.025	0.010	U
108-90-7	Chlorobenzene	0.037	0.12	0.037	0.015	U
100-41-4	Ethylbenzene	0.039	0.12	0.039	0.017	U
179601-23-1	m,p-Xylenes	0.078	0.25	0.078	0.032	U
75-25-2	Bromoform	0.031	0.051	0.031	0.011	U
100-42-5	Styrene	0.075	0.12	0.075	0.020	U
95-47-6	o-Xylene	0.039	0.12	0.039	0.018	U
111-84-2	n-Nonane	0.061	0.10	0.061	0.017	U
79-34-5	1,1,2,2-Tetrachloroethane	0.025	0.077	0.025	0.011	U
98-82-8	Cumene	0.035	0.11	0.035	0.016	U
80-56-8	alpha-Pinene	0.056	0.093	0.056	0.015	U
103-65-1	n-Propylbenzene	0.035	0.11	0.035	0.016	U
622-96-8	4-Ethyltoluene	0.065	0.11	0.065	0.017	U
108-67-8	1,3,5-Trimethylbenzene	0.035	0.11	0.035	0.016	U
95-63-6	1,2,4-Trimethylbenzene	0.035	0.11	0.035	0.015	U
100-44-7	Benzyl Chloride	0.062	0.21	0.062	0.023	U
541-73-1	1,3-Dichlorobenzene	0.028	0.090	0.028	0.013	U
106-46-7	1,4-Dichlorobenzene	0.053	0.090	0.053	0.014	U
95-50-1	1,2-Dichlorobenzene	0.028	0.090	0.028	0.013	U
5989-27-5	d-Limonene	0.054	0.092	0.054	0.020	U
96-12-8	1,2-Dibromo-3-chloropropane	0.032	0.054	0.032	0.010	U
120-82-1	1,2,4-Trichlorobenzene	0.043	0.071	0.043	0.018	U
91-20-3	Naphthalene	0.059	0.097	0.059	0.025	U
87-68-3	Hexachlorobutadiene	0.030	0.050	0.030	0.010	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 / 10A023.002.330

ALS Project ID: P1901884

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: 4/2/19
Date(s) Received: 4/5/19
Date(s) Analyzed: 4/15/19

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	P190415-MB	103	97	110	70-130	
Lab Control Sample	P190415-LCS	102	96	113	70-130	
Duplicate Lab Control Sample	P190415-DLCS	105	101	120	70-130	
ODSVE-EFF-Y8Q3	P1901884-001	103	98	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 / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 3

Client: Trinity Analysis & Development Corp.

Client Sample ID: Duplicate Lab Control Sample

Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1901884

ALS Sample ID: P190415-DLCS

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: 4/16/19

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount		Result		% Recovery		DOD		RPD	RPD	Data
		LCS / DLCS		LCS	DLCS	LCS	DLCS	Acceptance				
		ppbV		ppbV	ppbV			Limits			Limit	Qualifier
115-07-1	Propene	123		102	101	83	82	57-136		1	25	
75-71-8	Dichlorodifluoromethane (CFC 12)	42.6		38.0	38.5	89	90	59-128		1	25	
74-87-3	Chloromethane	102		90.3	93.2	89	91	59-132		2	25	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	30.2		28.4	29.5	94	98	63-121		4	25	
75-01-4	Vinyl Chloride	83.7		80.0	82.3	96	98	64-127		2	25	
106-99-0	1,3-Butadiene	95.1		95.0	85.3	100	90	66-134		11	25	
74-83-9	Bromomethane	54.6		51.3	51.6	94	95	63-134		1	25	
75-00-3	Chloroethane	81.1		70.3	71.8	87	89	63-127		2	25	
64-17-5	Ethanol	544		476	477	88	88	59-125		0	25	
75-05-8	Acetonitrile	123		110	111	89	90	63-132		1	25	
107-02-8	Acrolein	89.4		84.6	84.5	95	95	62-126		0	25	
67-64-1	Acetone	446		369	373	83	84	58-128		1	25	
75-69-4	Trichlorofluoromethane	37.6		34.1	35.4	91	94	62-126		3	25	
67-63-0	2-Propanol (Isopropyl Alcohol)	168		151	154	90	92	52-125		2	25	
107-13-1	Acrylonitrile	95.4		99.2	101	104	106	71-137		2	25	
75-35-4	1,1-Dichloroethene	55.0		49.9	50.7	91	92	61-133		1	25	
75-09-2	Methylene Chloride	62.4		58.2	59.4	93	95	62-115		2	25	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	69.0		64.2	65.1	93	94	71-131		1	25	
76-13-1	Trichlorotrifluoroethane	28.1		25.6	26.2	91	93	66-126		2	25	
75-15-0	Carbon Disulfide	69.9		57.5	58.4	82	84	57-134		2	25	
156-60-5	trans-1,2-Dichloroethene	53.9		52.3	53.3	97	99	67-124		2	25	
75-34-3	1,1-Dichloroethane	53.3		45.4	46.0	85	86	68-126		1	25	
1634-04-4	Methyl tert-Butyl Ether	59.5		52.5	53.7	88	90	66-126		2	25	
108-05-4	Vinyl Acetate	302		279	283	92	94	56-139		2	25	
78-93-3	2-Butanone (MEK)	70.4		62.9	63.7	89	90	67-130		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 2 of 3

Client: Trinity Analysis & Development Corp.

Client Sample ID: Duplicate Lab Control Sample

Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1901884

ALS Sample ID: P190415-DLCS

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: 4/16/19

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	53.2	47.9	48.4	90	91	70-121	1	25	
141-78-6	Ethyl Acetate	121	106	108	88	89	65-128	1	25	
110-54-3	n-Hexane	61.2	47.1	47.6	77	78	63-120	1	25	
67-66-3	Chloroform	44.4	39.2	39.8	88	90	68-123	2	25	
109-99-9	Tetrahydrofuran (THF)	73.3	60.7	60.2	83	82	64-123	1	25	
107-06-2	1,2-Dichloroethane	53.1	49.1	49.7	92	94	65-128	2	25	
71-55-6	1,1,1-Trichloroethane	39.5	36.3	36.8	92	93	68-125	1	25	
71-43-2	Benzene	66.1	55.7	56.1	84	85	69-119	1	25	
56-23-5	Carbon Tetrachloride	33.7	32.4	33.2	96	99	68-132	3	25	
110-82-7	Cyclohexane	121	104	105	86	87	70-117	1	25	
78-87-5	1,2-Dichloropropane	46.7	40.3	40.7	86	87	69-123	1	25	
75-27-4	Bromodichloromethane	32.0	30.9	31.5	97	98	72-128	1	25	
79-01-6	Trichloroethene	39.7	36.6	37.4	92	94	71-123	2	25	
123-91-1	1,4-Dioxane	59.4	55.2	55.6	93	94	71-122	1	25	
80-62-6	Methyl Methacrylate	105	105	107	100	102	70-128	2	25	
142-82-5	n-Heptane	52.5	44.1	44.8	84	85	69-123	1	25	
10061-01-5	cis-1,3-Dichloropropene	47.2	43.6	44.1	92	93	70-128	1	25	
108-10-1	4-Methyl-2-pentanone	51.1	47.8	48.0	94	94	67-130	0	25	
10061-02-6	trans-1,3-Dichloropropene	46.9	46.1	46.9	98	100	75-133	2	25	
79-00-5	1,1,2-Trichloroethane	39.4	36.3	37.0	92	94	73-119	2	25	
108-88-3	Toluene	56.3	43.8	45.8	78	81	66-119	4	25	
591-78-6	2-Hexanone	52.3	48.3	49.6	92	95	62-128	3	25	
124-48-1	Dibromochloromethane	25.0	25.0	26.0	100	104	70-130	4	25	
106-93-4	1,2-Dibromoethane	28.1	27.4	28.2	98	100	74-122	2	25	
123-86-4	n-Butyl Acetate	46.1	40.6	41.2	88	89	64-128	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: Trinity Analysis & Development Corp.

Client Sample ID: Duplicate Lab Control Sample

Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1901884

ALS Sample ID: P190415-DLCS

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: 4/16/19

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	46.5	36.5	37.6	78	81	69-121	4	25	
127-18-4	Tetrachloroethene	31.4	27.9	28.8	89	92	66-124	3	25	
108-90-7	Chlorobenzene	46.6	39.6	40.6	85	87	70-119	2	25	
100-41-4	Ethylbenzene	48.9	39.9	40.8	82	83	70-124	1	25	
179601-23-1	m,p-Xylenes	98.2	80.5	82.5	82	84	61-134	2	25	
75-25-2	Bromoform	20.6	21.8	22.6	106	110	66-139	4	25	
100-42-5	Styrene	49.8	45.3	46.4	91	93	73-127	2	25	
95-47-6	o-Xylene	49.3	40.4	41.5	82	84	67-125	2	25	
111-84-2	n-Nonane	40.9	32.2	33.0	79	81	63-128	3	25	
79-34-5	1,1,2,2-Tetrachloroethane	31.2	26.8	27.5	86	88	65-127	2	25	
98-82-8	Cumene	43.6	35.6	35.9	82	82	68-124	0	25	
80-56-8	alpha-Pinene	37.9	32.8	32.3	87	85	65-120	2	25	
103-65-1	n-Propylbenzene	44.3	36.6	37.5	83	85	69-123	2	25	
622-96-8	4-Ethyltoluene	43.6	35.0	35.6	80	82	67-129	2	25	
108-67-8	1,3,5-Trimethylbenzene	43.5	35.0	36.0	80	83	67-130	4	25	
95-63-6	1,2,4-Trimethylbenzene	43.8	36.7	37.8	84	86	66-132	2	25	
100-44-7	Benzyl Chloride	41.9	39.8	41.1	95	98	50-147	3	25	
541-73-1	1,3-Dichlorobenzene	35.9	31.8	32.9	89	92	65-130	3	25	
106-46-7	1,4-Dichlorobenzene	35.9	30.4	31.1	85	87	60-131	2	25	
95-50-1	1,2-Dichlorobenzene	35.9	31.9	32.8	89	91	63-129	2	25	
5989-27-5	d-Limonene	37.9	33.1	29.2	87	77	66-124	12	25	
96-12-8	1,2-Dibromo-3-chloropropane	21.7	21.2	21.8	98	100	67-138	2	25	
120-82-1	1,2,4-Trichlorobenzene	28.9	26.9	27.6	93	96	55-142	3	25	
91-20-3	Naphthalene	38.7	37.3	37.9	96	98	57-138	2	25	
87-68-3	Hexachlorobutadiene	19.6	16.8	17.3	86	88	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.



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LABORATORY REPORT

June 28, 2019

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

RE: DDMT / 10A023.002.330

Dear Todd:

Enclosed are the results of the sample submitted to our laboratory on June 7, 2019. For your reference, this analysis has been assigned our service request number P1903275.

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 9:48 am, 06/28/19

Kate Kaneko
Laboratory Director



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

Client: Trinity Analysis & Development Corp.
Project: DDMT / 10A023.002.330

Service Request No: P1903275

CASE NARRATIVE

The sample was received intact under chain of custody on June 7, 2019 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 integrations were performed on the following sample(s) and analyte(s). Refer to the raw data for additional information.

Sample Identification(s)	Analyte(s)
P1903275-001	Acrolein

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
Alaska DEC	http://dec.alaska.gov/eh/lab.aspx	17-019
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/page/la-lab-accreditation	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml	2018027
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1521096
New Jersey DEP (NELAP)	http://www.nj.gov/dep/enforcement/oqa.html	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-006
Pennsylvania DEP	http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlab.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/agency/qa/env_lab_accreditation.html	T104704413-18-9
Utah DOH (NELAP)	http://health.utah.gov/lab/lab_cert_env	CA016272019-10
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 / 10A023.002.330

Service Request: P1903275

Date Received: 6/7/2019
Time Received: 10:00

TO-15 - VOC Cans

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)
ODSVE-EFF-Y8Q4	P1903275-001	Air	6/4/2019	08:30	SC02184	-9.03	3.82

X



Page 1 of 1

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ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: Trinity Analysis & Development Corp.

Client Sample ID: ODSVE-EFF-Y8Q4

Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1903275

ALS Sample ID: P1903275-001

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: SC02184

Date Collected: 6/4/19

Date Received: 6/7/19

Date Analyzed: 6/19/19

Volume(s) Analyzed: 1.00 Liter(s)

0.10 Liter(s)

Initial Pressure (psig): -9.03

Final Pressure (psig): 3.82

Container Dilution Factor: 3.27

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	7.5	0.99	0.59	0.25	
75-71-8	Dichlorodifluoromethane (CFC 12)	4.1	0.34	0.21	0.058	
74-87-3	Chloromethane	0.48	0.79	0.48	0.14	U
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	0.15	0.24	0.15	0.039	U
75-01-4	Vinyl Chloride	0.22	0.68	0.22	0.073	U
106-99-0	1,3-Butadiene	0.46	0.77	0.46	0.13	U
74-83-9	Bromomethane	0.13	0.42	0.13	0.062	U
75-00-3	Chloroethane	0.38	0.63	0.38	0.082	U
64-17-5	Ethanol	46	8.9	1.4	0.64	
75-05-8	Acetonitrile	0.60	1.0	0.60	0.25	U
107-02-8	Acrolein	3.5	1.4	0.44	0.21	
67-64-1	Acetone	110	7.4	3.7	1.7	
75-69-4	Trichlorofluoromethane	0.33	0.31	0.19	0.047	
67-63-0	2-Propanol (Isopropyl Alcohol)	20	2.8	0.83	0.29	
107-13-1	Acrylonitrile	0.47	0.78	0.47	0.17	U
75-35-4	1,1-Dichloroethene	0.24	0.45	0.14	0.061	J
75-09-2	Methylene Chloride	1.1	0.51	0.30	0.14	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	0.18	0.55	0.18	0.075	U
76-13-1	Trichlorotrifluoroethane	1.5	0.23	0.073	0.032	
75-15-0	Carbon Disulfide	3.8	1.2	0.57	0.17	
156-60-5	trans-1,2-Dichloroethene	0.28	0.44	0.14	0.061	J
75-34-3	1,1-Dichloroethane	0.16	0.42	0.25	0.063	J
1634-04-4	Methyl tert-Butyl Ether	0.15	0.49	0.15	0.057	U
108-05-4	Vinyl Acetate	2.4	4.9	2.4	1.1	U
78-93-3	2-Butanone (MEK)	13	1.1	0.34	0.12	

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-Y8Q4

Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1903275

ALS Sample ID: P1903275-001

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: SC02184

Date Collected: 6/4/19

Date Received: 6/7/19

Date Analyzed: 6/19/19

Volume(s) Analyzed: 1.00 Liter(s)

0.10 Liter(s)

Initial Pressure (psig): -9.03

Final Pressure (psig): 3.82

Container Dilution Factor: 3.27

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	13	0.44	0.14	0.062	
141-78-6	Ethyl Acetate	330	10	5.9	2.5	D
110-54-3	n-Hexane	7.9	0.50	0.30	0.10	
67-66-3	Chloroform	2.0	0.36	0.11	0.048	
109-99-9	Tetrahydrofuran (THF)	0.65	0.59	0.19	0.074	
107-06-2	1,2-Dichloroethane	0.14	0.43	0.14	0.048	U
71-55-6	1,1,1-Trichloroethane	0.11	0.32	0.10	0.040	J
71-43-2	Benzene	1.4	0.53	0.17	0.079	
56-23-5	Carbon Tetrachloride	0.24	0.27	0.088	0.038	J
110-82-7	Cyclohexane	5.3	0.95	0.31	0.14	
78-87-5	1,2-Dichloropropane	0.048	0.38	0.12	0.047	J
75-27-4	Bromodichloromethane	0.083	0.26	0.083	0.038	U
79-01-6	Trichloroethene	9.4	0.32	0.10	0.044	
123-91-1	1,4-Dioxane	0.15	0.48	0.15	0.057	U
80-62-6	Methyl Methacrylate	0.51	0.88	0.51	0.15	U
142-82-5	n-Heptane	8.6	0.43	0.26	0.068	
10061-01-5	cis-1,3-Dichloropropene	0.13	0.40	0.13	0.060	U
108-10-1	4-Methyl-2-pentanone	0.77	0.42	0.14	0.058	
10061-02-6	trans-1,3-Dichloropropene	0.23	0.38	0.23	0.079	U
79-00-5	1,1,2-Trichloroethane	0.10	0.32	0.10	0.032	U
108-88-3	Toluene	29	0.46	0.15	0.056	
591-78-6	2-Hexanone	0.14	0.43	0.14	0.053	U
124-48-1	Dibromochloromethane	0.065	0.21	0.065	0.027	U
106-93-4	1,2-Dibromoethane	0.072	0.23	0.072	0.026	U
123-86-4	n-Butyl Acetate	3.8	0.37	0.12	0.050	

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-Y8Q4
Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1903275
 ALS Sample ID: P1903275-001

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: SC02184

Date Collected: 6/4/19
Date Received: 6/7/19
Date Analyzed: 6/19/19
Volume(s) Analyzed: 1.00 Liter(s)
 0.10 Liter(s)

Initial Pressure (psig): -9.03

Final Pressure (psig): 3.82

Container Dilution Factor: 3.27

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	3.2	0.38	0.22	0.084	
127-18-4	Tetrachloroethene	1.7	0.26	0.082	0.033	
108-90-7	Chlorobenzene	0.12	0.38	0.12	0.050	U
100-41-4	Ethylbenzene	1.9	0.39	0.13	0.056	
179601-23-1	m,p-Xylenes	4.6	0.83	0.26	0.11	
75-25-2	Bromoform	0.10	0.17	0.10	0.035	U
100-42-5	Styrene	2.9	0.41	0.25	0.066	
95-47-6	o-Xylene	2.1	0.40	0.13	0.058	
111-84-2	n-Nonane	3.0	0.34	0.20	0.056	
79-34-5	1,1,2,2-Tetrachloroethane	0.081	0.25	0.081	0.035	U
98-82-8	Cumene	0.27	0.35	0.11	0.051	J
80-56-8	alpha-Pinene	14	0.31	0.18	0.048	
103-65-1	n-Propylbenzene	0.49	0.36	0.11	0.051	
622-96-8	4-Ethyltoluene	0.62	0.35	0.21	0.057	
108-67-8	1,3,5-Trimethylbenzene	0.67	0.35	0.11	0.051	
95-63-6	1,2,4-Trimethylbenzene	2.2	0.35	0.11	0.049	
100-44-7	Benzyl Chloride	0.20	0.70	0.20	0.076	U
541-73-1	1,3-Dichlorobenzene	0.076	0.29	0.092	0.044	J
106-46-7	1,4-Dichlorobenzene	0.17	0.29	0.17	0.045	U
95-50-1	1,2-Dichlorobenzene	0.092	0.29	0.092	0.043	U
5989-27-5	d-Limonene	2.5	0.30	0.18	0.065	
96-12-8	1,2-Dibromo-3-chloropropane	0.10	0.18	0.10	0.034	U
120-82-1	1,2,4-Trichlorobenzene	0.14	0.23	0.14	0.057	U
91-20-3	Naphthalene	0.41	0.32	0.19	0.081	
87-68-3	Hexachlorobutadiene	0.098	0.16	0.098	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.
 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 / 10A023.002.330

ALS Project ID: P1903275

ALS Sample ID: P190618-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: 6/18/19

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	0.18	0.30	0.18	0.076	U
75-71-8	Dichlorodifluoromethane (CFC 12)	0.063	0.11	0.063	0.018	U
74-87-3	Chloromethane	0.15	0.24	0.15	0.042	U
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	0.044	0.073	0.044	0.012	U
75-01-4	Vinyl Chloride	0.067	0.21	0.067	0.022	U
106-99-0	1,3-Butadiene	0.14	0.24	0.14	0.040	U
74-83-9	Bromomethane	0.041	0.13	0.041	0.019	U
75-00-3	Chloroethane	0.12	0.19	0.12	0.025	U
64-17-5	Ethanol	0.44	2.7	0.44	0.20	U
75-05-8	Acetonitrile	0.18	0.31	0.18	0.077	U
107-02-8	Acrolein	0.14	0.44	0.14	0.065	U
67-64-1	Acetone	1.1	2.3	1.1	0.51	U
75-69-4	Trichlorofluoromethane	0.057	0.094	0.057	0.014	U
67-63-0	2-Propanol (Isopropyl Alcohol)	0.25	0.85	0.25	0.090	U
107-13-1	Acrylonitrile	0.14	0.24	0.14	0.051	U
75-35-4	1,1-Dichloroethene	0.043	0.14	0.043	0.019	U
75-09-2	Methylene Chloride	0.092	0.16	0.092	0.043	U
107-05-1	3-Chloro-1-propene (Allyl Chloride)	0.054	0.17	0.054	0.023	U
76-13-1	Trichlorotrifluoroethane	0.022	0.069	0.022	0.0099	U
75-15-0	Carbon Disulfide	0.17	0.35	0.17	0.051	U
156-60-5	trans-1,2-Dichloroethene	0.043	0.13	0.043	0.019	U
75-34-3	1,1-Dichloroethane	0.077	0.13	0.077	0.019	U
1634-04-4	Methyl tert-Butyl Ether	0.047	0.15	0.047	0.017	U
108-05-4	Vinyl Acetate	0.74	1.5	0.74	0.34	U
78-93-3	2-Butanone (MEK)	0.11	0.34	0.11	0.037	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 / 10A023.002.330

ALS Project ID: P1903275

ALS Sample ID: P190618-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: 6/18/19

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	0.043	0.13	0.043	0.019	U
141-78-6	Ethyl Acetate	0.18	0.31	0.18	0.078	U
110-54-3	n-Hexane	0.091	0.15	0.091	0.031	U
67-66-3	Chloroform	0.035	0.11	0.035	0.015	U
109-99-9	Tetrahydrofuran (THF)	0.058	0.18	0.058	0.023	U
107-06-2	1,2-Dichloroethane	0.042	0.13	0.042	0.015	U
71-55-6	1,1,1-Trichloroethane	0.031	0.099	0.031	0.012	U
71-43-2	Benzene	0.053	0.16	0.053	0.024	U
56-23-5	Carbon Tetrachloride	0.027	0.083	0.027	0.012	U
110-82-7	Cyclohexane	0.096	0.29	0.096	0.044	U
78-87-5	1,2-Dichloropropane	0.037	0.12	0.037	0.014	U
75-27-4	Bromodichloromethane	0.025	0.079	0.025	0.011	U
79-01-6	Trichloroethene	0.032	0.099	0.032	0.013	U
123-91-1	1,4-Dioxane	0.047	0.15	0.047	0.017	U
80-62-6	Methyl Methacrylate	0.16	0.27	0.16	0.046	U
142-82-5	n-Heptane	0.078	0.13	0.078	0.021	U
10061-01-5	cis-1,3-Dichloropropene	0.040	0.12	0.040	0.018	U
108-10-1	4-Methyl-2-pentanone	0.041	0.13	0.041	0.018	U
10061-02-6	trans-1,3-Dichloropropene	0.071	0.12	0.071	0.024	U
79-00-5	1,1,2-Trichloroethane	0.031	0.099	0.031	0.0099	U
108-88-3	Toluene	0.045	0.14	0.045	0.017	U
591-78-6	2-Hexanone	0.042	0.13	0.042	0.016	U
124-48-1	Dibromochloromethane	0.020	0.063	0.020	0.0082	U
106-93-4	1,2-Dibromoethane	0.022	0.070	0.022	0.0081	U
123-86-4	n-Butyl Acetate	0.036	0.11	0.036	0.015	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 / 10A023.002.330

ALS Project ID: P1903275
 ALS Sample ID: P190618-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: 6/18/19
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	0.069	0.12	0.069	0.026	U
127-18-4	Tetrachloroethene	0.025	0.078	0.025	0.010	U
108-90-7	Chlorobenzene	0.037	0.12	0.037	0.015	U
100-41-4	Ethylbenzene	0.039	0.12	0.039	0.017	U
179601-23-1	m,p-Xylenes	0.078	0.25	0.078	0.032	U
75-25-2	Bromoform	0.031	0.051	0.031	0.011	U
100-42-5	Styrene	0.075	0.12	0.075	0.020	U
95-47-6	o-Xylene	0.039	0.12	0.039	0.018	U
111-84-2	n-Nonane	0.061	0.10	0.061	0.017	U
79-34-5	1,1,2,2-Tetrachloroethane	0.025	0.077	0.025	0.011	U
98-82-8	Cumene	0.035	0.11	0.035	0.016	U
80-56-8	alpha-Pinene	0.056	0.093	0.056	0.015	U
103-65-1	n-Propylbenzene	0.035	0.11	0.035	0.016	U
622-96-8	4-Ethyltoluene	0.065	0.11	0.065	0.017	U
108-67-8	1,3,5-Trimethylbenzene	0.035	0.11	0.035	0.016	U
95-63-6	1,2,4-Trimethylbenzene	0.035	0.11	0.035	0.015	U
100-44-7	Benzyl Chloride	0.062	0.21	0.062	0.023	U
541-73-1	1,3-Dichlorobenzene	0.028	0.090	0.028	0.013	U
106-46-7	1,4-Dichlorobenzene	0.053	0.090	0.053	0.014	U
95-50-1	1,2-Dichlorobenzene	0.028	0.090	0.028	0.013	U
5989-27-5	d-Limonene	0.054	0.092	0.054	0.020	U
96-12-8	1,2-Dibromo-3-chloropropane	0.032	0.054	0.032	0.010	U
120-82-1	1,2,4-Trichlorobenzene	0.043	0.071	0.043	0.018	U
91-20-3	Naphthalene	0.059	0.097	0.059	0.025	U
87-68-3	Hexachlorobutadiene	0.030	0.050	0.030	0.010	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 / 10A023.002.330

ALS Project ID: P1903275

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: 6/4/19
Date(s) Received: 6/7/19
Date(s) Analyzed: 6/18 - 6/19/19

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	P190618-MB	103	102	108	70-130	
Lab Control Sample	P190618-LCS	102	100	112	70-130	
Duplicate Lab Control Sample	P190618-DLCS	99	102	114	70-130	
ODSVE-EFF-Y8Q4	P1903275-001	100	104	112	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: Trinity Analysis & Development Corp.

Client Sample ID: Duplicate Lab Control Sample

Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1903275

ALS Sample ID: P190618-DLCS

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: 6/18/19

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	123	94.4	91.8	77	75	57-136	3	25	
75-71-8	Dichlorodifluoromethane (CFC 12)	42.6	35.8	34.9	84	82	59-128	2	25	
74-87-3	Chloromethane	102	87.4	85.8	86	84	59-132	2	25	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	30.2	26.1	25.7	86	85	63-121	1	25	
75-01-4	Vinyl Chloride	83.7	75.3	74.0	90	88	64-127	2	25	
106-99-0	1,3-Butadiene	95.1	90.8	89.0	95	94	66-134	1	25	
74-83-9	Bromomethane	54.6	47.1	47.0	86	86	63-134	0	25	
75-00-3	Chloroethane	81.1	65.3	65.5	81	81	63-127	0	25	
64-17-5	Ethanol	544	425	423	78	78	59-125	0	25	
75-05-8	Acetonitrile	123	103	101	84	82	63-132	2	25	
107-02-8	Acrolein	89.4	73.8	72.8	83	81	62-126	2	25	
67-64-1	Acetone	446	318	314	71	70	58-128	1	25	
75-69-4	Trichlorofluoromethane	37.6	32.4	31.9	86	85	62-126	1	25	
67-63-0	2-Propanol (Isopropyl Alcohol)	168	139	136	83	81	52-125	2	25	
107-13-1	Acrylonitrile	95.4	86.0	85.2	90	89	71-137	1	25	
75-35-4	1,1-Dichloroethene	55.0	45.1	45.3	82	82	61-133	0	25	
75-09-2	Methylene Chloride	62.4	51.4	51.1	82	82	62-115	0	25	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	69.0	56.0	55.3	81	80	71-131	1	25	
76-13-1	Trichlorotrifluoroethane	28.1	23.4	23.6	83	84	66-126	1	25	
75-15-0	Carbon Disulfide	69.9	53.5	53.5	77	77	57-134	0	25	
156-60-5	trans-1,2-Dichloroethene	53.9	46.2	45.7	86	85	67-124	1	25	
75-34-3	1,1-Dichloroethane	53.3	42.5	42.1	80	79	68-126	1	25	
1634-04-4	Methyl tert-Butyl Ether	59.5	40.7	39.7	68	67	66-126	1	25	
108-05-4	Vinyl Acetate	302	271	272	90	90	56-139	0	25	
78-93-3	2-Butanone (MEK)	70.4	53.9	53.7	77	76	67-130	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 2 of 3

Client: Trinity Analysis & Development Corp.

Client Sample ID: Duplicate Lab Control Sample

Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1903275

ALS Sample ID: P190618-DLCS

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: 6/18/19

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	53.2	43.7	42.9	82	81	70-121	1	25	
141-78-6	Ethyl Acetate	121	97.6	96.3	81	80	65-128	1	25	
110-54-3	n-Hexane	61.2	47.5	46.1	78	75	63-120	4	25	
67-66-3	Chloroform	44.4	36.8	36.2	83	82	68-123	1	25	
109-99-9	Tetrahydrofuran (THF)	73.3	55.6	56.0	76	76	64-123	0	25	
107-06-2	1,2-Dichloroethane	53.1	46.8	45.5	88	86	65-128	2	25	
71-55-6	1,1,1-Trichloroethane	39.5	34.5	33.7	87	85	68-125	2	25	
71-43-2	Benzene	66.1	53.7	53.4	81	81	69-119	0	25	
56-23-5	Carbon Tetrachloride	33.7	30.7	30.2	91	90	68-132	1	25	
110-82-7	Cyclohexane	121	98.3	97.8	81	81	70-117	0	25	
78-87-5	1,2-Dichloropropane	46.7	37.2	36.7	80	79	69-123	1	25	
75-27-4	Bromodichloromethane	32.0	28.6	28.2	89	88	72-128	1	25	
79-01-6	Trichloroethene	39.7	34.5	34.5	87	87	71-123	0	25	
123-91-1	1,4-Dioxane	59.4	49.2	49.0	83	82	71-122	1	25	
80-62-6	Methyl Methacrylate	105	89.9	89.9	86	86	70-128	0	25	
142-82-5	n-Heptane	52.5	42.0	41.8	80	80	69-123	0	25	
10061-01-5	cis-1,3-Dichloropropene	47.2	42.8	42.1	91	89	70-128	2	25	
108-10-1	4-Methyl-2-pentanone	51.1	42.1	41.8	82	82	67-130	0	25	
10061-02-6	trans-1,3-Dichloropropene	46.9	43.5	43.0	93	92	75-133	1	25	
79-00-5	1,1,2-Trichloroethane	39.4	33.7	33.2	86	84	73-119	2	25	
108-88-3	Toluene	56.3	46.5	47.0	83	83	66-119	0	25	
591-78-6	2-Hexanone	52.3	44.0	43.9	84	84	62-128	0	25	
124-48-1	Dibromochloromethane	25.0	23.9	24.2	96	97	70-130	1	25	
106-93-4	1,2-Dibromoethane	28.1	26.1	26.3	93	94	74-122	1	25	
123-86-4	n-Butyl Acetate	46.1	38.8	38.8	84	84	64-128	0	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: Trinity Analysis & Development Corp.

Client Sample ID: Duplicate Lab Control Sample

Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1903275

ALS Sample ID: P190618-DLCS

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: 6/18/19

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	46.5	37.0	37.2	80	80	69-121	0	25	
127-18-4	Tetrachloroethene	31.4	27.8	28.2	89	90	66-124	1	25	
108-90-7	Chlorobenzene	46.6	40.1	40.4	86	87	70-119	1	25	
100-41-4	Ethylbenzene	48.9	40.7	41.0	83	84	70-124	1	25	
179601-23-1	m,p-Xylenes	98.2	83.7	85.4	85	87	61-134	2	25	
75-25-2	Bromoform	20.6	19.5	19.8	95	96	66-139	1	25	
100-42-5	Styrene	49.8	45.6	46.9	92	94	73-127	2	25	
95-47-6	o-Xylene	49.3	42.0	43.1	85	87	67-125	2	25	
111-84-2	n-Nonane	40.9	33.3	34.7	81	85	63-128	5	25	
79-34-5	1,1,2,2-Tetrachloroethane	31.2	26.3	27.3	84	88	65-127	5	25	
98-82-8	Cumene	43.6	37.7	38.8	86	89	68-124	3	25	
80-56-8	alpha-Pinene	37.9	33.1	33.5	87	88	65-120	1	25	
103-65-1	n-Propylbenzene	44.3	38.1	38.6	86	87	69-123	1	25	
622-96-8	4-Ethyltoluene	43.6	39.9	40.6	92	93	67-129	1	25	
108-67-8	1,3,5-Trimethylbenzene	43.5	36.9	37.2	85	86	67-130	1	25	
95-63-6	1,2,4-Trimethylbenzene	43.8	39.4	40.1	90	92	66-132	2	25	
100-44-7	Benzyl Chloride	41.9	41.2	42.2	98	101	50-147	3	25	
541-73-1	1,3-Dichlorobenzene	35.9	34.0	34.2	95	95	65-130	0	25	
106-46-7	1,4-Dichlorobenzene	35.9	33.5	33.6	93	94	60-131	1	25	
95-50-1	1,2-Dichlorobenzene	35.9	33.6	33.9	94	94	63-129	0	25	
5989-27-5	d-Limonene	37.9	34.3	35.6	91	94	66-124	3	25	
96-12-8	1,2-Dibromo-3-chloropropane	21.7	20.4	20.3	94	94	67-138	0	25	
120-82-1	1,2,4-Trichlorobenzene	28.9	27.4	27.7	95	96	55-142	1	25	
91-20-3	Naphthalene	38.7	35.8	36.3	93	94	57-138	1	25	
87-68-3	Hexachlorobutadiene	19.6	17.5	17.6	89	90	56-138	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

RESULTS OF ANALYSIS

Page 1 of 1

Client: Trinity Analysis & Development Corp.
Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1903275

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: 06181929.D
Date Analyzed: 6/18/19
Time Analyzed: 20:06

Client Sample ID	ALS Sample ID	Lab File ID	Time Analyzed
Lab Control Sample	P190618-LCS	06181930.D	20:40
Duplicate Lab Control Sample	P190618-DLCS	06181931.D	21:14
ODSVE-EFF-Y8Q4	P1903275-001	06181939.D	10:20
ODSVE-EFF-Y8Q4 (Dilution)	P1903275-001	06181940.D	10:54

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Trinity Analysis & Development Corp.
Client Project ID: DDMT / 10A023.002.330

ALS Project ID: P1903275

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: 06181927.D
Date Analyzed: 6/18/19
Time Analyzed: 18:59

	IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
	AREA	#	RT	#	AREA	#
24 Hour Standard	114807	10.97	490052	13.10	209412	17.42
Upper Limit	160730	11.30	686073	13.43	293177	17.75
Lower Limit	68884	10.64	294031	12.77	125647	17.09

Client Sample ID						
01	Method Blank	102750	10.97	452568	13.10	196113
02	Lab Control Sample	112035	10.98	470249	13.10	206314
03	Duplicate Lab Control Sample	116209	10.98	489971	13.10	211022
04	ODSVE-EFF-Y8Q4	117523	10.98	499217	13.10	207429
05	ODSVE-EFF-Y8Q4 (Dilution)	117959	10.96	505413	13.10	217696
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\2019 06\18\06181939.D
 Acq On : 19 Jun 2019 10:20
 Sample : P1903275-001 (1000mL)
 Misc : S31-05311902

Vial: 4
 Operator: WA
 Inst : MS13

Quant Time: Jun 19 13:36:40 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:48:46 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

40A 6/19/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.98	130	117523	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.10	114	499217	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.42	82	207429	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.83	65	149025	12.481	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.84%
57) Toluene-d8 (SS2)	15.54	98	535106	13.012	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	104.08%
73) Bromofluorobenzene (SS3)	18.83	174	210654	14.050	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	112.40%

Target Compounds

						Qvalue
2) Propene	3.97	42	46351	3.966	ng	93
3) Dichlorodifluoromethan...	4.13	85	113841	6.239	ng	100
4) Chloromethane	0.00	50	0	N.D.	d	
5) 1,2-Dichloro-1,1,2,2-t...	4.66	135	184	N.D.		
6) Vinyl Chloride	4.84	62	275	N.D.		
7) 1,3-Butadiene	0.00	54	0	N.D.	d	
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.21	45	209457	26.523	ng	99
11) Acetonitrile	0.00	41	0	N.D.	d	
12) Acrolein	6.65	56	15161m	2.438	ng	
13) Acetone	6.84	58	634698	77.453	ng	# 76
14) Trichlorofluoromethane	7.07	101	8723	0.568	ng	99
15) 2-Propanol (Isopropanol)	7.33	45	367746	14.854	ng	94
16) Acrylonitrile	0.00	53	0	N.D.	d	
17) 1,1-Dichloroethene	8.03	96	2802	0.294	ng	# 77
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.	d	
19) Methylene Chloride	8.26	84	10976	1.132	ng	# 76
20) 3-Chloro-1-propene (Al...	8.41	41	469	N.D.		
21) Trichlorotrifluoroethane	8.68	151	35292	3.631	ng	83
22) Carbon Disulfide	8.52	76	136554	3.597	ng	98
23) trans-1,2-Dichloroethene	9.54	61	4337	0.340	ng	82
24) 1,1-Dichloroethane	9.78	63	3338	0.195	ng	98
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.	d	
26) Vinyl Acetate	0.00	86	0	N.D.	d	
27) 2-Butanone (MEK)	10.28	72	82293	11.489	ng	# 73
28) cis-1,2-Dichloroethene	10.80	61	197953	15.390	ng	82
29) Diisopropyl Ether	0.00	87	0	N.D.	d	
30) Ethyl Acetate	11.12	61	1215913	351.097	ng	99
31) n-Hexane	11.08	57	135634	8.496	ng	98
32) Chloroform	11.16	83	48496	3.045	ng	99
34) Tetrahydrofuran (THF)	11.59	72	4017	0.585	ng	# 1
35) Ethyl tert-Butyl Ether	11.72	87	180	N.D.		
36) 1,2-Dichloroethane	0.00	62	0	N.D.	d	
38) 1,1,1-Trichloroethane	12.23	97	2466	0.183	ng	97
39) Isopropyl Acetate	0.00	61	0	N.D.	d	
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	12.70	78	54953	1.388	ng	97
42) Carbon Tetrachloride	12.86	117	5525	0.456	ng	99
43) Cyclohexane	12.99	84	87996	5.593	ng	90
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	13.55	63	663	0.068	ng	83
46) Bromodichloromethane	0.00	83	0	N.D.	d	
47) Trichloroethene	13.80	130	171323	15.415	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	0.00	100	0	N.D.	d	

19 of 112

Data File : I:\MS13\DATA\2019 06\18\06181939.D
 Acq On : 19 Jun 2019 10:20
 Sample : P1903275-001 (1000mL)
 Misc : S31-05311902

Vial: 4
 Operator: WA
 Inst : MS13

Quant Time: Jun 19 13:36:40 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:48:46 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

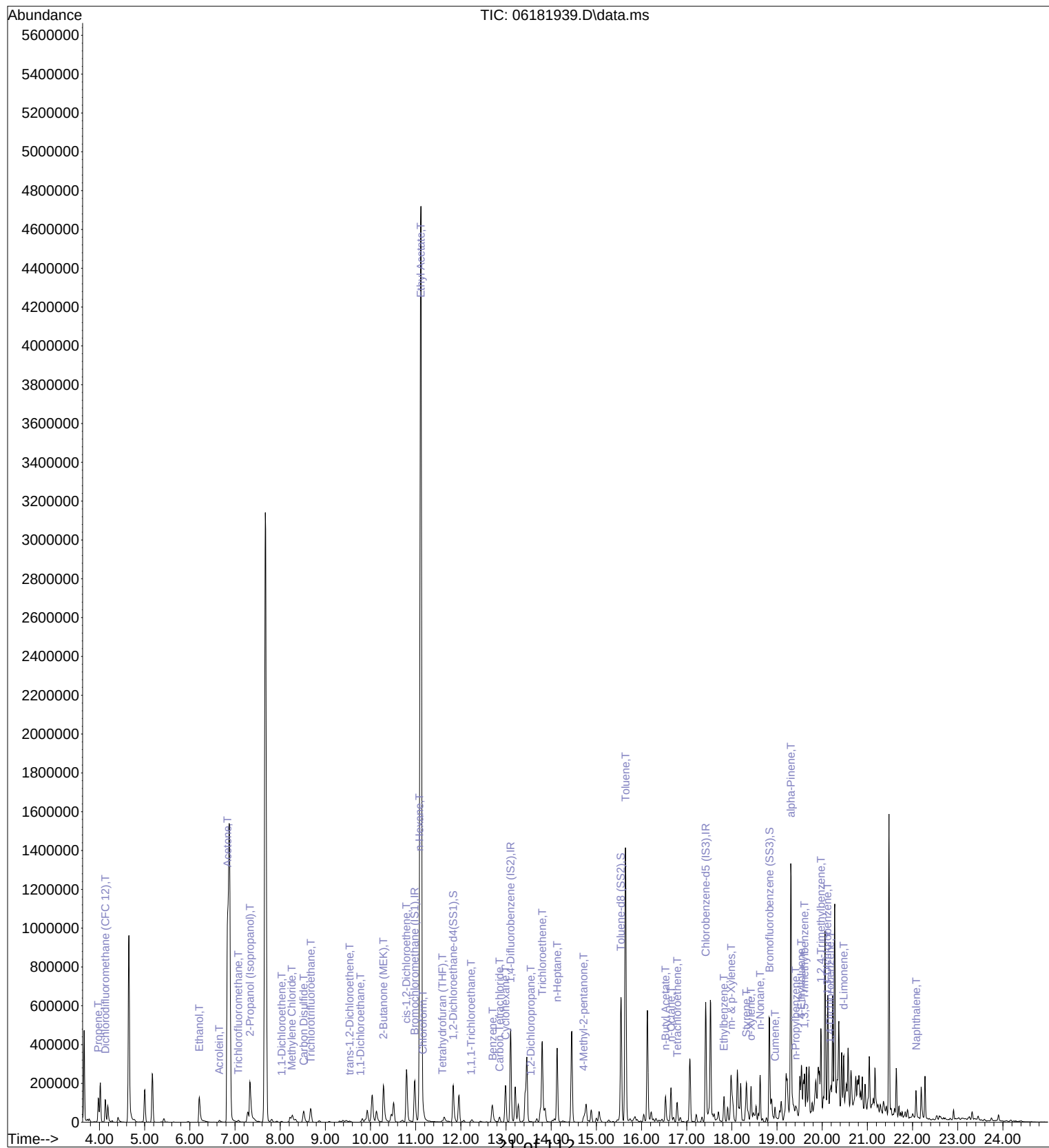
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.13	71	105896	10.726	ng	94
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	14.72	58	8747	0.969	ng	93
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.	d	
58) Toluene	15.65	91	1256479	33.286	ng	99
59) 2-Hexanone	0.00	43	0	N.D.	d	
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.53	43	111647	5.531	ng	91
63) n-Octane	16.65	57	35387	4.515	ng	87
64) Tetrachloroethene	16.79	166	40423	3.459	ng	100
65) Chlorobenzene	0.00	112	0	N.D.	d	
66) Ethylbenzene	17.83	91	106670	2.509	ng	97
67) m- & p-Xylenes	17.98	91	197472	6.098	ng	92
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.32	104	93851	3.732	ng	94
70) o-Xylene	18.42	91	88430	2.731	ng	95
71) n-Nonane	18.63	43	84894	4.762	ng	90
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.	d	
74) Cumene	18.96	105	17435	0.411	ng	98
75) alpha-Pinene	19.30	93	545681	24.674	ng	94
76) n-Propylbenzene	19.41	91	35572	0.730	ng	98
77) 3-Ethyltoluene	0.00	105	0	N.D.	d	
78) 4-Ethyltoluene	19.54	105	35639	0.933	ng	99
79) 1,3,5-Trimethylbenzene	19.61	105	35844	1.010	ng	94
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	19.97	105	112271	3.299	ng	95
83) n-Decane	0.00	57	0	N.D.	d	
84) Benzyl Chloride	0.00	91	0	N.D.	d	
85) 1,3-Dichlorobenzene	20.11	146	2880	0.139	ng	97
86) 1,4-Dichlorobenzene	20.18	146	1428	0.067	ng	92
87) sec-Butylbenzene	0.00	105	0	N.D.	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	20.48	146	265	N.D.		
91) d-Limonene	20.48	68	57464	4.238	ng	95
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	0.00	57	0	N.D.	d	
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	22.08	128	27856	0.664	ng	97
96) n-Dodecane	0.00	57	0	N.D.	d	
97) Hexachlorobutadiene	22.39	225	183	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:\MS13\DATA\2019 06\18\06181939.D
Acq On : 19 Jun 2019 10:20
Sample : P1903275-001 (1000mL)
Misc : S31-05311902

Vial: 4
Operator: WA
Inst : MS13

Quant Time: Jun 19 13:36:40 2019
Quant Method : I:\MS13\METHODS\R13052019A.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue May 28 08:48:46 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019 06\18\06181939.D
 Acq On : 19 Jun 2019 10:20
 Sample : P1903275-001 (1000mL)
 Misc : S31-05311902

Vial: 4
 Operator: WA
 Inst : MS13

Quant Time: Jun 19 13:36:40 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:48:46 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

6/19/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.98	130	117523	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.10	114	499217	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.42	82	207429	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.83	65	149025	12.481	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.84%
57) Toluene-d8 (SS2)	15.54	98	535106	13.012	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	104.08%
73) Bromofluorobenzene (SS3)	18.83	174	210654	14.050	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	112.40%

Target Compounds

						Qvalue
2) Propene	3.97	42	46351	3.966	ng	93
3) Dichlorodifluoromethan...	4.13	85	113841	6.239	ng	100
10) Ethanol	6.21	45	209457	26.523	ng	99
12) Acrolein	6.65	56	15161m	2.438	ng	
13) Acetone	6.84	58	634698	77.453	ng	# 76
14) Trichlorofluoromethane	7.07	101	8723	0.568	ng	99
15) 2-Propanol (Isopropanol)	7.33	45	367746	14.854	ng	94
17) 1,1-Dichloroethene	8.03	96	2802	0.294	ng	# 77
19) Methylene Chloride	8.26	84	10976	1.132	ng	# 76
21) Trichlorotrifluoroethane	8.68	151	35292	3.631	ng	83
22) Carbon Disulfide	8.52	76	136554	3.597	ng	98
23) trans-1,2-Dichloroethene	9.54	61	4337	0.340	ng	82
24) 1,1-Dichloroethane	9.78	63	3338	0.195	ng	98
27) 2-Butanone (MEK)	10.28	72	82293	11.489	ng	# 73
28) cis-1,2-Dichloroethene	10.80	61	197953	15.390	ng	82
30) Ethyl Acetate	11.12	61	1215913	351.097	ng	99
31) n-Hexane	11.08	57	135634	8.496	ng	98
32) Chloroform	11.16	83	48496	3.045	ng	99
34) Tetrahydrofuran (THF)	11.59	72	4017	0.585	ng	# 1
38) 1,1,1-Trichloroethane	12.23	97	2466	0.183	ng	97
41) Benzene	12.70	78	54953	1.388	ng	97
42) Carbon Tetrachloride	12.86	117	5525	0.456	ng	99
43) Cyclohexane	12.99	84	87996	5.593	ng	90
45) 1,2-Dichloropropane	13.55	63	663	0.068	ng	83
47) Trichloroethene	13.80	130	171323	15.415	ng	99
51) n-Heptane	14.13	71	105896	10.726	ng	94
53) 4-Methyl-2-pentanone	14.72	58	8747	0.969	ng	93
58) Toluene	15.65	91	1256479	33.286	ng	99
62) n-Butyl Acetate	16.53	43	111647	5.531	ng	91
63) n-Octane	16.65	57	35387	4.515	ng	87
64) Tetrachloroethene	16.79	166	40423	3.459	ng	100
66) Ethylbenzene	17.83	91	106670	2.509	ng	97
67) m- & p-Xylenes	17.98	91	197472	6.098	ng	92
69) Styrene	18.32	104	93851	3.732	ng	94
70) o-Xylene	18.42	91	88430	2.731	ng	95
71) n-Nonane	18.63	43	84894	4.762	ng	90
74) Cumene	18.96	105	17435	0.411	ng	98
75) alpha-Pinene	19.30	93	545681	24.674	ng	94
76) n-Propylbenzene	19.41	91	35572	0.730	ng	98
78) 4-Ethyltoluene	19.54	105	35639	0.933	ng	99
79) 1,3,5-Trimethylbenzene	19.61	105	35844	1.010	ng	94
82) 1,2,4-Trimethylbenzene	19.97	105	112271	3.299	ng	95
85) 1,3-Dichlorobenzene	20.11	146	2880	0.139	ng	97
86) 1,4-Dichlorobenzene	20.18	146	1428	0.067	ng	92
91) d-Limonene	20.48	68	57464	4.238	ng	95
95) Naphthalene	22.08	128	27856	0.664	ng	97

Data File : I:\MS13\DATA\2019 06\18\06181939.D Vial: 4
Acq On : 19 Jun 2019 10:20 Operator: WA
Sample : P1903275-001 (1000mL) Inst : MS13
Misc : S31-05311902

Quant Time: Jun 19 13:36:40 2019
Quant Method : I:\MS13\METHODS\R13052019A.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue May 28 08:48:46 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

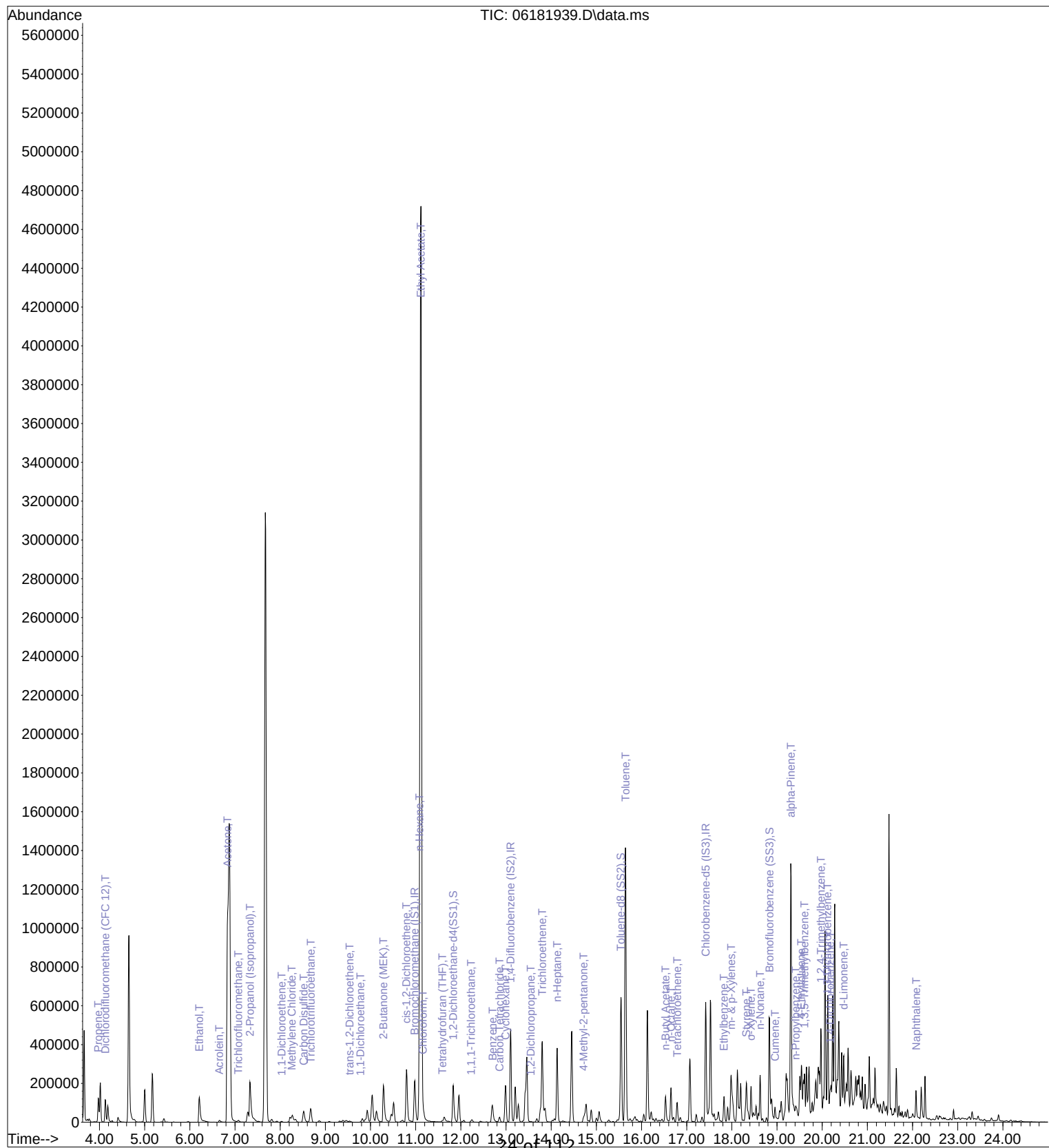
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev	(Min)

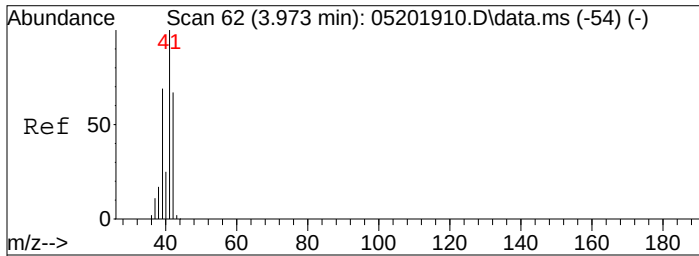
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2019 06\18\06181939.D
Acq On : 19 Jun 2019 10:20
Sample : P1903275-001 (1000mL)
Misc : S31-05311902

Vial: 4
Operator: WA
Inst : MS13

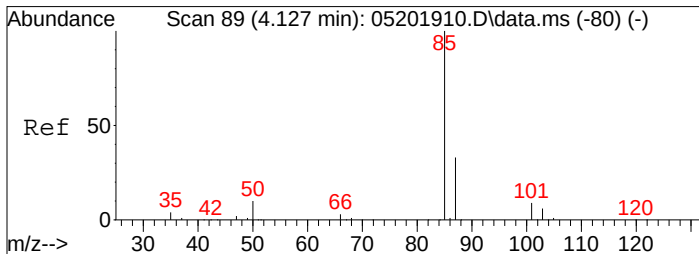
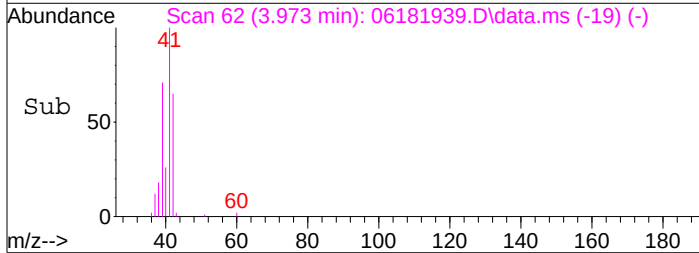
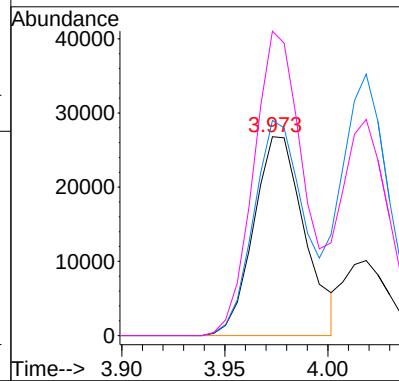
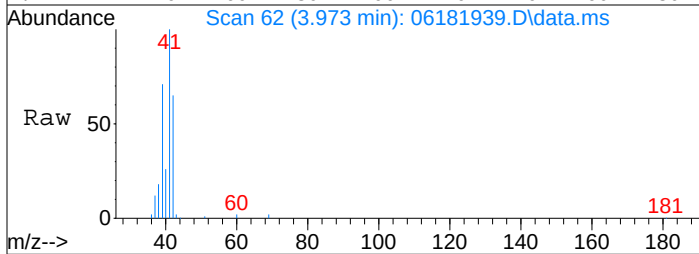
Quant Time: Jun 19 13:36:40 2019
Quant Method : I:\MS13\METHODS\R13052019A.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue May 28 08:48:46 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M





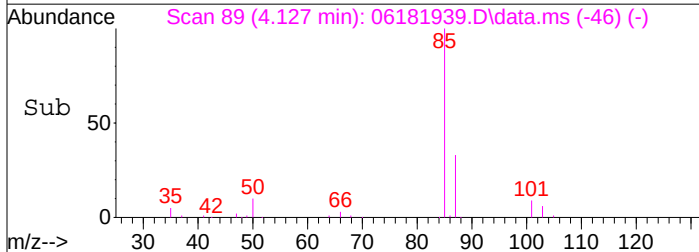
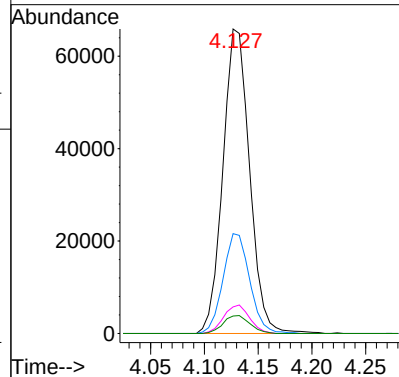
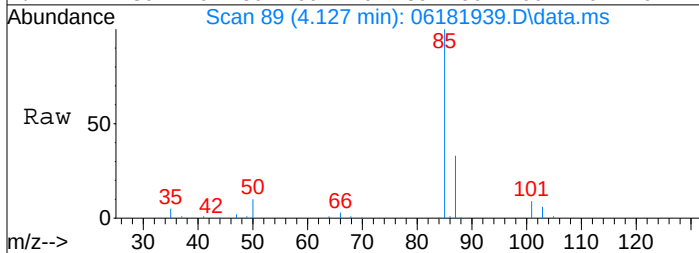
#2
Propene
Concen: 3.97 ng
RT: 3.97 min Scan# 62
Delta R.T. -0.006 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

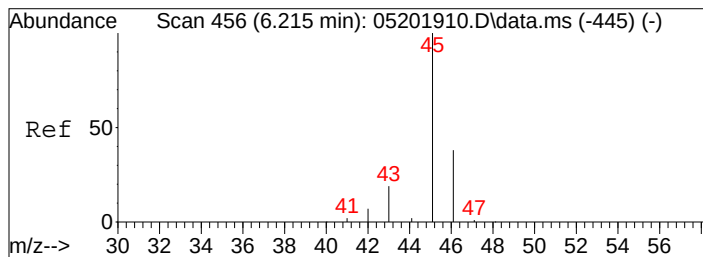
Tgt Ion	Ratio	Lower	Upper
42	100		
39	105.8	96.5	136.5
41	145.5	131.0	171.0



#3
Dichlorodifluoromethane (CFC 12)
Concen: 6.24 ng
RT: 4.13 min Scan# 89
Delta R.T. -0.006 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

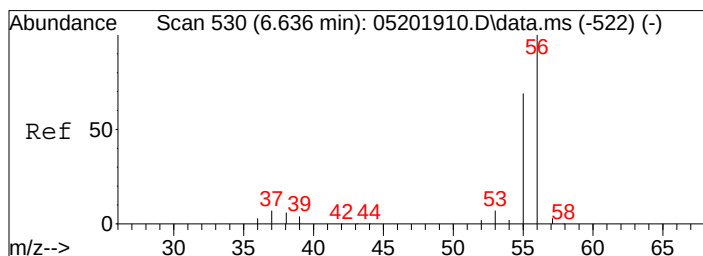
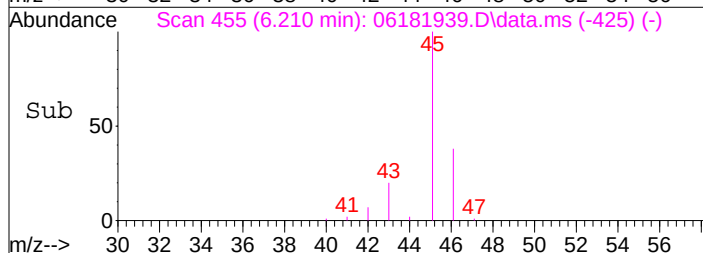
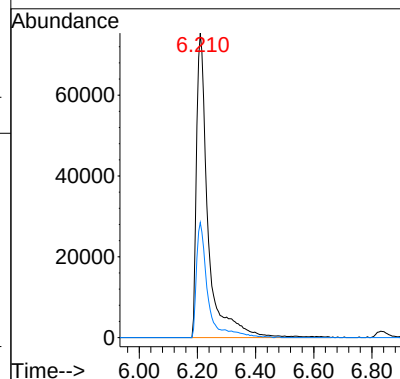
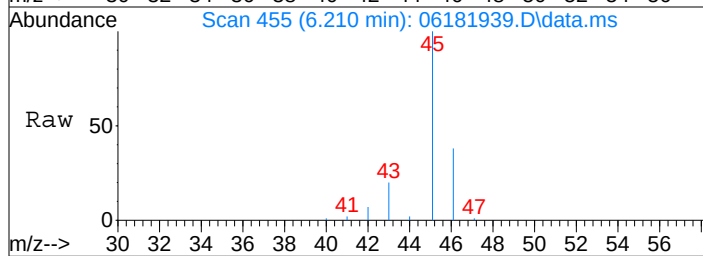
Tgt Ion	Ratio	Lower	Upper
85	100		
87	32.6	12.5	52.5
101	9.1	0.0	28.9
103	5.9	0.0	25.8





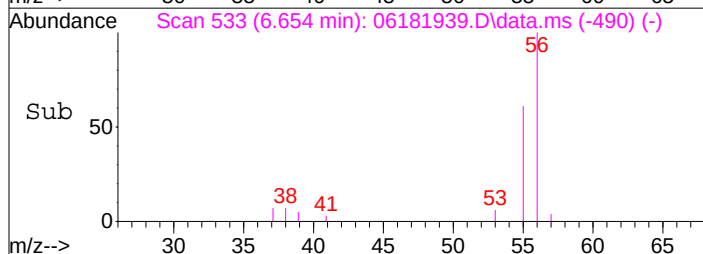
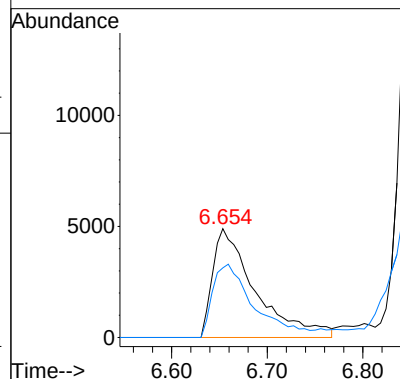
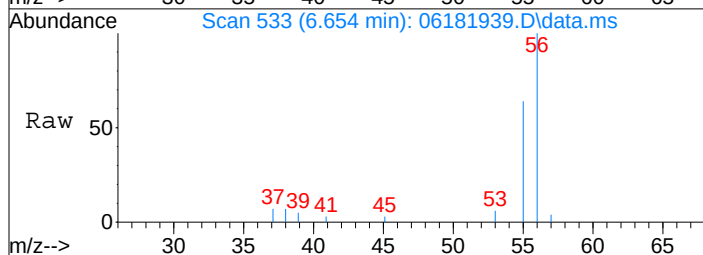
#10
Ethanol
Concen: 26.52 ng
RT: 6.21 min Scan# 455
Delta R.T. -0.080 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

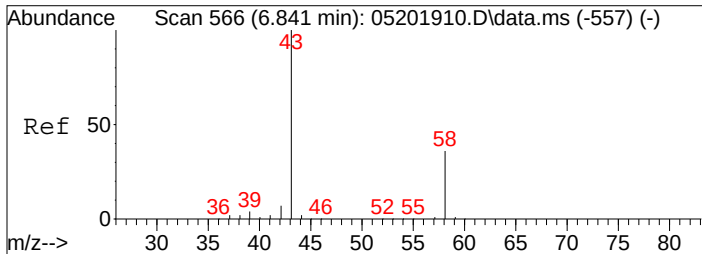
Tgt Ion: 45 Resp: 209457
Ion Ratio Lower Upper
45 100
46 36.9 17.6 57.6



#12
Acrolein
Concen: 2.44 ng m
RT: 6.65 min Scan# 533
Delta R.T. -0.005 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

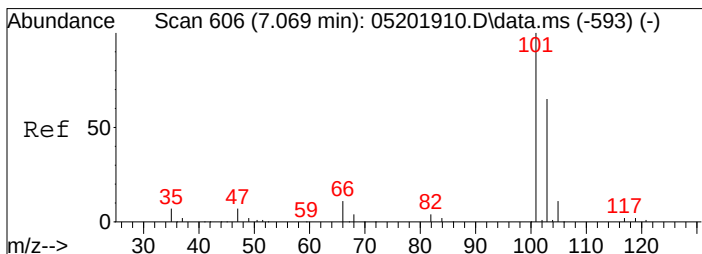
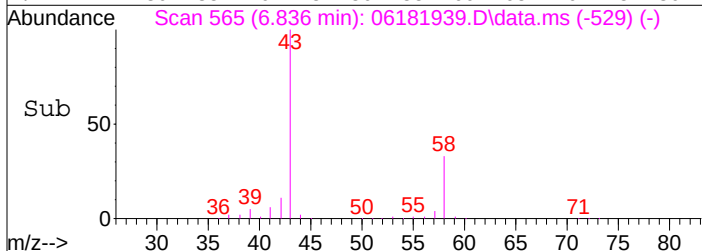
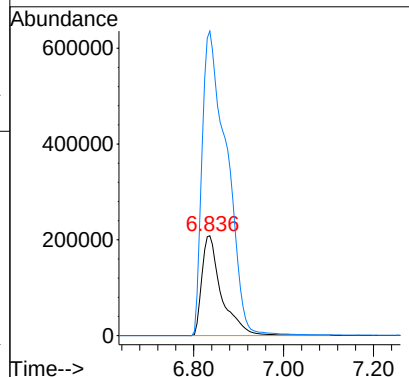
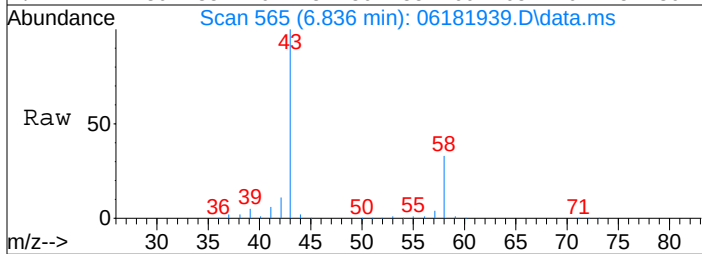
Tgt Ion: 56 Resp: 15161
Ion Ratio Lower Upper
56 100
55 73.4 50.1 90.1





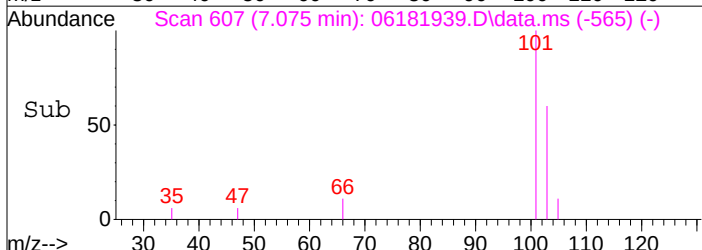
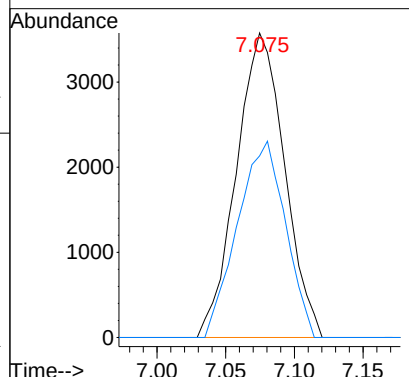
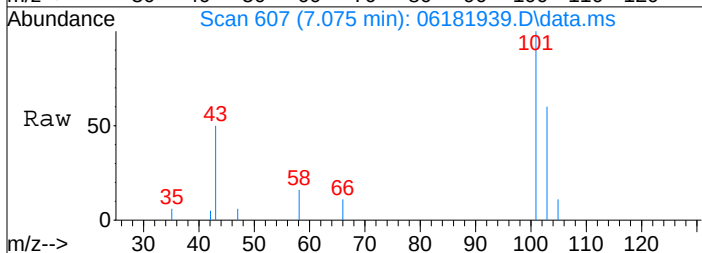
#13
Acetone
Concen: 77.45 ng
RT: 6.84 min Scan# 565
Delta R.T. -0.045 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

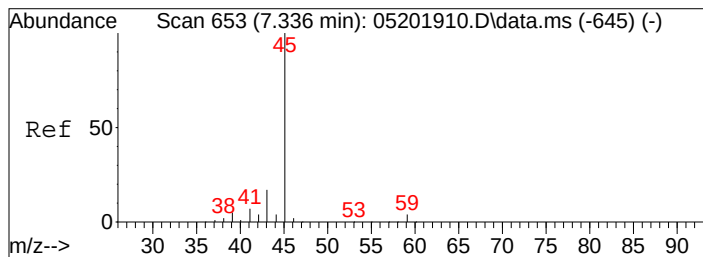
Tgt Ion: 58 Resp: 634698
Ion Ratio Lower Upper
58 100
43 383.5 302.5 362.5#



#14
Trichlorofluoromethane
Concen: 0.57 ng
RT: 7.07 min Scan# 607
Delta R.T. -0.011 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

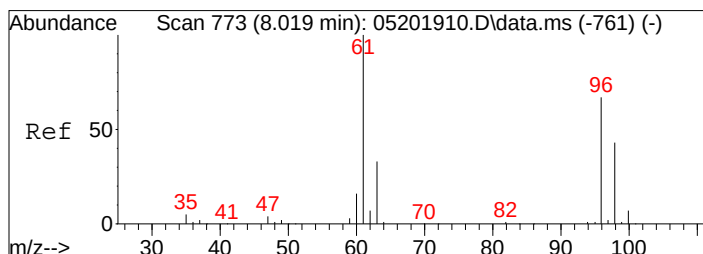
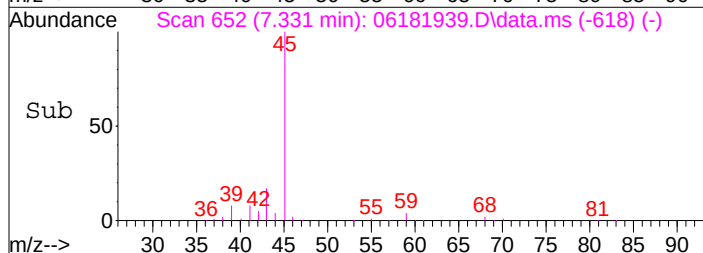
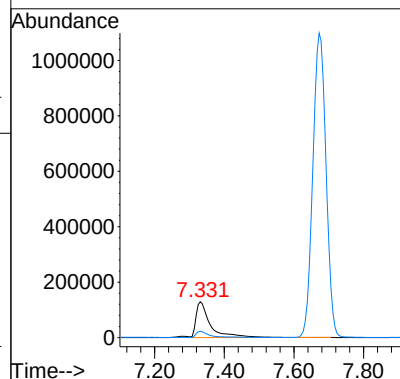
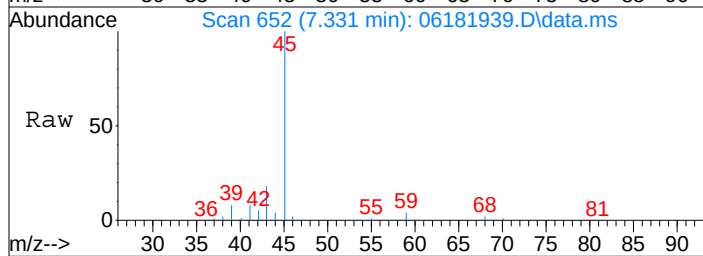
Tgt Ion: 101 Resp: 8723
Ion Ratio Lower Upper
101 100
103 64.2 44.9 84.9





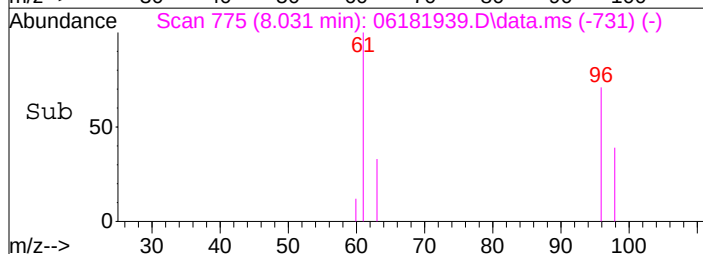
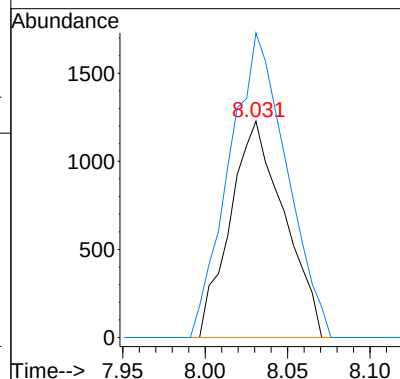
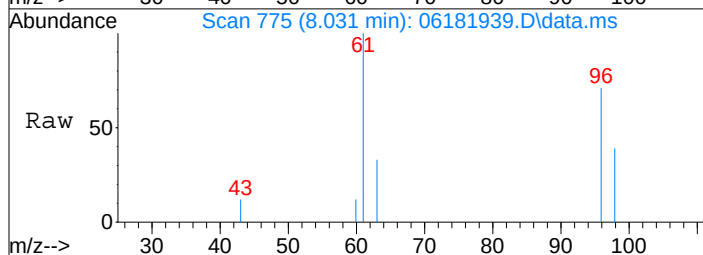
#15
2-Propanol (Isopropanol)
Concen: 14.85 ng
RT: 7.33 min Scan# 652
Delta R.T. -0.057 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

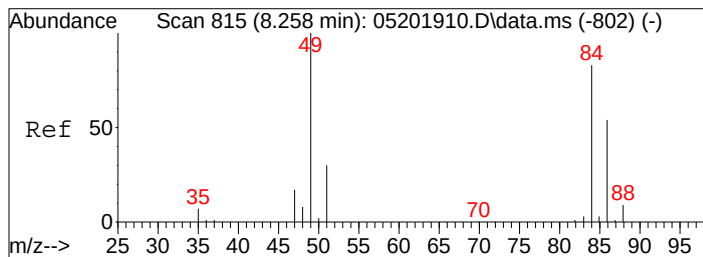
Tgt Ion: 45 Resp: 367746
Ion Ratio Lower Upper
45 100
43 17.0 0.0 39.7



#17
1,1-Dichloroethene
Concen: 0.29 ng
RT: 8.03 min Scan# 775
Delta R.T. 0.000 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

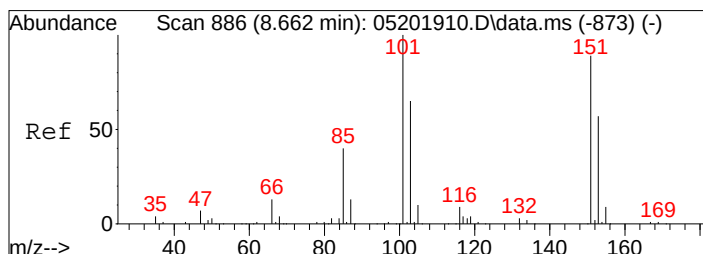
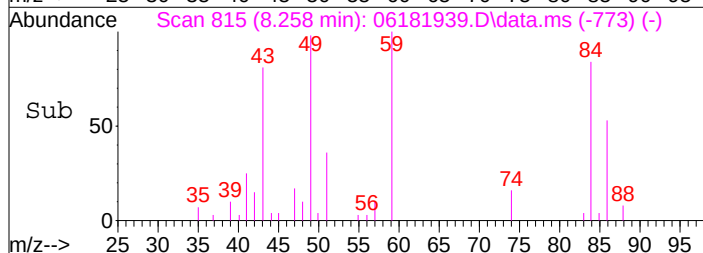
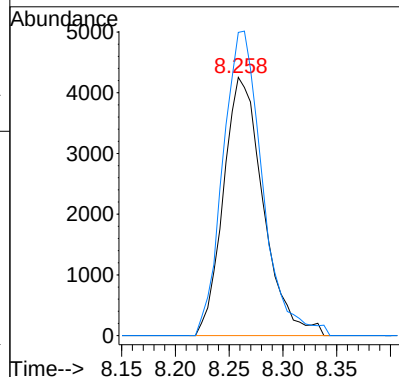
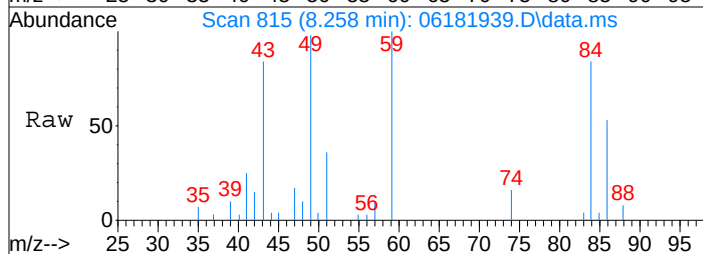
Tgt Ion: 96 Resp: 2802
Ion Ratio Lower Upper
96 100
61 149.5 162.9 202.9#





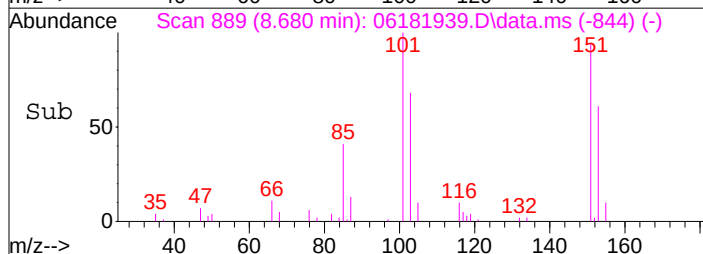
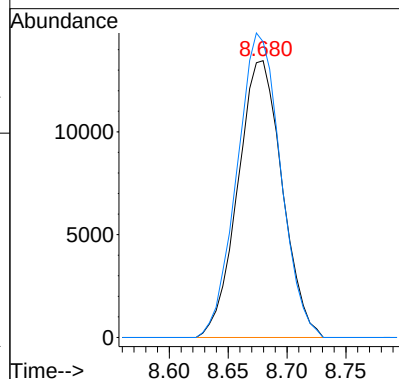
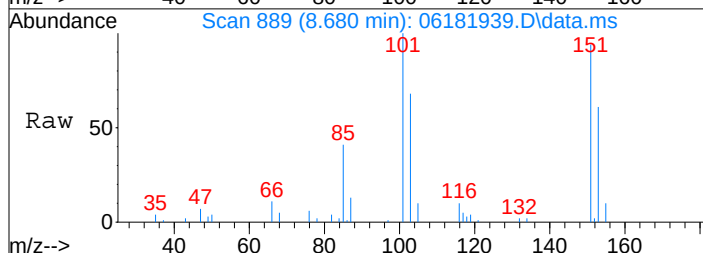
#19
Methylene Chloride
Concen: 1.13 ng
RT: 8.26 min Scan# 815
Delta R.T. -0.011 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

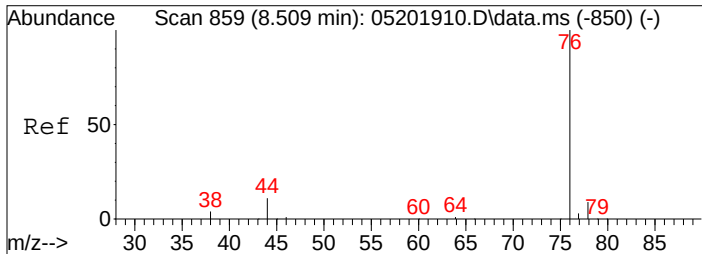
Tgt Ion: 84 Resp: 10976
Ion Ratio Lower Upper
84 100
49 117.0 121.8 171.8#



#21
Trichlorotrifluoroethane
Concen: 3.63 ng
RT: 8.68 min Scan# 889
Delta R.T. 0.006 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

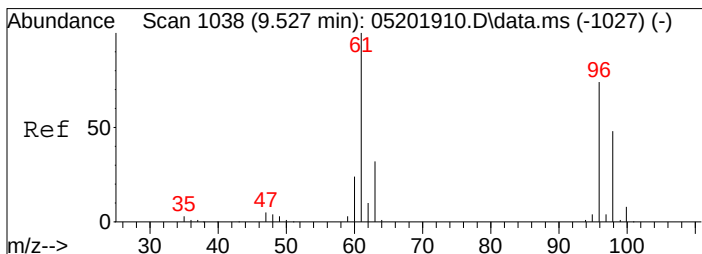
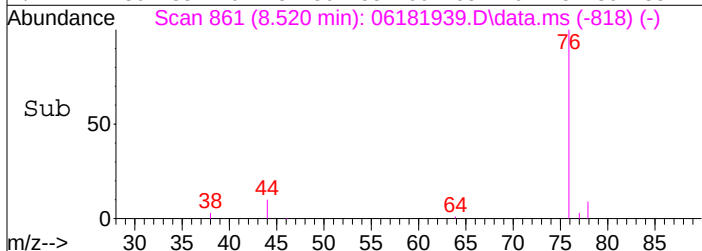
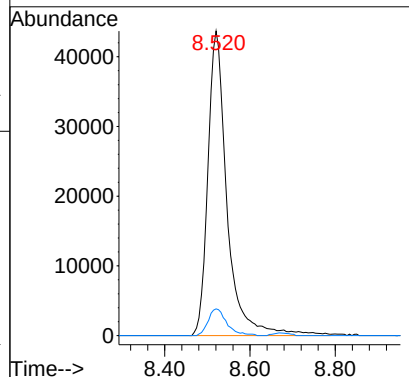
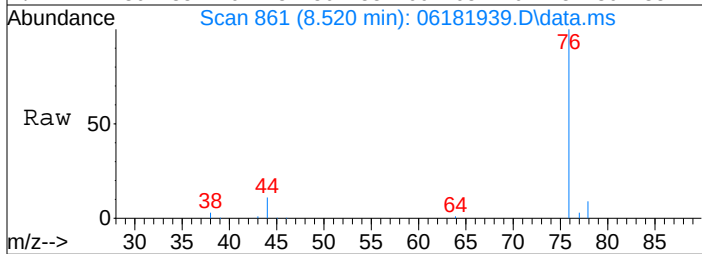
Tgt Ion: 151 Resp: 35292
Ion Ratio Lower Upper
151 100
101 108.3 107.3 147.3





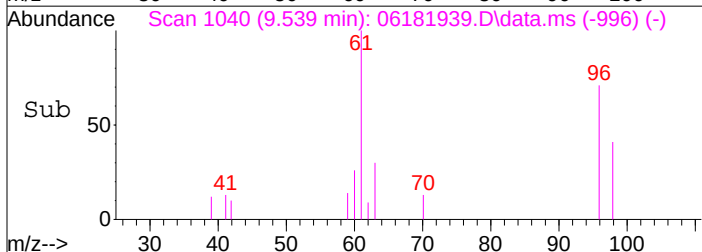
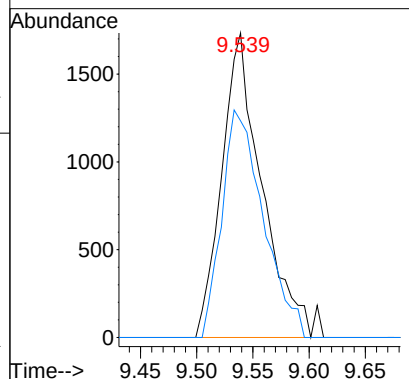
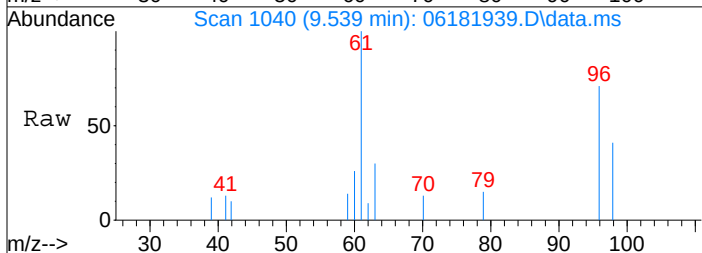
#22
Carbon Disulfide
Concen: 3.60 ng
RT: 8.52 min Scan# 861
Delta R.T. -0.006 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

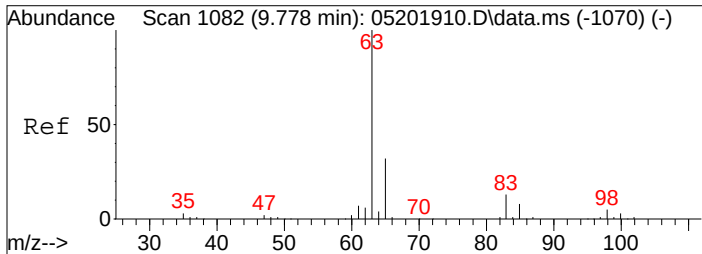
Tgt Ion: 76 Resp: 136554
Ion Ratio Lower Upper
76 100
78 8.5 0.0 29.2



#23
trans-1,2-Dichloroethene
Concen: 0.34 ng
RT: 9.54 min Scan# 1040
Delta R.T. 0.000 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

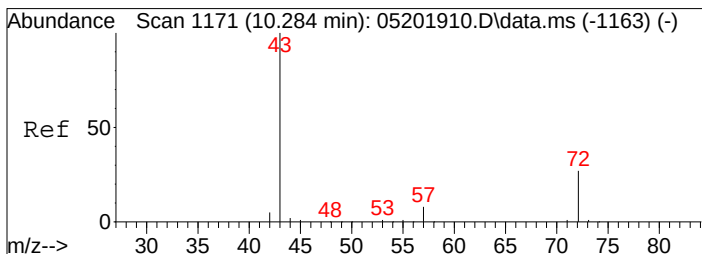
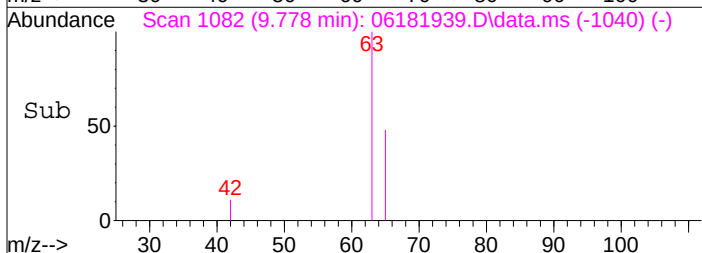
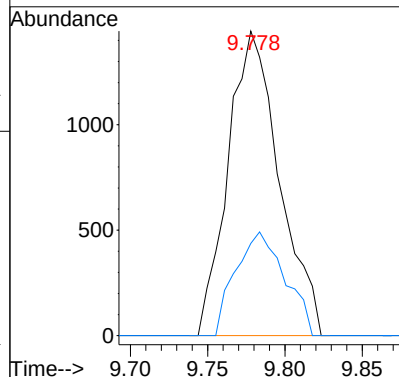
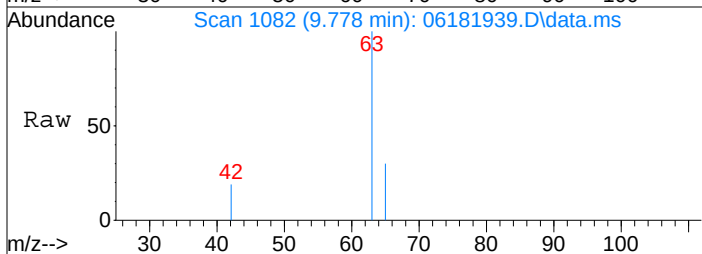
Tgt Ion: 61 Resp: 4337
Ion Ratio Lower Upper
61 100
96 76.5 42.8 82.8





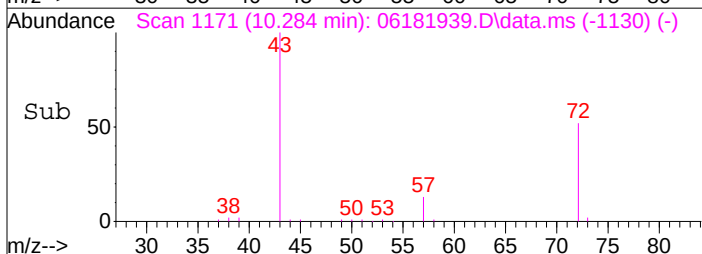
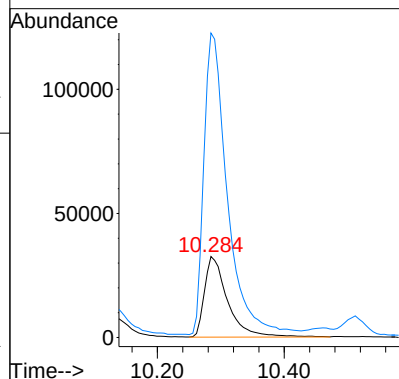
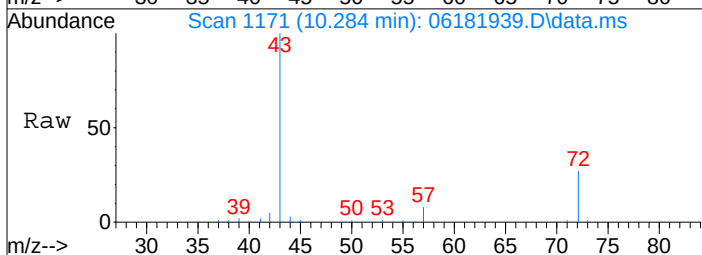
#24
1,1-Dichloroethane
Concen: 0.20 ng
RT: 9.78 min Scan# 1082
Delta R.T. -0.011 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

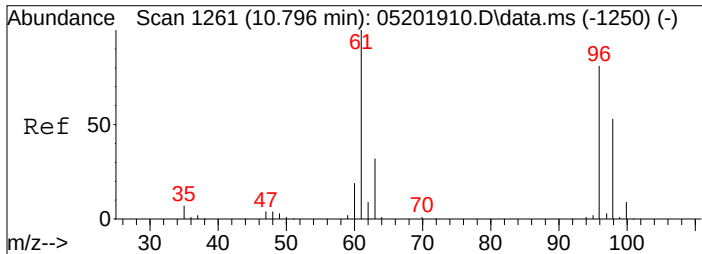
Tgt Ion: 63 Resp: 3338
Ion Ratio Lower Upper
63 100
65 32.8 11.6 51.6



#27
2-Butanone (MEK)
Concen: 11.49 ng
RT: 10.28 min Scan# 1171
Delta R.T. -0.017 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

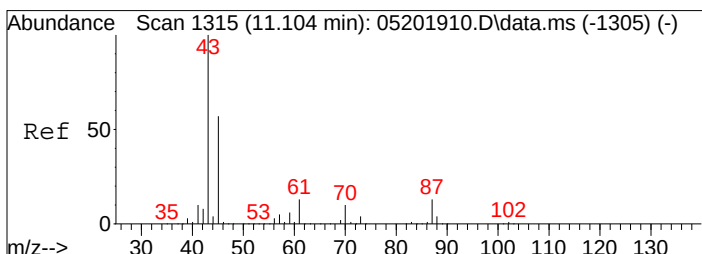
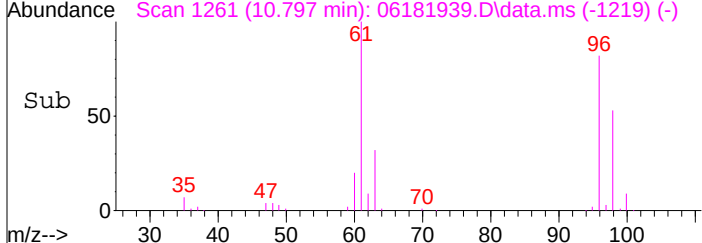
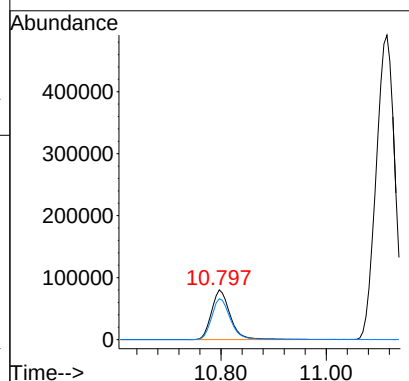
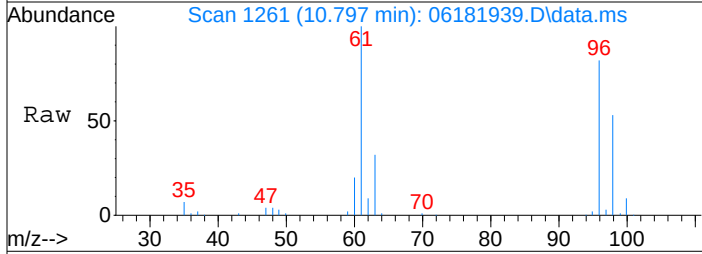
Tgt Ion: 72 Resp: 82293
Ion Ratio Lower Upper
72 100
43 377.7 427.7 467.7#





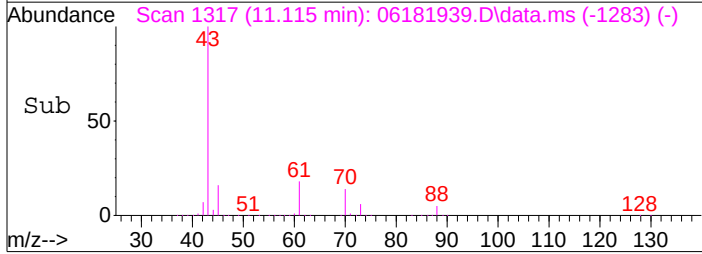
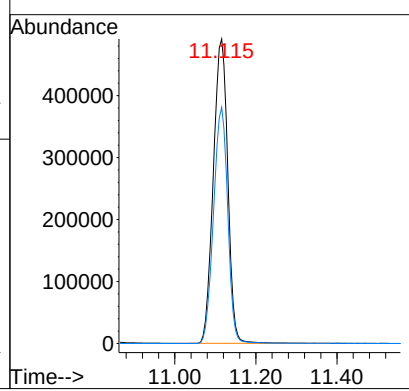
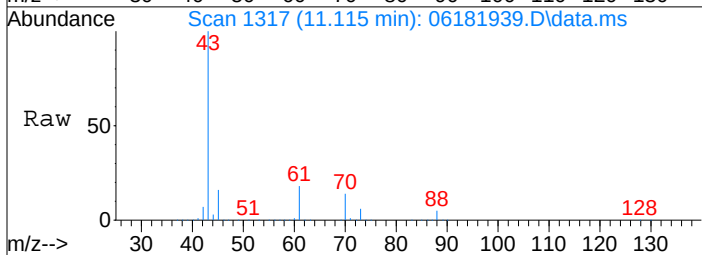
#28
 cis-1,2-Dichloroethene
 Concen: 15.39 ng
 RT: 10.80 min Scan# 1261
 Delta R.T. -0.011 min
 Lab File: 06181939.D
 Acq: 19 Jun 2019 10:20

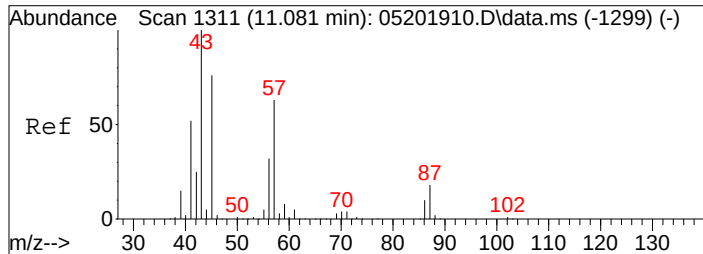
Tgt Ion:	61	Resp:	197953
Ion Ratio		Lower	Upper
61	100		
96	83.1	48.6	88.6



#30
 Ethyl Acetate
 Concen: 351.10 ng
 RT: 11.12 min Scan# 1317
 Delta R.T. -0.006 min
 Lab File: 06181939.D
 Acq: 19 Jun 2019 10:20

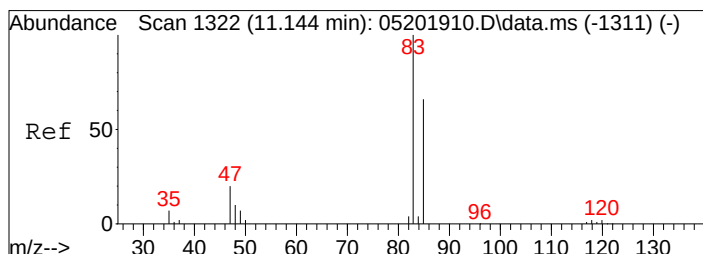
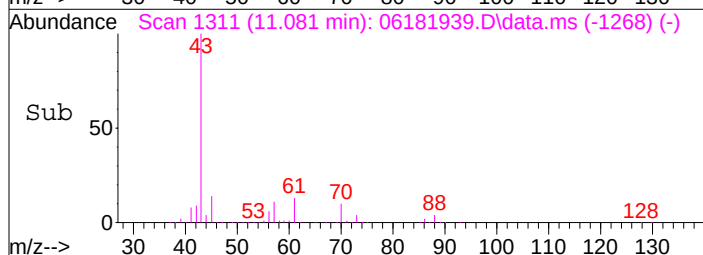
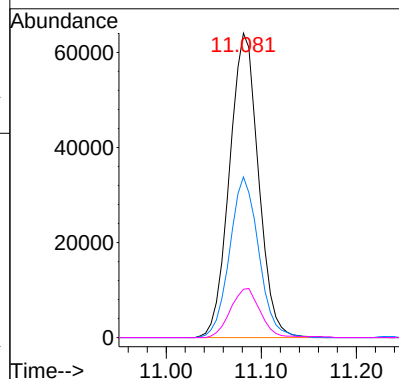
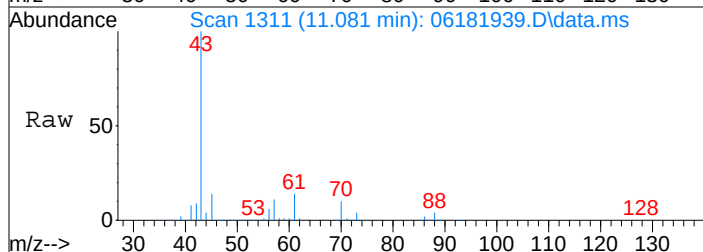
Tgt Ion:	61	Resp:	1215913
Ion Ratio		Lower	Upper
61	100		
70	76.4	57.1	97.1





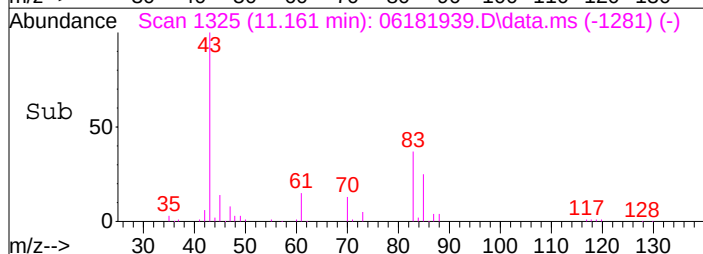
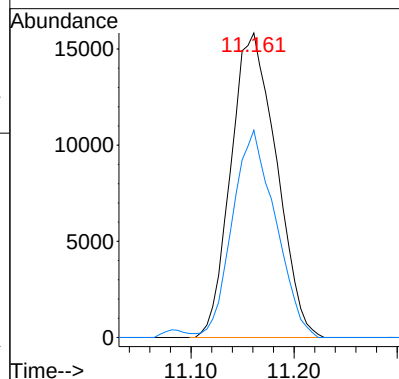
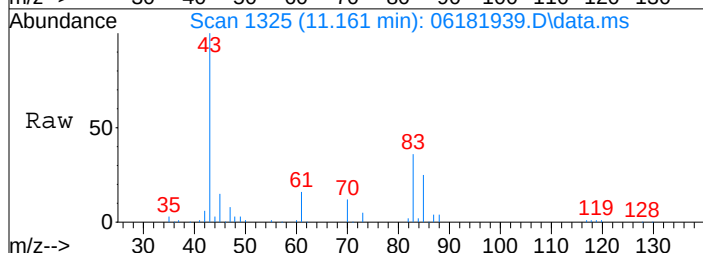
#31
n-Hexane
Concen: 8.50 ng
RT: 11.08 min Scan# 1311
Delta R.T. -0.006 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

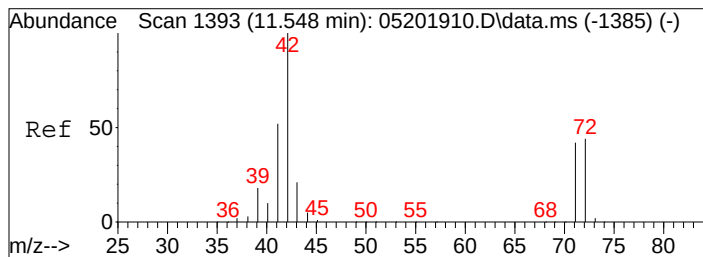
Tgt Ion: 57 Resp: 135634
Ion Ratio Lower Upper
57 100
56 52.9 41.4 62.2
86 16.8 11.8 17.8



#32
Chloroform
Concen: 3.04 ng
RT: 11.16 min Scan# 1325
Delta R.T. 0.000 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

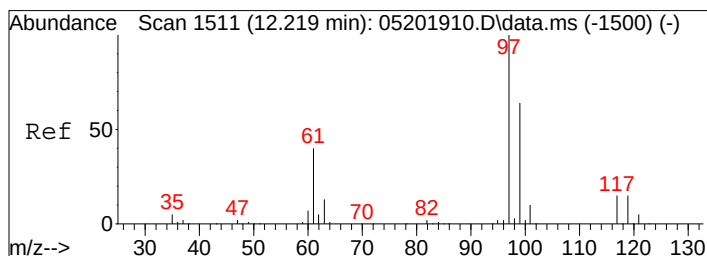
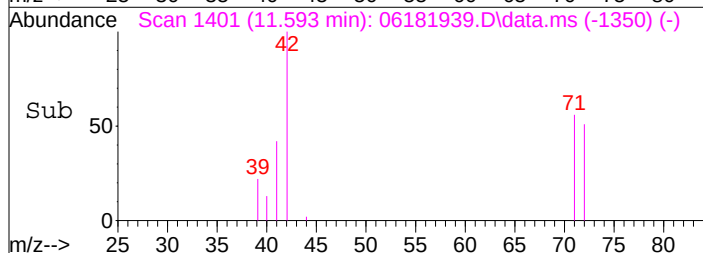
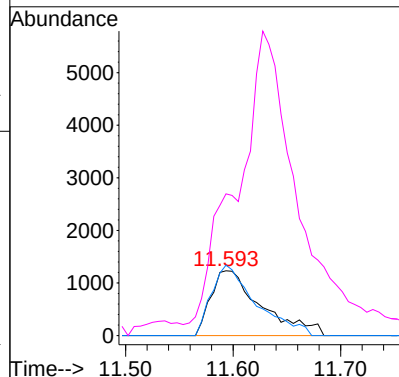
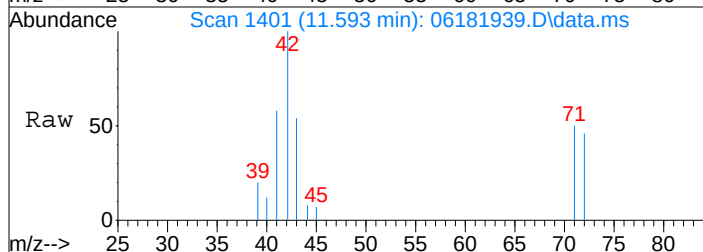
Tgt Ion: 83 Resp: 48496
Ion Ratio Lower Upper
83 100
85 64.5 45.4 85.4





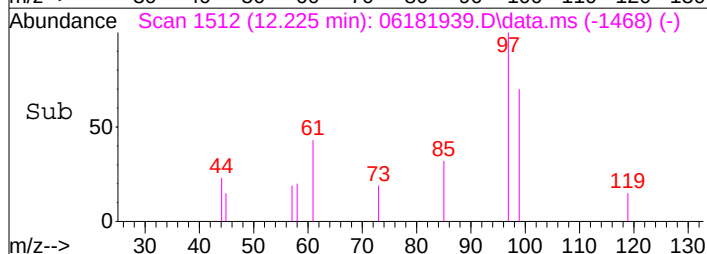
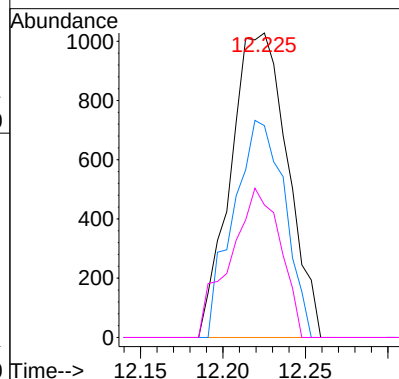
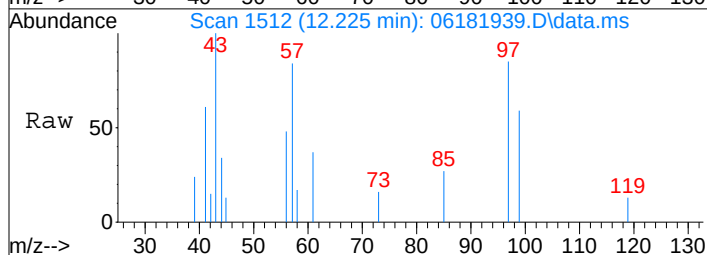
#34
Tetrahydrofuran (THF)
Concen: 0.59 ng
RT: 11.59 min Scan# 1401
Delta R.T. 0.040 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

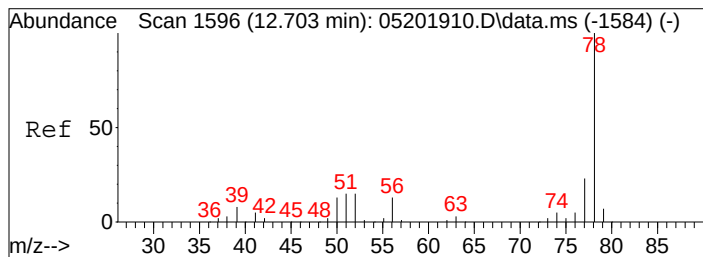
Tgt Ion: 72 Resp: 4017
Ion Ratio Lower Upper
72 100
71 95.8 76.3 116.3
42 557.2 241.4 281.4#



#38
1,1,1-Trichloroethane
Concen: 0.18 ng
RT: 12.23 min Scan# 1512
Delta R.T. 0.000 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

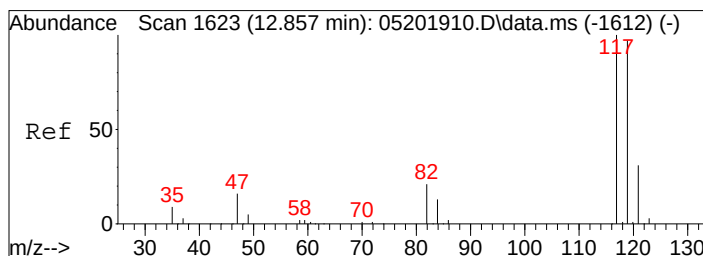
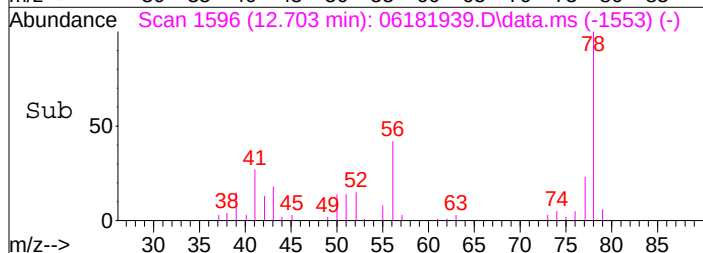
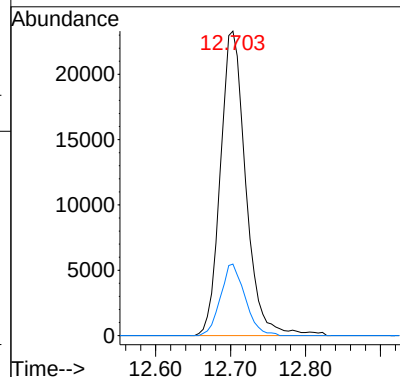
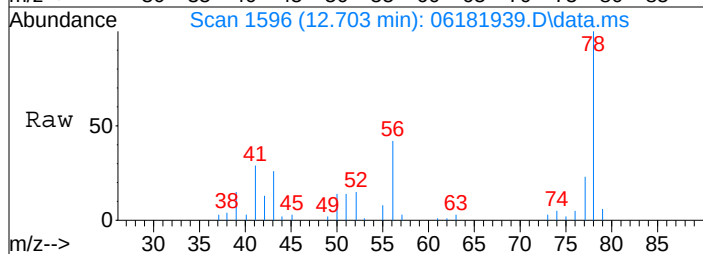
Tgt Ion: 97 Resp: 2466
Ion Ratio Lower Upper
97 100
99 64.2 44.2 84.2
61 43.3 27.7 67.7





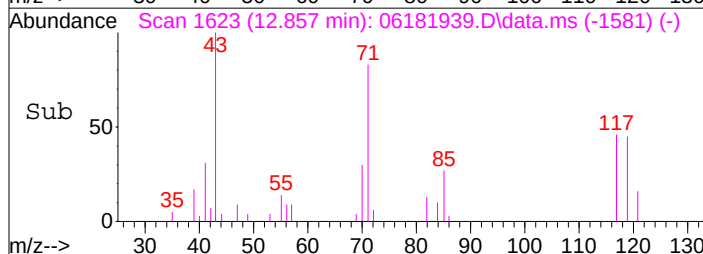
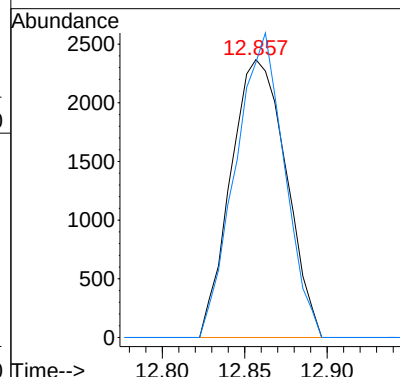
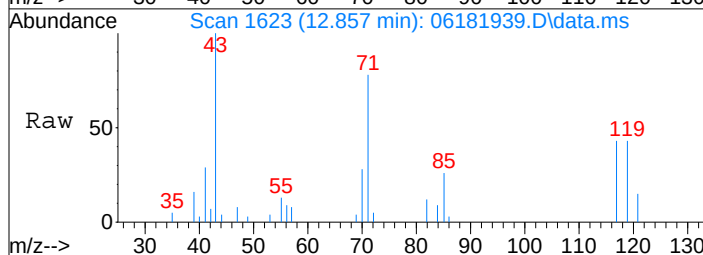
#41
Benzene
Concen: 1.39 ng
RT: 12.70 min Scan# 1596
Delta R.T. -0.006 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

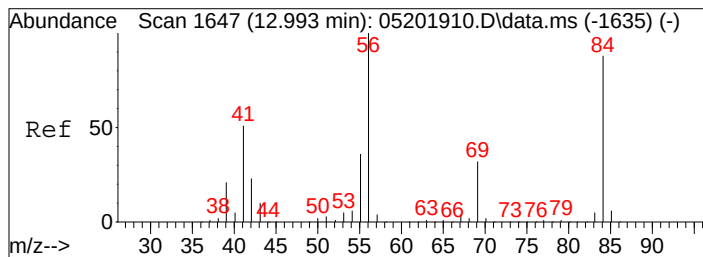
Tgt Ion: 78 Resp: 54953
Ion Ratio Lower Upper
78 100
77 22.7 4.0 44.0



#42
Carbon Tetrachloride
Concen: 0.46 ng
RT: 12.86 min Scan# 1623
Delta R.T. -0.011 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

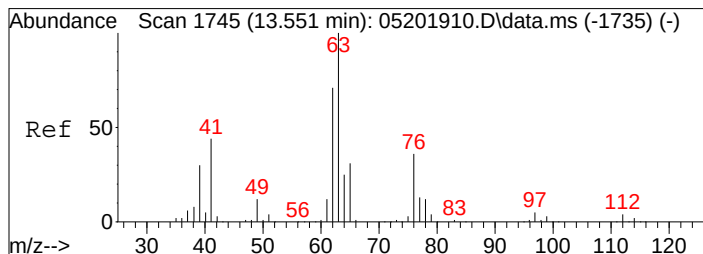
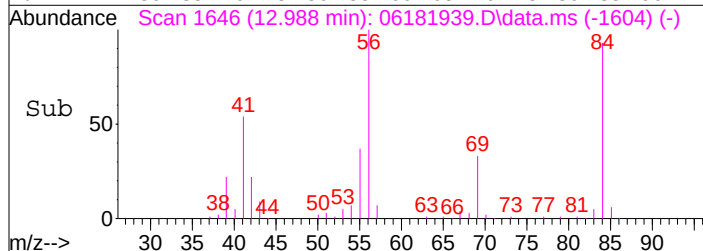
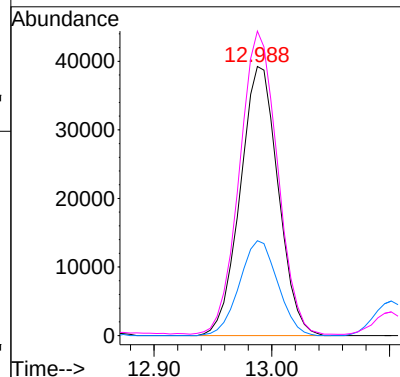
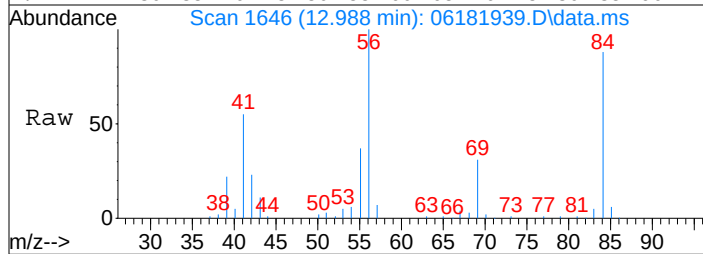
Tgt Ion: 117 Resp: 5525
Ion Ratio Lower Upper
117 100
119 97.0 76.0 116.0





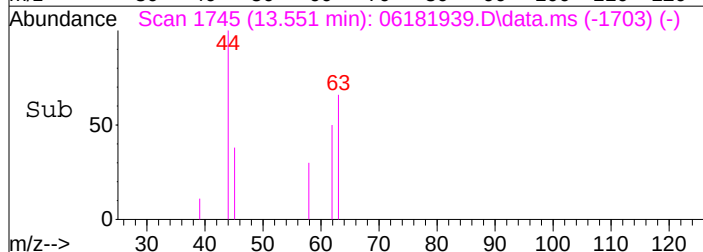
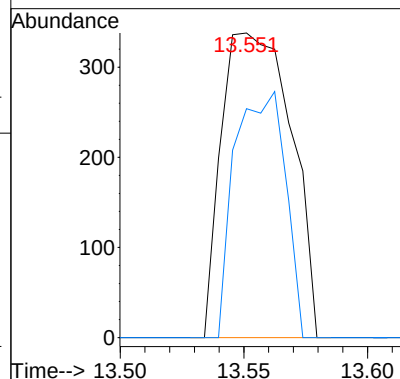
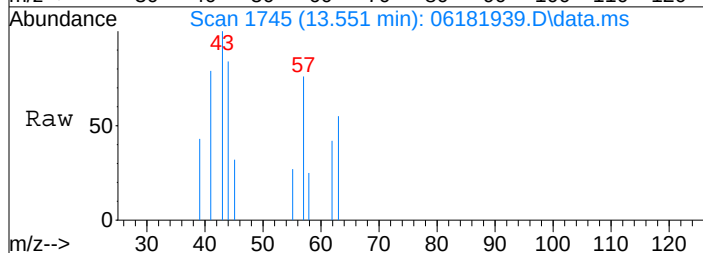
#43
Cyclohexane
Concen: 5.59 ng
RT: 12.99 min Scan# 1646
Delta R.T. -0.011 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

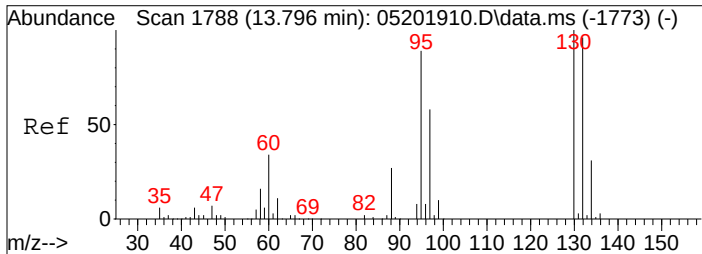
Tgt Ion: 84 Resp: 87996
Ion Ratio Lower Upper
84 100
69 35.6 18.1 58.1
56 112.3 105.1 145.1



#45
1,2-Dichloropropane
Concen: 0.07 ng
RT: 13.55 min Scan# 1745
Delta R.T. -0.011 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

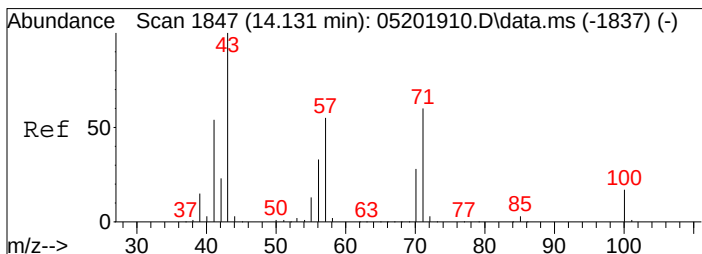
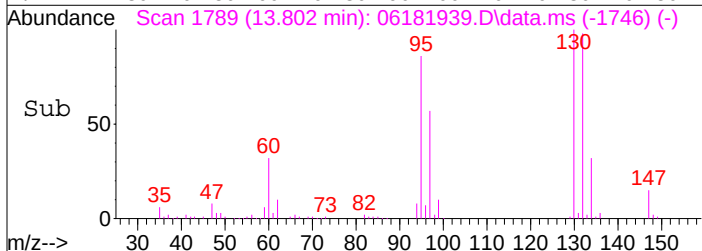
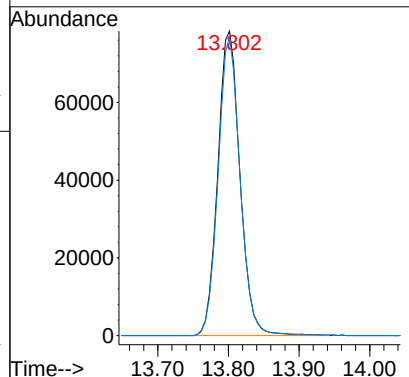
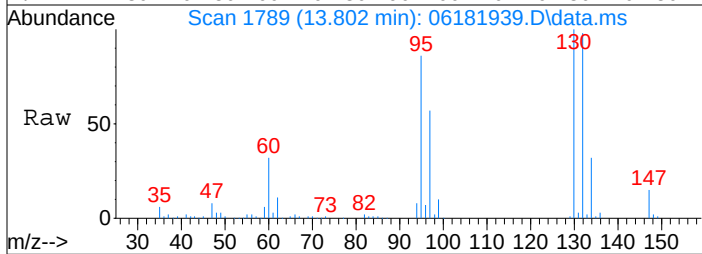
Tgt Ion: 63 Resp: 663
Ion Ratio Lower Upper
63 100
62 58.5 52.5 92.5





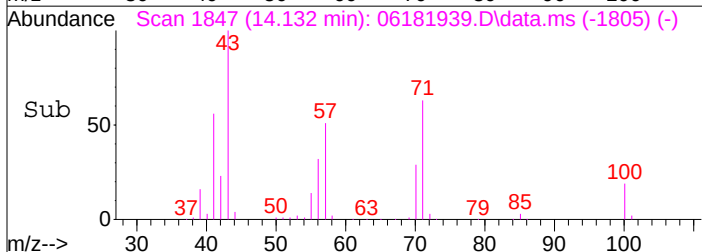
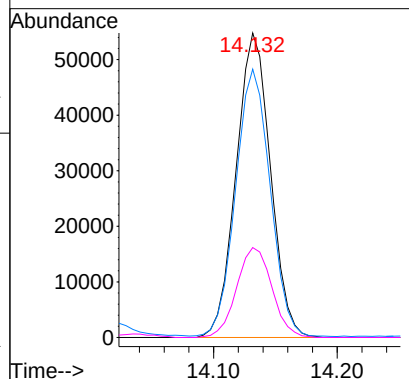
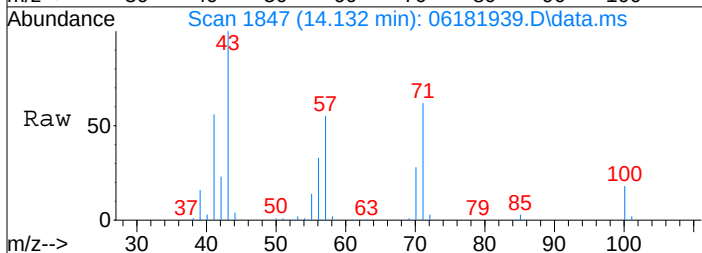
#47
 Trichloroethene
 Concen: 15.41 ng
 RT: 13.80 min Scan# 1789
 Delta R.T. -0.006 min
 Lab File: 06181939.D
 Acq: 19 Jun 2019 10:20

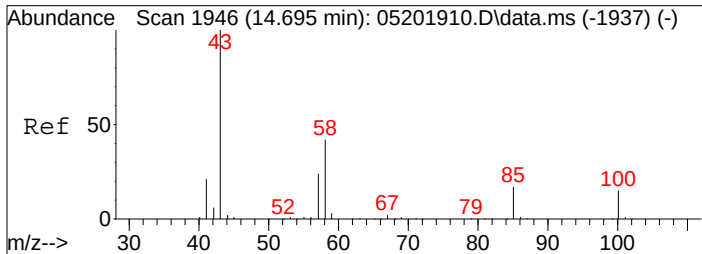
Tgt Ion:	130	Resp:	171323
Ion Ratio	Lower	Upper	
130	100		
132	97.0	75.6	115.6



#51
 n-Heptane
 Concen: 10.73 ng
 RT: 14.13 min Scan# 1847
 Delta R.T. -0.011 min
 Lab File: 06181939.D
 Acq: 19 Jun 2019 10:20

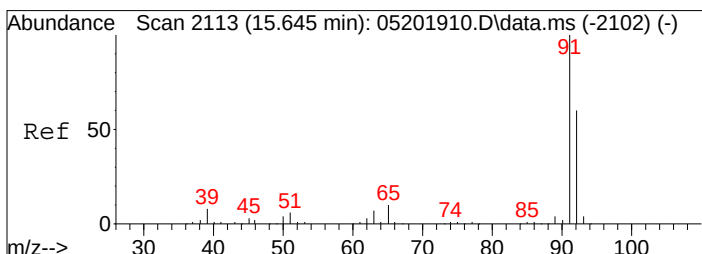
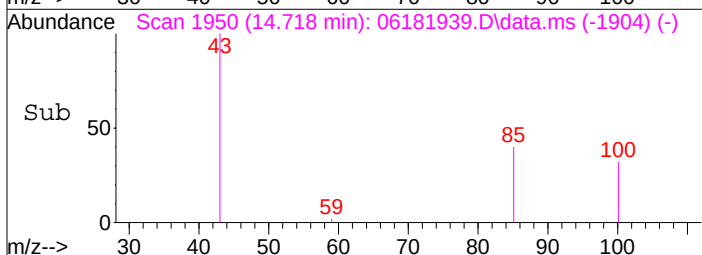
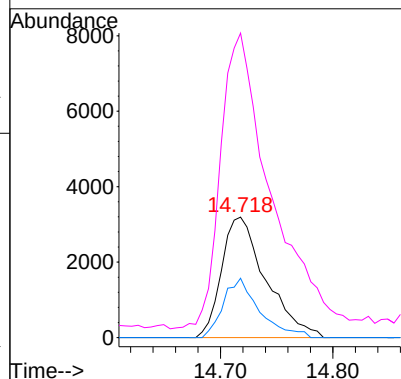
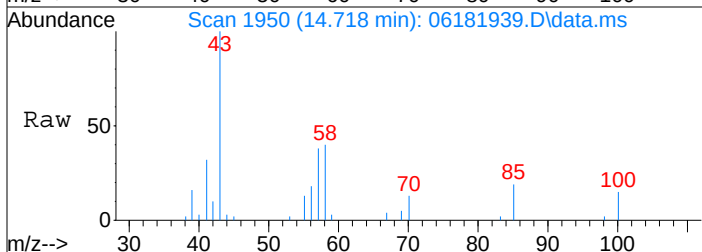
Tgt Ion:	71	Resp:	105896
Ion Ratio	Lower	Upper	
71	100		
57	88.4	74.3	114.3
100	30.3	6.6	46.6





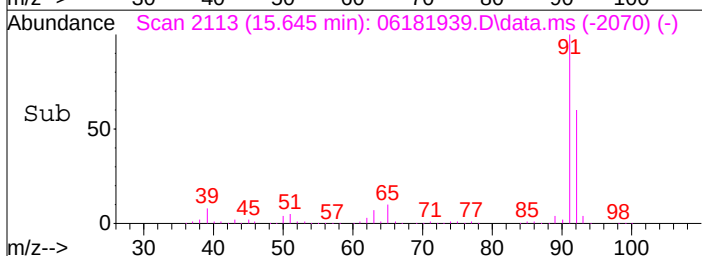
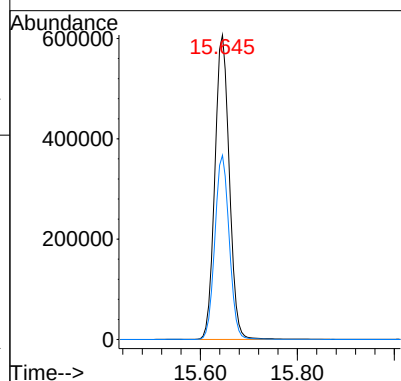
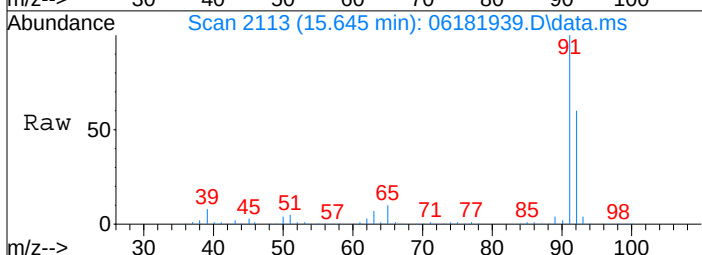
#53
4-Methyl-2-pentanone
Concen: 0.97 ng
RT: 14.72 min Scan# 1950
Delta R.T. 0.012 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

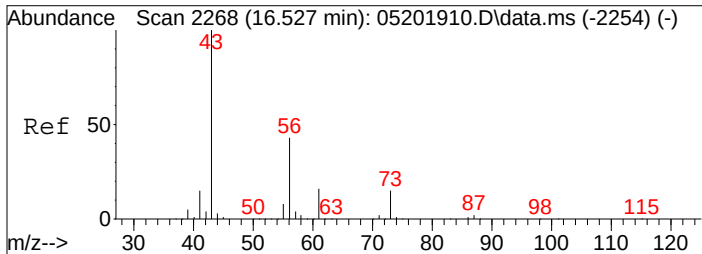
Tgt Ion: 58	Resp: 8747
Ion Ratio	Lower Upper
58	100
85	40.1 33.9 50.9
43	285.1 217.2 325.8



#58
Toluene
Concen: 33.29 ng
RT: 15.65 min Scan# 2113
Delta R.T. -0.006 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

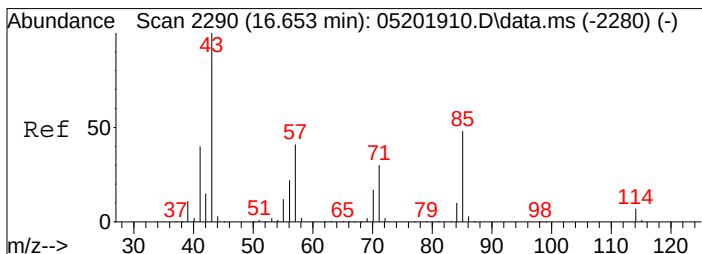
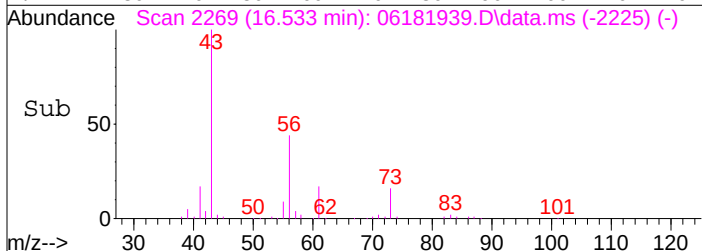
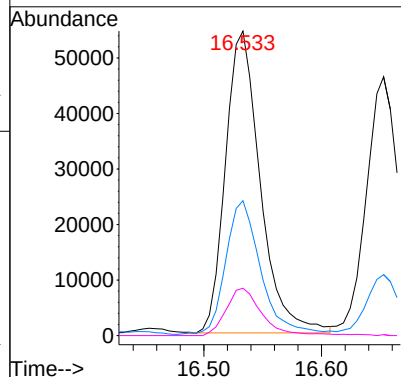
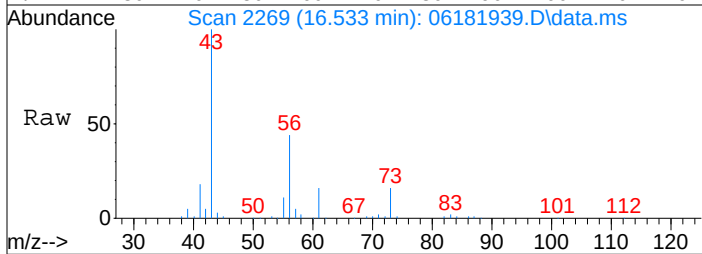
Tgt Ion: 91	Resp: 1256479
Ion Ratio	Lower Upper
91	100
92	60.3 39.3 79.3





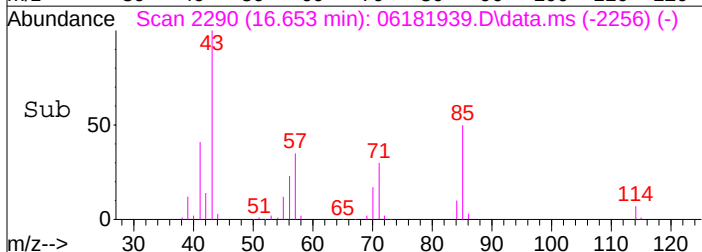
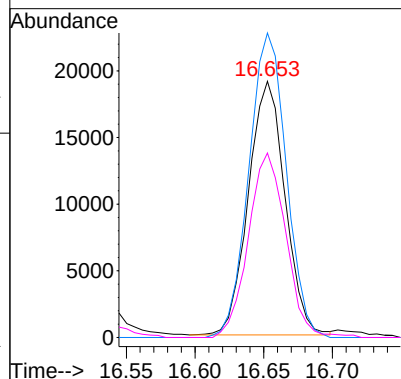
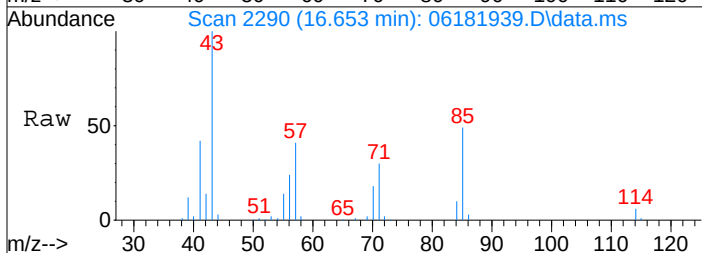
#62
n-Butyl Acetate
Concen: 5.53 ng
RT: 16.53 min Scan# 2269
Delta R.T. 0.000 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

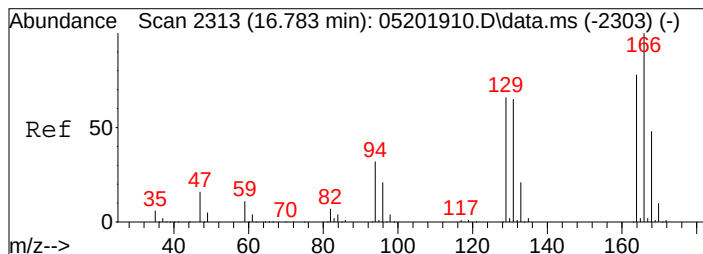
Tgt Ion: 43 Resp: 111647
Ion Ratio Lower Upper
43 100
56 44.5 18.5 58.5
73 16.4 0.0 33.2



#63
n-Octane
Concen: 4.52 ng
RT: 16.65 min Scan# 2290
Delta R.T. -0.006 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

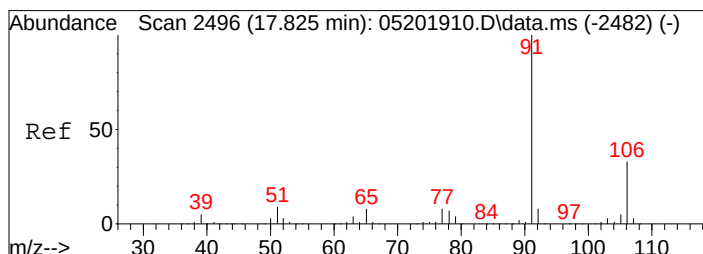
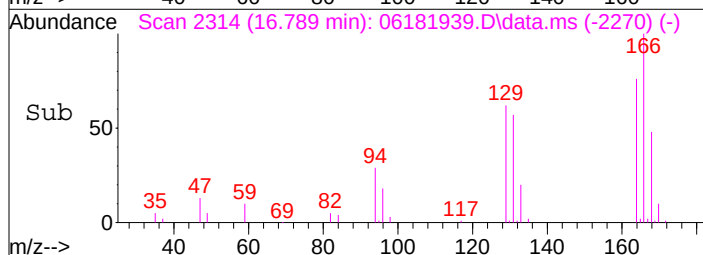
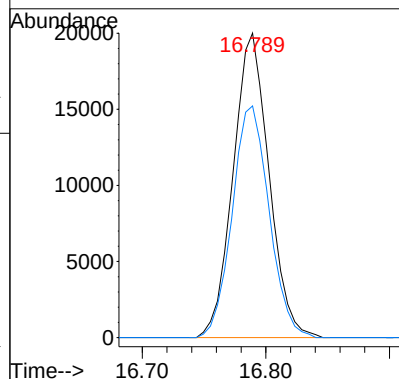
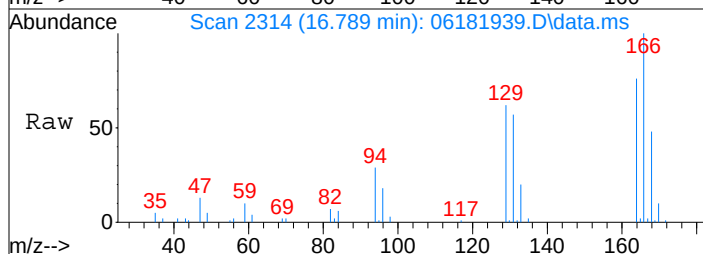
Tgt Ion: 57 Resp: 35387
Ion Ratio Lower Upper
57 100
85 122.4 85.1 127.7
71 74.3 54.2 81.4





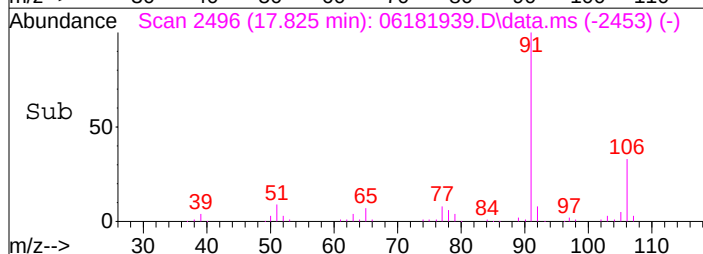
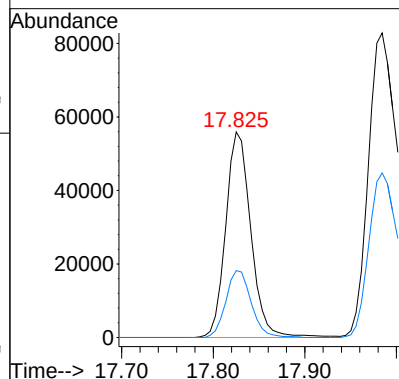
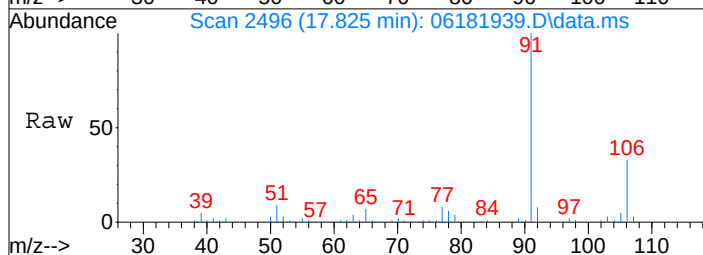
#64
Tetrachloroethene
Concen: 3.46 ng
RT: 16.79 min Scan# 2314
Delta R.T. 0.000 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

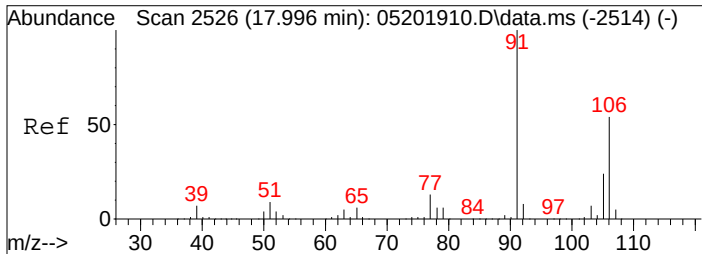
Tgt Ion: 166 Resp: 40423
Ion Ratio Lower Upper
166 100
164 78.3 58.1 98.1



#66
Ethylbenzene
Concen: 2.51 ng
RT: 17.83 min Scan# 2496
Delta R.T. -0.006 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

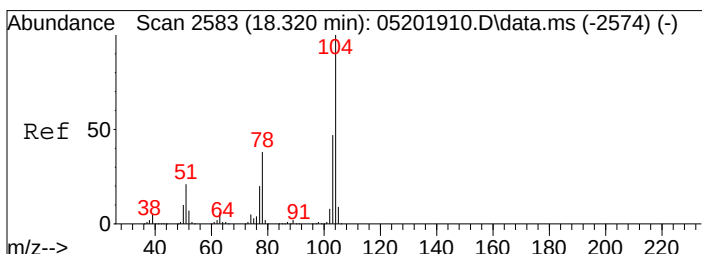
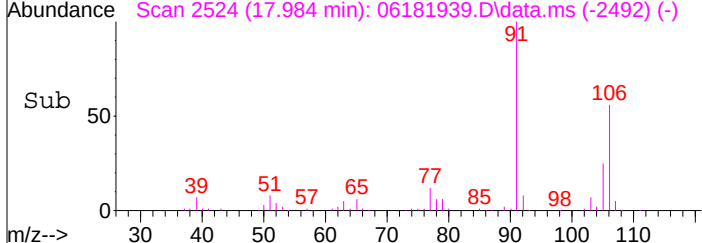
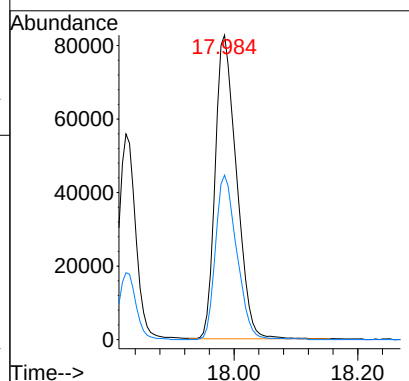
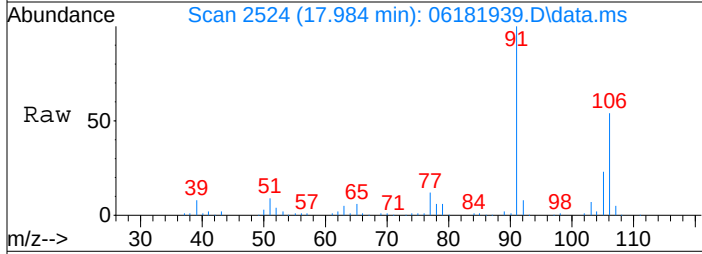
Tgt Ion: 91 Resp: 106670
Ion Ratio Lower Upper
91 100
106 32.7 11.2 51.2





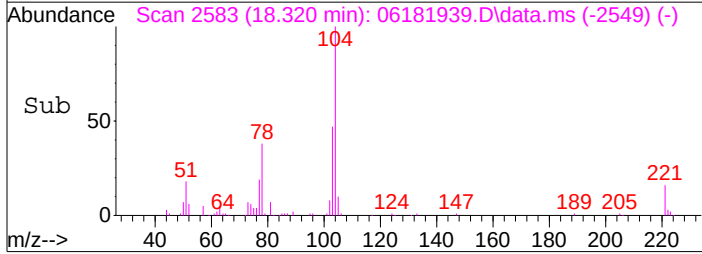
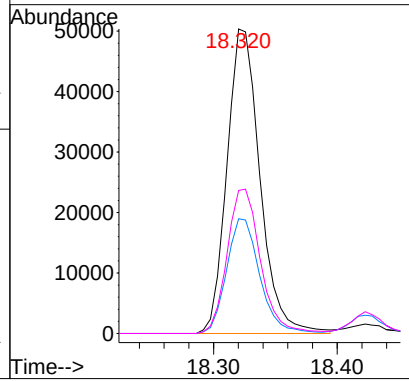
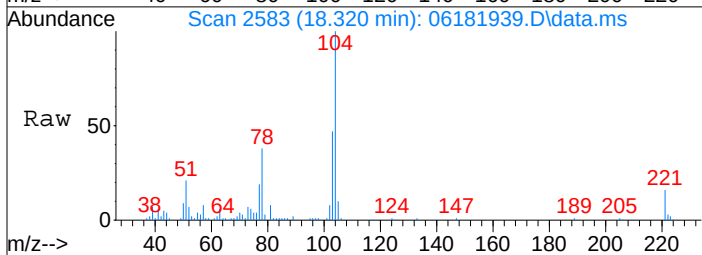
#67
 m- & p-Xylenes
 Concen: 6.10 ng
 RT: 17.98 min Scan# 2524
 Delta R.T. -0.017 min
 Lab File: 06181939.D
 Acq: 19 Jun 2019 10:20

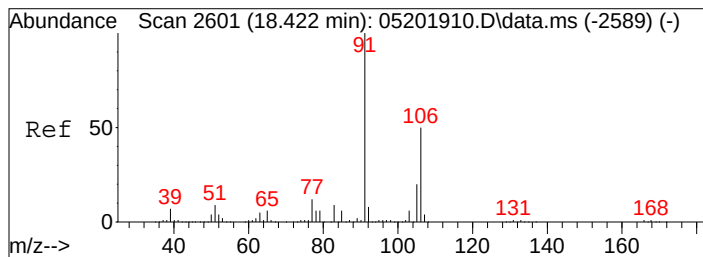
Tgt Ion:	91	Resp:	197472
Ion Ratio	Lower	Upper	
91	100		
106	54.3	28.8	68.8



#69
 Styrene
 Concen: 3.73 ng
 RT: 18.32 min Scan# 2583
 Delta R.T. -0.006 min
 Lab File: 06181939.D
 Acq: 19 Jun 2019 10:20

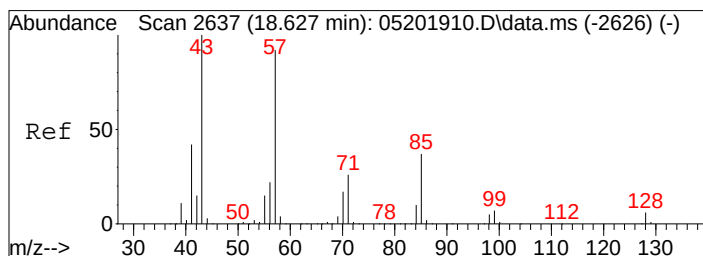
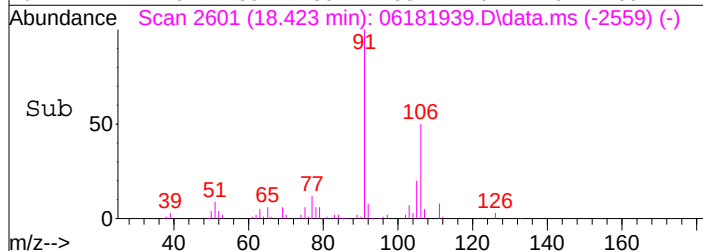
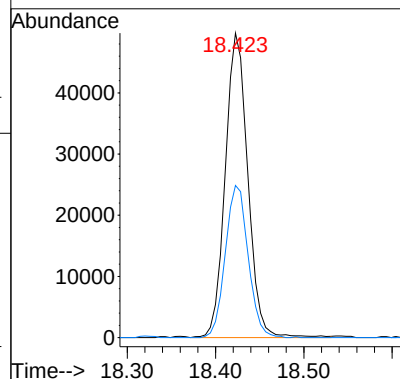
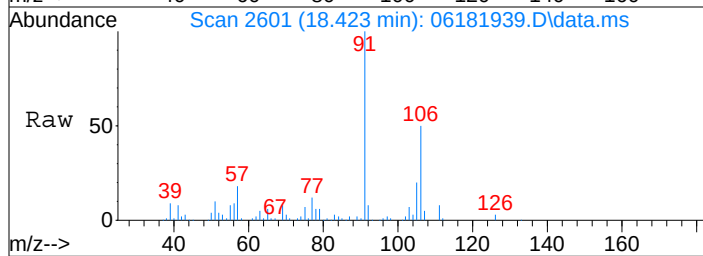
Tgt Ion:	104	Resp:	93851
Ion Ratio	Lower	Upper	
104	100		
78	37.8	25.0	65.0
103	47.8	27.6	67.6





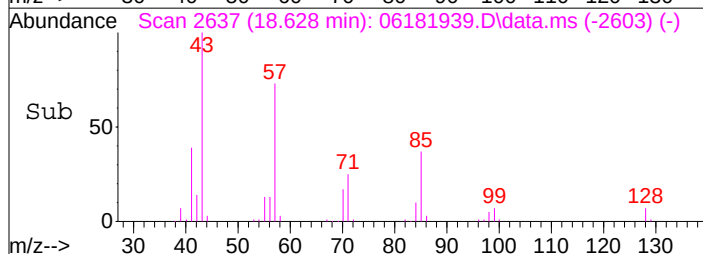
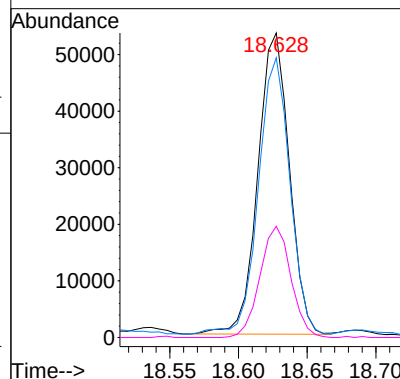
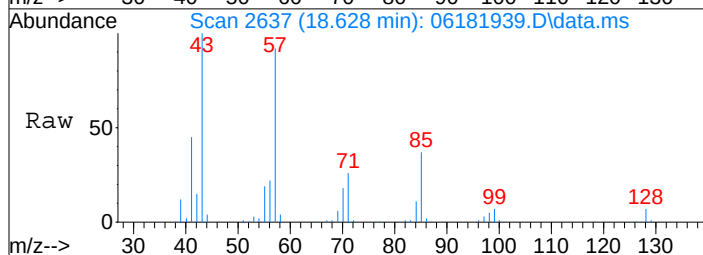
#70
o-Xylene
Concen: 2.73 ng
RT: 18.42 min Scan# 2601
Delta R.T. -0.011 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

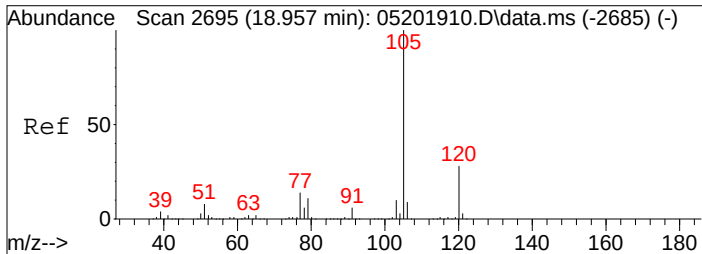
Tgt Ion: 91 Resp: 88430
Ion Ratio Lower Upper
91 100
106 50.5 27.1 67.1



#71
n-Nonane
Concen: 4.76 ng
RT: 18.63 min Scan# 2637
Delta R.T. -0.006 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

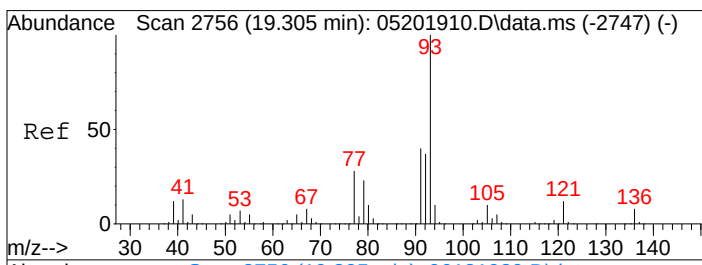
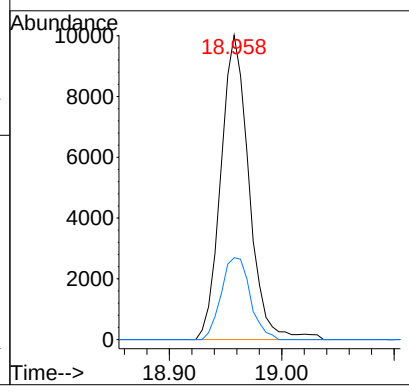
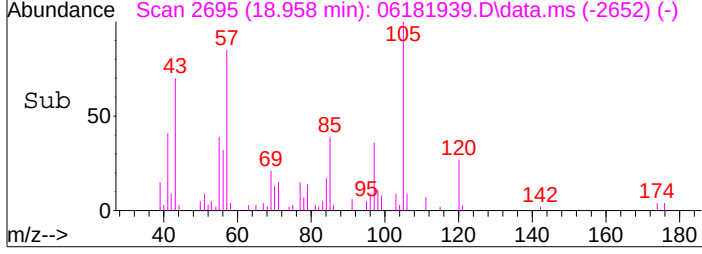
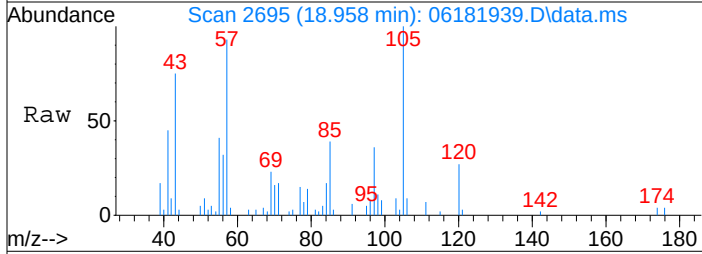
Tgt Ion: 43 Resp: 84894
Ion Ratio Lower Upper
43 100
57 92.2 63.7 103.7
85 36.3 10.1 50.1





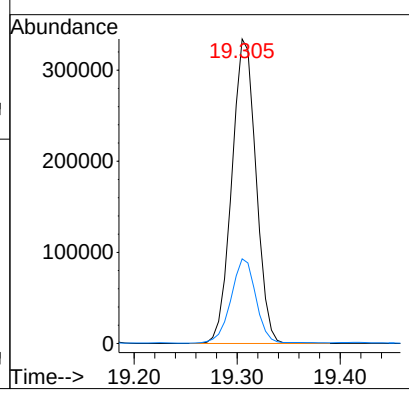
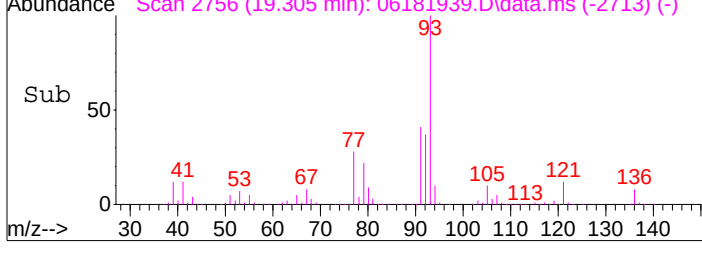
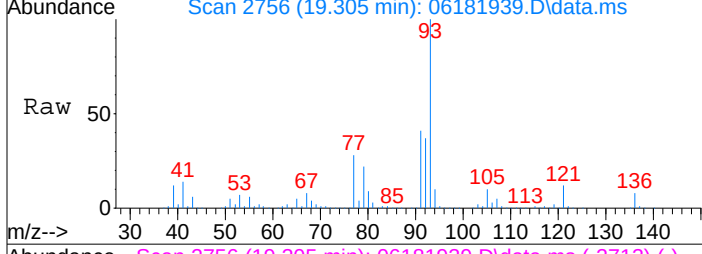
#74
Cumene
Concen: 0.41 ng
RT: 18.96 min Scan# 2695
Delta R.T. -0.006 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

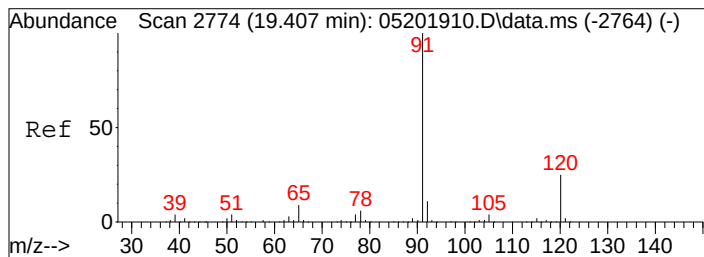
Tgt Ion: 105	Resp: 17435
Ion Ratio	Lower Upper
105	100
120	27.7 6.8 46.8



#75
alpha-Pinene
Concen: 24.67 ng
RT: 19.30 min Scan# 2756
Delta R.T. -0.006 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

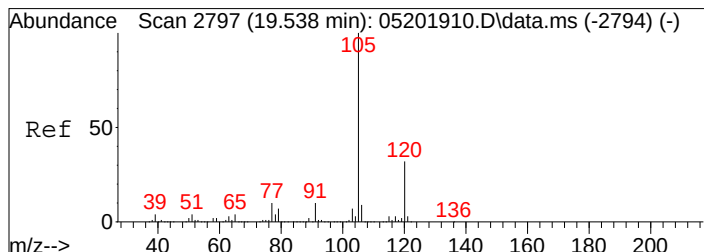
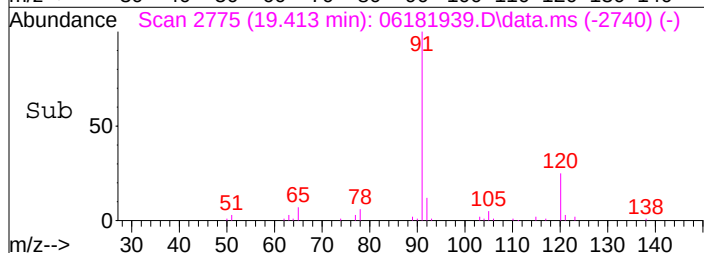
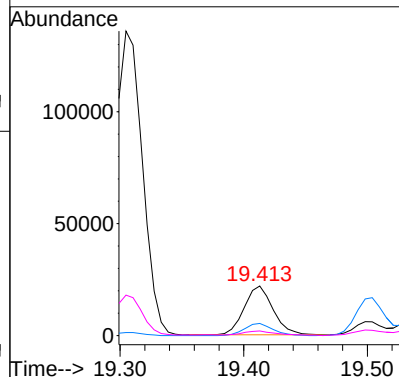
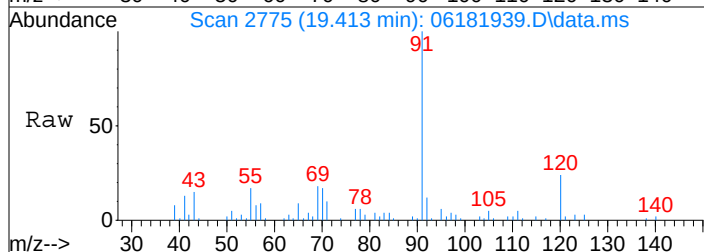
Tgt Ion: 93	Resp: 545681
Ion Ratio	Lower Upper
93	100
77	28.8 12.2 52.2





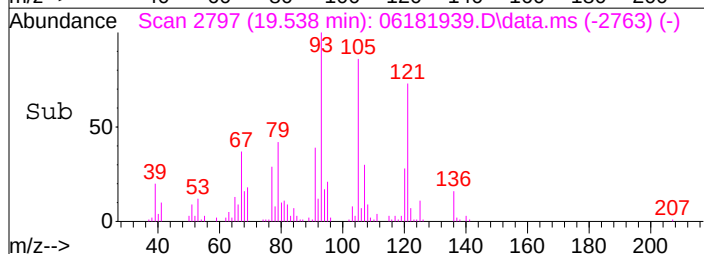
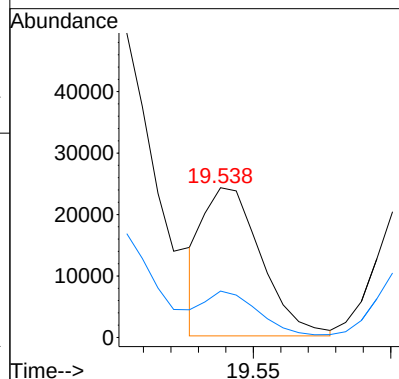
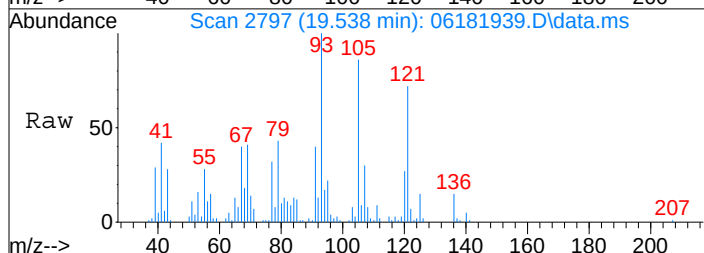
#76
n-Propylbenzene
Concen: 0.73 ng
RT: 19.41 min Scan# 2775
Delta R.T. 0.000 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

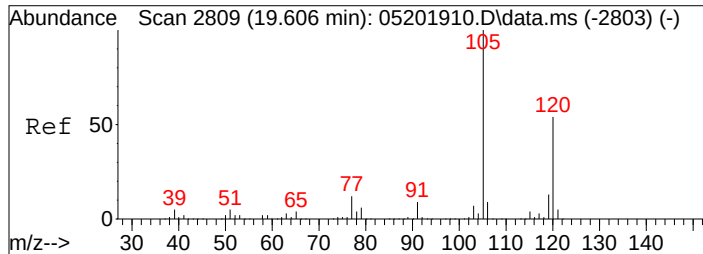
Tgt Ion	Ratio	Lower	Upper
91	100		
120	24.4	2.9	42.9
65	11.7	0.0	31.3



#78
4-Ethyltoluene
Concen: 0.93 ng
RT: 19.54 min Scan# 2797
Delta R.T. -0.006 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

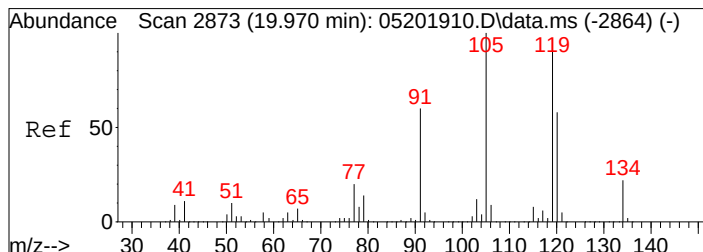
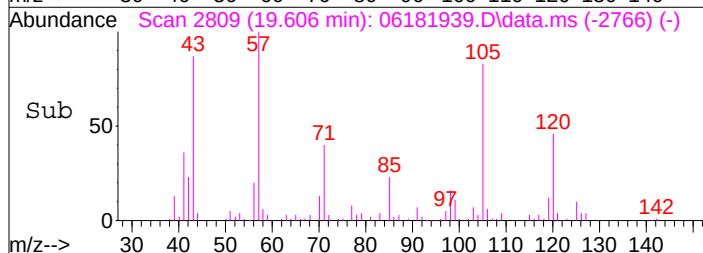
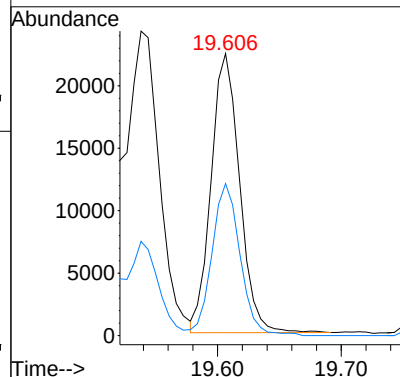
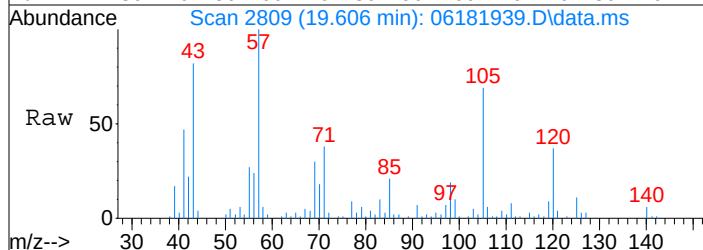
Tgt Ion	Ratio	Lower	Upper
105	100		
120	29.8	10.6	50.6





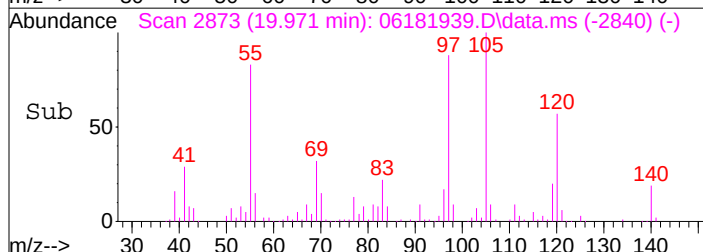
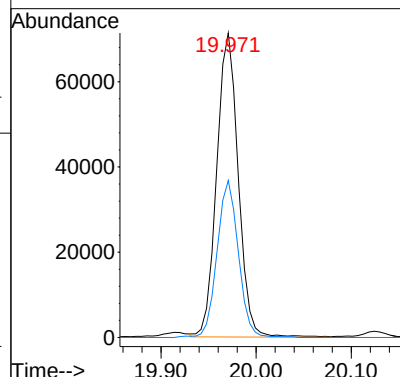
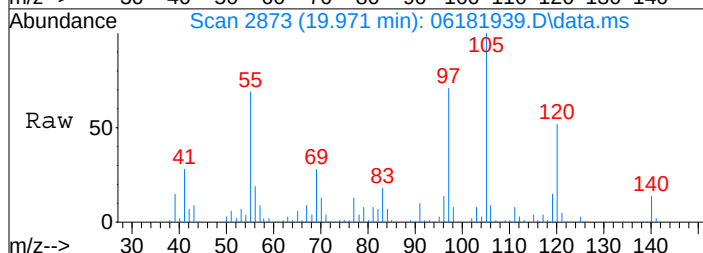
#79
1,3,5-Trimethylbenzene
Concen: 1.01 ng
RT: 19.61 min Scan# 2809
Delta R.T. -0.006 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

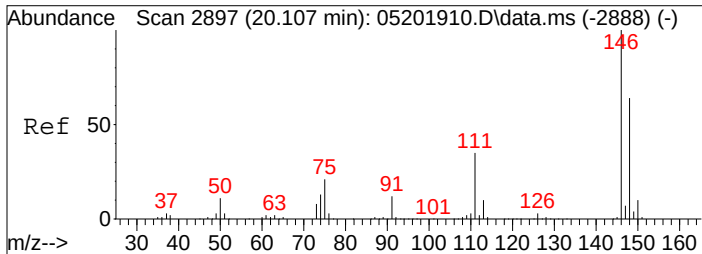
Tgt Ion:105 Resp: 35844
Ion Ratio Lower Upper
105 100
120 54.0 30.0 70.0



#82
1,2,4-Trimethylbenzene
Concen: 3.30 ng
RT: 19.97 min Scan# 2873
Delta R.T. -0.011 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

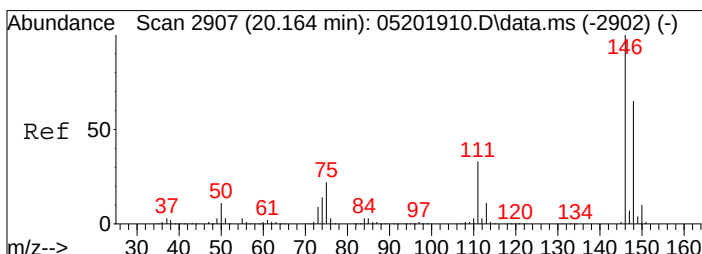
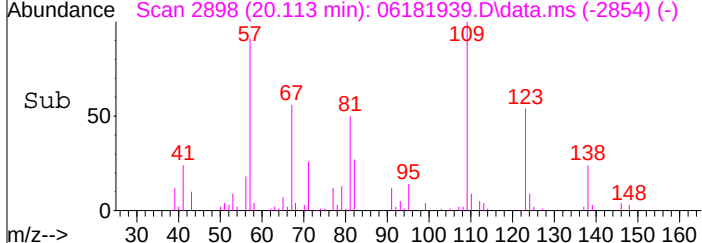
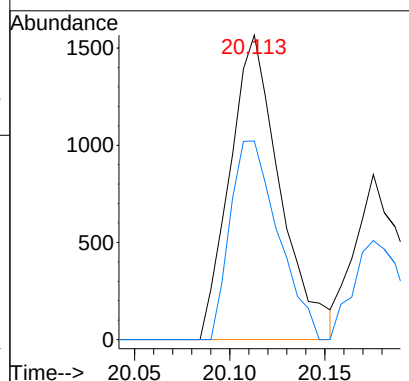
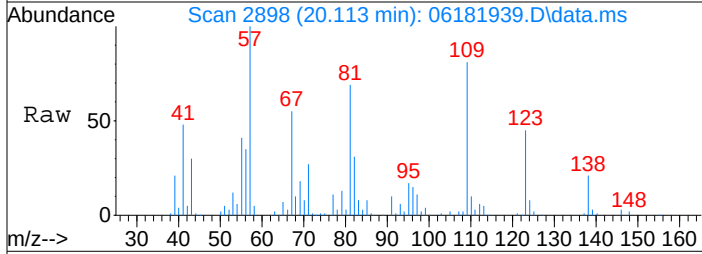
Tgt Ion:105 Resp: 112271
Ion Ratio Lower Upper
105 100
120 51.1 35.1 75.1





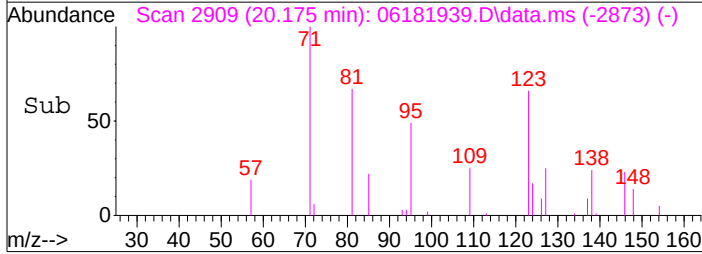
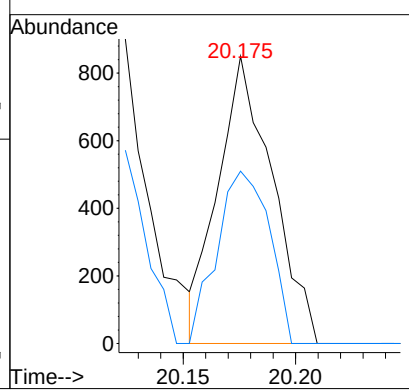
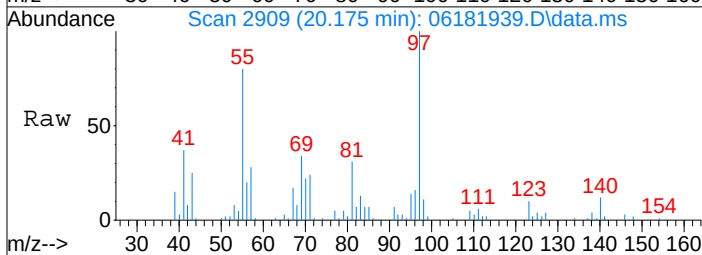
#85
 1,3-Dichlorobenzene
 Concen: 0.14 ng
 RT: 20.11 min Scan# 2898
 Delta R.T. 0.000 min
 Lab File: 06181939.D
 Acq: 19 Jun 2019 10:20

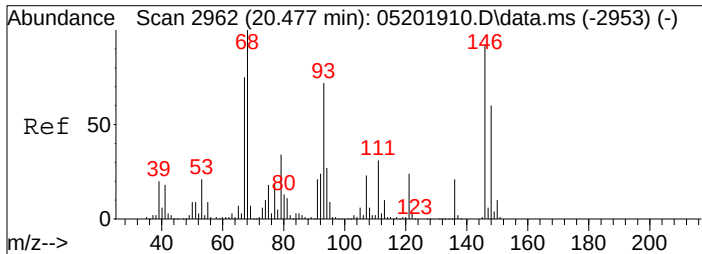
Tgt Ion:146	Resp:	2880
Ion Ratio	Lower	Upper
146	100	
148	62.2	44.3 84.3



#86
 1,4-Dichlorobenzene
 Concen: 0.07 ng
 RT: 20.18 min Scan# 2909
 Delta R.T. 0.006 min
 Lab File: 06181939.D
 Acq: 19 Jun 2019 10:20

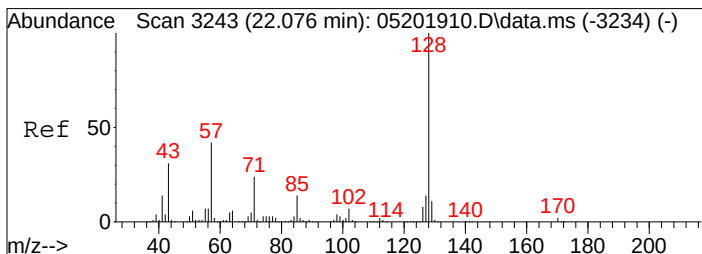
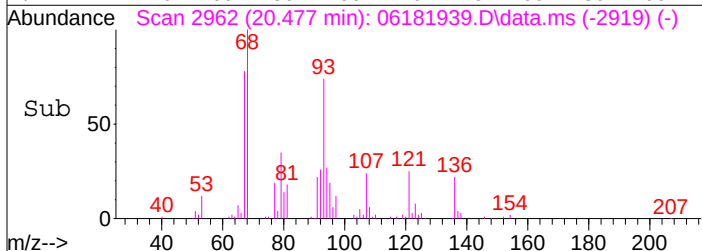
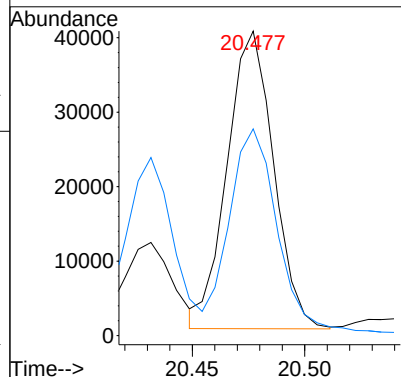
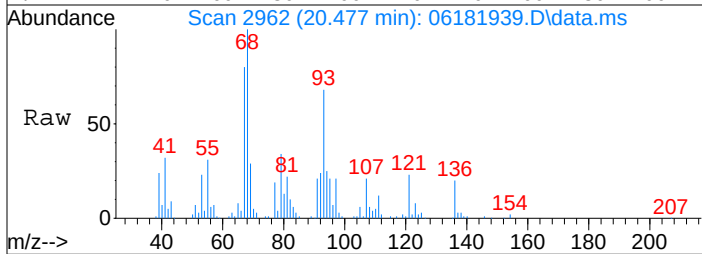
Tgt Ion:146	Resp:	1428
Ion Ratio	Lower	Upper
146	100	
148	58.1	44.1 84.1





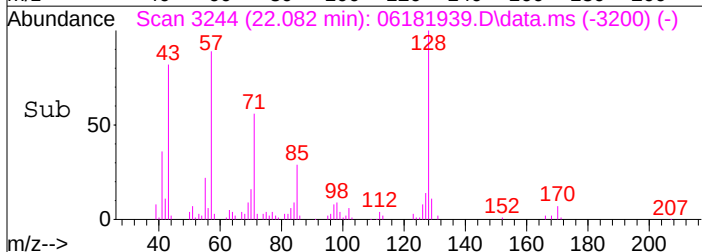
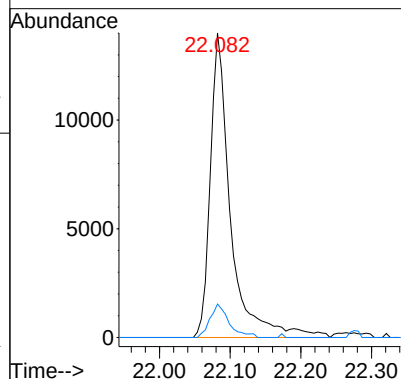
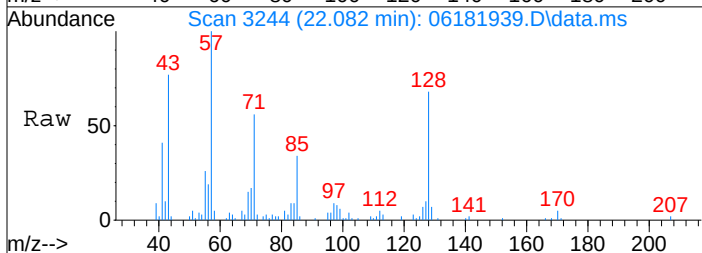
#91
d-Limonene
Concen: 4.24 ng
RT: 20.48 min Scan# 2962
Delta R.T. -0.006 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

Tgt Ion: 68 Resp: 57464
Ion Ratio Lower Upper
68 100
93 72.8 48.5 88.5



#95
Naphthalene
Concen: 0.66 ng
RT: 22.08 min Scan# 3244
Delta R.T. 0.000 min
Lab File: 06181939.D
Acq: 19 Jun 2019 10:20

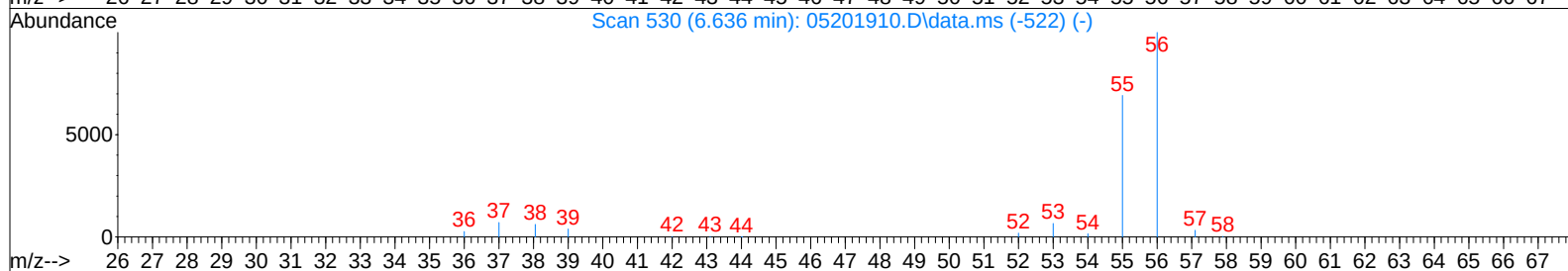
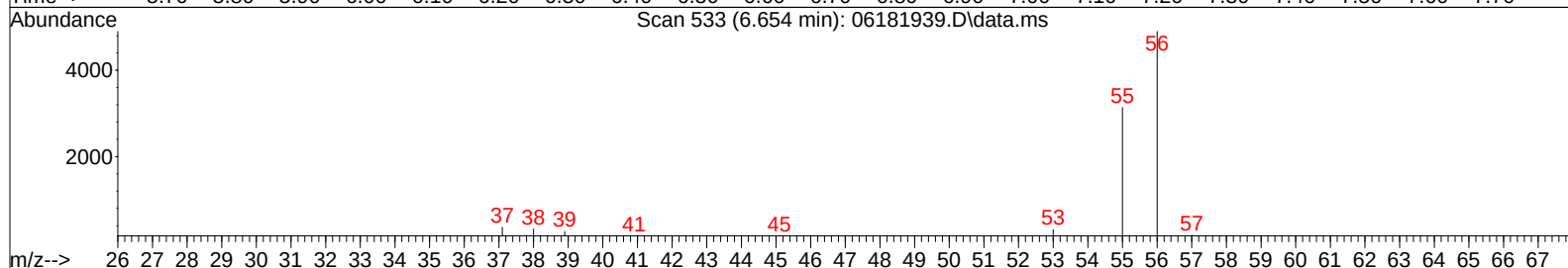
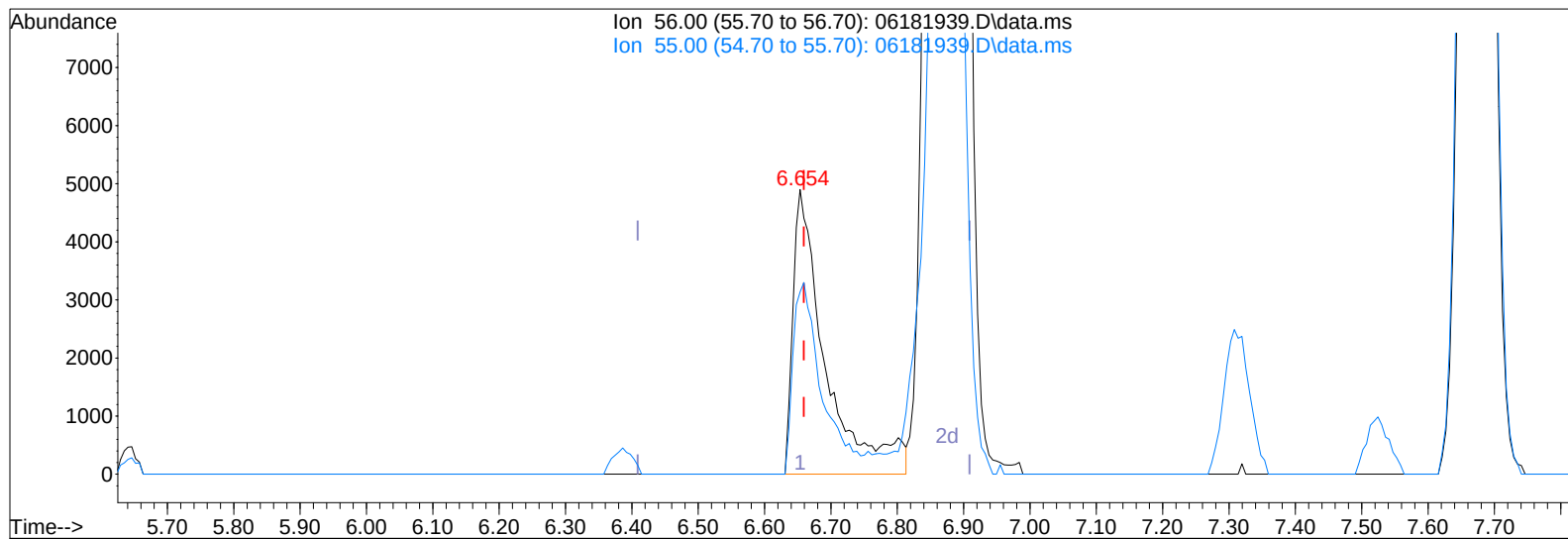
Tgt Ion: 128 Resp: 27856
Ion Ratio Lower Upper
128 100
129 10.3 0.0 31.3



Data File : I:\MS13\DATA\2019 06\18\06181939.D
Acq On : 19 Jun 2019 10:20
Sample : P1903275-001 (1000mL)
Misc : S31-05311902

Vial: 4
Operator: WA
Inst : MS13

Quant Time: Jun 19 13:30:37 2019
Quant Method : I:\MS13\METHODS\R13052019A.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue May 28 08:48:46 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 06181939.D\data.ms

(12) Acrolein (T)

6.654min (-0.005) 2.67ng

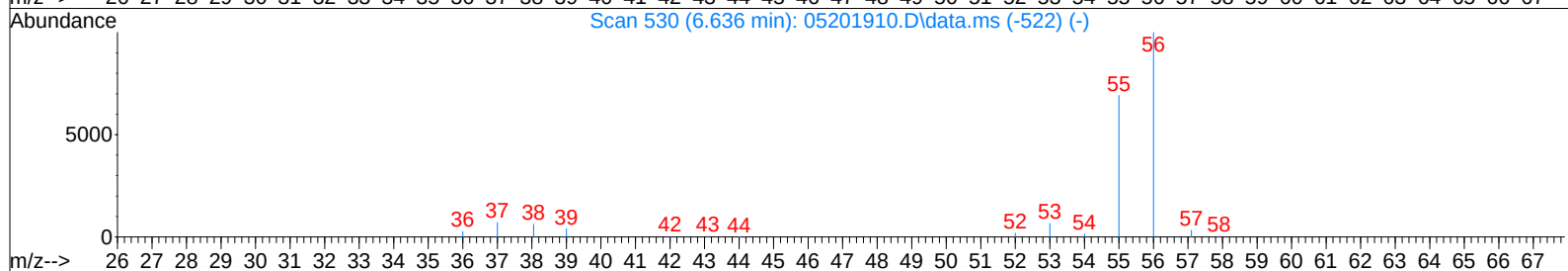
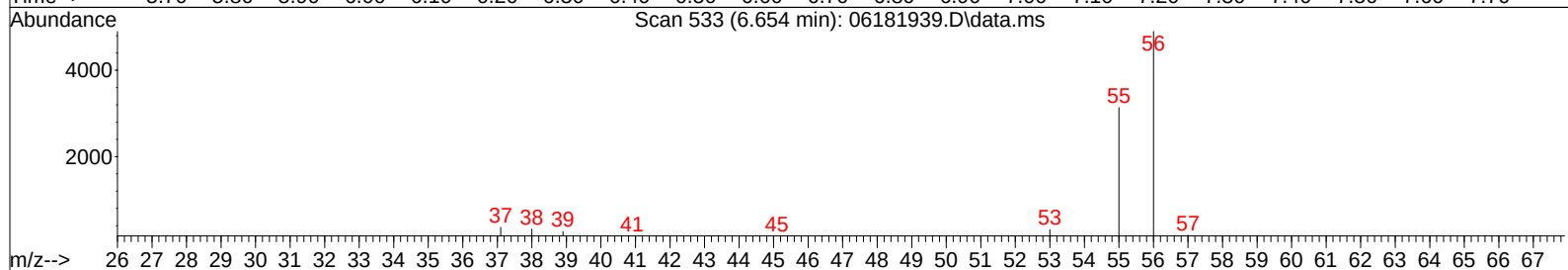
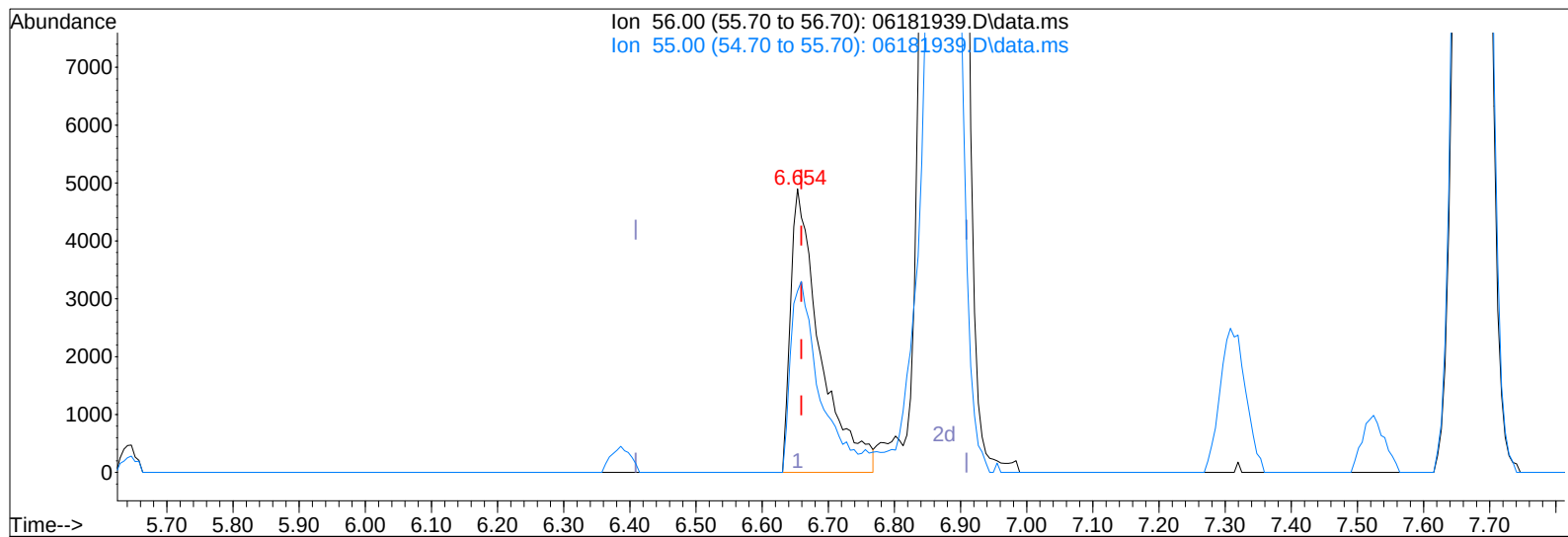
response 16584

Ion	Exp%	Act%
56.00	100	100
55.00	70.10	67.12
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2019 06\18\06181939.D
 Acq On : 19 Jun 2019 10:20
 Sample : P1903275-001 (1000mL)
 Misc : S31-05311902

Vial: 4
 Operator: WA
 Inst : MS13

Quant Time: Jun 19 13:30:37 2019
 Quant Method : I:\MS13\METHODS\R13052019A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Tue May 28 08:48:46 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



TIC: 06181939.D\data.ms

(12) Acrolein (T)

6.654min (-0.005) 2.44ng m

response 15161

Ion Exp% Act%

56.00 100 100

55.00 70.10 73.43

0.00 0.00 0.00

0.00 0.00 0.00

IPC

WA 6/19/19

LH 6/19/19

Data File : I:\MS13\DATA\2019 06\18\06181940.D
 Acq On : 19 Jun 2019 10:54
 Sample : P1903275-001d11 (100mL)
 Misc : S31-05311902

Vial: 4
 Operator: WA
 Inst : MS13

Quant Time: Jun 19 13:33:07 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:48:46 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

6/19/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.96	130	117959	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.10	114	505413	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.42	82	217696	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.82	65	146202	12.199	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.60%
57) Toluene-d8 (SS2)	15.54	98	551881	12.787	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.32%
73) Bromofluorobenzene (SS3)	18.83	174	214426	13.627	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	109.04%

Target Compounds

						Qvalue
2) Propene	0.00	42	0	N.D.	d	
3) Dichlorodifluoromethan...	4.14	85	11493	0.628	ng	98
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	6.22	45	23560	2.972	ng	95
11) Acetonitrile	6.39	41	303	N.D.		
12) Acrolein	6.78	56	107	N.D.		
13) Acetone	6.84	58	69458	8.445	ng	# 40
14) Trichlorofluoromethane	7.07	101	754	N.D.		
15) 2-Propanol (Isopropanol)	7.35	45	46149	1.857	ng	96
16) Acrylonitrile	0.00	53	0	N.D.	d	
17) 1,1-Dichloroethene	0.00	96	0	N.D.		
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.	d	
19) Methylene Chloride	8.25	84	814	0.084	ng	# 75
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.	d	
21) Trichlorotrifluoroethane	8.66	151	3428	0.351	ng	85
22) Carbon Disulfide	8.53	76	14353	0.377	ng	82
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	9.93	73	7992	0.280	ng	94
26) Vinyl Acetate	0.00	86	0	N.D.	d	
27) 2-Butanone (MEK)	10.32	72	6453	0.898	ng	# 64
28) cis-1,2-Dichloroethene	10.80	61	17417	1.349	ng	77
29) Diisopropyl Ether	0.00	87	0	N.D.	d	
30) Ethyl Acetate	11.10	61	125544	36.117	ng	96
31) n-Hexane	11.08	57	15389	0.960	ng	99
32) Chloroform	11.14	83	4599	0.288	ng	93
34) Tetrahydrofuran (THF)	0.00	72	0	N.D.	d	
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	0.00	62	0	N.D.		
38) 1,1,1-Trichloroethane	0.00	97	0	N.D.		
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	12.70	78	5606	0.140	ng	91
42) Carbon Tetrachloride	12.85	117	444	N.D.		
43) Cyclohexane	12.99	84	9729	0.611	ng	94
44) tert-Amyl Methyl Ether	13.39	73	524	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	13.76	83	117	N.D.		
47) Trichloroethene	13.80	130	16191	1.439	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\2019 06\18\06181940.D
 Acq On : 19 Jun 2019 10:54
 Sample : P1903275-001dil (100mL)
 Misc : S31-05311902

Vial: 4
 Operator: WA
 Inst : MS13

Quant Time: Jun 19 13:33:07 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:48:46 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

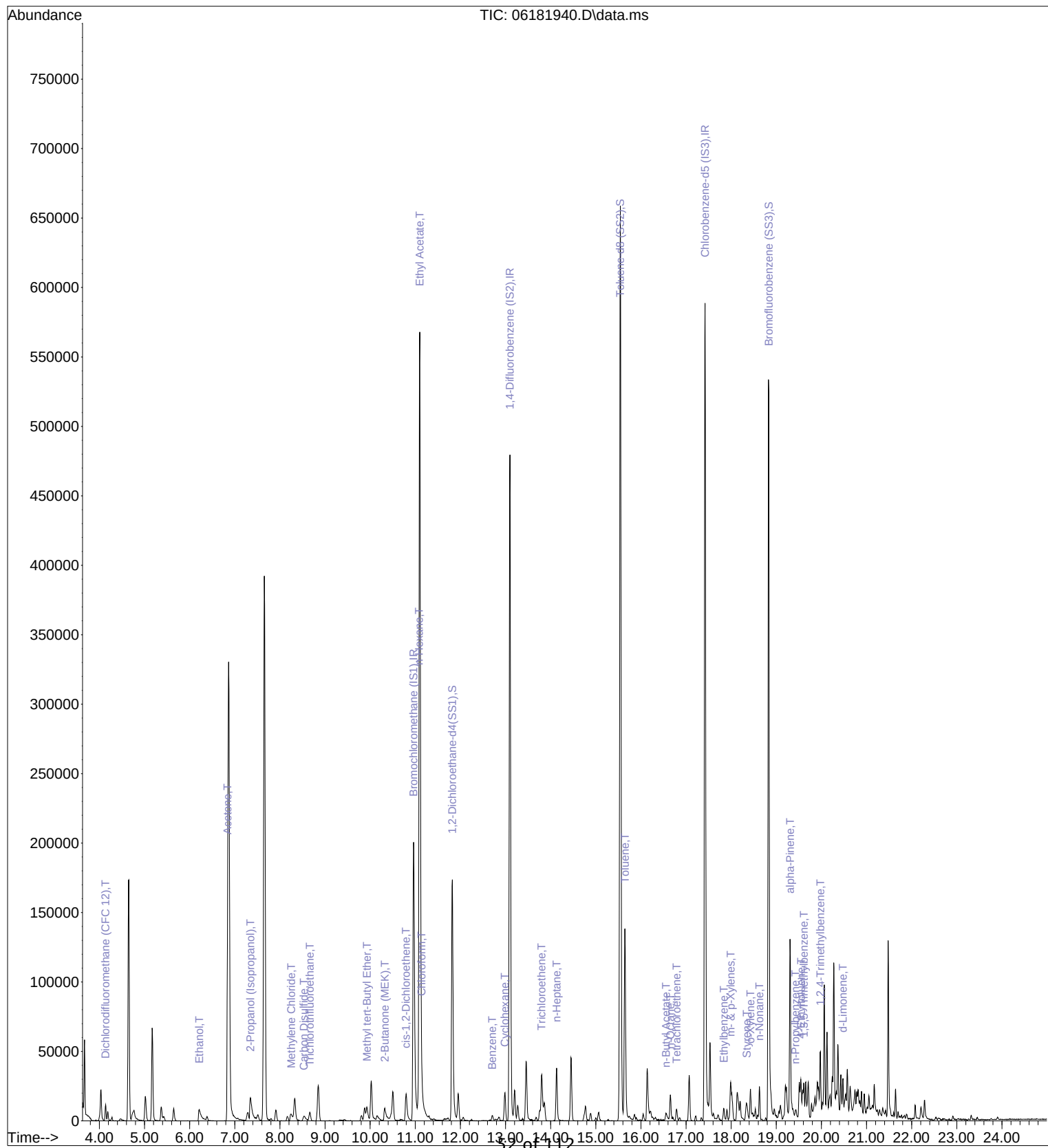
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.13	71	10991	1.100	ng	97
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	15.65	91	129495	3.269	ng	100
59) 2-Hexanone	0.00	43	0	N.D.	d	
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.56	43	7760	0.366	ng	90
63) n-Octane	16.65	57	4040	0.491	ng	96
64) Tetrachloroethene	16.79	166	3870	0.316	ng	96
65) Chlorobenzene	17.50	112	889	N.D.		
66) Ethylbenzene	17.84	91	10734	0.241	ng	100
67) m- & p-Xylenes	17.99	91	27975	0.823	ng	97
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.34	104	8888	0.337	ng	83
70) o-Xylene	18.43	91	13349	0.393	ng	92
71) n-Nonane	18.63	43	10123	0.541	ng	99
72) 1,1,2,2-Tetrachloroethane	18.42	83	471	N.D.		
74) Cumene	18.96	105	1764	N.D.		
75) alpha-Pinene	19.30	93	54167	2.334	ng	91
76) n-Propylbenzene	19.42	91	3680	0.072	ng	93
77) 3-Ethyltoluene	0.00	105	0	N.D.	d	
78) 4-Ethyltoluene	19.55	105	5353	0.134	ng	95
79) 1,3,5-Trimethylbenzene	19.61	105	7303	0.196	ng	93
80) alpha-Methylstyrene	19.77	118	359	N.D.		
81) 2-Ethyltoluene	0.00	105	0	N.D.	d	
82) 1,2,4-Trimethylbenzene	19.98	105	14551	0.407	ng	89
83) n-Decane	0.00	57	0	N.D.	d	
84) Benzyl Chloride	0.00	91	0	N.D.	d	
85) 1,3-Dichlorobenzene	0.00	146	0	N.D.		
86) 1,4-Dichlorobenzene	0.00	146	0	N.D.		
87) sec-Butylbenzene	20.22	105	773	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	20.48	68	5760	0.405	ng	99
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	0.00	57	0	N.D.	d	
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	0.00	128	0	N.D.	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	0.00	119	0	N.D.	d	
100) n-Butylbenzene	20.72	91	647	N.D.		

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

Data File : I:\MS13\DATA\2019 06\18\06181940.D
Acq On : 19 Jun 2019 10:54
Sample : P1903275-001dil (100mL)
Misc : S31-05311902

Vial: 4
Operator: WA
Inst : MS13

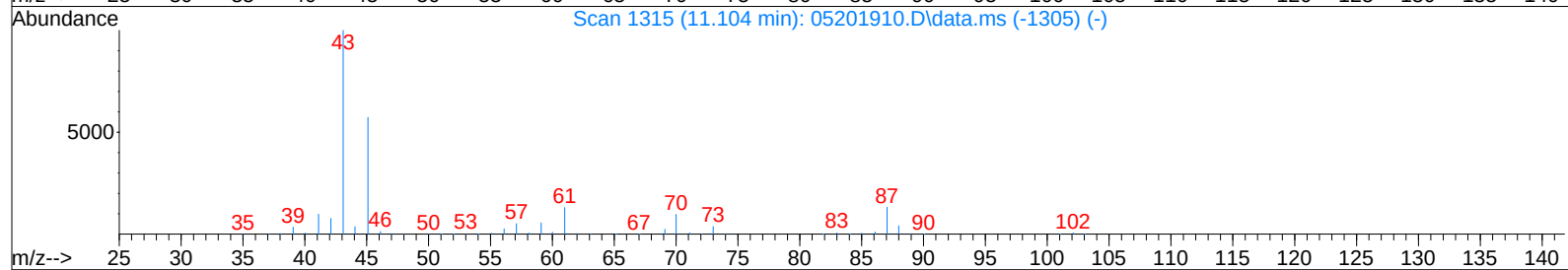
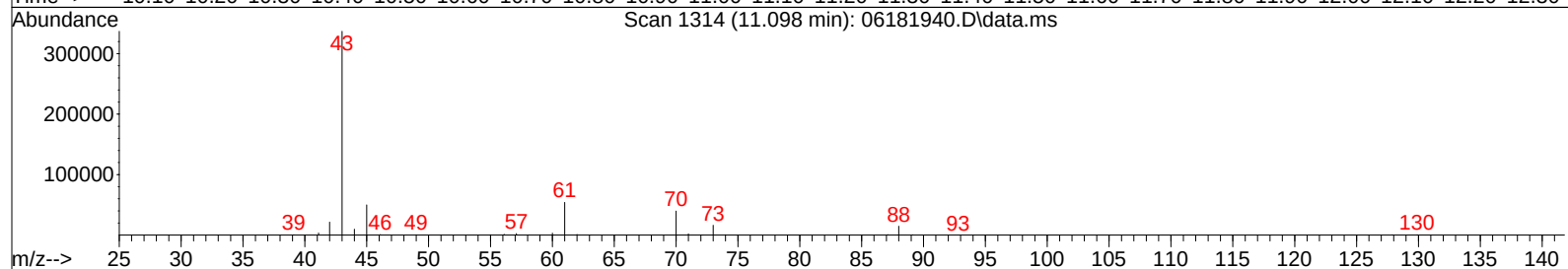
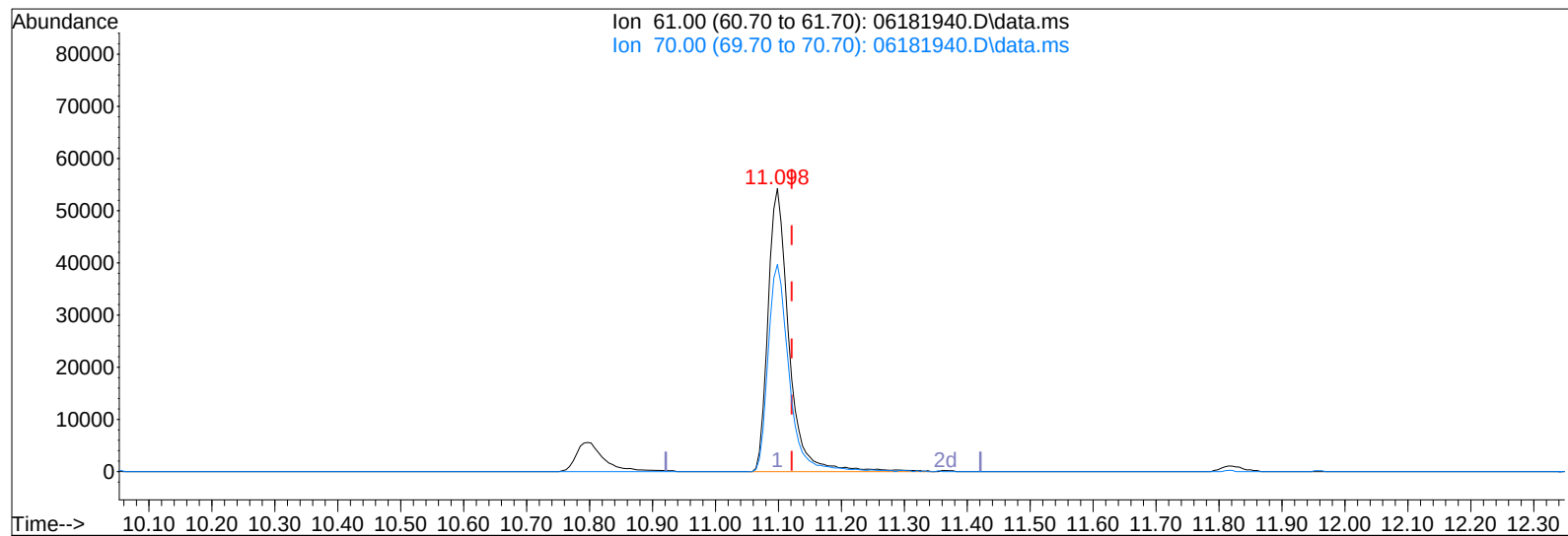
Quant Time: Jun 19 13:33:07 2019
Quant Method : I:\MS13\METHODS\R13052019A.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue May 28 08:48:46 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019 06\18\06181940.D
Acq On : 19 Jun 2019 10:54
Sample : P1903275-001dil (100mL)
Misc : S31-05311902

Vial: 4
Operator: WA
Inst : MS13

Quant Time: Jun 19 13:30:45 2019
Quant Method : I:\MS13\METHODS\R13052019A.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue May 28 08:48:46 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 06181940.D\data.ms

(30) Ethyl Acetate (T)

11.098min (-0.023) 36.12ng

response 125544

Ion	Exp%	Act%
61.00	100	100
70.00	77.10	73.25
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2019 06\18\06181929.D
 Acq On : 18 Jun 2019 20:06
 Sample : MB2 R13061819 1000mL
 Misc : S31-05311902/AC00880

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Jun 19 06:55:12 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:48:46 2019

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)	10.97	130	102750	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.10	114	452568	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.42	82	196113	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.82	65	135351	12.966	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.76%
57) Toluene-d8 (SS2)	15.54	98	494273	12.712	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.68%
73) Bromofluorobenzene (SS3)	18.83	174	191882	13.536	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	108.32%

Target Compounds

						Qvalue
2) Propene	0.00	42	0	N.D.		
3) Dichlorodifluoromethan...	0.00	85	0	N.D.		
4) Chloromethane	0.00	50	0	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.		
6) Vinyl Chloride	0.00	62	0	N.D.		
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	0.00	45	0	N.D.		
11) Acetonitrile	0.00	41	0	N.D.		
12) Acrolein	0.00	56	0	N.D.		
13) Acetone	6.96	58	4194	0.585	ng	# 49
14) Trichlorofluoromethane	0.00	101	0	N.D.		
15) 2-Propanol (Isopropanol)	0.00	45	0	N.D.		
16) Acrylonitrile	0.00	53	0	N.D.		
17) 1,1-Dichloroethene	0.00	96	0	N.D.		
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.		
19) Methylene Chloride	0.00	84	0	N.D.		
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.		
21) Trichlorotrifluoroethane	0.00	151	0	N.D.		
22) Carbon Disulfide	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	0.00	78	0	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\2019 06\18\06181929.D
 Acq On : 18 Jun 2019 20:06
 Sample : MB2 R13061819 1000mL
 Misc : S31-05311902/AC00880

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Jun 19 06:55:12 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:48:46 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

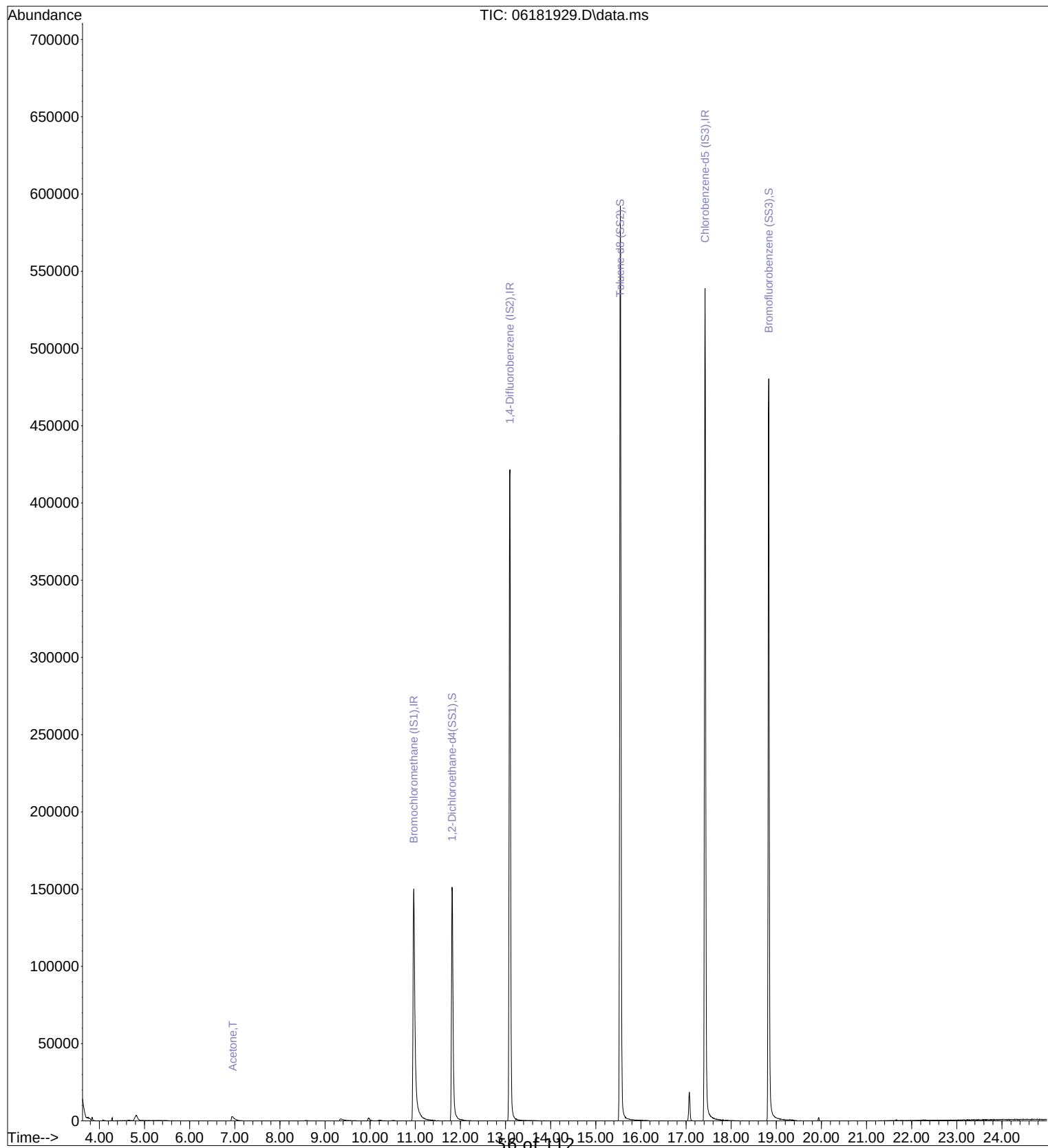
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	0.00	71	0	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	0.00	91	0	N.D.		
59) 2-Hexanone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

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

Data File : I:\MS13\DATA\2019 06\18\06181929.D
Acq On : 18 Jun 2019 20:06
Sample : MB2 R13061819 1000mL
Misc : S31-05311902/AC00880

Vial: 2
Operator: WA
Inst : MS13

Quant Time: Jun 19 06:55:12 2019
Quant Method : I:\MS13\METHODS\R13052019A.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue May 28 08:48:46 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019 06\18\06181930.D
 Acq On : 18 Jun 2019 20:40
 Sample : LCS2 R13061819 25ng
 Misc : S31-05311902/S31-06071901 (7/6)

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Jun 19 05:52:09 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:48:46 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

WA 6/19/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.98	130	112035	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.10	114	470249	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.42	82	206314	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.83	65	145436	12.777	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.24%
57) Toluene-d8 (SS2)	15.54	98	511425	12.503	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.00%
73) Bromofluorobenzene (SS3)	18.83	174	209382	14.041	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	112.32%

Target Compounds

						Qvalue
2) Propene	3.97	42	226162	20.300	ng	95
3) Dichlorodifluoromethan...	4.13	85	385209	22.145	ng	100
4) Chloromethane	4.41	50	310815	22.558	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.66	135	234330	22.822	ng	99
6) Vinyl Chloride	4.82	62	310219	24.049	ng	99
7) 1,3-Butadiene	5.08	54	249024	25.086	ng	94
8) Bromomethane	5.50	94	197595	22.867	ng	100
9) Chloroethane	5.83	64	150125	21.536	ng	99
10) Ethanol	6.22	45	752853	100.002	ng	100
11) Acetonitrile	6.46	41	380145	21.599	ng	99
12) Acrolein	6.64	56	125447	21.157	ng	99
13) Acetone	6.84	58	737743	94.437	ng	86
14) Trichlorofluoromethane	7.07	101	333186	22.769	ng	100
15) 2-Propanol (Isopropanol)	7.34	45	1008797	42.743	ng	96
16) Acrylonitrile	7.59	53	266396	23.313	ng	98
17) 1,1-Dichloroethene	8.02	96	203046	22.338	ng	# 77
18) 2-Methyl-2-Propanol (t...	8.20	59	816336	36.956	ng	95
19) Methylene Chloride	8.25	84	205987	22.292	ng	# 78
20) 3-Chloro-1-propene (Al...	8.41	41	305414	21.919	ng	87
21) Trichlorotrifluoroethane	8.66	151	207361	22.378	ng	85
22) Carbon Disulfide	8.51	76	753229	20.815	ng	100
23) trans-1,2-Dichloroethene	9.53	61	278308	22.871	ng	83
24) 1,1-Dichloroethane	9.78	63	350140	21.471	ng	99
25) Methyl tert-Butyl Ether	9.87	73	497926	18.355	ng	97
26) Vinyl Acetate	10.04	86	254734	119.353	ng	# 68
27) 2-Butanone (MEK)	10.28	72	135677	19.871	ng	# 75
28) cis-1,2-Dichloroethene	10.80	61	265403	21.645	ng	82
29) Diisopropyl Ether	11.10	87	205025	22.660	ng	# 66
30) Ethyl Acetate	11.10	61	145013	43.924	ng	99
31) n-Hexane	11.08	57	318468	20.927	ng	99
32) Chloroform	11.14	83	340931	22.454	ng	99
34) Tetrahydrofuran (THF)	11.55	72	134118	20.494	ng	# 84
35) Ethyl tert-Butyl Ether	11.69	87	245023	21.818	ng	# 85
36) 1,2-Dichloroethane	11.95	62	245450	23.643	ng	100
38) 1,1,1-Trichloroethane	12.22	97	298711	23.521	ng	94
39) Isopropyl Acetate	12.66	61	253413	42.684	ng	# 76
40) 1-Butanol	12.68	56	388942	43.259	ng	96
41) Benzene	12.70	78	799941	21.442	ng	98
42) Carbon Tetrachloride	12.86	117	275374	24.118	ng	100
43) Cyclohexane	12.99	84	626669	42.284	ng	90
44) tert-Amyl Methyl Ether	13.34	73	573192	22.410	ng	92
45) 1,2-Dichloropropane	13.55	63	198488	21.481	ng	100
46) Bromodichloromethane	13.74	83	268749	23.959	ng	99
47) Trichloroethene	13.80	130	242647	23.177	ng	99
48) 1,4-Dioxane	13.77	88	172122	22.135	ng	89
49) 2,2,4-Trimethylpentane...	13.86	57	821568	20.764	ng	89
50) Methyl Methacrylate	14.01	100	174634	45.981	ng	# 82

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Data File : I:\MS13\DATA\2019 06\18\06181930.D
 Acq On : 18 Jun 2019 20:40
 Sample : LCS2 R13061819 25ng
 Misc : S31-05311902/S31-06071901 (7/6)

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Jun 19 05:52:09 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:48:46 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.13	71	200160	21.524	ng	95
52) cis-1,3-Dichloropropene	14.66	75	328932	24.258	ng	100
53) 4-Methyl-2-pentanone	14.70	58	183384	21.565	ng	87
54) trans-1,3-Dichloropropene	15.18	75	294787	24.688	ng	100
55) 1,1,2-Trichloroethane	15.36	97	200430	22.963	ng	96
58) Toluene	15.65	91	822662	21.911	ng	99
59) 2-Hexanone	15.89	43	416601	22.503	ng	92
60) Dibromochloromethane	16.05	129	252620	25.398	ng	99
61) 1,2-Dibromoethane	16.31	107	232177	25.082	ng	98
62) n-Butyl Acetate	16.53	43	462894	23.056	ng	94
63) n-Octane	16.65	57	168146	21.571	ng	91
64) Tetrachloroethene	16.79	166	274145	23.583	ng	100
65) Chlorobenzene	17.46	112	585637	23.050	ng	100
66) Ethylbenzene	17.83	91	934350	22.098	ng	96
67) m- & p-Xylenes	18.00	91	1462687	45.412	ng	94
68) Bromoform	18.05	173	235123	25.177	ng	100
69) Styrene	18.32	104	607249	24.280	ng	94
70) o-Xylene	18.42	91	734065	22.791	ng	94
71) n-Nonane	18.63	43	386614	21.804	ng	91
72) 1,1,2,2-Tetrachloroethane	18.40	83	354641	22.568	ng	99
74) Cumene	18.96	105	979013	23.182	ng	97
75) alpha-Pinene	19.30	93	506358	23.019	ng	92
76) n-Propylbenzene	19.41	91	1135333	23.418	ng	95
77) 3-Ethyltoluene	19.50	105	974650	23.027	ng	96
78) 4-Ethyltoluene	19.54	105	931824	24.526	ng	97
79) 1,3,5-Trimethylbenzene	19.61	105	799432	22.658	ng	94
80) alpha-Methylstyrene	19.74	118	473979	26.261	ng	94
81) 2-Ethyltoluene	19.78	105	959554	23.378	ng	97
82) 1,2,4-Trimethylbenzene	19.97	105	819950	24.221	ng	94
83) n-Decane	20.06	57	414615	22.801	ng	96
84) Benzyl Chloride	20.08	91	684107	26.630	ng	94
85) 1,3-Dichlorobenzene	20.11	146	527706	25.521	ng	100
86) 1,4-Dichlorobenzene	20.16	146	533453	25.189	ng	100
87) sec-Butylbenzene	20.21	105	1101532	23.406	ng	96
88) 4-Isopropyltoluene (p-...	20.35	119	1077393	24.697	ng	94
89) 1,2,3-Trimethylbenzene	20.35	105	843628	24.708	ng	95
90) 1,2-Dichlorobenzene	20.47	146	506653	25.216	ng	99
91) d-Limonene	20.48	68	321852	23.863	ng	94
92) 1,2-Dibromo-3-Chloropr...	20.85	157	187449	24.606	ng	# 65
93) n-Undecane	21.17	57	421110	25.113	ng	95
94) 1,2,4-Trichlorobenzene	21.97	180	371832	25.441	ng	100
95) Naphthalene	22.08	128	978790	23.460	ng	99
96) n-Dodecane	22.08	57	358269	31.436	ng	97
97) Hexachlorobutadiene	22.39	225	267647	23.314	ng	100
98) Cyclohexanone	18.13	55	244771	18.040	ng	87
99) tert-Butylbenzene	19.97	119	836569	24.386	ng	98
100) n-Butylbenzene	20.72	91	843963	23.323	ng	97

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

Data File : I:\MS13\DATA\2019 06\18\06181931.D
 Acq On : 18 Jun 2019 21:14
 Sample : LCSD2 R13061819 25ng
 Misc : S31-05311902/S31-06071901 (7/6)

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Jun 19 05:53:02 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:48:46 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

WA 6/19/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.98	130	116209	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.10	114	489971	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.42	82	211022	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.83	65	147095	12.459	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.68%
57) Toluene-d8 (SS2)	15.55	98	529312	12.652	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.20%
73) Bromofluorobenzene (SS3)	18.83	174	217215	14.241	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	113.92%

Target Compounds

						Qvalue
2) Propene	3.97	42	228137	19.742	ng	95
3) Dichlorodifluoromethan...	4.12	85	388583	21.536	ng	100
4) Chloromethane	4.41	50	316402	22.139	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.66	135	238614	22.405	ng	99
6) Vinyl Chloride	4.82	62	316066	23.623	ng	100
7) 1,3-Butadiene	5.08	54	253285	24.599	ng	93
8) Bromomethane	5.50	94	204518	22.818	ng	100
9) Chloroethane	5.83	64	156047	21.581	ng	99
10) Ethanol	6.22	45	776831	99.480	ng	100
11) Acetonitrile	6.46	41	388449	21.279	ng	99
12) Acrolein	6.64	56	128305	20.862	ng	99
13) Acetone	6.84	58	755783	93.272	ng	# 84
14) Trichlorofluoromethane	7.07	101	340401	22.427	ng	100
15) 2-Propanol (Isopropanol)	7.34	45	1024099	41.833	ng	96
16) Acrylonitrile	7.59	53	273814	23.101	ng	97
17) 1,1-Dichloroethene	8.02	96	211765	22.460	ng	# 75
18) 2-Methyl-2-Propanol (t...	8.20	59	811710	35.427	ng	94
19) Methylene Chloride	8.25	84	212783	22.200	ng	# 77
20) 3-Chloro-1-propene (Al...	8.41	41	312409	21.616	ng	86
21) Trichlorotrifluoroethane	8.66	151	216898	22.567	ng	84
22) Carbon Disulfide	8.51	76	780770	20.801	ng	100
23) trans-1,2-Dichloroethene	9.53	61	286000	22.659	ng	82
24) 1,1-Dichloroethane	9.78	63	359839	21.273	ng	100
25) Methyl tert-Butyl Ether	9.87	73	503227	17.884	ng	97
26) Vinyl Acetate	10.04	86	264865	119.642	ng	# 63
27) 2-Butanone (MEK)	10.28	72	140072	19.777	ng	# 73
28) cis-1,2-Dichloroethene	10.80	61	270445	21.264	ng	80
29) Diisopropyl Ether	11.10	87	211384	22.524	ng	# 63
30) Ethyl Acetate	11.10	61	148508	43.367	ng	98
31) n-Hexane	11.08	57	320314	20.292	ng	99
32) Chloroform	11.14	83	347941	22.092	ng	99
34) Tetrahydrofuran (THF)	11.55	72	140170	20.649	ng	# 81
35) Ethyl tert-Butyl Ether	11.69	87	253562	21.767	ng	# 84
36) 1,2-Dichloroethane	11.95	62	247911	23.023	ng	99
38) 1,1,1-Trichloroethane	12.22	97	304160	22.986	ng	95
39) Isopropyl Acetate	12.66	61	260606	42.128	ng	# 75
40) 1-Butanol	12.68	56	402000	42.911	ng	94
41) Benzene	12.70	78	828264	21.308	ng	98
42) Carbon Tetrachloride	12.86	117	282565	23.752	ng	99
43) Cyclohexane	12.99	84	649847	42.083	ng	89
44) tert-Amyl Methyl Ether	13.34	73	594015	22.290	ng	92
45) 1,2-Dichloropropane	13.55	63	204125	21.202	ng	100
46) Bromodichloromethane	13.74	83	275630	23.584	ng	100
47) Trichloroethene	13.80	130	253064	23.199	ng	99
48) 1,4-Dioxane	13.77	88	178651	22.050	ng	88
49) 2,2,4-Trimethylpentane...	13.86	57	839941	20.374	ng	88
50) Methyl Methacrylate	14.01	100	182039	46.002	ng	# 80

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Data File : I:\MS13\DATA\2019 06\18\06181931.D
 Acq On : 18 Jun 2019 21:14
 Sample : LCSD2 R13061819 25ng
 Misc : S31-05311902/S31-06071901 (7/6)

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Jun 19 05:53:02 2019
 Quant Method : I:\MS13\METHODS\R13052019A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Tue May 28 08:48:46 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.14	71	207526	21.417	ng	94
52) cis-1,3-Dichloropropene	14.67	75	337017	23.853	ng	100
53) 4-Methyl-2-pentanone	14.70	58	189799	21.421	ng	84
54) trans-1,3-Dichloropropene	15.18	75	303584	24.401	ng	99
55) 1,1,2-Trichloroethane	15.35	97	205883	22.638	ng	97
58) Toluene	15.65	91	849615	22.124	ng	98
59) 2-Hexanone	15.89	43	425748	22.484	ng	91
60) Dibromochloromethane	16.05	129	261751	25.728	ng	99
61) 1,2-Dibromoethane	16.31	107	239050	25.248	ng	98
62) n-Butyl Acetate	16.53	43	473049	23.036	ng	93
63) n-Octane	16.65	57	173093	21.710	ng	90
64) Tetrachloroethene	16.79	166	283808	23.870	ng	100
65) Chlorobenzene	17.47	112	604345	23.256	ng	100
66) Ethylbenzene	17.82	91	961990	22.244	ng	96
67) m- & p-Xylenes	17.99	91	1527738	46.374	ng	94
68) Bromoform	18.05	173	244117	25.557	ng	100
69) Styrene	18.32	104	638779	24.970	ng	94
70) o-Xylene	18.42	91	769838	23.369	ng	94
71) n-Nonane	18.63	43	412019	22.718	ng	92
72) 1,1,2,2-Tetrachloroethane	18.40	83	376112	23.401	ng	99
74) Cumene	18.96	105	1028716	23.816	ng	98
75) alpha-Pinene	19.30	93	524517	23.313	ng	92
76) n-Propylbenzene	19.41	91	1174338	23.682	ng	95
77) 3-Ethyltoluene	19.50	105	1004559	23.204	ng	97
78) 4-Ethyltoluene	19.54	105	968532	24.923	ng	97
79) 1,3,5-Trimethylbenzene	19.61	105	825705	22.881	ng	94
80) alpha-Methylstyrene	19.74	118	490576	26.575	ng	95
81) 2-Ethyltoluene	19.78	105	991461	23.617	ng	97
82) 1,2,4-Trimethylbenzene	19.97	105	853122	24.639	ng	94
83) n-Decane	20.06	57	438089	23.554	ng	94
84) Benzyl Chloride	20.08	91	716616	27.273	ng	94
85) 1,3-Dichlorobenzene	20.11	146	543014	25.676	ng	99
86) 1,4-Dichlorobenzene	20.16	146	546866	25.247	ng	99
87) sec-Butylbenzene	20.21	105	1145261	23.793	ng	96
88) 4-Isopropyltoluene (p-...	20.35	119	1119960	25.100	ng	94
89) 1,2,3-Trimethylbenzene	20.35	105	879082	25.172	ng	95
90) 1,2-Dichlorobenzene	20.47	146	523635	25.480	ng	99
91) d-Limonene	20.48	68	341906	24.785	ng	96
92) 1,2-Dibromo-3-Chloropr...	20.85	157	190728	24.478	ng	# 68
93) n-Undecane	21.17	57	448255	26.136	ng	96
94) 1,2,4-Trichlorobenzene	21.97	180	383726	25.669	ng	99
95) Naphthalene	22.08	128	1014494	23.774	ng	99
96) n-Dodecane	22.08	57	367443	31.522	ng	97
97) Hexachlorobutadiene	22.39	225	275407	23.454	ng	100
98) Cyclohexanone	18.13	55	260664	18.782	ng	88
99) tert-Butylbenzene	19.97	119	870262	24.802	ng	98
100) n-Butylbenzene	20.72	91	881382	23.814	ng	97

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

Data File : I:\MS13\DATA\2019 06\18\06181931.D
Acq On : 18 Jun 2019 21:14
Sample : LCSD2 R13061819 25ng
Misc : S31-05311902/S31-06071901 (7/6)

Vial: 2
Operator: WA
Inst : MS13

Quant Time: Jun 19 05:53:02 2019

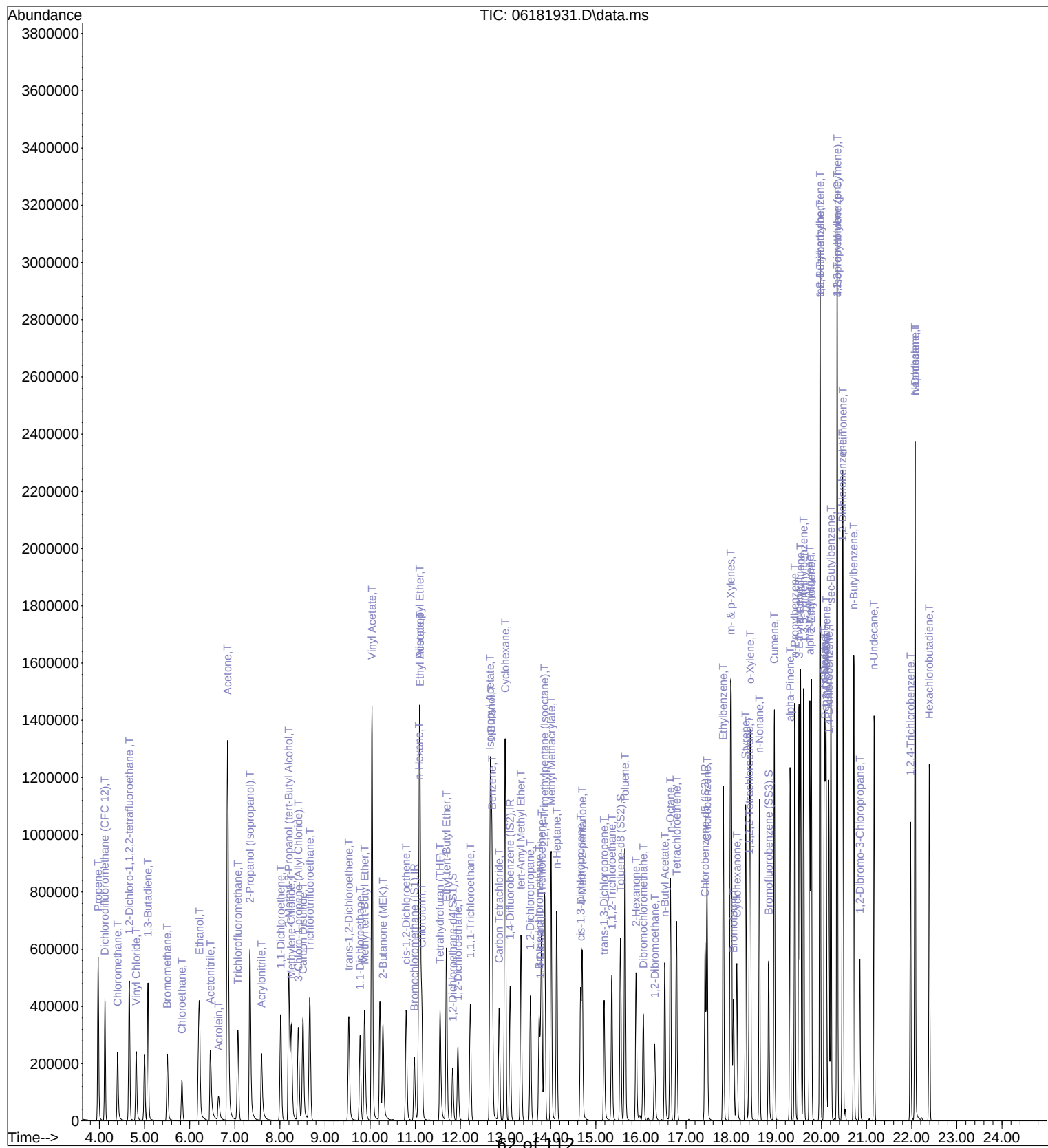
Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:48:46 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



Method Path : I:\MS13\METHODS\
 Method File : R13052019A.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Tue May 28 08:48:46 2019
 Response Via : Initial Calibration

Calibration Files

0.2 =05201906.D 0.5 =05201907.D 1.0 =05201908.D 5.0 =05201909.D 25 =05201910.D 50 =05201911.D 100 =05201912.D

Compound	0.2	0.5	1.0	5.0	25	50	100	Avg	%RSD

1) IR Bromochloromethane...	-----ISTD-----								
2) T Propene	1.196	1.230	1.295	1.366	1.243	1.183	1.187	1.243	5.40
3) T Dichlorodifluo...	1.809	2.002	2.020	2.111	1.972	1.889	1.783	1.941	6.12
4) T Chloromethane	1.447	1.558	1.318	1.706	1.672	1.650	1.410	1.537	9.66
5) T 1,2-Dichloro-1...	1.092	1.125	1.166	1.233	1.150	1.131	1.122	1.146	3.92
6) T Vinyl Chloride	1.281	1.312	1.344	1.621	1.529	1.506	1.481	1.439	8.87
7) T 1,3-Butadiene	0.839	0.998	1.084	1.244	1.224	1.213	1.151	1.108	13.27
8) T Bromomethane	0.760	0.974	0.991	1.010	1.033	1.008	0.974	0.964	9.58
9) T Chloroethane	0.603	0.771	0.800	0.871	0.823	0.807	0.771	0.778	10.85
10) T Ethanol	0.799	0.938	0.936	0.844	0.838	0.795	0.730	0.840	9.05
11) T Acetonitrile	1.172	1.871	2.084	2.199	2.201	2.155	2.063	1.964	18.68
12) T Acrolein	0.522	0.622	0.683	0.739	0.714	0.689	0.662	0.662	11.89
13) T Acetone	0.994	1.014	1.026	0.883	0.796	0.739	0.649	0.872	17.01
14) T Trichlorofluor...	1.526	1.703	1.694	1.758	1.631	1.583	1.535	1.633	5.47
15) T 2-Propanol (Is...	2.372	2.657	2.687	2.903	2.836	2.685	2.293	2.633	8.54
16) T Acrylonitrile	0.709	1.034	1.442	1.524	1.496	1.445	1.275	25.92	
17) T 1,1-Dichloroet...	0.822	1.023	1.011	1.117	1.070	1.042	1.013	1.014	9.15
18) T 2-Methyl-2-Pro...	2.268	2.519	2.560	2.698	2.620	2.501	2.085	2.465	8.69
19) T Methylene Chlo...	0.873	0.978	1.039	1.136	1.100	1.075	1.017	1.031	8.47
20) T 3-Chloro-1-pro...	1.338	1.527	1.598	1.654	1.641	1.601	1.523	1.555	6.95
21) T Trichlorotrifl...	0.940	1.034	1.065	1.098	1.048	1.035	1.017	1.034	4.75
22) T Carbon Disulfide	4.518	4.187	3.977	4.155	3.946	3.834	3.645	4.037	6.97
23) T trans-1,2-Dich...	0.932	1.262	1.346	1.553	1.519	1.480	1.412	1.358	15.69
24) T 1,1-Dichloroet...	1.679	1.836	1.866	1.990	1.850	1.796	1.718	1.819	5.63
25) T Methyl tert-Bu...	2.736	3.111	3.116	3.262	3.108	3.002	2.850	3.027	5.93
26) T Vinyl Acetate	0.186	0.226	0.258	0.267	0.267	0.257	0.235	0.238	12.50
27) T 2-Butanone (MEK)	0.701	0.809	0.796	0.771	0.757	0.737	0.762	5.19	
28) T cis-1,2-Dichlo...	1.172	1.347	1.369	1.496	1.452	1.404	1.336	1.368	7.58
29) T Diisopropyl Ether	0.896	1.017	1.046	1.111	1.053	1.010	0.932	1.009	7.30
30) T Ethyl Acetate	0.322	0.376	0.422	0.394	0.371	0.326	0.368	10.58	
31) T n-Hexane	1.719	1.896	1.903	1.832	1.630	1.514	1.392	1.698	11.57
32) T Chloroform	1.590	1.679	1.744	1.804	1.732	1.689	1.619	1.694	4.36
33) S 1,2-Dichloroet...	1.288	1.274	1.293	1.256	1.263	1.257	1.259	1.270	1.21
34) T Tetrahydrofura...	0.691	0.734	0.743	0.788	0.740	0.722	0.694	0.730	4.55
35) T Ethyl tert-But...	1.138	1.243	1.278	1.358	1.290	1.255	1.209	1.253	5.46
36) T 1,2-Dichloroet...	0.971	1.142	1.187	1.275	1.224	1.183	1.126	1.158	8.33
-----ISTD-----									
37) IR 1,4-Difluorobenzen...	-----ISTD-----								
38) T 1,1,1-Trichlor...	0.300	0.332	0.340	0.366	0.355	0.343	0.326	0.338	6.32
39) T Isopropyl Acetate	0.140	0.157	0.164	0.179	0.169	0.158	0.138	0.158	9.37
40) T 1-Butanol	0.232	0.258	0.241	0.252	0.240	0.212	0.239	6.81	
41) T Benzene	0.997	1.017	1.012	1.083	1.021	0.967	0.843	0.992	7.48
42) T Carbon Tetrach...	0.264	0.288	0.283	0.323	0.330	0.326	0.311	0.304	8.38
43) T Cyclohexane	0.380	0.406	0.405	0.428	0.406	0.386	0.345	0.394	6.80

5/28/19

Method Path : I:\MS13\METHODS\
Method File : R13052019A.M

44)	T	tert-Amyl Meth...	0.620	0.686	0.682	0.742	0.710	0.687	0.633	0.680	6.20
45)	T	1,2-Dichloropr...	0.227	0.249	0.244	0.267	0.255	0.246	0.230	0.246	5.68
46)	T	Bromodichlorom...	0.247	0.287	0.292	0.328	0.322	0.314	0.297	0.298	9.19
47)	T	Trichloroethene	0.230	0.269	0.276	0.302	0.296	0.293	0.282	0.278	8.76
48)	T	1,4-Dioxane	0.163	0.198	0.211	0.228	0.223	0.217	0.205	0.207	10.48
49)	T	2,2,4-Trimethy...	1.036	1.121	1.090	1.132	1.066	1.012	0.905	1.052	7.41
50)	T	Methyl Methacr...	0.085	0.094	0.110	0.109	0.108	0.101	0.101	0.101	9.95
51)	T	n-Heptane	0.232	0.259	0.252	0.266	0.253	0.242	0.226	0.247	5.88
52)	T	cis-1,3-Dichlo...	0.247	0.318	0.345	0.415	0.415	0.404	0.379	0.360	17.25
53)	T	4-Methyl-2-pen...	0.184	0.221	0.229	0.251	0.245	0.235	0.217	0.226	9.77
54)	T	trans-1,3-Dich...	0.216	0.260	0.349	0.371	0.364	0.343	0.317	0.317	20.03
55)	T	1,1,2-Trichlor...	0.193	0.218	0.233	0.256	0.250	0.243	0.231	0.232	9.27
56)	IR	Chlorobenzene-d5 (...)	2.510	2.488	2.489	2.481	2.459	2.449	2.472	2.478	0.82
57)	S	Toluene-d8 (SS2)	2.177	2.295	2.314	2.470	2.332	2.244	2.091	2.275	5.31
58)	T	Toluene	0.860	1.077	1.173	1.288	1.219	1.165	1.070	1.122	12.33
59)	T	2-Hexanone	0.453	0.544	0.560	0.662	0.675	0.669	0.655	0.603	14.15
60)	T	Dibromochlorom...	0.379	0.501	0.540	0.637	0.637	0.626	0.606	0.561	17.06
61)	T	1,2-Dibromoethane	0.928	1.122	1.212	1.382	1.369	1.304	1.198	1.216	13.05
62)	T	n-Butyl Acetate	0.458	0.479	0.486	0.515	0.484	0.459	0.425	0.472	6.00
63)	T	n-Octane	0.630	0.689	0.698	0.745	0.728	0.723	0.718	0.704	5.36
64)	T	Tetrachloroethene	1.461	1.509	1.517	1.645	1.613	1.558	1.473	1.539	4.50
65)	T	Chlorobenzene	2.377	2.574	2.603	2.795	2.684	2.565	2.334	2.562	6.32
66)	T	Ethylbenzene	1.876	1.969	1.958	2.113	2.046	1.947	1.750	1.951	5.98
67)	T	m- & p-Xylenes	0.438	0.463	0.587	0.630	0.630	0.638	0.639	0.566	16.20
68)	T	Bromoform	1.213	1.392	1.434	1.654	1.698	1.658	1.558	1.515	11.69
69)	T	Styrene	1.844	1.945	1.953	2.110	2.044	1.966	1.798	1.951	5.51
70)	T	o-Xylene	1.035	1.144	1.125	1.194	1.111	1.025	0.887	1.074	9.47
71)	T	n-Nonane	0.851	0.925	0.929	1.045	1.020	0.985	0.908	0.952	7.14
72)	T	1,1,2,2-Tetrac...	0.879	0.879	0.887	0.911	0.917	0.916	0.936	0.904	2.43
73)	S	Bromofluoroben...	2.396	2.587	2.607	2.806	2.672	2.559	2.284	2.559	6.75
74)	T	Cumene	1.191	1.360	1.359	1.454	1.383	1.341	1.241	1.333	6.65
75)	T	alpha-Pinene	2.783	2.950	2.976	3.245	3.101	2.933	2.573	2.937	7.34
76)	T	n-Propylbenzene	2.266	2.520	2.570	2.865	2.754	2.569	2.407	2.564	7.83
77)	T	3-Ethyltoluene	2.164	2.273	2.251	2.434	2.464	2.436	2.092	2.302	6.36
78)	T	4-Ethyltoluene	2.136	2.129	2.141	2.262	2.209	2.136	1.950	2.138	4.52
79)	T	1,3,5-Trimethy...	0.869	1.009	1.073	1.181	1.213	1.191	1.119	1.094	11.21
80)	T	alpha-Methylst...	2.377	2.478	2.482	2.686	2.597	2.520	2.269	2.487	5.51
81)	T	2-Ethyltoluene	1.939	2.032	2.038	2.253	2.228	2.091	1.776	2.051	8.02
82)	T	1,2,4-Trimethy...	1.046	1.114	1.150	1.216	1.176	1.087	0.924	1.102	8.78
83)	T	n-Decane	1.086	1.180	1.180	1.536	1.912	1.902	1.722	1.556	22.93
84)	T	Benzyl Chloride	1.140	1.180	1.207	1.310	1.412	1.403	1.325	1.253	11.38
85)	T	1,3-Dichlorobe...	1.140	1.180	1.207	1.310	1.406	1.400	1.338	1.283	8.37
86)	T	1,4-Dichlorobe...	2.730	2.842	2.865	3.108	3.000	2.881	2.534	2.851	6.47
87)	T	sec-Butylbenzene	2.539	2.698	2.689	2.928	2.865	2.642	2.141	2.643	9.75
88)	T	4-Isopropyltol...	1.956	2.063	2.056	2.247	2.252	2.119	1.787	2.069	7.90
89)	T	1,2,3-Trimethy...	1.078	1.152	1.155	1.279	1.343	1.321	1.193	1.217	8.10
90)	T	1,2-Dichlorobe...	0.747	0.823	0.860	0.917	0.874	0.819	0.680	0.817	9.86
91)	T	d-Limonene	0.386	0.392	0.412	0.469	0.522	0.527	0.522	0.462	13.87
92)	T	1,2-Dibromo-3-...	0.779	0.893	0.948	1.101	1.247	1.157	0.988	1.016	15.94
93)	T	n-Undecane	0.721	0.694	0.777	1.042	1.056	1.021	0.886	1.016	19.39
94)	T	1,2,4-Trichlor...	2.953	2.070	1.953	1.966	3.129	3.032	2.591	2.528	20.79
95)	T	Naphthalene	0.312	0.341	0.526	1.132	1.031	0.800	0.690	0.690	50.83
96)	T	n-Dodecane									

Method Path : I:\MS13\METHODS\ Method File : R13052019A.M												
97)	T	Hexachlorobuta...	0.730	0.698	0.653	0.658	0.705	0.714	0.710	0.696		4.19
98)	T	Cyclohexanone	0.758	0.852	0.869	0.860	0.837	0.817	0.763	0.822		5.51
99)	T	tert-Butylbenzene	2.059	2.097	2.104	2.278	2.207	2.063	1.741	2.078		8.14
100)	T	n-Butylbenzene	2.040	2.179	2.207	2.357	2.357	2.241	1.967	2.192		6.74

(#) = Out of Range												

1ng/L Std. ID: S31-05011902
 4ng/L Std. ID: S31-05081902
 20ng/L Std. ID: S31-05081902
 200ng/L Std. ID: S31-05071904

Primary Source Standards Concentrations (Working & Initial Calibration)

200ng/L Std. ID: S31-05071904																												
Dilution Factors:					Primary Working Standards										Working STD Conc.(ng/L):													
Compounds	Source Std. mg/m ³	5					250					1000					Injection (L):	ICAL Points:										
		200ng/L	20ng/L	20ng/L	4ng/L	1ng/L	200ng/L	20ng/L	20ng/L	4ng/L	1ng/L	200ng/L	20ng/L	20ng/L	4ng/L	1ng/L												
Propene	1.031	206.2	20.62	4.124	1.031										0.1ng	NA	0.050	0.2ng	0.125	0.5ng	1ng	0.250	4	20	200	200	0.50	
Dichlorodifluoromethane	1.045	209.0	20.90	4.180	1.045										NA	NA	0.2062	0.5155	1.031	5.155	25.775	25ng	103.1	500ng	51.55	50ng	100ng	
Chloromethane	1.008	201.6	20.16	4.032	1.008										NA	NA	0.2090	0.5225	1.045	5.225	26.125	25ng	103.1	50ng	51.55	100ng		
Freon-114	1.028	205.6	20.56	4.112	1.028										NA	NA	0.2016	0.5040	1.008	5.040	25.200	25ng	100.8	50ng	51.40	100.8		
Vinyl Chloride	1.051	210.2	21.02	4.204	1.051										NA	NA	0.2056	0.5140	1.028	5.140	25.700	25ng	102.8	51.40	102.8			
1,1,3-Butadiene	1.049	209.8	20.98	4.196	1.049										NA	NA	0.2102	0.5255	1.051	5.255	26.275	26.275	52.55	105.1				
Bromomethane	1.009	201.8	20.18	4.036	1.009										NA	NA	0.2098	0.5245	1.049	5.245	26.225	26.225	52.45	104.9				
Chloroethane	1.022	204.4	20.44	4.088	1.022										NA	NA	0.2018	0.5045	1.009	5.045	25.225	25.225	50.45	100.9				
Ethanol	5.140	1028.0	102.80	20.560	5.140										NA	NA	0.2044	0.5110	1.022	5.110	25.550	25.550	51.10	102.2				
Acetonitrile	1.033	206.6	20.66	4.132	1.033										NA	NA	1.0280	2.5700	5.140	25.700	128.500	128.500	257.00	514.0				
Acrolein	1.028	205.6	20.56	4.112	1.028										NA	NA	0.2066	0.5165	1.033	5.165	25.825	25.825	51.65	103.3				
Acetone	5.370	1074.0	107.40	21.480	5.370										NA	NA	0.2056	0.5140	1.028	5.140	25.700	25.700	51.40	102.8				
Trichlorofluoromethane	1.060	212.0	21.20	4.240	1.060										NA	NA	1.0740	2.6850	5.370	26.850	134.250	134.250	268.50	537.0				
Isopropanol	2.063	412.6	41.26	8.252	2.063										NA	NA	0.2120	0.5300	1.060	5.300	26.500	26.500	53.00	106.0				
Acrylonitrile	1.034	206.8	20.68	4.136	1.034										NA	NA	0.4126	1.0315	2.063	10.315	51.575	51.575	103.15	206.3				
1,1,1-Dichloroethene	1.074	214.8	21.48	4.296	1.074										NA	NA	0.2068	0.5170	1.034	5.170	25.850	25.850	51.70	103.4				
tert-Butanol	2.144	428.8	42.88	8.576	2.144										NA	NA	0.2148	0.5370	1.074	5.370	26.850	26.850	53.70	107.4				
Methylene Chloride	1.070	214.0	21.40	4.280	1.070										NA	NA	0.4288	1.0720	2.144	10.720	53.600	53.600	107.20	214.4				
Allyl Chloride	1.067	213.4	21.34	4.268	1.067										NA	NA	0.2140	0.5350	1.070	5.350	26.750	26.750	53.50	107.0				
Trichlorotrifluoroethane	1.065	213.0	21.30	4.260	1.065										NA	NA	0.2134	0.5335	1.067	5.335	26.675	26.675	53.35	106.7				
Carbon Disulfide	1.075	215.0	21.50	4.300	1.075										NA	NA	0.2130	0.5325	1.065	5.325	26.625	26.625	53.25	106.5				
trans-1,2-Dichloroethene	1.062	212.4	21.24	4.248	1.062										NA	NA	0.2150	0.5375	1.075	5.375	26.875	26.875	53.75	107.5				
1,1,1-Dichloroethane	1.030	206.0	20.60	4.120	1.030										NA	NA	0.2124	0.5310	1.062	5.310	26.550	26.550	53.10	106.2				
Methyl tert-Butyl Ether	1.089	217.8	21.78	4.356	1.089										NA	NA	0.2060	0.5150	1.030	5.150	25.750	25.750	51.50	103.0				
Vinyl Acetate	5.252	1050.4	105.04	21.008	5.252										NA	NA	0.2178	0.5445	1.089	5.445	27.225	27.225	54.45	108.9				
2-Butanone	1.027	205.4	20.54	4.108	1.027										NA	NA	1.0504	2.6260	5.252	26.260	131.300	131.300	262.60	525.2				
cis-1,2-Dichloroethene	1.054	210.8	21.08	4.216	1.054										NA	NA	0.2054	0.5135	1.027	5.135	25.675	25.675	51.35	102.7				
Diisopropyl Ether	1.081	216.2	21.62	4.324	1.081										NA	NA	0.2108	0.5270	1.054	5.270	26.350	26.350	52.70	105.4				
Ethyl Acetate	2.166	433.2	43.32	8.664	2.166										NA	NA	0.2162	0.5405	1.081	5.405	27.025	27.025	54.05	108.1				
n-Hexane	1.082	216.4	21.64	4.328	1.082										NA	NA	0.4332	1.0830	2.166	10.830	54.150	54.150	108.30	216.6				
Chloroform	1.077	215.4	21.54	4.308	1.077										NA	NA	0.2164	0.5410	1.082	5.410	27.050	27.050	54.10	108.2				
Tetrahydrofuran	1.068	213.6	21.36	4.272	1.068										NA	NA	0.2154	0.5385	1.077	5.385	26.925	26.925	53.85	107.7				
Ethyl tert-Butyl Ether	1.060	212.0	21.20	4.240	1.060										NA	NA	0.2136	0.5340	1.068	5.340	26.700	26.700	53.40	106.8				
1,2-Dichloroethane	1.061	212.2	21.22	4.244	1.061										NA	NA	0.2120	0.5300	1.060	5.300	26.500	26.500	53.00	106.0				
1,1,1-Trichloroethane	1.081	216.2	21.62	4.324	1.081										NA	NA	0.2122	0.5305	1.061	5.305	26.525	26.525	53.05	106.1				
Isopropyl Acetate	2.066	413.2	41.32	8.264	2.066										NA	NA	0.2162	0.5405	1.081	5.405	27.025	27.025	54.05	108.1				
1-Butanol	2.067	413.4	41.34	8.268	2.067										NA	NA	0.4132	1.0330	2.066	10.330	51.650	51.650	103.30	206.6				
Benzene	1.033	206.6	20.66	4.132	1.033										NA	NA	0.4134	1.0335	2.067	10.335	51.675	51.675	103.35	206.7				
Carbon Tetrachloride	1.036	207.2	20.72	4.144	1.036										NA	NA	0.2066	0.5165	1.033	5.165	25.825	25.825	51.65	103.3				
Cyclohexane	2.087	417.4	41.74	8.348	2.087										NA	NA	0.2072	0.5180	1.036	5.180	25.900	25.900	51.80	103.6				
tert-Amyl Methyl Ether	1.074	214.8	21.48	4.296	1.074										NA	NA	0.4174	1.0435	2.087	10.435	52.175	52.175	104.35	208.7				
1,1,2-Dichloropropane	1.073	214.6	21.46	4.292	1.073										NA	NA	0.2148	0.5370	1.074	5.370	26.850	26.850	53.70	107.4				
Bromodichloromethane	1.068	213.6	21.36	4.272	1.068										NA	NA	0.2146	0.5365	1.073	5.365	26.825	26.825	53.65	107.3				
Trichloroethene	1.062	212.4	21.24	4.248	1.062										NA	NA	0.2136	0.5340	1.068	5.340	26.700	26.700	53.40	106.8				
1,4-Dioxane	1.064	212.8	21.28	4.256	1.064										NA	NA	0.2124	0.5310	1.062	5.310	26.550	26.550	53.10	106.2				
Isocutane	1.061	212.2	21.22	4.244	1.061										NA	NA	0.2128	0.5320	1.064	5.320	26.600	26.600	53.20	106.4				
Methyl Methacrylate	2.135	427.0	42.70	8.540	2.135										NA	NA	0.2122	0.5305	1.061	5.305	26.525	26.525	53.05	106.1				
n-Heptane	1.076	215.2	21.52	4.304	1.076										NA	NA	0.4270	1.0675	2.135	10.675	53.375	53.375	106.75	213.5				
															NA	NA	0.2152	0.5380	1.076	5.380	26.900	26.900	53.80	107.6				

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Primary Source Standards Concentrations (Working & Initial Calibration)

1ng/L Std. ID:
4ng/L Std. ID: S31-05011902
20ng/L Std. ID: S31-05081902
200ng/L Std. ID: S31-05071904

200ng/L Std. ID: S31-05071904														
Dilution Factors:			5	50	250	1000	Working STD Conc.(ng/L):							
Compounds	Source Std. mg/m ³	Primary Working Standards					Injection (L):	ICAL Points:						
		200ng/L	20ng/L	4ng/L	1ng/L	1ng/L		0.1ng	0.050	4	4	20	200	200
cis-1,3-Dichloropropene	1.120	224.0	22.40	4.480	1.120		NA	0.2240	0.5600	1.120	5.600	28.000	56.00	112.0
4-Methyl-2-pentanone	1.060	212.0	21.20	4.240	1.060		NA	0.2120	0.5300	1.060	5.300	26.500	53.00	106.0
trans-1,3-Dichloropropene	1.055	211.0	21.10	4.220	1.055		NA	0.2110	0.5275	1.055	5.275	26.375	52.75	105.5
1,1,2-Trichloroethane	1.076	215.2	21.52	4.304	1.076		NA	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6
Toluene	1.052	210.4	21.04	4.208	1.052		NA	0.2104	0.5260	1.052	5.260	26.300	52.60	105.2
2-Hexanone	1.074	214.8	21.48	4.296	1.074		NA	0.2148	0.5370	1.074	5.370	26.850	53.70	107.4
Dibromochloromethane	1.075	215.0	21.50	4.300	1.075		NA	0.2150	0.5375	1.075	5.375	26.875	53.75	107.5
1,2-Dibromoethane	1.076	215.2	21.52	4.304	1.076		NA	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6
n-Butyl Acetate	1.085	217.0	21.70	4.340	1.085		NA	0.2170	0.5425	1.085	5.425	27.125	54.25	108.5
n-Octane	1.076	215.2	21.52	4.304	1.076		NA	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6
Tetrachloroethene	1.058	211.6	21.16	4.232	1.058		NA	0.2116	0.5290	1.058	5.290	26.450	52.90	105.8
Chlorobenzene	1.066	213.2	21.32	4.264	1.066		NA	0.2132	0.5330	1.066	5.330	26.650	53.30	106.6
Ethylbenzene	1.033	206.6	20.66	4.132	1.033		NA	0.2066	0.5165	1.033	5.165	25.825	51.65	103.3
m-&p-Xylene	2.123	424.6	42.46	8.492	2.123		NA	0.4246	1.0615	2.123	10.615	53.075	106.15	212.3
Bromoform	1.063	212.6	21.26	4.252	1.063		NA	0.2126	0.5315	1.063	5.315	26.575	53.15	106.3
Styrene	1.060	212.0	21.20	4.240	1.060		NA	0.2120	0.5300	1.060	5.300	26.500	53.00	106.0
o-Xylene	1.062	212.4	21.24	4.248	1.062		NA	0.2124	0.5310	1.062	5.310	26.550	53.10	106.2
n-Nonane	1.071	214.2	21.42	4.284	1.071		NA	0.2142	0.5355	1.071	5.355	26.775	53.55	107.1
1,1,2,2-Tetrachloroethane	1.064	212.8	21.28	4.256	1.064		NA	0.2128	0.5320	1.064	5.320	26.600	53.20	106.4
Cumene	1.057	211.4	21.14	4.228	1.057		NA	0.2114	0.5285	1.057	5.285	26.425	52.85	105.7
alpha-Phene	1.035	207.0	20.70	4.140	1.035		NA	0.2070	0.5175	1.035	5.175	25.875	51.75	103.5
n-Propylbenzene	1.076	215.2	21.52	4.304	1.076		NA	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6
3-Ethyltoluene	1.062	212.4	21.24	4.248	1.062		NA	0.2124	0.5310	1.062	5.310	26.550	53.10	106.2
4-Ethyltoluene	1.061	212.2	21.22	4.244	1.061		NA	0.2122	0.5305	1.061	5.305	26.525	53.05	106.1
1,3,5-Trimethylbenzene	1.057	211.4	21.14	4.228	1.057		NA	0.2114	0.5285	1.057	5.285	26.425	52.85	105.7
alpha-Methylstyrene	1.058	211.6	21.16	4.232	1.058		NA	0.2116	0.5290	1.058	5.290	26.450	52.90	105.8
2-Ethyltoluene	1.072	214.4	21.44	4.288	1.072		NA	0.2144	0.5360	1.072	5.360	26.800	53.60	107.2
1,2,4-Trimethylbenzene	1.068	213.6	21.36	4.272	1.068		NA	0.2136	0.5340	1.068	5.340	26.700	53.40	106.8
n-Decane	1.076	215.2	21.52	4.304	1.076		NA	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6
Benzyl Chloride	1.051	210.2	21.02	4.204	1.051		NA	0.2102	0.5255	1.051	5.255	26.275	52.55	105.1
1,3-Dichlorobenzene	1.080	216.0	21.60	4.320	1.080		NA	0.2160	0.5400	1.080	5.400	27.000	54.00	108.0
1,4-Dichlorobenzene	1.081	216.2	21.62	4.324	1.081		NA	0.2162	0.5405	1.081	5.405	27.025	54.05	108.1
sec-Butylbenzene	1.063	212.6	21.26	4.252	1.063		NA	0.2126	0.5315	1.063	5.315	26.575	53.15	106.3
p-Isopropyltoluene	1.042	208.4	20.84	4.168	1.042		NA	0.2084	0.5210	1.042	5.210	26.050	52.10	104.2
1,2,3-Trimethylbenzene	1.042	208.4	20.84	4.168	1.042		NA	0.2084	0.5210	1.042	5.210	26.050	52.10	104.2
1,2-Dichlorobenzene	1.089	217.8	21.78	4.356	1.089		NA	0.2178	0.5445	1.089	5.445	27.225	54.45	108.9
d-Limonene	1.010	202.0	20.20	4.040	1.010		NA	0.2020	0.5050	1.010	5.050	25.250	50.50	101.0
1,2-Dibromo-3-chloropropane	1.042	208.4	20.84	4.168	1.042		NA	0.2084	0.5210	1.042	5.210	26.050	52.10	104.2
n-Undecane	1.057	211.4	21.14	4.228	1.057		NA	0.2114	0.5285	1.057	5.285	26.425	52.85	105.7
1,2,4-Trichlorobenzene	1.064	212.8	21.28	4.256	1.064		NA	0.2128	0.5320	1.064	5.320	26.600	53.20	106.4
Naphthalene	1.025	205.0	20.50	4.100	1.025		NA	0.2050	0.5125	1.025	5.125	25.625	51.25	102.5
n-Dodecane	1.031	206.2	20.62	4.124	1.031		NA	0.2062	0.5155	1.031	5.155	25.775	51.55	103.1
Hexachloro-1,3-butadiene	1.053	210.6	21.06	4.212	1.053		NA	0.2106	0.5265	1.053	5.265	26.325	52.65	105.3
Methacrylonitrile	1.041	208.2	20.82	4.164	1.041		NA	0.2082	0.5205	1.041	5.205	26.025	52.05	104.1
Cyclohexanone	0.982	196.4	19.64	3.928	0.982		NA	0.1964	0.4910	0.982	4.910	24.550	49.10	98.2
tert-Butylbenzene	1.067	213.4	21.34	4.268	1.067		NA	0.2134	0.5335	1.067	5.335	26.675	53.35	106.7
n-Butylbenzene	1.064	212.8	21.28	4.256	1.064		NA	0.2128	0.5320	1.064	5.320	26.600	53.20	106.4

Method : I:\MS13\METHODS\R13052019A.M (RTE Integrator)
 Title : EPA T0-15 per SOP VOA-T015 (CASS T0-15/GC-MS)
 Last Update : Mon May 20 16:07:55 2019
 Response via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
2	0.2	13	13	I:\MS13\DATA\2019_05\20\05201906.D
3	0.5	13	13	I:\MS13\DATA\2019_05\20\05201907.D
4	1.0	13	13	I:\MS13\DATA\2019_05\20\05201908.D
5	5.0	13	13	I:\MS13\DATA\2019_05\20\05201909.D
6	25	13	13	I:\MS13\DATA\2019_05\20\05201910.D
7	50	13	13	I:\MS13\DATA\2019_05\20\05201911.D
8	100	13	13	I:\MS13\DATA\2019_05\20\05201912.D

 5/20/19

#	ID	Update Time	Quant Time	Acquisition Time
2	0.2	May 20 13:06 2019	May 20 12:44 2019	20 May 2019 9:44
3	0.5	May 20 13:06 2019	May 20 12:40 2019	20 May 2019 10:17
4	1.0	May 20 13:06 2019	May 20 12:40 2019	20 May 2019 10:50
5	5.0	May 20 13:06 2019	May 20 12:40 2019	20 May 2019 11:23
6	25	May 20 13:25 2019	May 20 12:40 2019	20 May 2019 11:56
7	50	May 20 13:25 2019	May 20 13:00 2019	20 May 2019 12:29
7	100	May 20 13:25 2019	May 20 13:25 2019	20 May 2019 13:03

R13052019A.M

Mon May 20 16:17:52 2019

Data File : I:\MS13\DATA\2019 05\20\05201906.D
 Acq On : 20 May 2019 9:44
 Sample : 0.2ng R13052019 ICAL Std
 Misc : S31-05011901/S31-05011902 (5/28)

Vial: 14
 Operator: WA
 Inst : MS13

Quant Time: May 28 08:39:16 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:38:52 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

5/28/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.96	130	140331	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.09	114	619738	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.42	82	271479	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.82	65	180745	12.677	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.44%
57) Toluene-d8 (SS2)	15.54	98	681452	12.661	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.28%
73) Bromofluorobenzene (SS3)	18.83	174	238684	12.164	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.28%

Target Compounds

						Qvalue
2) Propene	4.05	42	2769	0.198	ng	93
3) Dichlorodifluoromethan...	4.19	85	4245	0.195	ng	# 94
4) Chloromethane	4.49	50	3275	0.190	ng	67
5) 1,2-Dichloro-1,1,2,2-t...	4.71	135	2520	0.196	ng	89
6) Vinyl Chloride	4.89	62	3022	0.187	ng	72
7) 1,3-Butadiene	5.13	54	1977	0.159	ng	95
8) Bromomethane	5.55	94	1722	0.159	ng	94
9) Chloroethane	5.87	64	1383	0.158	ng	73
10) Ethanol	6.24	45	9217	0.977	ng	89
11) Acetonitrile	6.62	41	2719	0.123	ng	# 48
12) Acrolein	6.76	56	173	0.023	ng	# 15
13) Acetone	6.89	58	11990	1.225	ng	# 67
14) Trichlorofluoromethane	7.09	101	3631	0.198	ng	98
15) 2-Propanol (Isopropanol)	7.40	45	10988	0.372	ng	97
16) Acrylonitrile	0.00	53	0	N.D.		
17) 1,1-Dichloroethene	8.04	96	1982	0.174	ng	# 86
18) 2-Methyl-2-Propanol (t...	8.28	59	10919	0.395	ng	90
19) Methylene Chloride	8.26	84	2097	0.181	ng	85
20) 3-Chloro-1-propene (Al...	8.42	41	3206	0.184	ng	85
21) Trichlorotrifluoroethane	8.67	151	2247	0.194	ng	87
22) Carbon Disulfide	8.55	76	10906	0.241	ng	85
23) trans-1,2-Dichloroethene	9.54	61	2223	0.146	ng	100
24) 1,1-Dichloroethane	9.77	63	3884	0.190	ng	90
25) Methyl tert-Butyl Ether	9.94	73	6691	0.197	ng	91
26) Vinyl Acetate	10.07	86	1182	0.442	ng	# 1
27) 2-Butanone (MEK)	10.38	72	882	0.103	ng	# 60
28) cis-1,2-Dichloroethene	10.80	61	2774	0.181	ng	88
29) Diisopropyl Ether	11.13	87	2174	0.192	ng	# 48
30) Ethyl Acetate	11.17	61	938	0.227	ng	86
31) n-Hexane	11.08	57	4175	0.219	ng	# 96
32) Chloroform	11.13	83	3846	0.202	ng	93
34) Tetrahydrofuran (THF)	11.63	72	1656	0.202	ng	95
35) Ethyl tert-Butyl Ether	11.71	87	2709	0.193	ng	94
36) 1,2-Dichloroethane	11.94	62	2313	0.178	ng	88
38) 1,1,1-Trichloroethane	12.21	97	3214	0.192	ng	94
39) Isopropyl Acetate	12.68	61	2860	0.366	ng	# 88
40) 1-Butanol	12.74	56	2436	0.206	ng	98
41) Benzene	12.70	78	10217	0.208	ng	97
42) Carbon Tetrachloride	12.85	117	2708	0.180	ng	99
43) Cyclohexane	12.98	84	7869	0.403	ng	96
44) tert-Amyl Methyl Ether	13.37	73	6598	0.196	ng	95
45) 1,2-Dichloropropane	13.55	63	2416	0.198	ng	95
46) Bromodichloromethane	13.74	83	2615	0.177	ng	95
47) Trichloroethene	13.80	130	2419	0.175	ng	97
48) 1,4-Dioxane	13.83	88	1724	0.168	ng	# 72
49) 2,2,4-Trimethylpentane...	13.86	57	10904	0.209	ng	87
50) Methyl Methacrylate	14.03	100	1195	0.239	ng	# 78

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Data File : I:\MS13\DATA\2019 05\20\05201906.D
 Acq On : 20 May 2019 9:44
 Sample : 0.2ng R13052019 ICAL Std
 Misc : S31-05011901/S31-05011902 (5/28)

Vial: 14
 Operator: WA
 Inst : MS13

Quant Time: May 28 08:39:16 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:38:52 2019

Response via : Initial Calibration

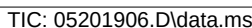
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.13	71	2478	0.202	ng	98
52) cis-1,3-Dichloropropene	14.68	75	2740	0.153	ng	76
53) 4-Methyl-2-pentanone	14.73	58	1938	0.173	ng #	96
54) trans-1,3-Dichloropropene	15.23	75	1205	0.077	ng #	43
55) 1,1,2-Trichloroethane	15.36	97	2054	0.179	ng	99
58) Toluene	15.65	91	9948	0.201	ng	99
59) 2-Hexanone	15.94	43	4011	0.165	ng	97
60) Dibromochloromethane	16.06	129	2116	0.162	ng	96
61) 1,2-Dibromoethane	16.32	107	1771	0.145	ng	97
62) n-Butyl Acetate	16.55	43	4372	0.165	ng	97
63) n-Octane	16.65	57	2142	0.209	ng	97
64) Tetrachloroethene	16.79	166	2895	0.189	ng	99
65) Chlorobenzene	17.46	112	6767	0.202	ng	99
66) Ethylbenzene	17.82	91	10664	0.192	ng	98
67) m- & p-Xylenes	18.00	91	17300	0.408	ng	100
68) Bromoform	18.06	173	1689	0.137	ng	97
69) Styrene	18.33	104	5583	0.170	ng	92
70) o-Xylene	18.42	91	8506	0.201	ng	98
71) n-Nonane	18.62	43	4813	0.206	ng	94
72) 1,1,2,2-Tetrachloroethane	18.41	83	3935	0.190	ng	96
74) Cumene	18.96	105	11000	0.198	ng	99
75) alpha-Pinene	19.30	93	5354	0.185	ng	93
76) n-Propylbenzene	19.41	91	13006	0.204	ng	95
77) 3-Ethyltoluene	19.50	105	10455	0.188	ng	99
78) 4-Ethyltoluene	19.54	105	9971	0.199	ng	97
79) 1,3,5-Trimethylbenzene	19.61	105	9809	0.211	ng	97
80) alpha-Methylstyrene	19.75	118	3993	0.168	ng	89
81) 2-Ethyltoluene	19.78	105	11069	0.205	ng	96
82) 1,2,4-Trimethylbenzene	19.97	105	8997	0.202	ng	99
83) n-Decane	20.06	57	4888	0.204	ng	97
84) Benzyl Chloride	20.10	91	4108	0.122	ng	87
85) 1,3-Dichlorobenzene	20.11	146	4913	0.181	ng	95
86) 1,4-Dichlorobenzene	20.17	146	5355	0.192	ng	98
87) sec-Butylbenzene	20.21	105	12607	0.204	ng	98
88) 4-Isopropyltoluene (p-...	20.35	119	11494	0.200	ng	95
89) 1,2,3-Trimethylbenzene	20.35	105	8853	0.197	ng	94
90) 1,2-Dichlorobenzene	20.47	146	5100	0.193	ng	99
91) d-Limonene	20.48	68	3277	0.185	ng	99
92) 1,2-Dibromo-3-Chloropr...	20.86	157	1747	0.174	ng #	72
93) n-Undecane	21.17	57	3576	0.162	ng	97
94) 1,2,4-Trichlorobenzene	21.99	180	3599	0.187	ng	97
95) Naphthalene	22.09	128	13149	0.240	ng	86
96) n-Dodecane	22.09	57	1978	0.132	ng	95
97) Hexachlorobutadiene	22.39	225	3341	0.221	ng	98
98) Cyclohexanone	18.14	55	3232	0.181	ng	90
99) tert-Butylbenzene	19.96	119	9545	0.211	ng	99
100) n-Butylbenzene	20.72	91	9427	0.198	ng	95

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

Vial: 14
Operator: WA
Inst : MS13

Quant Time: May 28 08:39:16 2019



Data File : I:\MS13\DATA\2019 05\20\05201907.D
 Acq On : 20 May 2019 10:17
 Sample : 0.5ng R13052019 ICAL Std
 Misc : S31-05011901/S31-05011902 (5/28)

Vial: 14
 Operator: WA
 Inst : MS13

Quant Time: May 28 08:39:18 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:38:52 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

WA 5/28/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.96	130	132497	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.09	114	578611	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.42	82	256791	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.82	65	168775	12.538	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.32%
57) Toluene-d8 (SS2)	15.54	98	638882	12.549	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.40%
73) Bromofluorobenzene (SS3)	18.83	174	225672	12.158	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.28%

Target Compounds

						Qvalue
2) Propene	4.03	42	6721	0.510	ng	95
3) Dichlorodifluoromethan...	4.17	85	11089	0.539	ng	98
4) Chloromethane	4.47	50	8324	0.511	ng	84
5) 1,2-Dichloro-1,1,2,2-t...	4.70	135	6131	0.505	ng	100
6) Vinyl Chloride	4.87	62	7310	0.479	ng	93
7) 1,3-Butadiene	5.12	54	5548	0.473	ng	89
8) Bromomethane	5.55	94	5207	0.510	ng	81
9) Chloroethane	5.86	64	4175	0.506	ng	92
10) Ethanol	6.20	45	25556	2.870	ng	96
11) Acetonitrile	6.55	41	10244	0.492	ng	80
12) Acrolein	6.70	56	2845	0.406	ng	91
13) Acetone	6.86	58	28849	3.122	ng	# 71
14) Trichlorofluoromethane	7.09	101	9565	0.553	ng	99
15) 2-Propanol (Isopropanol)	7.37	45	29054	1.041	ng	96
16) Acrylonitrile	7.69	53	3884	0.287	ng	92
17) 1,1-Dichloroethene	8.04	96	5824	0.542	ng	# 74
18) 2-Methyl-2-Propanol (t...	8.24	59	28623	1.096	ng	95
19) Methylene Chloride	8.25	84	5545	0.507	ng	83
20) 3-Chloro-1-propene (Al...	8.42	41	8637	0.524	ng	99
21) Trichlorotrifluoroethane	8.67	151	5836	0.533	ng	91
22) Carbon Disulfide	8.54	76	23854	0.557	ng	97
23) trans-1,2-Dichloroethene	9.54	61	7104	0.494	ng	85
24) 1,1-Dichloroethane	9.77	63	10025	0.520	ng	98
25) Methyl tert-Butyl Ether	9.91	73	17957	0.560	ng	96
26) Vinyl Acetate	10.05	86	5182	2.053	ng	# 79
27) 2-Butanone (MEK)	10.33	72	3815	0.472	ng	# 75
28) cis-1,2-Dichloroethene	10.80	61	7526	0.519	ng	86
29) Diisopropyl Ether	11.11	87	5829	0.545	ng	# 59
30) Ethyl Acetate	11.13	61	3694	0.946	ng	99
31) n-Hexane	11.08	57	10870	0.604	ng	99
32) Chloroform	11.13	83	9586	0.534	ng	98
34) Tetrahydrofuran (THF)	11.60	72	4154	0.537	ng	# 91
35) Ethyl tert-Butyl Ether	11.71	87	6982	0.526	ng	# 90
36) 1,2-Dichloroethane	11.94	62	6421	0.523	ng	95
38) 1,1,1-Trichloroethane	12.21	97	8315	0.532	ng	94
39) Isopropyl Acetate	12.67	61	7509	1.028	ng	# 84
40) 1-Butanol	12.72	56	11084	1.002	ng	# 62
41) Benzene	12.70	78	24312	0.530	ng	97
42) Carbon Tetrachloride	12.85	117	6901	0.491	ng	99
43) Cyclohexane	12.99	84	19628	1.076	ng	96
44) tert-Amyl Methyl Ether	13.36	73	17056	0.542	ng	96
45) 1,2-Dichloropropane	13.55	63	6183	0.544	ng	97
46) Bromodichloromethane	13.74	83	7097	0.514	ng	97
47) Trichloroethene	13.80	130	6613	0.513	ng	97
48) 1,4-Dioxane	13.81	88	4882	0.510	ng	83
49) 2,2,4-Trimethylpentane...	13.86	57	27529	0.565	ng	88
50) Methyl Methacrylate	14.02	100	4187	0.896	ng	100

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Data File : I:\MS13\DATA\2019 05\20\05201907.D
 Acq On : 20 May 2019 10:17
 Sample : 0.5ng R13052019 ICAL Std
 Misc : S31-05011901/S31-05011902 (5/28)

Vial: 14
 Operator: WA
 Inst : MS13

Quant Time: May 28 08:39:18 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:38:52 2019

Response via : Initial Calibration

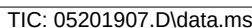
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.13	71	6447	0.563	ng	95
52) cis-1,3-Dichloropropene	14.67	75	8244	0.494	ng	93
53) 4-Methyl-2-pentanone	14.72	58	5413	0.517	ng	95
54) trans-1,3-Dichloropropene	15.20	75	5283	0.360	ng	90
55) 1,1,2-Trichloroethane	15.36	97	5438	0.506	ng	100
58) Toluene	15.65	91	24797	0.531	ng	99
59) 2-Hexanone	15.91	43	11879	0.516	ng	94
60) Dibromochloromethane	16.06	129	6004	0.485	ng	99
61) 1,2-Dibromoethane	16.31	107	5541	0.481	ng	99
62) n-Butyl Acetate	16.54	43	12507	0.500	ng	97
63) n-Octane	16.65	57	5299	0.546	ng	93
64) Tetrachloroethene	16.78	166	7484	0.517	ng	99
65) Chlorobenzene	17.46	112	16520	0.522	ng	100
66) Ethylbenzene	17.83	91	27313	0.519	ng	100
67) m- & p-Xylenes	18.00	91	42945	1.071	ng	98
68) Bromoform	18.06	173	4787	0.412	ng	96
69) Styrene	18.33	104	15161	0.487	ng	93
70) o-Xylene	18.42	91	21221	0.529	ng	99
71) n-Nonane	18.63	43	12584	0.570	ng	97
72) 1,1,2,2-Tetrachloroethane	18.40	83	10112	0.517	ng	99
74) Cumene	18.96	105	28092	0.534	ng	99
75) alpha-Pinene	19.30	93	14458	0.528	ng	92
76) n-Propylbenzene	19.41	91	32603	0.540	ng	97
77) 3-Ethyltoluene	19.50	105	27484	0.522	ng	100
78) 4-Ethyltoluene	19.54	105	24770	0.524	ng	98
79) 1,3,5-Trimethylbenzene	19.61	105	23112	0.526	ng	98
80) alpha-Methylstyrene	19.74	118	10962	0.488	ng	92
81) 2-Ethyltoluene	19.78	105	27284	0.534	ng	100
82) 1,2,4-Trimethylbenzene	19.97	105	22288	0.529	ng	98
83) n-Decane	20.06	57	12310	0.544	ng	99
84) Benzyl Chloride	20.09	91	11720	0.367	ng	94
85) 1,3-Dichlorobenzene	20.11	146	12663	0.492	ng	100
86) 1,4-Dichlorobenzene	20.16	146	13106	0.497	ng	99
87) sec-Butylbenzene	20.21	105	31028	0.530	ng	98
88) 4-Isopropyltoluene (p-...	20.35	119	28879	0.532	ng	95
89) 1,2,3-Trimethylbenzene	20.35	105	22081	0.520	ng	100
90) 1,2-Dichlorobenzene	20.47	146	12882	0.515	ng	96
91) d-Limonene	20.48	68	8537	0.509	ng	98
92) 1,2-Dibromo-3-Chloropr...	20.86	157	4197	0.443	ng	# 72
93) n-Undecane	21.17	57	9691	0.464	ng	97
94) 1,2,4-Trichlorobenzene	21.98	180	7884	0.433	ng	95
95) Naphthalene	22.09	128	21793	0.420	ng	95
96) n-Dodecane	22.08	57	3306	0.233	ng	98
97) Hexachlorobutadiene	22.40	225	7555	0.529	ng	99
98) Cyclohexanone	18.13	55	8589	0.509	ng	# 87
99) tert-Butylbenzene	19.96	119	22984	0.538	ng	100
100) n-Butylbenzene	20.72	91	23809	0.529	ng	98

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

Vial: 14
Operator: WA
Inst : MS13

Quant Time: May 28 08:39:18 2019



Data File : I:\MS13\DATA\2019 05\20\05201908.D
 Acq On : 20 May 2019 10:50
 Sample : 1.0ng R13052019 ICAL Std
 Misc : S31-05011901/S31-05011902 (5/28)

Vial: 14
 Operator: WA
 Inst : MS13

Quant Time: May 28 08:39:20 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:38:52 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

5/28/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.96	130	132609	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.09	114	582017	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.42	82	258714	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.82	65	171501	12.729	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.84%
57) Toluene-d8 (SS2)	15.54	98	643828	12.552	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.40%
73) Bromofluorobenzene (SS3)	18.83	174	229549	12.275	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.24%

Target Compounds

						Qvalue
2) Propene	4.01	42	14167	1.074	ng	94
3) Dichlorodifluoromethan...	4.16	85	22391	1.087	ng	99
4) Chloromethane	4.44	50	14093	0.864	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.68	135	12720	1.047	ng	99
6) Vinyl Chloride	4.84	62	14987	0.982	ng	95
7) 1,3-Butadiene	5.09	54	12066	1.027	ng	89
8) Bromomethane	5.53	94	10604	1.037	ng	99
9) Chloroethane	5.84	64	8669	1.051	ng	95
10) Ethanol	6.18	45	51056	5.729	ng	97
11) Acetonitrile	6.52	41	22833	1.096	ng	92
12) Acrolein	6.66	56	6781	0.966	ng	94
13) Acetone	6.84	58	58436	6.319	ng	# 69
14) Trichlorofluoromethane	7.07	101	19050	1.100	ng	99
15) 2-Propanol (Isopropanol)	7.34	45	58807	2.105	ng	99
16) Acrylonitrile	7.62	53	11343	0.839	ng	99
17) 1,1-Dichloroethene	8.03	96	11518	1.071	ng	# 81
18) 2-Methyl-2-Propanol (t...	8.21	59	58238	2.227	ng	96
19) Methylene Chloride	8.24	84	11797	1.079	ng	84
20) 3-Chloro-1-propene (Al...	8.40	41	18090	1.097	ng	98
21) Trichlorotrifluoroethane	8.66	151	12032	1.097	ng	89
22) Carbon Disulfide	8.52	76	45357	1.059	ng	98
23) trans-1,2-Dichloroethene	9.52	61	15164	1.053	ng	84
24) 1,1-Dichloroethane	9.76	63	20386	1.056	ng	99
25) Methyl tert-Butyl Ether	9.90	73	36002	1.121	ng	98
26) Vinyl Acetate	10.03	86	12595	4.986	ng	# 96
27) 2-Butanone (MEK)	10.31	72	8814	1.091	ng	# 72
28) cis-1,2-Dichloroethene	10.79	61	15308	1.055	ng	83
29) Diisopropyl Ether	11.10	87	11997	1.120	ng	# 83
30) Ethyl Acetate	11.12	61	8633	2.209	ng	93
31) n-Hexane	11.08	57	21849	1.213	ng	99
32) Chloroform	11.13	83	19930	1.109	ng	98
34) Tetrahydrofuran (THF)	11.59	72	8413	1.086	ng	94
35) Ethyl tert-Butyl Ether	11.70	87	14372	1.081	ng	# 89
36) 1,2-Dichloroethane	11.93	62	13362	1.087	ng	99
38) 1,1,1-Trichloroethane	12.21	97	17137	1.090	ng	95
39) Isopropyl Acetate	12.66	61	15777	2.147	ng	# 82
40) 1-Butanol	12.70	56	24811	2.230	ng	99
41) Benzene	12.69	78	48697	1.055	ng	98
42) Carbon Tetrachloride	12.85	117	13675	0.968	ng	99
43) Cyclohexane	12.98	84	39370	2.146	ng	95
44) tert-Amyl Methyl Ether	13.35	73	34087	1.077	ng	96
45) 1,2-Dichloropropane	13.55	63	12203	1.067	ng	100
46) Bromodichloromethane	13.74	83	14513	1.045	ng	99
47) Trichloroethene	13.80	130	13639	1.053	ng	97
48) 1,4-Dioxane	13.80	88	10461	1.087	ng	86
49) 2,2,4-Trimethylpentane...	13.86	57	53868	1.100	ng	87
50) Methyl Methacrylate	14.01	100	9297	1.978	ng	95

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Data File : I:\MS13\DATA\2019 05\20\05201908.D
 Acq On : 20 May 2019 10:50
 Sample : 1.0ng R13052019 ICAL Std
 Misc : S31-05011901/S31-05011902 (5/28)

Vial: 14
 Operator: WA
 Inst : MS13

Quant Time: May 28 08:39:20 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:38:52 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.13	71	12636	1.098	ng	97
52) cis-1,3-Dichloropropene	14.67	75	18010	1.073	ng	97
53) 4-Methyl-2-pentanone	14.71	58	11323	1.076	ng	93
54) trans-1,3-Dichloropropene	15.20	75	12793	0.866	ng	95
55) 1,1,2-Trichloroethane	15.36	97	11666	1.080	ng	96
58) Toluene	15.65	91	50392	1.070	ng	100
59) 2-Hexanone	15.90	43	26077	1.123	ng	93
60) Dibromochloromethane	16.06	129	12458	0.999	ng	98
61) 1,2-Dibromoethane	16.31	107	12025	1.036	ng	99
62) n-Butyl Acetate	16.53	43	27224	1.081	ng	95
63) n-Octane	16.65	57	10825	1.107	ng	95
64) Tetrachloroethene	16.78	166	15276	1.048	ng	100
65) Chlorobenzene	17.46	112	33467	1.050	ng	100
66) Ethylbenzene	17.83	91	55648	1.050	ng	100
67) m- & p-Xylenes	17.99	91	86026	2.130	ng	96
68) Bromoform	18.05	173	10180	0.869	ng	99
69) Styrene	18.33	104	31460	1.003	ng	95
70) o-Xylene	18.42	91	42919	1.063	ng	97
71) n-Nonane	18.62	43	24927	1.121	ng	93
72) 1,1,2,2-Tetrachloroethane	18.40	83	20466	1.039	ng	98
74) Cumene	18.95	105	57040	1.077	ng	100
75) alpha-Pinene	19.30	93	29108	1.055	ng	94
76) n-Propylbenzene	19.41	91	66284	1.090	ng	97
77) 3-Ethyltoluene	19.50	105	56496	1.064	ng	98
78) 4-Ethyltoluene	19.54	105	49422	1.037	ng	97
79) 1,3,5-Trimethylbenzene	19.61	105	46844	1.059	ng	99
80) alpha-Methylstyrene	19.74	118	23501	1.038	ng	94
81) 2-Ethyltoluene	19.77	105	55058	1.070	ng	99
82) 1,2,4-Trimethylbenzene	19.97	105	45039	1.061	ng	96
83) n-Decane	20.06	57	25614	1.123	ng	99
84) Benzyl Chloride	20.08	91	25671	0.797	ng	99
85) 1,3-Dichlorobenzene	20.11	146	25522	0.984	ng	100
86) 1,4-Dichlorobenzene	20.16	146	27007	1.017	ng	97
87) sec-Butylbenzene	20.21	105	63033	1.068	ng	99
88) 4-Isopropyltoluene (p-...	20.35	119	57983	1.060	ng	95
89) 1,2,3-Trimethylbenzene	20.35	105	44347	1.036	ng	97
90) 1,2-Dichlorobenzene	20.47	146	26042	1.034	ng	100
91) d-Limonene	20.48	68	17981	1.063	ng	99
92) 1,2-Dibromo-3-Chloropr...	20.85	157	8895	0.931	ng	# 72
93) n-Undecane	21.17	57	20729	0.986	ng	98
94) 1,2,4-Trichlorobenzene	21.97	180	15287	0.834	ng	98
95) Naphthalene	22.08	128	41428	0.792	ng	96
96) n-Dodecane	22.08	57	7279	0.509	ng	97
97) Hexachlorobutadiene	22.39	225	14233	0.989	ng	99
98) Cyclohexanone	18.13	55	17654	1.038	ng	88
99) tert-Butylbenzene	19.96	119	46474	1.080	ng	99
100) n-Butylbenzene	20.72	91	48591	1.071	ng	97

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

Data File : I:\MS13\DATA\2019 05\20\05201908.D
Acq On : 20 May 2019 10:50
Sample : 1.0ng R13052019 ICAL Std
Misc : S31-05011901/S31-05011902 (5/28)

Vial: 14
Operator: WA
Inst : MS13

Quant Time: May 28 08:39:20 2019

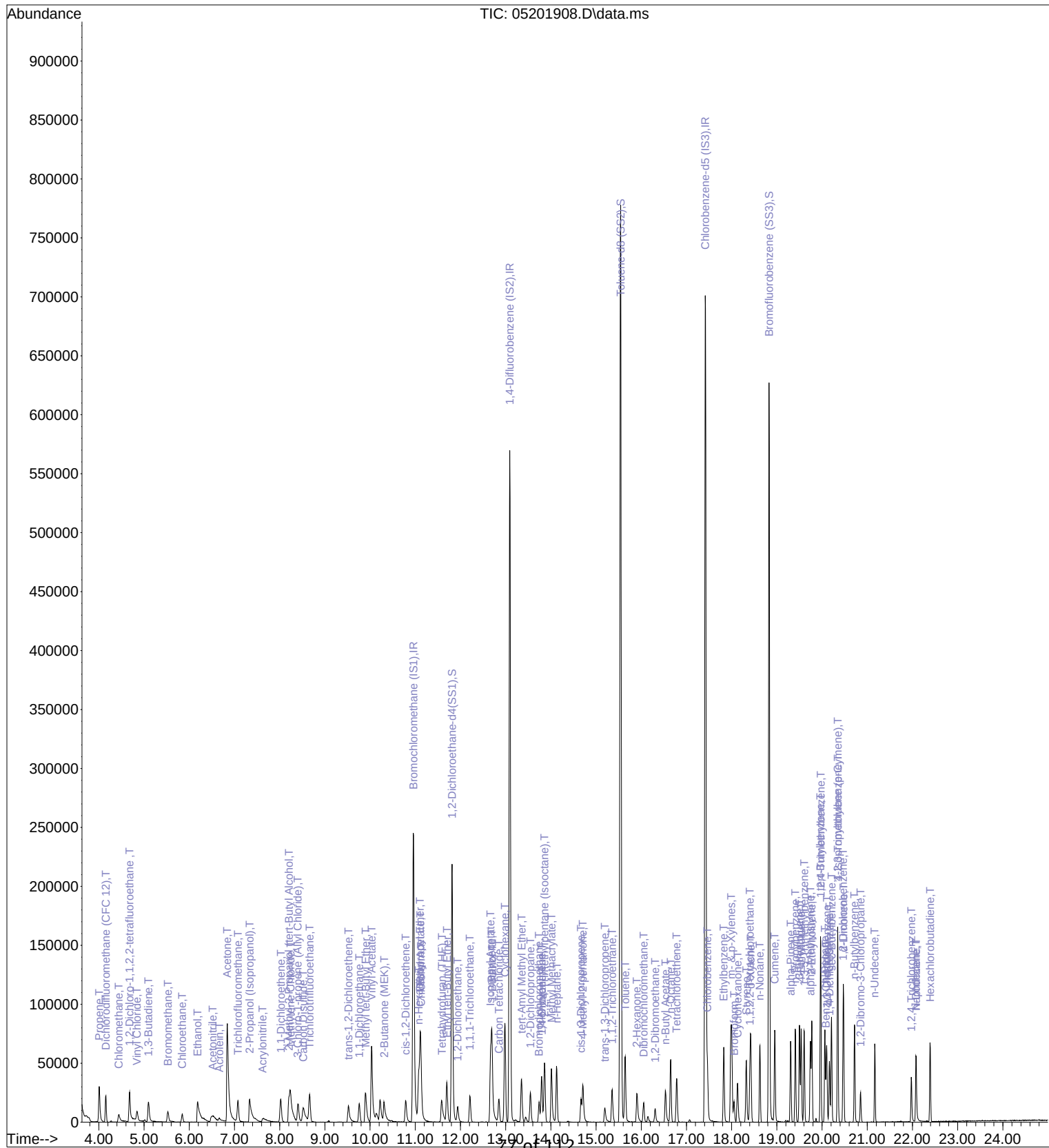
Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:38:52 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019 05\20\05201909.D
 Acq On : 20 May 2019 11:23
 Sample : 5.0ng R13052019 ICAL Std
 Misc : S31-05011901/S31-05081902 (6/6)

Vial: 15
 Operator: WA
 Inst : MS13

Quant Time: May 28 08:39:23 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:38:52 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

4074 5/28/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.97	130	137662	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.10	114	587714	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.42	82	262317	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.82	65	172959	12.366	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.96%
57) Toluene-d8 (SS2)	15.54	98	650898	12.516	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.16%
73) Bromofluorobenzene (SS3)	18.83	174	239009	12.606	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.88%

Target Compounds

						Qvalue
2) Propene	3.98	42	77572	5.667	ng	95
3) Dichlorodifluoromethan...	4.13	85	121450	5.682	ng	100
4) Chloromethane	4.41	50	94718	5.595	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.67	135	69771	5.530	ng	99
6) Vinyl Chloride	4.82	62	93831	5.920	ng	98
7) 1,3-Butadiene	5.08	54	71859	5.891	ng	92
8) Bromomethane	5.50	94	56127	5.286	ng	99
9) Chloroethane	5.83	64	48990	5.719	ng	99
10) Ethanol	6.19	45	238784	25.811	ng	100
11) Acetonitrile	6.45	41	125066	5.783	ng	100
12) Acrolein	6.64	56	38682	5.309	ng	96
13) Acetone	6.83	58	261111	27.201	ng	# 78
14) Trichlorofluoromethane	7.07	101	102591	5.706	ng	100
15) 2-Propanol (Isopropanol)	7.32	45	329741	11.370	ng	95
16) Acrylonitrile	7.59	53	82115	5.848	ng	98
17) 1,1-Dichloroethene	8.02	96	66086	5.917	ng	# 77
18) 2-Methyl-2-Propanol (t...	8.18	59	318562	11.736	ng	95
19) Methylene Chloride	8.24	84	66911	5.893	ng	81
20) 3-Chloro-1-propene (Al...	8.40	41	97164	5.675	ng	90
21) Trichlorotrifluoroethane	8.66	151	64404	5.657	ng	88
22) Carbon Disulfide	8.51	76	245976	5.532	ng	100
23) trans-1,2-Dichloroethene	9.52	61	90818	6.074	ng	85
24) 1,1-Dichloroethane	9.77	63	112886	5.634	ng	99
25) Methyl tert-Butyl Ether	9.88	73	195631	5.869	ng	99
26) Vinyl Acetate	10.03	86	74706	28.487	ng	# 82
27) 2-Butanone (MEK)	10.29	72	45009	5.365	ng	# 73
28) cis-1,2-Dichloroethene	10.79	61	86832	5.763	ng	83
29) Diisopropyl Ether	11.10	87	66145	5.950	ng	# 76
30) Ethyl Acetate	11.10	61	50328	12.406	ng	98
31) n-Hexane	11.08	57	109140	5.837	ng	98
32) Chloroform	11.13	83	107002	5.735	ng	98
34) Tetrahydrofuran (THF)	11.55	72	46362	5.765	ng	# 85
35) Ethyl tert-Butyl Ether	11.69	87	79249	5.743	ng	# 87
36) 1,2-Dichloroethane	11.94	62	74503	5.841	ng	99
38) 1,1,1-Trichloroethane	12.21	97	93043	5.862	ng	95
39) Isopropyl Acetate	12.66	61	86859	11.706	ng	# 75
40) 1-Butanol	12.67	56	116933	10.406	ng	99
41) Benzene	12.70	78	263079	5.642	ng	98
42) Carbon Tetrachloride	12.85	117	78649	5.512	ng	99
43) Cyclohexane	12.99	84	210228	11.350	ng	93
44) tert-Amyl Methyl Ether	13.34	73	187268	5.858	ng	93
45) 1,2-Dichloropropane	13.55	63	67450	5.841	ng	99
46) Bromodichloromethane	13.74	83	82388	5.877	ng	99
47) Trichloroethene	13.80	130	75343	5.758	ng	100
48) 1,4-Dioxane	13.78	88	57077	5.873	ng	90
49) 2,2,4-Trimethylpentane...	13.86	57	282336	5.709	ng	87
50) Methyl Methacrylate	14.01	100	55019	11.591	ng	# 85

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Data File : I:\MS13\DATA\2019 05\20\05201909.D
 Acq On : 20 May 2019 11:23
 Sample : 5.0ng R13052019 ICAL Std
 Misc : S31-05011901/S31-05081902 (6/6)

Vial: 15
 Operator: WA
 Inst : MS13

Quant Time: May 28 08:39:23 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:38:52 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.13	71	67362	5.796	ng	96
52) cis-1,3-Dichloropropene	14.66	75	109348	6.452	ng	99
53) 4-Methyl-2-pentanone	14.70	58	62553	5.886	ng	89
54) trans-1,3-Dichloropropene	15.18	75	86602	5.803	ng	100
55) 1,1,2-Trichloroethane	15.35	97	64881	5.948	ng	96
58) Toluene	15.64	91	272682	5.712	ng	100
59) 2-Hexanone	15.90	43	145095	6.164	ng	93
60) Dibromochloromethane	16.05	129	74725	5.909	ng	100
61) 1,2-Dibromoethane	16.31	107	71864	6.106	ng	100
62) n-Butyl Acetate	16.53	43	157367	6.165	ng	94
63) n-Octane	16.65	57	58099	5.862	ng	94
64) Tetrachloroethene	16.78	166	82659	5.593	ng	100
65) Chlorobenzene	17.46	112	183985	5.695	ng	100
66) Ethylbenzene	17.83	91	302988	5.636	ng	98
67) m- & p-Xylenes	17.99	91	470688	11.494	ng	95
68) Bromoform	18.05	173	65432	5.511	ng	99
69) Styrene	18.32	104	184001	5.786	ng	94
70) o-Xylene	18.42	91	235160	5.742	ng	96
71) n-Nonane	18.63	43	134220	5.954	ng	93
72) 1,1,2,2-Tetrachloroethane	18.40	83	116673	5.840	ng	100
74) Cumene	18.95	105	311172	5.795	ng	99
75) alpha-Pinene	19.30	93	157891	5.645	ng	93
76) n-Propylbenzene	19.41	91	366343	5.943	ng	97
77) 3-Ethyltoluene	19.50	105	319239	5.932	ng	98
78) 4-Ethyltoluene	19.54	105	271014	5.610	ng	98
79) 1,3,5-Trimethylbenzene	19.60	105	250843	5.592	ng	96
80) alpha-Methylstyrene	19.74	118	131134	5.714	ng	94
81) 2-Ethyltoluene	19.77	105	302076	5.788	ng	99
82) 1,2,4-Trimethylbenzene	19.97	105	252473	5.866	ng	97
83) n-Decane	20.06	57	137332	5.940	ng	99
84) Benzyl Chloride	20.08	91	169433	5.187	ng	97
85) 1,3-Dichlorobenzene	20.10	146	147286	5.602	ng	100
86) 1,4-Dichlorobenzene	20.16	146	148612	5.519	ng	99
87) sec-Butylbenzene	20.21	105	346603	5.793	ng	97
88) 4-Isopropyltoluene (p-...	20.35	119	320128	5.772	ng	95
89) 1,2,3-Trimethylbenzene	20.35	105	245691	5.659	ng	96
90) 1,2-Dichlorobenzene	20.47	146	146155	5.721	ng	99
91) d-Limonene	20.48	68	97225	5.670	ng	99
92) 1,2-Dibromo-3-Chloropr...	20.85	157	51313	5.298	ng	# 69
93) n-Undecane	21.17	57	122133	5.729	ng	97
94) 1,2,4-Trichlorobenzene	21.97	180	86798	4.671	ng	99
95) Naphthalene	22.08	128	211406	3.985	ng	98
96) n-Dodecane	22.08	57	56869	3.925	ng	99
97) Hexachlorobutadiene	22.39	225	72684	4.980	ng	99
98) Cyclohexanone	18.13	55	88612	5.136	ng	88
99) tert-Butylbenzene	19.97	119	254992	5.846	ng	99
100) n-Butylbenzene	20.72	91	263107	5.719	ng	98

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

Data File : I:\MS13\DATA\2019 05\20\05201909.D
Acq On : 20 May 2019 11:23
Sample : 5.0ng R13052019 ICAL Std
Misc : S31-05011901/S31-05081902 (6/6)

Vial: 15
Operator: WA
Inst : MS13

Quant Time: May 28 08:39:23 2019

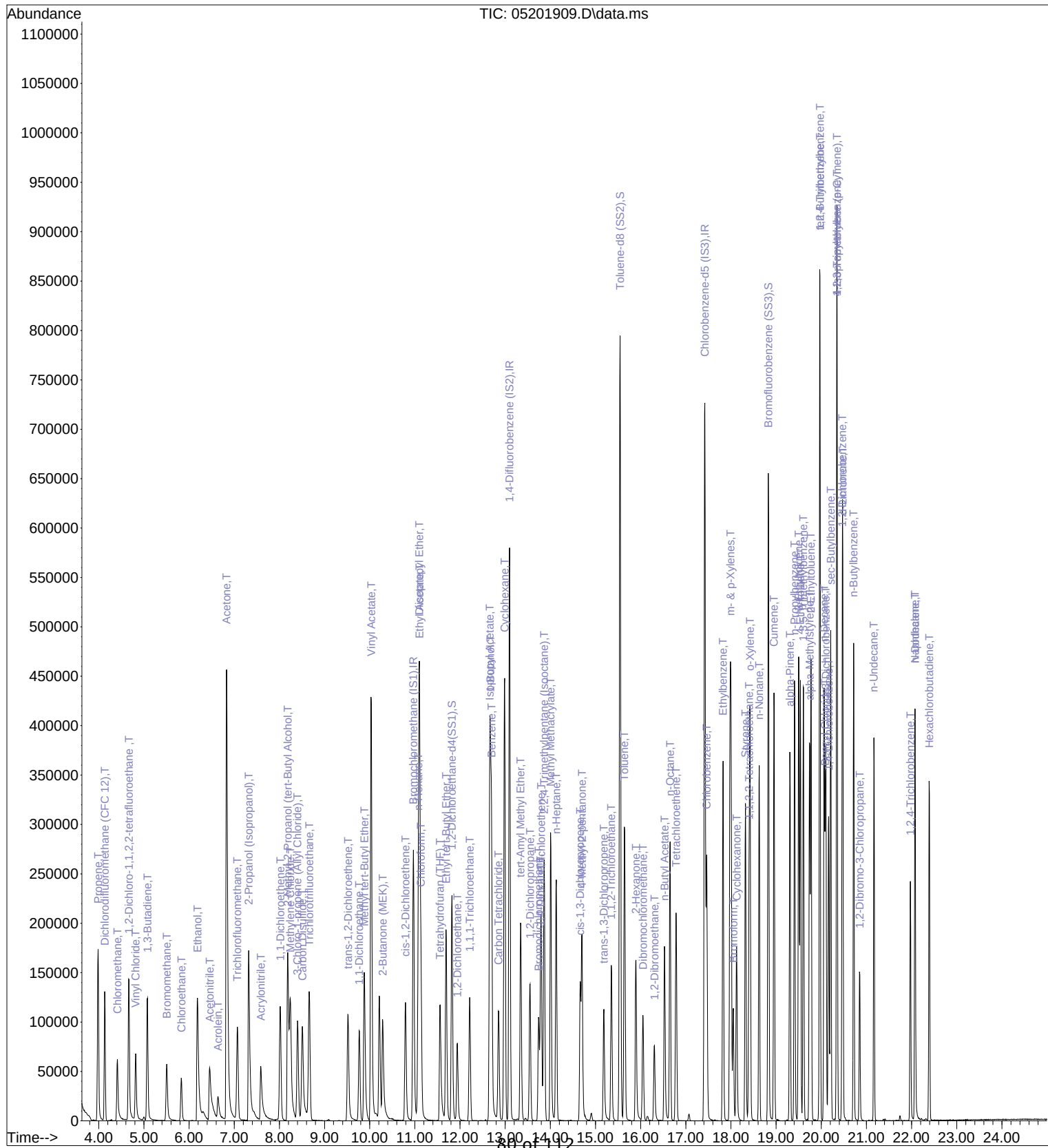
Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:38:52 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019 05\20\05201910.D
 Acq On : 20 May 2019 11:56
 Sample : 25ng R13052019 ICAL Std
 Misc : S31-05011901/S31-05071904 (6/5)

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: May 28 08:39:25 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:38:52 2019

Response via : Initial Calibration

5/28/19

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.98	130	138522	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.10	114	586975	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.42	82	262845	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.83	65	174887	12.427	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.44%
57) Toluene-d8 (SS2)	15.54	98	646315	12.402	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.20%
73) Bromofluorobenzene (SS3)	18.83	174	240939	12.682	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.44%

Target Compounds

						Qvalue
2) Propene	3.97	42	355083	25.778	ng	94
3) Dichlorodifluoromethan...	4.13	85	570777	26.538	ng	100
4) Chloromethane	4.41	50	466835	27.403	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.66	135	327617	25.807	ng	99
6) Vinyl Chloride	4.82	62	445155	27.911	ng	99
7) 1,3-Butadiene	5.08	54	355586	28.971	ng	91
8) Bromomethane	5.50	94	288661	27.017	ng	99
9) Chloroethane	5.83	64	233152	27.051	ng	99
10) Ethanol	6.22	45	1193315	128.191	ng	99
11) Acetonitrile	6.46	41	629908	28.946	ng	97
12) Acrolein	6.64	56	210417	28.698	ng	98
13) Acetone	6.84	58	1184500	122.627	ng	# 76
14) Trichlorofluoromethane	7.07	101	478998	26.474	ng	100
15) 2-Propanol (Isopropanol)	7.34	45	1620657	55.536	ng	94
16) Acrylonitrile	7.59	53	436432	30.890	ng	97
17) 1,1-Dichloroethene	8.02	96	318520	28.342	ng	# 76
18) 2-Methyl-2-Propanol (t...	8.20	59	1556347	56.982	ng	95
19) Methylene Chloride	8.26	84	325978	28.531	ng	80
20) 3-Chloro-1-propene (Al...	8.41	41	485169	28.162	ng	89
21) Trichlorotrifluoroethane	8.66	151	309218	26.990	ng	88
22) Carbon Disulfide	8.51	76	1175259	26.265	ng	100
23) trans-1,2-Dichloroethene	9.53	61	446874	29.702	ng	86
24) 1,1-Dichloroethane	9.78	63	527980	26.185	ng	99
25) Methyl tert-Butyl Ether	9.87	73	937699	27.957	ng	99
26) Vinyl Acetate	10.04	86	387982	147.025	ng	# 64
27) 2-Butanone (MEK)	10.28	72	219261	25.972	ng	# 73
28) cis-1,2-Dichloroethene	10.80	61	424082	27.972	ng	84
29) Diisopropyl Ether	11.10	87	315427	28.196	ng	# 69
30) Ethyl Acetate	11.10	61	236648	57.974	ng	99
31) n-Hexane	11.08	57	488657	25.970	ng	98
32) Chloroform	11.14	83	516867	27.532	ng	99
34) Tetrahydrofuran (THF)	11.55	72	219006	27.066	ng	# 86
35) Ethyl tert-Butyl Ether	11.69	87	378711	27.274	ng	# 86
36) 1,2-Dichloroethane	11.94	62	359828	28.033	ng	100
38) 1,1,1-Trichloroethane	12.22	97	450137	28.396	ng	95
39) Isopropyl Acetate	12.66	61	409673	55.281	ng	# 72
40) 1-Butanol	12.68	56	612219	54.549	ng	92
41) Benzene	12.70	78	1238416	26.594	ng	98
42) Carbon Tetrachloride	12.86	117	401836	28.195	ng	99
43) Cyclohexane	12.99	84	995448	53.811	ng	92
44) tert-Amyl Methyl Ether	13.34	73	895644	28.054	ng	92
45) 1,2-Dichloropropane	13.55	63	321712	27.894	ng	99
46) Bromodichloromethane	13.74	83	403866	28.845	ng	100
47) Trichloroethene	13.80	130	369573	28.281	ng	100
48) 1,4-Dioxane	13.77	88	279126	28.757	ng	91
49) 2,2,4-Trimethylpentane...	13.86	57	1328099	26.891	ng	87
50) Methyl Methacrylate	14.01	100	273657	57.725	ng	# 84

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Data File : I:\MS13\DATA\2019 05\20\05201910.D
 Acq On : 20 May 2019 11:56
 Sample : 25ng R13052019 ICAL Std
 Misc : S31-05011901/S31-05071904 (6/5)

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: May 28 08:39:25 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:38:52 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.13	71	319182	27.497	ng	95
52) cis-1,3-Dichloropropene	14.66	75	546234	32.272	ng	100
53) 4-Methyl-2-pentanone	14.69	58	305101	28.743	ng	84
54) trans-1,3-Dichloropropene	15.18	75	459615	30.837	ng	100
55) 1,1,2-Trichloroethane	15.35	97	315200	28.931	ng	97
58) Toluene	15.65	91	1289546	26.959	ng	99
59) 2-Hexanone	15.89	43	688327	29.184	ng	89
60) Dibromochloromethane	16.05	129	381225	30.084	ng	99
61) 1,2-Dibromoethane	16.30	107	360586	30.576	ng	100
62) n-Butyl Acetate	16.53	43	781024	30.534	ng	93
63) n-Octane	16.65	57	273905	27.581	ng	93
64) Tetrachloroethene	16.78	166	404940	27.343	ng	100
65) Chlorobenzene	17.46	112	903749	27.920	ng	100
66) Ethylbenzene	17.82	91	1457447	27.056	ng	97
67) m- & p-Xylenes	18.00	91	2283959	55.659	ng	95
68) Bromoform	18.05	173	351776	29.567	ng	100
69) Styrene	18.32	104	946118	29.693	ng	94
70) o-Xylene	18.42	91	1141156	27.810	ng	95
71) n-Nonane	18.63	43	625278	27.680	ng	91
72) 1,1,2,2-Tetrachloroethane	18.40	83	570753	28.509	ng	99
74) Cumene	18.96	105	1484474	27.591	ng	98
75) alpha-Pinene	19.30	93	752408	26.848	ng	92
76) n-Propylbenzene	19.41	91	1753949	28.397	ng	96
77) 3-Ethyltoluene	19.50	105	1537742	28.517	ng	97
78) 4-Ethyltoluene	19.54	105	1374321	28.393	ng	98
79) 1,3,5-Trimethylbenzene	19.61	105	1227547	27.310	ng	95
80) alpha-Methylstyrene	19.74	118	674880	29.350	ng	94
81) 2-Ethyltoluene	19.78	105	1463566	27.989	ng	97
82) 1,2,4-Trimethylbenzene	19.97	105	1251145	29.010	ng	95
83) n-Decane	20.06	57	664941	28.702	ng	94
84) Benzyl Chloride	20.08	91	1056338	32.276	ng	95
85) 1,3-Dichlorobenzene	20.11	146	801382	30.421	ng	100
86) 1,4-Dichlorobenzene	20.16	146	799023	29.615	ng	100
87) sec-Butylbenzene	20.21	105	1676431	27.961	ng	96
88) 4-Isopropyltoluene (p-...	20.35	119	1569208	28.234	ng	94
89) 1,2,3-Trimethylbenzene	20.35	105	1233671	28.360	ng	96
90) 1,2-Dichlorobenzene	20.47	146	768781	30.034	ng	100
91) d-Limonene	20.48	68	464060	27.007	ng	97
92) 1,2-Dibromo-3-Chloropr...	20.85	157	285754	29.443	ng	# 67
93) n-Undecane	21.17	57	692831	32.431	ng	96
94) 1,2,4-Trichlorobenzene	21.97	180	583101	31.315	ng	99
95) Naphthalene	22.08	128	1686200	31.724	ng	100
96) n-Dodecane	22.08	57	613748	42.271	ng	97
97) Hexachlorobutadiene	22.39	225	390477	26.698	ng	100
98) Cyclohexanone	18.12	55	431915	24.986	ng	87
99) tert-Butylbenzene	19.97	119	1237794	28.321	ng	98
100) n-Butylbenzene	20.72	91	1318583	28.602	ng	97

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

Data File : I:\MS13\DATA\2019 05\20\05201910.D
Acq On : 20 May 2019 11:56
Sample : 25ng R13052019 ICAL Std
Misc : S31-05011901/S31-05071904 (6/5)

Vial: 2
Operator: WA
Inst : MS13

Quant Time: May 28 08:39:25 2019

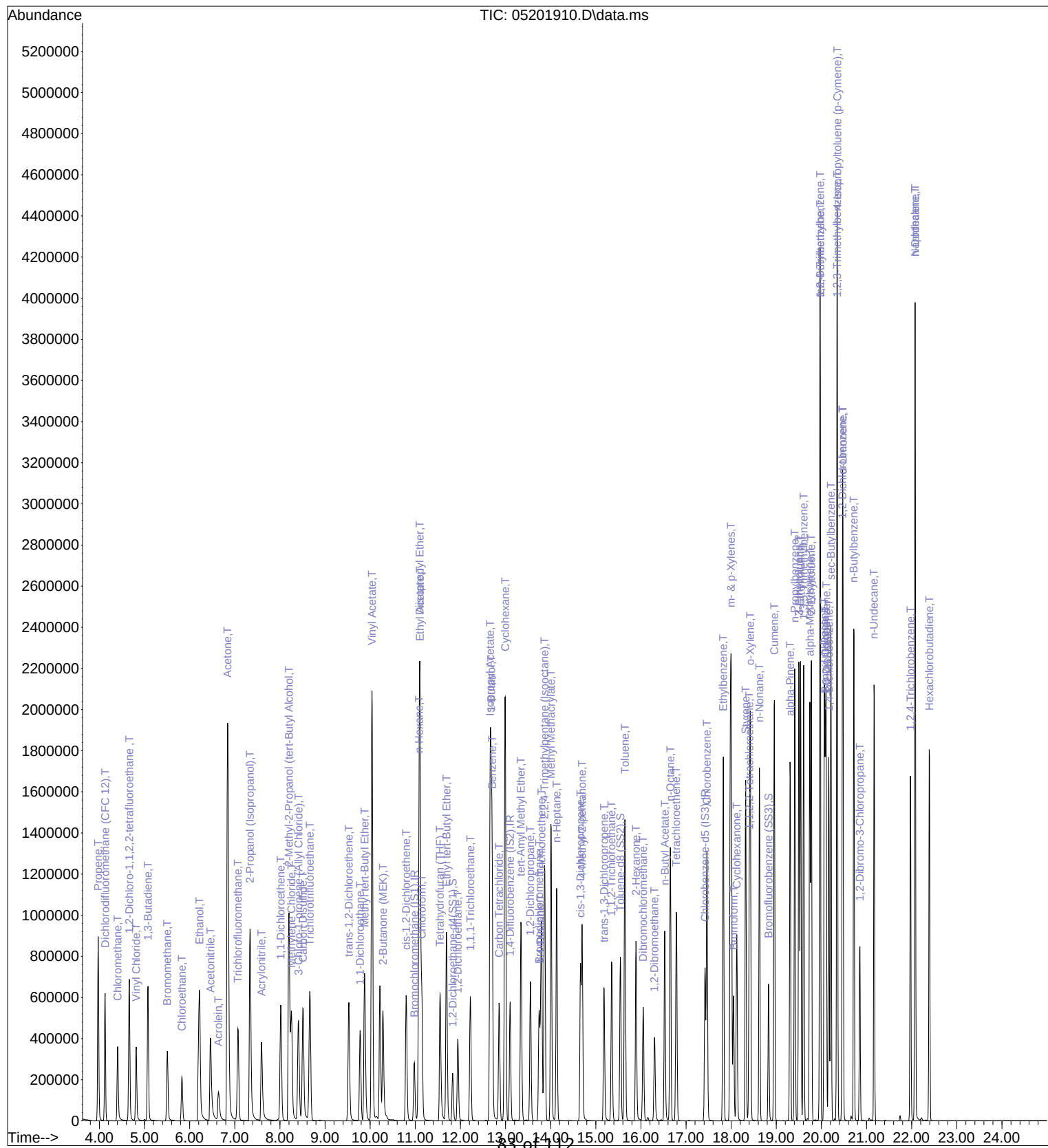
Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:38:52 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019 05\20\05201911.D
 Acq On : 20 May 2019 12:29
 Sample : 50ng R13052019 ICAL Std
 Misc : S31-05011901/S31-05071904 (6/5)

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: May 28 08:39:27 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:38:52 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

WA 5/28/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.98	130	140262	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.10	114	595747	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.42	82	265975	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.83	65	176283	12.370	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.96%
57) Toluene-d8 (SS2)	15.55	98	651325	12.351	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.80%
73) Bromofluorobenzene (SS3)	18.83	174	243539	12.668	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.36%

Target Compounds

						Qvalue
2) Propene	3.98	42	684131	49.050	ng	94
3) Dichlorodifluoromethan...	4.13	85	1107533	50.856	ng	99
4) Chloromethane	4.41	50	933113	54.094	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.67	135	652071	50.727	ng	100
6) Vinyl Chloride	4.82	62	887890	54.980	ng	99
7) 1,3-Butadiene	5.08	54	713854	57.440	ng	91
8) Bromomethane	5.52	94	570421	52.726	ng	100
9) Chloroethane	5.84	64	462466	52.991	ng	98
10) Ethanol	6.25	45	2291404	243.099	ng	99
11) Acetonitrile	6.48	41	1249243	56.693	ng	97
12) Acrolein	6.65	56	411800	55.467	ng	99
13) Acetone	6.86	58	2225950	227.587	ng	# 73
14) Trichlorofluoromethane	7.08	101	941234	51.377	ng	99
15) 2-Propanol (Isopropanol)	7.36	45	3107362	105.161	ng	94
16) Acrylonitrile	7.60	53	867966	60.671	ng	98
17) 1,1-Dichloroethene	8.03	96	628099	55.194	ng	# 75
18) 2-Methyl-2-Propanol (t...	8.22	59	3008492	108.783	ng	94
19) Methylene Chloride	8.26	84	645409	55.788	ng	# 79
20) 3-Chloro-1-propene (Al...	8.42	41	958440	54.943	ng	88
21) Trichlorotrifluoroethane	8.67	151	618544	53.319	ng	87
22) Carbon Disulfide	8.52	76	2312319	51.036	ng	100
23) trans-1,2-Dichloroethene	9.53	61	881769	57.880	ng	84
24) 1,1-Dichloroethane	9.78	63	1037966	50.840	ng	99
25) Methyl tert-Butyl Ether	9.88	73	1834291	54.009	ng	99
26) Vinyl Acetate	10.05	86	756736	283.207	ng	# 48
27) 2-Butanone (MEK)	10.29	72	436444	51.056	ng	# 71
28) cis-1,2-Dichloroethene	10.80	61	830065	54.072	ng	82
29) Diisopropyl Ether	11.10	87	612769	54.096	ng	# 59
30) Ethyl Acetate	11.12	61	450358	108.960	ng	97
31) n-Hexane	11.08	57	919033	48.237	ng	98
32) Chloroform	11.15	83	1020602	53.690	ng	99
34) Tetrahydrofuran (THF)	11.55	72	432568	52.796	ng	# 84
35) Ethyl tert-Butyl Ether	11.70	87	746572	53.099	ng	# 85
36) 1,2-Dichloroethane	11.95	62	704142	54.178	ng	99
38) 1,1,1-Trichloroethane	12.23	97	884671	54.987	ng	95
39) Isopropyl Acetate	12.66	61	777234	103.336	ng	# 67
40) 1-Butanol	12.69	56	1180632	103.646	ng	90
41) Benzene	12.70	78	2381195	50.382	ng	99
42) Carbon Tetrachloride	12.86	117	803924	55.578	ng	100
43) Cyclohexane	12.99	84	1922039	102.369	ng	90
44) tert-Amyl Methyl Ether	13.35	73	1757149	54.228	ng	92
45) 1,2-Dichloropropane	13.56	63	629250	53.755	ng	100
46) Bromodichloromethane	13.74	83	798278	56.176	ng	99
47) Trichloroethene	13.80	130	741535	55.909	ng	100
48) 1,4-Dioxane	13.78	88	550328	55.863	ng	91
49) 2,2,4-Trimethylpentane...	13.87	57	2557648	51.024	ng	88
50) Methyl Methacrylate	14.01	100	546975	113.681	ng	# 79

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Data File : I:\MS13\DATA\2019 05\20\05201911.D
 Acq On : 20 May 2019 12:29
 Sample : 50ng R13052019 ICAL Std
 Misc : S31-05011901/S31-05071904 (6/5)

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: May 28 08:39:27 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:38:52 2019

Response via : Initial Calibration

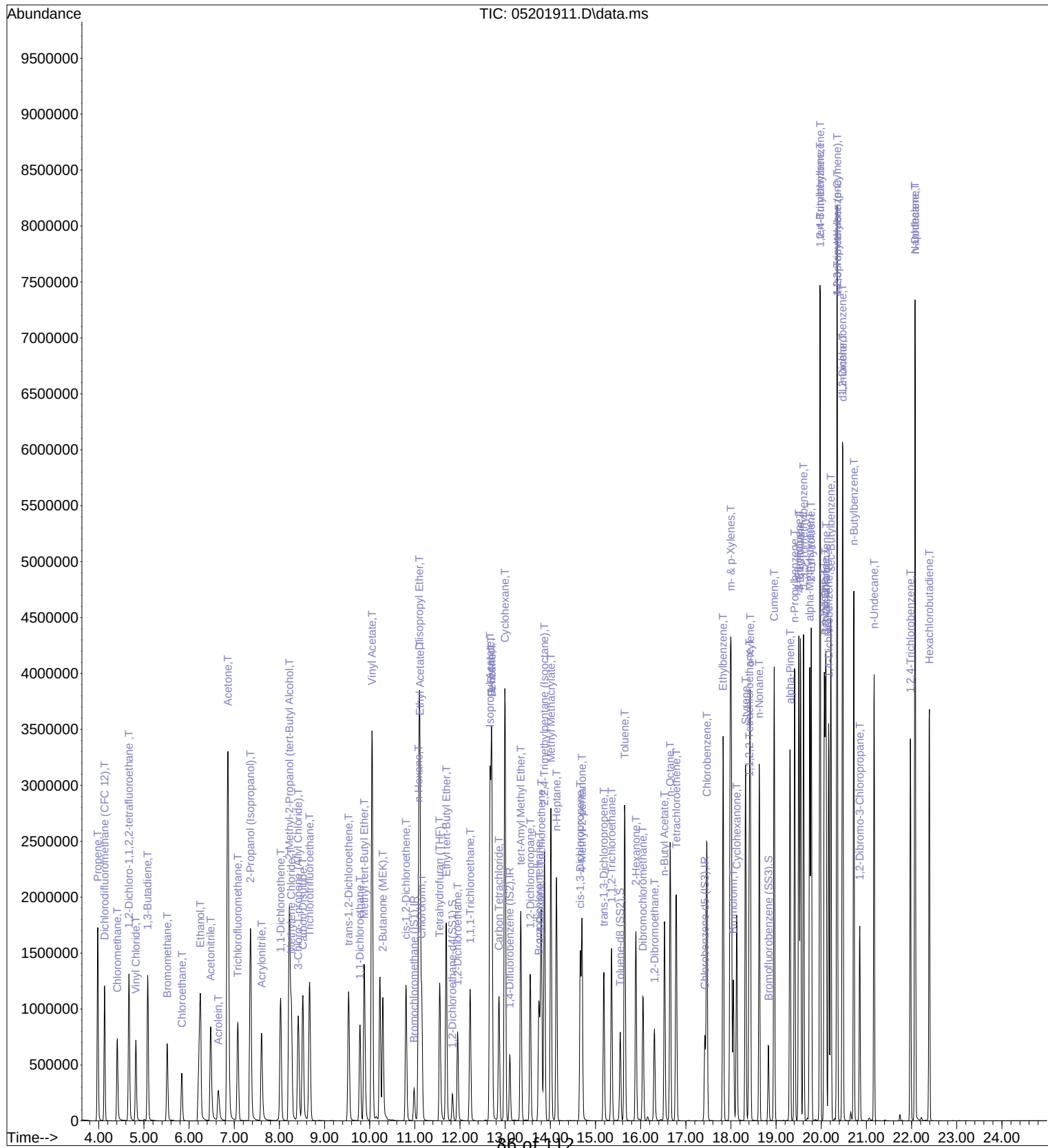
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.14	71	621530	52.755	ng	95
52) cis-1,3-Dichloropropene	14.66	75	1077293	62.711	ng	99
53) 4-Methyl-2-pentanone	14.70	58	593003	55.043	ng	82
54) trans-1,3-Dichloropropene	15.18	75	915993	60.552	ng	99
55) 1,1,2-Trichloroethane	15.36	97	623174	56.356	ng	96
58) Toluene	15.65	91	2511231	51.882	ng	98
59) 2-Hexanone	15.90	43	1331457	55.788	ng	89
60) Dibromochloromethane	16.05	129	765544	59.701	ng	100
61) 1,2-Dibromoethane	16.31	107	716208	60.016	ng	99
62) n-Butyl Acetate	16.53	43	1504842	58.140	ng	92
63) n-Octane	16.65	57	524872	52.231	ng	91
64) Tetrachloroethene	16.79	166	813900	54.310	ng	100
65) Chlorobenzene	17.47	112	1766670	53.936	ng	99
66) Ethylbenzene	17.83	91	2819083	51.718	ng	96
67) m- & p-Xylenes	18.00	91	4398044	105.918	ng	94
68) Bromoform	18.05	173	721917	59.963	ng	100
69) Styrene	18.33	104	1869981	57.996	ng	94
70) o-Xylene	18.43	91	2221105	53.492	ng	94
71) n-Nonane	18.63	43	1167514	51.075	ng	89
72) 1,1,2,2-Tetrachloroethane	18.41	83	1115404	55.059	ng	99
74) Cumene	18.96	105	2877279	52.850	ng	97
75) alpha-Pinene	19.31	93	1476959	52.082	ng	92
76) n-Propylbenzene	19.41	91	3357608	53.722	ng	94
77) 3-Ethyltoluene	19.50	105	2902376	53.191	ng	96
78) 4-Ethyltoluene	19.54	105	2749759	56.140	ng	96
79) 1,3,5-Trimethylbenzene	19.61	105	2402455	52.819	ng	94
80) alpha-Methylstyrene	19.74	118	1340048	57.593	ng	94
81) 2-Ethyltoluene	19.78	105	2873712	54.309	ng	96
82) 1,2,4-Trimethylbenzene	19.98	105	2376043	54.444	ng	95
83) n-Decane	20.07	57	1243920	53.062	ng	95
84) Benzyl Chloride	20.09	91	2127006	64.225	ng	93
85) 1,3-Dichlorobenzene	20.11	146	1611688	60.462	ng	100
86) 1,4-Dichlorobenzene	20.16	146	1610033	58.972	ng	99
87) sec-Butylbenzene	20.21	105	3257745	53.696	ng	96
88) 4-Isopropyltoluene (p-...	20.35	119	2928634	52.073	ng	95
89) 1,2,3-Trimethylbenzene	20.35	105	2349539	53.377	ng	96
90) 1,2-Dichlorobenzene	20.47	146	1530290	59.079	ng	100
91) d-Limonene	20.48	68	879833	50.602	ng	93
92) 1,2-Dibromo-3-Chloropr...	20.85	157	584724	59.539	ng	# 65
93) n-Undecane	21.17	57	1301045	60.185	ng	94
94) 1,2,4-Trichlorobenzene	21.97	180	1195668	63.457	ng	100
95) Naphthalene	22.08	128	3306217	61.470	ng	99
96) n-Dodecane	22.08	57	1131235	76.995	ng	95
97) Hexachlorobutadiene	22.39	225	799548	54.023	ng	100
98) Cyclohexanone	18.13	55	853422	48.789	ng	86
99) tert-Butylbenzene	19.97	119	2341983	52.955	ng	97
100) n-Butylbenzene	20.72	91	2536857	54.380	ng	96

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

Vial: 2
Operator: WA
Inst : MS13

Quant Time: May 28 08:39:27 2019
Quant Method : I:\MS13\METHODS\R13052019A.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue May 28 08:38:52 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019 05\20\05201912.D
 Acq On : 20 May 2019 13:03
 Sample : 100ng R13052019 ICAL Std
 Misc : S31-05011901/S31-05071904 (6/5)

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: May 28 08:39:29 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:38:52 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

WA 5/28/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.99	130	144456	12.500	ng	0.01
37) 1,4-Difluorobenzene (IS2)	13.11	114	623846	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.42	82	272993	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.84	65	181867	12.392	ng	0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.12%
57) Toluene-d8 (SS2)	15.55	98	674874	12.469	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.76%
73) Bromofluorobenzene (SS3)	18.83	174	255491	12.948	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.60%

Target Compounds

						Qvalue
2) Propene	3.98	42	1414657	98.481	ng	94
3) Dichlorodifluoromethan...	4.13	85	2153636	96.021	ng	99
4) Chloromethane	4.41	50	1642206	92.438	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.67	135	1333094	100.696	ng	100
6) Vinyl Chloride	4.83	62	1799265	108.180	ng	98
7) 1,3-Butadiene	5.09	54	1395196	109.004	ng	92
8) Bromomethane	5.52	94	1135637	101.923	ng	99
9) Chloroethane	5.85	64	910301	101.277	ng	99
10) Ethanol	6.29	45	4338579	446.924	ng	99
11) Acetonitrile	6.50	41	2463144	108.537	ng	98
12) Acrolein	6.66	56	818638	107.063	ng	99
13) Acetone	6.88	58	4029654	400.040	ng	# 69
14) Trichlorofluoromethane	7.09	101	1880380	99.660	ng	99
15) 2-Propanol (Isopropanol)	7.39	45	5467403	179.659	ng	95
16) Acrylonitrile	7.62	53	1726628	117.188	ng	98
17) 1,1-Dichloroethene	8.03	96	1257044	107.256	ng	# 73
18) 2-Methyl-2-Propanol (t...	8.25	59	5165163	181.342	ng	94
19) Methylene Chloride	8.27	84	1257123	105.509	ng	# 75
20) 3-Chloro-1-propene (Al...	8.42	41	1877548	104.506	ng	87
21) Trichlorotrifluoroethane	8.67	151	1251608	104.758	ng	86
22) Carbon Disulfide	8.53	76	4527830	97.033	ng	99
23) trans-1,2-Dichloroethene	9.54	61	1732460	110.419	ng	83
24) 1,1-Dichloroethane	9.79	63	2045058	97.259	ng	98
25) Methyl tert-Butyl Ether	9.89	73	3587116	102.553	ng	99
26) Vinyl Acetate	10.07	86	1424892	517.781	ng	# 27
27) 2-Butanone (MEK)	10.30	72	874766	99.361	ng	# 66
28) cis-1,2-Dichloroethene	10.81	61	1627291	102.926	ng	81
29) Diisopropyl Ether	11.10	87	1164865	99.849	ng	# 44
30) Ethyl Acetate	11.12	61	815261	191.518	ng	93
31) n-Hexane	11.09	57	1740565	88.705	ng	99
32) Chloroform	11.16	83	2014859	102.916	ng	100
34) Tetrahydrofuran (THF)	11.55	72	856228	101.471	ng	# 82
35) Ethyl tert-Butyl Ether	11.70	87	1481305	102.298	ng	# 82
36) 1,2-Dichloroethane	11.95	62	1380315	103.120	ng	98
38) 1,1,1-Trichloroethane	12.22	97	1759355	104.428	ng	94
39) Isopropyl Acetate	12.67	61	1427394	181.229	ng	# 62
40) 1-Butanol	12.71	56	2185589	183.228	ng	89
41) Benzene	12.71	78	4346396	87.820	ng	99
42) Carbon Tetrachloride	12.87	117	1606181	106.038	ng	100
43) Cyclohexane	13.00	84	3589598	182.573	ng	88
44) tert-Amyl Methyl Ether	13.35	73	3393794	100.020	ng	91
45) 1,2-Dichloropropane	13.56	63	1232271	100.527	ng	100
46) Bromodichloromethane	13.75	83	1584702	106.495	ng	100
47) Trichloroethene	13.81	130	1495770	107.697	ng	100
48) 1,4-Dioxane	13.78	88	1090687	105.727	ng	89
49) 2,2,4-Trimethylpentane...	13.88	57	4790118	91.256	ng	88
50) Methyl Methacrylate	14.02	100	1077906	213.936	ng	# 75

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Data File : I:\MS13\DATA\2019 05\20\05201912.D
 Acq On : 20 May 2019 13:03
 Sample : 100ng R13052019 ICAL Std
 Misc : S31-05011901/S31-05071904 (6/5)

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: May 28 08:39:29 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:38:52 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.14	71	1211766	98.222	ng	94
52) cis-1,3-Dichloropropene	14.67	75	2116409	117.650	ng	98
53) 4-Methyl-2-pentanone	14.71	58	1147494	101.714	ng	79
54) trans-1,3-Dichloropropene	15.18	75	1805957	114.006	ng	98
55) 1,1,2-Trichloroethane	15.36	97	1242215	107.278	ng	96
58) Toluene	15.65	91	4805109	96.721	ng	97
59) 2-Hexanone	15.90	43	2509336	102.438	ng	87
60) Dibromochloromethane	16.06	129	1538261	116.878	ng	100
61) 1,2-Dibromoethane	16.31	107	1424072	116.266	ng	99
62) n-Butyl Acetate	16.53	43	2837629	106.814	ng	90
63) n-Octane	16.66	57	998174	96.776	ng	89
64) Tetrachloroethene	16.79	166	1659359	107.880	ng	99
65) Chlorobenzene	17.47	112	3429430	102.009	ng	99
66) Ethylbenzene	17.83	91	5266131	94.127	ng	94
67) m- & p-Xylenes	18.00	91	8115683	190.425	ng	93
68) Bromoform	18.06	173	1484058	120.098	ng	99
69) Styrene	18.33	104	3606500	108.978	ng	95
70) o-Xylene	18.43	91	4169583	97.837	ng	92
71) n-Nonane	18.63	43	2075681	88.470	ng	85
72) 1,1,2,2-Tetrachloroethane	18.41	83	2109114	101.434	ng	99
74) Cumene	18.96	105	5272505	94.355	ng	94
75) alpha-Pinene	19.31	93	2806162	96.410	ng	93
76) n-Propylbenzene	19.41	91	6047489	94.272	ng	92
77) 3-Ethyltoluene	19.50	105	5581573	99.662	ng	94
78) 4-Ethyltoluene	19.54	105	4847998	96.433	ng	93
79) 1,3,5-Trimethylbenzene	19.61	105	4500726	96.407	ng	93
80) alpha-Methylstyrene	19.75	118	2584621	108.226	ng	94
81) 2-Ethyltoluene	19.78	105	5311471	97.799	ng	94
82) 1,2,4-Trimethylbenzene	19.98	105	4142451	92.479	ng	96
83) n-Decane	20.07	57	2170949	90.225	ng	92
84) Benzyl Chloride	20.10	91	3953190	116.299	ng	90
85) 1,3-Dichlorobenzene	20.11	146	3125000	114.219	ng	99
86) 1,4-Dichlorobenzene	20.17	146	3157867	112.692	ng	99
87) sec-Butylbenzene	20.22	105	5882570	94.467	ng	95
88) 4-Isopropyltoluene (p-...	20.36	119	4872451	84.409	ng	96
89) 1,2,3-Trimethylbenzene	20.35	105	4066324	90.004	ng	98
90) 1,2-Dichlorobenzene	20.47	146	2838208	106.757	ng	99
91) d-Limonene	20.48	68	1499560	84.027	ng	88
92) 1,2-Dibromo-3-Chloropr...	20.85	157	1187588	117.816	ng	# 63
93) n-Undecane	21.17	57	2279796	102.750	ng	91
94) 1,2,4-Trichlorobenzene	21.98	180	2373408	122.724	ng	99
95) Naphthalene	22.08	128	5800871	105.079	ng	98
96) n-Dodecane	22.08	57	1801915	119.490	ng	90
97) Hexachlorobutadiene	22.39	225	1632590	107.474	ng	100
98) Cyclohexanone	18.13	55	1636781	91.166	ng	# 85
99) tert-Butylbenzene	19.98	119	4056664	89.368	ng	96
100) n-Butylbenzene	20.72	91	4570661	95.459	ng	# 93

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

Data File : I:\MS13\DATA\2019 05\20\05201912.D
Acq On : 20 May 2019 13:03
Sample : 100ng R13052019 ICAL Std
Misc : S31-05011901/S31-05071904 (6/5)

Vial: 2
Operator: WA
Inst : MS13

Quant Time: May 28 08:39:29 2019

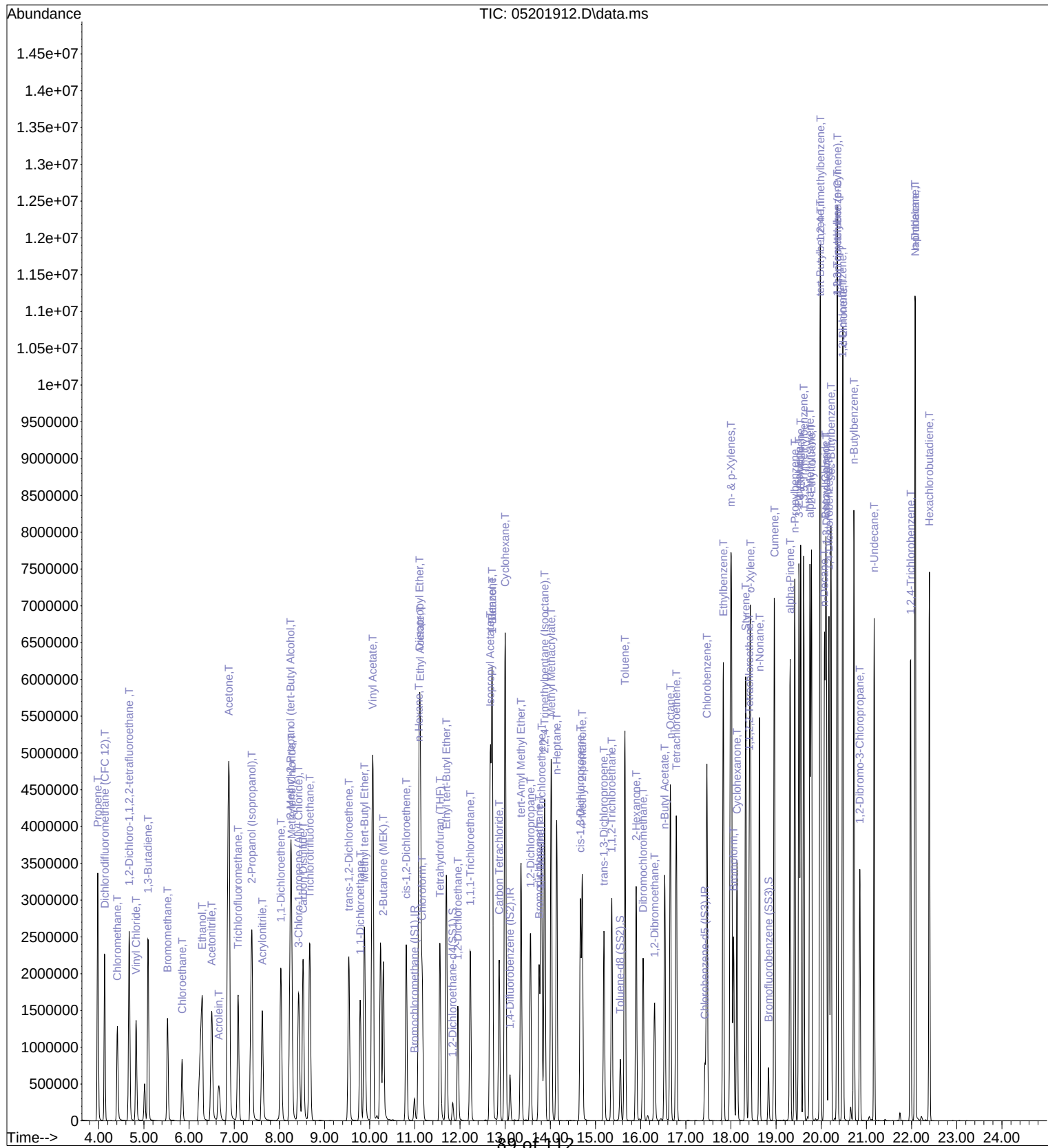
Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:38:52 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019 05\20\05201915.D
 Acq On : 20 May 2019 14:51
 Sample : 25ng R13052019 ICV Std
 Misc : S31-05011901/S31-05091901 (6/7)

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: May 28 08:56:01 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:48:46 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

5/28/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.98	130	140256	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.10	114	599305	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.42	82	266851	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.83	65	178110	12.499	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.00%
57) Toluene-d8 (SS2)	15.54	98	659904	12.473	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.76%
73) Bromofluorobenzene (SS3)	18.83	174	246023	12.755	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.00%

Target Compounds

						Qvalue
2) Propene	3.97	42	367111	26.322	ng	94
3) Dichlorodifluoromethan...	4.12	85	575962	26.448	ng	100
4) Chloromethane	4.41	50	511789	29.671	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.66	135	350801	27.291	ng	99
6) Vinyl Chloride	4.82	62	491373	30.428	ng	99
7) 1,3-Butadiene	5.07	54	378446	30.453	ng	92
8) Bromomethane	5.50	94	307729	28.446	ng	100
9) Chloroethane	5.83	64	248116	28.431	ng	99
10) Ethanol	6.22	45	1249927	132.622	ng	99
11) Acetonitrile	6.46	41	635802	28.857	ng	98
12) Acrolein	6.64	56	211121	28.442	ng	99
13) Acetone	6.84	58	1203013	123.010	ng	# 76
14) Trichlorofluoromethane	7.07	101	479983	26.201	ng	99
15) 2-Propanol (Isopropanol)	7.34	45	1657931	56.113	ng	94
16) Acrylonitrile	7.59	53	439704	30.737	ng	98
17) 1,1-Dichloroethene	8.02	96	320440	28.160	ng	# 76
18) 2-Methyl-2-Propanol (t...	8.20	59	1579908	57.132	ng	95
19) Methylene Chloride	8.25	84	328219	28.372	ng	81
20) 3-Chloro-1-propene (Al...	8.41	41	505907	29.002	ng	89
21) Trichlorotrifluoroethane	8.66	151	309716	26.699	ng	88
22) Carbon Disulfide	8.51	76	1182956	26.112	ng	100
23) trans-1,2-Dichloroethene	9.53	61	446860	29.334	ng	85
24) 1,1-Dichloroethane	9.78	63	551424	27.010	ng	99
25) Methyl tert-Butyl Ether	9.87	73	940677	27.699	ng	99
26) Vinyl Acetate	10.04	86	397248	148.676	ng	# 64
27) 2-Butanone (MEK)	10.28	72	223953	26.200	ng	# 73
28) cis-1,2-Dichloroethene	10.80	61	420183	27.372	ng	83
29) Diisopropyl Ether	11.10	87	320088	28.259	ng	# 69
30) Ethyl Acetate	11.10	61	245178	59.321	ng	99
31) n-Hexane	11.08	57	496793	26.076	ng	98
32) Chloroform	11.14	83	514231	27.053	ng	99
34) Tetrahydrofuran (THF)	11.55	72	222546	27.164	ng	# 84
35) Ethyl tert-Butyl Ether	11.69	87	379920	27.023	ng	# 87
36) 1,2-Dichloroethane	11.95	62	359407	27.654	ng	99
38) 1,1,1-Trichloroethane	12.22	97	443796	27.420	ng	95
39) Isopropyl Acetate	12.66	61	413318	54.626	ng	# 74
40) 1-Butanol	12.68	56	656527	57.296	ng	91
41) Benzene	12.70	78	1261452	26.532	ng	98
42) Carbon Tetrachloride	12.86	117	397389	27.310	ng	99
43) Cyclohexane	12.99	84	992562	52.551	ng	93
44) tert-Amyl Methyl Ether	13.34	73	900839	27.636	ng	92
45) 1,2-Dichloropropane	13.55	63	323728	27.491	ng	99
46) Bromodichloromethane	13.74	83	407257	28.489	ng	100
47) Trichloroethene	13.80	130	369159	27.668	ng	100
48) 1,4-Dioxane	13.77	88	279612	28.215	ng	91
49) 2,2,4-Trimethylpentane...	13.86	57	1334384	26.462	ng	87
50) Methyl Methacrylate	14.01	100	276705	57.168	ng	# 84

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Data File : I:\MS13\DATA\2019 05\20\05201915.D
 Acq On : 20 May 2019 14:51
 Sample : 25ng R13052019 ICV Std
 Misc : S31-05011901/S31-05091901 (6/7)

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: May 28 08:56:01 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:48:46 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.13	71	320875	27.074	ng	96
52) cis-1,3-Dichloropropene	14.66	75	517867	29.967	ng	100
53) 4-Methyl-2-pentanone	14.70	58	307913	28.411	ng	84
54) trans-1,3-Dichloropropene	15.18	75	460119	30.236	ng	100
55) 1,1,2-Trichloroethane	15.35	97	312277	28.073	ng	97
58) Toluene	15.65	91	1289160	26.547	ng	99
59) 2-Hexanone	15.89	43	704724	29.431	ng	90
60) Dibromochloromethane	16.05	129	376856	29.293	ng	99
61) 1,2-Dibromoethane	16.31	107	358684	29.958	ng	99
62) n-Butyl Acetate	16.53	43	804095	30.964	ng	93
63) n-Octane	16.65	57	275309	27.306	ng	93
64) Tetrachloroethene	16.78	166	403820	26.858	ng	100
65) Chlorobenzene	17.46	112	899164	27.362	ng	100
66) Ethylbenzene	17.82	91	1448516	26.487	ng	97
67) m- & p-Xylenes	18.00	91	2268396	54.450	ng	95
68) Bromoform	18.05	173	343314	28.422	ng	100
69) Styrene	18.32	104	949848	29.362	ng	94
70) o-Xylene	18.42	91	1138897	27.339	ng	95
71) n-Nonane	18.63	43	624591	27.234	ng	91
72) 1,1,2,2-Tetrachloroethane	18.40	83	560731	27.588	ng	99
74) Cumene	18.96	105	1496669	27.400	ng	98
75) alpha-Pinene	19.30	93	774216	27.212	ng	92
76) n-Propylbenzene	19.41	91	1757139	28.022	ng	96
77) 3-Ethyltoluene	19.50	105	1515996	27.692	ng	97
78) 4-Ethyltoluene	19.54	105	1423912	28.975	ng	98
79) 1,3,5-Trimethylbenzene	19.61	105	1225760	26.860	ng	95
80) alpha-Methylstyrene	19.74	118	716901	30.710	ng	95
81) 2-Ethyltoluene	19.78	105	1472912	27.745	ng	98
82) 1,2,4-Trimethylbenzene	19.97	105	1250063	28.550	ng	95
83) n-Decane	20.06	57	668729	28.432	ng	94
84) Benzyl Chloride	20.08	91	1070160	32.208	ng	95
85) 1,3-Dichlorobenzene	20.11	146	801144	29.956	ng	100
86) 1,4-Dichlorobenzene	20.16	146	803779	29.344	ng	100
87) sec-Butylbenzene	20.21	105	1685805	27.695	ng	96
88) 4-Isopropyltoluene (p-...	20.35	119	1600853	28.371	ng	95
89) 1,2,3-Trimethylbenzene	20.35	105	1278895	28.959	ng	96
90) 1,2-Dichlorobenzene	20.47	146	767797	29.544	ng	100
91) d-Limonene	20.48	68	502912	28.829	ng	97
92) 1,2-Dibromo-3-Chloropr...	20.85	157	287792	29.208	ng	# 67
93) n-Undecane	21.17	57	696964	32.135	ng	96
94) 1,2,4-Trichlorobenzene	21.97	180	600998	31.792	ng	100
95) Naphthalene	22.08	128	1725650	31.979	ng	100
96) n-Dodecane	22.08	57	626657	42.512	ng	98
97) Hexachlorobutadiene	22.39	225	385949	25.992	ng	99
98) Cyclohexanone	18.13	55	458910	26.149	ng	87
99) tert-Butylbenzene	19.97	119	1247542	28.116	ng	99
100) n-Butylbenzene	20.72	91	1322063	28.247	ng	97

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

Data File : I:\MS13\DATA\2019 05\20\05201915.D
Acq On : 20 May 2019 14:51
Sample : 25ng R13052019 ICV Std
Misc : S31-05011901/S31-05091901 (6/7)

Vial: 2
Operator: WA
Inst : MS13

Quant Time: May 28 08:56:01 2019

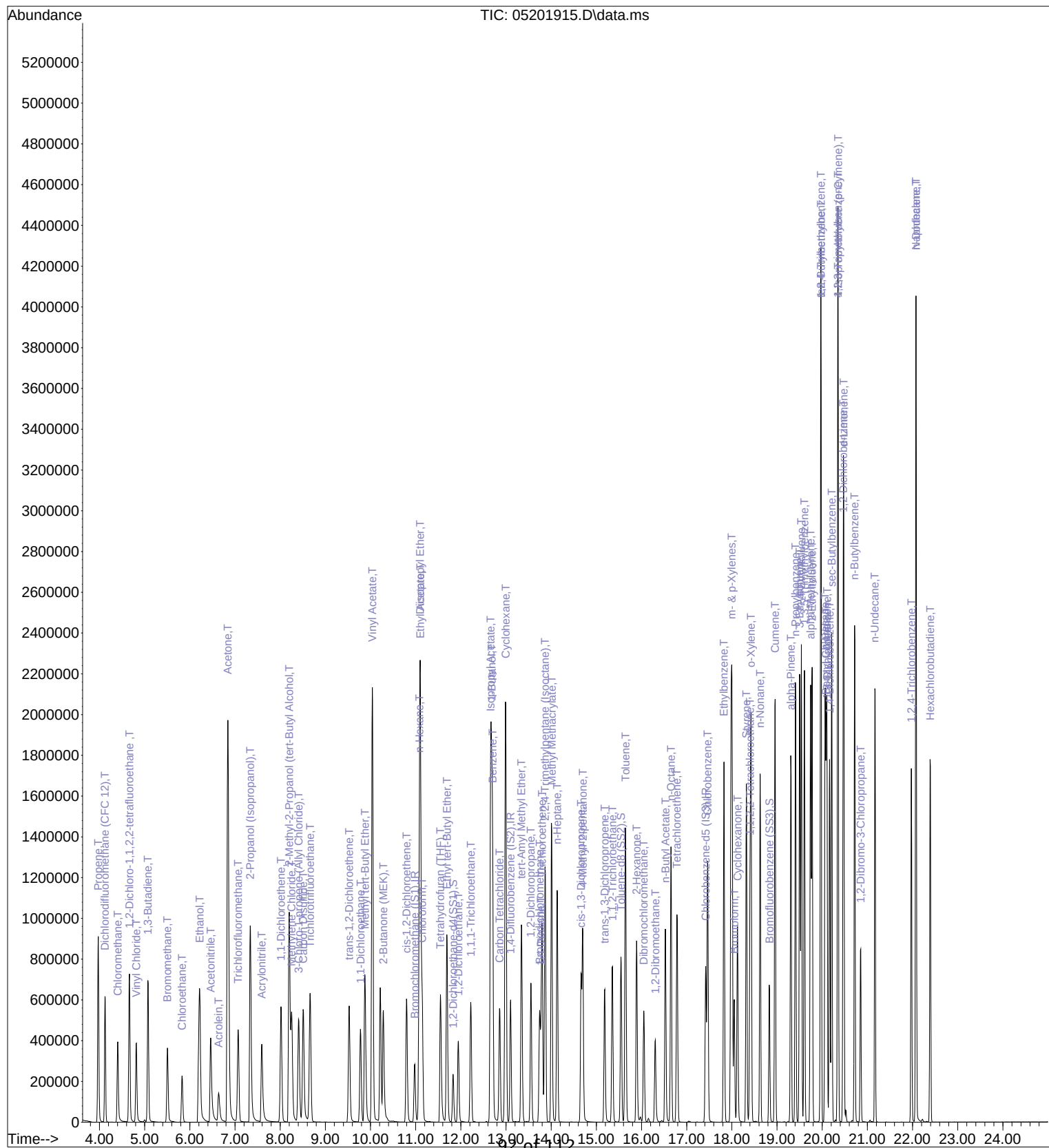
Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:48:46 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



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LABORATORY CONTROL SAMPLE CHECK SHEET for DoD

Data File Name: 05201915.D

Acq. Method File: TO15.M

Data File Path: I:\MS13\DATA\2019_05\20\

Sample Name: 25ng R13052019 ICV Std

Operator: WA

Misc Info: S31-05011901/S31-05091901 (

Date Acquired: 5/20/2019

14:51

Instrument Name: MS13

#	Compound Name	Ret. Time	Amt. (ng)	Spike Amt.(ng)	% Rec.	Lower Limit	Upper Limit	* OR Fail	Method 70-130%
2)	Propene	3.97	26.322	26.425	100	57	136	*	*
3)	Dichlorodifluoromethane (CFC 12)	4.12	26.448	26.300	101	59	128	*	*
4)	Chloromethane	4.41	29.671	26.375	112	59	132	*	*
5)	1,2-Dichloro-1,1,2,2-tetrafluoroethane	4.66	27.291	26.375	103	63	121	*	*
6)	Vinyl Chloride	4.82	30.428	26.725	114	64	127	*	*
7)	1,3-Butadiene	5.07	30.453	26.275	116	66	134	*	*
8)	Bromomethane	5.50	28.446	26.475	107	63	134	*	*
9)	Chloroethane	5.83	28.431	26.750	106	63	127	*	*
10)	Ethanol	6.22	132.622	128.100	104	59	125	*	*
11)	Acetonitrile	6.46	28.857	25.725	112	63	132	*	*
12)	Acrolein	6.64	28.442	25.625	111	62	126	*	*
13)	Acetone	6.84	123.010	132.325	93	58	128	*	*
14)	Trichlorofluoromethane	7.07	26.201	26.400	99	62	126	*	*
15)	2-Propanol (Isopropanol)	7.34	56.113	51.600	109	52	125	*	*
16)	Acrylonitrile	7.59	30.737	25.875	119	71	137	*	*
17)	1,1-Dichloroethene	8.02	28.160	27.225	103	61	133	*	*
18)	2-Methyl-2-Propanol (tert-Butyl Alcohol)	8.20	57.132	54.250	105	24	150	*	*
19)	Methylene Chloride	8.25	28.372	27.075	105	62	115	*	*
20)	3-Chloro-1-propene (Allyl Chloride)	8.41	29.002	27.000	107	71	131	*	*
21)	Trichlorotrifluoroethane	8.66	26.699	26.950	99	66	126	*	*
22)	Carbon Disulfide	8.51	26.112	27.200	96	57	134	*	*
23)	trans-1,2-Dichloroethene	9.53	29.334	26.725	110	67	124	*	*
24)	1,1-Dichloroethane	9.78	27.010	26.950	100	68	126	*	*
25)	Methyl tert-Butyl Ether	9.87	27.699	26.800	103	66	126	*	*
26)	Vinyl Acetate	10.04	148.676	133.025	112	56	139	*	*
27)	2-Butanone (MEK)	10.28	26.200	25.950	101	67	130	*	*
28)	cis-1,2-Dichloroethene	10.80	27.372	26.350	104	70	121	*	*
29)	Diisopropyl Ether	11.10	28.259	27.175	104	70	117	*	*
30)	Ethyl Acetate	11.10	59.321	54.450	109	65	128	*	*
31)	n-Hexane	11.08	26.076	26.950	97	63	120	*	*
32)	Chloroform	11.14	27.053	27.075	100	68	123	*	*
34)	Tetrahydrofuran (THF)	11.55	27.164	27.000	101	64	123	*	*
35)	Ethyl tert-Butyl Ether	11.69	27.023	26.800	101	73	117	*	*
36)	1,2-Dichloroethane	11.95	27.654	26.850	103	65	128	*	*
38)	1,1,1-Trichloroethane	12.22	27.420	26.900	102	68	125	*	*
39)	Isopropyl Acetate	12.66	54.626	51.550	106	68	122	*	*
40)	1-Butanol	12.68	57.296	51.575	111	62	133	*	*
41)	Benzene	12.70	26.532	26.375	101	69	119	*	*
42)	Carbon Tetrachloride	12.86	27.310	26.450	103	68	132	*	*
43)	Cyclohexane	12.99	52.551	52.050	101	70	117	*	*
44)	tert-Amyl Methyl Ether	13.34	27.636	27.075	102	73	115	*	*
45)	1,2-Dichloropropane	13.55	27.491	26.975	102	69	123	*	*
46)	Bromodichloromethane	13.74	28.489	26.825	106	72	128	*	*
47)	Trichloroethene	13.80	27.668	26.675	104	71	123	*	*
48)	1,4-Dioxane	13.77	28.215	26.725	106	71	122	*	*
49)	2,2,4-Trimethylpentane (Isooctane)	13.86	26.462	26.650	99	68	121	*	*

Bold = 75 Compound List

*** = Pass**

LABORATORY CONTROL SAMPLE CHECK SHEET for DoD

Data File Name: 05201915.D

TO15.M

5/28/19

Data File Path: I:\MS13\DATA\2019_05\20\

Sample Name: 25ng R13052019 ICV Std

Operator: WA

Misc Info: S31-05011901/S31-05091901 (

Date Acquired: 5/20/2019

14:51

Instrument Name: MS13

#	Compound Name	Ret. Time	Amt. (ng)	Spike Amt.(ng)	% Rec.	Lower Limit	Upper Limit	* OR Fail	Method 70-130%
50)	Methyl Methacrylate	14.01	57.168	53.875	106	70	128	*	*
51)	n-Heptane	14.13	27.074	26.900	101	69	123	*	*
52)	cis-1,3-Dichloropropene	14.66	29.967	26.775	112	70	128	*	*
53)	4-Methyl-2-pentanone	14.70	28.411	26.150	109	67	130	*	*
54)	trans-1,3-Dichloropropene	15.18	30.236	26.600	114	75	133	*	*
55)	1,1,2-Trichloroethane	15.35	28.073	26.850	105	73	119	*	*
58)	Toluene	15.65	26.547	26.500	100	66	119	*	*
59)	2-Hexanone	15.89	29.431	26.775	110	62	128	*	*
60)	Dibromochloromethane	16.05	29.293	26.600	110	70	130	*	*
61)	1,2-Dibromoethane	16.31	29.958	27.025	111	74	122	*	*
62)	n-Butyl Acetate	16.53	30.964	27.350	113	69	130	*	*
63)	n-Octane	16.65	27.306	27.125	101	69	121	*	*
64)	Tetrachloroethene	16.78	26.858	26.600	101	66	124	*	*
65)	Chlorobenzene	17.46	27.362	26.825	102	70	119	*	*
66)	Ethylbenzene	17.82	26.487	26.525	100	70	124	*	*
67)	m- & p-Xylenes	18.00	54.450	53.275	102	61	134	*	*
68)	Bromoform	18.05	28.422	26.675	107	66	139	*	*
69)	Styrene	18.32	29.362	26.500	111	73	127	*	*
70)	o-Xylene	18.42	27.339	26.750	102	67	125	*	*
71)	n-Nonane	18.63	27.234	26.825	102	63	128	*	*
72)	1,1,2,2-Tetrachloroethane	18.40	27.588	26.800	103	65	127	*	*
74)	Cumene	18.96	27.400	26.800	102	68	124	*	*
75)	alpha-Pinene	19.30	27.212	26.400	103	70	128	*	*
76)	n-Propylbenzene	19.41	28.022	27.225	103	69	123	*	*
77)	3-Ethyltoluene	19.50	27.692	26.825	103	67	128	*	*
78)	4-Ethyltoluene	19.54	28.975	26.800	108	67	129	*	*
79)	1,3,5-Trimethylbenzene	19.61	26.860	26.725	101	67	130	*	*
80)	alpha-Methylstyrene	19.74	30.710	26.750	115	67	128	*	*
81)	2-Ethyltoluene	19.78	27.745	27.075	102	67	124	*	*
82)	1,2,4-Trimethylbenzene	19.97	28.550	26.900	106	66	132	*	*
83)	n-Decane	20.06	28.432	26.875	106	70	118	*	*
84)	Benzyl Chloride	20.08	32.208	27.075	119	50	147	*	*
85)	1,3-Dichlorobenzene	20.11	29.956	26.975	111	65	130	*	*
86)	1,4-Dichlorobenzene	20.16	29.344	27.000	109	60	131	*	*
87)	sec-Butylbenzene	20.21	27.695	26.550	104	68	125	*	*
88)	4-Isopropyltoluene (p-Cymene)	20.35	28.371	26.950	105	67	130	*	*
89)	1,2,3-Trimethylbenzene	20.35	28.959	26.950	107	68	132	*	*
90)	1,2-Dichlorobenzene	20.47	29.544	26.950	110	63	129	*	*
91)	d-Limonene	20.48	28.829	26.375	109	71	134	*	*
92)	1,2-Dibromo-3-Chloropropane	20.85	29.208	26.150	112	73	136	*	*
93)	n-Undecane	21.17	32.135	27.025	119	69	123	*	*
94)	1,2,4-Trichlorobenzene	21.97	31.792	26.775	119	55	142	*	*
95)	Naphthalene	22.08	31.979	25.375	126	57	138	*	*
96)	n-Dodecane	22.08	42.512	25.625	166	62	147	FAIL	FAIL
97)	Hexachlorobutadiene	22.39	25.992	26.125	99	56	138	*	*
98)	Cyclohexanone	18.13	26.149	24.450	107	64	131	*	*
99)	tert-Butylbenzene	19.97	28.116	26.875	105	65	124	*	*
100)	n-Butylbenzene	20.72	28.247	27.000	105	66	130	*	*

Data File : I:\MS13\DATA\2019 06\18\06181927.D

Vial: 2

Acq On : 18 Jun 2019 18:59

Operator: WA

Sample : CCV2 R13061819 5ng

Inst : MS13

Misc : S31-05311902/S31-06061904 (7/5)

Quant Time: Jun 19 05:51:07 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:48:46 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

DA 6/19/19

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	83	-0.02
2	T Propene	1.243	1.076	13.4	66	0.01
3	T Dichlorodifluoromethane (CF	1.941	1.900	2.1	75	0.00
4	T Chloromethane	1.537	1.557	-1.3	76	0.00
5	T 1,2-Dichloro-1,1,2,2-tetra	1.146	1.146	0.0	78	0.00
6	T Vinyl Chloride	1.439	1.499	-4.2	77	0.00
7	T 1,3-Butadiene	1.108	1.236	-11.6	83	-0.01
8	T Bromomethane	0.964	0.951	1.3	78	-0.01
9	T Chloroethane	0.778	0.736	5.4	71	-0.01
10	T Ethanol	0.840	0.764	9.0	75	-0.10
11	T Acetonitrile	1.964	1.833	6.7	70	-0.03
12	T Acrolein	0.662	0.591	10.7	72	0.00
13	T Acetone	0.872	0.727	16.6	69	-0.05
14	T Trichlorofluoromethane	1.633	1.608	1.5	76	-0.02
15	T 2-Propanol (Isopropanol)	2.633	2.542	3.5	73	-0.07
16	T Acrylonitrile	1.275	1.128	11.5	65	-0.02
17	T 1,1-Dichloroethene	1.014	0.988	2.6	74	-0.01
18	T 2-Methyl-2-Propanol (tert-B	2.465	2.399	2.7	74	-0.07
19	T Methylene Chloride	1.031	0.972	5.7	71	-0.02
20	T 3-Chloro-1-propene (Allyl C	1.555	1.303	16.2	66	-0.02
21	T Trichlorotrifluoroethane	1.034	1.013	2.0	77	-0.02
22	T Carbon Disulfide	4.037	3.580	11.3	72	-0.01
23	T trans-1,2-Dichloroethene	1.358	1.261	7.1	68	-0.02
24	T 1,1-Dichloroethane	1.819	1.737	4.5	73	-0.02
25	T Methyl tert-Butyl Ether	3.027	2.251	25.6	58	0.00
26	T Vinyl Acetate	0.238	0.237	0.4	76	-0.03
27	T 2-Butanone (MEK)	0.762	0.652	14.4	68	-0.01
28	T cis-1,2-Dichloroethene	1.368	1.287	5.9	72	-0.01
29	T Diisopropyl Ether	1.009	0.978	3.1	73	0.00
30	T Ethyl Acetate	0.368	0.353	4.1	70	-0.01
31	T n-Hexane	1.698	1.584	6.7	72	0.00
32	T Chloroform	1.694	1.617	4.5	75	-0.02
33	S 1,2-Dichloroethane-d4 (SS1)	1.270	1.262	0.6	84	-0.02
34	T Tetrahydrofuran (THF)	0.730	0.678	7.1	72	0.00
35	T Ethyl tert-Butyl Ether	1.253	1.174	6.3	72	0.00
36	T 1,2-Dichloroethane	1.158	1.142	1.4	75	-0.01
37	IR 1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	83	-0.01
38	T 1,1,1-Trichloroethane	0.338	0.332	1.8	76	-0.01
39	T Isopropyl Acetate	0.158	0.152	3.8	71	0.00
40	T 1-Butanol	0.239	0.211	11.7	73	-0.03
41	T Benzene	0.992	0.933	5.9	72	-0.01
42	T Carbon Tetrachloride	0.304	0.311	-2.3	80	-0.01
43	T Cyclohexane	0.394	0.368	6.6	72	-0.01
44	T tert-Amyl Methyl Ether	0.680	0.638	6.2	72	0.00
45	T 1,2-Dichloropropane	0.246	0.225	8.5	70	-0.01
46	T Bromodichloromethane	0.298	0.293	1.7	74	0.00
47	T Trichloroethene	0.278	0.271	2.5	75	0.00
48	T 1,4-Dioxane	0.207	0.199	3.9	73	0.00
49	T 2,2,4-Trimethylpentane (Iso	1.052	0.956	9.1	70	-0.01
50	T Methyl Methacrylate	0.101	0.094	6.9	71	-0.01
51	T n-Heptane	0.247	0.231	6.5	72	-0.01
52	T cis-1,3-Dichloropropene	0.360	0.353	1.9	71	0.00
53	T 4-Methyl-2-pentanone	0.226	0.209	7.5	70	0.00
54	T trans-1,3-Dichloropropene	0.317	0.298	6.0	71	0.00
55	T 1,1,2-Trichloroethane	0.232	0.220	5.2	72	0.00

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Data File : I:\MS13\DATA\2019 06\18\06181927.D
 Acq On : 18 Jun 2019 18:59
 Sample : CCV2 R13061819 5ng
 Misc : S31-05311902/S31-06061904 (7/5)

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Jun 19 05:51:07 2019
 Quant Method : I:\MS13\METHODS\R13052019A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Tue May 28 08:48:46 2019
 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	80	0.00
57	S Toluene-d8 (SS2)	2.478	2.545	-2.7	82	0.00
58	T Toluene	2.275	2.258	0.7	73	0.00
59	T 2-Hexanone	1.122	1.081	3.7	67	0.00
60	T Dibromochloromethane	0.603	0.640	-6.1	77	0.00
61	T 1,2-Dibromoethane	0.561	0.585	-4.3	73	0.00
62	T n-Butyl Acetate	1.216	1.173	3.5	68	0.00
63	T n-Octane	0.472	0.450	4.7	70	0.00
64	T Tetrachloroethene	0.704	0.730	-3.7	78	0.00
65	T Chlorobenzene	1.539	1.561	-1.4	76	0.00
66	T Ethylbenzene	2.562	2.558	0.2	73	0.00
67	T m- & p-Xylenes	1.951	1.941	0.5	73	0.00
68	T Bromoform	0.566	0.585	-3.4	80	0.00
69	T Styrene	1.515	1.546	-2.0	75	0.00
70	T o-Xylene	1.951	1.970	-1.0	75	-0.01
71	T n-Nonane	1.074	1.049	2.3	70	0.00
72	T 1,1,2,2-Tetrachloroethane	0.952	0.958	-0.6	73	0.00
73	S Bromofluorobenzene (SS3)	0.904	0.991	-9.6	87	0.00
74	T Cumene	2.559	2.614	-2.1	74	0.00
75	T alpha-Pinene	1.333	1.319	1.1	72	0.00
76	T n-Propylbenzene	2.937	2.971	-1.2	73	0.00
77	T 3-Ethyltoluene	2.564	2.622	-2.3	73	0.00
78	T 4-Ethyltoluene	2.302	2.349	-2.0	77	0.00
79	T 1,3,5-Trimethylbenzene	2.138	2.151	-0.6	76	0.00
80	T alpha-Methylstyrene	1.094	1.201	-9.8	81	0.00
81	T 2-Ethyltoluene	2.487	2.511	-1.0	75	-0.01
82	T 1,2,4-Trimethylbenzene	2.051	2.119	-3.3	75	-0.01
83	T n-Decane	1.102	1.100	0.2	72	0.00
84	T Benzyl Chloride	1.556	1.646	-5.8	86	-0.01
85	T 1,3-Dichlorobenzene	1.253	1.318	-5.2	81	0.00
86	T 1,4-Dichlorobenzene	1.283	1.363	-6.2	83	0.00
87	T sec-Butylbenzene	2.851	2.922	-2.5	75	0.00
88	T 4-Isopropyltoluene (p-Cymen	2.643	2.830	-7.1	77	-0.01
89	T 1,2,3-Trimethylbenzene	2.069	2.151	-4.0	76	0.00
90	T 1,2-Dichlorobenzene	1.217	1.308	-7.5	82	0.00
91	T d-Limonene	0.817	0.845	-3.4	74	0.00
92	T 1,2-Dibromo-3-Chloropropane	0.462	0.496	-7.4	84	0.00
93	T n-Undecane	1.016	1.149	-13.1	83	0.00
94	T 1,2,4-Trichlorobenzene	0.886	0.983	-10.9	101	0.00
95	T Naphthalene	2.528	2.882	-14.0	117	0.00
96	T n-Dodecane	0.690	1.018	-47.5#	155	0.00
97	T Hexachlorobutadiene	0.696	0.702	-0.9	85	0.00
98	T Cyclohexanone	0.822	0.749	8.9	70	0.00
99	T tert-Butylbenzene	2.078	2.180	-4.9	76	-0.01
100	T n-Butylbenzene	2.192	2.250	-2.6	76	0.00

(#) = Out of Range

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

Data File : I:\MS13\DATA\2019 06\18\06181927.D
 Acq On : 18 Jun 2019 18:59
 Sample : CCV2 R13061819 5ng
 Misc : S31-05311902/S31-06061904 (7/5)

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Jun 19 05:51:07 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:48:46 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

6/19/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.97	130	114807	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.10	114	490052	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.42	82	209412	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.82	65	144907	12.423	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.36%
57) Toluene-d8 (SS2)	15.54	98	532918	12.836	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.72%
73) Bromofluorobenzene (SS3)	18.83	174	207506	13.709	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	109.68%

Target Compounds

						Qvalue
2) Propene	3.99	42	50965	4.464	ng	96
3) Dichlorodifluoromethan...	4.13	85	91180	5.115	ng	100
4) Chloromethane	4.42	50	72058	5.104	ng	98
5) 1,2-Dichloro-1,1,2,2-t...	4.67	135	54108	5.143	ng	100
6) Vinyl Chloride	4.82	62	72329	5.472	ng	99
7) 1,3-Butadiene	5.08	54	59552	5.854	ng	92
8) Bromomethane	5.51	94	44058	4.975	ng	100
9) Chloroethane	5.83	64	34545	4.836	ng	99
10) Ethanol	6.19	45	180272	23.367	ng	99
11) Acetonitrile	6.47	41	86966	4.822	ng	99
12) Acrolein	6.65	56	27914	4.594	ng	95
13) Acetone	6.83	58	179240	22.390	ng	# 85
14) Trichlorofluoromethane	7.07	101	78277	5.220	ng	100
15) 2-Propanol (Isopropanol)	7.32	45	240823	9.957	ng	99
16) Acrylonitrile	7.60	53	53546	4.573	ng	97
17) 1,1-Dichloroethene	8.02	96	48739	5.233	ng	# 74
18) 2-Methyl-2-Propanol (t...	8.18	59	236203	10.435	ng	95
19) Methylene Chloride	8.25	84	47780	5.046	ng	# 77
20) 3-Chloro-1-propene (Al...	8.41	41	63868	4.473	ng	88
21) Trichlorotrifluoroethane	8.66	151	49538	5.217	ng	85
22) Carbon Disulfide	8.51	76	176750	4.766	ng	99
23) trans-1,2-Dichloroethene	9.52	61	61506	4.932	ng	80
24) 1,1-Dichloroethane	9.77	63	82152	4.916	ng	99
25) Methyl tert-Butyl Ether	9.88	73	112560	4.049	ng	97
26) Vinyl Acetate	10.03	86	57133	26.123	ng	# 76
27) 2-Butanone (MEK)	10.29	72	30750	4.395	ng	# 70
28) cis-1,2-Dichloroethene	10.80	61	62298	4.958	ng	82
29) Diisopropyl Ether	11.10	87	48540	5.235	ng	# 69
30) Ethyl Acetate	11.11	61	35144	10.388	ng	97
31) n-Hexane	11.08	57	78701	5.047	ng	97
32) Chloroform	11.14	83	79980	5.140	ng	99
34) Tetrahydrofuran (THF)	11.56	72	33260	4.960	ng	# 79
35) Ethyl tert-Butyl Ether	11.69	87	57143	4.965	ng	# 85
36) 1,2-Dichloroethane	11.94	62	55651	5.231	ng	100
38) 1,1,1-Trichloroethane	12.21	97	70318	5.313	ng	95
39) Isopropyl Acetate	12.66	61	61511	9.942	ng	# 76
40) 1-Butanol	12.68	56	85580	9.134	ng	100
41) Benzene	12.70	78	188853	4.858	ng	98
42) Carbon Tetrachloride	12.86	117	63209	5.312	ng	99
43) Cyclohexane	12.99	84	150481	9.743	ng	91
44) tert-Amyl Methyl Ether	13.35	73	134372	5.041	ng	92
45) 1,2-Dichloropropane	13.55	63	47309	4.913	ng	99
46) Bromodichloromethane	13.74	83	61243	5.239	ng	99
47) Trichloroethene	13.80	130	56458	5.175	ng	99
48) 1,4-Dioxane	13.78	88	41568	5.130	ng	85
49) 2,2,4-Trimethylpentane...	13.86	57	198832	4.822	ng	89
50) Methyl Methacrylate	14.01	100	39253	9.918	ng	# 88

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Data File : I:\MS13\DATA\2019 06\18\06181927.D
 Acq On : 18 Jun 2019 18:59
 Sample : CCV2 R13061819 5ng
 Misc : S31-05311902/S31-06061904 (7/5)

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Jun 19 05:51:07 2019
 Quant Method : I:\MS13\METHODS\R13052019A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Tue May 28 08:48:46 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.13	71	48766	5.032	ng	93
52) cis-1,3-Dichloropropene	14.67	75	77510	5.485	ng	99
53) 4-Methyl-2-pentanone	14.70	58	43515	4.910	ng	89
54) trans-1,3-Dichloropropene	15.19	75	61590	4.950	ng	98
55) 1,1,2-Trichloroethane	15.36	97	46418	5.103	ng	97
58) Toluene	15.65	91	198954	5.221	ng	99
59) 2-Hexanone	15.90	43	97290	5.178	ng	93
60) Dibromochloromethane	16.06	129	57667	5.712	ng	99
61) 1,2-Dibromoethane	16.31	107	52755	5.615	ng	99
62) n-Butyl Acetate	16.53	43	106620	5.232	ng	94
63) n-Octane	16.65	57	40596	5.131	ng	92
64) Tetrachloroethene	16.79	166	64663	5.480	ng	99
65) Chlorobenzene	17.47	112	139375	5.404	ng	99
66) Ethylbenzene	17.82	91	221332	5.157	ng	97
67) m- & p-Xylenes	18.00	91	345227	10.560	ng	93
68) Bromoform	18.05	173	52096	5.496	ng	99
69) Styrene	18.33	104	137304	5.409	ng	94
70) o-Xylene	18.42	91	175262	5.361	ng	95
71) n-Nonane	18.63	43	94067	5.227	ng	92
72) 1,1,2,2-Tetrachloroethane	18.40	83	85364	5.352	ng	100
74) Cumene	18.96	105	231406	5.398	ng	99
75) alpha-Pinene	19.30	93	114360	5.122	ng	92
76) n-Propylbenzene	19.41	91	267784	5.442	ng	96
77) 3-Ethyltoluene	19.50	105	233285	5.430	ng	96
78) 4-Ethyltoluene	19.54	105	208738	5.413	ng	97
79) 1,3,5-Trimethylbenzene	19.61	105	190424	5.317	ng	94
80) alpha-Methylstyrene	19.74	118	106447	5.811	ng	95
81) 2-Ethyltoluene	19.77	105	225488	5.412	ng	97
82) 1,2,4-Trimethylbenzene	19.97	105	189532	5.516	ng	94
83) n-Decane	20.06	57	99125	5.370	ng	98
84) Benzyl Chloride	20.08	91	144921	5.558	ng	96
85) 1,3-Dichlorobenzene	20.11	146	119246	5.682	ng	100
86) 1,4-Dichlorobenzene	20.16	146	123435	5.742	ng	99
87) sec-Butylbenzene	20.21	105	260183	5.447	ng	97
88) 4-Isopropyltoluene (p-...	20.35	119	247050	5.579	ng	94
89) 1,2,3-Trimethylbenzene	20.35	105	187759	5.418	ng	95
90) 1,2-Dichlorobenzene	20.47	146	119280	5.849	ng	99
91) d-Limonene	20.48	68	71502	5.223	ng	96
92) 1,2-Dibromo-3-Chloropr...	20.85	157	43320	5.602	ng	# 66
93) n-Undecane	21.17	57	101688	5.975	ng	97
94) 1,2,4-Trichlorobenzene	21.97	180	87649	5.908	ng	99
95) Naphthalene	22.08	128	247470	5.844	ng	98
96) n-Dodecane	22.08	57	87928	7.601	ng	99
97) Hexachlorobutadiene	22.39	225	61881	5.310	ng	100
98) Cyclohexanone	18.13	55	61629	4.475	ng	87
99) tert-Butylbenzene	19.96	119	194852	5.596	ng	99
100) n-Butylbenzene	20.72	91	200508	5.459	ng	97

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

[illegible]

Data File : I:\MS13\DATA\2019 06\19\06191902.D
 Acq On : 19 Jun 2019 17:51
 Sample : CCV R13061919 5ng
 Misc : S31-05311902/S31-06061904 (7/5)

Vial: 16
 Operator: WA
 Inst : MS13

Quant Time: Jun 20 06:12:39 2019
 Quant Method : I:\MS13\METHODS\R13052019A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Tue May 28 08:48:46 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

6/20/19

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	85	-0.02
2	T Propene	1.243	0.983	20.9	61	0.01
3	T Dichlorodifluoromethane (CF	1.941	1.747	10.0	70	0.00
4	T Chloromethane	1.537	1.452	5.5	72	0.00
5	T 1,2-Dichloro-1,1,2,2-tetra	1.146	1.044	8.9	72	0.00
6	T Vinyl Chloride	1.439	1.355	5.8	71	0.00
7	T 1,3-Butadiene	1.108	1.147	-3.5	78	-0.01
8	T Bromomethane	0.964	0.854	11.4	72	0.00
9	T Chloroethane	0.778	0.680	12.6	66	-0.02
10	T Ethanol	0.840	0.694	17.4	70	-0.11
11	T Acetonitrile	1.964	1.605	18.3	62	-0.03
12	T Acrolein	0.662	0.537	18.9	67	-0.01
13	T Acetone	0.872	0.667	23.5	64	-0.05
14	T Trichlorofluoromethane	1.633	1.446	11.5	70	-0.02
15	T 2-Propanol (Isopropanol)	2.633	2.323	11.8	68	-0.07
16	T Acrylonitrile	1.275	1.021	19.9	60	-0.02
17	T 1,1-Dichloroethene	1.014	0.922	9.1	70	-0.01
18	T 2-Methyl-2-Propanol (tert-B	2.465	2.097	14.9	66	-0.07
19	T Methylene Chloride	1.031	0.919	10.9	69	-0.03
20	T 3-Chloro-1-propene (Allyl C	1.555	1.200	22.8	62	-0.02
21	T Trichlorotrifluoroethane	1.034	0.959	7.3	74	-0.02
22	T Carbon Disulfide	4.037	3.303	18.2	67	-0.02
23	T trans-1,2-Dichloroethene	1.358	1.184	12.8	65	-0.02
24	T 1,1-Dichloroethane	1.819	1.560	14.2	67	-0.02
25	T Methyl tert-Butyl Ether	3.027	2.193	27.6	57	0.00
26	T Vinyl Acetate	0.238	0.205	13.9	67	-0.04
27	T 2-Butanone (MEK)	0.762	0.600	21.3	64	-0.01
28	T cis-1,2-Dichloroethene	1.368	1.169	14.5	66	-0.02
29	T Diisopropyl Ether	1.009	0.901	10.7	69	0.00
30	T Ethyl Acetate	0.368	0.320	13.0	64	-0.02
31	T n-Hexane	1.698	1.332	21.6	62	-0.01
32	T Chloroform	1.694	1.475	12.9	69	-0.03
33	S 1,2-Dichloroethane-d4 (SS1)	1.270	1.208	4.9	82	-0.02
34	T Tetrahydrofuran (THF)	0.730	0.620	15.1	67	0.00
35	T Ethyl tert-Butyl Ether	1.253	1.089	13.1	68	0.00
36	T 1,2-Dichloroethane	1.158	1.033	10.8	69	-0.01
37	IR 1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	83	-0.01
38	T 1,1,1-Trichloroethane	0.338	0.311	8.0	71	-0.01
39	T Isopropyl Acetate	0.158	0.136	13.9	63	-0.01
40	T 1-Butanol	0.239	0.174	27.2	60	-0.04
41	T Benzene	0.992	0.876	11.7	67	-0.01
42	T Carbon Tetrachloride	0.304	0.290	4.6	75	-0.02
43	T Cyclohexane	0.394	0.346	12.2	67	-0.01
44	T tert-Amyl Methyl Ether	0.680	0.591	13.1	66	-0.01
45	T 1,2-Dichloropropane	0.246	0.208	15.4	65	-0.01
46	T Bromodichloromethane	0.298	0.276	7.4	70	0.00
47	T Trichloroethene	0.278	0.259	6.8	71	-0.01
48	T 1,4-Dioxane	0.207	0.186	10.1	68	0.00
49	T 2,2,4-Trimethylpentane (Iso	1.052	0.882	16.2	65	-0.01
50	T Methyl Methacrylate	0.101	0.089	11.9	67	-0.01
51	T n-Heptane	0.247	0.206	16.6	64	-0.01
52	T cis-1,3-Dichloropropene	0.360	0.332	7.8	67	0.00
53	T 4-Methyl-2-pentanone	0.226	0.185	18.1	61	0.00
54	T trans-1,3-Dichloropropene	0.317	0.276	12.9	66	0.00
55	T 1,1,2-Trichloroethane	0.232	0.212	8.2	69	0.00

100 of 112

Data File : I:\MS13\DATA\2019 06\19\06191902.D

Vial: 16

Acq On : 19 Jun 2019 17:51

Operator: WA

Sample : CCV R13061919 5ng

Inst : MS13

Misc : S31-05311902/S31-06061904 (7/5)

Quant Time: Jun 20 06:12:39 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:48:46 2019

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	79	0.00
57 S	Toluene-d8 (SS2)	2.478	2.547	-2.8	81	0.00
58 T	Toluene	2.275	2.128	6.5	68	0.00
59 T	2-Hexanone	1.122	0.949	15.4	58	0.00
60 T	Dibromochloromethane	0.603	0.611	-1.3	73	0.00
61 T	1,2-Dibromoethane	0.561	0.562	-0.2	70	0.00
62 T	n-Butyl Acetate	1.216	1.004	17.4	58	0.00
63 T	n-Octane	0.472	0.410	13.1	63	0.00
64 T	Tetrachloroethene	0.704	0.701	0.4	75	0.00
65 T	Chlorobenzene	1.539	1.479	3.9	71	0.00
66 T	Ethylbenzene	2.562	2.434	5.0	69	0.00
67 T	m- & p-Xylenes	1.951	1.825	6.5	68	-0.01
68 T	Bromoform	0.566	0.558	1.4	75	0.00
69 T	Styrene	1.515	1.454	4.0	70	0.00
70 T	o-Xylene	1.951	1.848	5.3	69	-0.01
71 T	n-Nonane	1.074	0.943	12.2	63	0.00
72 T	1,1,2,2-Tetrachloroethane	0.952	0.892	6.3	68	0.00
73 S	Bromofluorobenzene (SS3)	0.904	1.028	-13.7	89	0.00
74 T	Cumene	2.559	2.497	2.4	71	0.00
75 T	alpha-Pinene	1.333	1.238	7.1	67	0.00
76 T	n-Propylbenzene	2.937	2.770	5.7	68	0.00
77 T	3-Ethyltoluene	2.564	2.430	5.2	67	0.00
78 T	4-Ethyltoluene	2.302	2.179	5.3	71	0.00
79 T	1,3,5-Trimethylbenzene	2.138	1.989	7.0	70	0.00
80 T	alpha-Methylstyrene	1.094	1.066	2.6	71	0.00
81 T	2-Ethyltoluene	2.487	2.323	6.6	69	-0.01
82 T	1,2,4-Trimethylbenzene	2.051	1.958	4.5	69	-0.01
83 T	n-Decane	1.102	0.991	10.1	65	0.00
84 T	Benzyl Chloride	1.556	1.418	8.9	73	-0.01
85 T	1,3-Dichlorobenzene	1.253	1.218	2.8	74	0.00
86 T	1,4-Dichlorobenzene	1.283	1.259	1.9	76	0.00
87 T	sec-Butylbenzene	2.851	2.646	7.2	67	0.00
88 T	4-Isopropyltoluene (p-Cymen	2.643	2.573	2.6	70	-0.01
89 T	1,2,3-Trimethylbenzene	2.069	1.970	4.8	69	0.00
90 T	1,2-Dichlorobenzene	1.217	1.201	1.3	74	0.00
91 T	d-Limonene	0.817	0.772	5.5	67	0.00
92 T	1,2-Dibromo-3-Chloropropane	0.462	0.424	8.2	72	0.00
93 T	n-Undecane	1.016	1.004	1.2	72	0.00
94 T	1,2,4-Trichlorobenzene	0.886	0.802	9.5	82	0.00
95 T	Naphthalene	2.528	2.183	13.6	88	0.00
96 T	n-Dodecane	0.690	0.749	-8.6	113	0.00
97 T	Hexachlorobutadiene	0.696	0.588	15.5	71	0.00
98 T	Cyclohexanone	0.822	0.570	30.7#	53	0.00
99 T	tert-Butylbenzene	2.078	1.984	4.5	69	-0.01
100 T	n-Butylbenzene	2.192	2.075	5.3	70	0.00

(#) = Out of Range

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

Data File : I:\MS13\DATA\2019 06\19\06191902.D
 Acq On : 19 Jun 2019 17:51
 Sample : CCV R13061919 5ng
 Misc : S31-05311902/S31-06061904 (7/5)

Vial: 16
 Operator: WA
 Inst : MS13

Quant Time: Jun 20 06:12:39 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:48:46 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

WA 6/20/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	10.97	130	116889	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.10	114	488961	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.42	82	207860	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	11.82	65	141236	11.893	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	95.12%
57) Toluene-d8 (SS2)	15.54	98	529370	12.845	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.80%
73) Bromofluorobenzene (SS3)	18.83	174	213648	14.220	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	113.76%

Target Compounds

						Qvalue
2) Propene	3.99	42	47398	4.078	ng	95
3) Dichlorodifluoromethan...	4.13	85	85376	4.704	ng	100
4) Chloromethane	4.42	50	68447	4.761	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.67	135	50177	4.684	ng	100
6) Vinyl Chloride	4.82	62	66589	4.948	ng	100
7) 1,3-Butadiene	5.08	54	56279	5.434	ng	93
8) Bromomethane	5.52	94	40276	4.467	ng	99
9) Chloroethane	5.83	64	32517	4.471	ng	100
10) Ethanol	6.18	45	166828	21.240	ng	100
11) Acetonitrile	6.47	41	77534	4.222	ng	100
12) Acrolein	6.65	56	25828	4.175	ng	96
13) Acetone	6.83	58	167488	20.550	ng	# 83
14) Trichlorofluoromethane	7.07	101	71669	4.694	ng	99
15) 2-Propanol (Isopropanol)	7.31	45	224089	9.101	ng	100
16) Acrylonitrile	7.60	53	49362	4.140	ng	97
17) 1,1-Dichloroethene	8.02	96	46282	4.880	ng	# 74
18) 2-Methyl-2-Propanol (t...	8.18	59	210255	9.123	ng	94
19) Methylene Chloride	8.24	84	45961	4.767	ng	# 75
20) 3-Chloro-1-propene (Al...	8.40	41	59847	4.117	ng	85
21) Trichlorotrifluoroethane	8.66	151	47739	4.938	ng	83
22) Carbon Disulfide	8.51	76	166009	4.397	ng	97
23) trans-1,2-Dichloroethene	9.52	61	58788	4.631	ng	87
24) 1,1-Dichloroethane	9.77	63	75118	4.415	ng	99
25) Methyl tert-Butyl Ether	9.88	73	111678	3.946	ng	96
26) Vinyl Acetate	10.03	86	50263	22.572	ng	# 73
27) 2-Butanone (MEK)	10.29	72	28797	4.042	ng	# 65
28) cis-1,2-Dichloroethene	10.79	61	57632	4.505	ng	80
29) Diisopropyl Ether	11.10	87	45517	4.822	ng	# 61
30) Ethyl Acetate	11.10	61	32367	9.397	ng	98
31) n-Hexane	11.08	57	67406	4.245	ng	98
32) Chloroform	11.13	83	74279	4.689	ng	99
34) Tetrahydrofuran (THF)	11.55	72	30980	4.537	ng	# 78
35) Ethyl tert-Butyl Ether	11.69	87	53972	4.606	ng	# 84
36) 1,2-Dichloroethane	11.94	62	51228	4.730	ng	99
38) 1,1,1-Trichloroethane	12.21	97	65657	4.972	ng	95
39) Isopropyl Acetate	12.66	61	54985	8.907	ng	# 72
40) 1-Butanol	12.67	56	70420	7.532	ng	100
41) Benzene	12.70	78	176902	4.560	ng	98
42) Carbon Tetrachloride	12.85	117	58694	4.944	ng	99
43) Cyclohexane	12.99	84	141211	9.164	ng	89
44) tert-Amyl Methyl Ether	13.34	73	124154	4.668	ng	92
45) 1,2-Dichloropropane	13.55	63	43659	4.544	ng	98
46) Bromodichloromethane	13.74	83	57650	4.943	ng	100
47) Trichloroethene	13.80	130	53802	4.942	ng	100
48) 1,4-Dioxane	13.78	88	38725	4.789	ng	87
49) 2,2,4-Trimethylpentane...	13.86	57	183041	4.449	ng	88
50) Methyl Methacrylate	14.01	100	1020112	9.394	ng	# 84

Data File : I:\MS13\DATA\2019 06\19\06191902.D
 Acq On : 19 Jun 2019 17:51
 Sample : CCV R13061919 5ng
 Misc : S31-05311902/S31-06061904 (7/5)

Vial: 16
 Operator: WA
 Inst : MS13

Quant Time: Jun 20 06:12:39 2019

Quant Method : I:\MS13\METHODS\R13052019A.M

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

QLast Update : Tue May 28 08:48:46 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.13	71	43253	4.473	ng	93
52) cis-1,3-Dichloropropene	14.67	75	72719	5.158	ng	99
53) 4-Methyl-2-pentanone	14.70	58	38392	4.342	ng	87
54) trans-1,3-Dichloropropene	15.19	75	57015	4.592	ng	99
55) 1,1,2-Trichloroethane	15.36	97	44835	4.940	ng	95
58) Toluene	15.65	91	186110	4.920	ng	100
59) 2-Hexanone	15.90	43	84698	4.541	ng	92
60) Dibromochloromethane	16.06	129	54628	5.451	ng	99
61) 1,2-Dibromoethane	16.31	107	50293	5.393	ng	98
62) n-Butyl Acetate	16.53	43	90539	4.476	ng	93
63) n-Octane	16.65	57	36646	4.666	ng	90
64) Tetrachloroethene	16.79	166	61704	5.269	ng	99
65) Chlorobenzene	17.46	112	131130	5.123	ng	98
66) Ethylbenzene	17.83	91	209032	4.907	ng	98
67) m- & p-Xylenes	17.99	91	322082	9.925	ng	93
68) Bromoform	18.05	173	49345	5.245	ng	100
69) Styrene	18.33	104	128185	5.087	ng	93
70) o-Xylene	18.42	91	163200	5.029	ng	95
71) n-Nonane	18.63	43	84001	4.702	ng	91
72) 1,1,2,2-Tetrachloroethane	18.40	83	78919	4.985	ng	100
74) Cumene	18.96	105	219459	5.158	ng	99
75) alpha-Pinene	19.30	93	106540	4.807	ng	91
76) n-Propylbenzene	19.41	91	247787	5.073	ng	95
77) 3-Ethyltoluene	19.50	105	214577	5.032	ng	97
78) 4-Ethyltoluene	19.54	105	192187	5.021	ng	98
79) 1,3,5-Trimethylbenzene	19.61	105	174799	4.917	ng	95
80) alpha-Methylstyrene	19.74	118	93735	5.155	ng	95
81) 2-Ethyltoluene	19.77	105	207025	5.006	ng	96
82) 1,2,4-Trimethylbenzene	19.97	105	173905	5.099	ng	94
83) n-Decane	20.06	57	88701	4.842	ng	97
84) Benzyl Chloride	20.08	91	123877	4.786	ng	94
85) 1,3-Dichlorobenzene	20.11	146	109331	5.248	ng	100
86) 1,4-Dichlorobenzene	20.16	146	113157	5.303	ng	98
87) sec-Butylbenzene	20.21	105	233879	4.933	ng	97
88) 4-Isopropyltoluene (p-...	20.35	119	222941	5.072	ng	94
89) 1,2,3-Trimethylbenzene	20.35	105	170712	4.963	ng	95
90) 1,2-Dichlorobenzene	20.47	146	108777	5.374	ng	99
91) d-Limonene	20.48	68	64803	4.769	ng	96
92) 1,2-Dibromo-3-Chloropr...	20.85	157	36712	4.783	ng	# 67
93) n-Undecane	21.17	57	88236	5.223	ng	97
94) 1,2,4-Trichlorobenzene	21.97	180	70967	4.819	ng	99
95) Naphthalene	22.08	128	186077	4.427	ng	99
96) n-Dodecane	22.08	57	64166	5.588	ng	97
97) Hexachlorobutadiene	22.39	225	51486	4.451	ng	100
98) Cyclohexanone	18.13	55	46560	3.406	ng	86
99) tert-Butylbenzene	19.96	119	176038	5.093	ng	98
100) n-Butylbenzene	20.72	91	183534	5.034	ng	97

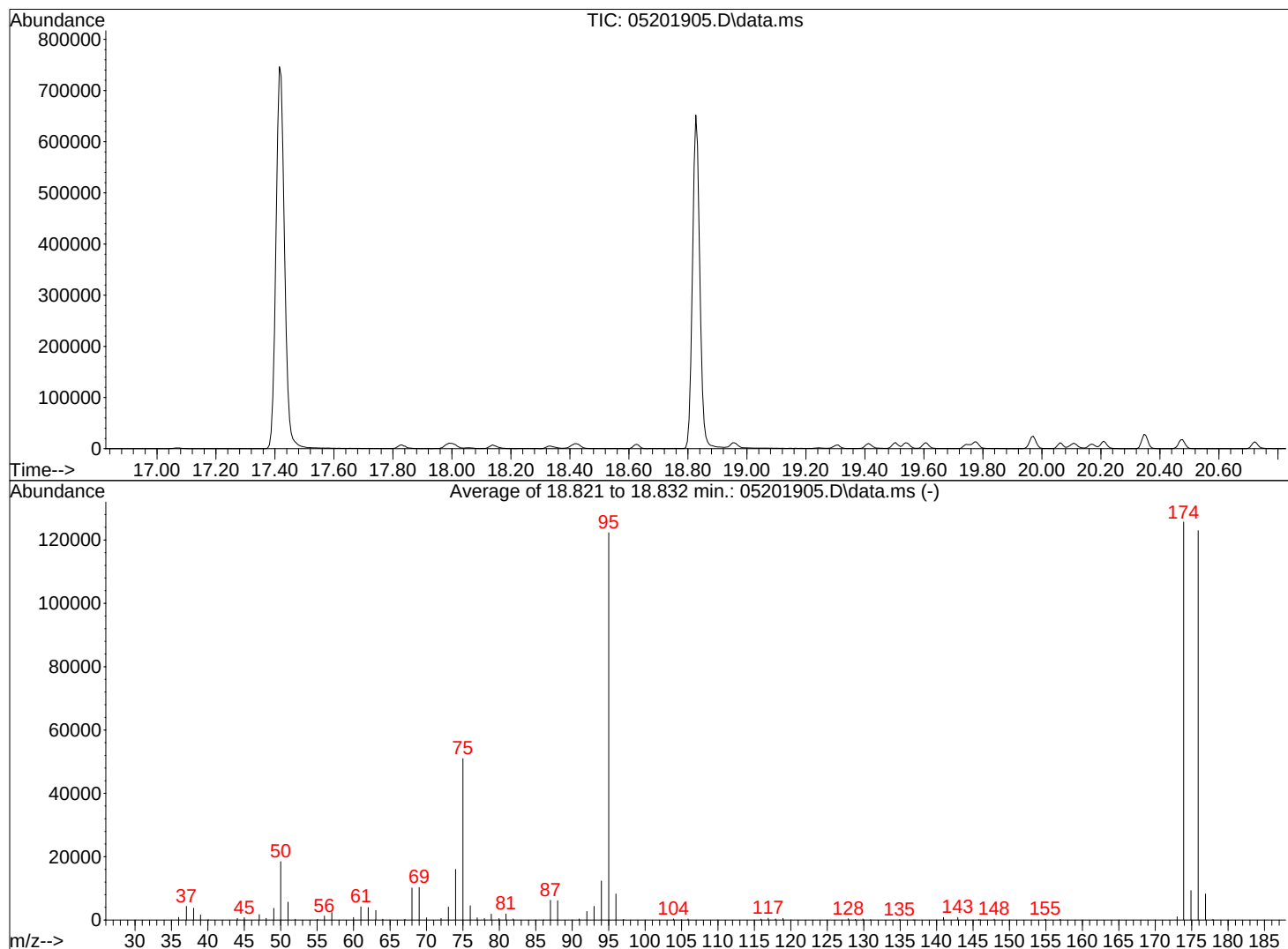
(#) = qualifier out of range (m) = manual integration (+) = signals summed

[illegible]

Data Path : I:\MS13\DATA\2019 05\20\
 Data File : 05201905.D
 Acq On : 20 May 2019 9:09
 Operator : WA
 Sample : BFB std
 Misc : S31-05011901/S31-05011902 (5/28)
 ALS Vial : 14 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS13\METHODS\R13050219.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Fri May 03 08:48:48 2019



AutoFind: Scans 2671, 2672, 2673; Background Corrected with Scan 2664

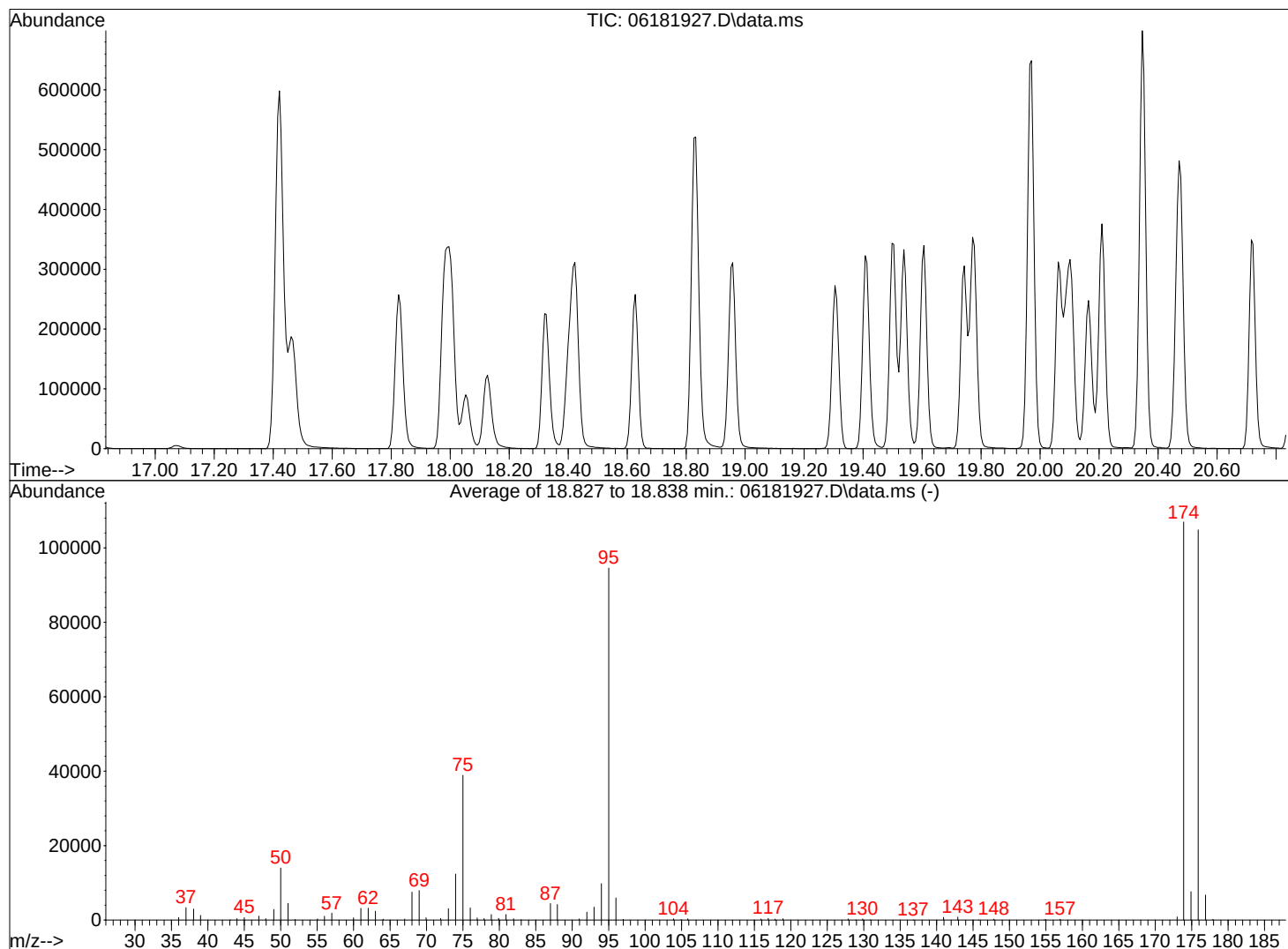
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	15.1	18443	PASS
75	95	30	66	41.7	50965	PASS
95	95	100	100	100.0	122341	PASS
96	95	5	9	6.7	8240	PASS
173	174	0.00	2	0.8	1029	PASS
174	95	50	120	102.7	125704	PASS
175	174	4	9	7.4	9305	PASS
176	174	93	101	97.8	122963	PASS
177	176	5	9	6.7	8248	PASS

WA 5/23/19

Data Path : I:\MS13\DATA\2019 06\18\
 Data File : 06181927.D
 Acq On : 18 Jun 2019 18:59
 Operator : WA
 Sample : CCV2 R13061819 5ng
 Misc : S31-05311902/S31-06061904 (7/5)
 ALS Vial : 2 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS13\METHODS\R13052019A.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Tue May 28 08:48:46 2019



AutoFind: Scans 2672, 2673, 2674; Background Corrected with Scan 2665

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	14.7	13940	PASS
75	95	30	66	41.2	38915	PASS
95	95	100	100	100.0	94563	PASS
96	95	5	9	6.3	5957	PASS
173	174	0.00	2	0.8	854	PASS
174	95	50	120	113.1	106968	PASS
175	174	4	9	7.1	7633	PASS
176	174	93	101	98.0	104843	PASS
177	176	5	9	6.4	6729	PASS

WA 6/19/19

Injection Log

Directory: J:\MS13\DATA\2019_05\20\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	5/20/19 6:50	05201901.D	CCV R19052019_25ng	S31-05011901/S31-05071904 (6/5)	WA	2	not used
2	5/20/19 7:24	05201902.D	CCV C19052019_25ng	S31-05011901/S31-05151907 (6/13)	WA	16	
3	5/20/19 7:57	05201903.D	CCV R19052019_5ng	S31-05011901/S31-05071904 (6/5)	WA	2	
4	5/20/19 8:33	05201904.D	System	S31-05011901	WA	2	
5	5/20/19 9:09	05201905.D	BFB std	S31-05011901/S31-05011902 (5/28)	WA	14	Passed
6	5/20/19 9:44	05201906.D	0.2ng R13052019 ICAL Std	S31-05011901/S31-05011902 (5/28)	WA	14	R13052019A.M
7	5/20/19 10:17	05201907.D	0.5ng R13052019 ICAL Std	S31-05011901/S31-05011902 (5/28)	WA	14	
8	5/20/19 10:50	05201908.D	1.0ng R13052019 ICAL Std	S31-05011901/S31-05011902 (5/28)	WA	14	
9	5/20/19 11:23	05201909.D	5.0ng R13052019 ICAL Std	S31-05011901/S31-05081902 (6/6)	WA	15	
10	5/20/19 11:56	05201910.D	25ng R13052019 ICAL Std	S31-05011901/S31-05071904 (6/5)	WA	2	
11	5/20/19 12:29	05201911.D	50ng R13052019 ICAL Std	S31-05011901/S31-05071904 (6/5)	WA	2	
12	5/20/19 13:03	05201912.D	100ng R13052019 ICAL Std	S31-05011901/S31-05071904 (6/5)	WA	2	
13	5/20/19 13:45	05201913.D	Blank	S31-05011901	WA	2	
14	5/20/19 14:18	05201914.D	0.1ng R13052019 ICAL Std	S31-05011901/S31-05011902 (5/28)	WA	14	not used
15	5/20/19 14:51	05201915.D	25ng R13052019 ICV Std	S31-05011901/S31-05091901 (6/7)	WA	2	Passed all compds
R13052019A.M: not for n-Dodecane and low level compounds; ranges from 0.2ng --> 100ng, except: acrolein, acrylonitrile, MEK, MeMethacrylate,							
trans-1,3-DCP, Bromoform, Benzyl-Cl, 1,2,4-TCB: from 0.5ng -->100ng; Ethyl AC,1-Butanol:from 1ng --> 200ng; Vynyl AC: 2.5ng -->500ng							

WA 5/23/19

Injection Log

Directory: I:\MS13\DATA\2019_06\18\

[illegible]

SIMIVALLEY QC Certification

Conditioner: P-Conditioner-07

Cycles: 30

Batch: 23650

Batch Started By: JUSTIN.FREEMAN on 5/20/19 0932
Finished Cleaning By: JUSTIN.FREEMAN on 5/20/19 0934

Container IDs	Cleaned Date	QC Date Analyzed	QC Results	Initial Vacuum		Final Vacuum		Comments
				Vacuum	Date/Time	Vacuum	Date/Time	
SC00813	5/20/19	5/20/19	Pass w/ Conditions	-14.3	5/20/19 0934	JUSTIN.FREEMAN		MS21_05/21/19
SC02184	5/20/19	5/20/19	Pass w/ Conditions	-14.3	5/20/19 0934	JUSTIN.FREEMAN	-14.0	
SC01880	5/20/19	5/20/19	Pass w/ Conditions	-14.3	5/20/19 0934	JUSTIN.FREEMAN	-14.0	
SC00932	5/20/19	5/20/19	Pass w/ Conditions	-14.3	5/20/19 0934	JUSTIN.FREEMAN	-14.0	
SC01783	5/20/19	5/20/19	Pass w/ Conditions	-14.3	5/20/19 0935	JUSTIN.FREEMAN	-14.0	
SC01670	5/20/19	5/20/19	Pass w/ Conditions	-14.3	5/20/19 0935	JUSTIN.FREEMAN	-14.0	
SC01693	5/20/19	5/20/19	Pass w/ Conditions	-14.3	5/20/19 0935	JUSTIN.FREEMAN	-14.0	
SC02214	5/20/19	5/20/19	Pass w/ Conditions	-14.3	5/20/19 0935	JUSTIN.FREEMAN	-14.0	
SC01547	5/20/19	5/20/19	Pass w/ Conditions	-14.3	5/20/19 0935	JUSTIN.FREEMAN	-14.0	
SC01801	5/20/19	5/20/19	Pass w/ Conditions	-14.3	5/20/19 0935	JUSTIN.FREEMAN	-14.0	

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\2019 05\20\
 Data File : 05201909.D
 Acq On : 20 May 2019 14:51
 Operator : RVT
 Sample : 052019 SC00813 23650
 Misc : LL+TICS (Sig #1); S31-05151908 (Sig #2)
 ALS Vial : 204 Sample Multiplier: 1

RVT 5/21/19

Quant Time: May 21 08:03:34 2019
 Quant Method : I:\MS21\Methods\F21043019.M
 Quant Title : EPA TO-15
 QLast Update : Wed May 01 08:48:23 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	7.54	130	55175	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.77	114	182446	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.70	117	138636	1000.000	pg	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4 ...	8.35	65	66823	1002.071	pg	0.00
Spiked Amount 1000.000			Recovery	=	100.21%	
57) Toluene-d8 (SS2)	12.62	98	143814	924.335	pg	0.00
Spiked Amount 1000.000			Recovery	=	92.43%	
74) Bromofluorobenzene (SS3)	16.14	174	57331	1093.146	pg	0.00
Spiked Amount 1000.000			Recovery	=	109.32%	

Target Compounds

						Qvalue
2) * Propene	3.53	42	2214	31.854	pg	# 26
3) * Dichlorodifluoromethane	3.58	85	124	0.746	pg	# 42
4) * Chloromethane	3.71	50	490	5.241	pg	# 94
6) * Vinyl Chloride	3.89	62	75	0.830	pg	# 42
7) * 1,3-Butadiene	4.01	54	72	1.072	pg	# 1
9) * Chloroethane	4.35	64	158	3.548	pg	# 43
10) * Ethanol	4.44	45	3815	85.928	pg	# 98
11) * Acetonitrile	4.60	41	2629	22.141	pg	# 67
12) * Acrolein	4.71	56	2792	45.069	pg	# 100
13) * Acetone	4.82	58	60469	800.517	pg	# 93
14) * Trichlorofluoromethane	4.96	101	55	0.365	pg	# 17
15) * 2-Propanol (Isopropa...	5.04	45	7437	54.602	pg	# 93
16) * Acrylonitrile	5.17	53	174	2.018	pg	# 73
18) tert-Butanol	5.58	59	1108	11.580	pg	# 74
19) * Methylene Chloride	5.56	84	127	1.472	pg	# 7
22) * Carbon Disulfide	5.83	76	5184	20.261	pg	# 98
26) * Vinyl Acetate	6.69	86	1800	116.818	pg	# 11
27) * 2-Butanone (MEK)	6.96	72	15636	310.466	pg	# 92
29) DIPE	7.63	45	122	0.726	pg	# 42
30) * Ethyl Acetate	7.63	61	158	8.282	pg	# 97
31) * n-Hexane	7.62	57	131	1.510	pg	# 56
34) * Tetrahydrofuran	8.16	71	157	4.643	pg	# 68
39) * Benzene	9.33	78	951	3.281	pg	# 96
41) 1-Butanol	9.31	56	19477	34.866	pg	# 82
48) * 1,4-Dioxane	10.68	88	533	7.720	pg	# 94
49) Isooctane	10.72	56	164	1.759	pg	# 1
51) * n-Heptane	11.02	71	172	2.508	pg	# 40
53) * 4-Methyl-2-pentanone	11.73	58	216	4.987	pg	# 85
58) * Toluene	12.73	91	579	2.277	pg	# 99
59) * 2-Hexanone	13.08	58	393	11.231	pg	# 82
66) * Ethylbenzene	15.13	91	68	0.322	pg	# 42
67) * m- & p-Xylenes	15.30	91	209	1.322	pg	# 99
69) Cyclohexanone	15.48	98	206	6.334	pg	# 86
70) * Styrene	15.65	104	60	0.608	pg	# 30
71) * o-Xylene	15.74	91	81	0.480	pg	# 81
72) * n-Nonane	15.99	57	79	1.259	pg	# 33
73) * 1,1,2,2-Tetrachloroe...	15.66	83	69	0.557	pg	# 18
77) * n-Propylbenzene	16.72	91	76	0.336	pg	# 52
78) 3-Ethyltoluene	16.81	105	72	0.392	pg	# 42
83) tert-Butylbenzene	17.28	134	133	3.074	pg	# 1
84) * 1,2,4-Trimethylbenzene	17.25	105	148	0.986	pg	# 21
86) * 1,3-Dichlorobenzene	17.37	146	928	9.124	pg	# 97
88) n-Decane	17.37	85	62	2.889	pg	# 29
90) 1,2,3-Trimethylbenzene	17.62	105	62	0.384	pg	# 24
98) * Naphthalene	19.29	128	250	6.821	pg	# 69

110 of 112

Data Path : I:\MS21\DATA\2019 05\20\
Data File : 05201909.D
Acq On : 20 May 2019 14:51
Operator : RVT
Sample : 052019 SC00813 23650
Misc : LL+TICS (Sig #1); S31-05151908 (Sig #2)
ALS Vial : 204 Sample Multiplier: 1

Quant Time: May 21 08:03:34 2019
Quant Method : I:\MS21\Methods\F21043019.M
Quant Title : EPA TO-15
QLast Update : Wed May 01 08:48:23 2019
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)

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



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

LABORATORY REPORT

August 1, 2019

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

RE: DDMT / 10A023.002.310

Dear Todd:

Enclosed are the results of the sample submitted to our laboratory on July 12, 2019. For your reference, this analysis has been assigned our service request number P1904112.

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 12:59 pm, 08/01/19

Kate Kaneko
Laboratory Director



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

Client: Trinity Analysis & Development Corp.
Project: DDMT / 10A023.002.310

Service Request No: P1904112

CASE NARRATIVE

The sample was received intact under chain of custody on July 12, 2019 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 containers were 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.



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

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Alaska DEC	http://dec.alaska.gov/eh/lab.aspx	17-019
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/page/la-lab-accreditation	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml	2018027
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1521096
New Jersey DEP (NELAP)	http://www.nj.gov/dep/enforcement/oqa.html	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-006
Pennsylvania DEP	http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/agency/qa/env_lab_accreditation.html	T104704413-19-10
Utah DOH (NELAP)	http://health.utah.gov/lab/lab_cert_env	CA016272019-10
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 / 10A023.002.310

Service Request: P1904112

Date Received: 7/12/2019
Time Received: 09:00

TO-15 - VOC Cans

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)
ODSVE-EFF-Y8Q4A	P1904112-001	Air	7/9/2019	09:15	SC01691	-0.75	4.05

X



Air - Chain of Custody Record & Analytical Service Request

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

Company Name & Address (Reporting Information) Trinity ADC 1002 Eglintown Way Sausalito, CA 94965				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. P1904112					
Project Manager TODD CALHOUN				Project Name DDMT				ALS Contact:					
Phone 850-613-6800				Project Number 10A023.002.310				Analysis Method					
Fax				P.O. # / Billing Information PO# 8516				Comments e.g. Actual Preservative or specific instructions					
Email Address for Result Reporting TCALHOUN@TrinityADC.com				Sampler (Print & Sign) Cody Miller									
Client Sample ID ODSUE-EFF-Y0804A		Laboratory ID Number —cm	Date Collected 7/9/19	Time Collected 0915	Canister ID (Bar code # - AC, SC, etc.) SC011691	Flow Controller ID (Bar code # - FC #) —cm	Canister Start Pressure "Hg -29	Canister End Pressure "Hg/psig -2	Sample Volume 6L	10-15			
5 of 107													
Report Tier Levels - please select Tier I - Results (Default if not specified) _____ Tier II (Results + QC & Calibration Summaries) _____ Tier II (Results + QC Summaries) _____ Tier IV (Data Validation Package) 10% Surcharge _____													
Relinquished by: (Signature) [Signature]				Date: 7/9/19		Time: 0930		Received by: (Signature) [Signature]		Date: 7/10/19		Time: 0900	
Relinquished by: (Signature) [Signature]				Date: 7/9/19		Time: 0930		Received by: (Signature) [Signature]		Date: 7/10/19		Time: 0900	
Project Requirements (MRLs, QAPP)										Cooler / Blank Temperature °C			

ALS Environmental Sample Acceptance Check Form

Client: Trinity Analysis & Development Corp.

Work order: P1904112

Project: DDMT / 10A023.002.310

Sample(s) received on: 7/12/19

Date opened: 7/12/19

by: DENISE.POSADA

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

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

[illegible]

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

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

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: Trinity Analysis & Development Corp.

Client Sample ID: ODSVE-EFF-Y8Q4A

Client Project ID: DDMT / 10A023.002.310

ALS Project ID: P1904112

ALS Sample ID: P1904112-001

Test Code: EPA TO-15

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

Analyst: Raneem Sahtah

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC01691

Date Collected: 7/9/19

Date Received: 7/12/19

Date Analyzed: 7/22/19

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.75

Final Pressure (psig): 4.05

Container Dilution Factor: 1.34

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	0.17	0.41	0.24	0.10	J
75-71-8	Dichlorodifluoromethane (CFC 12)	5.1	0.14	0.084	0.024	
74-87-3	Chloromethane	0.19	0.32	0.19	0.056	U
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	0.059	0.098	0.059	0.016	U
75-01-4	Vinyl Chloride	0.18	0.28	0.089	0.030	J
106-99-0	1,3-Butadiene	0.19	0.32	0.19	0.053	U
74-83-9	Bromomethane	0.055	0.17	0.055	0.026	U
75-00-3	Chloroethane	0.16	0.26	0.16	0.034	U
64-17-5	Ethanol	5.0	3.6	0.58	0.26	
75-05-8	Acetonitrile	0.25	0.42	0.25	0.10	U
107-02-8	Acrolein	0.14	0.58	0.18	0.088	J
67-64-1	Acetone	1.5	3.0	1.5	0.68	U
75-69-4	Trichlorofluoromethane	0.26	0.13	0.076	0.019	
67-63-0	2-Propanol (Isopropyl Alcohol)	0.34	1.1	0.34	0.12	U
107-13-1	Acrylonitrile	0.19	0.32	0.19	0.068	U
75-35-4	1,1-Dichloroethene	0.53	0.18	0.057	0.025	
75-09-2	Methylene Chloride	0.12	0.21	0.12	0.058	U
107-05-1	3-Chloro-1-propene (Allyl Chloride)	0.073	0.23	0.073	0.031	U
76-13-1	Trichlorotrifluoroethane	4.1	0.093	0.030	0.013	
75-15-0	Carbon Disulfide	4.3	0.47	0.23	0.069	
156-60-5	trans-1,2-Dichloroethene	0.34	0.18	0.057	0.025	
75-34-3	1,1-Dichloroethane	0.31	0.17	0.10	0.026	
1634-04-4	Methyl tert-Butyl Ether	0.063	0.20	0.063	0.023	U
108-05-4	Vinyl Acetate	0.99	2.0	0.99	0.46	U
78-93-3	2-Butanone (MEK)	0.21	0.45	0.14	0.050	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-Y8Q4A

Client Project ID: DDMT / 10A023.002.310

ALS Project ID: P1904112

ALS Sample ID: P1904112-001

Test Code: EPA TO-15

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

Analyst: Raneem Sahtah

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC01691

Date Collected: 7/9/19

Date Received: 7/12/19

Date Analyzed: 7/22/19

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.75

Final Pressure (psig): 4.05

Container Dilution Factor: 1.34

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	28	0.18	0.057	0.025	
141-78-6	Ethyl Acetate	0.24	0.41	0.24	0.10	U
110-54-3	n-Hexane	0.12	0.21	0.12	0.042	U
67-66-3	Chloroform	4.9	0.15	0.047	0.019	
109-99-9	Tetrahydrofuran (THF)	0.26	0.24	0.077	0.030	
107-06-2	1,2-Dichloroethane	0.056	0.18	0.056	0.020	U
71-55-6	1,1,1-Trichloroethane	0.21	0.13	0.042	0.016	
71-43-2	Benzene	0.042	0.22	0.071	0.032	J
56-23-5	Carbon Tetrachloride	0.42	0.11	0.036	0.016	
110-82-7	Cyclohexane	0.13	0.39	0.13	0.058	U
78-87-5	1,2-Dichloropropane	0.049	0.16	0.049	0.019	U
75-27-4	Bromodichloromethane	0.034	0.11	0.034	0.015	U
79-01-6	Trichloroethene	19	0.13	0.042	0.018	
123-91-1	1,4-Dioxane	0.063	0.20	0.063	0.023	U
80-62-6	Methyl Methacrylate	0.21	0.36	0.21	0.062	U
142-82-5	n-Heptane	0.10	0.18	0.10	0.028	U
10061-01-5	cis-1,3-Dichloropropene	0.053	0.17	0.053	0.025	U
108-10-1	4-Methyl-2-pentanone	0.056	0.17	0.056	0.024	U
10061-02-6	trans-1,3-Dichloropropene	0.094	0.16	0.094	0.032	U
79-00-5	1,1,2-Trichloroethane	0.031	0.13	0.042	0.013	J
108-88-3	Toluene	0.056	0.19	0.060	0.023	J
591-78-6	2-Hexanone	0.056	0.18	0.056	0.022	J
124-48-1	Dibromochloromethane	0.027	0.085	0.027	0.011	U
106-93-4	1,2-Dibromoethane	0.030	0.094	0.030	0.011	U
123-86-4	n-Butyl Acetate	0.037	0.15	0.048	0.021	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 3 of 3

Client: Trinity Analysis & Development Corp.
Client Sample ID: ODSVE-EFF-Y8Q4A
Client Project ID: DDMT / 10A023.002.310

ALS Project ID: P1904112
 ALS Sample ID: P1904112-001

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8
Analyst: Raneem Sahtah
Sampling Media: 6.0 L Summa Canister
Test Notes:
Container ID: SC01691

Date Collected: 7/9/19
Date Received: 7/12/19
Date Analyzed: 7/22/19
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.75

Final Pressure (psig): 4.05

Container Dilution Factor: 1.34

CAS #	Compound	Result ppbV	LOQ ppbV	LOD ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	0.092	0.15	0.092	0.034	U
127-18-4	Tetrachloroethene	2.1	0.10	0.034	0.014	
108-90-7	Chlorobenzene	0.049	0.15	0.049	0.021	U
100-41-4	Ethylbenzene	0.052	0.16	0.052	0.023	U
179601-23-1	m,p-Xylenes	0.076	0.34	0.10	0.043	J
75-25-2	Bromoform	0.041	0.069	0.041	0.014	U
100-42-5	Styrene	0.10	0.17	0.10	0.027	U
95-47-6	o-Xylene	0.045	0.16	0.052	0.024	J
111-84-2	n-Nonane	0.082	0.14	0.082	0.023	U
79-34-5	1,1,2,2-Tetrachloroethane	0.34	0.10	0.033	0.014	
98-82-8	Cumene	0.046	0.14	0.046	0.021	U
80-56-8	alpha-Pinene	0.027	0.13	0.075	0.020	J
103-65-1	n-Propylbenzene	0.046	0.15	0.046	0.021	U
622-96-8	4-Ethyltoluene	0.032	0.14	0.087	0.023	J
108-67-8	1,3,5-Trimethylbenzene	0.032	0.14	0.046	0.021	J
95-63-6	1,2,4-Trimethylbenzene	0.16	0.14	0.046	0.020	
100-44-7	Benzyl Chloride	0.083	0.28	0.083	0.031	U
541-73-1	1,3-Dichlorobenzene	0.026	0.12	0.038	0.018	J
106-46-7	1,4-Dichlorobenzene	0.071	0.12	0.071	0.018	U
95-50-1	1,2-Dichlorobenzene	0.038	0.12	0.038	0.018	U
5989-27-5	d-Limonene	0.094	0.12	0.072	0.026	J
96-12-8	1,2-Dibromo-3-chloropropane	0.043	0.072	0.043	0.014	U
120-82-1	1,2,4-Trichlorobenzene	0.058	0.096	0.058	0.023	U
91-20-3	Naphthalene	0.12	0.13	0.079	0.033	J
87-68-3	Hexachlorobutadiene	0.040	0.067	0.040	0.014	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 / 10A023.002.310

ALS Project ID: P1904112

ALS Sample ID: P190722-MB

Test Code: EPA TO-15

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

Analyst: Raneem Sahtah

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 7/22/19

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	0.18	0.30	0.18	0.076	U
75-71-8	Dichlorodifluoromethane (CFC 12)	0.063	0.11	0.063	0.018	U
74-87-3	Chloromethane	0.15	0.24	0.15	0.042	U
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	0.044	0.073	0.044	0.012	U
75-01-4	Vinyl Chloride	0.067	0.21	0.067	0.022	U
106-99-0	1,3-Butadiene	0.14	0.24	0.14	0.040	U
74-83-9	Bromomethane	0.041	0.13	0.041	0.019	U
75-00-3	Chloroethane	0.12	0.19	0.12	0.025	U
64-17-5	Ethanol	0.44	2.7	0.44	0.20	U
75-05-8	Acetonitrile	0.18	0.31	0.18	0.077	U
107-02-8	Acrolein	0.14	0.44	0.14	0.065	U
67-64-1	Acetone	1.1	2.3	1.1	0.51	U
75-69-4	Trichlorofluoromethane	0.057	0.094	0.057	0.014	U
67-63-0	2-Propanol (Isopropyl Alcohol)	0.25	0.85	0.25	0.090	U
107-13-1	Acrylonitrile	0.14	0.24	0.14	0.051	U
75-35-4	1,1-Dichloroethene	0.043	0.14	0.043	0.019	U
75-09-2	Methylene Chloride	0.092	0.16	0.092	0.043	U
107-05-1	3-Chloro-1-propene (Allyl Chloride)	0.054	0.17	0.054	0.023	U
76-13-1	Trichlorotrifluoroethane	0.022	0.069	0.022	0.0099	U
75-15-0	Carbon Disulfide	0.17	0.35	0.17	0.051	U
156-60-5	trans-1,2-Dichloroethene	0.043	0.13	0.043	0.019	U
75-34-3	1,1-Dichloroethane	0.077	0.13	0.077	0.019	U
1634-04-4	Methyl tert-Butyl Ether	0.047	0.15	0.047	0.017	U
108-05-4	Vinyl Acetate	0.74	1.5	0.74	0.34	U
78-93-3	2-Butanone (MEK)	0.11	0.34	0.11	0.037	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 / 10A023.002.310

ALS Project ID: P1904112

ALS Sample ID: P190722-MB

Test Code: EPA TO-15

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

Analyst: Raneem Sahtah

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 7/22/19

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	0.043	0.13	0.043	0.019	U
141-78-6	Ethyl Acetate	0.18	0.31	0.18	0.078	U
110-54-3	n-Hexane	0.091	0.15	0.091	0.031	U
67-66-3	Chloroform	0.035	0.11	0.035	0.015	U
109-99-9	Tetrahydrofuran (THF)	0.058	0.18	0.058	0.023	U
107-06-2	1,2-Dichloroethane	0.042	0.13	0.042	0.015	U
71-55-6	1,1,1-Trichloroethane	0.031	0.099	0.031	0.012	U
71-43-2	Benzene	0.053	0.16	0.053	0.024	U
56-23-5	Carbon Tetrachloride	0.027	0.083	0.027	0.012	U
110-82-7	Cyclohexane	0.096	0.29	0.096	0.044	U
78-87-5	1,2-Dichloropropane	0.037	0.12	0.037	0.014	U
75-27-4	Bromodichloromethane	0.025	0.079	0.025	0.011	U
79-01-6	Trichloroethene	0.032	0.099	0.032	0.013	U
123-91-1	1,4-Dioxane	0.047	0.15	0.047	0.017	U
80-62-6	Methyl Methacrylate	0.16	0.27	0.16	0.046	U
142-82-5	n-Heptane	0.078	0.13	0.078	0.021	U
10061-01-5	cis-1,3-Dichloropropene	0.040	0.12	0.040	0.018	U
108-10-1	4-Methyl-2-pentanone	0.041	0.13	0.041	0.018	U
10061-02-6	trans-1,3-Dichloropropene	0.071	0.12	0.071	0.024	U
79-00-5	1,1,2-Trichloroethane	0.031	0.099	0.031	0.0099	U
108-88-3	Toluene	0.045	0.14	0.045	0.017	U
591-78-6	2-Hexanone	0.042	0.13	0.042	0.016	U
124-48-1	Dibromochloromethane	0.020	0.063	0.020	0.0082	U
106-93-4	1,2-Dibromoethane	0.022	0.070	0.022	0.0081	U
123-86-4	n-Butyl Acetate	0.036	0.11	0.036	0.015	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 / 10A023.002.310

ALS Project ID: P1904112
 ALS Sample ID: P190722-MB

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

Date Collected: NA
Date Received: NA
Date Analyzed: 7/22/19
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	0.069	0.12	0.069	0.026	U
127-18-4	Tetrachloroethene	0.025	0.078	0.025	0.010	U
108-90-7	Chlorobenzene	0.037	0.12	0.037	0.015	U
100-41-4	Ethylbenzene	0.039	0.12	0.039	0.017	U
179601-23-1	m,p-Xylenes	0.078	0.25	0.078	0.032	U
75-25-2	Bromoform	0.031	0.051	0.031	0.011	U
100-42-5	Styrene	0.075	0.12	0.075	0.020	U
95-47-6	o-Xylene	0.039	0.12	0.039	0.018	U
111-84-2	n-Nonane	0.061	0.10	0.061	0.017	U
79-34-5	1,1,2,2-Tetrachloroethane	0.025	0.077	0.025	0.011	U
98-82-8	Cumene	0.035	0.11	0.035	0.016	U
80-56-8	alpha-Pinene	0.056	0.093	0.056	0.015	U
103-65-1	n-Propylbenzene	0.035	0.11	0.035	0.016	U
622-96-8	4-Ethyltoluene	0.065	0.11	0.065	0.017	U
108-67-8	1,3,5-Trimethylbenzene	0.035	0.11	0.035	0.016	U
95-63-6	1,2,4-Trimethylbenzene	0.035	0.11	0.035	0.015	U
100-44-7	Benzyl Chloride	0.062	0.21	0.062	0.023	U
541-73-1	1,3-Dichlorobenzene	0.028	0.090	0.028	0.013	U
106-46-7	1,4-Dichlorobenzene	0.053	0.090	0.053	0.014	U
95-50-1	1,2-Dichlorobenzene	0.028	0.090	0.028	0.013	U
5989-27-5	d-Limonene	0.054	0.092	0.054	0.020	U
96-12-8	1,2-Dibromo-3-chloropropane	0.032	0.054	0.032	0.010	U
120-82-1	1,2,4-Trichlorobenzene	0.043	0.071	0.043	0.018	U
91-20-3	Naphthalene	0.059	0.097	0.059	0.025	U
87-68-3	Hexachlorobutadiene	0.030	0.050	0.030	0.010	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 / 10A023.002.310

ALS Project ID: P1904112

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

Date(s) Collected: 7/9/19
Date(s) Received: 7/12/19
Date(s) Analyzed: 7/22/19

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	P190722-MB	95	98	105	70-130	
Lab Control Sample	P190722-LCS	93	98	105	70-130	
Duplicate Lab Control Sample	P190722-DLCS	93	97	106	70-130	
ODSVE-EFF-Y8Q4A	P1904112-001	96	97	104	70-130	

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

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

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 3

Client: Trinity Analysis & Development Corp.

Client Sample ID: Duplicate Lab Control Sample

Client Project ID: DDMT / 10A023.002.310

ALS Project ID: P1904112

ALS Sample ID: P190722-DLCS

Test Code: EPA TO-15

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

Analyst: Raneem Sahtah

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 7/22/19

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount		Result		% Recovery		DOD		RPD	RPD	Data
		LCS / DLCS		LCS	DLCS	LCS	DLCS	Acceptance				
		ppbV		ppbV	ppbV			Limits			Limit	Qualifier
115-07-1	Propene	123		105	107	85	87	57-136		2	25	
75-71-8	Dichlorodifluoromethane (CFC 12)	42.6		33.2	33.7	78	79	59-128		1	25	
74-87-3	Chloromethane	102		76.2	78.7	75	77	59-132		3	25	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	30.2		25.8	26.0	85	86	63-121		1	25	
75-01-4	Vinyl Chloride	83.7		75.0	76.0	90	91	64-127		1	25	
106-99-0	1,3-Butadiene	95.1		87.7	89.1	92	94	66-134		2	25	
74-83-9	Bromomethane	54.6		46.0	46.3	84	85	63-134		1	25	
75-00-3	Chloroethane	81.1		66.7	67.0	82	83	63-127		1	25	
64-17-5	Ethanol	544		459	466	84	86	59-125		2	25	
75-05-8	Acetonitrile	123		108	109	88	89	63-132		1	25	
107-02-8	Acrolein	89.4		88.4	90.3	99	101	62-126		2	25	
67-64-1	Acetone	446		382	386	86	87	58-128		1	25	
75-69-4	Trichlorofluoromethane	37.6		29.3	29.5	78	78	62-126		0	25	
67-63-0	2-Propanol (Isopropyl Alcohol)	168		143	145	85	86	52-125		1	25	
107-13-1	Acrylonitrile	95.4		101	102	106	107	71-137		0.9	25	
75-35-4	1,1-Dichloroethene	55.0		44.6	45.2	81	82	61-133		1	25	
75-09-2	Methylene Chloride	62.4		52.4	53.0	84	85	62-115		1	25	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	69.0		62.1	62.8	90	91	71-131		1	25	
76-13-1	Trichlorotrifluoroethane	28.1		22.5	22.6	80	80	66-126		0	25	
75-15-0	Carbon Disulfide	69.9		60.4	60.7	86	87	57-134		1	25	
156-60-5	trans-1,2-Dichloroethene	53.9		46.6	47.2	86	88	67-124		2	25	
75-34-3	1,1-Dichloroethane	53.3		42.6	43.0	80	81	68-126		1	25	
1634-04-4	Methyl tert-Butyl Ether	59.5		48.6	49.1	82	83	66-126		1	25	
108-05-4	Vinyl Acetate	302		308	311	102	103	56-139		1	25	
78-93-3	2-Butanone (MEK)	70.4		73.0	73.3	104	104	67-130		0	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: Trinity Analysis & Development Corp.

Client Sample ID: Duplicate Lab Control Sample

Client Project ID: DDMT / 10A023.002.310

ALS Project ID: P1904112

ALS Sample ID: P190722-DLCS

Test Code: EPA TO-15

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

Analyst: Raneem Sahtah

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 7/22/19

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	53.2	43.4	43.6	82	82	70-121	0	25	
141-78-6	Ethyl Acetate	121	117	118	97	98	65-128	1	25	
110-54-3	n-Hexane	61.2	51.8	52.2	85	85	63-120	0	25	
67-66-3	Chloroform	44.4	34.9	35.3	79	80	68-123	1	25	
109-99-9	Tetrahydrofuran (THF)	73.3	61.4	61.7	84	84	64-123	0	25	
107-06-2	1,2-Dichloroethane	53.1	40.4	40.8	76	77	65-128	1	25	
71-55-6	1,1,1-Trichloroethane	39.5	30.8	31.0	78	78	68-125	0	25	
71-43-2	Benzene	66.1	53.6	54.0	81	82	69-119	1	25	
56-23-5	Carbon Tetrachloride	33.7	26.8	27.0	80	80	68-132	0	25	
110-82-7	Cyclohexane	121	97.3	98.1	80	81	70-117	1	25	
78-87-5	1,2-Dichloropropane	46.7	38.6	39.2	83	84	69-123	1	25	
75-27-4	Bromodichloromethane	32.0	27.3	27.6	85	86	72-128	1	25	
79-01-6	Trichloroethene	39.7	33.2	33.5	84	84	71-123	0	25	
123-91-1	1,4-Dioxane	59.4	56.4	56.7	95	95	71-122	0	25	
80-62-6	Methyl Methacrylate	105	105	106	100	101	70-128	1	25	
142-82-5	n-Heptane	52.5	44.4	44.4	85	85	69-123	0	25	
10061-01-5	cis-1,3-Dichloropropene	47.2	44.2	44.7	94	95	70-128	1	25	
108-10-1	4-Methyl-2-pentanone	51.1	52.6	53.4	103	105	67-130	2	25	
10061-02-6	trans-1,3-Dichloropropene	46.9	45.9	46.8	98	100	75-133	2	25	
79-00-5	1,1,2-Trichloroethane	39.4	33.5	33.8	85	86	73-119	1	25	
108-88-3	Toluene	56.3	45.7	45.6	81	81	66-119	0	25	
591-78-6	2-Hexanone	52.3	53.2	53.8	102	103	62-128	1	25	
124-48-1	Dibromochloromethane	25.0	21.9	22.0	88	88	70-130	0	25	
106-93-4	1,2-Dibromoethane	28.1	24.3	24.4	86	87	74-122	1	25	
123-86-4	n-Butyl Acetate	46.1	46.6	47.1	101	102	64-128	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: Trinity Analysis & Development Corp.

Client Sample ID: Duplicate Lab Control Sample

Client Project ID: DDMT / 10A023.002.310

ALS Project ID: P1904112

ALS Sample ID: P190722-DLCS

Test Code: EPA TO-15

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

Analyst: Raneem Sahtah

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 7/22/19

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	46.5	37.0	36.8	80	79	69-121	1	25	
127-18-4	Tetrachloroethene	31.4	24.5	24.6	78	78	66-124	0	25	
108-90-7	Chlorobenzene	46.6	36.3	36.3	78	78	70-119	0	25	
100-41-4	Ethylbenzene	48.9	37.2	37.2	76	76	70-124	0	25	
179601-23-1	m,p-Xylenes	98.2	74.5	74.4	76	76	61-134	0	25	
75-25-2	Bromoform	20.6	18.7	18.7	91	91	66-139	0	25	
100-42-5	Styrene	49.8	43.9	44.2	88	89	73-127	1	25	
95-47-6	o-Xylene	49.3	37.4	37.4	76	76	67-125	0	25	
111-84-2	n-Nonane	40.9	32.2	32.2	79	79	63-128	0	25	
79-34-5	1,1,2,2-Tetrachloroethane	31.2	25.2	25.2	81	81	65-127	0	25	
98-82-8	Cumene	43.6	33.2	33.4	76	77	68-124	1	25	
80-56-8	alpha-Pinene	37.9	31.5	31.9	83	84	65-120	1	25	
103-65-1	n-Propylbenzene	44.3	34.5	34.5	78	78	69-123	0	25	
622-96-8	4-Ethyltoluene	43.6	37.8	37.7	87	86	67-129	1	25	
108-67-8	1,3,5-Trimethylbenzene	43.5	33.8	33.9	78	78	67-130	0	25	
95-63-6	1,2,4-Trimethylbenzene	43.8	34.7	34.9	79	80	66-132	1	25	
100-44-7	Benzyl Chloride	41.9	42.2	42.6	101	102	50-147	1	25	
541-73-1	1,3-Dichlorobenzene	35.9	29.7	30.1	83	84	65-130	1	25	
106-46-7	1,4-Dichlorobenzene	35.9	30.6	30.9	85	86	60-131	1	25	
95-50-1	1,2-Dichlorobenzene	35.9	31.5	31.7	88	88	63-129	0	25	
5989-27-5	d-Limonene	37.9	32.6	33.2	86	88	66-124	2	25	
96-12-8	1,2-Dibromo-3-chloropropane	21.7	20.6	20.9	95	96	67-138	1	25	
120-82-1	1,2,4-Trichlorobenzene	28.9	24.6	25.6	85	89	55-142	5	25	
91-20-3	Naphthalene	38.7	36.6	38.0	95	98	57-138	3	25	
87-68-3	Hexachlorobutadiene	19.6	14.3	14.9	73	76	56-138	4	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: Trinity Analysis & Development Corp.
Client Project ID: DDMT / 10A023.002.310

ALS Project ID: P1904112

Method Blank Summary

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

Lab File ID: 07221904.D
Date Analyzed: 7/22/19
Time Analyzed: 09:04

Client Sample ID	ALS Sample ID	Lab File ID	Time Analyzed
Lab Control Sample	P190722-LCS	07221905.D	09:36
Duplicate Lab Control Sample	P190722-DLCS	07221910.D	12:27
ODSVE-EFF-Y8Q4A	P1904112-001	07221909.D	11:54

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Trinity Analysis & Development Corp.
Client Project ID: DDMT / 10A023.002.310

ALS Project ID: P1904112

Internal Standard Area and RT Summary

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

Lab File ID: 07221902.D
Date Analyzed: 7/22/19
Time Analyzed: 07:59

	IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
	AREA	#	RT	#	AREA	#
24 Hour Standard	147502		11.24		651950	13.36
Upper Limit	206503		11.57		912730	13.69
Lower Limit	88501		10.91		391170	13.03

Client Sample ID		IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
		AREA	#	RT	#	AREA	#
01	Method Blank	142973		11.23		644694	13.35
02	Lab Control Sample	152649		11.25		674061	13.36
03	ODSVE-EFF-Y8Q4A	151743		11.23		677145	13.36
04	Duplicate Lab Control Sample	153636		11.25		676117	13.36
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\2019 07\22\07221909.D

Sample : P1904112-001 (1000mL)

Acq On : 22 Jul 2019 11:54

Misc : S31-07111901

ALS Vial : 7 Sample Multiplier: 1

Inst : MS08

Operator: RS

RS 7/22/19

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

Quant Time: Jul 22 13:09:45 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:57:28 2019

Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.23	130	151743	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.36	114	677145	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.67	82	295012	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.08	65	180323	11.956	ng	-0.03
Spiked Amount	12.500	Range 70 - 130	Recovery	=	95.68%	
57) Toluene-d8 (SS2)	15.81	98	730152	12.034	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	96.24%	
73) Bromofluorobenzene (SS3)	19.06	174	259761	13.034	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	104.24%	

Target Compounds

						Qvalue
2) Propene	4.17	42	2643	0.213	ng	# 51
3) Dichlorodifluoromethan...	4.32	85	363367	18.756	ng	100
4) Chloromethane	0.00	50	0	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.	d	
6) Vinyl Chloride	5.03	62	4861	0.338	ng	99
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	6.42	45	61608	7.010	ng	100
11) Acetonitrile	6.71	41	2790	0.125	ng	98
12) Acrolein	6.93	56	1508	0.232	ng	94
13) Acetone	0.00	58	0	N.D.	d	
14) Trichlorofluoromethane	7.33	101	18425	1.107	ng	99
15) 2-Propanol (Isopropanol)	7.63	45	4635	0.154	ng	93
16) Acrylonitrile	7.93	53	113	N.D.		
17) 1,1-Dichloroethene	8.30	96	17530	1.570	ng	99
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.	d	
19) Methylene Chloride	8.52	84	593	0.053	ng	89
20) 3-Chloro-1-propene (Al...	8.62	41	153	N.D.		
21) Trichlorotrifluoroethane	8.93	151	258169	23.599	ng	99
22) Carbon Disulfide	8.79	76	378159	9.878	ng	99
23) trans-1,2-Dichloroethene	9.79	61	14803	1.015	ng	99
24) 1,1-Dichloroethane	10.04	63	18072	0.927	ng	99
25) Methyl tert-Butyl Ether	10.20	73	1461	N.D.		
26) Vinyl Acetate	10.28	86	2829	0.975	ng	# 94
27) 2-Butanone (MEK)	10.58	72	3518	0.469	ng	# 86
28) cis-1,2-Dichloroethene	11.05	61	1234921	83.535	ng	98
29) Diisopropyl Ether	0.00	87	0	N.D.	d	
30) Ethyl Acetate	0.00	61	0	N.D.	d	
31) n-Hexane	11.35	57	1926	0.101	ng	# 1
32) Chloroform	11.40	83	315971	17.880	ng	100
34) Tetrahydrofuran (THF)	11.85	72	4817	0.579	ng	91
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.21	62	311	N.D.		
38) 1,1,1-Trichloroethane	12.49	97	13663	0.857	ng	98
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	12.97	78	4808	0.099	ng	94
42) Carbon Tetrachloride	13.13	117	27239	1.978	ng	100
43) Cyclohexane	13.26	84	1126	0.054	ng	87
44) tert-Amyl Methyl Ether	13.64	73	739	N.D.		
45) 1,2-Dichloropropane	13.83	63	169	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D.	d	
47) Trichloroethene	14.06	130	990854	75.619	ng	100
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.		

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Data File: I:\MS08\Data\2019 07\22\07221909.D

Sample : P1904112-001 (1000mL)

Acq On : 22 Jul 2019 11:54

Misc : S31-07111901

ALS Vial : 7 Sample Multiplier: 1

Inst : MS08

Operator: RS

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

Quant Time: Jul 22 13:09:45 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:57:28 2019

Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.39	71	892	0.067	ng	# 72
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	14.98	58	339	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	15.62	97	1396	0.126	ng	99
58) Toluene	15.91	91	8076	0.157	ng	100
59) 2-Hexanone	16.17	43	4183	0.172	ng	73
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.79	43	3511	0.132	ng	81
63) n-Octane	16.90	57	482	N.D.		
64) Tetrachloroethene	17.05	166	168865	10.777	ng	100
65) Chlorobenzene	17.72	112	467	N.D.		
66) Ethylbenzene	18.07	91	3904	0.064	ng	98
67) m- & p-Xylenes	18.22	91	11287	0.246	ng	100
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.56	104	1505	N.D.		
70) o-Xylene	18.65	91	6808	0.146	ng	98
71) n-Nonane	18.85	43	2010	0.077	ng	# 81
72) 1,1,2,2-Tetrachloroethane	18.63	83	35536	1.749	ng	98
74) Cumene	19.18	105	1268	N.D.		
75) alpha-Pinene	19.52	93	3392	0.113	ng	# 1
76) n-Propylbenzene	19.63	91	5010	0.071	ng	93
77) 3-Ethyltoluene	0.00	105	0	N.D.	d	
78) 4-Ethyltoluene	19.75	105	6463	0.118	ng	97
79) 1,3,5-Trimethylbenzene	19.82	105	5880	0.118	ng	98
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	20.18	105	26972	0.576	ng	91
83) n-Decane	0.00	57	0	N.D.	d	
84) Benzyl Chloride	20.38	91	382	N.D.		
85) 1,3-Dichlorobenzene	20.32	146	3217	0.115	ng	97
86) 1,4-Dichlorobenzene	20.37	146	945	N.D.		
87) sec-Butylbenzene	20.42	105	798	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	20.67	146	380	N.D.		
91) d-Limonene	20.69	68	7045	0.390	ng	100
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	0.00	57	0	N.D.	d	
94) 1,2,4-Trichlorobenzene	22.19	180	334	N.D.		
95) Naphthalene	22.29	128	25575	0.488	ng	98
96) n-Dodecane	0.00	57	0	N.D.	d	
97) Hexachlorobutadiene	22.61	225	154	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:\MS08\Data\2019 07\22\07221909.D

Sample : P1904112-001 (1000mL)

Acq On : 22 Jul 2019 11:54

Misc : S31-07111901

ALS Vial : 7 Sample Multiplier: 1

Inst : MS08

Operator: RS

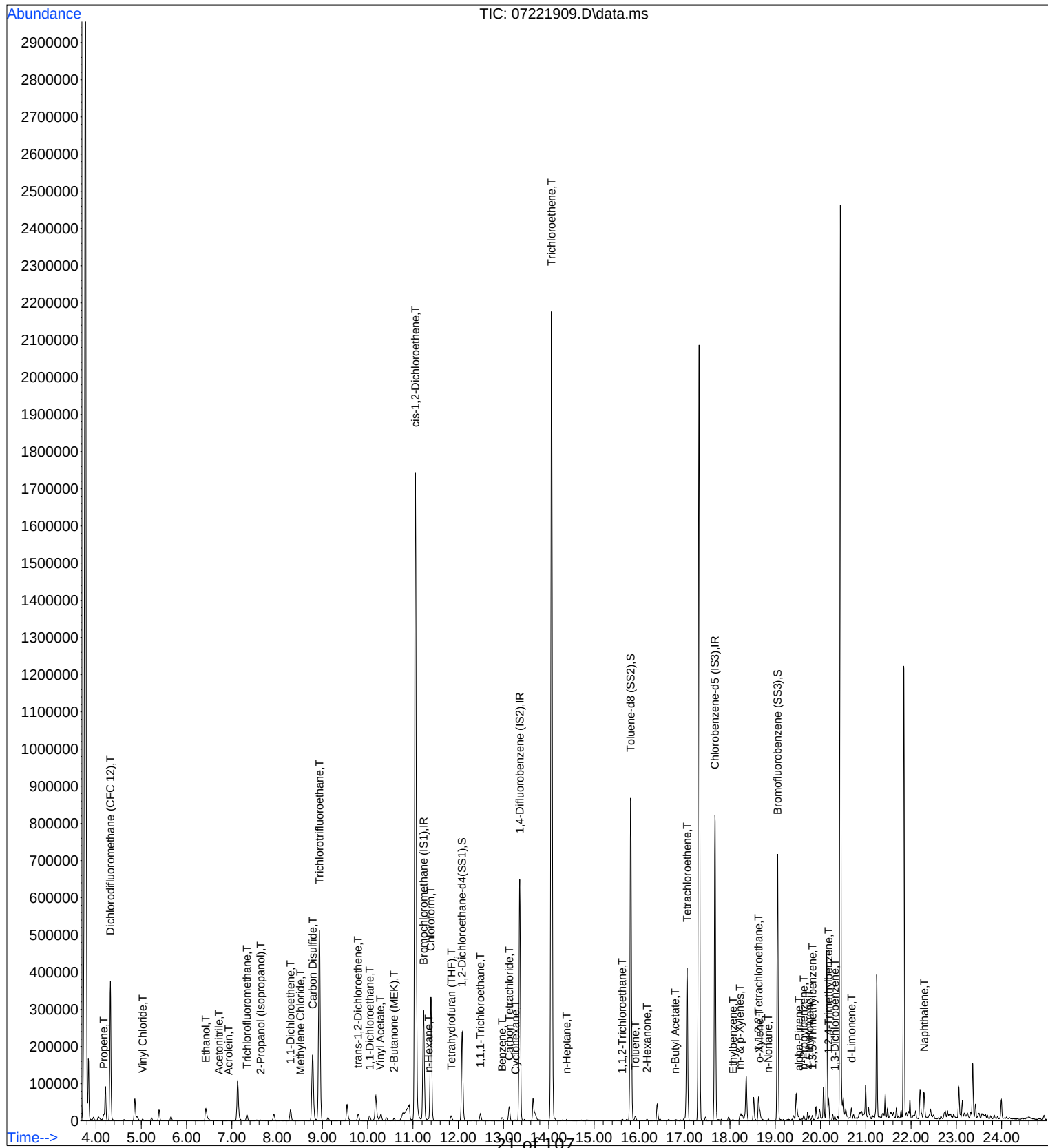
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

Quant Time: Jul 22 13:09:45 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:57:28 2019

Response via : Initial Calibration



Data File: I:\MS08\Data\2019 07\22\07221909.D

Sample : P1904112-001 (1000mL)

Acq On : 22 Jul 2019 11:54

Misc : S31-07111901

ALS Vial : 7 Sample Multiplier: 1

Inst : MS08

Operator: RS

RS 7/22/19

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

Quant Time: Jul 22 13:09:45 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:57:28 2019

Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.23	130	151743	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.36	114	677145	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.67	82	295012	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.08	65	180323	11.956	ng	-0.03
Spiked Amount	12.500	Range 70 - 130	Recovery	=	95.68%	
57) Toluene-d8 (SS2)	15.81	98	730152	12.034	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	96.24%	
73) Bromofluorobenzene (SS3)	19.06	174	259761	13.034	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	104.24%	

Target Compounds

						Qvalue
2) Propene	4.17	42	2643	0.213	ng	# 51
3) Dichlorodifluoromethan...	4.32	85	363367	18.756	ng	100
6) Vinyl Chloride	5.03	62	4861	0.338	ng	99
10) Ethanol	6.42	45	61608	7.010	ng	100
11) Acetonitrile	6.71	41	2790	0.125	ng	98
12) Acrolein	6.93	56	1508	0.232	ng	94
14) Trichlorofluoromethane	7.33	101	18425	1.107	ng	99
15) 2-Propanol (Isopropanol)	7.63	45	4635	0.154	ng	93
17) 1,1-Dichloroethene	8.30	96	17530	1.570	ng	99
19) Methylene Chloride	8.52	84	593	0.053	ng	89
21) Trichlorotrifluoroethane	8.93	151	258169	23.599	ng	99
22) Carbon Disulfide	8.79	76	378159	9.878	ng	99
23) trans-1,2-Dichloroethene	9.79	61	14803	1.015	ng	99
24) 1,1-Dichloroethane	10.04	63	18072	0.927	ng	99
26) Vinyl Acetate	10.28	86	2829	0.975	ng	# 94
27) 2-Butanone (MEK)	10.58	72	3518	0.469	ng	# 86
28) cis-1,2-Dichloroethene	11.05	61	1234921	83.535	ng	98
31) n-Hexane	11.35	57	1926	0.101	ng	# 1
32) Chloroform	11.40	83	315971	17.880	ng	100
34) Tetrahydrofuran (THF)	11.85	72	4817	0.579	ng	91
38) 1,1,1-Trichloroethane	12.49	97	13663	0.857	ng	98
41) Benzene	12.97	78	4808	0.099	ng	94
42) Carbon Tetrachloride	13.13	117	27239	1.978	ng	100
43) Cyclohexane	13.26	84	1126	0.054	ng	87
47) Trichloroethene	14.06	130	990854	75.619	ng	100
51) n-Heptane	14.39	71	892	0.067	ng	# 72
55) 1,1,2-Trichloroethane	15.62	97	1396	0.126	ng	99
58) Toluene	15.91	91	8076	0.157	ng	100
59) 2-Hexanone	16.17	43	4183	0.172	ng	73
62) n-Butyl Acetate	16.79	43	3511	0.132	ng	81
64) Tetrachloroethene	17.05	166	168865	10.777	ng	100
66) Ethylbenzene	18.07	91	3904	0.064	ng	98
67) m- & p-Xylenes	18.22	91	11287	0.246	ng	100
70) o-Xylene	18.65	91	6808	0.146	ng	98
71) n-Nonane	18.85	43	2010	0.077	ng	# 81
72) 1,1,2,2-Tetrachloroethane	18.63	83	35536	1.749	ng	98
75) alpha-Pinene	19.52	93	3392	0.113	ng	# 1
76) n-Propylbenzene	19.63	91	5010	0.071	ng	93
78) 4-Ethyltoluene	19.75	105	6463	0.118	ng	97
79) 1,3,5-Trimethylbenzene	19.82	105	5880	0.118	ng	98
82) 1,2,4-Trimethylbenzene	20.18	105	26972	0.576	ng	91
85) 1,3-Dichlorobenzene	20.32	146	3217	0.115	ng	97
91) d-Limonene	20.69	68	7045	0.390	ng	100
95) Naphthalene	22.29	128	25575	0.488	ng	98

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

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Data File: I:\MS08\Data\2019 07\22\07221909.D

Sample : P1904112-001 (1000mL)

Acq On : 22 Jul 2019 11:54

Misc : S31-07111901

ALS Vial : 7 Sample Multiplier: 1

Inst : MS08

Operator: RS

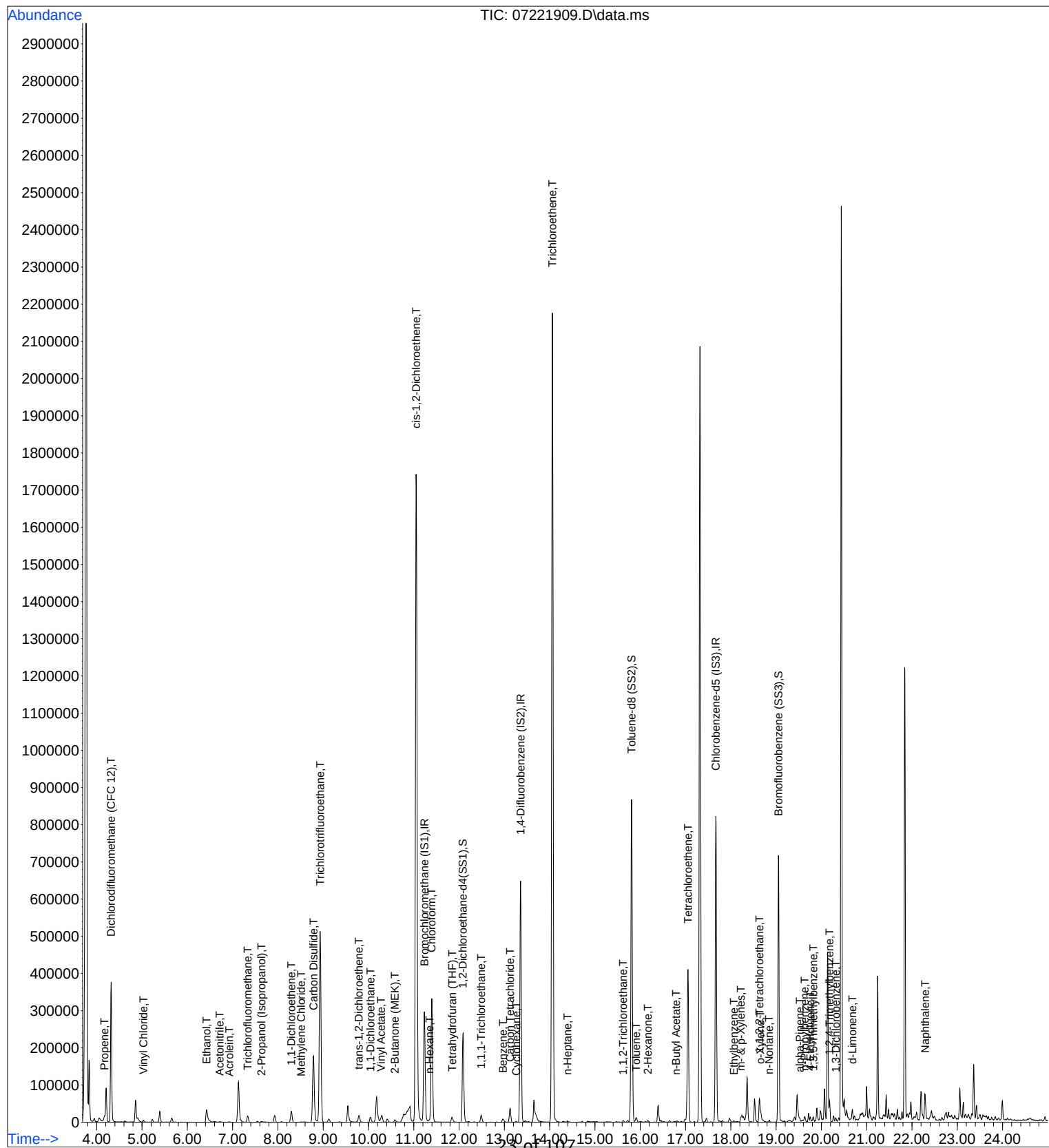
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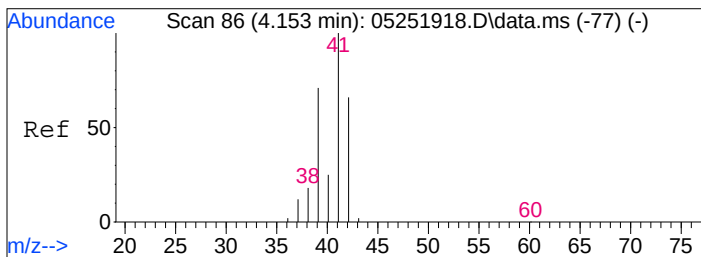
Quant Time: Jul 22 13:09:45 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:57:28 2019

Response via : Initial Calibration





#2

Propene

Concen: 0.21 ng

RT: 4.17 min Scan# 89

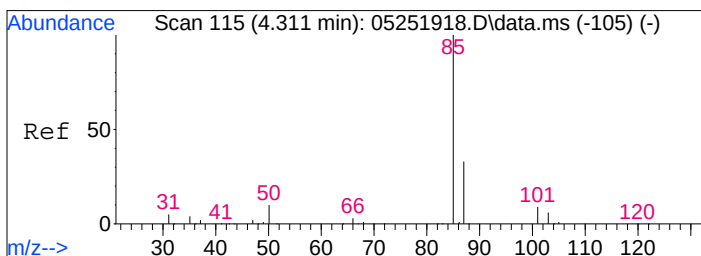
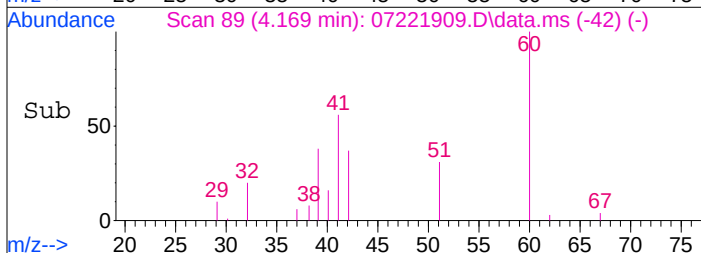
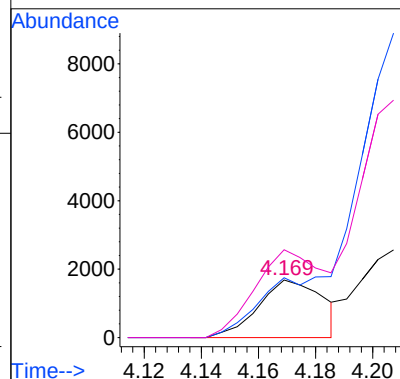
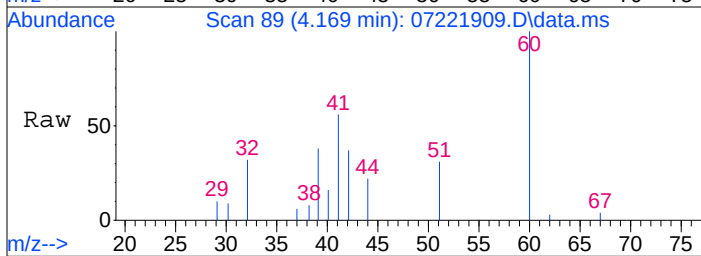
Delta R.T. 0.005 min

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Tgt Ion: 42 Resp: 2643

Ion	Ratio	Lower	Upper
42	100		
39	0.0	85.8	125.8#
41	163.7	130.2	170.2



#3

Dichlorodifluoromethane (CFC 12)

Concen: 18.76 ng

RT: 4.32 min Scan# 116

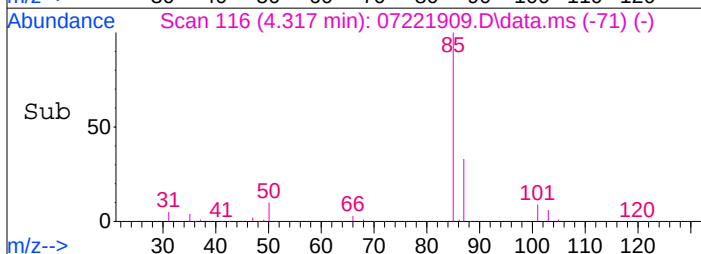
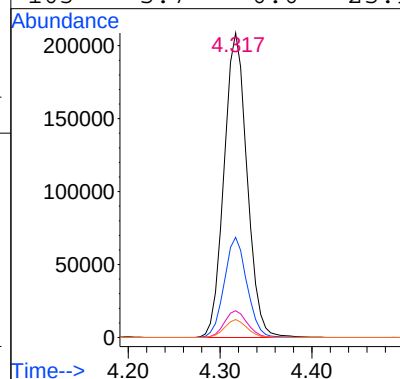
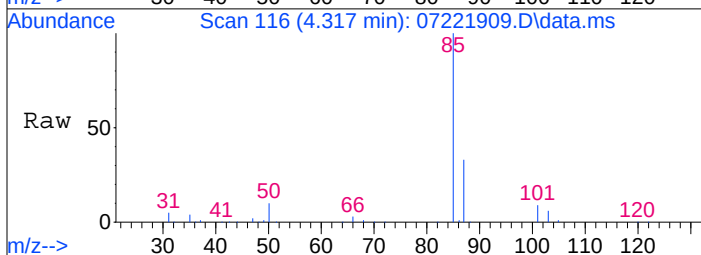
Delta R.T. -0.006 min

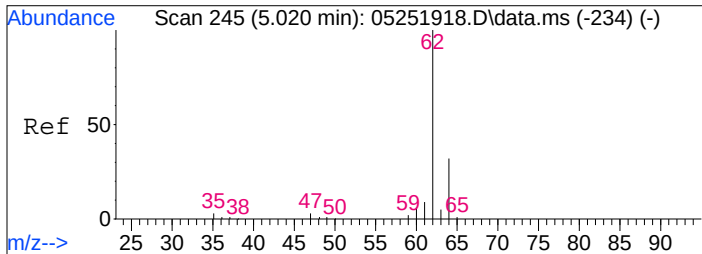
Lab File: 07221909.D

Acq: 22 Jul 2019 11:54

Tgt Ion: 85 Resp: 363367

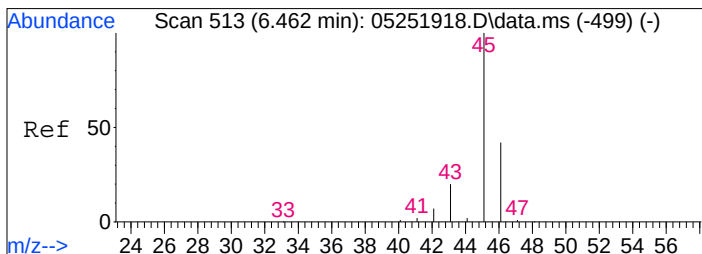
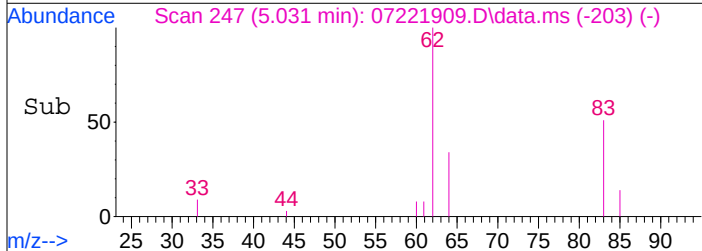
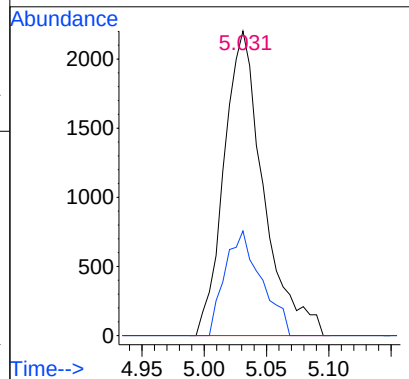
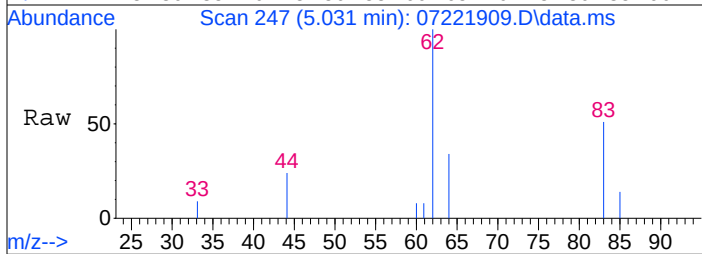
Ion	Ratio	Lower	Upper
85	100		
87	32.4	12.5	52.5
101	8.7	0.0	29.0
103	5.7	0.0	25.9





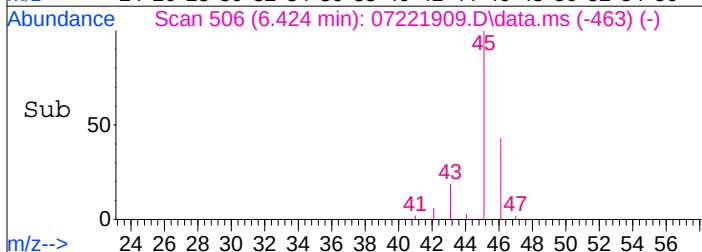
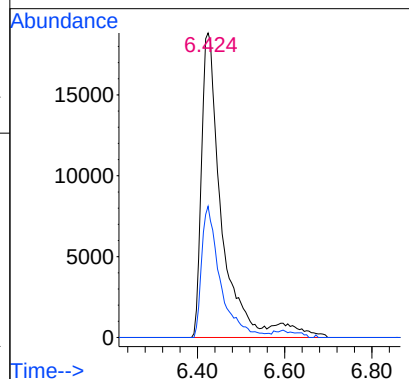
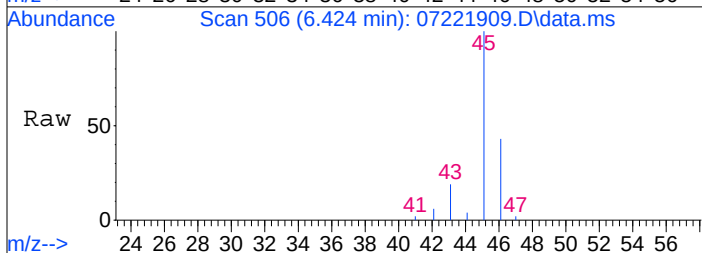
#6
Vinyl Chloride
Concen: 0.34 ng
RT: 5.03 min Scan# 247
Delta R.T. -0.011 min
Lab File: 07221909.D
Acq: 22 Jul 2019 11:54

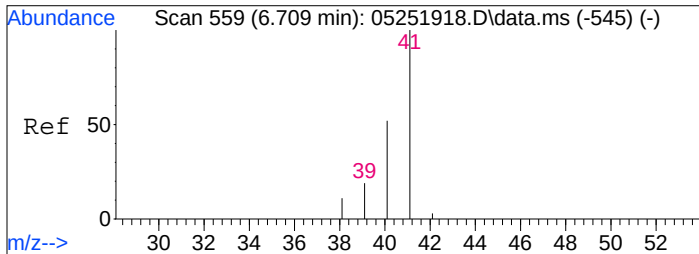
Tgt Ion: 62 Resp: 4861
Ion Ratio Lower Upper
62 100
64 31.5 12.0 52.0



#10
Ethanol
Concen: 7.01 ng
RT: 6.42 min Scan# 506
Delta R.T. -0.019 min
Lab File: 07221909.D
Acq: 22 Jul 2019 11:54

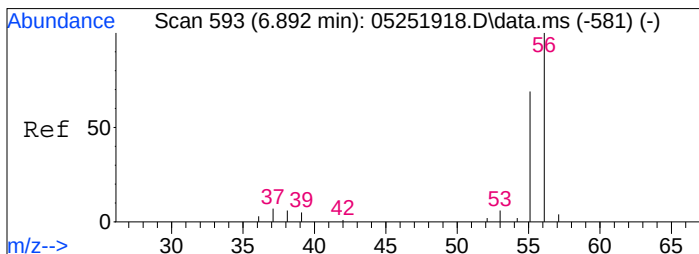
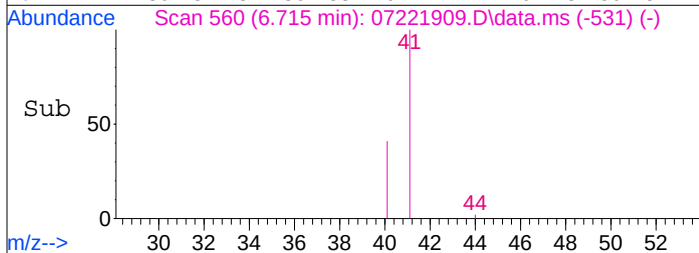
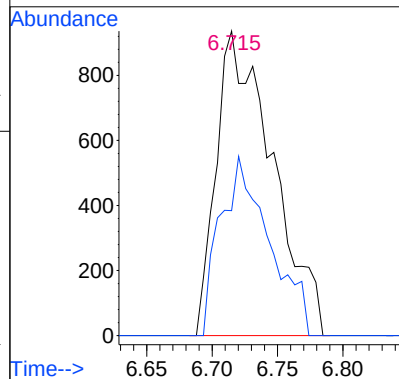
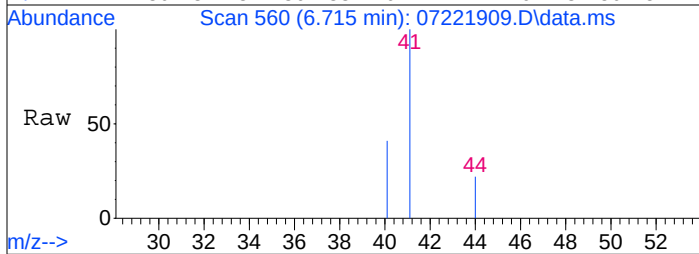
Tgt Ion: 45 Resp: 61608
Ion Ratio Lower Upper
45 100
46 41.9 21.7 61.7





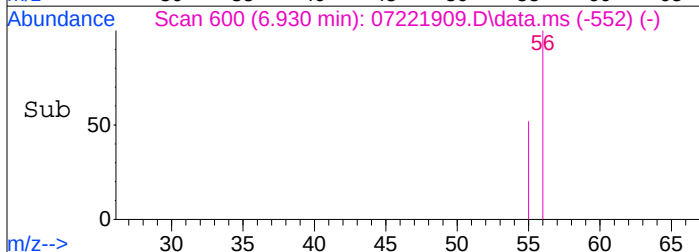
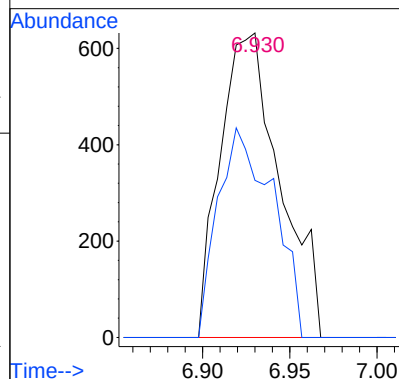
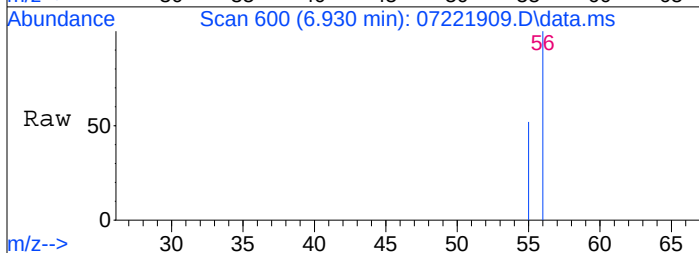
#11
Acetonitrile
Concen: 0.12 ng
RT: 6.71 min Scan# 560
Delta R.T. -0.043 min
Lab File: 07221909.D
Acq: 22 Jul 2019 11:54

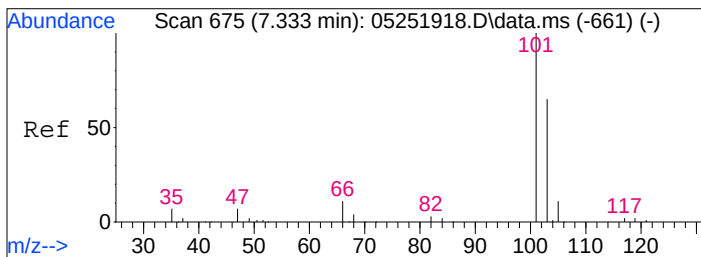
Tgt Ion: 41 Resp: 2790
Ion Ratio Lower Upper
41 100
40 51.3 32.5 72.5



#12
Acrolein
Concen: 0.23 ng
RT: 6.93 min Scan# 600
Delta R.T. 0.011 min
Lab File: 07221909.D
Acq: 22 Jul 2019 11:54

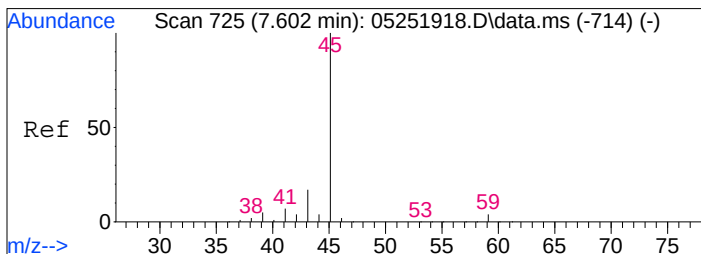
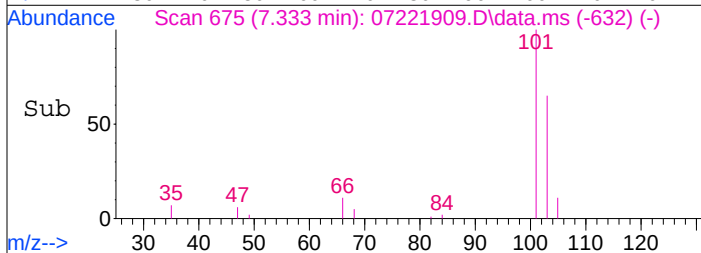
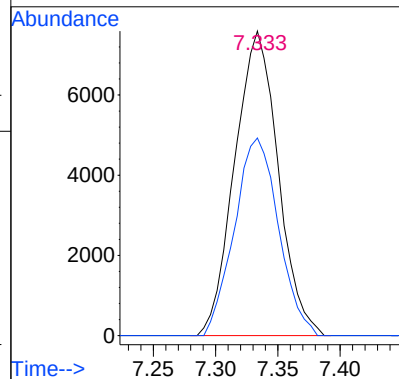
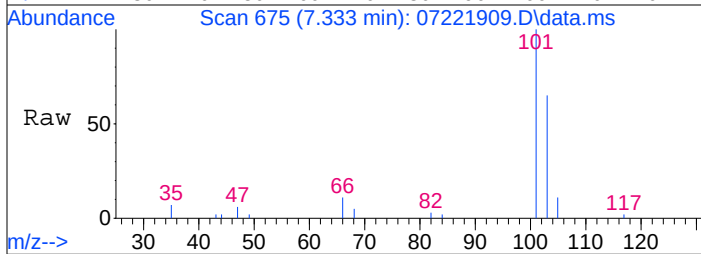
Tgt Ion: 56 Resp: 1508
Ion Ratio Lower Upper
56 100
55 63.3 48.1 88.1





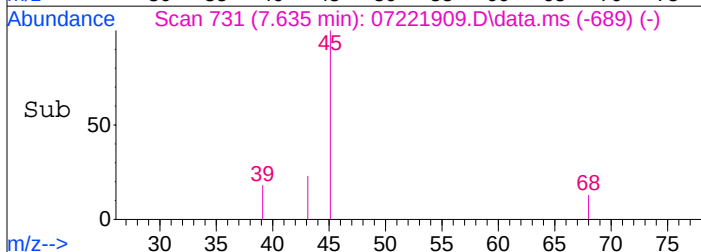
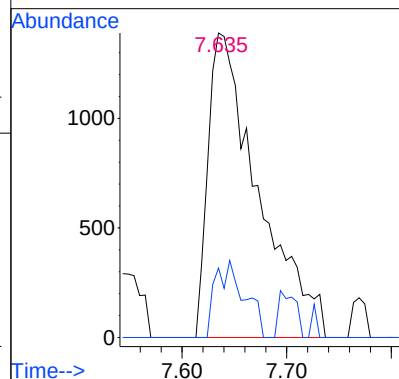
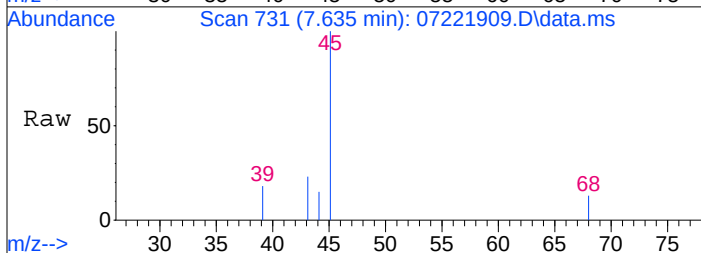
#14
 Trichlorofluoromethane
 Concen: 1.11 ng
 RT: 7.33 min Scan# 675
 Delta R.T. -0.016 min
 Lab File: 07221909.D
 Acq: 22 Jul 2019 11:54

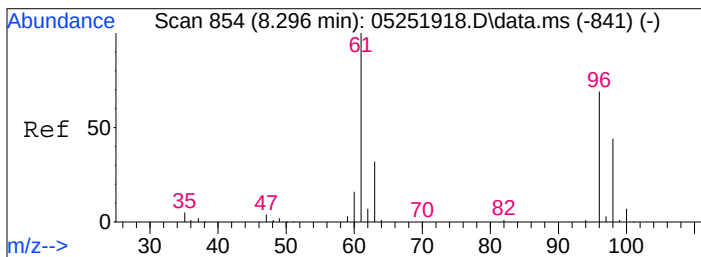
Tgt Ion: 101 Resp: 18425
 Ion Ratio Lower Upper
 101 100
 103 65.9 44.7 84.7



#15
 2-Propanol (Isopropanol)
 Concen: 0.15 ng
 RT: 7.63 min Scan# 731
 Delta R.T. -0.022 min
 Lab File: 07221909.D
 Acq: 22 Jul 2019 11:54

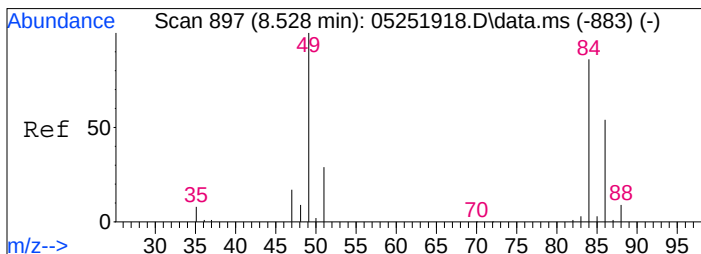
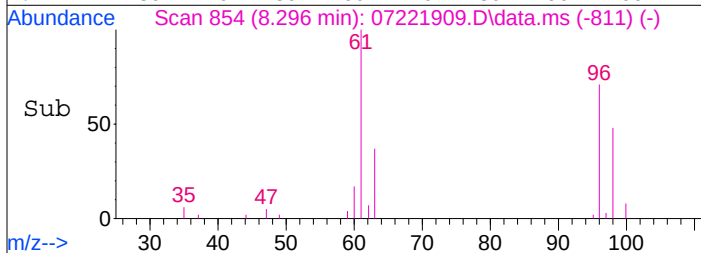
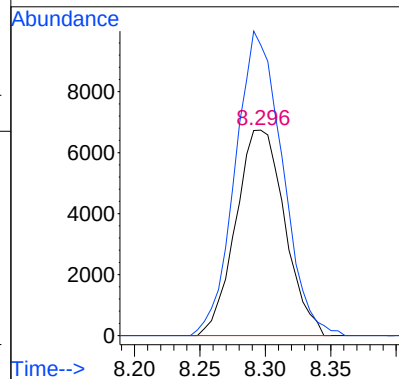
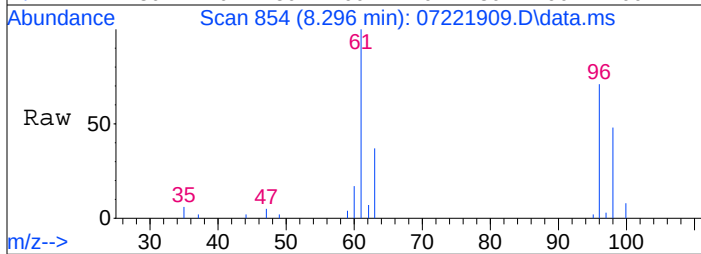
Tgt Ion: 45 Resp: 4635
 Ion Ratio Lower Upper
 45 100
 43 14.5 0.0 37.6





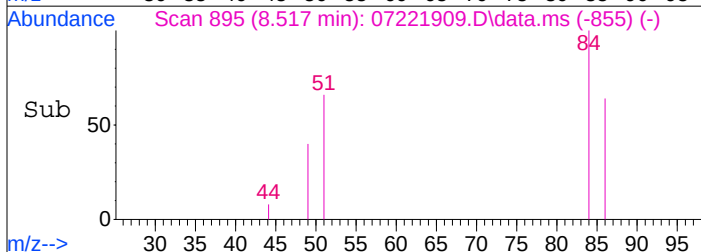
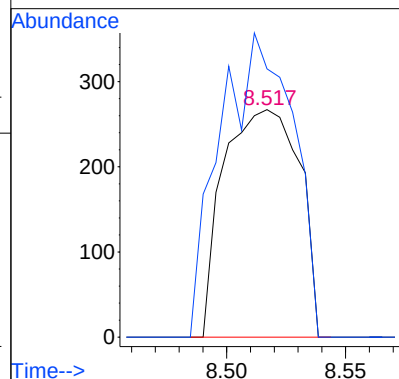
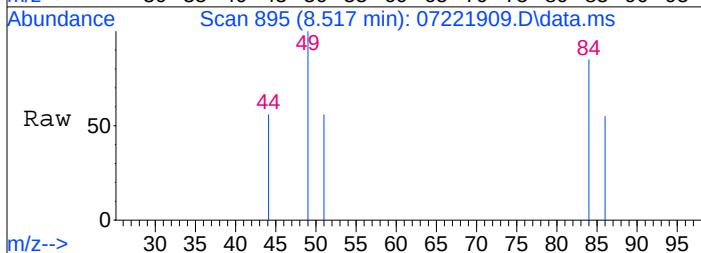
#17
1,1-Dichloroethene
Concen: 1.57 ng
RT: 8.30 min Scan# 854
Delta R.T. -0.016 min
Lab File: 07221909.D
Acq: 22 Jul 2019 11:54

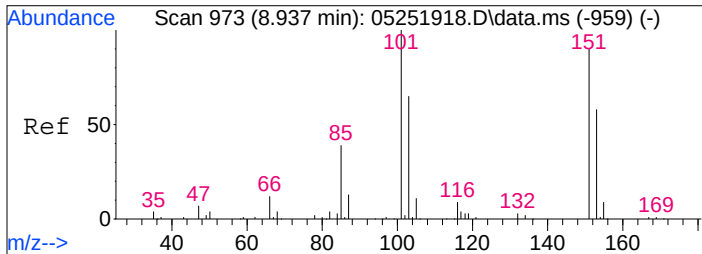
Tgt Ion: 96 Resp: 17530
Ion Ratio Lower Upper
96 100
61 143.1 124.4 164.4



#19
Methylene Chloride
Concen: 0.05 ng
RT: 8.52 min Scan# 895
Delta R.T. -0.032 min
Lab File: 07221909.D
Acq: 22 Jul 2019 11:54

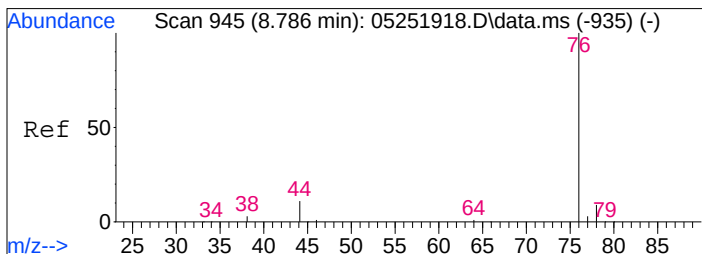
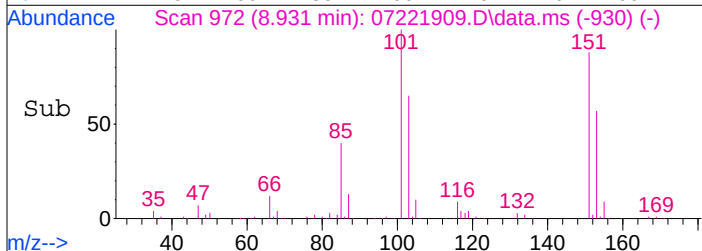
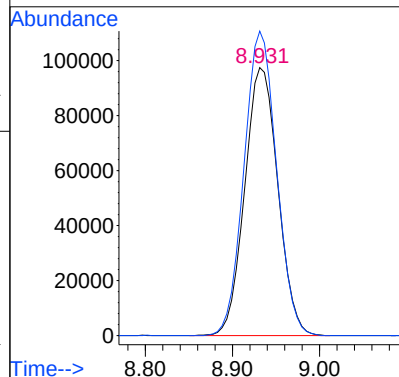
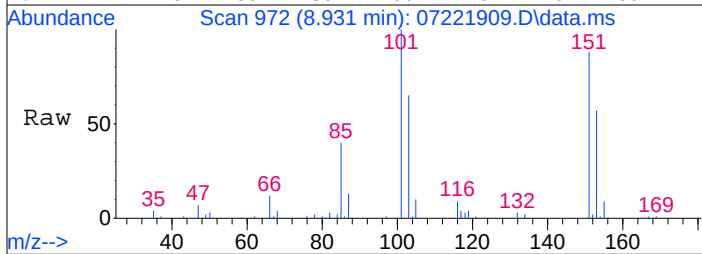
Tgt Ion: 84 Resp: 593
Ion Ratio Lower Upper
84 100
49 128.8 92.3 142.3





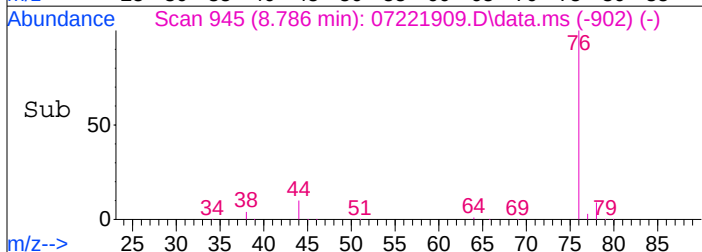
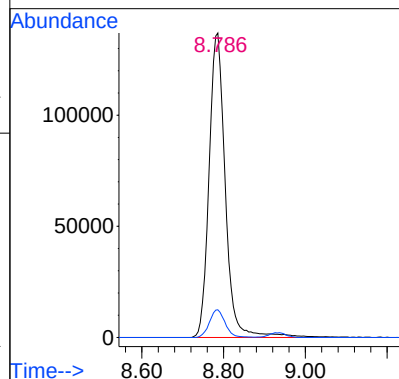
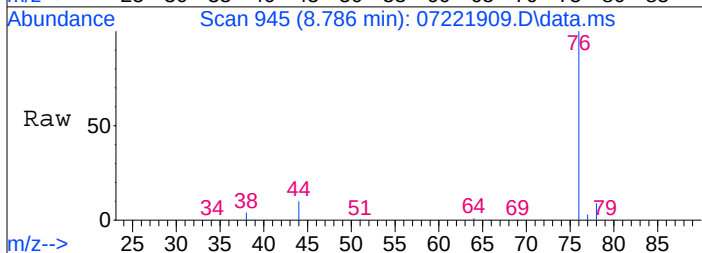
#21
 Trichlorotrifluoroethane
 Concen: 23.60 ng
 RT: 8.93 min Scan# 972
 Delta R.T. -0.022 min
 Lab File: 07221909.D
 Acq: 22 Jul 2019 11:54

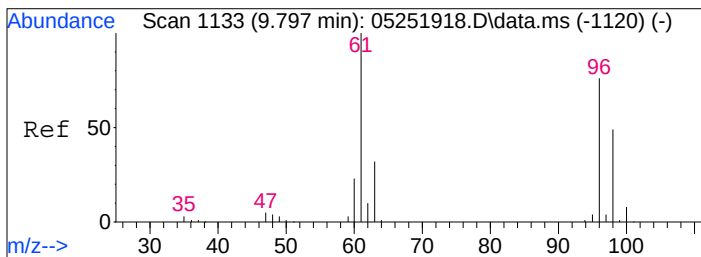
Tgt Ion: 151 Resp: 258169
 Ion Ratio Lower Upper
 151 100
 101 111.3 92.2 132.2



#22
 Carbon Disulfide
 Concen: 9.88 ng
 RT: 8.79 min Scan# 945
 Delta R.T. -0.016 min
 Lab File: 07221909.D
 Acq: 22 Jul 2019 11:54

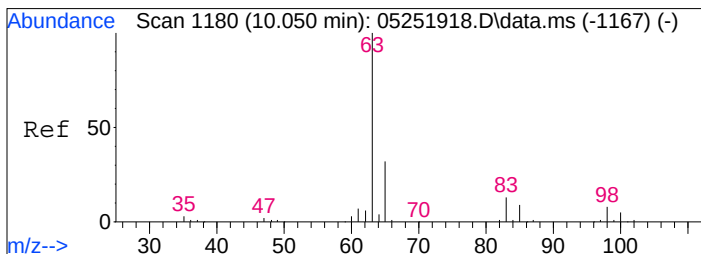
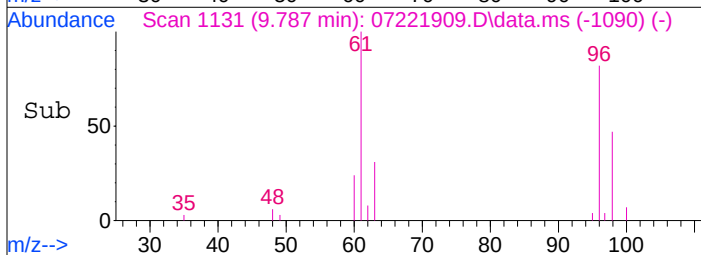
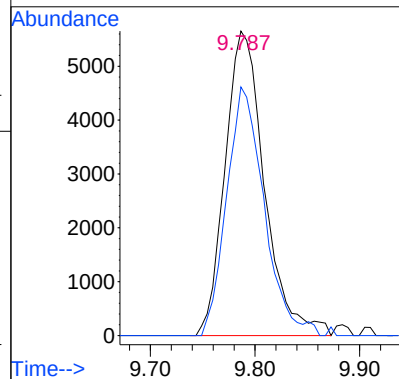
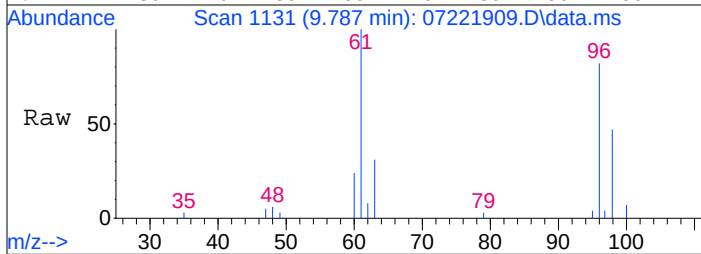
Tgt Ion: 76 Resp: 378159
 Ion Ratio Lower Upper
 76 100
 78 8.8 0.0 29.2





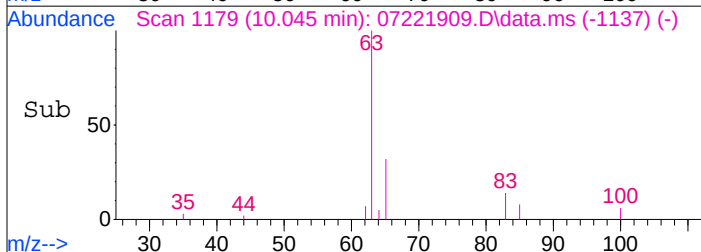
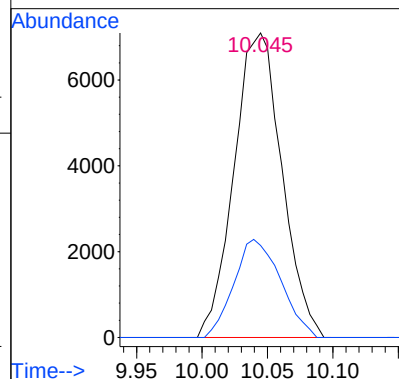
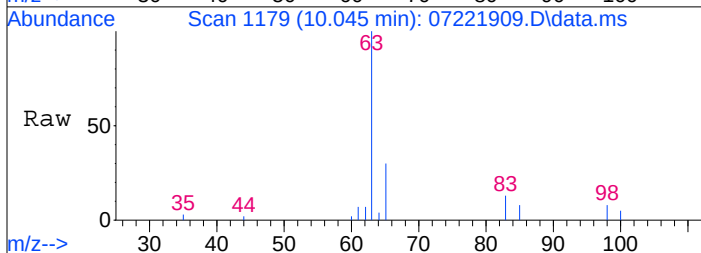
#23
trans-1,2-Dichloroethene
Concen: 1.02 ng
RT: 9.79 min Scan# 1131
Delta R.T. -0.027 min
Lab File: 07221909.D
Acq: 22 Jul 2019 11:54

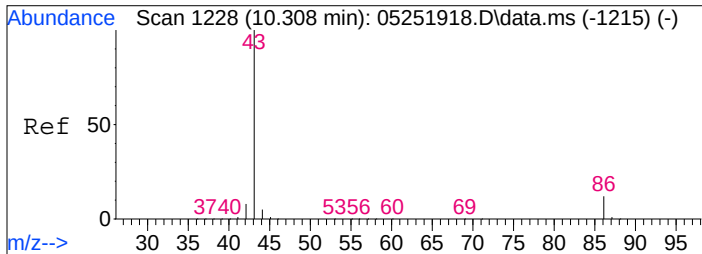
Tgt Ion: 61 Resp: 14803
Ion Ratio Lower Upper
61 100
96 77.6 58.3 98.3



#24
1,1-Dichloroethane
Concen: 0.93 ng
RT: 10.04 min Scan# 1179
Delta R.T. -0.022 min
Lab File: 07221909.D
Acq: 22 Jul 2019 11:54

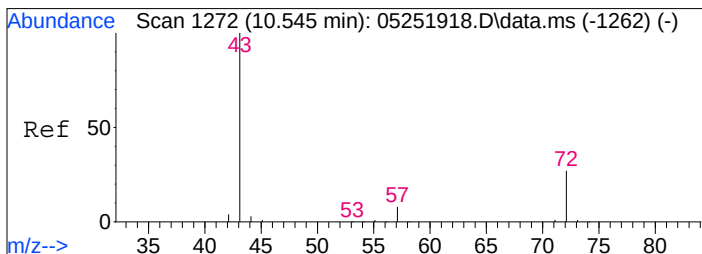
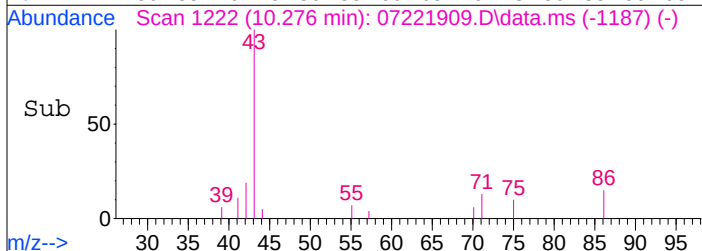
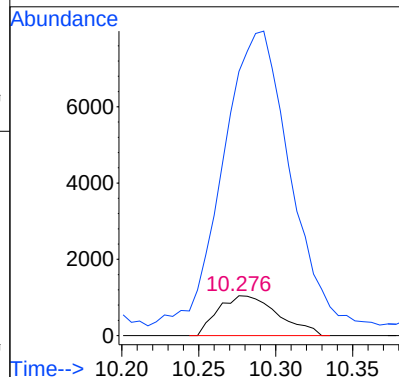
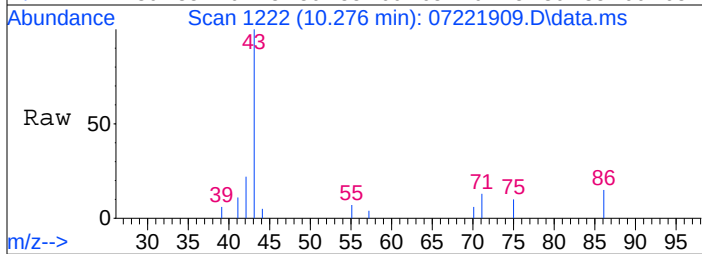
Tgt Ion: 63 Resp: 18072
Ion Ratio Lower Upper
63 100
65 31.4 11.9 51.9





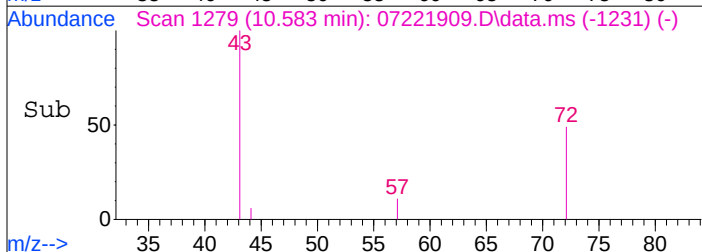
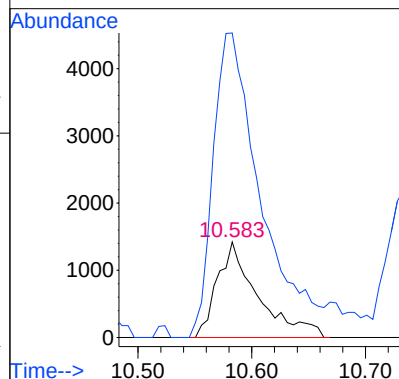
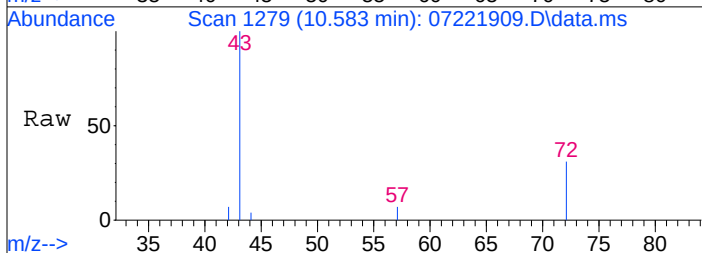
#26
 Vinyl Acetate
 Concen: 0.98 ng
 RT: 10.28 min Scan# 1222
 Delta R.T. -0.059 min
 Lab File: 07221909.D
 Acq: 22 Jul 2019 11:54

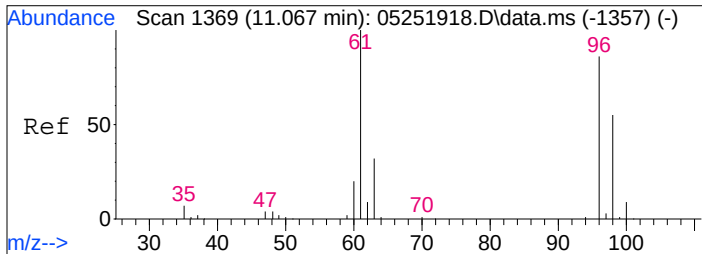
Tgt Ion	86	Resp	2829
Ion Ratio	86	100	
	43	909.1	864.9 904.9#



#27
 2-Butanone (MEK)
 Concen: 0.47 ng
 RT: 10.58 min Scan# 1279
 Delta R.T. 0.011 min
 Lab File: 07221909.D
 Acq: 22 Jul 2019 11:54

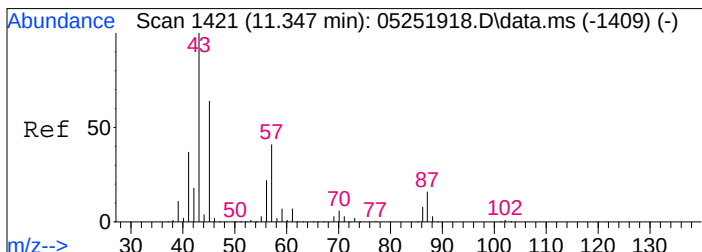
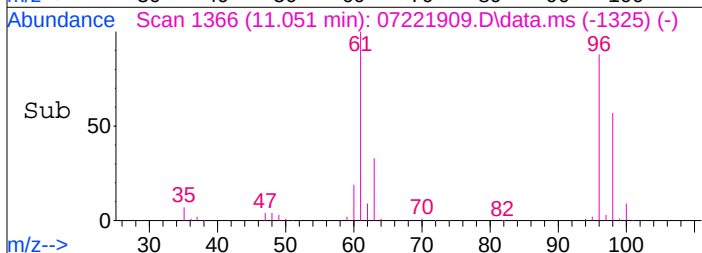
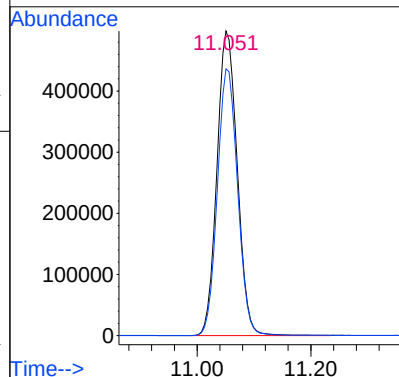
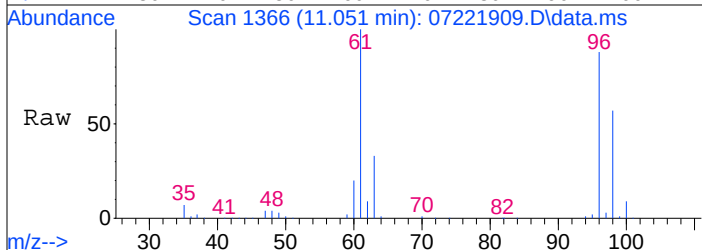
Tgt Ion	72	Resp	3518
Ion Ratio	72	100	
	43	397.8	346.9 386.9#





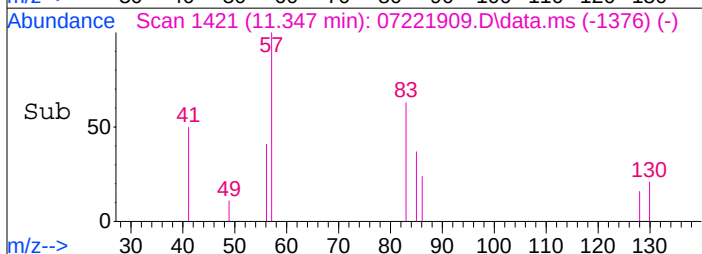
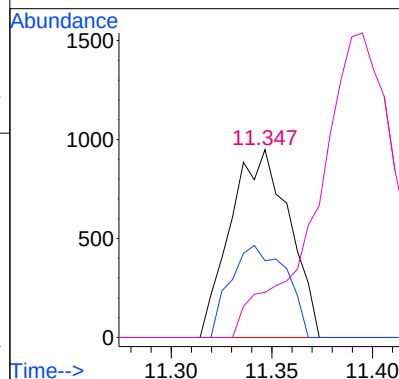
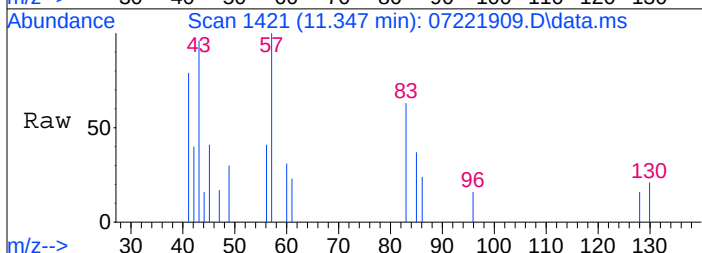
#28
 cis-1,2-Dichloroethene
 Concen: 83.53 ng
 RT: 11.05 min Scan# 1366
 Delta R.T. -0.027 min
 Lab File: 07221909.D
 Acq: 22 Jul 2019 11:54

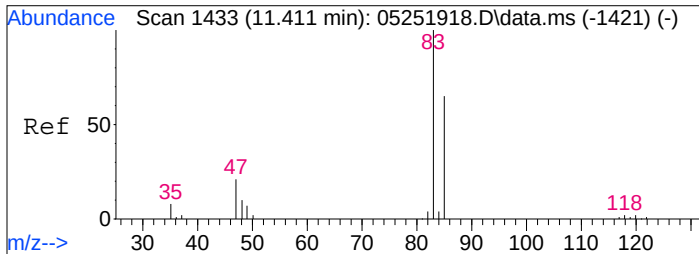
Tgt Ion: 61 Resp: 1234921
 Ion Ratio Lower Upper
 61 100
 96 87.6 65.6 105.6



#31
 n-Hexane
 Concen: 0.10 ng
 RT: 11.35 min Scan# 1421
 Delta R.T. -0.005 min
 Lab File: 07221909.D
 Acq: 22 Jul 2019 11:54

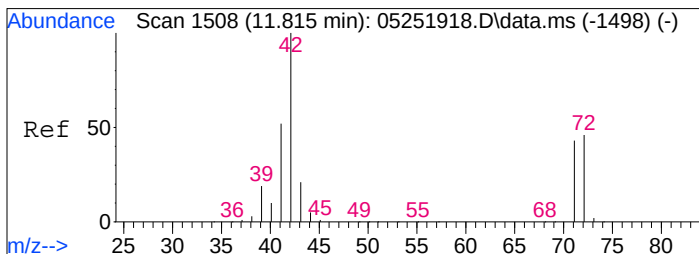
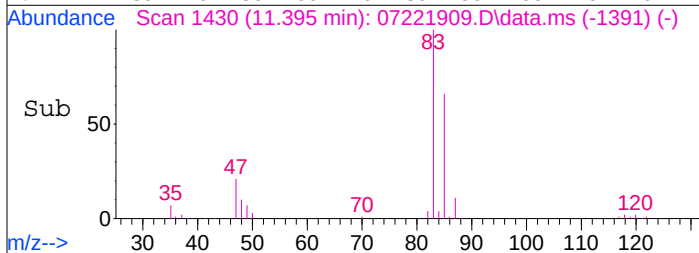
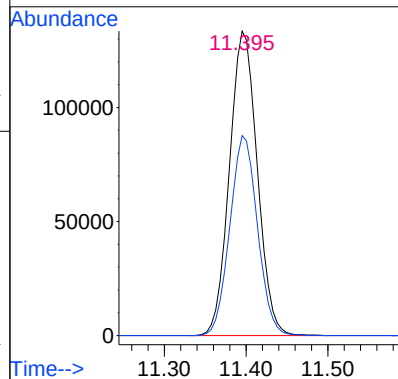
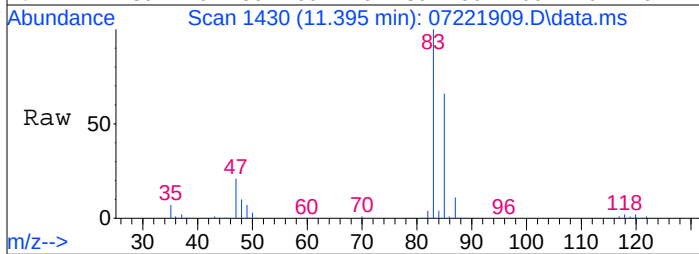
Tgt Ion: 57 Resp: 1926
 Ion Ratio Lower Upper
 57 100
 56 46.3 41.1 61.7
 86 211.3 16.4 24.6#





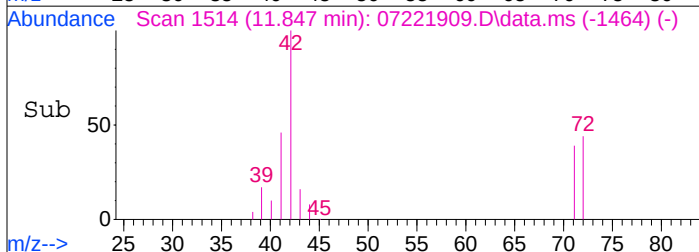
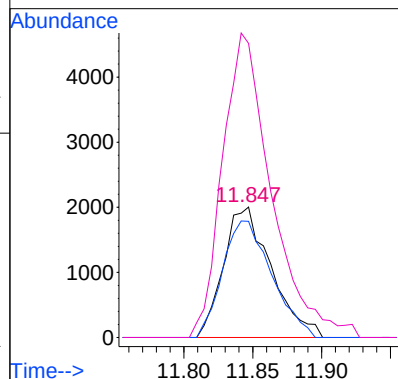
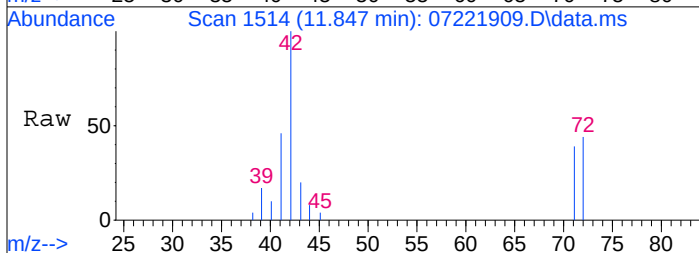
#32
Chloroform
Concen: 17.88 ng
RT: 11.40 min Scan# 1430
Delta R.T. -0.038 min
Lab File: 07221909.D
Acq: 22 Jul 2019 11:54

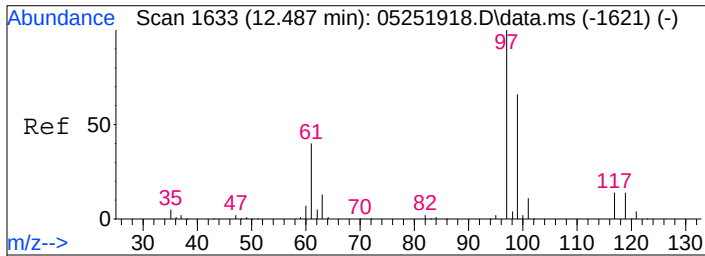
Tgt Ion: 83 Resp: 315971
Ion Ratio Lower Upper
83 100
85 65.1 45.3 85.3



#34
Tetrahydrofuran (THF)
Concen: 0.58 ng
RT: 11.85 min Scan# 1514
Delta R.T. 0.021 min
Lab File: 07221909.D
Acq: 22 Jul 2019 11:54

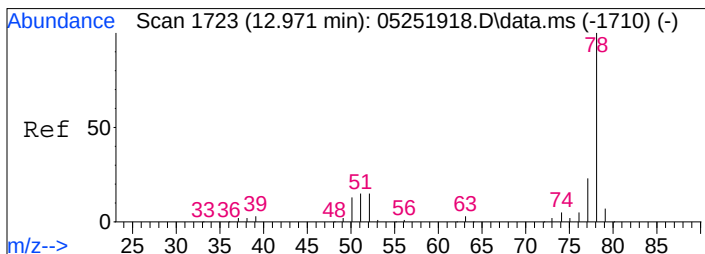
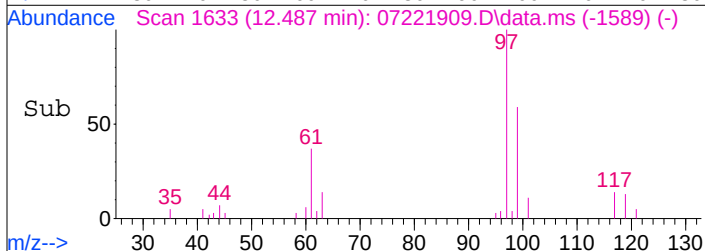
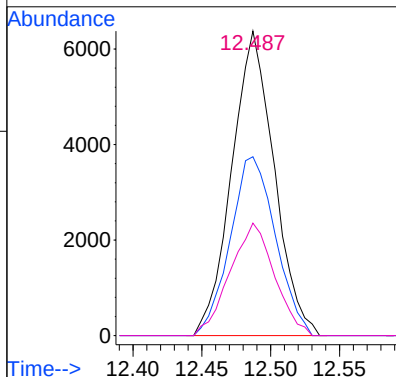
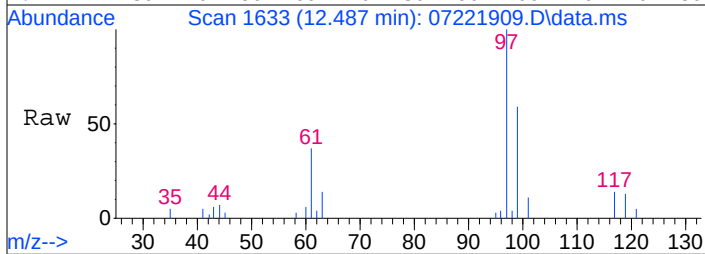
Tgt Ion: 72 Resp: 4817
Ion Ratio Lower Upper
72 100
71 92.0 73.9 113.9
42 240.5 201.9 241.9





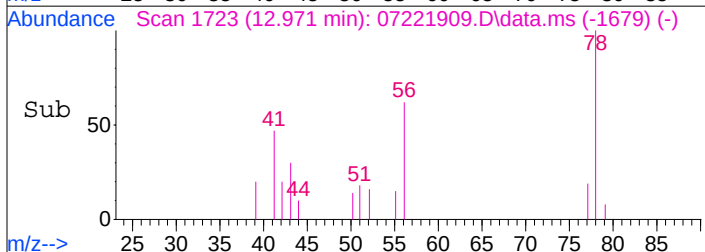
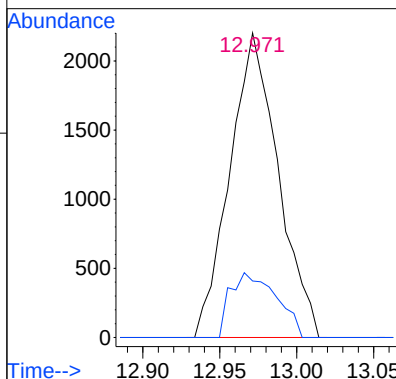
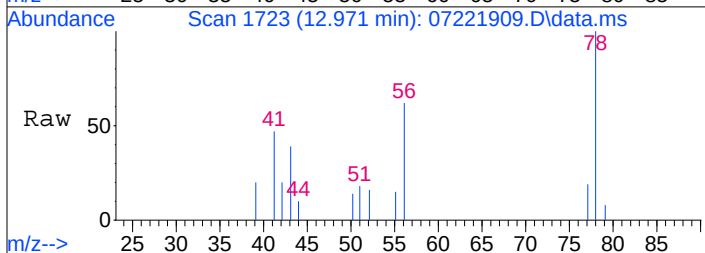
#38
1,1,1-Trichloroethane
Concen: 0.86 ng
RT: 12.49 min Scan# 1633
Delta R.T. -0.011 min
Lab File: 07221909.D
Acq: 22 Jul 2019 11:54

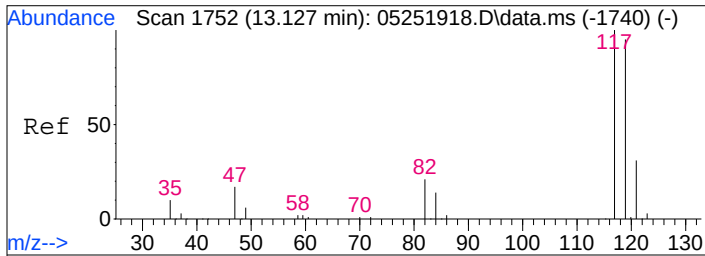
Tgt Ion: 97	Resp: 13663
Ion Ratio	Lower Upper
97 100	
99 62.7	44.7 84.7
61 38.6	19.5 59.5



#41
Benzene
Concen: 0.10 ng
RT: 12.97 min Scan# 1723
Delta R.T. -0.011 min
Lab File: 07221909.D
Acq: 22 Jul 2019 11:54

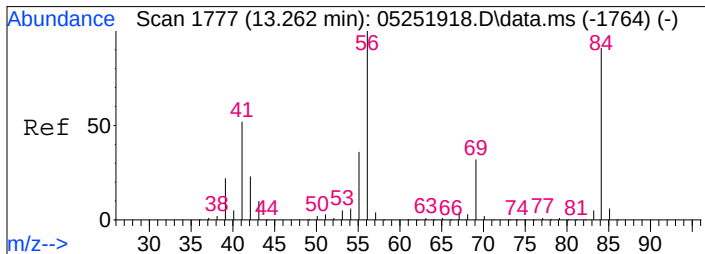
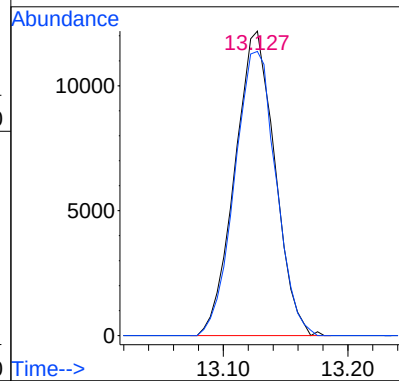
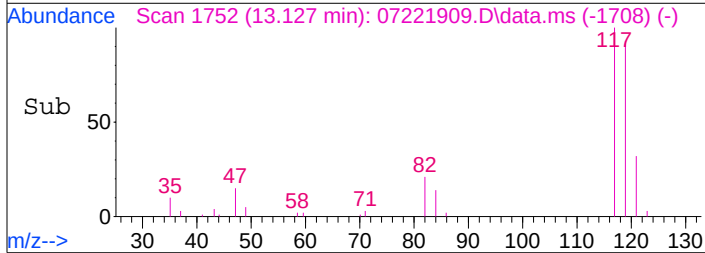
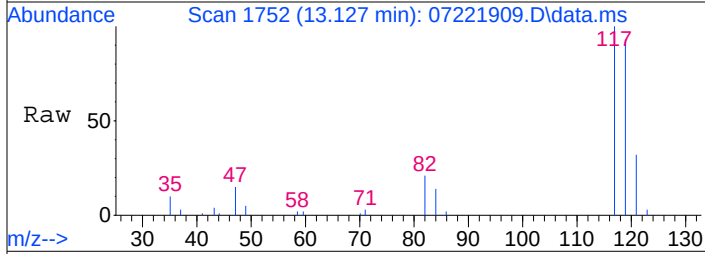
Tgt Ion: 78	Resp: 4808
Ion Ratio	Lower Upper
78 100	
77 20.3	3.2 43.2





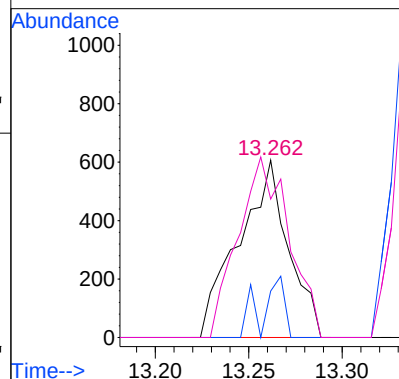
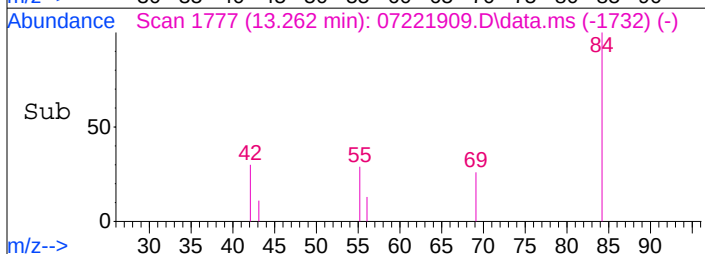
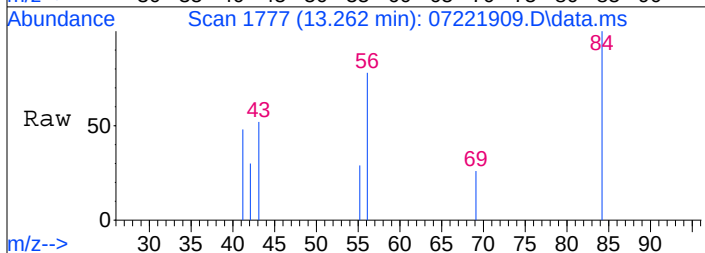
#42
Carbon Tetrachloride
Concen: 1.98 ng
RT: 13.13 min Scan# 1752
Delta R.T. -0.011 min
Lab File: 07221909.D
Acq: 22 Jul 2019 11:54

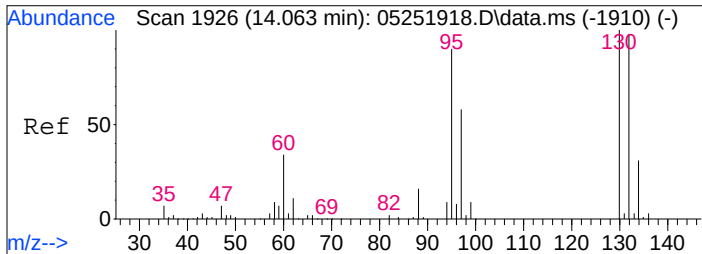
Tgt Ion: 117 Resp: 27239
Ion Ratio Lower Upper
117 100
119 96.2 76.4 116.4



#43
Cyclohexane
Concen: 0.05 ng
RT: 13.26 min Scan# 1777
Delta R.T. -0.005 min
Lab File: 07221909.D
Acq: 22 Jul 2019 11:54

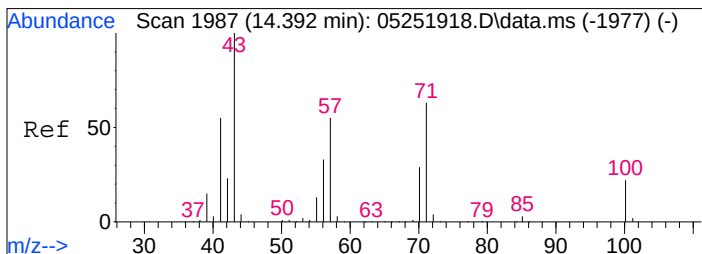
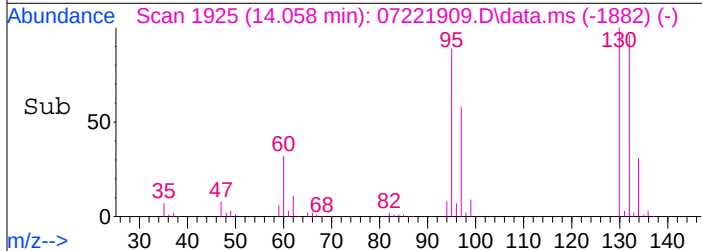
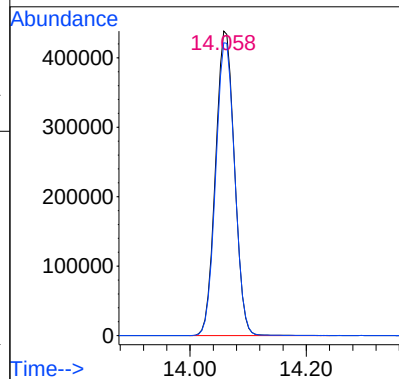
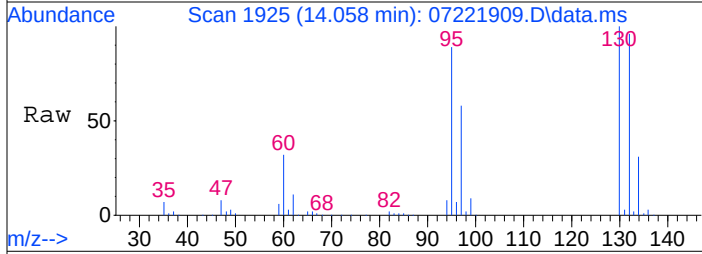
Tgt Ion: 84 Resp: 1126
Ion Ratio Lower Upper
84 100
69 15.8 14.8 54.8
56 103.7 90.2 130.2





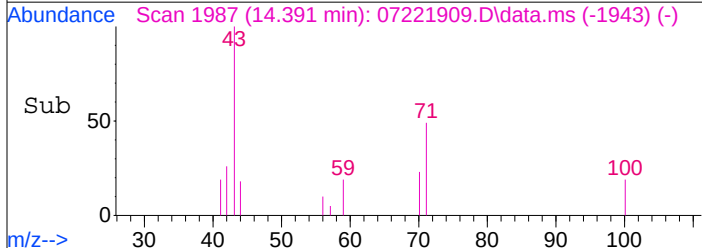
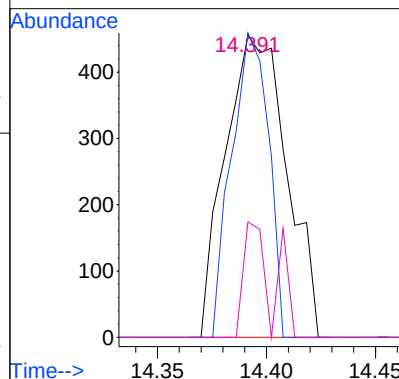
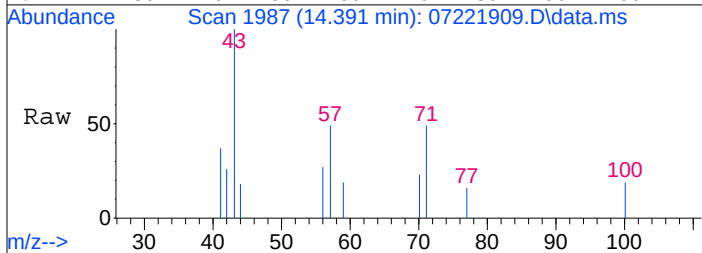
#47
 Trichloroethene
 Concen: 75.62 ng
 RT: 14.06 min Scan# 1925
 Delta R.T. -0.016 min
 Lab File: 07221909.D
 Acq: 22 Jul 2019 11:54

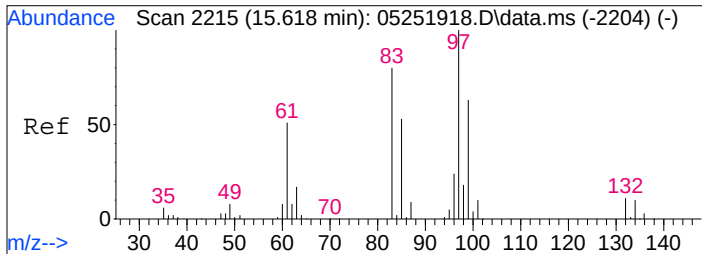
Tgt Ion: 130 Resp: 990854
 Ion Ratio Lower Upper
 130 100
 132 96.5 76.1 116.1



#51
 n-Heptane
 Concen: 0.07 ng
 RT: 14.39 min Scan# 1987
 Delta R.T. -0.011 min
 Lab File: 07221909.D
 Acq: 22 Jul 2019 11:54

Tgt Ion: 71 Resp: 892
 Ion Ratio Lower Upper
 71 100
 57 60.8 66.0 106.0#
 100 18.2 16.3 56.3

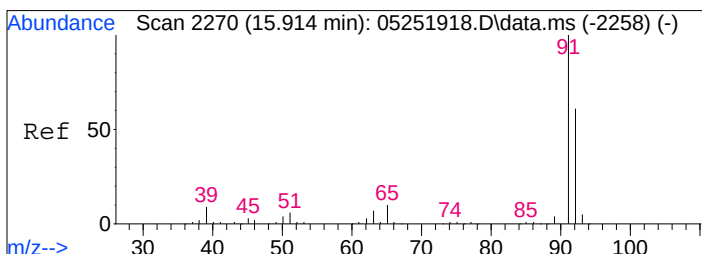
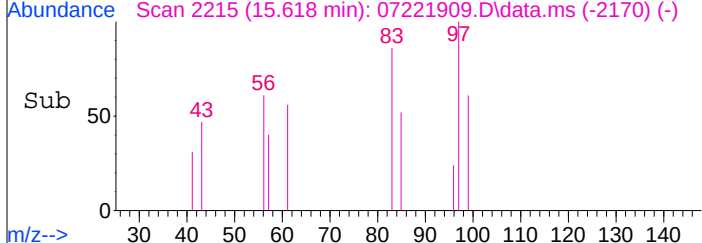
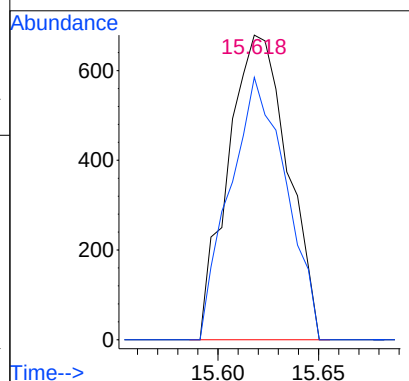
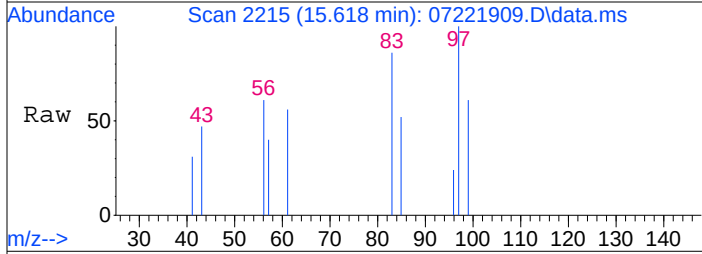




#55
 1,1,2-Trichloroethane
 Concen: 0.13 ng
 RT: 15.62 min Scan# 2215
 Delta R.T. -0.005 min
 Lab File: 07221909.D
 Acq: 22 Jul 2019 11:54

Tgt Ion: 97 Resp: 1396

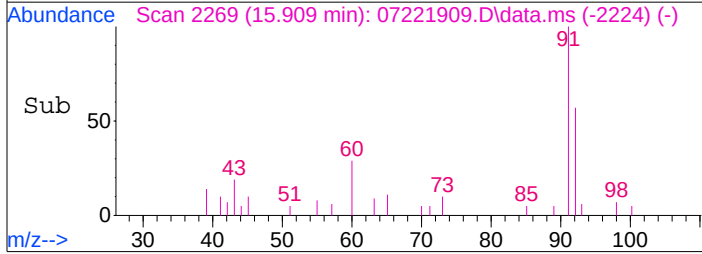
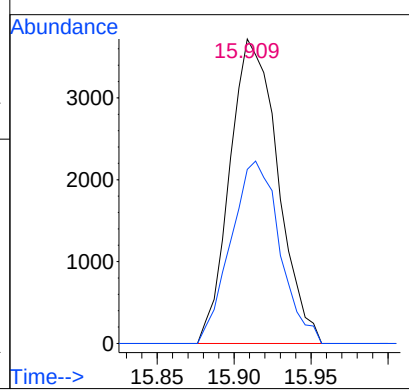
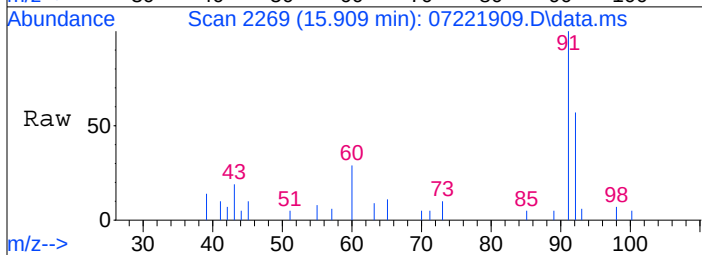
Ion	Ratio	Lower	Upper
97	100		
83	81.4	61.9	101.9

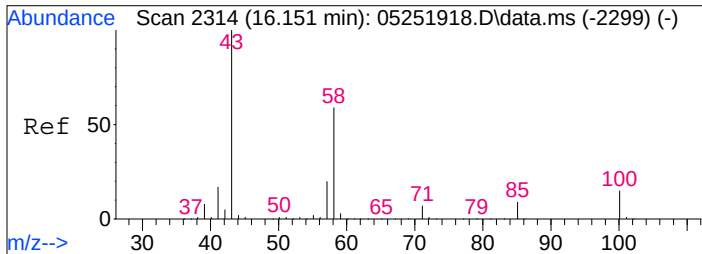


#58
 Toluene
 Concen: 0.16 ng
 RT: 15.91 min Scan# 2269
 Delta R.T. -0.011 min
 Lab File: 07221909.D
 Acq: 22 Jul 2019 11:54

Tgt Ion: 91 Resp: 8076

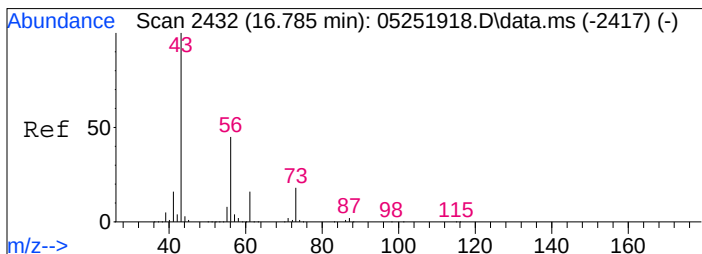
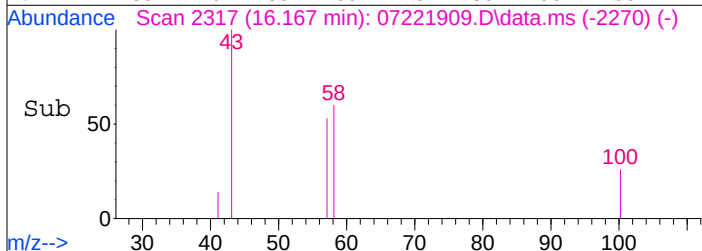
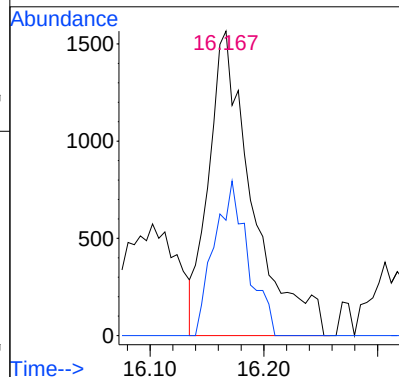
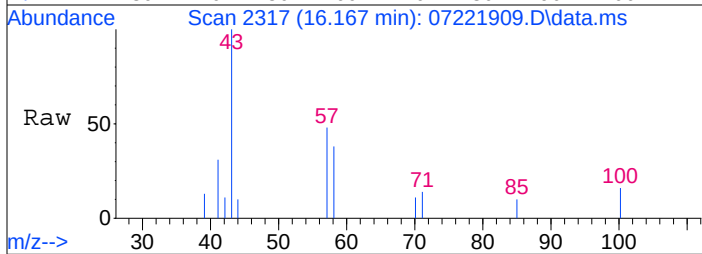
Ion	Ratio	Lower	Upper
91	100		
92	61.0	41.2	81.2





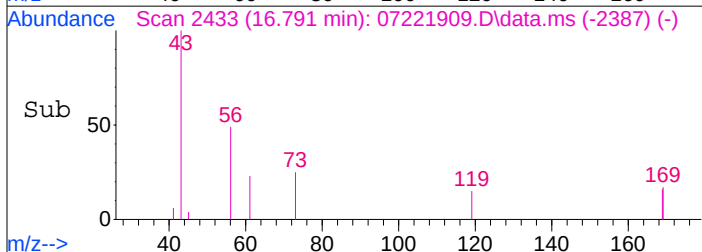
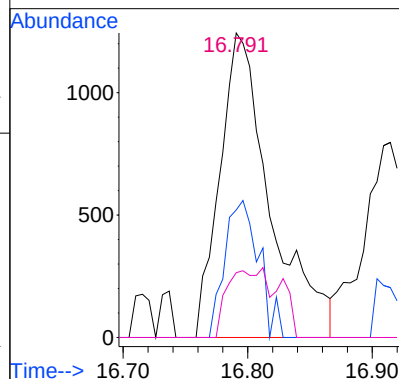
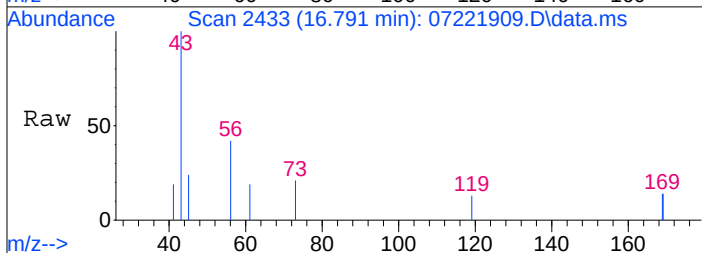
#59
2-Hexanone
Concen: 0.17 ng
RT: 16.17 min Scan# 2317
Delta R.T. 0.005 min
Lab File: 07221909.D
Acq: 22 Jul 2019 11:54

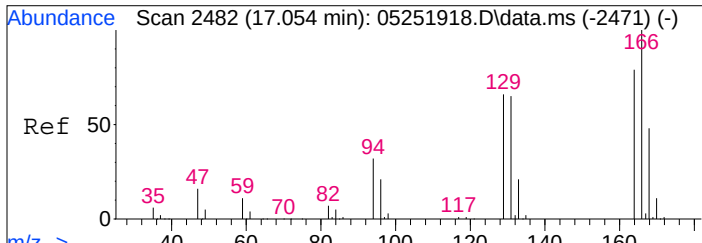
Tgt Ion: 43 Resp: 4183
Ion Ratio Lower Upper
43 100
58 38.9 38.8 78.8



#62
n-Butyl Acetate
Concen: 0.13 ng
RT: 16.79 min Scan# 2433
Delta R.T. -0.000 min
Lab File: 07221909.D
Acq: 22 Jul 2019 11:54

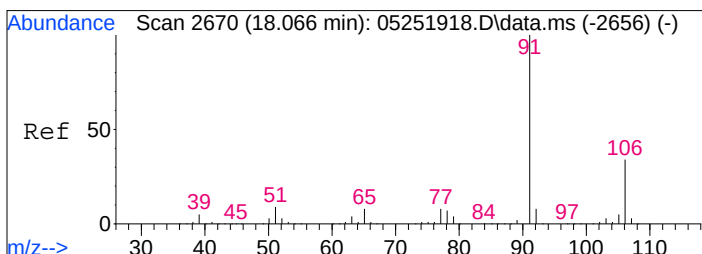
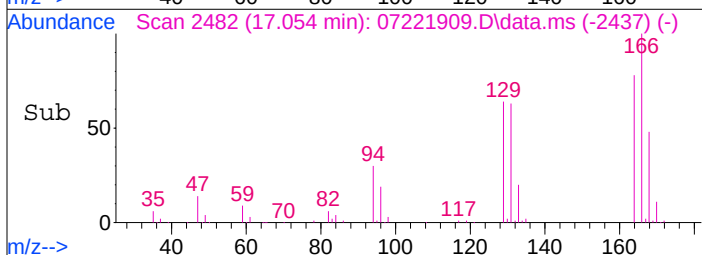
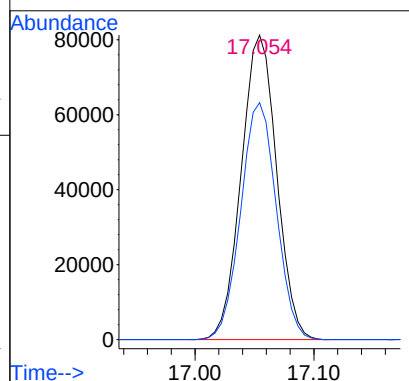
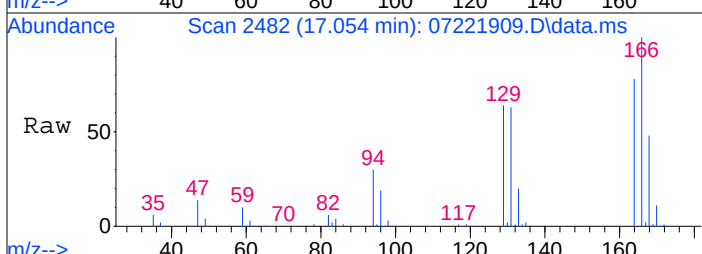
Tgt Ion: 43 Resp: 3511
Ion Ratio Lower Upper
43 100
56 30.3 24.6 64.6
73 23.0 0.0 37.8





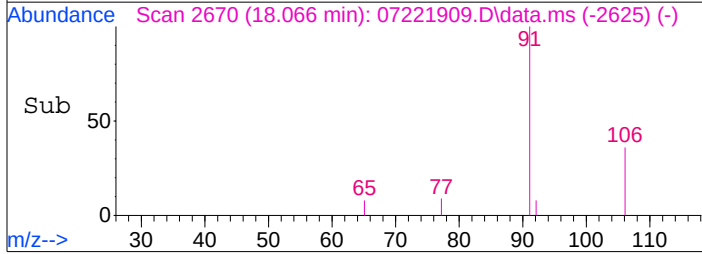
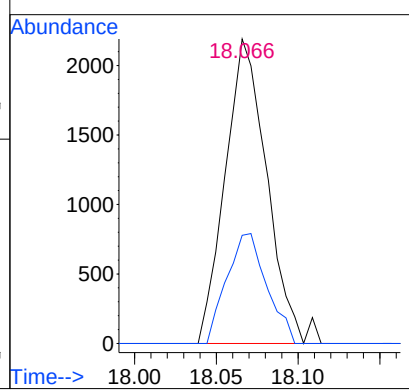
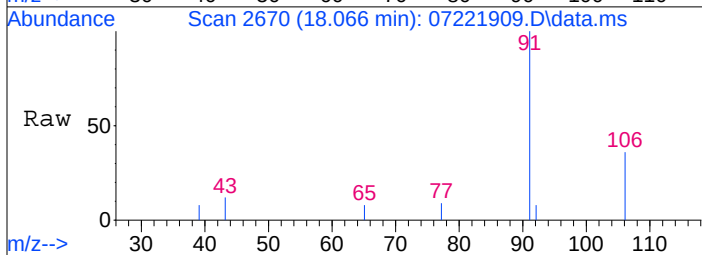
#64
 Tetrachloroethene
 Concen: 10.78 ng
 RT: 17.05 min Scan# 2482
 Delta R.T. -0.005 min
 Lab File: 07221909.D
 Acq: 22 Jul 2019 11:54

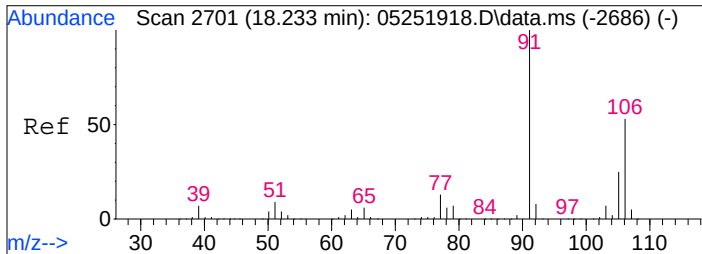
Tgt Ion:166	Resp: 168865
Ion Ratio	Lower Upper
166	100
164	78.0 58.4 98.4



#66
 Ethylbenzene
 Concen: 0.06 ng
 RT: 18.07 min Scan# 2670
 Delta R.T. -0.005 min
 Lab File: 07221909.D
 Acq: 22 Jul 2019 11:54

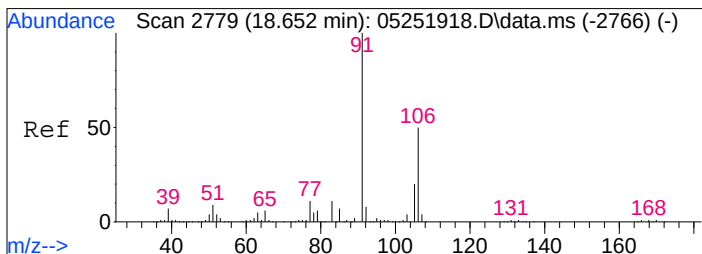
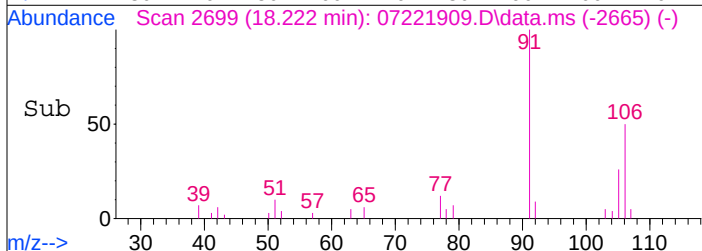
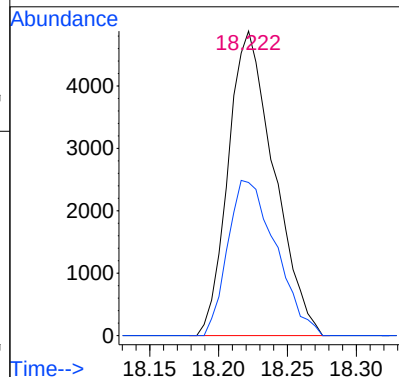
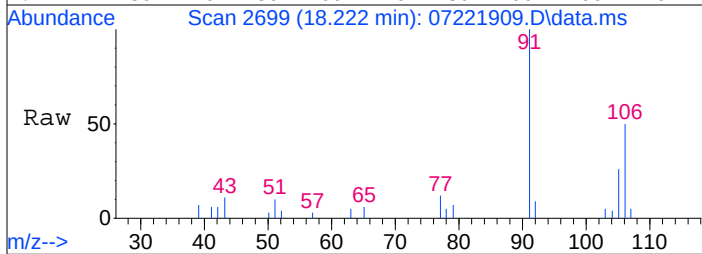
Tgt Ion: 91	Resp: 3904
Ion Ratio	Lower Upper
91	100
106	34.5 13.4 53.4





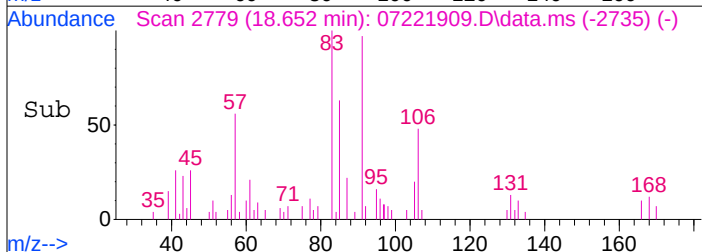
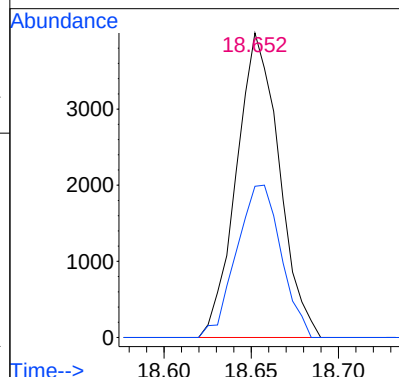
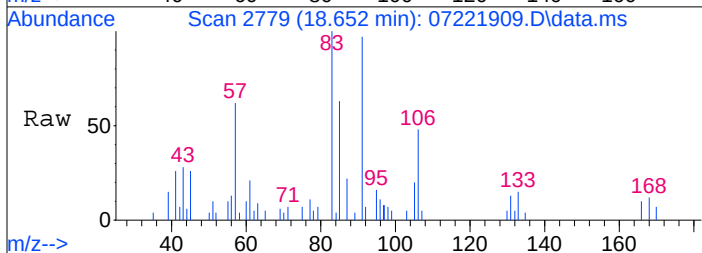
#67
m- & p-Xylenes
Concen: 0.25 ng
RT: 18.22 min Scan# 2699
Delta R.T. -0.016 min
Lab File: 07221909.D
Acq: 22 Jul 2019 11:54

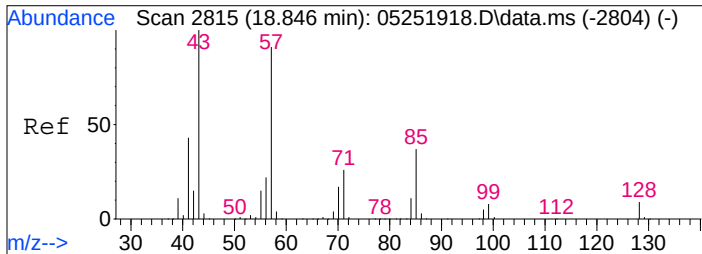
Tgt Ion: 91 Resp: 11287
Ion Ratio Lower Upper
91 100
106 53.6 33.4 73.4



#70
o-Xylene
Concen: 0.15 ng
RT: 18.65 min Scan# 2779
Delta R.T. -0.011 min
Lab File: 07221909.D
Acq: 22 Jul 2019 11:54

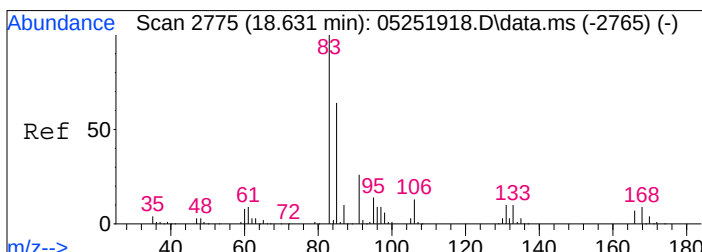
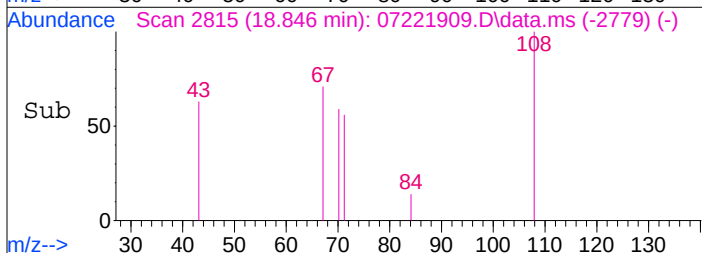
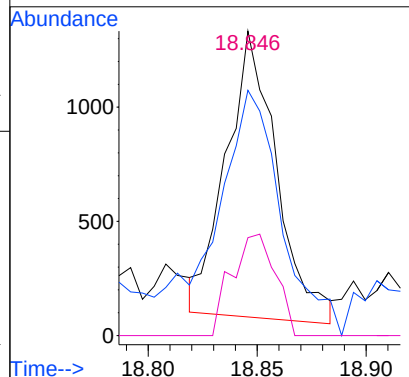
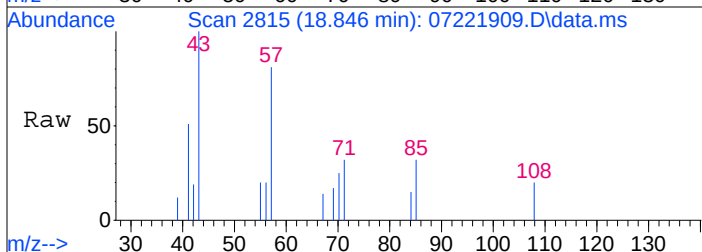
Tgt Ion: 91 Resp: 6808
Ion Ratio Lower Upper
91 100
106 52.3 30.6 70.6





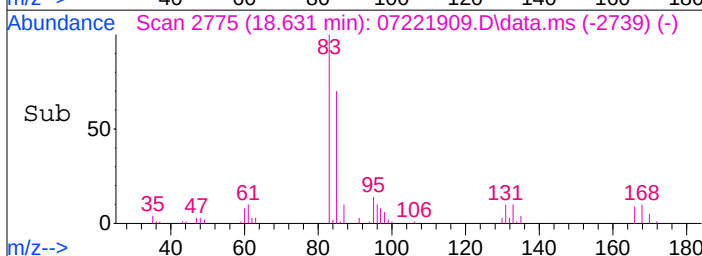
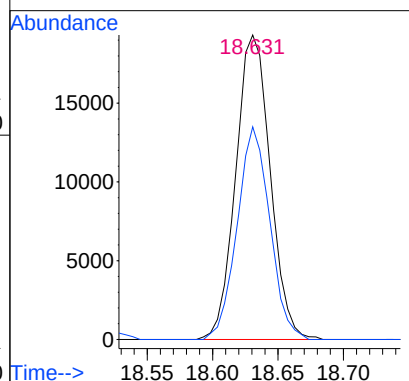
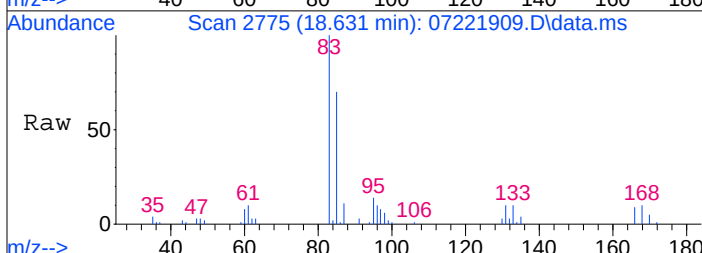
#71
n-Nonane
Concen: 0.08 ng
RT: 18.85 min Scan# 2815
Delta R.T. -0.005 min
Lab File: 07221909.D
Acq: 22 Jul 2019 11:54

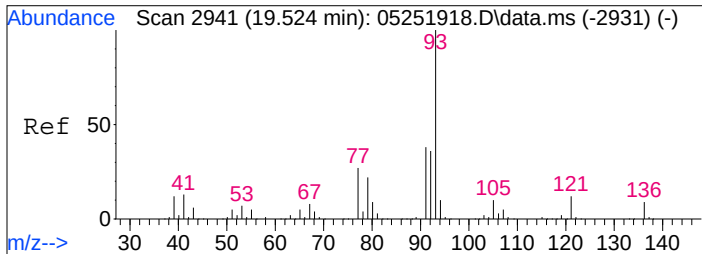
Tgt Ion:	43	Resp:	2010
Ion Ratio	Lower	Upper	
43	100		
57	112.8	71.7	111.7#
85	30.8	18.7	58.7



#72
1,1,2,2-Tetrachloroethane
Concen: 1.75 ng
RT: 18.63 min Scan# 2775
Delta R.T. -0.005 min
Lab File: 07221909.D
Acq: 22 Jul 2019 11:54

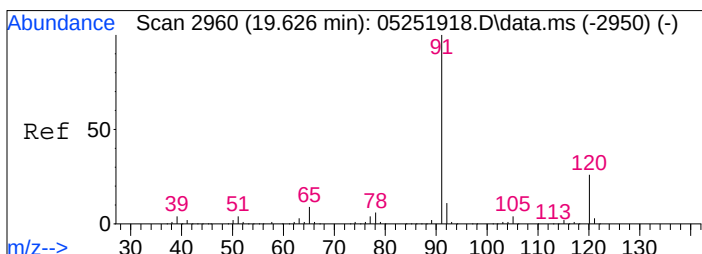
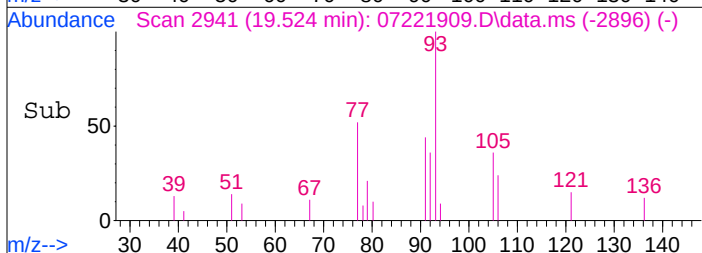
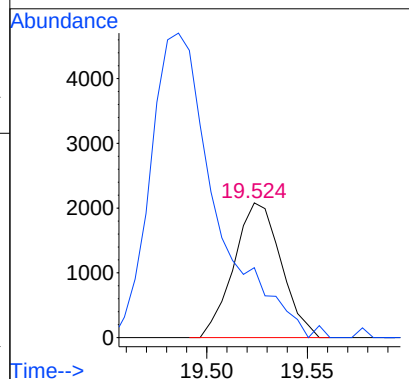
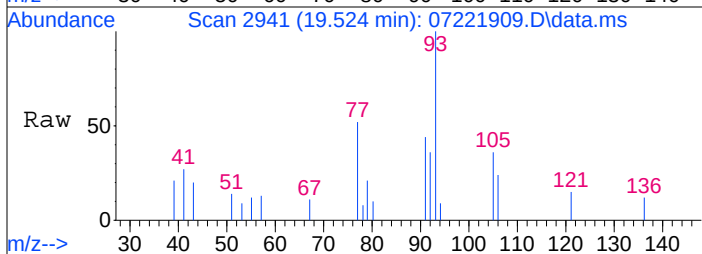
Tgt Ion:	83	Resp:	35536
Ion Ratio	Lower	Upper	
83	100		
85	66.1	44.6	84.6





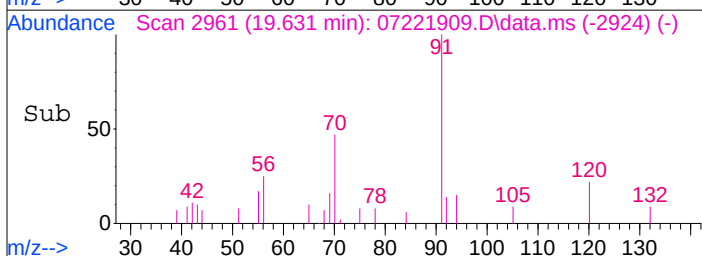
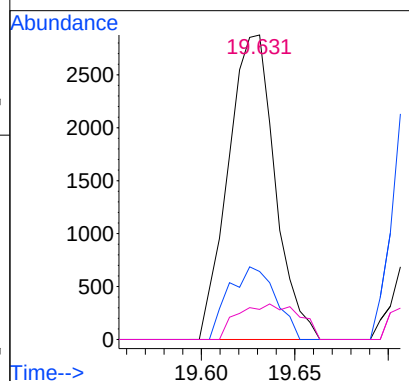
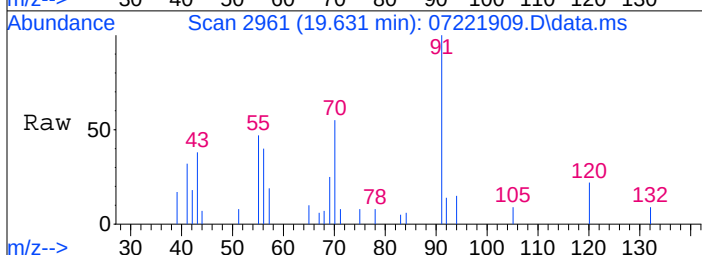
#75
 alpha-Pinene
 Concen: 0.11 ng
 RT: 19.52 min Scan# 2941
 Delta R.T. -0.005 min
 Lab File: 07221909.D
 Acq: 22 Jul 2019 11:54

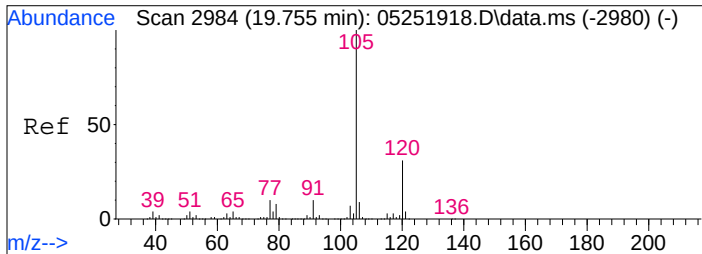
Tgt Ion: 93 Resp: 3392
 Ion Ratio Lower Upper
 93 100
 77 313.9 7.0 47.0#



#76
 n-Propylbenzene
 Concen: 0.07 ng
 RT: 19.63 min Scan# 2961
 Delta R.T. -0.000 min
 Lab File: 07221909.D
 Acq: 22 Jul 2019 11:54

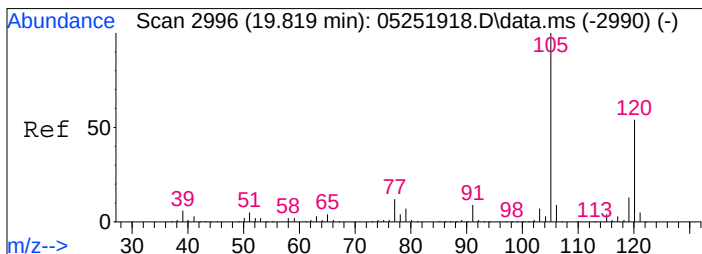
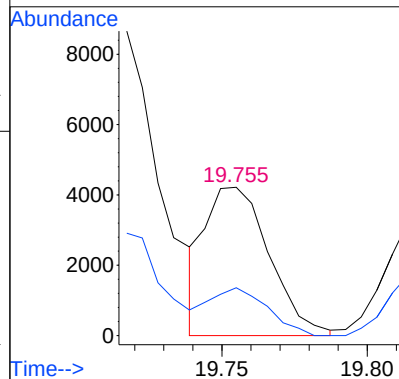
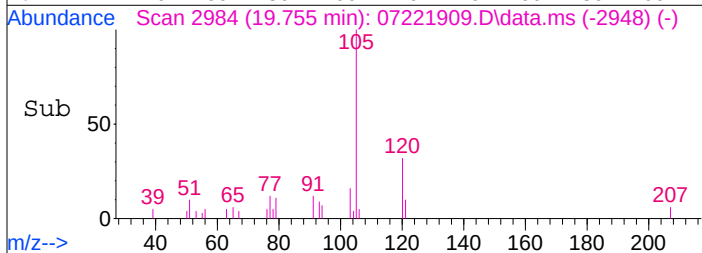
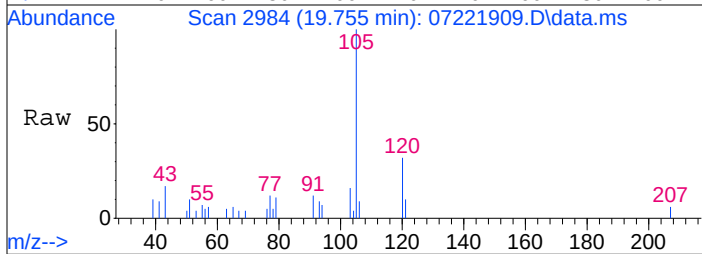
Tgt Ion: 91 Resp: 5010
 Ion Ratio Lower Upper
 91 100
 120 23.9 5.3 45.3
 65 15.3 0.0 29.3





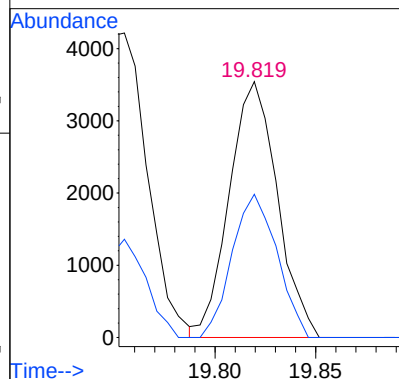
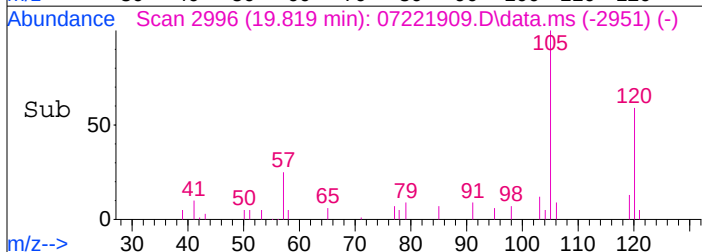
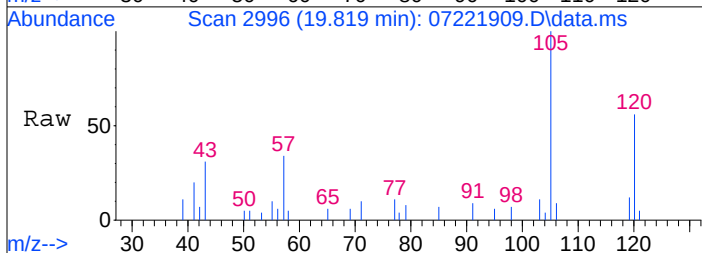
#78
4-Ethyltoluene
Concen: 0.12 ng
RT: 19.75 min Scan# 2984
Delta R.T. -0.005 min
Lab File: 07221909.D
Acq: 22 Jul 2019 11:54

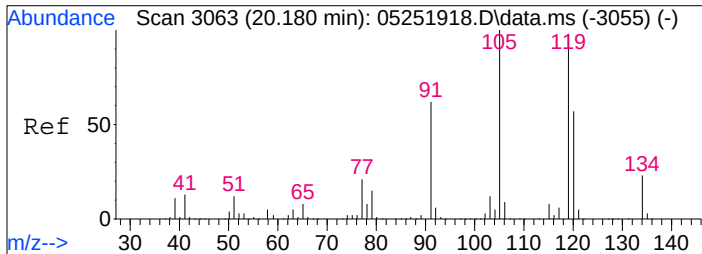
Tgt Ion:105 Resp: 6463
Ion Ratio Lower Upper
105 100
120 30.0 11.7 51.7



#79
1,3,5-Trimethylbenzene
Concen: 0.12 ng
RT: 19.82 min Scan# 2996
Delta R.T. -0.006 min
Lab File: 07221909.D
Acq: 22 Jul 2019 11:54

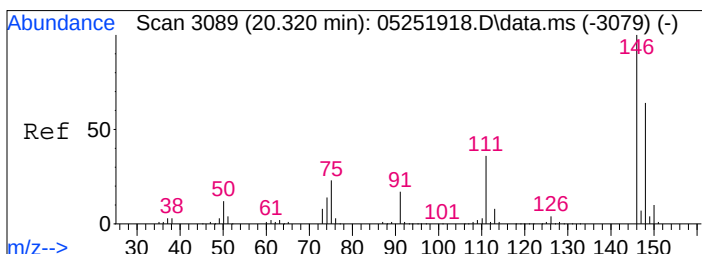
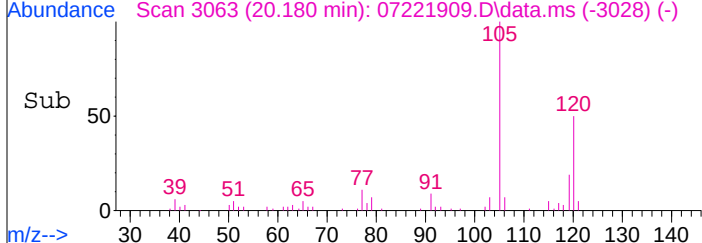
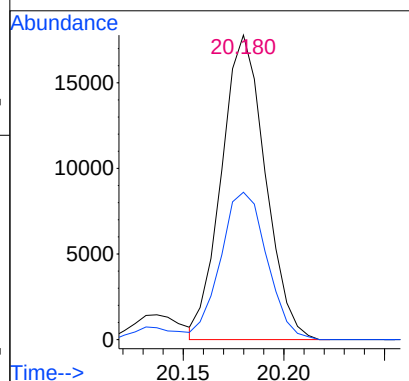
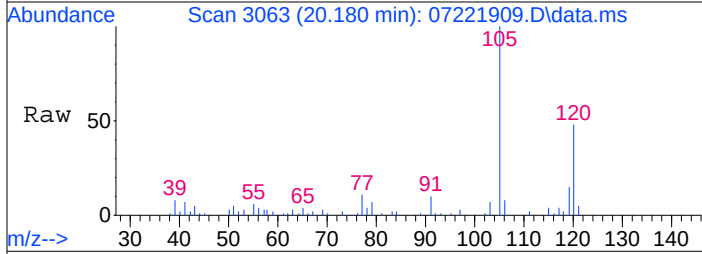
Tgt Ion:105 Resp: 5880
Ion Ratio Lower Upper
105 100
120 52.4 34.0 74.0





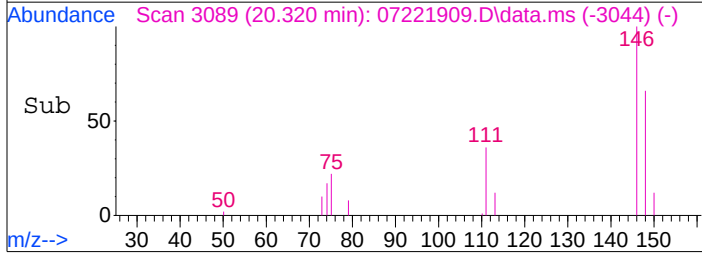
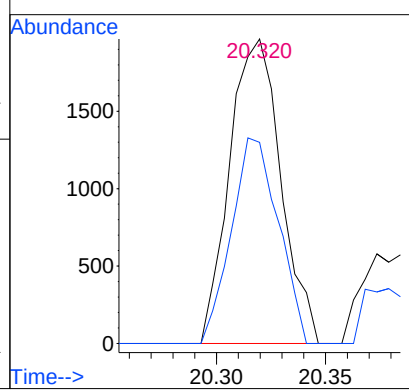
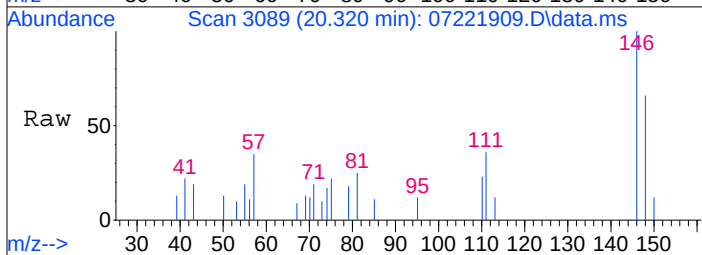
#82
 1,2,4-Trimethylbenzene
 Concen: 0.58 ng
 RT: 20.18 min Scan# 3063
 Delta R.T. -0.011 min
 Lab File: 07221909.D
 Acq: 22 Jul 2019 11:54

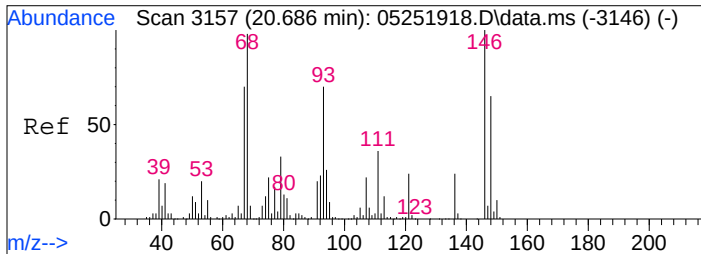
Tgt Ion:105	Resp:	26972
Ion Ratio	Lower	Upper
105	100	
120	51.0	37.4 77.4



#85
 1,3-Dichlorobenzene
 Concen: 0.11 ng
 RT: 20.32 min Scan# 3089
 Delta R.T. -0.005 min
 Lab File: 07221909.D
 Acq: 22 Jul 2019 11:54

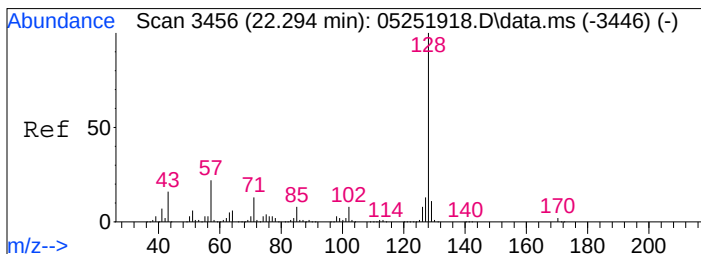
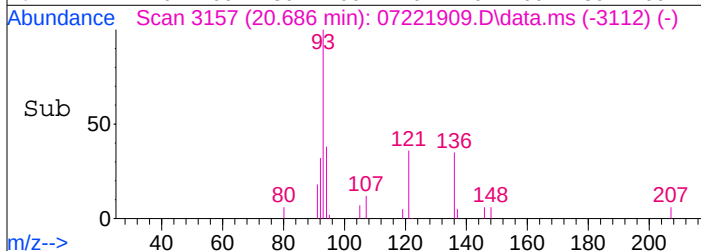
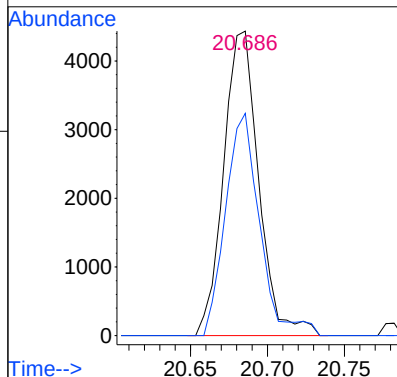
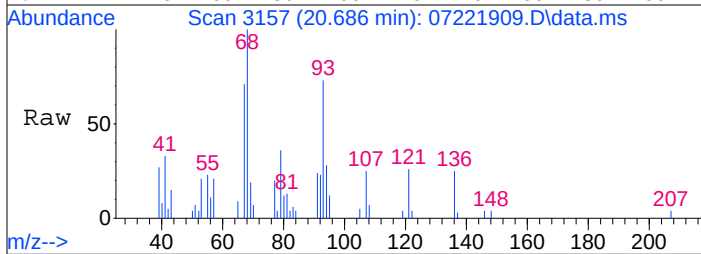
Tgt Ion:146	Resp:	3217
Ion Ratio	Lower	Upper
146	100	
148	62.0	44.1 84.1





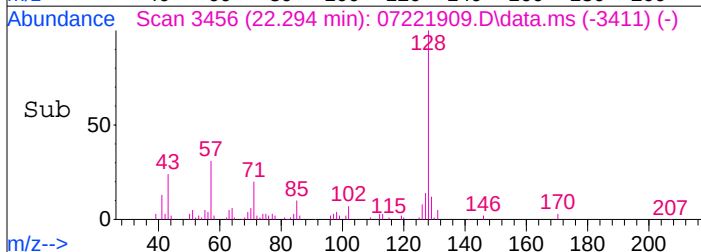
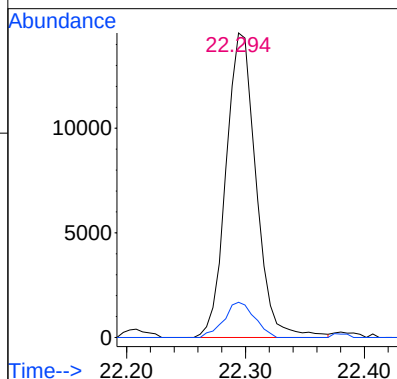
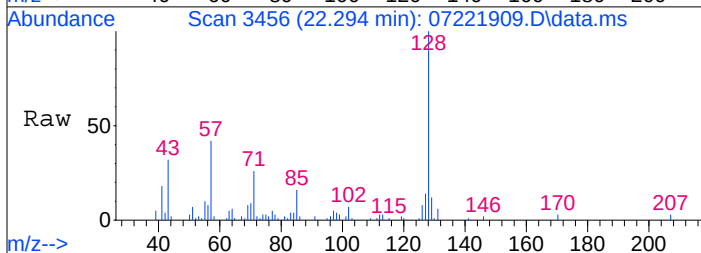
#91
d-Limonene
Concen: 0.39 ng
RT: 20.69 min Scan# 3157
Delta R.T. -0.005 min
Lab File: 07221909.D
Acq: 22 Jul 2019 11:54

Tgt Ion: 68 Resp: 7045
Ion Ratio Lower Upper
68 100
93 70.9 50.9 90.9



#95
Naphthalene
Concen: 0.49 ng
RT: 22.29 min Scan# 3456
Delta R.T. -0.005 min
Lab File: 07221909.D
Acq: 22 Jul 2019 11:54

Tgt Ion: 128 Resp: 25575
Ion Ratio Lower Upper
128 100
129 11.8 0.0 31.1



Data File: I:\MS08\Data\2019 07\22\07221904.D

Sample : MB R8072219 1000mL

Acq On : 22 Jul 2019 9:04

Misc : S31-07111901AS00703

ALS Vial : 1 Sample Multiplier: 1

Inst : MS08

Operator: RS

RS 7/22/19

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

Quant Time: Jul 22 10:43:19 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:57:28 2019

Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.23	130	142973	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.35	114	644694	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.67	82	275977	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.08	65	168549	11.861	ng	-0.03
Spiked Amount	12.500	Range 70 - 130	Recovery	=	94.88%	
57) Toluene-d8 (SS2)	15.81	98	692006	12.192	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.52%	
73) Bromofluorobenzene (SS3)	19.06	174	244315	13.104	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	104.80%	

Target Compounds

						Qvalue
2) Propene	0.00	42	0	N.D.		
3) Dichlorodifluoromethan...	0.00	85	0	N.D.		
4) Chloromethane	0.00	50	0	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.		
6) Vinyl Chloride	0.00	62	0	N.D.		
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	0.00	45	0	N.D. d		
11) Acetonitrile	0.00	41	0	N.D.		
12) Acrolein	0.00	56	0	N.D.		
13) Acetone	7.17	58	892	0.108	ng	88
14) Trichlorofluoromethane	0.00	101	0	N.D.		
15) 2-Propanol (Isopropanol)	0.00	45	0	N.D.		
16) Acrylonitrile	0.00	53	0	N.D.		
17) 1,1-Dichloroethene	0.00	96	0	N.D.		
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.		
19) Methylene Chloride	0.00	84	0	N.D.		
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.		
21) Trichlorotrifluoroethane	0.00	151	0	N.D.		
22) Carbon Disulfide	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	0.00	78	0	N.D. d		
42) Carbon Tetrachloride	0.00	117	0	N.D.		
43) Cyclohexane	0.00	84	0	N.D. 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:\MS08\Data\2019 07\22\07221904.D

Sample : MB R8072219 1000mL

Acq On : 22 Jul 2019 9:04

Misc : S31-07111901AS00703

ALS Vial : 1 Sample Multiplier: 1

Inst : MS08

Operator: RS

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

Quant Time: Jul 22 10:43:19 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:57:28 2019

Response via : Initial Calibration

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	0.00	43	0	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	0.00	43	0	N.D.		
63) n-Octane	0.00	57	0	N.D.		
64) Tetrachloroethene	0.00	166	0	N.D.		
65) Chlorobenzene	0.00	112	0	N.D.		
66) Ethylbenzene	0.00	91	0	N.D.		
67) m- & p-Xylenes	0.00	91	0	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	0.00	104	0	N.D.		
70) o-Xylene	0.00	91	0	N.D.	d	
71) n-Nonane	0.00	43	0	N.D.		
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.		
74) Cumene	0.00	105	0	N.D.	d	
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	0.00	91	0	N.D.	d	
77) 3-Ethyltoluene	0.00	105	0	N.D.	d	
78) 4-Ethyltoluene	0.00	105	0	N.D.	d	
79) 1,3,5-Trimethylbenzene	0.00	105	0	N.D.	d	
80) alpha-Methylstyrene	0.00	118	0	N.D.		
81) 2-Ethyltoluene	0.00	105	0	N.D.	d	
82) 1,2,4-Trimethylbenzene	0.00	105	0	N.D.	d	
83) n-Decane	0.00	57	0	N.D.		
84) Benzyl Chloride	0.00	91	0	N.D.	d	
85) 1,3-Dichlorobenzene	0.00	146	0	N.D.	d	
86) 1,4-Dichlorobenzene	0.00	146	0	N.D.	d	
87) sec-Butylbenzene	0.00	105	0	N.D.		
88) 4-Isopropyltoluene (p-...	0.00	119	0	N.D.	d	
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	0.00	68	0	N.D.		
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	0.00	57	0	N.D.	d	
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	0.00	128	0	N.D.	d	
96) n-Dodecane	0.00	57	0	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.		
99) tert-Butylbenzene	0.00	119	0	N.D.		
100) n-Butylbenzene	0.00	91	0	N.D.		

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

Data File: I:\MS08\Data\2019 07\22\07221904.D

Sample : MB R8072219 1000mL

Acq On : 22 Jul 2019 9:04

Misc : S31-07111901AS00703

ALS Vial : 1 Sample Multiplier: 1

Inst : MS08

Operator: RS

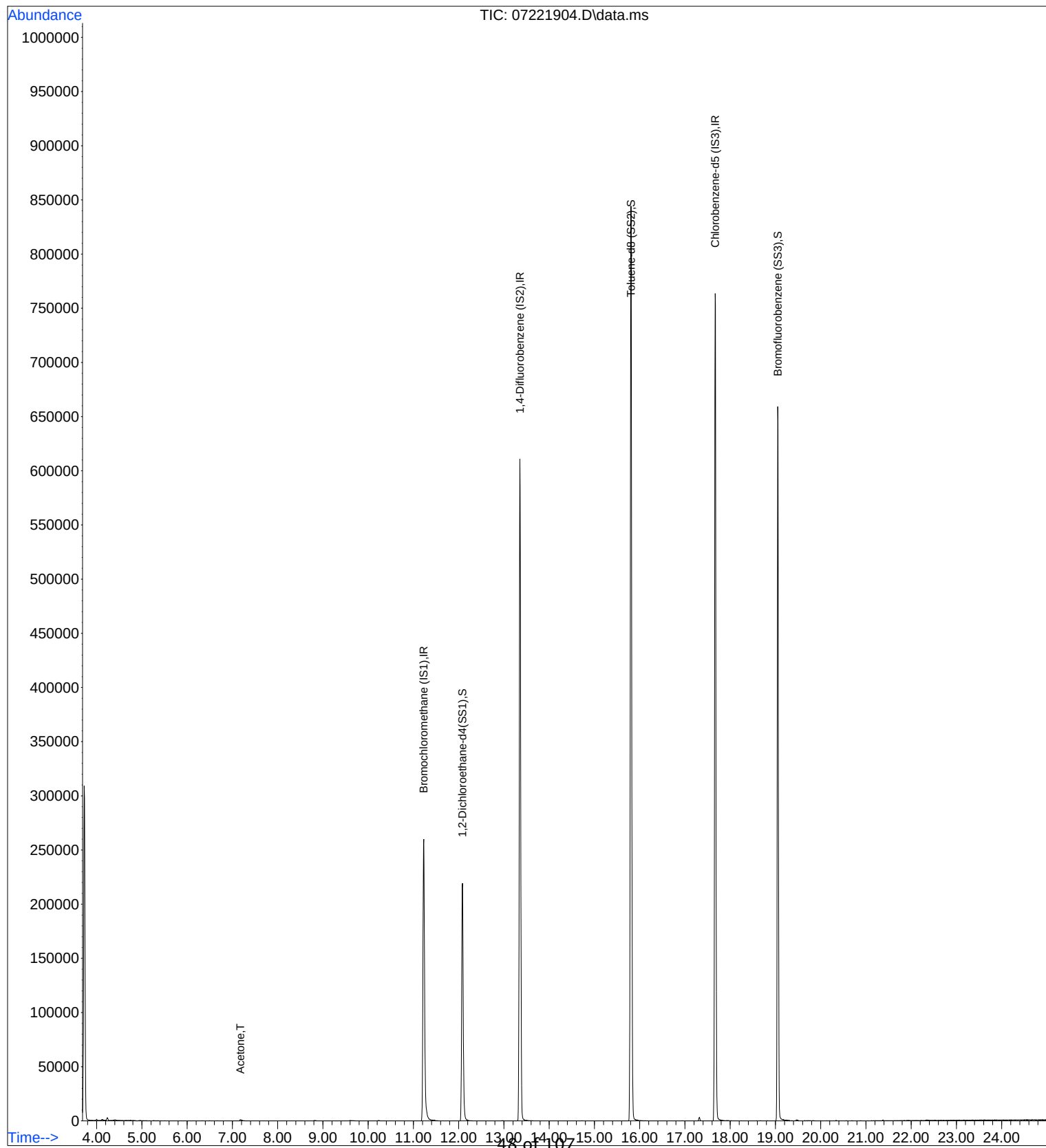
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

Quant Time: Jul 22 10:43:19 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:57:28 2019

Response via : Initial Calibration



Data File: I:\MS08\Data\2019 07\22\07221905.D

Sample : LCS R8072219 25ng Inst : MS08
 Acq On : 22 Jul 2019 9:36 Operator: RS
 Misc : S31-07111901/S31-07151909 (8/13)
 ALS Vial : 1 Sample Multiplier: 1

RS 7/22/19

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

Quant Time: Jul 22 10:18:00 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:57:28 2019

Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.25	130	152649	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.36	114	674061	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	287845	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	177196	11.679	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	93.44%	
57) Toluene-d8 (SS2)	15.81	98	720693	12.174	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.36%	
73) Bromofluorobenzene (SS3)	19.06	174	255708	13.150	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	105.20%	

Target Compounds

						Qvalue
2) Propene	4.16	42	283077	22.650	ng	98
3) Dichlorodifluoromethan...	4.31	85	399794	20.514	ng	100
4) Chloromethane	4.60	50	288912	19.658	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.86	135	248401	22.546	ng	99
6) Vinyl Chloride	5.03	62	346238	23.939	ng	100
7) 1,3-Butadiene	5.29	54	281670	24.243	ng	97
8) Bromomethane	5.74	94	219366	22.337	ng	99
9) Chloroethane	6.07	64	199115	21.977	ng	99
10) Ethanol	6.46	45	955979	108.125	ng	99
11) Acetonitrile	6.71	41	506904	22.575	ng	99
12) Acrolein	6.89	56	165392	25.334	ng	100
13) Acetone	7.10	58	999487	113.384	ng	92
14) Trichlorofluoromethane	7.34	101	344503	20.581	ng	100
15) 2-Propanol (Isopropanol)	7.60	45	1324288	43.820	ng	99
16) Acrylonitrile	7.86	53	357679	27.255	ng	98
17) 1,1-Dichloroethene	8.30	96	248419	22.113	ng	96
18) 2-Methyl-2-Propanol (t...	8.47	59	1293126	45.833	ng	99
19) Methylene Chloride	8.53	84	254699	22.751	ng	100
20) 3-Chloro-1-propene (Al...	8.69	41	415465	24.281	ng	100
21) Trichlorotrifluoroethane	8.94	151	236878	21.524	ng	99
22) Carbon Disulfide	8.79	76	905468	23.512	ng	100
23) trans-1,2-Dichloroethene	9.80	61	338326	23.069	ng	98
24) 1,1-Dichloroethane	10.05	63	422803	21.554	ng	100
25) Methyl tert-Butyl Ether	10.15	73	777168	21.892	ng	99
26) Vinyl Acetate	10.31	86	395769	135.633	ng	95
27) 2-Butanone (MEK)	10.55	72	202694	26.887	ng	99
28) cis-1,2-Dichloroethene	11.07	61	319649	21.494	ng	98
29) Diisopropyl Ether	11.36	87	267271	22.881	ng	98
30) Ethyl Acetate	11.37	61	191896	52.820	ng	99
31) n-Hexane	11.35	57	438906	22.808	ng	99
32) Chloroform	11.41	83	378081	21.268	ng	100
34) Tetrahydrofuran (THF)	11.81	72	189429	22.638	ng	100
35) Ethyl tert-Butyl Ether	11.95	87	337804	22.374	ng	98
36) 1,2-Dichloroethane	12.21	62	265805	20.409	ng	98
38) 1,1,1-Trichloroethane	12.49	97	333027	20.989	ng	100
39) Isopropyl Acetate	12.92	61	342192	44.917	ng	95
40) 1-Butanol	12.94	56	589892	58.338	ng	96
41) Benzene	12.97	78	1035685	21.378	ng	99
42) Carbon Tetrachloride	13.13	117	288969	21.080	ng	100
43) Cyclohexane	13.26	84	874852	41.858	ng	99
44) tert-Amyl Methyl Ether	13.61	73	756927	22.529	ng	100
45) 1,2-Dichloropropane	13.82	63	251229	22.273	ng	99
46) Bromodichloromethane	14.01	83	304402	22.855	ng	100
47) Trichloroethene	14.06	130	290754	22.291	ng	100
48) 1,4-Dioxane	14.04	88	245082	25.389	ng	99
49) 2,2,4-Trimethylpentane...	14.13	57	1129992	21.137	ng	98
50) Methyl Methacrylate	14.27	100	264349	53.786	ng	98

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Data File: I:\MS08\Data\2019 07\22\07221905.D

Sample : LCS R8072219 25ng Inst : MS08
 Acq On : 22 Jul 2019 9:36 Operator: RS
 Misc : S31-07111901/S31-07151909 (8/13)
 ALS Vial : 1 Sample Multiplier: 1

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

Quant Time: Jul 22 10:18:00 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:57:28 2019

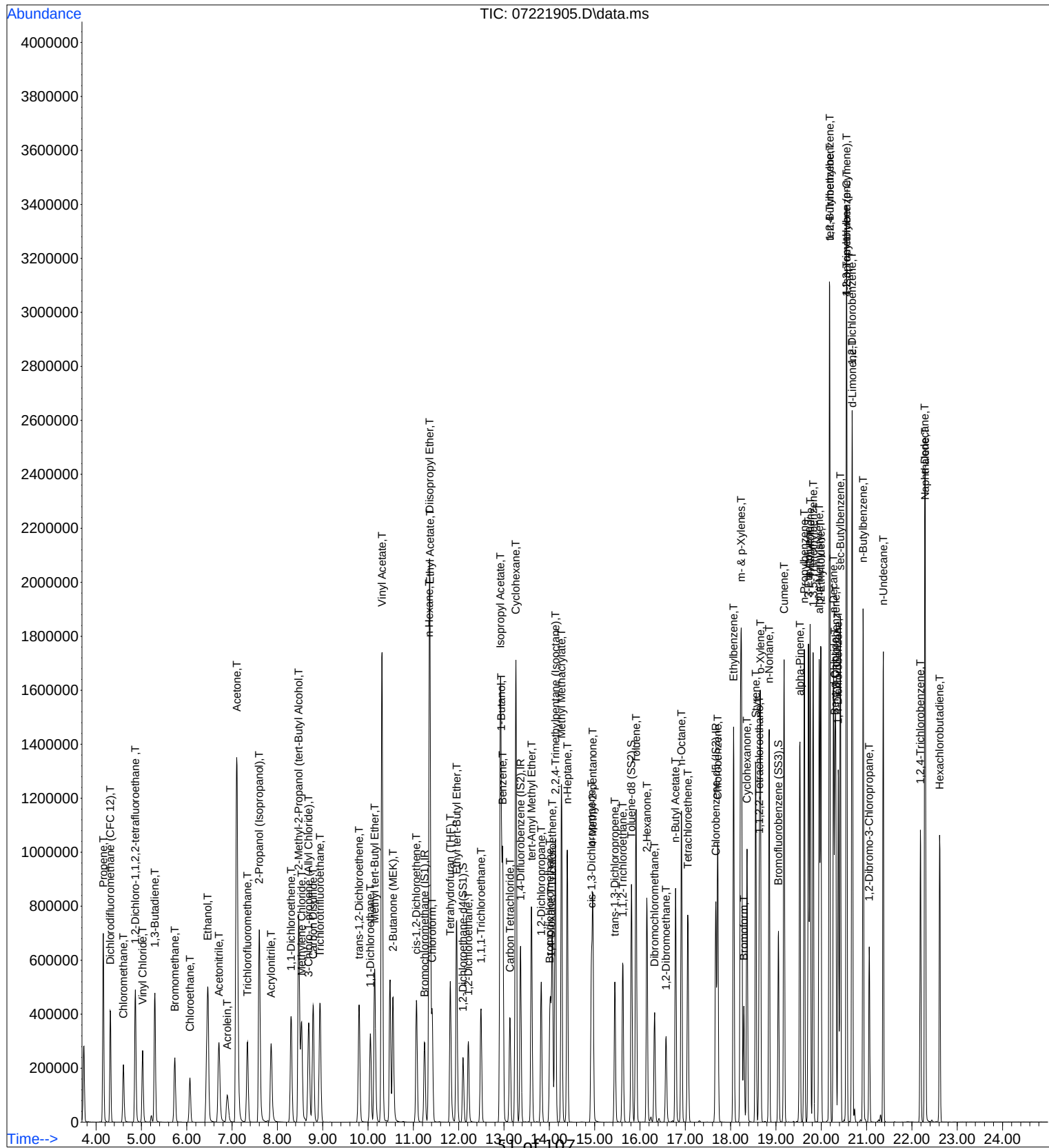
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.40	71	301373	22.723	ng	99
52) cis-1,3-Dichloropropene	14.93	75	411150	25.078	ng	100
53) 4-Methyl-2-pentanone	14.96	58	265448	26.948	ng	99
54) trans-1,3-Dichloropropene	15.45	75	357206	26.021	ng	100
55) 1,1,2-Trichloroethane	15.62	97	251013	22.813	ng	100
58) Toluene	15.91	91	1077804	21.518	ng	100
59) 2-Hexanone	16.15	43	645924	27.223	ng	99
60) Dibromochloromethane	16.32	129	283619	23.304	ng	100
61) 1,2-Dibromoethane	16.58	107	283762	23.326	ng	100
62) n-Butyl Acetate	16.79	43	716833	27.642	ng	99
63) n-Octane	16.91	57	239794	21.578	ng	99
64) Tetrachloroethene	17.05	166	317732	20.784	ng	99
65) Chlorobenzene	17.72	112	731126	20.873	ng	100
66) Ethylbenzene	18.07	91	1209897	20.180	ng	99
67) m- & p-Xylenes	18.23	91	1811973	40.443	ng	98
68) Bromoform	18.29	173	250111	24.194	ng	99
69) Styrene	18.56	104	811161	23.349	ng	98
70) o-Xylene	18.66	91	923628	20.293	ng	98
71) n-Nonane	18.85	43	540803	21.116	ng	100
72) 1,1,2,2-Tetrachloroethane	18.63	83	427801	21.586	ng	100
74) Cumene	19.18	105	1254996	20.404	ng	99
75) alpha-Pinene	19.53	93	644364	21.963	ng	98
76) n-Propylbenzene	19.63	91	1455832	21.190	ng	99
77) 3-Ethyltoluene	19.72	105	1197625	19.986	ng	99
78) 4-Ethyltoluene	19.76	105	1241188	23.199	ng	99
79) 1,3,5-Trimethylbenzene	19.82	105	1006406	20.758	ng	98
80) alpha-Methylstyrene	19.95	118	601341	24.535	ng	99
81) 2-Ethyltoluene	19.99	105	1216707	21.590	ng	99
82) 1,2,4-Trimethylbenzene	20.19	105	974751	21.317	ng	97
83) n-Decane	20.27	57	564791	21.452	ng	100
84) Benzyl Chloride	20.30	91	807514	27.302	ng	98
85) 1,3-Dichlorobenzene	20.32	146	610539	22.348	ng	100
86) 1,4-Dichlorobenzene	20.37	146	624745	22.955	ng	100
87) sec-Butylbenzene	20.42	105	1388422	21.552	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	1260052	20.801	ng	98
89) 1,2,3-Trimethylbenzene	20.56	105	993573	20.356	ng	98
90) 1,2-Dichlorobenzene	20.68	146	569022	23.640	ng	100
91) d-Limonene	20.69	68	400932	22.730	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.06	157	224698	24.858	ng	96
93) n-Undecane	21.37	57	556401	21.751	ng	100
94) 1,2,4-Trichlorobenzene	22.19	180	402983	22.844	ng	100
95) Naphthalene	22.29	128	1225403	23.972	ng	100
96) n-Dodecane	22.28	57	440930	28.378	ng	99
97) Hexachlorobutadiene	22.61	225	243618	19.027	ng	99
98) Cyclohexanone	18.36	55	459490	26.859	ng	99
99) tert-Butylbenzene	20.19	119	1001752	21.296	ng	99
100) n-Butylbenzene	20.92	91	1050879	21.251	ng	99

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

Inst : MS08
Operator: RS

Response via : Initial Calibration



Data File: I:\MS08\Data\2019 07\22\07221910.D

Sample : LCSD R8072219 25ng

Acq On : 22 Jul 2019 12:27

Misc : S31-07111901/S31-07151909 (8/13)

ALS Vial : 1 Sample Multiplier: 1

Inst : MS08

Operator: RS

RS 7/22/19

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

Quant Time: Jul 22 13:02:28 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:57:28 2019

Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.25	130	153636	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.36	114	676117	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	291179	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.10	65	179111	11.729	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	93.84%
57) Toluene-d8 (SS2)	15.81	98	726553	12.132	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.04%
73) Bromofluorobenzene (SS3)	19.06	174	261604	13.299	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	106.40%

Target Compounds

						Qvalue
2) Propene	4.16	42	288666	22.948	ng	98
3) Dichlorodifluoromethan...	4.32	85	408627	20.832	ng	100
4) Chloromethane	4.61	50	300181	20.294	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.87	135	251801	22.708	ng	99
6) Vinyl Chloride	5.03	62	353260	24.268	ng	100
7) 1,3-Butadiene	5.30	54	287879	24.618	ng	97
8) Bromomethane	5.74	94	221951	22.455	ng	100
9) Chloroethane	6.07	64	201388	22.086	ng	99
10) Ethanol	6.47	45	975937	109.673	ng	99
11) Acetonitrile	6.71	41	518706	22.953	ng	99
12) Acrolein	6.90	56	170049	25.880	ng	100
13) Acetone	7.11	58	1016768	114.604	ng	92
14) Trichlorofluoromethane	7.34	101	348980	20.714	ng	100
15) 2-Propanol (Isopropanol)	7.61	45	1358295	44.656	ng	99
16) Acrylonitrile	7.87	53	365198	27.649	ng	98
17) 1,1-Dichloroethene	8.31	96	253161	22.390	ng	97
18) 2-Methyl-2-Propanol (t...	8.47	59	1336745	47.074	ng	99
19) Methylene Chloride	8.54	84	259438	23.025	ng	100
20) 3-Chloro-1-propene (Al...	8.69	41	422952	24.560	ng	100
21) Trichlorotrifluoroethane	8.94	151	240046	21.672	ng	99
22) Carbon Disulfide	8.79	76	915135	23.611	ng	100
23) trans-1,2-Dichloroethene	9.80	61	345193	23.386	ng	99
24) 1,1-Dichloroethane	10.06	63	429390	21.749	ng	100
25) Methyl tert-Butyl Ether	10.15	73	791084	22.141	ng	99
26) Vinyl Acetate	10.31	86	401360	136.665	ng	96
27) 2-Butanone (MEK)	10.55	72	204812	26.994	ng	100
28) cis-1,2-Dichloroethene	11.07	61	323434	21.609	ng	98
29) Diisopropyl Ether	11.36	87	271989	23.136	ng	98
30) Ethyl Acetate	11.37	61	194254	53.125	ng	100
31) n-Hexane	11.35	57	444930	22.973	ng	100
32) Chloroform	11.42	83	384911	21.513	ng	100
34) Tetrahydrofuran (THF)	11.81	72	191429	22.730	ng	99
35) Ethyl tert-Butyl Ether	11.95	87	344059	22.642	ng	99
36) 1,2-Dichloroethane	12.21	62	270416	20.630	ng	99
38) 1,1,1-Trichloroethane	12.49	97	336601	21.150	ng	99
39) Isopropyl Acetate	12.92	61	344801	45.122	ng	97
40) 1-Butanol	12.94	56	607568	59.904	ng	96
41) Benzene	12.97	78	1048094	21.568	ng	100
42) Carbon Tetrachloride	13.13	117	291561	21.204	ng	100
43) Cyclohexane	13.26	84	884721	42.201	ng	99
44) tert-Amyl Methyl Ether	13.61	73	778226	23.093	ng	99
45) 1,2-Dichloropropane	13.82	63	256163	22.641	ng	100
46) Bromodichloromethane	14.01	83	309143	23.140	ng	100
47) Trichloroethene	14.07	130	294164	22.484	ng	100
48) 1,4-Dioxane	14.04	88	247156	25.526	ng	99
49) 2,2,4-Trimethylpentane...	14.13	57	1146995	21.390	ng	98
50) Methyl Methacrylate	14.27	100	266194	53.997	ng	99

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Data File: I:\MS08\Data\2019 07\22\07221910.D

Sample : LCSD R8072219 25ng

Acq On : 22 Jul 2019 12:27

Misc : S31-07111901/S31-07151909 (8/13)

ALS Vial : 1 Sample Multiplier: 1

Inst : MS08

Operator: RS

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

Quant Time: Jul 22 13:02:28 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:57:28 2019

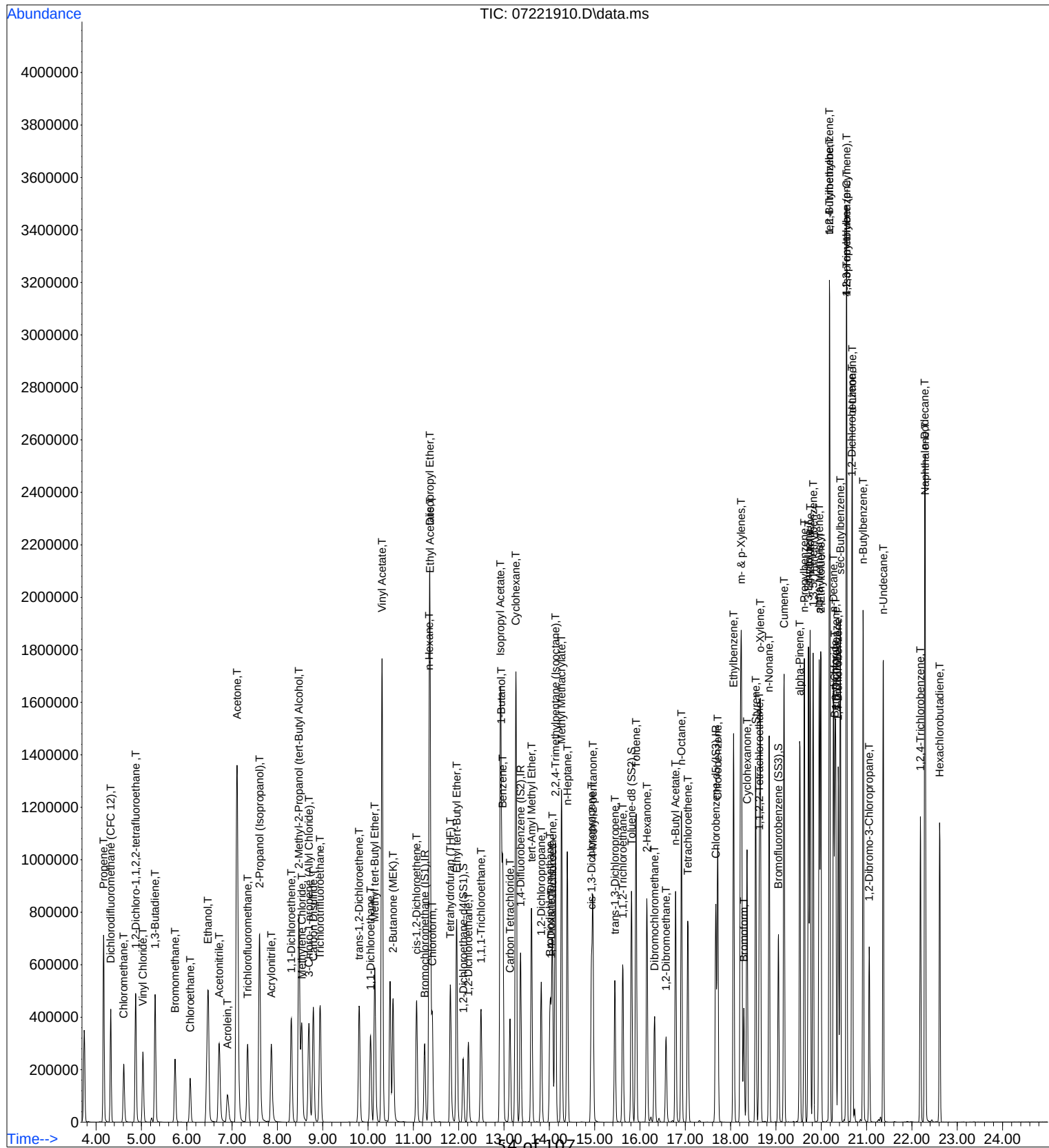
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.40	71	302557	22.743	ng	99
52) cis-1,3-Dichloropropene	14.93	75	417358	25.379	ng	100
53) 4-Methyl-2-pentanone	14.96	58	269975	27.324	ng	99
54) trans-1,3-Dichloropropene	15.45	75	365478	26.543	ng	100
55) 1,1,2-Trichloroethane	15.62	97	254510	23.060	ng	99
58) Toluene	15.91	91	1088858	21.490	ng	100
59) 2-Hexanone	16.15	43	661111	27.544	ng	99
60) Dibromochloromethane	16.32	129	288301	23.418	ng	100
61) 1,2-Dibromoethane	16.58	107	288099	23.412	ng	99
62) n-Butyl Acetate	16.79	43	734083	27.983	ng	99
63) n-Octane	16.91	57	241481	21.481	ng	98
64) Tetrachloroethene	17.05	166	322043	20.824	ng	99
65) Chlorobenzene	17.72	112	739186	20.861	ng	100
66) Ethylbenzene	18.07	91	1225505	20.206	ng	99
67) m- & p-Xylenes	18.23	91	1830030	40.378	ng	98
68) Bromoform	18.29	173	252206	24.117	ng	100
69) Styrene	18.56	104	826053	23.505	ng	98
70) o-Xylene	18.65	91	935300	20.314	ng	97
71) n-Nonane	18.85	43	547360	21.127	ng	100
72) 1,1,2,2-Tetrachloroethane	18.63	83	433964	21.646	ng	100
74) Cumene	19.18	105	1274952	20.491	ng	99
75) alpha-Pinene	19.52	93	659752	22.230	ng	98
76) n-Propylbenzene	19.63	91	1472785	21.191	ng	99
77) 3-Ethyltoluene	19.72	105	1219712	20.122	ng	99
78) 4-Ethyltoluene	19.75	105	1252280	23.138	ng	98
79) 1,3,5-Trimethylbenzene	19.82	105	1022206	20.842	ng	98
80) alpha-Methylstyrene	19.95	118	613456	24.742	ng	99
81) 2-Ethyltoluene	19.99	105	1233226	21.632	ng	99
82) 1,2,4-Trimethylbenzene	20.18	105	992257	21.451	ng	97
83) n-Decane	20.27	57	575330	21.602	ng	100
84) Benzyl Chloride	20.30	91	825515	27.591	ng	98
85) 1,3-Dichlorobenzene	20.32	146	624043	22.580	ng	100
86) 1,4-Dichlorobenzene	20.37	146	639983	23.246	ng	100
87) sec-Butylbenzene	20.42	105	1415031	21.714	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	1277170	20.842	ng	98
89) 1,2,3-Trimethylbenzene	20.56	105	1010166	20.459	ng	98
90) 1,2-Dichlorobenzene	20.67	146	580760	23.851	ng	100
91) d-Limonene	20.69	68	411926	23.086	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.06	157	231072	25.271	ng	96
93) n-Undecane	21.37	57	576906	22.295	ng	100
94) 1,2,4-Trichlorobenzene	22.19	180	423127	23.711	ng	100
95) Naphthalene	22.29	128	1285849	24.866	ng	100
96) n-Dodecane	22.28	57	468969	29.837	ng	100
97) Hexachlorobutadiene	22.61	225	257607	19.889	ng	99
98) Cyclohexanone	18.36	55	473185	27.342	ng	99
99) tert-Butylbenzene	20.18	119	1014945	21.329	ng	99
100) n-Butylbenzene	20.92	91	1074244	21.475	ng	99

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

ALS Vial : 1 Sample Multiplier: 1

Response via : Initial Calibration



Method Path : I:\MS08\Methods\
Method File : R8052519.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Tue May 28 07:57:28 2019
Response Via : Initial Calibration

RS 528/19

Calibration Files

0.1 =05251913.D 0.2 =05251914.D 0.5 =05251915.D 1.0 =05251916.D 5.0 =05251917.D 25 =05251918.D 50 =05251919.D
100 =05251920.D

Compound 0.1 0.2 0.5 1.0 5.0 25 50 100 Avg %RSD

-----ISTD-----										
1) IR Bromochloromethane...										
2) T Propene	1.217	1.192	1.158	0.979	0.927	0.856	0.835	1.023		15.89
3) T Dichlorodifluo...	2.091	1.778	1.785	1.723	1.459	1.406	1.314	1.210	1.596	18.54
4) T Chloromethane	1.616	1.378	1.376	1.289	1.047	1.080	1.021	0.821	1.203	21.25
5) T 1,2-Dichloro-1...	1.204	1.036	0.980	0.917	0.807	0.788	0.769	0.716	0.902	18.25
6) T Vinyl Chloride	1.472	1.261	1.275	1.265	1.082	1.072	1.058	0.988	1.184	13.57
7) T 1,3-Butadiene	0.985	0.935	0.992	1.040	0.936	0.947	0.920	0.858	0.951	5.73
8) T Bromomethane	0.977	0.890	0.870	0.868	0.738	0.747	0.712	0.631	0.804	14.23
9) T Chloroethane	0.913	0.836	0.819	0.780	0.681	0.672	0.635	0.600	0.742	14.90
10) T Ethanol	0.998	0.851	0.776	0.756	0.636	0.642	0.591	0.543	0.724	20.88
11) T Acetonitrile	2.149	2.061	1.925	1.897	1.686	1.732	1.666	1.594	1.839	10.90
12) T Acrolein	0.482	0.462	0.556	0.529	0.598	0.573	0.542	0.535	9.03	
13) T Acetone	0.913	0.872	0.826	0.700	0.646	0.583	0.513	0.722	21.08	
14) T Trichlorofluor...	1.754	1.482	1.525	1.483	1.257	1.229	1.151	1.085	1.371	16.51
15) T 2-Propanol (Is...	3.121	2.746	2.699	2.610	2.319	2.303	2.142	1.858	2.475	16.06
16) T Acrylonitrile	0.517	0.903	1.162	1.295	1.190	1.229	1.177	1.124	1.075	23.50
17) T 1,1-Dichloroet...	1.127	1.043	0.981	0.974	0.843	0.847	0.798	0.746	0.920	14.30
18) T Methyl-2-Pro...	2.590	2.446	2.603	2.502	2.256	2.206	2.043	1.836	2.310	11.91
19) T Methylene Chlo...	1.120	0.953	0.973	1.024	0.877	0.863	0.807	0.717	0.917	13.89
20) T 3-Chloro-1-pro...	1.530	1.492	1.540	1.423	1.316	1.386	1.310	1.212	1.401	8.36
21) T Trichlorotrifl...	1.084	1.034	0.999	0.978	0.833	0.809	0.763	0.708	0.901	15.47
22) T Carbon Disulfide			3.900	3.406	3.113	3.032	2.839	2.632	3.153	14.24
23) T trans-1,2-Dich...	1.227	1.198	1.316	1.328	1.186	1.187	1.120	1.046	1.201	7.78
24) T 1,1-Dichloroet...	1.961	1.783	1.750	1.745	1.489	1.457	1.376	1.289	1.606	14.63
25) T Methyl tert-Bu...	3.541	3.221	3.195	3.142	2.738	2.653	2.476	2.290	2.907	14.82
26) T Vinyl Acetate	0.180	0.235	0.261	0.271	0.259	0.262	0.237	0.207	0.239	13.19
27) T 2-Butanone (MEK)	0.478	0.578	0.663	0.684	0.680	0.641	0.597	0.617	11.88	
28) T cis-1,2-Dichlo...	1.398	1.361	1.336	1.302	1.145	1.133	1.069	0.997	1.218	12.32
29) T Diisopropyl Ether	1.149	1.106	1.157	1.111	0.959	0.881	0.691	0.598	0.956	22.64
30) T Ethyl Acetate	0.267	0.327	0.358	0.327	0.301	0.271	0.232	0.298	14.53	
31) T n-Hexane	1.950	1.915	1.864	1.568	1.384	1.250	1.099	1.576	21.80	
32) T Chloroform	1.764	1.587	1.618	1.589	1.360	1.329	1.248	1.150	1.456	14.66
33) S 1,2-Dichloroet...	1.238	1.236	1.243	1.256	1.261	1.243	1.240	1.222	1.242	0.98
34) T Tetrahydrofura...	0.804	0.772	0.730	0.745	0.642	0.636	0.597	0.556	0.685	13.06
35) T Ethyl tert-But...	1.414	1.336	1.377	1.353	1.194	1.149	1.075	0.992	1.236	12.60
36) T 1,2-Dichloroet...	1.326	1.198	1.117	1.140	0.995	0.981	0.917	0.857	1.066	14.67
-----ISTD-----										
37) IR 1,4-Difluorobenzen...										
38) T 1,1,1-Trichlor...	0.359	0.324	0.325	0.305	0.271	0.274	0.258	0.239	0.294	13.80
39) T Isopropyl Acetate	0.163	0.158	0.160	0.159	0.138	0.130	0.118	0.105	0.141	15.81
40) T 1-Butanol	0.129	0.174	0.182	0.214	0.209	0.219	0.199	0.175	0.188	15.69
41) T Benzene	1.186	1.070	1.013	0.968	0.830	0.794	0.720	0.606	0.898	21.57
42) T Carbon Tetrach...	0.304	0.276	0.273	0.261	0.234	0.243	0.229	0.212	0.254	11.75

22.78	1.42	10.89	10.60
12.69	17.80	18.21	10.60
14.80	10.86	18.97	10.60
7.78	6.01	20.12	10.60
14.89	7.67	19.36	10.60
10.51	10.89	21.44	10.60
21.25	18.21	4.79	10.60
11.23	18.97	11.20	10.60
18.93	20.12	21.44	10.60
7.40	19.36	11.20	10.60
16.75	21.44	21.44	10.60
13.68	4.79	11.20	10.60
11.92	11.20	21.44	10.60
	21.44	11.20	10.60
	4.79	11.20	10.60
	11.20	21.44	10.60
	21.44	11.20	10.60
	21.13	11.43	10.60
	14.56	11.43	10.60
	0.45	11.43	10.60
	22.23	11.43	10.60
	24.98	11.43	10.60
	20.36	11.43	10.60
	20.45	11.43	10.60
	19.31	11.43	10.60
	21.39	11.43	10.60
	11.43	11.43	10.60
	21.10	11.43	10.60
	22.65	11.43	10.60
	20.99	11.43	10.60
	16.03	11.43	10.60
	17.52	11.43	10.60
	17.35	11.43	10.60
	21.06	11.43	10.60
	26.54	11.43	10.60
	24.98	11.43	10.60
	19.53	11.43	10.60
	14.80	11.43	10.60
	11.18	11.43	10.60
	17.47	11.43	10.60
	10.60	11.43	10.60

Method Path : I:\MS08\Methods\
Method File : R8052519.M

Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)															
95) T	Naphthalene	2.258	2.692	1.950	2.031	1.927	2.654	2.318	1.930	2.220					14.25
96) T	n-Dodecane			0.541	0.608	0.577	0.895	0.780	0.648	0.675					20.09
97) T	Hexachlorobuta...	0.701	0.641	0.604	0.600	0.511	0.517	0.464	0.410	0.556					17.43
98) T	Cyclohexanone	0.816	0.825	0.752	0.776	0.718	0.743	0.688	0.626	0.743					8.92
99) T	tert-Butylbenzene		2.613	2.560	2.421	2.022	1.837	1.570	1.276	2.043					25.20
100) T	n-Butylbenzene	2.638	2.425	2.404	2.365	2.023	2.011	1.789	1.524	2.147					17.44

(#) = Out of Range

Primary Source Standards Concentrations (Working & Initial Calibration)

1ng/L Std. ID: S31-05201907
4ng/L Std. ID: S31-05081902
20ng/L Std. ID: S31-05081902
200ng/L Std. ID: S31-05201908

Dilution Factors:										Working STD Conc.(ng/L):	
Compounds	Source Std. mg/m ³	Primary Working Standards								Injection (L):	ICAL Points:
		200ng/L	20ng/L	2ng/L	4ng/L	1ng/L	4	4	4		
Propene	1.031	206.2	20.62	4.124	1.031	0.1031	0.025	0.050	0.125	0.050	200
Dichlorodifluoromethane	1.045	209.0	20.90	4.180	1.045	0.1045	0.0262	0.0525	0.131	0.0515	200
Chloromethane	1.008	201.6	20.16	4.032	1.008	0.1008	0.02016	0.05040	0.125	0.0525	200
Freon-114	1.028	205.6	20.56	4.112	1.028	0.1028	0.02056	0.05140	0.125	0.05140	200
Vinyl Chloride	1.051	210.2	21.02	4.204	1.051	0.1051	0.02102	0.05255	0.125	0.05255	200
1,3-Butadiene	1.049	209.8	20.98	4.196	1.049	0.1049	0.02098	0.05245	0.125	0.05245	200
Bromomethane	1.009	201.8	20.18	4.036	1.009	0.1009	0.02018	0.05045	0.125	0.05045	200
Chloroethane	1.022	204.4	20.44	4.088	1.022	0.1022	0.02044	0.05110	0.125	0.05110	200
Ethanol	5.140	1028.0	102.80	20.560	5.140	0.5140	1.0280	2.5700	5.140	25.700	257.00
Acetonitrile	1.033	206.6	20.66	4.132	1.033	0.1033	0.02066	0.05165	0.125	0.05165	200
Acrolein	1.028	205.6	20.56	4.112	1.028	0.1028	0.02056	0.05140	0.125	0.05140	200
Acetone	5.370	1074.0	107.40	21.480	5.370	0.5370	1.0740	2.6850	5.370	26.850	268.50
Trichlorofluoromethane	1.060	212.0	21.20	4.240	1.060	0.1060	0.02120	0.05300	0.125	0.05300	200
Isopropanol	2.063	412.6	41.26	8.252	2.063	0.2063	0.04126	0.10315	0.2063	0.315	103.15
Acrylonitrile	1.034	206.8	20.68	4.136	1.034	0.1034	0.02068	0.05170	0.125	0.05170	200
1,1-Dichloroethene	1.074	214.8	21.48	4.296	1.074	0.1074	0.02148	0.05370	0.125	0.05370	200
tert-Butanol	2.144	428.8	42.88	8.576	2.144	0.2144	0.04288	0.10720	0.2144	0.320	107.20
Methylene Chloride	1.070	214.0	21.40	4.280	1.070	0.1070	0.02140	0.05350	0.125	0.05350	200
Allyl Chloride	1.067	213.4	21.34	4.268	1.067	0.1067	0.02134	0.05335	0.125	0.05335	200
Trichlorotrifluoroethane	1.065	213.0	21.30	4.260	1.065	0.1065	0.02130	0.05325	0.125	0.05325	200
Carbon Disulfide	1.075	215.0	21.50	4.300	1.075	0.1075	0.02150	0.05375	0.125	0.05375	200
trans-1,2-Dichloroethene	1.062	212.4	21.24	4.248	1.062	0.1062	0.02124	0.05310	0.125	0.05310	200
1,1-Dichloroethane	1.030	206.0	20.60	4.120	1.030	0.1030	0.02060	0.05150	0.125	0.05150	200
Methyl tert-Butyl Ether	1.089	217.8	21.78	4.356	1.089	0.1089	0.02178	0.05445	0.125	0.05445	200
Vinyl Acetate	5.252	1050.4	105.04	21.008	5.252	0.5252	1.0504	2.6260	5.252	26.260	262.60
2-Butanone	1.027	205.4	20.54	4.108	1.027	0.1027	0.02054	0.05135	0.125	0.05135	200
cis-1,2-Dichloroethene	1.054	210.8	21.08	4.216	1.054	0.1054	0.02108	0.05270	0.125	0.05270	200
Diisopropyl Ether	1.081	216.2	21.62	4.324	1.081	0.1081	0.02162	0.05405	0.125	0.05405	200
Ethyl Acetate	2.166	433.2	43.32	8.664	2.166	0.2166	0.04332	0.10830	0.2166	0.330	108.30
n-Hexane	1.082	216.4	21.64	4.328	1.082	0.1082	0.02164	0.05410	0.125	0.05410	200
Chloroform	1.077	215.4	21.54	4.308	1.077	0.1077	0.02154	0.05385	0.125	0.05385	200
Tetrahydrofuran	1.068	213.6	21.36	4.272	1.068	0.1068	0.02136	0.05340	0.125	0.05340	200
Ethyl tert-Butyl Ether	1.060	212.0	21.20	4.240	1.060	0.1060	0.02120	0.05300	0.125	0.05300	200
1,2-Dichloroethane	1.061	212.2	21.22	4.244	1.061	0.1061	0.02122	0.05305	0.125	0.05305	200
1,1,1-Trichloroethane	1.081	216.2	21.62	4.324	1.081	0.1081	0.02162	0.05405	0.125	0.05405	200
Isopropyl Acetate	2.066	413.2	41.32	8.264	2.066	0.2066	0.04132	0.10330	0.2066	0.330	103.30
1-Butanol	2.067	413.4	41.34	8.268	2.067	0.2067	0.04134	0.10335	0.2067	0.335	103.35
Benzene	1.033	206.6	20.66	4.132	1.033	0.1033	0.02066	0.05165	0.125	0.05165	200
Carbon Tetrachloride	1.036	207.2	20.72	4.144	1.036	0.1036	0.02072	0.05180	0.125	0.05180	200
Cyclohexane	2.087	417.4	41.74	8.348	2.087	0.2087	0.04174	0.10435	0.2087	0.345	104.35
tert-Amyl Methyl Ether	1.074	214.8	21.48	4.296	1.074	0.1074	0.02148	0.05370	0.125	0.05370	200
1,2-Dichloropropane	1.073	214.6	21.46	4.292	1.073	0.1073	0.02146	0.05365	0.125	0.05365	200
Bromodichloromethane	1.068	213.6	21.36	4.272	1.068	0.1068	0.02136	0.05340	0.125	0.05340	200
Trichloroethene	1.062	212.4	21.24	4.248	1.062	0.1062	0.02124	0.05310	0.125	0.05310	200
1,4-Dioxane	1.064	212.8	21.28	4.256	1.064	0.1064	0.02128	0.05320	0.125	0.05320	200
Isocutane	1.061	212.2	21.22	4.244	1.061	0.1061	0.02122	0.05305	0.125	0.05305	200
Methyl Methacrylate	2.135	427.0	42.70	8.540	2.135	0.2135	0.04270	0.10675	0.2135	0.335	106.75
n-Heptane	1.076	215.2	21.52	4.304	1.076	0.1076	0.02152	0.05380	0.125	0.05380	200

Primary Source Standards Concentrations (Working & Initial Calibration)

1ng/L Std. ID:
4ng/L Std. ID: S31-05201907
20ng/L Std. ID: S31-05081902
200ng/L Std. ID: S31-05201908

200ng/L Std. ID: S31-05201908													
Dilution Factors:			5		50		250		1000				
Compounds	Source Std. mg/m³	200ng/L	Primary Working Standards				4	20	200	200	200		
			20ng/L	20ng/L	4ng/L	1ng/L							
cis-1,3-Dichloropropene	1.120	224.0	22.40	4.480	1.120	0.1120	0.2240	0.5600	1.120	5.600	28.000	56.00	112.0
4-Methyl-2-pentanone	1.060	212.0	21.20	4.240	1.060	0.1060	0.2120	0.5300	1.060	5.300	26.500	53.00	106.0
trans-1,3-Dichloropropene	1.055	211.0	21.10	4.220	1.055	0.1055	0.2110	0.5275	1.055	5.275	26.375	52.75	105.5
1,1,1,2-Trichloroethane	1.076	215.2	21.52	4.304	1.076	0.1076	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6
Toluene	1.052	210.4	21.04	4.208	1.052	0.1052	0.2104	0.5260	1.052	5.260	26.300	52.60	105.2
2-Hexanone	1.074	214.8	21.48	4.296	1.074	0.1074	0.2148	0.5370	1.074	5.370	26.850	53.70	107.4
Dibromochloromethane	1.075	215.0	21.50	4.300	1.075	0.1075	0.2150	0.5375	1.075	5.375	26.875	53.75	107.5
1,1,2-Dibromoethane	1.076	215.2	21.52	4.304	1.076	0.1076	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6
n-Butyl Acetate	1.085	217.0	21.70	4.340	1.085	0.1085	0.2170	0.5425	1.085	5.425	27.125	54.25	108.5
n-Octane	1.076	215.2	21.52	4.304	1.076	0.1076	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6
Tetrachloroethene	1.058	211.6	21.16	4.232	1.058	0.1058	0.2116	0.5290	1.058	5.290	26.450	52.90	105.8
Chlorobenzene	1.066	213.2	21.32	4.264	1.066	0.1066	0.2132	0.5330	1.066	5.330	26.650	53.30	106.6
Ethylbenzene	1.033	206.6	20.66	4.132	1.033	0.1033	0.2066	0.5165	1.033	5.165	25.825	51.65	103.3
m- & p-Xylene	2.123	424.6	42.46	8.492	2.123	0.2123	0.4246	1.0615	2.123	10.615	53.075	106.15	212.3
Bromoform	1.063	212.6	21.26	4.252	1.063	0.1063	0.2126	0.5315	1.063	5.315	26.575	53.15	106.3
Styrene	1.060	212.0	21.20	4.240	1.060	0.1060	0.2120	0.5300	1.060	5.300	26.500	53.00	106.0
o-Xylene	1.062	212.4	21.24	4.248	1.062	0.1062	0.2124	0.5310	1.062	5.310	26.550	53.10	106.2
n-Nonane	1.071	214.2	21.42	4.284	1.071	0.1071	0.2142	0.5355	1.071	5.355	26.775	53.55	107.1
1,1,1,2,2-Tetrachloroethane	1.064	212.8	21.28	4.256	1.064	0.1064	0.2128	0.5320	1.064	5.320	26.600	53.20	106.4
Cumene	1.057	211.4	21.14	4.228	1.057	0.1057	0.2114	0.5285	1.057	5.285	26.425	52.85	105.7
alpha-Phene	1.035	207.0	20.70	4.140	1.035	0.1035	0.2070	0.5175	1.035	5.175	25.875	51.75	103.5
n-Propylbenzene	1.076	215.2	21.52	4.304	1.076	0.1076	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6
3-Ethyltoluene	1.062	212.4	21.24	4.248	1.062	0.1062	0.2124	0.5310	1.062	5.310	26.550	53.10	106.2
4-Ethyltoluene	1.061	212.2	21.22	4.244	1.061	0.1061	0.2122	0.5305	1.061	5.305	26.525	53.05	106.1
1,3,5-Trimethylbenzene	1.057	211.4	21.14	4.228	1.057	0.1057	0.2114	0.5285	1.057	5.285	26.425	52.85	105.7
alpha-Methylstyrene	1.058	211.6	21.16	4.232	1.058	0.1058	0.2116	0.5290	1.058	5.290	26.450	52.90	105.8
2-Ethyltoluene	1.072	214.4	21.44	4.288	1.072	0.1072	0.2144	0.5360	1.072	5.360	26.800	53.60	107.2
1,2,4-Trimethylbenzene	1.068	213.6	21.36	4.272	1.068	0.1068	0.2136	0.5340	1.068	5.340	26.700	53.40	106.8
n-Decane	1.076	215.2	21.52	4.304	1.076	0.1076	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6
Benzyl Chloride	1.051	210.2	21.02	4.204	1.051	0.1051	0.2102	0.5255	1.051	5.255	26.275	52.55	105.1
1,3-Dichlorobenzene	1.080	216.0	21.60	4.320	1.080	0.1080	0.2160	0.5400	1.080	5.400	27.000	54.00	108.0
1,4-Dichlorobenzene	1.081	216.2	21.62	4.324	1.081	0.1081	0.2162	0.5405	1.081	5.405	27.025	54.05	108.1
sec-Butylbenzene	1.063	212.6	21.26	4.252	1.063	0.1063	0.2126	0.5315	1.063	5.315	26.575	53.15	106.3
p-Isopropyltoluene	1.042	208.4	20.84	4.168	1.042	0.1042	0.2084	0.5210	1.042	5.210	26.050	52.10	104.2
1,2,3-Trimethylbenzene	1.042	208.4	20.84	4.168	1.042	0.1042	0.2084	0.5210	1.042	5.210	26.050	52.10	104.2
1,2-Dichlorobenzene	1.089	217.8	21.78	4.356	1.089	0.1089	0.2178	0.5445	1.089	5.445	27.225	54.45	108.9
d-Limonene	1.010	202.0	20.20	4.040	1.010	0.1010	0.2020	0.5050	1.010	5.050	25.250	50.50	101.0
1,2-Dibromo-3-chloropropane	1.042	208.4	20.84	4.168	1.042	0.1042	0.2084	0.5210	1.042	5.210	26.050	52.10	104.2
n-Undecane	1.057	211.4	21.14	4.228	1.057	0.1057	0.2114	0.5285	1.057	5.285	26.425	52.85	105.7
1,2,4-Trichlorobenzene	1.064	212.8	21.28	4.256	1.064	0.1064	0.2128	0.5320	1.064	5.320	26.600	53.20	106.4
Naphthalene	1.025	205.0	20.50	4.100	1.025	0.1025	0.2050	0.5125	1.025	5.125	25.625	51.25	102.5
n-Dodecane	1.031	206.2	20.62	4.124	1.031	0.1031	0.2062	0.5155	1.031	5.155	25.775	51.55	103.1
Hexachloro-1,3-butadiene	1.053	210.6	21.06	4.212	1.053	0.1053	0.2106	0.5265	1.053	5.265	26.325	52.65	105.3
Methacrylonitrile	1.041	208.2	20.82	4.164	1.041	0.1041	0.2082	0.5205	1.041	5.205	26.025	52.05	104.1
Cyclohexanone	0.982	196.4	19.64	3.928	0.982	0.0982	0.1964	0.4910	0.982	4.910	24.550	49.10	98.2
tert-Butylbenzene	1.067	213.4	21.34	4.268	1.067	0.1067	0.2134	0.5335	1.067	5.335	26.675	53.35	106.7
n-Butylbenzene	1.064	212.8	21.28	4.256	1.064	0.1064	0.2128	0.5320	1.064	5.320	26.600	53.20	106.4

Method : I:\MS08\Methods\R8052519.M (RTE Integrator)
 Title : EPA T0-15 per SOP V0A-T015 (CASS T0-15/GC-MS)
 Last Update : Tue May 28 07:57:28 2019
 Response via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File	
1	0.1	0	13	I:\MS08\Data\2019_05\25\05251913.D	
2	0.2	0	13	I:\MS08\Data\2019_05\25\05251914.D	
3	0.5	1	13	I:\MS08\Data\2019_05\25\05251915.D	
4	1.0	1	13	I:\MS08\Data\2019_05\25\05251916.D	RS 5/28/19
5	5.0	5	13	I:\MS08\Data\2019_05\25\05251917.D	
6	25	26	13	I:\MS08\Data\2019_05\25\05251918.D	
7	50	52	13	I:\MS08\Data\2019_05\25\05251919.D	
8	100	103	13	I:\MS08\Data\2019_05\25\05251920.D	

#	ID	Update Time	Quant Time	Acquisition Time
1	0.1	May 28 07:56 2019	May 28 07:35 2019	25 May 2019 12:57
2	0.2	May 28 07:56 2019	May 28 07:29 2019	25 May 2019 13:30
3	0.5	May 28 07:56 2019	May 28 07:29 2019	25 May 2019 14:03
4	1.0	May 28 07:57 2019	May 28 07:29 2019	25 May 2019 14:36
5	5.0	May 28 07:57 2019	May 28 07:29 2019	25 May 2019 15:09
6	25	May 28 07:57 2019	May 28 07:29 2019	25 May 2019 15:42
7	50	May 28 07:57 2019	May 28 07:29 2019	25 May 2019 16:15
8	100	May 28 07:57 2019	May 28 07:29 2019	25 May 2019 16:49

R8052519.M

Tue May 28 15:38:20 2019

Data File: I:\MS08\Data\2019 05\25\05251913.D

Sample : 0.1ng TO-15 ICAL STD

Acq On : 25 May 2019 12:57

Misc : S31-05251901/S31-05201907 (6/18)

ALS Vial : 5 Sample Multiplier: 1

Inst : MS08

Operator: SC

RS 5/28/19

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

Quant Time: May 28 07:35:13 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:28:43 2019

Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.23	130	137480	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.35	114	615103	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.67	82	246840	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.08	65	170267	10.915	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	87.28%	
57) Toluene-d8 (SS2)	15.81	98	642666	13.604	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	108.80%	
73) Bromofluorobenzene (SS3)	19.05	174	209060	12.637	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	101.12%	

Target Compounds

						Qvalue
2) Propene	4.21	42	1698	0.145	ng	91
3) Dichlorodifluoromethan...	4.35	85	2403	0.153	ng	# 91
4) Chloromethane	4.64	50	1792	0.156	ng	80
5) 1,2-Dichloro-1,1,2,2-t...	4.89	135	1361	0.156	ng	78
6) Vinyl Chloride	5.06	62	1702	0.137	ng	85
7) 1,3-Butadiene	5.33	54	1136	0.111	ng	96
8) Bromomethane	5.76	94	1084	0.147	ng	95
9) Chloroethane	6.09	64	1026	0.144	ng	# 62
10) Ethanol	6.45	45	5640	0.720	ng	98
11) Acetonitrile	6.73	41	2442	0.120	ng	82
12) Acrolein	0.00	56	0	N.D.	d	
13) Acetone	7.13	58	6387	0.797	ng	93
14) Trichlorofluoromethane	7.34	101	2045	0.151	ng	100
15) 2-Propanol (Isopropanol)	7.67	45	7082	0.286	ng	92
16) Acrylonitrile	7.90	53	588	0.046	ng	# 33
17) 1,1-Dichloroethene	8.31	96	1331	0.160	ng	97
18) 2-Methyl-2-Propanol (t...	8.55	59	6108	0.268	ng	86
19) Methylene Chloride	8.52	84	1318	0.154	ng	97
20) 3-Chloro-1-propene (Al...	8.69	41	1795	0.122	ng	93
21) Trichlorotrifluoroethane	8.95	151	1270	0.160	ng	91
22) Carbon Disulfide	8.80	76	5931	0.179	ng	85
23) trans-1,2-Dichloroethene	9.81	61	1433	0.124	ng	84
24) 1,1-Dichloroethane	10.04	63	2221	0.142	ng	82
25) Methyl tert-Butyl Ether	10.19	73	4241	0.155	ng	94
26) Vinyl Acetate	10.33	86	1039	0.402	ng	# 1
27) 2-Butanone (MEK)	0.00	72	0	N.D.		
28) cis-1,2-Dichloroethene	11.06	61	1621	0.136	ng	100
29) Diisopropyl Ether	11.39	87	1366	0.154	ng	# 84
30) Ethyl Acetate	11.41	61	326	0.107	ng	91
31) n-Hexane	11.35	57	2849	0.174	ng	# 91
32) Chloroform	11.40	83	2090	0.151	ng	97
34) Tetrahydrofuran (THF)	11.87	72	944	0.154	ng	# 83
35) Ethyl tert-Butyl Ether	11.97	87	1649	0.141	ng	98
36) 1,2-Dichloroethane	12.21	62	1547	0.145	ng	72
38) 1,1,1-Trichloroethane	12.49	97	1911	0.153	ng	98
39) Isopropyl Acetate	12.94	61	1662	0.274	ng	93
40) 1-Butanol	13.00	56	1312	0.133	ng	85
41) Benzene	12.97	78	6030	0.165	ng	94
42) Carbon Tetrachloride	13.12	117	1551	0.147	ng	95
43) Cyclohexane	13.26	84	5409	0.339	ng	98
44) tert-Amyl Methyl Ether	13.62	73	3814	0.145	ng	95
45) 1,2-Dichloropropane	13.82	63	1339	0.149	ng	94
46) Bromodichloromethane	14.01	83	1365	0.129	ng	98
47) Trichloroethene	14.07	130	1502	0.154	ng	95
48) 1,4-Dioxane	14.08	88	858	0.114	ng	97
49) 2,2,4-Trimethylpentane...	14.13	57	7001	0.164	ng	98
50) Methyl Methacrylate	14.29	100	809	0.204	ng	94

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Data File: I:\MS08\Data\2019 05\25\05251913.D

Sample : 0.1ng TO-15 ICAL STD

Acq On : 25 May 2019 12:57

Misc : S31-05251901/S31-05201907 (6/18)

ALS Vial : 5 Sample Multiplier: 1

Inst : MS08

Operator: SC

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

Quant Time: May 28 07:35:13 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:28:43 2019

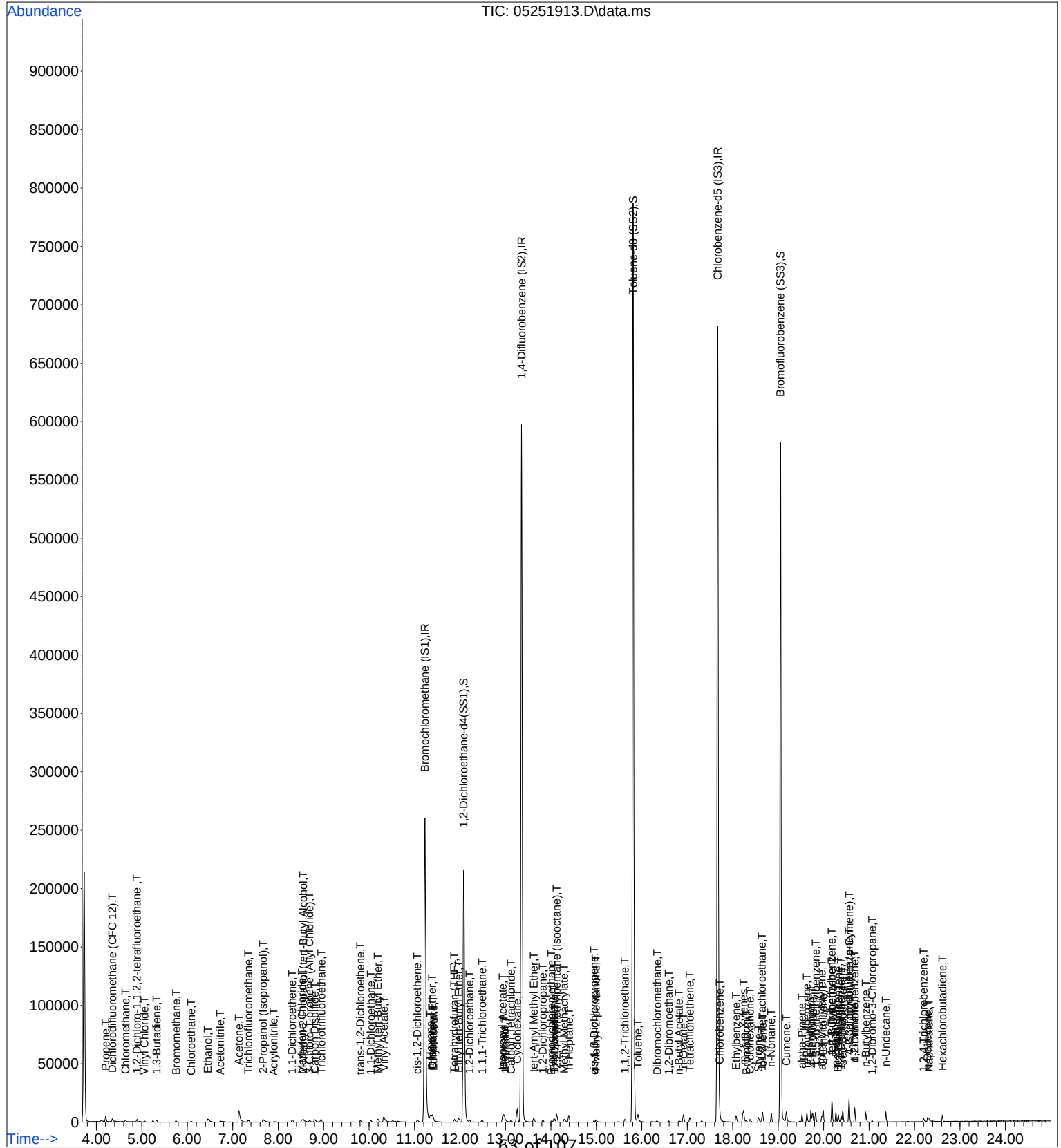
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.40	71	1676	0.161	ng	100
52) cis-1,3-Dichloropropene	14.95	75	1534	0.110	ng #	63
53) 4-Methyl-2-pentanone	14.99	58	632	0.072	ng #	7
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.	d	
55) 1,1,2-Trichloroethane	15.62	97	1279	0.157	ng	88
58) Toluene	15.91	91	6711	0.202	ng	98
59) 2-Hexanone	0.00	43	0	N.D.	d	
60) Dibromochloromethane	16.34	129	1136	0.152	ng	100
61) 1,2-Dibromoethane	16.59	107	1059	0.138	ng	94
62) n-Butyl Acetate	16.82	43	1918	0.096	ng #	75
63) n-Octane	16.92	57	1252	0.168	ng	92
64) Tetrachloroethene	17.05	166	1758	0.191	ng	100
65) Chlorobenzene	17.72	112	4199	0.191	ng	98
66) Ethylbenzene	18.08	91	6921	0.184	ng	93
67) m- & p-Xylenes	18.24	91	10688	0.379	ng	99
68) Bromoform	18.30	173	932	0.148	ng	91
69) Styrene	18.57	104	3708	0.173	ng	90
70) o-Xylene	18.66	91	5499	0.194	ng	99
71) n-Nonane	18.85	43	3054	0.167	ng	96
72) 1,1,2,2-Tetrachloroethane	18.64	83	2152	0.173	ng	92
74) Cumene	19.18	105	7542	0.200	ng	97
75) alpha-Pinene	19.52	93	3137	0.169	ng	95
76) n-Propylbenzene	19.63	91	8211	0.192	ng	95
77) 3-Ethyltoluene	19.72	105	7083	0.194	ng	97
78) 4-Ethyltoluene	19.76	105	6925	0.199	ng	95
79) 1,3,5-Trimethylbenzene	19.82	105	6389	0.207	ng	94
80) alpha-Methylstyrene	19.96	118	2560	0.168	ng	98
81) 2-Ethyltoluene	19.99	105	7461	0.206	ng	97
82) 1,2,4-Trimethylbenzene	20.18	105	5709	0.195	ng	94
83) n-Decane	20.27	57	3059	0.177	ng	95
84) Benzyl Chloride	20.31	91	2346	0.109	ng	79
85) 1,3-Dichlorobenzene	20.33	146	3019	0.180	ng	94
86) 1,4-Dichlorobenzene	20.38	146	3642	0.211	ng	100
87) sec-Butylbenzene	20.42	105	8052	0.195	ng	98
88) 4-Isopropyltoluene (p-...	20.56	119	7953	0.207	ng	100
89) 1,2,3-Trimethylbenzene	20.56	105	5819	0.197	ng	97
90) 1,2-Dichlorobenzene	20.69	146	3307	0.207	ng	90
91) d-Limonene	20.69	68	1718	0.151	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.07	157	652	0.111	ng	98
93) n-Undecane	21.37	57	2949	0.180	ng	92
94) 1,2,4-Trichlorobenzene	22.20	180	1826	0.158	ng #	95
95) Naphthalene	22.32	128	4571	0.126	ng	81
96) n-Dodecane	22.29	57	1981	0.164	ng	91
97) Hexachlorobutadiene	22.62	225	1458	0.196	ng	95
98) Cyclohexanone	18.38	55	1582	0.134	ng	93
99) tert-Butylbenzene	20.18	119	6122	0.203	ng	99
100) n-Butylbenzene	20.93	91	5543	0.180	ng	95

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

ALS Vial : 5 Sample Multiplier: 1

Response via : Initial Calibration



Data File: I:\MS08\Data\2019 05\25\05251914.D

Sample : 0.2ng TO-15 ICAL STD

Acq On : 25 May 2019 13:30

Misc : S31-05251901/S31-05201907 (6/18)

ALS Vial : 5 Sample Multiplier: 1

Inst : MS08

Operator: SC

RS 5/28/19

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

Quant Time: May 28 07:29:26 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:28:58 2019

Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.23	130	136858	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.35	114	611556	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.67	82	246745	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.08	65	169166	10.894	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	87.12%	
57) Toluene-d8 (SS2)	15.81	98	643933	13.636	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	109.12%	
73) Bromofluorobenzene (SS3)	19.06	174	208509	12.608	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	100.88%	

Target Compounds

						Qvalue
2) Propene	4.19	42	2748	0.236	ng	94
3) Dichlorodifluoromethan...	4.34	85	4069	0.260	ng	# 97
4) Chloromethane	4.62	50	3041	0.266	ng	93
5) 1,2-Dichloro-1,1,2,2-t...	4.89	135	2333	0.269	ng	91
6) Vinyl Chloride	5.05	62	2901	0.234	ng	89
7) 1,3-Butadiene	5.31	54	2147	0.210	ng	95
8) Bromomethane	5.74	94	1967	0.267	ng	94
9) Chloroethane	6.07	64	1870	0.263	ng	80
10) Ethanol	6.44	45	9582	1.229	ng	96
11) Acetonitrile	6.71	41	4661	0.230	ng	93
12) Acrolein	6.91	56	1086	0.190	ng	94
13) Acetone	7.11	58	10732	1.346	ng	94
14) Trichlorofluoromethane	7.34	101	3441	0.255	ng	98
15) 2-Propanol (Isopropanol)	7.64	45	12406	0.503	ng	97
16) Acrylonitrile	7.89	53	2045	0.162	ng	98
17) 1,1-Dichloroethene	8.30	96	2453	0.297	ng	96
18) 2-Methyl-2-Propanol (t...	8.52	59	11483	0.506	ng	94
19) Methylene Chloride	8.51	84	2232	0.262	ng	92
20) 3-Chloro-1-propene (Al...	8.68	41	3486	0.238	ng	93
21) Trichlorotrifluoroethane	8.94	151	2412	0.305	ng	96
22) Carbon Disulfide	8.79	76	9680	0.294	ng	93
23) trans-1,2-Dichloroethene	9.80	61	2786	0.241	ng	94
24) 1,1-Dichloroethane	10.04	63	4022	0.259	ng	93
25) Methyl tert-Butyl Ether	10.18	73	7680	0.282	ng	94
26) Vinyl Acetate	10.31	86	2706	1.052	ng	# 62
27) 2-Butanone (MEK)	10.59	72	1076	0.164	ng	# 1
28) cis-1,2-Dichloroethene	11.06	61	3141	0.265	ng	98
29) Diisopropyl Ether	11.37	87	2618	0.296	ng	# 92
30) Ethyl Acetate	11.40	61	1267	0.417	ng	90
31) n-Hexane	11.35	57	4621	0.284	ng	96
32) Chloroform	11.40	83	3743	0.272	ng	98
34) Tetrahydrofuran (THF)	11.86	72	1806	0.296	ng	94
35) Ethyl tert-Butyl Ether	11.97	87	3101	0.266	ng	95
36) 1,2-Dichloroethane	12.21	62	2784	0.263	ng	77
38) 1,1,1-Trichloroethane	12.49	97	3426	0.277	ng	95
39) Isopropyl Acetate	12.93	61	3195	0.530	ng	96
40) 1-Butanol	12.98	56	3515	0.358	ng	# 69
41) Benzene	12.97	78	10814	0.298	ng	94
42) Carbon Tetrachloride	13.12	117	2799	0.267	ng	100
43) Cyclohexane	13.26	84	9365	0.591	ng	100
44) tert-Amyl Methyl Ether	13.62	73	7136	0.273	ng	98
45) 1,2-Dichloropropane	13.82	63	2467	0.276	ng	99
46) Bromodichloromethane	14.00	83	2764	0.263	ng	93
47) Trichloroethene	14.06	130	2858	0.294	ng	99
48) 1,4-Dioxane	14.07	88	2044	0.274	ng	90
49) 2,2,4-Trimethylpentane...	14.13	57	12052	0.285	ng	99
50) Methyl Methacrylate	14.28	100	1744	0.443	ng	89

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Data File: I:\MS08\Data\2019 05\25\05251914.D

Sample : 0.2ng TO-15 ICAL STD

Acq On : 25 May 2019 13:30

Misc : S31-05251901/S31-05201907 (6/18)

ALS Vial : 5 Sample Multiplier: 1

Inst : MS08

Operator: SC

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

Quant Time: May 28 07:29:26 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:28:58 2019

Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.39	71	2846	0.274	ng	93
52) cis-1,3-Dichloropropene	14.95	75	3090	0.224	ng	93
53) 4-Methyl-2-pentanone	14.98	58	1761	0.203	ng	# 74
54) trans-1,3-Dichloropropene	15.47	75	1911	0.158	ng	84
55) 1,1,2-Trichloroethane	15.62	97	2239	0.277	ng	100
58) Toluene	15.91	91	11005	0.332	ng	97
59) 2-Hexanone	16.18	43	3654	0.198	ng	84
60) Dibromochloromethane	16.33	129	2284	0.305	ng	94
61) 1,2-Dibromoethane	16.58	107	2398	0.314	ng	92
62) n-Butyl Acetate	16.81	43	4591	0.230	ng	95
63) n-Octane	16.91	57	2364	0.317	ng	98
64) Tetrachloroethene	17.06	166	3233	0.351	ng	99
65) Chlorobenzene	17.72	112	7513	0.343	ng	99
66) Ethylbenzene	18.07	91	12000	0.319	ng	99
67) m- & p-Xylenes	18.23	91	19135	0.678	ng	98
68) Bromoform	18.30	173	1790	0.285	ng	97
69) Styrene	18.56	104	6625	0.310	ng	96
70) o-Xylene	18.65	91	9580	0.338	ng	100
71) n-Nonane	18.85	43	5426	0.297	ng	97
72) 1,1,2,2-Tetrachloroethane	18.64	83	3872	0.311	ng	99
74) Cumene	19.18	105	12934	0.343	ng	99
75) alpha-Pinene	19.53	93	5782	0.311	ng	96
76) n-Propylbenzene	19.63	91	14553	0.340	ng	99
77) 3-Ethyltoluene	19.72	105	12929	0.354	ng	99
78) 4-Ethyltoluene	19.75	105	11340	0.326	ng	97
79) 1,3,5-Trimethylbenzene	19.82	105	11179	0.363	ng	97
80) alpha-Methylstyrene	19.95	118	4809	0.316	ng	95
81) 2-Ethyltoluene	19.99	105	13021	0.359	ng	97
82) 1,2,4-Trimethylbenzene	20.19	105	10527	0.359	ng	95
83) n-Decane	20.27	57	5821	0.337	ng	96
84) Benzyl Chloride	20.30	91	4431	0.207	ng	93
85) 1,3-Dichlorobenzene	20.32	146	6011	0.358	ng	98
86) 1,4-Dichlorobenzene	20.38	146	6301	0.364	ng	97
87) sec-Butylbenzene	20.42	105	14614	0.355	ng	97
88) 4-Isopropyltoluene (p-...	20.56	119	14041	0.366	ng	99
89) 1,2,3-Trimethylbenzene	20.56	105	10640	0.361	ng	99
90) 1,2-Dichlorobenzene	20.68	146	6091	0.382	ng	96
91) d-Limonene	20.69	68	3448	0.304	ng	96
92) 1,2-Dibromo-3-Chloropr...	21.07	157	1423	0.242	ng	86
93) n-Undecane	21.37	57	5518	0.336	ng	93
94) 1,2,4-Trichlorobenzene	22.19	180	3582	0.311	ng	98
95) Naphthalene	22.30	128	10892	0.299	ng	90
96) n-Dodecane	22.29	57	4614	0.382	ng	89
97) Hexachlorobutadiene	22.61	225	2663	0.358	ng	94
98) Cyclohexanone	18.37	55	3200	0.270	ng	99
99) tert-Butylbenzene	20.18	119	11007	0.366	ng	99
100) n-Butylbenzene	20.93	91	10187	0.330	ng	96

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

Inst : MS08
Operator: SC

[illegible]

Data File: I:\MS08\Data\2019 05\25\05251915.D

Sample : 0.5ng TO-15 ICAL STD

Acq On : 25 May 2019 14:03

Misc : S31-05251901/S31-05081902 (6/6)

ALS Vial : 6 Sample Multiplier: 1

Inst : MS08

Operator: SC

RS 5/28/19

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

Quant Time: May 28 07:29:28 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:28:58 2019

Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.23	130	136465	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.35	114	610657	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.67	82	245916	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.08	65	169641	10.956	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	87.68%
57) Toluene-d8 (SS2)	15.81	98	640553	13.610	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	108.88%
73) Bromofluorobenzene (SS3)	19.06	174	208479	12.649	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.20%

Target Compounds

						Qvalue
2) Propene	4.19	42	6707	0.578	ng	99
3) Dichlorodifluoromethan...	4.33	85	10183	0.654	ng	99
4) Chloromethane	4.62	50	7571	0.664	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.88	135	5501	0.636	ng	100
6) Vinyl Chloride	5.04	62	7317	0.592	ng	95
7) 1,3-Butadiene	5.31	54	5681	0.558	ng	97
8) Bromomethane	5.74	94	4789	0.653	ng	99
9) Chloroethane	6.07	64	4568	0.644	ng	94
10) Ethanol	6.41	45	21766	2.799	ng	97
11) Acetonitrile	6.70	41	10857	0.538	ng	93
12) Acrolein	6.91	56	2594	0.454	ng	96
13) Acetone	7.10	58	25566	3.215	ng	98
14) Trichlorofluoromethane	7.33	101	8821	0.656	ng	99
15) 2-Propanol (Isopropanol)	7.60	45	30392	1.236	ng	98
16) Acrylonitrile	7.86	53	6560	0.522	ng	94
17) 1,1-Dichloroethene	8.30	96	5753	0.699	ng	97
18) 2-Methyl-2-Propanol (t...	8.50	59	30468	1.348	ng	98
19) Methylene Chloride	8.51	84	5685	0.670	ng	95
20) 3-Chloro-1-propene (Al...	8.68	41	8970	0.615	ng	94
21) Trichlorotrifluoroethane	8.94	151	5808	0.737	ng	100
22) Carbon Disulfide	8.79	76	22883	0.697	ng	96
23) trans-1,2-Dichloroethene	9.79	61	7629	0.663	ng	99
24) 1,1-Dichloroethane	10.03	63	9841	0.635	ng	100
25) Methyl tert-Butyl Ether	10.17	73	18994	0.698	ng	99
26) Vinyl Acetate	10.30	86	7476	2.916	ng	# 81
27) 2-Butanone (MEK)	10.58	72	3241	0.495	ng	# 61
28) cis-1,2-Dichloroethene	11.06	61	7687	0.651	ng	99
29) Diisopropyl Ether	11.36	87	6826	0.775	ng	98
30) Ethyl Acetate	11.38	61	3862	1.274	ng	94
31) n-Hexane	11.35	57	11308	0.697	ng	99
32) Chloroform	11.40	83	9515	0.692	ng	100
34) Tetrahydrofuran (THF)	11.85	72	4257	0.700	ng	# 89
35) Ethyl tert-Butyl Ether	11.95	87	7967	0.685	ng	97
36) 1,2-Dichloroethane	12.21	62	6471	0.612	ng	97
38) 1,1,1-Trichloroethane	12.48	97	8574	0.693	ng	99
39) Isopropyl Acetate	12.92	61	8091	1.344	ng	98
40) 1-Butanol	12.96	56	9203	0.939	ng	80
41) Benzene	12.97	78	25561	0.704	ng	97
42) Carbon Tetrachloride	13.12	117	6902	0.661	ng	99
43) Cyclohexane	13.25	84	22384	1.415	ng	97
44) tert-Amyl Methyl Ether	13.61	73	18233	0.698	ng	99
45) 1,2-Dichloropropane	13.82	63	5935	0.666	ng	96
46) Bromodichloromethane	14.01	83	6882	0.656	ng	96
47) Trichloroethene	14.06	130	6848	0.705	ng	99
48) 1,4-Dioxane	14.06	88	5112	0.686	ng	98
49) 2,2,4-Trimethylpentane...	14.13	57	28370	0.671	ng	100
50) Methyl Methacrylate	14.27	100	5054	1.286	ng	89

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Data File: I:\MS08\Data\2019 05\25\05251915.D

Sample : 0.5ng TO-15 ICAL STD

Acq On : 25 May 2019 14:03

Misc : S31-05251901/S31-05081902 (6/6)

ALS Vial : 6 Sample Multiplier: 1

Inst : MS08

Operator: SC

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

Quant Time: May 28 07:29:28 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:28:58 2019

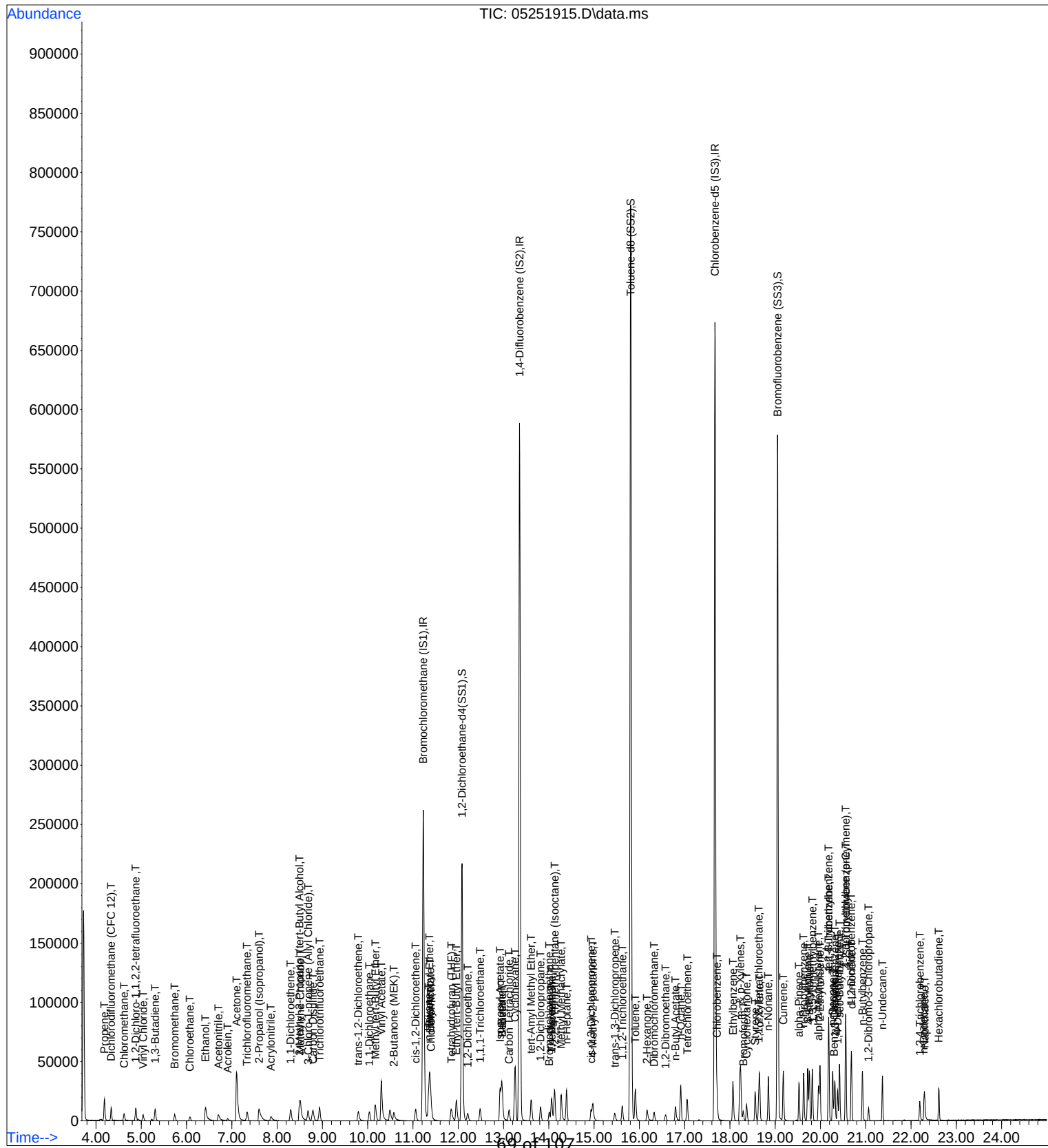
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.39	71	7602	0.734	ng	98
52) cis-1,3-Dichloropropene	14.93	75	9085	0.659	ng	92
53) 4-Methyl-2-pentanone	14.97	58	5392	0.622	ng	88
54) trans-1,3-Dichloropropene	15.46	75	6128	0.506	ng	96
55) 1,1,2-Trichloroethane	15.62	97	5826	0.721	ng	99
58) Toluene	15.91	91	26631	0.806	ng	100
59) 2-Hexanone	16.17	43	11840	0.644	ng	91
60) Dibromochloromethane	16.32	129	5856	0.785	ng	97
61) 1,2-Dibromoethane	16.58	107	5964	0.783	ng	99
62) n-Butyl Acetate	16.80	43	13250	0.666	ng	95
63) n-Octane	16.91	57	5960	0.803	ng	99
64) Tetrachloroethene	17.06	166	7777	0.846	ng	100
65) Chlorobenzene	17.71	112	18023	0.824	ng	99
66) Ethylbenzene	18.07	91	29913	0.799	ng	100
67) m- & p-Xylenes	18.23	91	46545	1.655	ng	99
68) Bromoform	18.30	173	4753	0.760	ng	98
69) Styrene	18.56	104	16809	0.789	ng	97
70) o-Xylene	18.65	91	23611	0.836	ng	100
71) n-Nonane	18.85	43	13754	0.756	ng	98
72) 1,1,2,2-Tetrachloroethane	18.64	83	10106	0.815	ng	99
74) Cumene	19.18	105	31500	0.838	ng	99
75) alpha-Pinene	19.52	93	14326	0.773	ng	99
76) n-Propylbenzene	19.63	91	36125	0.847	ng	99
77) 3-Ethyltoluene	19.72	105	30037	0.825	ng	100
78) 4-Ethyltoluene	19.75	105	29506	0.852	ng	100
79) 1,3,5-Trimethylbenzene	19.82	105	26638	0.867	ng	98
80) alpha-Methylstyrene	19.95	118	11708	0.772	ng	99
81) 2-Ethyltoluene	19.99	105	31265	0.865	ng	100
82) 1,2,4-Trimethylbenzene	20.18	105	25322	0.867	ng	98
83) n-Decane	20.27	57	14078	0.817	ng	98
84) Benzyl Chloride	20.30	91	11386	0.533	ng	95
85) 1,3-Dichlorobenzene	20.32	146	14112	0.844	ng	99
86) 1,4-Dichlorobenzene	20.38	146	14560	0.845	ng	96
87) sec-Butylbenzene	20.42	105	35226	0.858	ng	100
88) 4-Isopropyltoluene (p-...	20.56	119	34051	0.891	ng	98
89) 1,2,3-Trimethylbenzene	20.56	105	25427	0.866	ng	100
90) 1,2-Dichlorobenzene	20.68	146	13685	0.861	ng	98
91) d-Limonene	20.69	68	8412	0.743	ng	97
92) 1,2-Dibromo-3-Chloropr...	21.06	157	4079	0.697	ng	95
93) n-Undecane	21.37	57	11996	0.734	ng	99
94) 1,2,4-Trichlorobenzene	22.19	180	7468	0.651	ng	98
95) Naphthalene	22.30	128	19666	0.543	ng	93
96) n-Dodecane	22.28	57	5486	0.456	ng	97
97) Hexachlorobutadiene	22.61	225	6261	0.846	ng	100
98) Cyclohexanone	18.37	55	7266	0.616	ng	99
99) tert-Butylbenzene	20.18	119	26872	0.896	ng	100
100) n-Butylbenzene	20.93	91	25157	0.818	ng	99

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

Sample : 0.5ng TO-15 ICAL STD
Acq On : 25 May 2019 14:03
Misc : S31-05251901/S31-05081902 (6/6)
ALS Vial : 6 Sample Multiplier: 1

Response via : Initial Calibration



Data File: I:\MS08\Data\2019 05\25\05251916.D

Sample : 1.0ng TO-15 ICAL STD

Acq On : 25 May 2019 14:36

Misc : S31-05251901/S31-05081902 (6/6)

ALS Vial : 6 Sample Multiplier: 1

Inst : MS08

Operator: SC

RS 5/28/19

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

Quant Time: May 28 07:29:30 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:28:58 2019

Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.23	130	135287	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.35	114	608118	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.67	82	247058	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.08	65	169937	11.070	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	88.56%
57) Toluene-d8 (SS2)	15.81	98	639611	13.527	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	108.24%
73) Bromofluorobenzene (SS3)	19.06	174	208922	12.617	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.96%

Target Compounds

						Qvalue
2) Propene	4.18	42	12916	1.123	ng	98
3) Dichlorodifluoromethan...	4.33	85	19490	1.262	ng	99
4) Chloromethane	4.61	50	14067	1.244	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.88	135	10199	1.190	ng	97
6) Vinyl Chloride	5.04	62	14391	1.174	ng	94
7) 1,3-Butadiene	5.30	54	11802	1.168	ng	99
8) Bromomethane	5.73	94	9481	1.303	ng	97
9) Chloroethane	6.07	64	8629	1.227	ng	100
10) Ethanol	6.41	45	42058	5.456	ng	99
11) Acetonitrile	6.69	41	21206	1.059	ng	96
12) Acrolein	6.90	56	6187	1.093	ng	94
13) Acetone	7.10	58	47987	6.087	ng	100
14) Trichlorofluoromethane	7.33	101	17010	1.277	ng	99
15) 2-Propanol (Isopropanol)	7.58	45	58275	2.390	ng	99
16) Acrylonitrile	7.86	53	14488	1.163	ng	95
17) 1,1-Dichloroethene	8.30	96	11327	1.388	ng	99
18) 2-Methyl-2-Propanol (t...	8.46	59	58065	2.591	ng	97
19) Methylene Chloride	8.51	84	11855	1.408	ng	97
20) 3-Chloro-1-propene (Al...	8.68	41	16438	1.136	ng	99
21) Trichlorotrifluoroethane	8.94	151	11278	1.444	ng	99
22) Carbon Disulfide	8.79	76	39626	1.217	ng	100
23) trans-1,2-Dichloroethene	9.79	61	15265	1.338	ng	100
24) 1,1-Dichloroethane	10.03	63	19451	1.266	ng	100
25) Methyl tert-Butyl Ether	10.16	73	37038	1.374	ng	99
26) Vinyl Acetate	10.30	86	15385	6.053	ng	# 85
27) 2-Butanone (MEK)	10.57	72	7364	1.135	ng	# 85
28) cis-1,2-Dichloroethene	11.06	61	14858	1.269	ng	98
29) Diisopropyl Ether	11.36	87	13001	1.489	ng	95
30) Ethyl Acetate	11.37	61	8382	2.789	ng	97
31) n-Hexane	11.34	57	21830	1.358	ng	99
32) Chloroform	11.40	83	18520	1.359	ng	99
34) Tetrahydrofuran (THF)	11.84	72	8613	1.429	ng	98
35) Ethyl tert-Butyl Ether	11.95	87	15523	1.345	ng	97
36) 1,2-Dichloroethane	12.21	62	13094	1.250	ng	97
38) 1,1,1-Trichloroethane	12.48	97	16040	1.302	ng	99
39) Isopropyl Acetate	12.92	61	15955	2.661	ng	95
40) 1-Butanol	12.94	56	21476	2.201	ng	90
41) Benzene	12.97	78	48632	1.345	ng	99
42) Carbon Tetrachloride	13.12	117	13154	1.264	ng	100
43) Cyclohexane	13.25	84	42585	2.703	ng	99
44) tert-Amyl Methyl Ether	13.61	73	34892	1.341	ng	99
45) 1,2-Dichloropropane	13.82	63	11989	1.350	ng	99
46) Bromodichloromethane	14.00	83	13617	1.303	ng	100
47) Trichloroethene	14.06	130	13717	1.418	ng	98
48) 1,4-Dioxane	14.05	88	10496	1.415	ng	95
49) 2,2,4-Trimethylpentane...	14.13	57	55077	1.308	ng	100
50) Methyl Methacrylate	14.27	100	11079	2.831	ng	98

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Data File: I:\MS08\Data\2019 05\25\05251916.D

Sample : 1.0ng TO-15 ICAL STD

Acq On : 25 May 2019 14:36

Misc : S31-05251901/S31-05081902 (6/6)

ALS Vial : 6 Sample Multiplier: 1

Inst : MS08

Operator: SC

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

Quant Time: May 28 07:29:30 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:28:58 2019

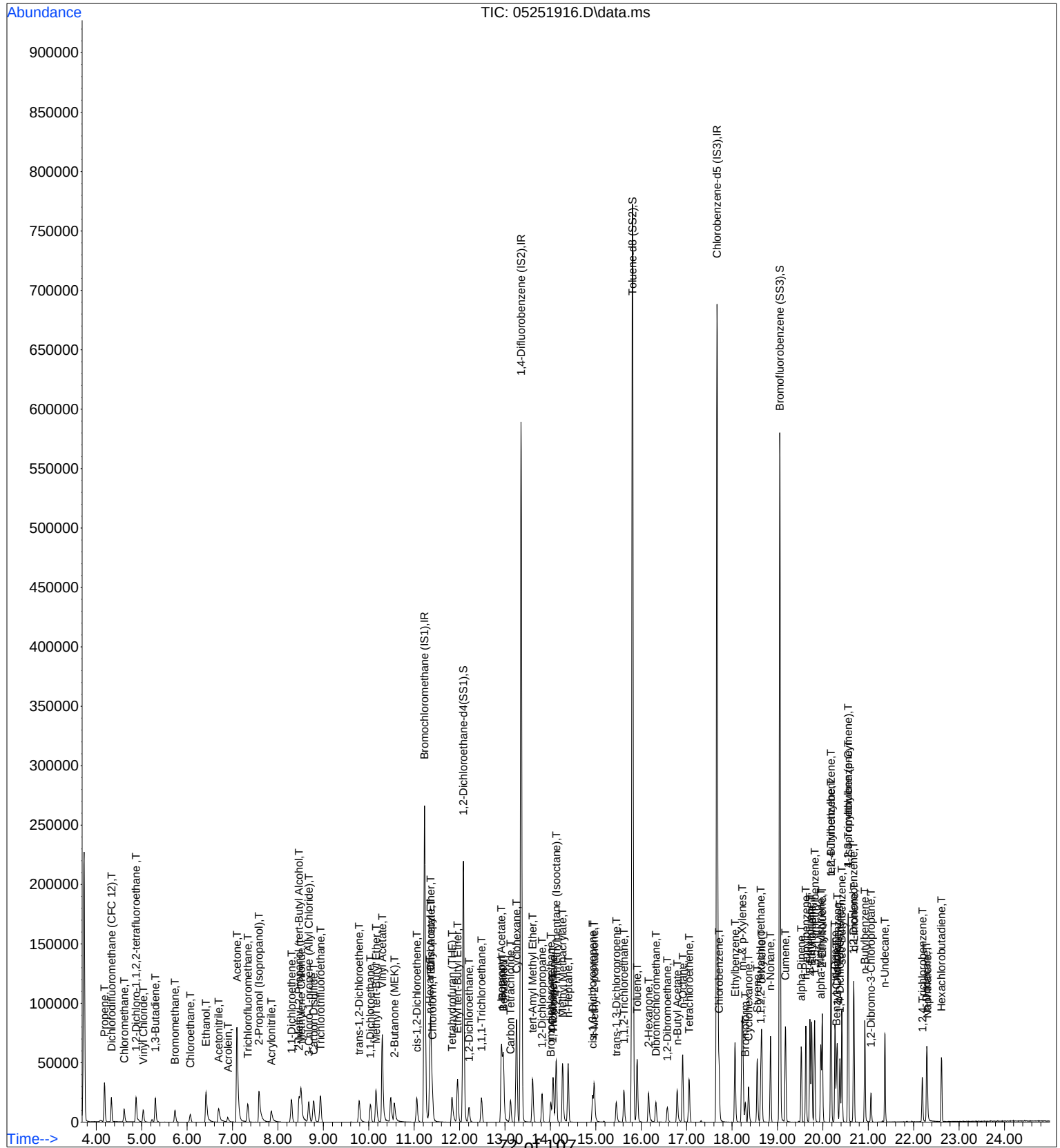
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.39	71	13860	1.344	ng	99
52) cis-1,3-Dichloropropene	14.93	75	17765	1.294	ng	99
53) 4-Methyl-2-pentanone	14.97	58	11192	1.297	ng	99
54) trans-1,3-Dichloropropene	15.45	75	13429	1.113	ng	95
55) 1,1,2-Trichloroethane	15.62	97	11548	1.434	ng	100
58) Toluene	15.91	91	50835	1.532	ng	100
59) 2-Hexanone	16.16	43	24756	1.341	ng	95
60) Dibromochloromethane	16.32	129	12124	1.618	ng	100
61) 1,2-Dibromoethane	16.58	107	12398	1.620	ng	100
62) n-Butyl Acetate	16.80	43	26581	1.329	ng	99
63) n-Octane	16.91	57	11181	1.499	ng	97
64) Tetrachloroethene	17.05	166	15254	1.653	ng	99
65) Chlorobenzene	17.71	112	34126	1.554	ng	99
66) Ethylbenzene	18.07	91	57460	1.528	ng	99
67) m- & p-Xylenes	18.23	91	90092	3.189	ng	99
68) Bromoform	18.29	173	9657	1.537	ng	99
69) Styrene	18.56	104	32609	1.524	ng	99
70) o-Xylene	18.65	91	45269	1.595	ng	100
71) n-Nonane	18.85	43	25682	1.405	ng	99
72) 1,1,2,2-Tetrachloroethane	18.63	83	19815	1.591	ng	98
74) Cumene	19.17	105	60652	1.606	ng	100
75) alpha-Pinene	19.52	93	28007	1.504	ng	97
76) n-Propylbenzene	19.63	91	69367	1.619	ng	99
77) 3-Ethyltoluene	19.72	105	59196	1.618	ng	100
78) 4-Ethyltoluene	19.75	105	56834	1.633	ng	99
79) 1,3,5-Trimethylbenzene	19.82	105	49926	1.618	ng	99
80) alpha-Methylstyrene	19.95	118	23162	1.521	ng	98
81) 2-Ethyltoluene	19.99	105	59213	1.631	ng	99
82) 1,2,4-Trimethylbenzene	20.18	105	48969	1.668	ng	98
83) n-Decane	20.27	57	26510	1.532	ng	99
84) Benzyl Chloride	20.30	91	24705	1.150	ng	97
85) 1,3-Dichlorobenzene	20.32	146	27314	1.626	ng	100
86) 1,4-Dichlorobenzene	20.37	146	27329	1.578	ng	100
87) sec-Butylbenzene	20.42	105	67851	1.645	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	64752	1.687	ng	99
89) 1,2,3-Trimethylbenzene	20.56	105	48518	1.644	ng	99
90) 1,2-Dichlorobenzene	20.67	146	26632	1.667	ng	99
91) d-Limonene	20.69	68	16802	1.477	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.06	157	8536	1.452	ng	96
93) n-Undecane	21.36	57	23875	1.453	ng	99
94) 1,2,4-Trichlorobenzene	22.19	180	15004	1.301	ng	96
95) Naphthalene	22.30	128	41146	1.130	ng	98
96) n-Dodecane	22.28	57	12388	1.024	ng	98
97) Hexachlorobutadiene	22.61	225	12487	1.679	ng	99
98) Cyclohexanone	18.36	55	15058	1.270	ng	99
99) tert-Butylbenzene	20.18	119	51050	1.695	ng	99
100) n-Butylbenzene	20.92	91	49736	1.610	ng	99

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

ALS Vial : 6 Sample Multiplier: 1

Response via : Initial Calibration



Data File: I:\MS08\Data\2019 05\25\05251917.D

Sample : 5.0ng TO-15 ICAL STD

Acq On : 25 May 2019 15:09

Misc : S31-05251901/S31-05081902 (6/6)

ALS Vial : 6 Sample Multiplier: 1

Inst : MS08

Operator: SC

RS 5/28/19

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

Quant Time: May 28 07:29:32 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:28:58 2019

Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.23	130	148437	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.36	114	667169	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	273610	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	187195	11.114	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	88.88%
57) Toluene-d8 (SS2)	15.81	98	702999	13.425	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	107.36%
73) Bromofluorobenzene (SS3)	19.06	174	231942	12.648	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.20%

Target Compounds

						Qvalue
2) Propene	4.16	42	59940	4.749	ng	100
3) Dichlorodifluoromethan...	4.32	85	90513	5.342	ng	99
4) Chloromethane	4.60	50	62652	5.050	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.86	135	49287	5.243	ng	99
6) Vinyl Chloride	5.02	62	67541	5.023	ng	100
7) 1,3-Butadiene	5.29	54	58316	5.261	ng	98
8) Bromomethane	5.73	94	44235	5.541	ng	98
9) Chloroethane	6.06	64	41316	5.354	ng	100
10) Ethanol	6.42	45	193992	22.936	ng	100
11) Acetonitrile	6.69	41	103394	4.707	ng	100
12) Acrolein	6.88	56	32292	5.200	ng	100
13) Acetone	7.09	58	223221	25.805	ng	98
14) Trichlorofluoromethane	7.33	101	79090	5.410	ng	100
15) 2-Propanol (Isopropanol)	7.58	45	284055	10.618	ng	99
16) Acrylonitrile	7.84	53	73036	5.344	ng	99
17) 1,1-Dichloroethene	8.30	96	53738	6.001	ng	98
18) 2-Methyl-2-Propanol (t...	8.45	59	287187	11.678	ng	99
19) Methylene Chloride	8.52	84	55697	6.030	ng	99
20) 3-Chloro-1-propene (Al...	8.68	41	83390	5.254	ng	99
21) Trichlorotrifluoroethane	8.94	151	52644	6.142	ng	99
22) Carbon Disulfide	8.78	76	198694	5.560	ng	100
23) trans-1,2-Dichloroethene	9.79	61	74768	5.975	ng	100
24) 1,1-Dichloroethane	10.04	63	91076	5.402	ng	100
25) Methyl tert-Butyl Ether	10.15	73	177009	5.983	ng	100
26) Vinyl Acetate	10.30	86	80658	28.924	ng	# 93
27) 2-Butanone (MEK)	10.55	72	41728	5.860	ng	99
28) cis-1,2-Dichloroethene	11.06	61	71634	5.574	ng	100
29) Diisopropyl Ether	11.36	87	61562	6.426	ng	98
30) Ethyl Acetate	11.36	61	42024	12.746	ng	99
31) n-Hexane	11.34	57	100712	5.709	ng	100
32) Chloroform	11.40	83	86970	5.817	ng	100
34) Tetrahydrofuran (THF)	11.82	72	40722	6.157	ng	98
35) Ethyl tert-Butyl Ether	11.95	87	75135	5.935	ng	99
36) 1,2-Dichloroethane	12.21	62	62701	5.454	ng	99
38) 1,1,1-Trichloroethane	12.48	97	78270	5.792	ng	100
39) Isopropyl Acetate	12.91	61	75874	11.535	ng	97
40) 1-Butanol	12.93	56	115435	10.782	ng	97
41) Benzene	12.97	78	228920	5.773	ng	99
42) Carbon Tetrachloride	13.12	117	64761	5.673	ng	99
43) Cyclohexane	13.26	84	197340	11.417	ng	100
44) tert-Amyl Methyl Ether	13.60	73	170110	5.958	ng	99
45) 1,2-Dichloropropane	13.82	63	55150	5.660	ng	100
46) Bromodichloromethane	14.00	83	68530	5.976	ng	100
47) Trichloroethene	14.06	130	63963	6.029	ng	100
48) 1,4-Dioxane	14.04	88	50631	6.222	ng	100
49) 2,2,4-Trimethylpentane...	14.13	57	253886	5.497	ng	100
50) Methyl Methacrylate	14.27	100	55547	12.939	ng	100

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Data File: I:\MS08\Data\2019 05\25\05251917.D

Sample : 5.0ng TO-15 ICAL STD

Acq On : 25 May 2019 15:09

Misc : S31-05251901/S31-05081902 (6/6)

ALS Vial : 6 Sample Multiplier: 1

Inst : MS08

Operator: SC

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

Quant Time: May 28 07:29:32 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:28:58 2019

Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.39	71	65098	5.755	ng	99
52) cis-1,3-Dichloropropene	14.92	75	93750	6.225	ng	99
53) 4-Methyl-2-pentanone	14.96	58	56280	5.943	ng	98
54) trans-1,3-Dichloropropene	15.45	75	76236	5.759	ng	99
55) 1,1,2-Trichloroethane	15.62	97	55426	6.275	ng	100
58) Toluene	15.91	91	239791	6.526	ng	100
59) 2-Hexanone	16.15	43	126740	6.198	ng	98
60) Dibromochloromethane	16.32	129	61291	7.384	ng	99
61) 1,2-Dibromoethane	16.57	107	61353	7.238	ng	100
62) n-Butyl Acetate	16.79	43	140365	6.339	ng	100
63) n-Octane	16.91	57	52965	6.410	ng	100
64) Tetrachloroethene	17.05	166	69894	6.838	ng	100
65) Chlorobenzene	17.71	112	159905	6.575	ng	100
66) Ethylbenzene	18.07	91	272059	6.532	ng	100
67) m- & p-Xylenes	18.23	91	410659	13.125	ng	99
68) Bromoform	18.29	173	52810	7.589	ng	100
69) Styrene	18.55	104	168936	7.128	ng	100
70) o-Xylene	18.65	91	211031	6.712	ng	99
71) n-Nonane	18.85	43	120228	5.940	ng	100
72) 1,1,2,2-Tetrachloroethane	18.63	83	96118	6.969	ng	99
74) Cumene	19.17	105	284362	6.798	ng	99
75) alpha-Pinene	19.52	93	139232	6.753	ng	99
76) n-Propylbenzene	19.63	91	327411	6.899	ng	100
77) 3-Ethyltoluene	19.71	105	284400	7.017	ng	100
78) 4-Ethyltoluene	19.75	105	262689	6.814	ng	100
79) 1,3,5-Trimethylbenzene	19.82	105	231832	6.782	ng	99
80) alpha-Methylstyrene	19.95	118	117887	6.990	ng	99
81) 2-Ethyltoluene	19.99	105	276314	6.874	ng	99
82) 1,2,4-Trimethylbenzene	20.18	105	228488	7.029	ng	98
83) n-Decane	20.27	57	125133	6.528	ng	100
84) Benzyl Chloride	20.30	91	152898	6.427	ng	99
85) 1,3-Dichlorobenzene	20.31	146	131335	7.059	ng	100
86) 1,4-Dichlorobenzene	20.37	146	129019	6.728	ng	100
87) sec-Butylbenzene	20.42	105	317907	6.962	ng	100
88) 4-Isopropyltoluene (p-...	20.56	119	296117	6.968	ng	99
89) 1,2,3-Trimethylbenzene	20.56	105	225203	6.891	ng	98
90) 1,2-Dichlorobenzene	20.67	146	128116	7.240	ng	98
91) d-Limonene	20.68	68	83966	6.665	ng	99
92) 1,2-Dibromo-3-Chloropr...	21.06	157	47523	7.300	ng	99
93) n-Undecane	21.36	57	118012	6.487	ng	99
94) 1,2,4-Trichlorobenzene	22.19	180	78807	6.171	ng	100
95) Naphthalene	22.29	128	216120	5.359	ng	99
96) n-Dodecane	22.28	57	65148	4.862	ng	100
97) Hexachlorobutadiene	22.61	225	58886	7.147	ng	98
98) Cyclohexanone	18.36	55	77161	5.876	ng	99
99) tert-Butylbenzene	20.18	119	236116	7.079	ng	99
100) n-Butylbenzene	20.92	91	235630	6.886	ng	100

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

Data File: I:\MS08\Data\2019 05\25\05251917.D

Sample : 5.0ng TO-15 ICAL STD

Acq On : 25 May 2019 15:09

Misc : S31-05251901/S31-05081902 (6/6)

ALS Vial : 6 Sample Multiplier: 1

Inst : MS08

Operator: SC

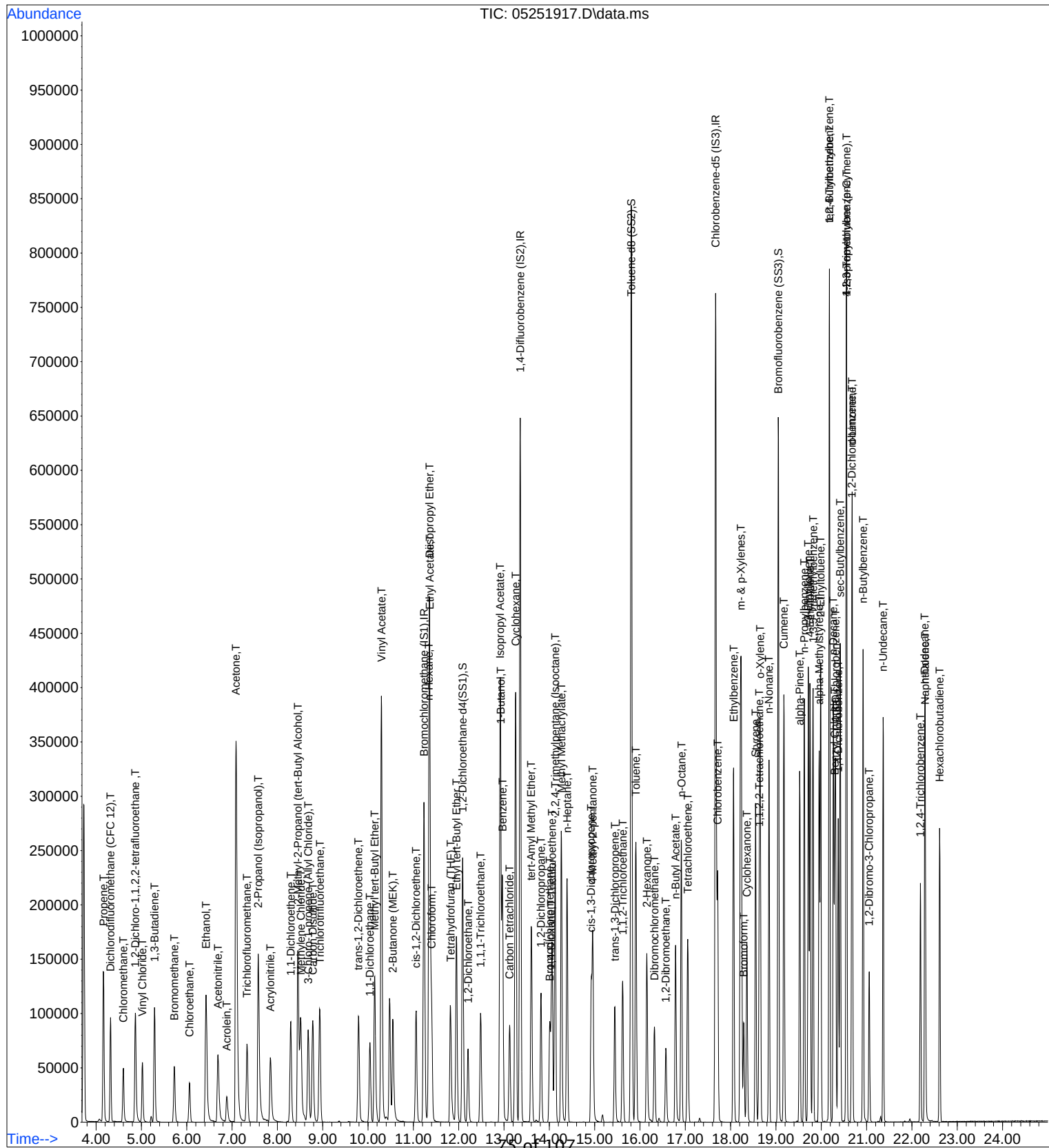
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

Quant Time: May 28 07:29:32 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:28:58 2019

Response via : Initial Calibration



Data File: I:\MS08\Data\2019 05\25\05251918.D

Sample : 25ng TO-15 ICAL STD

Acq On : 25 May 2019 15:42

Misc : S31-05251901/S31-05201908 (6/18)

ALS Vial : 7 Sample Multiplier: 1

Inst : MS08

Operator: SC

RS 5/28/19

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

Quant Time: May 28 07:29:34 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:28:58 2019

Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.25	130	153348	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.36	114	674568	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	280023	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	190616	10.955	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	87.60%
57) Toluene-d8 (SS2)	15.81	98	710276	13.253	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	106.00%
73) Bromofluorobenzene (SS3)	19.06	174	236534	12.603	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.80%

Target Compounds

						Qvalue
2) Propene	4.15	42	293241	22.490	ng	100
3) Dichlorodifluoromethan...	4.31	85	450751	25.752	ng	100
4) Chloromethane	4.60	50	333896	26.049	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.86	135	248415	25.578	ng	100
6) Vinyl Chloride	5.02	62	345652	24.883	ng	100
7) 1,3-Butadiene	5.29	54	304514	26.594	ng	100
8) Bromomethane	5.73	94	231213	28.036	ng	100
9) Chloroethane	6.06	64	210632	26.422	ng	100
10) Ethanol	6.46	45	1011892	115.808	ng	100
11) Acetonitrile	6.71	41	548573	24.174	ng	100
12) Acrolein	6.89	56	188583	29.393	ng	100
13) Acetone	7.10	58	1064421	119.108	ng	100
14) Trichlorofluoromethane	7.33	101	399400	26.447	ng	100
15) 2-Propanol (Isopropanol)	7.60	45	1457111	52.722	ng	100
16) Acrylonitrile	7.86	53	389754	27.602	ng	100
17) 1,1-Dichloroethene	8.30	96	279116	30.172	ng	100
18) 2-Methyl-2-Propanol (t...	8.47	59	1450598	57.099	ng	100
19) Methylene Chloride	8.53	84	283118	29.671	ng	100
20) 3-Chloro-1-propene (Al...	8.69	41	453519	27.658	ng	100
21) Trichlorotrifluoroethane	8.94	151	264393	29.858	ng	100
22) Carbon Disulfide	8.79	76	999541	27.075	ng	100
23) trans-1,2-Dichloroethene	9.80	61	386476	29.893	ng	100
24) 1,1-Dichloroethane	10.05	63	460415	26.436	ng	100
25) Methyl tert-Butyl Ether	10.14	73	886083	28.993	ng	100
26) Vinyl Acetate	10.31	86	422666	146.715	ng	100
27) 2-Butanone (MEK)	10.55	72	214130	29.106	ng	100
28) cis-1,2-Dichloroethene	11.07	61	366377	27.597	ng	100
29) Diisopropyl Ether	11.36	87	292143	29.517	ng	100
30) Ethyl Acetate	11.36	61	200207	58.780	ng	100
31) n-Hexane	11.35	57	459229	25.199	ng	100
32) Chloroform	11.41	83	438869	28.416	ng	100
34) Tetrahydrofuran (THF)	11.81	72	208209	30.474	ng	100
35) Ethyl tert-Butyl Ether	11.95	87	373520	28.559	ng	100
36) 1,2-Dichloroethane	12.21	62	319246	26.880	ng	100
38) 1,1,1-Trichloroethane	12.49	97	398950	29.200	ng	100
39) Isopropyl Acetate	12.92	61	361247	54.319	ng	100
40) 1-Butanol	12.93	56	609454	56.301	ng	100
41) Benzene	12.97	78	1106322	27.593	ng	100
42) Carbon Tetrachloride	13.13	117	340271	29.478	ng	100
43) Cyclohexane	13.26	84	946915	54.181	ng	100
44) tert-Amyl Methyl Ether	13.61	73	844235	29.244	ng	100
45) 1,2-Dichloropropane	13.82	63	275755	27.992	ng	100
46) Bromodichloromethane	14.01	83	351806	30.342	ng	100
47) Trichloroethene	14.06	130	320209	29.850	ng	100
48) 1,4-Dioxane	14.04	88	257184	31.260	ng	100
49) 2,2,4-Trimethylpentane...	14.13	57	1241881	26.595	ng	100
50) Methyl Methacrylate	14.27	100	279796	64.458	ng	100

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Data File: I:\MS08\Data\2019 05\25\05251918.D

Sample : 25ng TO-15 ICAL STD

Inst : MS08

Acq On : 25 May 2019 15:42

Operator: SC

Misc : S31-05251901/S31-05201908 (6/18)

ALS Vial : 7 Sample Multiplier: 1

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

Quant Time: May 28 07:29:34 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:28:58 2019

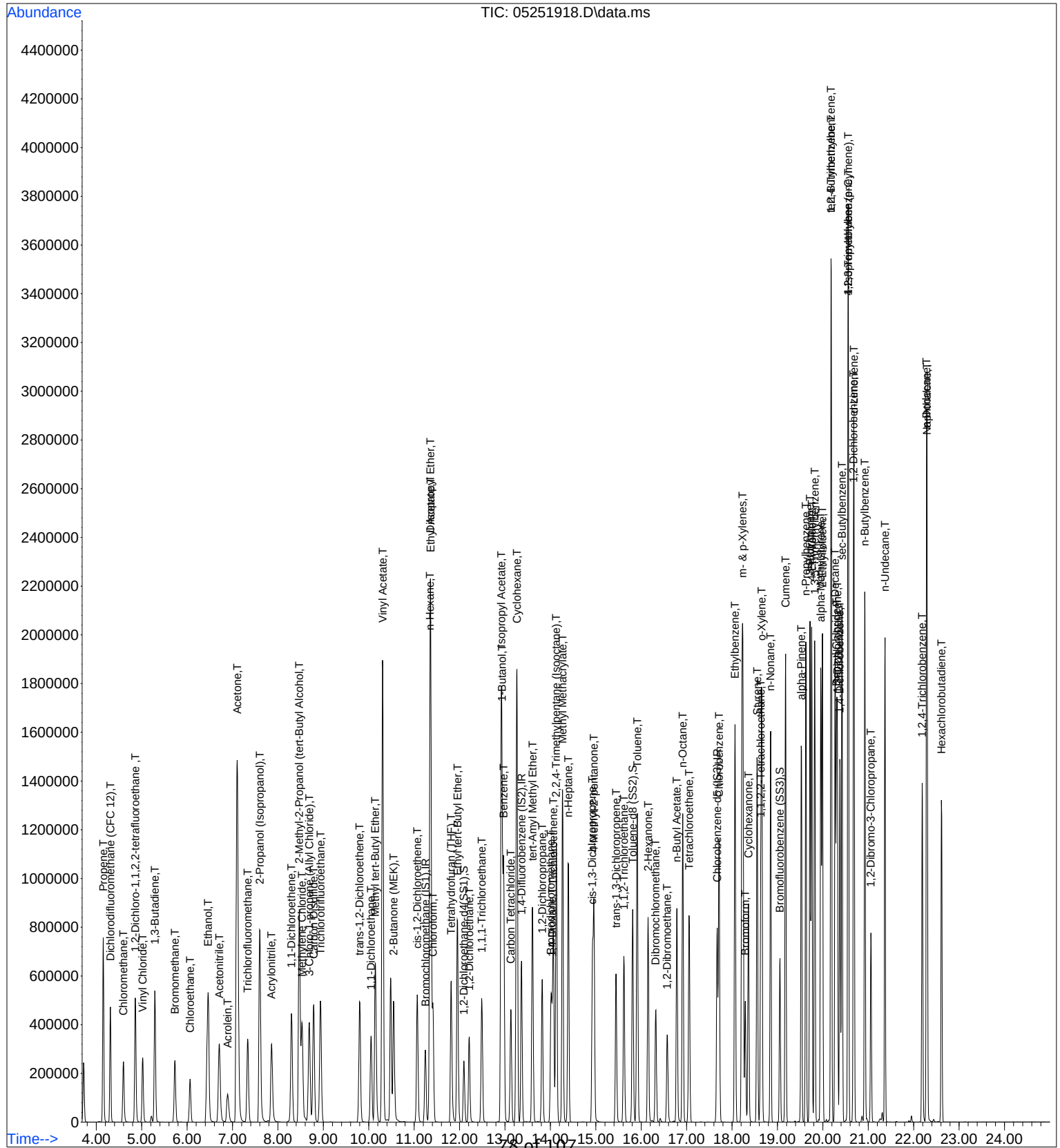
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.39	71	315341	27.572	ng	100
52) cis-1,3-Dichloropropene	14.92	75	485425	31.878	ng	100
53) 4-Methyl-2-pentanone	14.96	58	282176	29.469	ng	100
54) trans-1,3-Dichloropropene	15.45	75	413589	30.903	ng	100
55) 1,1,2-Trichloroethane	15.62	97	281335	31.504	ng	100
58) Toluene	15.91	91	1182134	31.435	ng	100
59) 2-Hexanone	16.15	43	648920	31.009	ng	100
60) Dibromochloromethane	16.32	129	323853	38.122	ng	100
61) 1,2-Dibromoethane	16.57	107	321178	37.020	ng	100
62) n-Butyl Acetate	16.79	43	743097	32.791	ng	100
63) n-Octane	16.91	57	260387	30.793	ng	100
64) Tetrachloroethene	17.05	166	348822	33.343	ng	100
65) Chlorobenzene	17.72	112	803519	32.281	ng	100
66) Ethylbenzene	18.07	91	1353115	31.742	ng	100
67) m- & p-Xylenes	18.23	91	2039612	63.693	ng	100
68) Bromoform	18.29	173	289395	40.637	ng	100
69) Styrene	18.56	104	897665	37.010	ng	100
70) o-Xylene	18.65	91	1043017	32.414	ng	100
71) n-Nonane	18.85	43	589565	28.460	ng	100
72) 1,1,2,2-Tetrachloroethane	18.63	83	485165	34.372	ng	100
74) Cumene	19.18	105	1393993	32.561	ng	100
75) alpha-Pinene	19.52	93	687803	32.595	ng	100
76) n-Propylbenzene	19.63	91	1615133	33.252	ng	100
77) 3-Ethyltoluene	19.72	105	1366253	32.939	ng	100
78) 4-Ethyltoluene	19.75	105	1326018	33.609	ng	100
79) 1,3,5-Trimethylbenzene	19.82	105	1133278	32.394	ng	100
80) alpha-Methylstyrene	19.95	118	641858	37.186	ng	100
81) 2-Ethyltoluene	19.99	105	1350112	32.817	ng	100
82) 1,2,4-Trimethylbenzene	20.18	105	1099590	33.053	ng	100
83) n-Decane	20.27	57	617949	31.499	ng	100
84) Benzyl Chloride	20.30	91	971432	39.899	ng	100
85) 1,3-Dichlorobenzene	20.32	146	675788	35.489	ng	100
86) 1,4-Dichlorobenzene	20.37	146	696240	35.476	ng	100
87) sec-Butylbenzene	20.42	105	1535614	32.857	ng	100
88) 4-Isopropyltoluene (p-...	20.56	119	1377684	31.675	ng	100
89) 1,2,3-Trimethylbenzene	20.56	105	1078853	32.254	ng	100
90) 1,2-Dichlorobenzene	20.67	146	637394	35.197	ng	100
91) d-Limonene	20.69	68	420970	32.652	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.06	157	263952	39.615	ng	100
93) n-Undecane	21.37	57	635266	34.118	ng	100
94) 1,2,4-Trichlorobenzene	22.19	180	505982	38.713	ng	100
95) Naphthalene	22.29	128	1523372	36.906	ng	100
96) n-Dodecane	22.28	57	516506	37.663	ng	100
97) Hexachlorobutadiene	22.61	225	304630	36.128	ng	100
98) Cyclohexanone	18.36	55	408649	30.405	ng	100
99) tert-Butylbenzene	20.18	119	1097750	32.160	ng	100
100) n-Butylbenzene	20.92	91	1198382	34.217	ng	100

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

ALS Vial : 7 Sample Multiplier: 1

Response via : Initial Calibration



Data File: I:\MS08\Data\2019 05\25\05251919.D

RS 5/28/19

Sample : 50ng TO-15 ICAL STD

Inst : MS08

Acq On : 25 May 2019 16:15

Operator: SC

Misc : S31-05251901/S31-05201908 (6/18)

ALS Vial : 7 Sample Multiplier: 1

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

Quant Time: May 28 07:29:36 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:28:58 2019

Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.26	130	153841	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.37	114	674164	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	282817	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.10	65	190744	10.927	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	87.44%
57) Toluene-d8 (SS2)	15.81	98	711650	13.148	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	105.20%
73) Bromofluorobenzene (SS3)	19.06	174	237880	12.550	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.40%

Target Compounds

						Qvalue
2) Propene	4.16	42	543363	41.539	ng	100
3) Dichlorodifluoromethan...	4.32	85	845232	48.134	ng	100
4) Chloromethane	4.61	50	633242	49.244	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.87	135	486520	49.935	ng	99
6) Vinyl Chloride	5.04	62	684481	49.117	ng	100
7) 1,3-Butadiene	5.31	54	593643	51.679	ng	100
8) Bromomethane	5.75	94	442164	53.444	ng	99
9) Chloroethane	6.08	64	399133	49.907	ng	99
10) Ethanol	6.50	45	1869768	213.303	ng	100
11) Acetonitrile	6.73	41	1059275	46.529	ng	100
12) Acrolein	6.91	56	362169	56.268	ng	100
13) Acetone	7.12	58	1927717	215.019	ng	100
14) Trichlorofluoromethane	7.34	101	750887	49.562	ng	100
15) 2-Propanol (Isopropanol)	7.62	45	2719078	98.067	ng	99
16) Acrylonitrile	7.88	53	748948	52.871	ng	99
17) 1,1-Dichloroethene	8.31	96	527410	56.830	ng	99
18) 2-Methyl-2-Propanol (t...	8.50	59	2695126	105.747	ng	100
19) Methylene Chloride	8.54	84	531612	55.536	ng	100
20) 3-Chloro-1-propene (Al...	8.70	41	860010	52.280	ng	100
21) Trichlorotrifluoroethane	8.95	151	500135	56.300	ng	100
22) Carbon Disulfide	8.80	76	1877915	50.705	ng	100
23) trans-1,2-Dichloroethene	9.81	61	732149	56.449	ng	100
24) 1,1-Dichloroethane	10.06	63	871901	49.902	ng	100
25) Methyl tert-Butyl Ether	10.15	73	1659052	54.111	ng	99
26) Vinyl Acetate	10.32	86	765999	265.040	ng	96
27) 2-Butanone (MEK)	10.56	72	405380	54.925	ng	100
28) cis-1,2-Dichloroethene	11.07	61	693596	52.078	ng	100
29) Diisopropyl Ether	11.36	87	459465	46.274	ng	# 76
30) Ethyl Acetate	11.37	61	360667	105.551	ng	100
31) n-Hexane	11.35	57	832503	45.535	ng	100
32) Chloroform	11.42	83	827316	53.395	ng	100
34) Tetrahydrofuran (THF)	11.82	72	392341	57.241	ng	100
35) Ethyl tert-Butyl Ether	11.95	87	701399	53.456	ng	100
36) 1,2-Dichloroethane	12.22	62	598529	50.234	ng	99
38) 1,1,1-Trichloroethane	12.49	97	751032	55.002	ng	99
39) Isopropyl Acetate	12.92	61	656706	98.804	ng	99
40) 1-Butanol	12.95	56	1109714	102.576	ng	99
41) Benzene	12.98	78	2005023	50.038	ng	100
42) Carbon Tetrachloride	13.13	117	641034	55.566	ng	100
43) Cyclohexane	13.27	84	1714970	98.186	ng	100
44) tert-Amyl Methyl Ether	13.61	73	1576134	54.629	ng	100
45) 1,2-Dichloropropane	13.82	63	518952	52.710	ng	100
46) Bromodichloromethane	14.01	83	661479	57.083	ng	100
47) Trichloroethene	14.07	130	594752	55.476	ng	99
48) 1,4-Dioxane	14.04	88	476130	57.907	ng	100
49) 2,2,4-Trimethylpentane...	14.13	57	2282819	48.916	ng	100
50) Methyl Methacrylate	14.27	100	520465	119.974	ng	99

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Data File: I:\MS08\Data\2019 05\25\05251919.D

Sample : 50ng TO-15 ICAL STD

Inst : MS08

Acq On : 25 May 2019 16:15

Operator: SC

Misc : S31-05251901/S31-05201908 (6/18)

ALS Vial : 7 Sample Multiplier: 1

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

Quant Time: May 28 07:29:36 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:28:58 2019

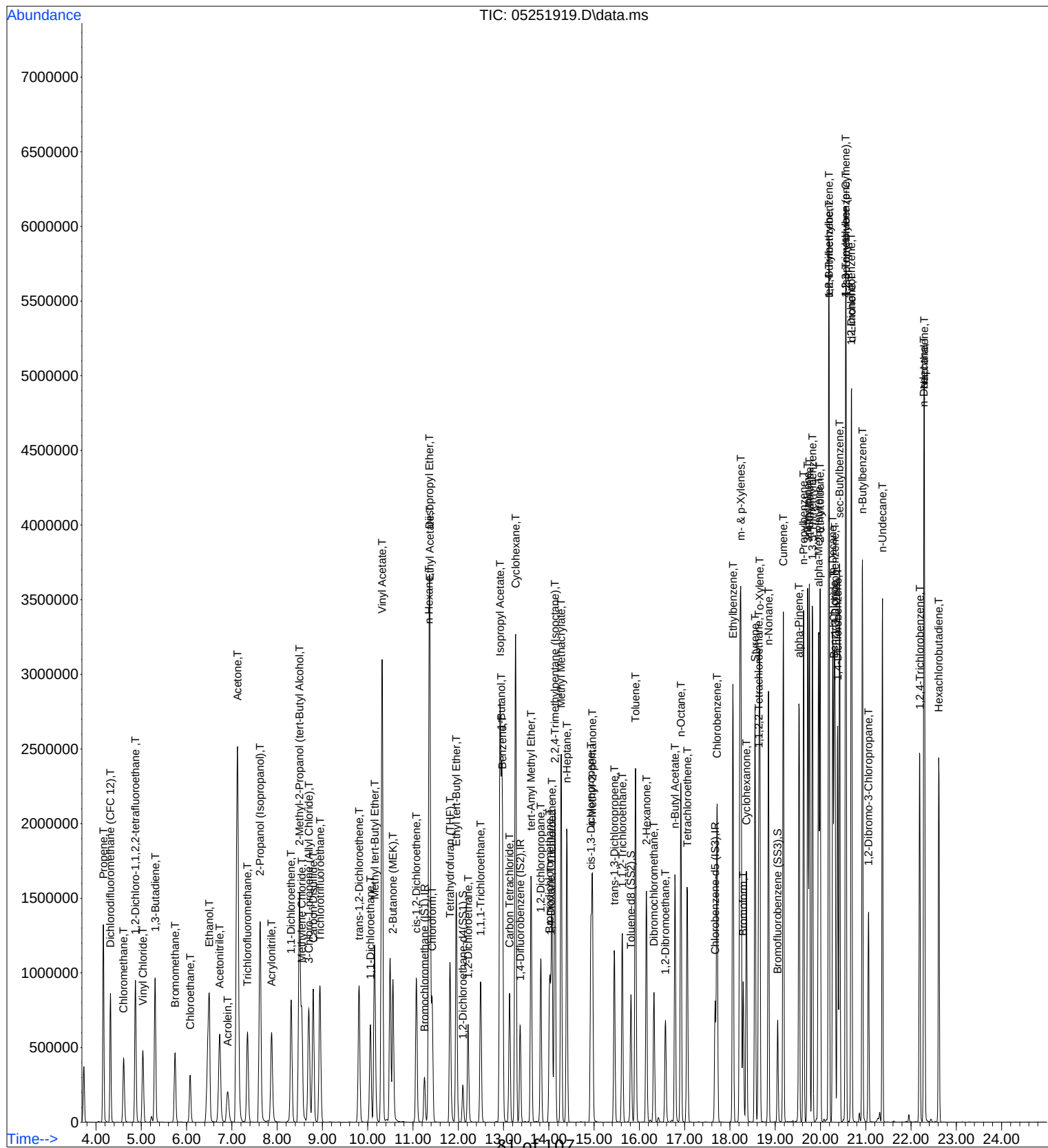
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.40	71	585559	51.229	ng	100
52) cis-1,3-Dichloropropene	14.93	75	911589	59.900	ng	100
53) 4-Methyl-2-pentanone	14.96	58	523673	54.723	ng	100
54) trans-1,3-Dichloropropene	15.45	75	791006	59.139	ng	100
55) 1,1,2-Trichloroethane	15.62	97	527265	59.078	ng	100
58) Toluene	15.91	91	2174695	57.258	ng	100
59) 2-Hexanone	16.16	43	1210262	57.262	ng	100
60) Dibromochloromethane	16.32	129	613547	71.509	ng	100
61) 1,2-Dibromoethane	16.58	107	607069	69.282	ng	100
62) n-Butyl Acetate	16.79	43	1389016	60.689	ng	100
63) n-Octane	16.91	57	477514	55.913	ng	100
64) Tetrachloroethene	17.06	166	646324	61.170	ng	100
65) Chlorobenzene	17.72	112	1486204	59.117	ng	100
66) Ethylbenzene	18.07	91	2476364	57.517	ng	100
67) m- & p-Xylenes	18.24	91	3667699	113.403	ng	100
68) Bromoform	18.29	173	543124	75.513	ng	100
69) Styrene	18.56	104	1642507	67.050	ng	99
70) o-Xylene	18.66	91	1878448	57.799	ng	100
71) n-Nonane	18.85	43	1063806	50.845	ng	100
72) 1,1,2,2-Tetrachloroethane	18.64	83	891871	62.561	ng	100
74) Cumene	19.18	105	2514051	58.143	ng	100
75) alpha-Pinene	19.52	93	1269867	59.584	ng	100
76) n-Propylbenzene	19.63	91	2905781	59.233	ng	100
77) 3-Ethyltoluene	19.72	105	2593866	61.918	ng	100
78) 4-Ethyltoluene	19.75	105	2221526	55.750	ng	100
79) 1,3,5-Trimethylbenzene	19.82	105	2052818	58.099	ng	99
80) alpha-Methylstyrene	19.96	118	1162184	66.666	ng	99
81) 2-Ethyltoluene	19.99	105	2416183	58.149	ng	100
82) 1,2,4-Trimethylbenzene	20.19	105	1916699	57.046	ng	99
83) n-Decane	20.27	57	1099217	55.478	ng	100
84) Benzyl Chloride	20.30	91	1785484	72.610	ng	100
85) 1,3-Dichlorobenzene	20.32	146	1217066	63.283	ng	100
86) 1,4-Dichlorobenzene	20.38	146	1242129	62.665	ng	100
87) sec-Butylbenzene	20.42	105	2732309	57.885	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	2345063	53.383	ng	99
89) 1,2,3-Trimethylbenzene	20.56	105	1869319	55.333	ng	99
90) 1,2-Dichlorobenzene	20.68	146	1110514	60.718	ng	100
91) d-Limonene	20.69	68	755255	58.002	ng	99
92) 1,2-Dibromo-3-Chloropr...	21.06	157	493602	73.350	ng	100
93) n-Undecane	21.37	57	1135731	60.394	ng	100
94) 1,2,4-Trichlorobenzene	22.19	180	932306	70.626	ng	100
95) Naphthalene	22.29	128	2687275	64.460	ng	100
96) n-Dodecane	22.28	57	909497	65.665	ng	100
97) Hexachlorobutadiene	22.61	225	553061	64.943	ng	99
98) Cyclohexanone	18.36	55	763768	56.267	ng	100
99) tert-Butylbenzene	20.19	119	1895063	54.969	ng	100
100) n-Butylbenzene	20.93	91	2153448	60.879	ng	100

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

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ALS Vial      : 7      Sample Multiplier: 1
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Response via : Initial Calibration



Data File: I:\MS08\Data\2019 05\25\05251920.D

Sample : 100ng TO-15 ICAL STD

Acq On : 25 May 2019 16:49

Misc : S31-05251901/S31-05201908 (6/18)

ALS Vial : 7 Sample Multiplier: 1

Inst : MS08

Operator: SC

RS 5/28/19

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

Quant Time: May 28 07:29:38 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:28:58 2019

Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.26	130	156318	12.500	ng	0.01
37) 1,4-Difluorobenzene (IS2)	13.37	114	684081	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	285683	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.11	65	190981	10.767	ng	0.02
Spiked Amount	12.500	Range 70	- 130	Recovery	=	86.16%
57) Toluene-d8 (SS2)	15.82	98	724963	13.259	ng	0.00
Spiked Amount	12.500	Range 70	- 130	Recovery	=	106.08%
73) Bromofluorobenzene (SS3)	19.06	174	239007	12.483	ng	0.00
Spiked Amount	12.500	Range 70	- 130	Recovery	=	99.84%

Target Compounds

						Qvalue
2) Propene	4.16	42	1076010	80.955	ng	99
3) Dichlorodifluoromethan...	4.32	85	1581666	88.645	ng	99
4) Chloromethane	4.62	50	1034449	79.170	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.88	135	920397	92.969	ng	99
6) Vinyl Chloride	5.04	62	1298867	91.728	ng	100
7) 1,3-Butadiene	5.31	54	1125338	96.412	ng	100
8) Bromomethane	5.75	94	796202	94.711	ng	99
9) Chloroethane	6.09	64	767236	94.414	ng	99
10) Ethanol	6.54	45	3487175	391.512	ng	100
11) Acetonitrile	6.76	41	2058695	88.996	ng	100
12) Acrolein	6.92	56	696440	106.486	ng	99
13) Acetone	7.15	58	3442301	377.873	ng	100
14) Trichlorofluoromethane	7.35	101	1438873	93.467	ng	99
15) 2-Propanol (Isopropanol)	7.66	45	4792738	170.118	ng	100
16) Acrylonitrile	7.89	53	1453949	101.012	ng	99
17) 1,1-Dichloroethene	8.31	96	1001705	106.226	ng	99
18) 2-Methyl-2-Propanol (t...	8.52	59	4923512	190.121	ng	100
19) Methylene Chloride	8.55	84	959982	98.697	ng	100
20) 3-Chloro-1-propene (Al...	8.71	41	1617364	96.761	ng	99
21) Trichlorotrifluoroethane	8.95	151	943527	104.529	ng	100
22) Carbon Disulfide	8.80	76	3538277	94.023	ng	100
23) trans-1,2-Dichloroethene	9.81	61	1388942	105.392	ng	100
24) 1,1-Dichloroethane	10.07	63	1660176	93.512	ng	100
25) Methyl tert-Butyl Ether	10.16	73	3118822	100.111	ng	99
26) Vinyl Acetate	10.34	86	1358683	462.663	ng	# 92
27) 2-Butanone (MEK)	10.57	72	766152	102.161	ng	99
28) cis-1,2-Dichloroethene	11.08	61	1314156	97.108	ng	100
29) Diisopropyl Ether	11.37	87	808380	80.123	ng	# 79
30) Ethyl Acetate	11.38	61	629591	181.333	ng	99
31) n-Hexane	11.35	57	1487535	80.074	ng	99
32) Chloroform	11.43	83	1548702	98.370	ng	100
34) Tetrahydrofuran (THF)	11.83	72	742118	106.556	ng	100
35) Ethyl tert-Butyl Ether	11.96	87	1315428	98.664	ng	99
36) 1,2-Dichloroethane	12.22	62	1137143	93.927	ng	99
38) 1,1,1-Trichloroethane	12.50	97	1411022	101.839	ng	99
39) Isopropyl Acetate	12.93	61	1181708	175.216	ng	97
40) 1-Butanol	12.97	56	1974742	179.889	ng	98
41) Benzene	12.98	78	3427742	84.304	ng	100
42) Carbon Tetrachloride	13.14	117	1204584	102.903	ng	100
43) Cyclohexane	13.27	84	2987287	168.551	ng	99
44) tert-Amyl Methyl Ether	13.61	73	2941698	100.482	ng	99
45) 1,2-Dichloropropane	13.83	63	976456	97.741	ng	100
46) Bromodichloromethane	14.02	83	1236463	105.156	ng	100
47) Trichloroethene	14.07	130	1082733	99.528	ng	99
48) 1,4-Dioxane	14.05	88	867451	103.971	ng	100
49) 2,2,4-Trimethylpentane...	14.14	57	4096361	86.504	ng	98
50) Methyl Methacrylate	14.28	100	935224	212.456	ng	99

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Data File: I:\MS08\Data\2019 05\25\05251920.D

Sample : 100ng TO-15 ICAL STD

Inst : MS08

Acq On : 25 May 2019 16:49

Operator: SC

Misc : S31-05251901/S31-05201908 (6/18)

ALS Vial : 7 Sample Multiplier: 1

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

Quant Time: May 28 07:29:38 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:28:58 2019

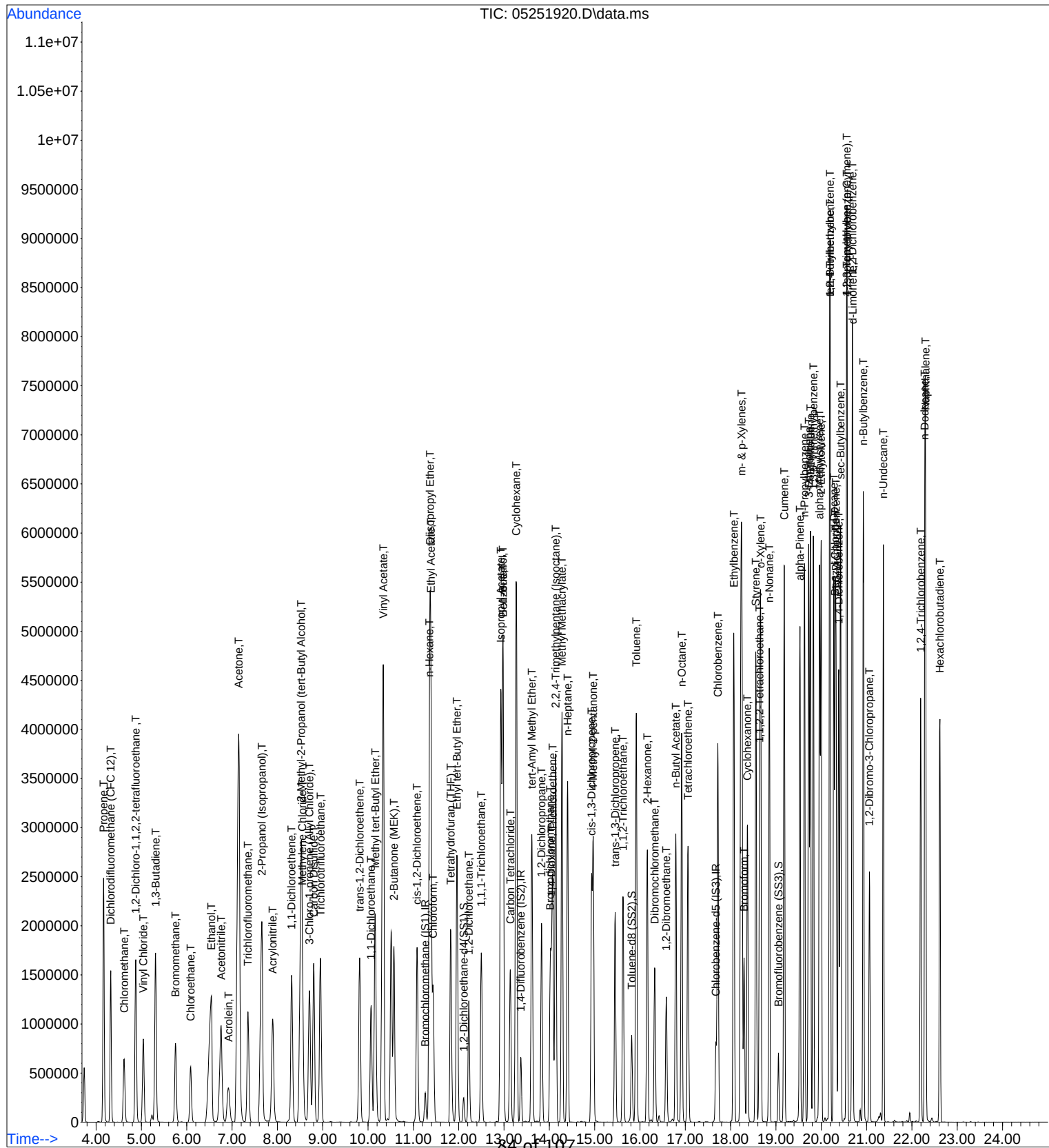
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.40	71	1065780	91.890	ng	100
52) cis-1,3-Dichloropropene	14.93	75	1698327	109.978	ng	100
53) 4-Methyl-2-pentanone	14.97	58	961067	98.975	ng	99
54) trans-1,3-Dichloropropene	15.45	75	1489616	109.755	ng	100
55) 1,1,2-Trichloroethane	15.62	97	985398	108.809	ng	100
58) Toluene	15.92	91	3946648	102.870	ng	100
59) 2-Hexanone	16.16	43	2235519	104.709	ng	100
60) Dibromochloromethane	16.33	129	1147257	132.372	ng	99
61) 1,2-Dibromoethane	16.58	107	1141400	128.955	ng	100
62) n-Butyl Acetate	16.79	43	2541144	109.914	ng	100
63) n-Octane	16.92	57	865476	100.323	ng	100
64) Tetrachloroethene	17.06	166	1176471	110.228	ng	99
65) Chlorobenzene	17.72	112	2683937	105.689	ng	100
66) Ethylbenzene	18.07	91	4417856	101.582	ng	100
67) m- & p-Xylenes	18.24	91	6534562	200.018	ng	97
68) Bromoform	18.30	173	1008229	138.773	ng	100
69) Styrene	18.56	104	2927207	118.296	ng	98
70) o-Xylene	18.66	91	3289469	100.201	ng	99
71) n-Nonane	18.85	43	1872017	88.576	ng	100
72) 1,1,2,2-Tetrachloroethane	18.64	83	1582733	109.908	ng	100
74) Cumene	19.18	105	4366054	99.961	ng	100
75) alpha-Pinene	19.53	93	2285270	106.152	ng	98
76) n-Propylbenzene	19.63	91	5054512	102.000	ng	99
77) 3-Ethyltoluene	19.72	105	4266321	100.819	ng	100
78) 4-Ethyltoluene	19.76	105	4060715	100.882	ng	100
79) 1,3,5-Trimethylbenzene	19.82	105	3556078	99.635	ng	98
80) alpha-Methylstyrene	19.96	118	2015064	114.430	ng	98
81) 2-Ethyltoluene	20.00	105	4161640	99.152	ng	100
82) 1,2,4-Trimethylbenzene	20.19	105	3157467	93.032	ng	98
83) n-Decane	20.28	57	1890852	94.474	ng	100
84) Benzyl Chloride	20.30	91	3134986	126.211	ng	100
85) 1,3-Dichlorobenzene	20.33	146	2057083	105.887	ng	100
86) 1,4-Dichlorobenzene	20.38	146	2203853	110.069	ng	100
87) sec-Butylbenzene	20.43	105	4659735	97.727	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	3782849	85.249	ng	98
89) 1,2,3-Trimethylbenzene	20.56	105	3088200	90.496	ng	98
90) 1,2-Dichlorobenzene	20.69	146	1830536	99.081	ng	100
91) d-Limonene	20.69	68	1266189	96.265	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.06	157	898529	132.184	ng	99
93) n-Undecane	21.37	57	1961404	103.254	ng	99
94) 1,2,4-Trichlorobenzene	22.19	180	1651950	123.887	ng	100
95) Naphthalene	22.30	128	4520830	107.354	ng	99
96) n-Dodecane	22.28	57	1526537	109.109	ng	99
97) Hexachlorobutadiene	22.62	225	987128	114.750	ng	99
98) Cyclohexanone	18.37	55	1404078	102.400	ng	100
99) tert-Butylbenzene	20.19	119	3112238	89.370	ng	100
100) n-Butylbenzene	20.93	91	3706378	103.730	ng	100

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

ALS Vial : 7 Sample Multiplier: 1

Response via : Initial Calibration



Data File: I:\MS08\Data\2019 05\25\05251922.D

Sample : 25ng TO-15 ICV STD Inst : MS08
 Acq On : 25 May 2019 17:55 Operator: SC
 Misc : S31-05011903/S31-05241902 (6/22)
 ALS Vial : 1 Sample Multiplier: 1

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

RS 5/28/19

Quant Time: May 28 08:45:19 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:57:28 2019

Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.24	130	159693	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.36	114	700808	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	295458	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	195705	12.330	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.64%
57) Toluene-d8 (SS2)	15.81	98	744967	12.260	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.08%
73) Bromofluorobenzene (SS3)	19.06	174	251331	12.592	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.72%

Target Compounds

						Qvalue
2) Propene	4.15	42	304951	23.324	ng	99
3) Dichlorodifluoromethan...	4.31	85	453319	22.234	ng	100
4) Chloromethane	4.60	50	375933	24.451	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.86	135	269959	23.422	ng	99
6) Vinyl Chloride	5.02	62	379478	25.080	ng	100
7) 1,3-Butadiene	5.29	54	321703	26.468	ng	100
8) Bromomethane	5.73	94	252930	24.619	ng	99
9) Chloroethane	6.06	64	226656	23.914	ng	100
10) Ethanol	6.47	45	1073775	116.091	ng	100
11) Acetonitrile	6.71	41	570816	24.300	ng	100
12) Acrolein	6.89	56	195457	28.618	ng	99
13) Acetone	7.10	58	1091403	118.350	ng	98
14) Trichlorofluoromethane	7.33	101	401834	22.947	ng	99
15) 2-Propanol (Isopropanol)	7.60	45	1496526	47.335	ng	99
16) Acrylonitrile	7.86	53	405929	29.567	ng	99
17) 1,1-Dichloroethene	8.30	96	286005	24.335	ng	99
18) 2-Methyl-2-Propanol (t...	8.47	59	1476777	50.033	ng	100
19) Methylene Chloride	8.53	84	288204	24.608	ng	100
20) 3-Chloro-1-propene (Al...	8.69	41	479787	26.803	ng	100
21) Trichlorotrifluoroethane	8.94	151	267498	23.234	ng	100
22) Carbon Disulfide	8.79	76	1029978	25.566	ng	100
23) trans-1,2-Dichloroethene	9.80	61	392593	25.589	ng	100
24) 1,1-Dichloroethane	10.05	63	484035	23.587	ng	100
25) Methyl tert-Butyl Ether	10.15	73	893313	24.054	ng	100
26) Vinyl Acetate	10.30	86	434748	142.419	ng	100
27) 2-Butanone (MEK)	10.55	72	219717	27.860	ng	98
28) cis-1,2-Dichloroethene	11.07	61	369792	23.769	ng	100
29) Diisopropyl Ether	11.36	87	297094	24.313	ng	99
30) Ethyl Acetate	11.37	61	207069	54.482	ng	100
31) n-Hexane	11.35	57	472218	23.457	ng	100
32) Chloroform	11.41	83	441645	23.748	ng	100
34) Tetrahydrofuran (THF)	11.81	72	212360	24.259	ng	100
35) Ethyl tert-Butyl Ether	11.95	87	381382	24.146	ng	99
36) 1,2-Dichloroethane	12.21	62	320453	23.520	ng	99
38) 1,1,1-Trichloroethane	12.49	97	394462	23.912	ng	100
39) Isopropyl Acetate	12.91	61	371299	46.878	ng	99
40) 1-Butanol	12.94	56	623795	59.337	ng	100
41) Benzene	12.97	78	1150611	22.844	ng	100
42) Carbon Tetrachloride	13.13	117	343340	24.090	ng	100
43) Cyclohexane	13.26	84	963129	44.322	ng	100
44) tert-Amyl Methyl Ether	13.61	73	864393	24.746	ng	100
45) 1,2-Dichloropropane	13.82	63	282482	24.087	ng	100
46) Bromodichloromethane	14.01	83	358784	25.910	ng	100
47) Trichloroethene	14.06	130	326256	24.058	ng	100
48) 1,4-Dioxane	14.04	88	261687	26.075	ng	100
49) 2,2,4-Trimethylpentane...	14.13	57	1272823	22.900	ng	100
50) Methyl Methacrylate	14.27	100	290268	56.806	ng	99

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Data File: I:\MS08\Data\2019 05\25\05251922.D

Sample : 25ng TO-15 ICV STD Inst : MS08
 Acq On : 25 May 2019 17:55 Operator: SC
 Misc : S31-05011903/S31-05241902 (6/22)
 ALS Vial : 1 Sample Multiplier: 1

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

Quant Time: May 28 08:45:19 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:57:28 2019

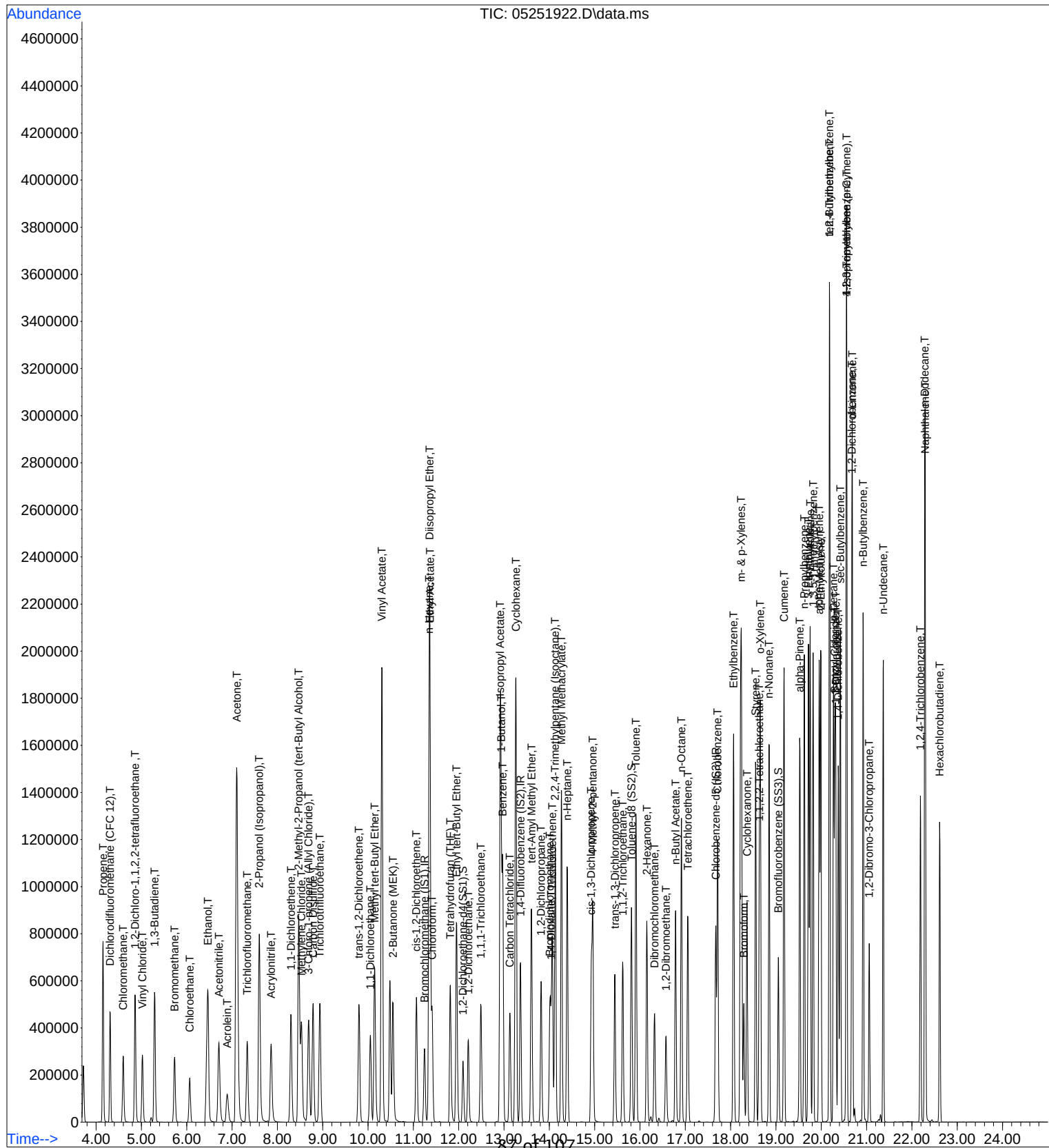
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.39	71	325725	23.622	ng	100
52) cis-1,3-Dichloropropene	14.92	75	473907	27.803	ng	99
53) 4-Methyl-2-pentanone	14.96	58	290624	28.377	ng	99
54) trans-1,3-Dichloropropene	15.45	75	424341	29.732	ng	100
55) 1,1,2-Trichloroethane	15.62	97	286360	25.032	ng	100
58) Toluene	15.91	91	1207793	23.492	ng	99
59) 2-Hexanone	16.15	43	663928	27.261	ng	100
60) Dibromochloromethane	16.32	129	328648	26.308	ng	100
61) 1,2-Dibromoethane	16.58	107	329923	26.422	ng	100
62) n-Butyl Acetate	16.79	43	756950	28.437	ng	100
63) n-Octane	16.91	57	266000	23.320	ng	100
64) Tetrachloroethene	17.05	166	354096	22.565	ng	100
65) Chlorobenzene	17.71	112	821001	22.835	ng	100
66) Ethylbenzene	18.07	91	1375218	22.346	ng	100
67) m- & p-Xylenes	18.23	91	2055792	44.702	ng	99
68) Bromoform	18.29	173	289683	27.300	ng	100
69) Styrene	18.55	104	918676	25.762	ng	100
70) o-Xylene	18.65	91	1056628	22.617	ng	100
71) n-Nonane	18.85	43	602079	22.903	ng	100
72) 1,1,2,2-Tetrachloroethane	18.63	83	485963	23.888	ng	100
74) Cumene	19.18	105	1417307	22.449	ng	100
75) alpha-Pinene	19.52	93	727017	24.142	ng	100
76) n-Propylbenzene	19.63	91	1640480	23.262	ng	100
77) 3-Ethyltoluene	19.72	105	1360582	22.121	ng	100
78) 4-Ethyltoluene	19.76	105	1383256	25.188	ng	100
79) 1,3,5-Trimethylbenzene	19.82	105	1147889	23.066	ng	99
80) alpha-Methylstyrene	19.95	118	673209	26.759	ng	99
81) 2-Ethyltoluene	19.99	105	1360593	23.521	ng	100
82) 1,2,4-Trimethylbenzene	20.18	105	1102180	23.483	ng	99
83) n-Decane	20.27	57	628419	23.254	ng	100
84) Benzyl Chloride	20.30	91	998237	32.881	ng	100
85) 1,3-Dichlorobenzene	20.32	146	684488	24.409	ng	99
86) 1,4-Dichlorobenzene	20.37	146	709302	25.391	ng	100
87) sec-Butylbenzene	20.42	105	1536345	23.234	ng	100
88) 4-Isopropyltoluene (p-...	20.56	119	1398446	22.490	ng	100
89) 1,2,3-Trimethylbenzene	20.56	105	1122919	22.413	ng	100
90) 1,2-Dichlorobenzene	20.67	146	637598	25.806	ng	100
91) d-Limonene	20.69	68	453084	25.025	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.06	157	256709	27.668	ng	99
93) n-Undecane	21.37	57	629459	23.973	ng	100
94) 1,2,4-Trichlorobenzene	22.19	180	505642	27.925	ng	100
95) Naphthalene	22.29	128	1540170	29.353	ng	100
96) n-Dodecane	22.28	57	554781	34.786	ng	100
97) Hexachlorobutadiene	22.61	225	287345	21.864	ng	100
98) Cyclohexanone	18.36	55	424959	24.200	ng	100
99) tert-Butylbenzene	20.18	119	1108900	22.966	ng	100
100) n-Butylbenzene	20.92	91	1192154	23.487	ng	100

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

Inst : MS08
Operator: SC

Response via : Initial Calibration



Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: 05251922.D

Acq. Method File: TO15.M

Data File Path: I:\MS08\Data\2019_05\25\

Sample Name: 25ng TO-15 ICV STD

Operator: SC

Misc Info: S31-05011903/S31-05241902 (

Date Acquired: 5/25/19

17:55

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	4.15	23.3	26.43	88	53	112	*	*
3)	Dichlorodifluoromethane (CFC 12)	4.31	22.2	26.30	84	62	103	*	*
4)	Chloromethane	4.60	24.5	26.38	93	51	121	*	*
5)	1,2-Dichloro-1,1,2,2-tetrafluoroethane	4.86	23.4	26.38	89	56	111	*	*
6)	Vinyl Chloride	5.02	25.1	26.73	94	57	117	*	*
7)	1,3-Butadiene	5.29	26.5	26.28	101	53	134	*	*
8)	Bromomethane	5.73	24.6	26.48	93	65	110	*	*
9)	Chloroethane	6.06	23.9	26.75	89	64	111	*	*
10)	Ethanol	6.47	116	128.10	91	57	124	*	*
11)	Acetonitrile	6.71	24.3	25.73	94	57	126	*	*
12)	Acrolein	6.89	28.6	25.63	112	62	121	*	*
13)	Acetone	7.10	118	132.33	89	60	113	*	*
14)	Trichlorofluoromethane	7.33	22.9	26.40	87	63	104	*	*
15)	2-Propanol (Isopropanol)	7.60	47.3	51.60	92	60	124	*	*
16)	Acrylonitrile	7.86	29.6	25.88	114	66	125	*	*
17)	1,1-Dichloroethene	8.30	24.3	27.23	89	68	107	*	*
18)	2-Methyl-2-Propanol (tert-Butyl Alcohol)	8.47	50.0	54.25	92	64	114	*	*
19)	Methylene Chloride	8.53	24.6	27.08	91	66	105	*	*
20)	3-Chloro-1-propene (Allyl Chloride)	8.69	26.8	27.00	99	63	127	*	*
21)	Trichlorotrifluoroethane	8.94	23.2	26.95	86	59	109	*	*
22)	Carbon Disulfide	8.79	25.6	27.20	94	67	109	*	*
23)	trans-1,2-Dichloroethene	9.80	25.6	26.73	96	70	115	*	*
24)	1,1-Dichloroethane	10.05	23.6	26.95	88	66	106	*	*
25)	Methyl tert-Butyl Ether	10.15	24.1	26.80	90	67	109	*	*
26)	Vinyl Acetate	10.30	142	133.03	107	68	136	*	*
27)	2-Butanone (MEK)	10.55	27.9	25.95	108	71	116	*	*
28)	cis-1,2-Dichloroethene	11.07	23.8	26.35	90	67	110	*	*
29)	Diisopropyl Ether	11.36	24.3	27.18	89	62	109	*	*
30)	Ethyl Acetate	11.37	54.5	54.45	100	64	127	*	*
31)	n-Hexane	11.35	23.5	26.95	87	60	115	*	*
32)	Chloroform	11.41	23.7	27.08	88	66	105	*	*
34)	Tetrahydrofuran (THF)	11.81	24.3	27.00	90	65	110	*	*
35)	Ethyl tert-Butyl Ether	11.95	24.1	26.80	90	69	109	*	*
36)	1,2-Dichloroethane	12.21	23.5	26.85	88	60	110	*	*
38)	1,1,1-Trichloroethane	12.49	23.9	26.90	89	64	108	*	*
39)	Isopropyl Acetate	12.91	46.9	51.55	91	66	119	*	*
40)	1-Butanol	12.94	59.3	51.58	115	54	143	*	*
41)	Benzene	12.97	22.8	26.38	86	67	106	*	*
42)	Carbon Tetrachloride	13.13	24.1	26.45	91	64	112	*	*
43)	Cyclohexane	13.26	44.3	52.05	85	67	110	*	*
44)	tert-Amyl Methyl Ether	13.61	24.7	27.08	91	68	112	*	*
45)	1,2-Dichloropropane	13.82	24.1	26.98	89	66	112	*	*
46)	Bromodichloromethane	14.01	25.9	26.83	97	67	113	*	*
47)	Trichloroethene	14.06	24.1	26.68	90	66	108	*	*
48)	1,4-Dioxane	14.04	26.1	26.73	98	70	116	*	*
49)	2,2,4-Trimethylpentane (Isooctane)	14.13	22.9	26.65	86	64	113	*	*

Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: **05251922.D**

TO15.M

Data File Path: I:\MS08\Data\2019_05\25\

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

Operator: **SC**

Misc Info: **S31-05011903/S31-05241902 (**

Date Acquired: **5/25/19**

17:55

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	14.27	56.8	53.88	105	73	118	*	*
51)	n-Heptane	14.39	23.6	26.90	88	66	110	*	*
52)	cis-1,3-Dichloropropene	14.92	27.8	26.78	104	75	120	*	*
53)	4-Methyl-2-pentanone	14.96	28.4	26.15	109	65	124	*	*
54)	trans-1,3-Dichloropropene	15.45	29.7	26.60	112	77	123	*	*
55)	1,1,2-Trichloroethane	15.62	25.0	26.85	93	68	112	*	*
58)	Toluene	15.91	23.5	26.50	89	62	111	*	*
59)	2-Hexanone	16.15	27.3	26.78	102	59	128	*	*
60)	Dibromochloromethane	16.32	26.3	26.60	99	67	123	*	*
61)	1,2-Dibromoethane	16.58	26.4	27.03	98	66	122	*	*
62)	n-Butyl Acetate	16.79	28.4	27.35	104	64	128	*	*
63)	n-Octane	16.91	23.3	27.13	86	65	114	*	*
64)	Tetrachloroethene	17.05	22.6	26.60	85	55	120	*	*
65)	Chlorobenzene	17.71	22.8	26.83	85	61	114	*	*
66)	Ethylbenzene	18.07	22.3	26.53	84	64	113	*	*
67)	m- & p-Xylenes	18.23	44.7	53.28	84	64	114	*	*
68)	Bromoform	18.29	27.3	26.68	102	65	132	*	*
69)	Styrene	18.55	25.8	26.50	97	67	124	*	*
70)	o-Xylene	18.65	22.6	26.75	84	65	114	*	*
71)	n-Nonane	18.85	22.9	26.83	85	64	117	*	*
72)	1,1,2,2-Tetrachloroethane	18.63	23.9	26.80	89	66	119	*	*
74)	Cumene	19.18	22.4	26.80	84	61	116	*	*
75)	alpha-Pinene	19.52	24.1	26.40	91	65	120	*	*
76)	n-Propylbenzene	19.63	23.3	27.23	86	63	117	*	*
77)	3-Ethyltoluene	19.72	22.1	26.83	82	60	117	*	*
78)	4-Ethyltoluene	19.76	25.2	26.80	94	63	124	*	*
79)	1,3,5-Trimethylbenzene	19.82	23.1	26.73	86	60	117	*	*
80)	alpha-Methylstyrene	19.95	26.8	26.75	100	64	131	*	*
81)	2-Ethyltoluene	19.99	23.5	27.08	87	62	116	*	*
82)	1,2,4-Trimethylbenzene	20.18	23.5	26.90	87	61	122	*	*
83)	n-Decane	20.27	23.3	26.88	87	67	120	*	*
84)	Benzyl Chloride	20.30	32.9	27.08	122	77	142	*	*
85)	1,3-Dichlorobenzene	20.32	24.4	26.98	90	61	125	*	*
86)	1,4-Dichlorobenzene	20.37	25.4	27.00	94	59	123	*	*
87)	sec-Butylbenzene	20.42	23.2	26.55	87	62	117	*	*
88)	4-Isopropyltoluene (p-Cymene)	20.56	22.5	26.95	83	58	122	*	*
89)	1,2,3-Trimethylbenzene	20.56	22.4	26.95	83	62	124	*	*
90)	1,2-Dichlorobenzene	20.67	25.8	26.95	96	61	126	*	*
91)	d-Limonene	20.69	25.0	26.38	95	66	124	*	*
92)	1,2-Dibromo-3-Chloropropane	21.06	27.7	26.15	106	67	138	*	*
93)	n-Undecane	21.37	24.0	27.03	89	68	127	*	*
94)	1,2,4-Trichlorobenzene	22.19	27.9	26.78	104	62	141	*	*
95)	Naphthalene	22.29	29.4	25.38	116	62	145	*	*
96)	n-Dodecane	22.28	34.8	25.63	136	64	152	*	FAIL
97)	Hexachlorobutadiene	22.61	21.9	26.13	84	49	131	*	*
98)	Cyclohexanone	18.36	24.2	24.45	99	61	127	*	*
99)	tert-Butylbenzene	20.18	23.0	26.88	86	58	122	*	*
100)	n-Butylbenzene	20.92	23.5	27.00	87	64	121	*	*

Bold = 75 Compound List

Data File: I:\MS08\Data\2019 07\22\07221902.D

Sample : CCV R8072219 25ng

Inst : MS08

Acq On : 22 Jul 2019 7:59

Operator: RS

Misc : S31-07111901/S31-07151905 (8/13)

ALS Vial : 16 Sample Multiplier: 1

RS 7/22/19

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

Quant Time: Jul 22 08:28:05 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:57:28 2019

Response via : Initial Calibration

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	96	-0.02
2 T	Propene	1.023	0.939	8.2	97	0.00
3 T	Dichlorodifluoromethane (CF	1.596	1.316	17.5	90	0.00
4 T	Chloromethane	1.203	0.902	25.0	80	-0.01
5 T	1,2-Dichloro-1,1,2,2-tetra	0.902	0.809	10.3	99	0.00
6 T	Vinyl Chloride	1.184	1.114	5.9	100	-0.01
7 T	1,3-Butadiene	0.951	0.942	0.9	96	-0.01
8 T	Bromomethane	0.804	0.713	11.3	92	-0.02
9 T	Chloroethane	0.742	0.645	13.1	92	-0.02
10 T	Ethanol	0.724	0.632	12.7	95	0.02
11 T	Acetonitrile	1.839	1.696	7.8	94	-0.05
12 T	Acrolein	0.535	0.574	-7.3	92	-0.03
13 T	Acetone	0.722	0.629	12.9	94	-0.04
14 T	Trichlorofluoromethane	1.371	1.097	20.0	86	-0.01
15 T	2-Propanol (Isopropanol)	2.475	2.208	10.8	92	-0.06
16 T	Acrylonitrile	1.075	1.183	-10.0	93	-0.03
17 T	1,1-Dichloroethene	0.920	0.794	13.7	90	0.00
18 T	2-Methyl-2-Propanol (tert-B	2.310	2.077	10.1	91	-0.05
19 T	Methylene Chloride	0.917	0.820	10.6	91	-0.02
20 T	3-Chloro-1-propene (Allyl C	1.401	1.303	7.0	90	-0.02
21 T	Trichlorotrifluoroethane	0.901	0.767	14.9	91	-0.01
22 T	Carbon Disulfide	3.153	2.856	9.4	91	-0.01
23 T	trans-1,2-Dichloroethene	1.201	1.103	8.2	89	-0.01
24 T	1,1-Dichloroethane	1.606	1.357	15.5	90	-0.02
25 T	Methyl tert-Butyl Ether	2.907	2.466	15.2	89	-0.01
26 T	Vinyl Acetate	0.239	0.257	-7.5	94	-0.03
27 T	2-Butanone (MEK)	0.617	0.658	-6.6	93	-0.03
28 T	cis-1,2-Dichloroethene	1.218	1.043	14.4	89	-0.01
29 T	Diisopropyl Ether	0.956	0.849	11.2	93	-0.01
30 T	Ethyl Acetate	0.298	0.298	0.0	95	-0.02
31 T	n-Hexane	1.576	1.408	10.7	98	0.00
32 T	Chloroform	1.456	1.215	16.6	88	-0.02
33 S	1,2-Dichloroethane-d4 (SS1)	1.242	1.162	6.4	90	-0.02
34 T	Tetrahydrofuran (THF)	0.685	0.604	11.8	91	-0.01
35 T	Ethyl tert-Butyl Ether	1.236	1.092	11.7	91	-0.01
36 T	1,2-Dichloroethane	1.066	0.861	19.2	84	-0.01
37 IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	97	0.00
38 T	1,1,1-Trichloroethane	0.294	0.241	18.0	85	-0.01
39 T	Isopropyl Acetate	0.141	0.127	9.9	95	-0.02
40 T	1-Butanol	0.188	0.217	-15.4	96	-0.04
41 T	Benzene	0.898	0.768	14.5	93	-0.01
42 T	Carbon Tetrachloride	0.254	0.213	16.1	85	-0.01
43 T	Cyclohexane	0.388	0.327	15.7	94	0.00
44 T	tert-Amyl Methyl Ether	0.623	0.547	12.2	91	0.00
45 T	1,2-Dichloropropane	0.209	0.183	12.4	93	0.00
46 T	Bromodichloromethane	0.247	0.220	10.9	87	-0.01
47 T	Trichloroethene	0.242	0.214	11.6	93	-0.01
48 T	1,4-Dioxane	0.179	0.172	3.9	93	-0.01
49 T	2,2,4-Trimethylpentane (Iso	0.991	0.827	16.5	92	-0.01
50 T	Methyl Methacrylate	0.091	0.095	-4.4	95	-0.01
51 T	n-Heptane	0.246	0.216	12.2	96	-0.01
52 T	cis-1,3-Dichloropropene	0.304	0.303	0.3	91	0.00
53 T	4-Methyl-2-pentanone	0.183	0.191	-4.4	93	-0.01
54 T	trans-1,3-Dichloropropene	0.255	0.268	-5.1	89	0.00
55 T	1,1,2-Trichloroethane	0.204	0.183	10.3	91	0.00

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Data File: I:\MS08\Data\2019 07\22\07221902.D

Sample : CCV R8072219 25ng Inst : MS08
 Acq On : 22 Jul 2019 7:59 Operator: RS
 Misc : S31-07111901/S31-07151905 (8/13)
 ALS Vial : 16 Sample Multiplier: 1

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

Quant Time: Jul 22 08:28:05 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:57:28 2019

Response via : Initial Calibration

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	101	0.00
57 S	Toluene-d8 (SS2)	2.571	2.503	2.6	99	0.00
58 T	Toluene	2.175	1.859	14.5	93	-0.01
59 T	2-Hexanone	1.030	1.001	2.8	93	-0.01
60 T	Dibromochloromethane	0.529	0.481	9.1	90	-0.01
61 T	1,2-Dibromoethane	0.528	0.480	9.1	91	-0.01
62 T	n-Butyl Acetate	1.126	1.124	0.2	92	0.00
63 T	n-Octane	0.483	0.402	16.8	94	0.00
64 T	Tetrachloroethene	0.664	0.543	18.2	93	0.00
65 T	Chlorobenzene	1.521	1.247	18.0	93	0.00
66 T	Ethylbenzene	2.604	2.128	18.3	92	0.00
67 T	m- & p-Xylenes	1.946	1.549	20.4	91	-0.01
68 T	Bromoform	0.449	0.430	4.2	89	0.00
69 T	Styrene	1.509	1.405	6.9	93	0.00
70 T	o-Xylene	1.977	1.577	20.2	90	-0.01
71 T	n-Nonane	1.112	0.911	18.1	93	0.00
72 T	1,1,2,2-Tetrachloroethane	0.861	0.743	13.7	92	0.00
73 S	Bromofluorobenzene (SS3)	0.844	0.879	-4.1	105	0.00
74 T	Cumene	2.671	2.144	19.7	92	0.00
75 T	alpha-Pinene	1.274	1.095	14.1	93	0.00
76 T	n-Propylbenzene	2.984	2.451	17.9	92	0.00
77 T	3-Ethyltoluene	2.602	2.136	17.9	94	0.00
78 T	4-Ethyltoluene	2.323	2.020	13.0	91	0.00
79 T	1,3,5-Trimethylbenzene	2.105	1.741	17.3	91	0.00
80 T	alpha-Methylstyrene	1.064	1.007	5.4	94	0.00
81 T	2-Ethyltoluene	2.447	2.062	15.7	92	-0.01
82 T	1,2,4-Trimethylbenzene	1.986	1.675	15.7	92	-0.01
83 T	n-Decane	1.143	0.964	15.7	95	0.00
84 T	Benzyl Chloride	1.284	1.455	-13.3	89	0.00
85 T	1,3-Dichlorobenzene	1.186	1.060	10.6	95	0.00
86 T	1,4-Dichlorobenzene	1.182	1.088	8.0	95	-0.01
87 T	sec-Butylbenzene	2.798	2.385	14.8	93	0.00
88 T	4-Isopropyltoluene (p-Cymen	2.631	2.180	17.1	93	0.00
89 T	1,2,3-Trimethylbenzene	2.120	1.686	20.5	92	0.00
90 T	1,2-Dichlorobenzene	1.045	0.983	5.9	95	-0.01
91 T	d-Limonene	0.766	0.692	9.7	94	0.00
92 T	1,2-Dibromo-3-Chloropropane	0.393	0.407	-3.6	90	0.00
93 T	n-Undecane	1.111	1.029	7.4	96	0.00
94 T	1,2,4-Trichlorobenzene	0.766	0.804	-5.0	95	0.00
95 T	Naphthalene	2.220	2.612	-17.7	99	0.00
96 T	n-Dodecane	0.675	0.972	-44.0#	109	0.00
97 T	Hexachlorobutadiene	0.556	0.450	19.1	88	0.00
98 T	Cyclohexanone	0.743	0.694	6.6	94	-0.01
99 T	tert-Butylbenzene	2.043	1.695	17.0	93	-0.01
100 T	n-Butylbenzene	2.147	1.838	14.4	92	0.00

(#) = Out of Range

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

Data File: I:\MS08\Data\2019 07\22\07221902.D

Sample : CCV R8072219 25ng
 Acq On : 22 Jul 2019 7:59
 Misc : S31-07111901/S31-07151905 (8/13)
 ALS Vial : 16 Sample Multiplier: 1

Inst : MS08
 Operator: RS

RS 7/22/19

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

Quant Time: Jul 22 08:28:05 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:57:28 2019

Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.24	130	147502	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.36	114	651950	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	281682	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	171404	11.691	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	93.52%	
57) Toluene-d8 (SS2)	15.81	98	705032	12.170	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.36%	
73) Bromofluorobenzene (SS3)	19.06	174	247512	13.007	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	104.08%	

Target Compounds

						Qvalue
2) Propene	4.16	42	285645	23.653	ng	97
3) Dichlorodifluoromethan...	4.32	85	405588	21.537	ng	100
4) Chloromethane	4.61	50	268308	18.893	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.87	135	245220	23.034	ng	100
6) Vinyl Chloride	5.03	62	345526	24.724	ng	100
7) 1,3-Butadiene	5.30	54	291521	25.967	ng	97
8) Bromomethane	5.74	94	212320	22.374	ng	99
9) Chloroethane	6.07	64	194610	22.230	ng	100
10) Ethanol	6.46	45	957616	112.089	ng	99
11) Acetonitrile	6.71	41	516801	23.819	ng	99
12) Acrolein	6.89	56	174132	27.603	ng	99
13) Acetone	7.10	58	996453	116.985	ng	92
14) Trichlorofluoromethane	7.34	101	343102	21.212	ng	100
15) 2-Propanol (Isopropanol)	7.60	45	1343605	46.010	ng	99
16) Acrylonitrile	7.86	53	360750	28.448	ng	98
17) 1,1-Dichloroethene	8.31	96	251443	23.163	ng	96
18) 2-Methyl-2-Propanol (t...	8.47	59	1313369	48.174	ng	99
19) Methylene Chloride	8.53	84	258853	23.929	ng	99
20) 3-Chloro-1-propene (Al...	8.69	41	410179	24.809	ng	100
21) Trichlorotrifluoroethane	8.94	151	240992	22.662	ng	98
22) Carbon Disulfide	8.79	76	905635	24.337	ng	100
23) trans-1,2-Dichloroethene	9.80	61	345571	24.386	ng	99
24) 1,1-Dichloroethane	10.05	63	412387	21.757	ng	100
25) Methyl tert-Butyl Ether	10.15	73	792114	23.092	ng	99
26) Vinyl Acetate	10.31	86	398091	141.189	ng	95
27) 2-Butanone (MEK)	10.55	72	199446	27.380	ng	99
28) cis-1,2-Dichloroethene	11.07	61	324267	22.565	ng	97
29) Diisopropyl Ether	11.36	87	270647	23.979	ng	100
30) Ethyl Acetate	11.36	61	190271	54.200	ng	100
31) n-Hexane	11.35	57	449270	24.162	ng	99
32) Chloroform	11.41	83	385938	22.467	ng	100
34) Tetrahydrofuran (THF)	11.81	72	190179	23.521	ng	99
35) Ethyl tert-Butyl Ether	11.95	87	341495	23.407	ng	99
36) 1,2-Dichloroethane	12.21	62	269455	21.412	ng	99
38) 1,1,1-Trichloroethane	12.49	97	340239	22.171	ng	100
39) Isopropyl Acetate	12.91	61	342455	46.476	ng	95
40) 1-Butanol	12.93	56	584417	59.757	ng	96
41) Benzene	12.97	78	1034204	22.072	ng	100
42) Carbon Tetrachloride	13.13	117	288265	21.742	ng	99
43) Cyclohexane	13.26	84	890809	44.067	ng	99
44) tert-Amyl Methyl Ether	13.61	73	765718	23.564	ng	99
45) 1,2-Dichloropropane	13.82	63	255901	23.456	ng	100
46) Bromodichloromethane	14.01	83	306645	23.804	ng	100
47) Trichloroethene	14.06	130	296346	23.490	ng	100
48) 1,4-Dioxane	14.04	88	238041	25.496	ng	99
49) 2,2,4-Trimethylpentane...	14.13	57	1144464	22.134	ng	98
50) Methyl Methacrylate	14.27	100	265727	55.900	ng	97

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Data File: I:\MS08\Data\2019 07\22\07221902.D

Sample : CCV R8072219 25ng Inst : MS08
 Acq On : 22 Jul 2019 7:59 Operator: RS
 Misc : S31-07111901/S31-07151905 (8/13)
 ALS Vial : 16 Sample Multiplier: 1

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

Quant Time: Jul 22 08:28:05 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:57:28 2019

Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.39	71	303694	23.675	ng	99
52) cis-1,3-Dichloropropene	14.92	75	442663	27.916	ng	100
53) 4-Methyl-2-pentanone	14.96	58	263788	27.687	ng	99
54) trans-1,3-Dichloropropene	15.45	75	368262	27.737	ng	100
55) 1,1,2-Trichloroethane	15.62	97	257243	24.172	ng	100
58) Toluene	15.91	91	1101985	22.482	ng	100
59) 2-Hexanone	16.15	43	605386	26.073	ng	99
60) Dibromochloromethane	16.32	129	291096	24.442	ng	100
61) 1,2-Dibromoethane	16.57	107	290810	24.429	ng	99
62) n-Butyl Acetate	16.79	43	687034	27.072	ng	99
63) n-Octane	16.91	57	243843	22.423	ng	98
64) Tetrachloroethene	17.05	166	323418	21.618	ng	100
65) Chlorobenzene	17.71	112	748886	21.847	ng	100
66) Ethylbenzene	18.07	91	1238464	21.108	ng	99
67) m- & p-Xylenes	18.23	91	1852439	42.251	ng	97
68) Bromoform	18.29	173	257262	25.430	ng	100
69) Styrene	18.55	104	838848	24.674	ng	98
70) o-Xylene	18.65	91	943664	21.187	ng	98
71) n-Nonane	18.85	43	549426	21.922	ng	100
72) 1,1,2,2-Tetrachloroethane	18.63	83	445085	22.949	ng	100
74) Cumene	19.18	105	1276732	21.211	ng	99
75) alpha-Pinene	19.52	93	638599	22.243	ng	98
76) n-Propylbenzene	19.63	91	1485702	22.098	ng	99
77) 3-Ethyltoluene	19.72	105	1277655	21.789	ng	99
78) 4-Ethyltoluene	19.75	105	1207700	23.067	ng	99
79) 1,3,5-Trimethylbenzene	19.82	105	1036671	21.850	ng	98
80) alpha-Methylstyrene	19.95	118	600243	25.026	ng	99
81) 2-Ethyltoluene	19.99	105	1245139	22.578	ng	98
82) 1,2,4-Trimethylbenzene	20.18	105	1007600	22.518	ng	97
83) n-Decane	20.27	57	584631	22.691	ng	100
84) Benzyl Chloride	20.30	91	861500	29.764	ng	98
85) 1,3-Dichlorobenzene	20.32	146	644936	24.123	ng	100
86) 1,4-Dichlorobenzene	20.37	146	662383	24.871	ng	100
87) sec-Butylbenzene	20.42	105	1428081	22.653	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	1279706	21.587	ng	98
89) 1,2,3-Trimethylbenzene	20.56	105	989533	20.717	ng	97
90) 1,2-Dichlorobenzene	20.67	146	603233	25.609	ng	100
91) d-Limonene	20.69	68	393799	22.814	ng	99
92) 1,2-Dibromo-3-Chloropr...	21.06	157	238810	26.998	ng	96
93) n-Undecane	21.36	57	612859	24.483	ng	100
94) 1,2,4-Trichlorobenzene	22.19	180	481821	27.910	ng	100
95) Naphthalene	22.29	128	1508346	30.152	ng	100
96) n-Dodecane	22.28	57	564302	37.113	ng	99
97) Hexachlorobutadiene	22.61	225	267072	21.315	ng	100
98) Cyclohexanone	18.36	55	384011	22.938	ng	99
99) tert-Butylbenzene	20.18	119	1018704	22.130	ng	99
100) n-Butylbenzene	20.92	91	1101467	22.761	ng	99

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

Data File: I:\MS08\Data\2019 07\22\07221902.D

Sample : CCV R8072219 25ng

Acq On : 22 Jul 2019 7:59

Misc : S31-07111901/S31-07151905 (8/13)

ALS Vial : 16 Sample Multiplier: 1

Inst : MS08

Operator: RS

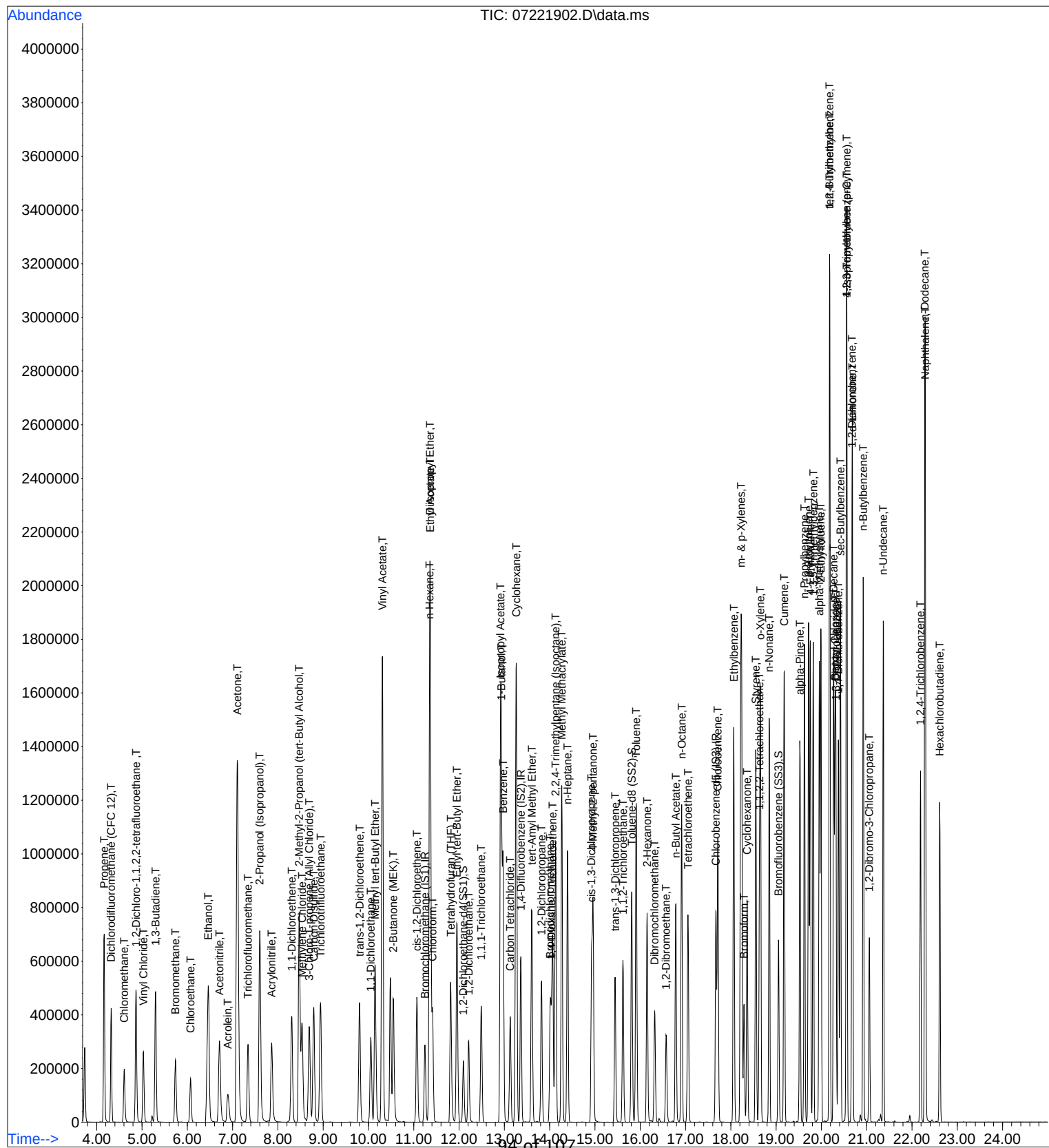
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

Quant Time: Jul 22 08:28:05 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:57:28 2019

Response via : Initial Calibration



Data File: I:\MS08\Data\2019 07\22\07221911.D

Sample : CCVend R8072219 25ng

Acq On : 22 Jul 2019 13:00

Misc : S31-07111901/S31-07151905 (8/13)

ALS Vial : 16 Sample Multiplier: 1

Inst : MS08

Operator: RS

RS 7/22/19

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

Quant Time: Jul 22 13:28:17 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:57:28 2019

Response via : Initial Calibration

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	98	-0.01
2	T Propene	1.023	0.914	10.7	97	0.00
3	T Dichlorodifluoromethane (CF	1.596	1.279	19.9	89	0.00
4	T Chloromethane	1.203	0.923	23.3	84	-0.01
5	T 1,2-Dichloro-1,1,2,2-tetra	0.902	0.775	14.1	96	0.00
6	T Vinyl Chloride	1.184	1.073	9.4	98	-0.01
7	T 1,3-Butadiene	0.951	0.905	4.8	94	-0.01
8	T Bromomethane	0.804	0.690	14.2	91	-0.01
9	T Chloroethane	0.742	0.631	15.0	92	-0.02
10	T Ethanol	0.724	0.622	14.1	95	0.02
11	T Acetonitrile	1.839	1.662	9.6	94	-0.04
12	T Acrolein	0.535	0.553	-3.4	91	-0.02
13	T Acetone	0.722	0.614	15.0	93	-0.04
14	T Trichlorofluoromethane	1.371	1.078	21.4	86	-0.01
15	T 2-Propanol (Isopropanol)	2.475	2.172	12.2	92	-0.05
16	T Acrylonitrile	1.075	1.160	-7.9	92	-0.03
17	T 1,1-Dichloroethene	0.920	0.778	15.4	90	0.00
18	T 2-Methyl-2-Propanol (tert-B	2.310	2.041	11.6	91	-0.05
19	T Methylene Chloride	0.917	0.793	13.5	90	-0.02
20	T 3-Chloro-1-propene (Allyl C	1.401	1.268	9.5	90	-0.01
21	T Trichlorotrifluoroethane	0.901	0.747	17.1	90	-0.01
22	T Carbon Disulfide	3.153	2.793	11.4	90	-0.01
23	T trans-1,2-Dichloroethene	1.201	1.069	11.0	88	-0.01
24	T 1,1-Dichloroethane	1.606	1.321	17.7	89	-0.01
25	T Methyl tert-Butyl Ether	2.907	2.400	17.4	89	-0.01
26	T Vinyl Acetate	0.239	0.252	-5.4	94	-0.03
27	T 2-Butanone (MEK)	0.617	0.649	-5.2	94	-0.02
28	T cis-1,2-Dichloroethene	1.218	1.022	16.1	88	-0.01
29	T Diisopropyl Ether	0.956	0.832	13.0	93	0.00
30	T Ethyl Acetate	0.298	0.291	2.3	95	-0.02
31	T n-Hexane	1.576	1.371	13.0	97	0.00
32	T Chloroform	1.456	1.185	18.6	87	-0.02
33	S 1,2-Dichloroethane-d4 (SS1)	1.242	1.169	5.9	92	-0.01
34	T Tetrahydrofuran (THF)	0.685	0.590	13.9	91	-0.01
35	T Ethyl tert-Butyl Ether	1.236	1.065	13.8	91	0.00
36	T 1,2-Dichloroethane	1.066	0.844	20.8	84	-0.01
37	IR 1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	98	0.00
38	T 1,1,1-Trichloroethane	0.294	0.237	19.4	85	0.00
39	T Isopropyl Acetate	0.141	0.125	11.3	95	-0.01
40	T 1-Butanol	0.188	0.213	-13.3	96	-0.03
41	T Benzene	0.898	0.751	16.4	93	-0.01
42	T Carbon Tetrachloride	0.254	0.209	17.7	84	0.00
43	T Cyclohexane	0.388	0.318	18.0	93	0.00
44	T tert-Amyl Methyl Ether	0.623	0.536	14.0	90	0.00
45	T 1,2-Dichloropropane	0.209	0.179	14.4	93	0.00
46	T Bromodichloromethane	0.247	0.214	13.4	86	-0.01
47	T Trichloroethene	0.242	0.208	14.0	91	0.00
48	T 1,4-Dioxane	0.179	0.167	6.7	91	-0.01
49	T 2,2,4-Trimethylpentane (Iso	0.991	0.809	18.4	92	0.00
50	T Methyl Methacrylate	0.091	0.093	-2.2	94	-0.01
51	T n-Heptane	0.246	0.212	13.8	96	0.00
52	T cis-1,3-Dichloropropene	0.304	0.295	3.0	90	0.00
53	T 4-Methyl-2-pentanone	0.183	0.185	-1.1	92	-0.01
54	T trans-1,3-Dichloropropene	0.255	0.258	-1.2	87	0.00
55	T 1,1,2-Trichloroethane	0.204	0.177	13.2	90	0.00

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Data File: I:\MS08\Data\2019 07\22\07221911.D

Sample : CCVend R8072219 25ng

Inst : MS08

Acq On : 22 Jul 2019 13:00

Operator: RS

Misc : S31-07111901/S31-07151905 (8/13)

ALS Vial : 16 Sample Multiplier: 1

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

Quant Time: Jul 22 13:28:17 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:57:28 2019

Response via : Initial Calibration

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)	2.571	2.495	3.0	100	0.00
58	T Toluene	2.175	1.811	16.7	92	0.00
59	T 2-Hexanone	1.030	0.983	4.6	93	-0.01
60	T Dibromochloromethane	0.529	0.466	11.9	88	0.00
61	T 1,2-Dibromoethane	0.528	0.468	11.4	89	0.00
62	T n-Butyl Acetate	1.126	1.098	2.5	91	0.00
63	T n-Octane	0.483	0.392	18.8	92	0.00
64	T Tetrachloroethene	0.664	0.526	20.8	91	0.00
65	T Chlorobenzene	1.521	1.210	20.4	92	0.00
66	T Ethylbenzene	2.604	2.071	20.5	90	0.00
67	T m- & p-Xylenes	1.946	1.511	22.4	90	0.00
68	T Bromoform	0.449	0.419	6.7	88	0.00
69	T Styrene	1.509	1.366	9.5	92	0.00
70	T o-Xylene	1.977	1.531	22.6	89	-0.01
71	T n-Nonane	1.112	0.895	19.5	93	0.00
72	T 1,1,2,2-Tetrachloroethane	0.861	0.724	15.9	91	0.00
73	S Bromofluorobenzene (SS3)	0.844	0.897	-6.3	108	0.00
74	T Cumene	2.671	2.089	21.8	90	0.00
75	T alpha-Pinene	1.274	1.073	15.8	92	0.00
76	T n-Propylbenzene	2.984	2.385	20.1	91	0.00
77	T 3-Ethyltoluene	2.602	2.043	21.5	91	0.00
78	T 4-Ethyltoluene	2.323	2.001	13.9	91	0.00
79	T 1,3,5-Trimethylbenzene	2.105	1.693	19.6	90	0.00
80	T alpha-Methylstyrene	1.064	0.982	7.7	92	0.00
81	T 2-Ethyltoluene	2.447	2.009	17.9	91	0.00
82	T 1,2,4-Trimethylbenzene	1.986	1.631	17.9	90	-0.01
83	T n-Decane	1.143	0.937	18.0	93	0.00
84	T Benzyl Chloride	1.284	1.418	-10.4	87	0.00
85	T 1,3-Dichlorobenzene	1.186	1.027	13.4	94	0.00
86	T 1,4-Dichlorobenzene	1.182	1.053	10.9	93	-0.01
87	T sec-Butylbenzene	2.798	2.316	17.2	91	0.00
88	T 4-Isopropyltoluene (p-Cymen	2.631	2.123	19.3	92	0.00
89	T 1,2,3-Trimethylbenzene	2.120	1.637	22.8	90	0.00
90	T 1,2-Dichlorobenzene	1.045	0.957	8.4	93	-0.01
91	T d-Limonene	0.766	0.672	12.3	92	0.00
92	T 1,2-Dibromo-3-Chloropropane	0.393	0.395	-0.5	89	0.00
93	T n-Undecane	1.111	0.995	10.4	94	0.00
94	T 1,2,4-Trichlorobenzene	0.766	0.774	-1.0	93	0.00
95	T Naphthalene	2.220	2.552	-15.0	98	0.00
96	T n-Dodecane	0.675	0.948	-40.4#	108	0.00
97	T Hexachlorobutadiene	0.556	0.439	21.0	87	0.00
98	T Cyclohexanone	0.743	0.678	8.7	93	0.00
99	T tert-Butylbenzene	2.043	1.648	19.3	91	-0.01
100	T n-Butylbenzene	2.147	1.786	16.8	90	0.00

(#) = Out of Range

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

Data File: I:\MS08\Data\2019 07\22\07221911.D

Sample : CCVend R8072219 25ng

Acq On : 22 Jul 2019 13:00

Misc : S31-07111901/S31-07151905 (8/13)

ALS Vial : 16 Sample Multiplier: 1

Inst : MS08

Operator: RS

RS 7/22/19

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

Quant Time: Jul 22 13:28:17 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:57:28 2019

Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.25	130	150266	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.36	114	662877	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	285162	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.10	65	175609	11.758	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	94.08%
57) Toluene-d8 (SS2)	15.81	98	711414	12.130	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.04%
73) Bromofluorobenzene (SS3)	19.06	174	255816	13.279	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	106.24%

Target Compounds

						Qvalue
2) Propene	4.16	42	283068	23.008	ng	98
3) Dichlorodifluoromethan...	4.32	85	401719	20.939	ng	99
4) Chloromethane	4.61	50	279621	19.328	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.87	135	239430	22.076	ng	99
6) Vinyl Chloride	5.03	62	338960	23.808	ng	100
7) 1,3-Butadiene	5.30	54	285197	24.936	ng	98
8) Bromomethane	5.74	94	209341	21.655	ng	100
9) Chloroethane	6.07	64	193851	21.736	ng	99
10) Ethanol	6.47	45	961437	110.466	ng	99
11) Acetonitrile	6.71	41	516077	23.348	ng	99
12) Acrolein	6.90	56	170792	26.576	ng	99
13) Acetone	7.11	58	990449	114.141	ng	92
14) Trichlorofluoromethane	7.34	101	343348	20.837	ng	99
15) 2-Propanol (Isopropanol)	7.60	45	1346647	45.266	ng	98
16) Acrylonitrile	7.87	53	360381	27.896	ng	98
17) 1,1-Dichloroethene	8.31	96	251161	22.711	ng	96
18) 2-Methyl-2-Propanol (t...	8.47	59	1315218	47.355	ng	99
19) Methylene Chloride	8.53	84	254872	23.128	ng	100
20) 3-Chloro-1-propene (Al...	8.69	41	406734	24.148	ng	100
21) Trichlorotrifluoroethane	8.94	151	239135	22.074	ng	98
22) Carbon Disulfide	8.79	76	902301	23.802	ng	100
23) trans-1,2-Dichloroethene	9.80	61	341071	23.625	ng	99
24) 1,1-Dichloroethane	10.06	63	408983	21.180	ng	100
25) Methyl tert-Butyl Ether	10.15	73	785467	22.477	ng	99
26) Vinyl Acetate	10.31	86	397701	138.456	ng	# 95
27) 2-Butanone (MEK)	10.55	72	200282	26.989	ng	97
28) cis-1,2-Dichloroethene	11.07	61	323691	22.111	ng	98
29) Diisopropyl Ether	11.36	87	270390	23.516	ng	99
30) Ethyl Acetate	11.37	61	189511	52.990	ng	99
31) n-Hexane	11.35	57	445860	23.537	ng	99
32) Chloroform	11.42	83	383549	21.918	ng	100
34) Tetrahydrofuran (THF)	11.81	72	189420	22.996	ng	98
35) Ethyl tert-Butyl Ether	11.95	87	339162	22.820	ng	99
36) 1,2-Dichloroethane	12.21	62	269011	20.983	ng	99
38) 1,1,1-Trichloroethane	12.49	97	340132	21.799	ng	100
39) Isopropyl Acetate	12.92	61	341421	45.572	ng	96
40) 1-Butanol	12.94	56	584020	58.732	ng	96
41) Benzene	12.97	78	1028899	21.596	ng	100
42) Carbon Tetrachloride	13.13	117	286520	21.254	ng	100
43) Cyclohexane	13.26	84	878817	42.757	ng	99
44) tert-Amyl Methyl Ether	13.61	73	763355	23.104	ng	99
45) 1,2-Dichloropropane	13.82	63	255171	23.004	ng	100
46) Bromodichloromethane	14.01	83	303234	23.151	ng	100
47) Trichloroethene	14.07	130	292324	22.789	ng	100
48) 1,4-Dioxane	14.04	88	234995	24.755	ng	100
49) 2,2,4-Trimethylpentane...	14.13	57	1137327	21.633	ng	98
50) Methyl Methacrylate	14.27	100	262443	54.299	ng	99

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Data File: I:\MS08\Data\2019 07\22\07221911.D

Sample : CCVend R8072219 25ng

Inst : MS08

Acq On : 22 Jul 2019 13:00

Operator: RS

Misc : S31-07111901/S31-07151905 (8/13)

ALS Vial : 16 Sample Multiplier: 1

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

Quant Time: Jul 22 13:28:17 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:57:28 2019

Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.40	71	302827	23.218	ng	99
52) cis-1,3-Dichloropropene	14.93	75	437647	27.145	ng	100
53) 4-Methyl-2-pentanone	14.96	58	260613	26.903	ng	99
54) trans-1,3-Dichloropropene	15.45	75	360796	26.726	ng	99
55) 1,1,2-Trichloroethane	15.62	97	252728	23.356	ng	100
58) Toluene	15.91	91	1086448	21.895	ng	100
59) 2-Hexanone	16.15	43	601948	25.608	ng	100
60) Dibromochloromethane	16.32	129	285488	23.679	ng	100
61) 1,2-Dibromoethane	16.58	107	286977	23.813	ng	100
62) n-Butyl Acetate	16.79	43	679219	26.438	ng	99
63) n-Octane	16.91	57	240520	21.847	ng	98
64) Tetrachloroethene	17.05	166	317330	20.953	ng	100
65) Chlorobenzene	17.72	112	735823	21.204	ng	100
66) Ethylbenzene	18.07	91	1220347	20.546	ng	99
67) m- & p-Xylenes	18.23	91	1830038	41.230	ng	98
68) Bromoform	18.29	173	253896	24.791	ng	99
69) Styrene	18.56	104	825646	23.989	ng	98
70) o-Xylene	18.65	91	927538	20.571	ng	97
71) n-Nonane	18.85	43	546451	21.537	ng	100
72) 1,1,2,2-Tetrachloroethane	18.63	83	439635	22.391	ng	100
74) Cumene	19.18	105	1259175	20.664	ng	99
75) alpha-Pinene	19.52	93	633510	21.796	ng	98
76) n-Propylbenzene	19.63	91	1463299	21.499	ng	99
77) 3-Ethyltoluene	19.72	105	1237584	20.848	ng	99
78) 4-Ethyltoluene	19.75	105	1210728	22.842	ng	99
79) 1,3,5-Trimethylbenzene	19.82	105	1020459	21.246	ng	98
80) alpha-Methylstyrene	19.95	118	592276	24.392	ng	99
81) 2-Ethyltoluene	19.99	105	1228387	22.002	ng	98
82) 1,2,4-Trimethylbenzene	20.18	105	993594	21.934	ng	97
83) n-Decane	20.27	57	575176	22.052	ng	100
84) Benzyl Chloride	20.30	91	849969	29.008	ng	98
85) 1,3-Dichlorobenzene	20.32	146	632712	23.377	ng	100
86) 1,4-Dichlorobenzene	20.37	146	649402	24.086	ng	100
87) sec-Butylbenzene	20.42	105	1403899	21.998	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	1261640	21.023	ng	98
89) 1,2,3-Trimethylbenzene	20.56	105	972633	20.114	ng	97
90) 1,2-Dichlorobenzene	20.67	146	594200	24.918	ng	100
91) d-Limonene	20.69	68	387028	22.148	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.06	157	235036	26.247	ng	96
93) n-Undecane	21.37	57	599962	23.675	ng	100
94) 1,2,4-Trichlorobenzene	22.19	180	469550	26.868	ng	99
95) Naphthalene	22.29	128	1492059	29.463	ng	100
96) n-Dodecane	22.28	57	557663	36.229	ng	99
97) Hexachlorobutadiene	22.61	225	263789	20.796	ng	99
98) Cyclohexanone	18.36	55	379626	22.399	ng	99
99) tert-Butylbenzene	20.18	119	1002912	21.521	ng	99
100) n-Butylbenzene	20.92	91	1083712	22.121	ng	99

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

Data File: I:\MS08\Data\2019 07\22\07221911.D

Sample : CCVend R8072219 25ng

Acq On : 22 Jul 2019 13:00

Misc : S31-07111901/S31-07151905 (8/13)

ALS Vial : 16 Sample Multiplier: 1

Inst : MS08

Operator: RS

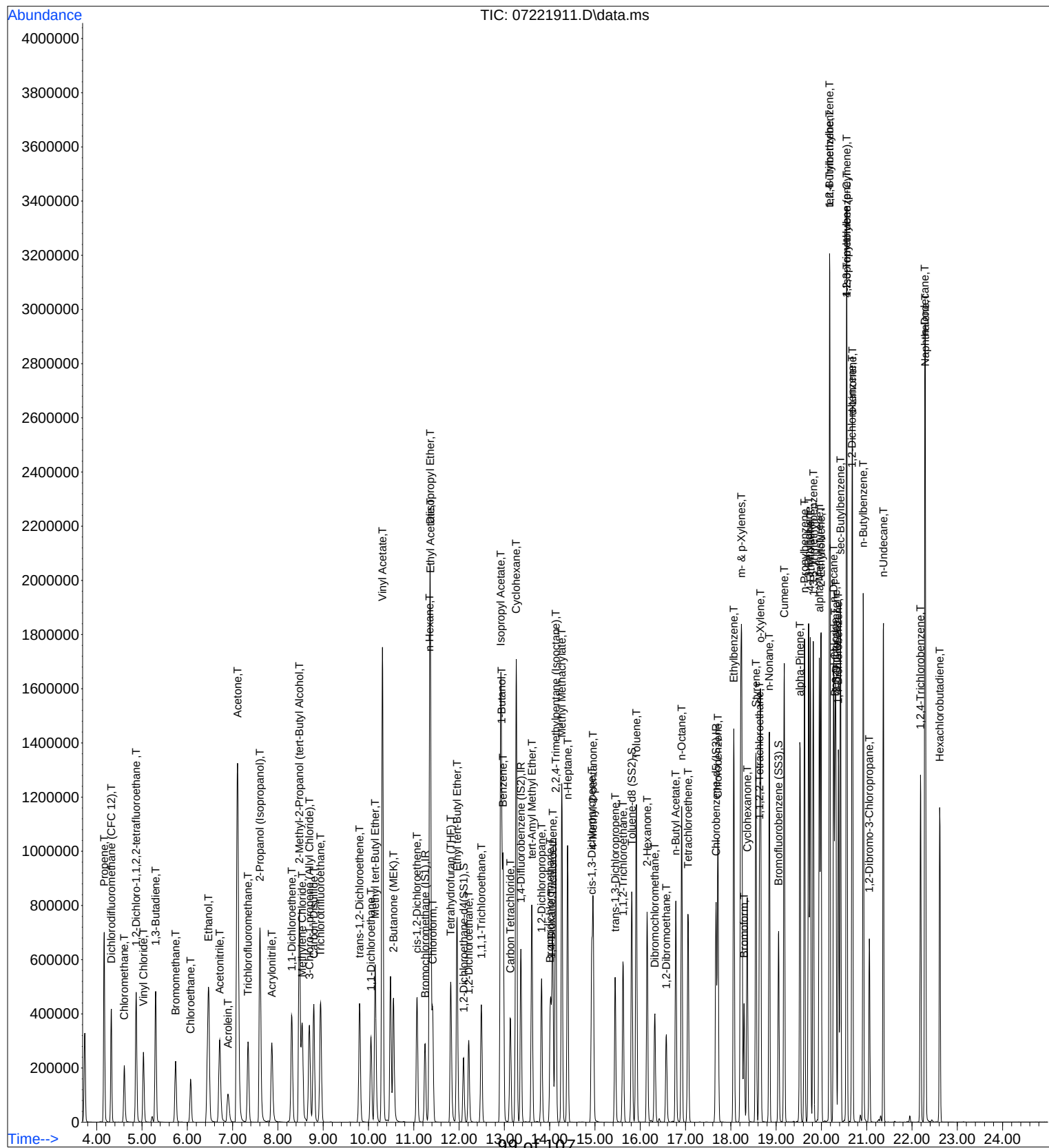
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

Quant Time: Jul 22 13:28:17 2019

Quant Method : I:\MS08\Methods\R8052519.M

QLast Update : Tue May 28 07:57:28 2019

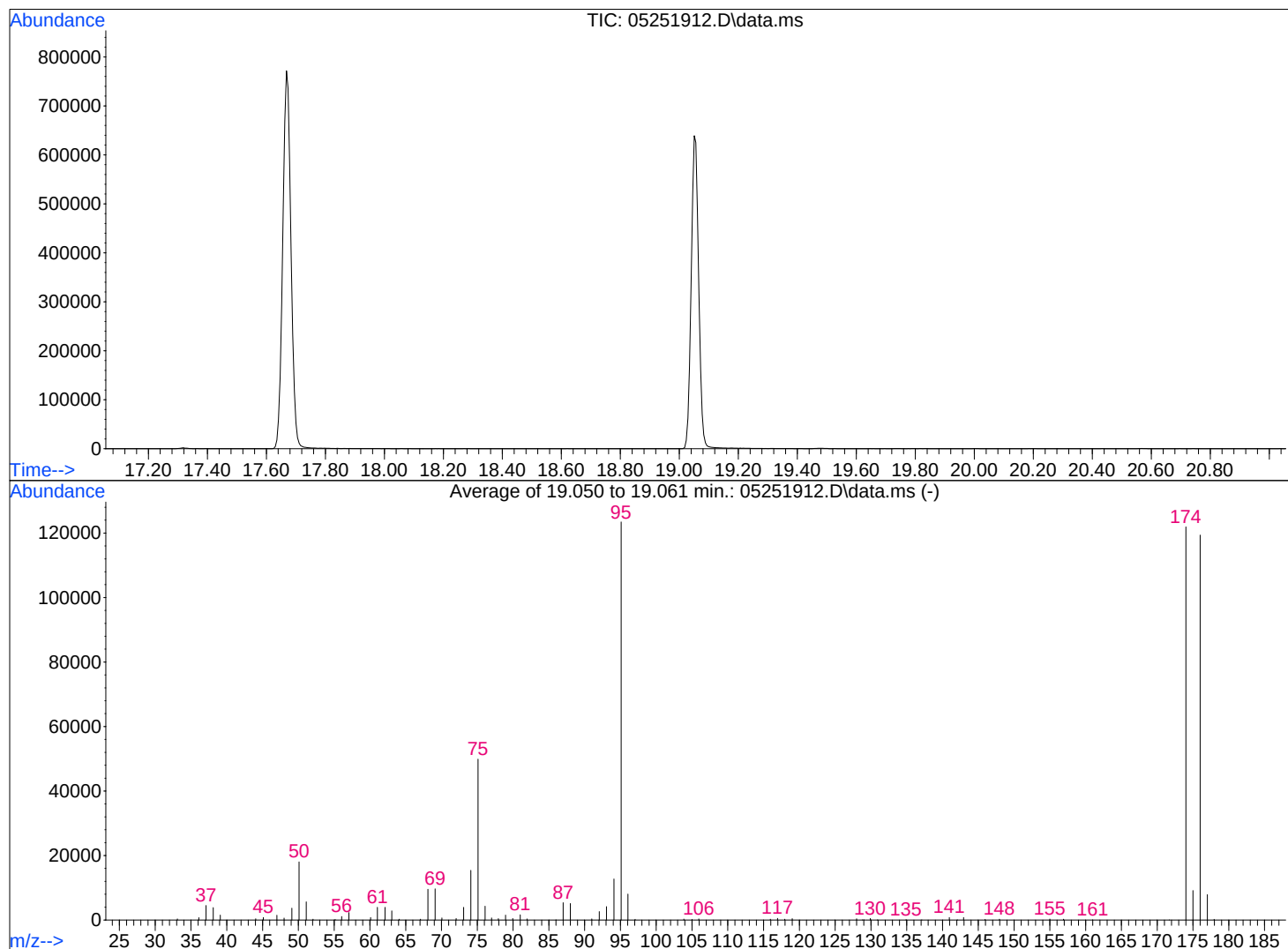
Response via : Initial Calibration



Data Path : I:\MS08\Data\2019 05\25\
 Data File : 05251912.D
 Acq On : 25 May 2019 12:23
 Operator : SC
 Sample : 12.5ng TO-15 BFB STD
 Misc : S31-05251901/AS00703
 ALS Vial : 1 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS08\Methods\R8052519.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Tue May 28 07:57:28 2019



AutoFind: Scans 2853, 2854, 2855; Background Corrected with Scan 2845

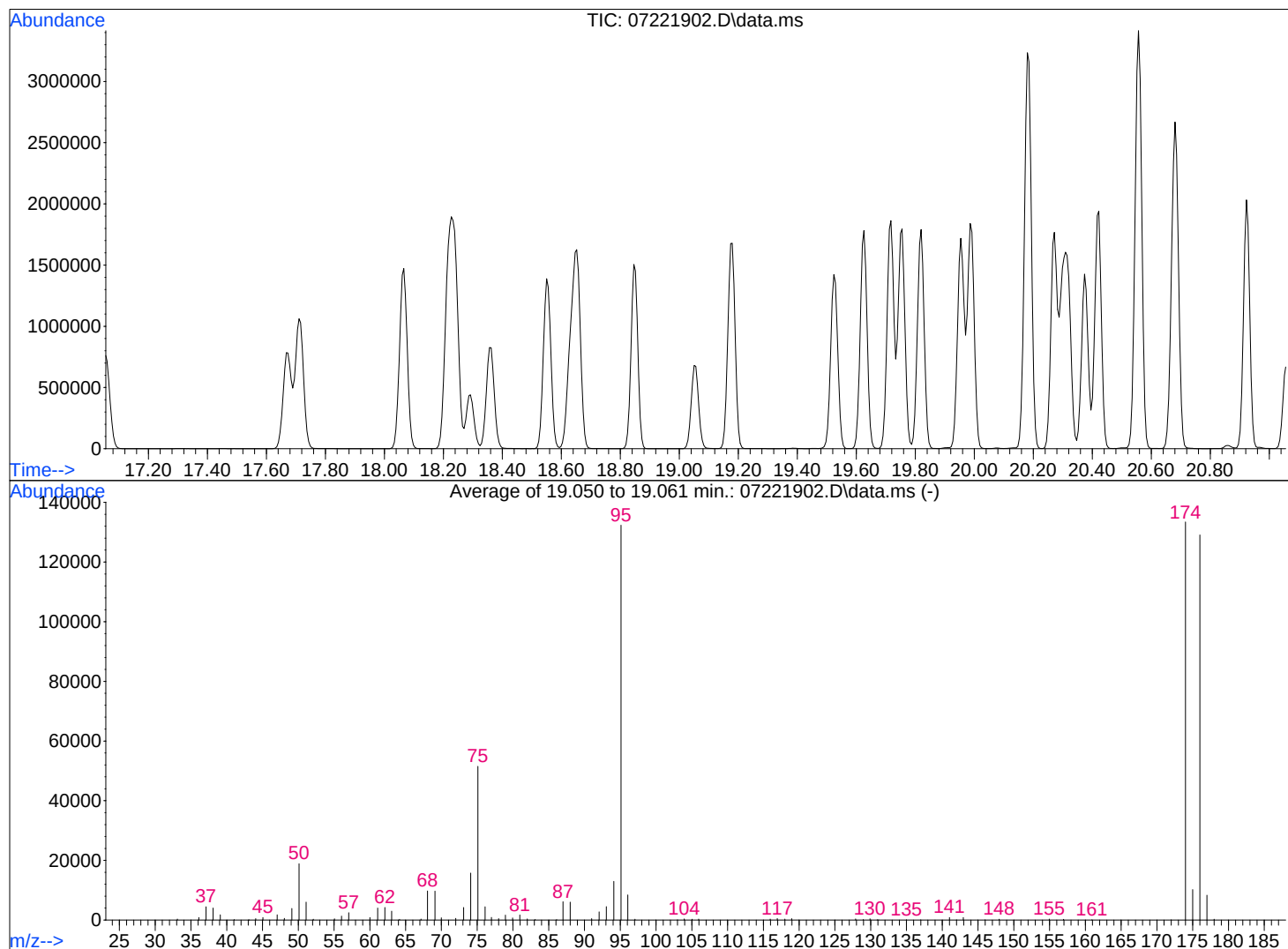
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	14.6	18022	PASS
75	95	30	66	40.4	49907	PASS
95	95	100	100	100.0	123445	PASS
96	95	5	9	6.5	8061	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	98.7	121899	PASS
175	174	4	9	7.5	9140	PASS
176	174	93	101	97.9	119384	PASS
177	176	5	9	6.6	7885	PASS

RS 5/28/19

Data Path : I:\MS08\Data\2019 07\22\
 Data File : 07221902.D
 Acq On : 22 Jul 2019 7:59
 Operator : RS
 Sample : CCV R8072219 25ng
 Misc : S31-07111901/S31-07151905 (8/13)
 ALS Vial : 16 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS08\Methods\R8052519.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Tue May 28 07:57:28 2019



AutoFind: Scans 2853, 2854, 2855; Background Corrected with Scan 2845

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	14.3	18898	PASS
75	95	30	66	38.9	51523	PASS
95	95	100	100	100.0	132355	PASS
96	95	5	9	6.4	8442	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	100.8	133432	PASS
175	174	4	9	7.7	10237	PASS
176	174	93	101	96.7	129093	PASS
177	176	5	9	6.5	8349	PASS

RS 7/22/19

Injection Log

Directory: J:\MS08\Data\2019_05\25\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
12	5/25/19 12:23	05251912.D	12.5ng TO-15 BFB STD	S31-05251901/AS00703	SC	1	<i>passed</i>
13	5/25/19 12:57	05251913.D	0.1ng TO-15 ICAL STD	S31-05251901/S31-05201907 (6/18)	SC	5	<i>R8052519.M</i>
14	5/25/19 13:30	05251914.D	0.2ng TO-15 ICAL STD	S31-05251901/S31-05201907 (6/18)	SC	5	
15	5/25/19 14:03	05251915.D	0.5ng TO-15 ICAL STD	S31-05251901/S31-05081902 (6/6)	SC	6	
16	5/25/19 14:36	05251916.D	1.0ng TO-15 ICAL STD	S31-05251901/S31-05081902 (6/6)	SC	6	
17	5/25/19 15:09	05251917.D	5.0ng TO-15 ICAL STD	S31-05251901/S31-05081902 (6/6)	SC	6	
18	5/25/19 15:42	05251918.D	25ng TO-15 ICAL STD	S31-05251901/S31-05201908 (6/18)	SC	7	
19	5/25/19 16:15	05251919.D	50ng TO-15 ICAL STD	S31-05251901/S31-05201908 (6/18)	SC	7	
20	5/25/19 16:49	05251920.D	100ng TO-15 ICAL STD	S31-05251901/S31-05201908 (6/18)	SC	7	
21	5/25/19 17:21	05251921.D	Blank (100mL)	S31-05251901/AS00703	SC	1	
22	5/25/19 17:55	05251922.D	25ng TO-15 ICV STD	S31-05011903/S31-05241902 (6/22)	SC	1	<i>passed</i>
23	5/25/19 18:28	05251923.D	25ng TO-15 ICV STD	S31-05011903/S31-05241902 (6/22)	SC	1	<i>not used</i>
	R8052519.M ranges from 0.1ng --> 100ng Except: propene, acrolein, acetone, MEK, ethyl acetate, hexane, trans-1,3-DCP, toluene, 2-hexanone, 4-ethyltoluene, 1,3,5-TMB,						
	2-ethyltoluene, 1,2,4-TMB, 1,4-DCB, sec-butylbenzene, 4-isopropyltoluene, tert-butylbenzene 0.2ng --> 100ng. CS2, 1,2-DCB and n-dodecane 0.5ng --> 100ng.						

RS 5/29/19

Injection Log

Directory: I:\MS08\Data\2019_07\22\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	7/22/19 7:26	07221901.D	CCV C8072219_25ng	S31-07111901/S31-06251904 (7/24)	RS	2	<i>passed/not used</i>
2	7/22/19 7:59	07221902.D	CCV R8072219_25ng	S31-07111901/S31-07151905 (8/13)	RS	16	<i>passed</i>
3	7/22/19 8:32	07221903.D	blank	S31-07111901	RS	4	
4	7/22/19 9:04	07221904.D	MB R8072219_1000mL	S31-07111901AS00703	RS	1	<i>passed</i>
5	7/22/19 9:36	07221905.D	LCS R8072219_25ng	S31-07111901/S31-07151909 (8/13)	RS	1	<i>passed</i>
6	7/22/19 10:09	07221906.D	P1904071-008 (0.90mL)	S31-07111901	RS	4	
7	7/22/19 10:42	07221907.D	P1904071-012 (0.17mL)	S31-07111901	RS	4	
8	7/22/19 11:15	07221908.D	P1904071-017dil (20mL)	S31-07111901	RS	8	
9	7/22/19 11:54	07221909.D	P1904112-001 (1000mL)	S31-07111901	RS	7	
10	7/22/19 12:27	07221910.D	LCSD R8072219_25ng	S31-07111901/S31-07151909 (8/13)	RS	1	<i>passed</i>
11	7/22/19 13:00	07221911.D	CCVend R8072219_25ng	S31-07111901/S31-07151905 (8/13)	RS	16	<i>passed</i>
12	7/22/19 13:34	07221912.D	P1904143-001 (2.0mL)	S31-07111901	RS	4	
13	7/22/19 14:07	07221913.D	P1904143-001 (2.0mL)	S31-07111901	RS	4	
14	7/22/19 14:41	07221914.D	P1904143-002 (0.5mL)	S31-07111901	RS	4	
15	7/22/19 15:17	07221915.D	P1904143-001 (5.0mL)	S31-07111901	RS	4	
16	7/22/19 15:49	07221916.D	P1904272-001 (1000mL)	S31-07111901	RS	8	
17	7/22/19 16:22	07221917.D	P1904272-002 (1000mL)	S31-07111901	RS	9	
18	7/22/19 16:55	07221918.D	P1904272-003 (1000mL)	S31-07111901	RS	10	
19	7/22/19 17:28	07221919.D	P1904272-004 (1000mL)	S31-07111901	RS	11	
20	7/22/19 18:00	07221920.D	P1904272-005 (1000mL)	S31-07111901	RS	12	
21	7/22/19 18:33	07221921.D	P1904272-005dup (1000mL)	S31-07111901	RS	12	<i>passed</i>
22	7/22/19 19:06	07221922.D	P1904212-001 (1000mL)	S31-07111901	RS	13	
23	7/22/19 19:39	07221923.D	P1904212-002 (1000mL)	S31-07111901	RS	14	
24	7/22/19 20:12	07221924.D	P1904212-003 (1000mL)	S31-07111901	RS	15	
25	7/22/19 20:45	07221925.D	P1904212-004 (1000mL)	S31-07111901	RS	16	
26	7/22/19 21:17	07221926.D	P1904143-003 (15mL)	S31-07111901	RS	5	
27	7/22/19 21:50	07221927.D	P1904143-004 (100mL)	S31-07111901	RS	6	
28	7/22/19 22:23	07221928.D	P1904143-004dil (25mL)	S31-07111901	RS	6	

RS 7/23/19

SIMIVALLEY QC Certification

Conditioner: P-Conditioner-03

Cycles: 36

Batch: 23860

Batch Started By: JHULETTE on 7/2/19 0749
Finished Cleaning By: JHULETTE on 7/2/19 0751

Container IDs	Cleaned Date	QC Date Analyzed	QC Results		Initial Vacuum		Final Vacuum		Comments	
					Vacuum	Date/Time	User	Vacuum		Date/Time
SC01691	7/2/19	7/2/19	Pass w/ Conditions		-14.3	7/2/19 0751	JHULETTE	-14.0	7/5/19 1024	JHULETTE
AC02002	7/2/19	7/2/19	Pass w/ Conditions		-14.3	7/2/19 0751	JHULETTE			
AC02464	7/2/19	7/2/19	Pass w/ Conditions		-14.3	7/2/19 0751	JHULETTE			
AC02222	7/2/19	7/2/19	Pass w/ Conditions		-14.3	7/2/19 0751	JHULETTE			
AC01139	7/2/19	7/2/19	Pass w/ Conditions		-14.3	7/2/19 0751	JHULETTE			
AC02048	7/2/19	7/2/19	Pass w/ Conditions		-14.3	7/2/19 0751	JHULETTE			
AC01101	7/2/19	7/2/19	Pass w/ Conditions		-14.3	7/2/19 0751	JHULETTE			
AC00435	7/2/19	7/2/19	Pass w/ Conditions		-14.3	7/2/19 0751	JHULETTE			
AC02430	7/2/19	7/2/19	Pass w/ Conditions		-14.3	7/2/19 0751	JHULETTE			
AC02143	7/2/19	7/2/19	Pass w/ Conditions		-14.3	7/2/19 0751	JHULETTE			
AC01946	7/2/19	7/2/19	Pass w/ Conditions		-14.3	7/2/19 0751	JHULETTE			
AS01091	7/2/19	7/2/19	Pass w/ Conditions		-14.3	7/2/19 0751	JHULETTE			
AC02309	7/2/19	7/2/19	Pass w/ Conditions		-14.3	7/2/19 0751	JHULETTE			
Passed For: TO-15 (75 Comp 0.1 ug/m3 + TICs)										
AC00998	7/2/19	7/2/19	Pass w/ Conditions		-14.3	7/2/19 0751	JHULETTE	-14.0	7/5/19 1023	JHULETTE
Passed For: TO-15 (client specified)										

99519_MS21_07/02/19

Batch Comment:

* QC Canister

Data Path : I:\MS21\DATA\2019 07\02\
 Data File : 07021915.D
 Acq On : 2 Jul 2019 12:50
 Operator : RVT
 Sample : 070219 AC00998 23860
 Misc : LL+TICS (Sig #1); S31-06191901 (Sig #2)
 ALS Vial : 3 Sample Multiplier: 1

RVT 7/3/19

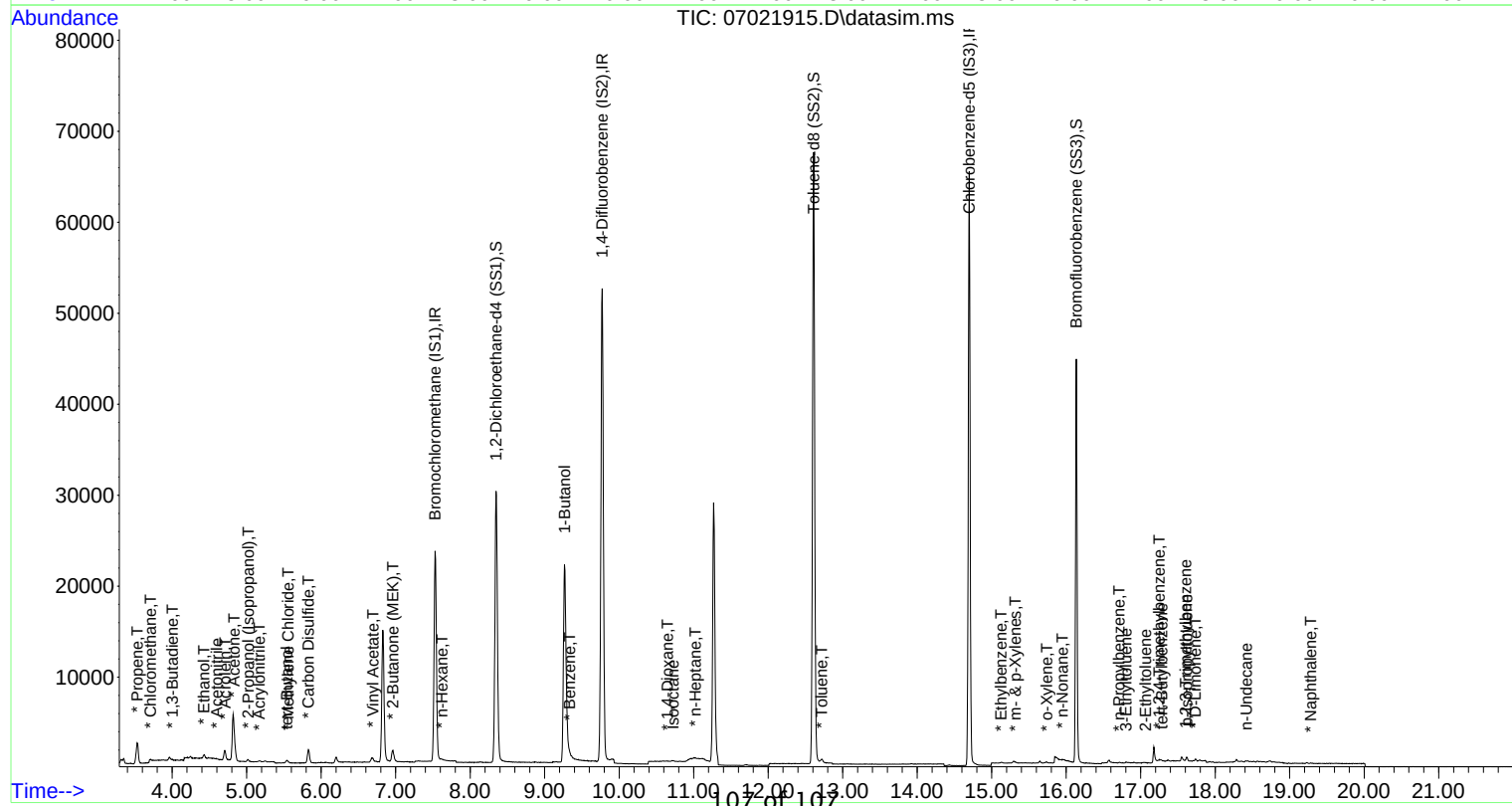
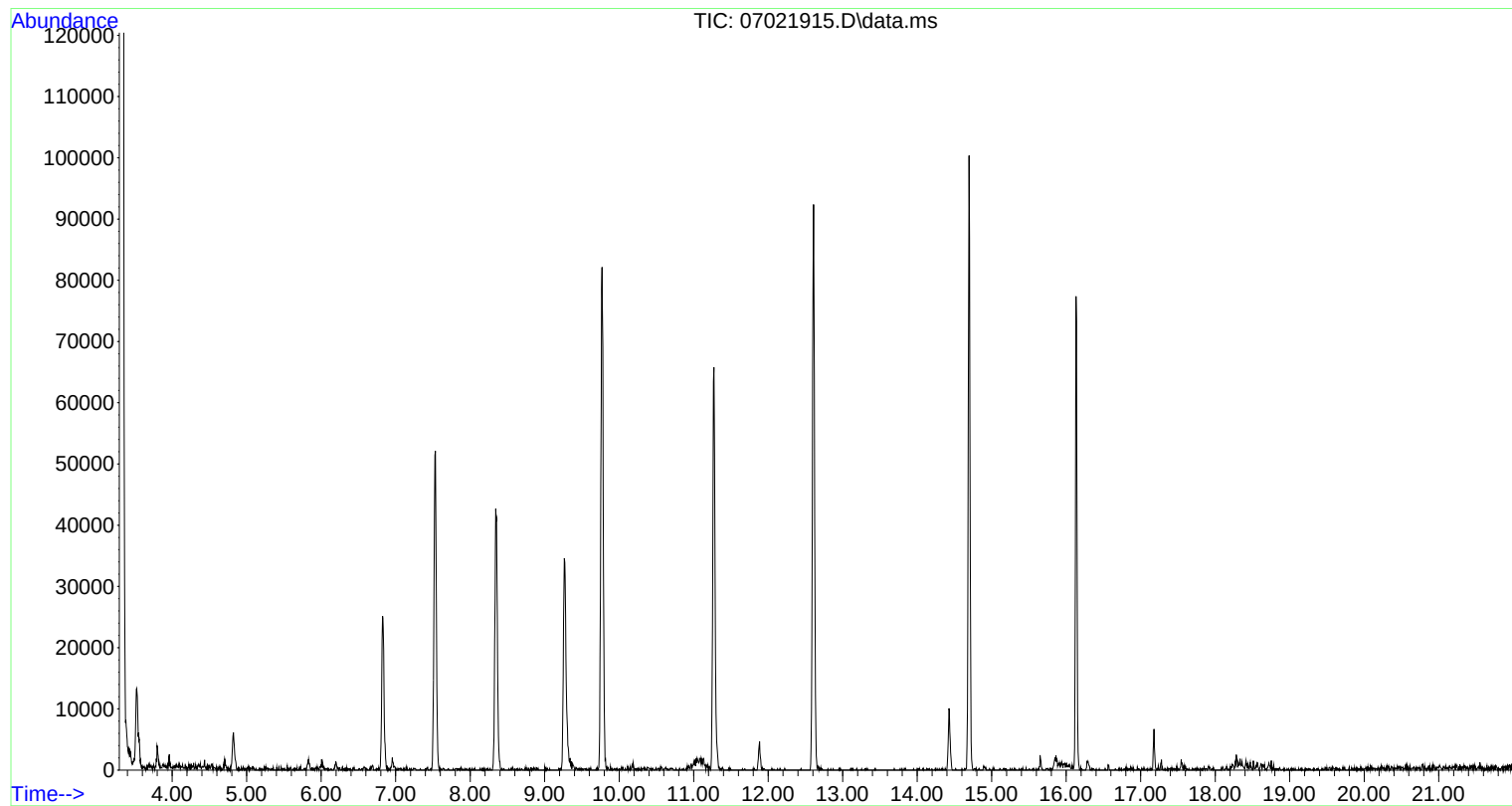
Quant Time: Jul 03 07:15:57 2019
 Quant Method : I:\MS21\Methods\F21061019.M
 Quant Title : EPA TO-15
 QLast Update : Mon Jun 10 08:35:54 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	7.53	130	29113	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.77	114	99599	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.70	117	67551	1000.000	pg	0.00
System Monitoring Compounds						
33) 1,2-Dichloroethane-d4 ...	8.35	65	47588	1360.018	pg	0.00
Spiked Amount 1000.000			Recovery	=	136.00%	
57) Toluene-d8 (SS2)	12.61	98	74334	1004.089	pg	0.00
Spiked Amount 1000.000			Recovery	=	100.41%	
74) Bromofluorobenzene (SS3)	16.14	174	31247	1050.714	pg	0.00
Spiked Amount 1000.000			Recovery	=	105.07%	
Target Compounds						
					Qvalue	
2) * Propene	3.53	42	803	32.388	pg	# 1
4) * Chloromethane	3.71	50	158	4.776	pg	# 40
7) * 1,3-Butadiene	4.00	54	23	0.951	pg	# 1
10) * Ethanol	4.43	45	413	32.322	pg	# 82
11) * Acetonitrile	4.60	41	86	2.335	pg	# 17
12) * Acrolein	4.71	56	1151	47.370	pg	# 95
13) * Acetone	4.83	58	3469	138.756	pg	# 69
15) * 2-Propanol (Isopropa...	5.02	45	318	7.732	pg	# 70
16) * Acrylonitrile	5.17	53	152	5.484	pg	# 66
18) tert-Butanol	5.54	59	344	11.645	pg	# 80
19) * Methylene Chloride	5.56	84	97	2.865	pg	# 19
22) * Carbon Disulfide	5.83	76	2727	25.716	pg	# 97
26) * Vinyl Acetate	6.70	86	121	24.338	pg	# 1
27) * 2-Butanone (MEK)	6.96	72	608	33.328	pg	# 98
31) * n-Hexane	7.62	57	63	2.119	pg	# 54
39) * Benzene	9.33	78	280	2.241	pg	# 53
41) 1-Butanol	9.27	56	24921	170.956	pg	# 82
48) * 1,4-Dioxane	10.65	88	54	2.063	pg	# 19
49) Isooctane	10.72	56	123	3.281	pg	# 1
51) * n-Heptane	11.02	71	65	2.356	pg	# 39
58) * Toluene	12.72	91	437	4.345	pg	# 99
66) * Ethylbenzene	15.13	91	109	1.350	pg	# 42
67) * m- & p-Xylenes	15.32	91	77	1.247	pg	# 28
71) * o-Xylene	15.74	91	111	1.644	pg	# 28
72) * n-Nonane	15.95	57	445	8.281	pg	# 31
77) * n-Propylbenzene	16.71	91	78	0.814	pg	# 51
78) 3-Ethyltoluene	16.80	105	76	0.956	pg	# 43
82) 2-Ethyltoluene	17.06	105	50	0.587	pg	# 42
83) tert-Butylbenzene	17.28	134	60	2.938	pg	# 1
84) * 1,2,4-Trimethylbenzene	17.25	105	114	1.642	pg	# 86
90) 1,2,3-Trimethylbenzene	17.61	105	55	0.714	pg	# 24
91) p-Isopropyltoluene	17.62	134	77	3.000	pg	# 91
93) * D-Limonene	17.73	68	109	5.552	pg	# 84
96) n-Undecane	18.42	85	148	23.294	pg	# 1
98) * Naphthalene	19.28	128	59	3.343	pg	# 66

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

Data Path : I:\MS21\DATA\2019 07\02\
Data File : 07021915.D
Acq On : 2 Jul 2019 12:50
Operator : RVT
Sample : 070219 AC00998 23860
Misc : LL+TICS (Sig #1); S31-06191901 (Sig #2)
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Jul 03 07:15:57 2019
Quant Method : I:\MS21\Methods\F21061019.M
Quant Title : EPA TO-15
QLast Update : Mon Jun 10 08:35:54 2019
Response via : Initial Calibration



Appendix G Data Quality Evaluation

DATA QUALITY EVALUATION

Quarterly vapor sampling of the Off Depot AS/SVE System effluent was conducted in October 2018, December 2018, April 2019, and June 2019. 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. 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 October 2018, December 2018, April 2019, and June 2019. An additional sample was collected in July 2019 to confirm anomalous results in the June 2019 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 (EPA) 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 are included as attachments in this Appendix. The SDGs and associated soil gas samples are listed on [Appendix E Table E-1](#). The following sections provide summary discussions of the required data qualifications for each sampling event. A Level III DQE was performed and the data quality indicators (DQIs), expressed in terms of precision, accuracy, representativeness, comparability, completeness, and sensitivity, were assessed. This included the evaluation of sample integrity, holding times, trip blanks, rinsate blanks, method blanks, internal standards, surrogate recoveries, LCSs, and field duplicate precision. The results of the DQI assessment are provided below.

Precision

An annual field duplicate was collected to assess sampling precision. It consisted of a replicate grab sample collected concurrently with the associated field sample. Precision is best expressed in terms of relative percent difference (RPD).

October 2018: All data are considered valid. Laboratory precision is discussed in more detail in the attached narratives.

December 2018: No duplicate sample pairs were collected during the sampling event.

April 2019: No duplicate sample pairs were collected during the sampling event.

June 2019: No duplicate sample pairs were collected during the sampling event.

July 2019: No duplicate sample pairs were collected during the sampling event.

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. Ethanol, acrolein, tetrachloroethene, and naphthalene were detected in the October 2018 method blank at trace concentrations. Naphthalene, acrolein, and tetrachloroethene did not require qualification in the sample. Ethanol was qualified in the field sample and lab duplicate as estimated with a possible high bias. Ethanol was detected in the December 2019 method blank at trace concentrations and was qualified in the field sample as estimated with possible high bias. No analytes were detected at trace levels in the April, June, or July 2018 method blanks.

There were no samples analyzed for MS/MSD during Year Eight. 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 – October 2018

A total of two soil gas samples, including one soil gas field sample and one QA/QC sample (a field duplicate), were collected from one AS/SVE location in October 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.

AS/SVE Event – December 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 December 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.

AS/SVE Event – April 2019

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 2019. 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 – June 2019

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 2019. The sample was analyzed for TO-15 VOCs. Although the analyses resulted in anomalous concentrations of non-typical analytes, 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 – July 2019

A total of one soil gas sample, including one soil gas field sample and no QA/QC samples (duplicates), was collected from one AS/SVE location in July 2019. 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.